

ABC - Prefabricated Bridge Move
District 5

BRF-021-1(46)--38-54

Letting Date 03-17-2026

Bridge Replacement - CCS

Design 0326

IA 21 over Cedar Creek

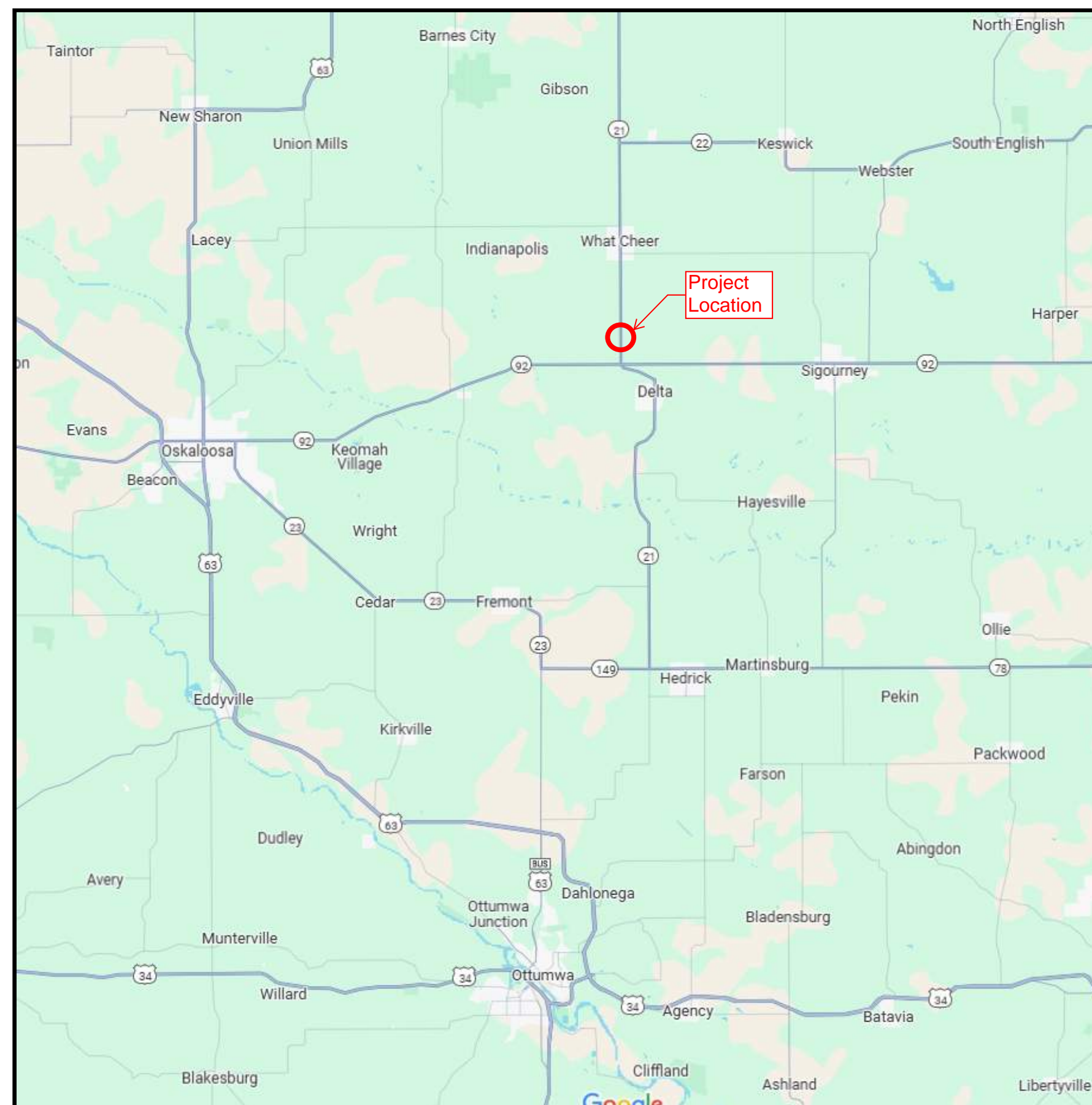
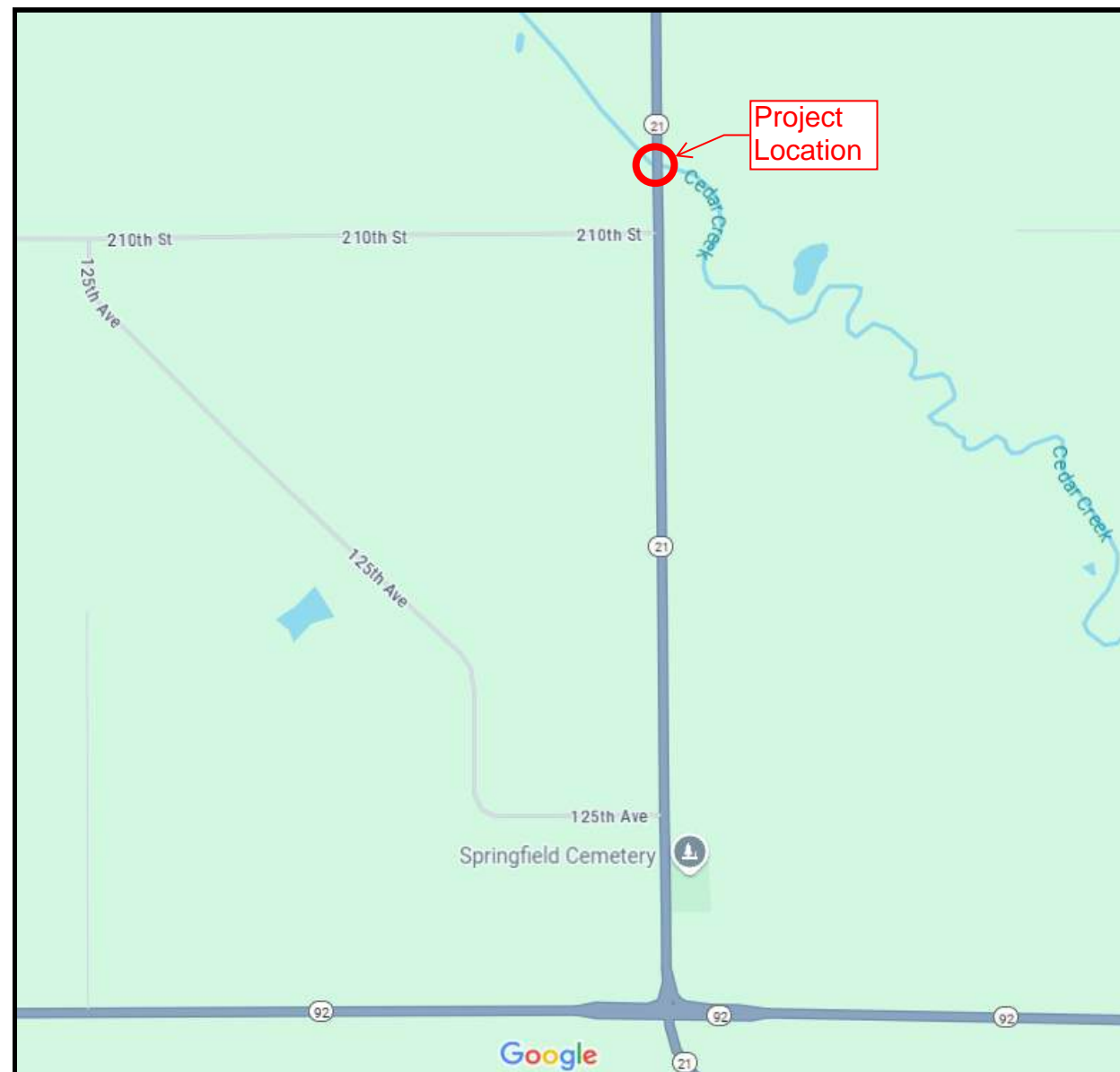
Keokuk County

140'-0 x 40'-0 CCS (42.5'-55'-42.5')

