



Overview of Lateral Slide in MN

Doing ABC with Design-Build

Tony Lesch, MnDOT Bridge Design-Build Engineer

September 17, 2015



U.S. Department of Transportation
Federal Highway Administration

AMERICAN ASSOCIATION
OF STATE HIGHWAY AND
TRANSPORTATION OFFICIALS

AASHIO

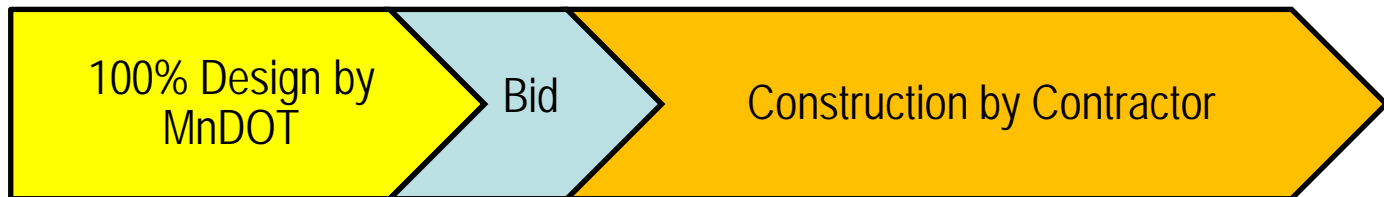
Outline



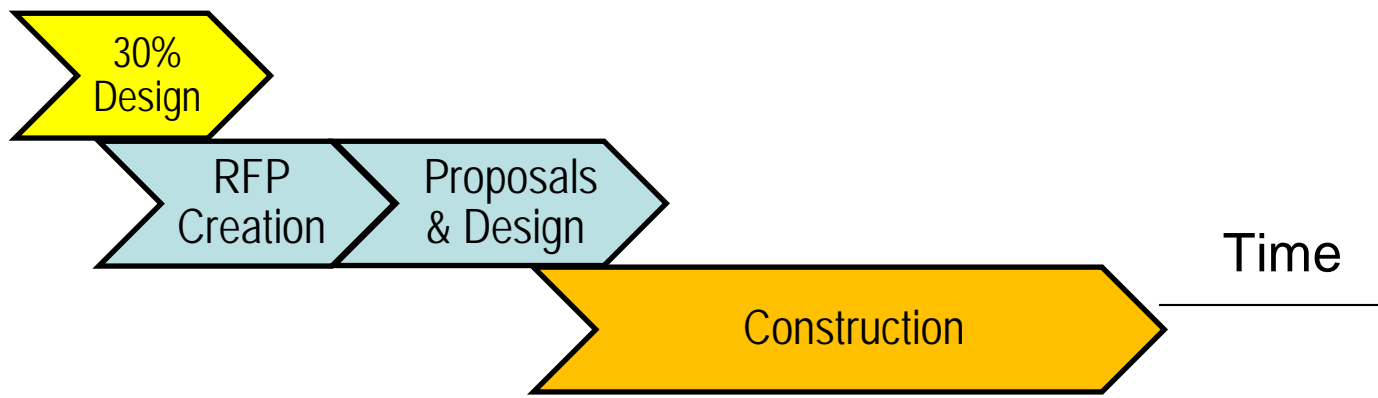
- **Delivery Methods**
 - **Design-Bid-Build**
 - **Design-Build**
 - **CMGC**
- **Lateral Slide at Larpenteur Ave.**

