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INTERNATIONAL

We Make a Difference

Utah SR-201 Bridge Slide

2015 Western Bridge Engineers' Seminar

Richard Hansen, SE

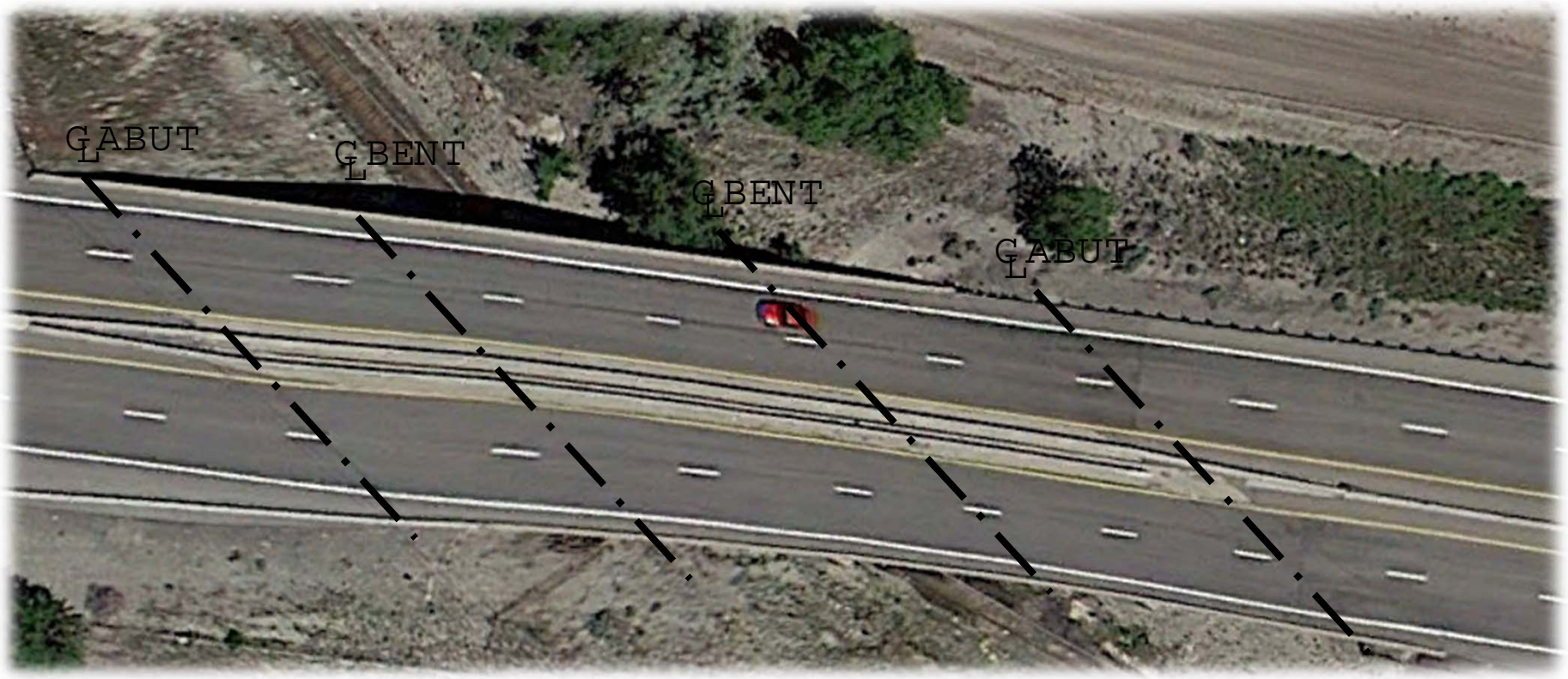
Project Overview

- Design-Bid-Build
- Originally scoped as deck replacement project
- Six month design schedule
- Type Selection Report with ABC Evaluation
- Best value when user cost included
- Reduced footprint of the bridge by ~2/3
- Final Bridge Selection
- Full superstructure replacement. Change 3-span bridge to a single-span bridge. Build MSE walls behind existing bents. The existing bents would become the abutments.
- Winning Bid = $3,808,454

Existing Structure

Existing Structure

High Skew



Design

- ABC Evaluation
- Superstructure
- Bridge Abutments
- Bearings Joints
- MSE Walls
- ABC Details

ABC Evaluation

- Construction Cost and User Cost
- UDOT's "ABC Rating Procedure and Decision Flowchart"
- Was ABC feasible?

