SDDOT US14/US83/SD34

Missouri River Bridge Replacement

Transportation Commission Mtg

Steve Johnson, PE
Chief Bridge Engineer

FORT PIERRE / PIERRE

Bridging the Future

July 28, 2022

Existing Bridge

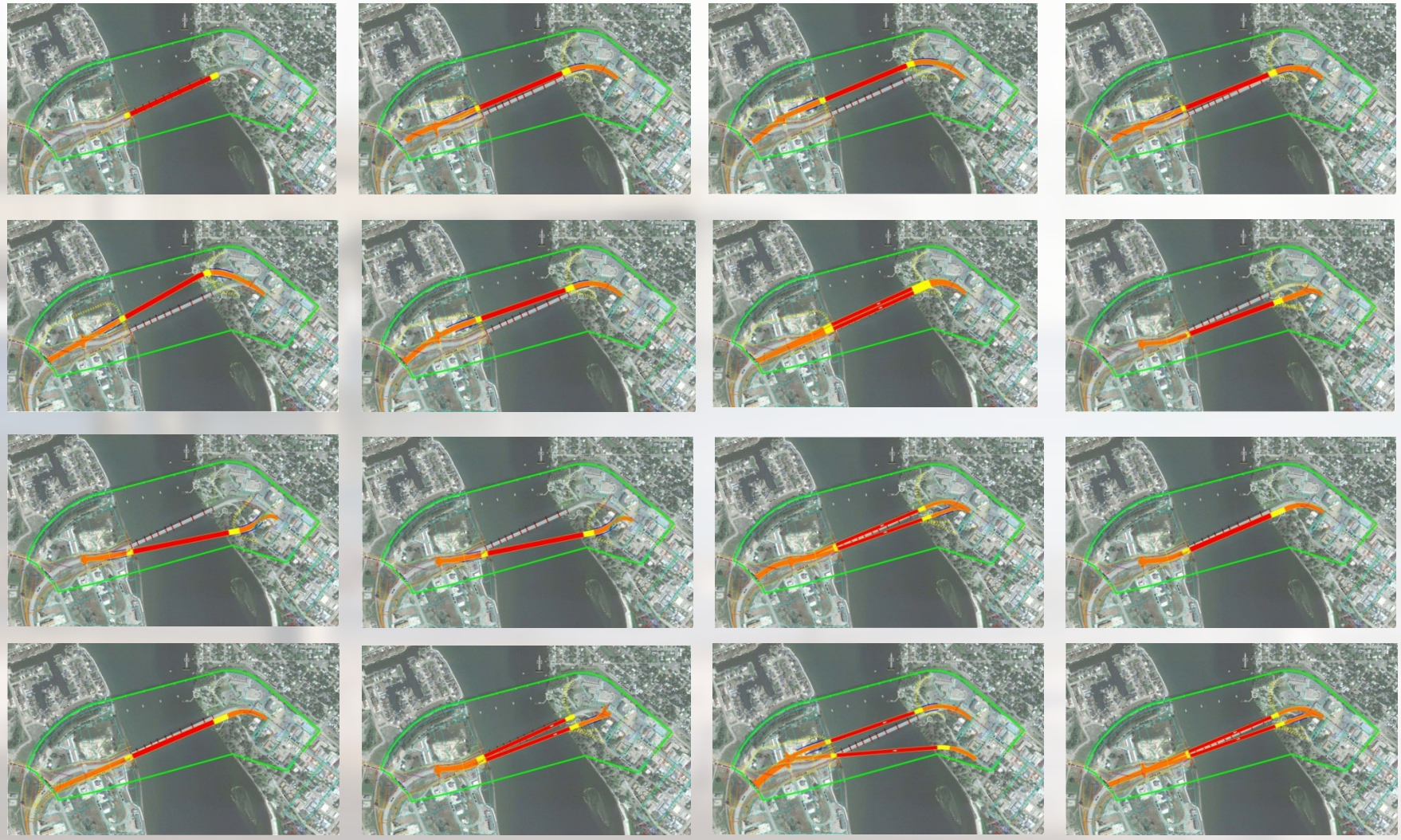
- 1962 Construction
- Aging, intended for 50 year life
- Scour Concerns
- Maintenance and Rehab Costs Increasing
- Narrow Shoulders
- Poor Pedestrian & Bicycle Accommodations