0 deg skew

Maint No. 5414.5S021

FHWA No. 032601



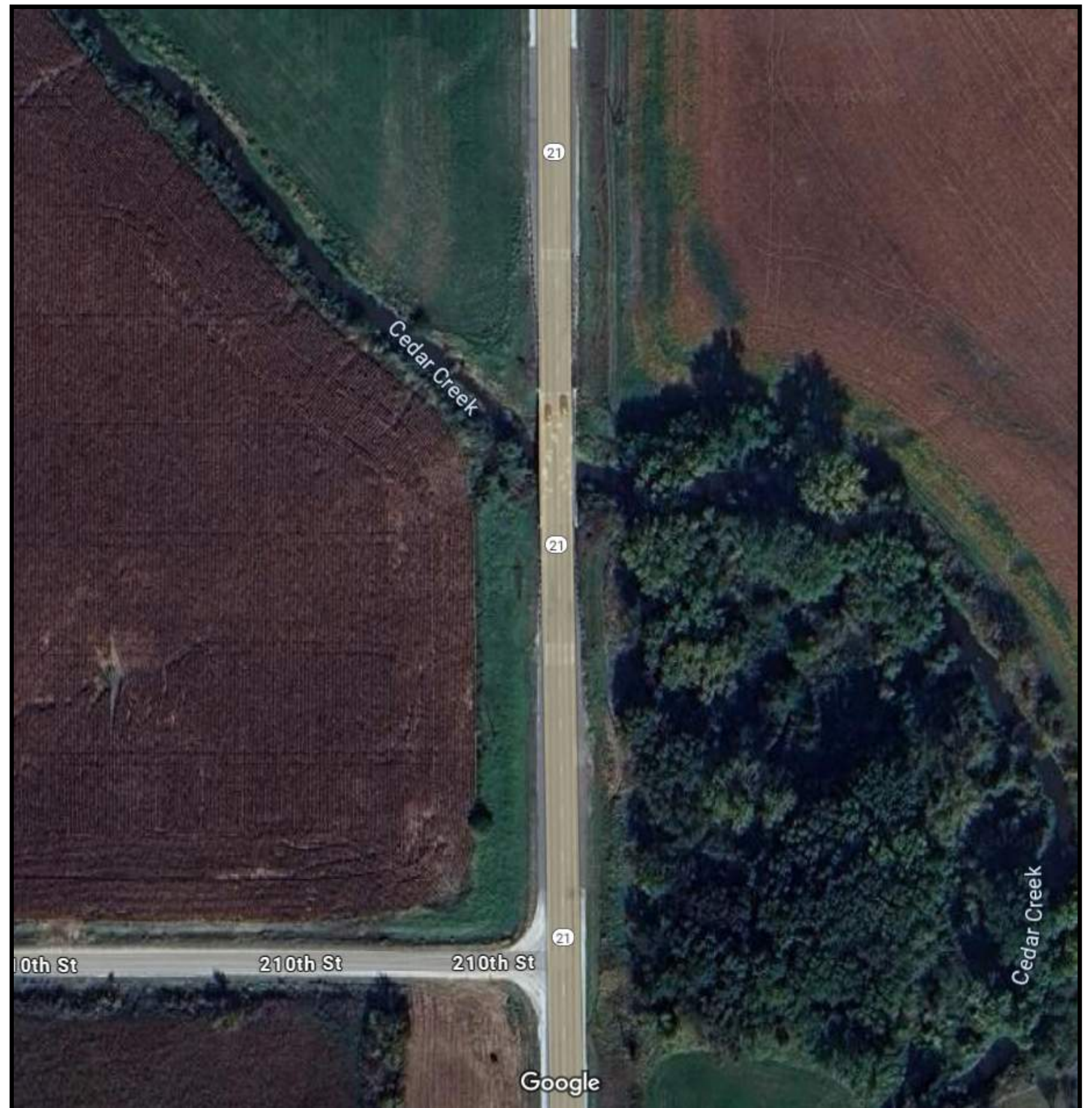
Traffic Estimate:

The 2021 daily traffic (ADT) is estimated as 1,760 with 18% trucks.

Selected Alternative:

IA-21 traffic will be maintained onsite until the superstructure is constructed on temporary bents, at which point an off-site detour will be used.

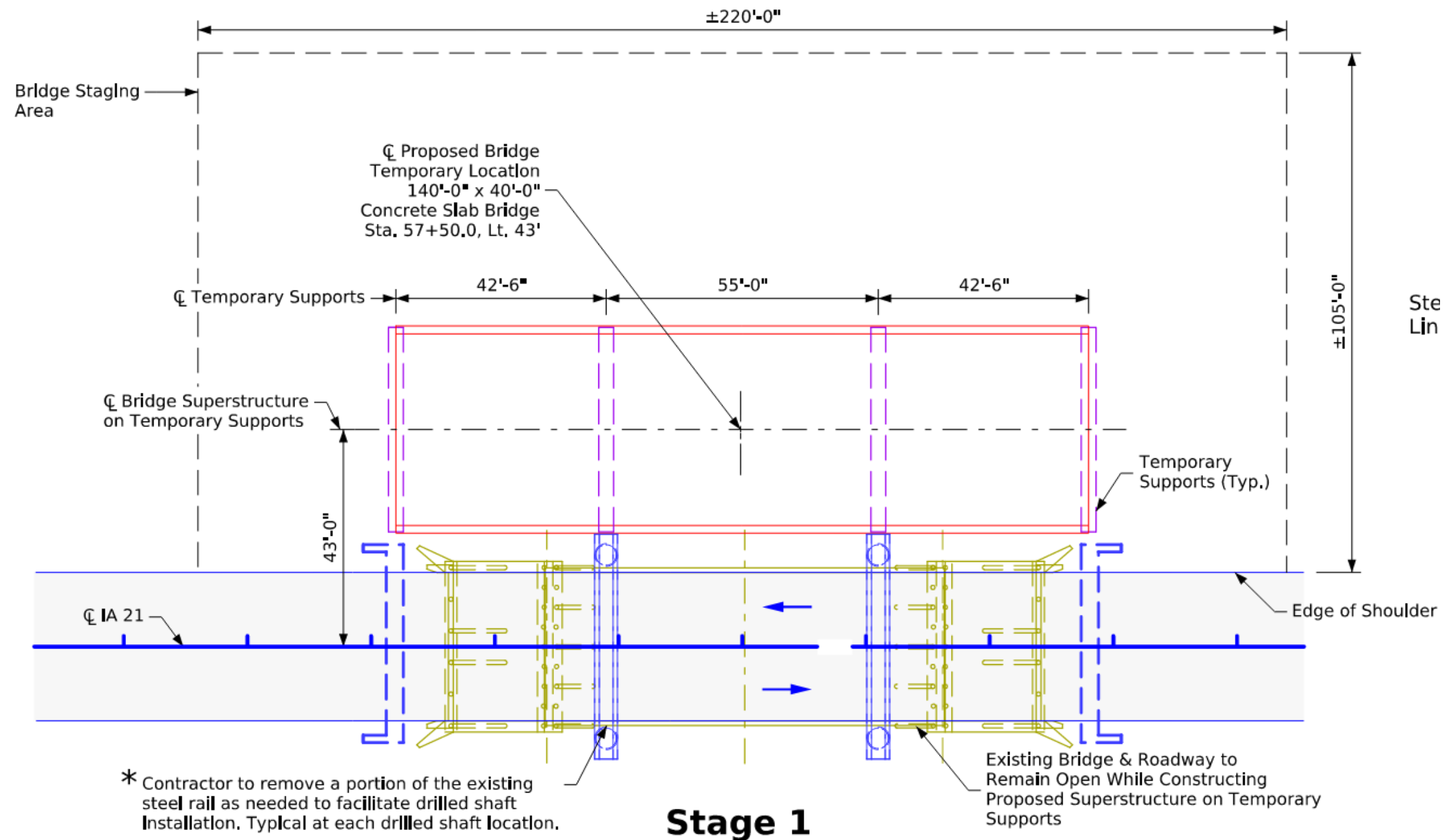
Accelerated bridge construction (ABC), with prefabricated lateral bridge move was selected to reduce duration of closure period.





