I-95 Bridge Restoration Project in Richmond, VA

ASHE Presentation
Norfolk, VA
September 18, 2012

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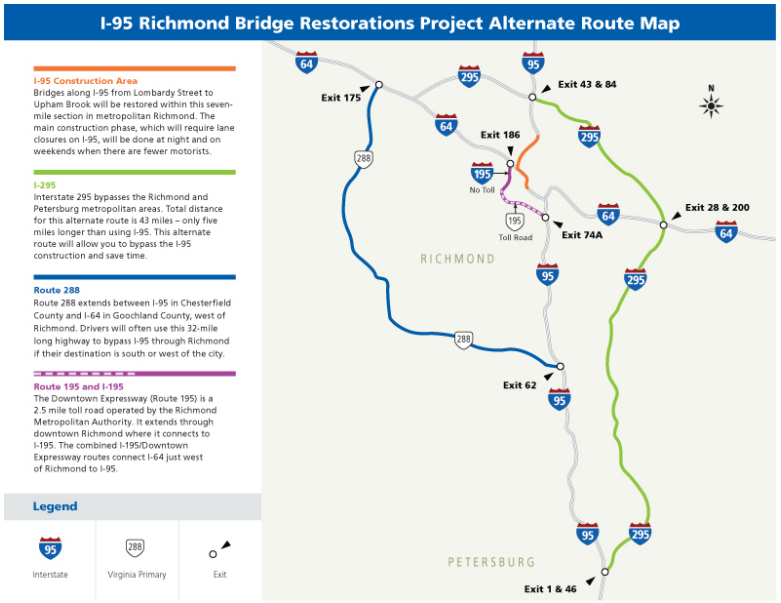
Project Background

- N-S six-lane divided highway
- 150,000 VPD
- 11 bridges
- Built 1958 to 1962
- Structurally deficient
- Functionally obsolete

Public Involvement

- Community meetings
- Radio
- TV
- VDOT 511
- Social media
- Newspapers
- Website



Maintenance of Traffic (MOT)

- Zipper barrier
- Cross overs
- Local traffic under bridge closures
- VSP coordination
- 8 pm - 6 am shift

Accelerated Bridge Construction (ABC)

- Why not conventional?
- Why night work?
- Safety
- Quality
- Reduced construction time

RICHMOND BRIDGE Restorations

Preconstructed Composite Units (PCUs)

- LW concrete 9 inch slab
- Fabricated plate girders
- 2 or 3 girder components
- Transverse PT bars
- Continuity bars
- Cast-in-place closure pours

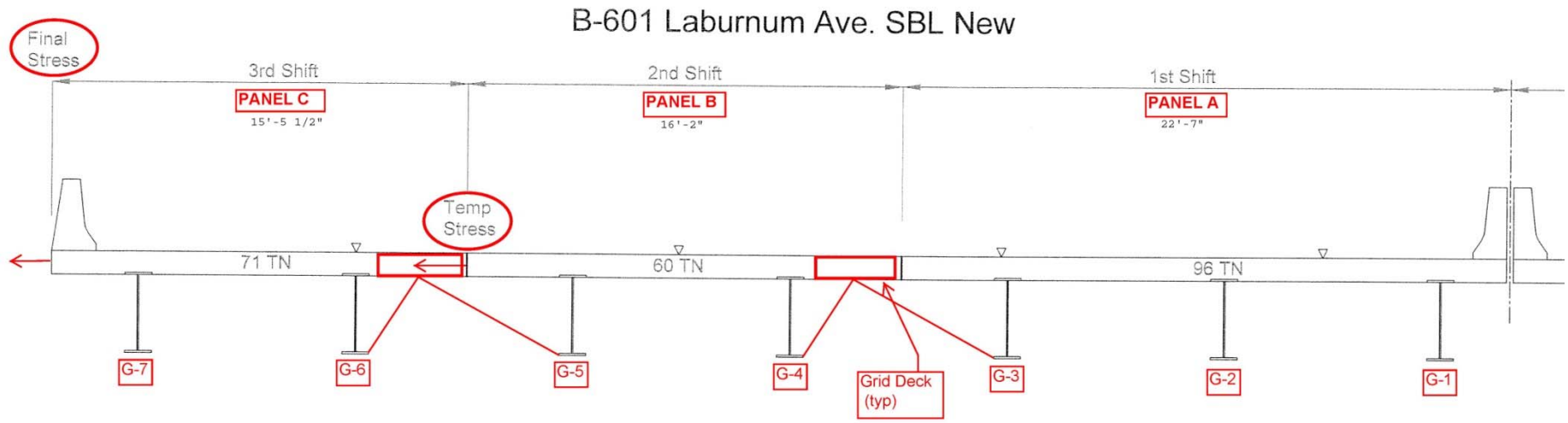
Casting Yard

- 22 acres
- Mi-jack gantry cranes
- PCU storage
- Casting beds
- Actual field substructure geometry

Substructure Repairs

- Abutment & pier widening
- Drilled shafts
- Surface repairs
- Crack injection
- Electrochemical Chloride Extraction (ECE)
- Sacrificial Cathodic Protection (SCP)
- Temporary Supports

Existing Bridge Demo / PCU Erection



Construction Challenges

- 10 hour window for night work
- Deploy zipper barrier
- Sawcut deck
- Remove demo pieces
- Prepare beam seats
- Haul routes for PCUs / load ratings
- Set PCUs
- Temp & final PT
- Temp grid deck

