

An aerial photograph showing a covered bridge crossing a river. The bridge has a green roof and wooden sides. The surrounding area is densely wooded with green trees. To the left of the bridge, there is a house with a white roof and a blue roof section, and a paved area. To the right, there is a paved path or driveway. The river is brownish and flows through the center of the image.

KINGSLEY COVERED BRIDGE

CLARENDON BO 1443(55)
TH 39, BRIDGE NO. 28 OVER MILL RIVER

ALTERNATIVES PRESENTATION

MARCH 22, 2021

PRESENTATION OUTLINE

- Purpose and Need
- Background
- Inspection Findings
- Rehabilitation Alternatives
- Right of Way, Utilities, Fire Protection
- Summary
- Cost
- Anticipated Schedule
- Questions



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PURPOSE AND NEED

Purpose

- Evaluate the Kingsley Covered Bridge for continued Special Use on Roads crossing the Mill River and to extend its service life

Need

- Continue to provide access for vehicles across Mill River in the eastern part of the Town of Clarendon



BACKGROUND

- Bridge constructed in 1836, Rehabilitated in 1949 & 1987
- Listed in National Register of Historic Places in 1974
- Town Lattice Trusses:
 - 121' Long (Portal to Portal)
 - 15'-7" On Center
 - 12'-1" Vertical Clearance (Posted for 11'-0")
 - Posted Weight 3 Tons
- Substructures: Reinforced Concrete Abutments Founded on Bedrock



INSPECTION FINDINGS

- National Bridge Inspection Standard Condition Ratings
 - 9 = Excellent
 - 0 = Failed Condition - Closed
- Overall bridge condition is rated 5 or fair.
 - Deck condition is rated 7 or good.
 - Superstructure condition is rated 5 or fair.
 - Substructure condition is rated 7 or good.
 - Channel condition is rated 8 or very good.



INSPECTION FINDINGS: METAL ROOF

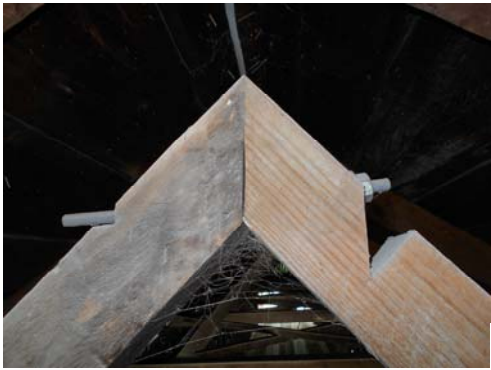
Paint Blistering,
Fading, Ridge
Cap Attached
with Nails &
Screws, Trees
Overgrown



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INSPECTION FINDINGS: ROOF MEMBERS

Splits, Breaks,
Rot,
Overcuts,
Insect
Damage



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INSPECTION FINDINGS: BRACING MEMBERS

Guy wires
not well
anchored



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INSPECTION FINDINGS: LATTICE MEMBERS

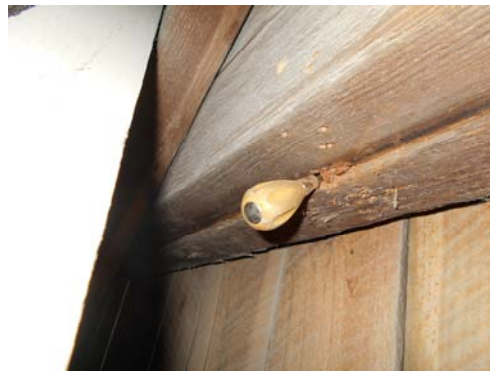
Large Gaps at
Previous
Splices, Splits,
Breaks, Rot,
Insect
Damage



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INSPECTION FINDINGS: TOP CHORD MEMBERS

Out of Plumb,
Splits, Breaks,
Rot, Insect
Damage



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INSPECTION FINDINGS: BOTTOM CHORD MEMBERS

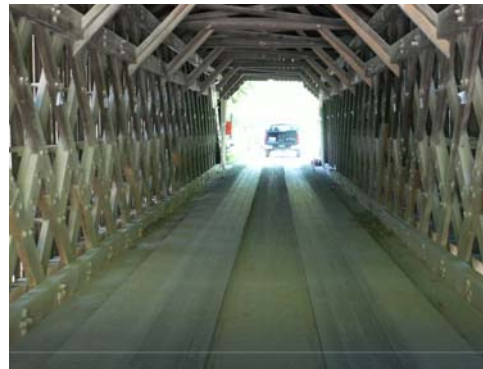
Bedding
Timbers
Rotted,
Settling of
Trusses,
Rusting of
Bolts



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INSPECTION FINDINGS: FLOOR MEMBERS

Runners Trap
Debris,
Ramps Each
End



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INSPECTION FINDINGS: SUBSTRUCTURE

