Innovative, Resilient, and Cost Effective Buried Bridge Case Studies

Steel In Action 2025 Summer Webinar Series
Short Span Steel Bridge Alliance
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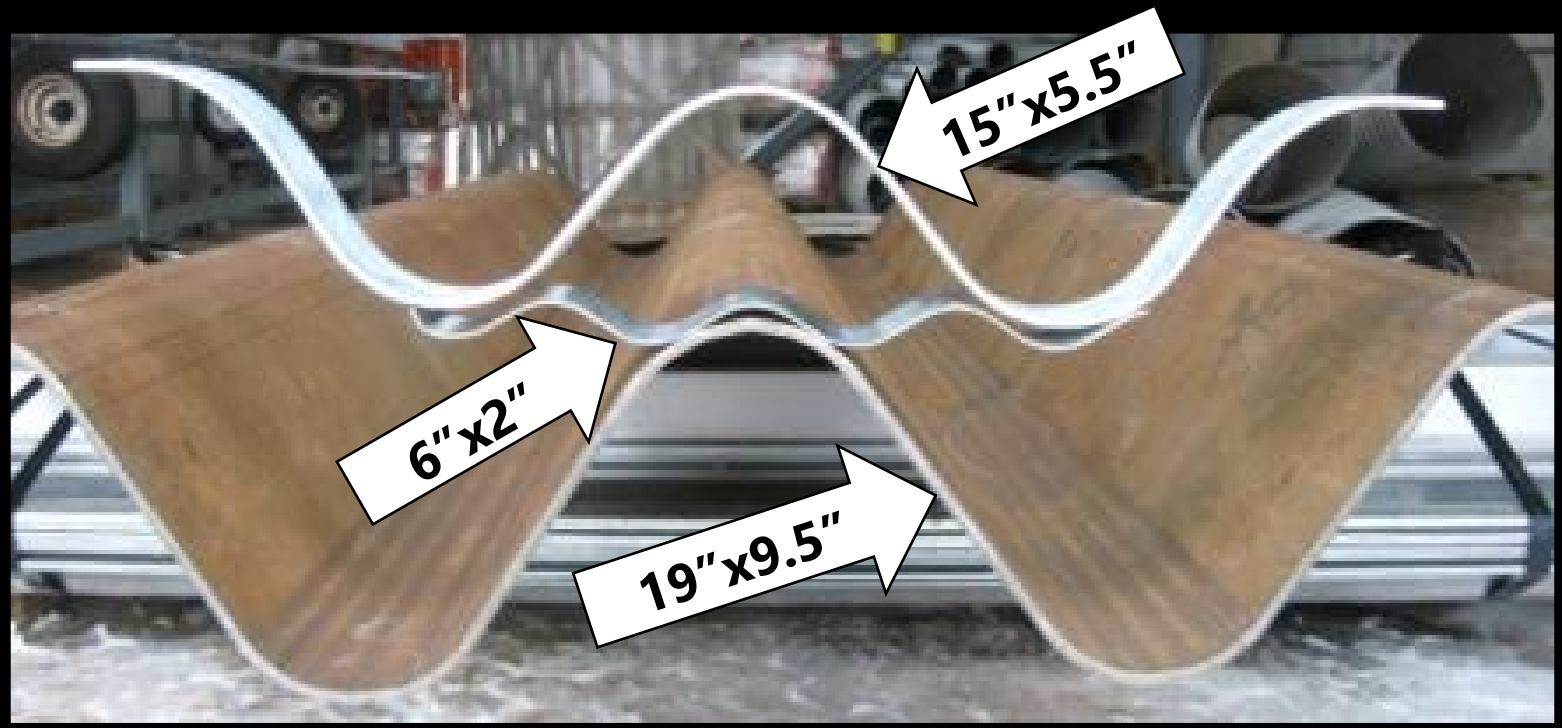
Definition of Buried Bridges

- >20’ span buried structure that works with granular backfill to support loads through soil-structure interaction
- Made with corrugated steel - Flexible & able to accommodate differential movement
- Subject of numerous webinars, conference sessions, & workshops – design, ABC, resilience, durability / service life, large span applications, load rating, low volume roads, and other topics
- Meet governing agency (e.g. AASHTO, CHBDC, etc.) materials, design, construction, and load rating requirements.

