RRR Design & Modeling with the FDOT Civil 3D State Kit

Florida Department of
TRANSPORTATION

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Session Objectives:

Part 1

- **Drawing Creation, External Reference's and Data Shortcuts**

  Create a new file Data Reference in objects such as Alignments, Surfaces, Pipe Networks, View Frames and Corridors.

- **FDOT Existing Conditions Subassembly**

  Utilizes existing survey data and a custom subassembly to create existing feature and Right of Way Cross Sections.

- **FDOT Existing Lane Slope**

  Works Similar to FDOT Existing Features Subassembly.

- **Cross Sections**

  Cover steps to create FDOT Civil 3D Cross Section with Existing Conditions.

Session Objectives:

Part 2

- **Subassemblies Essentials**

  Create assemblies and edit parameter's specific to FDOT subassemblies. Examine how to organize and work with tool pallets.

- **Corridor Modeling Essentials**

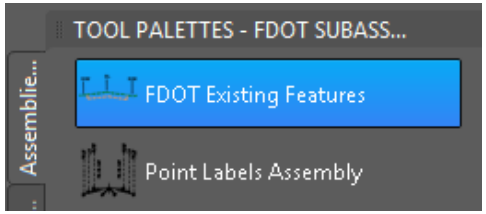
  Build a Corridor, assign width and profile targets, edit parameters. Create Surfaces and extract boundary's.

- **Cross Sections Sheets**

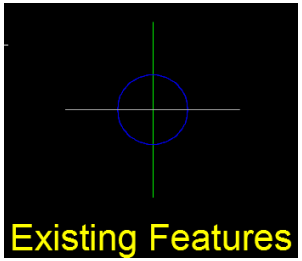
  Cover steps to create FDOT Civil 3D Cross Section sheets with Existing Conditions and Proposed Conditions.

Special Purpose Corridors for C3D

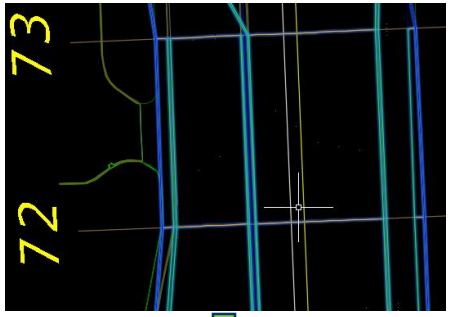
Tool Palette – FDOT Subassembly



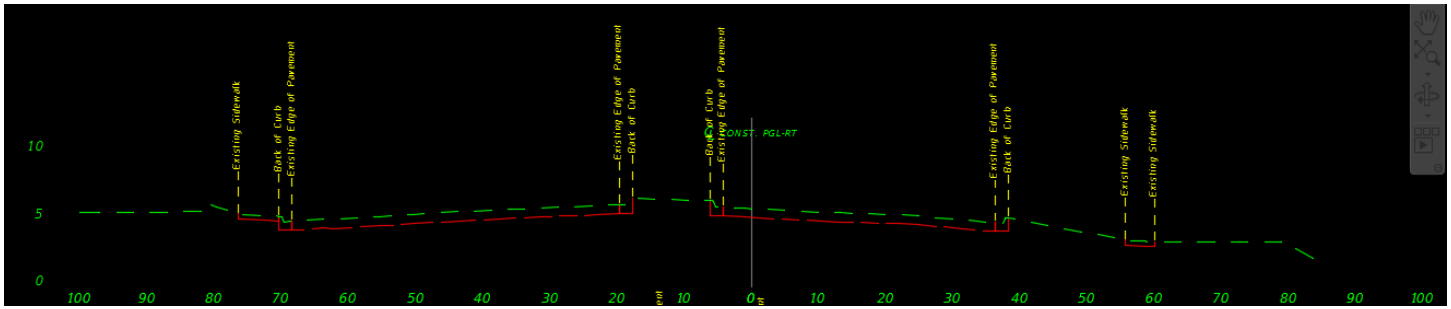
Assembly



Corridor



Cross Sections

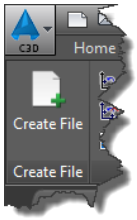


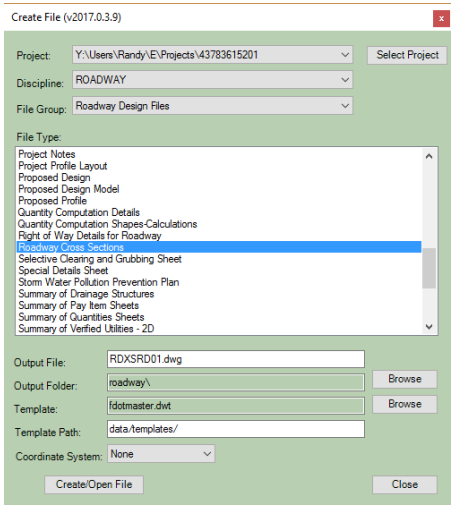
Existing Features

This subassembly searches a set width at each station for intersecting plan graphics and creates a corridor with below ground features; pavement, curbs, shoulders, sidewalks, as well as at grade traffic separators, guardrails and fences for cross sections. It then draws existing features that connect to the defined surface.

Requirements to Create Cross Sections drawings .dwg's.

- Use "Create File" tool to create FDOT compliant files for Cross Sections and assign Coordinate System. Save .dwg. For Drainage Structure Cross Sections set Discipline to Road and File Group to Drainage Design Files.

