Accelerated Bridge Construction in New York

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NYSDOT ABC

- Overview of NYSDOT ABC
- ABC Components
- ABC Construction
- What's Next?
- Case Study: I-84 over Delaware and Neversink Rivers

Drivers First Initiative

- Governor Andrew M. Cuomo on September 27, 2012 announced the 'Drivers First' initiative, a new approach by the State Department of Transportation to prioritize the convenience of motorists and ensure that disruptions are as minimal as possible to drivers at highway and bridge projects across the state.

ABC for Implementation of Drivers First Initiative

- ABC helps to:
  - Reduce detour
  - Reduce traffic delay
  - Reduce level of accident due to construction
  - Reduce vehicle operation cost
  - Minimize environmental impacts
  - Improve worker safety

Contracting and Construction

- Incentive / disincentive
- Lane rental
- Cost+ time (A+B)
- Design Build
- Best Value

I-87 over the Mohawk River - 2013

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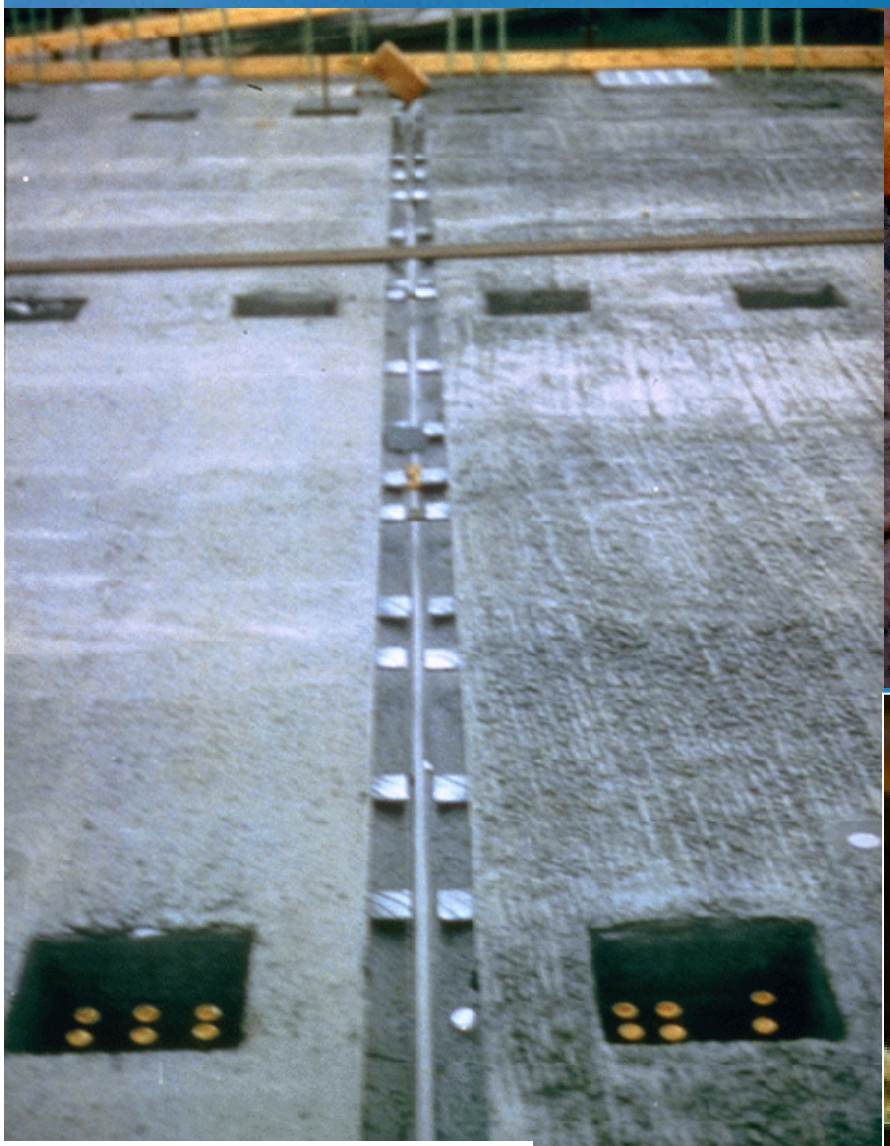
Slide-out, slide-in (Lateral Slide)

Hillside Avenue over Van Wyck Expressway - 2005

Grouted joints, PT, exposed stud pockets, overlay



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I-287 over Saw Mill River Parkway - 1998

First use of UHPC Joints in Deck Bulb Tees.