MnDOT Delivery Methods

Design-bid-build

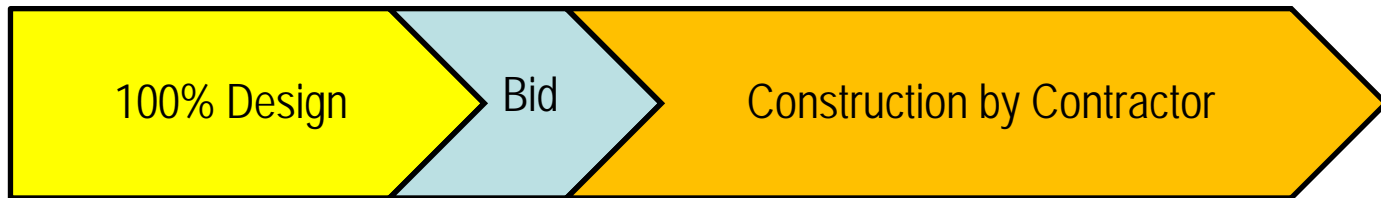


Design-build

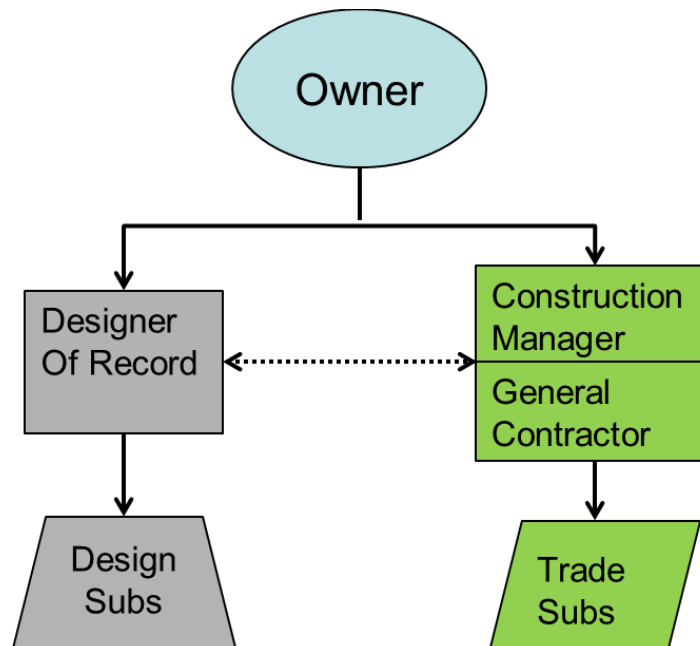


CMGC

DBB or CMGC



CMGC



MnDOT's DB Program

- 30 Awarded Projects since 1997
 - 20 Best Value
 - \$1 - \$234 Million
 - 10 Low Bid
 - \$2.2 - \$19 Million
- \$1.6 Billion Total



MnDOT's DB Program



Benefits

- Accelerated Project Delivery
- Innovation
 - Competing Designs
 - Alternative Technical Concepts (ATCs)
- Risk Transfer (e.g. quantities)
- Reduced Cost (?)
- Flexibility

Drawbacks

- May not be cost-effective
- Risk Transfer (e.g. environmental, third party)
- Oversight resources necessary

MnDOT's DB Program

Standard Uses

- Complicated Major Projects (10)
 - \$50-250 million
 - Involves all functional areas
 - Significant complexity
- Midsize, Partially-Complicated Projects (10)
 - \$20-50 million
 - At least 1-2 complicated areas
 - Possibly in need of acceleration
- Emergency Accelerations (3)
 - Improvement of dangerous intersections
 - I-35W bridge collapse



MnDOT's DB Program

Unique Uses

- Intersection Conflict Warning System (1)
- Groupings of Similar Work Types (3)
- Geotechnical Challenges (2)
- Accelerated Bridge Construction Trial (1)
 - Unfamiliar design and construction
 - Likely CMGC project if let today



MnDOT's DB Program

Standard Uses

- Complicated Major Projects
 - \$50-250 million
 - Involves all functional areas
 - Significant complexity

I-35E MnPASS



35E MnPASS Project

- **DB project to add express lanes (MnPASS lanes) to existing interstate corridor**
- **Awarded to Ames Construction in July, 2013**
- **\$98.4 Million**
- **Completion in Fall 2015**



35E MnPASS Project

- **Project Details**

- Roadway
- 9 Bridges
- Drainage
- Utilities
- Noise Walls
- MnPASS Infrastructure
- Maintenance of Traffic



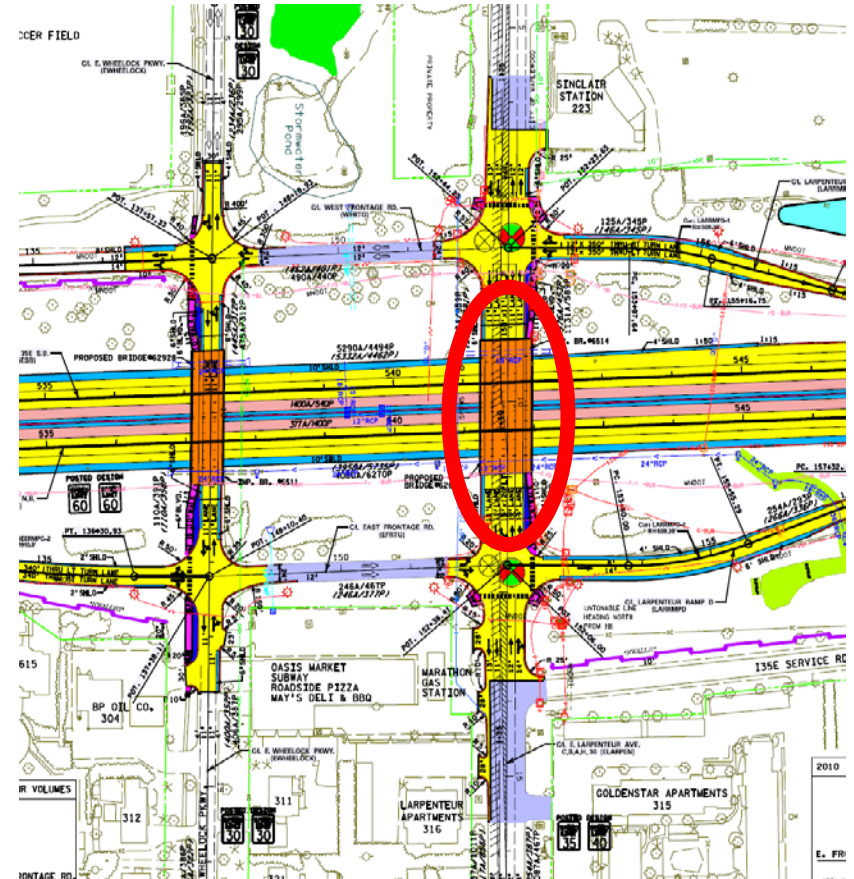
Best Value



- **Largest scored category was MOT**
- **Contractor to propose number of closure days:**
 - **I-35E first year**
 - **I-35E second year**
 - **Cross Streets**