2012 Preliminary Study To:

- Propose, develop and refine alternatives to determine the best bridge location and type, given project criteria, for this particular study area.
- Provide Environmental Assessment/Clearance

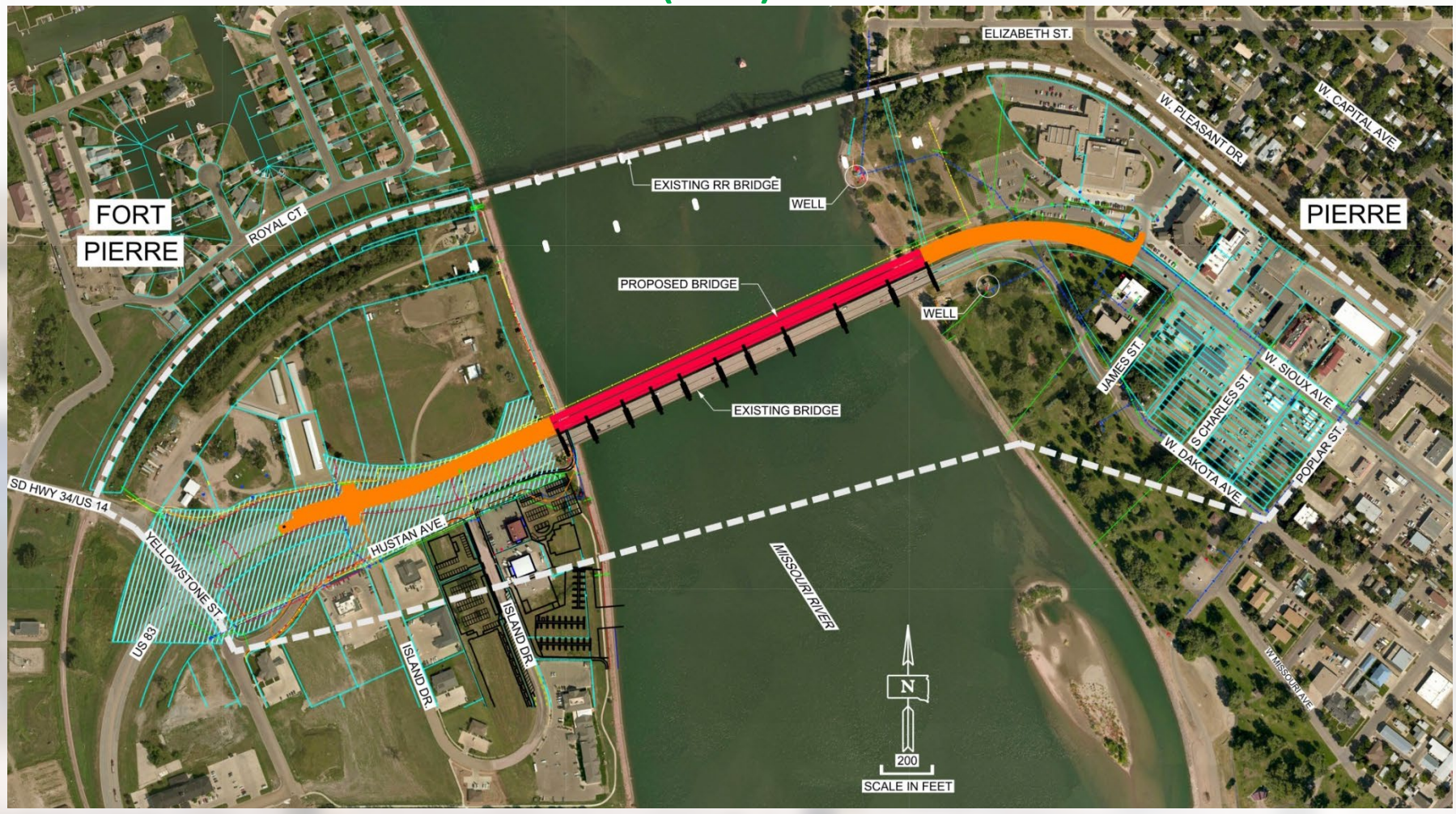
Study Area Boundary

Initial Layout and Location Alternatives



Alignment 50 ft North (10 ft Gap)

(Final)



- Minimal traffic interruption during construction (no anticipated detour)
- Park/Ramkota impacts

- West bank property impacts
- East approach curve broadened
- Improves S-curve on west approach
- Small visual impact

