MARYLAND HISTORICAL TRUST
DETERMINATION OF ELIGIBILITY FORM

NR Eligible: yes X
no ____

Property Name: CSXT Railroad Bridge No. BA172.3 Inventory Number: AL-III-B-181

Address: 11188 River Road SE . approximate Historic district: ____ yes X no

City: Cumberland Zip Code: 21502 County: Allegany

USGS Quadrangle(s): Patterson Creek

Property Owner: CSX Transportation (CSXT), Jacksonville, FL Tax Account ID Number: n/a

Tax Map Parcel Number(s): n/a Tax Map Number: n/a

Project: CSXT - Replacement of Bridge BA172.3 over the North Branc Agency: MDE and US Army Corps of Engineers (per

Agency Prepared By: Straughan Environmental, Inc.

Preparer's Name: Sarah Michailof Date Prepared: 2/4/2013

Documentation is presented in: ____

Preparer's Eligibility Recommendation: X Eligibility recommended ____ Eligibility not recommended

Criteria: X A ____ B X C ____ D Considerations: ____ A ____ B ____ C ____ D ____ E ____ F ____ G

Complete if the property is a contributing or non-contributing resource to a NR district/property:

Name of the District/Property: ____

Inventory Number: ____ Eligible: ____ yes Listed: ____ yes

Site visit by MHT Staff ____ yes X no Name: ____ Date: ____

Description of Property and Justification: *(Please attach map and photo)*

CSX Bridge No. BA 172.3 is a four-span railroad bridge that contains two steel deck truss spans and two steel plate girder spans. The bridge carries a double track over the North Branch of the Potomac River, south of North Branch, Maryland and connects Allegany County, Maryland and Mineral County, West Virginia (see attached map). The bridge was designed and constructed for the Baltimore and Ohio (B&O) Railroad as Bridge Number 64 by the American Bridge Company in 1901 and is one of at least three railroad bridges that has existed in this location since the railroad line was completed in the vicinity of North Branch in 1842 (Hollis 2003; Ketzner 1928; Lang 1927). The bridge was constructed as part of the B&O Main Line between Baltimore and Cumberland.

The bridge is a composite of open deck half through Pratt truss spans and deck-plate girder approach spans, which was a common design for railroad bridges constructed in the late nineteenth and early twentieth centuries. The bridge's half through Pratt truss superstructure includes two 166-foot spans, and the deck-plate girder superstructure includes two 48-foot 8-inch spans, for a total bridge length of 429 feet, 4 inches (HDR 2008). The posts of the Pratt truss are composed of vertical compression members and diagonal tension members and counterbraces. The lower chords are joined with pin-connected eye bars and the upper chords are connected with rivets. The open deck is located approximately 6-10 feet below the top chord of the truss. The Pratt truss spans are the two southernmost spans, and the deck plate girder spans are the two northernmost spans.

MARYLAND HISTORICAL TRUST REVIEW

Eligibility recommended X **Eligibility not recommended** ____

Criteria: X A ____ B ____ C ____ D **Considerations:** ____ A ____ B ____ C ____ D ____ E ____ F ____ G

MHT Comments:

Kim Galarneau ✓ 4/11/13
Reviewer, Office of Preservation Services **Date**

[illegible] 5/2/13
Reviewer, National Register Program **Date**

20130118A

The bridge substructure includes stone abutments, one concrete pier, one stone pier, and one concrete pedestal with steel bent. Each abutment and the central bridge pier is constructed of rough-cut granite blocks. A second pier, on the north (Maryland) bank of the river, was originally constructed of rough-granite blocks and was reconstructed in 1940 of reinforced concrete. The steel bent was constructed in 1940 (replacing a wooden trestle) and sits on a low concrete pedestal. Two rough-cut stone piers from an earlier Bollman truss bridge remain in the river below the existing bridge. The southern bridge abutment (on the West Virginia side of the river) was parged with shotcrete in 1995.

Around the turn of the twentieth century, there were numerous design variations in Pratt truss bridges to adapt them to particular sites and functions (such as carrying increasingly heavy loads on railroads). The lightweight top chords that extend from the ends of each truss to join vertical end posts are a relatively unique design feature in Bridge No. BA 172.3 (Lee personal communication 2009; Caplinger 1997).

History of the Property: Bridge No. BA 172.3 was constructed in 1901 during a period of system improvements along the original B&O Main Line. These improvements included new bridge construction and significant rebuilding and realignment to minimize curves and grades. The bridge was constructed by the American Bridge Company, which at the time of the bridge construction, had become one of the largest bridge manufacturing firms in the country. This subsidiary of U.S. Steel increased its size by purchasing and consolidating several smaller bridge companies (Danko 1976). The first bridge constructed in this location was a wooden trestle completed circa 1840 when the original Main Line alignment between Baltimore and Cumberland was completed. A section of a wooden trestle, likely from the original bridge, is visible in an 1856 photograph (attached). In 1856, the original bridge (except for one wooden trestle span) was replaced with a Bollman iron deck truss bridge. The 1856 bridge was burned by Confederate forces in 1861 during the Civil War and repaired by November 14 of that same year, and then burned once more on February 2, 1864. There may have been a succession of temporary bridges before a second Bollman iron deck truss bridge was constructed in 1880. The existing 1901 bridge replaced the Bollman truss bridge constructed in 1880 (Hollis 2003; New York Times 2/3/1864).

Drawing plans for various repairs are attached and indicate maintenance planned for the bridge since its construction. Dated as-built drawings were available for only a few of these repairs, and dates for completion are approximate, and it's possible some repairs were not completed. In addition, without an as-built drawing of the 1901 bridge structure, it is difficult to assess whether repairs resulted in the addition or substitution of new material or in kind replacement of materials such as bolts and rivets. During the mid-1920s and again in 1930, plans indicate the need for replacement of rivets in the stringers and floor beams. Around 1939, a tie plan indicates that the tops of the ties were raised on each track (2.25" on the westbound track and 1.25" on the eastbound track. During the late 1930s and 1940s, additional steel repairs were made including new rivets and floor beams. Masonry repairs were completed circa 1940 when the northernmost pier was rebuilt in concrete and the pedestals of the steel bent (that support the plate girder spans) were placed in concrete. As-built plans indicate steel repairs to stringers, floor beams, rivets, and other truss members, and masonry repairs to piers that were completed in 1961(Baltimore & Ohio Railroad Office of Engineer of Bridges & Buildings, Dwgs No.40451B and 40052B). Steel repairs were again completed to the floor beams in 1982, as indicated by available as-built design drawings (Chessie System Engineering Department, Bridge File 4054, Dwgs No.44094-5 and -6).

In 1963, the B&O Railroad merged with the Chesapeake & Ohio system to form the Chessie System and since 1980, the original Baltimore and Ohio Main Line has been part of the CSX Transportation system.

Historic Context: Bridge No. BA 172.3 was constructed during an intense rebuilding effort along the Baltimore and Ohio Main Line between Baltimore and Cumberland, which lasted from 1900 to 1908. The purpose of the rebuilding was to modernize the system to accommodate heavier and longer trains with fewer accidents and constraints caused by the sharp curves on the old Main Line. The construction of the Baltimore and Ohio Main Line in the early- to mid-eighteenth century corresponds to a growth in

MARYLAND HISTORICAL TRUST REVIEW

Eligibility recommended _____ **Eligibility not recommended** _____

Criteria: ___A ___B ___C ___D **Considerations:** ___A ___B ___C ___D ___E ___F ___G

MHT Comments:

_____ _____

Reviewer, Office of Preservation Services **Date**

_____ _____

Reviewer, National Register Program **Date**

transportation infrastructure to link and support growing industries and ports in Baltimore and western Maryland. The construction of CSX Bridge No. BA 172.3 (B&O Bridge No. 64) particularly corresponds to the intensification and dominance of the industrial economy that was occurring at the turn of the twentieth century, during a period widely acknowledged as the "Golden Age of Railroads." Concerns about the structural inadequacies of iron truss bridges led to the development of all-steel truss spans that could accommodate heavier locomotives carrying longer trains with heavier loads than those accommodated by earlier bridges. The current bridge faces similar challenges faced by the earlier iron truss bridges – the steel truss spans are becoming functionally obsolete as railroads adapt to increasingly heavier trains.

Assessment of Eligibility: Bridge No. BA 172.3 is significant under National Register Evaluation Criterion A because its construction is associated with the rising dominance and importance of the railroad - over other forms of transportation - in the nation's industrial economy at the turn of the twentieth century. It also is significant under Criterion C because it embodies distinctive characteristics of a type, period, or method of construction. The bridge is an excellent example of the steel, pin-connected Pratt truss that was becoming the most prominent element of standardized bridge design at the turn of the twentieth century. In addition to meeting National Register Evaluation Criteria A and C, the bridge maintains all aspects of historic integrity. The bridge retains very high integrity of location, setting, feeling, and association because it remains in its original location, continues to operate as a railroad bridge, and because it has had minimal alterations and its physical environment has changed little since it was constructed. The bridge retains somewhat lessened (but still high) integrity of design, materials, and workmanship, which are the result of maintenance activities required to extend the usefulness of the bridge as part of an active rail line. These aspects of integrity are less important than the aspects of setting, location, feeling, and association in contributing to the historic significance of the bridge. Masonry repairs to the piers and abutments and steel repairs to the truss superstructure have generally been done in kind with similar materials, and those repairs that deviate from original materials and construction methods (including concrete replacement of a stone pier, and shotcrete repairs to the southern bridge abutment) minimally detract from the overall integrity of the bridge.

Bibliography

Baltimore and Ohio Railroad, Office of the Engineer of Bridges and Buildings, Masonry Notes Bridge No. 64, March 11, 1901.

Baltimore and Ohio Railroad, Office of the Engineer of Bridges and Buildings, Steel Repairs, Drawings No. 40451 through 40456; 41472 through 41474, June 9, 1954.

Caplinger, Michael W. Bridges Over Time: A Technological Context for the Baltimore and Ohio Main Stem at Harper's Ferry, West Virginia. Institute for the History of Technology & Industrial Archaeology Monograph Series, Volume IV, 1997.

Danko, George M. The Development of the Truss Bridge, 1820 – 1930, with a Focus toward Wisconsin. State Historic Preservation Office, The State Historical Society of Wisconsin. August 27, 1976.

Harwood, Herbert H. Impossible Challenge: The Baltimore and Ohio Railroad in Maryland. Baltimore, MD: Barnard, Roberts & Co., 1979.

HDR Engineering, Inc. CSXT Bridge No. BA 172.3 over North Branch of Potomac River Project Information Package. On behalf of CSX Transportation. November 10, 2008.

Historic American Engineering Record. Office of Archeology and Historic Preservation, Technical Information Project. Trusses: A Study by the Historic American Engineering Record, 1976.

MARYLAND HISTORICAL TRUST REVIEW

Eligibility recommended _____ **Eligibility not recommended** _____

Criteria: ___A ___B ___C ___D **Considerations:** ___A ___B ___C ___D ___E ___F ___G

MHT Comments:

_____ _____

Reviewer, Office of Preservation Services **Date**

_____ _____

Reviewer, National Register Program **Date**

Hollis, Jeffrey R. East End: Harpers Ferry to Cumberland, 1842-1992. Baltimore, MD: Barnard, Roberts & Co., 2003.

J. Lawrence Lee, Ph.D., P.E. Engineer Historian, Historic American Engineering Record, National Park Service. Personal Communication via email, July 9, 2009.

Ketzner, R.L. "Bridge 64, Cumberland Division" Baltimore and Ohio Magazine Magazine, page 127, February, 1928.

Lang, Phillip George Jr., Engineer of Bridges. "Bollman Trusses on Valley of Virginia Branch will soon be Memories," Baltimore and Ohio Magazine, page unknown, October, 1923.

Lang, Phillip George Jr., Engineer of Bridges. "Bridge 64, Cumberland Division, a Fine Example of the Bollman Truss Structure," Baltimore and Ohio Magazine, page 22, December, 1927.

