



CMAR Delivery of I-15 Virgin River Bridge #1

The Longest Steel Girder Span in Arizona History



Kiewit

ASHE | March 2023





- 01** Project Background
- 02** CMAR Considerations for Bridge Layout and Design
- 03** Other Project CMAR Considerations
- 04** Construction Photos



01

Project Background

I-15 Corridor

- Major North-South Commercial Corridor
 - \$244B Movement of Goods in 2040
- Major Route between Los Angeles, Las Vegas, Salt Lake City
- Triple Trailers Allowed
- Detour Route
 - 250 miles for Commercial Trucks
 - 600 miles for Oversized Loads



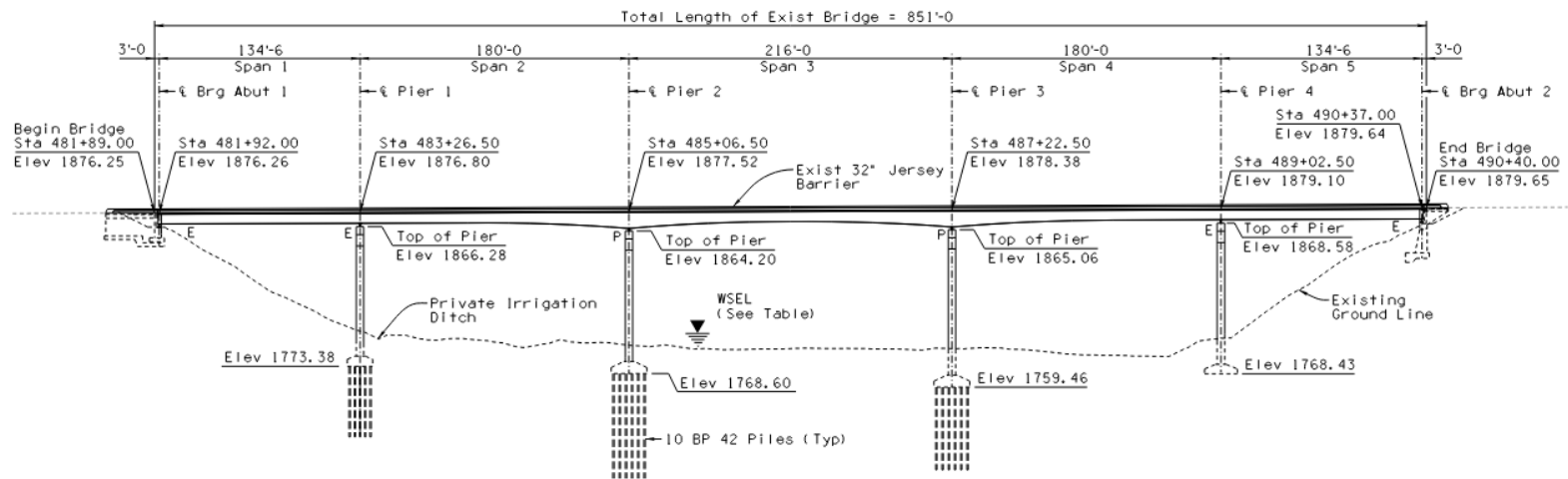
I-15 in Arizona

- 29 Miles in Length
- Crosses Virgin River 7 Times
 - All Bridges are Steel Girder Bridges
- ADOT Focused on Rehabilitation and Replacement
 - Recent Rehabilitation Work on Bridges #2, #4, #5
 - Recent Superstructure Replacement and Widening on Bridge #6



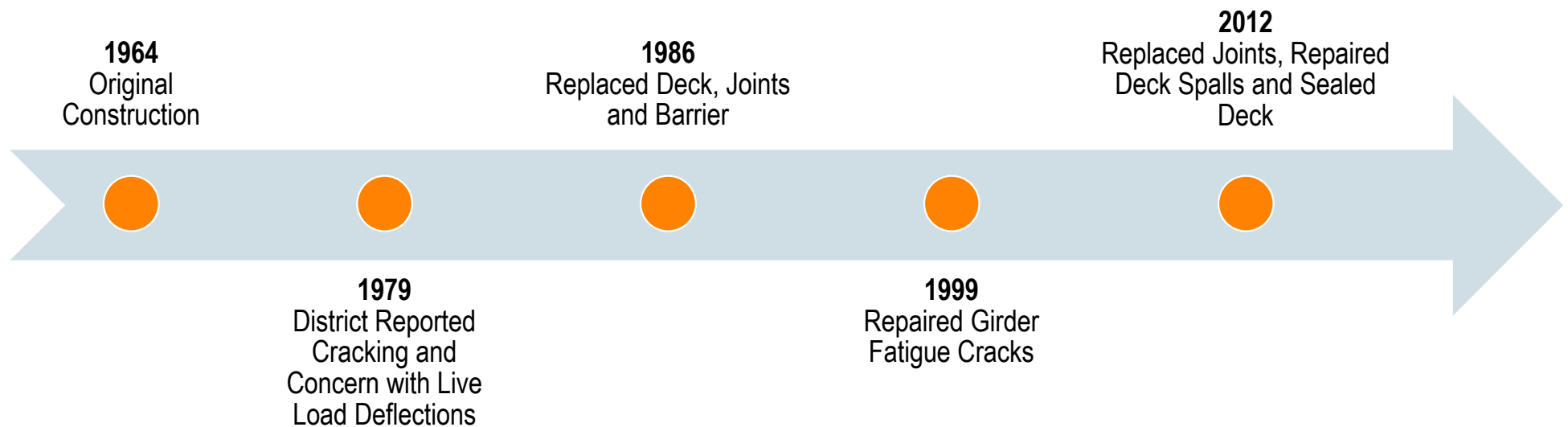
Existing Virgin River Bridge #1

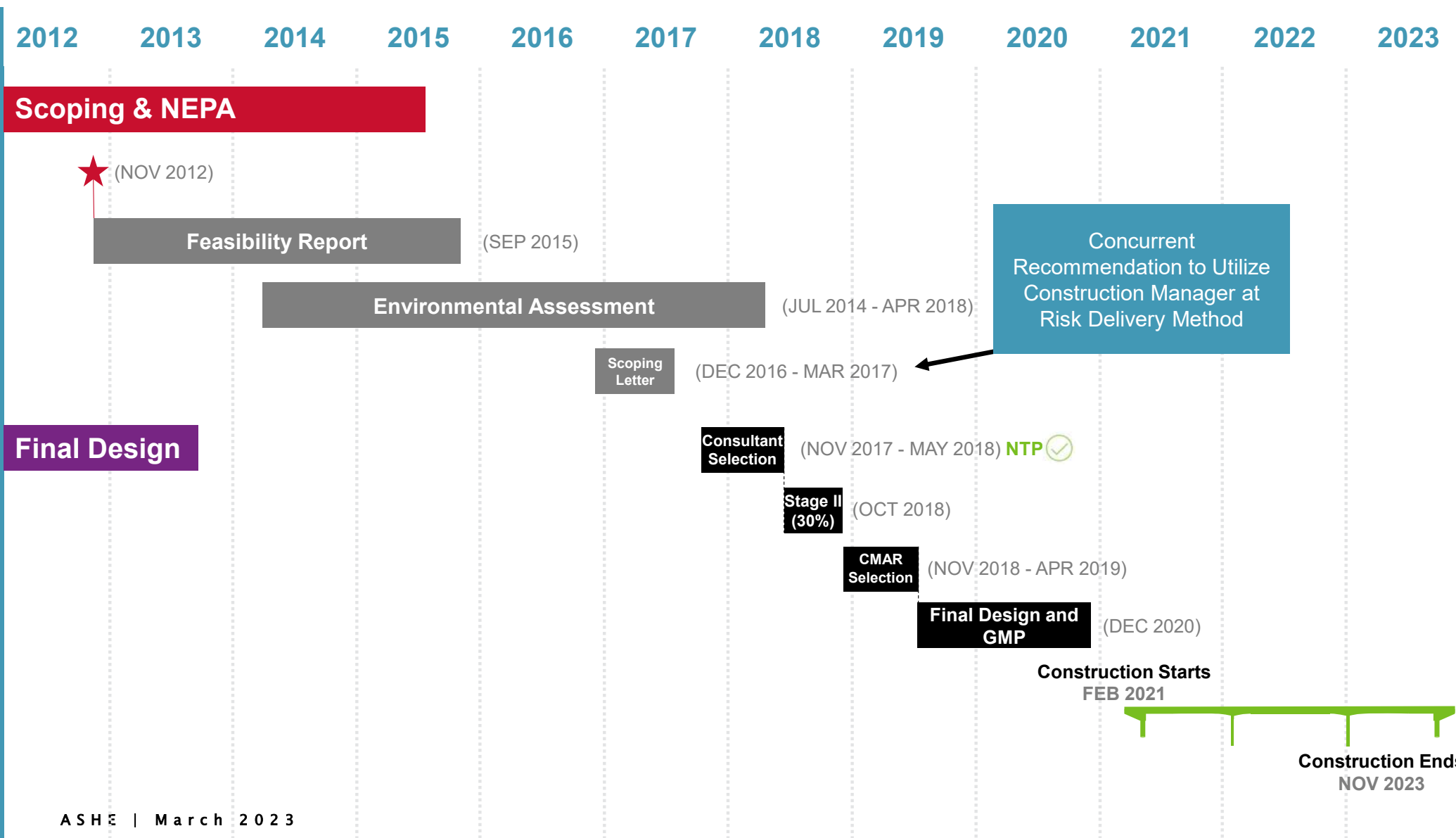
- 5-Span Haunched Steel Plate Girder Bridge (Length = 851', Width = 67'-4")
- Constructed in 1964
- Shallow and Deep Foundations