Pierre Approach

US14/US83/SD34 MISSOURI RIVER BRIDGE REPLACEMENT STUDY

OPTION N1.1B

SHEET 3 of 3

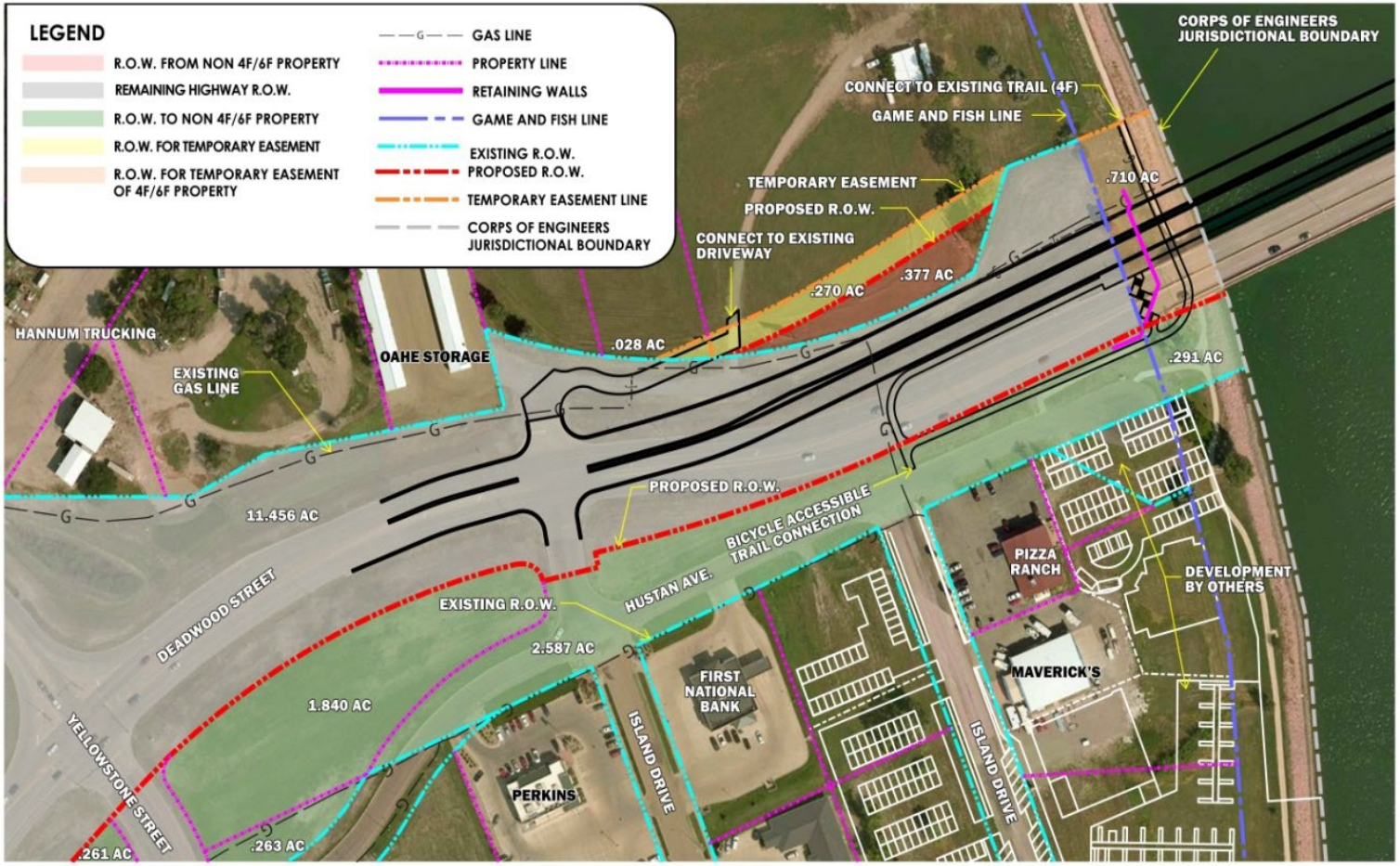
JUNE 13, 2014

0 50 100

URS

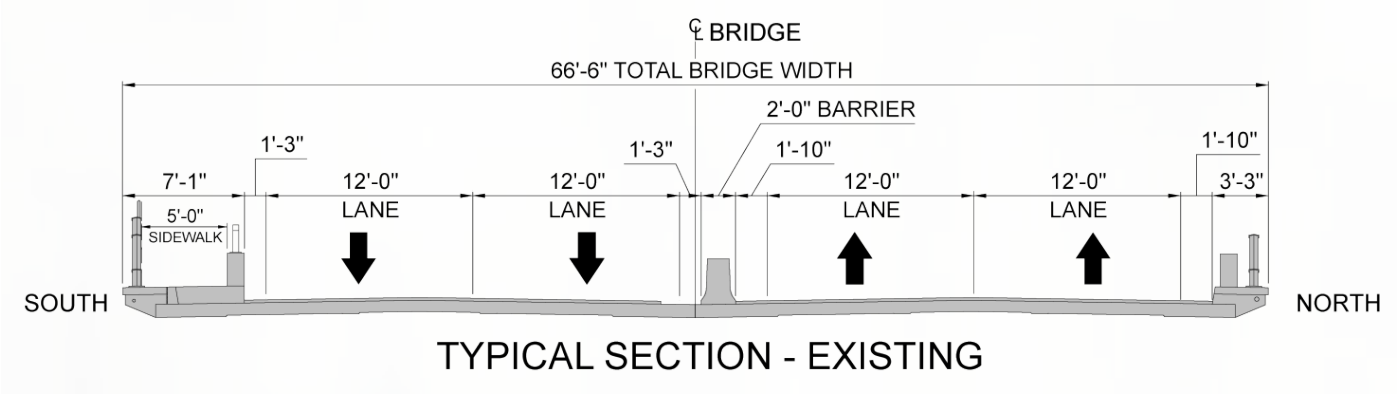
DOT

Fort Pierre Approach

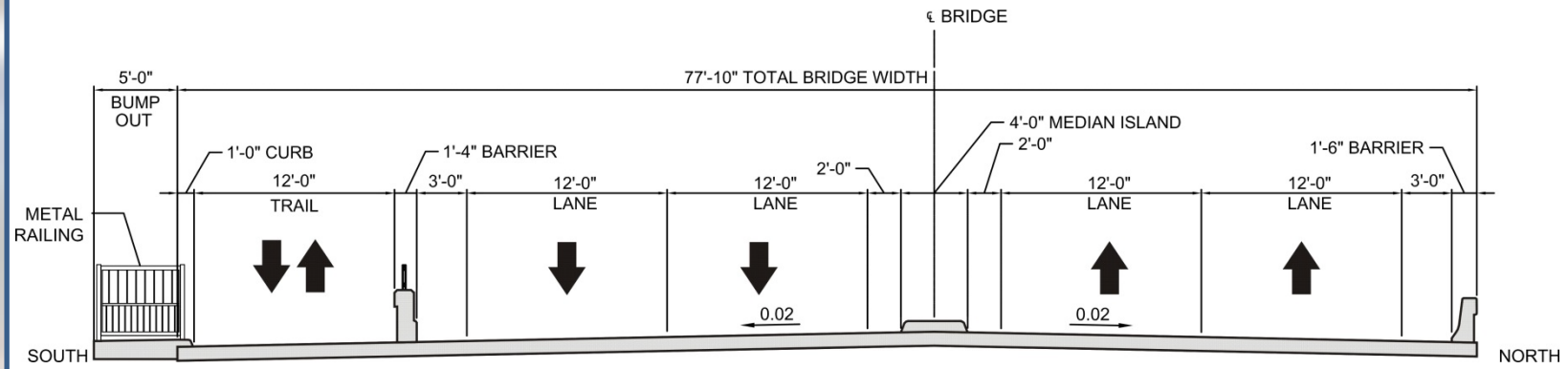


US14/US83/SD34 MISSOURI RIVER BRIDGE REPLACEMENT STUDY
