ABC with Bridge Kits

Jeff Parrett
Vice President, Wheeler Lumber

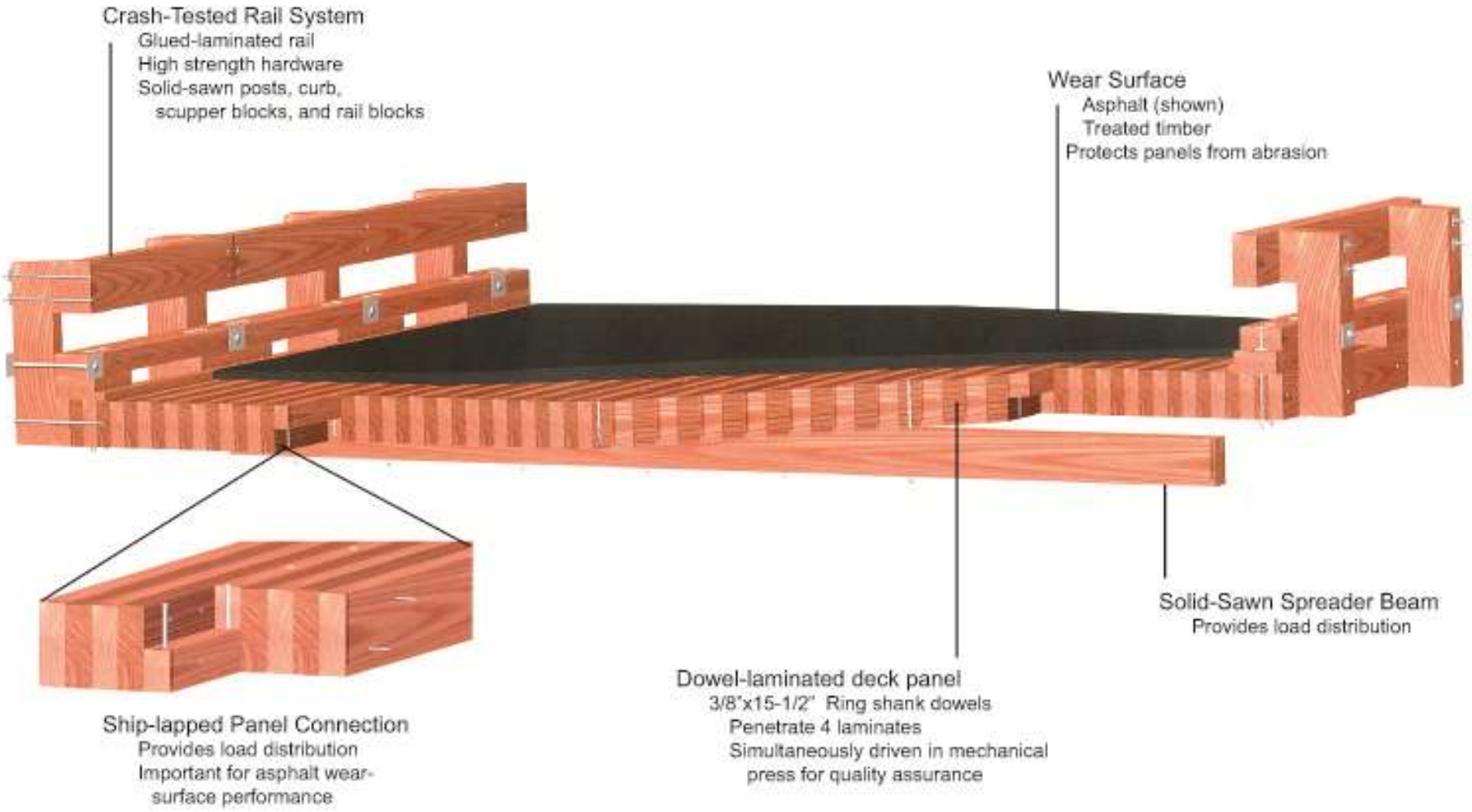
33rd Annual North Central Local Roads Conference
Rapid City, SD - October 17-18,2018

Panel-Lam Bridge Kits

Overview

- Panel-Lam System
- New Construction
- Repair/Renovation
- Owner or Contractor Built