Maryland State Highway Administration. Historic Highway Bridges in Maryland: 1631-1960: Historic Context Report. 2001

MARYLAND HISTORICAL TRUST REVIEW

Eligibility recommended _____ **Eligibility not recommended** _____

Criteria: ___A ___B ___C ___D **Considerations:** ___A ___B ___C ___D ___E ___F ___G

MHT Comments:

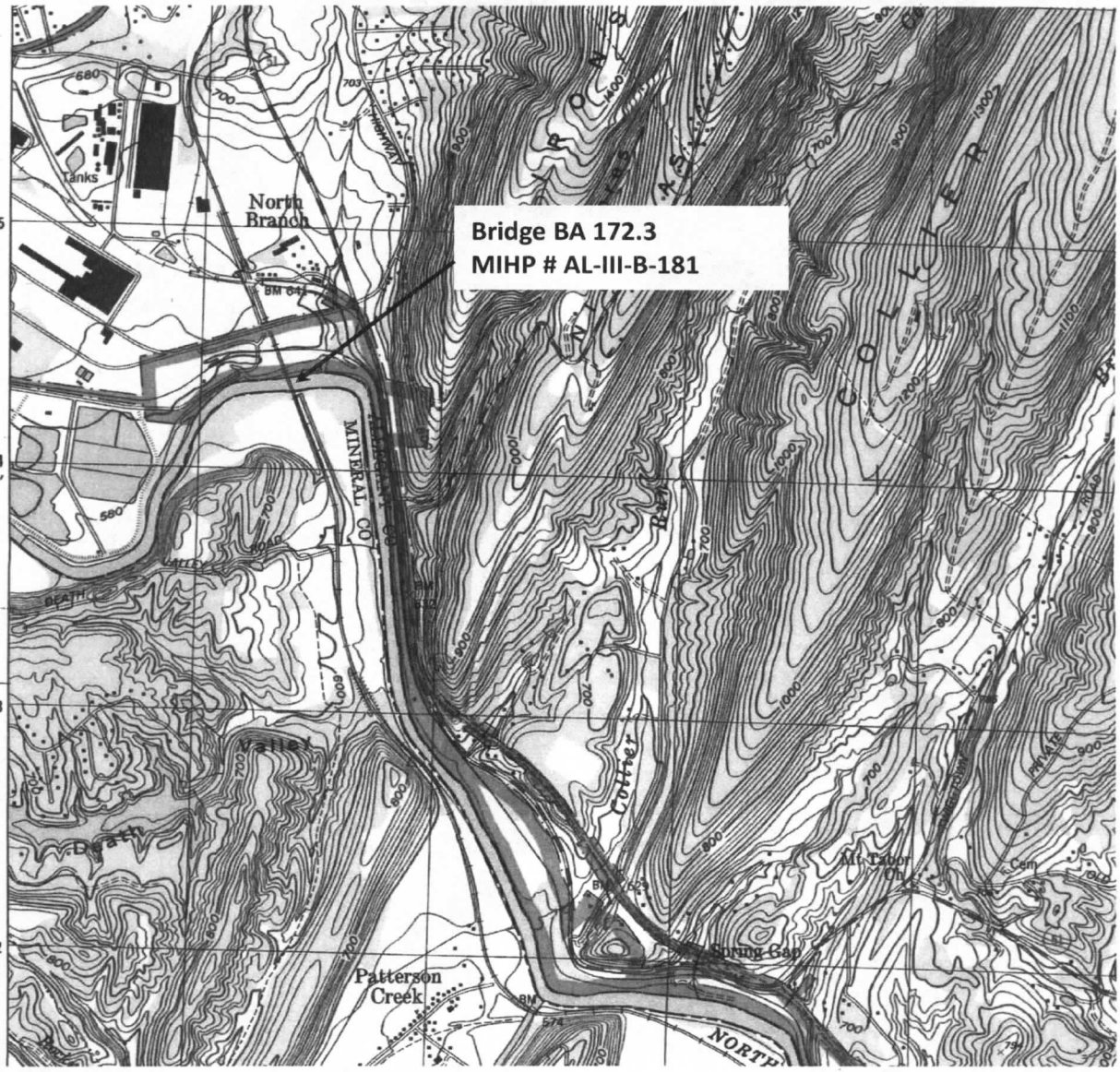
_____ _____

Reviewer, Office of Preservation Services **Date**

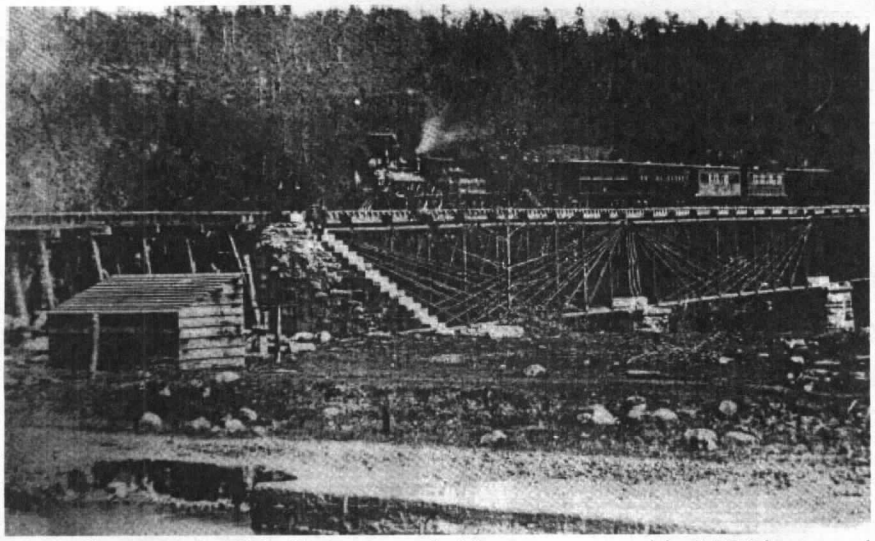
_____ _____

Reviewer, National Register Program **Date**

CSX Bridge BA 172.3 over the North Branch of the Potomac River



Source: *Patterson Creek* 7.5' USGS topographic quadrangle, 1996.

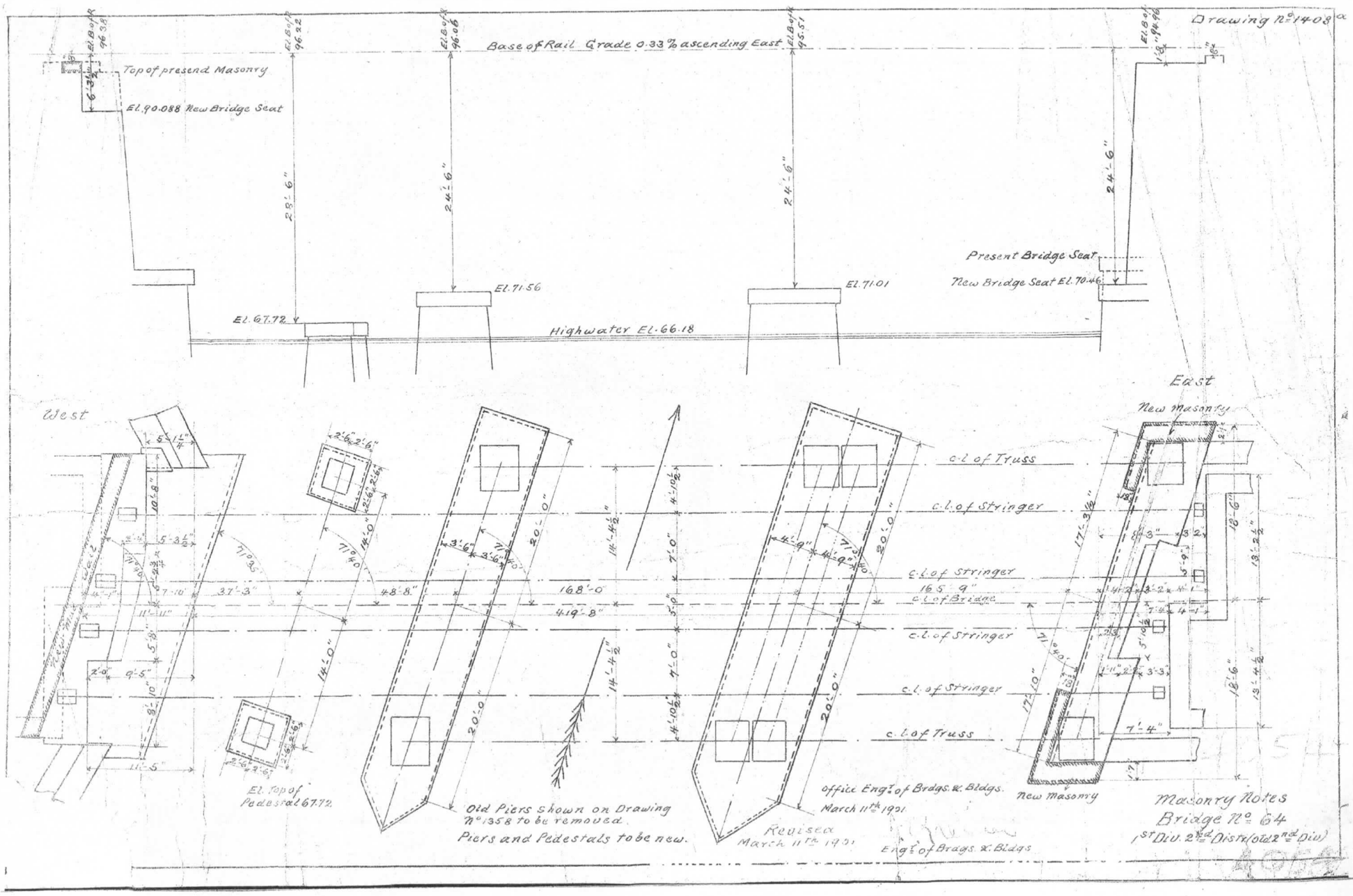


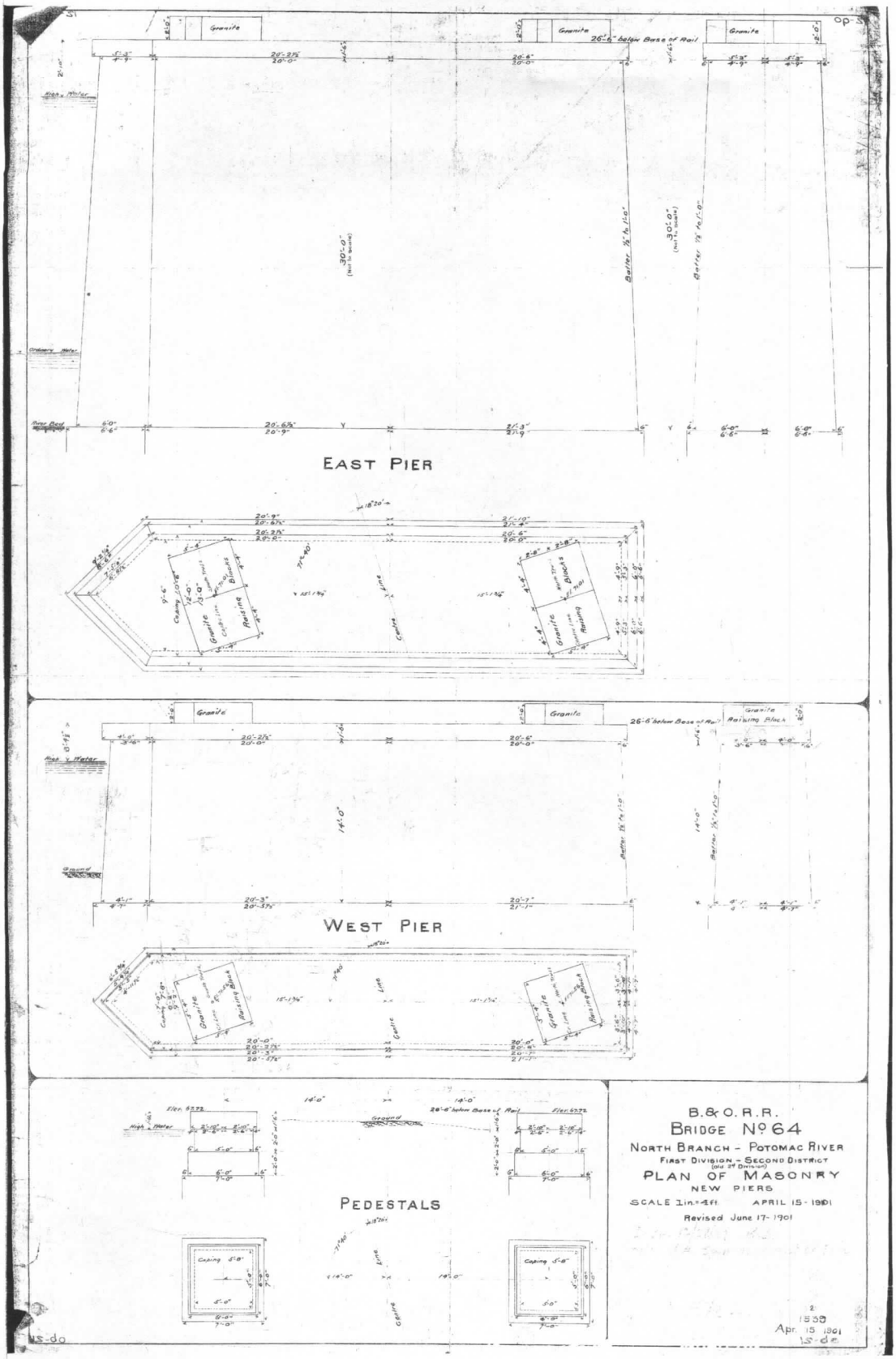
1858 photograph of Bollman truss bridge constructed in 1856 in same location as 1901 Pratt truss structure. Source: B&O Museum, copied in Hollis 2003.

Photolog - CSX Bridge BA172.3 over the North Branch of the Potomac River (MIHP #AL-III-B-181)

5" X 7" photo prints (which are replicated on next pages) were printed on HP Premium Plus Glossy Photo Paper with Epson Claria Premium Color Ink.

Repair Plans
CSX Bridge BA172.3


Drawing No. 1403
Base of Rail Grade 0.33% ascending East
Top of present Masonry
El. 90.088 New Bridge Seat
El. 67.72
El. 71.56
El. 71.01
Highwater El. 66.18
Present Bridge Seat
New Bridge Seat El. 70.46
West
East
New masonry
c.l. of Truss
c.l. of Stringer
c.l. of Bridge
168'-0
419'-8"
El. Top of Pedestal 67.72
Old Piers shown on Drawing No. 1358 to be removed.
Piers and Pedestals to be new.
Revised March 11th 1901
Office Engr. of Brdgs. & Bldgs. March 11th 1901
Engr. of Brdgs. & Bldgs.
Masonry Notes
Bridge No. 64
1st Div. 2nd Distr. (old 2nd Div.)


