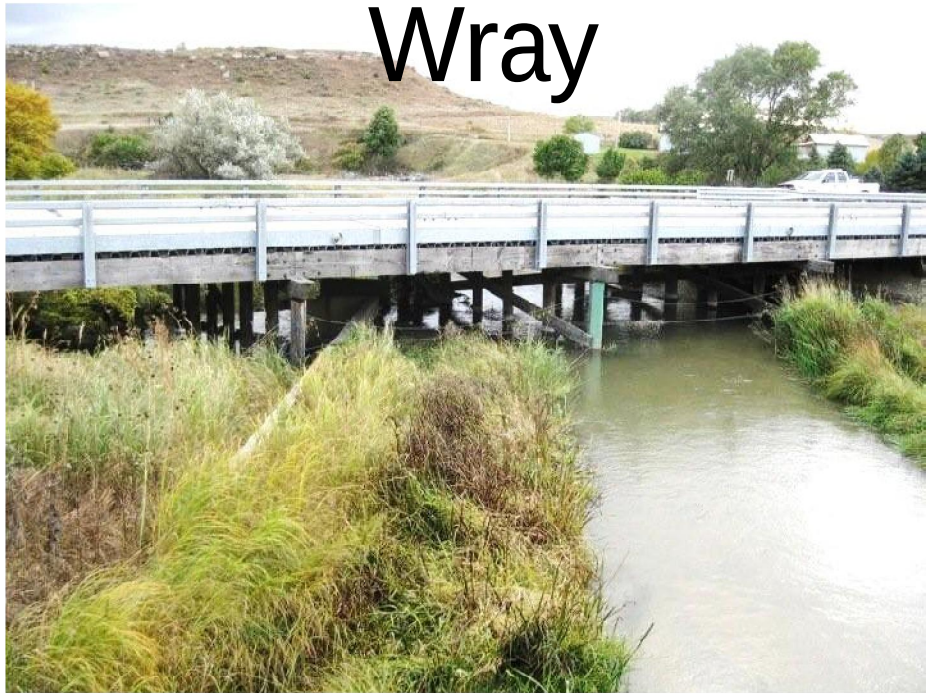
Transportation Commission Meeting
December 20, 2012

- Keith Sheaffer, R4 South Program Engineer
- Brett Locke, Sterling Resident Engineer
- Craig Schumacher, Sterling Project Engineer

FBR 0343-034
18432
US 34; Bridge Replacement East of Wray



Contract Bid Amount $2,316,105

Total Cost of Project $3,229,394

Timber Structure Specifications

- The bridge is located over the North Fork of the Republican River on US 34 at MP 254.6.
- The existing structure D-28-B was a timber bridge that was built in 1949 and widened in 1970.
- It was a 4 span bridge 94 feet in length and 38 feet wide curb to curb.
- It had a metal deck with an asphalt riding surface.

New Pre-stressed Concrete Box Girder Bridge D-28-U

- Single span 126 feet in length, with a 40 feet width curb to curb and 43 feet out to out.
- It sets on a drilled caisson foundation.
- There is no sleeper slab or expansion joint.