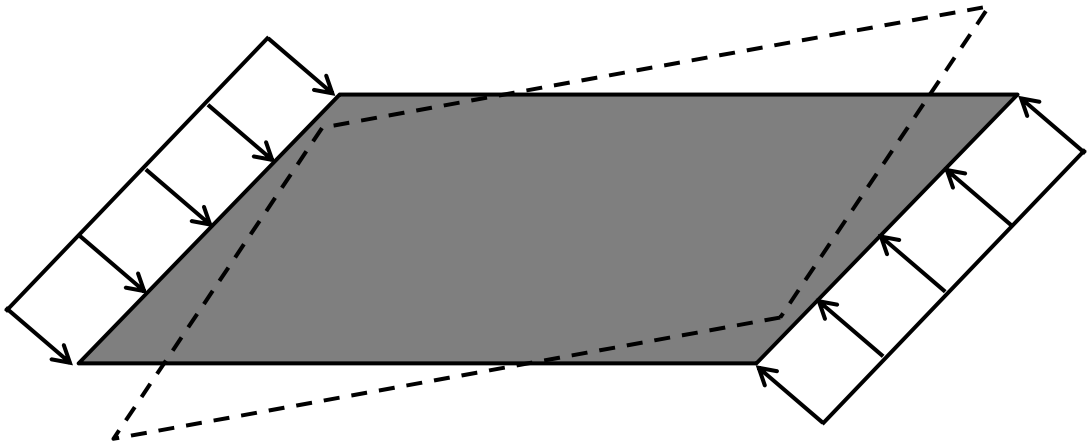
Superstructure

Bridge Abutments

- Semi-Integral Abutments
  - Facilitate ABC
  - Minimized work needed after bridge move

Bridge Skew

- Lateral forces with high skew



Bridge Skew Solution

- Eliminate passive pressure
  - Build the new wall behind the existing bents (new abutments)

Seismic

- Existing bents
- Lightweight concrete
- Isolation bearings

Issues with Bridge Isolation

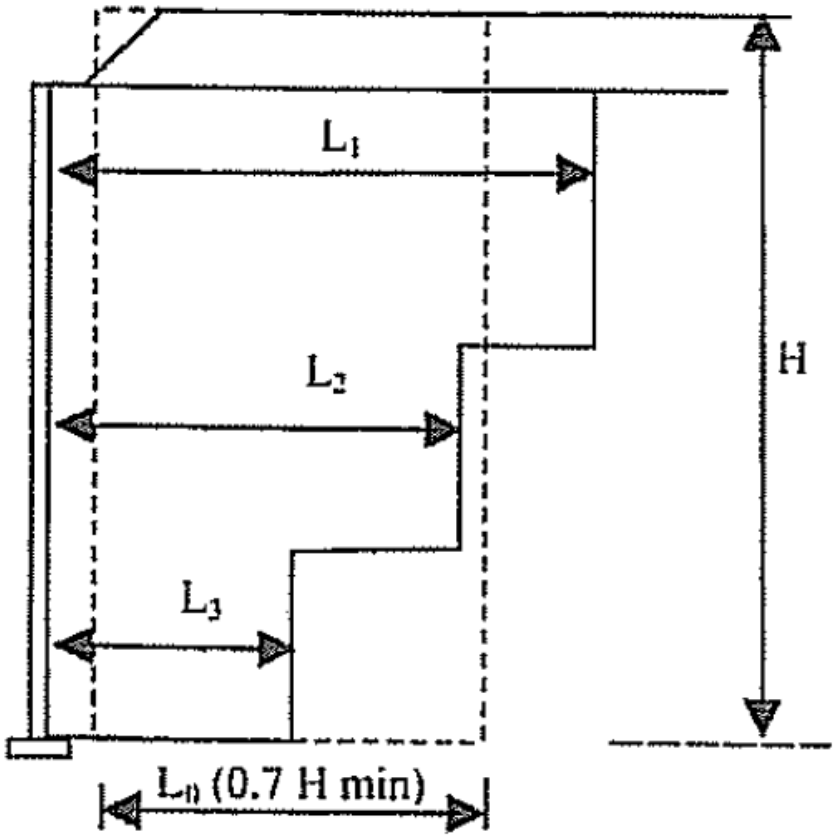
- Joint
  - Need to allow for movement
  - Considered modular joint
- Parapet to Roadway Barrier

