

Sequenced Removal of the Non-Redundant I-30 Bridge

Steve Eads, Genesis Structures

IBC 24-80



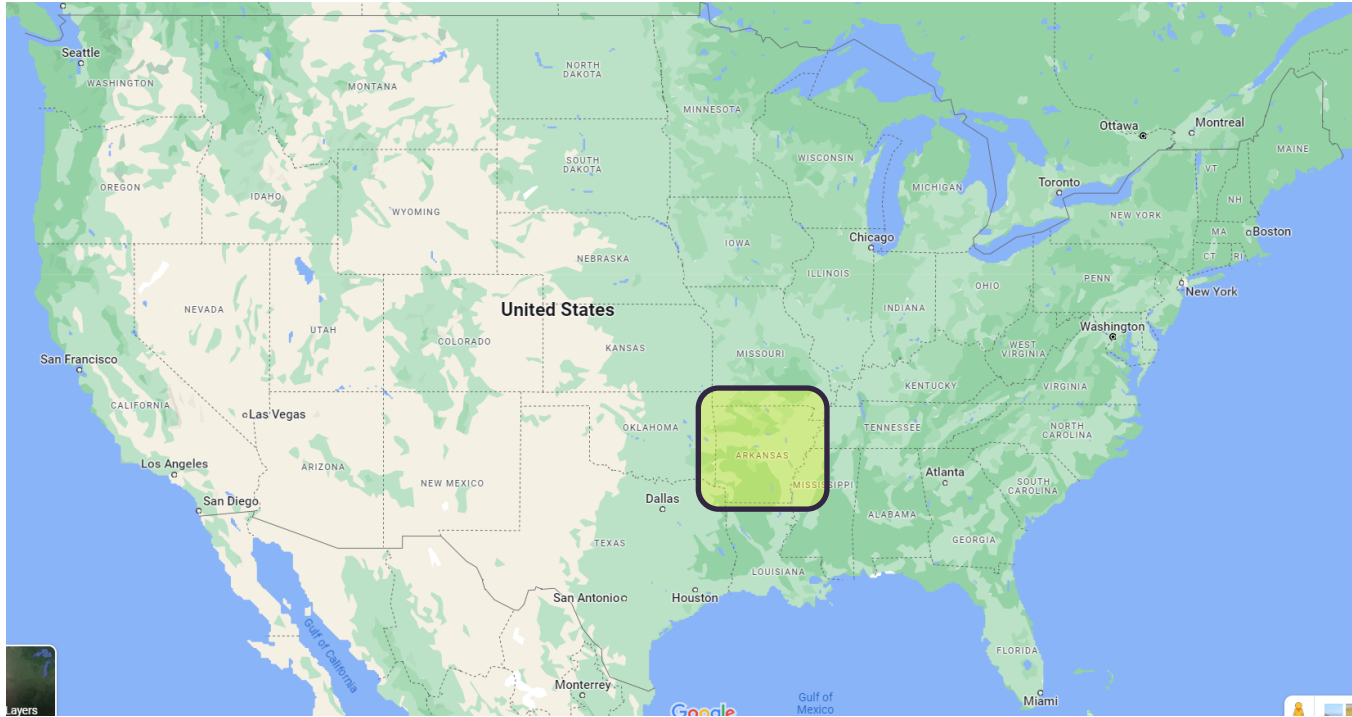
Presentation Outline

- Project Introduction
- Pre-Demolition Activities
- Deck & Misc Steel Removal
- Girder Removal
- Current Status

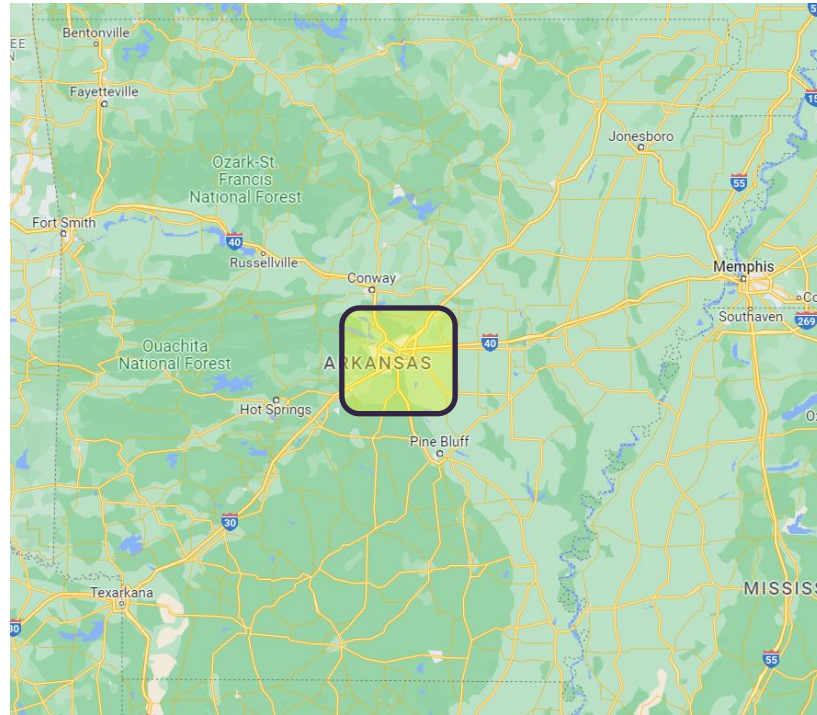
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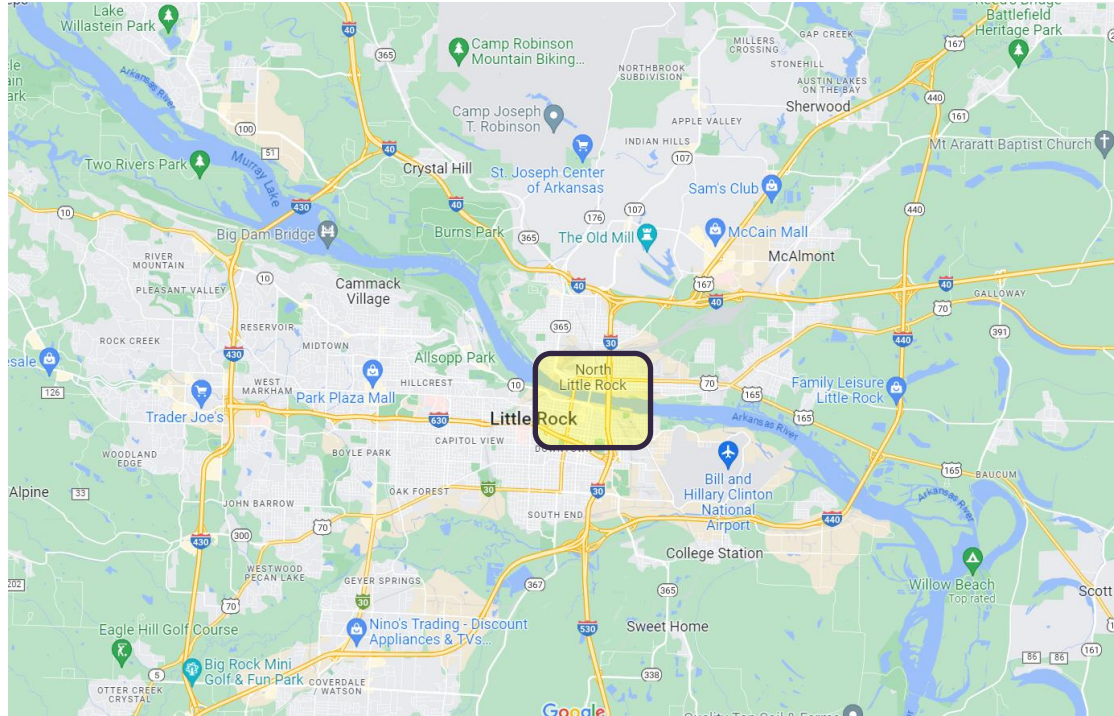
Project Location



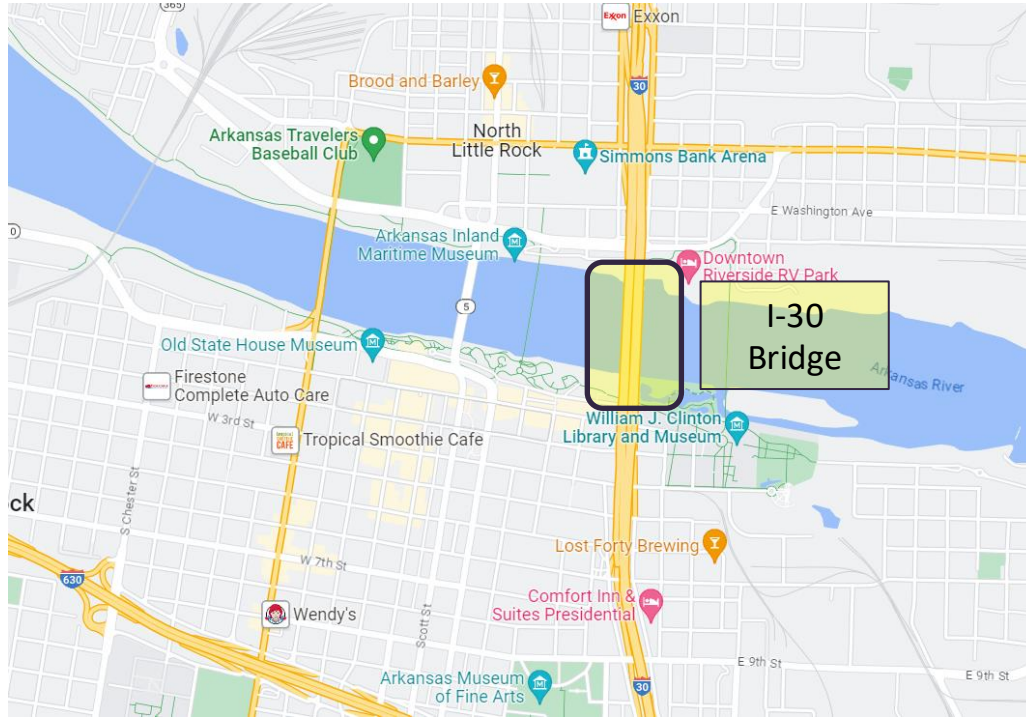
Project Location



Project Location



Project Location



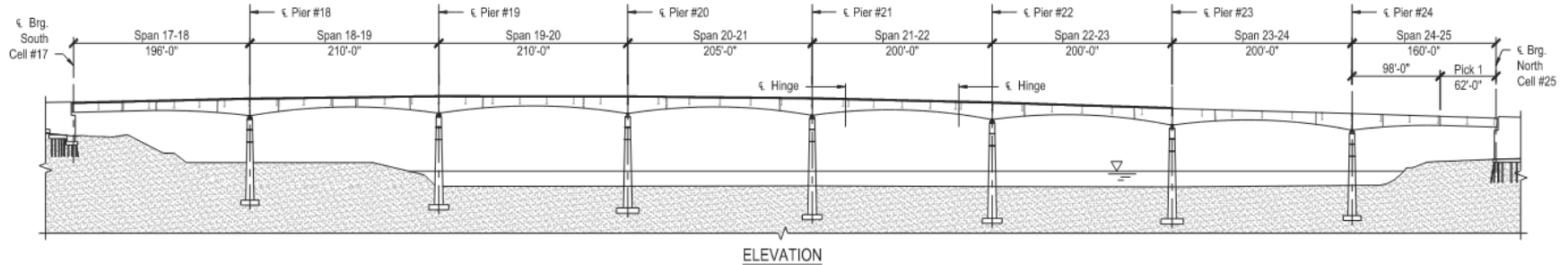
Project Team

- Owner: Arkansas Department of Transportation
- Engineer of Record: Burns & McDonnell/HDR
- Contractor: Kiewit Massman Construction
- Demolition Engineer: Genesis Structures

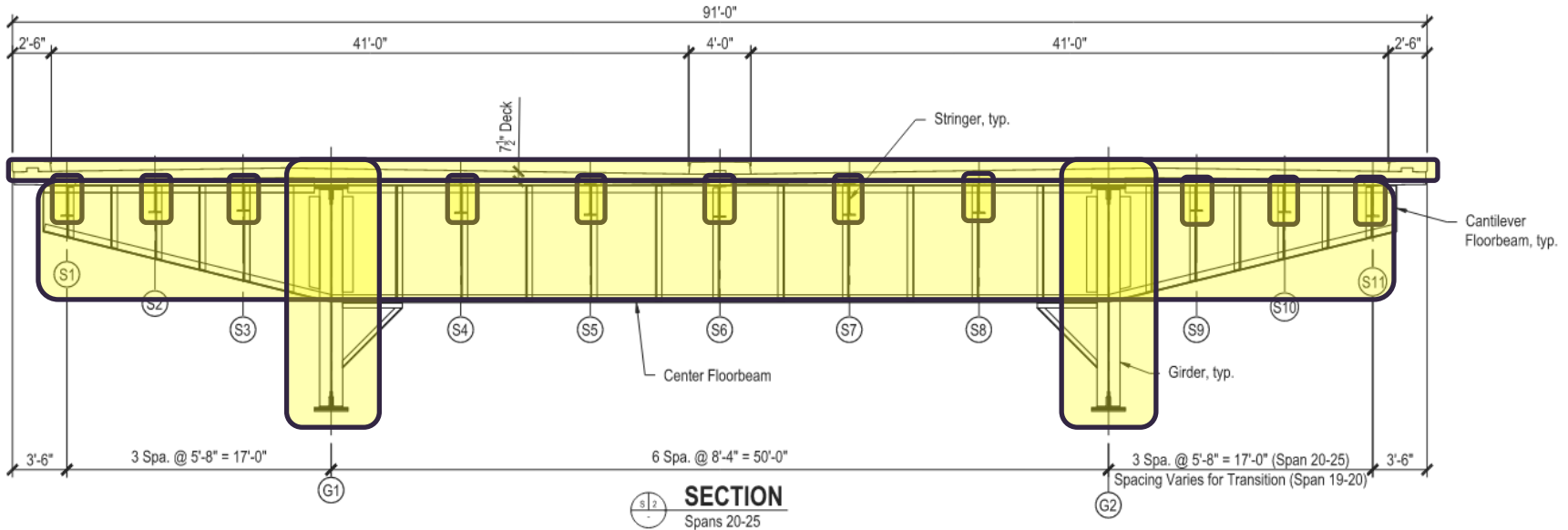
Project Timeline

- Original Design Complete: 1958
- Contract Awarded: 2019
- Begin Construction: 2020
- Demo Design Plans Complete: May 2022
- Demo Complete: June 2023

Main Span Bridge Elevation



Typical Cross Section



Typical Cross Section



Main Span Bridge Elevation



30 Crossing construction, Little Rock, Arkansas. September 26, 2020. ©David Hoge

IML14501.arw

Photo Credit:
David Hoge

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Pre-Demolition Activities

- New EB Bridge Construction
- Corbel Construction
 - Pier Bracket Vertical Support
- Girder Bracing
 - Lateral Torsion Buckling (LTB)

