

Accelerated Bridge Construction in Alabama: an update on ALDOT projects



ASCE AMERICAN SOCIETY
OF CIVIL ENGINEERS

MONTGOMERY, ALABAMA
March 17, 2015

ACCELERATED BRIDGE CONSTRUCTION -

- *innovative planning,*
- *design,*
- *materials,*
- *construction methods*

❖ *safe and cost-effective*

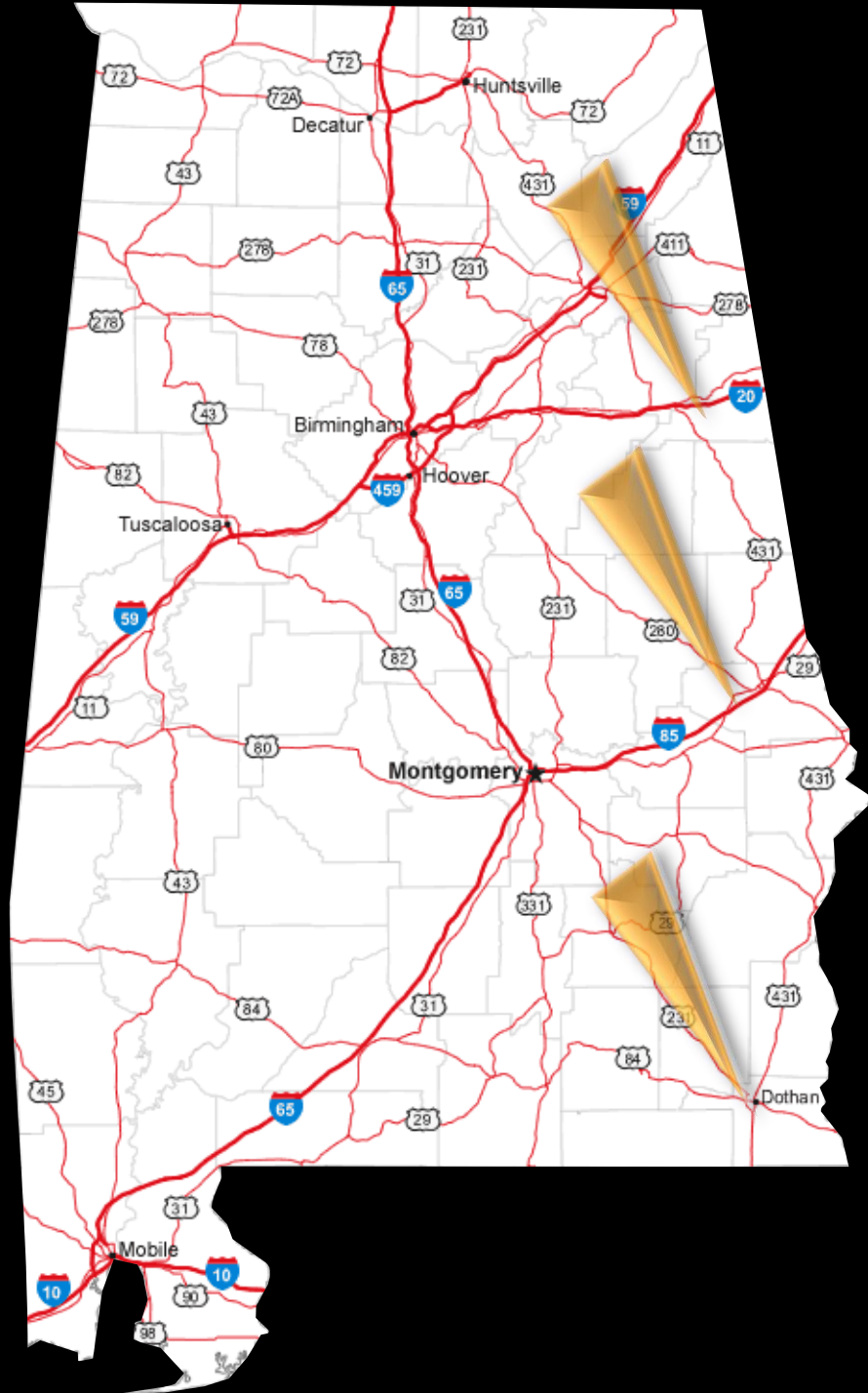
★ *reduce the onsite construction time*



ABC technologies being promoted under EDC2 :

- *Geosynthetic Reinforced Soil – Integrated Bridge System (GRS-IBS),*
- *Prefabricated Bridge Elements and Systems (PBES),*
- *Slide-In Bridge Construction*



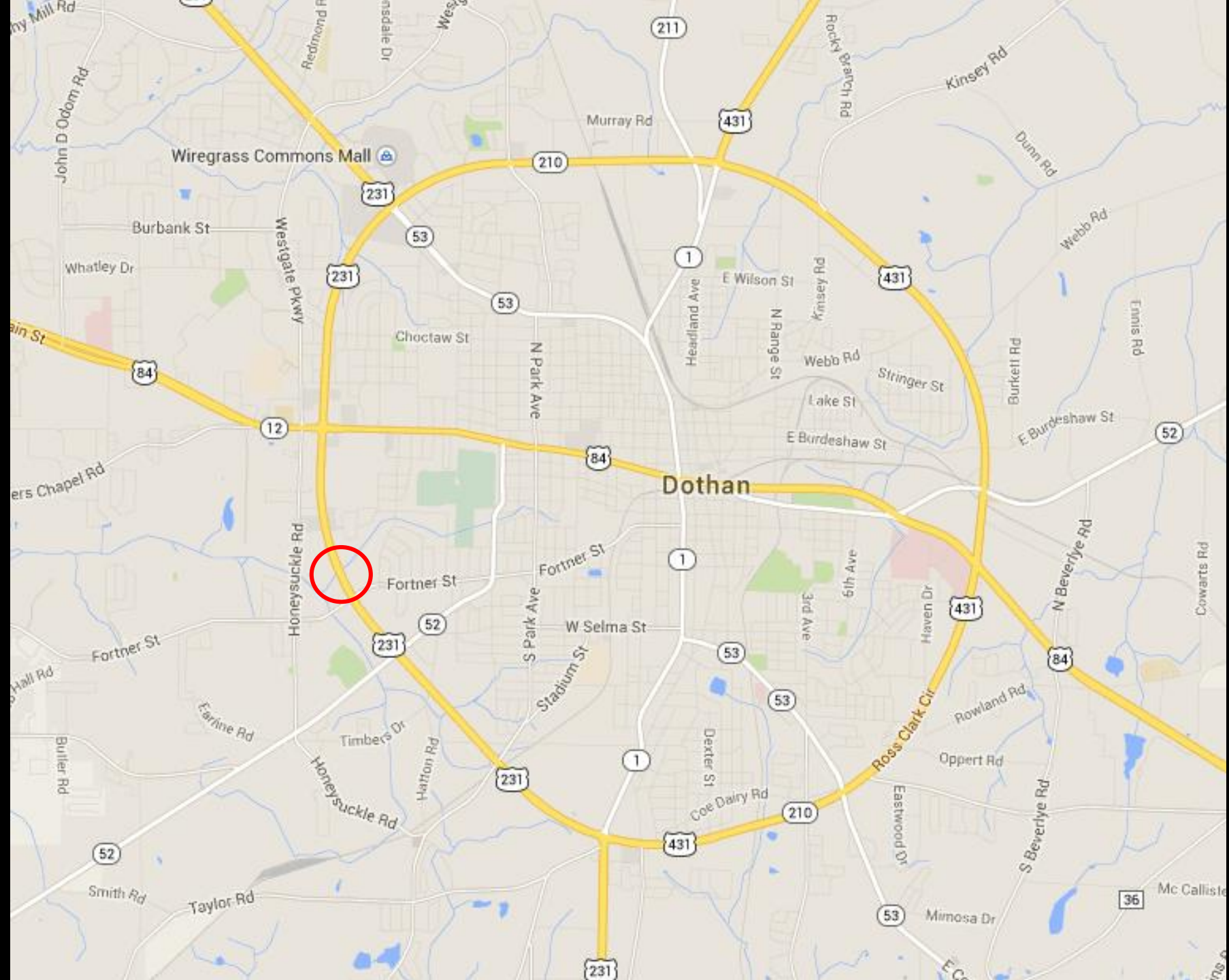


Project 1

**Bridge Over Culvert on State Route 210,
Ross Clark Circle, over Beaver Creek,
in Dothan**

Slide-in-Bridge Construction





Dothan

Wiregrass Commons Mall

Fortner St

Honeyuckle Rd

Murray Rd

210

431

231

53

1

431

Burbank St

Whately Dr

Westgate Pkwy

Choctaw St

53

N Park Ave

Headland Ave

E Wilson St

N Range St

Kinsey Rd

Webb Rd

Stringer St

Lake St

E Burdeshaw St

Burkett Rd

E Burdeshaw St

52

12

84

Dothan

1

Fortner St

3rd Ave
5th Ave

Haven Dr

431

84

N Beverlye Rd

Fortner St

52

231

S Park Ave

Stadium St

1

53

53

Ross Clark Cir

Rowland Rd

Oppert Rd

210

431

Eastwood Dr

S Beverlye Rd

36

52

Smith Rd

Taylor Rd

231

53

Mimosa Dr

Mc Callister

3-BBL 10 x 6 Culvert
~ 20 feet of fill (max)
Designed for H-15 Loads



1950 ADT – 5000 vpd
2013 ADT – 40,000+ vpd
2033 ADT – 73,000 vpd



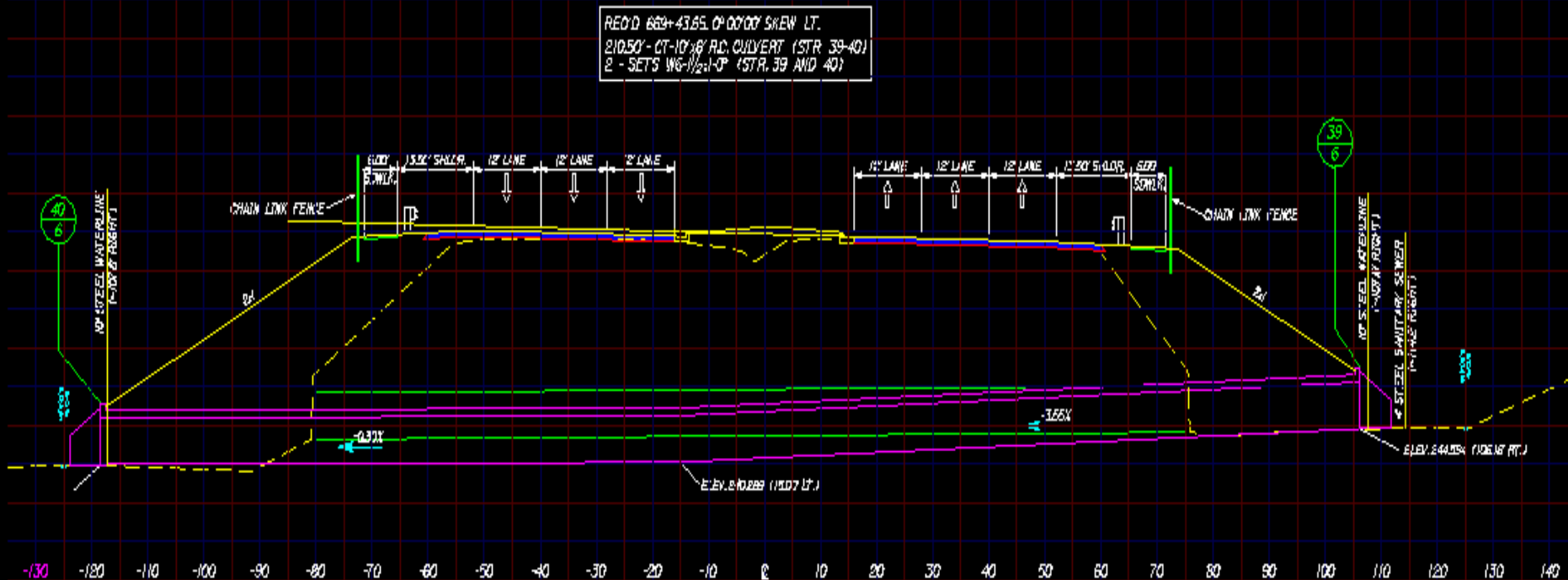
Culvert Issues

- Water / Sewer, Power, Telephone, & other utilities on *both* sides
- Upstream flooding has occurred, immersing culvert entrance, upstream parking lots.
- Culvert is structurally deficient – must be replaced



Consultant Solution #1:

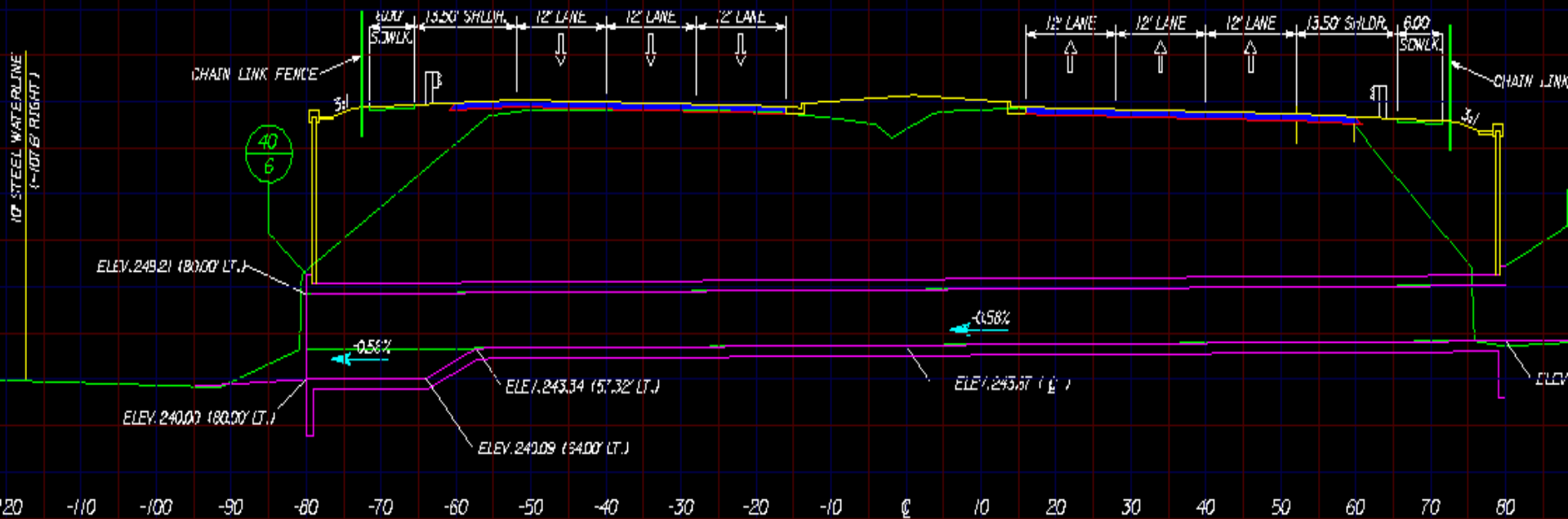
Extend both ends for 2:1 backslope.
Half of culvert at a time.



Consultant Solution #2:

Replace culvert to original length, use 20' high retaining walls.
Half of culvert at a time.

REQ'D 669+43.65, 0°00'00" SKEW LT.
160.00' - CT-10'x6' R.C. CULVERT (STR 39-40)



BEGIN BRIDGE
BACK OF ABUTMENT
STATION 668+92

ALDOT #1 STONE, 24" THICK W/
FILTER BLANKET (ROADWAY ITEM)

END BRIDGE
BACK OF ABUTMENT
STATION 670+12

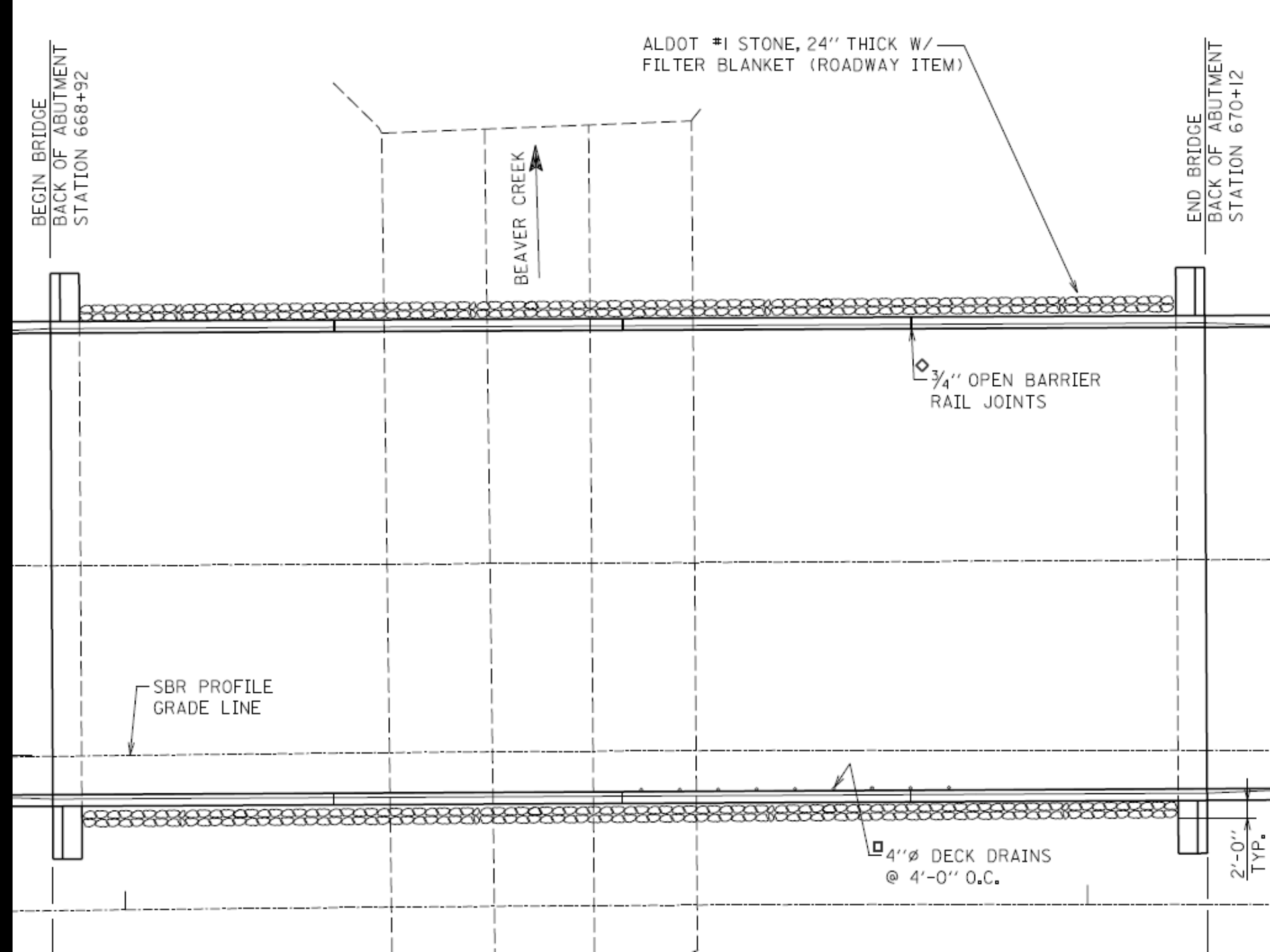
BEAVER CREEK

3/4" OPEN BARRIER
RAIL JOINTS

SBR PROFILE
GRADE LINE

4"Ø DECK DRAINS
@ 4'-0" O.C.

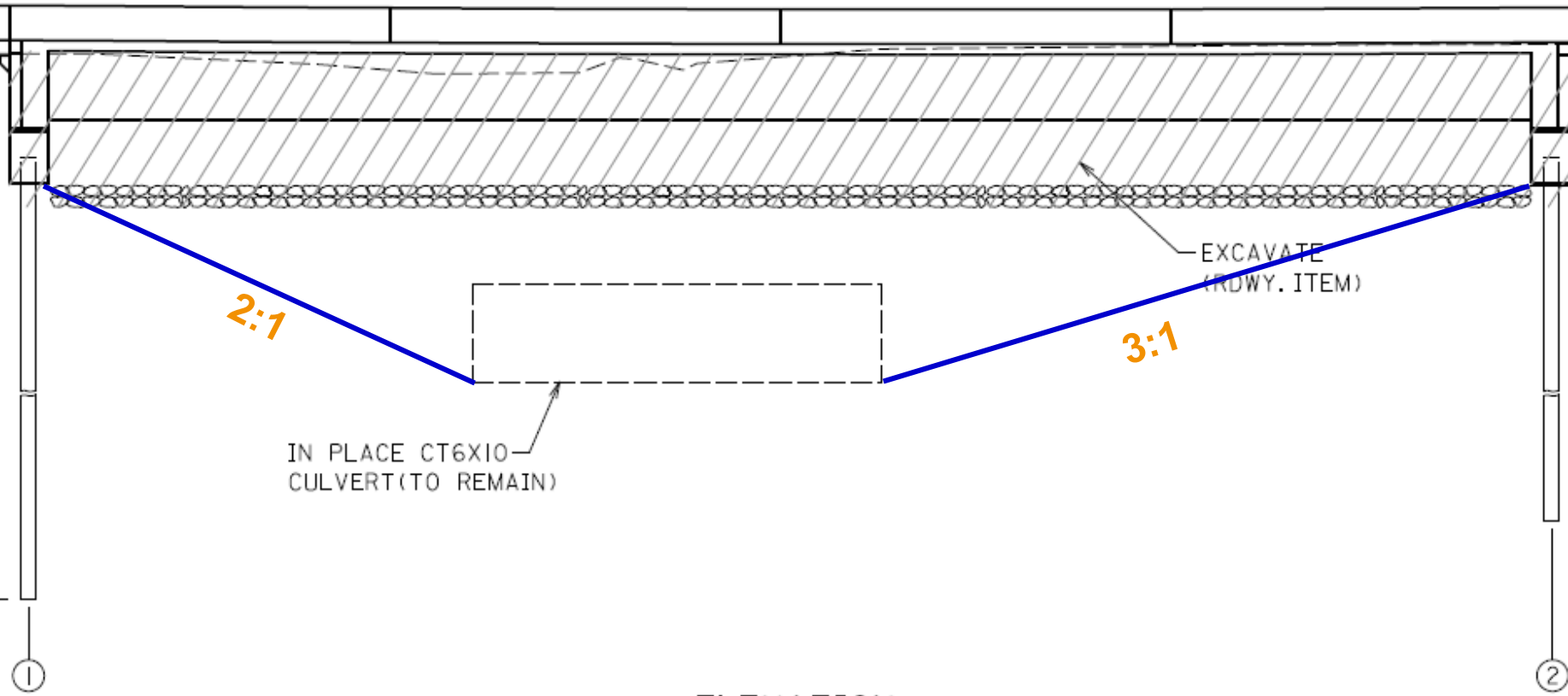
2'-0"
TYP.



ALIGNMENT: 0°-45'-00" CURVE RT OVERALL BRIDGE LENGTH = 120'-0"
PRETENSIONED-PRESTRESSED CONCRETE GIRDERS, TYPE BT-63 GRADE: SEE V.C. SKETCH

F

E



ELEVATION
SCALE: 1" = 10'-0"

e = 2.00%

PRESENT R.O.W.

34
137

IN-PL. BRIDGE CURB
A 669+27.84

IN-PL. BRIDGE CURB
A 669+59.13

670+00

IN-PL. CURB
(RETAIN)
CONC. SLAB

REQ'D BRIDGE END SLAB
AND SLEEPER SLAB

REQ'D CLASS A
TYPE 2 GUARDRAIL

REQ'D TYPE 13
END ANCHOR

+80.0



REQ'D TYPE 13
END ANCHOR

13
137

24'

24'

+80.0

IN-PL. INLET
(REMOVE)

ROSS CLARK CIRCLE

+24.0

24'

24'

+40.0

32
137

REQ'D TYPE 13
END ANCHOR

31
137

33'
(EXIST.)

REQ'D 13.5' SHLD.
(8' PAVED).



GRASS

34'
(EXIST.)

REQ'D TYPE C
CURB & GUTTER

REQ'D TYPE 13
END ANCHOR

+80.0

CONST. LTM.

CLASS A
TYPE 2 GUARDRAIL

REQ'D BRIDGE END SLAB
AND SLEEPER SLAB

BEG

END

+24.0

REQ'D TYPE 13
END ANCHOR

+41.2

REQ'D BRIDGE END SLAB
AND SLEEPER SLAB

REQ'D CLASS A
TYPE 2 GUARDRAIL

REQ'D 13.5' SHLD.
(8' PAVED).

PRESENT R.O.W.

