

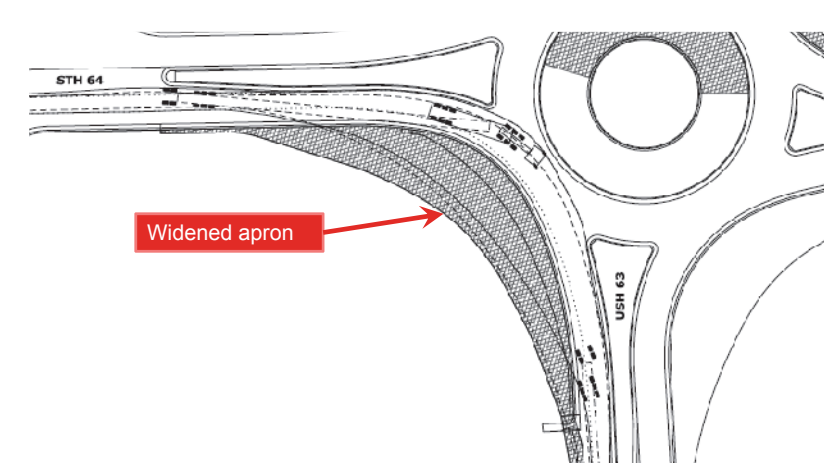
Roundabout Design, Construction Plans and Specifications: Development and Application of Best Practices

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Credits to Eric Gwidt, P.E. of WisDOT and Ben Wilkinson, P.E. of MSA Professional Services, Inc. for their contribution to the poster board content.

