LOCHNER

A consulting engineering firm with a focus on transportation since 1944. Always evolving to meet future demands; yet remaining steadfast to our foundation of teamwork, shared commitment and accountability.

The Lardo Bridge Slide-In

Presented by: Brian Byrne, P.E., P.Eng.

Discussion Outline

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- Project Overview
- Design Approach
- Construction Approach and Slide Details

McCall, Idaho

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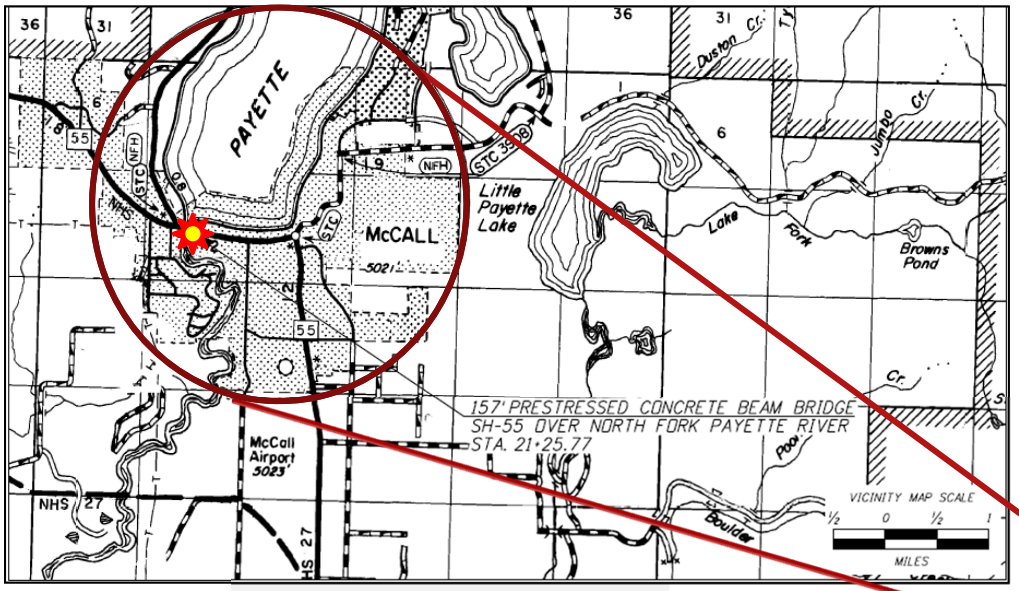
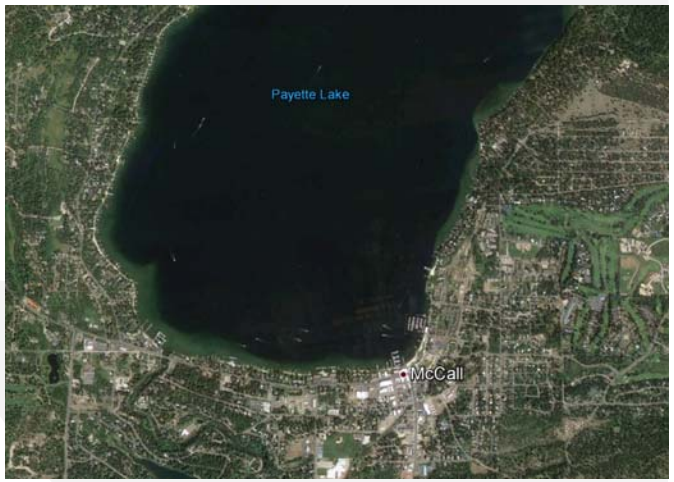
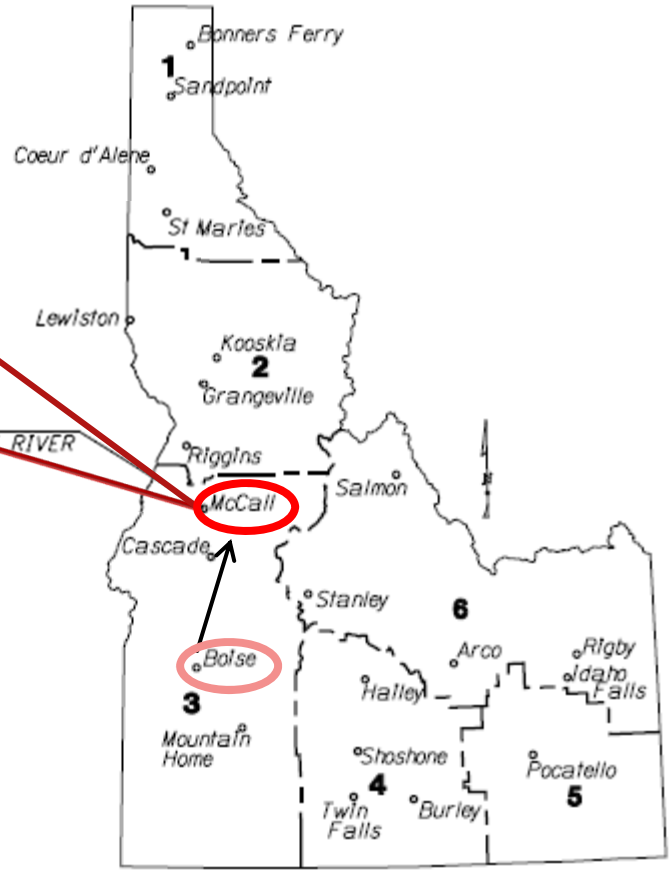