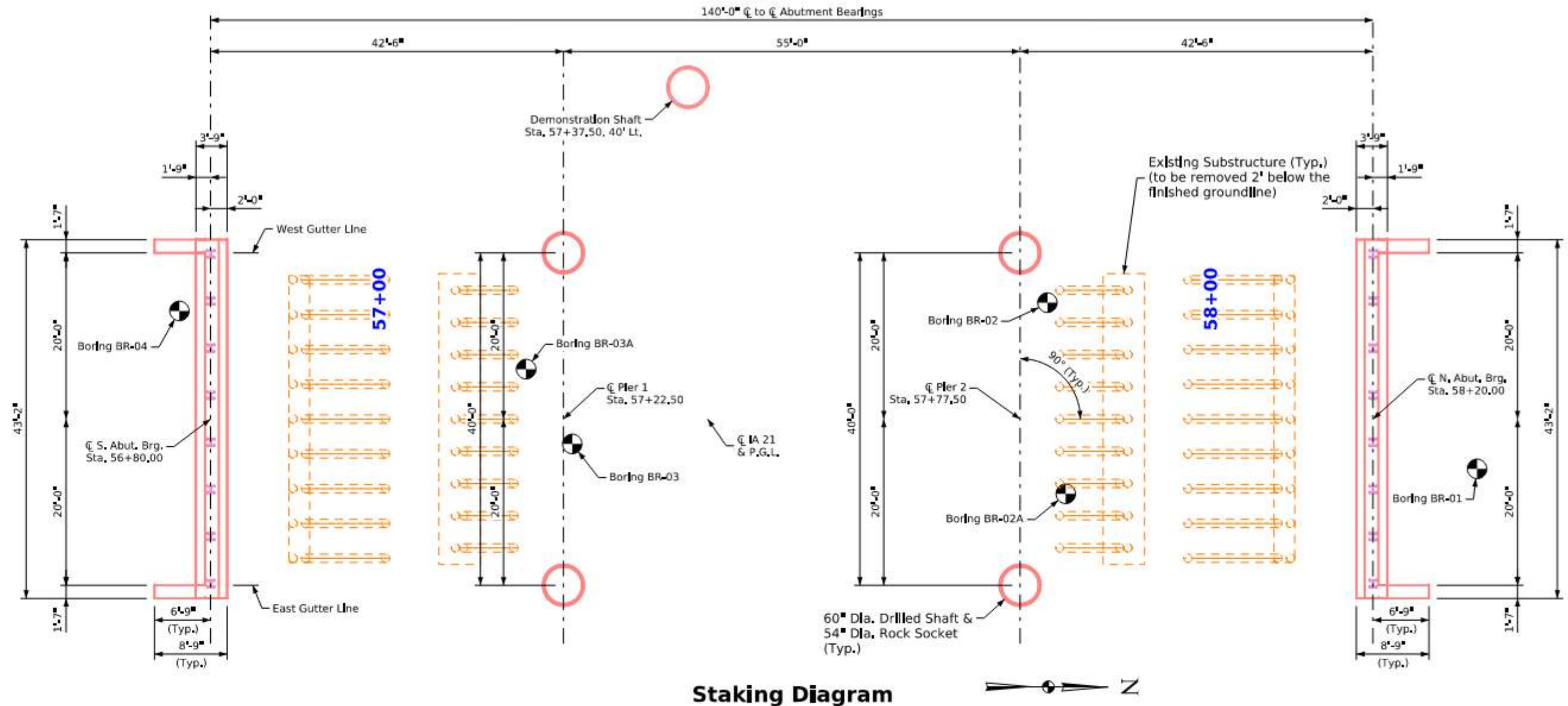
Prior to Critical Closure Period:

- Install 4 drilled shafts for piers
- Construct temporary bents
- Construct superstructure on temporary bents



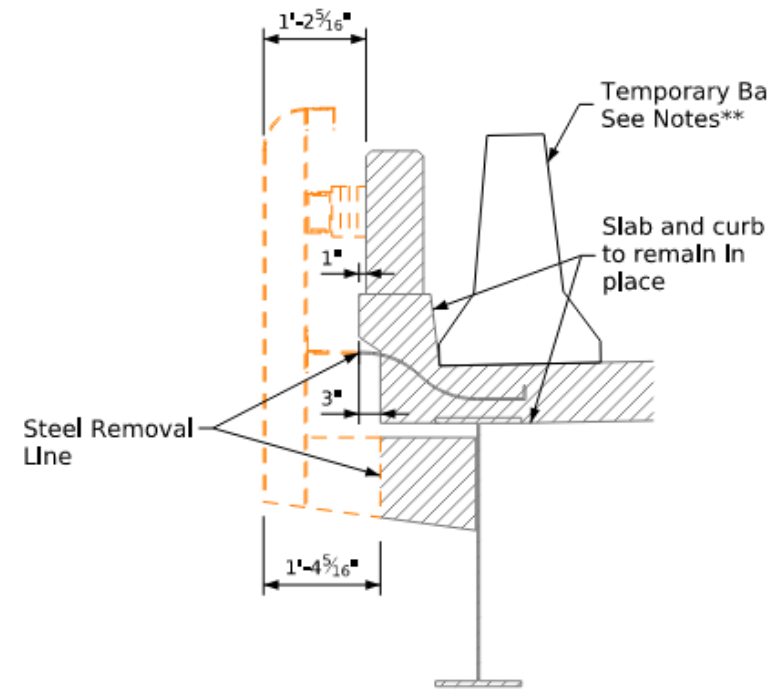
Demonstration Shaft:

- location on plans selected to avoid conflict w/ temp. bents
- Contractor has option to modify location and incorporate into temp. bents
- Per standard specifications, demo shaft requirement can be waived if contractor demonstrates previous experience.



Existing Bridge Rail - Potential Conflict:

- Installation of drilled shafts may require more clearance to existing structure than anticipated during design phase.
- Contractor has option to partially remove existing steel rail and posts per details and notes on V.6.
- TBR would be required.



Existing Bridge Railing Removal Detail

NOTES:

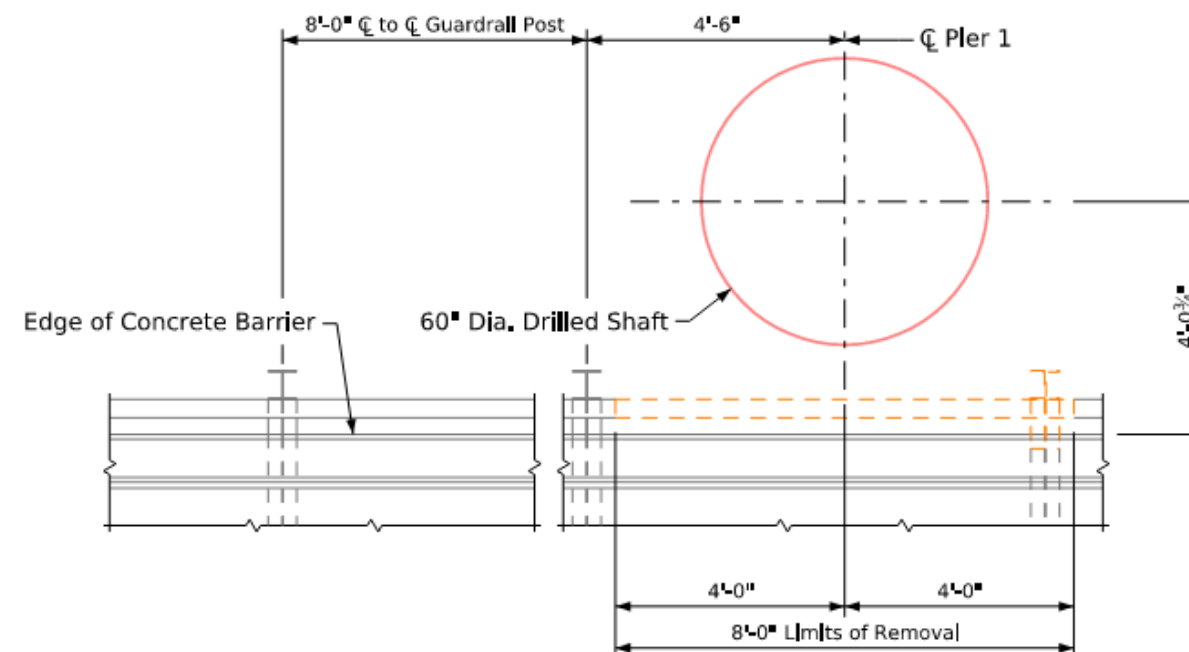
At the Contractor's option, partial removal of the steel rail and posts will be allowed to facilitate drilled shaft construction. Traffic will be maintained on the existing bridge during and following the partial removal. The Contractor shall submit to the Engineer for approval a partial removal plan before beginning removal operations.

The partial removal plan will show the location and proposed extent of the partial removal, how the removed area will be protected with Temporary Barrier Rail and include all traffic control required during and following removal.

The cost for the partial removal will be considered incidental to the bid item "Removal of Existing Bridge" and no direct payment will be made. Refer to the traffic control plan shown elsewhere in these plans.

The steel overhang brackets shall be cut at the locations noted; no removal of connectors at the girder webs shall be allowed.