Granite
26'-6" below Base of Rail
High Water
Ordinary Water
River Bed
30'-0"
Batter 1½" to 1'-0"
EAST PIER
Coping
Granite Blocks
Rubbing Blocks
Rubbing
Centre Line
Granite
Rubbing Block
Ground
WEST PIER
Elev. 6.72
PEDESTALS
Coping 5'-0"
B.&O.R.R.
BRIDGE No 64
NORTH BRANCH - POTOMAC RIVER
FIRST DIVISION - SECOND DISTRICT
(Old 2d Division)
PLAN OF MASONRY
NEW PIERS
SCALE 1in.=4ft.
APRIL 15 - 1901
Revised June 17 - 1901
1558
Apr. 15 1901

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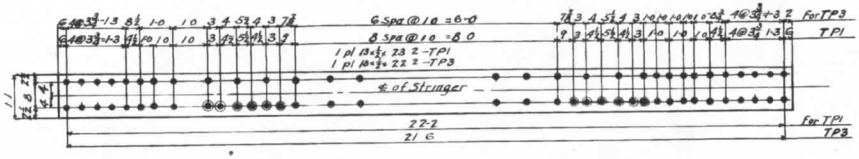
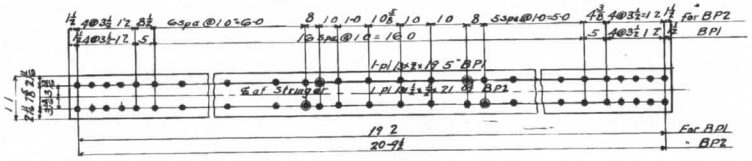
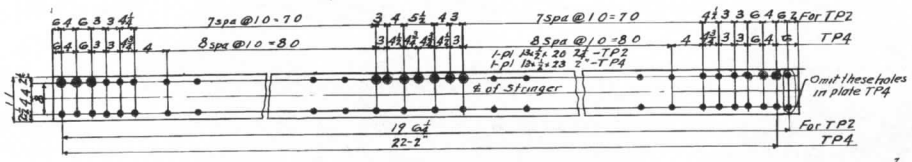


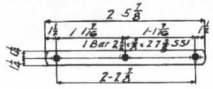
Required 9 - Top Cover Plates TP1, TP3
2



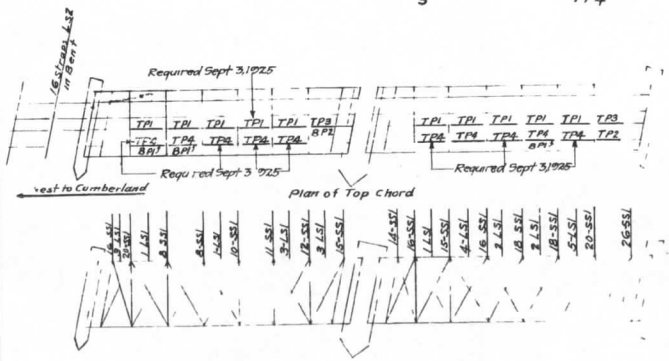
Required 3 Bolt Cover Plates BP1, BP2
1

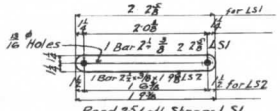


Required - 1 - Top Cover Plate TP2, TP4
3



Reqd 243 Strut Straps SS1





Reqd 35 Lall Straps LS1, LS2
16 Straps

BILL OF MATERIAL

SHOP BILL					SHIPPING BILL		
No	Description	Length ft	in	Mark Remarks	No	Description	Mark
9	pls 13×⅝	23	2	TP1	9	Top Cover pls	TP1
1	pl 13×⅝	20	2½	TP2	1	pl	TP2
2	pls 13×⅝	22	2	TP3	2	pls	TP3
3	pls 19×½	19	5	BP1	3	Bolt Cover pls	BP1
1	pl 13×½	21	0½	BP2	1	pl	BP2
243	Bars 2½×⅞	2	5⅞	SS1	243	Strut Straps	SS1
25	Bars 2½×⅜	2	2⅞	LS1	25	Lateral Straps	LS1
3	pls 8×½	23	2	TP4	3	Top Cover Pls	TP4
16	Bars 2½×⅜	1	9⅞	LS2	16	Straps	LS2

BILL OF MATERIAL — Required Sept 3, 1925

SHOP BILL					SHIPPING BILL		
No	Description	Length ft	in	Mark Remarks	No	Description	Mark
1	Pls 13"×½"	23	2	TP1	1	Top Cover Plate	TP1
7	Pls 13"×½"	23	2	TP4	7	Top Cover Plates	TP4

LIST OF FIELD RIVETS

ERECTORS LIST						SHIPPING LIST		
No	Dia	Head	Grip	Length	Location	No	Dia Head	Length
1048	⅞	Butt	1⅛	2¾	Cov Pls to Stringers	150	⅞ Butt	2⅜
486		¾	2⅞		SS1 to Struts	560		2½
121		¾	2⅜		SS1 to SS1	1190		2¾
50	¾		1⅛	2¾	Lateral Straps	240		3⅜
200	⅞		1½	3⅜	Cov Pls to Strgs	70	¾	2¾
32	¾		1	2⅜	LS2 to Bent	45		2⅜

LIST OF FIELD RIVETS Required Sept 3, 1925

ERECTION LIST						SHIPPING LIST		
No	Dia	Head	Grip	Length	Location	No	Dia Head	Length
434	⅞"	Butt	1⅛"	2⅜"	Cov Pls to Stringers	510	⅞" Butt	2¾
103	⅞"	Butt	1½"	3⅜"	" " " "	130	⅞" Butt	3⅜

General Notes:-
Material O H Structural Steel
Specifications B & O R R 1904
Rivets ⅞ diam unless noted
Holes ⅞ diam unless noted
Paint one coat in shop
Present material shown in red (light) lines
New material shown in black (heavy) lines
Holes shown thus ⊕ match present rivet spacing
Holes shown thus ● to be drilled in present material in field to match holes in new material
Present material in contact with new material to be thoroughly cleaned of all rust dirt etc and given one coat of paint before placing new material

THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO
CUMBERLAND DIV MAIN LINE
BRIDGE No 64 NORTH BRANCH MD
REPAIRS
Scale ¾" = 1 0 November 14th 1921
Office of Engineer of Bridges
Baltimore Md

Checked in Field by E Stimson 11-2-25 11-7-25 4-4-22
From field measurements furnished by ES 12-6-21

Approved — Engineer of Bridges

Drawing No 18582

23×17 BALTIMORE B0153204

"D-Corrected Bill of Material Rev'd Sept 3, 1925 as per Field Chk of 11-2-21 & 4-4-22"

Est'd Steel 11,600#
Rivets 1,500#

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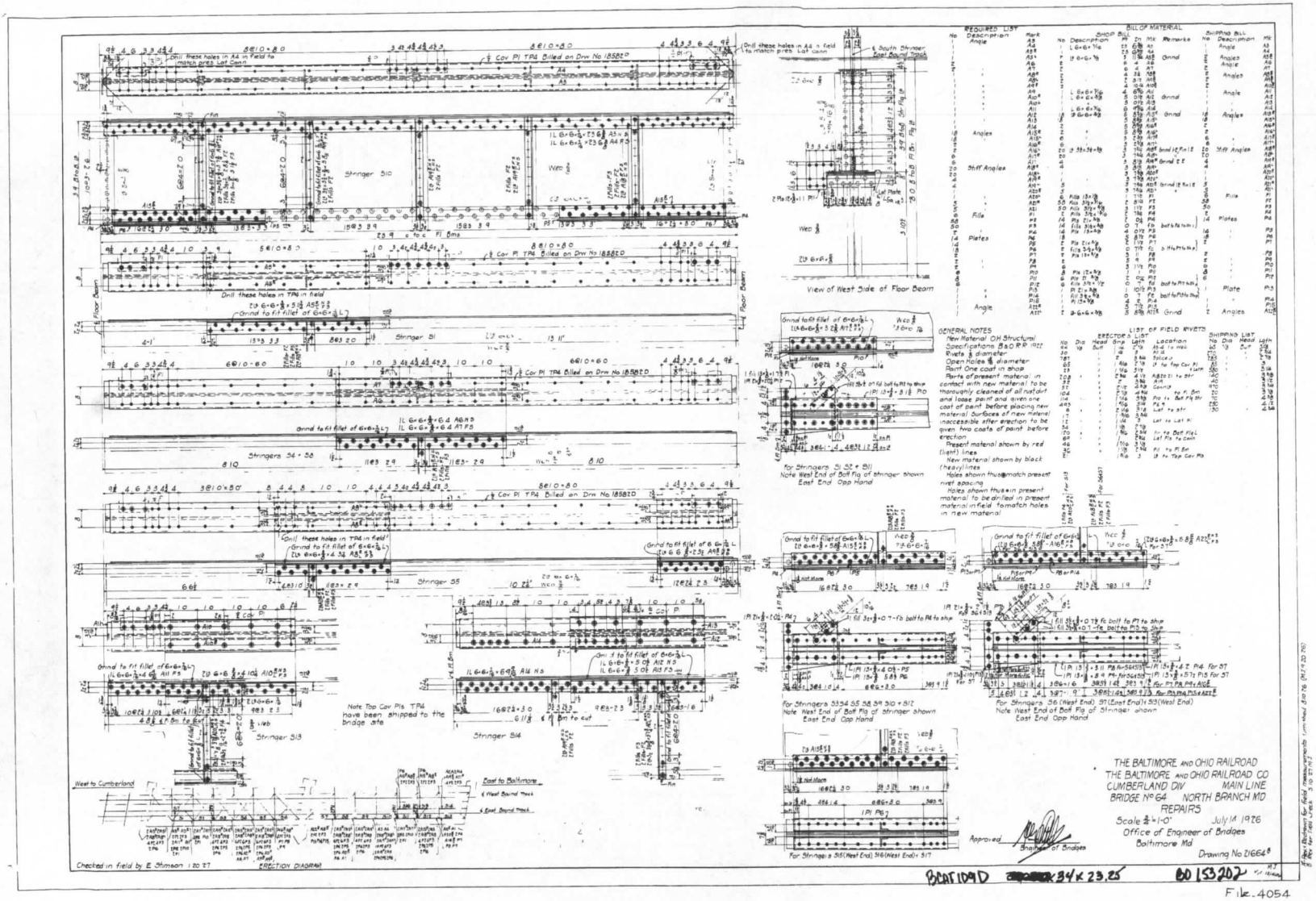

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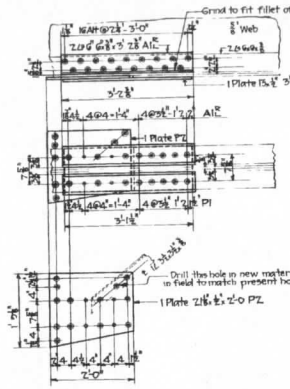
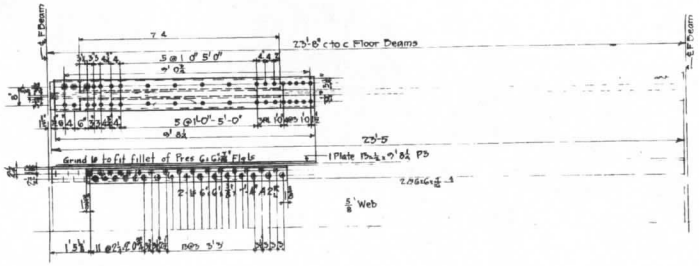
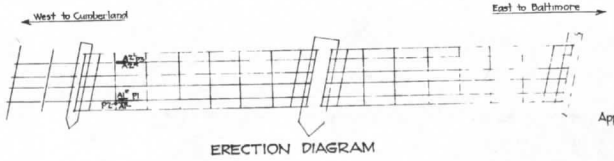


Note to Erector
During passage of trains a bolt drift pin or rivet must be in every hole in bottom flange

Required - 1 Angle A1
" 1 Angle A1
- 2 Angles A2
- 1 Plate P1
- 1 Plate PZ





ERECTION DIAGRAM

Checked in Field by E Stinson, 11-2-25 11-25-25

BILL OF MATERIAL

SHOP BILL

No	Description	Length Ft	Ins	Mark	Remarks
2	∠ G L G	3	2½	A1	
2	∠ G L G	7	4	A2	Grind to Fit
1	Plate	15	1½	P1	
1	Plate	21	1½	PZ	
1	Plate	15	1½	P3	

SHIPPING BILL

No	Description	Mark
2	Angles	A1
2	Angles	A2
1	Plate	P1
1	Plate	PZ
1	Plate	P3

LIST OF FIELD RIVETS

ERECTION LIST

No.	Dia	Head	Grip	Length	Location
17	⅞"	Butt	2½	3½	A1 to Stringer
19			1¾	3½	A1, P1 PZ to Stringer
1			2½	4	P1, PZ to Lateral
2			¾	2⅜	PZ to Lateral
5			1½	2⅜	PZ to Floor Beam
32		"	2½	4	A2 to Stringer
23	"	"	1⅜	2⅞	A2, P3 to Stringer
1		"	1⅜	3½	A2, P3 Lat Pl to Stringer
2	"	"	1⅜	3	P3 & Lat Pl to Stringer
12	"	"	1⅜	2⅜	P3 to Stringer

SHIPPING LIST

No	Dia	Head	Length
25	⅞"	Butt	2⅜"
40		"	2⅜"
15		"	3"
35		"	3½"
30	"	"	3⅝"
50	"		4"

GENERAL NOTES

New Material - OH Structural Steel
Specifications - B & O R R 1922
Rivets - ⅞" diameter
Open Holes - 1⅛" diameter
Paint One coat in shop
Parts of present material in contact with new material to be thoroughly cleaned of all rust dirt and loose paint and given one coat of paint before placing new material. Surfaces of new material inaccessible after erection to be given two coats of paint before erection.
Present material shown by red (light) lines
New material shown by Black (heavy) lines
Holes shown thus ● match present rivet spacing
Holes shown thus ● in present material, to be drilled in present material in field to match holes in new material