MSE Wall Issues

- Temporary shoring for MSE wall construction

Strap Length - MSE Walls

- Strap Length =
  0.7 x Wall Height



MSE Walls

- Skew -30° Acute Corners

MSE Walls

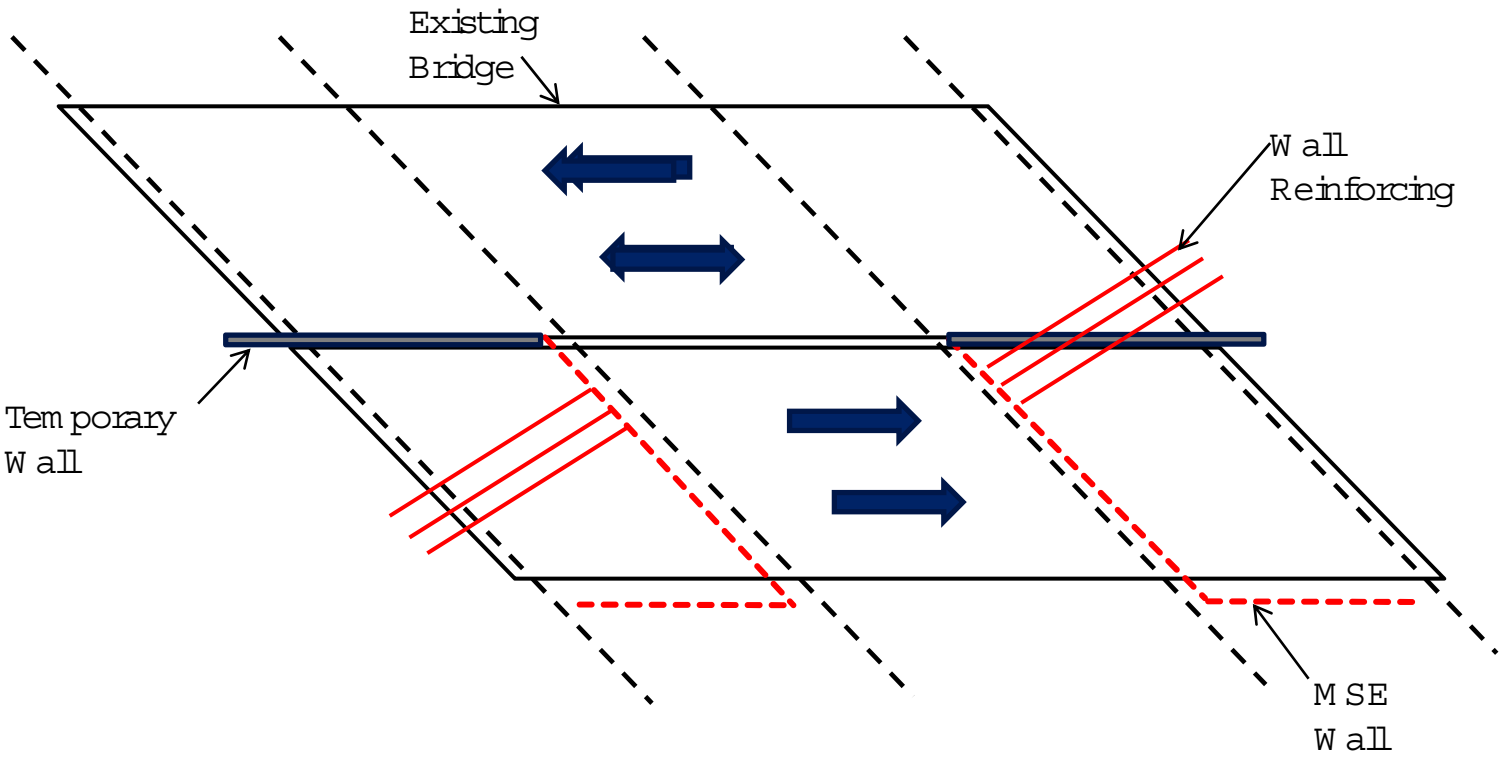