** TBR should be placed before the steel rail removal; If the Contractor determines that partial removal of the steel rail as shown is not necessary for the drilled shaft construction, TBR does not need to be placed on the bridge. Refer to Roadway plan sheet B.3 for additional information.



Existing Bridge Railing Removal Detail - Plan View

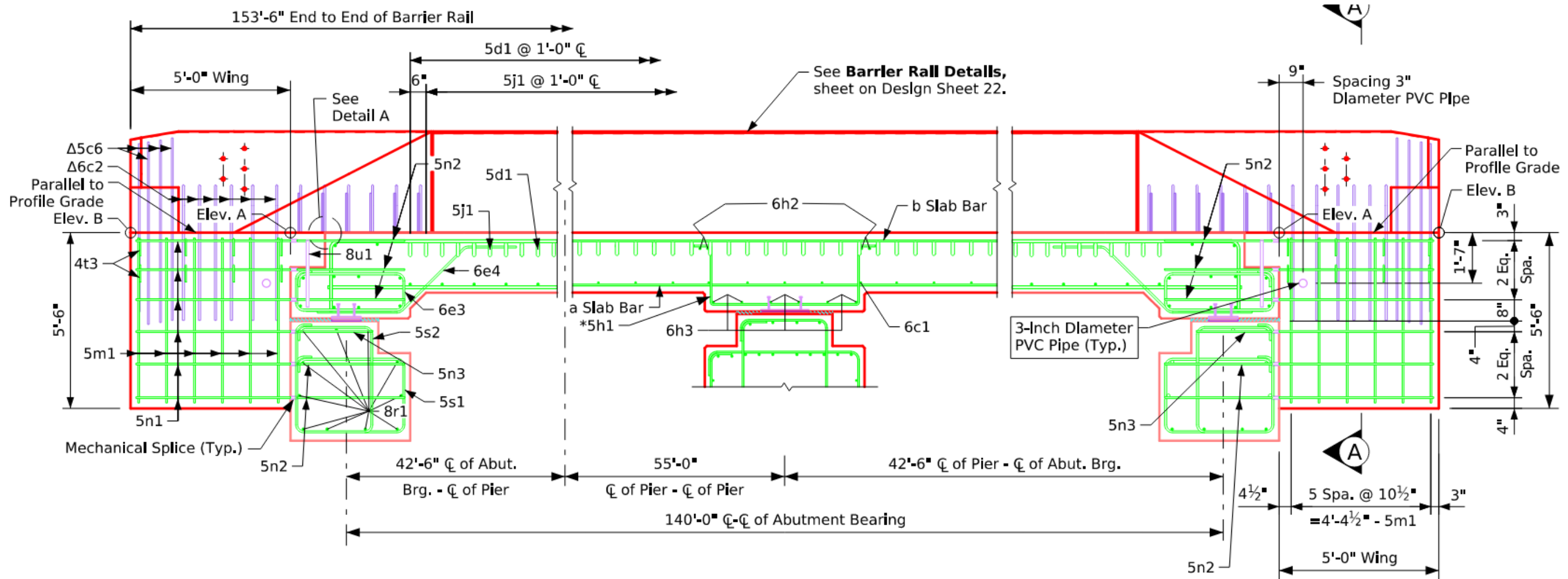
(Verify all dimensions in the field)
(West Drilled Shaft Shown, East Drilled Shaft Similar)

Prefabricated Bridge Move Methods:

1. Roller System
2. Lateral Slide
 - a. On Temporary Bearings Detailed in Plans
 - b. On Other Sliding Device
3. Other (Pre-Approved) Method of Contractor's Choosing

Notes:

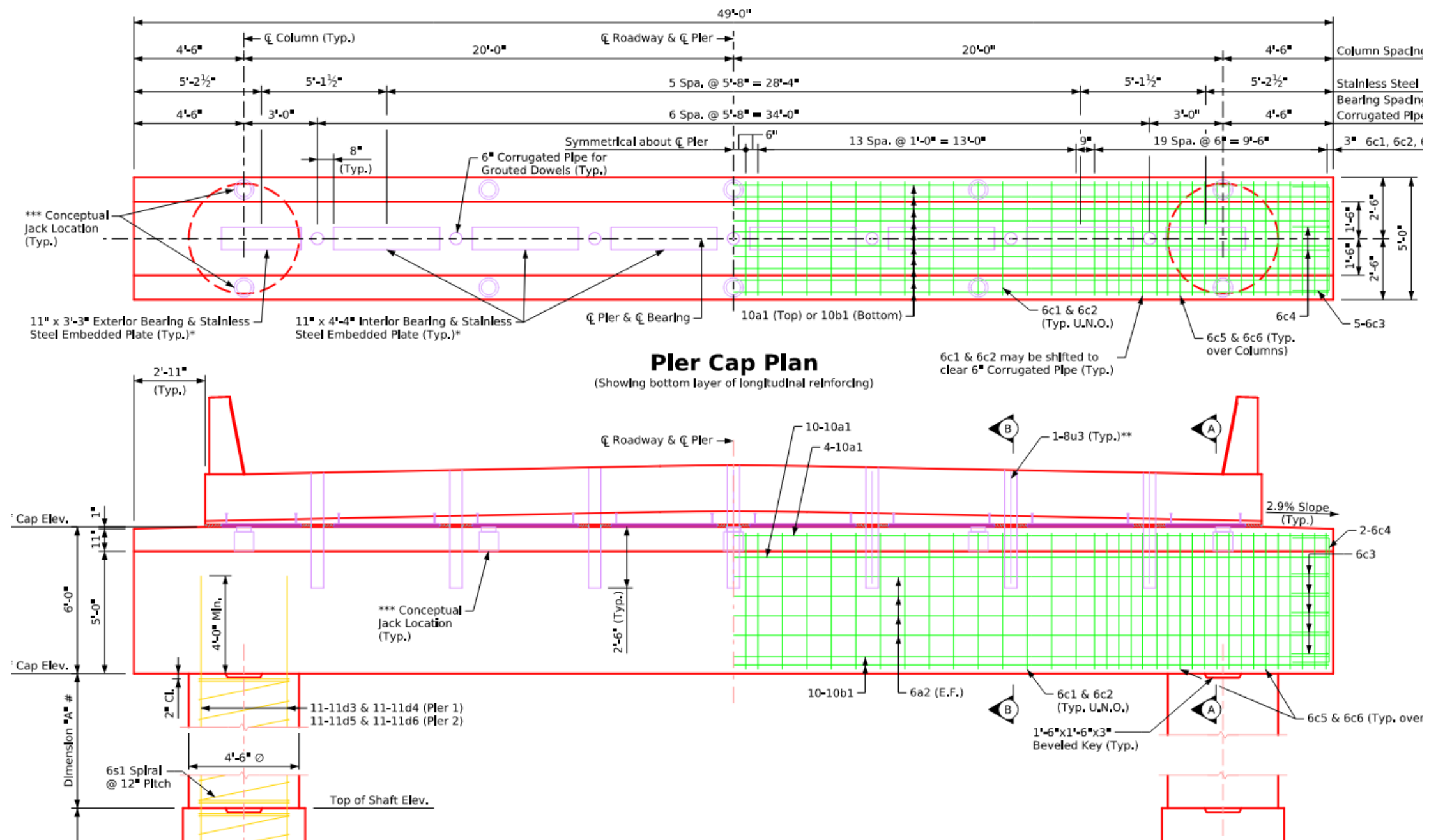
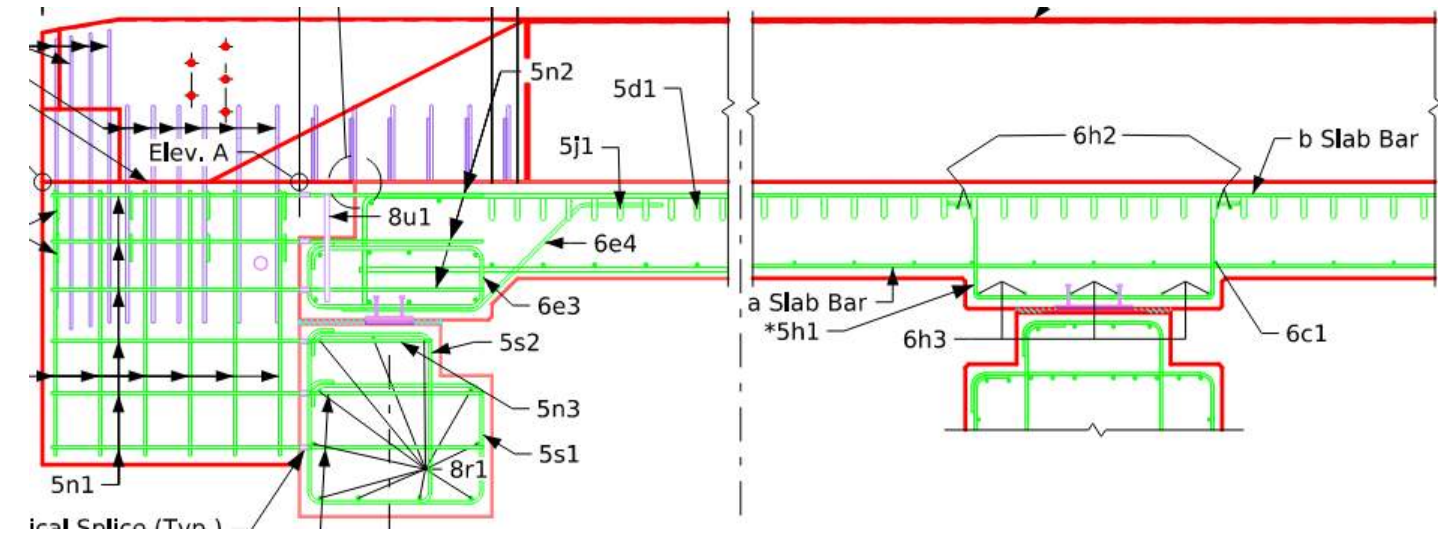
- **Barrier Rail: May be Poured Before or After Br. Move**
 - If barriers are placed prior to superstructure move, construction joints shall be included in barriers at CL of piers, CL of transverse slab joints, and any other location deemed necessary by Contractor's Engineer.
- **Wings and Barrier End Sections: Poured After Br. Move**
 - Wing horiz. reinf. to be connected after slide w/ mechanical splices