Project Design Team

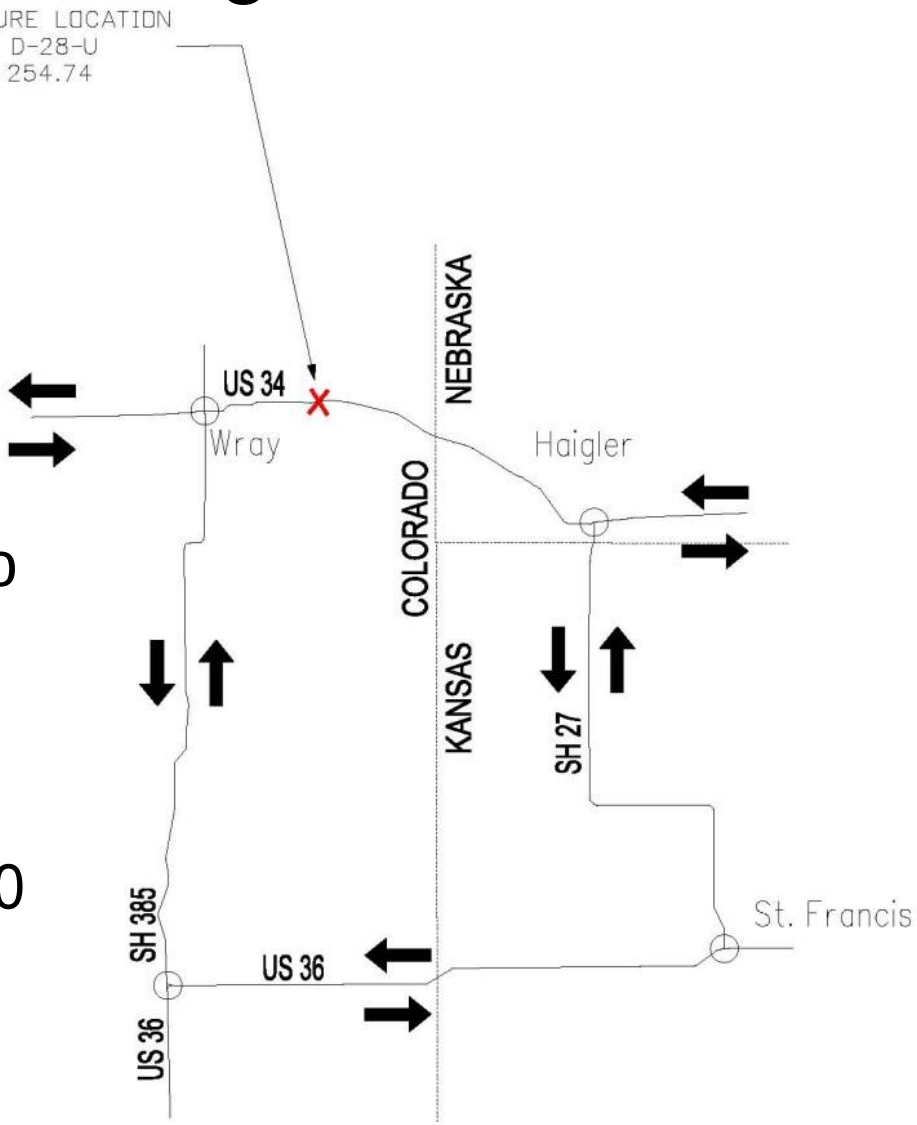
- Tsiouvaras Simmons Holderness Engineering: Structure Design
- Project Engineer (Roadway Design): Craig Schumacher CDOT
- Hydraulic Engineer: Steve Griffin CDOT
- Staff Bridge: Richard Osmun CDOT
- Environmental: Patrick Hickey, Jennifer Gorek, Jennifer Klaetsch CDOT
- Traffic: Daniel Thomas CDOT
- Utilities: Rudy Sipnefski CDOT
- Survey: Lee Groves CDOT
- Right of Way: Dan Michna CDOT

Project Construction Team

- CDOT Resident Engineer: Brett Locke
- CDOT Project Engineer: Craig Schumacher
- CDOT Inspector: Carlos Gomez
- CDOT Tester: Andrew Muller
- URS Consultant Inspector: Richard McKay
- Construction Contractor: Lawrence Construction
- Project Manager: Anne Lawrence
- Superintendent: Lee Adams
- Foreman: Jose Diaz

Design Challenges

- Limited right of way between the BNSF Railroad located to the north of the highway and the structure.
- Haigler Canal head gate structure located under and to the south of the structure.
- Shortest paved detour route was 69 miles long with a calculated user cost at $48,000 per day.