Condition of Existing Virgin River Bridge #1

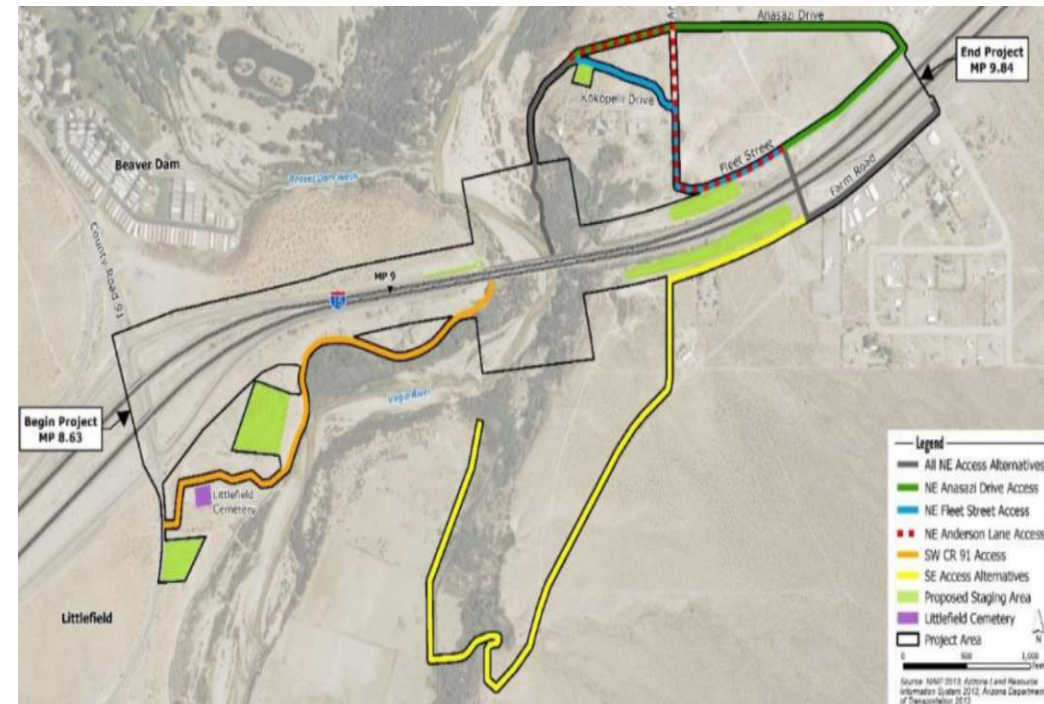
- Scour Vulnerable
- Structurally Deficient (Sufficiency Rating < 50)
- Long History of Maintenance & Repairs





Project Constraints

- Cultural Resources
- Limited & Challenging Access
- Environmental Resources & Impacts
- Maintain I-15 Traffic (One Lane Each Direction at All Times)





02

CMAR Considerations for Bridge Layout and Design

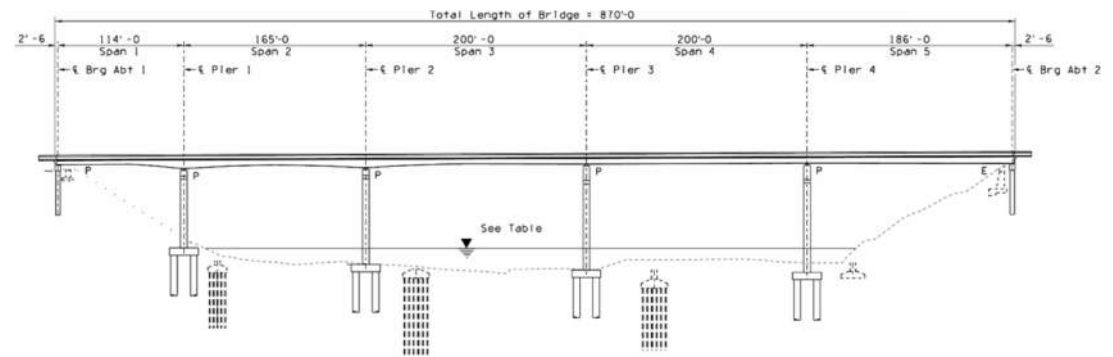
Alignment and Profile

- Alignment Shift is Limited Due to Cultural Resources on Both Sides of I-15 and Topography
- Stage II Design – No Alignment Shift
- CMAR Input – 9' Alignment Shift
- Maintain Same Profile With Tight Construction Clearances

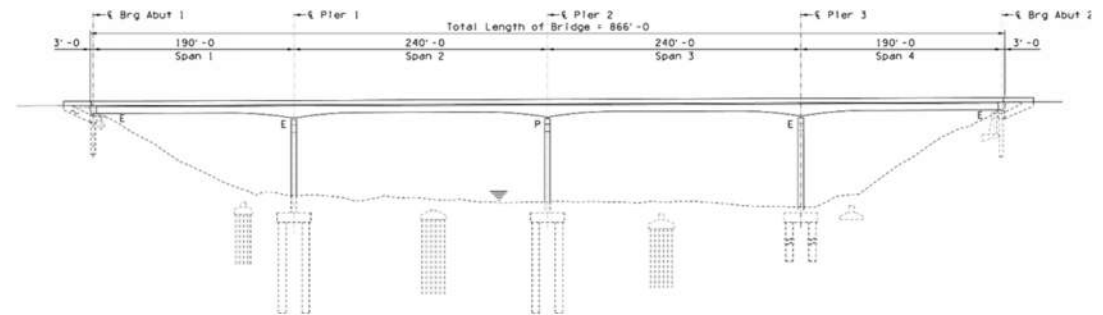


Span Arrangement

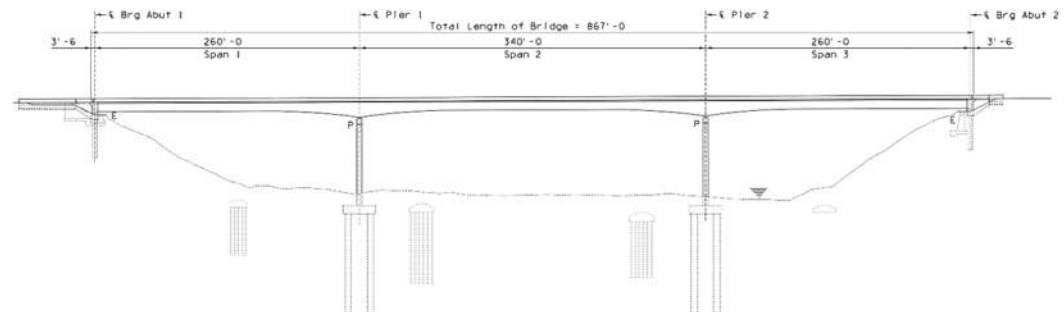
5-Span Bridge
(Scoping Phase
Concept)



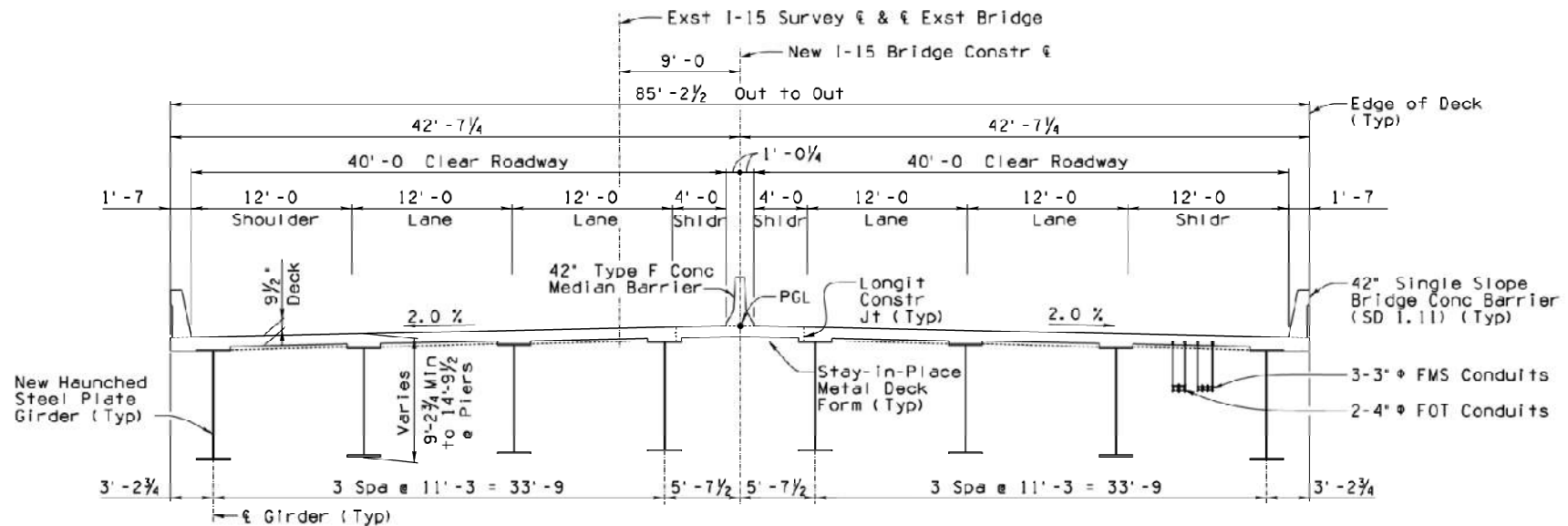
4-Span Bridge
(30% Design)



3-Span Bridge
(Final Design)



Structure Type



- 3-Span Continuous, Composite, Haunched Steel Plate Girder
- Grade 50 Weathering Steel
- Maximum Web Depth = 13'-6"
- CIP Concrete Deck with SIP Forms