Longitudinal Timber Deck Panels



Pre-manufactured Kits

- Shop Fabricated
- Shipped as Components
- Complete Material Package
- No Formwork

Proven System

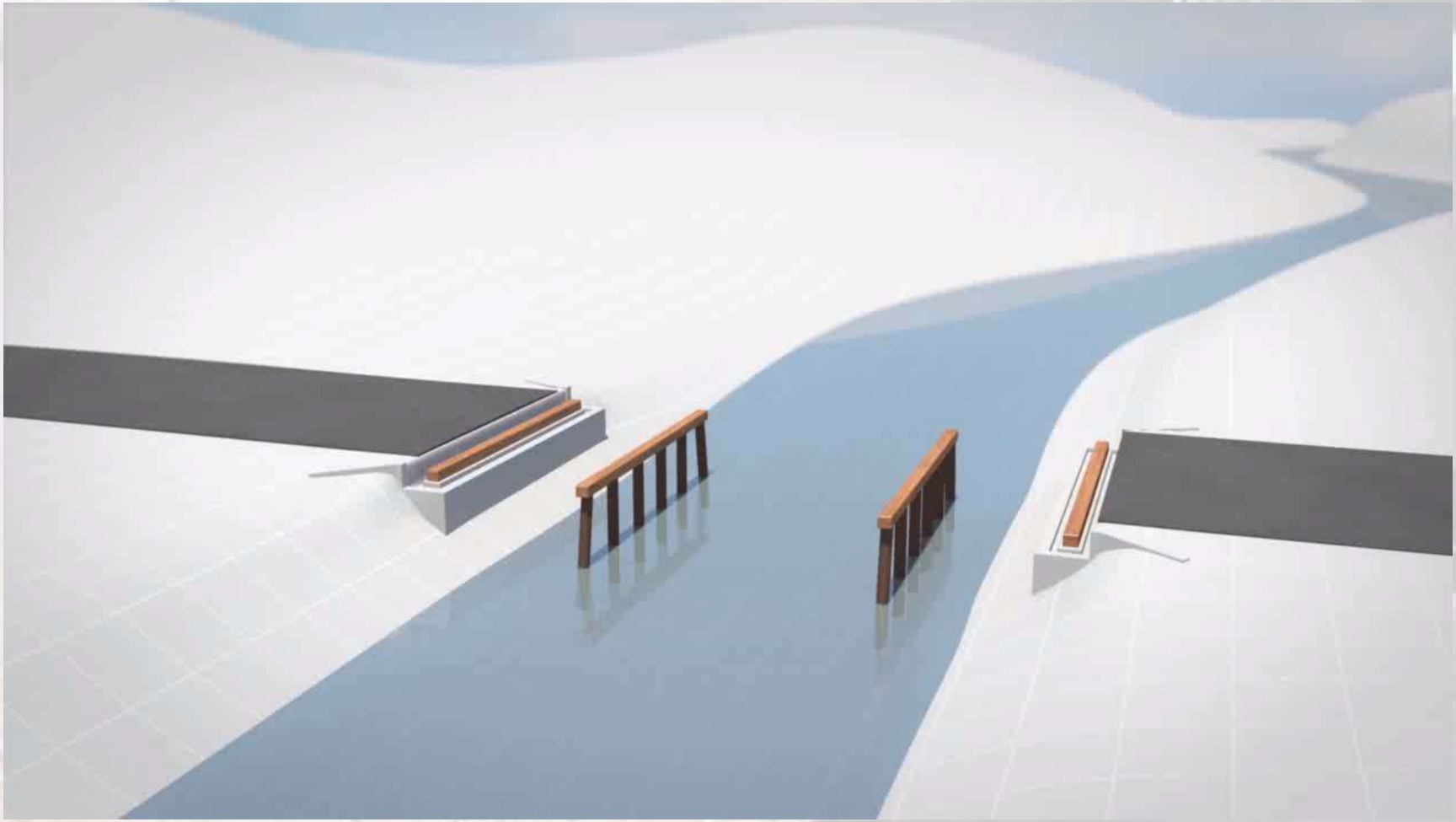
- Durable Treatment
- Typical Details
- Standard Equipment
- No Specialty Labor

Single Span

Multiple Span

Foundations

Installation



Wood County, WI - Young Road

SPECIFICATIONS:

GRADING
ALL DOUGLAS FIR-LARCH TO BE GRADED PER WCLIB STANDARD GRADING RULES.