Part Longitudinal Section Near Gutter Line

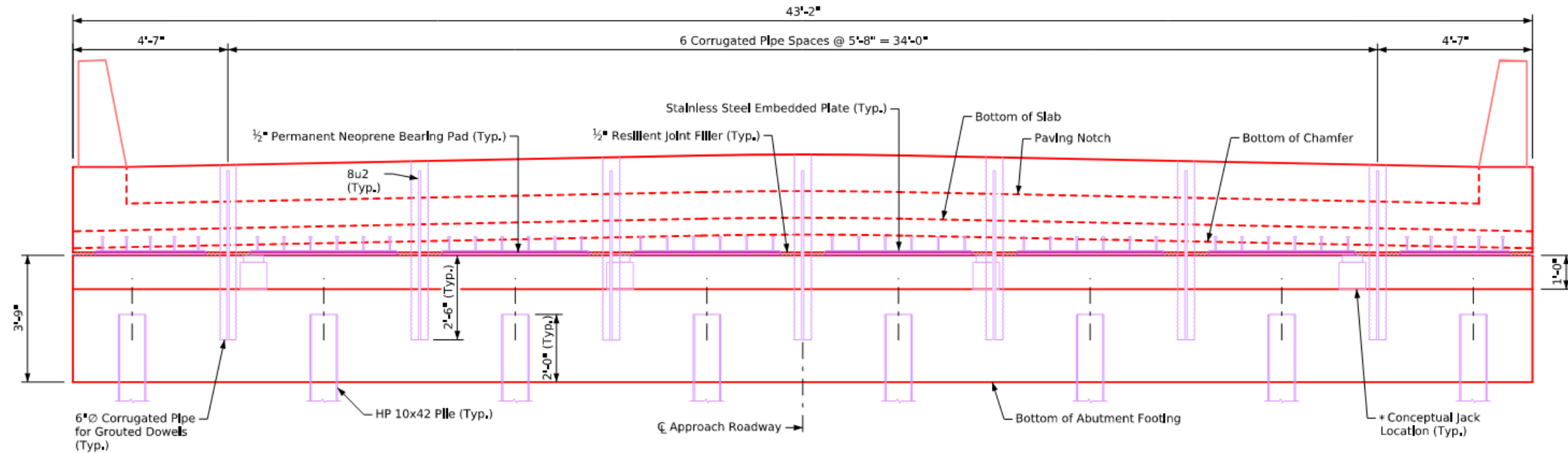
Jacking Notches & Jack Placement:

- Hydraulic cylinder jacks may be placed within 12" x 12" jacking notches.
- Jack placement as shown on plans is conceptual only.
- Number of jacks, jack locations, and calculations to verify superstructure and substructure are not overstressed is responsibility of Contractor's Superstructure Move Engineer.



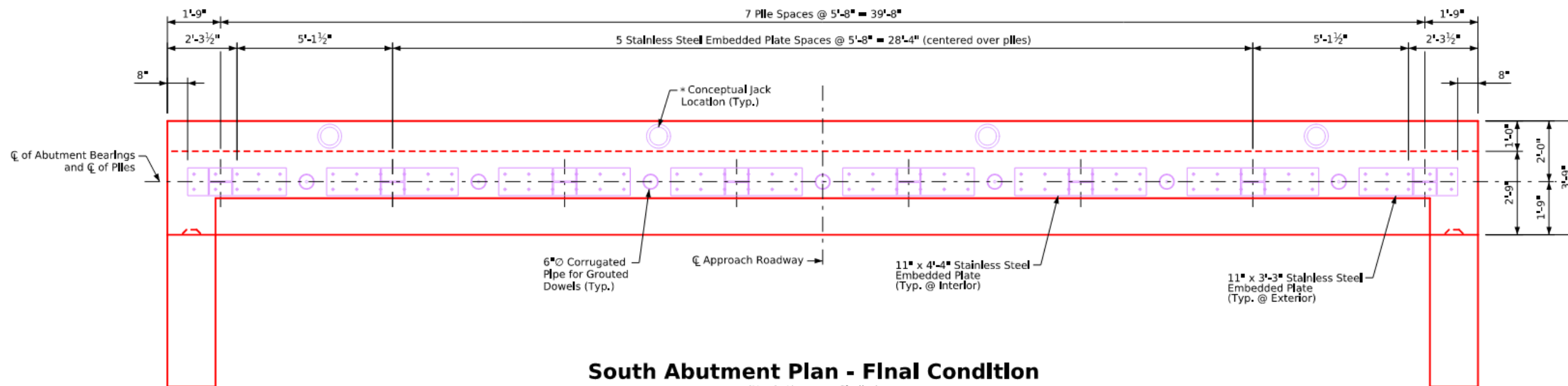
Slide Concept:

- Slide laterally until edge of temp. bearing reaches edge of stainless steel embedded plate.
- Use hydraulic cylinder jacks located in jacking pockets to lift superstructure and reset temp. brgs to new position.
- 'Leap-frog' until superstructure reaches final position.
- Guide system required.



South Abutment Elevation - Final Condition

(North Abutment Similar)
(Reinforcing (aside from dowels) not shown, for clarity)

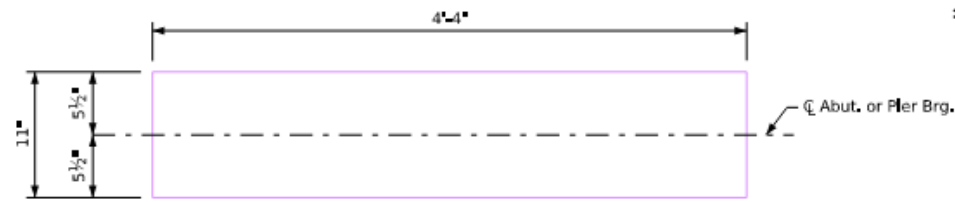


South Abutment Plan - Final Condition

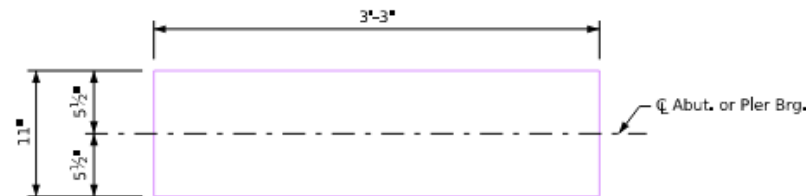
(North Abutment Similar)
(Reinforcing (aside from dowels) not shown, for clarity)

Stainless Steel Embedded Plates & Temp. Bearing w/ PTFE:

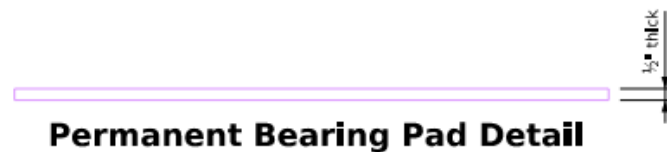
- May be omitted if Contractor selects roller method, or alternate lateral slide equipment
- Temp. bearing design may be modified, but would require sealed design by Iowa PE.