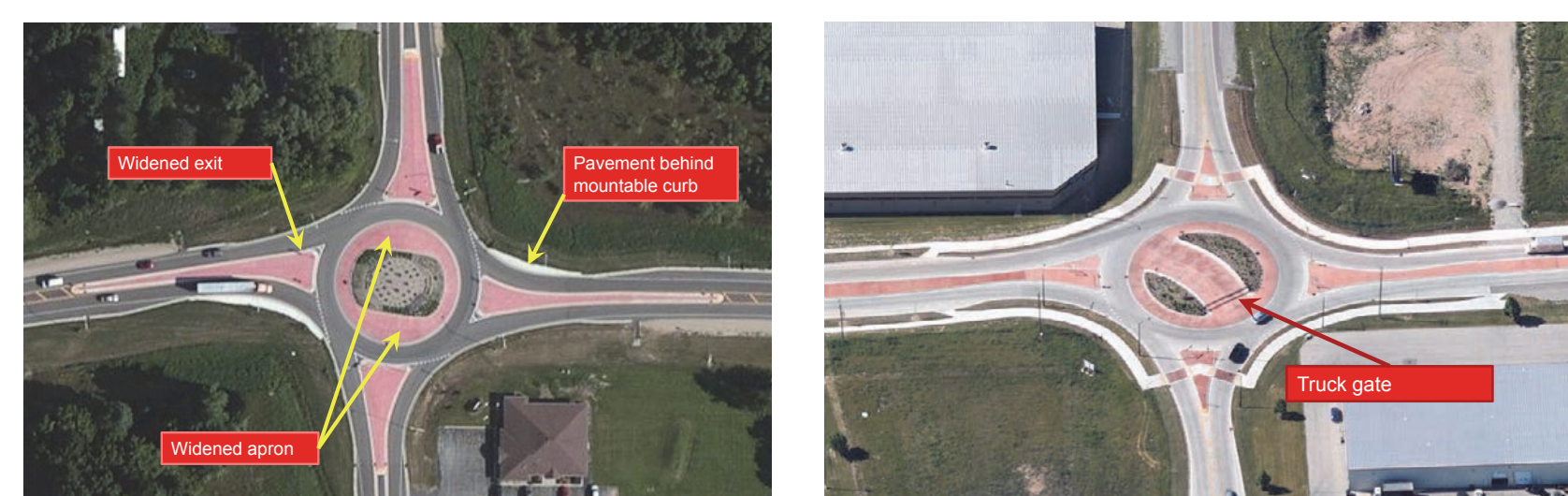
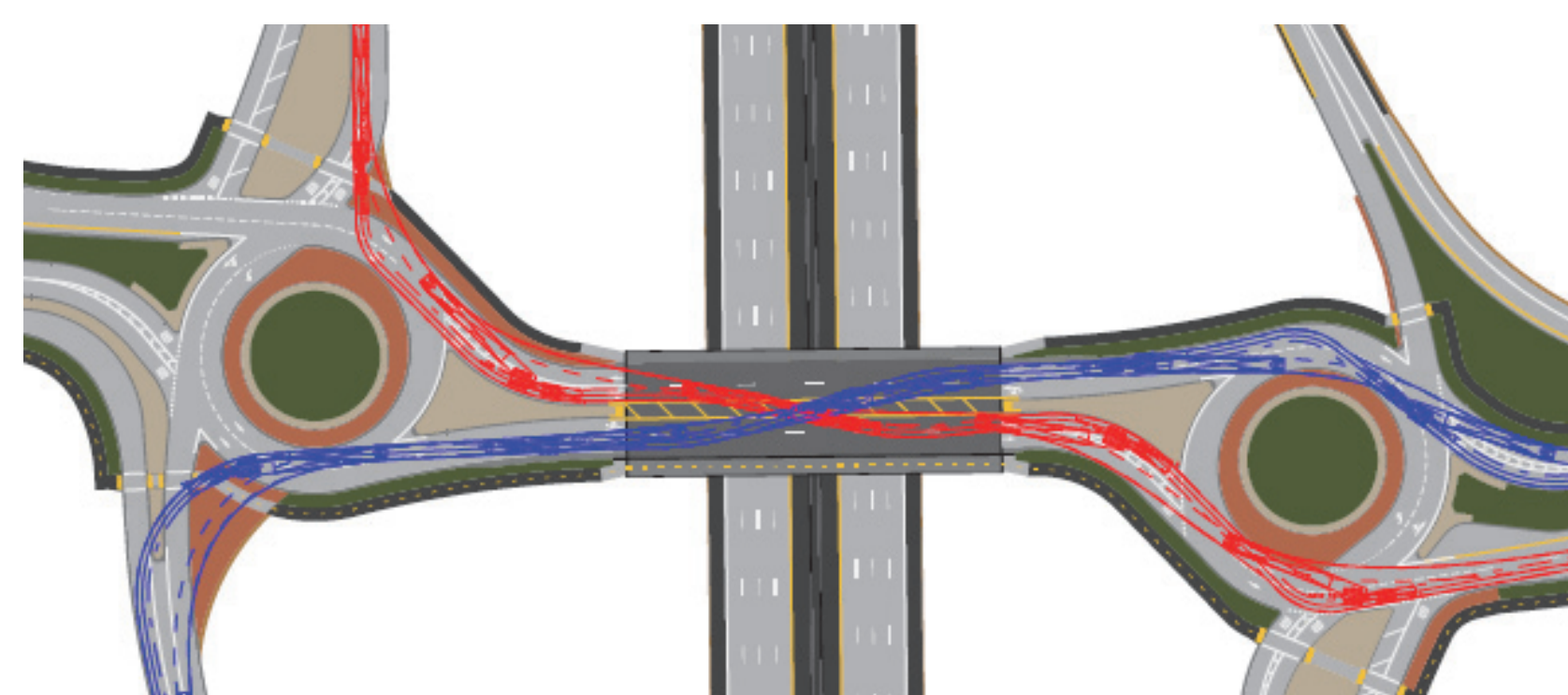
DESIGN

The state of Wisconsin is committed to safe, efficient freight travel. Oversize Overweight (OSOW) evaluation is an important aspect of WisDOT's design process for all intersections along OSOW routes.