Best Value

- Ames Proposal
 - Close Larpenteur for only 47 Days
 - ATC to use SIBC (contract required all bridges cast-in-place)



Larpenteur Ave. Bridge

- 4-span bridge built in 1958
- 4 lanes, narrow shoulders, one narrow sidewalk

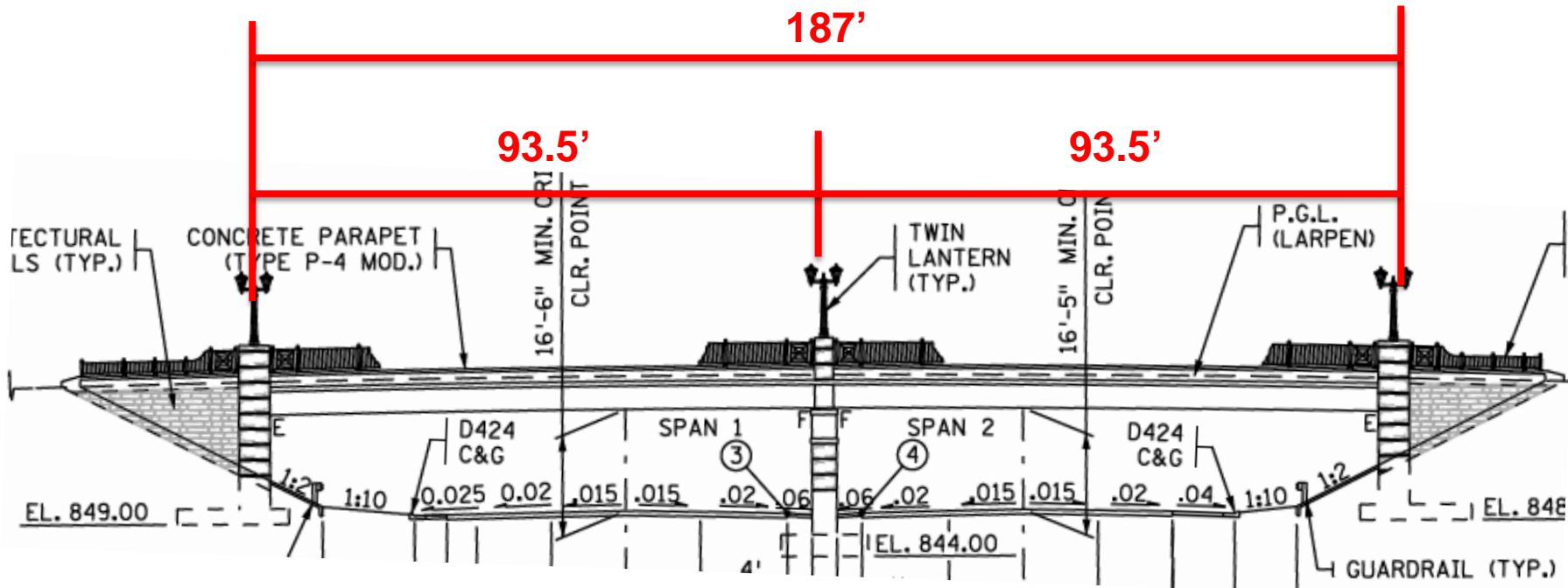
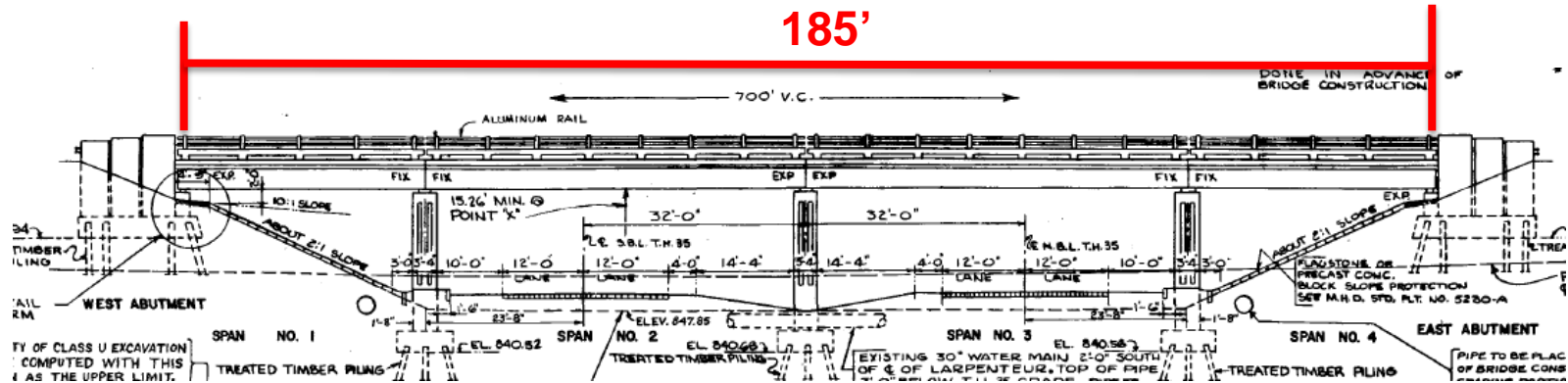