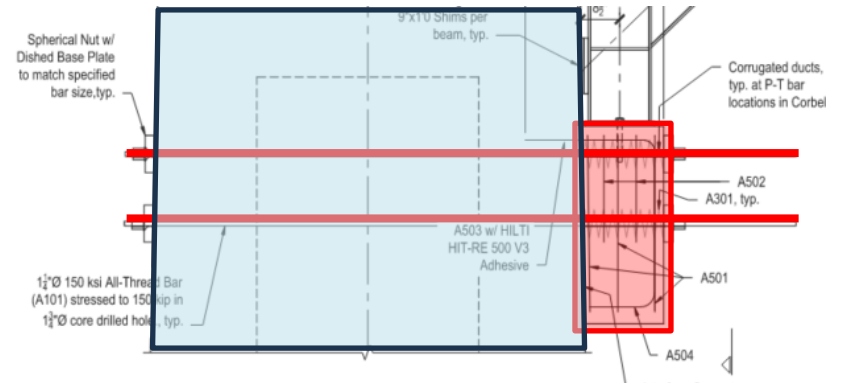
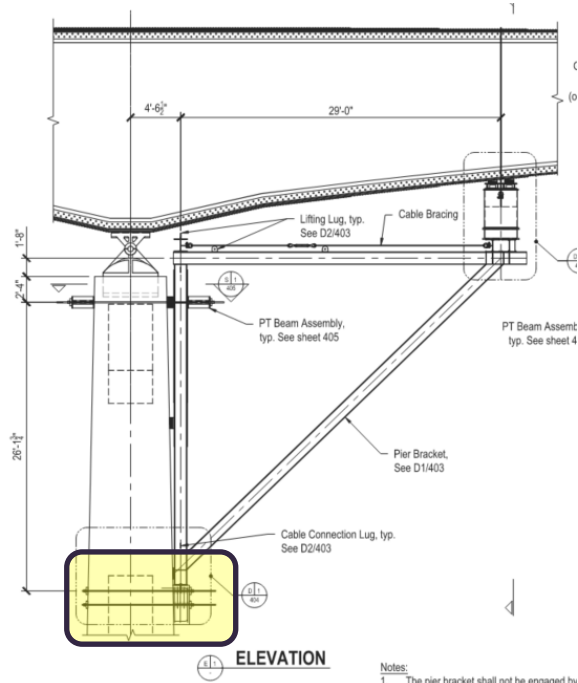
New Bridge Construction Photo



New Bridge Construction Photo



Cast-in-Place Corbel



Corbel Post Tensioning



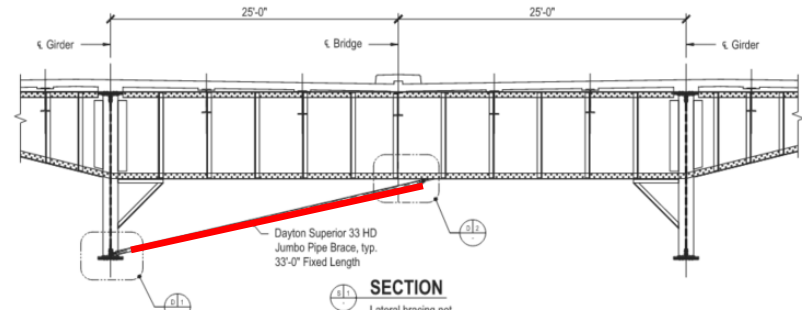
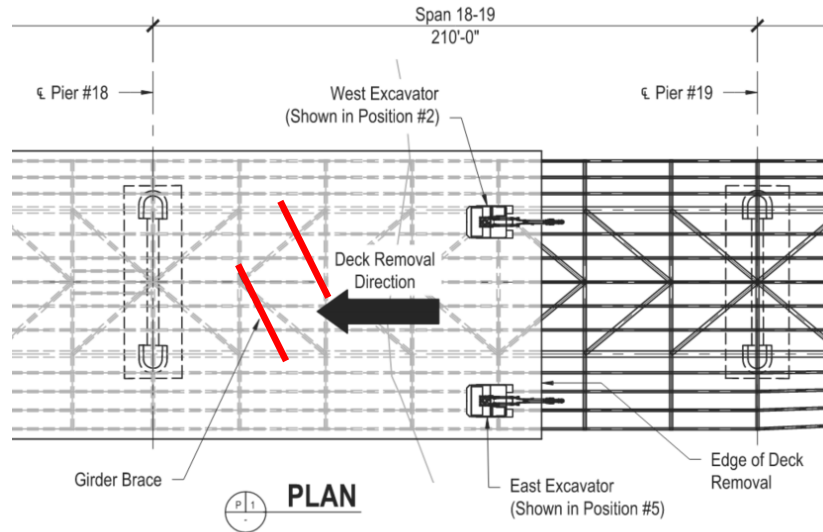
Corbel



Girder LTB Bracing

- Girder near dead load contraflexure point
 - Original demand minimal
 - No flange cover plates, only flange angles
- Negative moment increase during the deck removal operation
 - Bottom flange in compression
- Opted to increase capacity as opposed to decrease demands

Girder LTB Bracing



Girder LTB Bracing



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Deck Removal

CAT

326F

Hydraulic Excavator

Notes:

1. Excavator Operating Weight = 58,801 lbs (including hammer)
2. Impact Hammer Attachment Weight = 3,800 lbs
3. Shearing Tool Attachment Weight = 3,800 lbs



Deck Removal



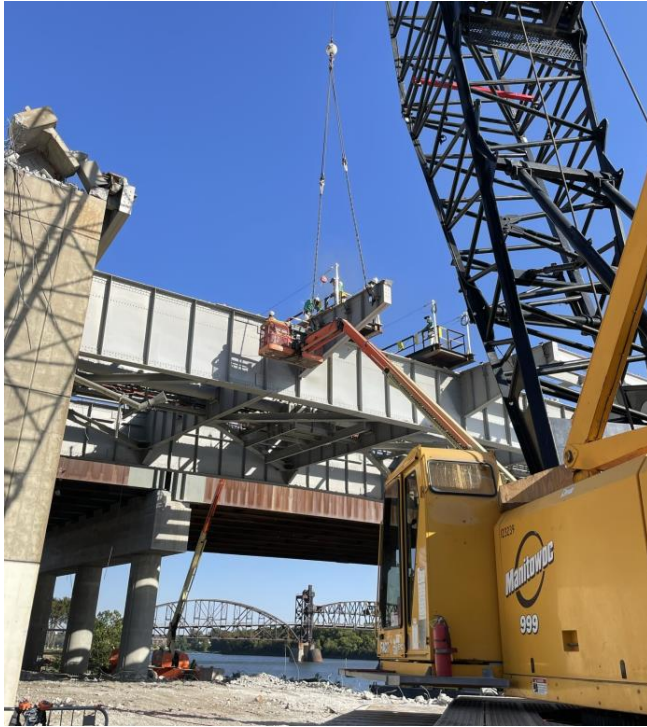
Deck Removal



Pre-Stripping Stringers



Pre-Stripping Cantilever Floorbeam



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- Deck & Misc Steel Removal
- **Girder Removal**
- Current Status

Presentation Outline

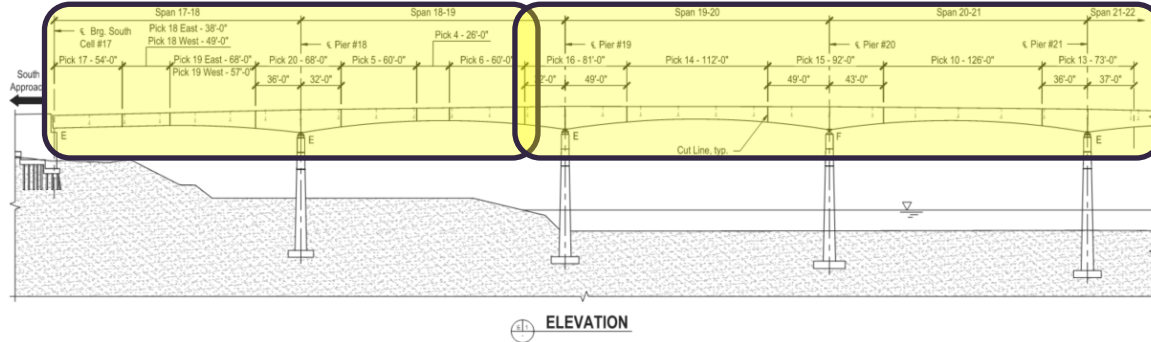
- Project Introduction
- Pre-Demolition Activities
- Deck & Misc Steel Removal
- **Girder Removal – Temporary Works**
- Current Status

Girder Removal - Temporary Works

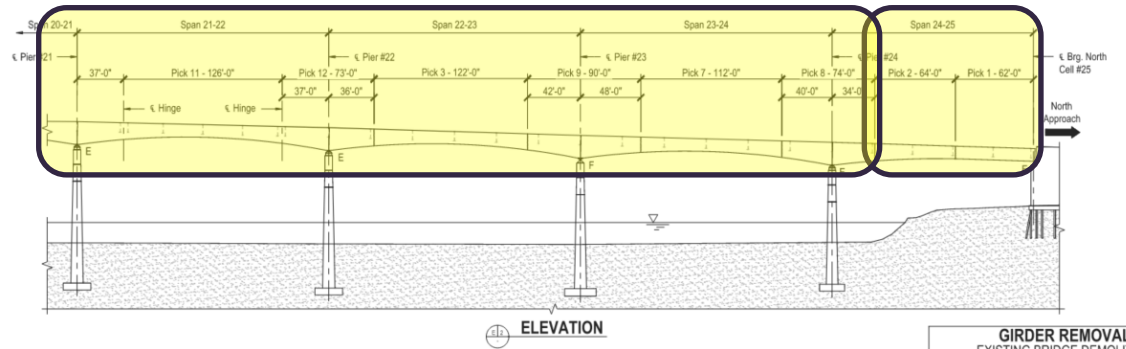
- Single Girder Pick - Beam Clamp
- Double Girder Pick - Custom Lifting Lugs
- Pier Brackets w/ Corbel
- Strong Backs
- Longitudinal Bearing Restraint
- Falsework
- Final Girder Brace