Note to Erector for placing stringer flange angles A2
Cut out necessary rivets in present flange angles replacing each rivet with a bolt or a drift pin using 50% of each. Between trains remove bolts and pins and place new 1s A2 replacing bolts and drift pins before traffic is resumed. Then replace each bolt and drift pin with a rivet. No live load shall be allowed on the bridge unless there is a rivet bolt or drift pin in every hole

THE BALTIMORE AND OHIO RAILROAD
THE BALTIMORE AND OHIO RAILROAD CO
CUMBERLAND DIV — MAIN LINE
BRIDGE No. G4 — NORTH BRANCH, MD

REPAIRS

Scales ½" & ¾" = 1'-0" — September 15 1925

Office of Engineer of Bridges
Baltimore, Md

Approved — Engineer of Bridges

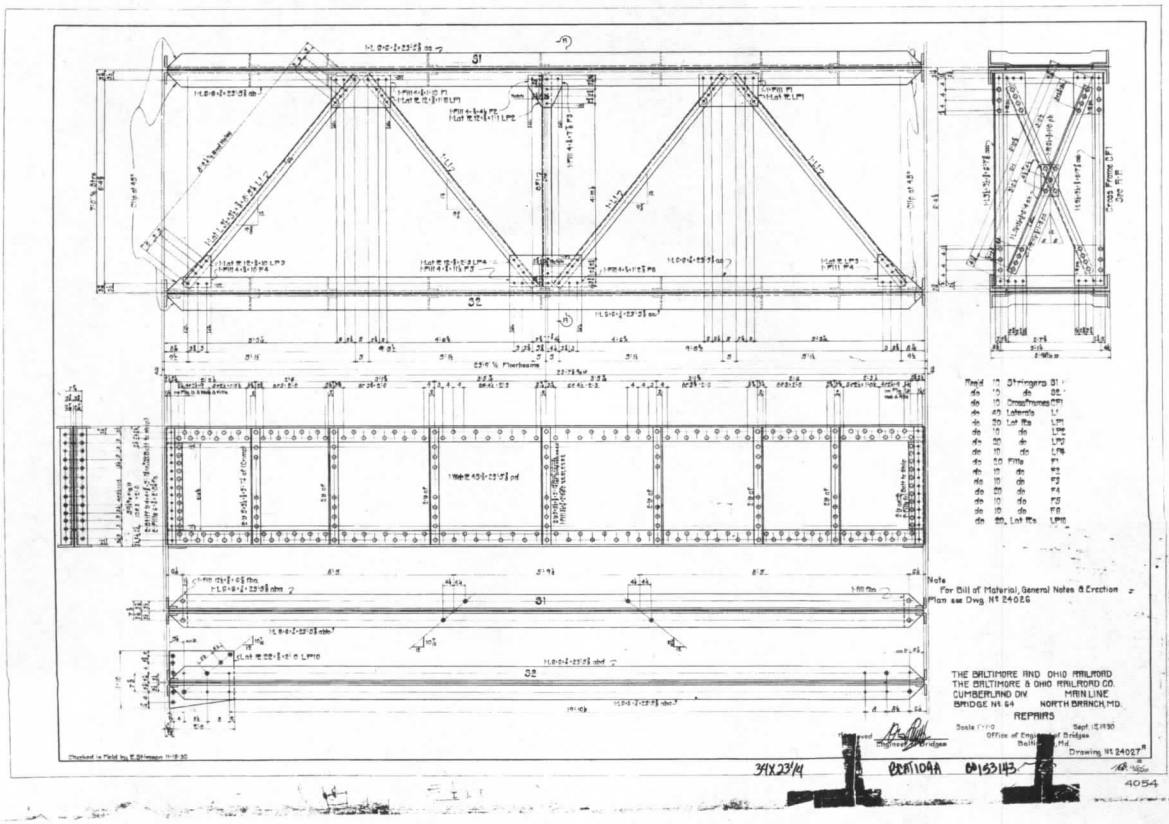
Drawing No 21234 D

A-Box for Field Cor. of 11-2-25 by JKN 11-2-25
A-2 11-25-25

22x17 BCAT 109 D B0153203

File 4054

B0153143.cit



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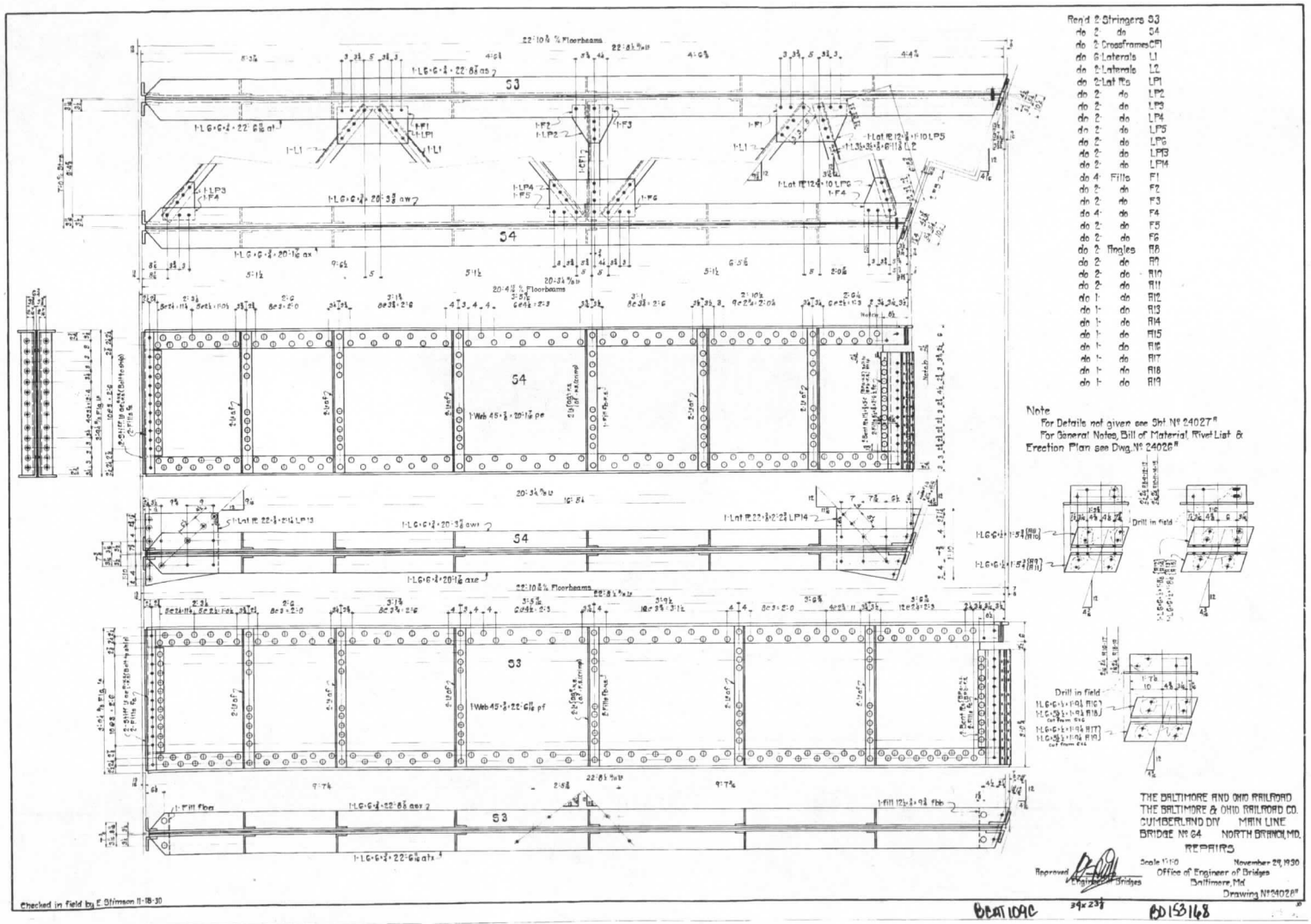

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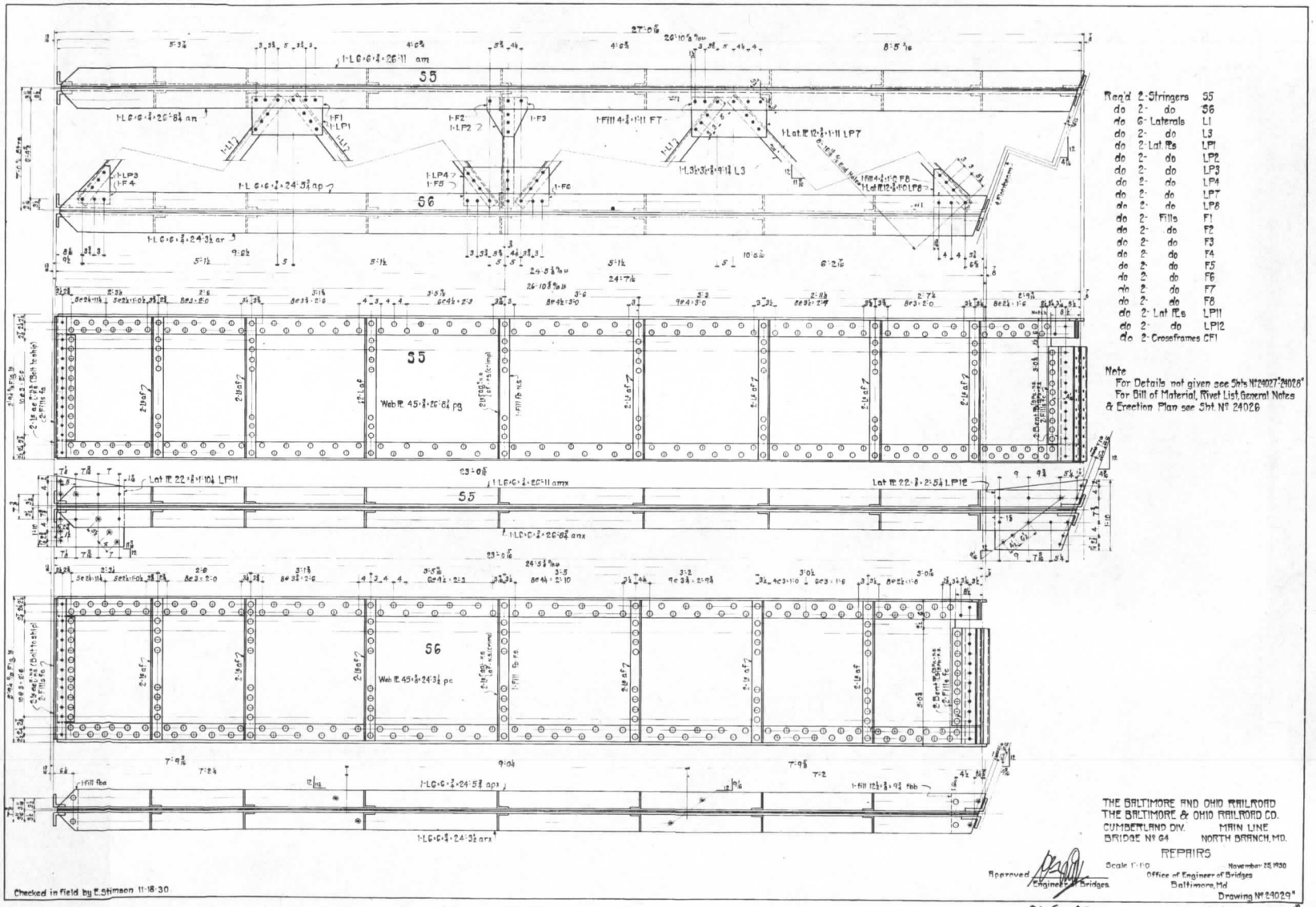


Req'd 2-Stringers S5
do 2- do S6
do 6- Laterals L1
do 2- do L3
do 2- Lat. Pls LP1
do 2- do LP2
do 2- do LP3
do 2- do LP4
do 2- do LP7
do 2- do LP8
do 2- Fills F1
do 2- do F2
do 2- do F3
do 2- do F4
do 2- do F5
do 2- do F6
do 2- do F7
do 2- do F8
do 2- Lat. Pls LP11
do 2- do LP12
do 2- Crossframes CF1

Note
For Details not given see Shts Nº 24027 & 24028
For Bill of Material, Rivet List, General Notes & Erection Plan see Sht. Nº 24026