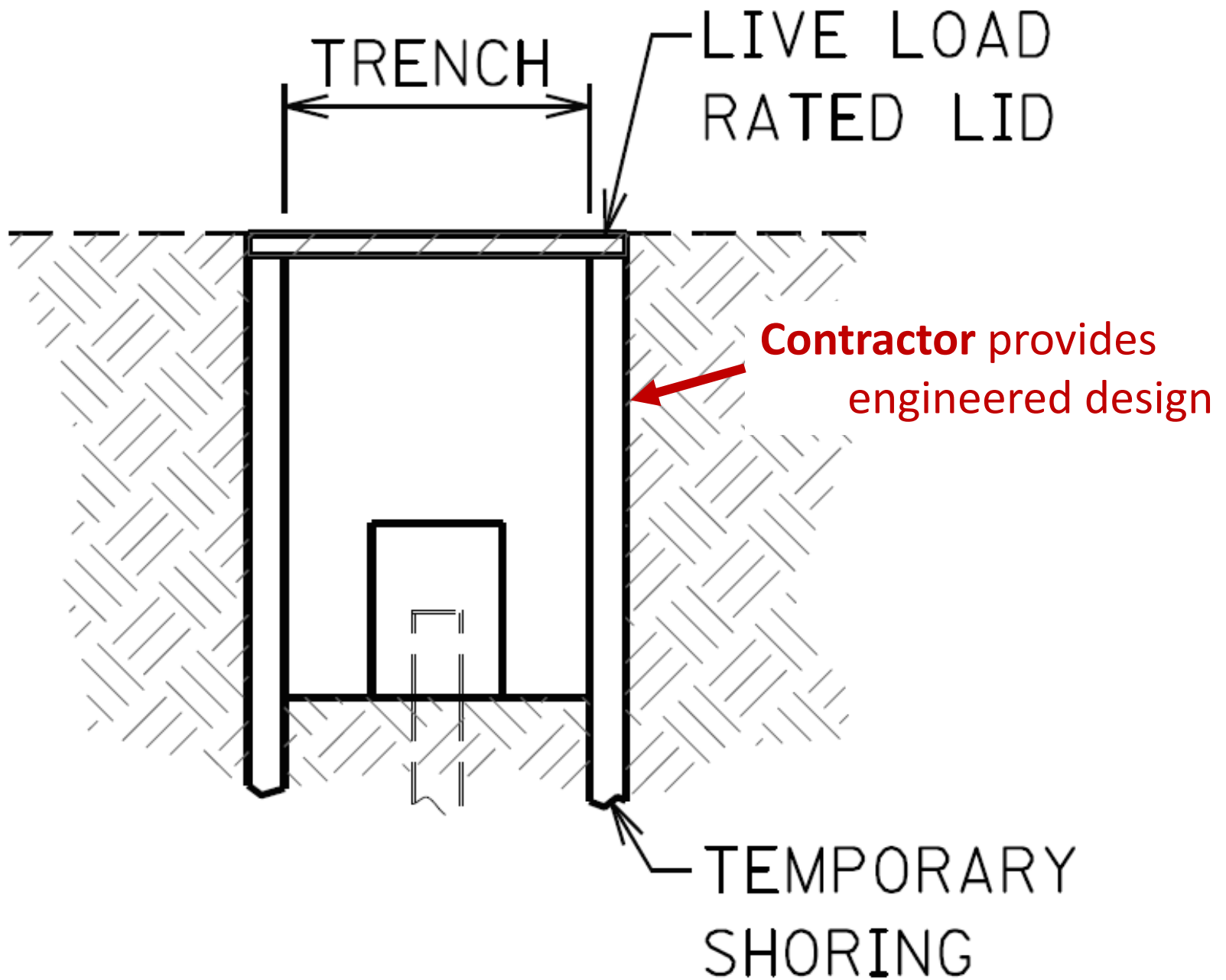
Three ABC Issues:

1. Temporary Shoring for Abutments
2. Falsework to support Superstructure
3. Slide



Building abutments under traffic?



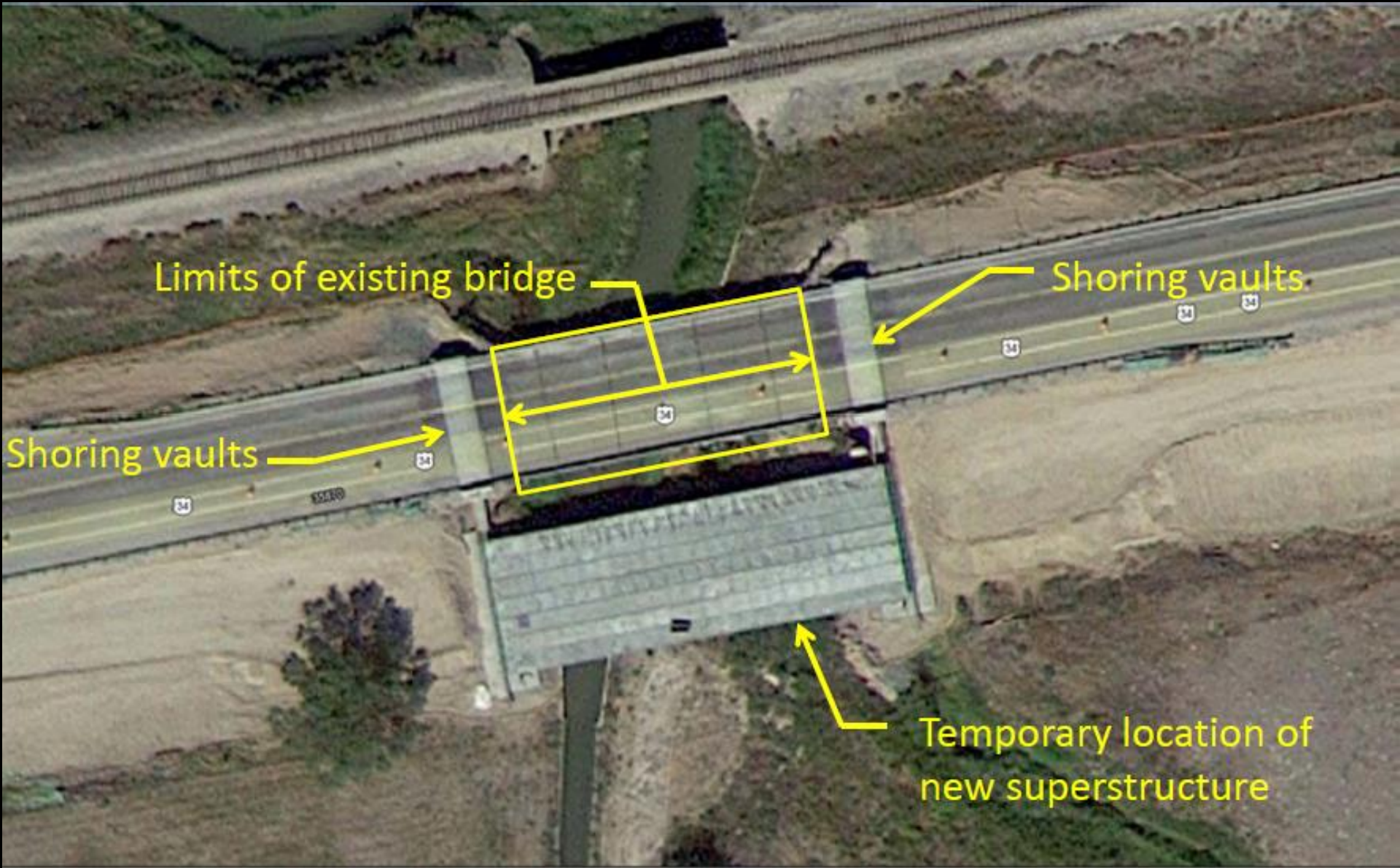




US-34 Bridge Replacement outside Wray, Colorado



US-34 Bridge Replacement outside Wray, Colorado



Limits of existing bridge

Shoring vaults

Shoring vaults

Temporary location of new superstructure

US-34 Bridge Replacement outside Wray, Colorado



2. Falsework

PROBLEM?