A013(392)
SH-55 OVER NORTH FORK PAYETTE RIVER
STA. 21+25.77
MP 145.001
SEGMENT CODE 001990



Existing Bridge

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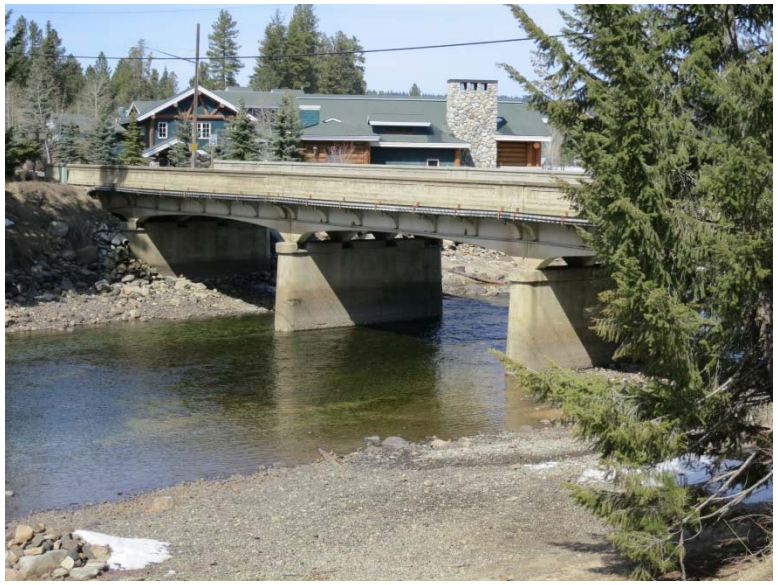
- 5-Spans, 200 feet long, 33’-8” Wide
- CIP Concrete Haunched T-beams
- Constructed in Early 1930s
- 30’ curb-to-curb with Two Lanes
- One 5’ Sidewalk



Project Constraints

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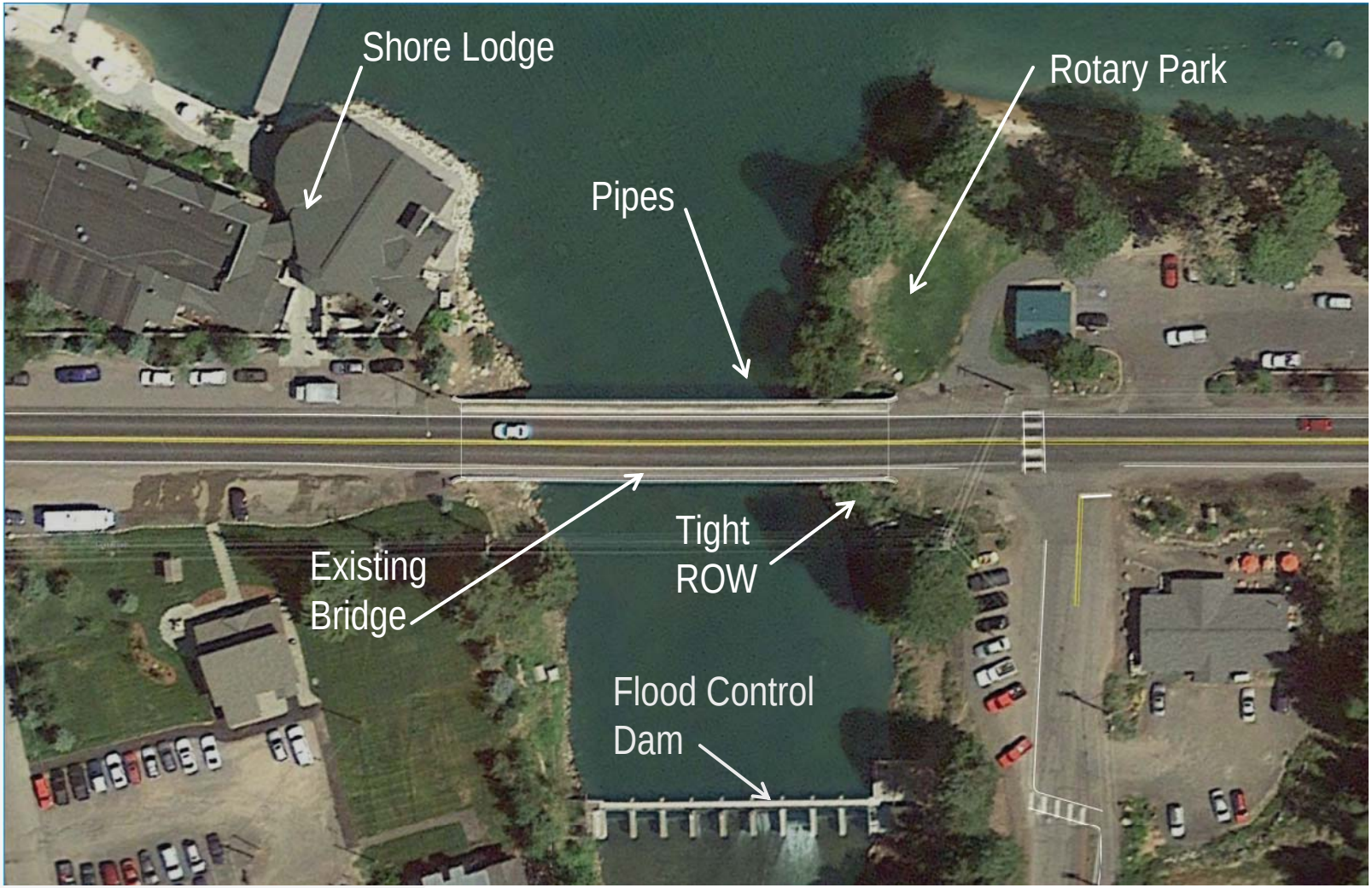
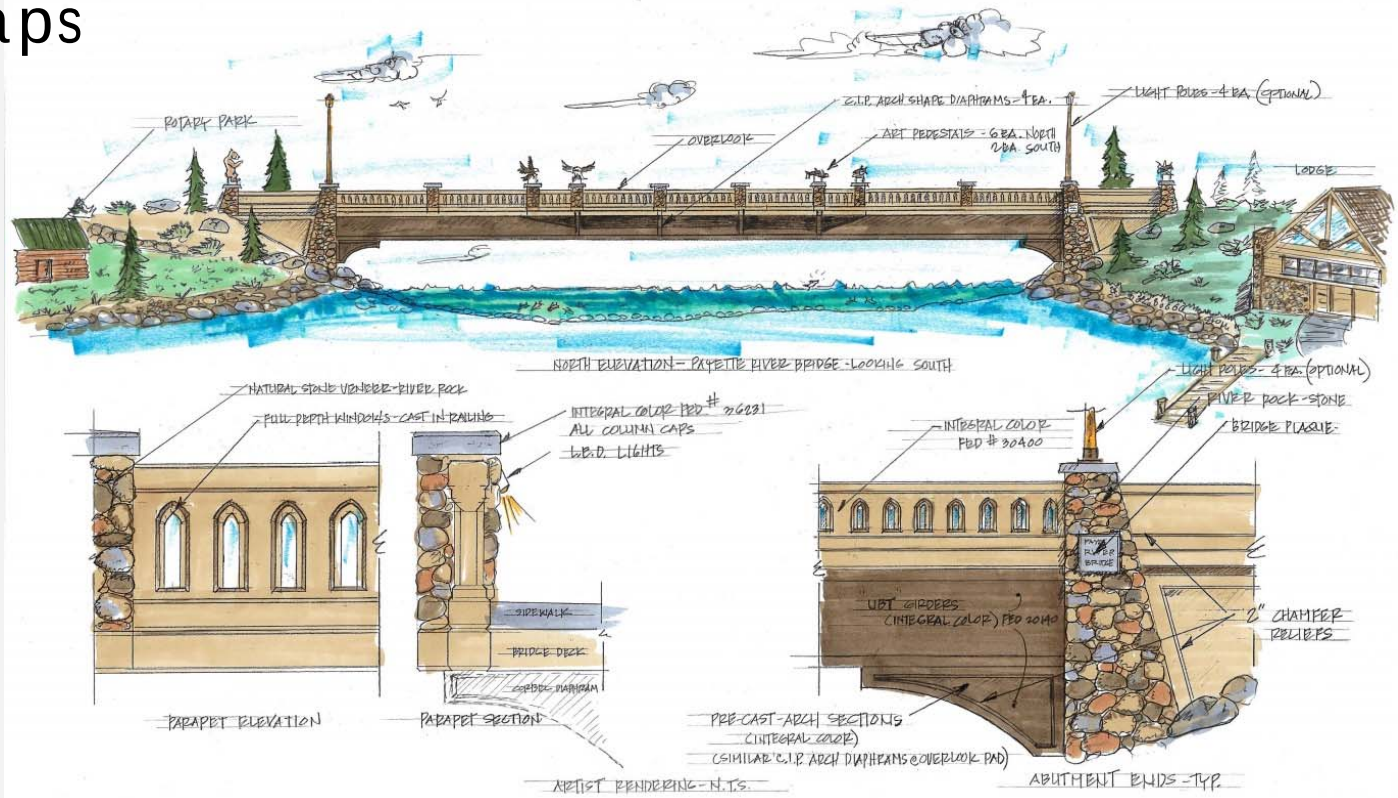