Girder Removal

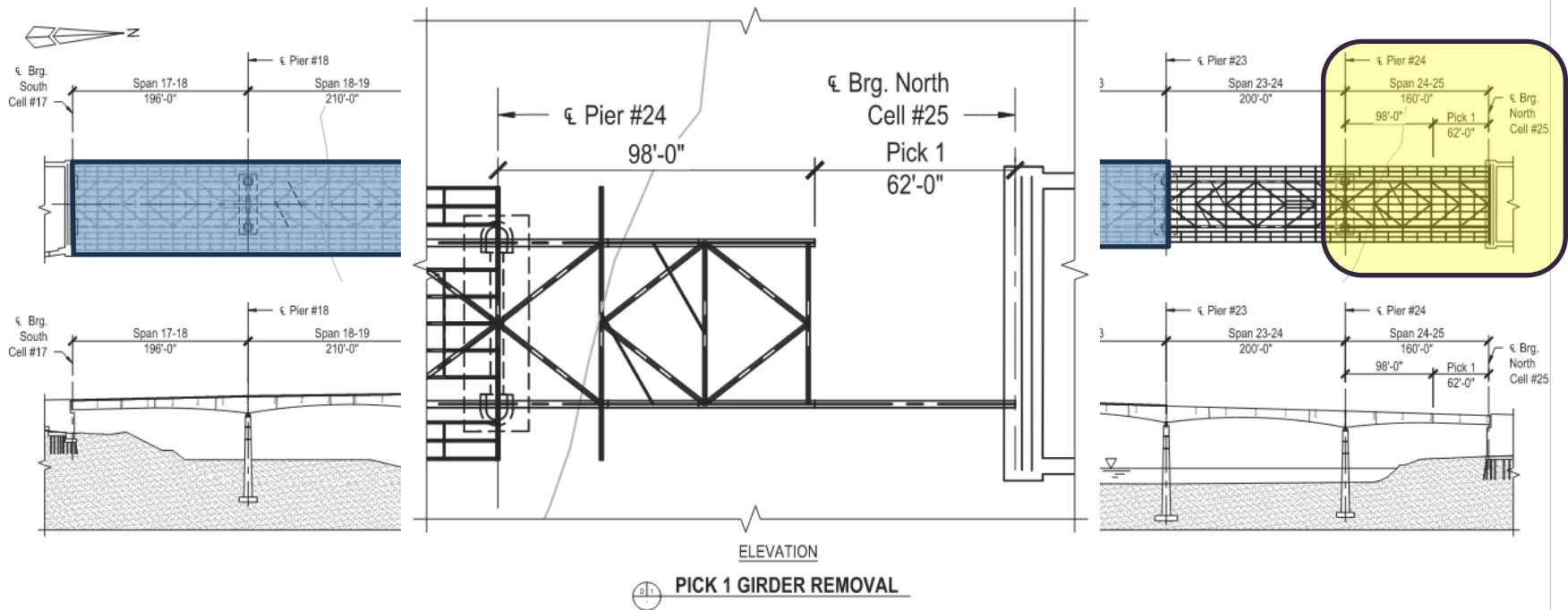
Single
Girder
Pick



Double
Girder
Pick



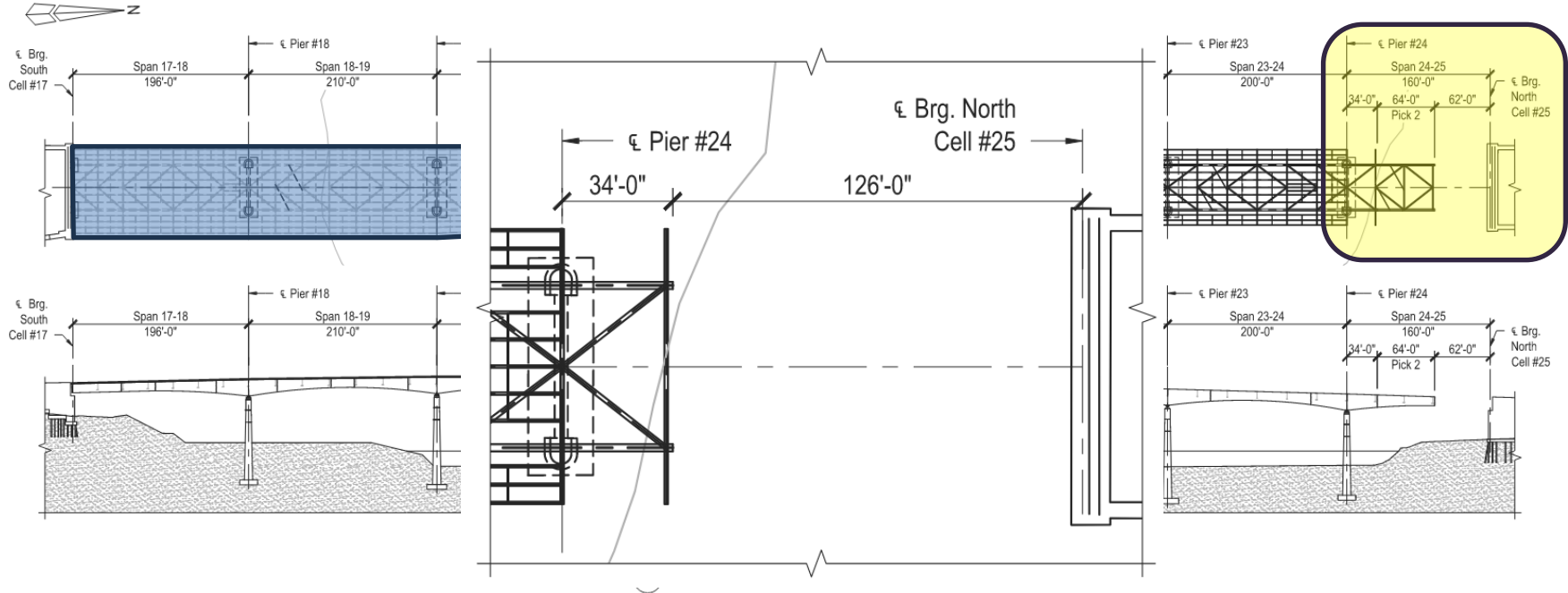
Girder Removal Stage 1



Girder Removal Stage 1



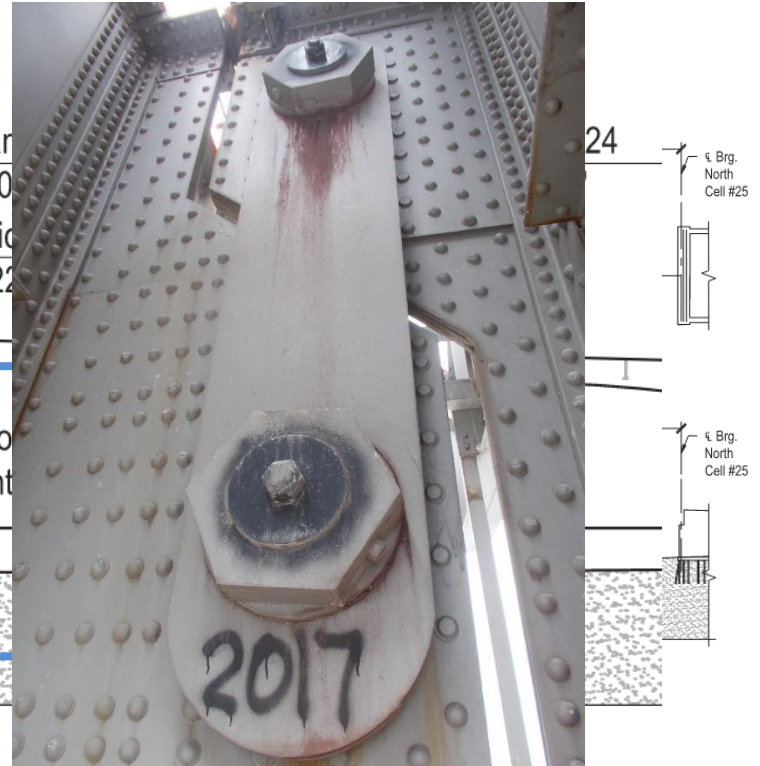
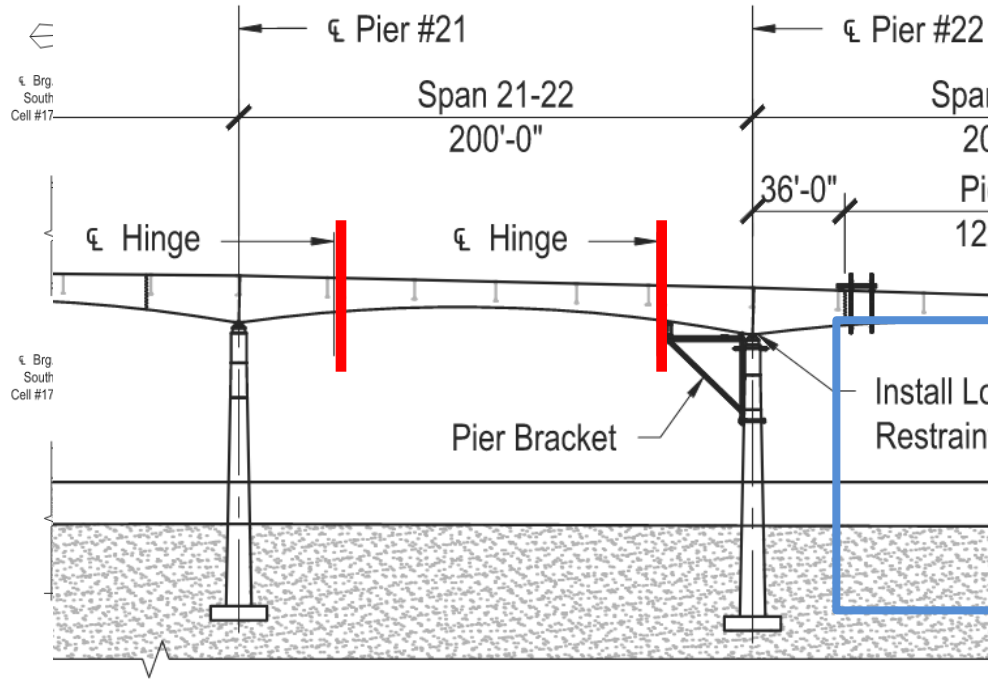
Girder Removal Stage 2



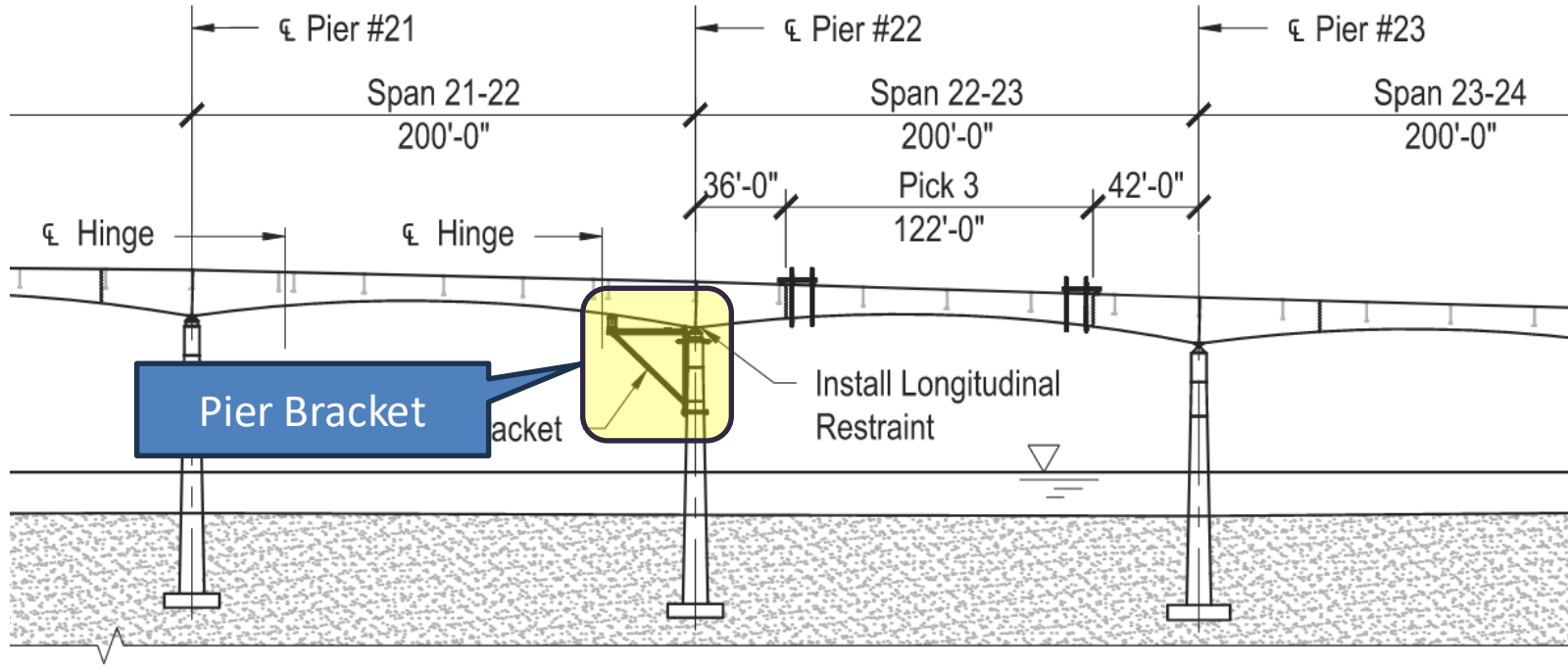
Girder Removal Stage 2



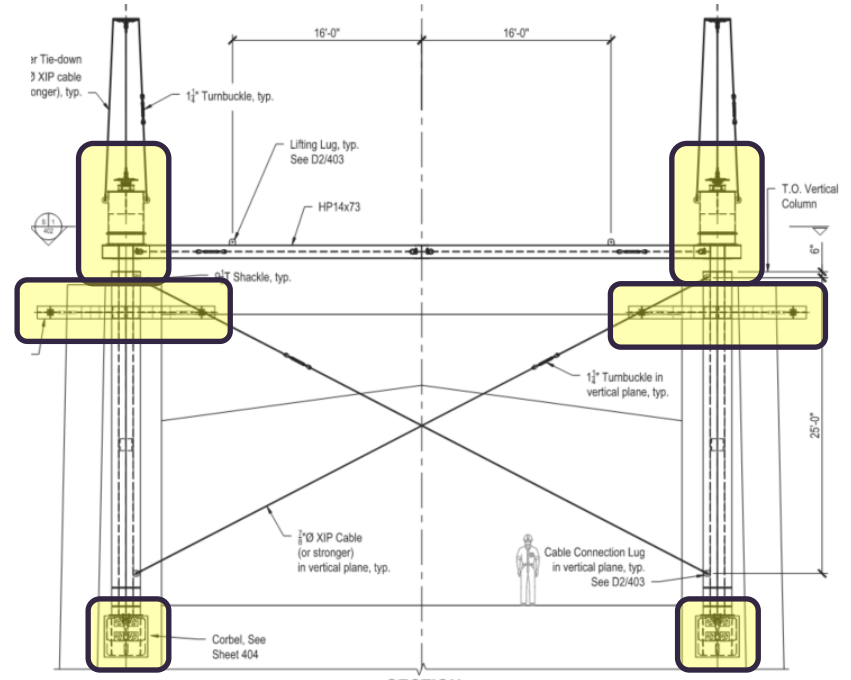
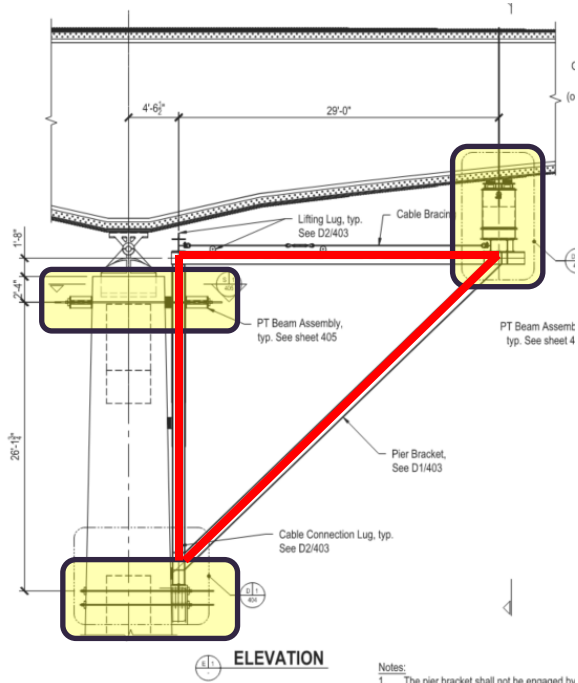
Girder Removal Stage 3