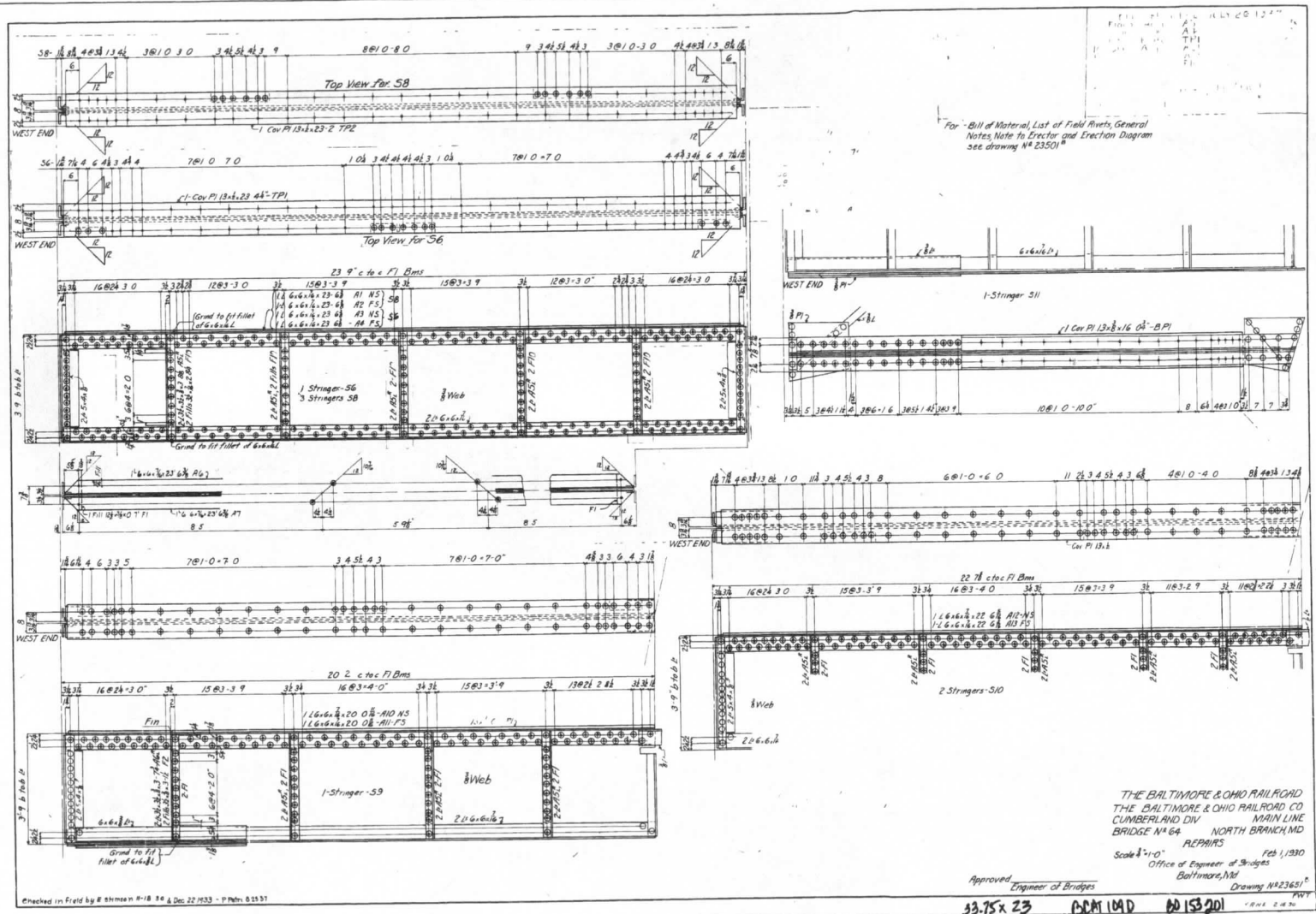
THE BALTIMORE AND OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.
CUMBERLAND DIV. MAIN LINE
BRIDGE Nº 64 NORTH BRANCH, MD.

REPAIRS

Scale 1"=1'-0" November 25, 1930
Office of Engineer of Bridges
Baltimore, Md
Drawing Nº 24029

Approved Engineer of Bridges

BEAT 109C 36x24 B0153182 168-195-30


Top View for 58
Top View for 56
WEST END
For - Bill of Material, List of Field Rivets, General Notes, Note to Erector and Erection Diagram see drawing No 23501
1-Stringer 511
23 9" c to c Fl Bms
1 Stringer-56
3 Stringers 58
Web
Grind to fit fillet of 6x6x3/4L
22 7/8 c to c Fl Bms
2 Stringers-510
20 2 c to c Fl Bms
1-Stringer-59
THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO
CUMBERLAND DIV MAIN LINE
BRIDGE No 64 NORTH BRANCH, MD
REPAIRS
Scale 3/8"=1'-0" Feb 1, 1930
Office of Engineer of Bridges
Baltimore, Md
Approved Engineer of Bridges
Drawing No 23651
Checked in Field by R Ehrmann 11-18-36 & Dec 22 1933 - P Petri 8 25 37
33.75x23 BCM 109D BO 153201
4054

Erectors List

Nº	Dia	Hd	Gp	Lg	Location	Nº	Dia	Hd	Gp	Lg	Location	Nº	Dia	Hd	Gp	Lg	Location
[illegible]																	

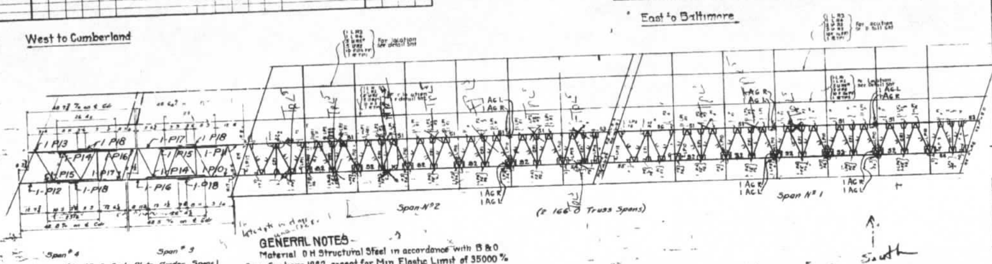
Shipping List

Nº	Dia	Hd	Lg
[illegible]			

Nº	Description						
[illegible]							

West to Cumberland

East to Baltimore



GENERAL NOTES -

Material O H Structural Steel in accordance with B & O Specifications 1922 except for Min Elastic Limit of 35000 % and copper content of 0.2%

Specifications B & O R R 1922

Rivets ⅞"

Open Holes 15/16"

Paint One coat in shop

Parts of present material in contact with new material to be thoroughly cleaned of all rust, dirt & loose paint and given one coat of paint before placing new material. Surfaces of new material inaccessible after erection to be given two coats of paint before erection

Present Material shown by red (light) lines

New Material shown by (black) heavy lines

Holes shown thus ◎ match present rivet spacing

See Dwg #30331 For detail and Bill of Material for Angles Ac R/L

List of Drawings

24026ᴱ	Erection Plan
24027ᴿ	Details
24028ᴿ	do
24029ᴿ	do
23651	do
30331	Conn Angles - Ac R/L
23598ᴮ	Details

THE BALTIMORE AND OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.
CUMBERLAND DIV MAIN LINE
BRIDGE Nº 64 NORTH BRANCH, MD.
REPAIRS

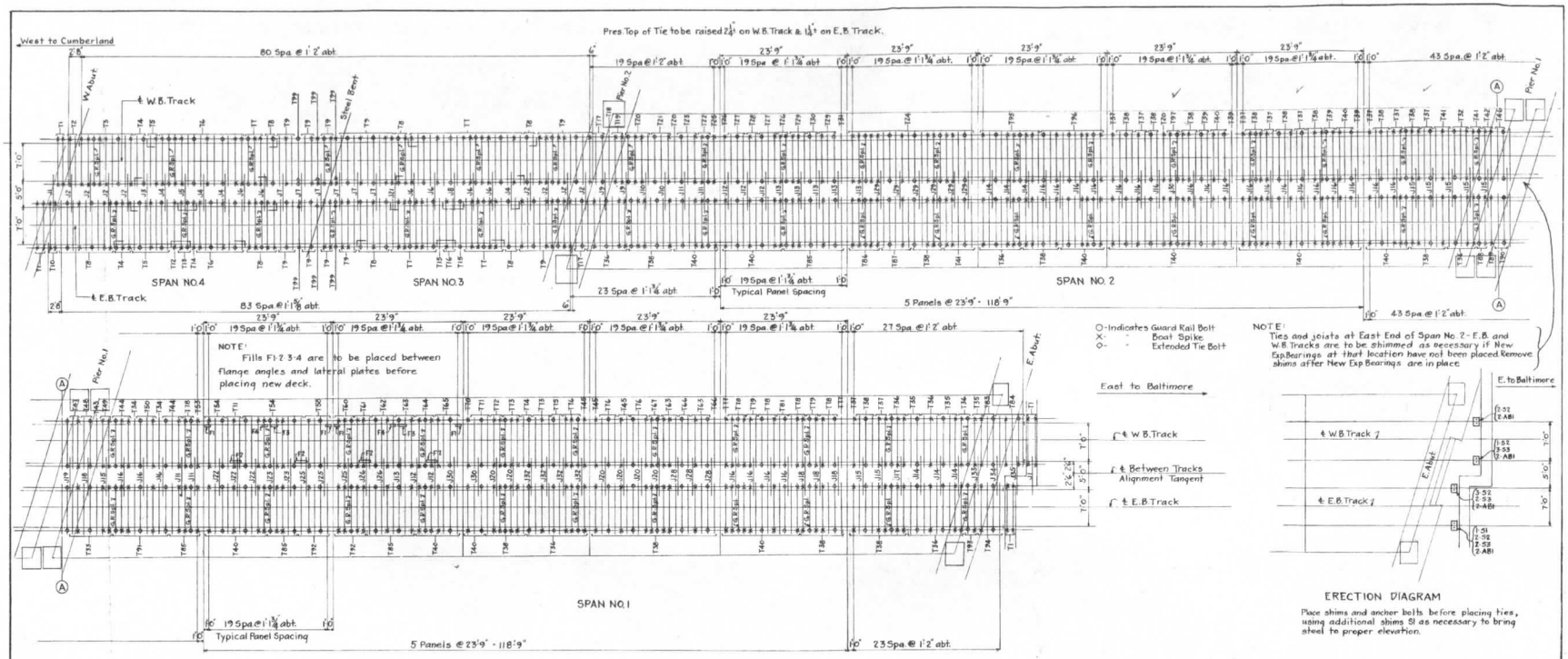
Scale None
Date
Office of Engineer of Bridges
Baltimore, Md.

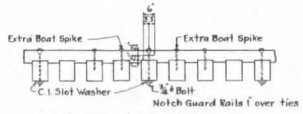
Approved
Engineer of Bridges

Checked in Field by E Stimson 11-18 30

34 x 22

B0153234





Detail of Guard Rail Splice

Note:- Splice Guard Rail every 12th Tie.
Notch Guard Rail over Joists as necessary.

NOTE:
For Bill of Timber, Bill of Hardware, Detail of Grooves in Ties and Joists for Flange Rivets, Detail of Fills, Shims and Anchor Bolts, Bill of Material and List of Field Rivets see Drawing No. 32609

THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.

CUMBERLAND DIV. MAIN LINE
BRIDGE NO. 64 NORTH BRANCH, MD.

TIE PLAN

SCALE: 1⅛" & 1¼" = 1'-0" MARCH 19, 1936

OFFICE OF ENGINEER OF BRIDGES
BALTIMORE, MD.

DRAWING No. 31605-D

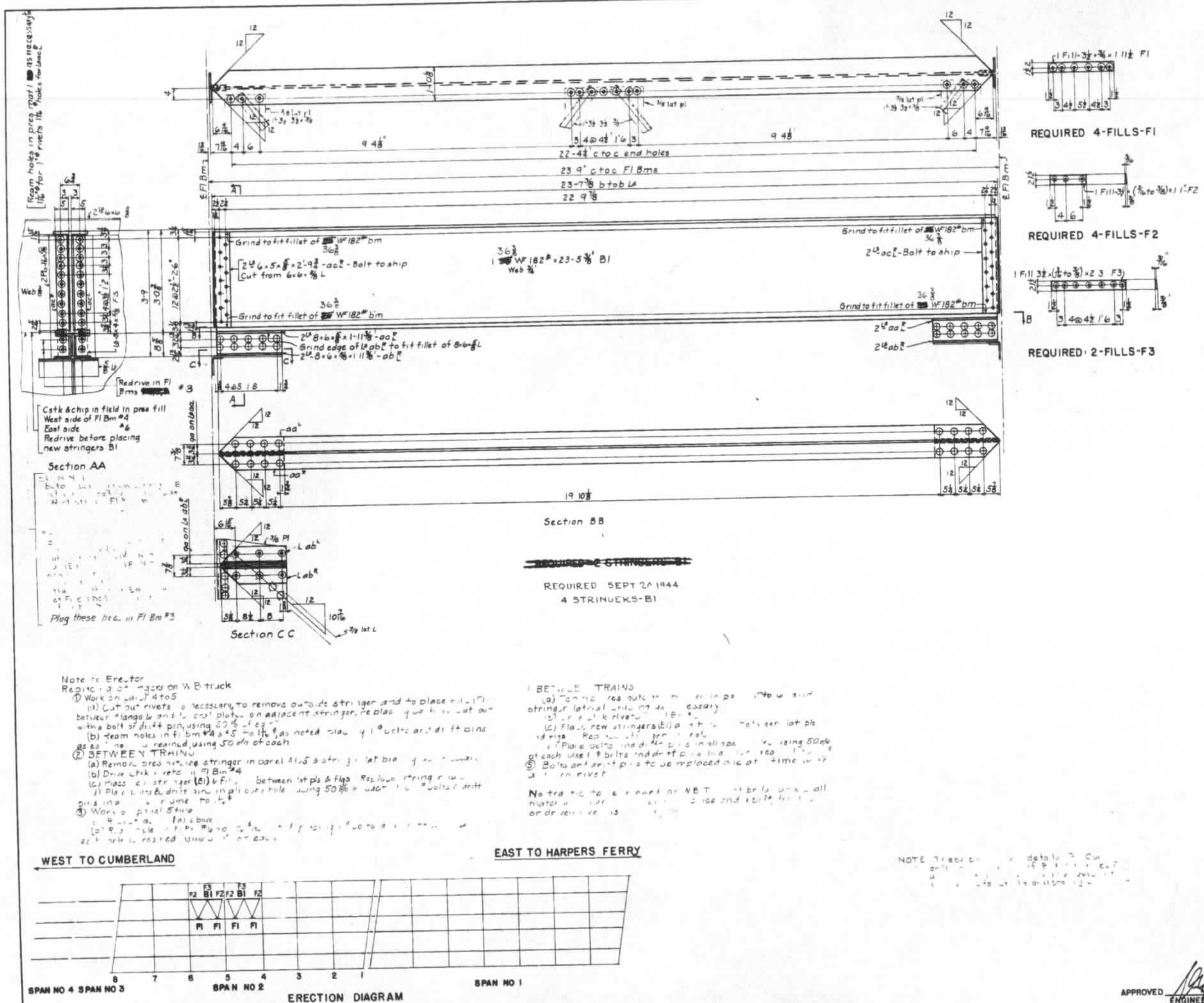
APPROVED: _____
ENGINEER OF BRIDGES

Checked in field by P. Petri 12-9-36, 2-12-37 & 7-25-39.