INTERSTATE 95 RICHMOND BRIDGE Restorations VDOT

Construction Photos

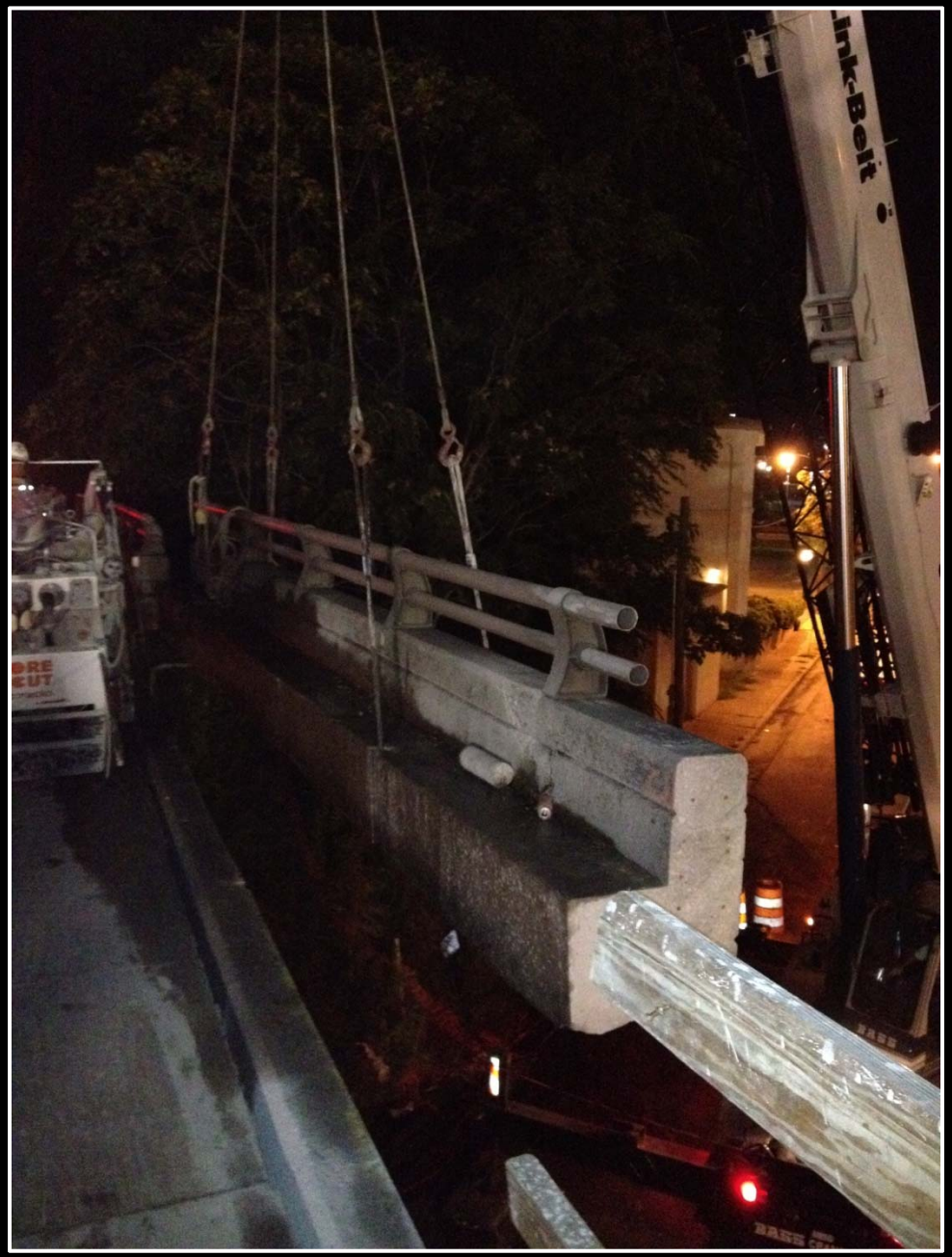

AWC
McNeilus

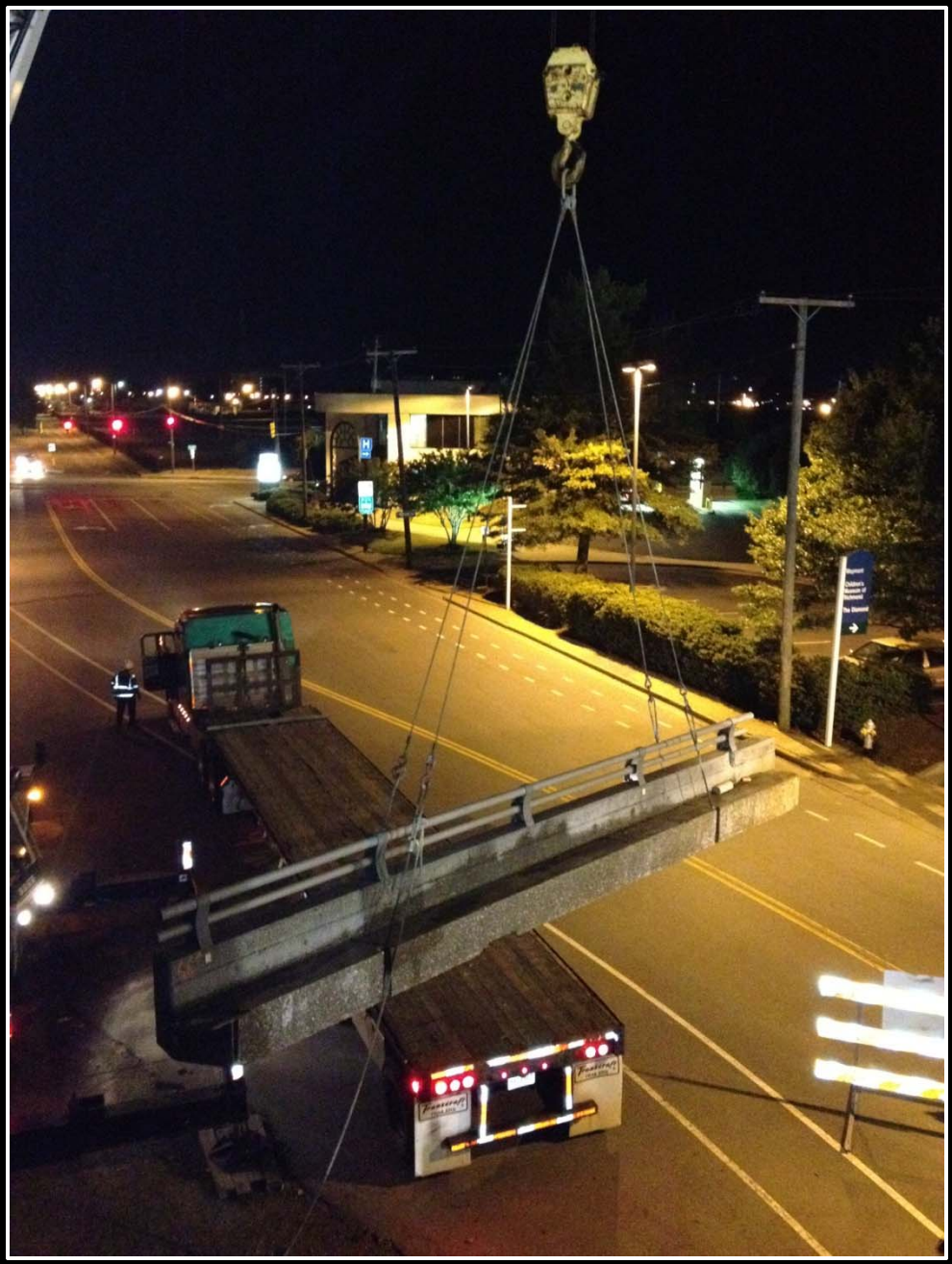

RED CARPET INN
PET
Fresh Dairy Products

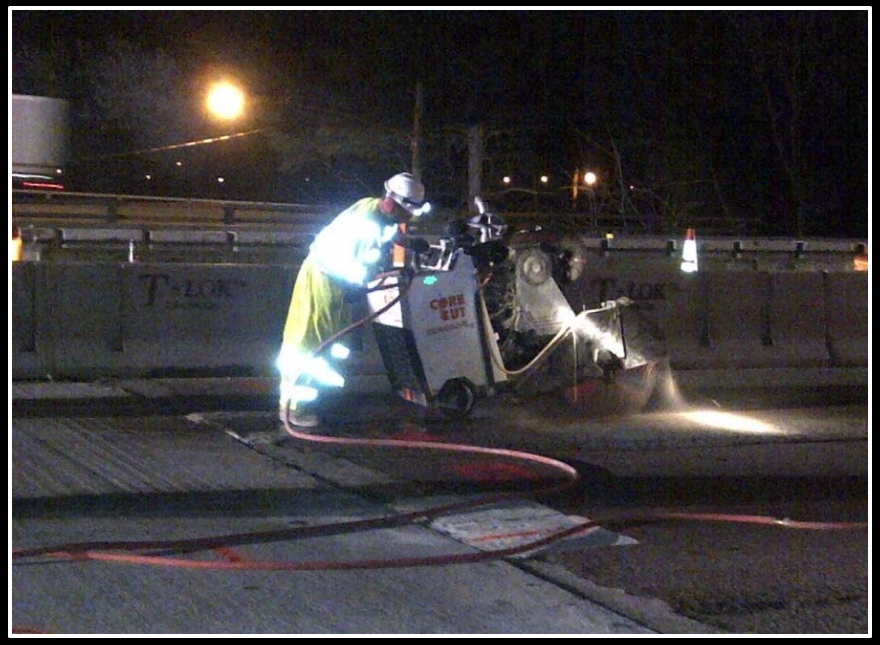

DEERE

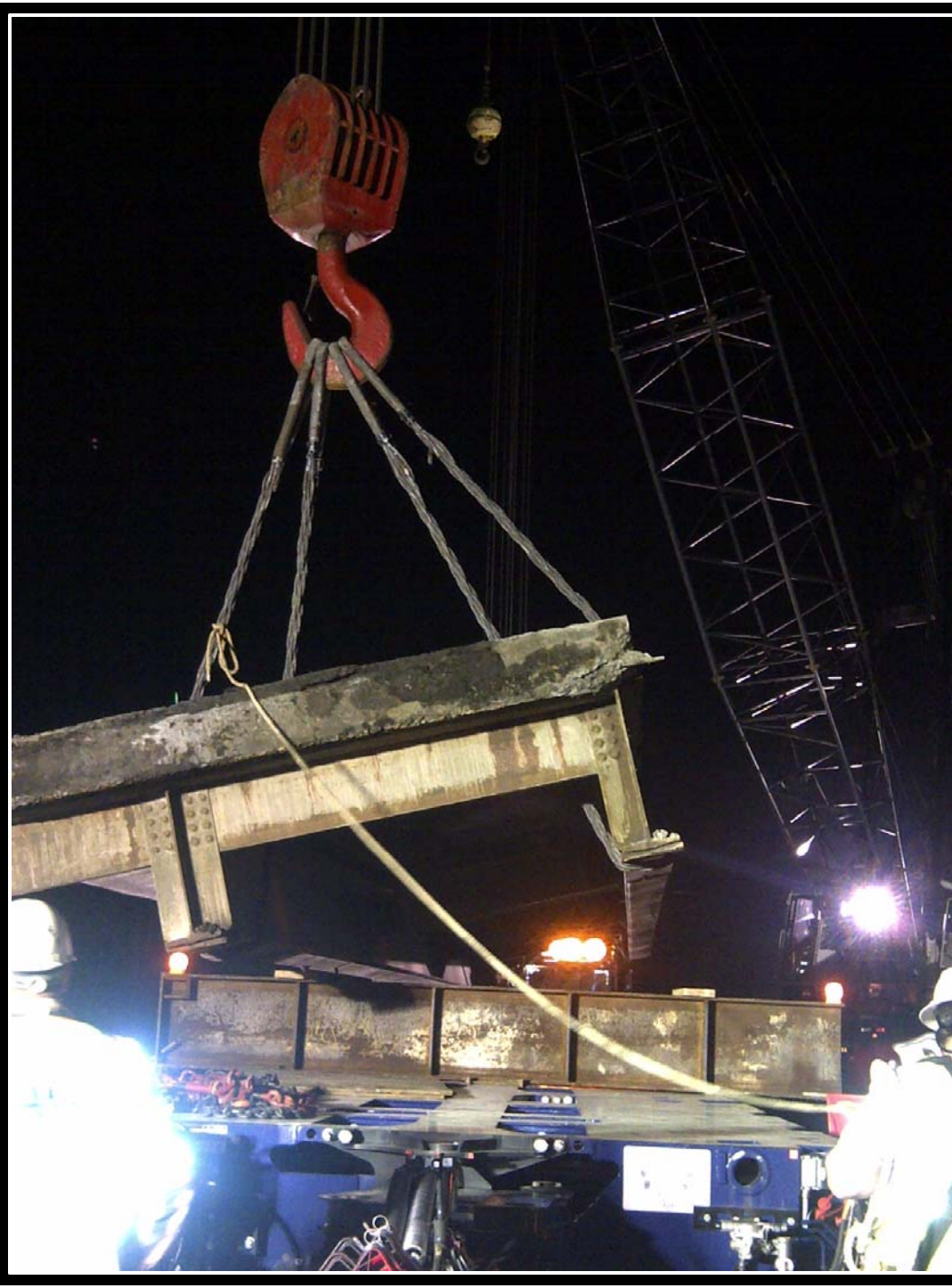

MI-JACK
MI-JACK