MATERIALS & TREATMENT
TIMBER PRESERVATIVE TREATMENT SHALL BE IN ACCORDANCE WITH CURRENT STATE AND/OR AASHTO SPECIFICATIONS. ALL TIMBER SHALL BE COPPER NAPHTHENATE TREATED UNLESS NOTED OTHERWISE.

DECK TO BE 12" DOUGLAS FIR-LARCH, NO.2, S1S.

BRIDGE RAILPOST TO BE DOUGLAS FIR-LARCH, DENSE SELECT STRUCTURAL.

GLU-LAM RAIL TO BE DOUGLAS FIR, COMB. SYMBOL 24F-V8, DF/DF.

ABUTMENT & PIER CAPS TO BE DOUGLAS FIR-LARCH, NO.1.

CURBS & SCUPPERS TO BE DOUGLAS FIR – LARCH, NO.1.

BALANCE OF TIMBER TO BE DOUGLAS FIR – LARCH, IN ACCORDANCE WITH DESIGN REQUIREMENTS.

ALL TIMBER IS ROUGH UNLESS OTHERWISE NOTED.

MISCELLANEOUS
ALL TIMBER TO BE CUT TO EXACT LENGTH, DRESSED TO SIZE REQUIRED AND ALL PRACTICAL FRAMING TO BE DONE PRIOR TO TREATMENT.

ALL DECK PLANKS SHALL BE PREDRILLED PRIOR TO TREATMENT.

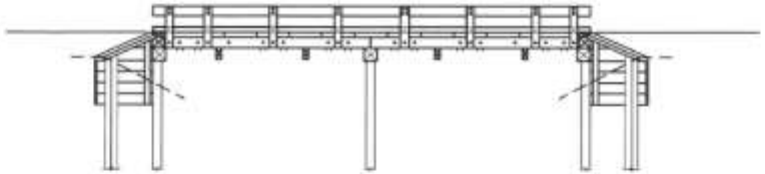
ALL PLANK FOR DECK PANELS SHALL BE PRECISION END TRIMMED TO LENGTH WITH 1/4" UNDERLENGTH & NO OVERLENGTH TOLERANCE PERMITTED.

DECK PANELS SHALL BE ASSEMBLED WITH 3/8" DIAMETER RING SHANK DOWELS. ALL DOWELS ARE TO BE SIMULTANEOUSLY DRIVEN WITH EQUAL FORCE USING A MECHANICAL PRESS THE FULL LENGTH OF THE DECK, ENSURING ALL HEADS ARE FLUSH WITH THE SURFACE OF THE TIMBER PLANK. MULTIPLE IMPACT TOOLS ARE NOT TO BE USED TO SET DOWELS BECAUSE OF POTENTIAL FOR WOOD FIBER RUPTURE.

DECK PANELS WILL BE DELIVERED TO JOBSITE AFTER BEING FULLY ASSEMBLED AT FABRICATION PLANT.

ALL HARDWARE TO MEET ASTM A307-97 GALVANIZED TO A153. ALL HIGH STRENGTH HARDWARE TO MEET ASTM A325 OR A449 GALVANIZED TO A153. ALL STRUCTURAL STEEL TO MEET ASTM A36, GALVANIZED TO A123.

WOOD COUNTY, WISCONSIN
YOUNG ROAD OVER ELM CREEK
DOUBLE SPAN PANEL-LAM BRIDGE



BRIDGE ELEVATION

INSTALLATION NOTE:
HIGH-STRENGTH (A449) SOME HEAD BOLTS (3/4" x 24") DO NOT HAVE FINS UNDER THE HEAD AT THE SHANK, AND ARE TO BE USED AT THE CURB TO DECK LOCATION.

CONSTRUCTION NOTES:

TIMBER DECK PANELS ARE MARKED IN THE SHOP FOR USE IN FIELD PLACEMENT OF THE PANELS ON THE CAPS, e.g. A1, B1, C1 FOR SPAN 1, A2, B2, C2 FOR SPAN 2.