85’-0” SPAN
42’-9” WIDE
15 DEGREE SKEW
3’-5” DEEP DBT
5’-4” DBT SPACING

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Route 31 over Canandaigua Outlet - 2009

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I-87 over the Mohawk River - 2013

Lateral slide

Dingle Ridge Road over I-84 - 2014

Haunch Down Approach Slab

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Precast Substructures

Ramp A over I-490 - 2013

Rapid Demolition

CASE STUDY

- Precast Deck with UHPC Joints
- I-84 over Delaware & Neversink Rivers
- Port Jervis, New York
- Upper Delaware River
  - Scenic Wildlife & Recreation Area

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Prefabricated superstructure systems

- Deck Bulb Tees, UHPC joints, with overlays
- Pre-fab Modular Deck Beams, UHPC joints
- NEXT Beams-Type D, UHPC joints w/wo overlays
- Pre-fabricated Modular Deck Beams, rapid set concrete joints, overlays

Underside DBT, with UHPC joints

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Route 31 over Canandaigua Outlet - 2009

Pre-fab Modular Deck Beams, UHPC joints

Route 2 over Route 9 - 2013

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Deck after grinding

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Route 2 over Route 9 - 2013

NEXT-D, UHPC joints, overlay

Route 5 over Sconondoa Creek - 2013

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I-87 over the Mohawk River

Prefabricated deck beam system, rapid set concrete joints, membrane and asphalt overlay, integral concrete barrier

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Prefabricated Deck Systems

- Grouted joints with overlay
- Grouted joints, post tensioning with overlay
- UHPC joints, exposed stud pockets overlay
- UHPC joints, exposed stud pockets diamond ground no overlay
- UHPC joints, hidden stud pockets diamond ground no overlay

Underside of the finished bridge

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Route 23 over Otego Creek - 2009

UHPC joints, exposed stud pockets diamond ground, no overlay

Seven Lakes Drive over Ramapo River - 2011

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Diamond ground deck with no overlay

Route 42 over Westkill Creek - 2009

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UHPC joints, hidden stud pockets diamond ground no overlay

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I-690 over Crouse Avenue - 2012

Hidden Pocket Detail

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Underside of the UHPC joint

I-81 over East Castle Street - 2013

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Finished deck surface, no overlay

I-81 over East Castle Street - 2013

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Case Study : I- 84 over Delaware & Neversink Rivers