35.75 X 23 BCUTIDAE BD153.213 F.W.T. ✓ H.D.

4054

A - Rev. for Field Check of 12-9-36 F.W.T. - H.D. 1-15-37
B - " " " 2-12-37 F.W.T. - H.D. 2-18-37
C - " to bring up to date C.L.J. & J.C.R. 4-25-39
D - " for letter P.P. to P.C. dated 4-19-39 J.C.R. 4-20-39
Traced by G.G. from paper drwg. 7-25-39 } C.A.J.W. 7-25-39



BILL OF MATERIAL

SHOP BILL

NO	DESCRIPTION	FT	IN	MARK	REMARKS
2	Bms 36 WF 182#	23	5 3/8	B1	
4	Ls 8×6×5/8	1	11 3/8	aa^R	
4	Ls do	1	11 3/8	aa^L	
4	Ls do	1	11 3/8	ab^R	Grind edge
4	Ls do	1	11 3/8	ab^L	
4	Ls 6 5×5/8	2	9 3/4	ac^R	[illegible]
4	Ls do	2	9 3/4	ac^L	[illegible]
4	Fills 3 1/2×3/4	1	11 1/2	F1	
4	" 3 1/2×(3/16 to 3/8)	1	1	F2	
2	" do	2	3	F3	

SHIPPING BILL

NO	DESCRIPTION	MARK
2	Stringers	B1
4	Fills	F1
4	"	F2
2	"	F3

LIST OF FIELD RIVETS

ERECTORS LIST

NO	DIA	HD	GRIP	LGTH	LOCATION
52	7/8	Butt	2	3 3/4	ac to B1
16	"		1	2 3/4	Lat Pl to ab
8			1 3/8	3 1/8	Lat Pl & L to ab
18	"		1 13/16	3 5/8	Lat Pls to B1-F2 F3
8	"	"	2 1/4	4 1/8	Redrive pres str to Fl Bm
4		Ctsk	2 1/4	4 1/8	
4		Butt	1 5/8	3 1/2	Fl Bm
8			2 1/16	3 7/8	Fl to Pres Str
8			1 9/16	3 3/8	
18			3/4	2 1/2	Redrive Str Lat to Lat Pl
20			1	2 3/4	Lat Pl to Fl Bm
60	1"		2 7/8	4 7/8	ac to Fl Bm
8	7/8		2 3/16	4	Lat Pls & Ls to B1-F2 F3
4	"		2 7/16	4 1/4	Fl to Pres Str
4	"	"	1 15/16	3 3/4	

SHIPPING LIST

NO	DIA	HD	LGTH
30	7/8	Butt	2 1/2
55			2 3/4
30	"	"	3 5/8
20			3 1/8
20			3 3/8
15			3 1/2
75			3 3/4
20			3 7/8
20			4 1/8
15	7/8	Ctsk	4 1/8
15		Butt	4 1/4
80	1"	Butt	4 7/8
20	7/8		4

GENERAL NOTES:

Baltimore & Ohio Railroad System General Specifications for Steel Railway Bridges 1922 are to apply except Paragraphs 156 to 197, inclusive and 275 to 281, inclusive, are to be omitted and the following specifications or current revisions thereof are to be substituted
Structural Steel ASTM A7 36 with copper content of 0.2% min
Rivet Steel ASTM A141 36
Rivets 7/8 diam
Open Holes 15/16 diam, unless noted
Paint One coat in shop
Parts of present material in contact with new material to be thoroughly cleaned of all rust, dirt and loose paint, and given one coat of paint before placing new material. Surfaces of new material inaccessible after erection to be given two coats of paint before erection
Present material shown by red (light) lines
New material shown by black (heavy) lines
Holes shown thus ⊙ match present rivet spacing

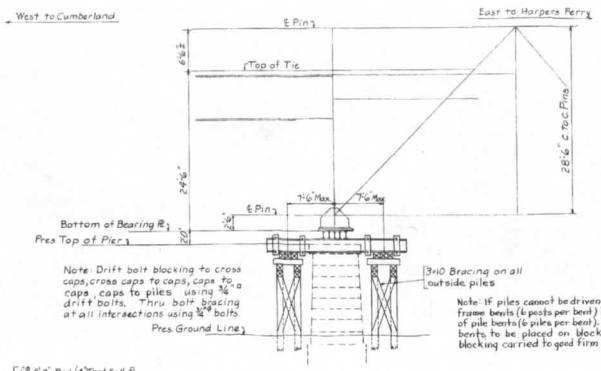
For General Notes, Bill of Material, List of Field Rivets, Erection Diagram, & Erection [illegible], see Drawing No 34956
Rivets 7/8 diam
Open Holes 15/16 diam unless noted

Note to Erector

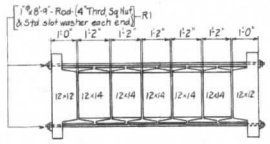
THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO
CUMBERLAND DIV MAIN LINE
BRIDGE NO 64 NORTH BRANCH, MD
REPAIRS
SCALE 3/4" = 1'-0" OCT 6, 1937
OFFICE OF ENGINEER OF BRIDGES
BALTIMORE, MD.
APPROVED ENGINEER OF BRIDGES
DRAWING No 32174C

Checked in field by P Petri Dec 1 1937 A by C B Herveson 10-17-45

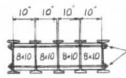
34×23 BCATIDAD B0153199 4054



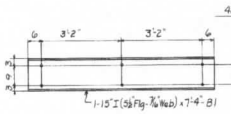
ELEVATION-AA



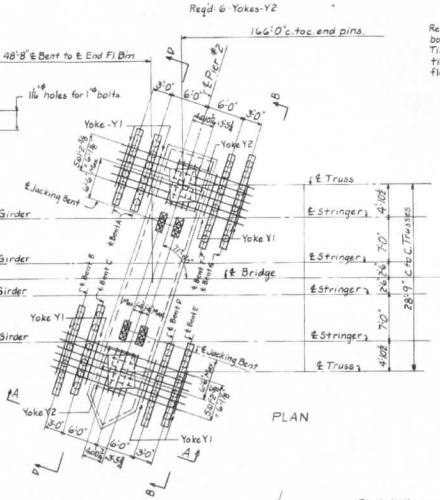
Reqd: 8-Yokes-Y1



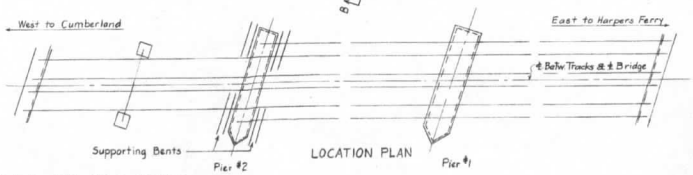
Reqd: 6-Yokes-Y2



Reqd: 10 Beams-B1

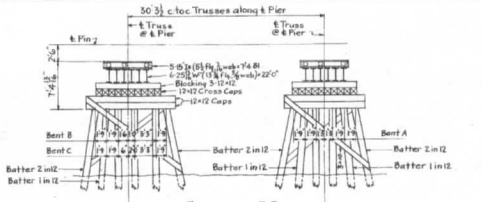


PLAN



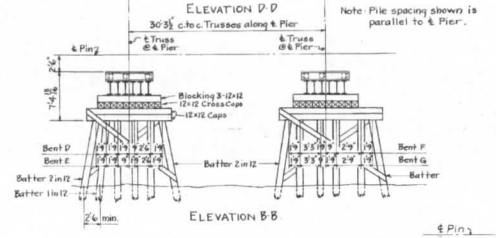
LOCATION PLAN

Checked in field by P. Petri July 29, 1938.

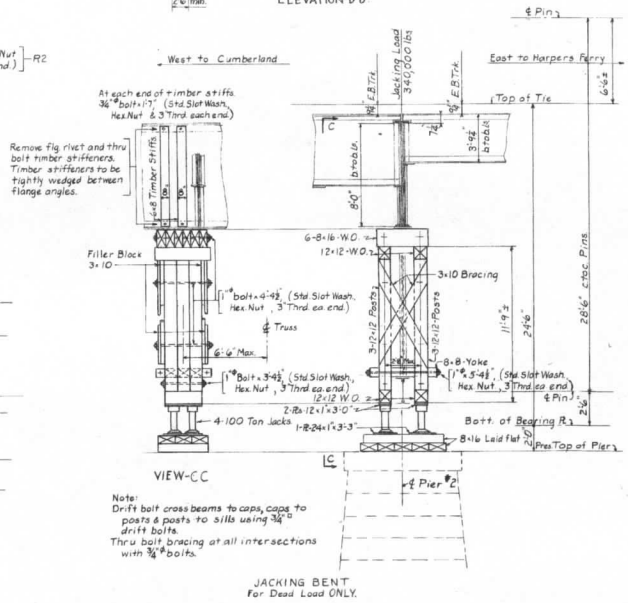


ELEVATION D-D

Note: Pile spacing shown is parallel to ℄ Pier.



ELEVATION B-B



VIEW-CC

Note:
Drift bolt cross beams to caps, caps to posts & posts to sills using ¾" □ drift bolts.
Thru bolt bracing at all intersections with ¾" φ bolts.

JACKING BENT
For Dead Load ONLY.

BILL OF MATERIAL FOR SUPPORTING

NO.	DESCRIPTION	FT.	IN.	MARK	REMARKS
12	25 12" W (53# Flg. ⅝")	22	0		Stored at Martinsburg
10	15" I (5# Flg. 7/16")	7	4	B1	" " " cut from 14'-8"
16	Rods 1" φ	8	9	R1	(4" Thrd. Sq. Nut & Std. Slot Washer ea. end)
12	Rods 1" φ	4	0	R2	(" " Hex. Nut, 3" φ × ⅜ Washer ea. end)

BILL OF MATERIAL FOR ONE JACKING BENT

2	Pls. 24×1	3	3	Plain
4	Pls. 12×1	3	0	
2	Bolts 1" φ	5	4½	(Std. Slot Washer, Hex. Nut, 3" Thrd. ea. end)
6	" 1" φ	4	4½	" " " " " "
2	" 1" φ	3	4½	" " " " " "
4	" ¾" φ	1	7	
4	100 Ton Jacks			

Note to Erector:

① Build supporting bents on each side of pier as shown.
② Place jacking bent at south end of pier to permit placing of supporting beams under south bearing. Keep all blocking north of masonry joint to permit the removal of masonry under the bearing.
③ Remove coping course of masonry as necessary outside of pres. south bearing block without disturbing present bearing.
④ Cut off anchor bolts at south shoe.
⑤ BETWEEN TRAINS
(a) Jack as necessary to remove pres. granite bearing block.
(b) Remove bearing block and coping course of masonry under beam block without disturbing masonry on which the jacking bent is supported. Follow up removal of masonry with timber blocking.
(c) Place supporting beams, removing blocking as necessary.
(d) Release jacks.
⑥ If necessary, to pass traffic during the removal of the masonry under the bearing, the shoe is to be thoroughly blocked to masonry and jacks released.
⑦ To place supporting beams under north bearing move jacking bent to north end of pier. Keep all blocking south of masonry joint to permit the removal of masonry under the bearing.
⑧ Cut off anchor bolts at north shoe.
⑨ Remove coping course of masonry as necessary outside of pres. north bearing block without disturbing present bearing.
⑩ Repeat as in ⑤ and ⑥
⑪ Jacking bent above jacks may be lashed to steel until needed to remove supporting beams after masonry is repaired.

Note: NO TRAFFIC to be allowed on bridge unless supporting beams are in place as bearing is thoroughly blocked to masonry and jacks released.

THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.
CUMBERLAND DIV. MAIN LINE
BRIDGE NO. 64 NORTH BRANCH, MD.

SUPPORTING PLAN

SCALES: 1/8", 1/4", 1/2" = 1'-0" JUNE 4, 1938.
OFFICE OF ENGINEER OF BRIDGES
BALTIMORE, MD.

APPROVED: _____ ENGINEER OF BRIDGES

DRAWING No. 32315 B

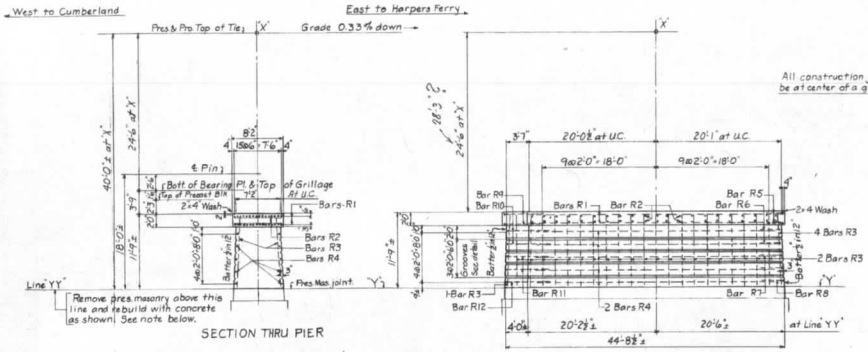
A Rev. for Office Check 12-8-38
B Rev. for change of frame bents to pile bents. G.G. 2-20-39

34×23 BOAT 109E 80153/17 H.D. ✓ 8-8-38 H.S.

