Stringless Paving Quality

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Route 364 – Quality Overview

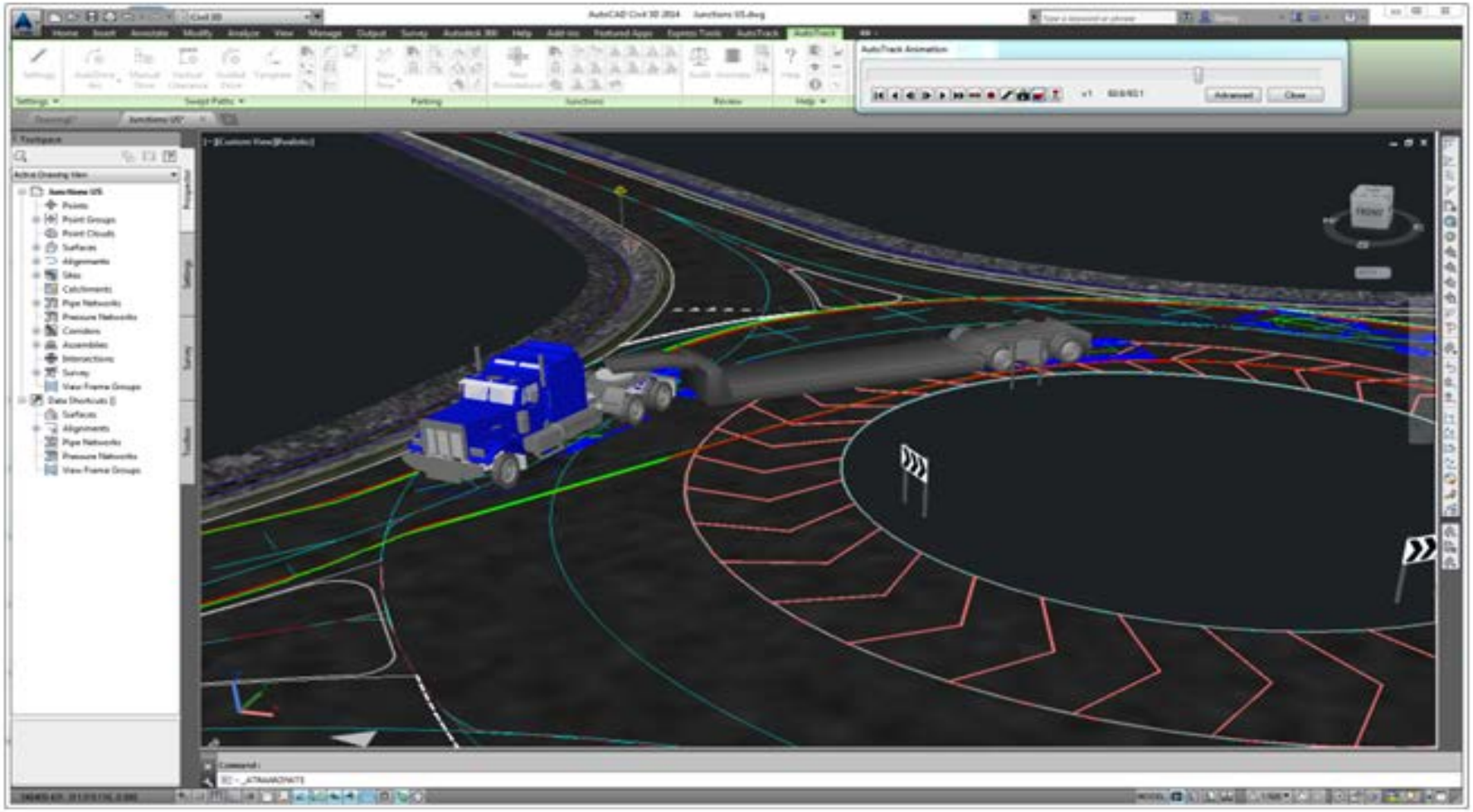
- Over 45 miles of new concrete pavement
- 36 Calendar days since paving began
- 77 Calendars day until open to traffic

- Utilizing stringless paving and traditional stringline paving
- One of the largest paving project in the state of Missouri

Who has a role in Pavement Quality?

- Surveyor
- Roadway Designer
- Drafter
- Construction Inspector
- Operator
- Laborer
- Pavement Designer
- Concrete Finisher
- Grade Checker
- Concrete Plant
- Material Supplier
- Concrete Driver

Starts with Design



Route 364 Design

- MoDOT provided LiDAR Data
- Discrete levels for each feature (Pavement, Cap Rock, Rock Base, Subgrade)
- Allows the Contractor to select the relevant features based on item of work
- Land XML versions of all proposed surfaces and DXF 3D Drawings

Design Quality Overview

- QC/QA checks to verify 3D features connect perfectly
- Concerns with paving at cross-road intersections making sure grades work out
- Concerns with grading at drainage-related transitions (tying into a detention facility)
- Verify level of detail in model where warping occurs
  - Gores
  - Intersections
  - Roundabouts
- QC/QA review of only cross-section is no longer sufficient

Contractor’s Role

Contractor Quality Overview

- Verify the accuracy of both the model and the control points
- Refine design information for use with equipment and construction sequencing
- Validate location and elevation with each new feature of work as it occurs
  - Subgrade
  - Base
  - Concrete
- Improved concrete yields