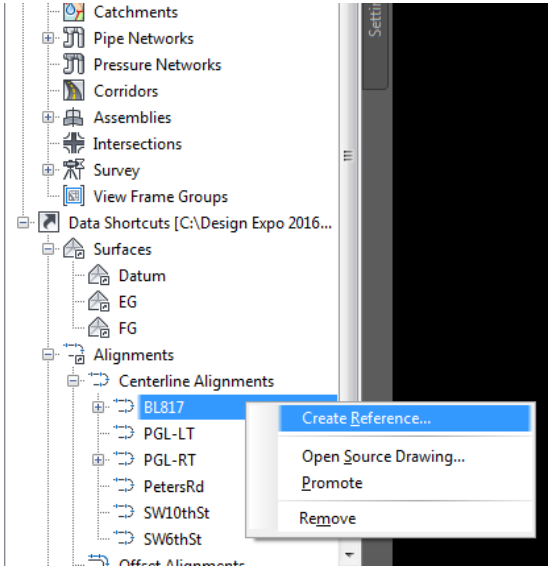


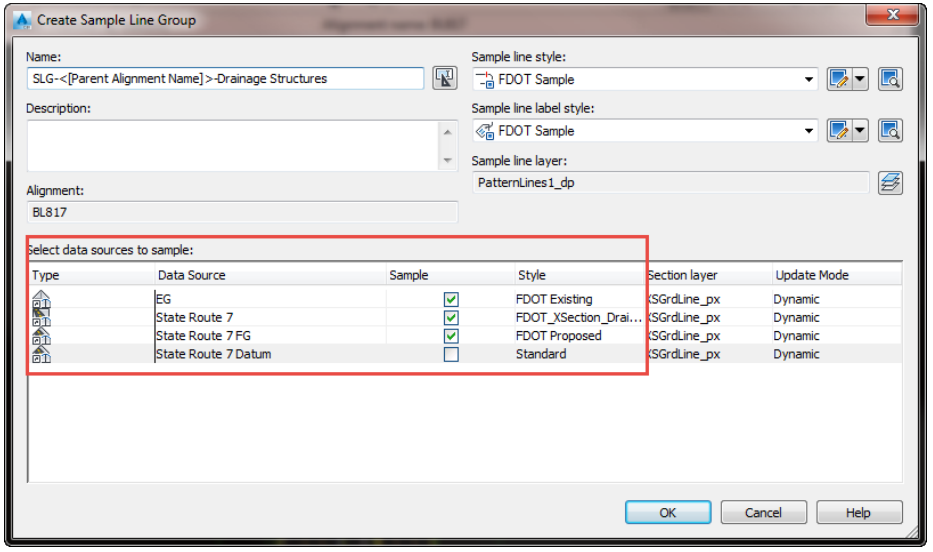


- Attach External Reference's (Xref) .dwg's. Set Current layer to Xreference##_dp and Xref in required drawings for Corridor Sampling. (FDOT Standard name should begin CORRRD##.dwg) Make sure everything in the "Attach External Reference" dialog box is unchecked. "Reference Type" can be set to Overlay since Cross-Sections drawings are created in the same file and not duplicated.
- During the Save process, associate the drawing to the Current/Desired project.

Requirements to Create Cross Sections .dwg's.

- Attach Data References (D-ref's) required for Cross Sections Ex Alignments, EG surfaces, FG surfaces, Pipe Networks.
- The Sample Lines command will not work if there is no Alignment in the file.
- Some surfaces will not need to be D-ref'd in due to Sample Line groups ability to Sample Data sources from an Xref.

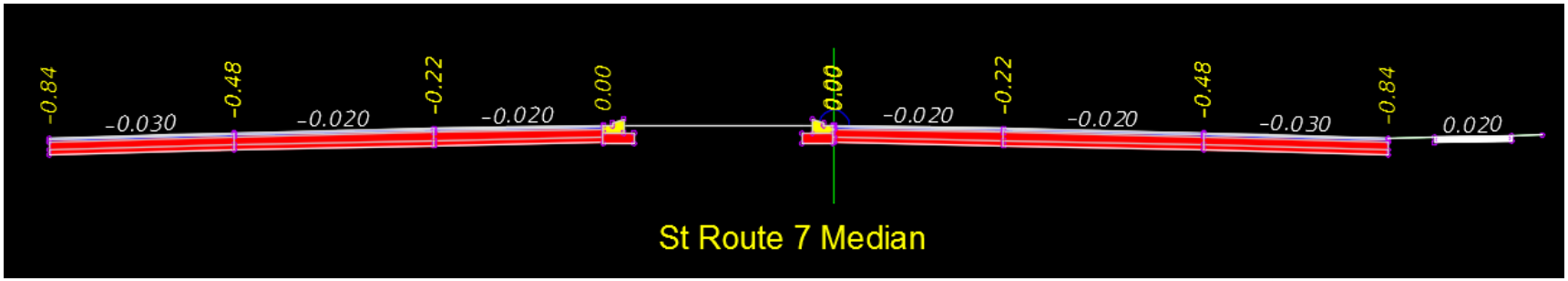




What are Subassemblies?

- A subassembly is a building block of a typical section, known as an assembly. Examples of subassemblies include lanes, curbs, sidewalks, railing, trenches, daylighting, and any other component required to complete a typical corridor section.

- FDOT has created many subassemblies that are specific to FDOT Design Standards.