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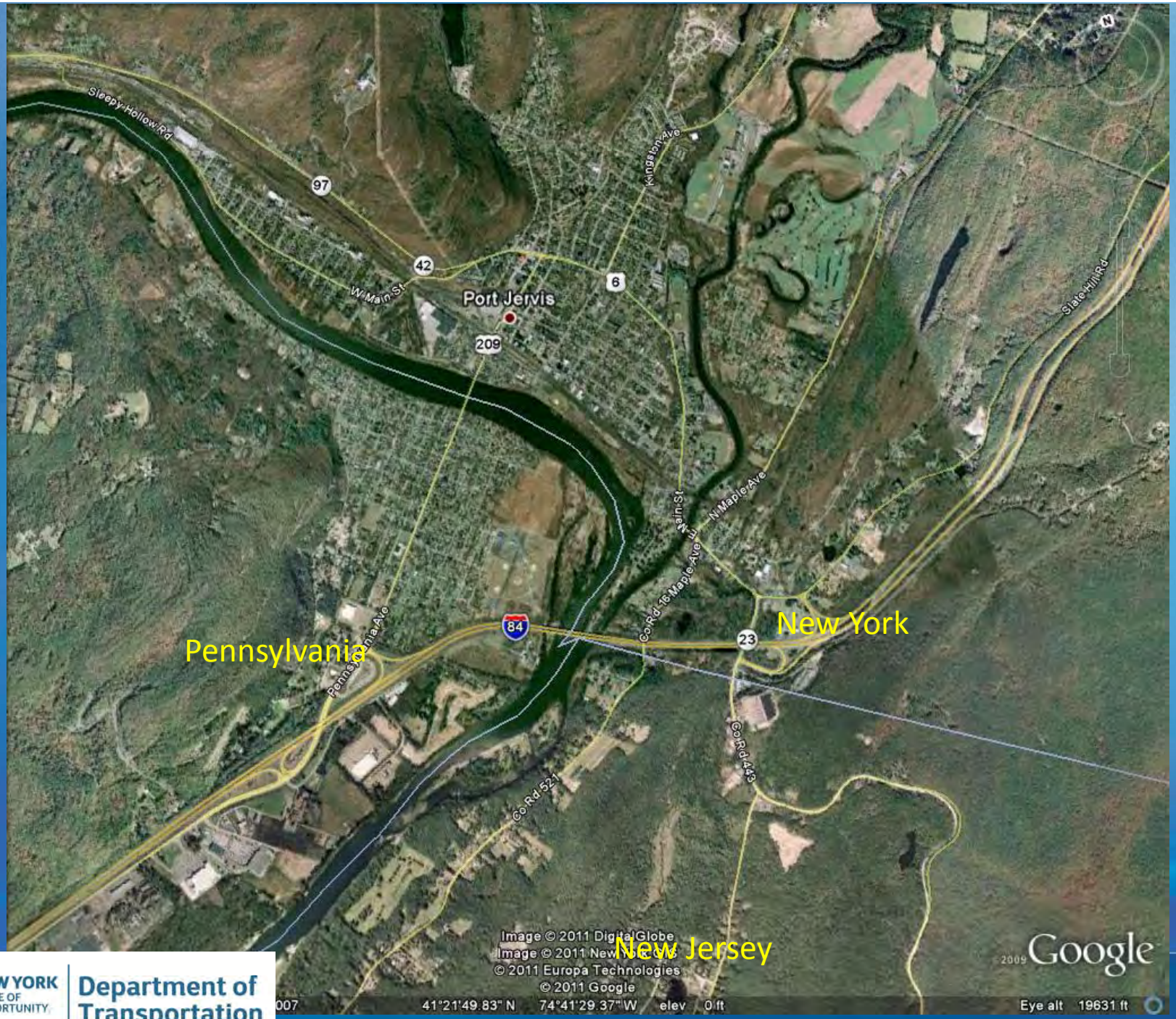