DOWEL LAMINATED DECK: PANEL "A" IS PLACED FIRST IN ITS FINAL POSITION ON THE CAPS. NEXT DRILL THE 11/16" DIA. HOLES THRU PANEL INTO CAP IN EACH END OF PANEL AT THE LOCATIONS SHOWN AND FASTEN THE 3/4" DIA. SMI. HD. DR. SPKS. NEXT PLACE PANEL "C" SO THAT ITS UPPER SPLICE BLOCK IS DIRECTLY OVER THE LOWER SPLICE BLOCK ON PANEL "A" AND DRAW TIGHT TOGETHER. THEN DRILL THE 9/16" DIA. HOLES THRU LOWER SPLICE BLOCK AND DRIVE THE 5/8" DIA. HD. DR. SPIKES IN LOCATIONS SHOWN. THEN DRILL HOLES THRU PANEL INTO CAP AND FASTEN THE 3/4" DIA. HD. DR. SPKS. THEREAFTER, SUCCESSIVELY PLACE PANELS "D" AND "B" IN THE SAME MANNER, ENSURING ALL PANELS ARE DRAWN TIGHT TOGETHER BEFORE ANY FASTENING OCCURS.

STEEL BANDING ON PANELS IS TO BE REMOVED AFTER PANELS HAVE BEEN PLACED IN THEIR FINAL POSITION ON THE CAPS.

ALL HOLES DRILLED IN THE FIELD WHERE SPIKES ARE USED ARE TO BE 1/16" SMALLER THAN SPIKE SIZE.

ALL HOLES DRILLED FOR BOLTS ARE TO BE 1/16" LARGER THAN BOLT SIZE.

HOLES DRILLED FOR 3/4" LAG BOLTS ARE TO BE 9/16" IN DIAMETER FOR THE THREADED PORTION OF THE BOLT AND 13/16" FOR THE SHANK.

ANY NUT OR MACHINE BOLT HEAD IN DIRECT CONTACT WITH TIMBER TO HAVE ONE PLATE WASHER BETWEEN NUT & TIMBER, OR BOLT HEAD & TIMBER.

ANY NUT OR MACHINE BOLT HEAD IN DIRECT CONTACT WITH STEEL TO HAVE ONE CUT WASHER BETWEEN NUT & STEEL, OR BOLT HEAD & STEEL.

SET THREADS ON ALL BOLTS AT NUT WITH A CENTER PUNCH AFTER TIGHTENING.

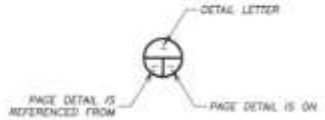
ABUTMENTS TO BE BACKFILLED WITH A CLEAN GRANULAR FILL.

ALL TIMBER CUT OR DRILLED IN THE FIELD SHALL BE TREATED WITH AN APPROVED PRESERVATIVE.

CONSTRUCTION REQUIREMENTS SHALL CONFORM TO STATE SPECIFICATIONS.

ALTHOUGH ALL PRACTICAL PRE-FRAMING WILL BE DONE PRIOR TO TREATING, SOME CUTTING & DRILLING WILL BE REQUIRED IN THE FIELD.

WISCONSIN
RONALD L. DOKKEN
E-34494
BLOOMINGTON MN
PROFESSIONAL ENGINEER



CALLOUT LEGEND

DO NOT SCALE DRAWINGS

PLAN SHEET INDEX

SHEET	DESCRIPTION
1	COVER SHEET & SPECIFICATIONS
2	GENERAL BRIDGE PLAN & ELEVATION
3	ABUTMENT PLAN & ELEVATION/SECTION/DETAILS
4	PIER PLAN & ELEVATION/DETAILS
5	SECTIONS THRU DECK
6	RAILPOST SECTION & DETAILS

BRIDGE SPAN RATINGS

BRIDGE IS DESIGNED TO AASHTO HL-93 LOADING
RATINGS BASED ON FLEXURE

LOAD	US TONS	
INVENTORY	48.3	
OPERATING	62.6	

REVISION	DESCRIPTION	DATE	INITIALS
1			
2			
3			

COVER SHEET & SPECIFICATIONS

20'/20' (40' TOTAL) TREATED TIMBER SPANS
32'-1" CLEAR ROADWAY
YOUNG ROAD OVER ELM CREEK
WOOD COUNTY, WISCONSIN
PL-1 RAIL SYSTEM