Permanent Bearing Pad Orientation - Interior



Permanent Bearing Pad Orientation - Exterior

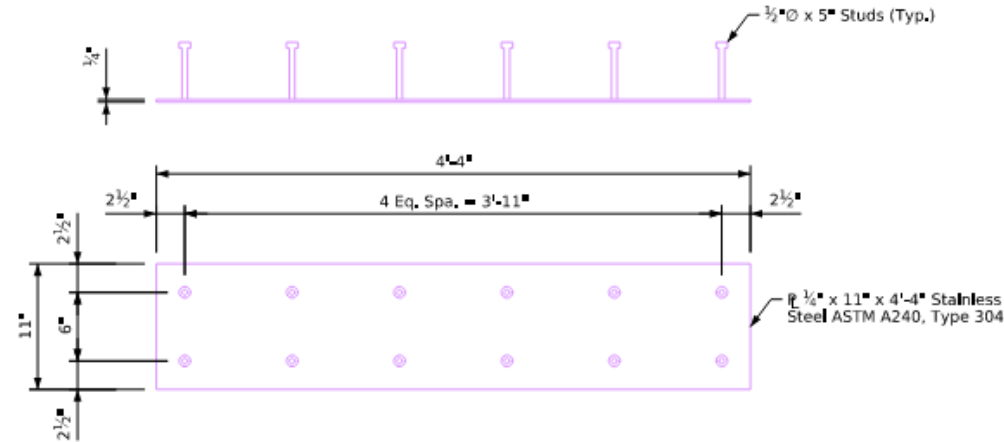


Notes:

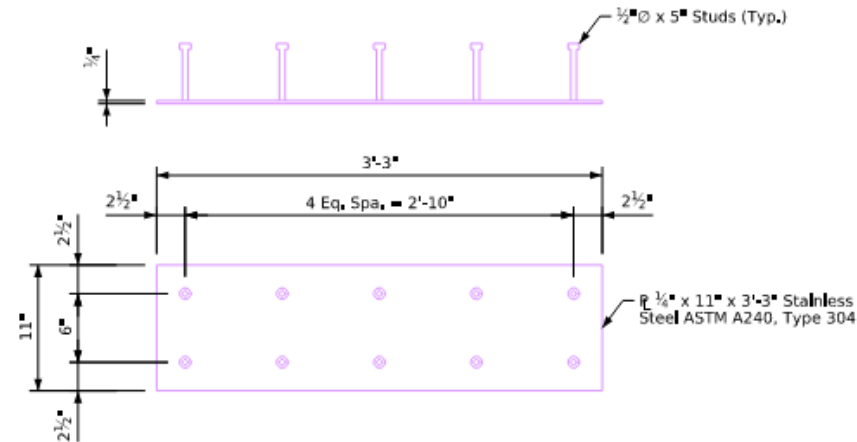
Material for neoprene pads in permanent and temporary cases to be of 60 durometer neoprene.

Bottom edge of stainless steel embedded plates shall be flush with bottom surface of abutment and pier diaphragms.

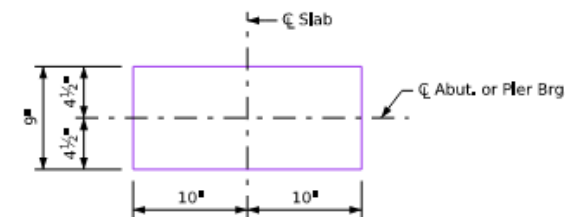
* If the Contractor chooses a prefabricated bridge move system that does not require sliding the bridge using the stainless steel embedded plates and the temporary bearings with bonded PTFE top surface, then the stainless steel embedded plates and temporary bearings can be omitted.



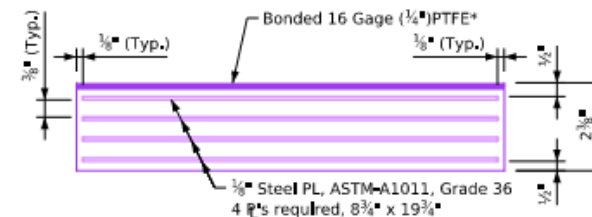
*** Stainless Steel Embedded Plate - Interior**