Design Decisions

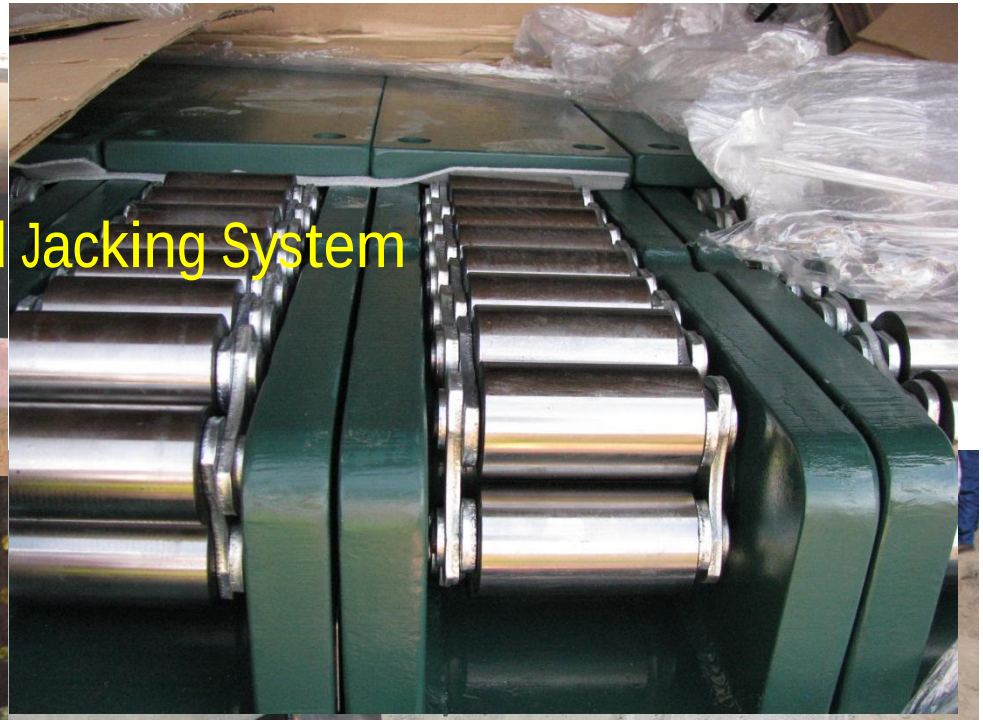
- Design two alternatives for contractors to bid.
- Alt 1 = Build in Place Utilizing Accelerated Bridge Construction
- Alt 2 = Slide-In
- Utilize A+B Cost Plus Time Bidding. The B portion being the number of days needed to close US 34 to traffic with a maximum number of days set at 16.
- The Slide-In would involve building the foundations under live traffic, building the bridge superstructure to the south of the existing bridge, and sliding it in to its final position.

Project Bid Results

Vendor Name	Total Bid (Section A)	Total Bid (Section A + B)
Engineer's Estimate	$ 2,394,382.00	$ 3,162,382.00
Lawrence Construction Co.	$ 2,316,105.34	$ 2,508,105.34
SEMA Construction, Inc.	$ 2,359,949.36	$ 2,791,949.36
Concrete Express, Inc.	$ 2,486,341.10	$ 2,870,341.10
Edward Kraemer & Sons, Inc.	$ 2,800,439.52	$ 3,040,439.52
TLM Constructors, Inc.	$ 2,448,000.00	$ 3,216,000.00
American Civil Constructors, Inc.	$ 3,039,318.00	$ 3,327,318.00
Dondlinger & Sons Construction	$ 3,540,127.02	$ 3,924,127.02