Wheeler
Lumber, LLC
4330 JAMES AVE. S.
BLOOMINGTON, MN 55431

DATE: 7/6/19		TRACKING NO: 718380	SHEET NO.
DWN: LAF	CHK: WEH	ORDER NO: 711-13752	1 OF 6

Removal of Old Structure

Pile Driven by Contractor

H-Pile Cut Off

Pile Caps Placed

Pile-Stays Behind Backing Plank

Filter Fabric

Rip-Rap Placed

Deck Panels Installed

Crash-Tested Railing

Asphalt Overlay

Wood County, WI - Young Road

Juneau County, WI - CTH M

JUNEAU COUNTY, WISCONSIN
COUNTY HIGHWAY "M" BRIDGE
SINGLE SPAN PANEL–LAM BRIDGE

SPECIFICATIONS:

GRADING
ALL DOUGLAS FIR–LARCH TO BE GRADED PER WCLIB STANDARD GRADING RULES.

MATERIALS & TREATMENT
TIMBER PRESERVATIVE TREATMENT SHALL BE IN ACCORDANCE WITH CURRENT STATE AND/OR AASHTO SPECIFICATIONS. ALL TIMBER SHALL BE COPPER NAPHTHENATE TREATED UNLESS NOTED OTHERWISE.

ALL PILING IS TO BE IN ACCORDANCE WITH CURRENT STATE SPECIFICATIONS.

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BRIDGE RAILPOST TO BE DOUGLAS FIR–LARCH, DENSE SELECT STRUCTURAL.

GLU–LAM PAIL TO BE DOUGLAS FIR, COMB. SYMBOL 24F–V8, DF/DF.

ABUTMENT & SPREADER BEAMS TO BE DOUGLAS FIR–LARCH, NO.1.

CURBS & SCUPPERS TO BE DOUGLAS FIR – LARCH, NO.1.

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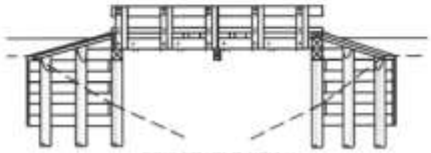
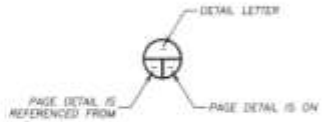


BRIDGE ELEVATION



CALLOUT LEGEND

DO NOT SCALE DRAWINGS

PLAN SHEET INDEX

BRIDGE SPAN RATINGS

BRIDGE IS DESIGNED TO AASHTO HS–20 LOADING

RATINGS BASED ON FLEXURE

LOAD	SPAN	
INVENTORY	HS–29.4	
OPERATING	HS–36.7	

REVISION	DESCRIPTION	DATE	INITIALS
1	WING LENGTH CHANGE	7/15	LAF
2			
3			

CONSTRUCTION NOTES:

EACH DECK PANELS ARE MARKED IN THE SHOP FOR USE IN FIELD PLACEMENT OF THE PANELS ON THE CAPS, e.g. A1, B1, C1 FOR SPAN 1.

DOWEL LAMINATED DECK: PANEL "A" IS PLACED FIRST IN ITS FINAL POSITION ON THE CAPS. NEXT DRILL TWO 17/16" DIA. HOLES THRU PANEL INTO CAP IN EACH END OF PANEL AT THE LOCATIONS SHOWN AND FASTEN THE 3/4" DIA. DW. HD. DR. SPIKS. NEXT PLACE PANEL "C" SO THAT ITS UPPER SPLICE BLOCK IS DIRECTLY OVER THE LOWER SPLICE BLOCK ON PANEL "A" AND DRAW TIGHT TOGETHER. THEN DRILL THE 9/16" DIA. HOLES THRU LOWER SPLICE BLOCK AND DRIVE THE 5/8" DIA. HD. DR. SPIKES IN LOCATIONS SHOWN. THEN DRILL HOLES THRU PANEL INTO CAP AND FASTEN THE 3/4" DIA. HD. DR. SPIKS. THEREAFTER, SUCCESSIVELY PLACE PANELS "C" AND "B" IN THE SAME MANNER, ENSURING ALL PANELS ARE DRAWN TIGHT TOGETHER BEFORE ANY FASTENING OCCURS.