*** Stainless Steel Embedded Plate - Exterior**



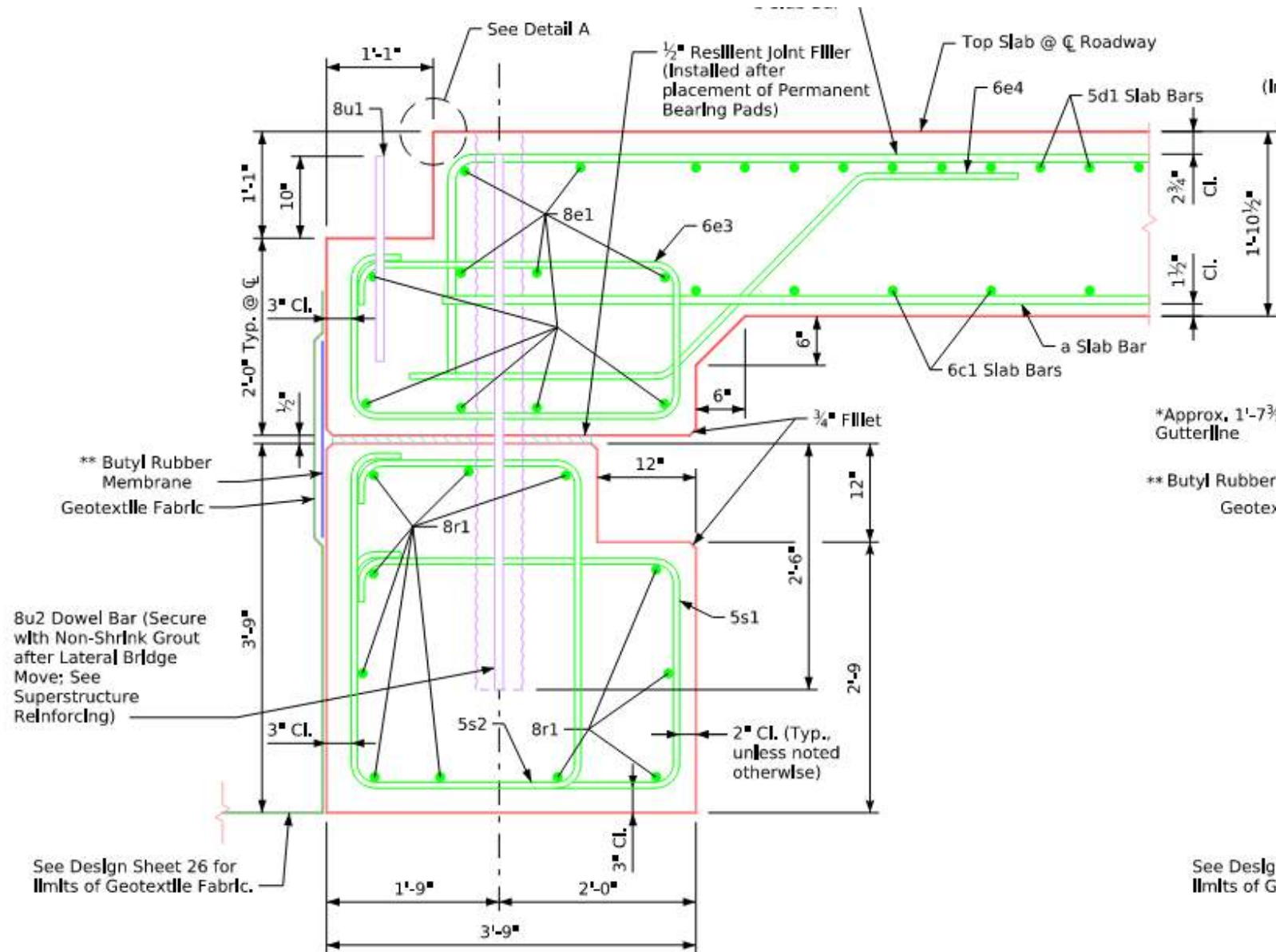
*** Temporary Bearing Orientation**



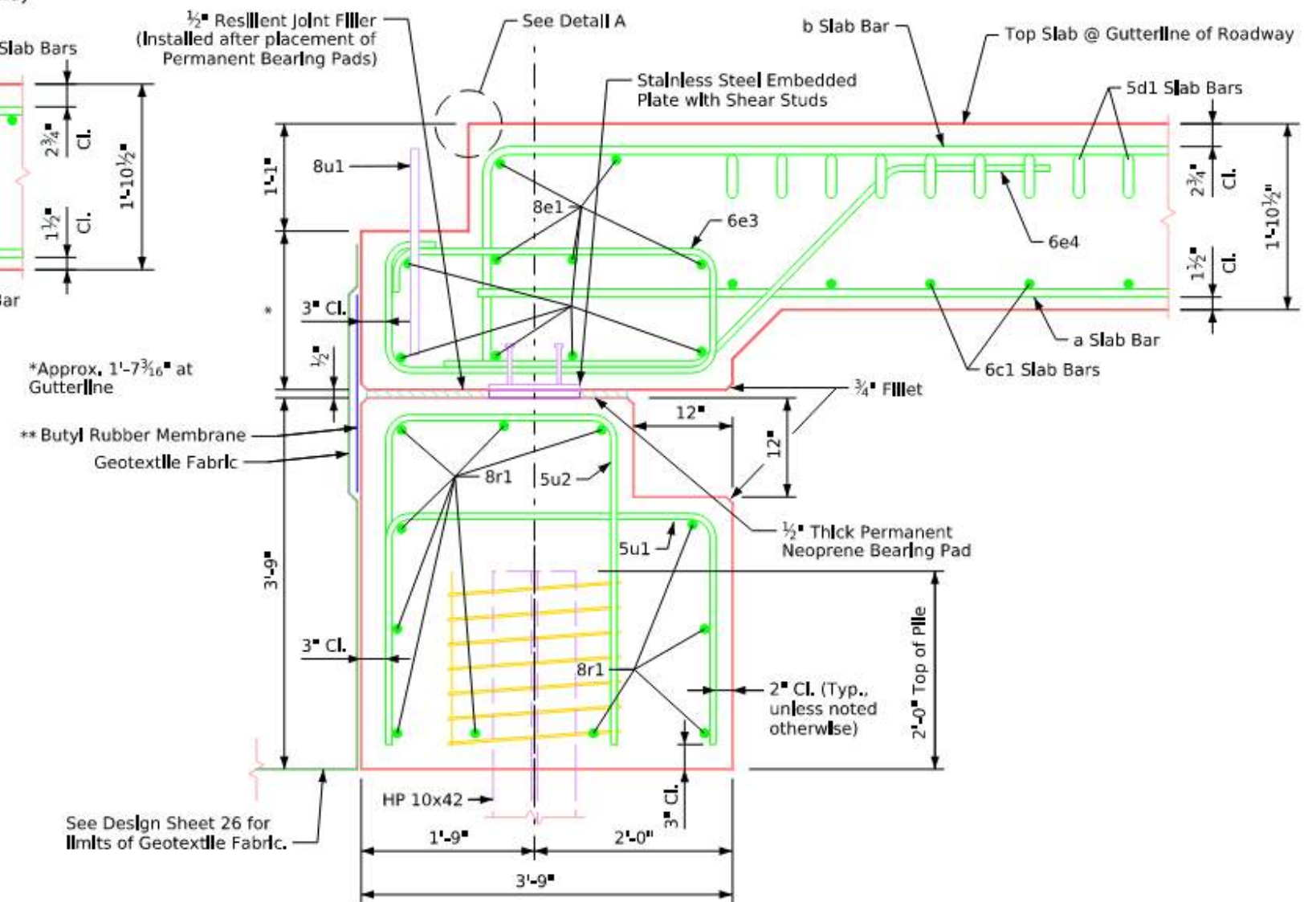
*** Temporary Bearing Detail**

Roller Concept:

- Use hydraulic cylinder jacks located in jacking pockets to lift superstructure and place roller system @ CL Brg.
- Rollers required to be contained within a guide system.
- When superstructure reaches final position, use jacks to lift superstructure again and remove roller system.
- Stainless steel embedded plates & temporary bearings can be omitted for roller concept.



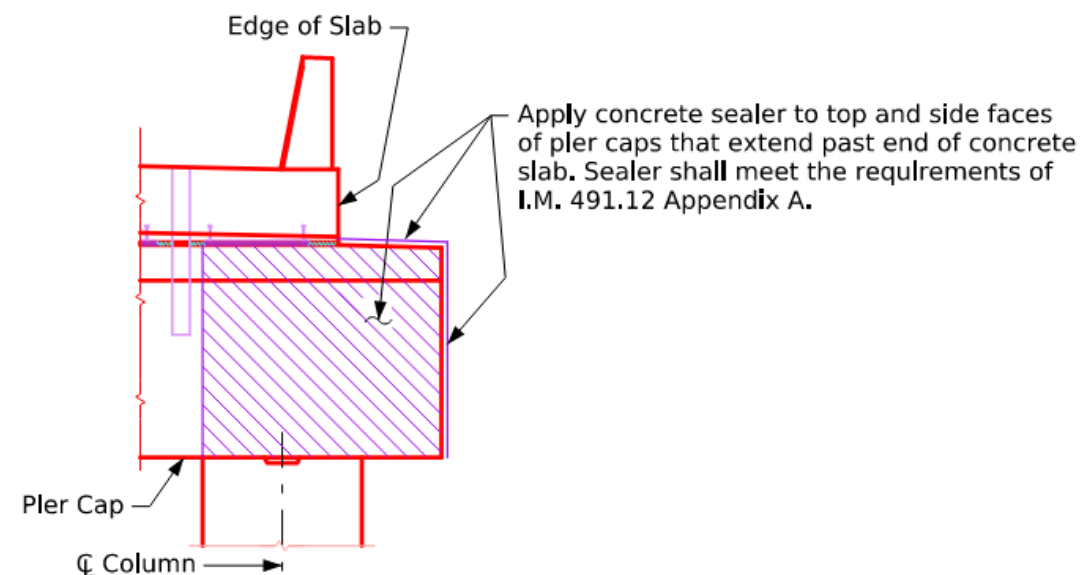
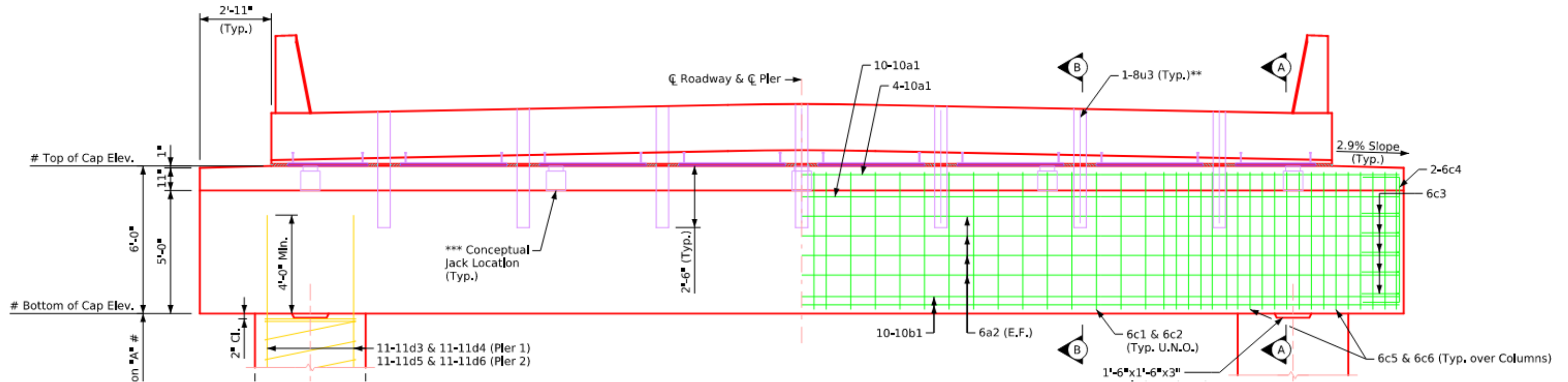
Abutment Section at CL Bridge



Abutment Section at Gutterline

Pier Cap Notes:

- 1" Wash (2.9% slope) at ends of pier caps to shed water. Accommodate with shims, etc. during lateral br. move.
- Apply sealer to ends of cap per detail on V.9