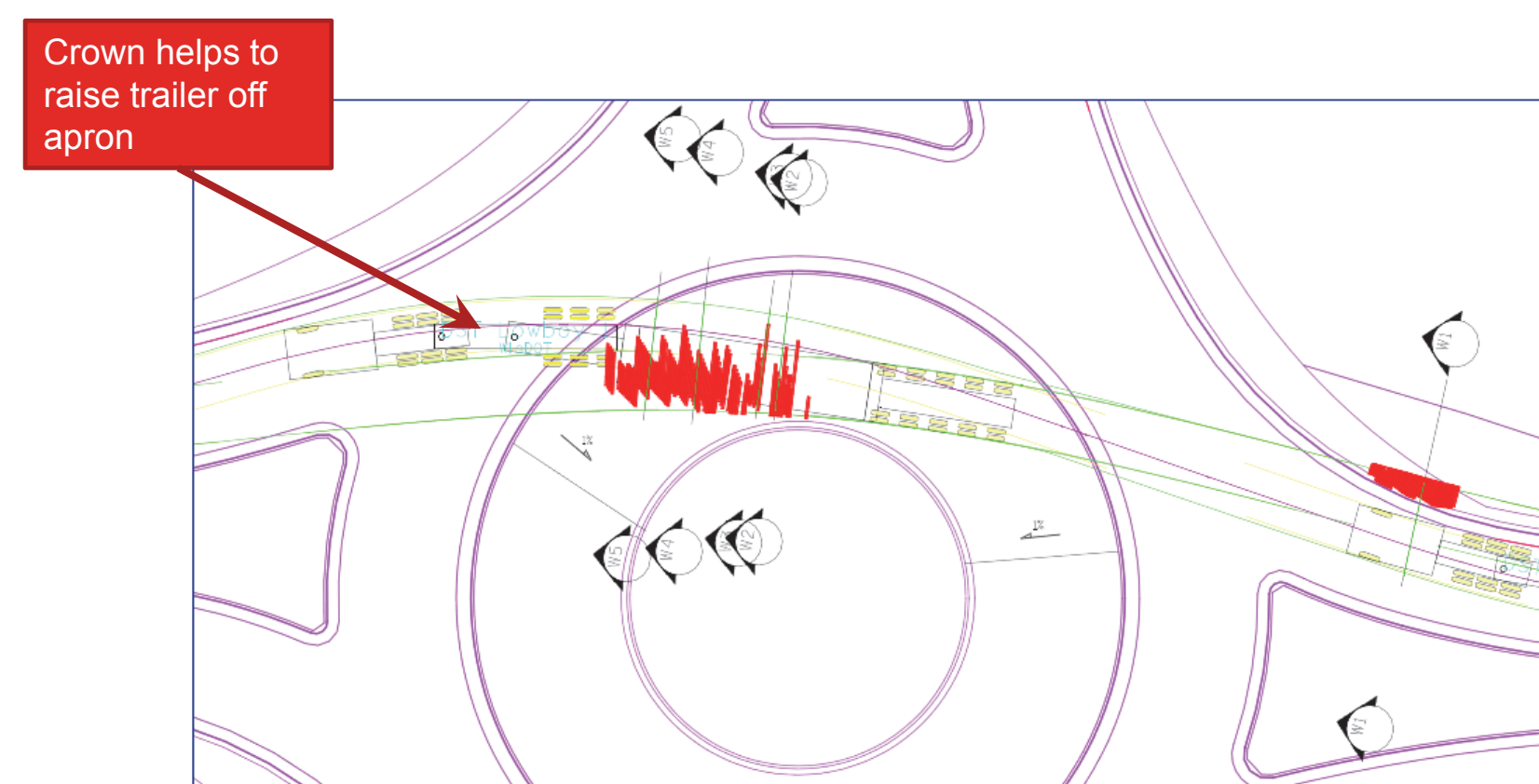
WisDOT has implemented the following OSOW accommodations at roundabouts:

- Widened entries and exits
- Wider truck aprons
- Outside truck aprons behind mountable curb
- OSOW crossovers
- Counter-directional movements
- Removable signs



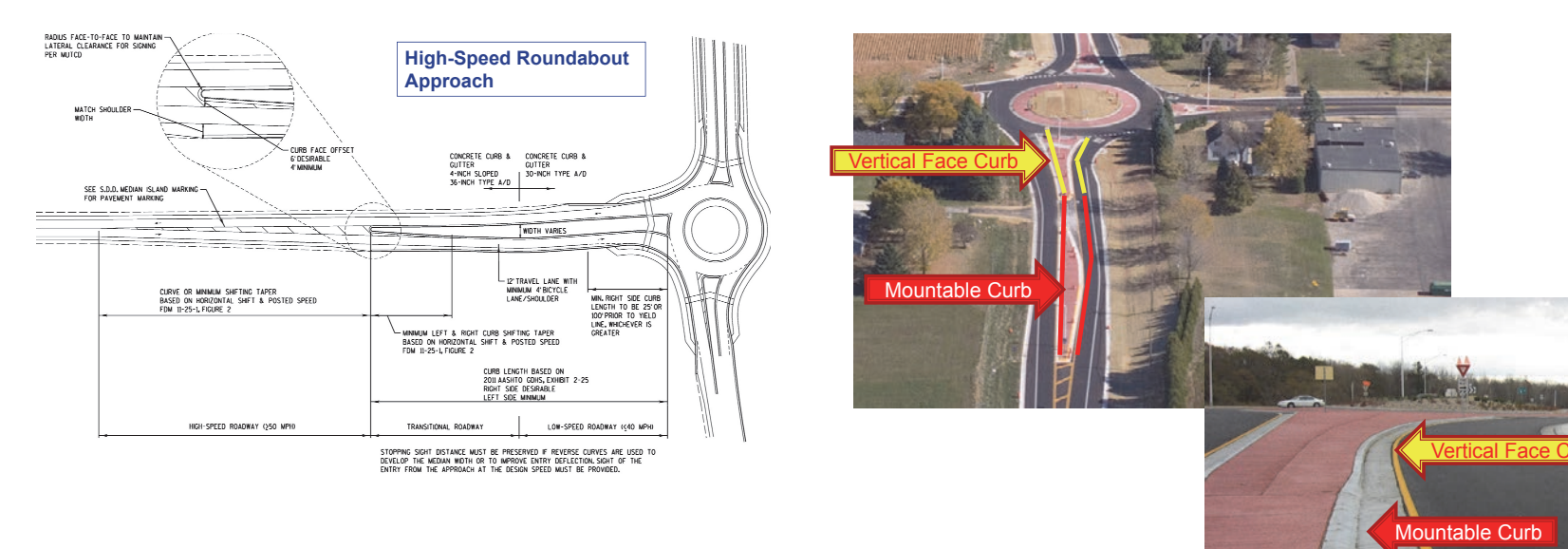
Vertical underclearance is also evaluated to help accommodate low OSOW vehicles. WisDOT uses the following design criteria:

- Slope truck apron at 1% toward the roadway
- Circulatory roadway should be crowned
- Use 3"-4" mountable curb between the driving surface and the truck apron or over-tracking area



High-speed roundabout approaches are designed by transitioning the facility between high-speed (>55 mph), transitional and low-speed (<40 mph) roadways. Vertical curb is introduced in the transitional segment. Typically this will require a total reconstruction length of about 1000 feet to complete the approach work.