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ABUTMENTS TO BE BACKFILLED WITH A CLEAN GRANULAR FILL.

ALL TIMBER CUT OR DRILLED IN THE FIELD SHALL BE TREATED WITH AN APPROVED PRESERVATIVE.

CONSTRUCTION REQUIREMENTS SHALL CONFORM TO STATE SPECIFICATIONS.

WISCONSIN
RONALD L BOKKEN
E-32491
BLOOMINGTON MN
PROFESSIONAL ENGINEER
7/17/15

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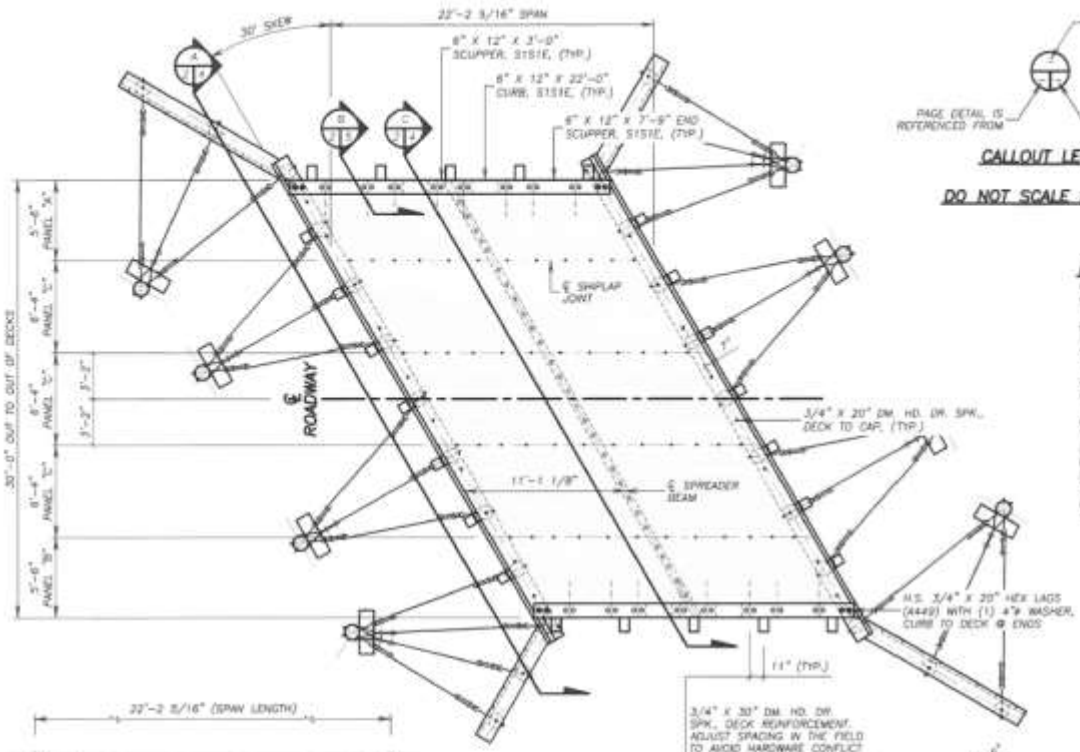
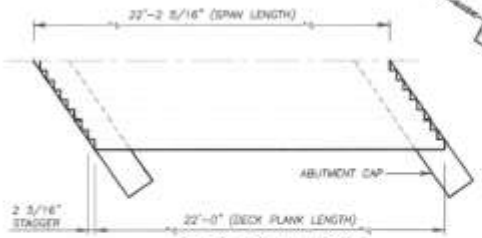
COVER SHEET & SPECIFICATIONS

22'–0" TREATED TIMBER SPAN
28'–1" CLEAR ROADWAY
COUNTY HIGHWAY "M" BRIDGE
JUNEAU COUNTY, WISCONSIN
PL–1 RAIL SYSTEM/30° R.H.F. SKEW

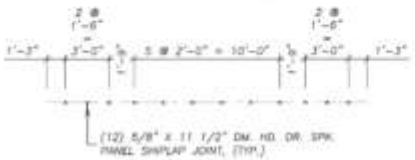
Wheeler
Engineers LLC
9330 JAMES AVE. S.
BLOOMINGTON, MN 55431