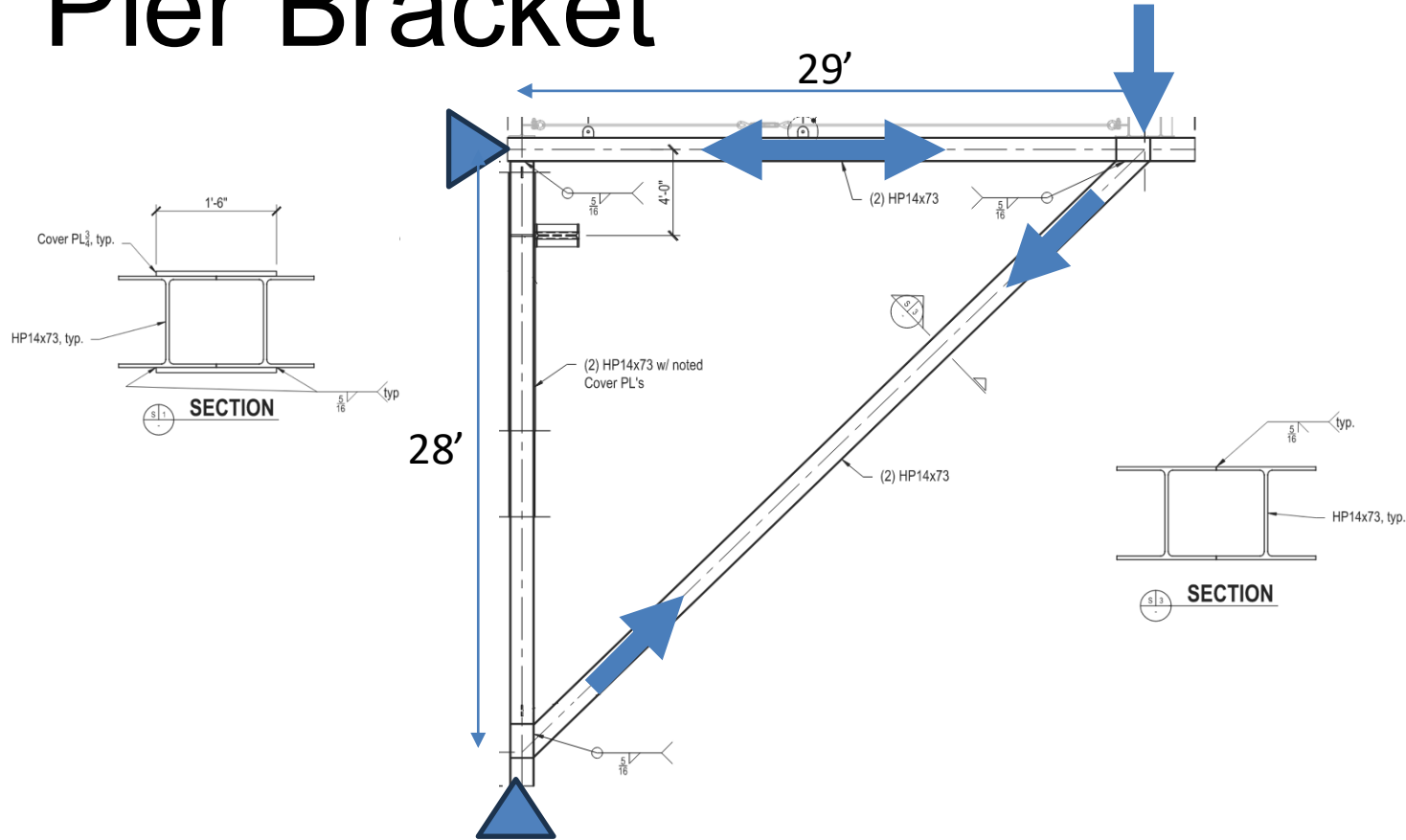
Pier Bracket



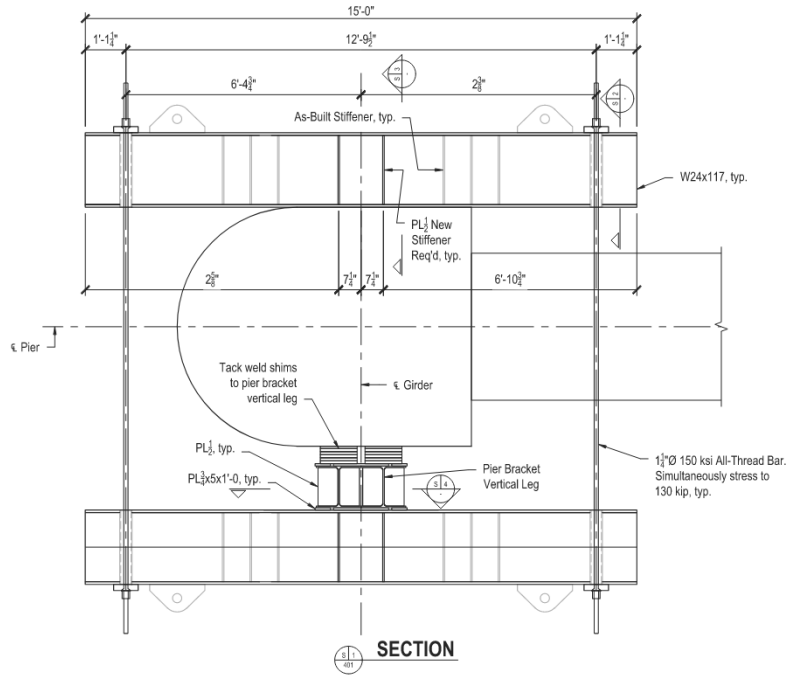
Pier Bracket



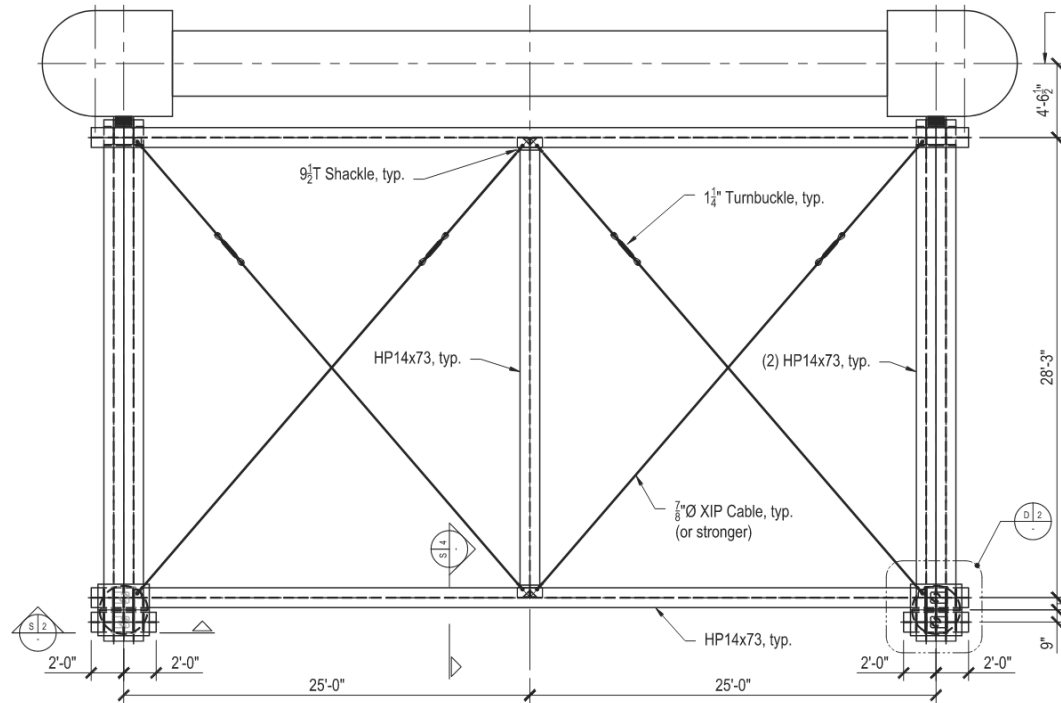
Pier Bracket



Pier Bracket – Upper PT Beam



Pier Bracket – Wind Bracing



Pier Bracket



Pier Bracket



30 Crossing Construction Pier 24 with pier brackets. Demolition of I-30 bridge, North Little Rock, Arkansas, October 20, 2022. ©David Hogg

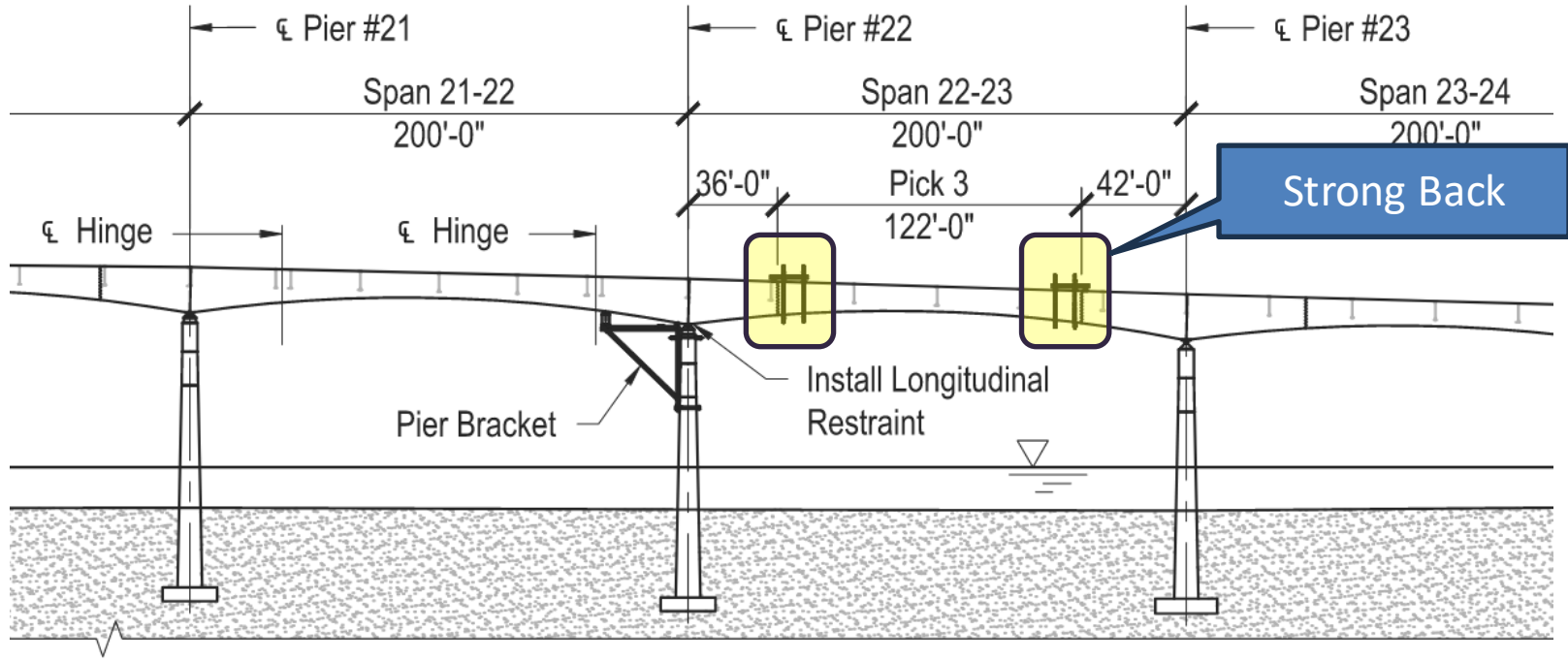
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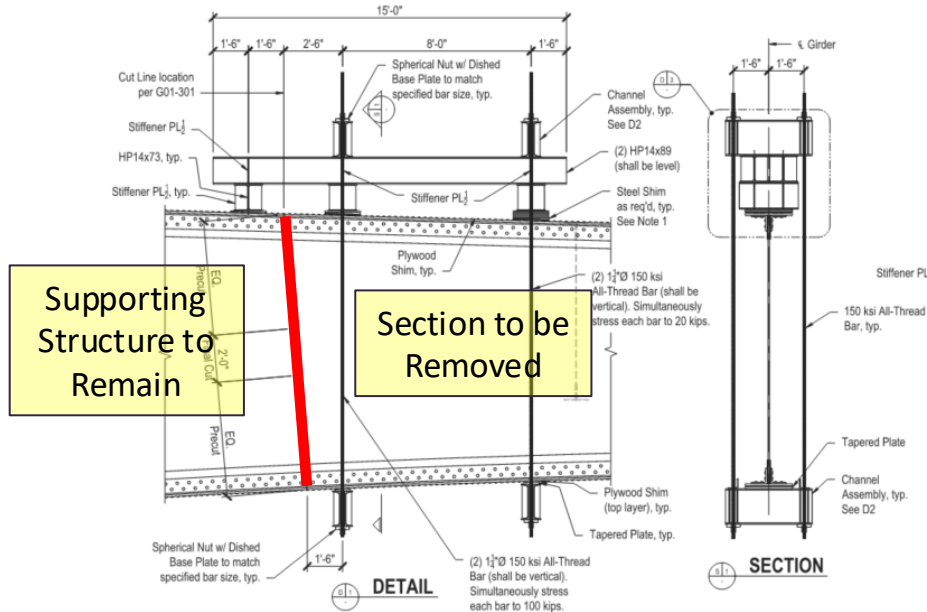
30 Crossing Construction Pier bracket on P-21. Demolition of I-30 bridge, North Little Rock, Arkansas, October 12, 2022. ©David Hogg