Concrete
Cracks,
Spalling,
Delamination,
Efflorescence
Staining



REHABILITATION ALTERNATIVES

- Bridge Rehabilitation is feasible based on:
 - Current condition of bridge.
 - Deterioration type and level of section losses observed.
- Rehabilitation includes:
 - Repair, Strengthening or Replacement of bridge members
- Bridge Loads
 - Snow – 50 PSF Ground, 27 PSF Roof Applied
 - Wind – 22 PSF
 - Live Load – H3 (3-Ton), H12 (12-Ton), H15 (15-Ton) and H20 (20-Ton)



ROOF MEMBERS



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ROOF MEMBERS – RECOMMENDED WORK

Roof Framing

- New Standing Seam Metal Roof
- Rafters are 3"x5" or 4"x5" Eastern Spruce
- Roof Boards are 1" thick Eastern Hemlock
- 20% Replacement of Existing Roof Boards
- 12 Rafters (19%) to be Replaced due to Condition
- 5 Rafters to be Epoxy Repaired



LATERAL BRACING MEMBERS



LAT. BRACING MEMBERS – RECOMMENDED WORK

Lateral Bracing Members

- Upper Bracing Includes 8”x9” Crossbeams, 4”x5” “X” Braces and 4”x4” Org. Knee Braces and 4”x5” Knee Braces
- Bracing Members are Eastern Spruce
- 3 Crossbeams (27%) to be Replaced due to Condition and 5 Epoxied Repaired
- 3 Braces (15%) to be Replaced due to Condition
- 5 - 4”x5” Knee Braces (23%) and 2 - 4”x4” Knee Braces (9%) to be Replaced due to Condition



LAT. BRACING MEMBERS – RECOMMENDED WORK

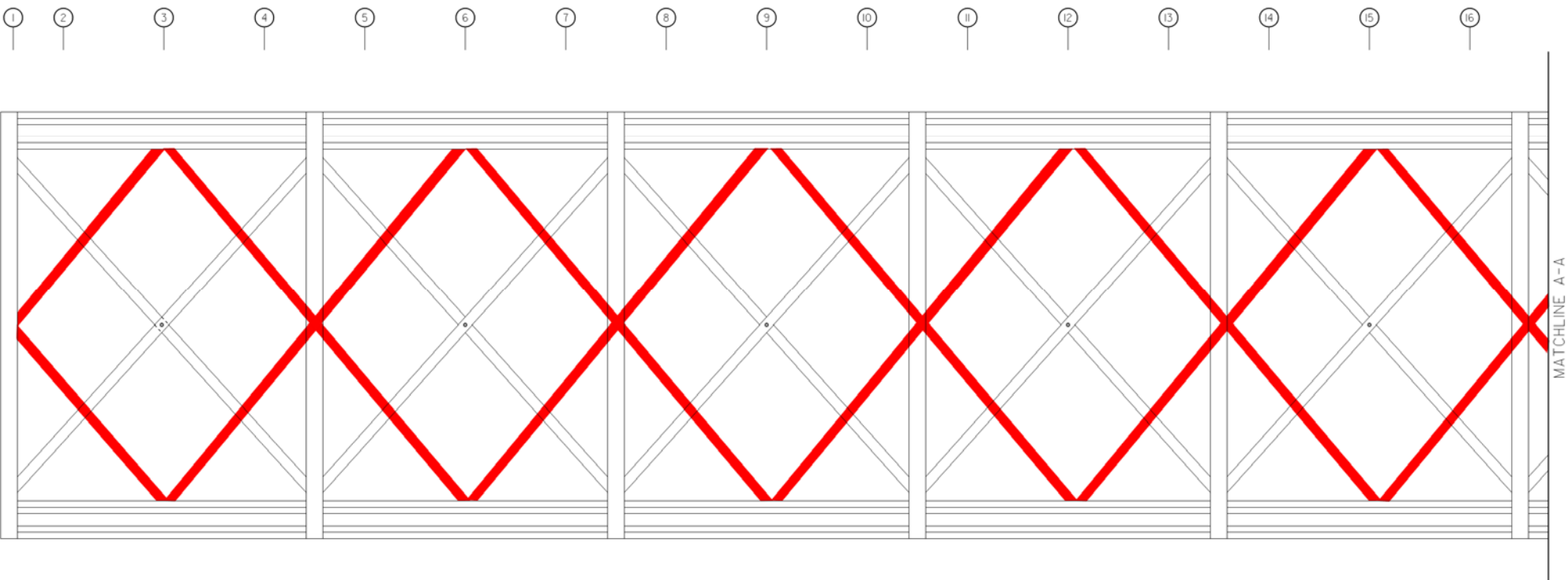
Guy Wiring Members

- Existing Lateral Bracing not Adequate to allow removal of guy wiring.
- Strengthen Crossbeam to Chord connection or
- Add Additional Lateral Bracing Below the Crossbeam



Green River Covered Bridge, Guilford

LAT. BRACING MEMBERS – RECOMMENDED WORK



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FLOOR FRAMING MEMBERS



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Hoyle, Tanner
& Associates, Inc.