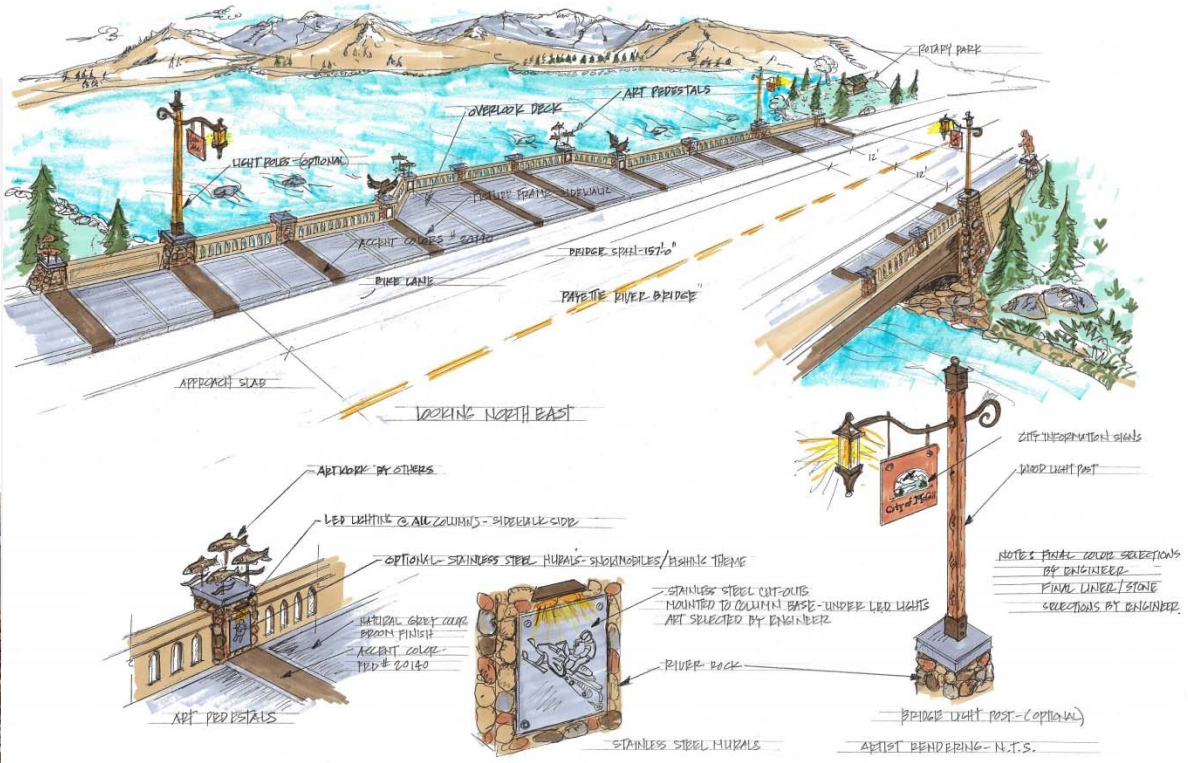
Proposed Bridge

- 155’ Single Span
- Precast Bulb Tee Girders (UBT90)
- Fixed Abutment with Stiff Leg Approach
- Four Pile Caps