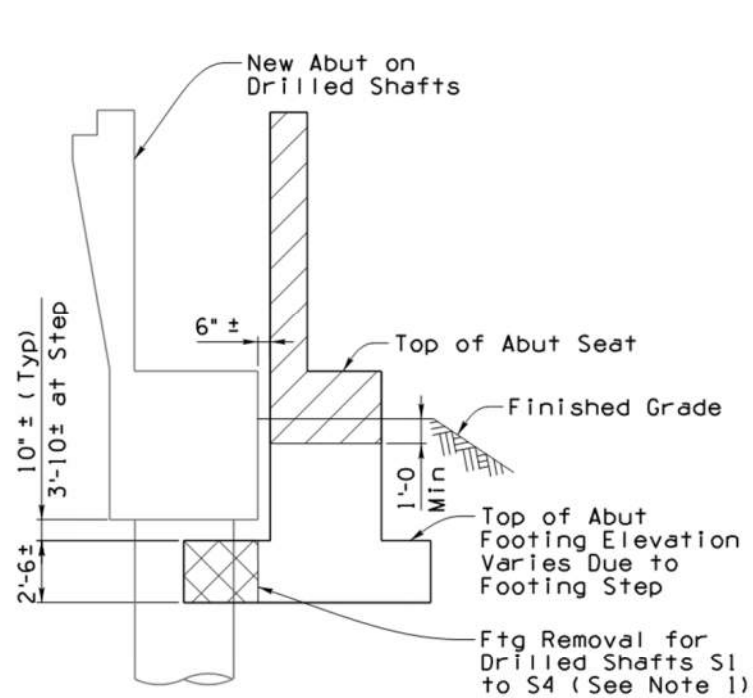


EXISTING BRIDGE



NEW BRIDGE

Location of New Abutments



ABUTMENT 1 SECTION
No Scale

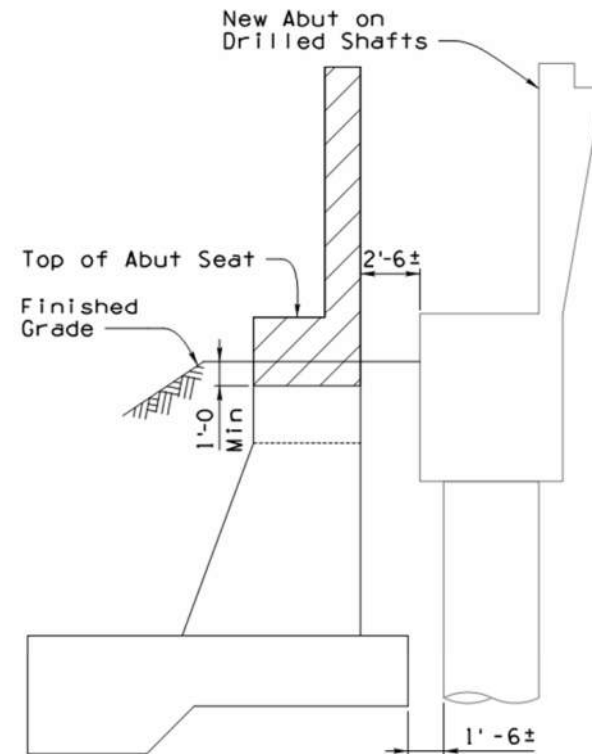
LEGEND:



Indicates Abut, Wingwall, Barrier & Pier Removal Area

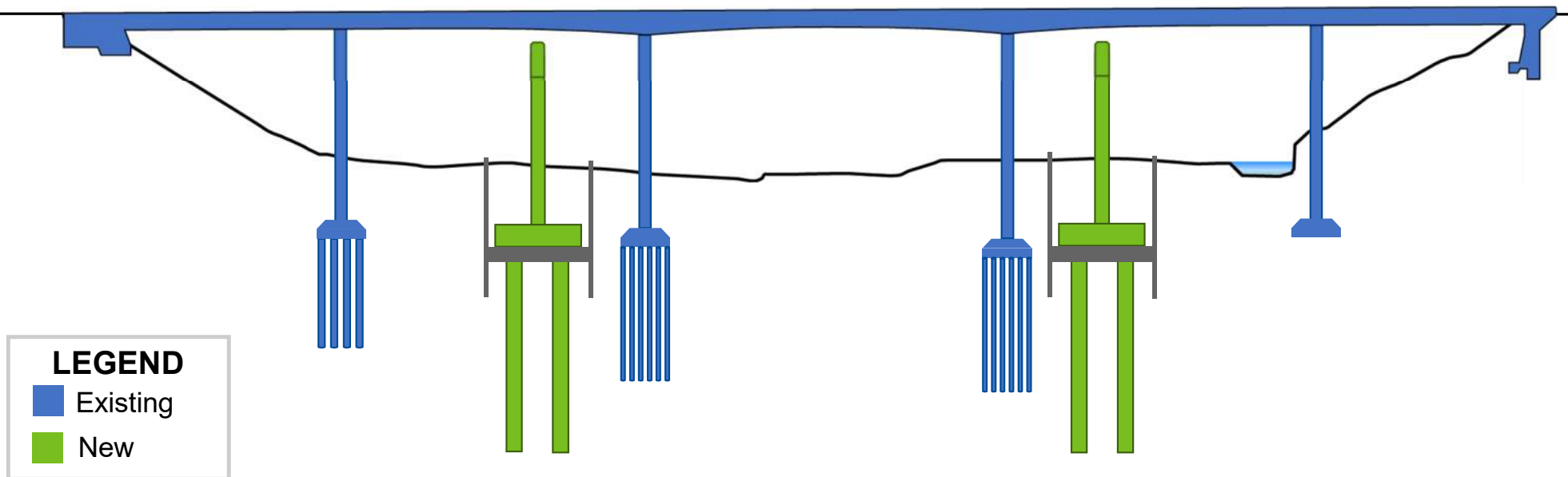


Indicates Abut Ftg Removal Area

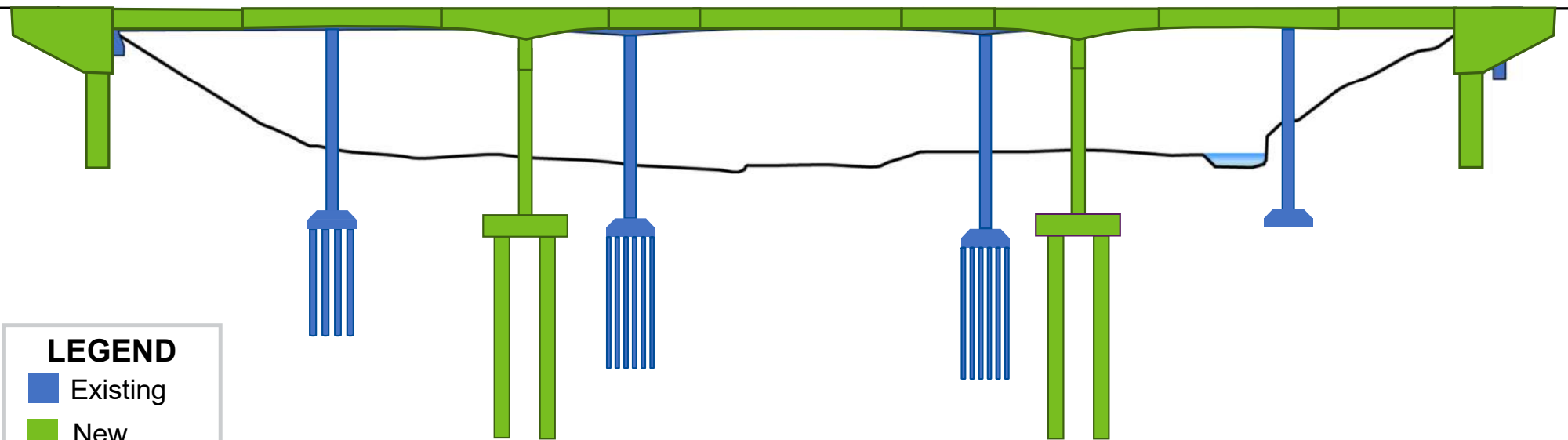


ABUTMENT 2 SECTION
No Scale

Construction Sequencing



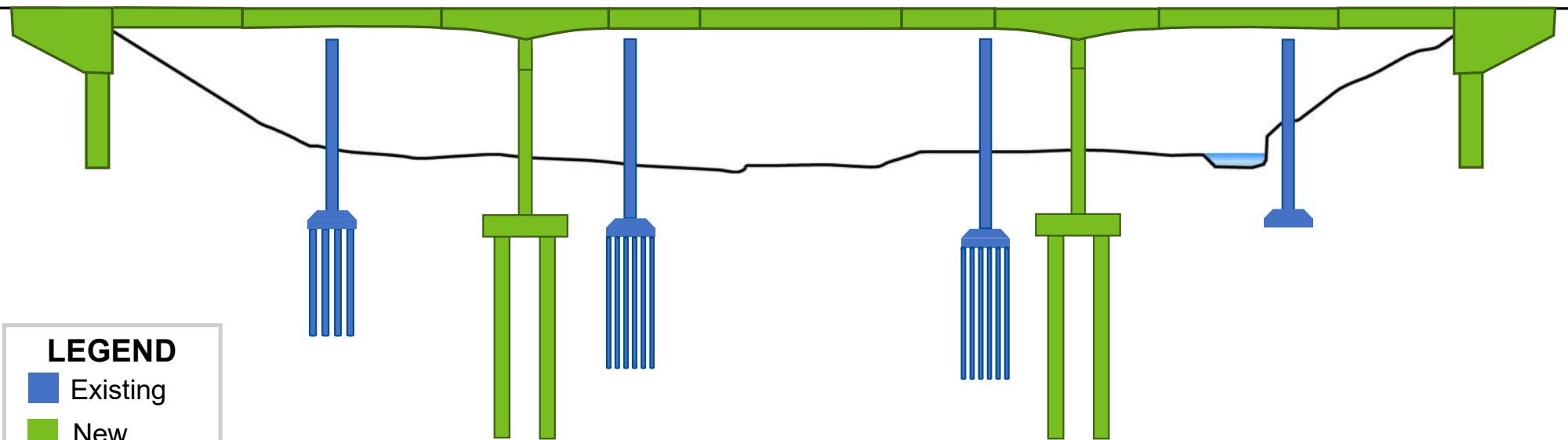
Construction Sequencing



LEGEND

- Existing
- New

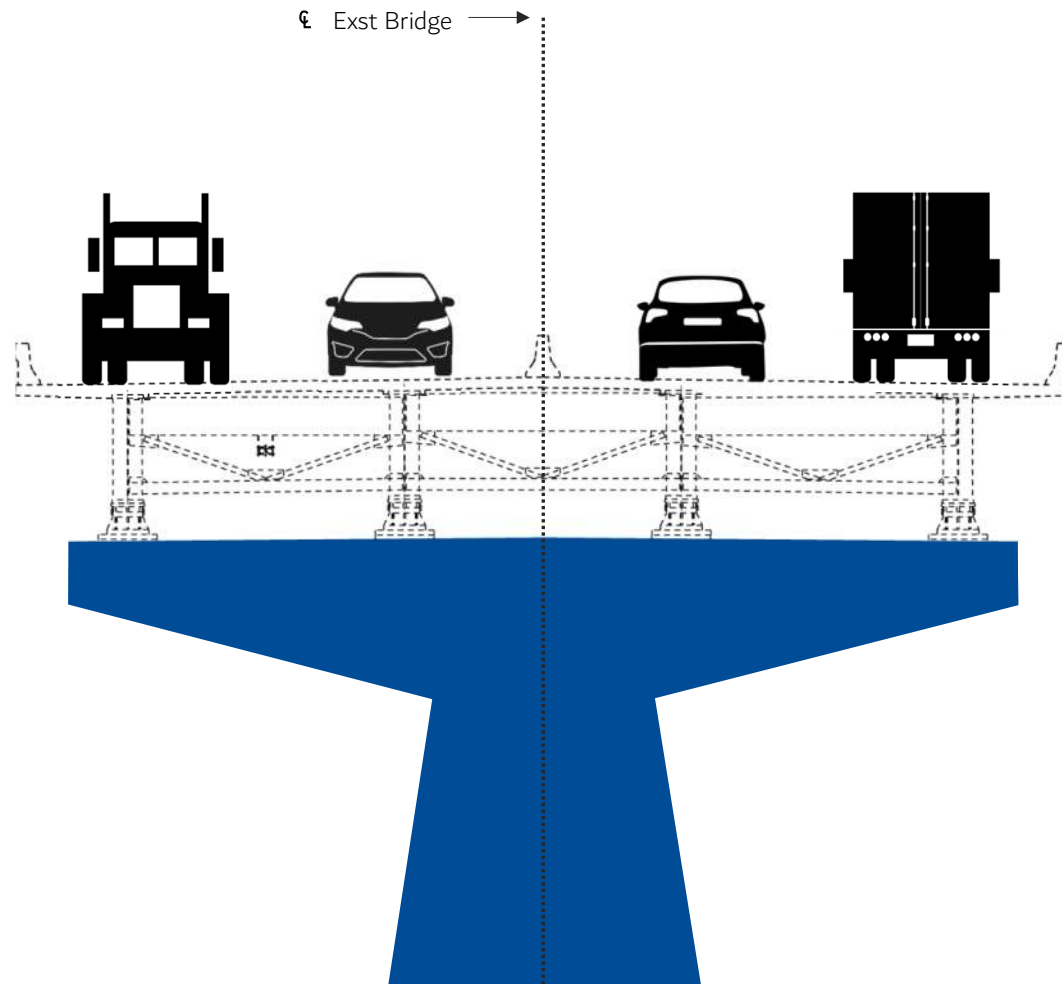
Construction Sequencing



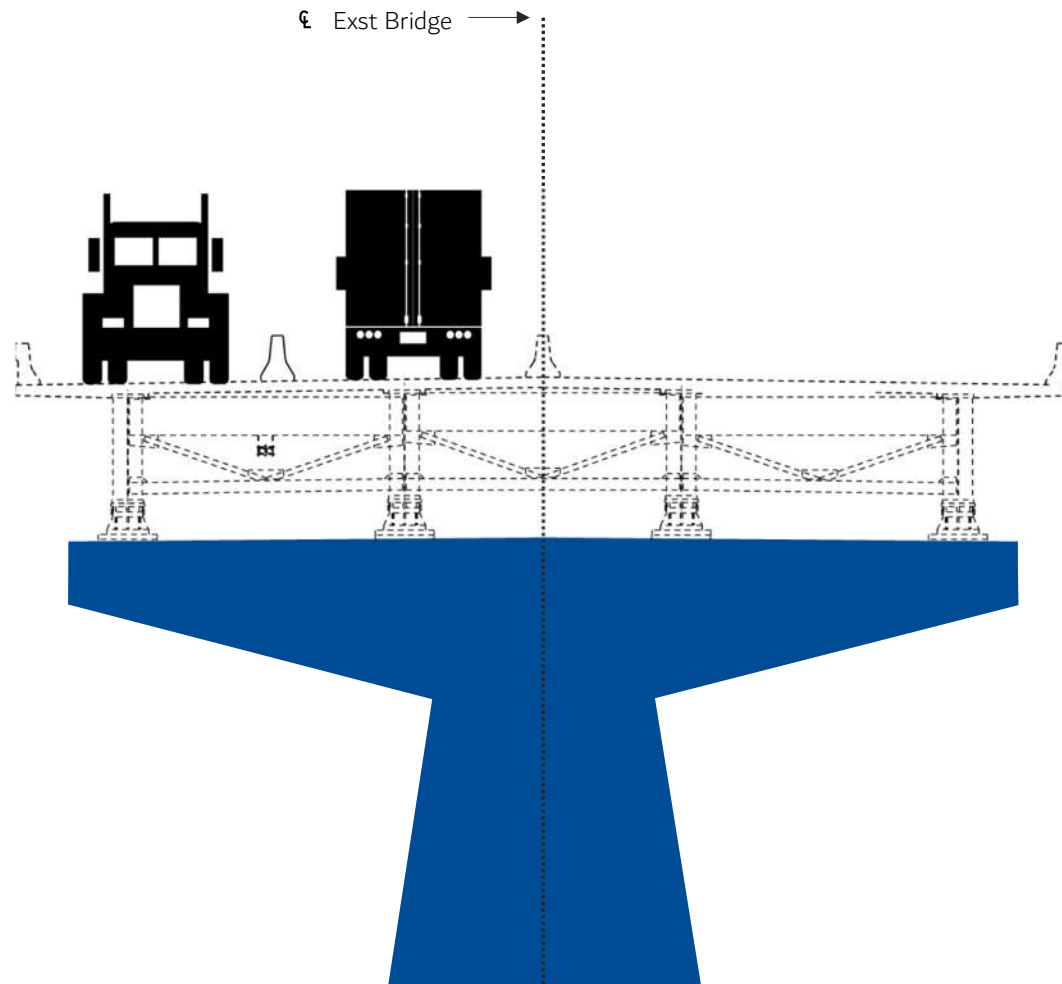
LEGEND

- Existing
- New

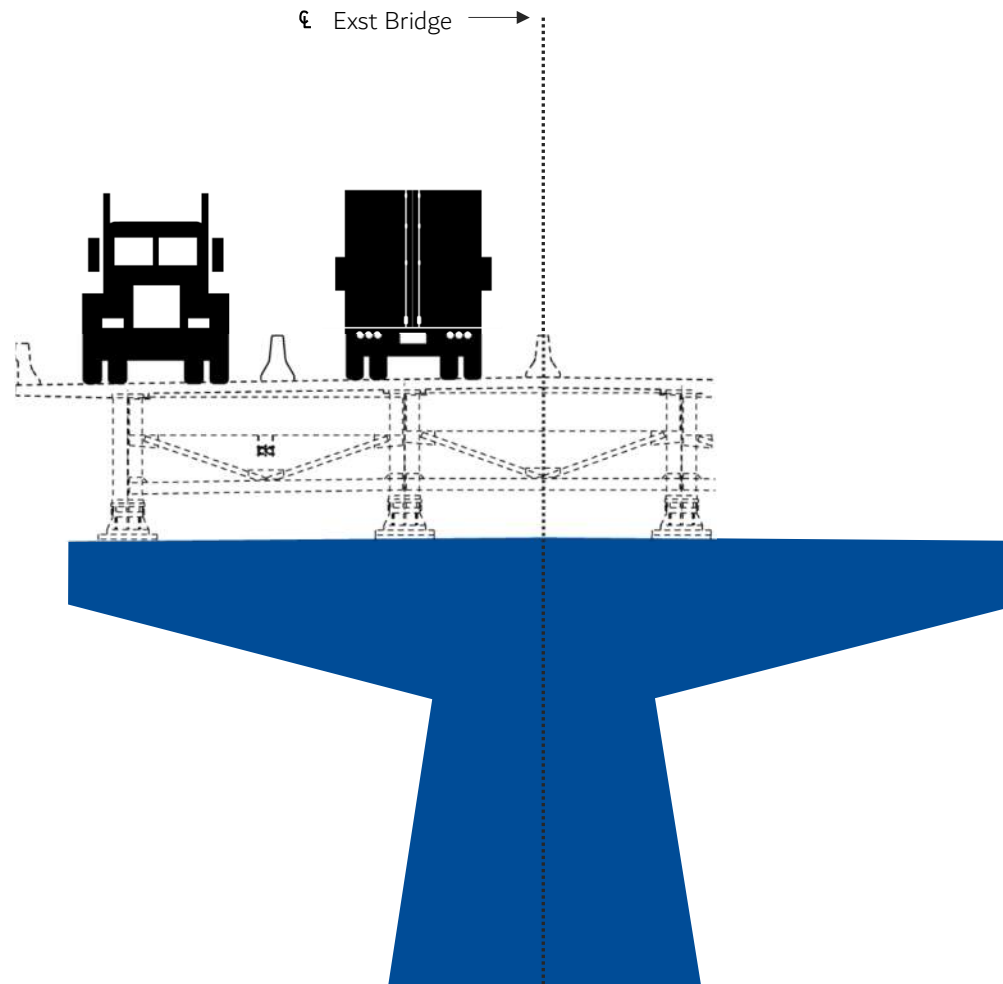
Staged Construction



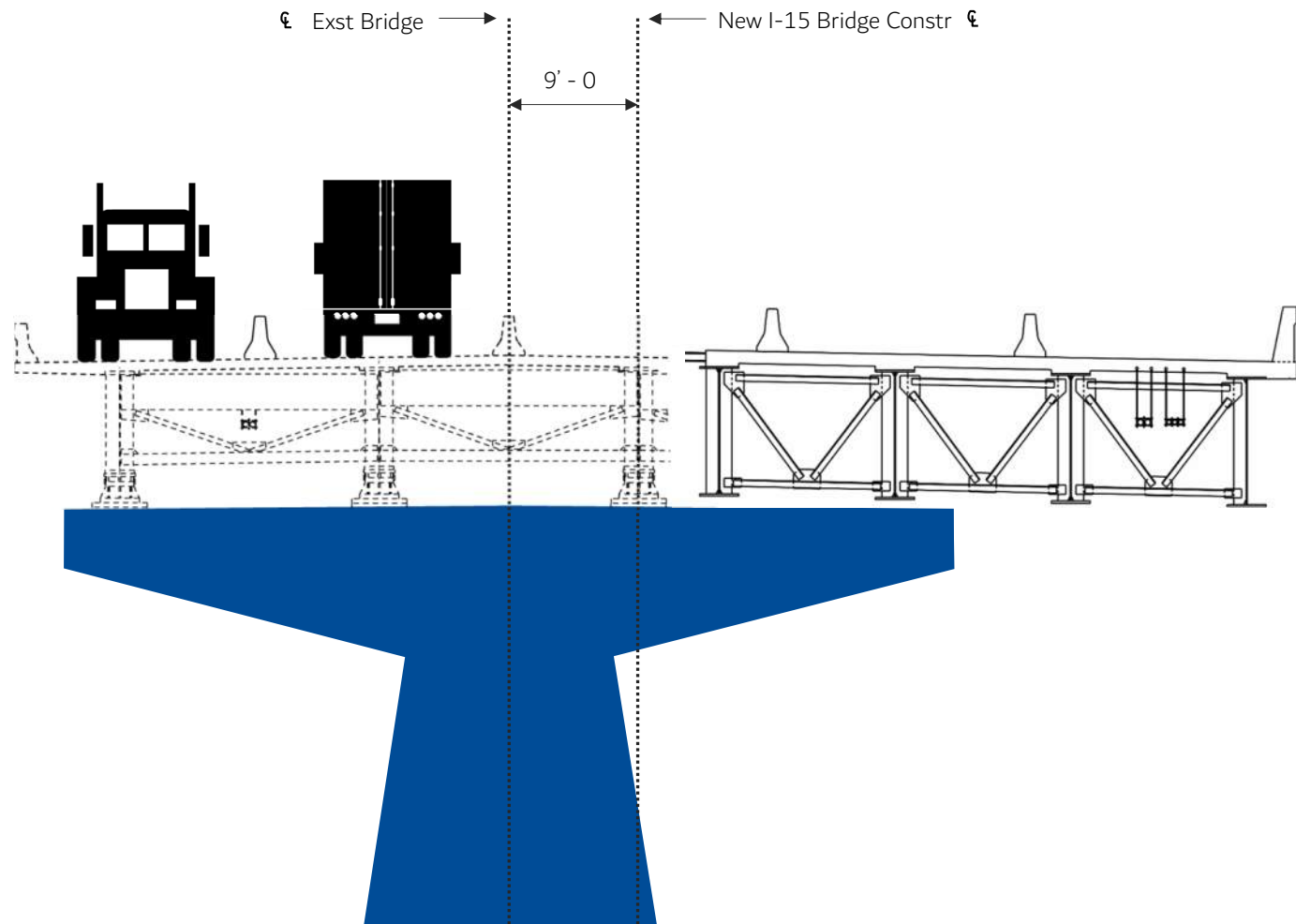
Stage 1



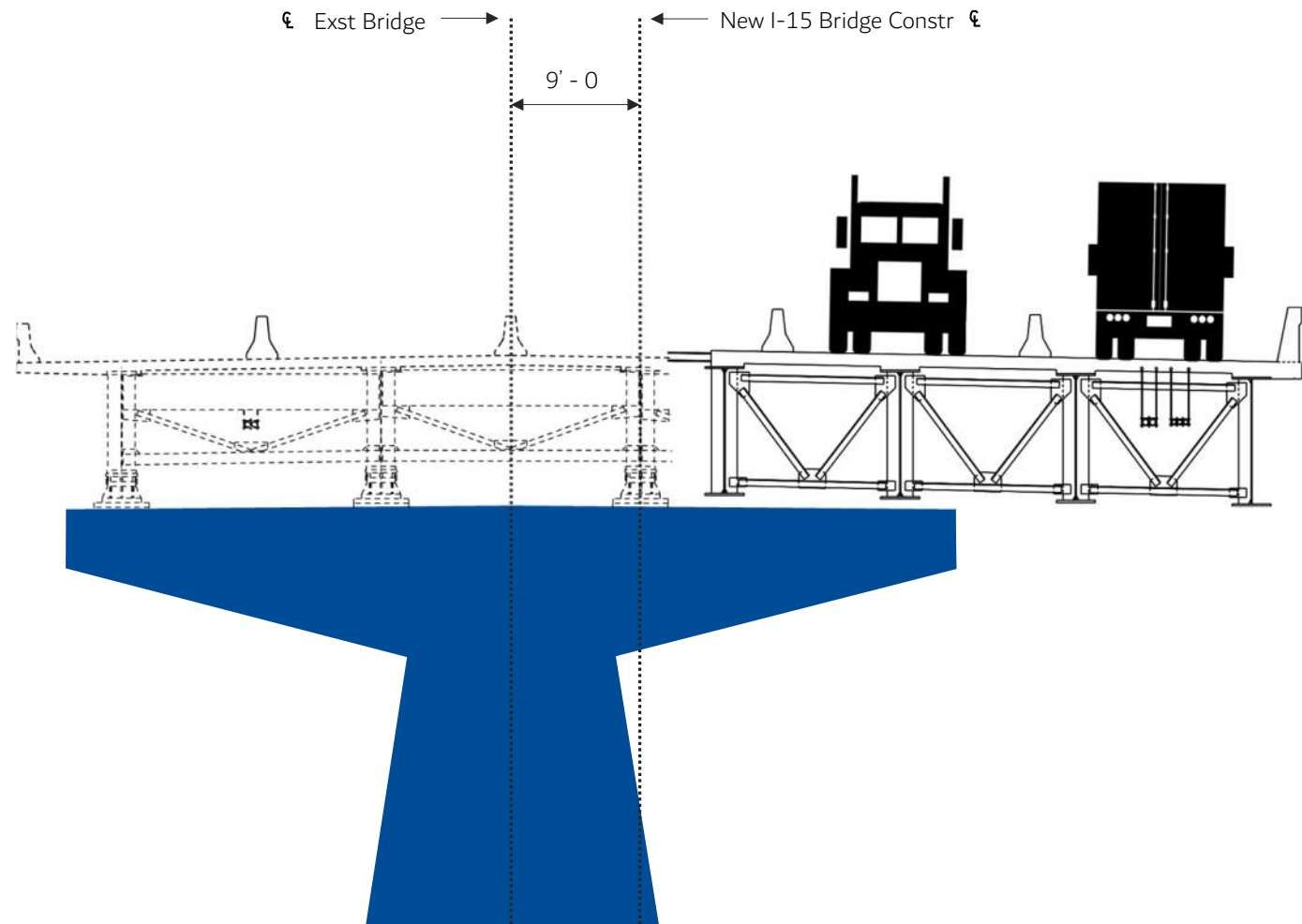
Stage 1



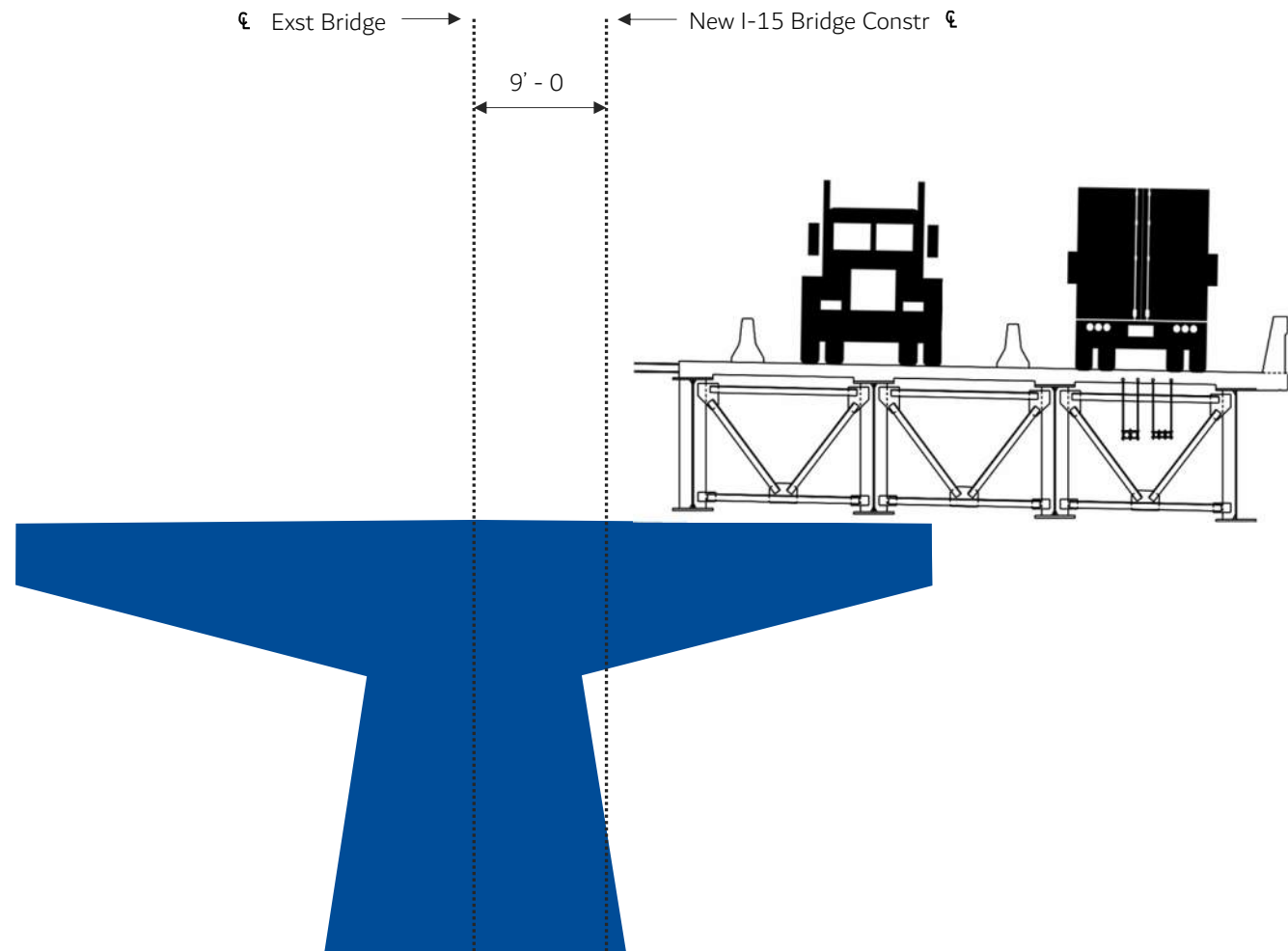
Stage 1



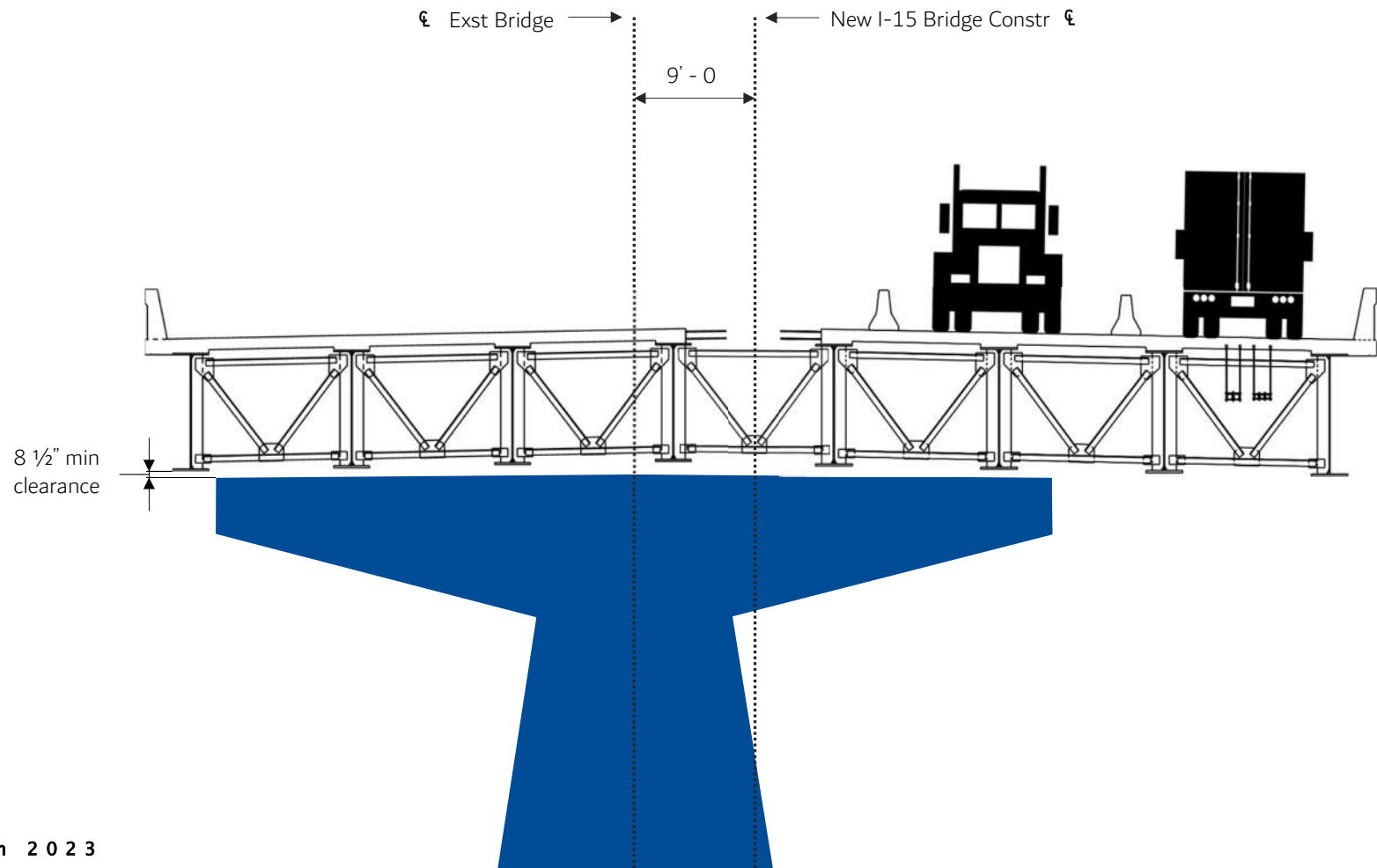
Stage 2



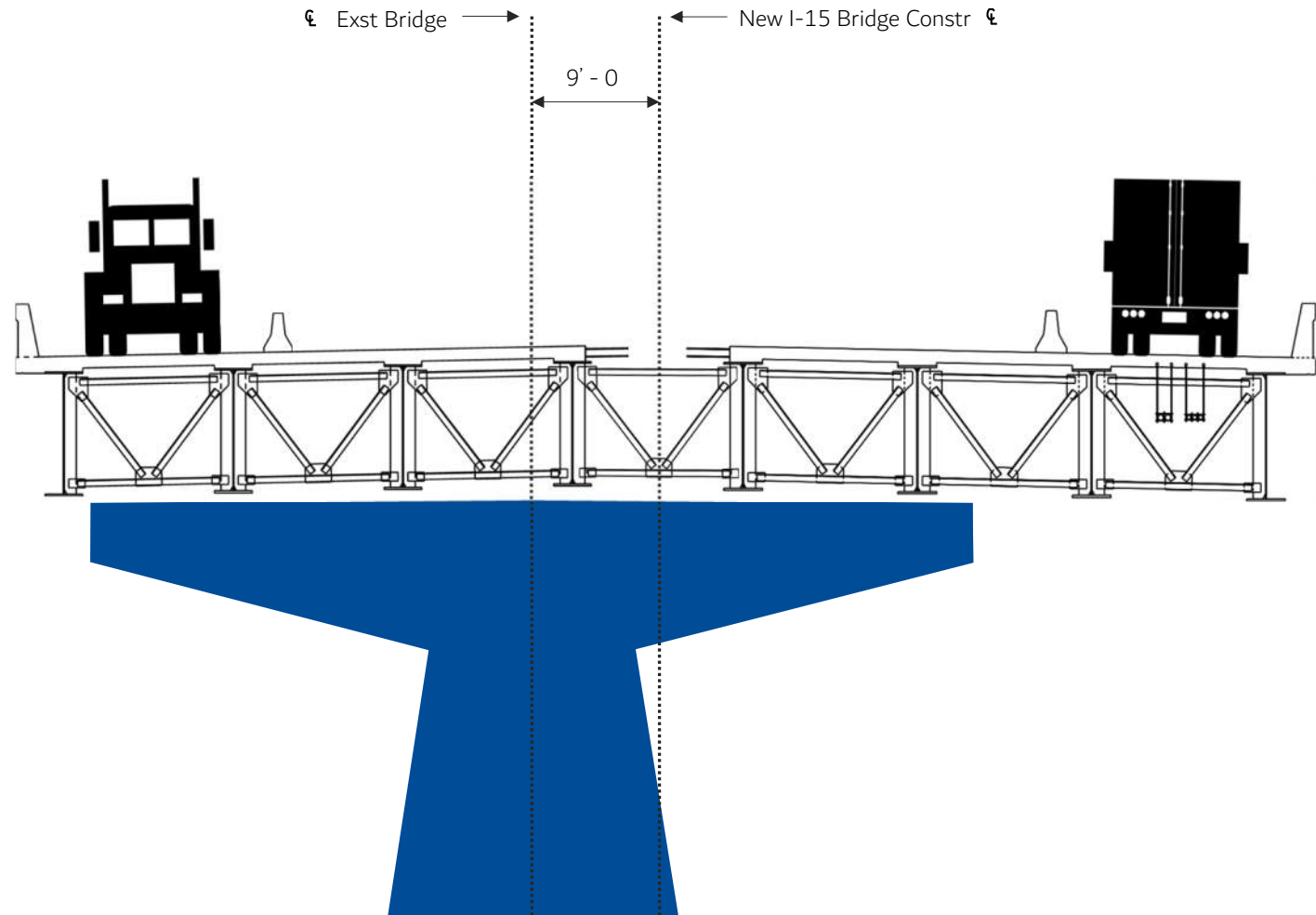
Stage 2



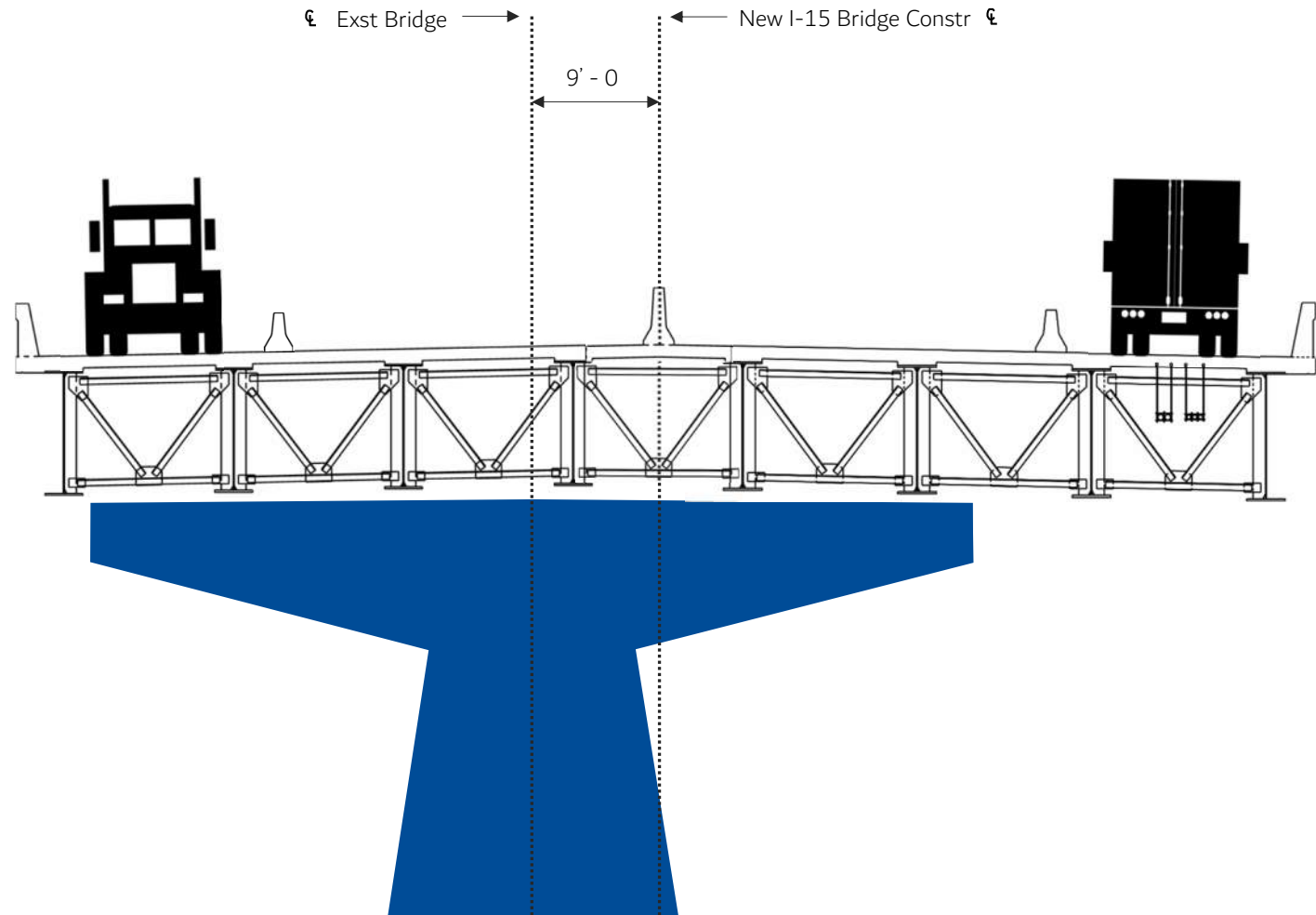
Stage 2