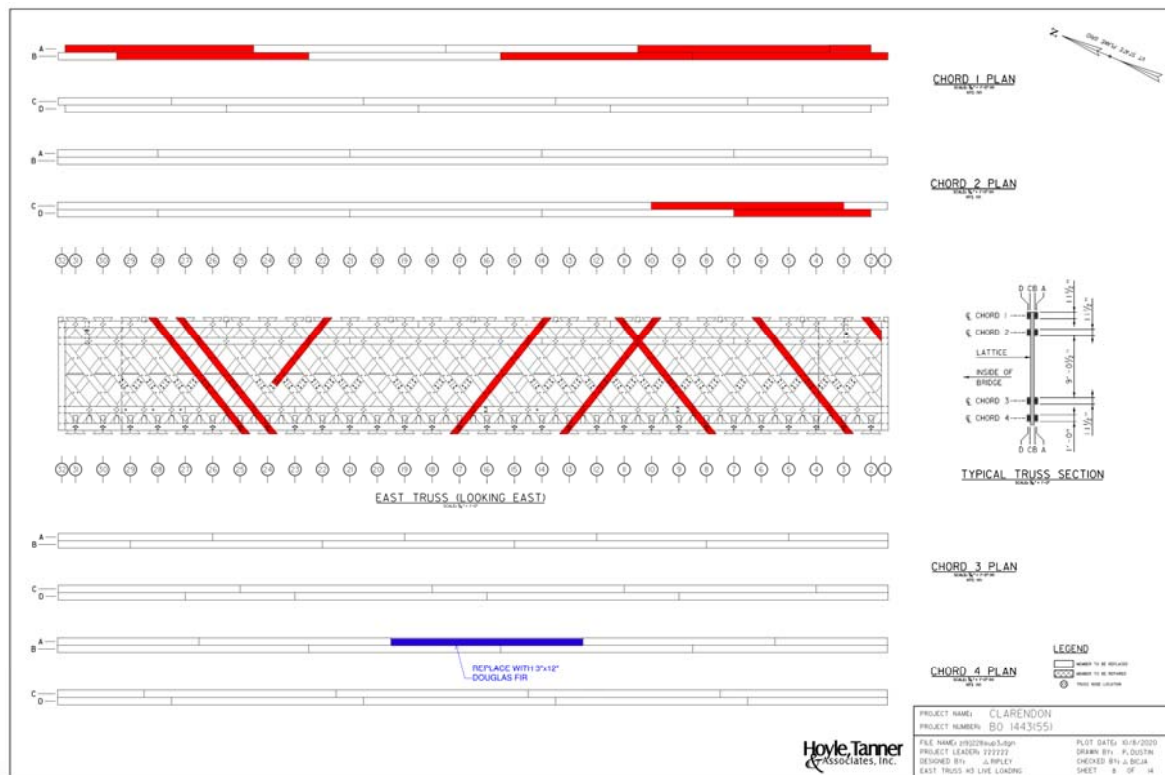
FLOOR MEMBERS – RECOMMENDED WORK

Floor Framing Members

- Floor Members Include 8”x14” Floorbeams, 2”x6” Nail Laminated Deck and 3” thick Runner Boards
- Floorbeams are Southern Pine and Decking is Eastern Spruce
- Nail Laminated Deck Adequate for H20
- Floorbeams Adequate for H15
- Replace Runner Boards with full width Runners
- No Floorbeam/Deck Replacement or Repair Required for H3, H12 or H15



REHABILITATION ALTERNATIVES: H3 EAST TRUSS



Lattice Replacement 12%
 Chord Replacement 12%

Legend:

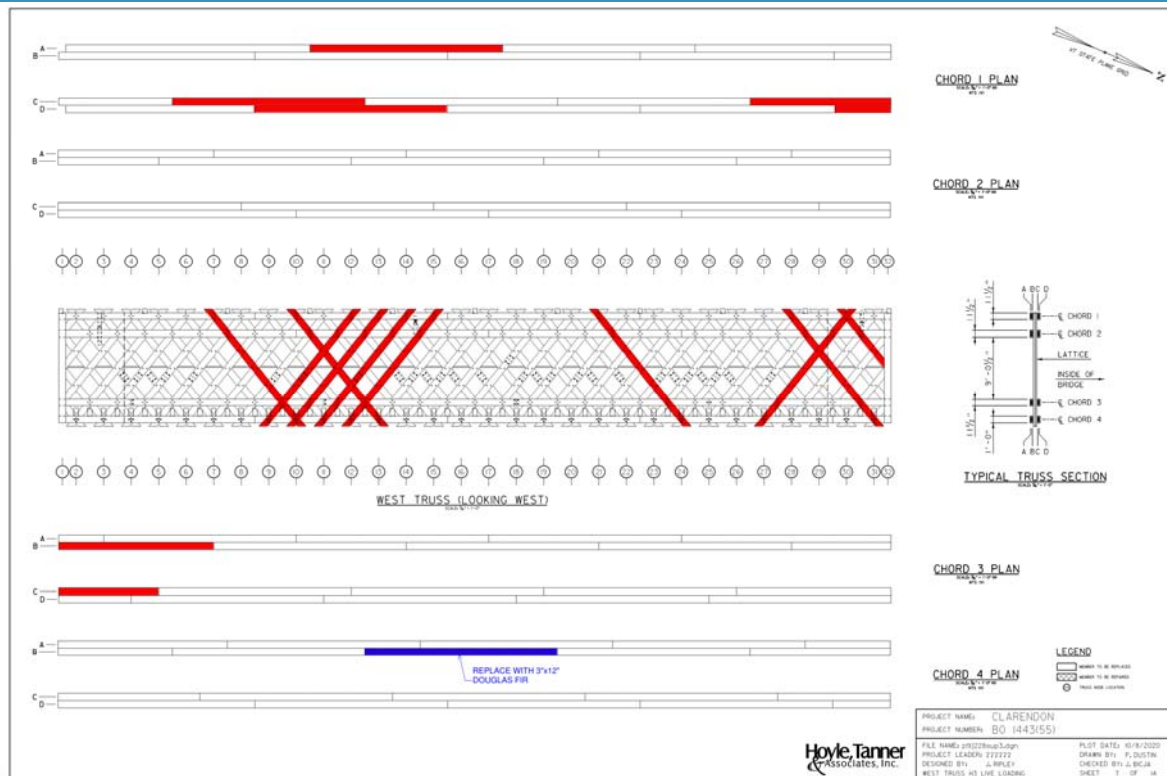
Red – Replace due to Condition
Blue – Replace due to Strength



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REHABILITATION ALTERNATIVES: H3 WEST TRUSS



Lattice Replacement 16%

Chord Replacement 10%

Legend:

Red – Replace due to Condition

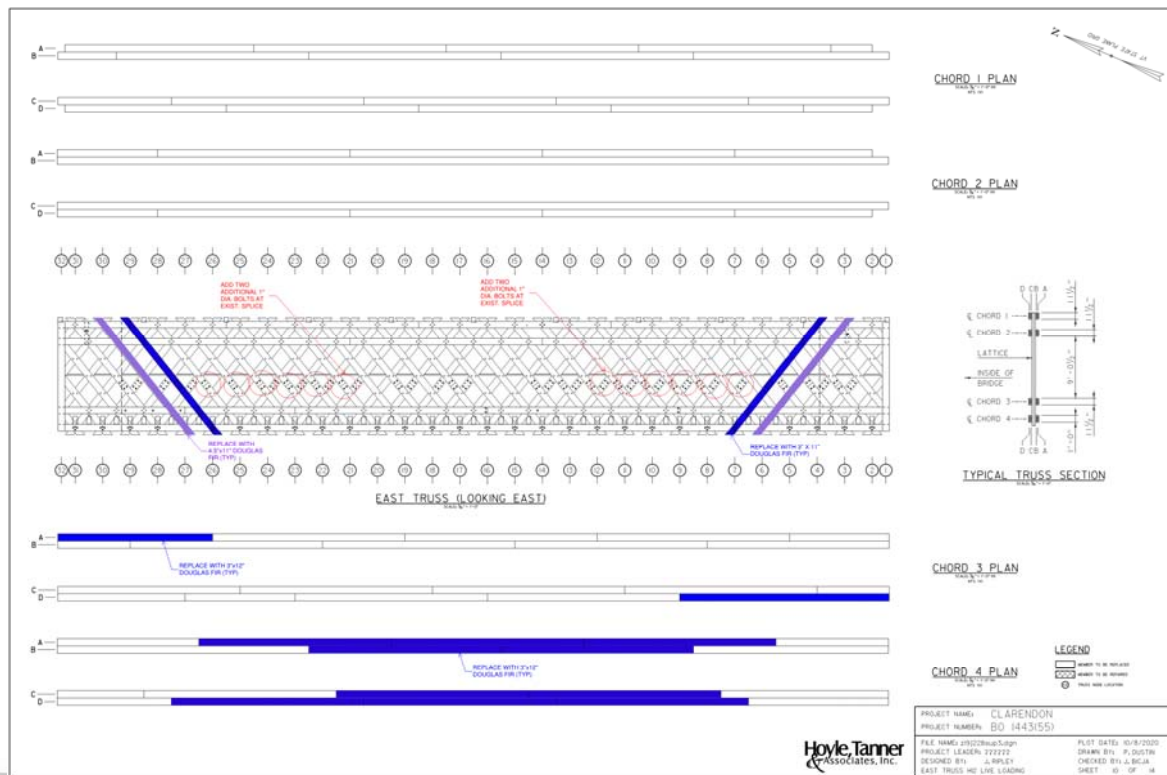
Blue – Replace due to Strength



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REHABILITATION ALTERNATIVES: H12 EAST TRUSS



Lattice Replacement +7%

Chord Replacement +18%

Legend:

Blue – Replace due to Strength

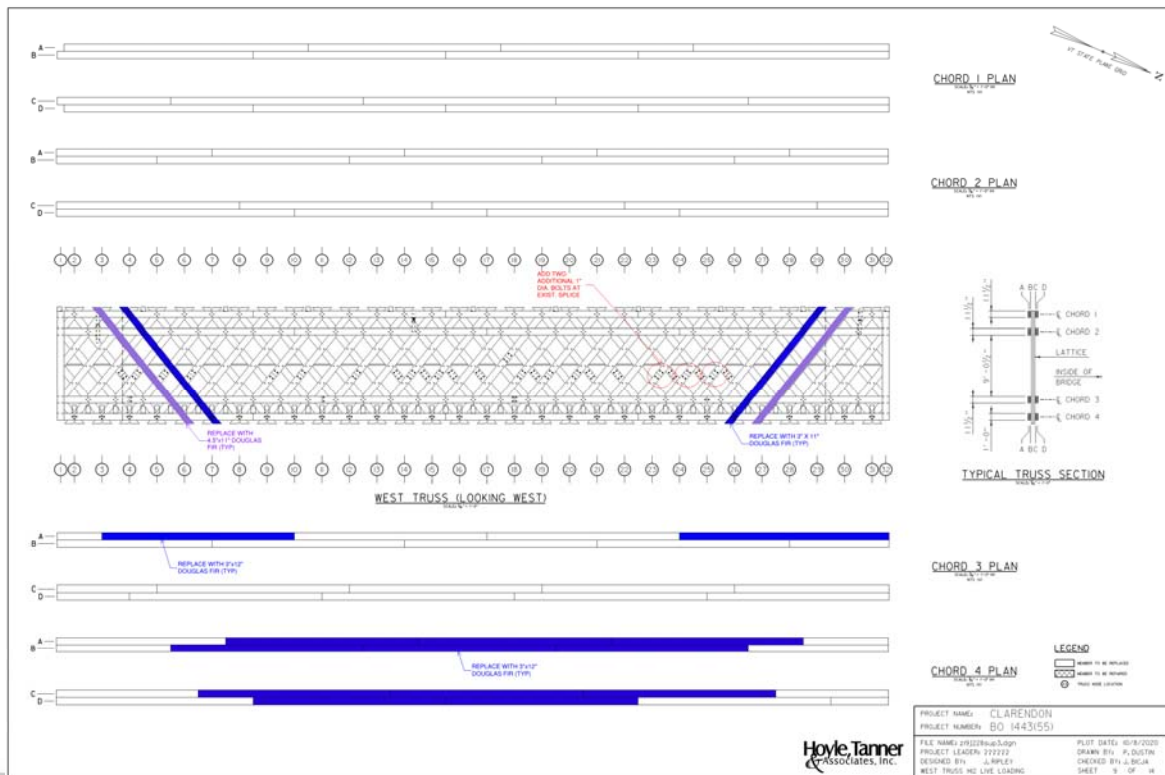
Purple – Replace due to Strength w/Larger Size



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REHABILITATION ALTERNATIVES: HI2 WEST TRUSS



Lattice Replacement +7%
Chord Replacement +20%

Legend:

Blue – Replace due to Strength

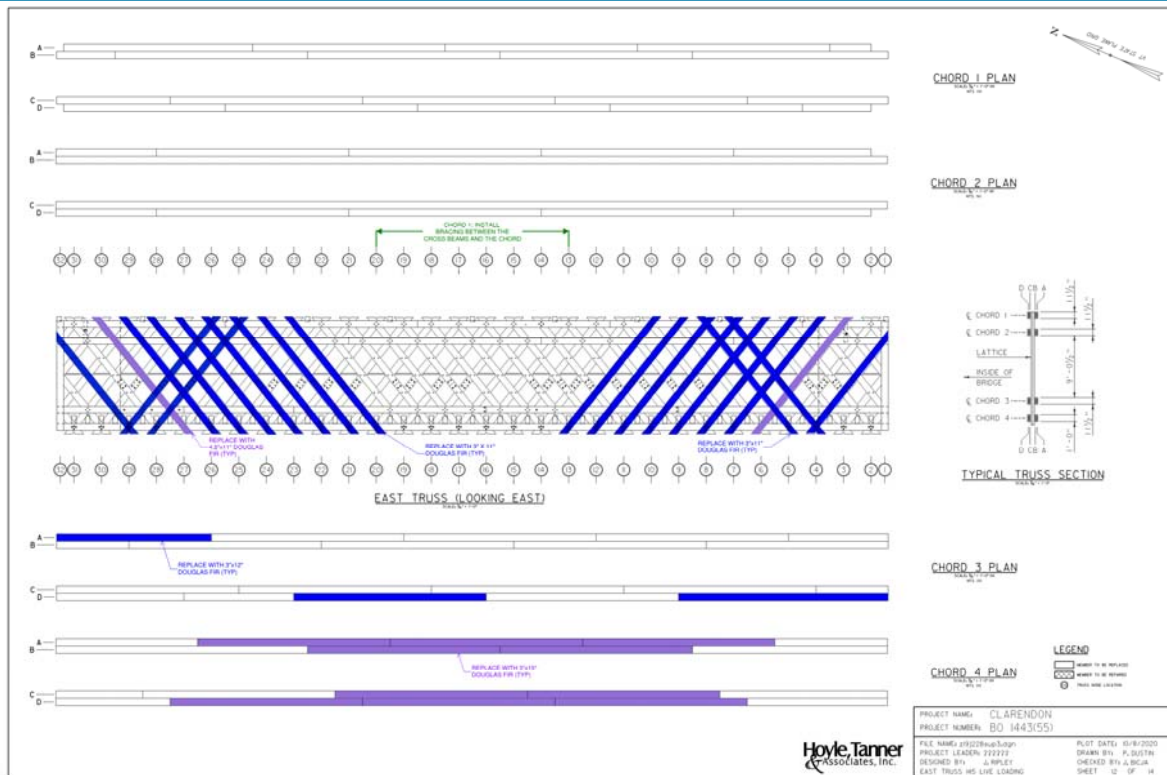
Purple – Replace due to Strength w/Larger Size



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REHABILITATION ALTERNATIVES: HI 5 EAST TRUSS



Lattice Replacement +37%

Chord Replacement +19%

Legend:

Blue – Replace due to Strength

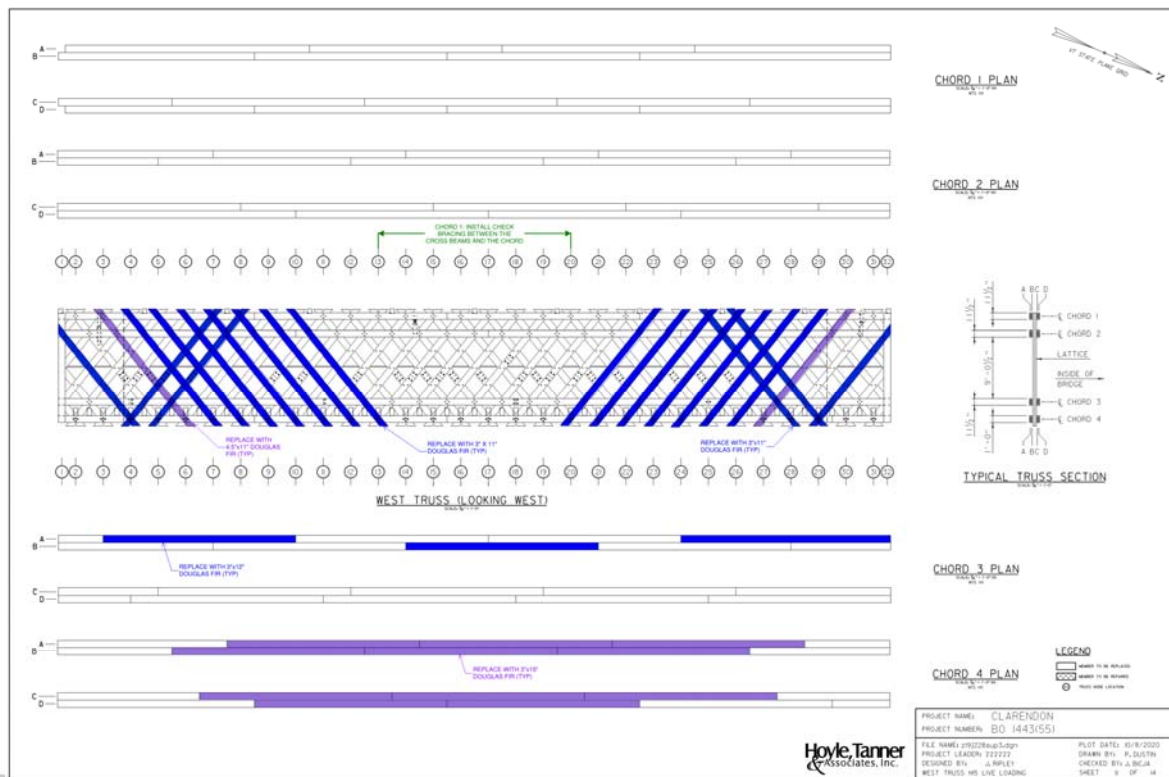
Purple – Replace due to Strength w/Larger Size