Proposed Bridge

- 54’ Wide + 8’ “Belvedere” Overlook
- 2 Lanes + Bike Lanes + Wider Sidewalks
- Architectural Elements



Project Configuration & Goals

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- Design Build Contract
- A+B Bidding… $7,700/ day
- Avoid Impacts to Summer Traffic, Maintain Connectivity along SH-55
- Reasonable Detour Available
- No closure before Sep 2nd
- Reopen by Dec 23rd

Proposed

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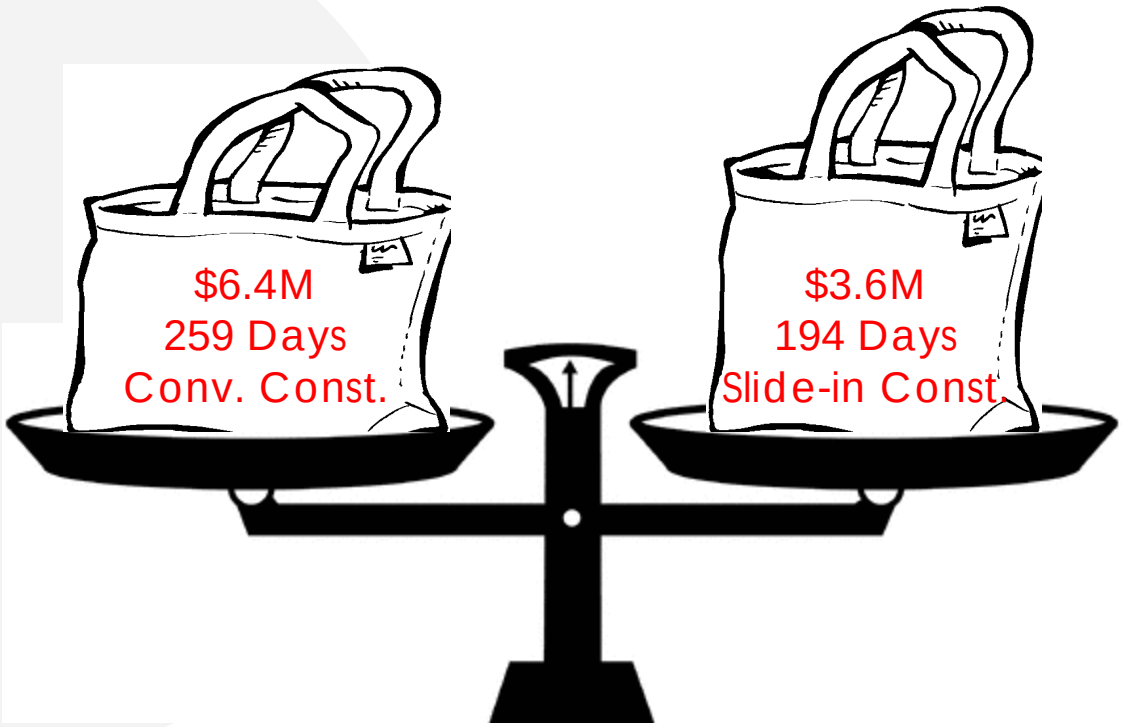
- $3.6 m Bid, less than $5 m Estimate
- 194 Days, NTP to Substantial Completion
- Cost and Time Savings over Conventional Construction Bid



Project Schedule

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- Dec 2013 — RFQ
- Jan 2014 — Shortlist
- Feb 2014 — Technical Proposal Submitted
- Late March 2014 — Project Award
- Early July 2014 — RFC of Early Bridge Package & Site Mob
- Mid Sept 2014 — Set Girders
- Oct 15, 2014 — Close SH-55 at Bridge
- Oct 27, 2014 — Slide Bridge
- Nov 26, 2014 — **Reopen SH-55**

Project Team

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- Idaho Transportation Department – Owner
- Ralph L. Wadsworth – Contractor
- Lochner – Prime Consultant
- Terracon – Geotechnical Engineer
- 4M Engineering – Temporary Works
- Hansen Precast – Precast Concrete Girders
- Forsgren Associates – State Liaison & Engineer

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Design Approach

Superstructure

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- 6 - UBT90s with Asymmetric Spacing
- Corbels for Belvedere Sidewalk
- Transportation of Girders… 500 mile delivery

Transportation of Girders

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Substructure

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- Pile Caps
  - 4 total ~ 1 in each Quadrant
  - Installed while Existing Bridge in Place
  - Constraints due to ROW in Southeast Quadrant
  - Constraints due to utilities on North Side

