

Construction of an Unbonded Concrete Overlay Under Traffic

US 18, Iowa

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(A tribute to Dr. James Cable)

National Concrete Pavement
Technology Center



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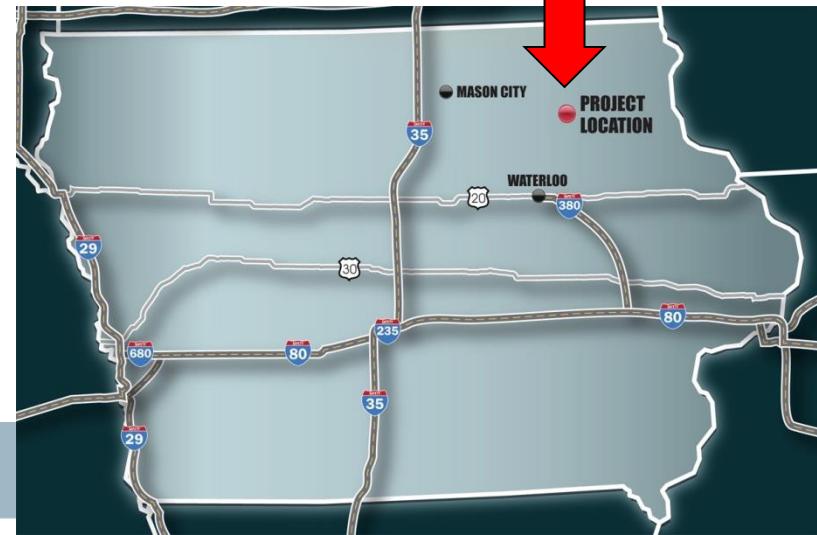


Overview

- Project description
- Constraints
- Design
- Traffic management
- Construction
- Things we learned the hard way

Project Overview

- 2 lane county road (2 counties)
- ~2400 ADT
- 18.8 miles long
- Existing composite pavement
- 4 bridges



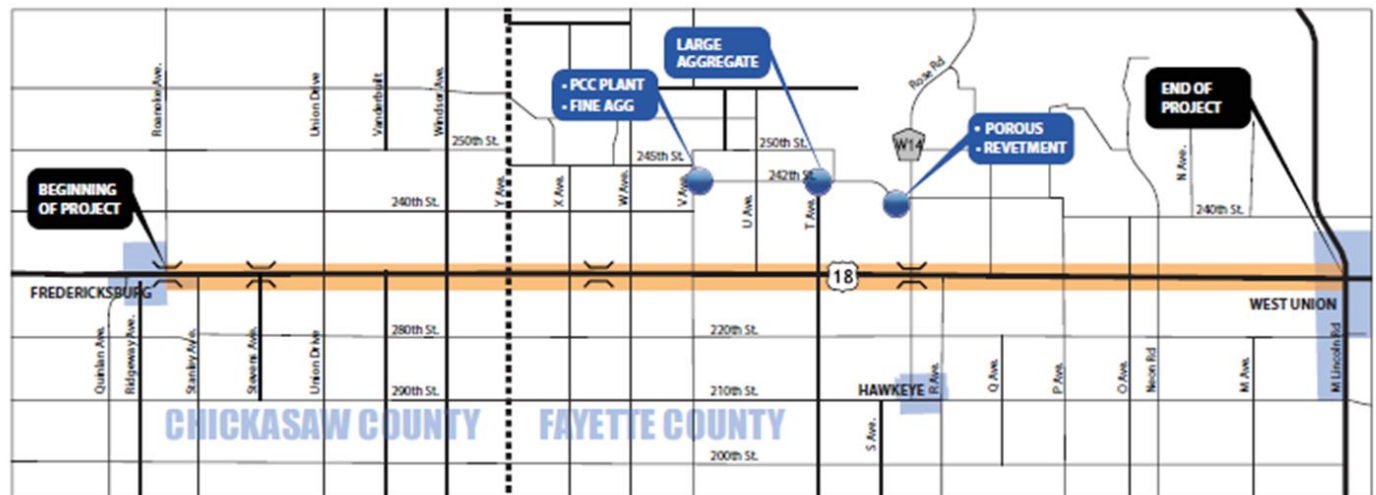
Project Overview

- Existing system
 - 1938 PCC 18' wide
 - 24' Asphalt overlay 6" thick
 - Rutted and raveled
 - Tenting from poor condition concrete joints