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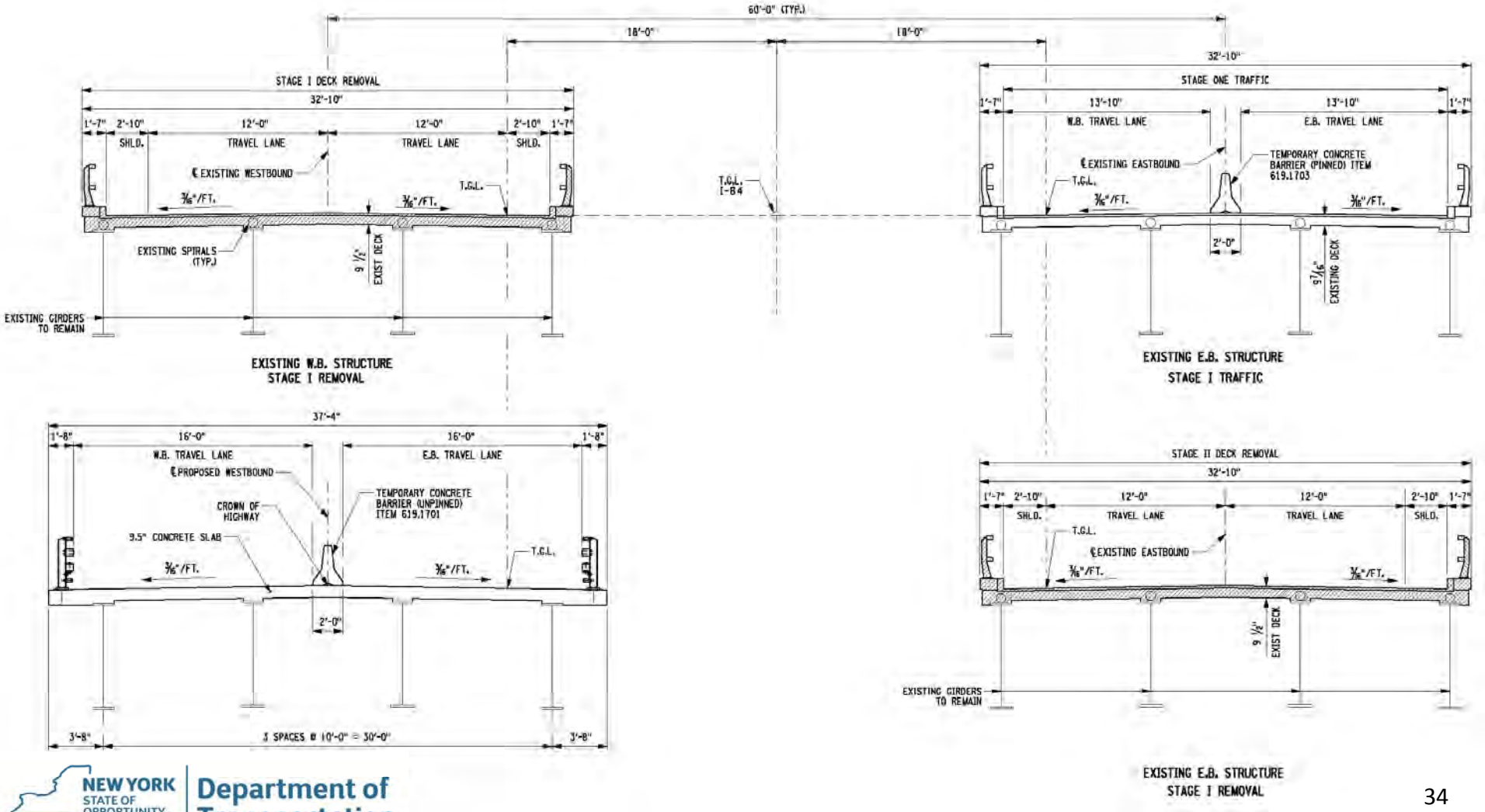
- Twin bridges built in 1967
- Bridges are 1250 ft, 9 - 137 foot spans
- Each span has 4 continuous girders
- 12 ft wide travel lanes, 2 ½ ft shoulders
- Bridges owner: 2/3 NY, 1/3 PA

- Contact allowed precast or cast in place
- Contact plans gave full cast in place details
- Contact plan showed approved connections
- Contactor/Fabricator developed layout
- DOT approved layout in the shop drawings
- DOT approved handling, installation, joints