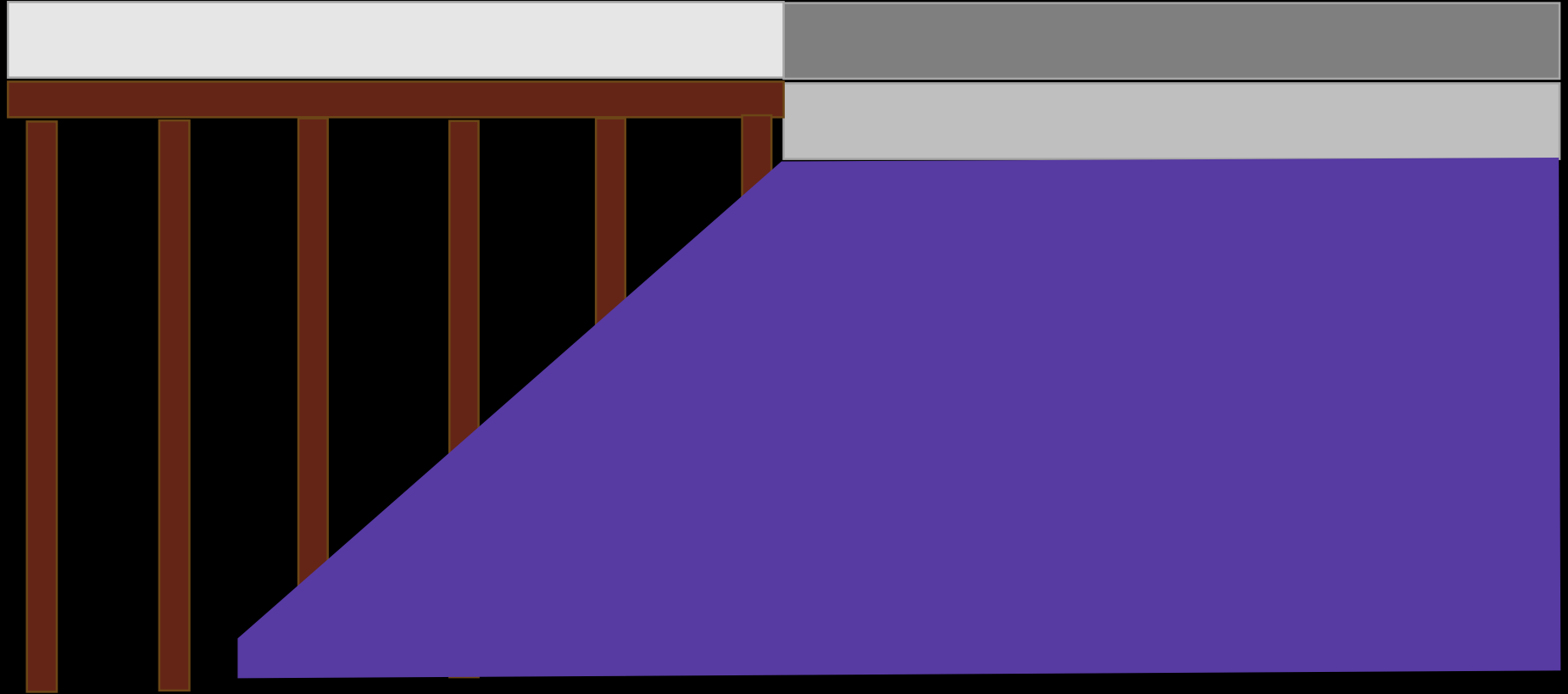


3. Slide

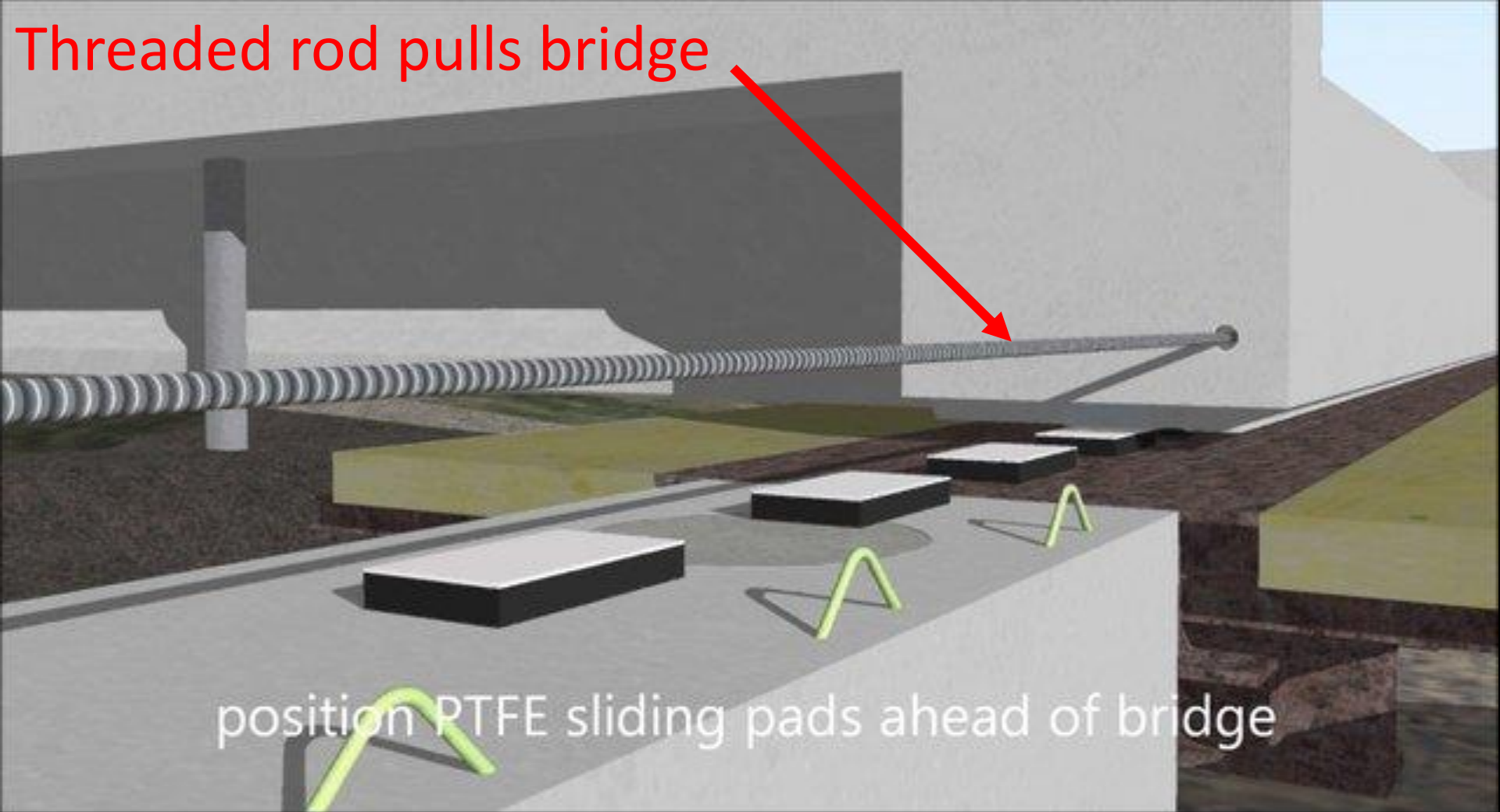
PROBLEM?



3. Slide or Roll

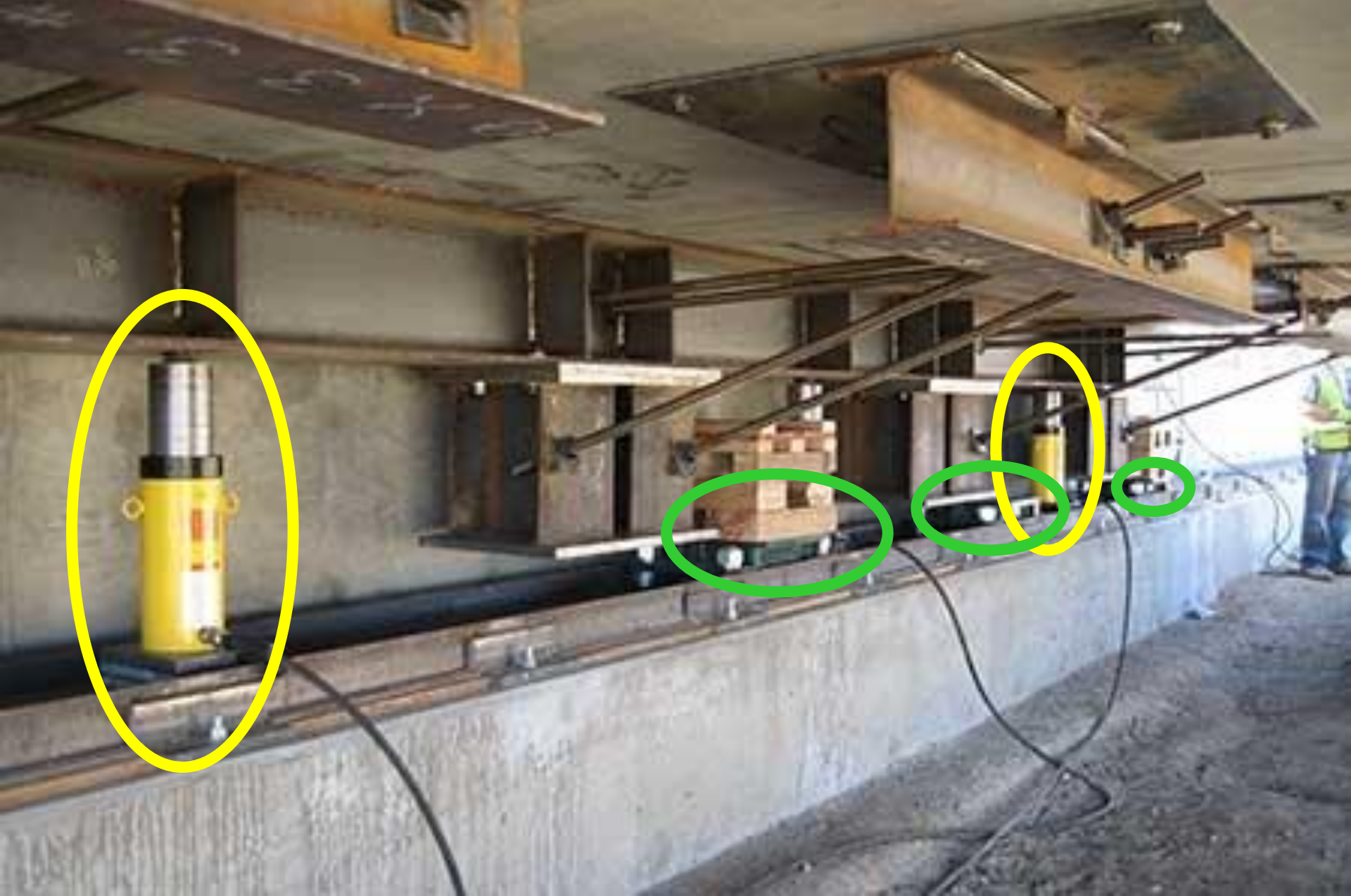


Threaded rod pulls bridge

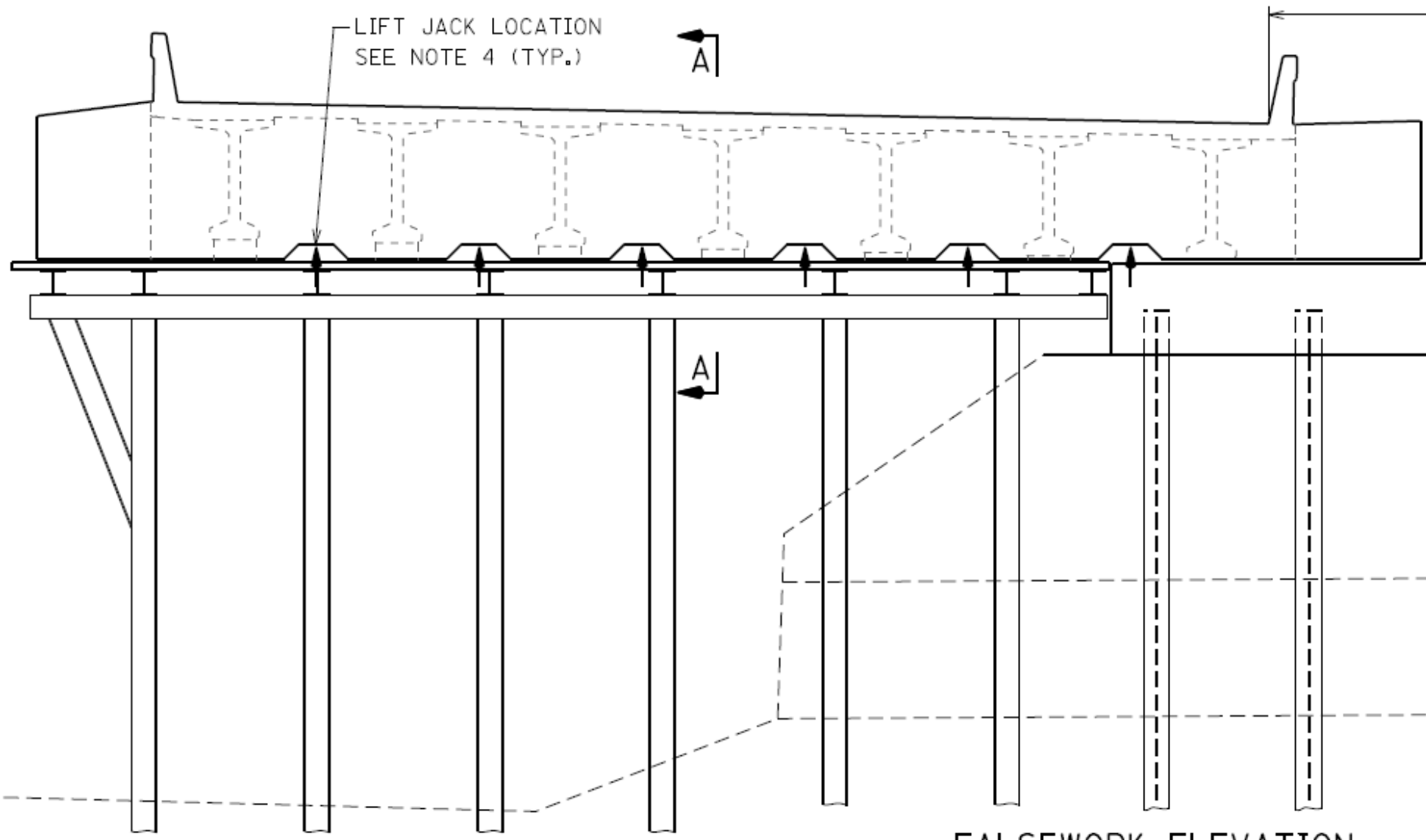


position PTFE sliding pads ahead of bridge





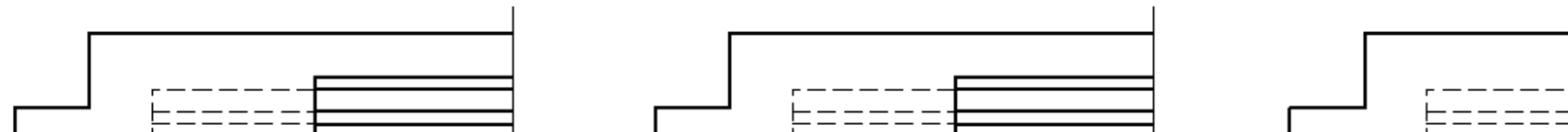
LIFT JACK LOCATION
SEE NOTE 4 (TYP.)



UTILITIES
(IN PLACE)