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REHABILITATION ALTERNATIVES: HI5 WEST TRUSS



Lattice Replacement +37%

Chord Replacement +21%

Legend:

Blue – Replace due to Strength

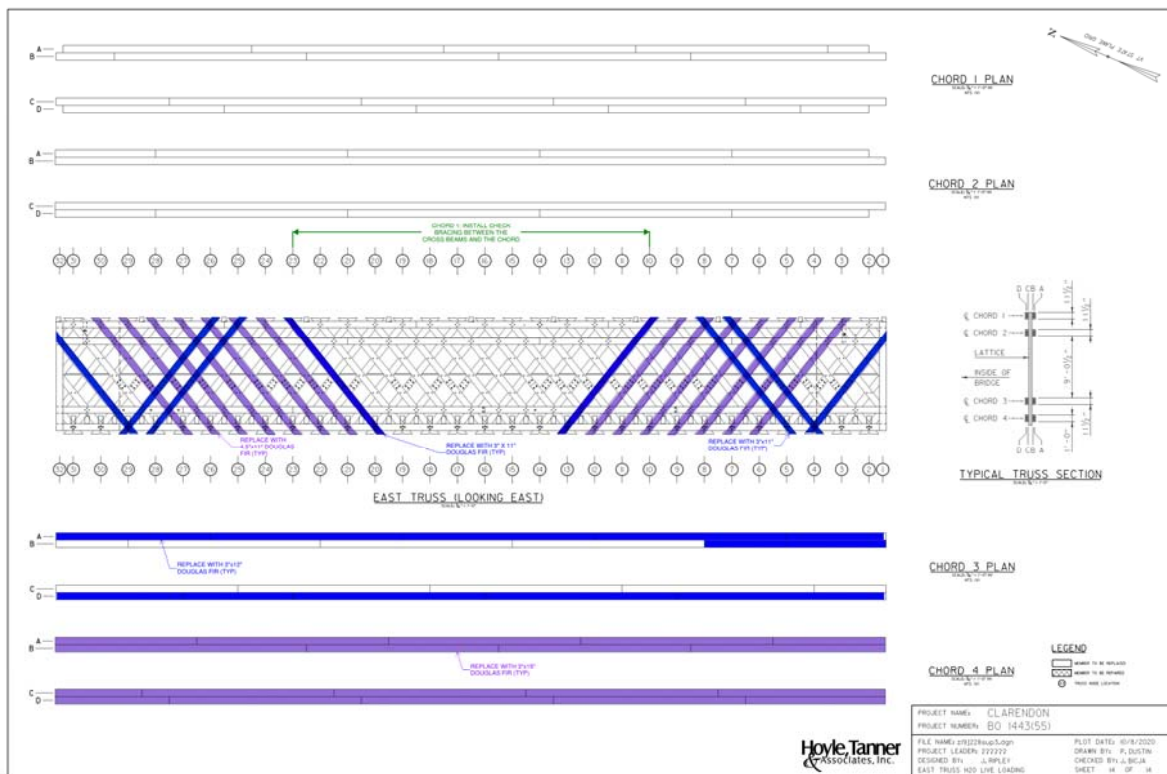
Purple – Replace due to Strength w/Larger Size



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REHABILITATION ALTERNATIVES: H20 EAST TRUSS



Lattice Replacement +37%

Chord Replacement +39%

Legend:

Blue – Replace due to Strength

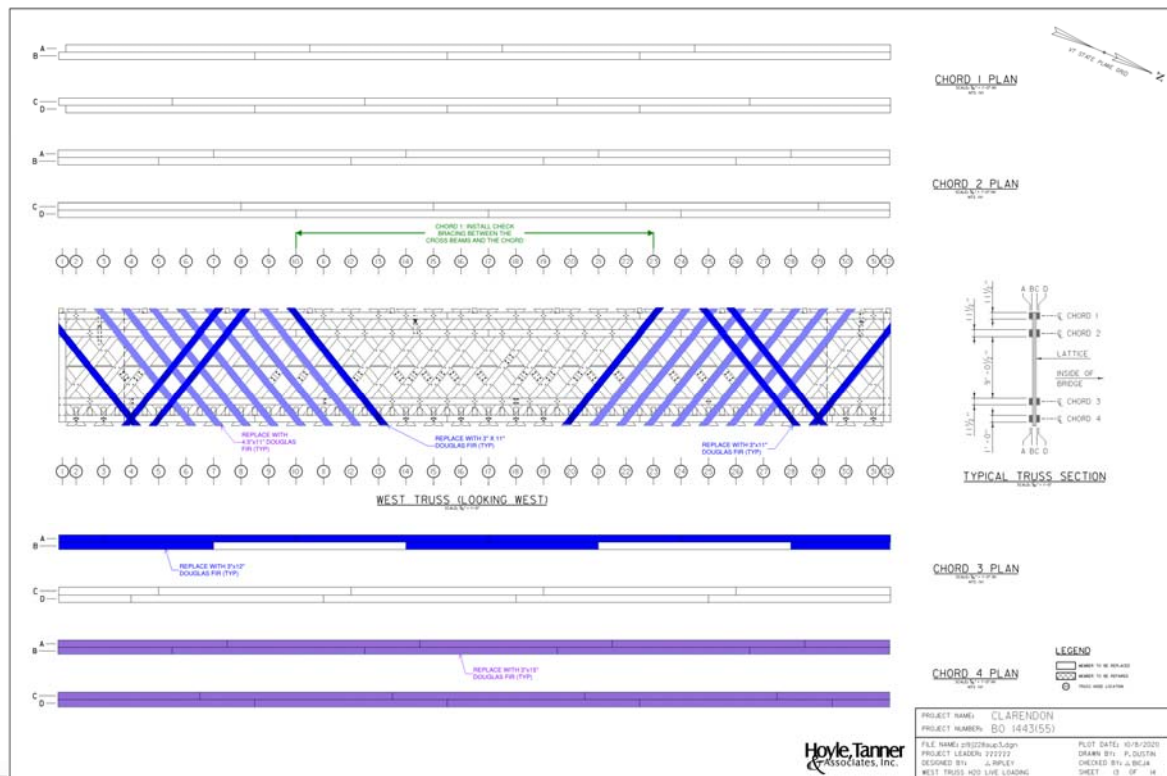
Purple – Replace due to Strength w/Larger Size