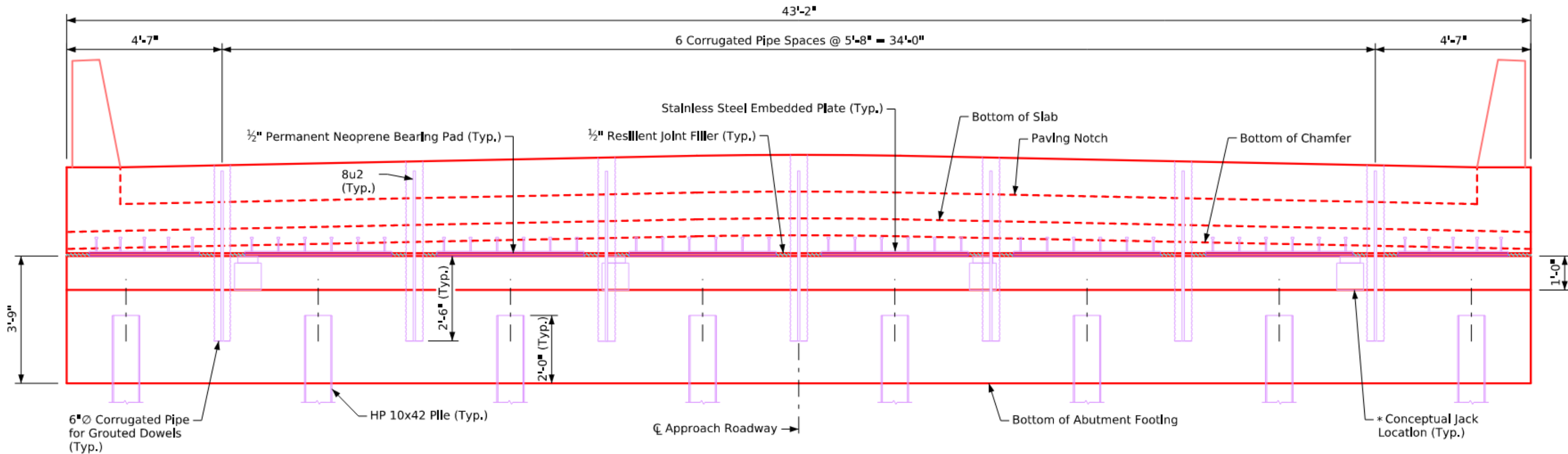
Pier Cap Concrete Sealer Detail

- If transverse construction joints are used, the Contractor's Superstructure Move Engineer shall include calcs to show that the bridge move will not cause overstress, cracking, or other damage at joint locations.



Securing Superstructure to Substructure after Bridge Move:

- Construct Abutment footings, Pier caps and Superstructure with embedded 6" dia. corrugated pipes.
- Top and bottom portions of pipes to line up vertically after bridge move.
- Place 1/2" Neoprene Bearing Pads and 1/2" Resilient Joint Filler prior to lowering Superstructure onto final supports.
- Place 8u2 dowel, centered in each 6" dia. corrugated pipe.
- Fill corrugated pipes with approved non-shrink hydraulic cement grout.



South Abutment Elevation - Final Condition

(North Abutment Similar)
(Reinforcing (aside from dowels) not shown, for clarity)

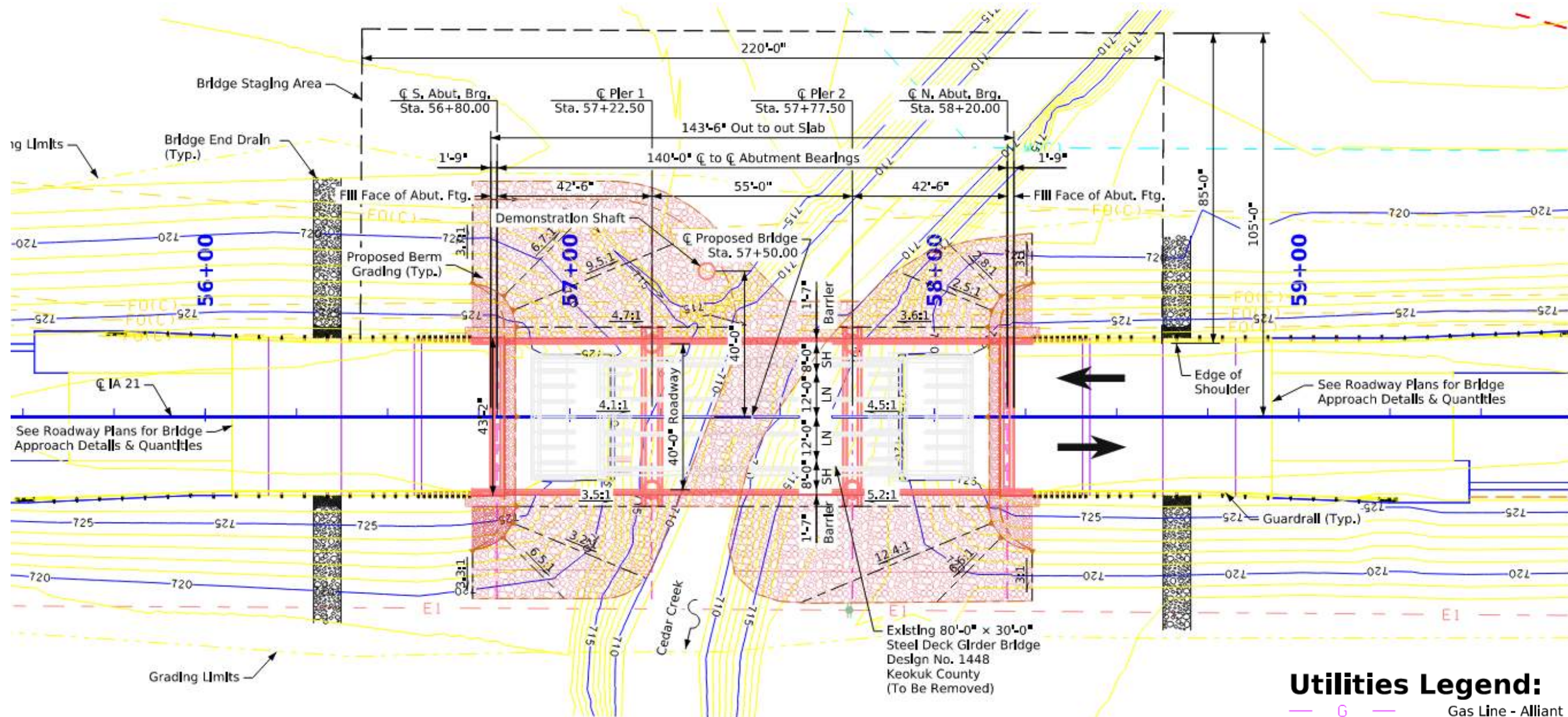
- Install 2' wide butyl rubber membrane after bridge move.
- Per Materials I.M. 493, thickness = 50 mils.
- Fasten to concrete faces w/ approved waterproof adhesive.



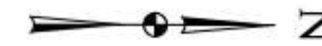
(Wing Reinforcing Not Shown For Clarity)

Utilities:

- water line being relocated by owner to outside limits of 'Bridge Staging Area' (see roadway sheets).
- all (4) fiber optic lines adjacent to bridge are Abandon In Place
- maintain adequate clearance to overhead power line along East side of project
- gas line to the east of the project should not be impacted



Situation Plan




Utilities Legend:

- | | |
|---|--|
| --- G | Gas Line - Alliant Energy |
| --- E1 | Electrical Line - Alliant Energy |
| --- W(C) | Water Line - Wapello Rural Water Association * |
| --- FO(C) | Fiber Optic Line - Windstream (Abandon In Place) |

Refer to Special Provision for Prefabricated Bridge Move for:

- temporary works (falsework) requirements
- prefabricated bridge move system requirements
- requirements for shop/working drawings, equipment cut sheets, calculations, etc.
- geometry control requirements for bridge move
- etc.

SP-230389
(New)



SPECIAL PROVISIONS
FOR
PREFABRICATED BRIDGE SUPERSTRUCTURE MOVE

Keokuk County
BRF-021-1(46)--38-54

Effective Date
March 17, 2026

THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING
MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL
OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

230389.01 DESCRIPTION.

A. Furnish, erect and install a prefabricated bridge superstructure move system including temporary works. Move the prefabricated bridge superstructure constructed off of the existing alignment into its final position.

B. Bridge Staging Area (BSA) – a suggested BSA off of the existing alignment and within the Right-of-Way and temporary easement for constructing the prefabricated bridge superstructure is shown in the plans.

C. Temporary works (falsework) for supporting and moving the prefabricated bridge superstructure