Substructure

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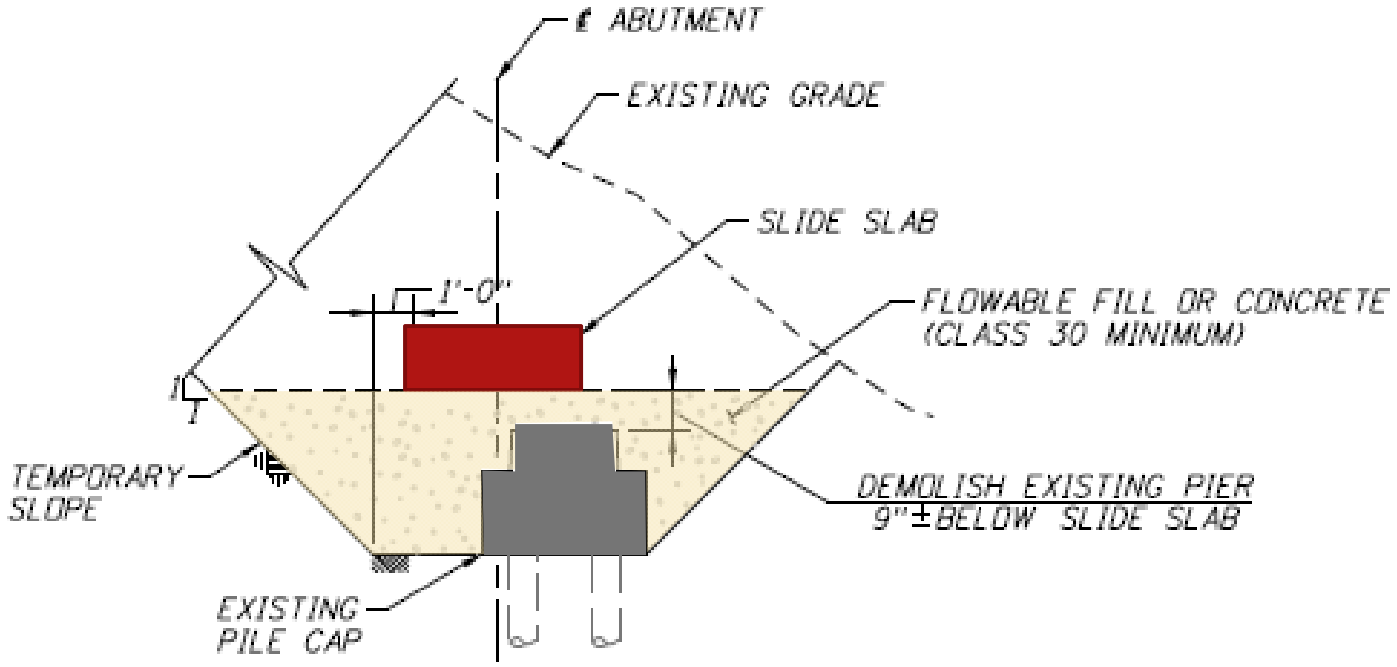
- Abutment Stem
  - No moment connection to Pile Caps
  - Used Shear Keys
  - Longitudinal Post Tensioning to Span between Pile Caps
  - Full Width “Shoes”

Substructure

- Slide Slab
  - Placed after demolition
  - Flowable Fill in lieu of Piles
  - Used Ledges to ensure no differential deflection during slide



Substructure

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- Temporary Substructure
  - Two rows of HP Piles each
  - Steel Cap of W14s
  - Separate Designer

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Construction Approach & Slide

Slide Concept

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- Pulled bridge
  - Center Hole Jacks
  - Threaded High Strength Bars
  - Anchorage
  - 3.5 million pounds
  - 10% static friction assumed
  - Steerable
- Sliding Surface
  - Stainless Steel anchored to Concrete Shoes
  - Teflon Slide Pads
  - Non-proprietary

Pre-Slide Site Plan

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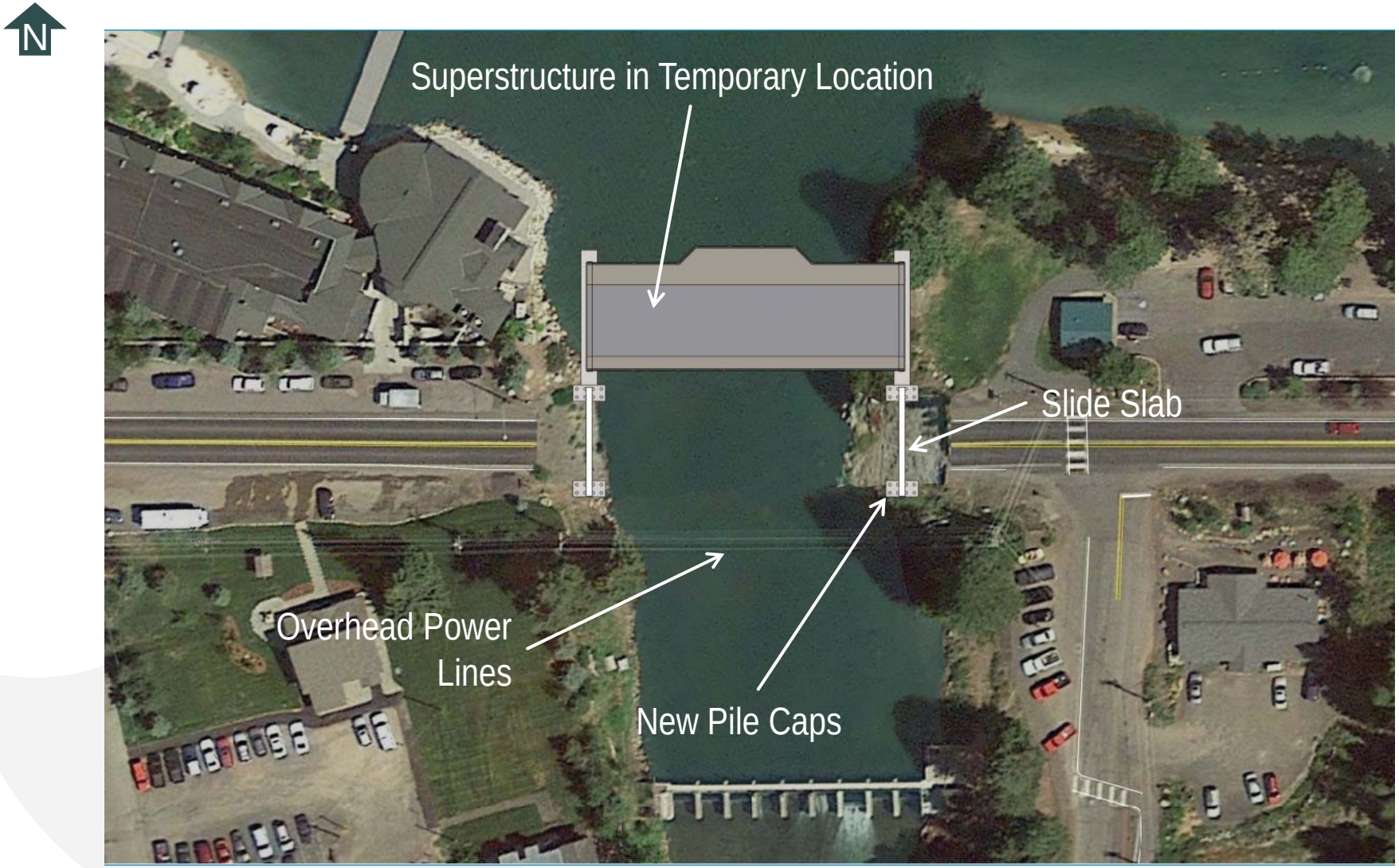