BRIDGE TYPICAL SECTION
STAGE I & II TRAFFIC – ONE LANE EACH DIRECTION



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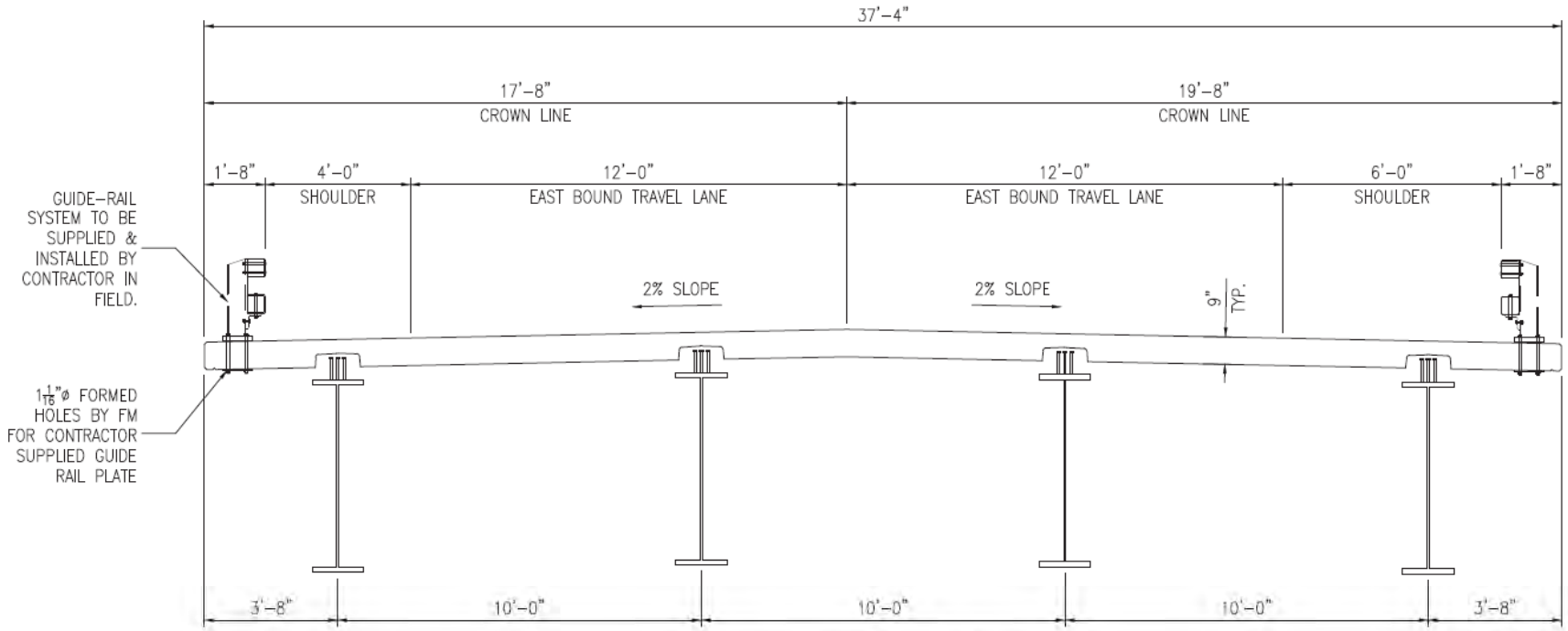

SECTION A-A

EAST-BOUND BRIDGE

Case Study: I-84 over Delaware & Neversink Rivers

- Contract Value $40.8M
- Replaced the steel girders and deck
- No work performed in the water
- Complete each bridge in one construction season.
- I/D clauses