Jacking Bent (H.L. only) Post Load = 28 Tons

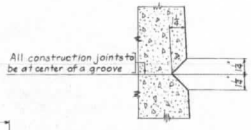
Line rates 320 - Used 51 Eqg. Loads
Max. Pile 202 Tons. Stress 25% W 25/100 Full Impact

A054



SECTION THRU PIER

ELEVATION OF PIER (Looking West)



DETAIL OF GROOVE

BILL OF REINFORCING BARS

NO.	SIZE	LGTH	MARK	REMARKS
32	¾"ϕ	40'-4"	R1	Straight
42	"	7'-6"	R2	"
47	"	11'-3"	R3	"
10	"	38'-0"	R4	"
2	"	12'-8"	R5	Bent
2	"	13'-8"	R6	"
2	"	14'-4"	R7	"
1	"	14'-8"	R8	"
2	"	15'-8"	R9	"
2	"	16'-4"	R10	"
2	"	17'-0"	R11	"
1	"	17'-4"	R12	"
34	¼"ϕ	13'-6"		Straight
30	"	15'-6"		Bend in field
8	"	21'-0"		for Blocks "A"
80	1"ϕ	2'-0"	R13	Dowels

BENDING DIAGRAM

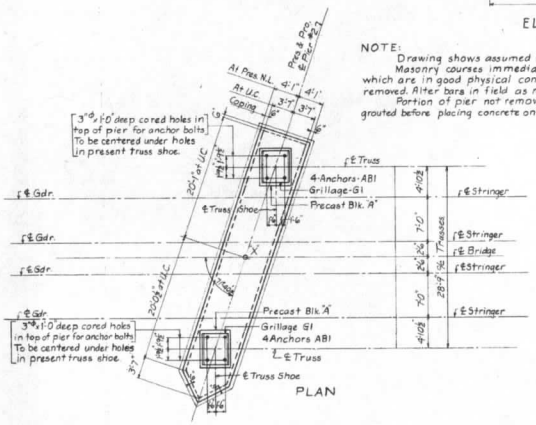
BILL OF MATERIAL

SHOP BILL

NO.	DESCRIPTION	FT.	IN.	MARK	REMARKS
4	Pls. 52"×⅜"	5	2	pa.	
4	Pls. " "	5	2	pb.	
8	15" I s 42.9#	5	2	ba.	
2	15" I s 42.9#	5	2	bb.	
8	Hacked Bolts 1¼"ϕ	5	7	ABI	Hex Nut - 3" thrd 1 9/16"ϕ hole
8	Washers 3½"ϕ×⅜"				

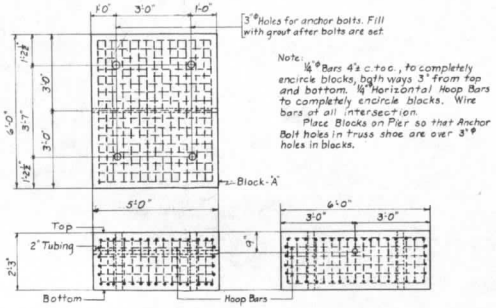
SHIPPING BILL

NO.	DESCRIPTION	MARK
2	Grillages	GI
8	Anchor Bolts	ABI



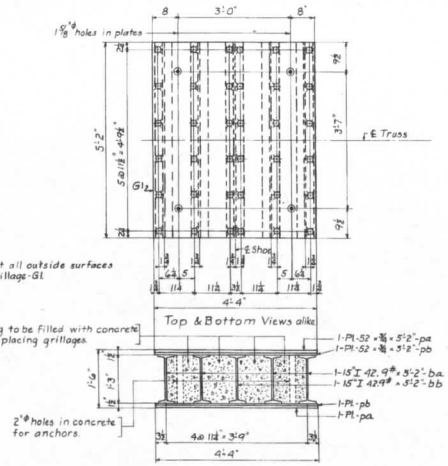
PLAN

NOTE:
Drawing shows assumed maximum rebuilding. Masonry courses immediately above Line YY which are in good physical condition shall not be removed. Alter bars in field as necessary.
Portion of pier not removed is to be thoroughly grouted before placing concrete on top.

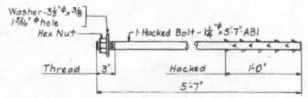


Note: ¼"ϕ Bars 4's c. to c., to completely encircle blocks, both ways 3" from top and bottom. ¼" Horizontal Hoop Bars to completely encircle blocks. Wire bars at all intersection.
Place Blocks on Pier so that Anchor Bolt holes in truss shoe are over 3"ϕ holes in blocks.

DETAIL OF PRECAST BLOCKS-"A"
Req'd.- 2 Blocks-Mark-"A"



Req'd. 2-Grillages-GI



Req'd. 8-Anchor Bolts-ABI

GENERAL NOTES
Baltimore & Ohio Railroad System "General Specifications for Steel Railway Bridges 1922" are to apply except Paragraphs 156 to 177, inclusive and 275 to 281, inclusive, are to be omitted and the following specifications or current revisions there of are to be substituted:
Structural Steel - A.S.T.M. A7-36 with copper content of 0.02% min.
Rivet Steel - A.S.T.M. A141-36
Rivets: ¾" diam.
Open Holes: 1 9/16" diam., unless noted.
Paint: - One coat in shop, except surfaces in contact with concrete.
Present material shown by red (light) lines.
New material shown by black (heavy) lines.
Holes shown thus ⊙ match present spacing.
Concrete to be in accordance with B.&O. Specifications for Concrete and Reinforced Concrete dated Sept. 1, 1929 Form 1631-A Spl.. Pier concrete to be Class 6. Precast Concrete Blocks to be Class 5.
Reinforcing Bars to be deformed bars in accordance with A.S.T.M. Spec. A16-35 for Rail Steel Reinforcing Bars, or A.S.T.M. Spec A15-35 for intermediate grade Billet Steel Reinforcing Bars or current revisions thereof.
All exposed edges of concrete except undercoping and where otherwise noted to be chamfered 1¼"×1¼".
All exposed surfaces of concrete to have a smooth, hard and dense finish.
Concrete not to be subjected to strains or vibrations until it has had time to season and harden.
Dowel masonry to new concrete with 1"ϕ×2'-0" lg. dowels placed 1'-0" into old masonry. One dowel to be placed in each 4 Sq. Ft. of common surface.
If local conditions require changes from what is shown on plan submit data to Engineer of Bridges for approval or redesign as necessary.
Surfaces of contact between old and new masonry shall be thoroughly cleaned and wetted before placing new concrete.

THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.
CUMBERLAND DIV. MAIN LINE
BRIDGE NO. 64 NORTH BRANCH, MD.

MASONRY REPAIRS

SCALE: ¼"=1'-0" JUNE 10, 1938
OFFICE OF ENGINEER OF BRIDGES
BALTIMORE, MD.

APPROVED: _____
ENGINEER OF BRIDGES

DRAWING No. 32316 A

Checked in field by P. Petri July 29, 1938.

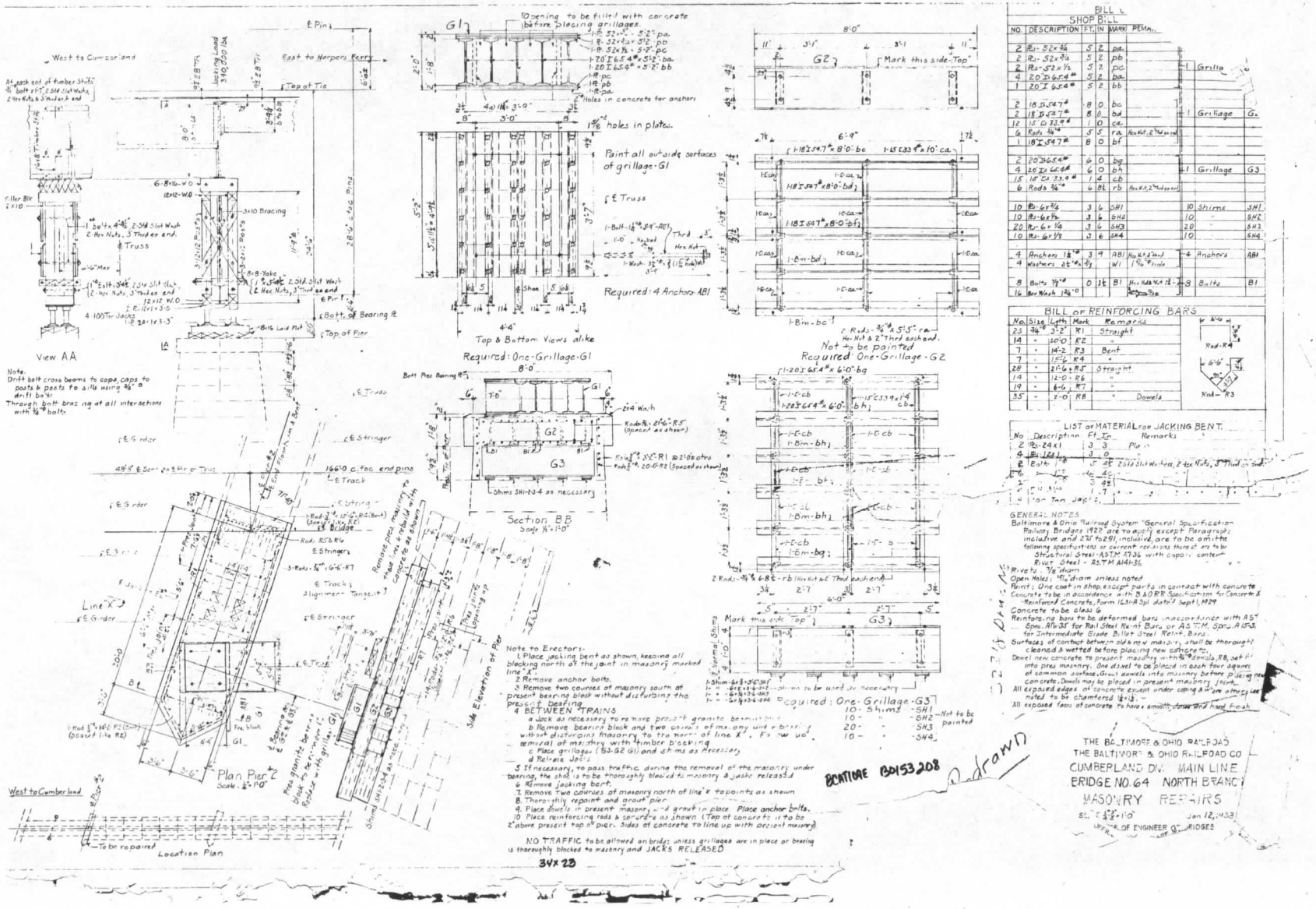
34x23 BCAT 109E BD153216

H.D. ✓ 8-8-38 H.S.

A Rev. for Office Check 10-8-38

Precast Block - 2.05 c.y. each. 10,150 lbs "
Concrete in Pier - 140± C.Y.
Reinforcing Bars - 4100 lbs
Grillage & Anchors - 8000 ± Steel

4054



BILL OF SHOP BILL

NO.	DESCRIPTION	FT.	IN	MARK	REMARKS		
2	Rs-52x¾	5	2	pa			
2	Rs-52x¾	5	2	pb			
2	Rs-52x½	5	2	pc		1	Grillage
4	20 I 65.4#	5	2	ba			
1	20 I 65.4#	5	2	bb			
2	18 I 54.7#	8	0	bc			
2	18 I 54.7#	8	0	bd		1	Grillage G1
12	15 C 33.9#	1	0	ca			
6	Rods ¾"	5	5	ra	Hex Nut, 2" Thread		
1	18 I 54.7#	8	0	bf			
2	20 I 65.4#	6	0	bg			
4	20 I 65.4#	6	0	bh		1	Grillage G3
15	15 C 33.9#	1	4	cb			
6	Rods ¾"	6	8½	rb	Hex Nut, 2" Thread		
10	Rs-6x¾	3	6	SH1		10	Shims SH1
10	Rs-6x¾	3	6	SH2		10	" SH2
20	Rs-6x¾	3	6	SH3		20	" SH3
10	Rs-6x¾	3	6	SH4		10	" SH4
4	Anchors 1¾"	3	9	AB1	Hex Nut & Thrd	4	Anchors AB1
4	Washers 8"x⅜			W1	1⅝" Hole		
8	Bolts ¾"	0	3½	B1	Hex Head, Nut & Thrd	8	Bolts B1
16	Bev Wash 1¾"						

BILL OF REINFORCING BARS

No.	Size	Lgth	Mark	Remarks
25	¾"	3'-2"	R1	Straight
14	"	20'-0	R2	"
7	"	14'-2	R3	Bent
7	"	15'-6	R4	"
28	"	21'-6	R5	Straight
14	"	12'-0	R6	"
19	"	6'-6	R7	"
35	"	1'-0	R8	" Dowels

LIST OF MATERIAL from JACKING BENT.