OPTION N1.1 ADDITIONAL R.O.W. REQUIREMENTS

Cross-Section Comparison



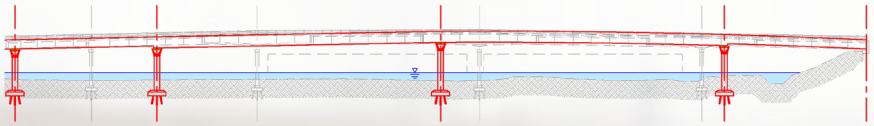
TYPICAL SECTION - EXISTING

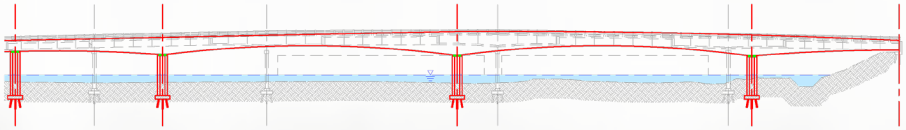


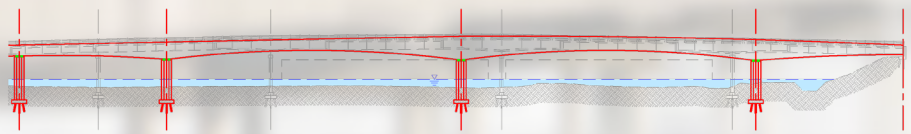
TYPICAL SECTION - PROPOSED

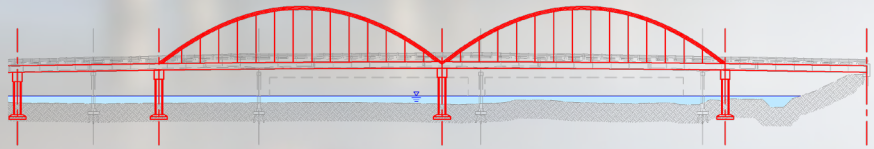
- Traffic Lanes, Shoulders Widths and Medians