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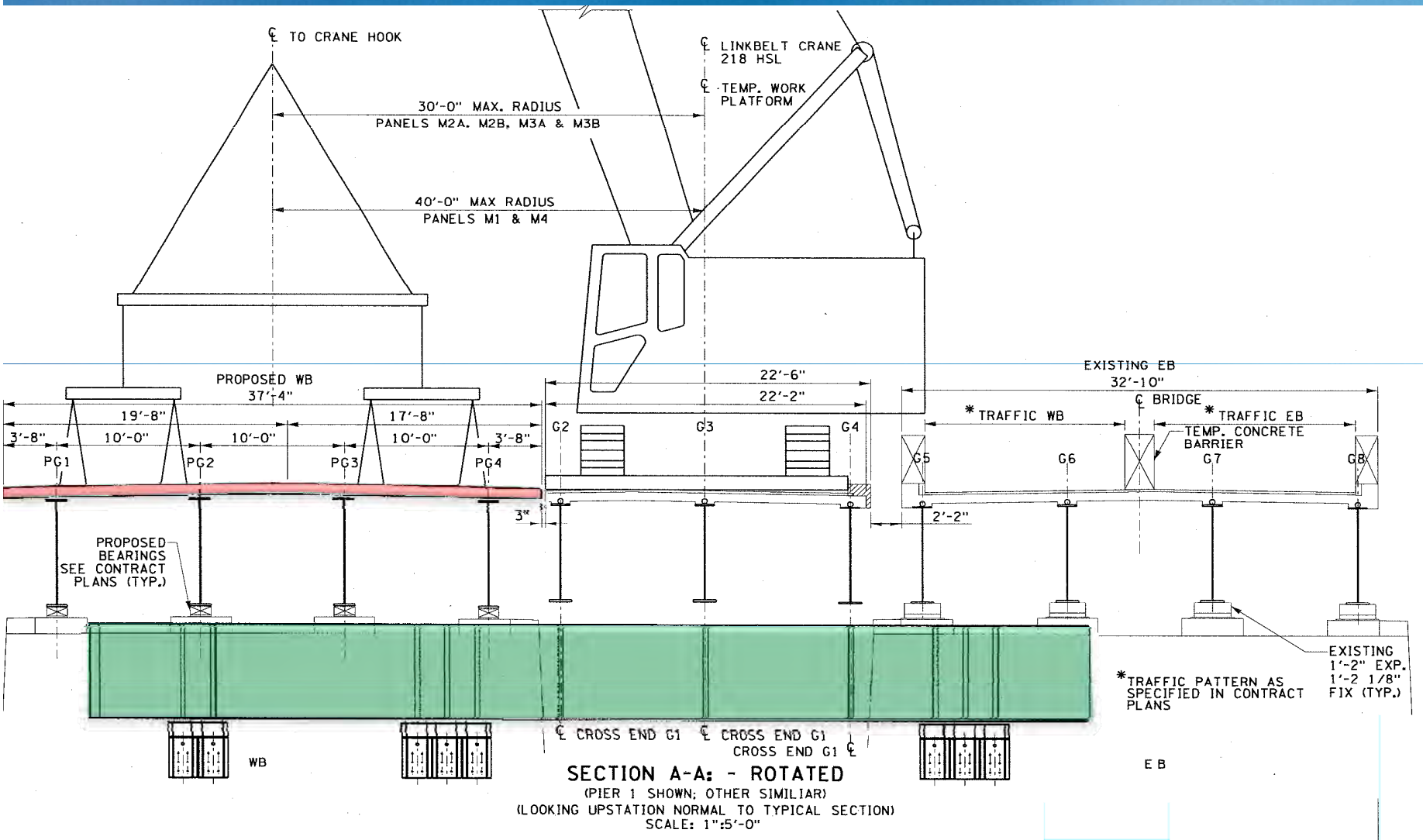

SECTION A-A: - ROTATED

(PIER 1 SHOWN; OTHER SIMILIAR)

(LOOKING UPSTATION NORMAL TO TYPICAL SECTION)

SCALE: 1":5'-0"