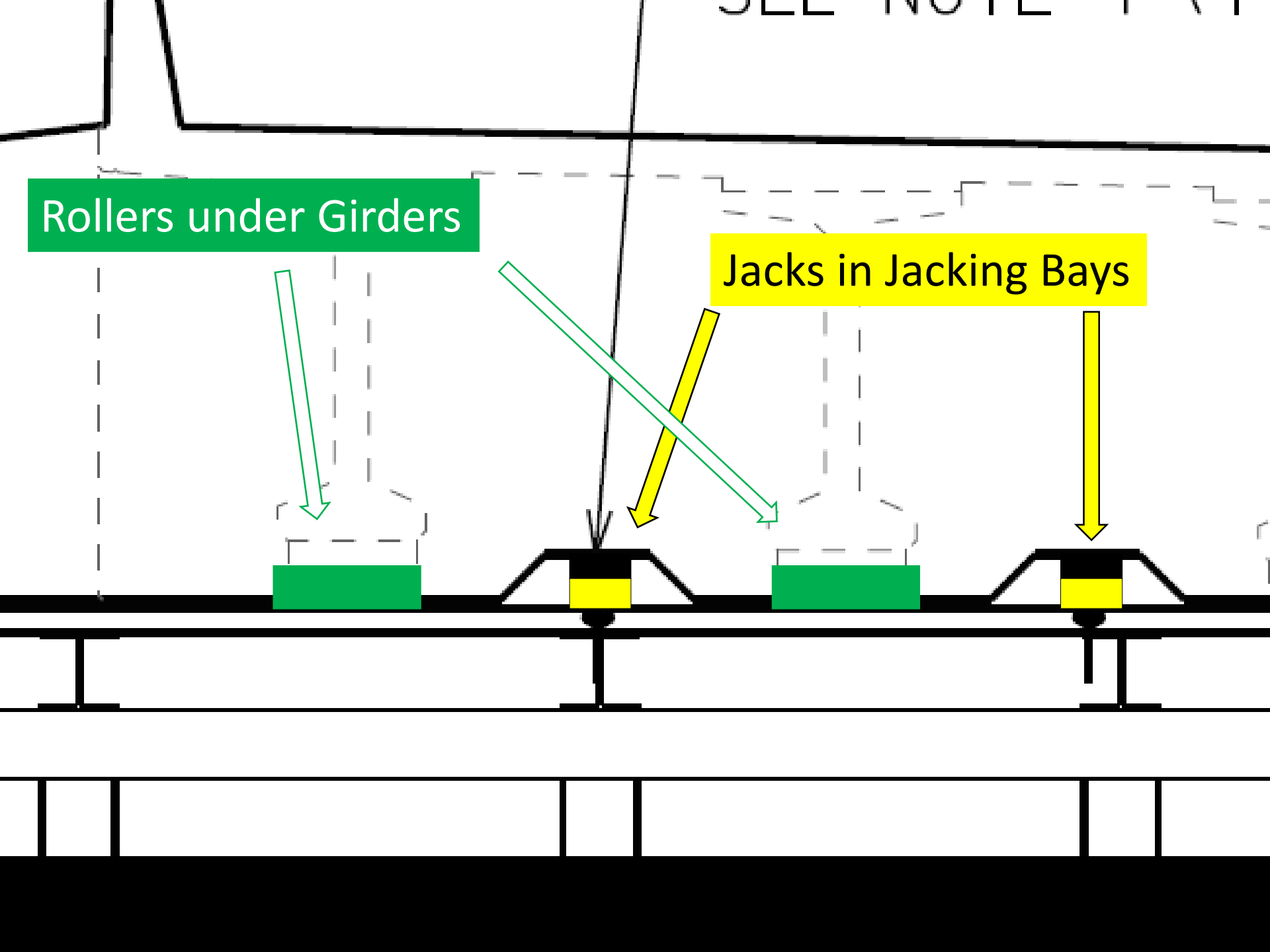
FALSEWORK ELEVATION

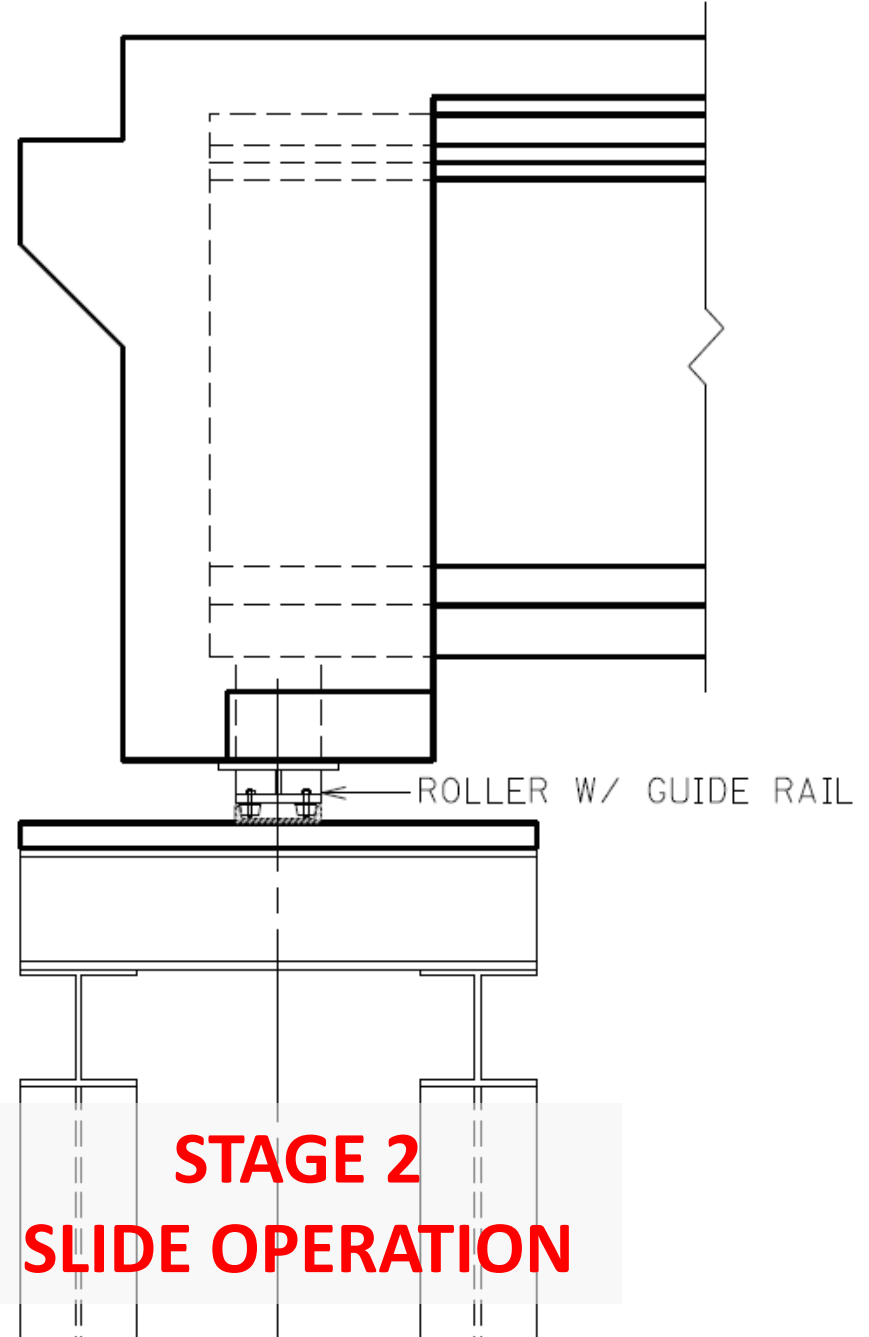
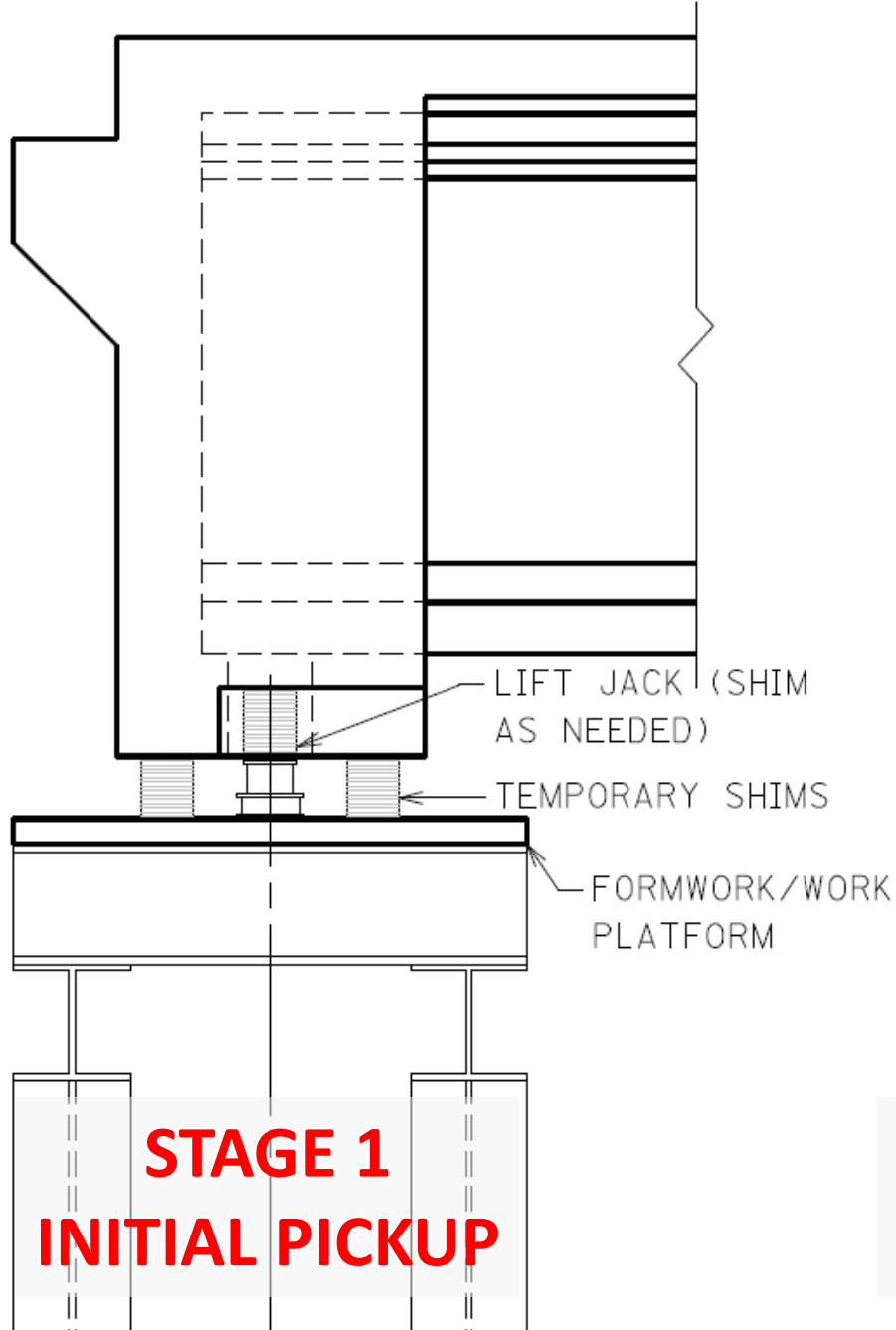
NO SCALE