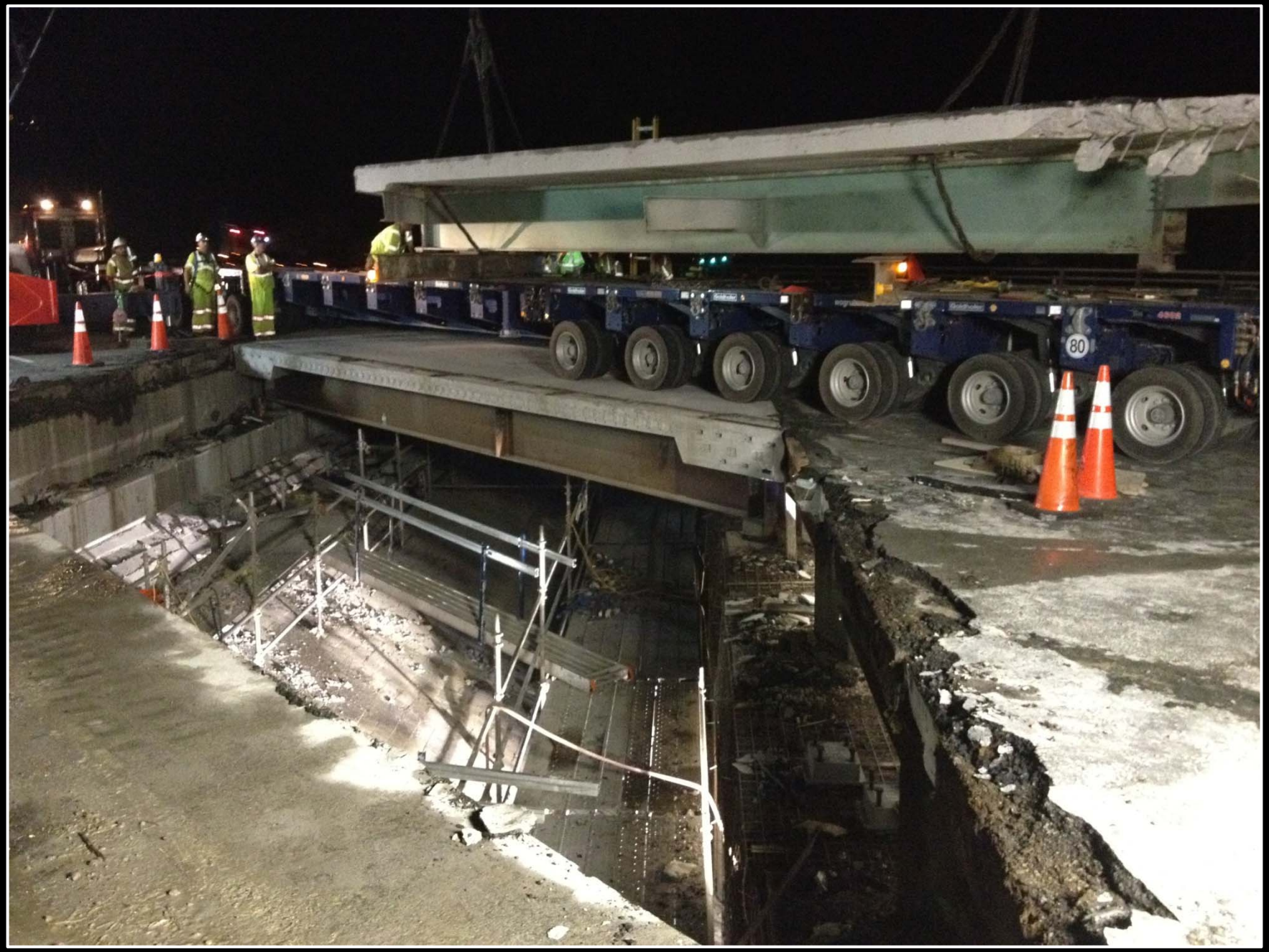

TRAVELIFT


ink-Belt

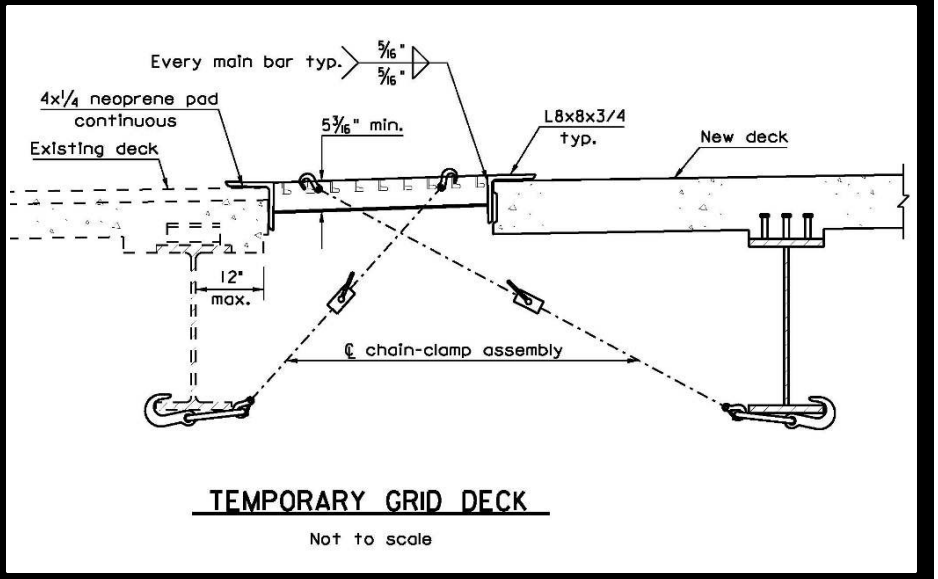



T-LOK
T-LOK
CORE CUT



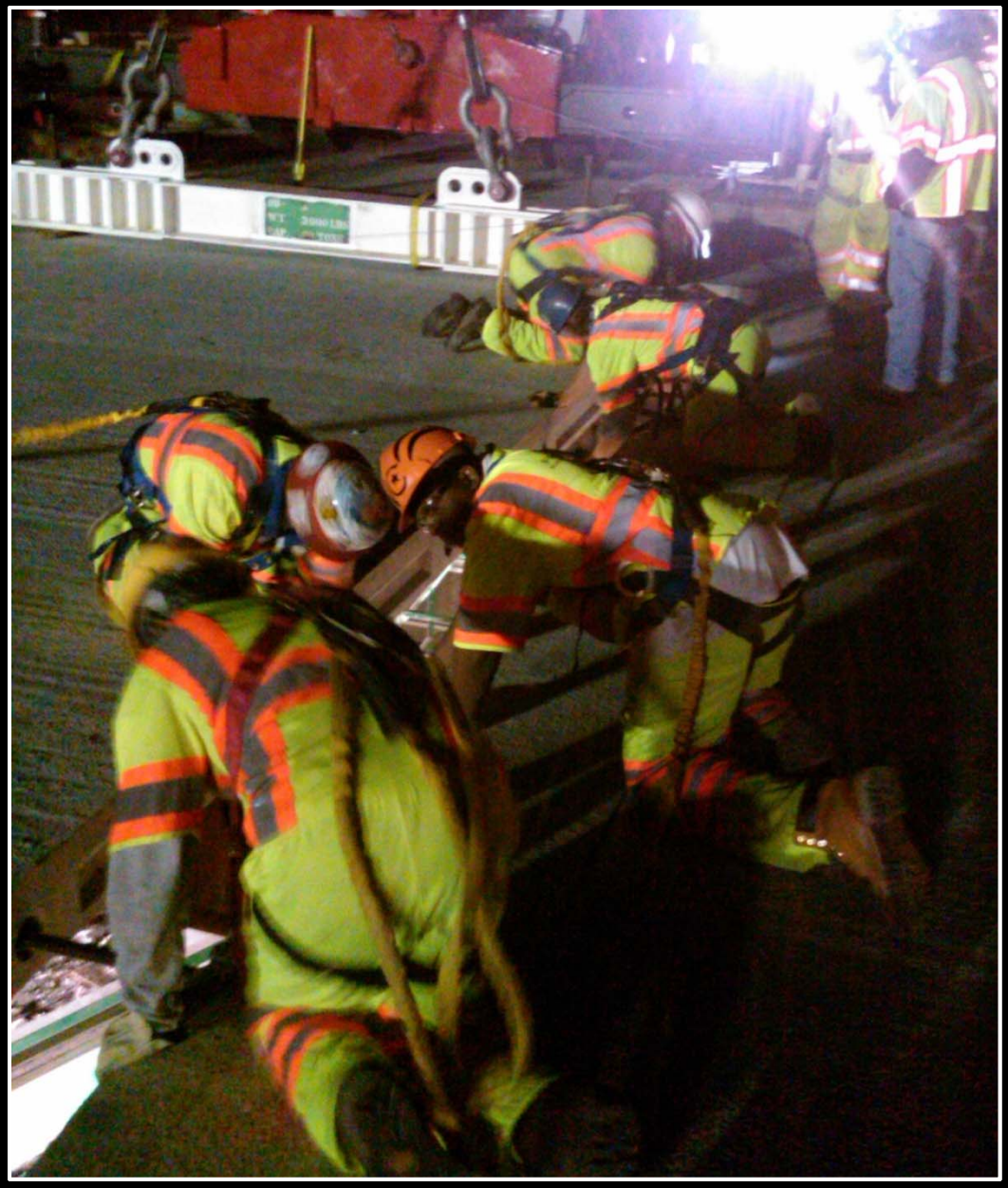

80

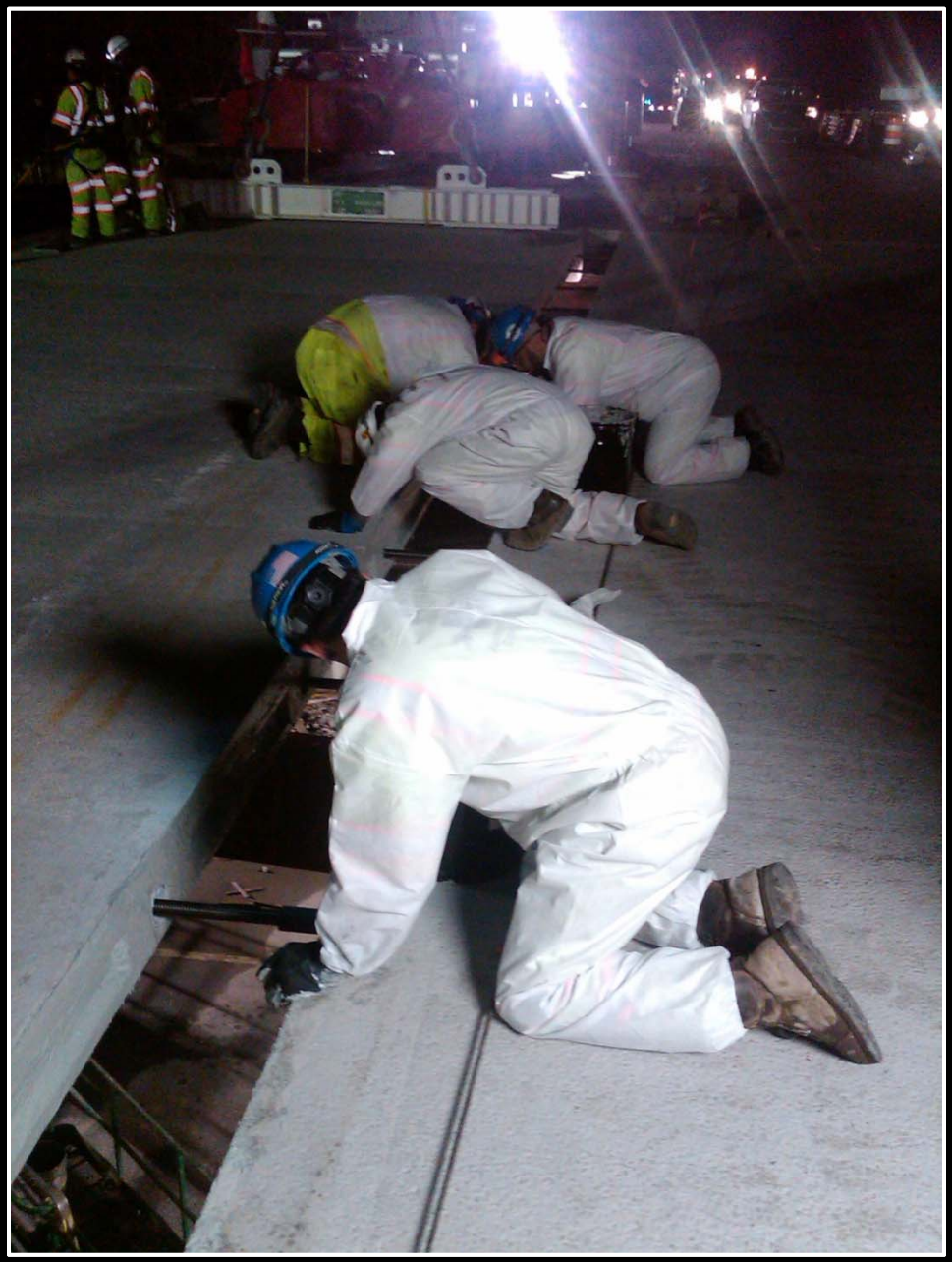

GOI NB B-1

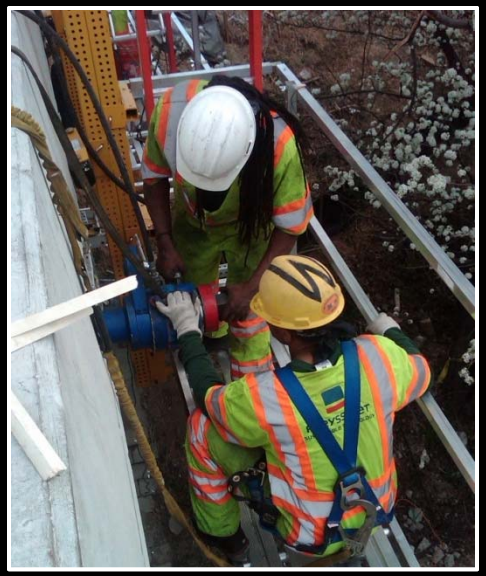


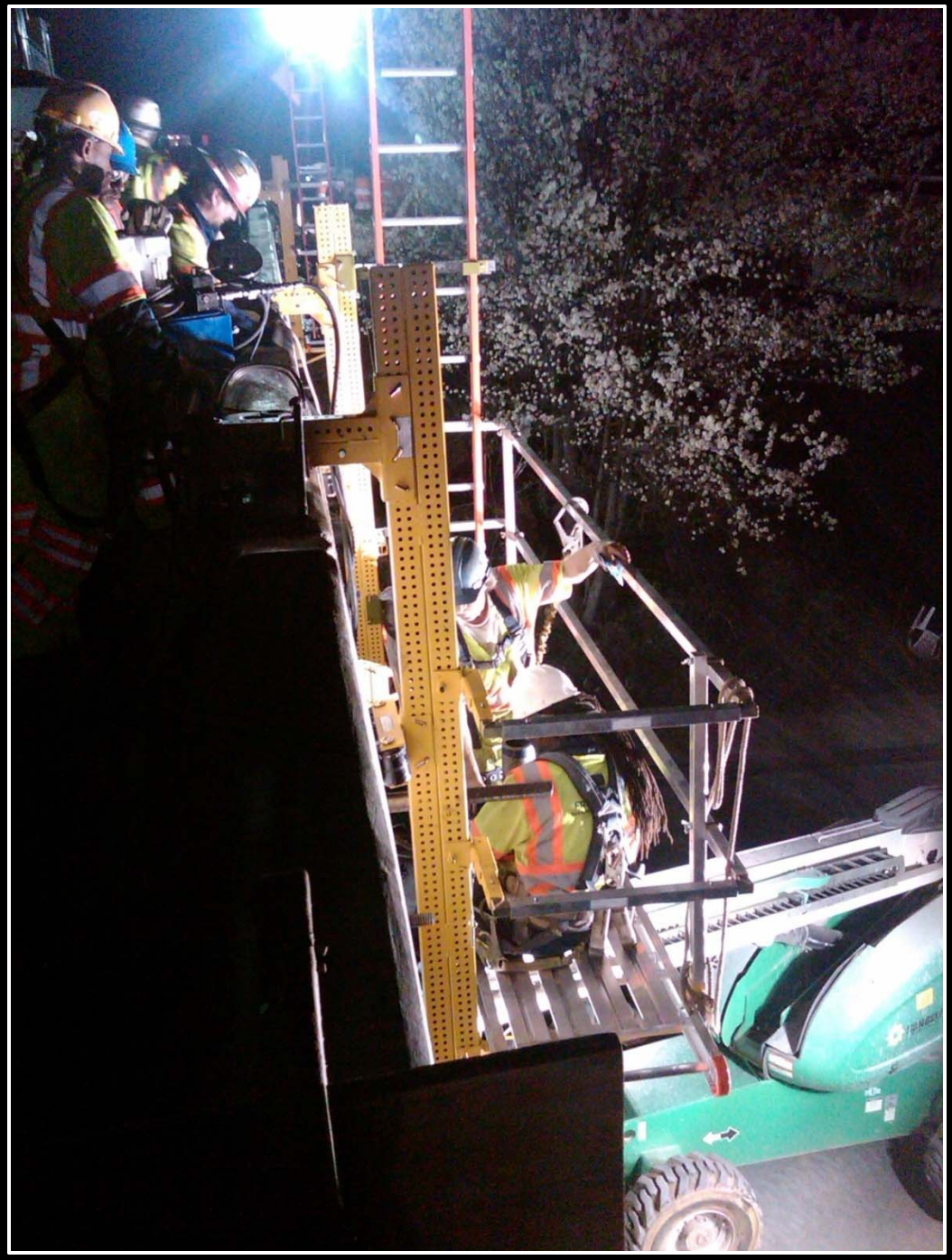