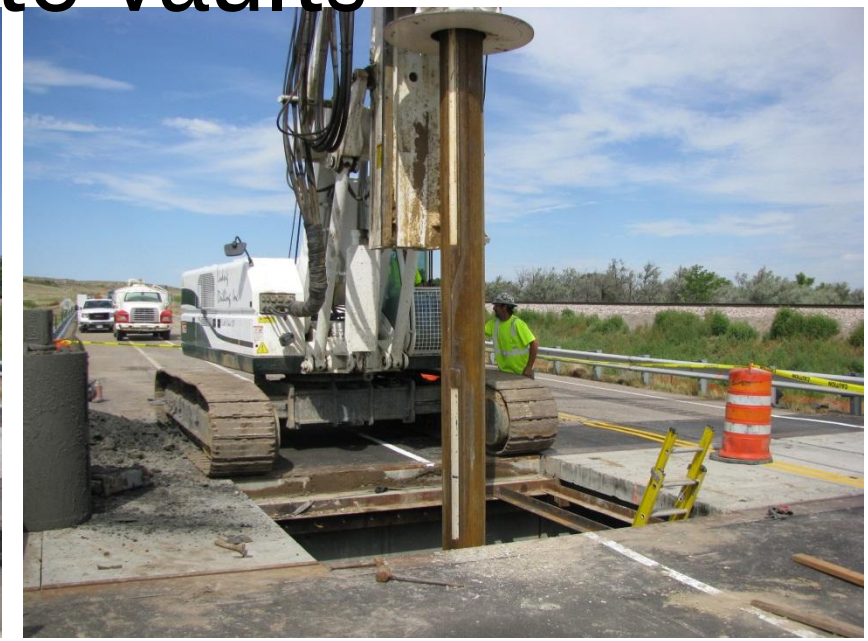
Slide-In Alt 2 Method Chosen

- Rollers and Jacking System



- Bridge Slide Connection Points

Concrete Vaults



- Top Left: Placing Vaults
- Top Right: Drilling Caissons
- Bottom Left: Abutment Reinforcing in the Vaults

Superstructure Falsework

Top Left: Completed Falsework

Top Right: Reinforcing for Slab

Bottom Left: Beams for Slide-In

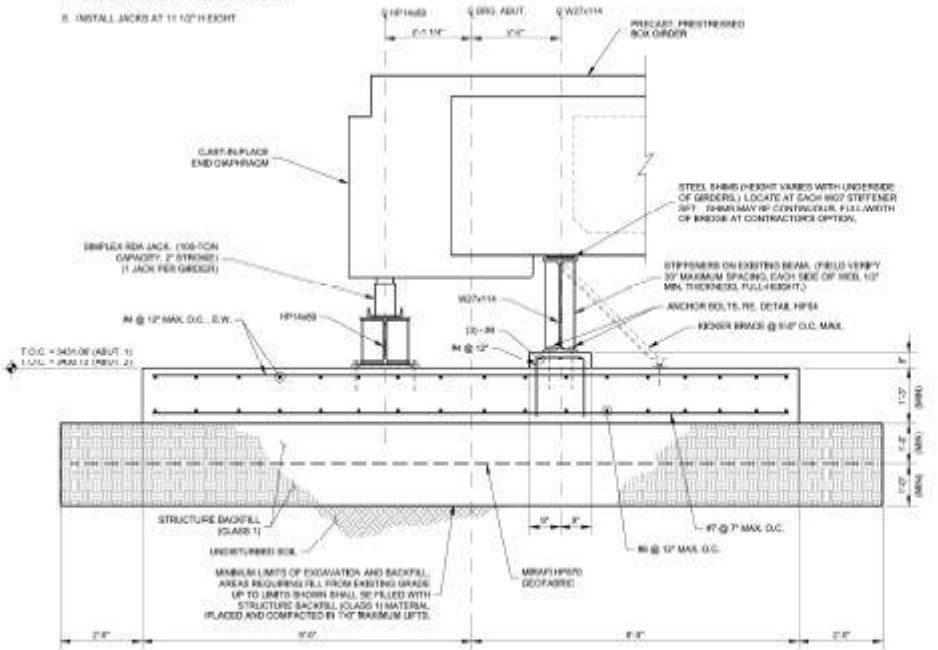
Girder Erection and Deck Pour

- Below: Pre-stressed Box Girders with timber bridge in the back ground.

- Above: Deck pour with average depth of 5 ½ to 6 inches of concrete.