- Bicycle and Pedestrian Access

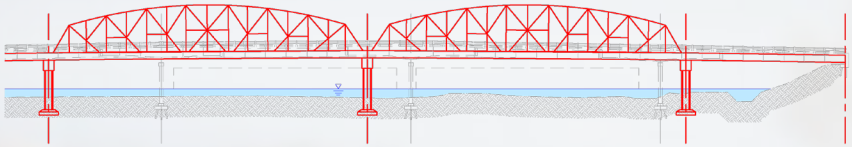
Bridge Types

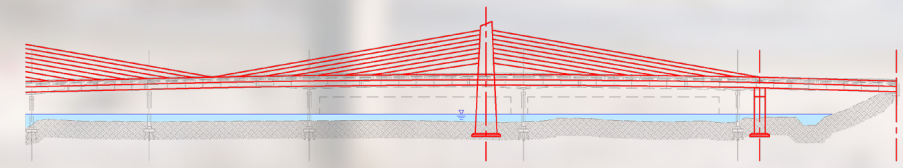


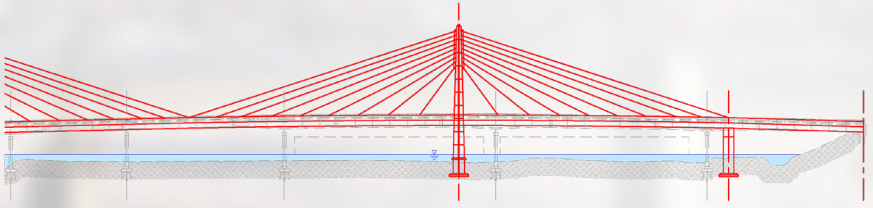












Haunched Steel Girder Chosen

Beam Depth: 7.5-11 ft.

Span Lengths: 200/255

7 Spans

6 Girders

Coast Guard Requirements:

210 Ft. Navigation Channel (One)

30 ft. Min. Vertical Clearance

Design Considerations

- Bridge Approach Foundations

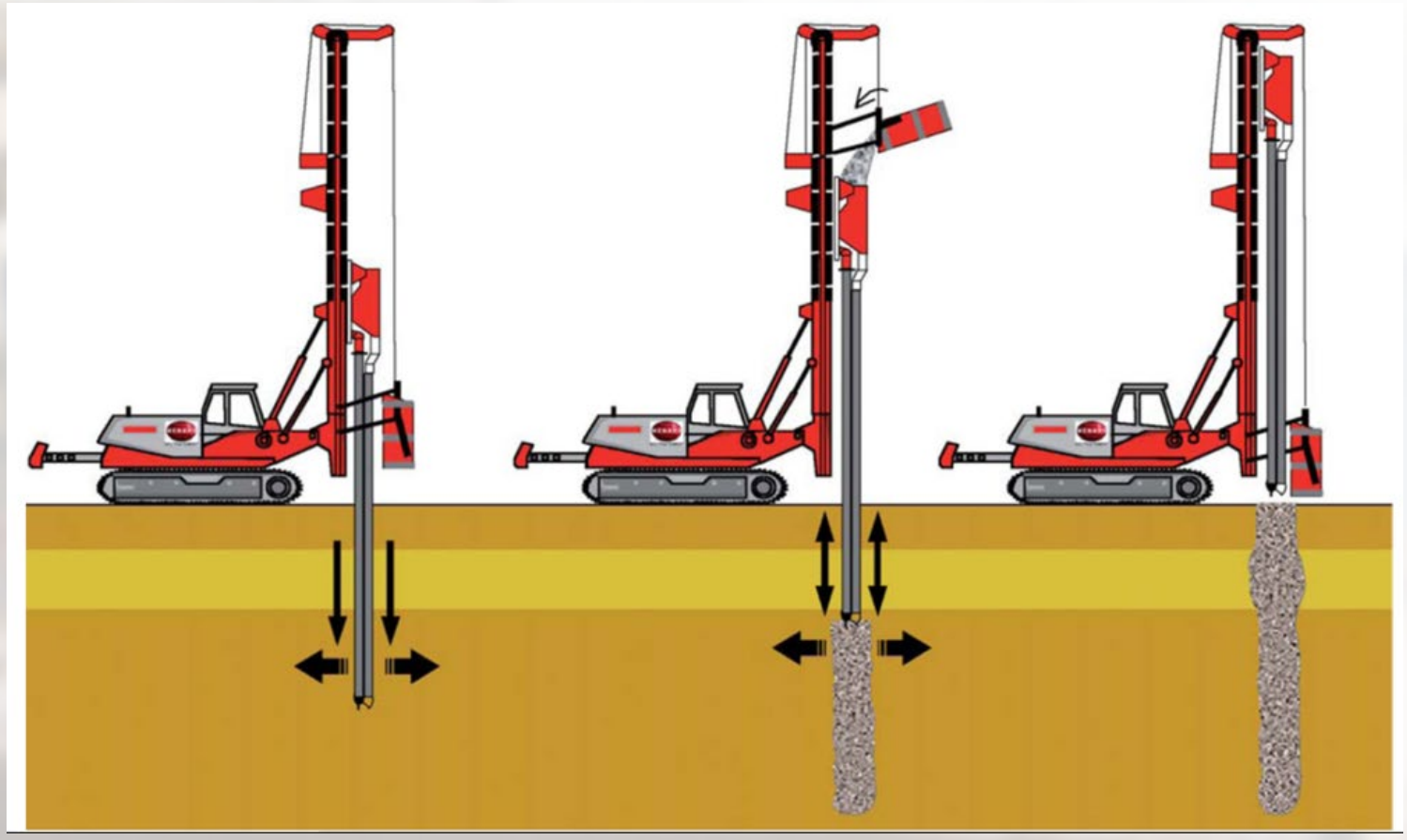
- City of Pierre Water Treatment Plant

- Superstructure

- 2 – Column Bents with Large Drilled Shafts

- Utilities

Aggregate Columns



Aggregate Column Installation