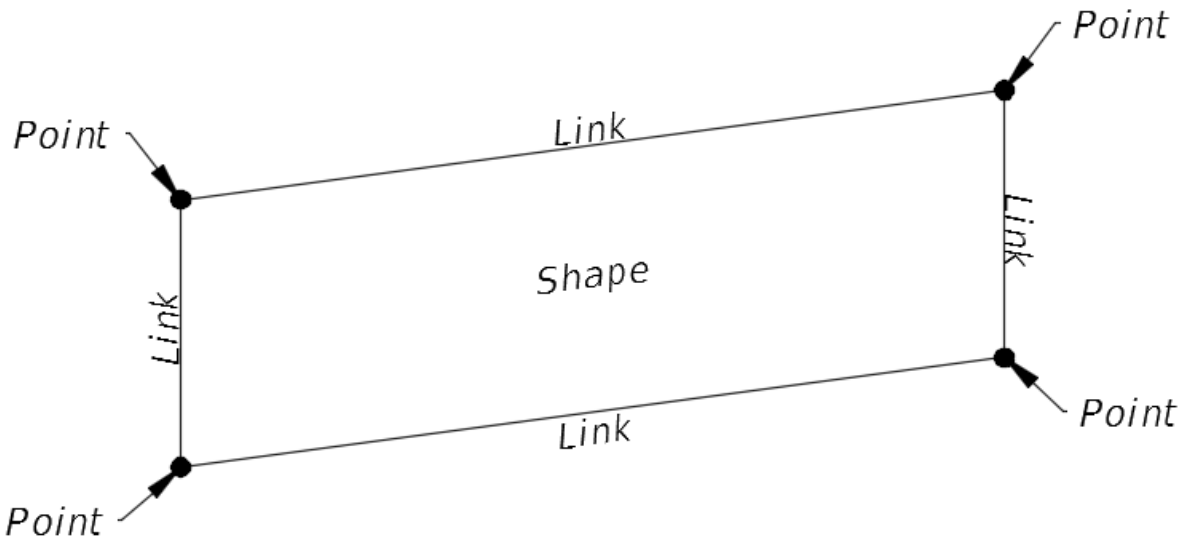


What are the elements of a Subassembly?

- Subassembly is made up of thee basic parts.
  - Points
  - Links
  - Shapes

Each piece is used for different purposes at each stage of your design process.

Schematic showing parts of a subassembly



What are the elements of a Subassembly?

➢ Point

- Marker points are located at the endpoints of every link.
- Used to “click” subassemblies together or “hook” to alignments and/or profiles known as targets.
- Controls automatic labeling.
- Coded points are used to connect the dots between each occurrence/frequency of the assembly.
- Creates feature lines which can then be used almost anywhere.

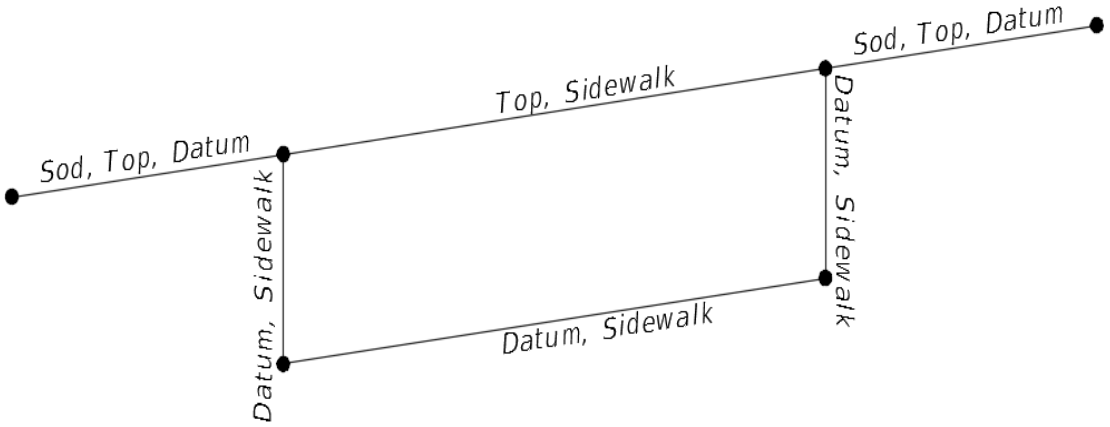
Points and point codes on the FDOT Sidewalk subassembly

What are the elements of a Subassembly?

➢Link

- Linear components that usually represent the outer edges of an assembly.
- Links have codes assigned to them that identify stratum materials and shapes.
- Controls automatic labeling.
- Simplifies surface creation. Top and datum codes are used to build surfaces