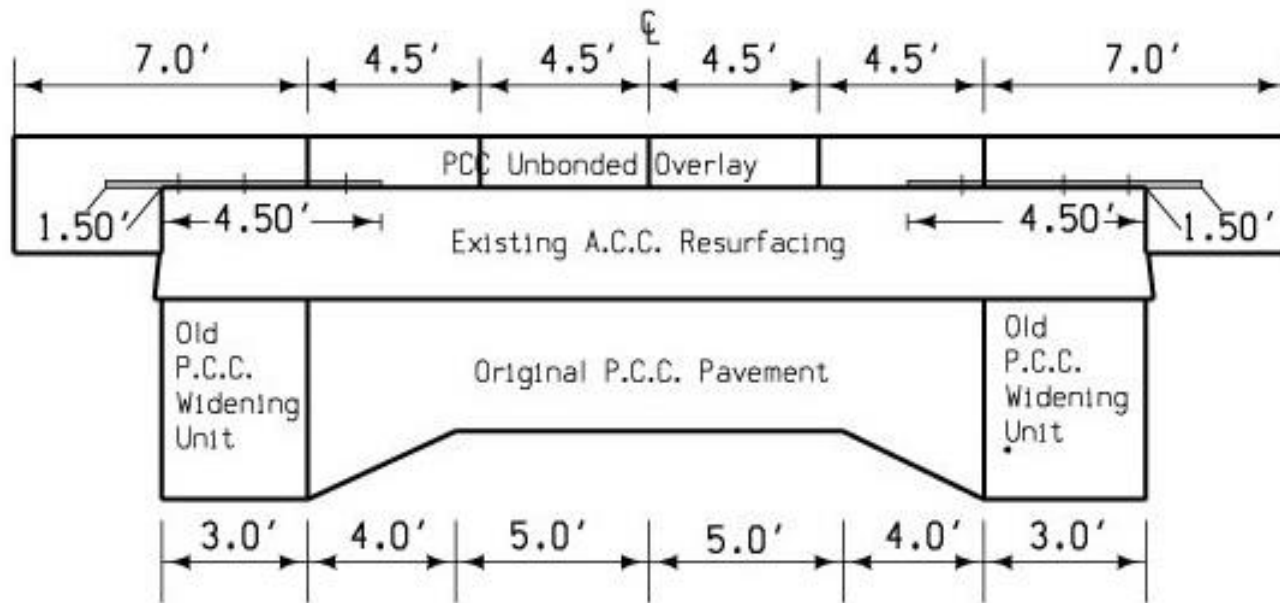


Constraints

- Widening from 24 to 32 feet
- Traffic had to be maintained
- 2 mile max work zone for patching & milling
- 3.5 mile max work zone paving
- Cross slope had to be adjusted