Demolition Setup (10/10)

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Demolition (10/15)

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Demolition (10/15)

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Pre-Slide Setup (10/22)

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Pre-slide Setup (10/27)

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Pre-slide Setup

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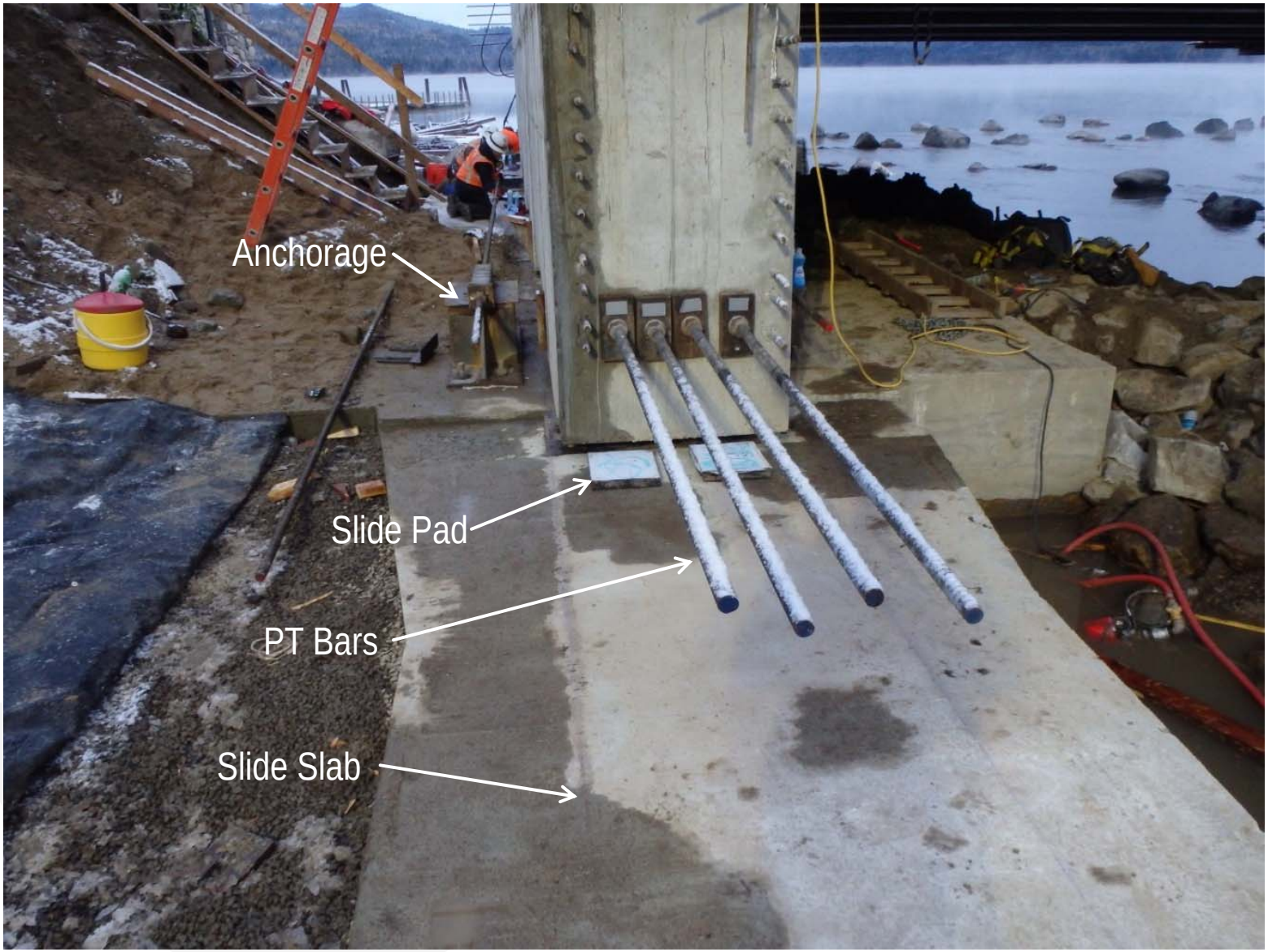