Larpenteur Ave. Bridge

- **2-span bridge built in 2014 – longer spans**
- **4 lanes plus turn lane, wider shoulders, wider sidewalk**



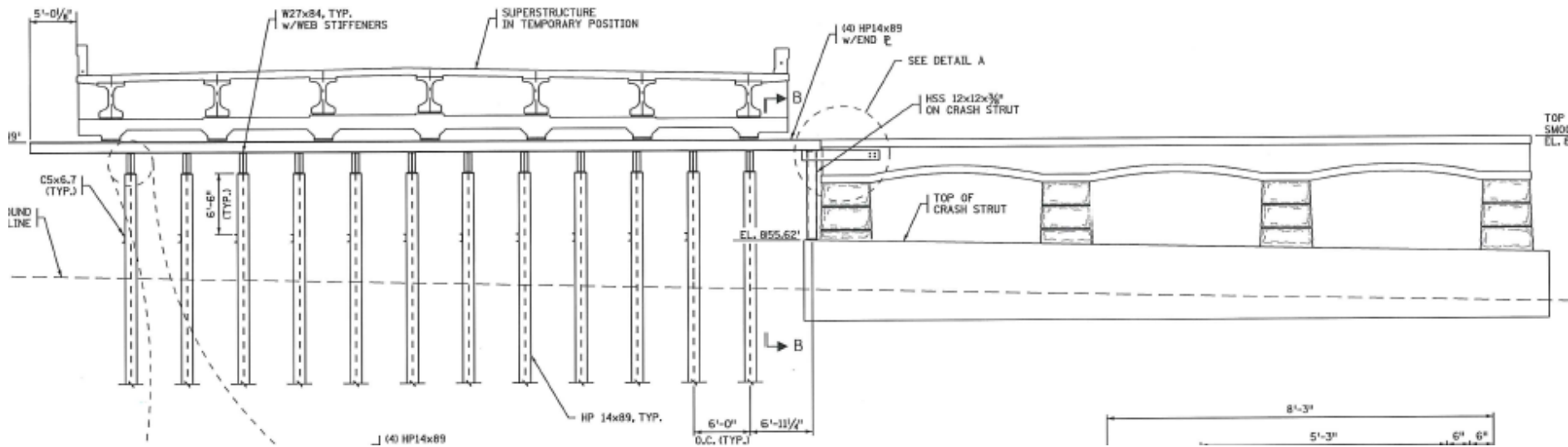
Larpenteur Ave. Bridge





SLIDE IN BRIDGE CONSTRUCTION

Temporary Supports



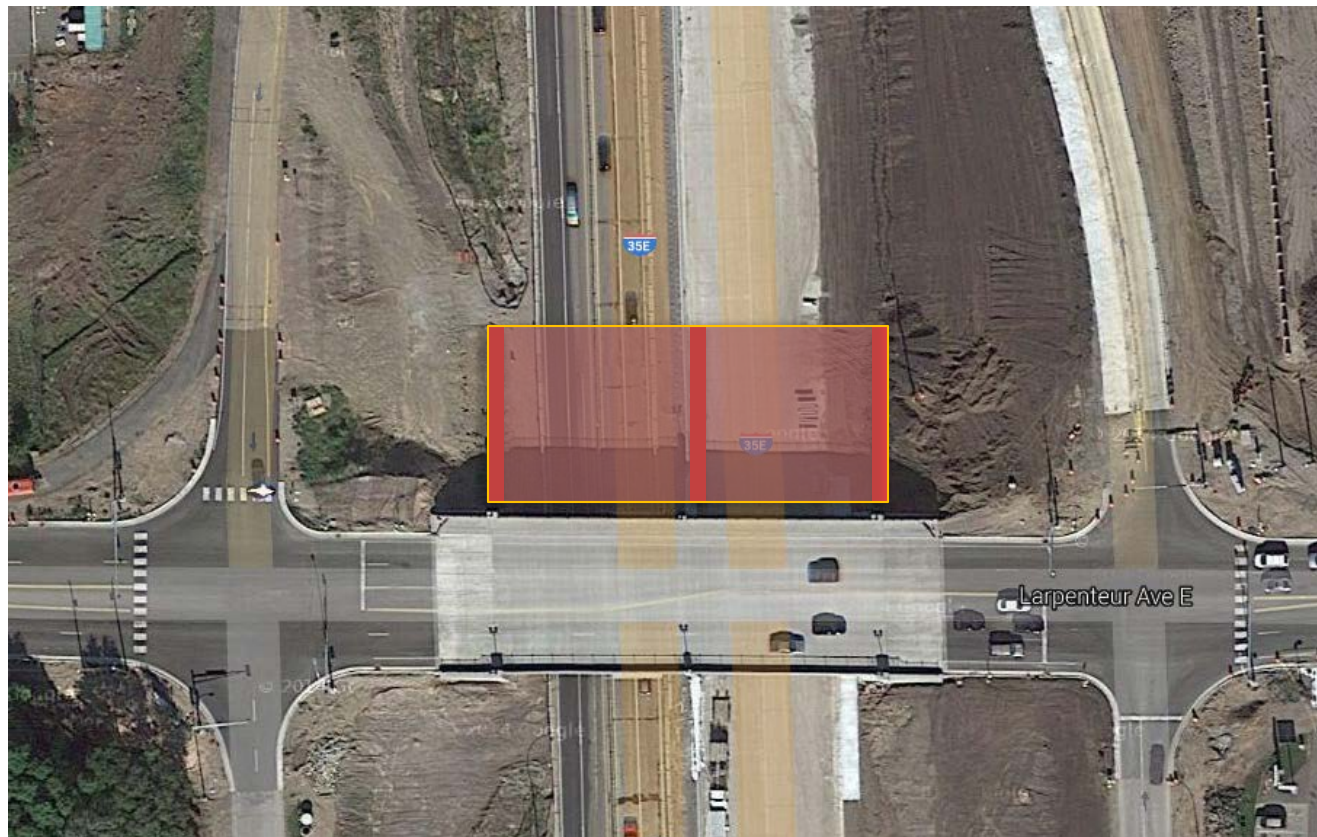