Buried Bridge Materials

- Shallow Corrugated Steel Structural Plate (6” x 2” profile) or aluminum (9” x 2.5” profile)
- Deep Corrugated Steel Structural Plate (> 5” corrugation profile depth)
- Deep Corrugated is ~9x stiffer than shallow corrugated steel & 6.25x stiffer than aluminum
- Deep Corrugated is ~33% stronger than shallow corrugated & ~100% stronger than aluminum.
- Structures are flexible - differential settlement tolerance of ~6” over 50 ft.



Advantages & Applications

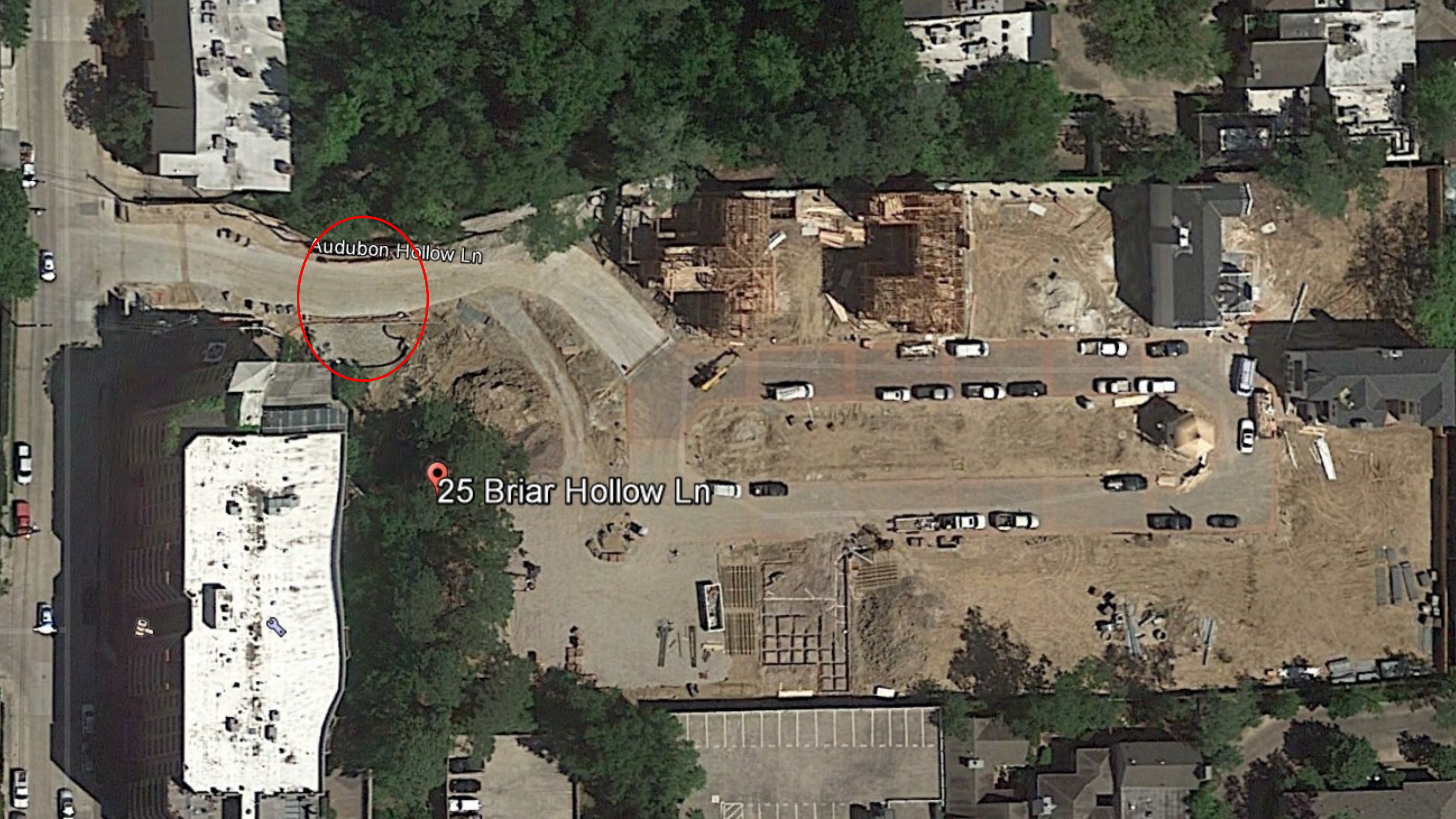
- Wildlife Crossings / AOP
- Value Engineered Solutions
- Grade Separation
- Challenging Geotechnical Conditions
- Bridge Replacement / Rehabilitation
- Single Span Alternative to Multi-Cell Crossings