Links and link codes on the FDOT Sidewalk subassembly

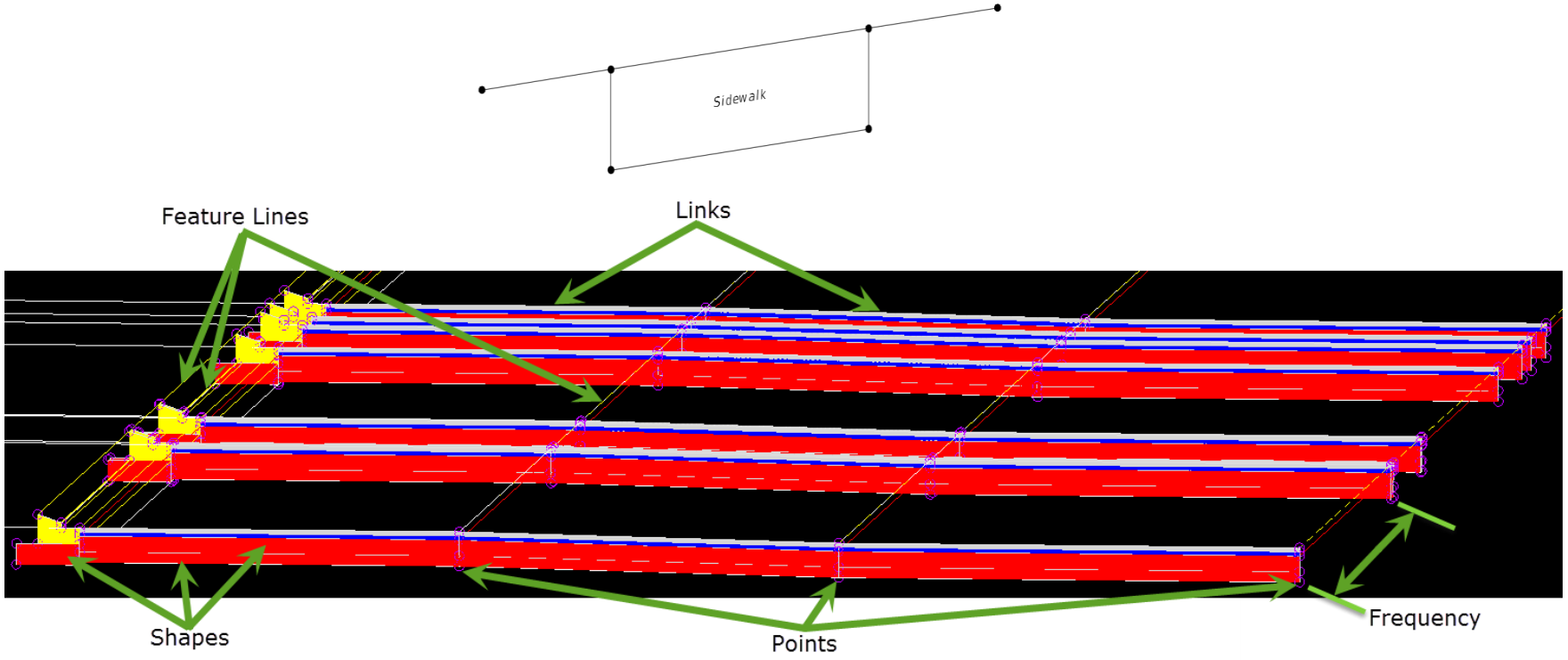


What are the elements of a Subassembly?

➢Shape

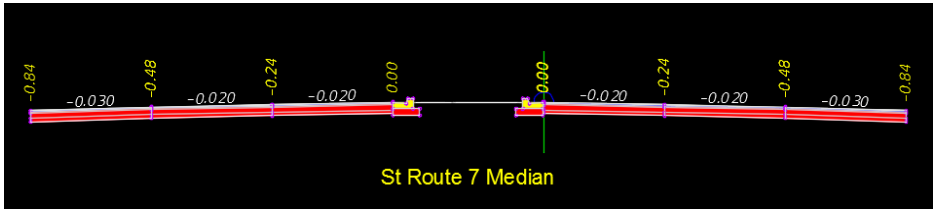
- Shapes are the areas inside a closed formation of links.
- Shapes are used for creating volumes or end-area material quantity calculations.

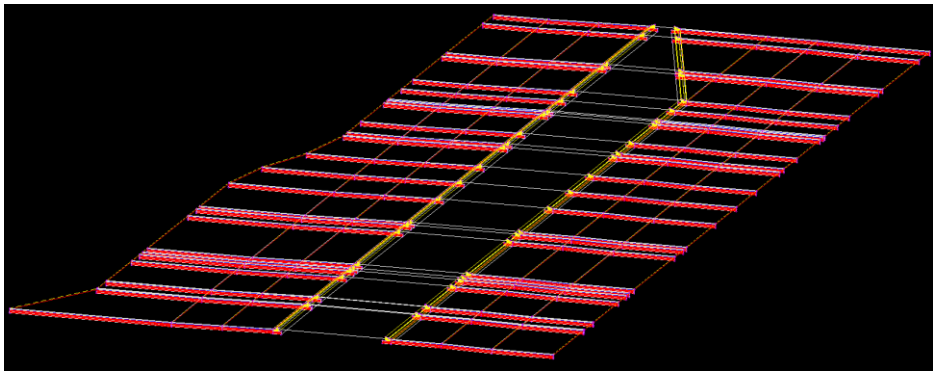
Shape codes on the FDOT Sidewalk subassembly



What is a Corridor?

- A corridor object is a three-dimensional model that combines the horizontal geometry of an alignment, the vertical geometry of a profile, and the cross-sectional geometry of an assembly.
- Corridors can be used to model many linear designs such as roads, channels, trenches, tunnels…
- In a transportation project the corridor is a critical element of the 3D model. Use Autodesk Civil 3D and the FDOT State Kit to create corridors that meet FDOT CADD standards.





What are the components of a Corridor?

➢ **Five components.**

Baseline

- First component for any Corridor.
- Baseline or Alignment must contain the horizontal layout, and a profile providing the vertical layout.

Region

- When the geometry along a base line requires a new assembly, a new region is needed.
- Each region has a start and end station, and may not overlap.