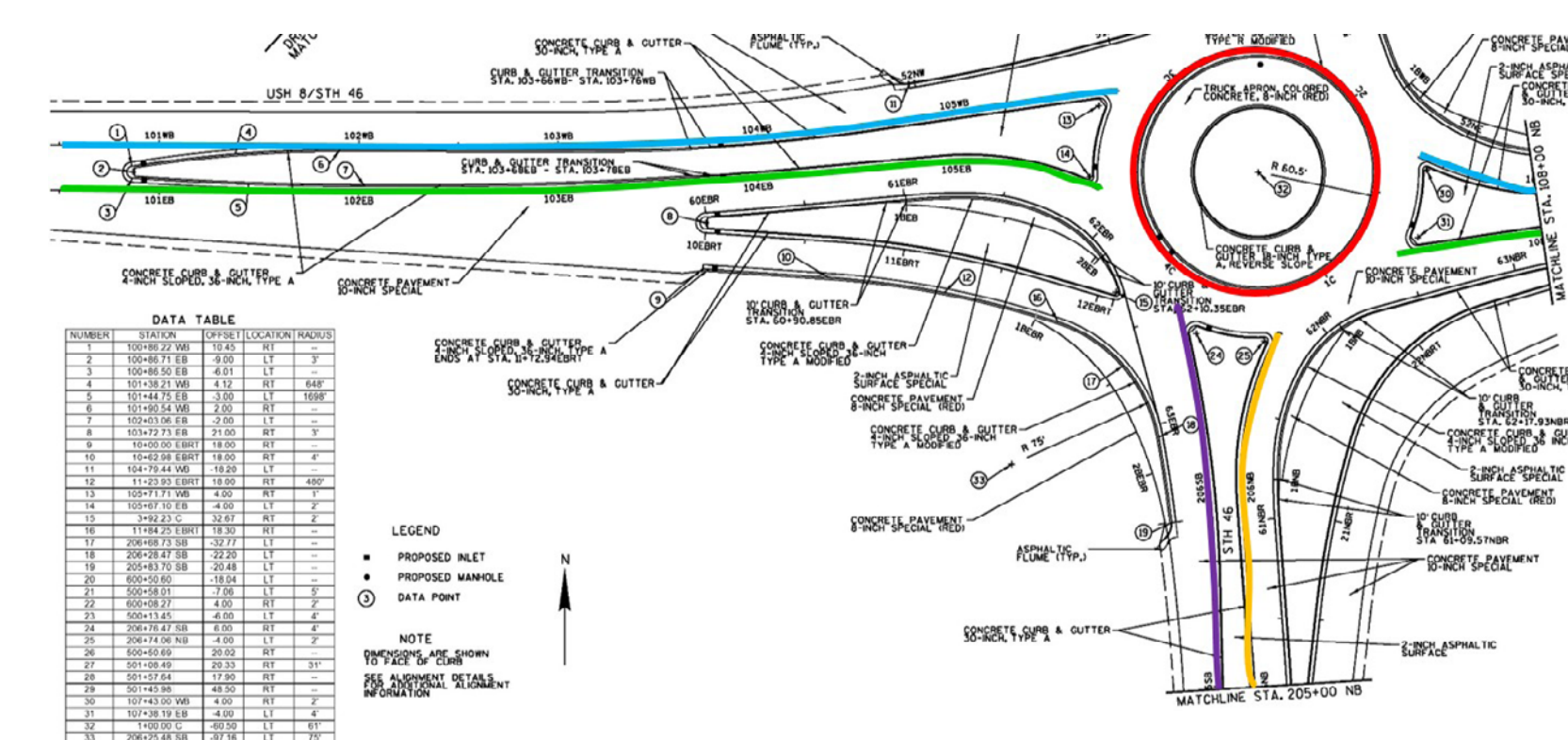
Superelevation is designed based on the low-speed urban criteria once deceleration is lowered to 45 mph. Speed for the curve is designed based on its distance from the yield line and the deceleration length determined from AASHTO Exhibit 2-25.