SLIDE-IN PHASE 1 PROCEDURE

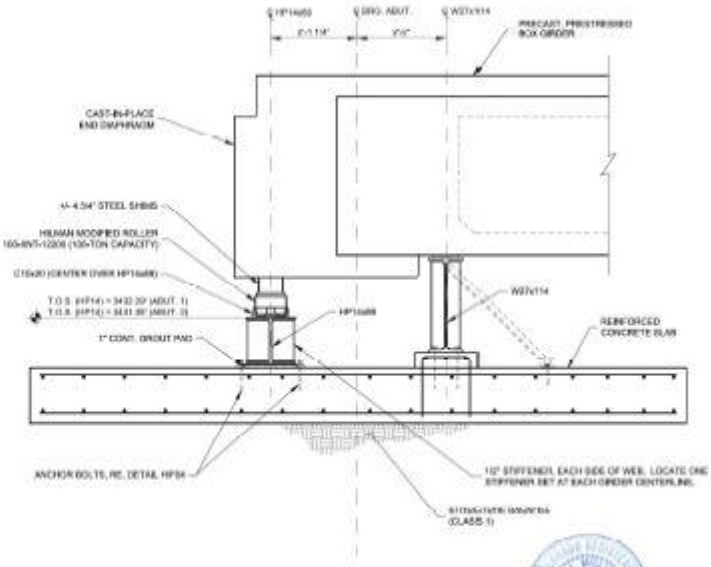
1. CONSTRUCT SLAB ON FILL.
2. INSTALL W27x114 AND SHIMS.
3. INSTALL HP14x89, C10x20.
4. SET GIRDERS ON W27x114.
5. CONSTRUCT FORMWORK FOR END DIAPHRAGM.
6. CONSTRUCT END DIAPHRAGM.
7. REMOVE FORMWORK FOR END DIAPHRAGM.
8. INSTALL JACKS AT 11 1/2" HEIGHT.



SLIDE-IN PHASE 1
A TEMPORARY SLAB SECTION

SLIDE-IN PHASE 2 PROCEDURE

1. RAISE JACKS TO 12" HEIGHT.
2. REMOVE SHIMS UNDER W27x114.
3. PLACE ROLLERS AND SHIMS TO 11 1/2" HEIGHT.
4. LOWER JACKS TO 11 1/2" HEIGHT / SUPPORT SUPERSTRUCTURE ON ROLLERS.



SLIDE-IN PHASE 2
B TEMPORARY SLAB SECTION

8/15/12

Print Date:	8/15/12		
Drawing File Name:	US34 over Republican River		
Horiz. Scale: As Indicated	Vert. Scale: As Indicated		
Unit Information	Unit Leader Initials		

Sun Engineering LLC

Sheet Revisions

Date	Comments	Init

Colorado Department of Transportation
DOT
120 North Riverview Road
Sterling, CO 80751
Phone: 970-522-0481
Region 4
LBL

As Constructed	
No Revisions	
Revised:	
Void:	

US34 BRIDGE OVER REPUBLICAN RIVER
SUPERSTRUCTURE TEMPORARY SUPPORT DETAILS

Designer: J. Migliaccio		Structure Numbers	D-28-U
Detailer: J. Migliaccio			
Subset: FALSEWORK	Subset Sheet: F02 of F04		