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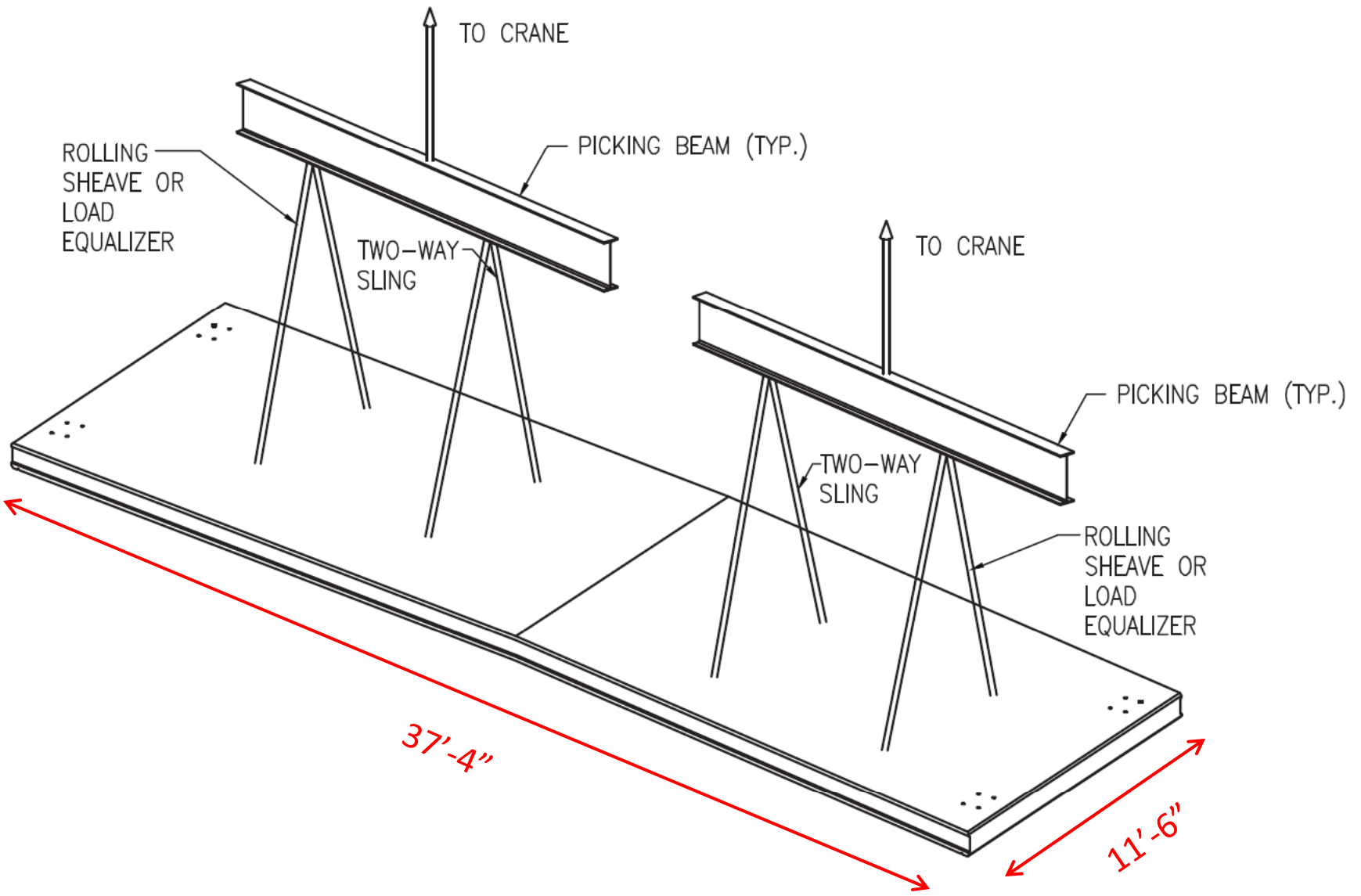