- Structurally Redundant / Resilient
- Lower Cost Foundations
- Reuse Bridge Foundations
- Emergency / Temp / Detour Bridges
- Staged Construction
- No “Bump at the end of the bridge”
- Low Maintenance Cost & Easy to Inspect
- Able to Carry Heavy Loads

Audubon Hollow – Houston, TX

- **Only point of site access**
- **32.25’ span deep corrugated steel arch with 3’ cover**
- **Staged construction with temporary & permanent MSE wire walls**
- **Tight site constraints – congested, up against property line**
- **Wanted to construct the crossing quickly to gain site access to start work while site details being finalized**
- **Used recycled concrete for backfill – almost 100% recycled content for structure + backfill**


Audubon Hollow Ln
25 Briar Hollow Ln


Audubon Hollow Ln
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JCB

I-95 Temporary Bridge over North Ave Attleboro, MA

- Carrying I-95 traffic during replacement of twin bridges
- VE alternative to Bailey Bridge
- Saved 4mo & over $1 million on project & won job for contractor
- 100 plates assembled in one 16hr day by first time contractor
- Incorporated MSE Wire Headwalls to avoid interference with new bridge abutments.

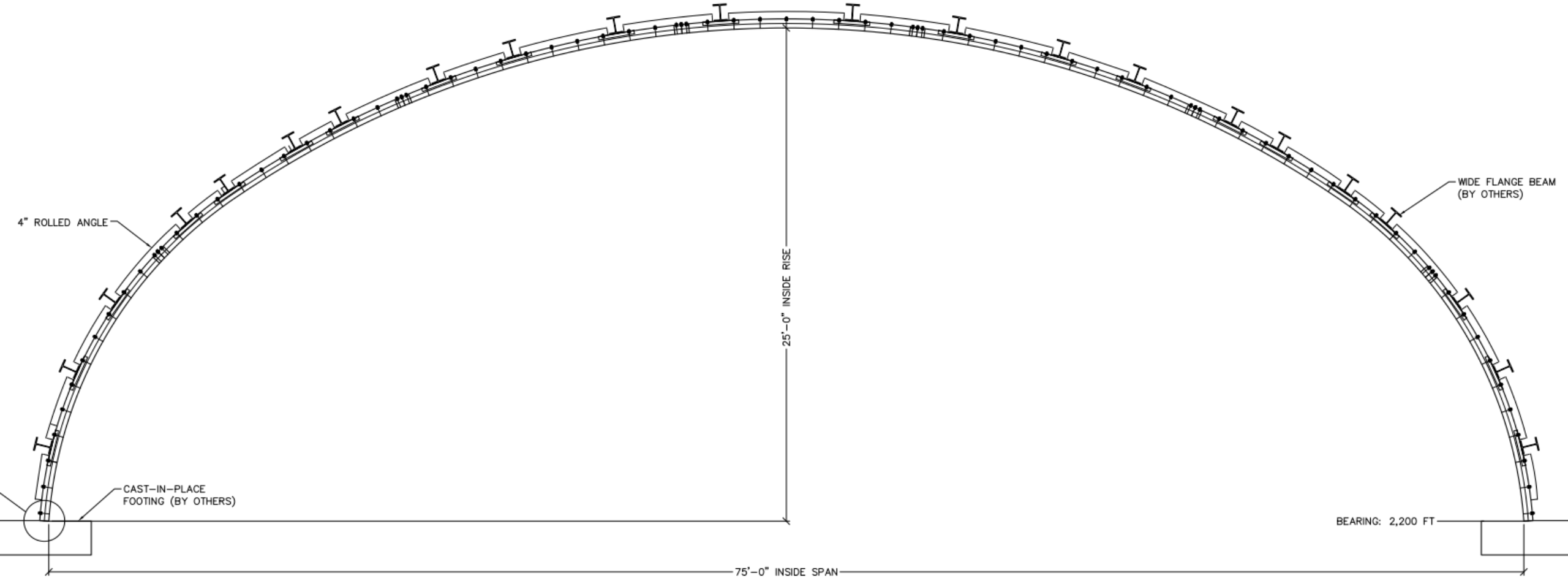

DEERE
220D
United Rentals

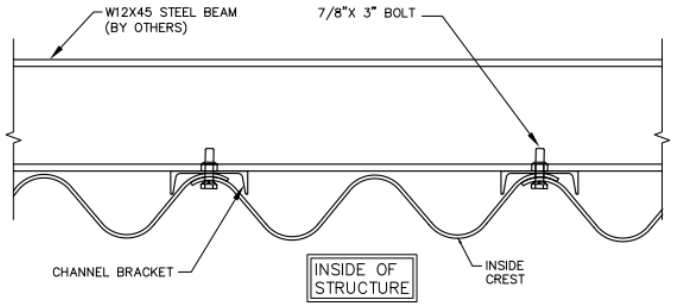

DEERE

1 Year in Service

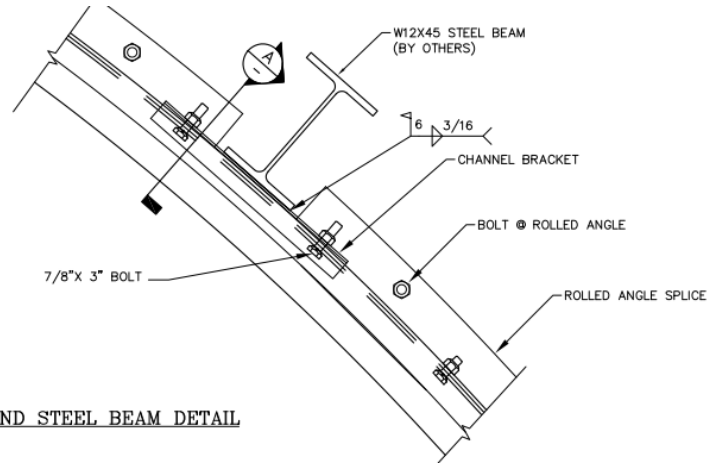
Captain William Henry Moore Bridge
Skagway, Alaska

- Replacement for suspension bridge unable to support mining equipment loads
- Crossing deep ravine - ~100’ from bottom of structure to top of road
- 18° skewed ends needed because of site constraints
- Backfilled with roller compacted concrete
- Assembled on foundation in 3 pieces