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Strong Back

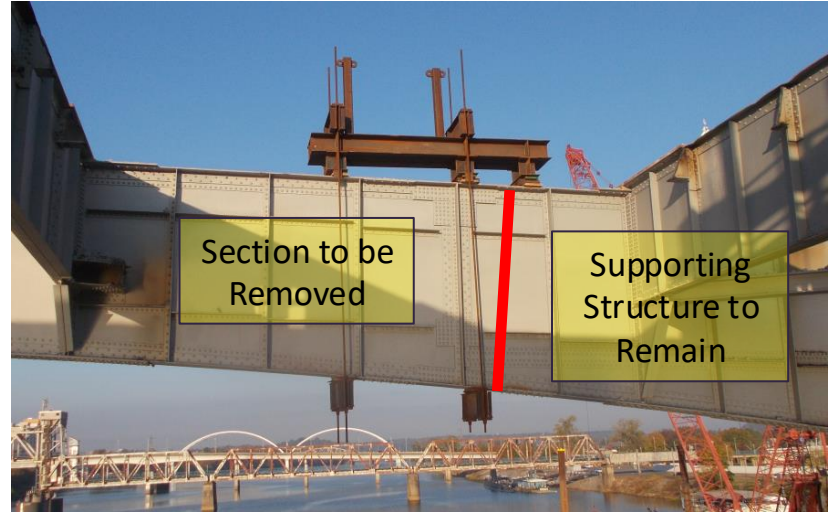


Strong Back



Supporting Structure to Remain

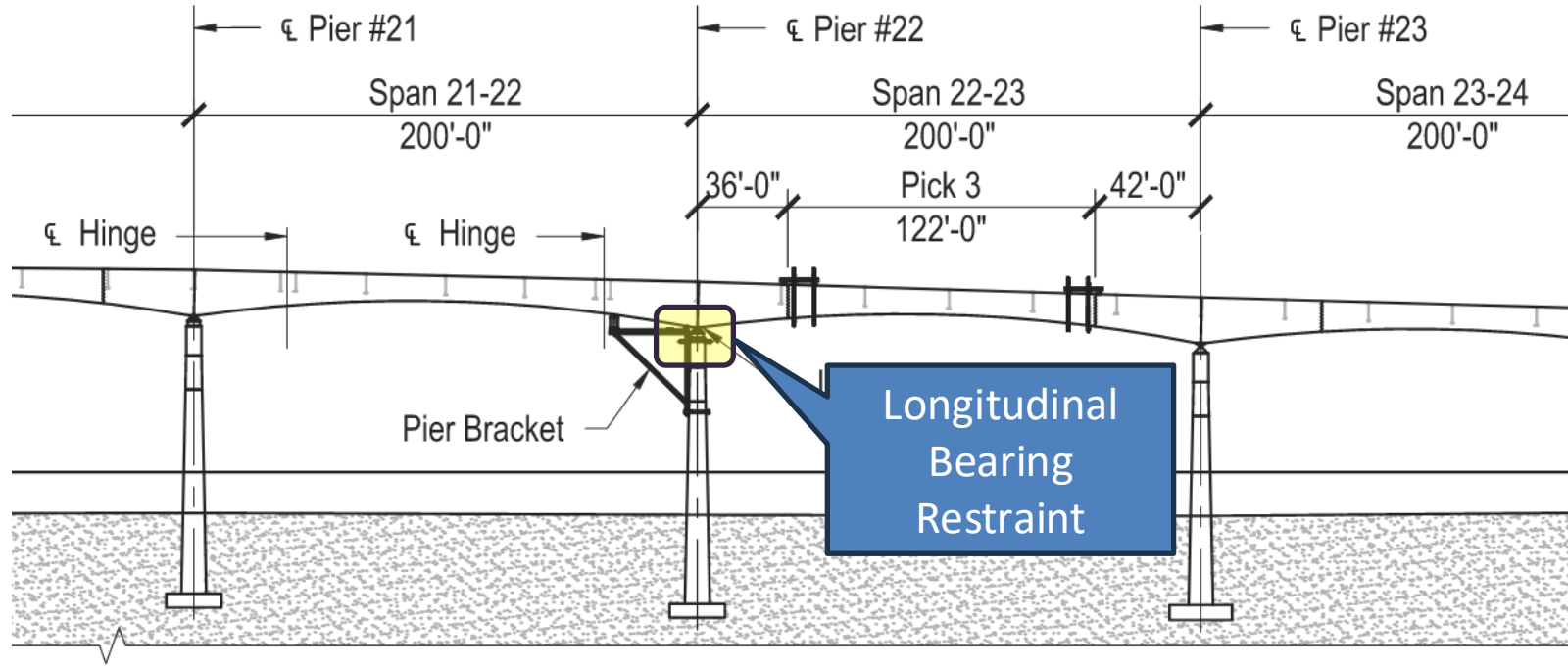
Section to be Removed



Strong Back



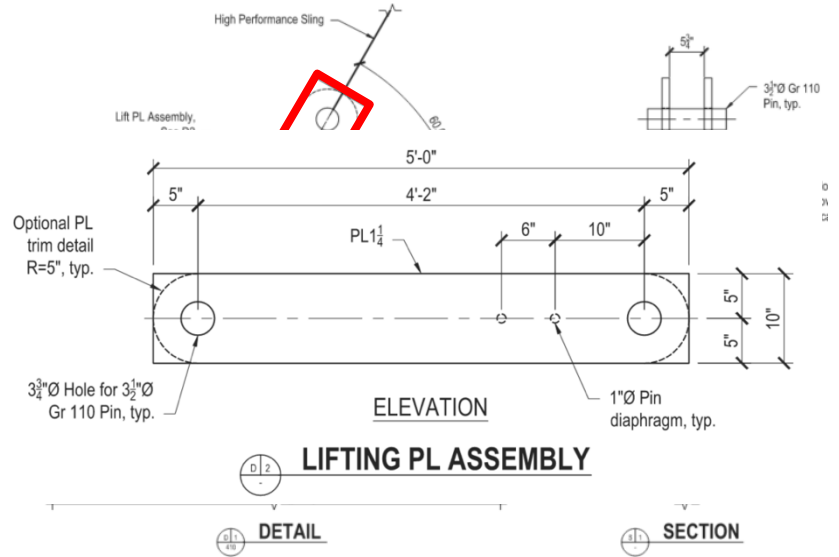
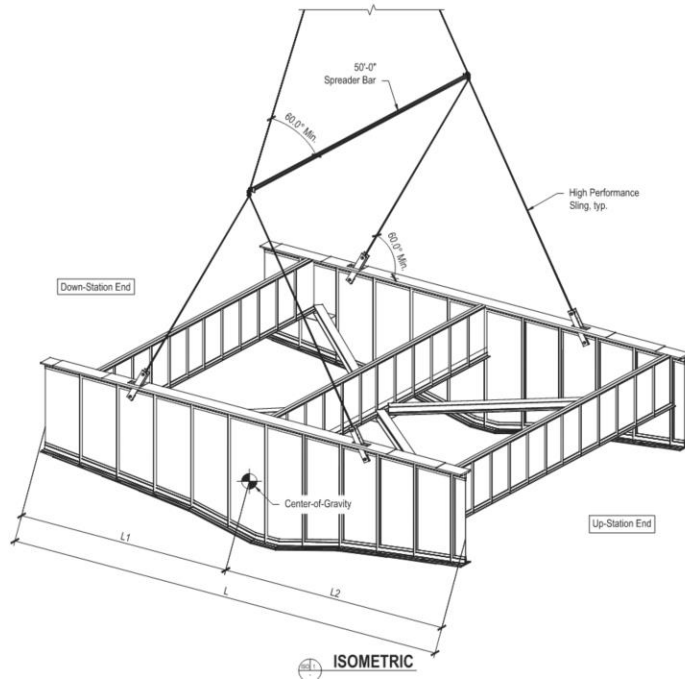
Longitudinal Bearing Restraints