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REHABILITATION ALTERNATIVES: H20 WEST TRUSS



Lattice Replacement +37%

Chord Replacement +41%

Legend:

Blue – Replace due to Strength

Purple – Replace due to Strength w/Larger Size



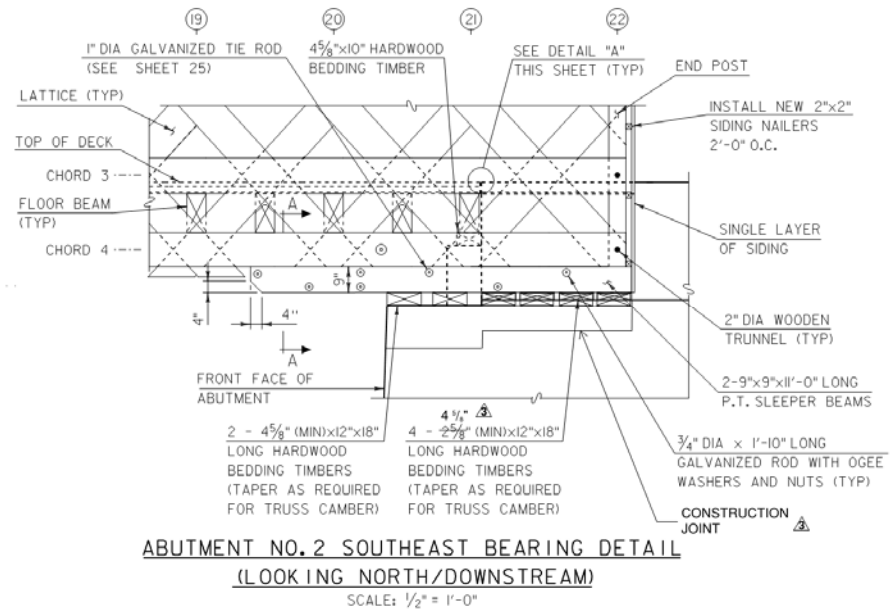
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REHABILITATION ALTERNATIVES: TRUSS BEARINGS



Existing Bearing Blocks



ABUTMENT NO. 2 SOUTHEAST BEARING DETAIL
(LOOKING NORTH/DOWNSTREAM)
SCALE: 1/2" = 1'-0"

Longley Covered Bridge, Montgomery

SUBSTRUCTURE – RECOMMENDED WORK

Substructure

- Concrete Repair / Crack Sealing
- Stain And Seal Concrete



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RIGHT OF WAY, UTILITIES, AND FIRE PROTECTION

- Right of Way is 3-Rod
- Relocation of Utilities may be Required
- Insecticide/Fungicide
- Fire Protection
 - Recommend NOCHAR
 - Protectowire/Sprinkler
 - Lighting



SUMMARY

- Superstructure Replacements/Repairs
- Substructure Repairs
- Approach Work
 - 250' of Roadway Reconstruction
 - New Signage
 - New Steel Backed Timber Guardrail



COST SUMMARY

- Alternative 1 - Rehabilitation for H3 (3-Ton) Loading - \$2.07M
- Alternative 2 - Rehabilitation for H12 (12-Ton) Loading - \$2.24M
- Alternative 3 - Rehabilitation for H15 (15-Ton) Loading - \$2.35M
- Alternative 4 - Rehabilitation for H20 (20-Ton) Loading - \$2.82M



ANTICIPATED SCHEDULE





QUESTIONS