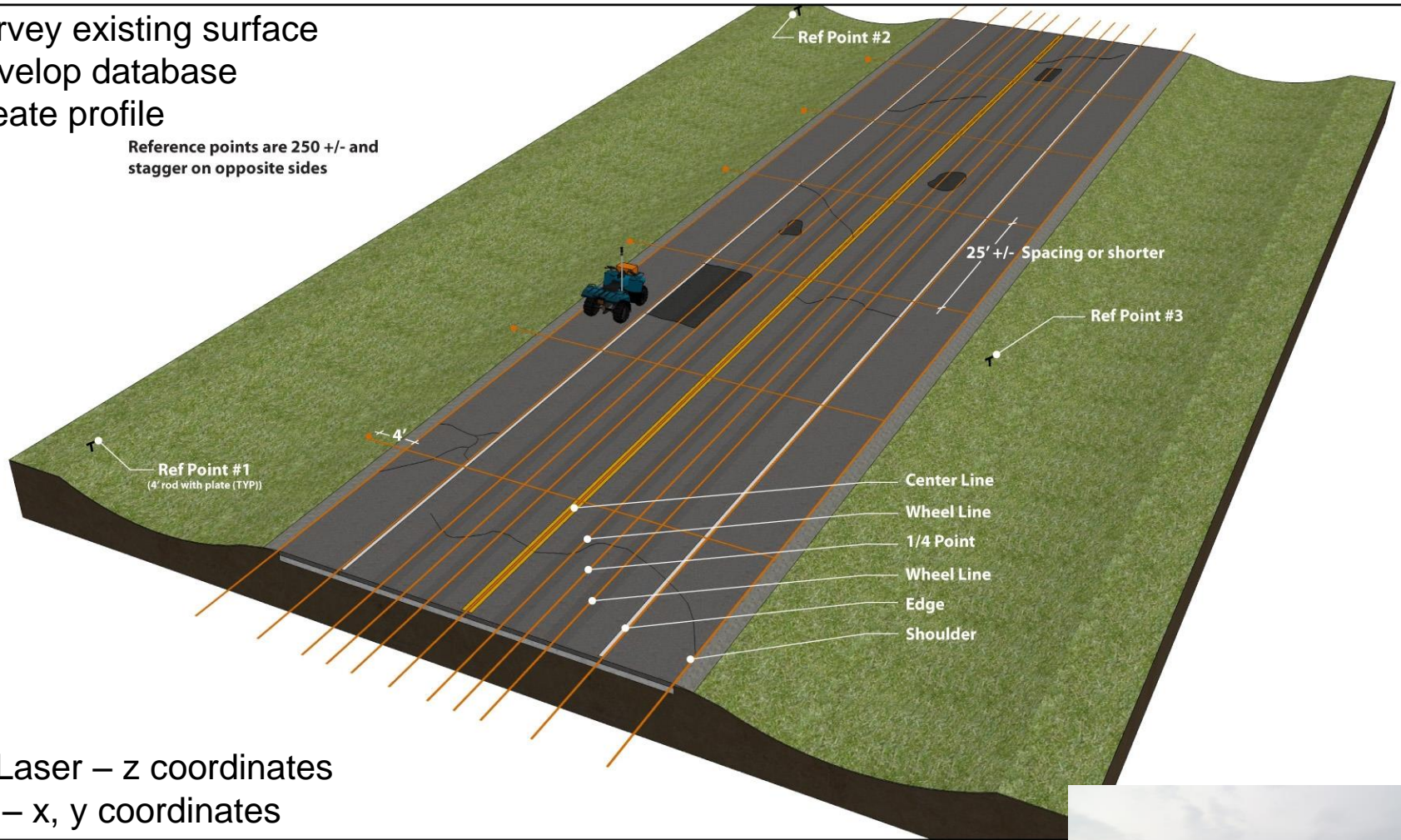


Design



- Survey existing surface
- Develop database
- Create profile

Reference points are 250 +/- and stagger on opposite sides



ATV Laser – z coordinates
 GPS – x, y coordinates

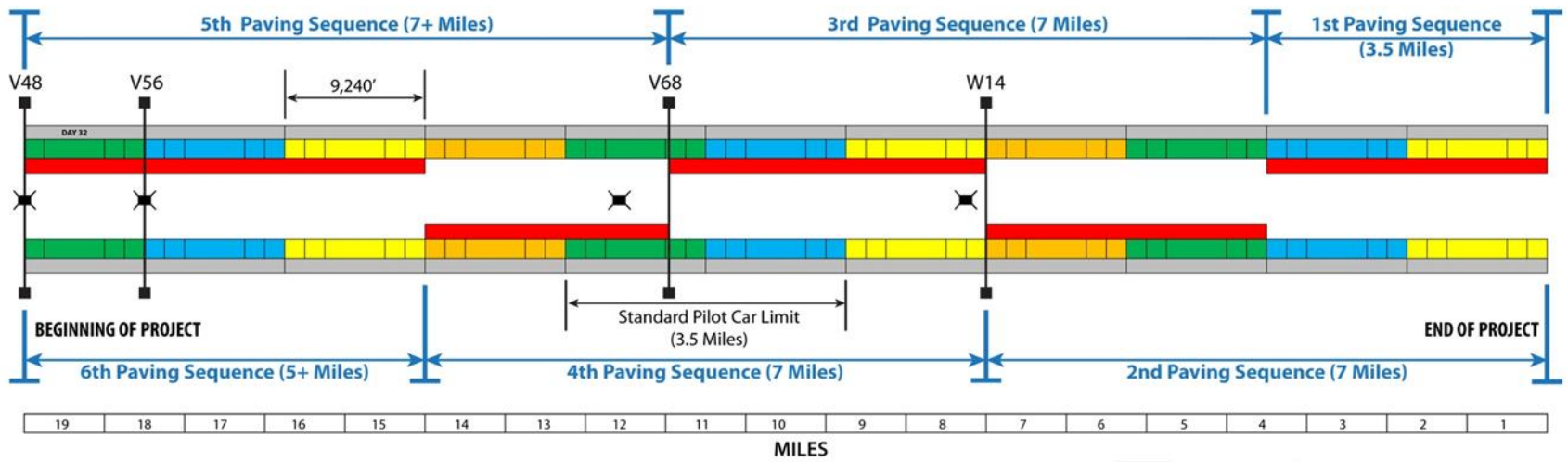
Survey – GPS / Total Stations



Traffic Management

Fredericksburg

West Union



PAVING SEQUENCE EAST TO WEST

- Pre-Paving:** Milled Trench, Install Steel, Clean Surface
- Paving:** Pavement and Safty Wedge
- Post-Paving:** Rock Shoulder, Striping Centerline, Signs