- Working under existing structures

MSE Wall

- Limited Access

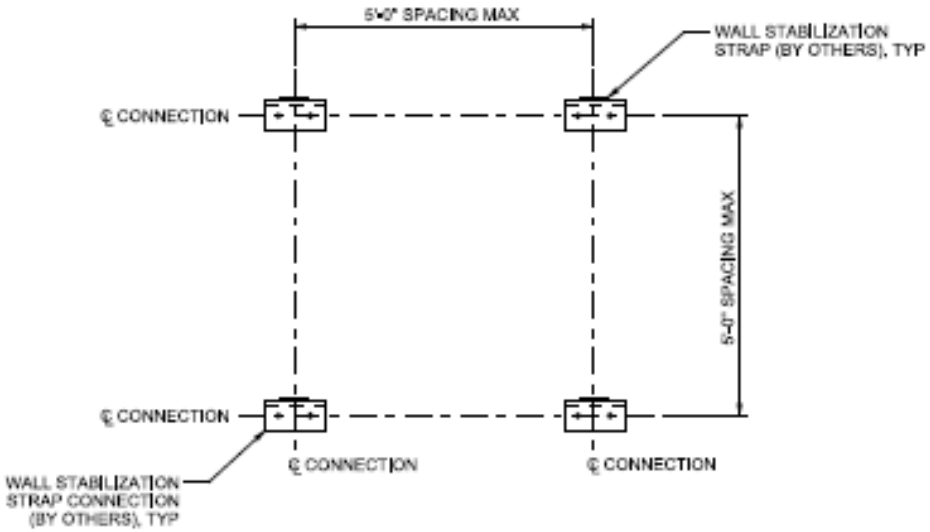
MSE Walls

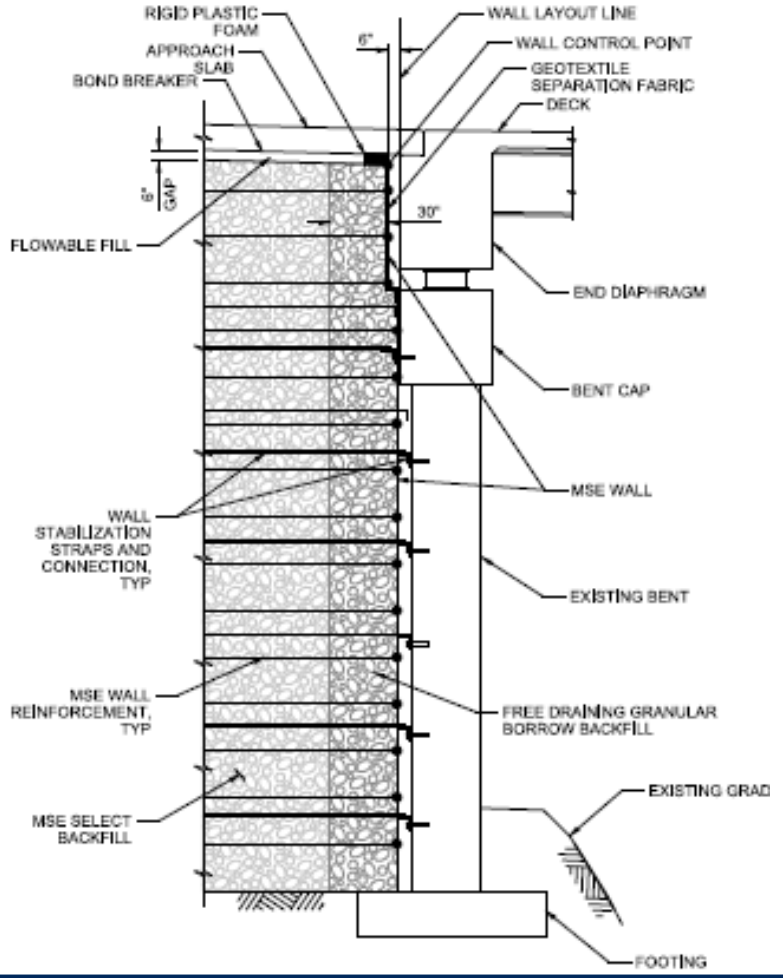
- Phasing



Existing Bents (New Abutments)