Temporary Supports

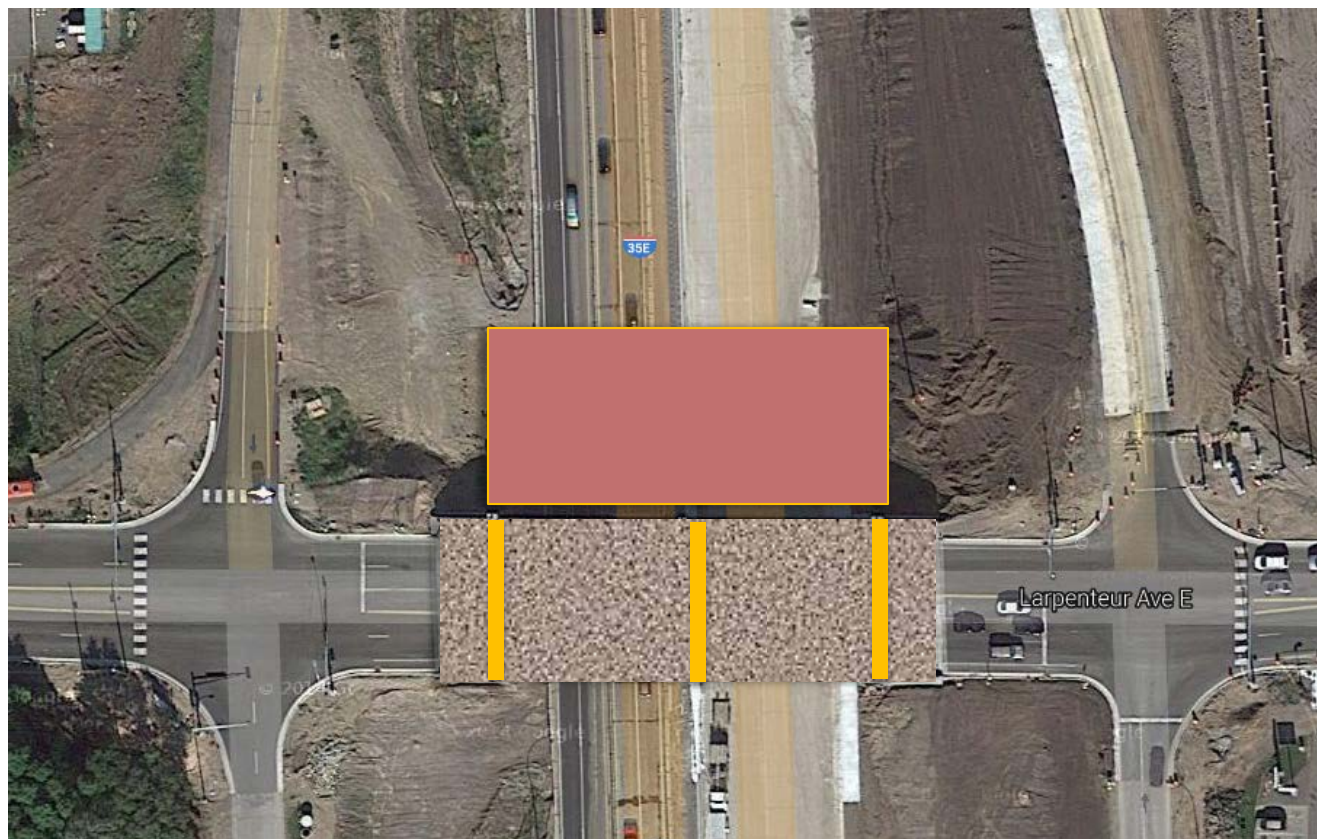


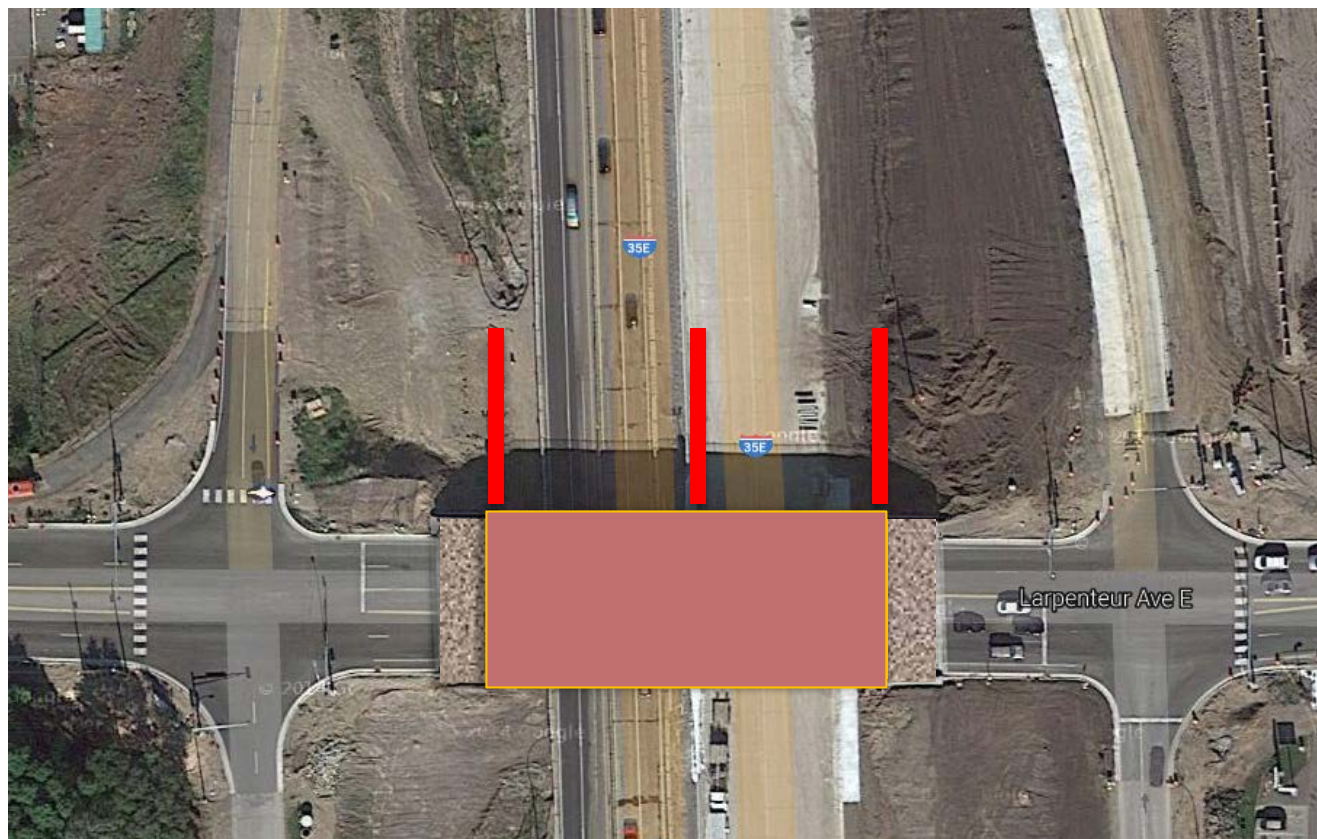


Nick Haltvick (c) 2014

SIBC









Slide System

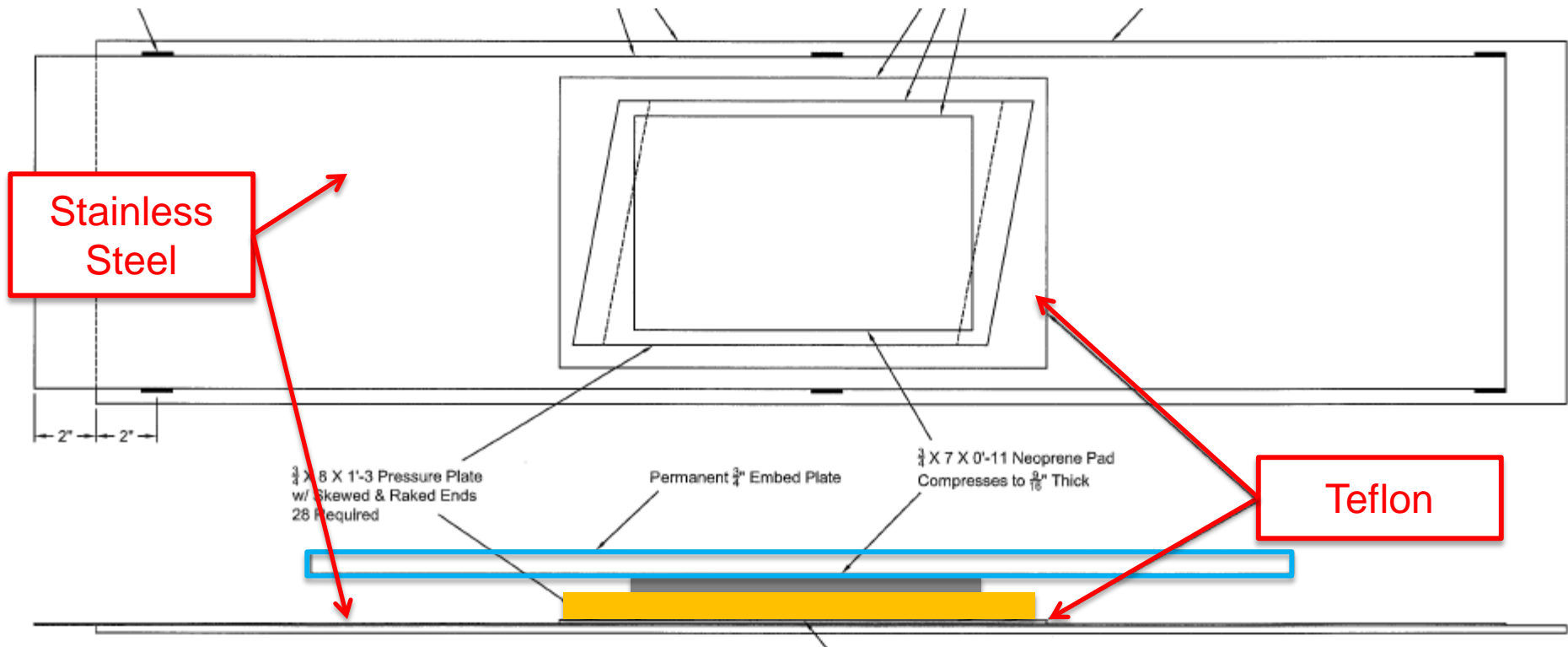
- Hydraulic Jacks
- Jack Floats
- Dog Plates



Slide System



Slide System



Slide System

- **Teflon on Polished Stainless Steel**



Highlights



- **Slide both spans together**
- **No Live Traffic**
- **Test Pushes**
- **Full Closure of Interstate**
- **Plan to move in one overnight closure**
- **Took two nights**

Larpenteur Ave. Bridge



What issues were encountered?