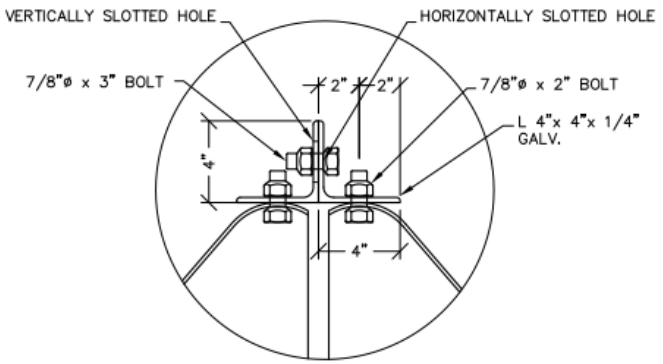




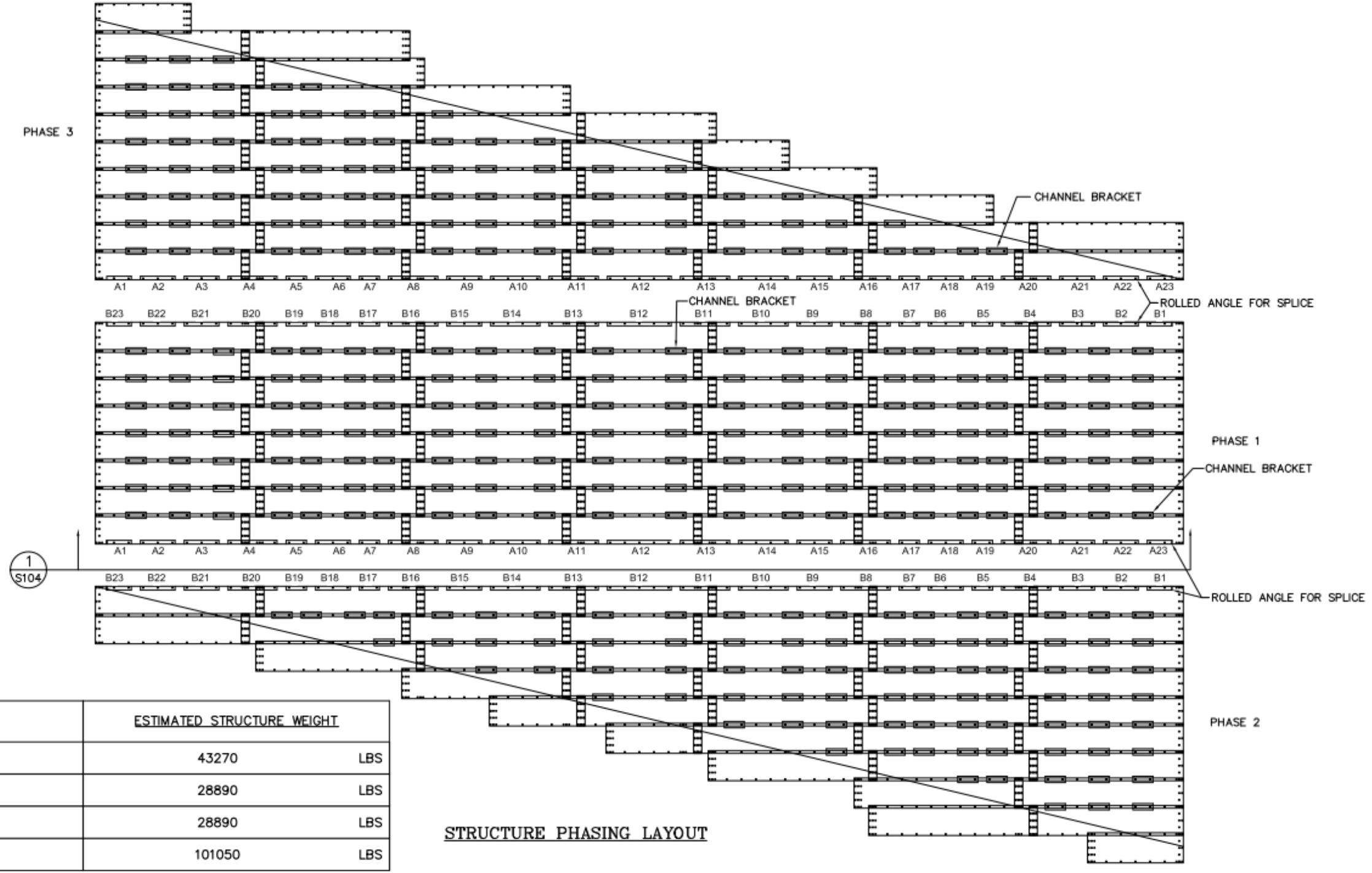
SECTION A



8 S104 CHANNEL BRACKET AND STEEL BEAM DETAIL