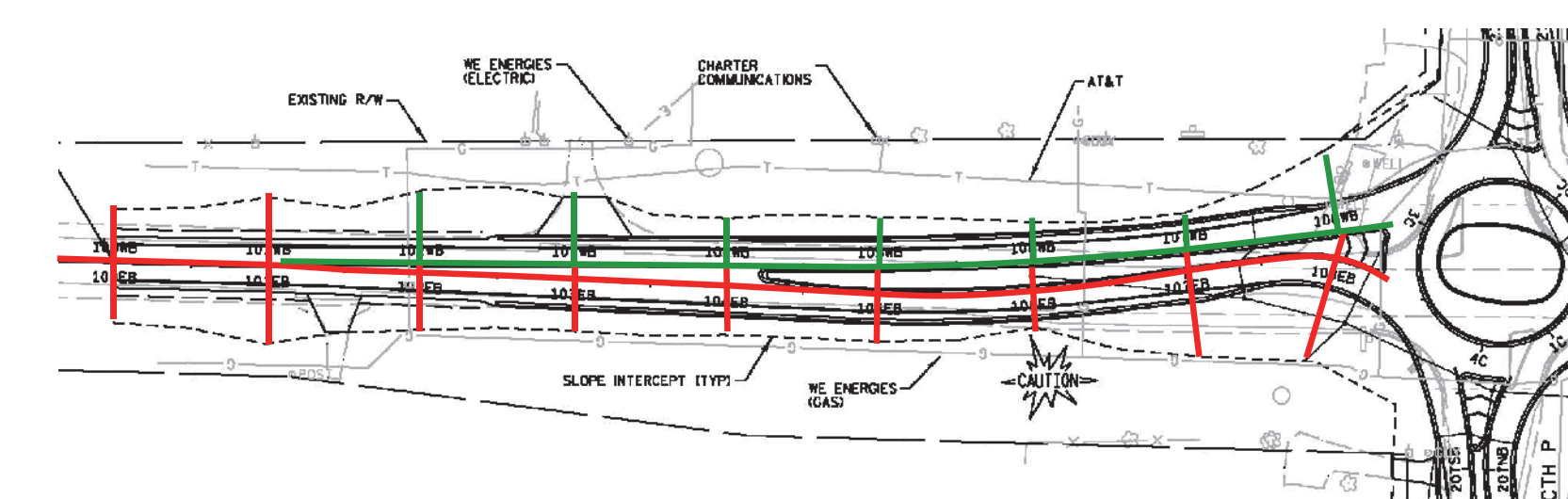
CONSTRUCTION

Roundabout plan preparation is similar to other intersection and roadway project types. Complete plan sets are developed and should include everything from essential typical cross sections, alignment, plan/profile and quantity sheets through detail paving grades, longitudinal jointing, lighting, landscaping and pavement marking/signing plan sheets. Include staged construction plan sheets if the roundabout is constructed under traffic.