Assembly

- Assembly's are required to generate the corridor by providing cross-sectional information to be applied a along some of all of the length of the baseline. Assemblies contain the subassemblies that are coded with marker points, links and shapes that generate roadways, curbs, sidewalks…

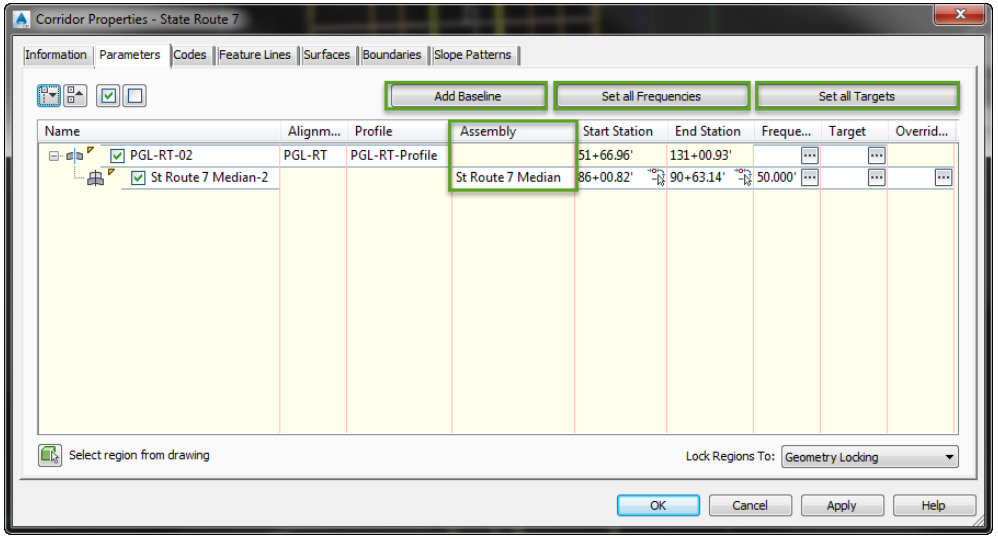
What are the components of a Corridor?

Frequency

- Frequency refers to how often the assembly is applied to the corridor.
- You specify the frequency and placement settings for station along the corridor.

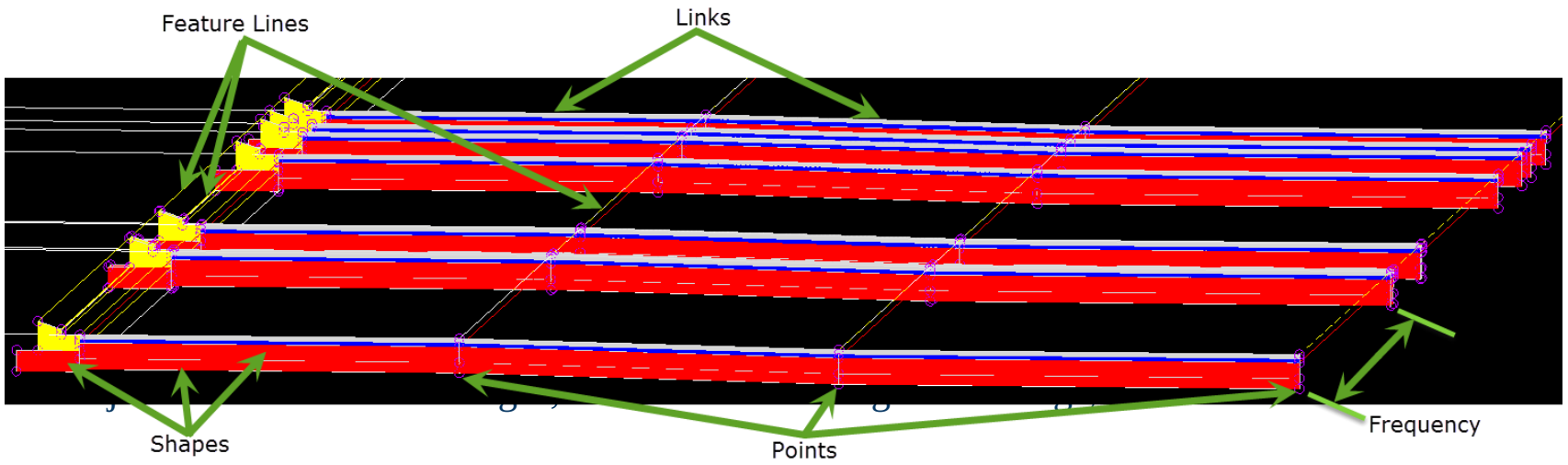
Targets

- Targets are used to change the corridor geometric characteristics such as cross slope (elevation targets) and lane width (width targets).
- Surface targets can be used for daylighting.
- Refer to each assembly help file for a detailed explanation for targeting options.