GRANULAR SHOULDER
 SAFETY WEDGE 0.25 MILE

Patching Traffic Control



Pilot Car



Construction

1. Subdrains, patching, drains, shoulders
2. Bridge approaches
3. Mill asphalt
4. Place overlay
5. Connections

Partial Depth Milling



Partial Depth Patching



Partial Depth Patch



Full Depth PCC Patches

- Average 30 per day



Full Depth PCC Patching



Milling

- 7' wide machine
- Minimum 1/2" to 1 1/2" maximum
- Centerline pass controlled by total stations
- Remainder controlled by sensor off milled surface



Milling



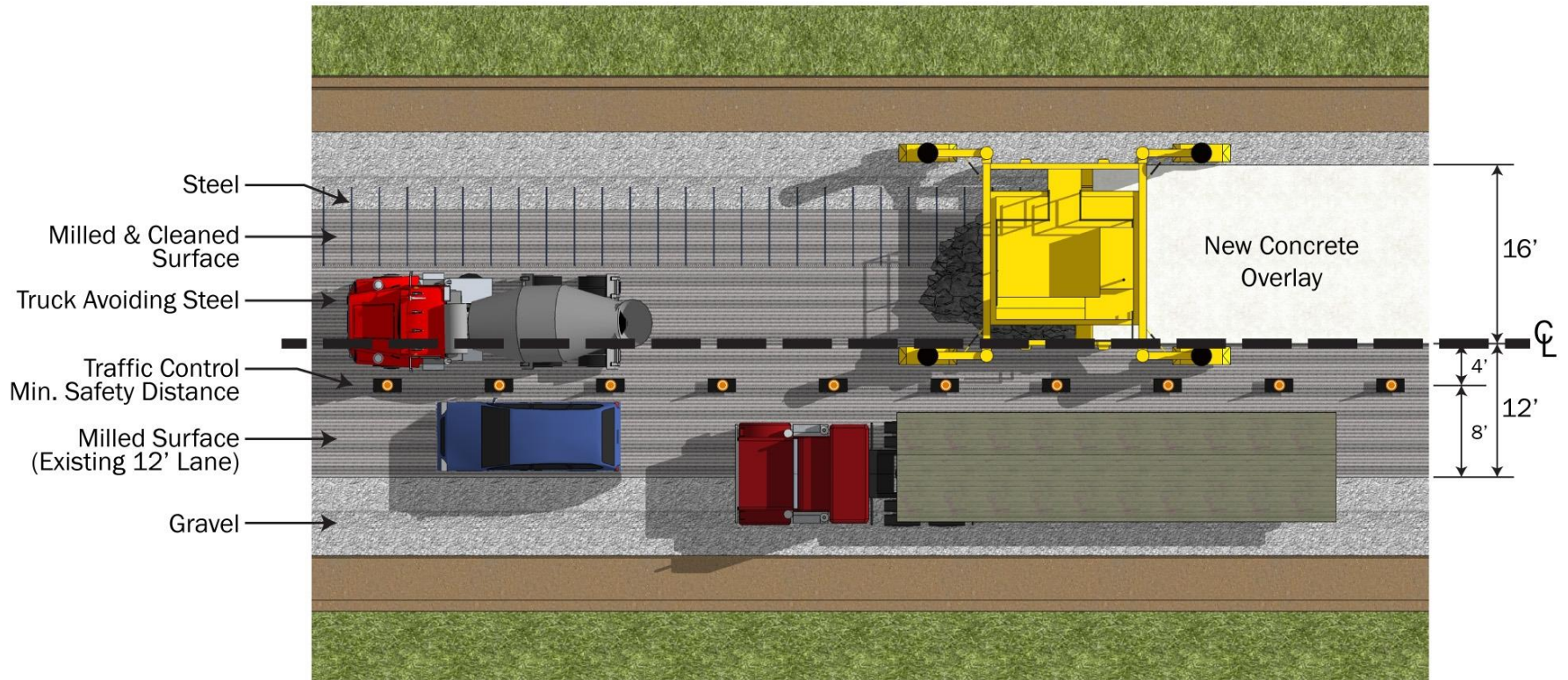
Skipped Mill and Pull Off



Tiebars



Traffic



US18 Bonded Concrete Overlay

Paving

- Average Paving per day 6,800 to 7,500 ft.
- Heated water for cold weather



Stringless Control



Sawing



Placing Safety Edge



Safety Edge



Removing Safety Edge



Things We Learned

- Know what is there
- Details matter
- Building under traffic is slower and does cost more
- Communication is critical
- But it can be done!

Concrete Overlay Field Application Program

National Concrete Pavement
Technology Center



Iowa Task Report US 18 Concrete Overlay Construction Under Traffic May 2012

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