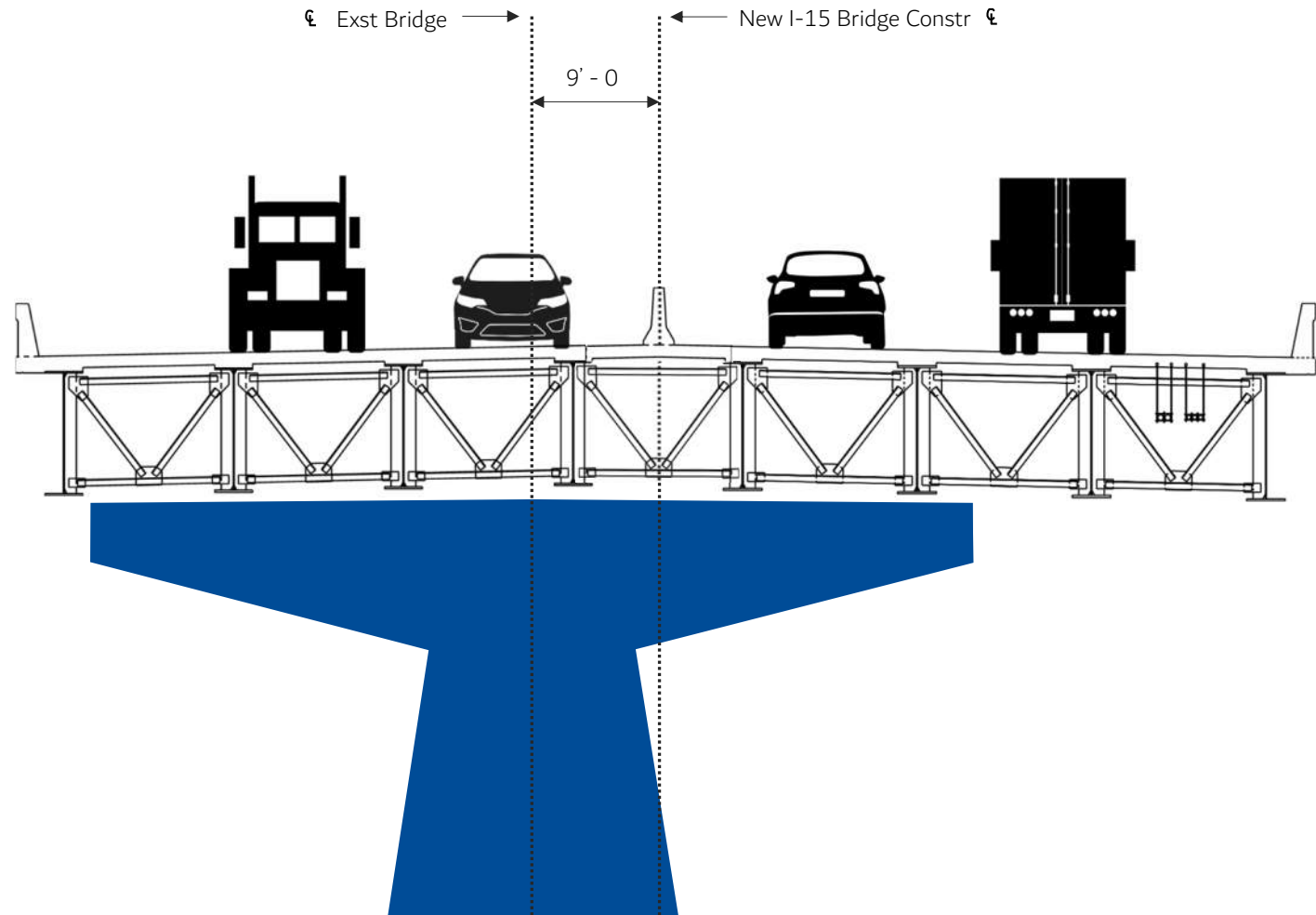
Stage 3 – Closure Pour



Stage 3 – Closure Pour



Existing Pier Removal



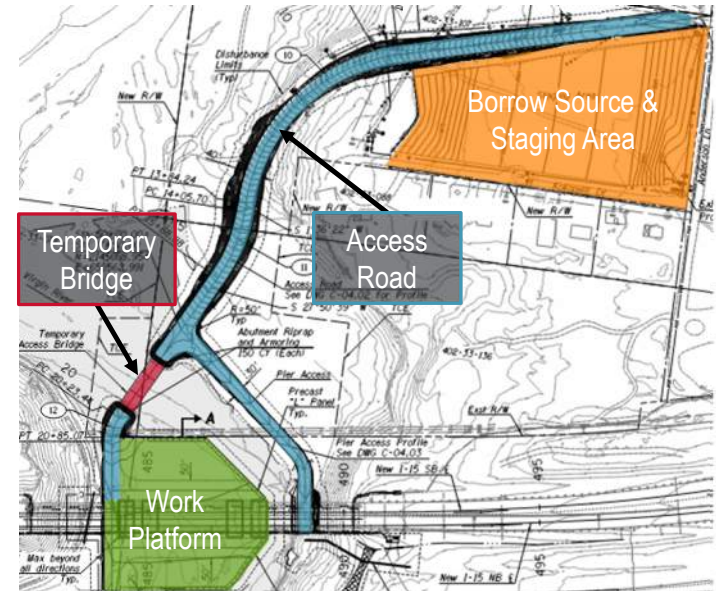


03

Other Project CMAR Considerations

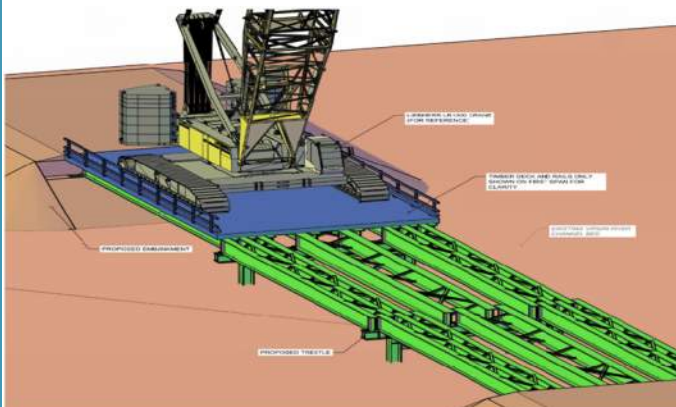
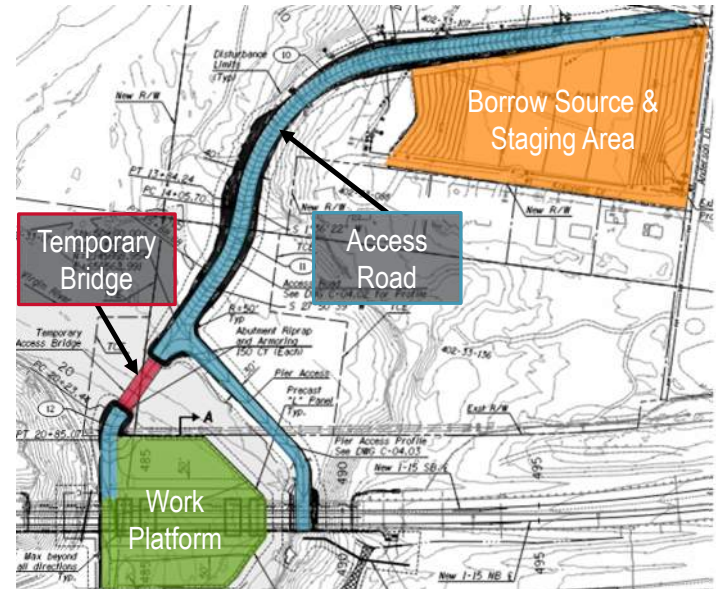
Access Road

- Northwest Access Preferred
- Width & Geometry Tied to Means & Methods
 - Cofferdam & Drilled Shaft Construction
 - Pier Reinforcing and Forming
 - Girder Erection
- Footprint Led to EA Re-evaluation



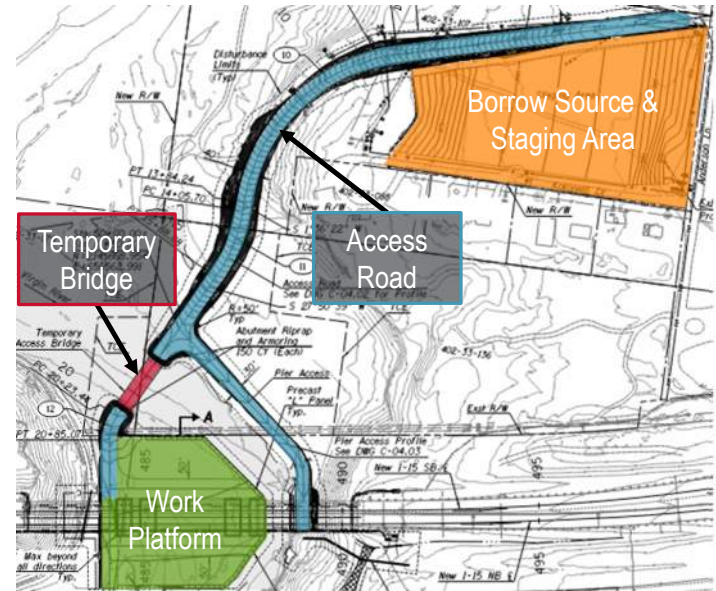
Temporary Bridge Layout

- Maximum of 3-Spans per EA
 - No Limit on Bridge Length or Width
- Hydraulic Opening = 2-year Event
 - Superstructure Removal for Events > 2-year
- Scour = 10-year Event
- Contractor Selection = 3-span Steel Girder



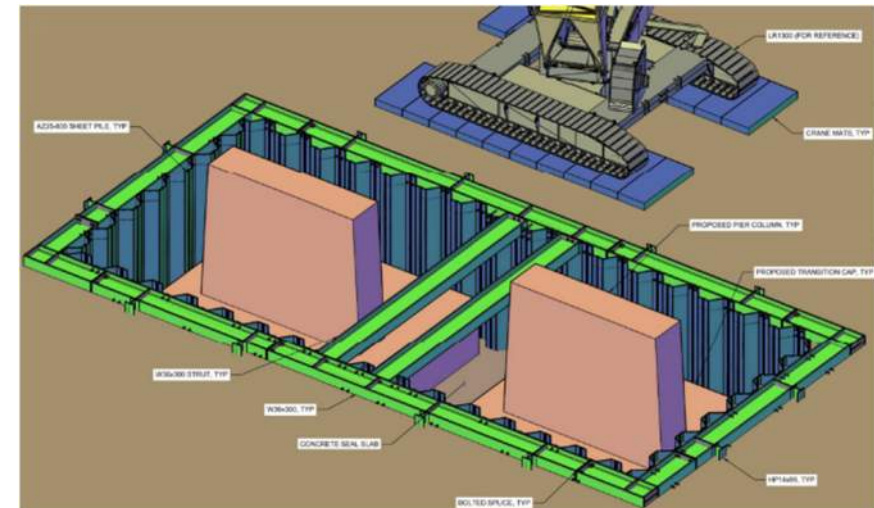
Work Platform

- Required for Pier Construction, Girder Erection & Removals