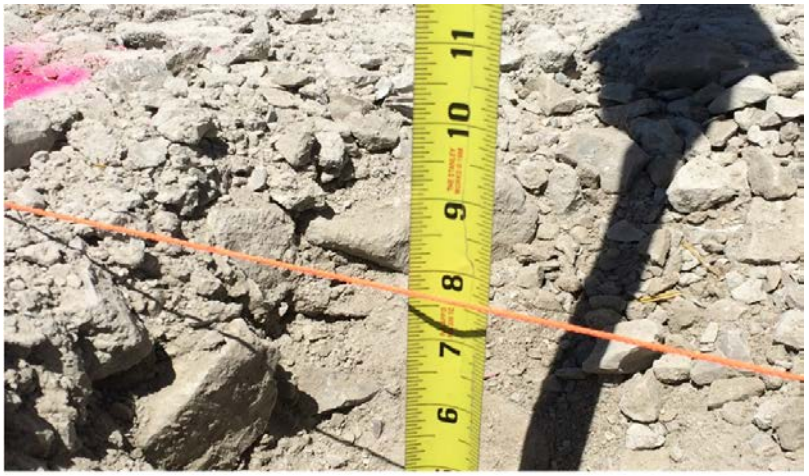
Owner’s Role

Owner's Construction Quality

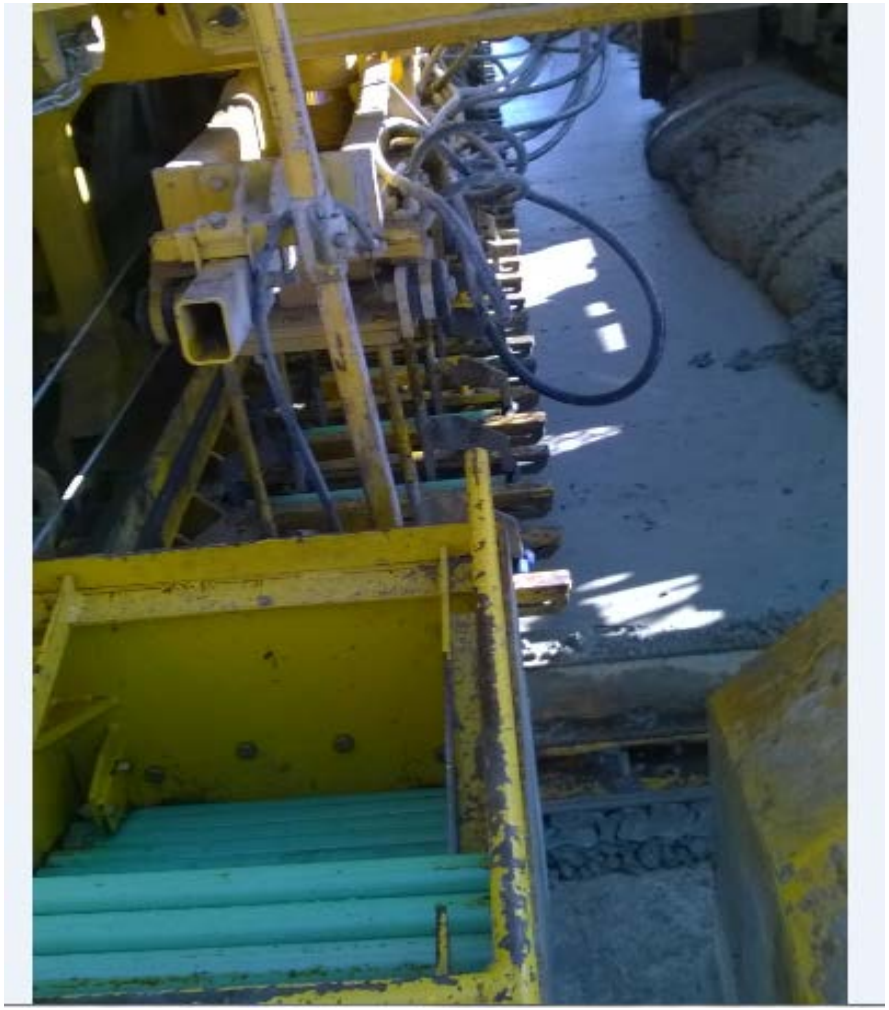
- Verify independently each new feature of work is meeting specification
- Document findings
- Perform or oversee various Construction Inspection

Construction Inspection – Base Rock

- GPS Rover Unit
- Total Station
- Transit Level
- Tape and shovel
- Grade Stakes



Construction Inspection – Concrete



MIT Scan

MIT Scan

- Provides X, Y, and Z location of dowel bar
- Estimated measurement error is 0.12”
- Provides in place data
- Can quickly verify numerous locations

Construction Inspection – Typical Items

- Slope
- Cross Slope
- Thickness
- Smoothness
- Texture
- Aggregate Gradation
- Cure
- Saw Cut Depth/Location
- Air Content
- Slump
- Strength
- Width

Risk Based Inspection

RPN – Severity, Probability, Detectability Rating

Severity Example

1 No discernable effect
2 Quality issues rarely noticed by stakeholders
3 Quality issues sometimes noticed by stakeholders

4 Quality issues often noticed by stakeholders
5 Reduction of secondary or maintenance function
6 Loss of secondary or maintenance function
7 Reduction of primary or safety function

8 Loss of primary or safety function
9 Catastrophic failure or loss of life with warning
10 Catastrophic failure or loss of life without warning

Questions?