Longitudinal Bearing Restraints



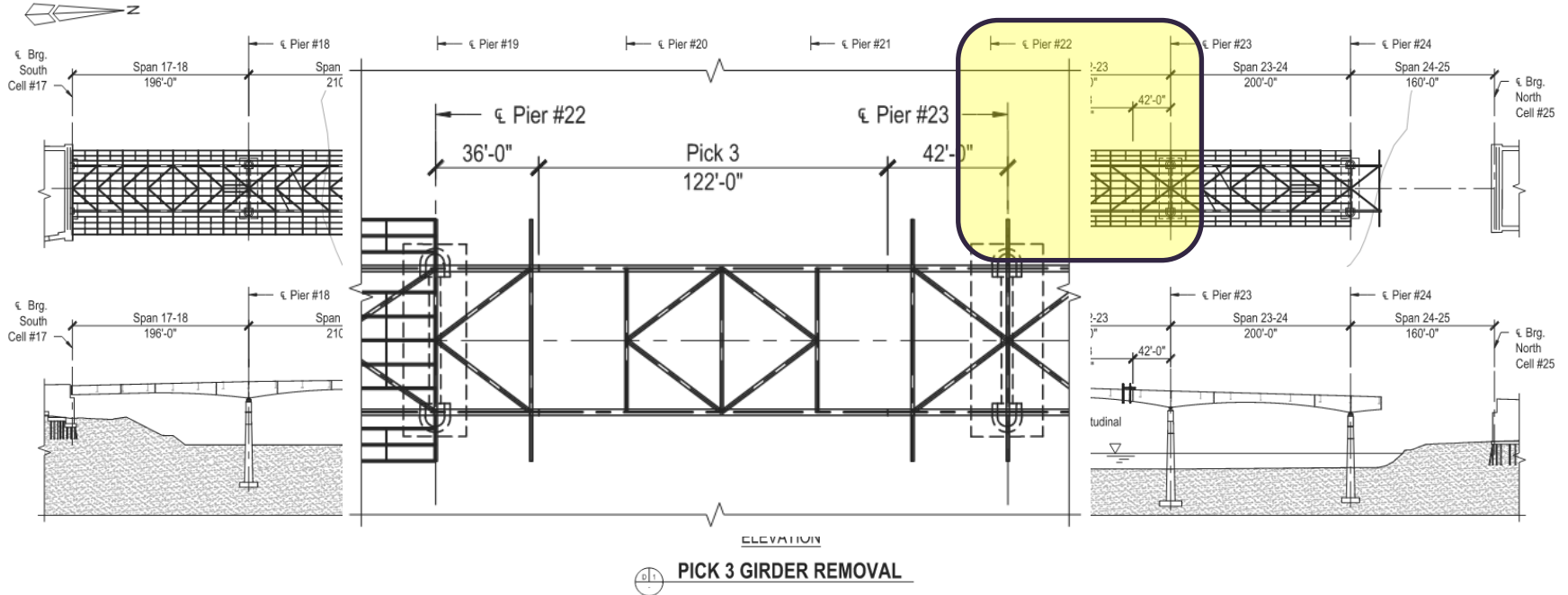
Custom Lifting Lug



Custom Lifting Lug

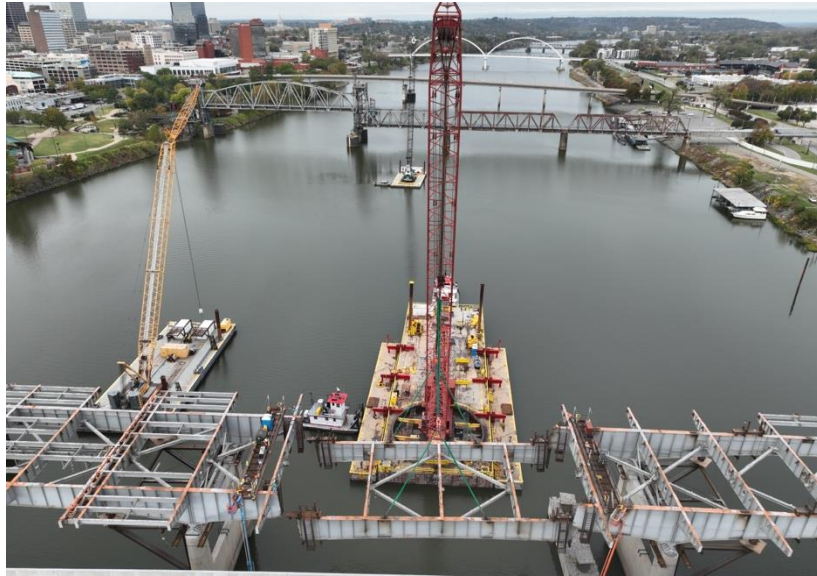


Girder Removal Stage 3



51 PICK 3 GIRDER REMOVAL

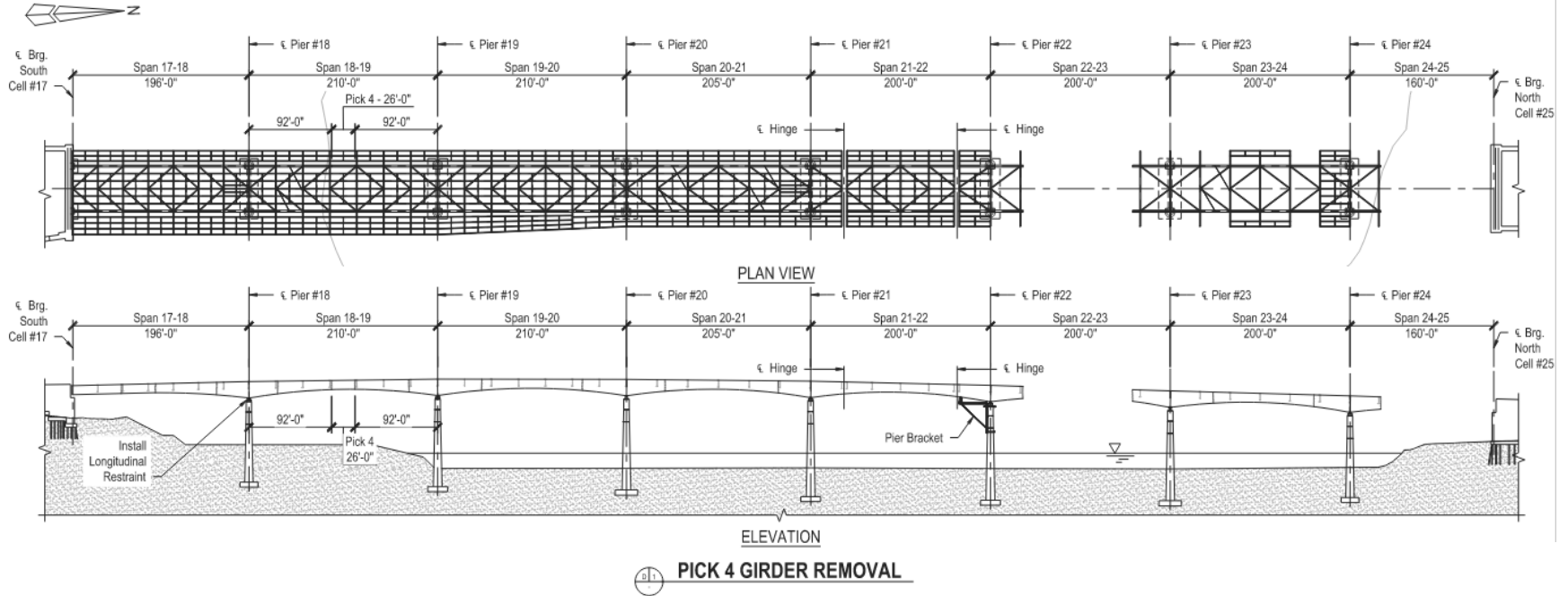
Girder Removal Stage 3



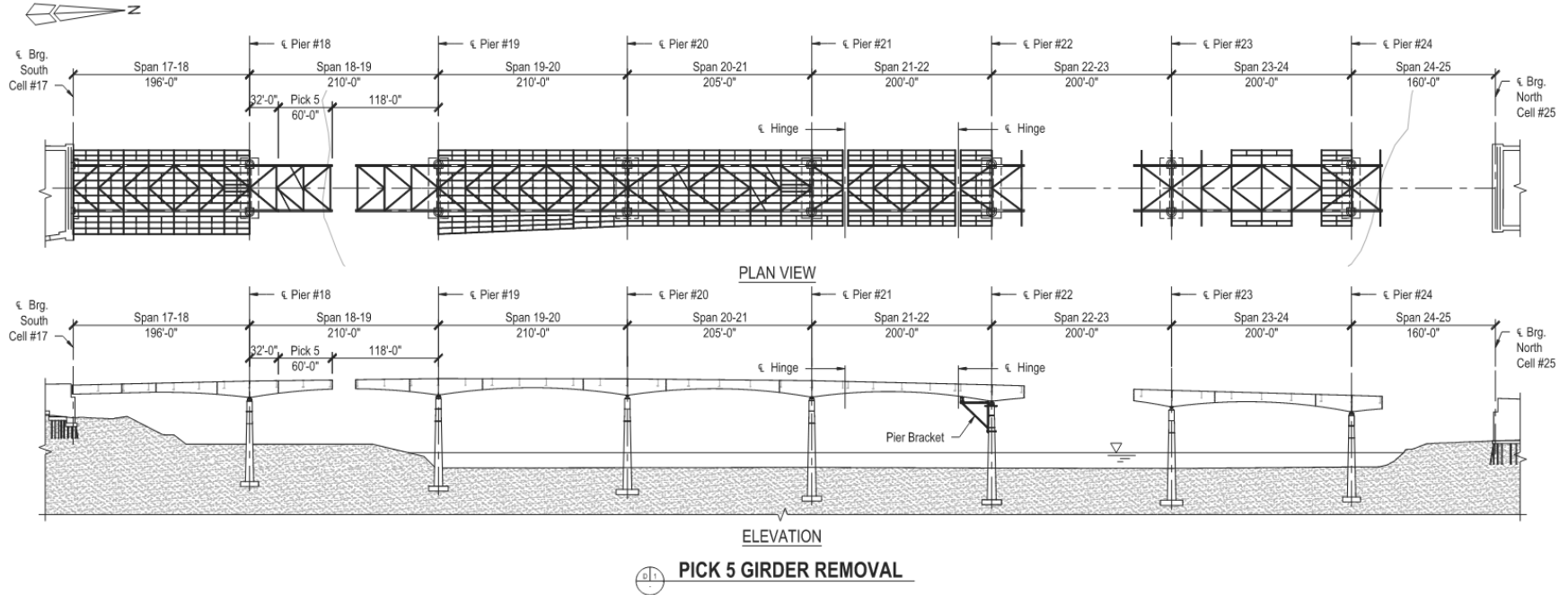
Girder Removal Stage 3



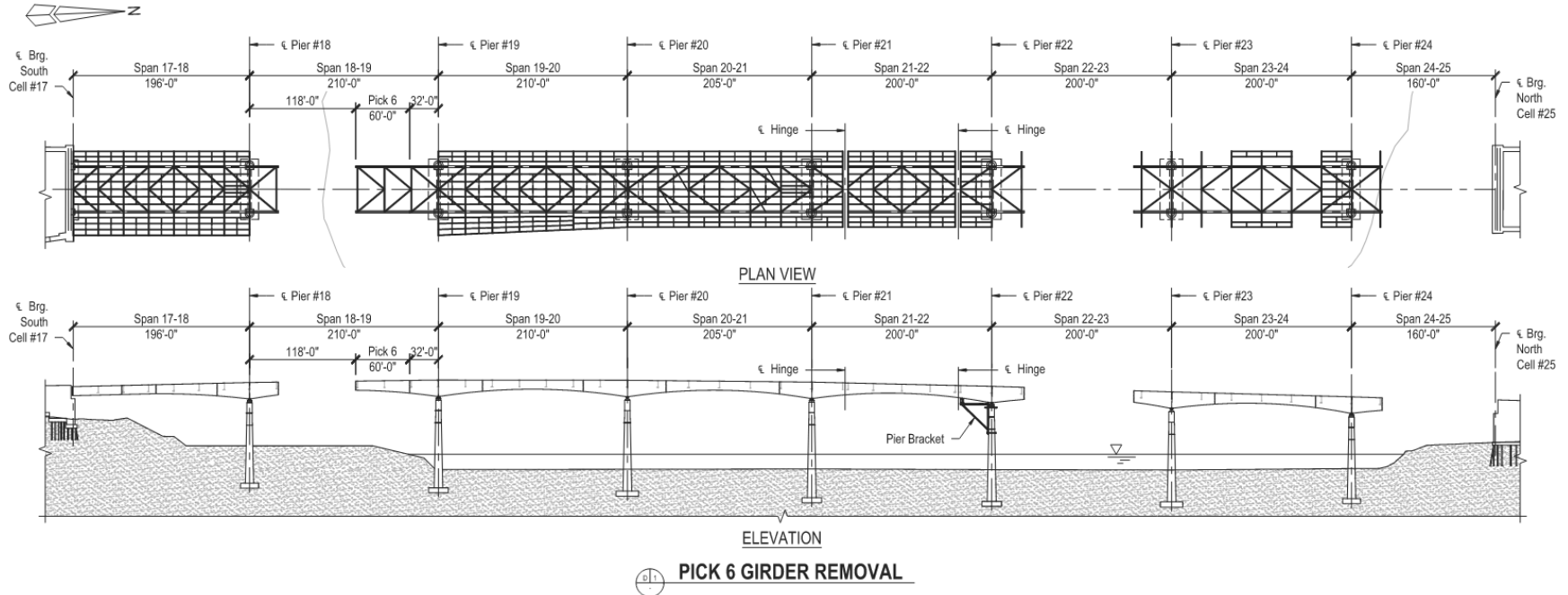
Girder Removal Stage 4



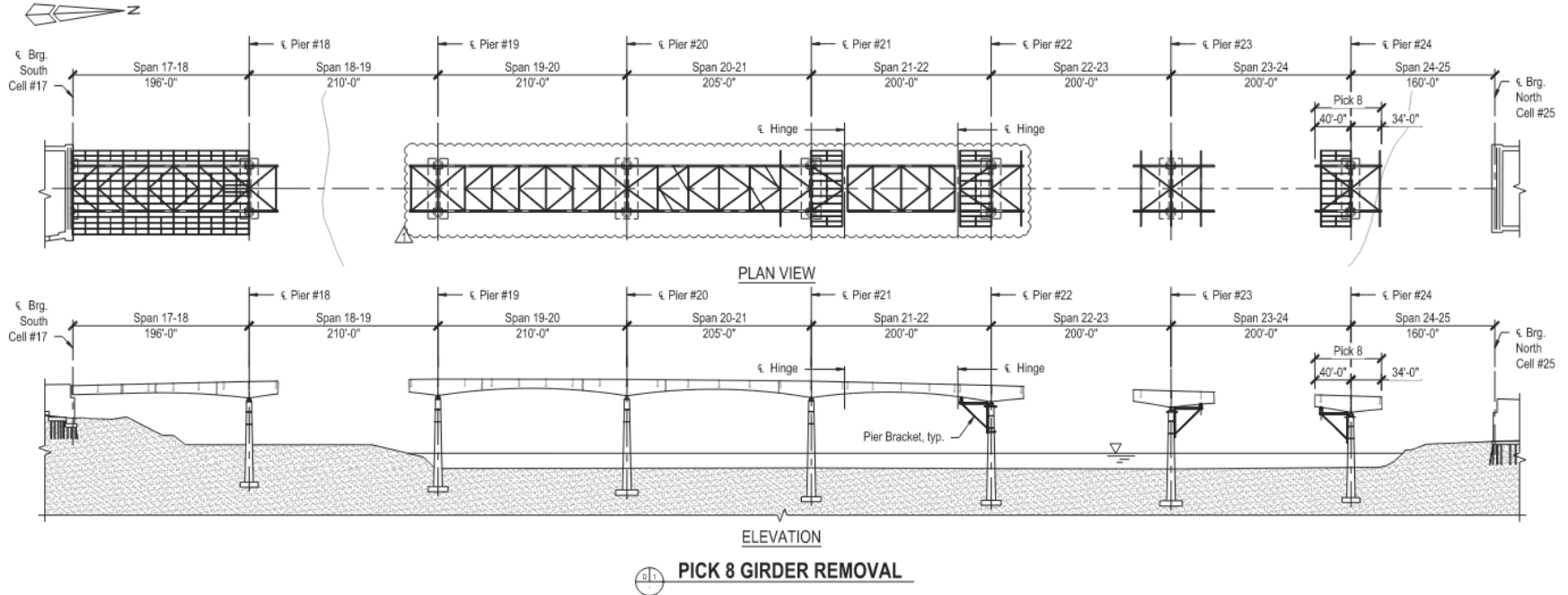
Girder Removal Stage 5



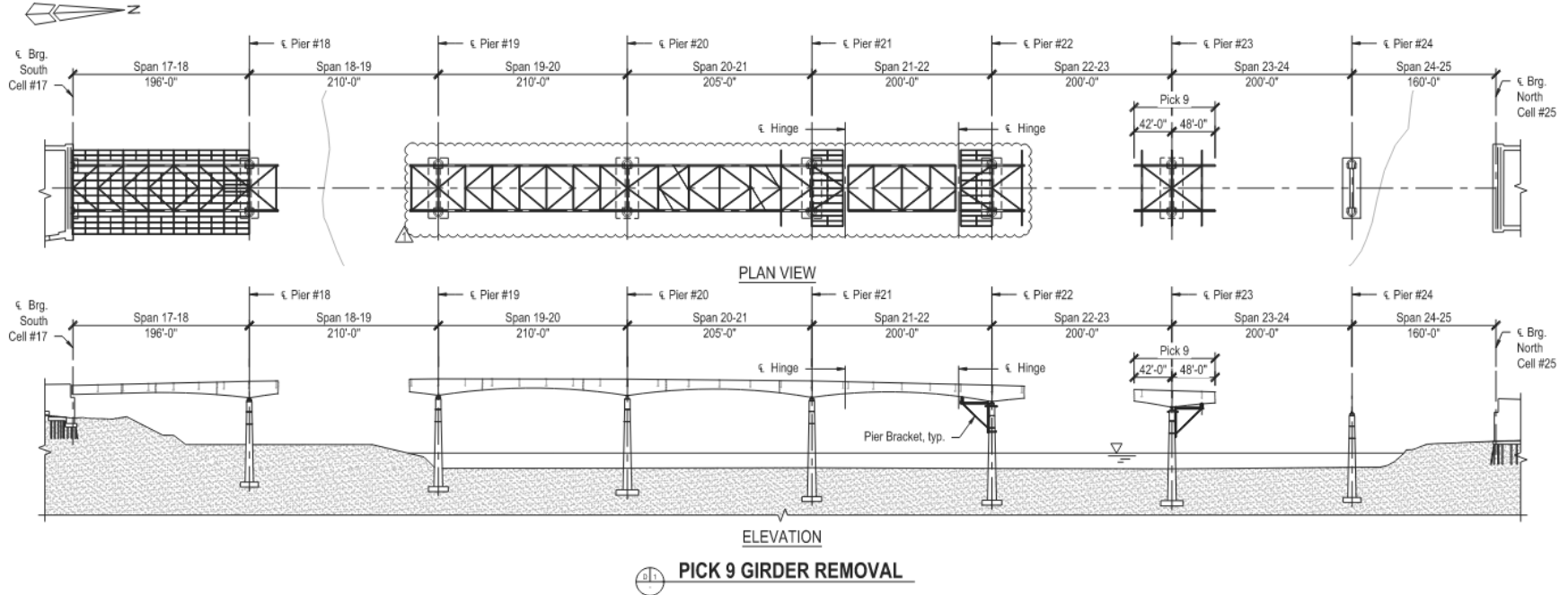
Girder Removal Stage 6



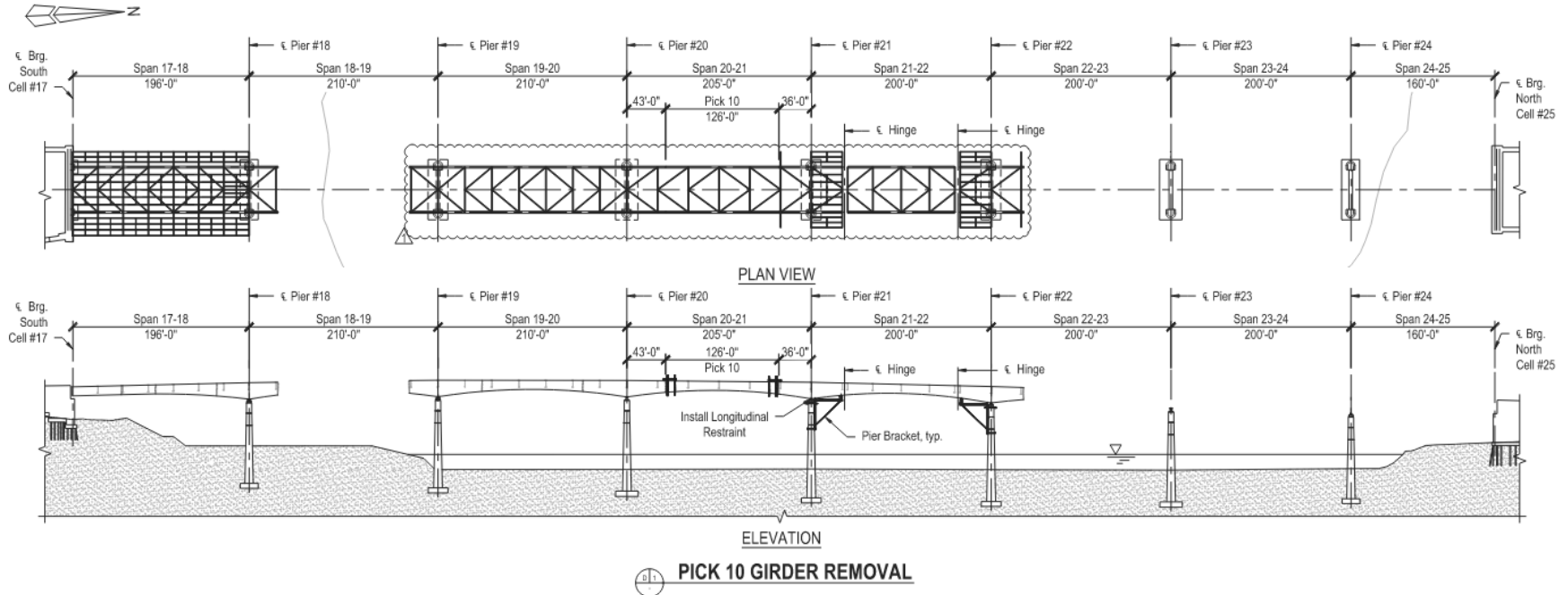
Girder Removal Stage 8