- Riverside Limits Controlled by Hydraulics
 - 2-year Event
- Scour Protection Required
 - Sheet Piles and Precast Concrete L-Panels



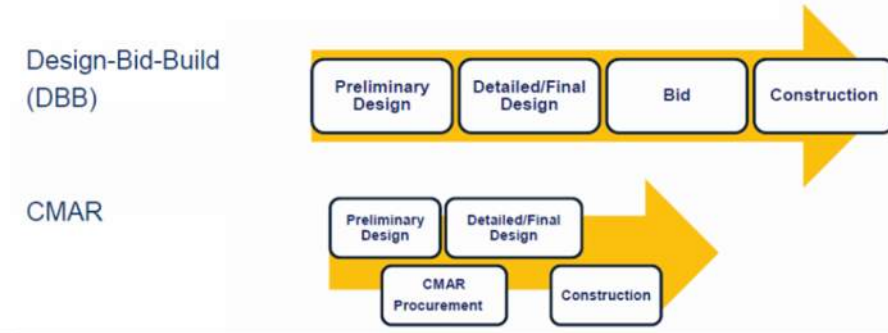
Cofferdams

- Shallow Groundwater (5' - 8')
- Required for Pier Foundation Construction
- 6' Thick Concrete Seal Slab
- Kiewit Type Selection & Design
- Limits Shown on 404 Permit Application



Special Provisions

- CMAR Based Special Provisions to Address Risk Identified by Team
- Traditional DBB Specifications Lead to Kiewit Including Risk in Bid
- Allowances to Cover Risks "if" They Occur
- Examples:
 - Temporary Bridge Superstructure Removal
 - Repairs to Temporary Bridge
 - Drilled Shaft Length Variations
 - Lead Based Paint Disposal



ITEM 9400020 – CMAR ALLOWANCE (REMOVE AND REINSTALL TEMPORARY BRIDGE) (OPEN):

Description:

This item establishes an open allowance to provide for removal and reinstallation of the temporary bridge superstructure due to high flow events.

Construction Requirements:

The CMAR shall obtain written permission from the Engineer prior to the use of each allowance.

The CMAR shall monitor the various websites specified under Item 9240053 for weather forecasts, rainfall amounts and stream gauge flows to assist in the evaluation of the need to remove the temporary bridge. The CMAR shall immediately notify the Engineer if the CMAR determines the bridge needs to be removed based on an evaluation of forecasts, rainfall amounts and stream gauge flows.

In the event of a storm that is expected to overtop the temporary bridge superstructure, the contractor shall move the temporary bridge superstructure to a location above the high flow. The temporary bridge superstructure shall be protected in its new location.

Once the storm has subsided, the open allowance will cover the cost of restoring the bridge superstructure.

Final removal of the temporary bridge superstructure and substructure at completion of the project will be paid under Item 9240053 Miscellaneous Work (Temporary Bridge).

Additional 5% Federal Match for Innovation

- Intent = Increased Construction Efficiency, Accelerated Construction, Reduced Construction Congestion & Extended Service Life
- Multiple Proposals were Rejected by FHWA
- Mobile App (Contractor Proposed) Accepted
 - Filled Gap in AZ511 System





04

Construction Photos

Access Road and Work Pad



Pier Shafts



Pier Cofferdam



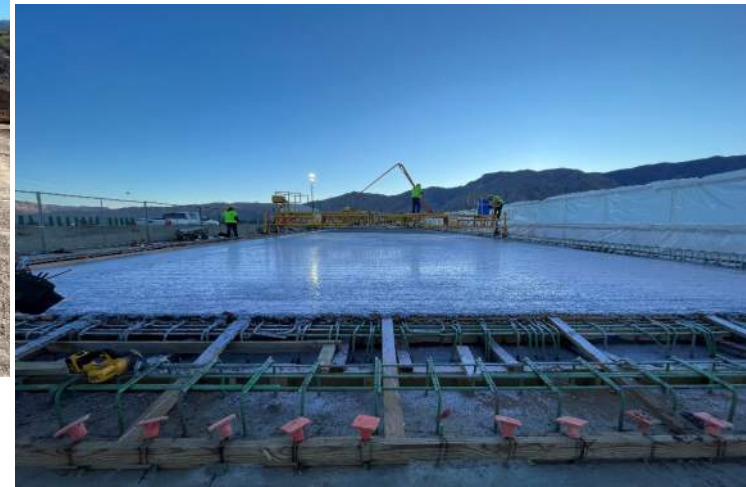
Pier Footing and Columns



Girder Erection



Deck



Current Status



Project Team