Push Block

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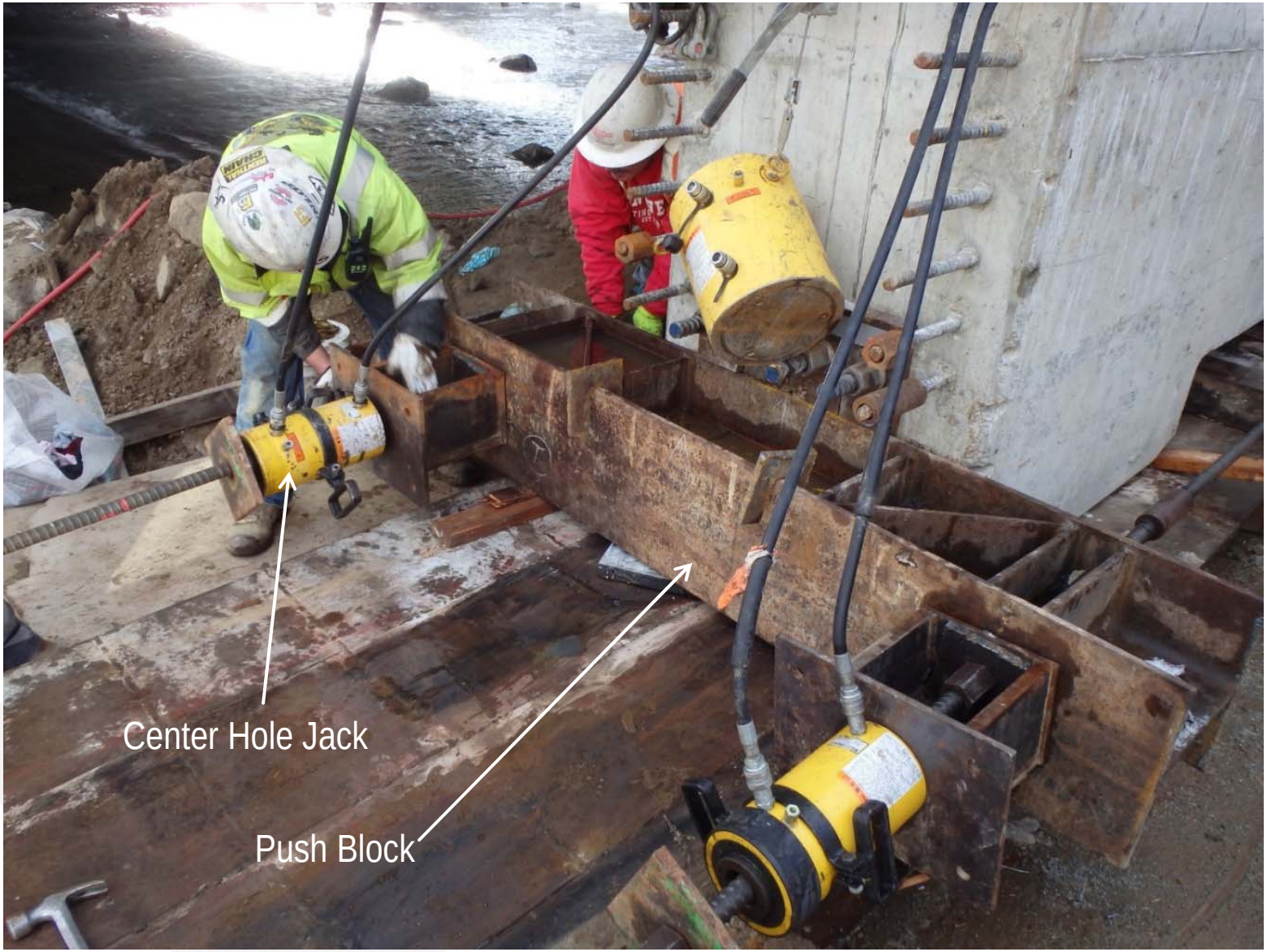

Pre-Slide Position

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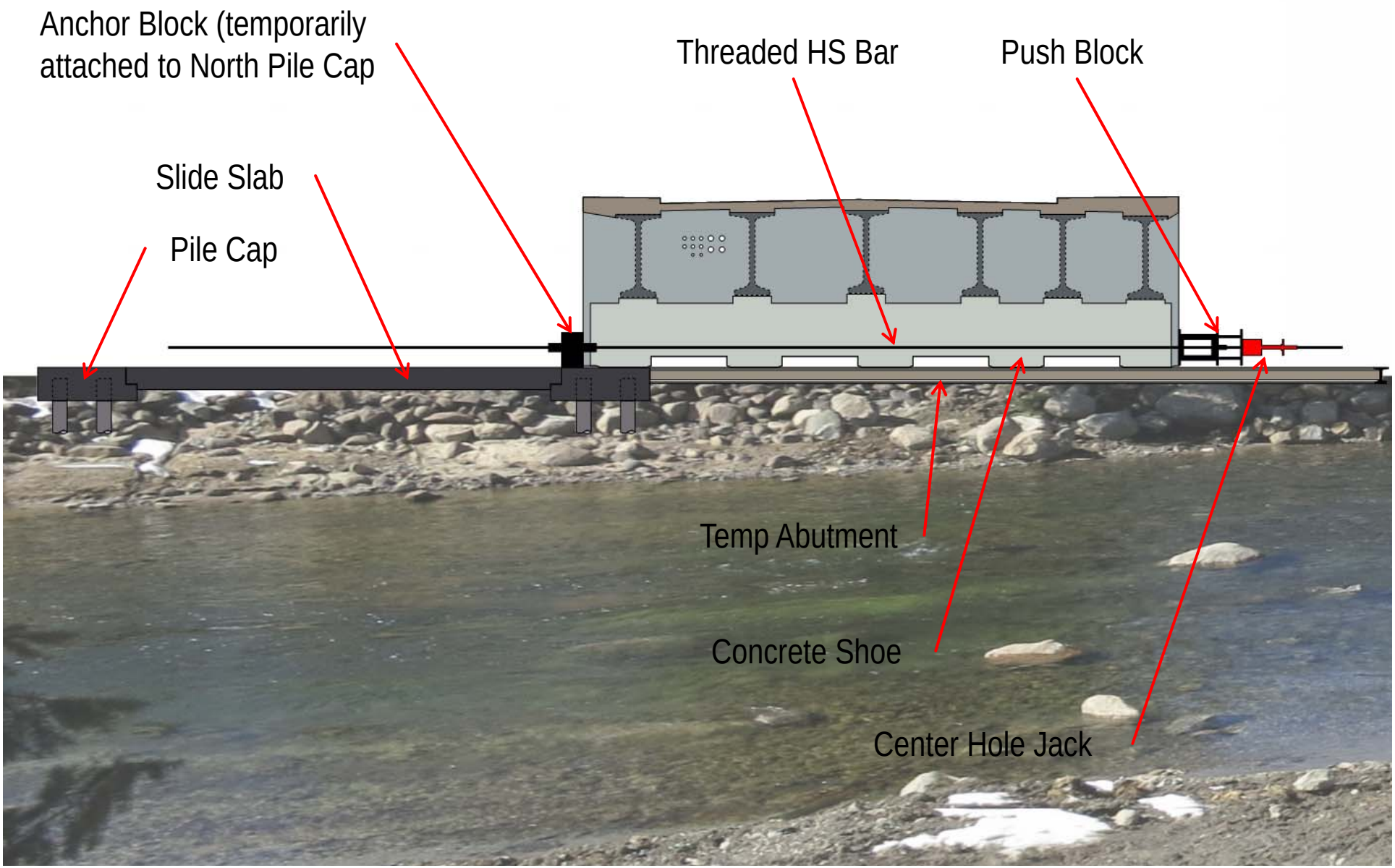