DATE: 5/4/15		TRACKING NO: 718626	SHEET NO.
DWN: LAF	CHK: WEH	ORDER NO: 711–13728	1 OF 5

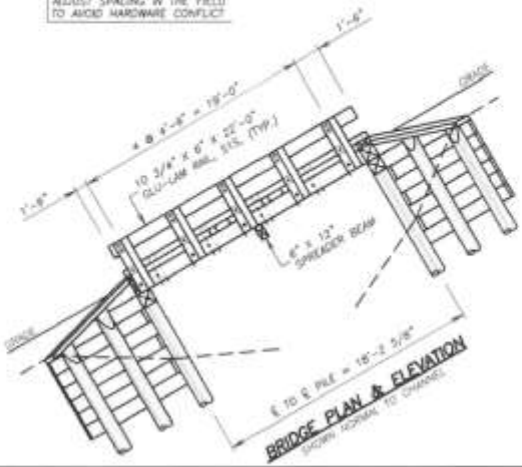




DECK PANEL LAYOUT



PANEL SHIPLAP JOINT SPACING DETAIL



BRIDGE PLAN & ELEVATION

CALLOUT LEGEND

DO NOT SCALE DRAWINGS

NOTES:

BURY A MINIMUM OF TWO BACKING PLANK AS SHOWN.

PANEL WIDTHS SHOWN ARE APPROXIMATE. DIMENSIONS GIVEN ARE TO ℄ OF SHIPLAP JOINTS.

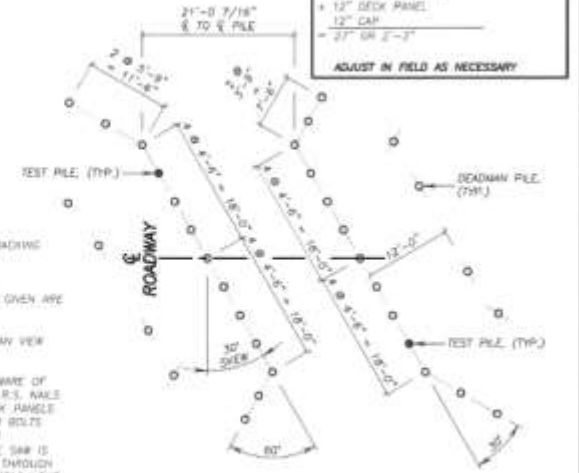
NAILING NOT SHOWN ON PLAN VIEW FOR CLARITY.

CONTRACTOR SHOULD BE AWARE OF THE POTENTIAL TO HIT THE R.S. NAILS IN THE PREFABRICATED DECK PANELS WHEN INSTALLING THE CURB BOLTS FOR THE CURB & SCUPPER ATTACHMENT. A 3/4" HOLE SAW IS RECOMMENDED IN DRILLING THROUGH THE R.S. NAILS FOR THIS ATTACHMENT.

ABUTMENT PILE CUT-OFF CALCULATIONS

3" BITUMINOUS @ ℄
+ 12" DECK PANEL
12" CAP
= 27" OR 2'-3"

ADJUST IN FIELD AS NECESSARY



PILE DRIVING DIAGRAM

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GENERAL BRIDGE PLAN & ELEVATION