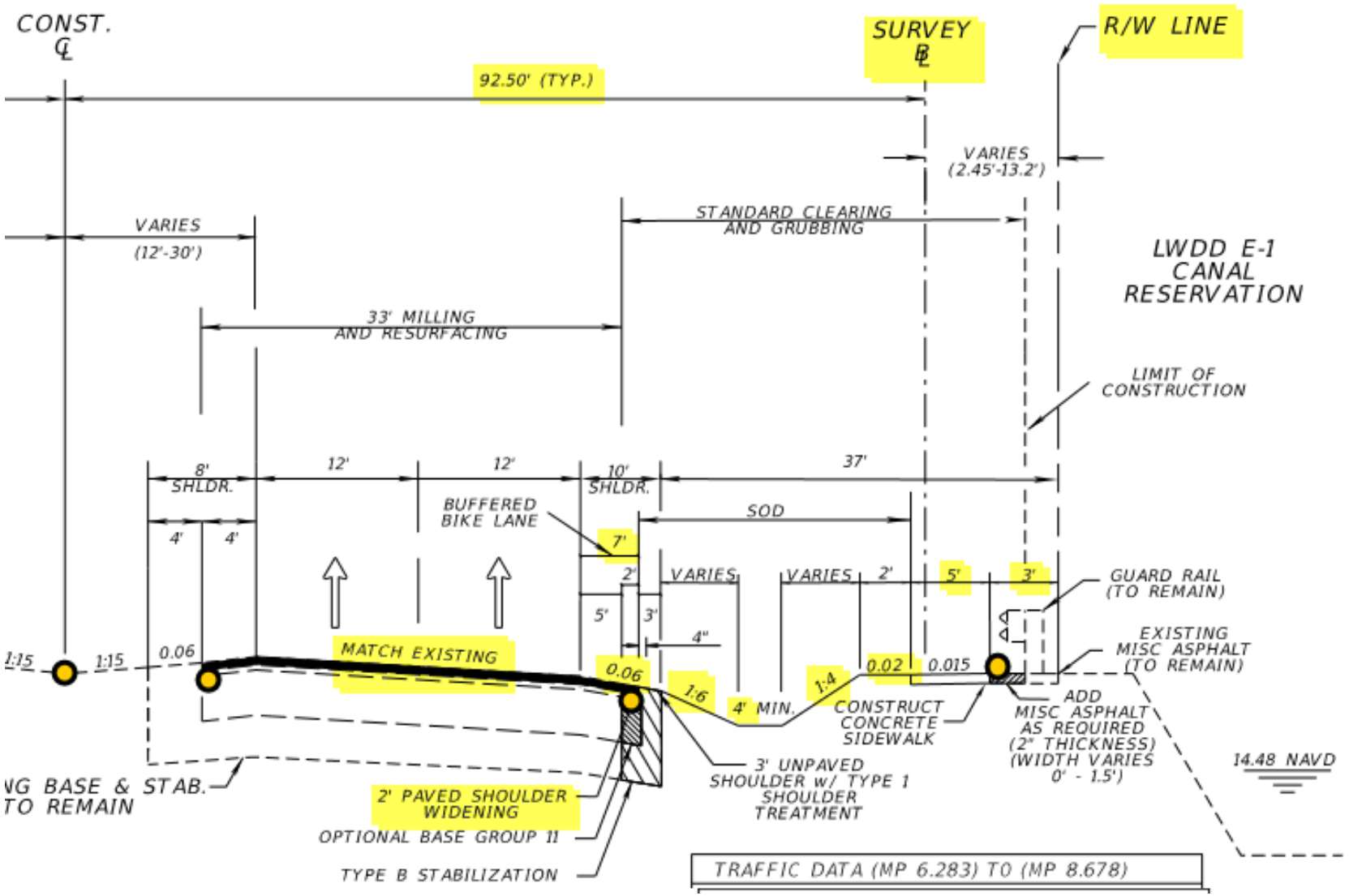


Corridor Feature Lines.

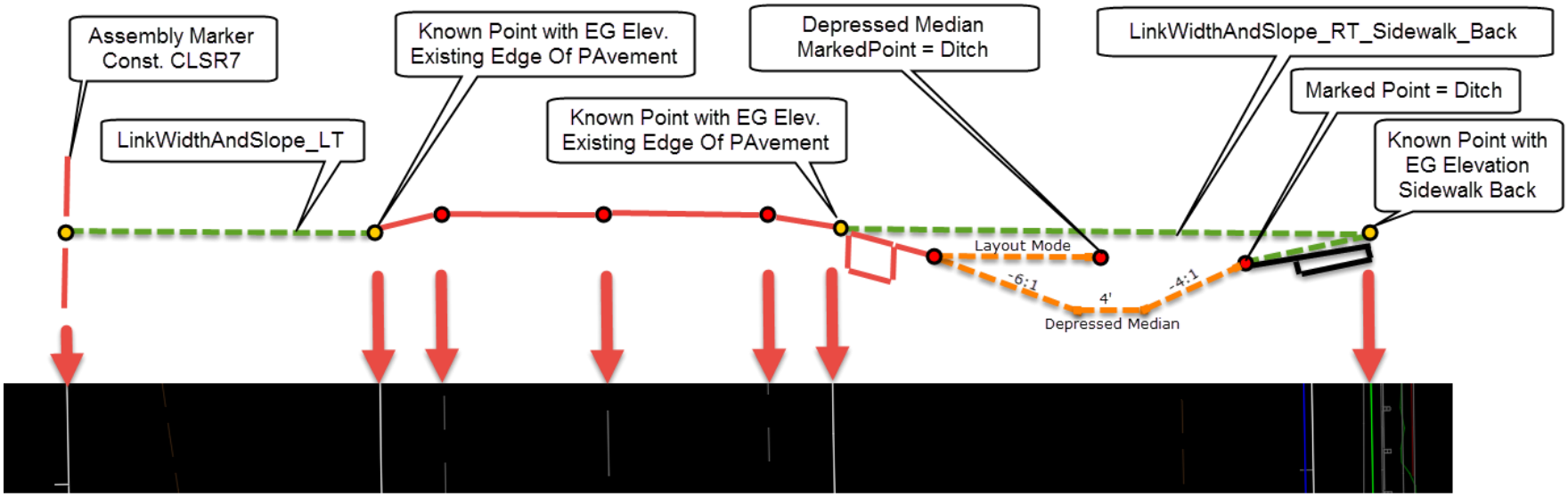
- When a corridor is created feature lines are generated. Feature lines are drawn along the corridor, connecting points with identical codes in between assembly frequencies.
- Feature lines can represent back of curb, top of curb, edge of pavement, crowns.