PRECAST PLANT HANDLING-INTERIOR BRIDGE PANELS

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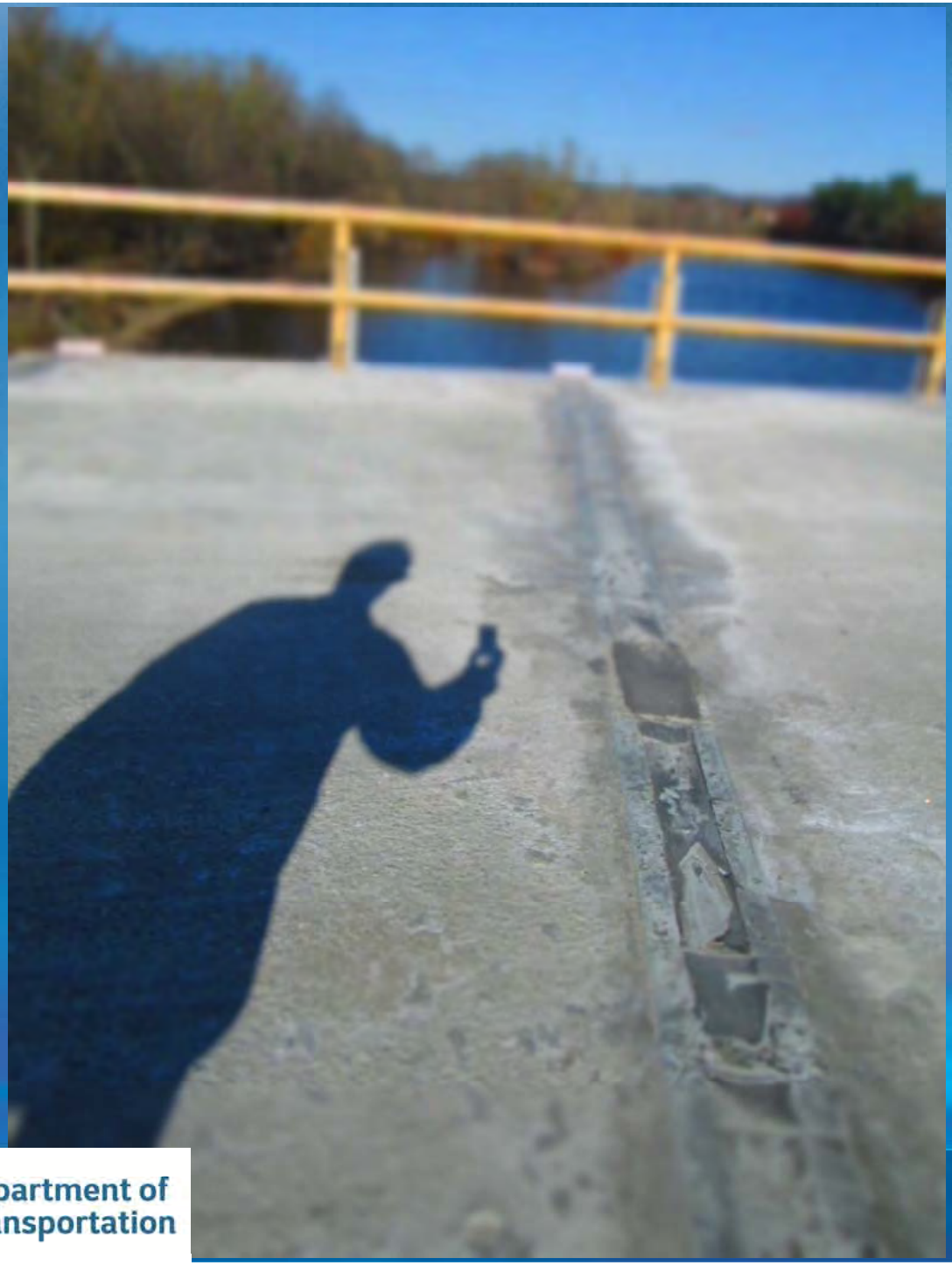

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PROJECT MILESTONES

- WB Bridge
  - Closed on March 21, 2014
  - First panel set on September 24, 2014
  - Last of 104 panels set on October 22, 2014
  - Completed on November 26, 2014
- EB Bridge
  - Completed on November 25, 2015

What's Next

- Public outreach to explain the benefits of ABC
- Develop standard details for PBES
- Develop design guidelines for PBES
- Develop PBES applications for substructures
- Explore ways to speed up construction

What's Next

- ABC using PBES is expected to accelerate
- Newer methods of faster construction
- Use of lighter and more durable bridge elements
- Complete closure will be more acceptable
- Cost of ABC also may come down