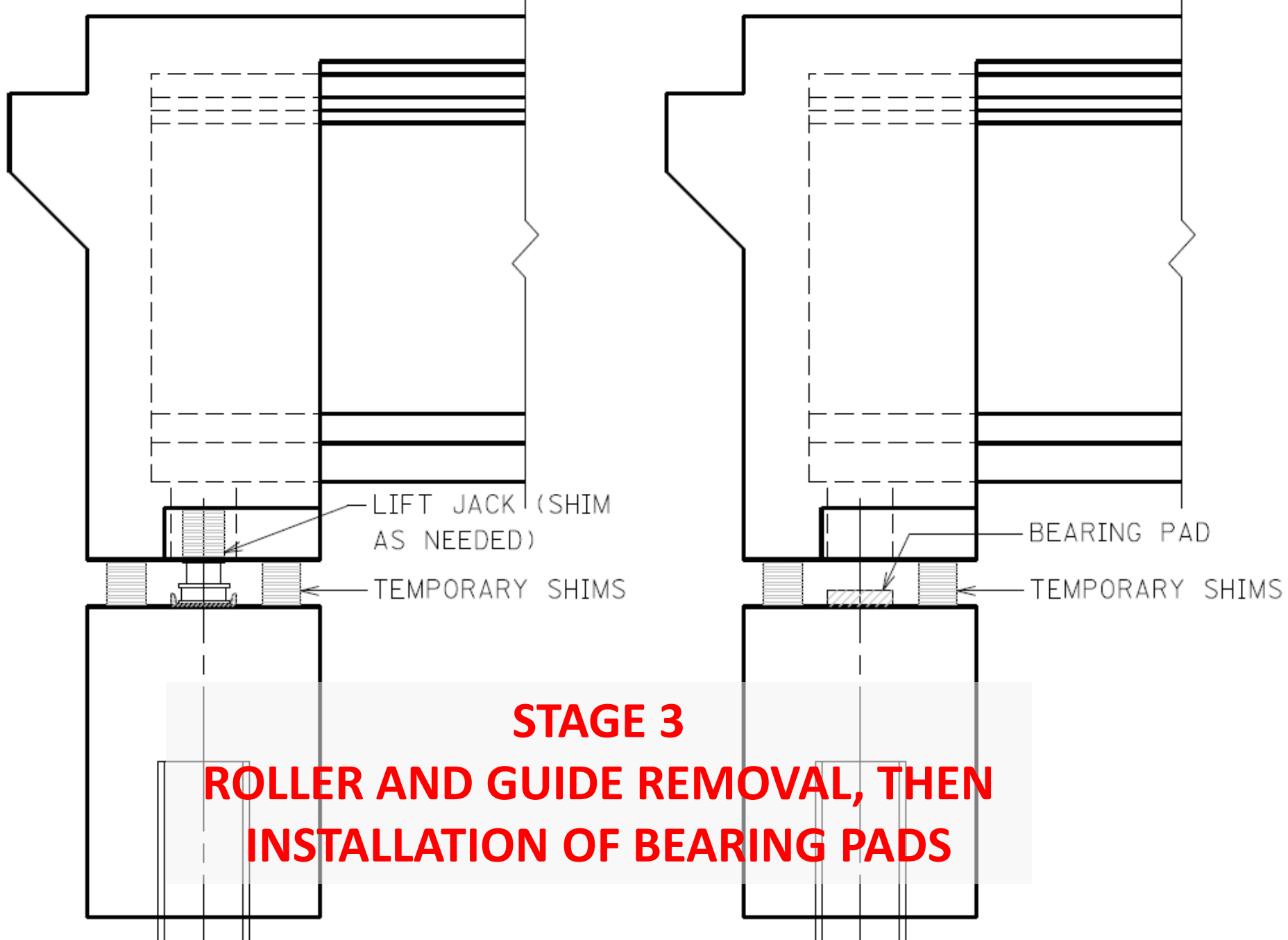


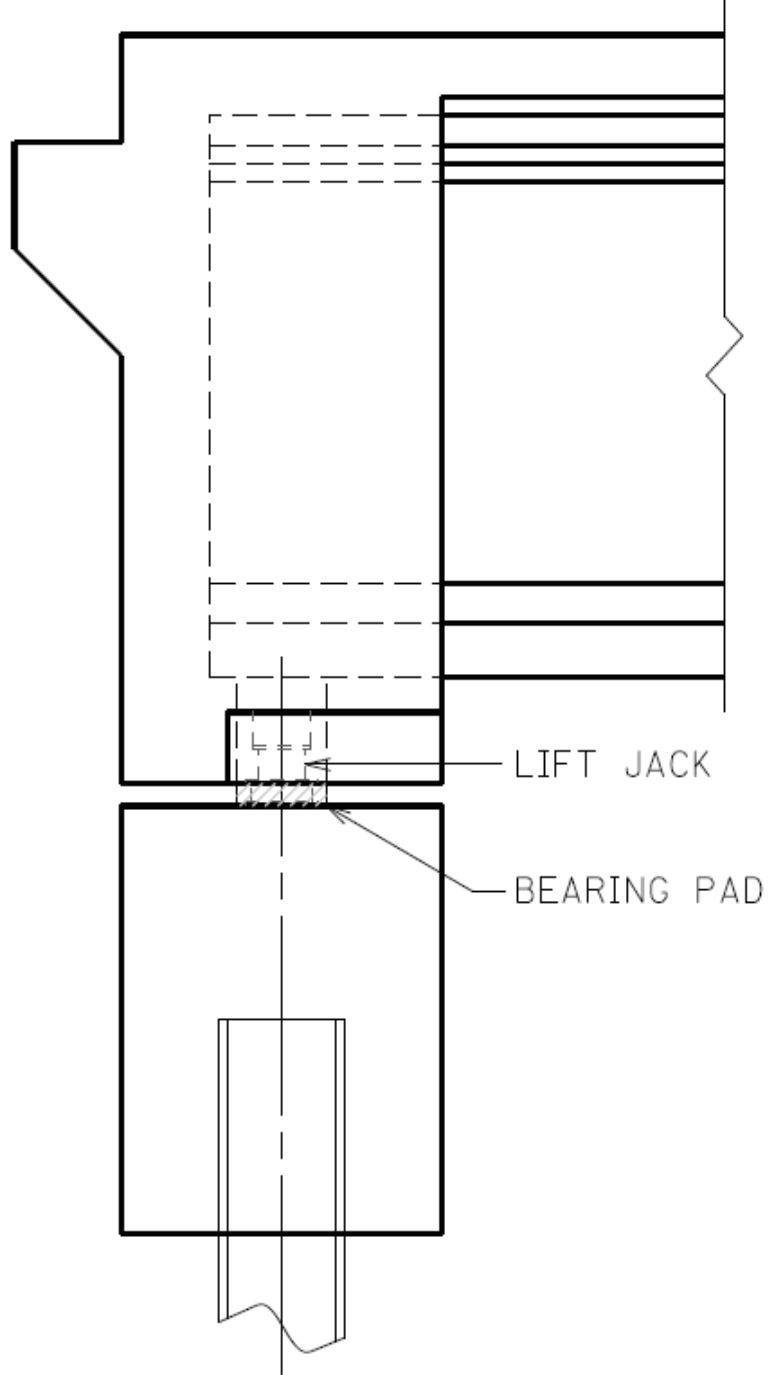
Rollers under Girders

Jacks in Jacking Bays









LIFT JACK

BEARING PAD

Ross Clark Circle Bridge Slide Dothan, Alabama

ASCE Montgomery Branch Meeting

March 17, 2015

Click here to see the animation:

http://www.montgomery-asce.org/documents/meetings/2015/march/rcc_animation.mp4



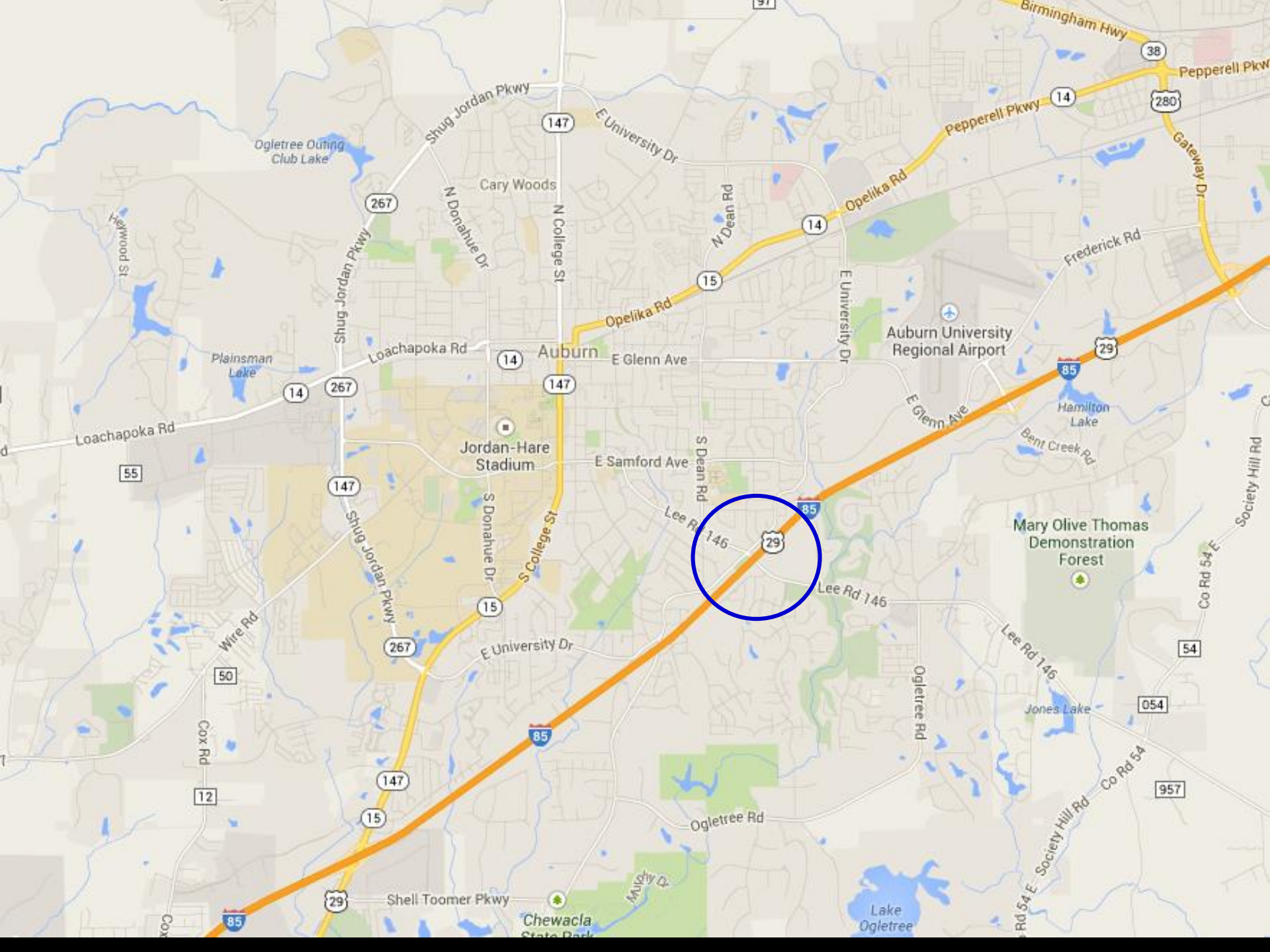
<https://www.youtube.com/watch?v=Ob-yg1c31z4>