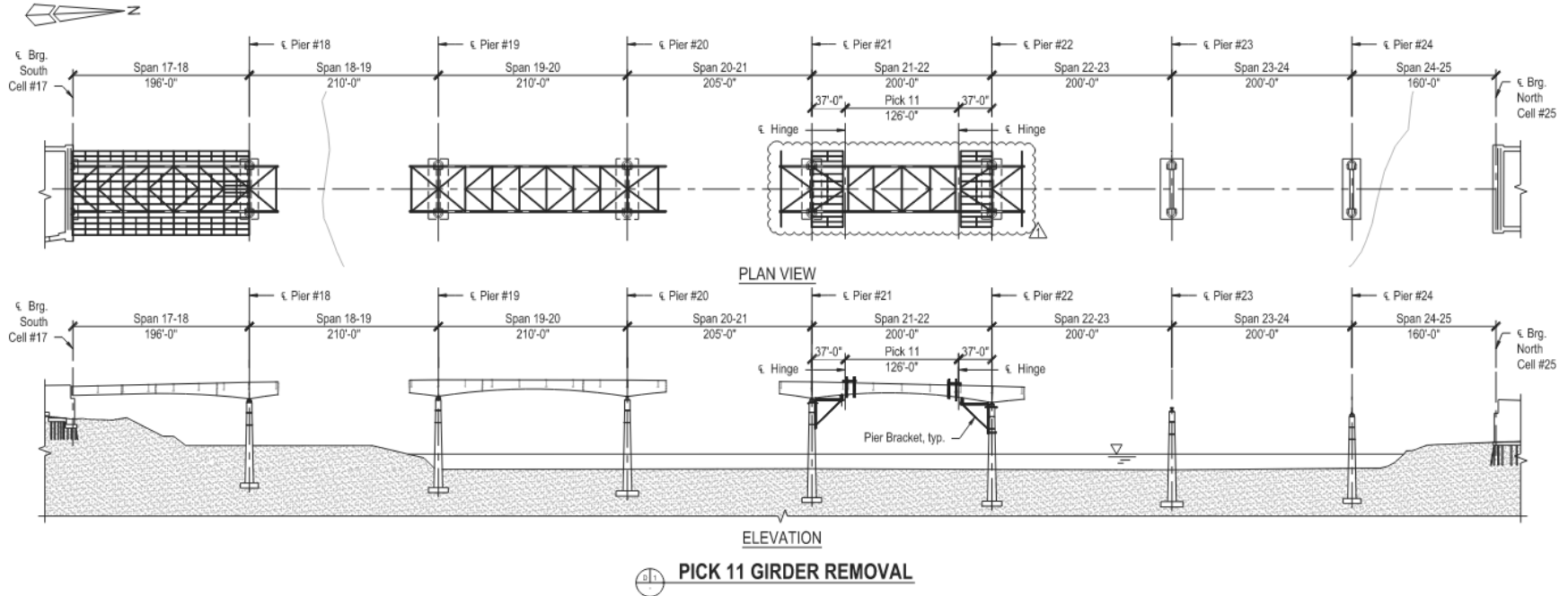
Girder Removal Stage 9



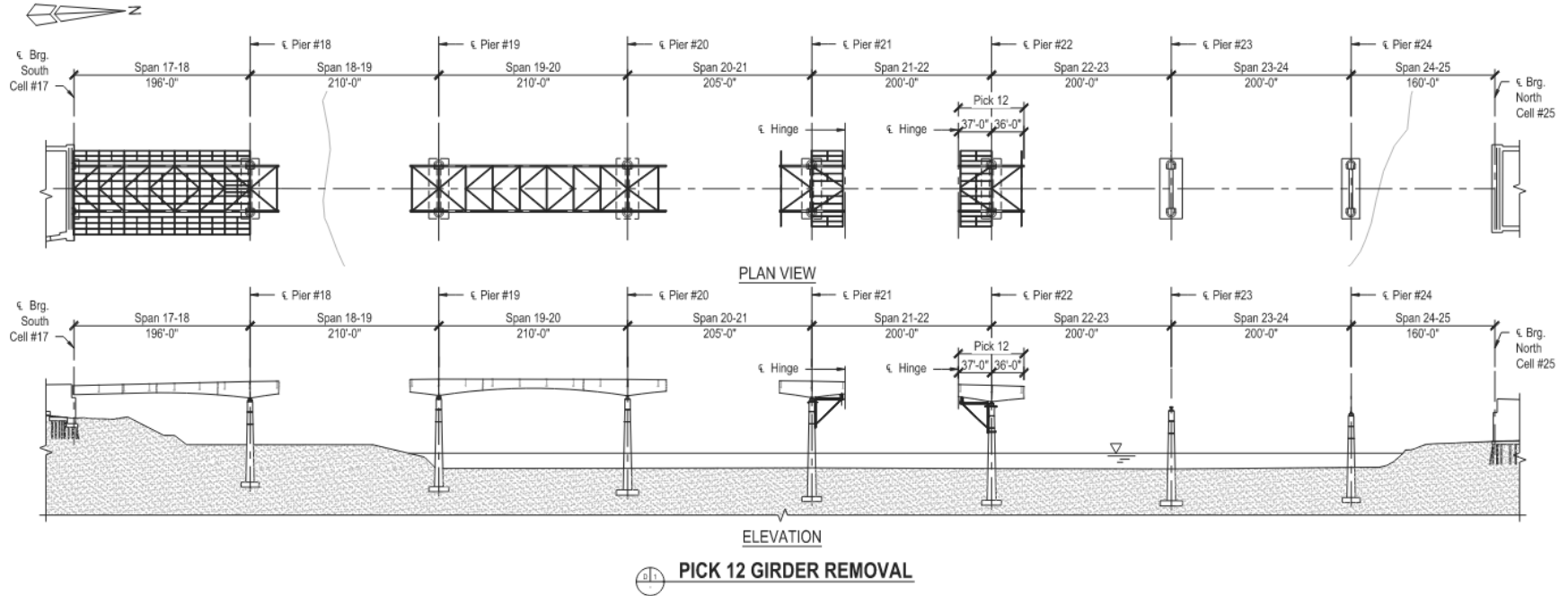
Girder Removal Stage 10



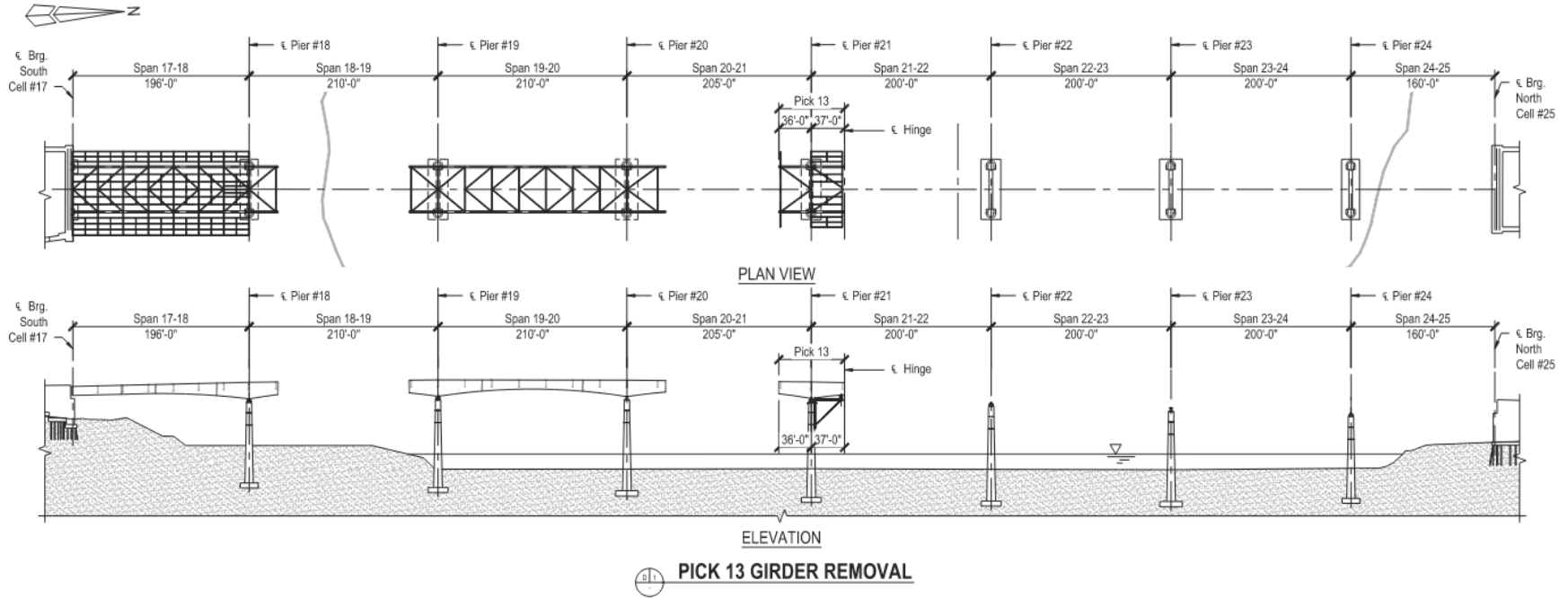
Girder Removal Stage 11



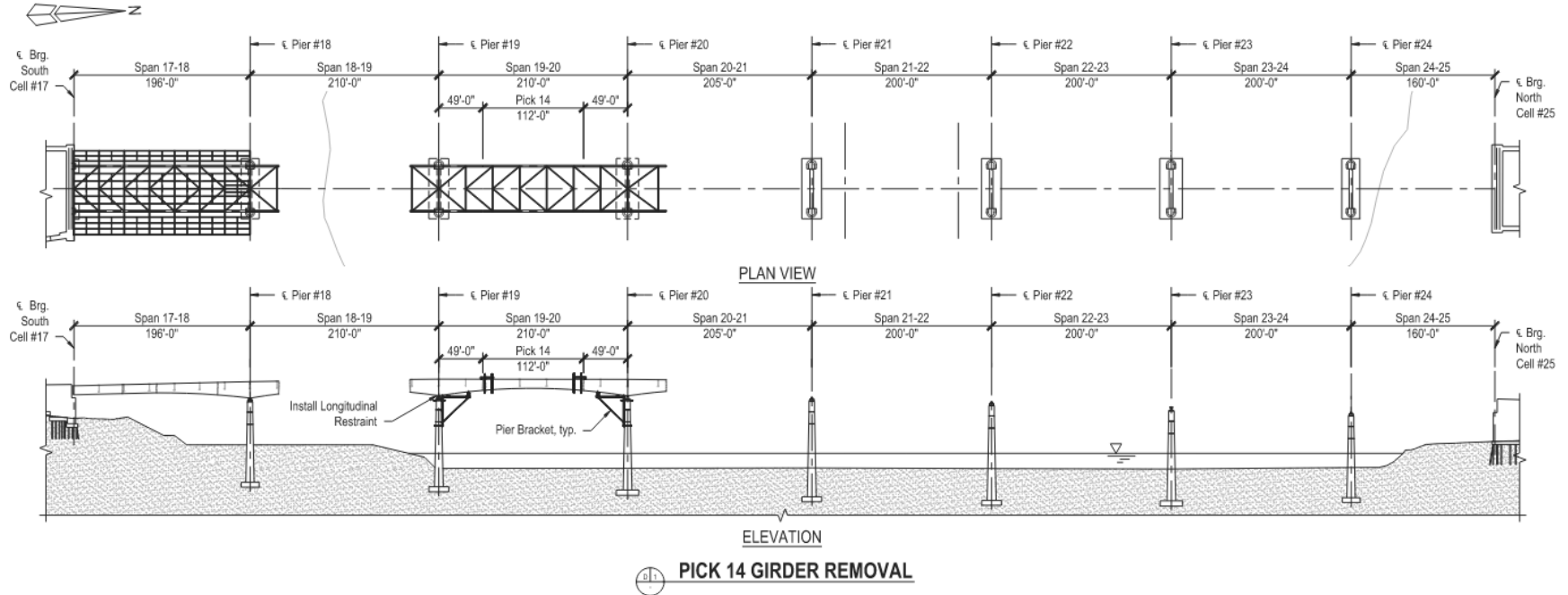
Girder Removal Stage 12



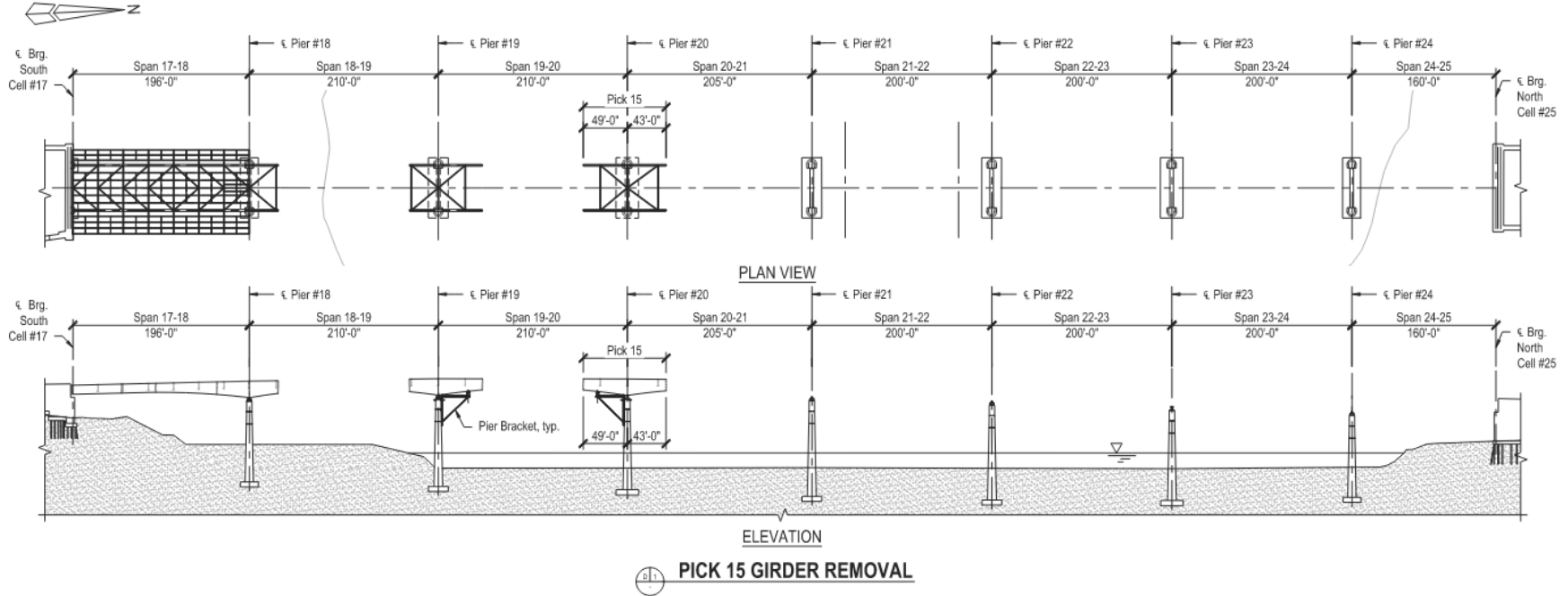
Girder Removal Stage 13



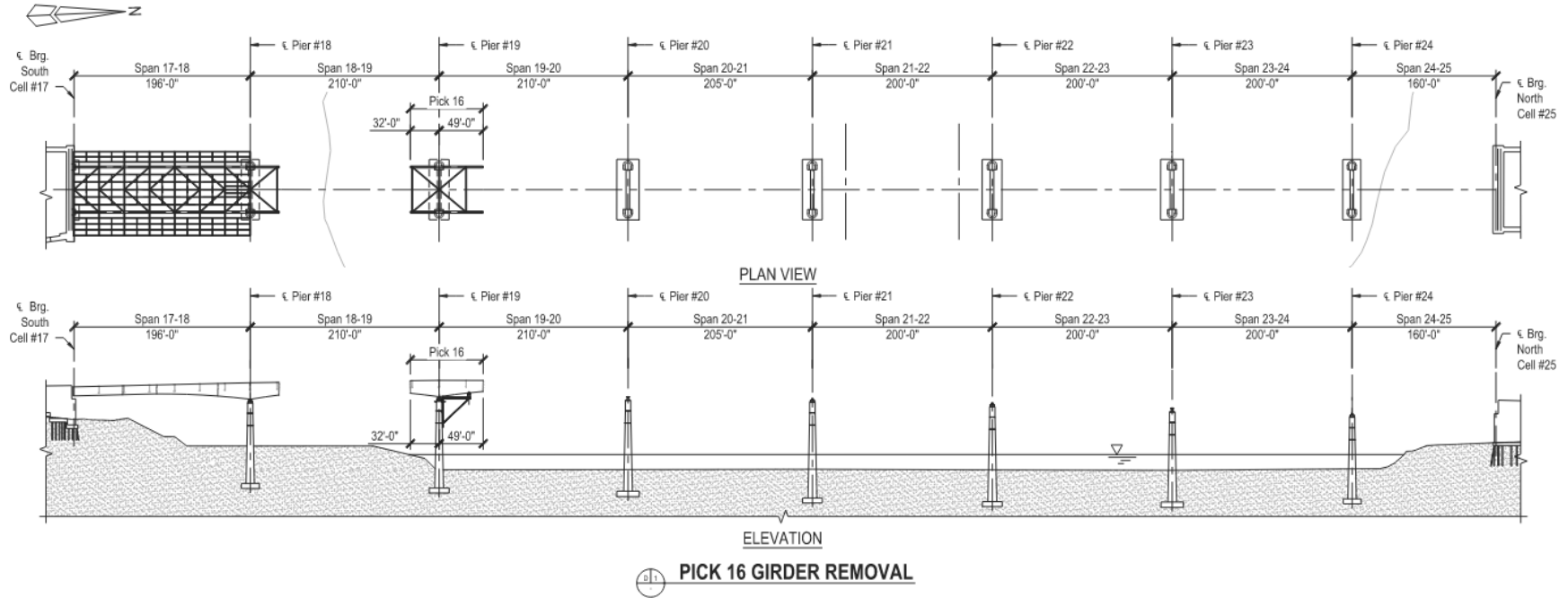
Girder Removal Stage 14



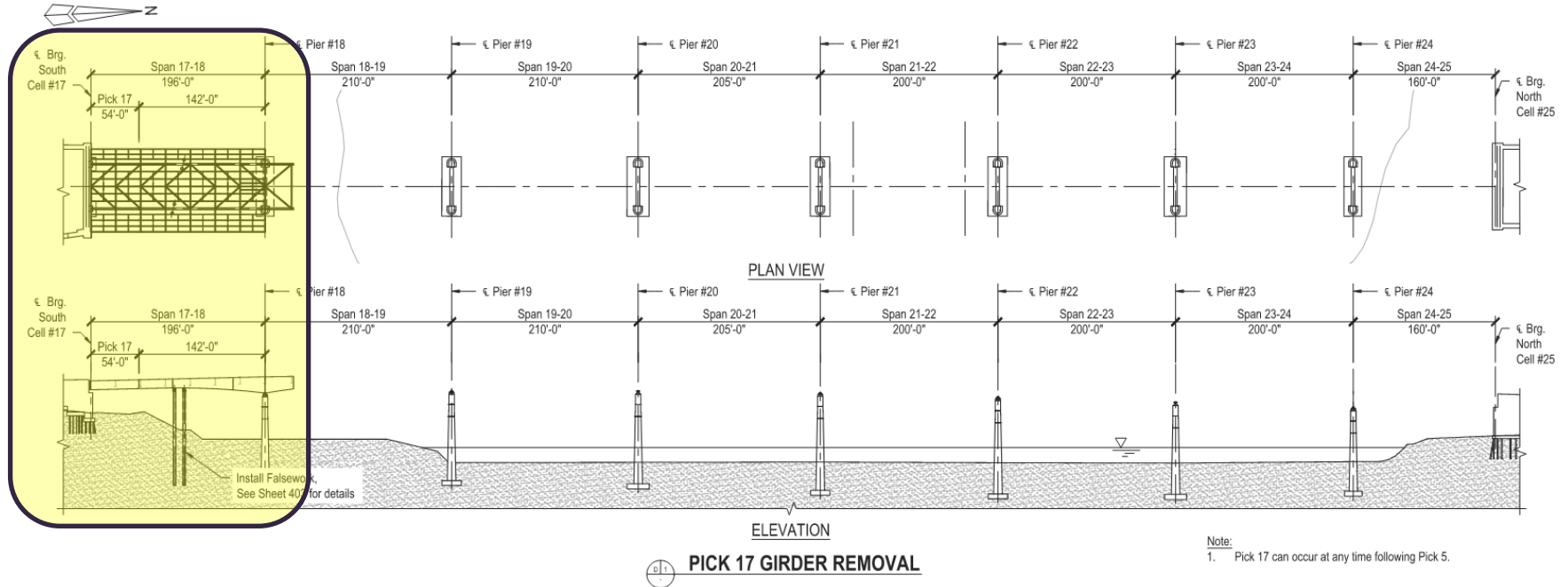
Girder Removal Stage 15



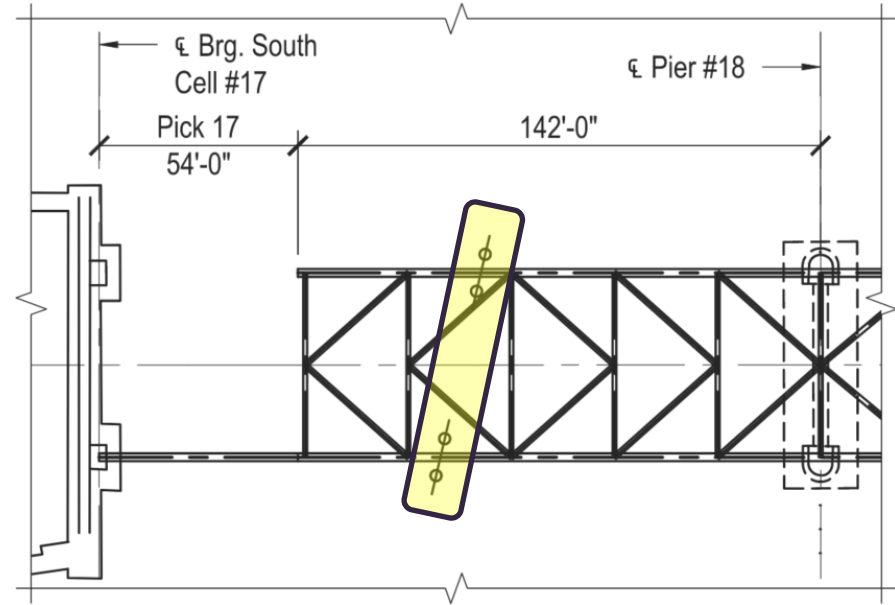
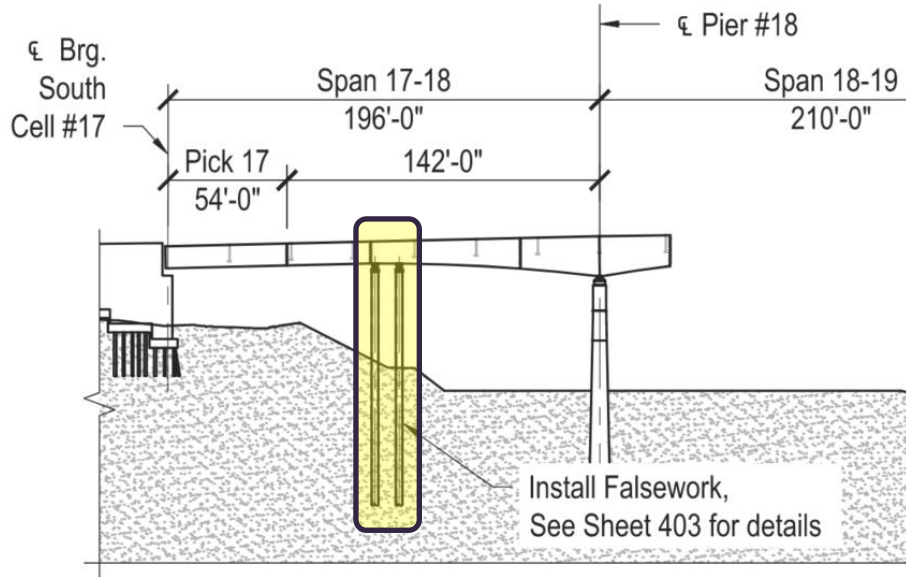
Girder Removal Stage 16



Girder Removal Stage 17