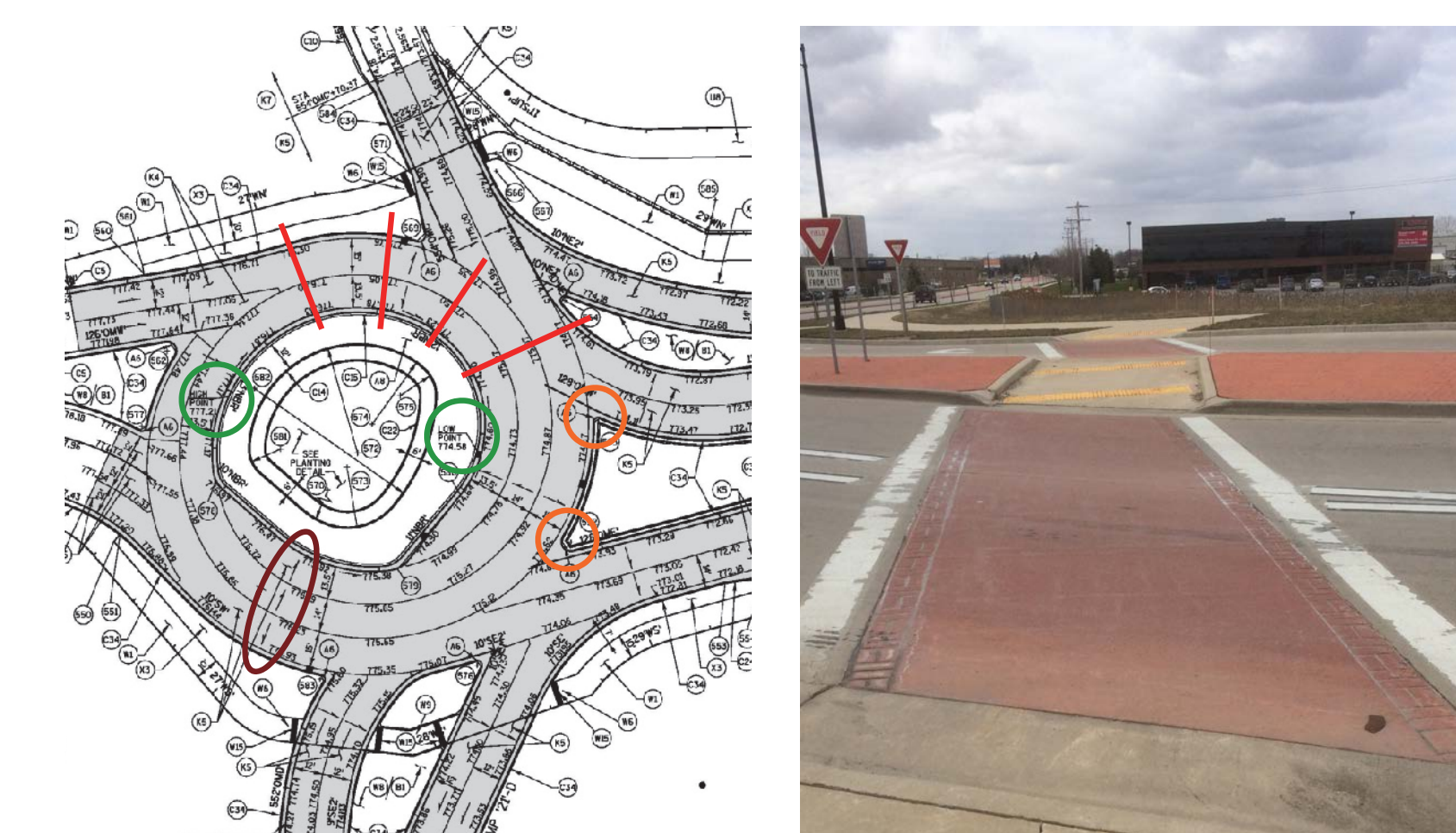
The main alignments, including circulatory roadways, typically are located along curb flange lines throughout the entire roundabout. Designers should economize the number of alignments, as too many can be confusing.



Due to the approach curvature, develop half cross sections along each of the main alignments. Cross sections are then cut at right angles to the alignments rather than skewed. Create match lines to correlate between the two alignments and to validate earthwork quantities. The designer should create separate sections for circulatory roadway and bypass lanes.



Paving grades and jointing details are some of the most important sheets developed. They are used directly in the field for contractor survey checks and paving sequence development. The detail should include all curb and gutter lines, longitudinal joint lines and surface utilities. Include elevations at minimum 25-foot intervals, island noses and high/low points. Include slope arrows. Splitter island/median drainage can be a plan challenge and may require construction elevation adjustments.



A big challenge for contractors is creating a paving sequence. For concrete roundabouts they must be wise with how to pave large sections to be productive but yet not lock themselves out of areas. Below is a plan developed by a contractor that shows how the concrete paving will be sequenced. The contractor elected to hand pour within the roundabout versus with a paver to allow for faster pour sequencing and more effectively accommodate variable widths, reducing the total time to pave the roundabout.