ALTBID2

Project No./Code	FBR U343-U34
	18432
Sheet Number	

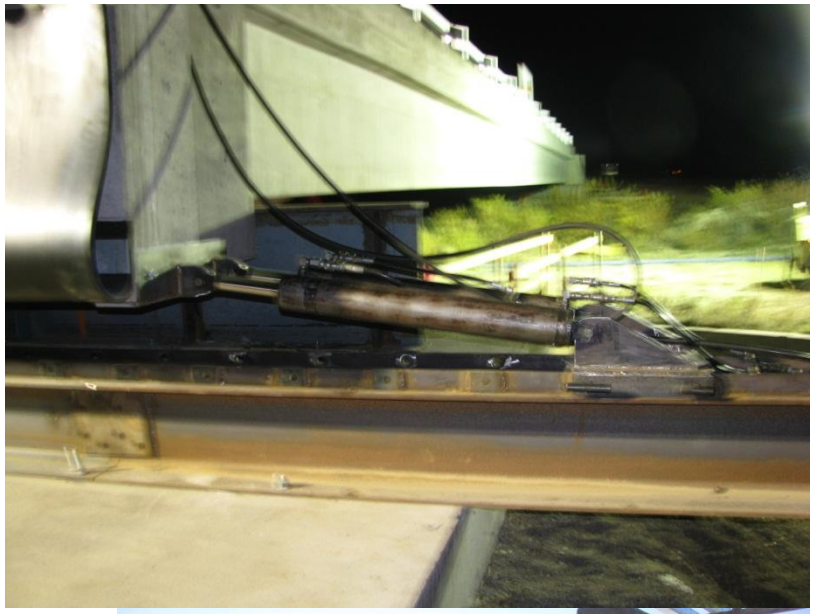
US 34 Closure
Slide-In Schedule

Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish	Resource
MILL EB LANE	12	12	0	30OCT12 07:00	30OCT12 18:59	
EB LANE CLOSURE	0	0	0	30OCT12 07:00	30OCT12 06:59	
PULL BARRIER AND SAND ARRAYS	3	3	0	30OCT12 07:00	30OCT12 09:59	
saw cut bridge deck	8	8	0	30OCT12 07:00	30OCT12 14:59	
REMOVE BRIDGE RAIL AND TY3	8	8	0	30OCT12 07:00	30OCT12 14:59	
ROAD CLOSED	0	0	0	30OCT12 19:00	30OCT12 18:59	
BRIDGE DEMO	9	9	0	30OCT12 19:00	31OCT12 03:59	
install dewatering	4	4	0	31OCT12 04:00	31OCT12 07:59	
INSTALL SUBGRADE AND ABC CLASS 6	48	48	0	30OCT12 19:00	01NOV12 18:59	
REMOVE CONCRETE VAULTS	7	7	0	31OCT12 11:00	31OCT12 17:59	
GRADE ABUTMENT SLOPES	3	3	0	31OCT12 08:00	31OCT12 10:59	
INSTALL FABRIC & REVETEMENT MATS	4	4	0	31OCT12 18:00	31OCT12 21:59	
ROLL BRIDGE	1	1	0	31OCT12 22:00	31OCT12 22:59	
Bearing devices, remove bra and Jack bridge down	3	3	0	31OCT12 23:00	01NOV12 01:59	
INSTALL ALL MATERIAL AT ABUTMENTS	5	5	0	01NOV12 02:00	01NOV12 06:59	
munch temp shoring slab at creek	4	4	0	01NOV12 07:00	01NOV12 10:59	
SHEET PILE ON 4 WING WALLS	8	8	0	01NOV12 07:00	01NOV12 14:59	
FLASH FILL BOTH ABUTMENTS	5	5	0	01NOV12 15:00	01NOV12 19:59	
BUILD CLASS 6 APPROACHES	3	3	0	01NOV12 20:00	01NOV12 22:59	
RESET BARRIER & SAND ARRAYS	3	3	0	01NOV12 23:00	02NOV12 01:59	
RE-OPEN	0	0	0	02NOV12 02:00	02NOV12 01:59	

Demolition and Revetment

- Top Left: Demolition of Timber Bridge
- Top Right: Removal of Vaults with abutment in place
- Bottom Right: Placement of Concrete Block Revetment

Bridge Slide



Rollers, rails and cylinders used to push the superstructure.

Bridge Slide Cont.

- Video of Bridge Slide-In.

Bridge Slide Video by TSH.mp4

Completed Bridge and Roadway

- Top Left: Completed Roadway
- Top Right: Nearly Completed Bridge North Side View
- Bottom Left: Bridge just after slide