Post-Slide Position

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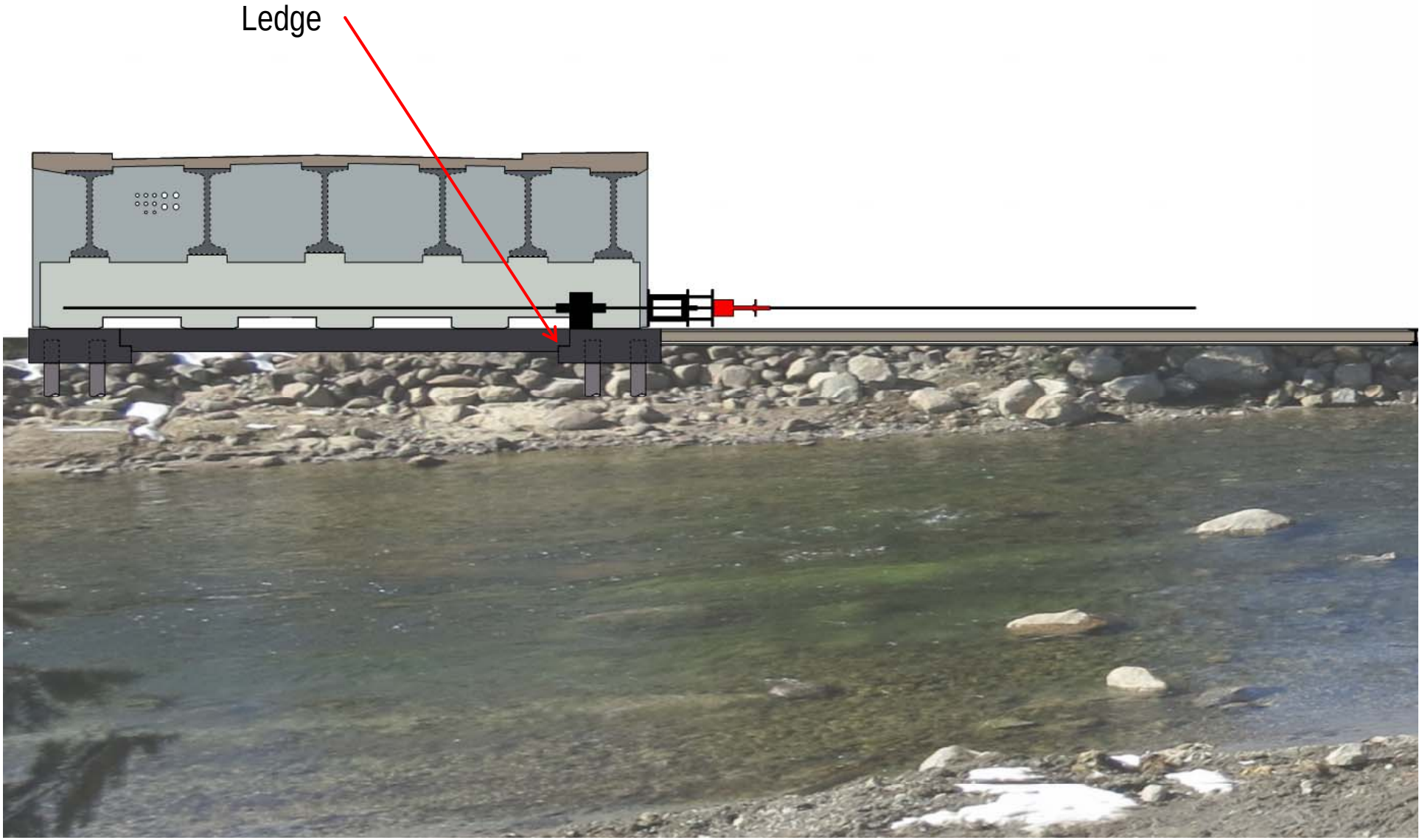

Post-Slide Tasks

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- Construct Wingwalls (Did not move with bridge)
- Place Backfill and Approach Slabs
- Pour Shear Keys
- Pour Sidewalks (Schedule not Weight)

Live Action

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Lardo Bridge Slide
McCall, Idaho 10-27-14

Thank you!

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PACIFIC INFRASTRUCTURE PARTNERS