Falsework



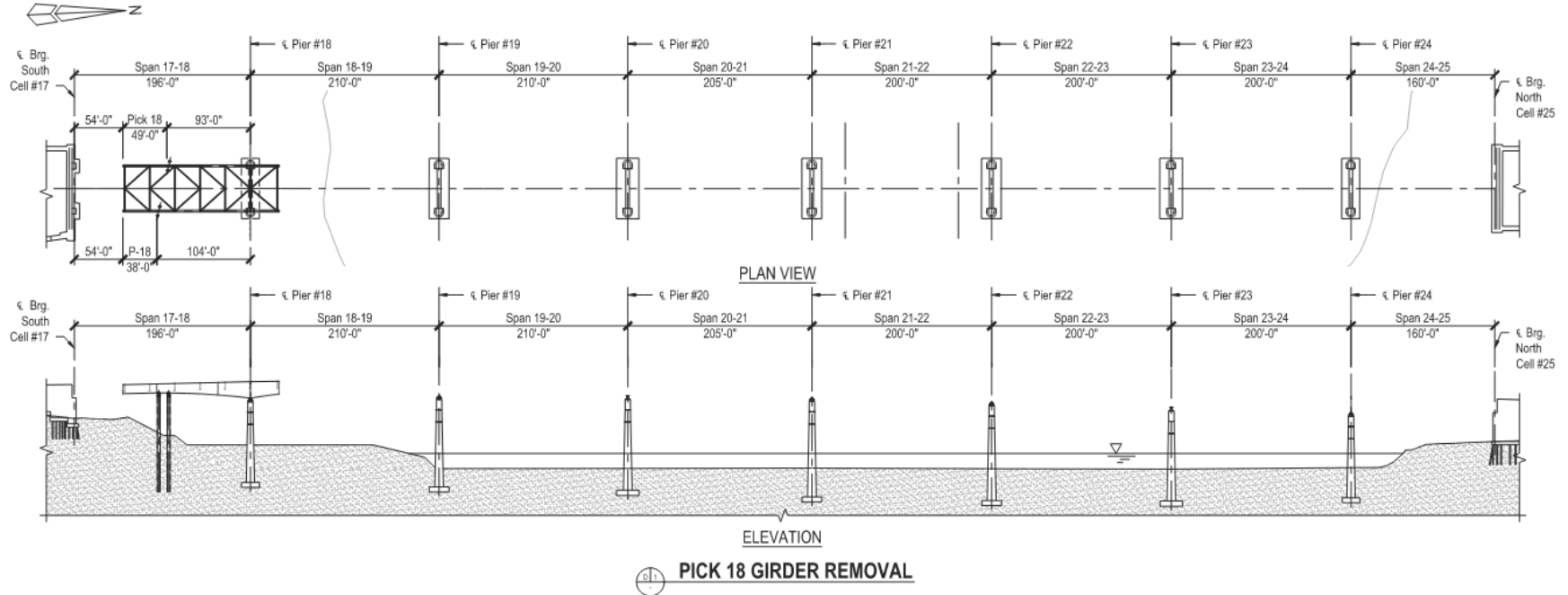
Falsework - Pile Sleeves



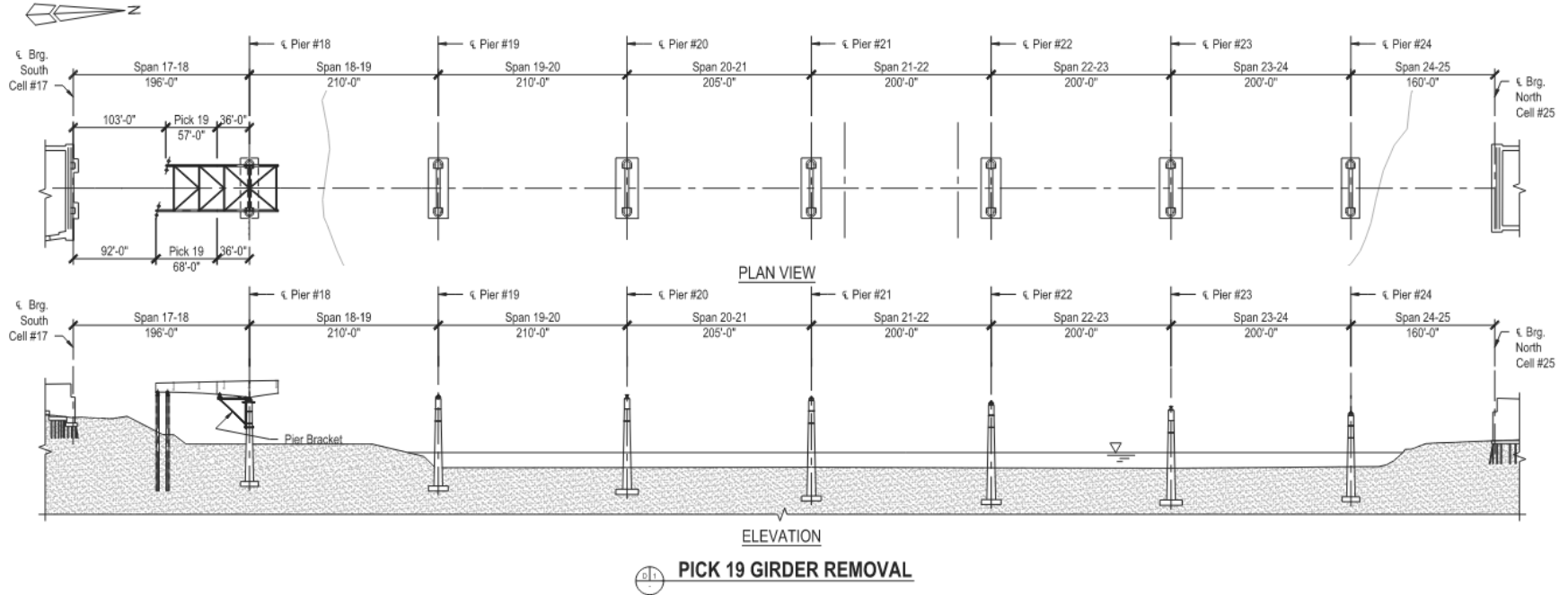
Falsework



Girder Removal Stage 18



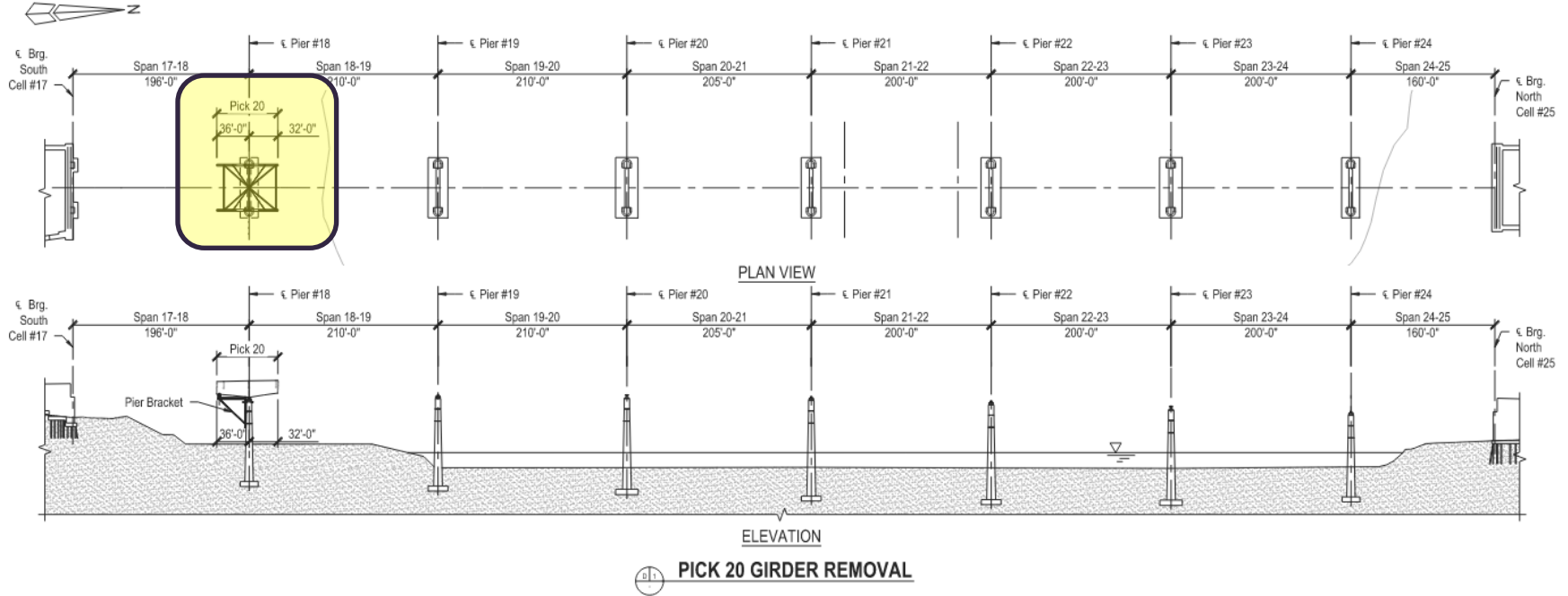
Girder Removal Stage 19



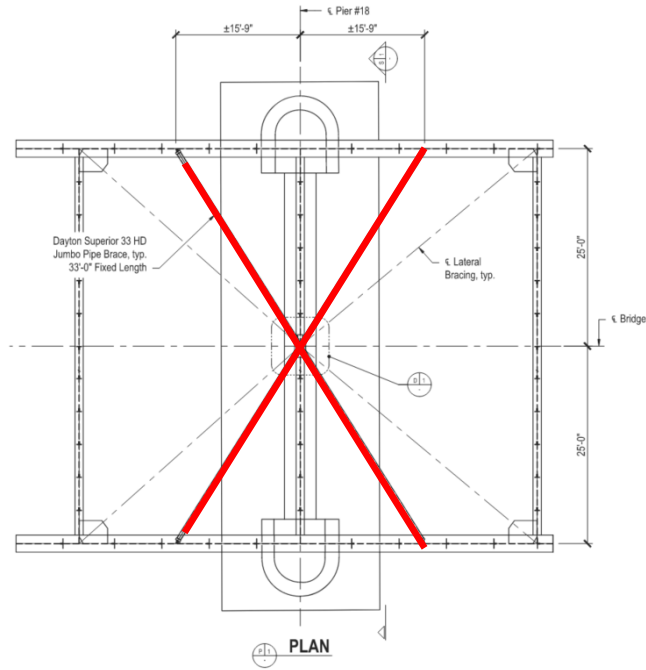
Custom Girder Clamps



Girder Removal Stage 20



Final Girder Braces



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Current Status



Questions?



30 Crossing Construction. Panorama demolition old I-30 bridge at Pier 24, North Little Rock, Arkansas. October 25, 2022. ©David Hoge IMM03195-pano.ar

Photo Credit: David Hoge