Issues

Slide Table Cast Against Pier, Damaged Concrete



Issues

Tolerance on track system fabrication



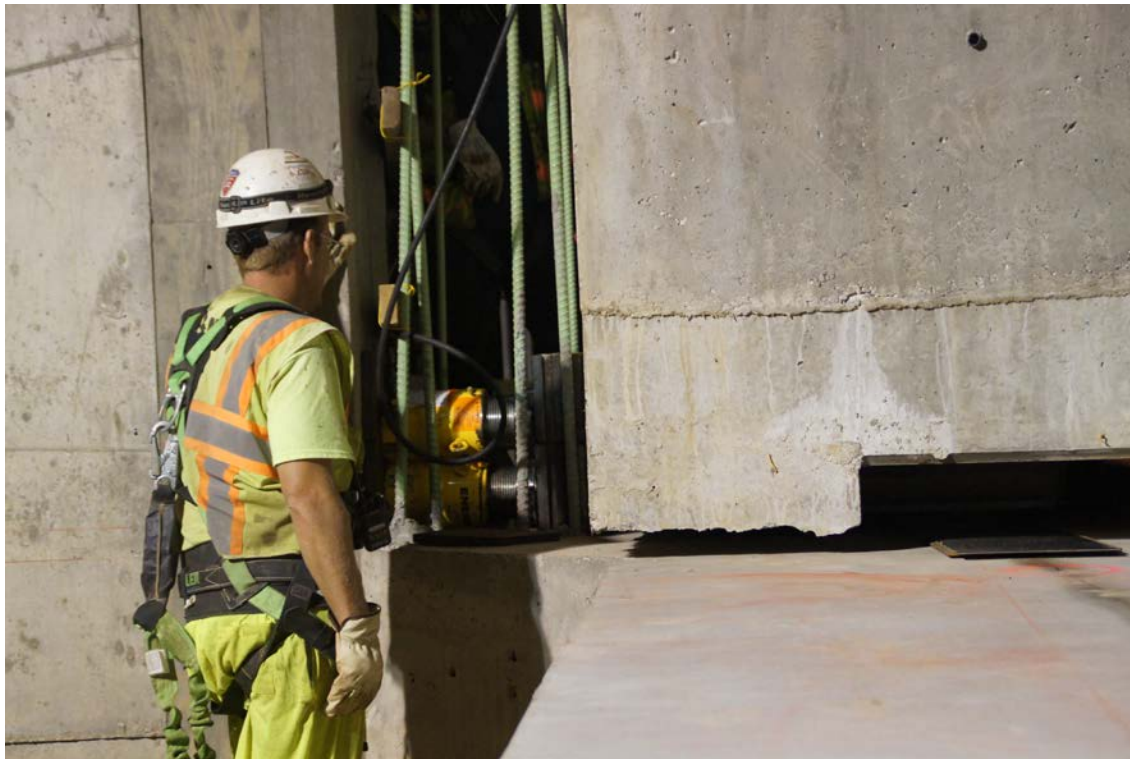
Issues

Tolerance on track system fabrication



Issues

Bridge Walked Sideways



Issues

Bent/Binding Guide Brackets



Issues

Bent/Binding Guide Brackets



Lessons Learned

Bridge Slide System

- **Use lubricant (dish soap), but not too much**



Lessons Learned

Bridge Slide System

- **Use lubricant (dish soap), but not too much**
- **Use a Single Pump (keep it simple)**



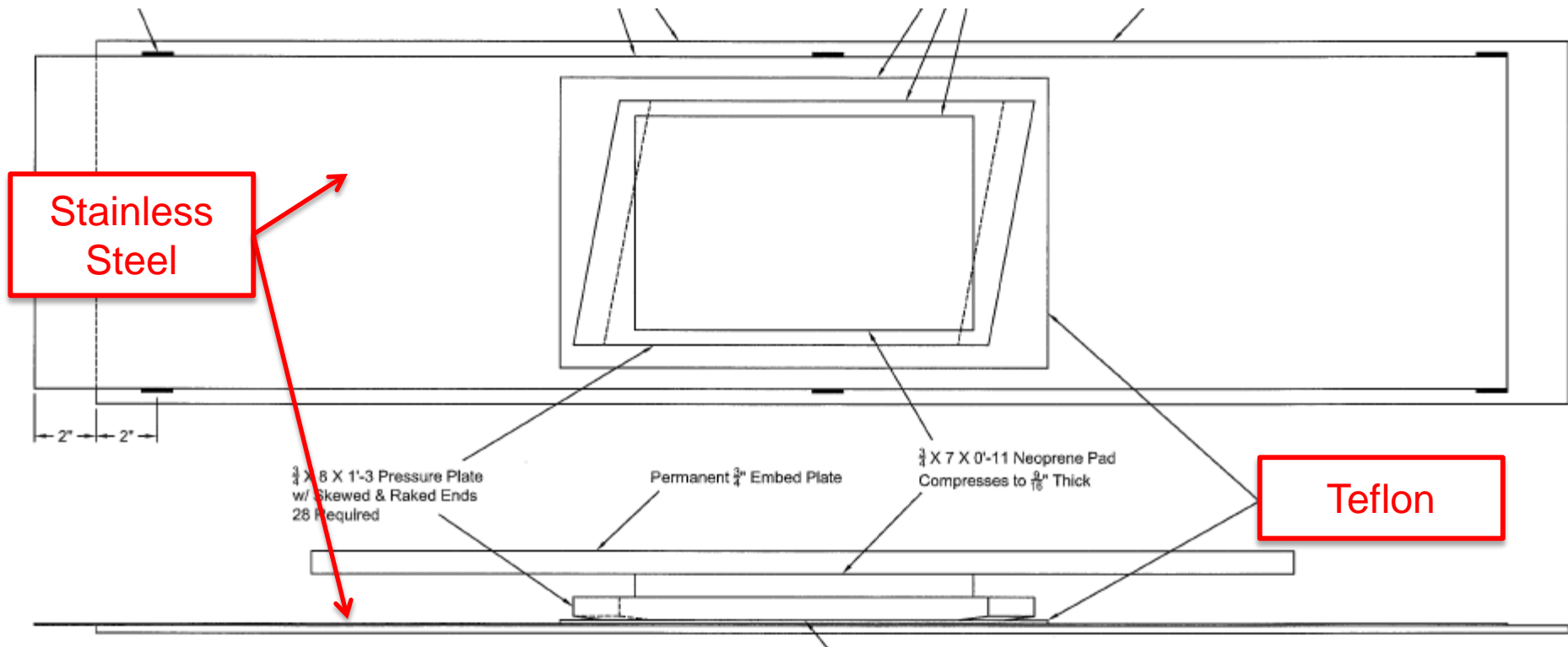
Lessons Learned



Bridge Slide System

- **Use thicker teflon**
- **Use thicker elastic medium for deviations in concrete and steel**
- **Design to reduce field welding**
- **Use readily-available materials (and reusable)**
- **Design for “field friendly” tolerances**
- **Secure the sliding mechanism to bridge**

Lessons Learned



Lessons Learned



Slide Execution

- **Prepare contingency plans**
- **Survey a lot (after every step and load)**
- **Clearly identify stopping points for critical locations**
- **More Lighting**
- **Radio Communication**
- **Use scaffold/walkways rather than man lifts**

Lessons Learned



Title

Questions?