5 S103 PLATE ANGLE CONNECTION DETAIL



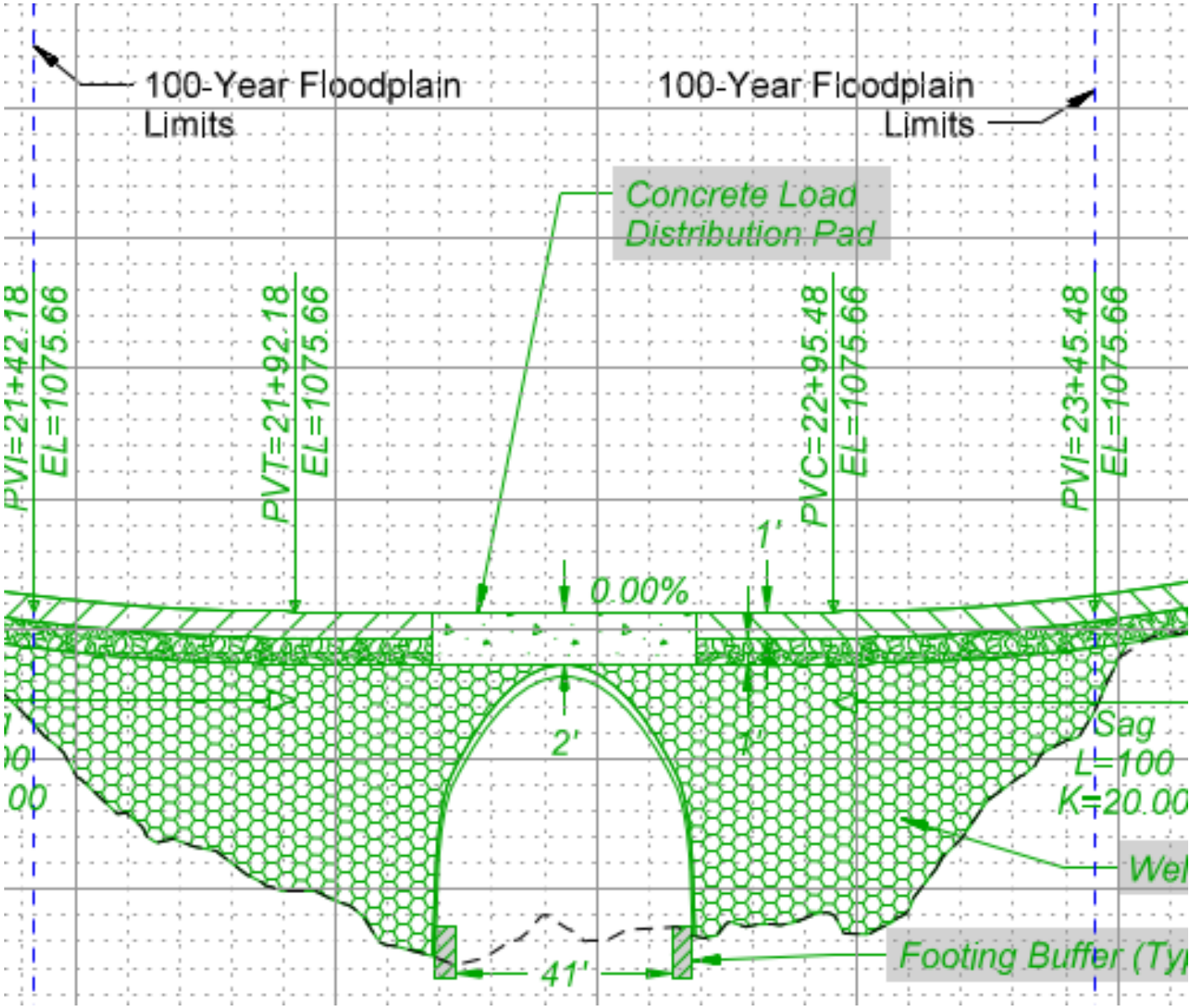
PHASE	ESTIMATED STRUCTURE WEIGHT	
1	43270	LBS
2	28890	LBS
3	28890	LBS
TOTAL WEIGHT:	101050	LBS