Aesthetic Considerations –

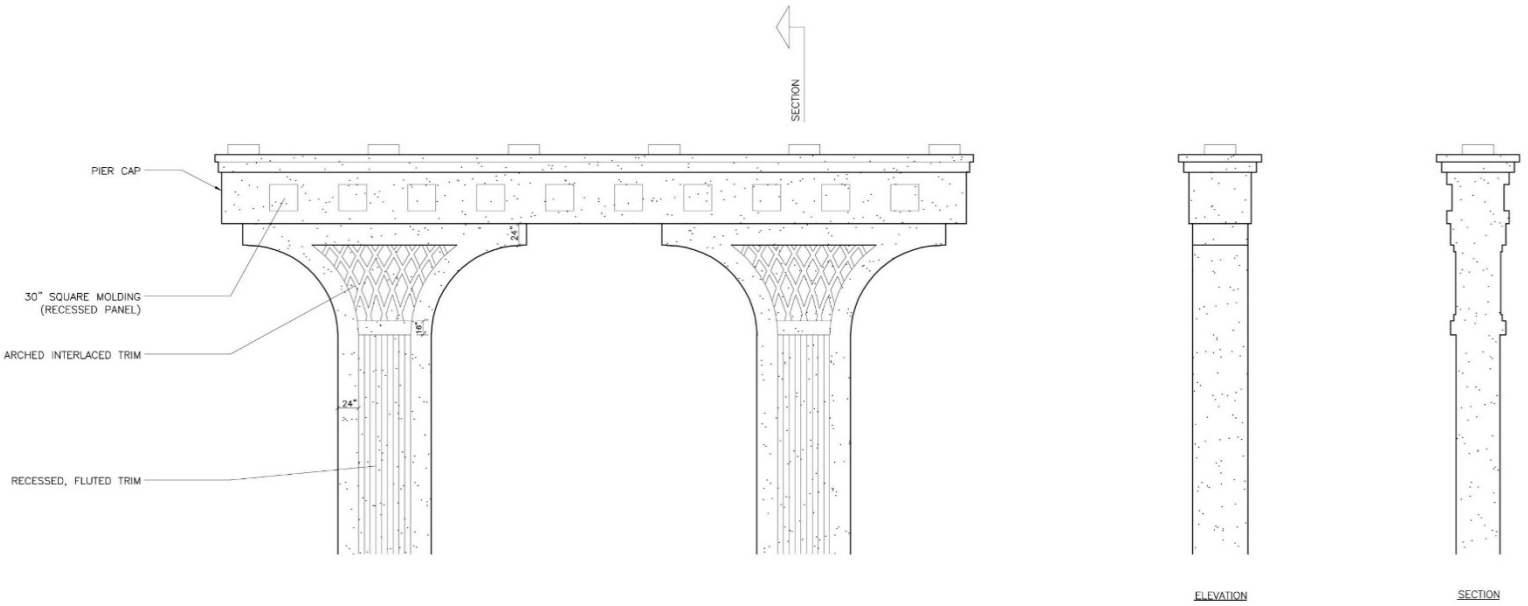
DOT Funded

City Funded (Pierre & Ft. Pierre)

Architect Jeff Grob

Formerly the Drummer for the band Looking Glass

Piers and Pier Caps



BRIDGE PIER - FRONT ELEVATION
SCALE: 3/32" = 1'-0"

BRIDGE PIER - SIDE ELEVATION/ SECTION
SCALE: 3/32" = 1'-0"