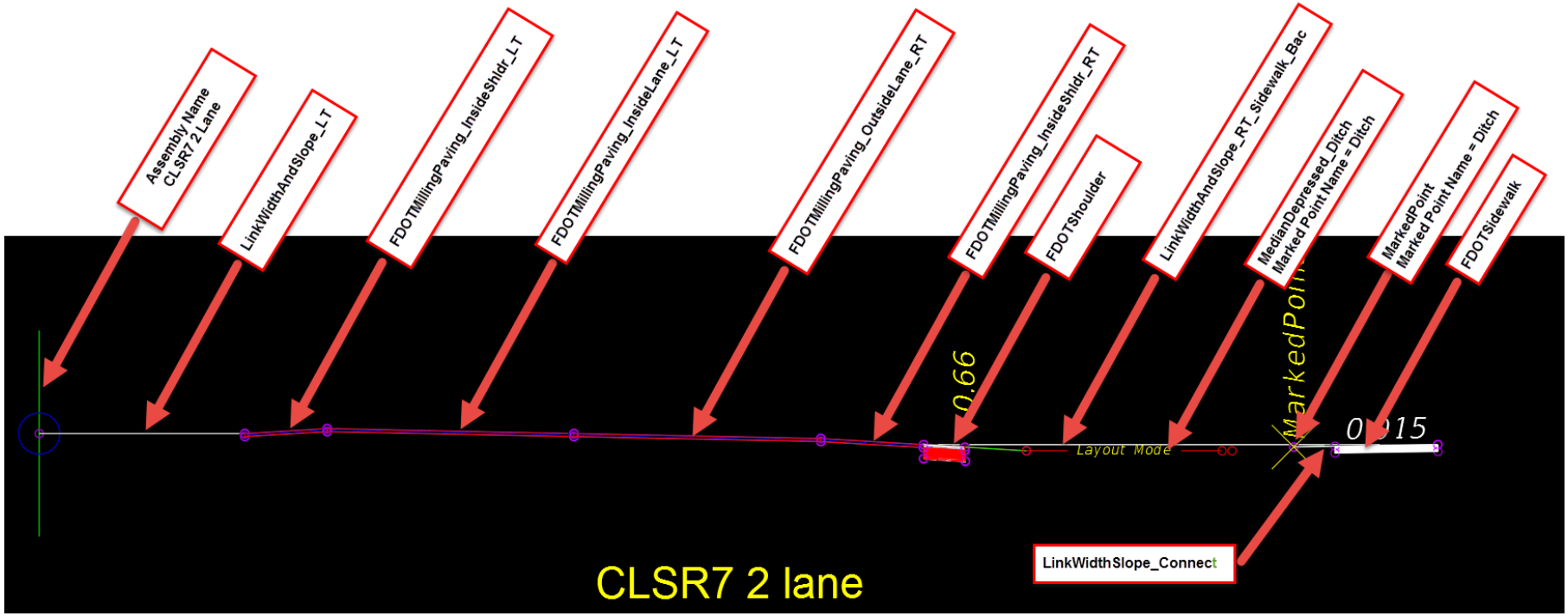
Typical Detail



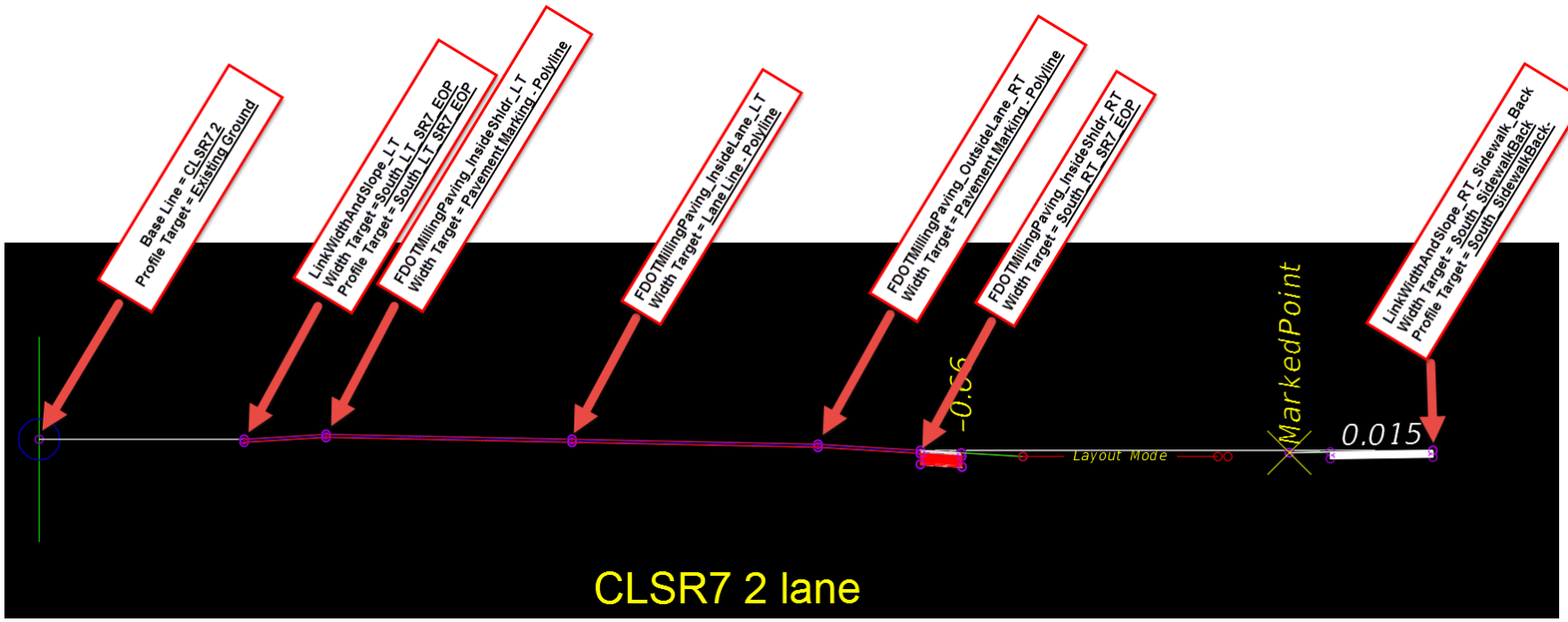
Assembly Layout Schematic Idea



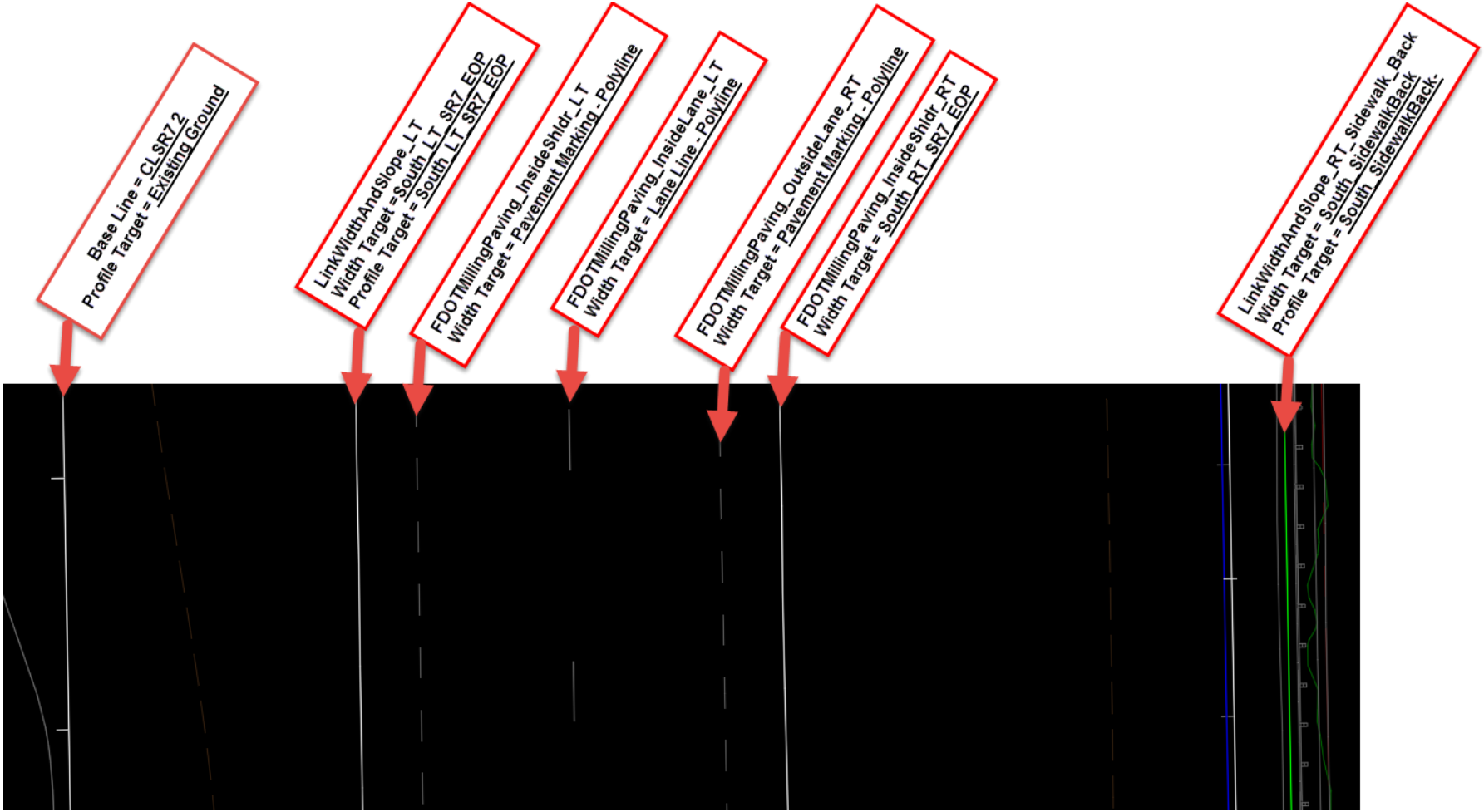
Assembly Name and Layout



Corridor Targets and Profiles



Plan view Corridor Targeting



Thank You!

Questions?

Email me:

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