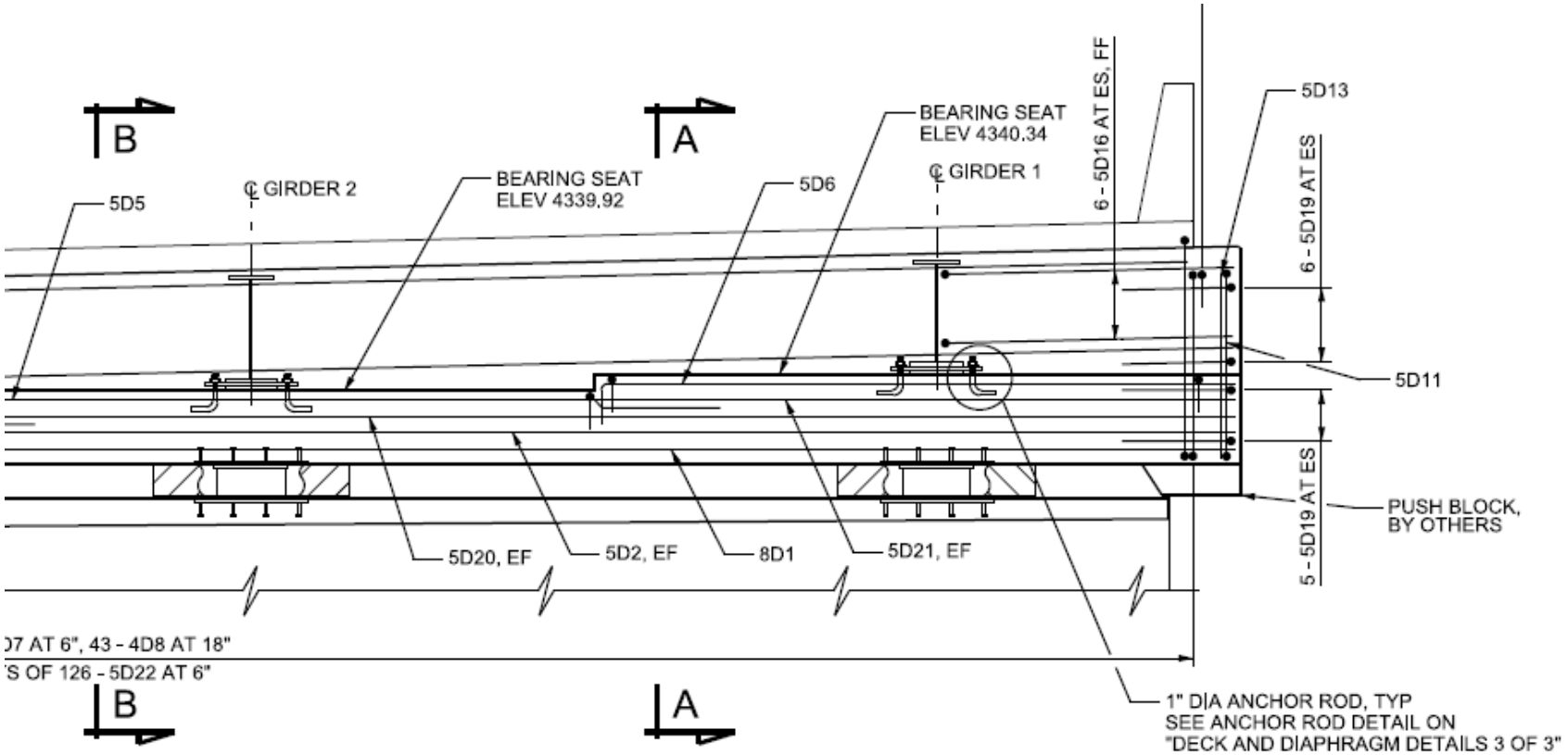
- Evaluation, analysis, modifications, stabilization





ABC Details

- Slide-In Bridge



ABC Details

- Modify Existing Bents/New Abutments to facilitate ABC

ABC Details

Substructure (Existing Bents)

ABC Details

Substructure (Existing Bents)

Tem porary Supports

Slide System

ABC Details

- Lane and Railroad Closures
  - Crossover with one lane in each direction for 12 days for each bridge.
  - Two full closures of the railroad spur were permitted for up to 44 hours for each bridge slide.

Price + Time

- Minimum # of Calendar Days = 145
- Maximum # of Calendar Days = 184
- Cost per day = $1,570

QUESTIONS