Project 2

Bridge over I-85 on Moore's Mill Road,
County Road 146, in Auburn

Pre-fabricated Bridge Elements







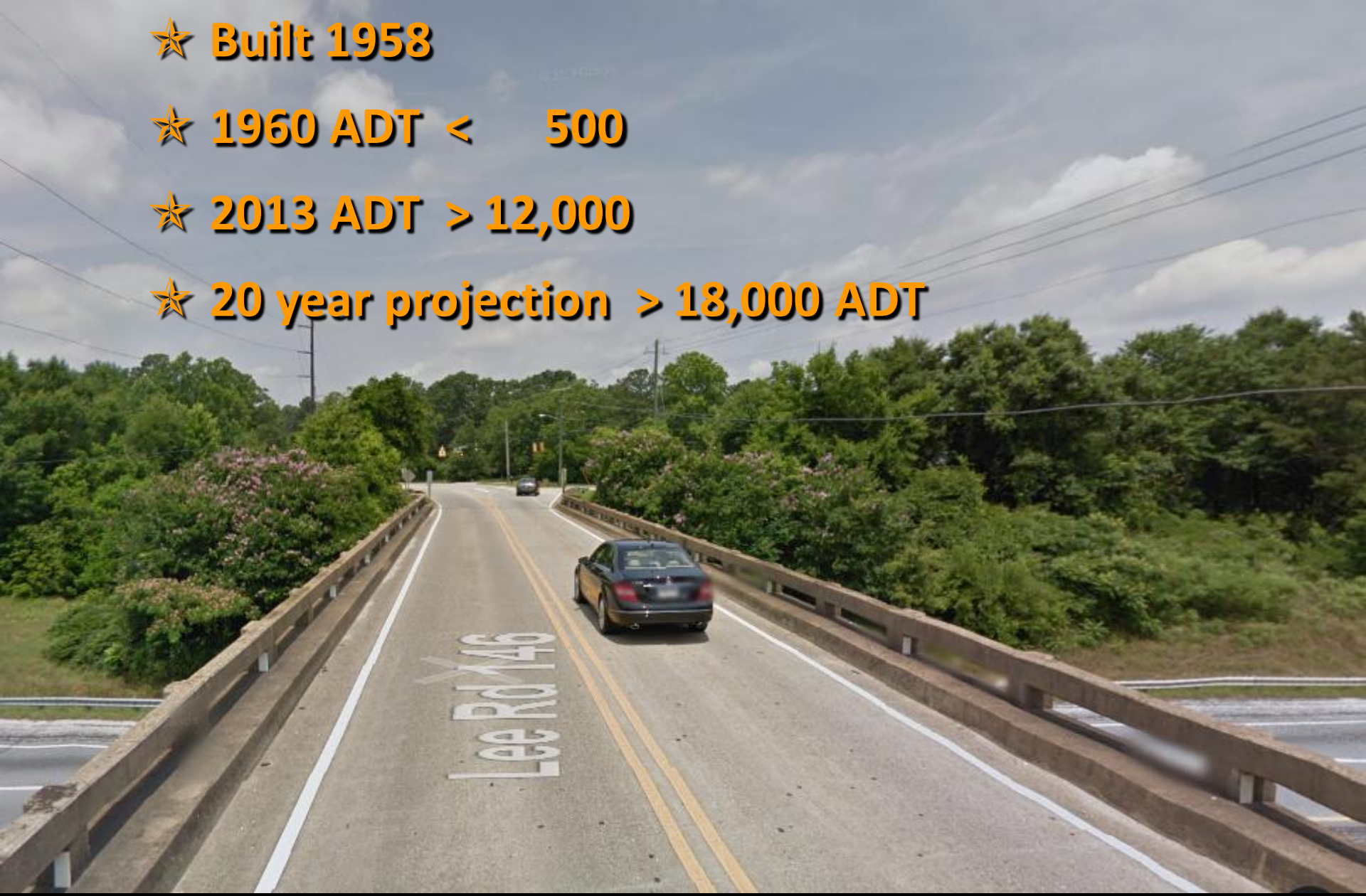


★ **Built 1958**

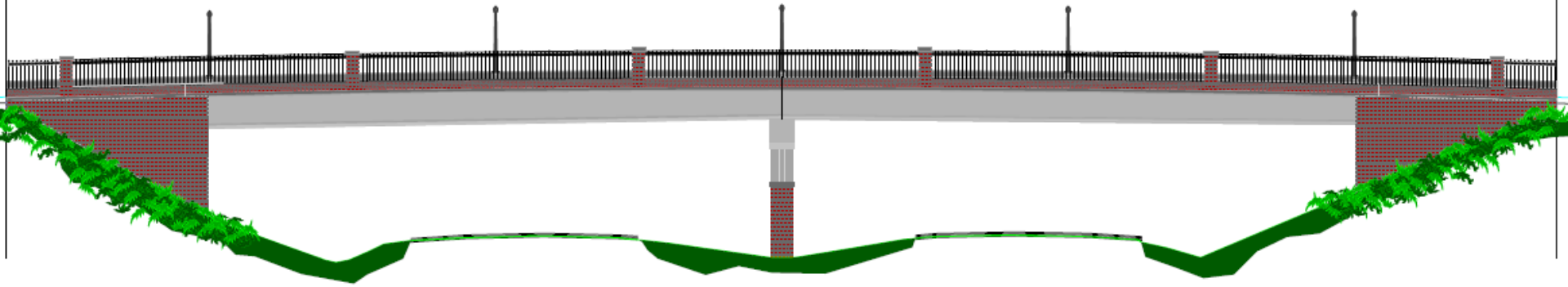
★ **1960 ADT < 500**

★ **2013 ADT > 12,000**

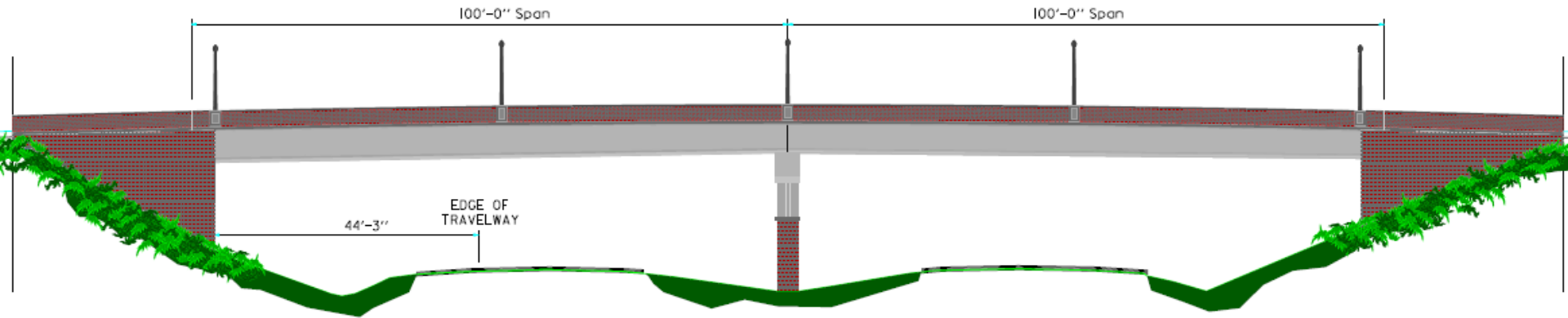
★ **20 year projection > 18,000 ADT**




View Heading East



View Heading West



ATTACHMENT 1 - BRIDGE PROFILE SHEET

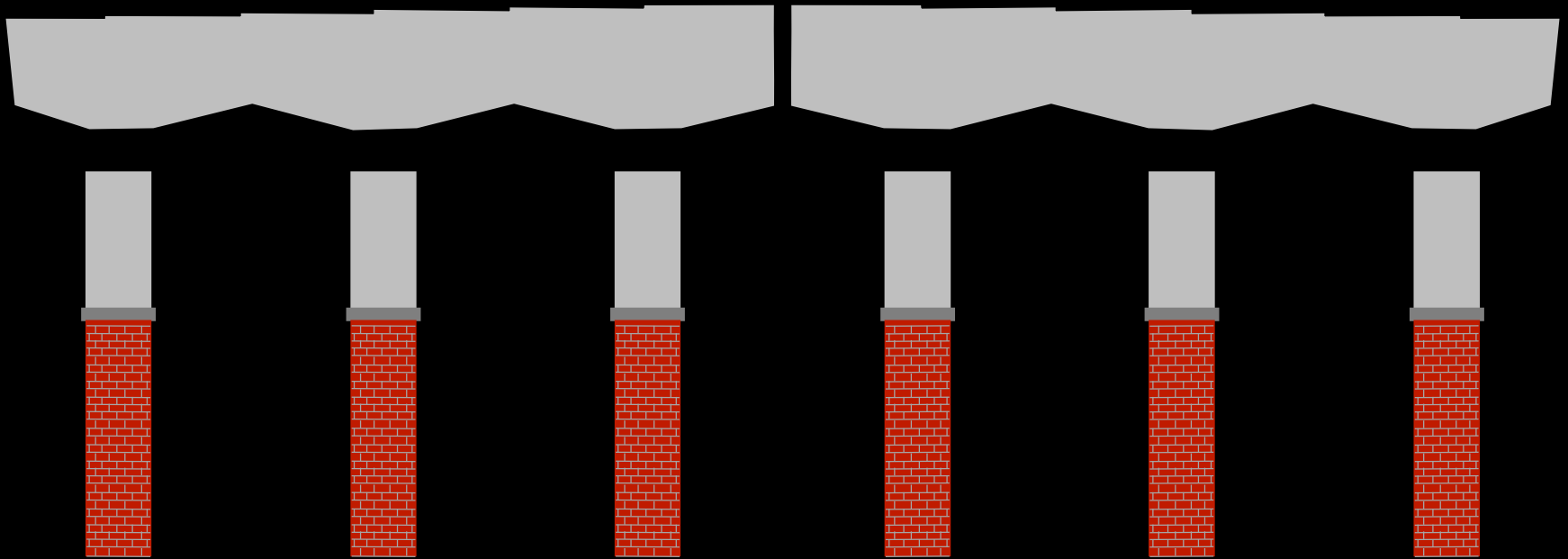
A large, rectangular, light-colored sign is mounted on a brick structure. The sign features the text "WELCOME TO AUBURN HOME OF AUBURN UNIVERSITY" in a serif font. The brick structure consists of two tall pillars on the right and a shorter one on the left, with a horizontal brick base. The background is filled with dense green trees and foliage. A small white sculpture is visible on top of the rightmost pillar.

WELCOME TO
AUBURN
HOME OF AUBURN UNIVERSITY





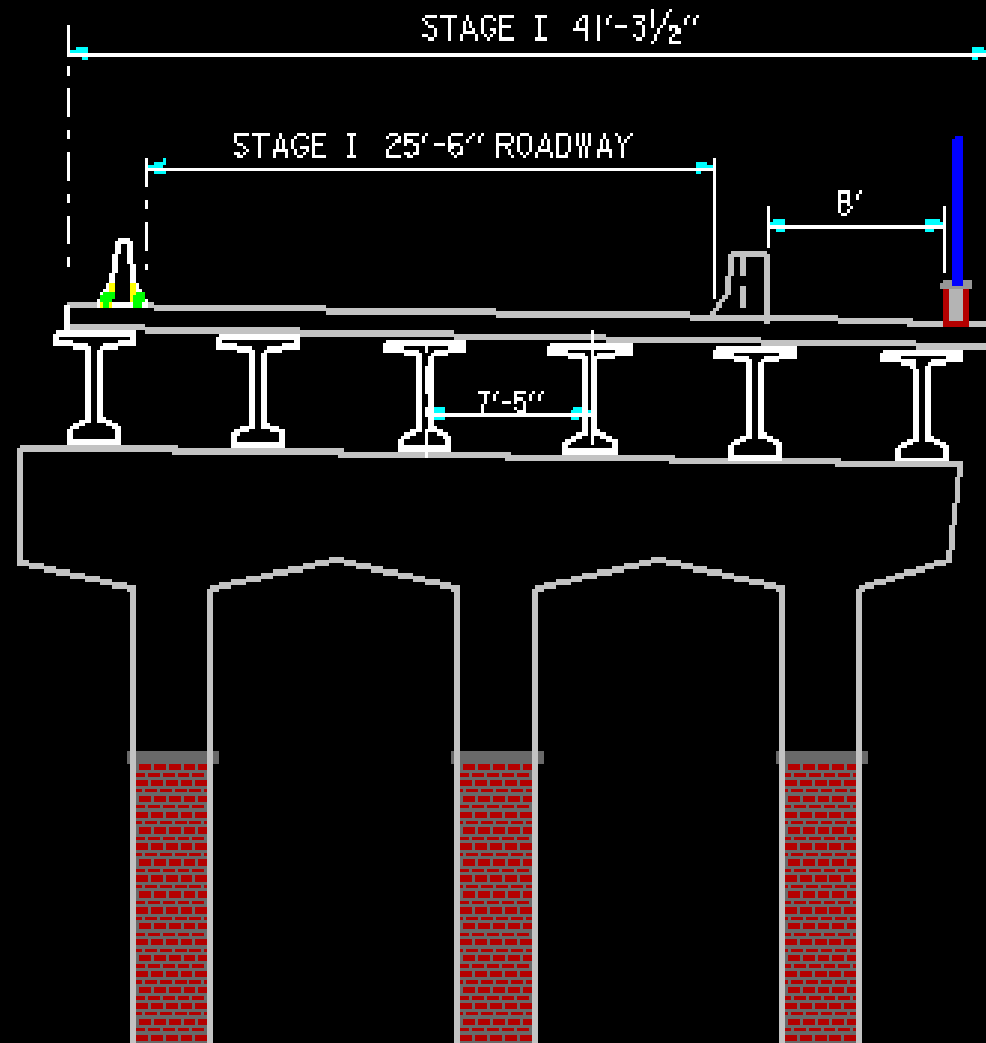
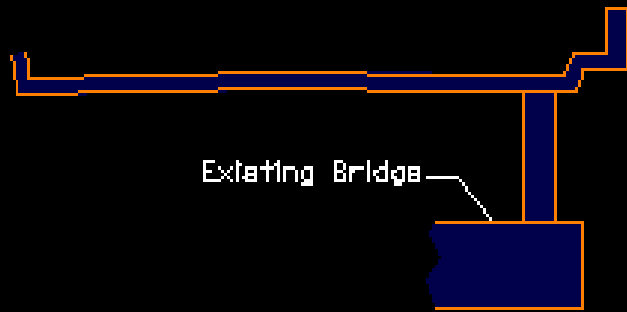