COUNTY HIGHWAY "M" BRIDGE, JUNEAU CO., WISCONSIN

Wheeler
Lenders, LLC
8330 JAMES AVE. S.
BLOOMINGTON, MN 55421

DATE: 5/14/15		TRACING NO. 118628	SHEET NO.
DWN: LAF	CHK: WEH	ORDER NO. 711-13728	2 OF 5

County built except Pile Driving

Juneau County, WI - CTH M

GRS – IBS

Geo-synthetic Reinforced Soil - Integrated Bridge System

Concrete Footing w/ Timber Sleeper


10/27/2011 17:28

Panel on Timber Sleeper

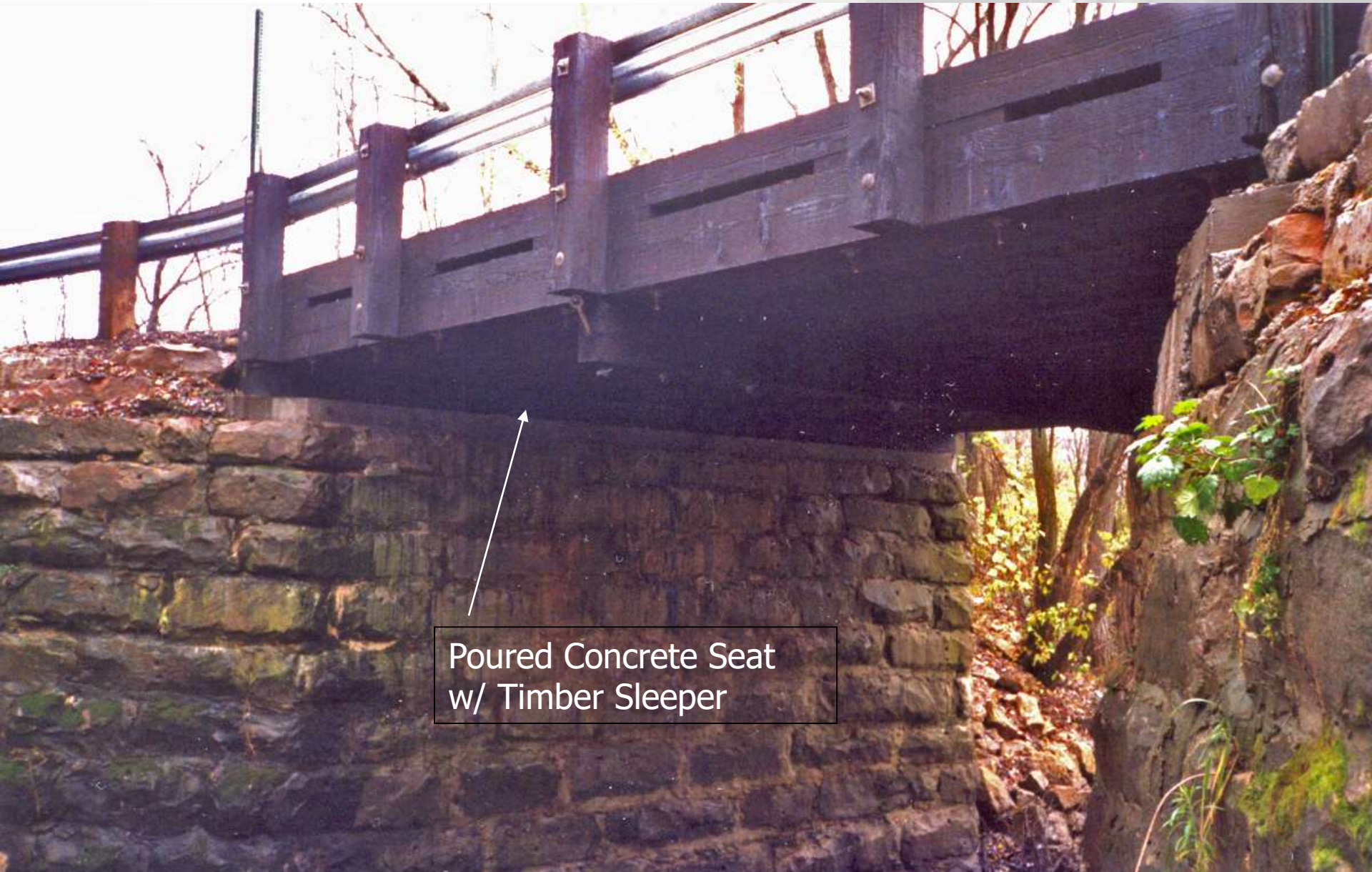
- Panel spiked to sleeper
- Panel handled once
- Rail posts & curbs attached prior to setting

Final Grading

- Approach fill placed directly against superstructure
- No allowance for thermal expansion required

Huston Township, PA

Superstructure Replacement



Sauk County, WI

Existing Concrete Abutments

Railing Attachment

Five Panels

Dane County, WI – CTH Z

Dodge County, MN

Deck Replaced in 5 Days

Deck Replacement on Steel Truss

Guthrie County, IA

More Information/Resources

- Wheelerbridge.com
- List books, articles, electronic sources
- List consulting services, other sources