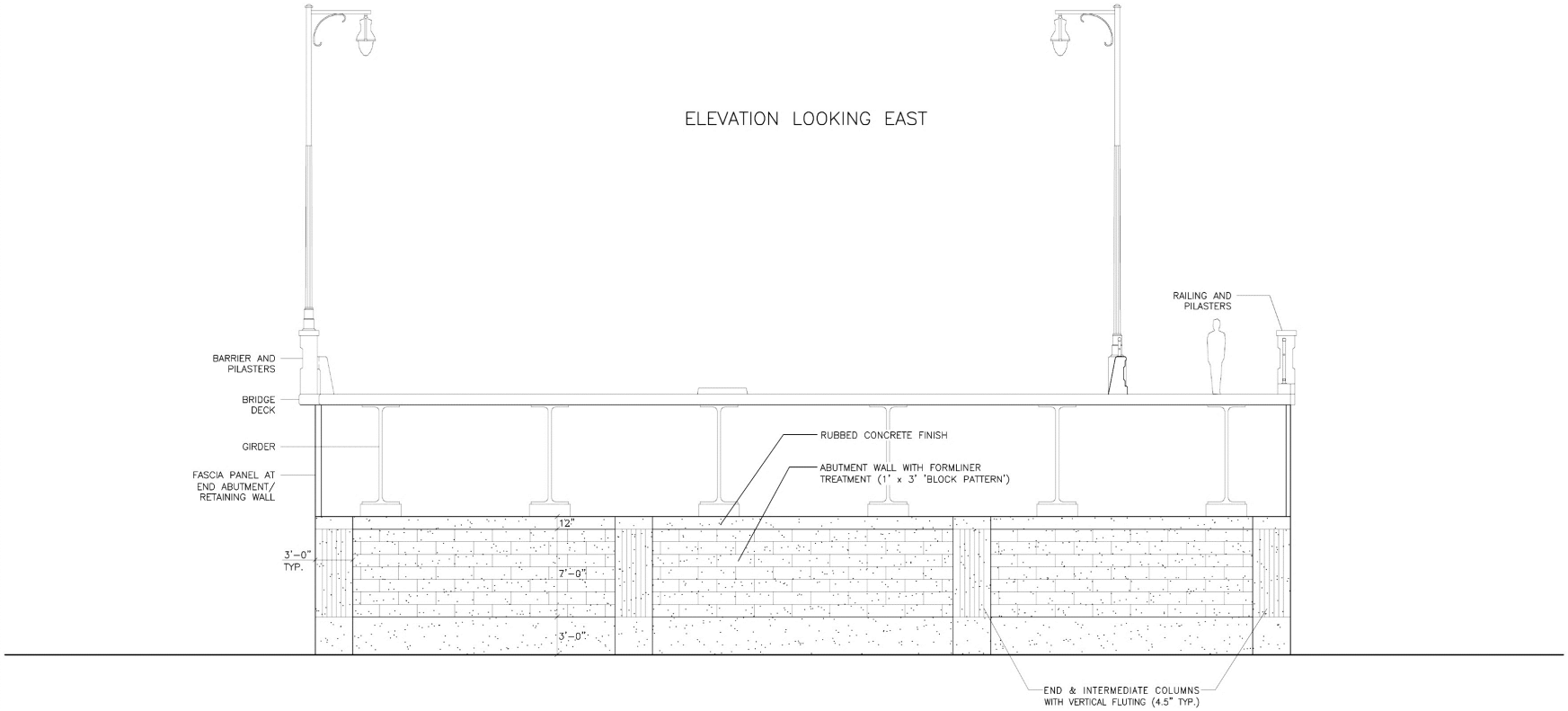
Photo by Tom Strubel

Abutment Walls

Lt. Cmdr. John C. Waldron Memorial Bridge

South Dakota Department of Transportation

AESTHETIC DESIGN GUIDELINES



ELEVATION

SCALE: 1/8" = 1' - 0"

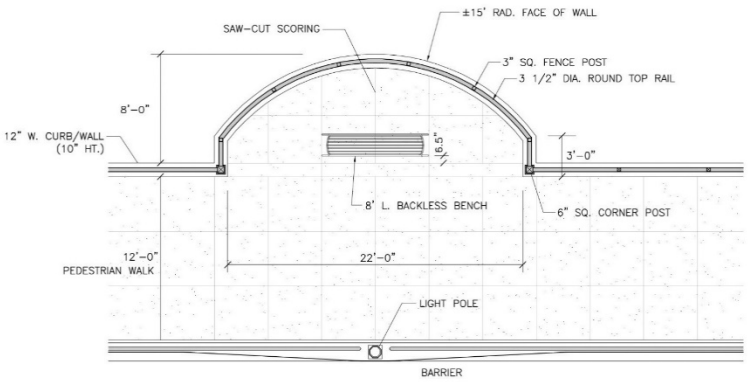
Bridge Substructure

Abutments

Belvederes

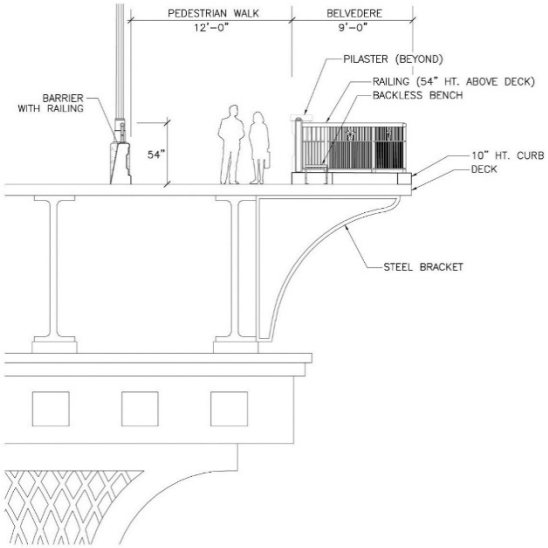
Lt. Cmdr. John C. Waldron Memorial Bridge — **South Dakota Department of Transportation**

AESTHETIC DESIGN GUIDELINES



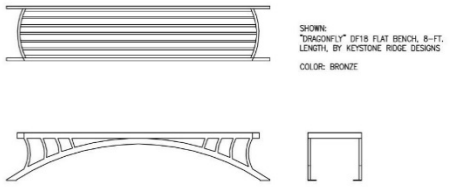
BELVEDERE
SCALE: 1/8" = 1' - 0"

Plan



BELVEDERE
SCALE: 1/8" = 1' - 0"

Section/ Elevation



Bench Detail

Bridge Superstructure

Belvederes

4 - 2.5

Questions?

Drone Photo by Cody Asher