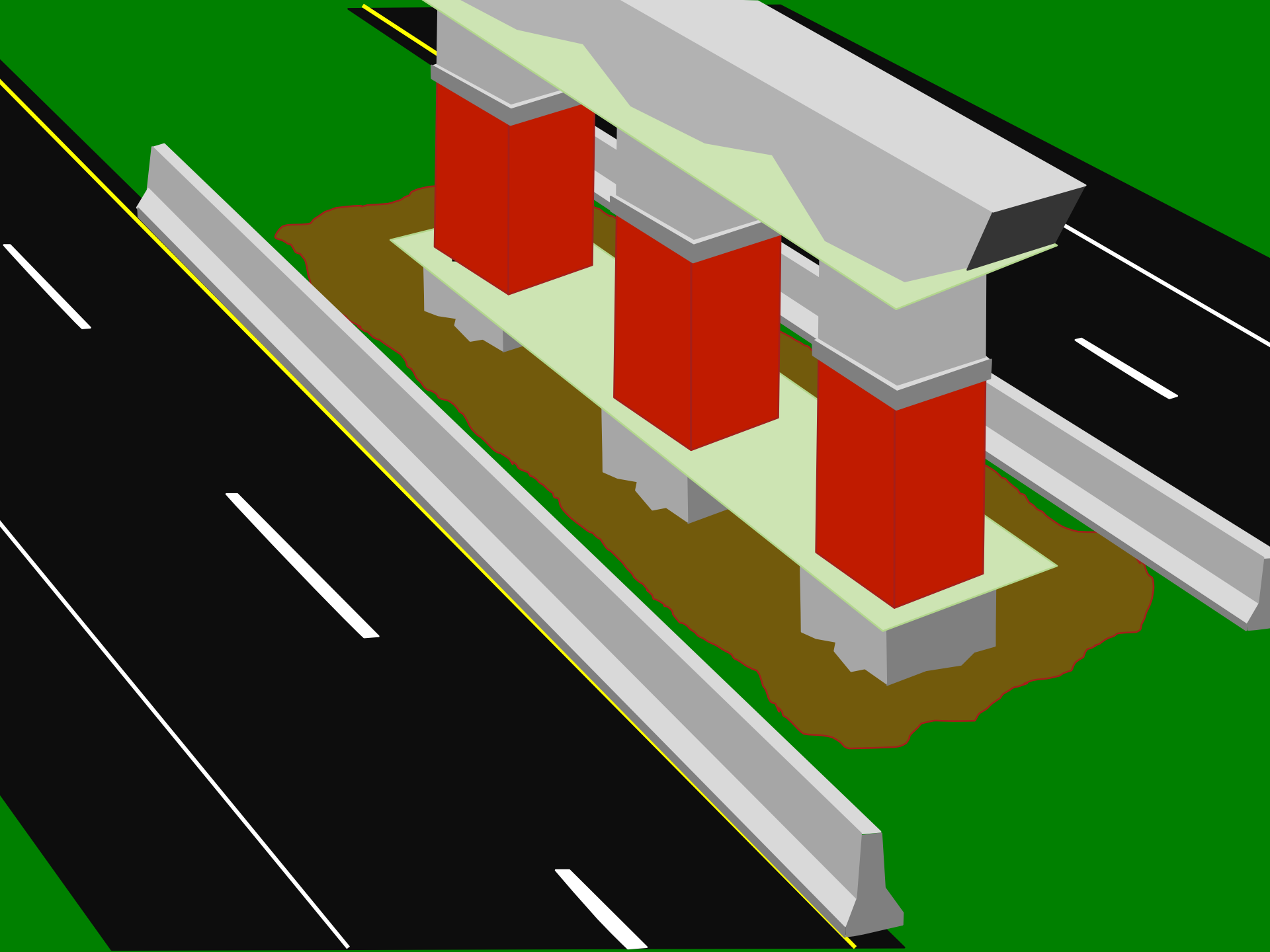


Columns \approx 41,000 lbs each

Caps \approx 108,000 lbs each







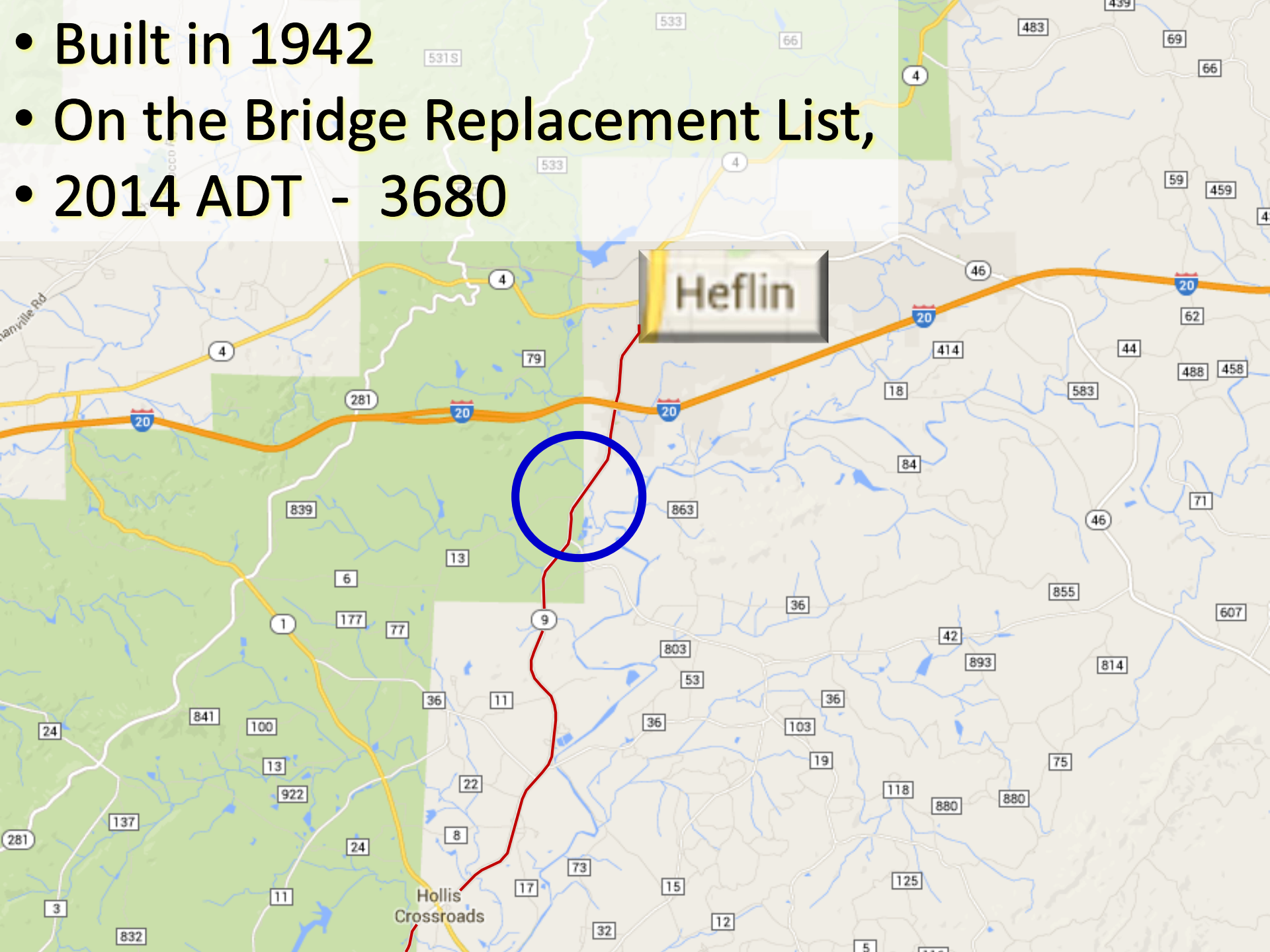
Project 3

**Bridge over Calhuga Creek on SR-9,
just south of I-20 & Heflin, in
Cleburne County**

Slide-in-Bridge Construction



- Built in 1942
- On the Bridge Replacement List,
- 2014 ADT - 3680





06.13.2011 13:04

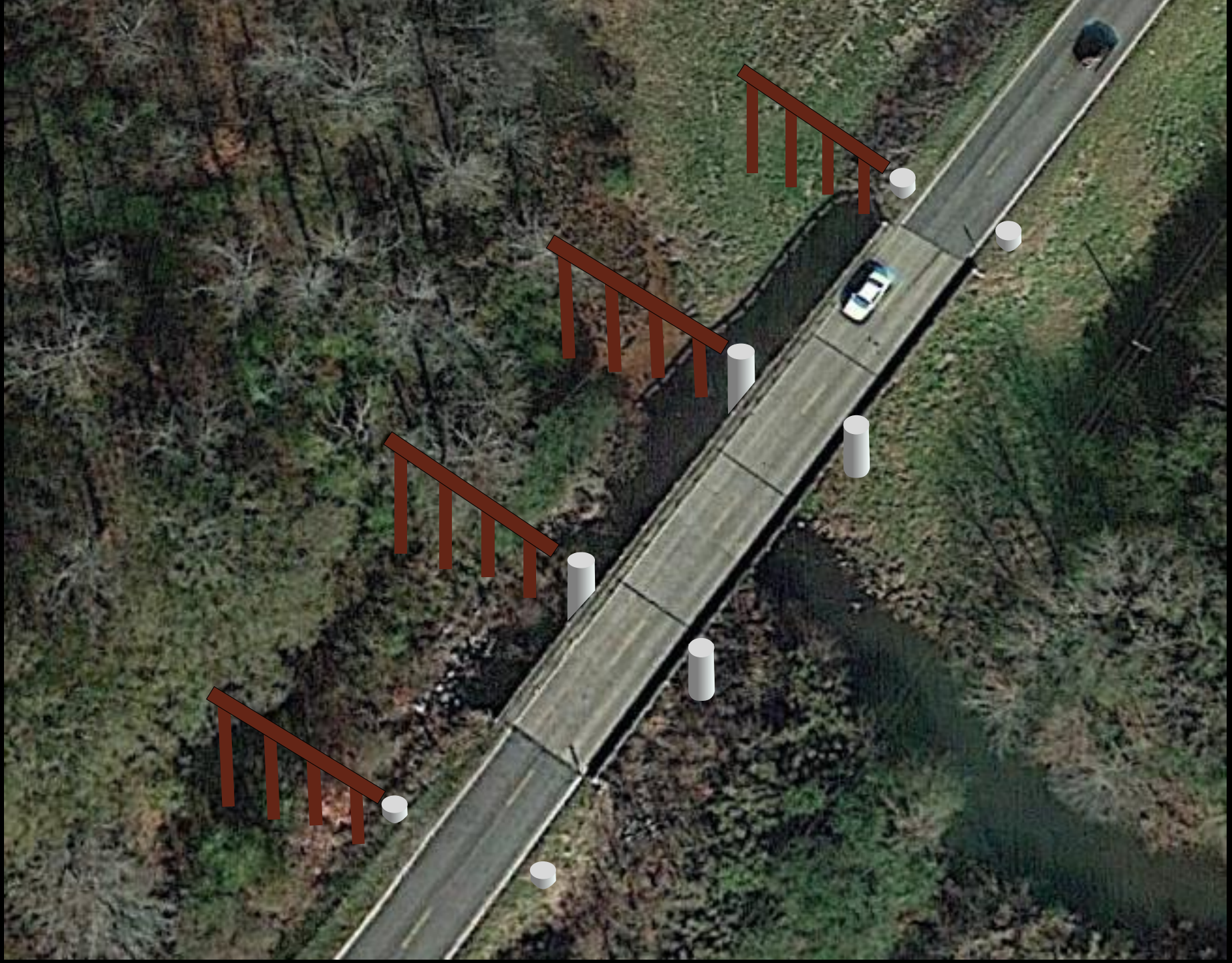


AL-9

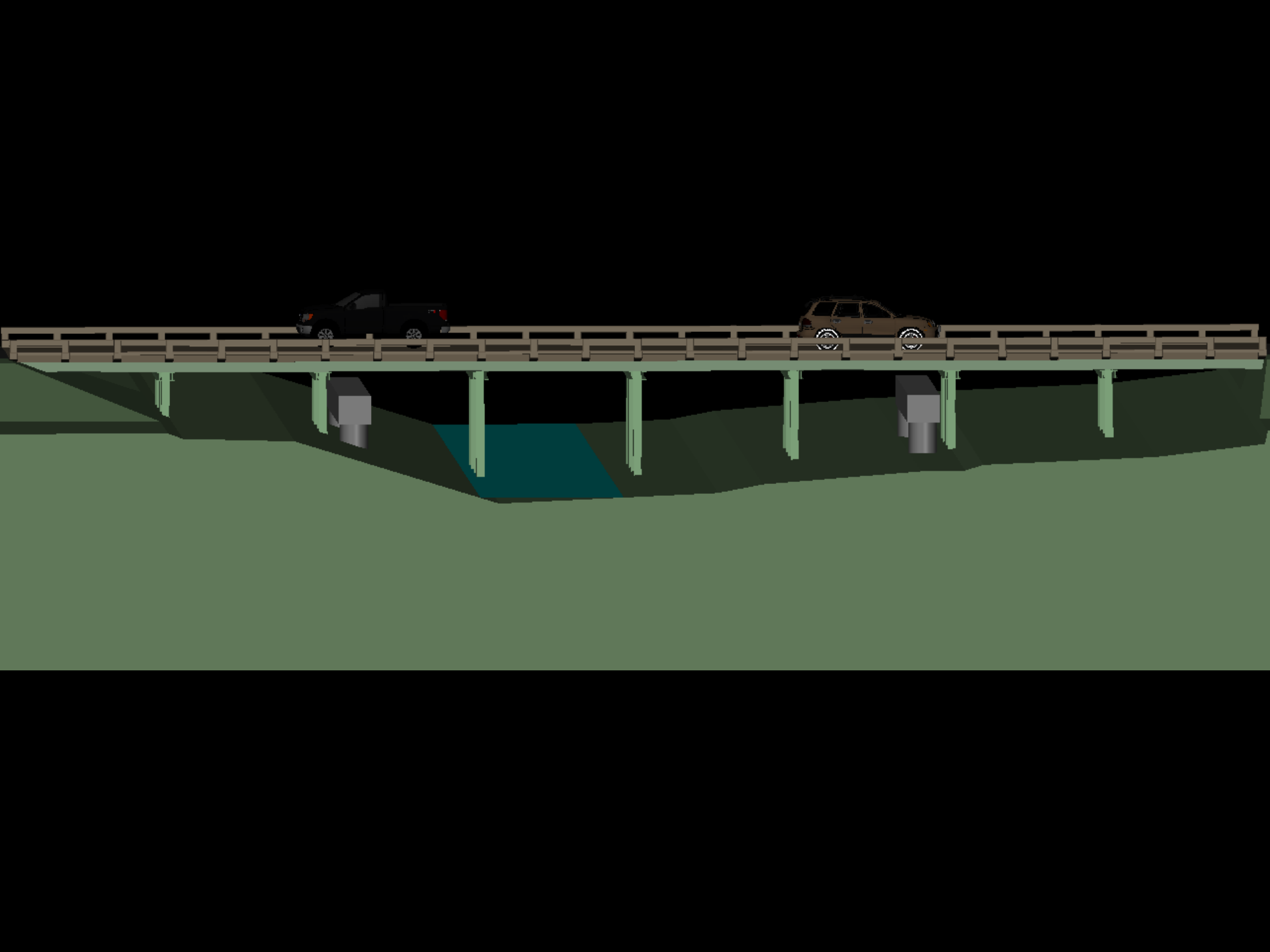
© 2014 Google

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Project Challenges

- **Straddle Bents**
- **Pre-fabricated Abutment Caps**
- **Three span slide/roll**
 - Alignment
 - Separation
- **Technology transfer**
- **Maintain September letting**

Cahulga Creek Bridge Slide Concept

Heflin, Alabama

ASCE Montgomery Branch Meeting

March 17, 2015

Click here to see the animation:

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