STRUCTURE PHASING LAYOUT

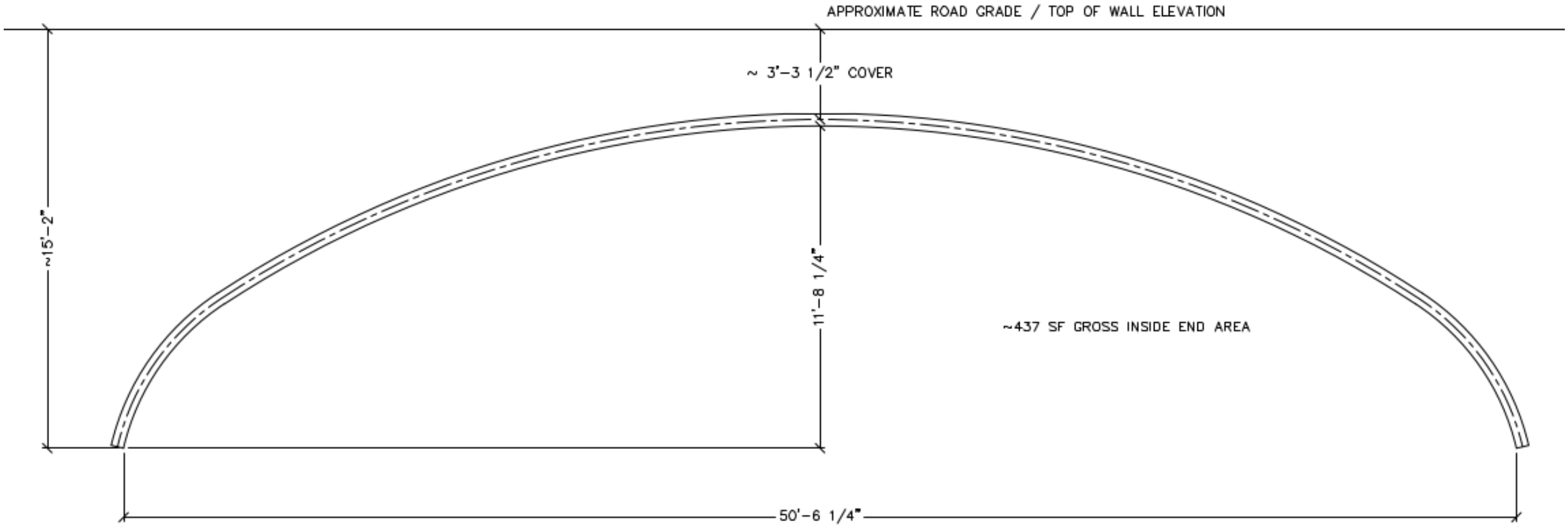

KUBOTA

Knife River Yard – Burnet County, TX

- Honey Creek crossing
- 50’6” span x 11’8” rise low profile arch with MSE wire walls
- Designed for CAT 770 haul trucks
- Overtopped by ~10’ during July 2025 flooding.
- Flood waters removed concrete barriers above structure, stripped away some of the pavement and fill down to first layer of geogrid



Knife River Yard – Burnet County, TX



Knife River Yard – Burnet County, TX

Additional Projects

Spokane, Washington

40’ cover, phased construction

Knox County, Indiana 53’ x 24’
E80 Loading


Union Township, Pennsylvania
Bridge Replacement, Skewed Ends

Gray, Maine
Bridge Replacement, Reused Foundation

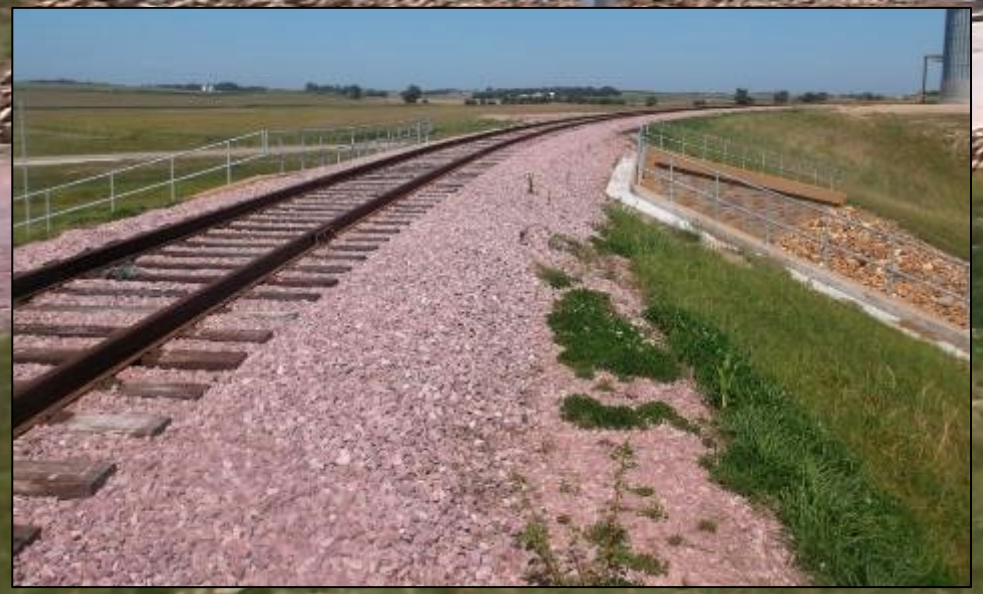

Craig, Alaska
Built by tribal forces


Knoxville, Tennessee
~33'+ span with step beveled ends


Findlay, Ohio 48’ x 21’
I-75 Bridge Replacement, Staged Construction
Genie


Topeka, Kansas
Reline of 40’ span x 200’ long concrete arch under I-70

Randolph, Nebraska 50’ x 17’
Grade Separation with E80 Loading




Irvine, California
Pedestrian Crossing, Sustainable Construction


Laguna Niguel, California
Twin 39.7’ span x 13.2’ rise Buried Bridges
Hydraulic Improvements & Signature Entrance to City Park


LaCygne, Kansas 53’ x 25’
Grade Separation

Banff, Alberta Animal Crossing

Thank You

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