TEMPORARY GRID DECK

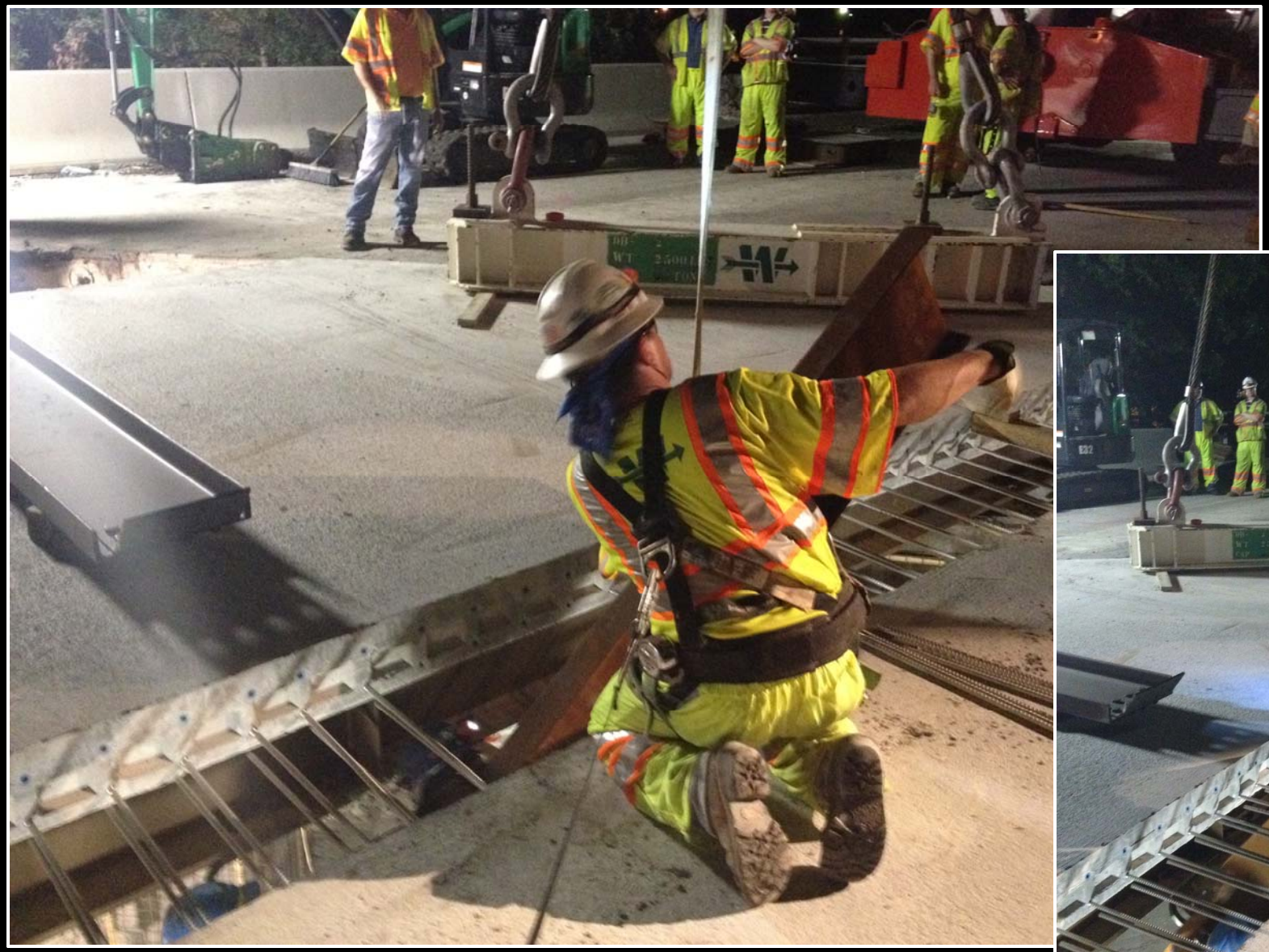
Not to scale

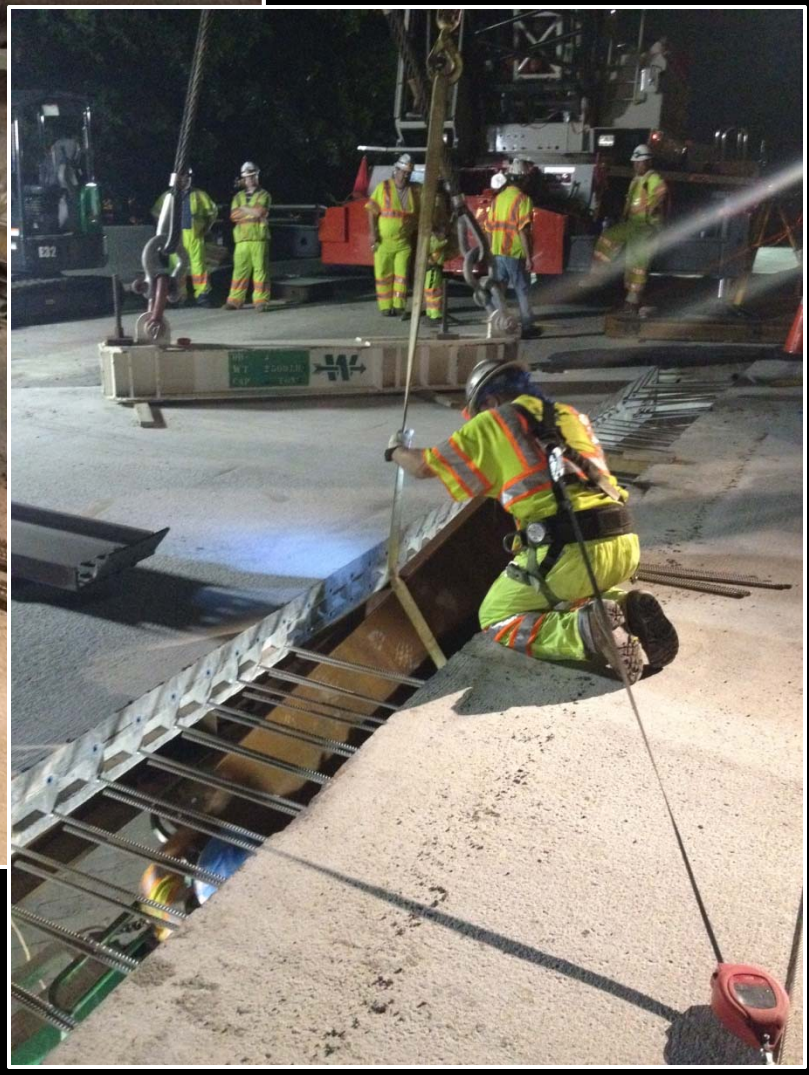










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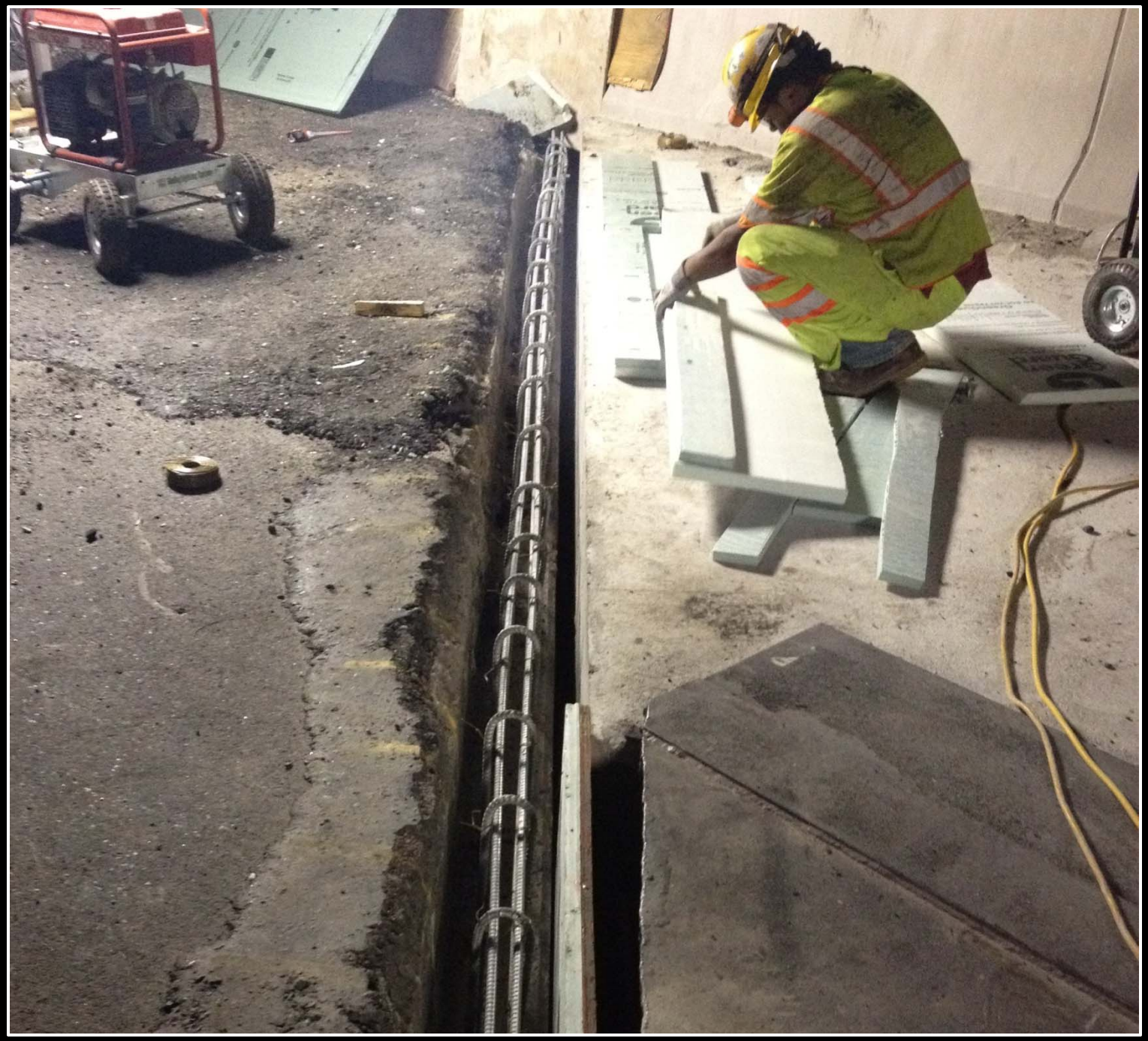


AWC
AWC
AWC


AMC
AMC

Lessons Learned

- Drilled shaft locations clear of existing piles
- Drilled shafts vs. Steel piles
- Allow for prep work prior to PCU replacement
- Carefully review existing bridges for embedded expansion dams
- Do not detail temp. grid deck design. Allow contractor to provide design

Lessons Learned

- Minimize skews if possible
- Multiple concrete suppliers with approved mixes
- Identify haul routes and bridge ratings
- Temporary Supports – concrete columns in lieu of steel
- Eliminate anchor bolts (use restraint blocks)
- Post-tension & grout the A panel in casting yard

Lessons Learned

- Maintenance of existing structures during life of project
- Consider slotted holes in diaphragm w/ friction connections
- Provisions for extensive repairs of pedestals prior to superstructure replacement
- More detailed geotechnical data
- NEVER cut PT bars in the field w/o approval
- Closure pour steel – use staggered U-bars in lieu of couplers

Lessons Learned

Cones make for great temporary supports!!!

RICHMOND BRIDGE Restorations

Acknowledgements

- **Owner:**
  Virginia Department of Transportation (Richmond District)
- **CEI Consultant:**
  Michael Baker Jr., Inc.
- **Engineer:**
  URS Corporation
- **General Contractor:**
  Archer Western Constructors, LLC

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