No	Description	Ft	In	Remarks
2	Rs-24x1	3	3	Plain
4	Rs-12x1	3	0	"
8	Bolts ¾" ø	5	8½	2 Slot Washers, 2 Hex Nuts, 3" Thread on Shank
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

GENERAL NOTES

Baltimore & Ohio Railroad System "General Specification Railway Bridges 1922" are to apply except Paragraphs inclusive and 2.7 to 2.91, inclusive, are to be omitted. The following specifications or current revisions thereof are to be: Structural Steel - ASTM 47-36 with copper content. Rivet Steel - ASTM A141-36.

Rivets - ⅞" diam

Open Holes: ⅞" diam unless noted

Paint: One coat in shop except parts in contact with concrete.

Concrete to be in accordance with B&ORR Specifications for Concrete & Reinforced Concrete, Form 1631-A Spl dated Sept 1, 1929

Concrete to be class G

Reinforcing bars to be deformed bars in accordance with ASTM Spec. A16-35 for Rail Steel Reinf. Bars or ASTM Spec. A15-35 for Intermediate Grade Billet Steel Reinf. Bars.

Surfaces of contact between old & new masonry shall be thoroughly cleaned & wetted before placing new concrete.

Dowel new concrete to present masonry with ¾" ø dowels, R8, set into pres masonry. One dowel to be placed in each four degrees of common surface. Grout dowels into masonry before placing new concrete. Dowels may be placed in present masonry joints.

All exposed edges of concrete except under coping & where otherwise noted to be chamfered ½"x½".

All exposed faces of concrete to have a smooth ~~stone~~ and hand finish.

Required: One-Grillage-G3

10 - Shims	-SH1	Not to be painted
10 - "	-SH2	
20 - "	-SH3	
10 - "	-SH4	

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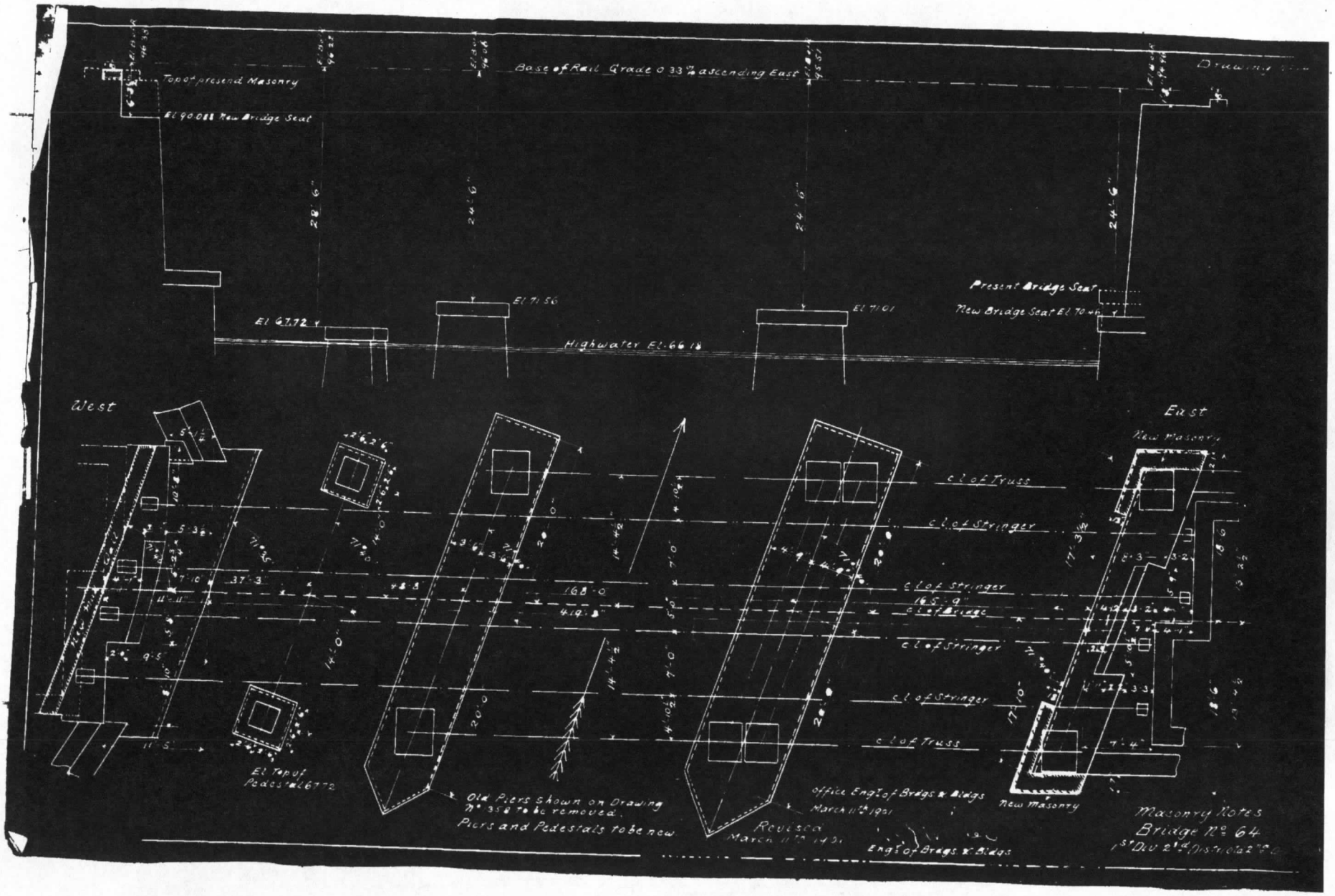

SEE ALSO REVERSE SIDE THIS CARD

Bridge 64, Main Line, Cumberland Division, crossing Potomac River, North Branch, Md.

DSCPT: Steelwork for repairs

AUTHY - Operation -

STEELWORK

CONTRACTOR: McClintic-Marshall Company
CONT.DATED: January 6th, 1931 (Order 34524/A-12830)
CONT.PRICE: 2.79¢ per lb.f.o.b.Rankin,Penna.
CONT.TIME: February 24th, 1931.
CONTRACT: Fabricate and deliver
WEIGHT: Estimated 166,000 lbs. Actual: 170,338 lbs.
SHIPMENTS: Commenced: 2-24-31 Completed: 2-24-31

NOTE ALSO OBVERSE SIDE THIS CARD

Bridge 64, Cumberland Division, North Branch, Md.
DSCPT: Steelwork for repairs
AUTHY: Operation
CONTRACTOR: Jones & Laughlin Steel Corp.
CONT.DATED: April 30th, 1934.
ORDER 63661/A-4815 (No formal contract)
CONT.PRICE: 3.08¢ per lb. fob North Branch, Md.
WEIGHT - Estimated: 31,000 lbs. Actual: 26,785 lbs.
SHIPMENTS - Commenced: 7-14-1934 Completed: 7-14-1934

ERECTION - M.of Way forces to erect - letter to Chf.Eng. Maint., May 2nd, 1934.

Bridge 64, Main Line, Cumberland Division, crossing Potomac River, North Branch, Md.

DSCPT: Repairs - reconstruction west pier
AUTHY: PRES-21417 VP-40636 C-44559 AFE-25380 - Amt. $18,000
Road and Equipment....$5,520 Stand. Est. 25663
Operation.....12,480 Val.Sec.1-MD-40.1
Division forces to handle - letter to Ch. Eng. Maint., Feb. 28th, 1939.

S1397

STEELWORK

CONTRACTOR: American Bridge Co.
ORDER ~~52396~~/A-12811 - January 4th, 1940
PRICE: 3.78¢ per lb.f.o.b. B.&O.Tracks, Millvale, Penna.
DELIVERY: 2 months (March 4th, 1940)
WEIGHT: Estimated: 12,500 lbs. Actual: 12,164 lbs.
SHIPMENTS: Commenced: 3/5/1940 Completed: 3/5/1940
WORK COMMENCED: Feb.15th, 1939. COMPLETED: Oct.23th, 1940.

Formal release May 17th, 1939.

Bridge No. 64, Main Line, Cumberland Division, North Branch, Md.
Placing walkway between tracks on bridge.
AUTHY:-PRES-3731, VP-21988, C-22100, AFE-5240.
Amount of form.....$430.00 Stand.Est.4847
R. & E..... 430.00 Val.Sec.1-MD-40.1
Work authorized by letter from VP-Galloway to Chf.Engr.Lane dated November 6th, 1923.

Maintenance of Way Department to handle work to completion
Letter to Ch.Eng.Maint., November 8th, 1923.

WORK - Commenced: Completed:
Chf.Eng.Maint advised 2-27-1924 work completed

Bridge No. 64, Main Line, Cumberland Division, North Branch, Md.
Repairs to superstructure - Drawing No. 18582-B
AUTHY:- OPERATION.

--STEELWORK--

CONTRACTOR - Phoenix Bridge Co.
Order Dated - Oct. 4th, 1922.
CONT.PRICE 3.9¢
CONTRACT - Furnish and deliver.
WEIGHT - Estimated 13,200 lbs. ACTUAL:- 13,124
SHIPMENTS COMMENCED 12-19-22 COMPLETED 12-19-22
PAINT:- B. & O. Red Lead.
CONT TIME - 7 to 8 weeks after date of order.

SUMMARY OF COST

MATERIAL.....$511.83
ERECTION.....

Drwg.No.	Bridge No. 64 - Cumberland Division - Main Line 2 Span Dk.Pl.Gr. 48'8"- 2 Span Dk.Tr. 166'0"		File No.
1358A	Layout Plan	4 Prints	4054
1408A	Masonry Notes	3 Prints	4054
	Details of Falsework	1 Print	4054
	Plan of Masonry of Old Bridge	1 Trac.	4054
18582	Repairs	1 Trac.	4054
21234	Repairs - 9-15-25	1 L.T.	4054
21664	Repairs - 7-14-26	1 L.T.	4054
~~23501~~	~~Repairs - Void - 11-18-29 - Destroyed~~	~~1 L.T.~~	~~4054~~
23598	Repairs - 12-27-29	1 L.T.	4054
	Masonry Plan - 1895	1 Trac.	4054
44094-6	Steel Repairs & Erection Dwgs. 3-4-80	1 Print	4054
44545	Steel Repairs and Erection Diag. 4-28-81	ILT	4054

Drwg.No.	Bridge No. 64 - Cumberland Division - Main Line		File No.
32218	Masonry Repairs - 1-12-38	1 P.T.	4054
32315	Supporting Plan - 6-4-38	1 L.T.	4054
32316	Masonry Repairs - 6-10-38	1 L.T.	4054
32518	Steel Repairs - 1-20-39	1 L.T.	4054
32516	Pedestal Repairs - 1-19-39	1 L.T.	4054
32597	Steel Repairs - 5-29-39	1 L.T.	4054
32598	Steel Repairs - 5-29-39	1 L.T.	4054
32609	Tie Plan - 6-9-39	1 P.T.	4054
	Field Measurements	Vault	A-18
32631	Expansion Shoe Repairs - 7-20-39	1 L.T.	4054
32633	Jacking Plan - 7-25-39	1 P.T.	4054
41473	Steel Repairs	1 L.T.	4054
41474	Steel Repairs	1 L.T.	4054
41472	Steel Repairs	1 L.T.	4054

Drwg.No.	Bridge No. 64 - Cumberland Division - Main Line		File No.
23651	Repairs - 2-1-30	1 L.T.	4054
24026	Repairs - 9-15-30	1 L.T.	4054
24027	Repairs - 9-15-30	1 L.T.	4054
24028	Repairs - 11-29-30	1 L.T.	4054
24029	Repairs - 11-25-30	1 L.T.	4054
30331	Repairs - 7-8-31	1 P.T.	4054
30835	Repairs - 11-15-33	1 Trac.	4054
31605	Tie Plan - 3-19-36	1 L.T.	4054
~~32107~~	~~Repairs - Void - 7-29-37 - Destroyed~~	~~1 L.T.~~	~~4054~~
32174	Repairs - 10-6-37	1 L.T.	4054
	Photographs	Ph.File	B-28
~~43991~~	~~Field Measurements (3-4-74)~~		604
43991	Field Measurements (3-4-74)	1 L.T.	4054
44094	Erection Diagram & General Notes 4-30-75	1 L.T.	4054
44094-1	Steel Repairs	1 L.T.	4054
44094-2	Steel Repairs	1 L.T.	4054
44094-3	Steel Repairs	1 L.T.	4054

Drwg.No.	Bridge No. 64 - Cumberland Division - Main Line North Branch, Md.		File No.
32626	Repair Plan - 7-13-39	1 P.T.	4054
32636	Steel Repairs - 8-2-39	1 P.T.	4054
32665	Steel Repairs - 9-8-39	1 L.T.	4054
32708	Steel Repairs - 10-26-39	1 L.T.	4054
	List of Rivets & Bolts-Am.Br.Co.- 1-9-40	2 P.T.	4054
34956	Steel Repairs - 10-16-44	1 L.T.	4054
35737	Steel Repairs - 11-9-45	1 L.T.	4054
36088	Steel Repairs - 6-28-46	1 L.T.	4054
36089	Steel Repairs - 6-28-46	1 L.T.	4054
36090	Steel Repairs - 6-28-46	1 L.T.	4054
40052	Masonry Repairs 9-1-53	1 L.T.	4054
40451	Steel Repairs 6-9-54	"	"
40452	" " "	"	"
40453	" " "	"	"
40454	" " "	"	"
40455	" " "	"	"
40456	" " "	"	"
40600	Jacking Plan 9-2-54	1 P.T.	"

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BRIDGE 64

BALT AND OHIO R R

NORTH BRANCH OF THE POTOMAC RIVER

Office of the Chief Engr

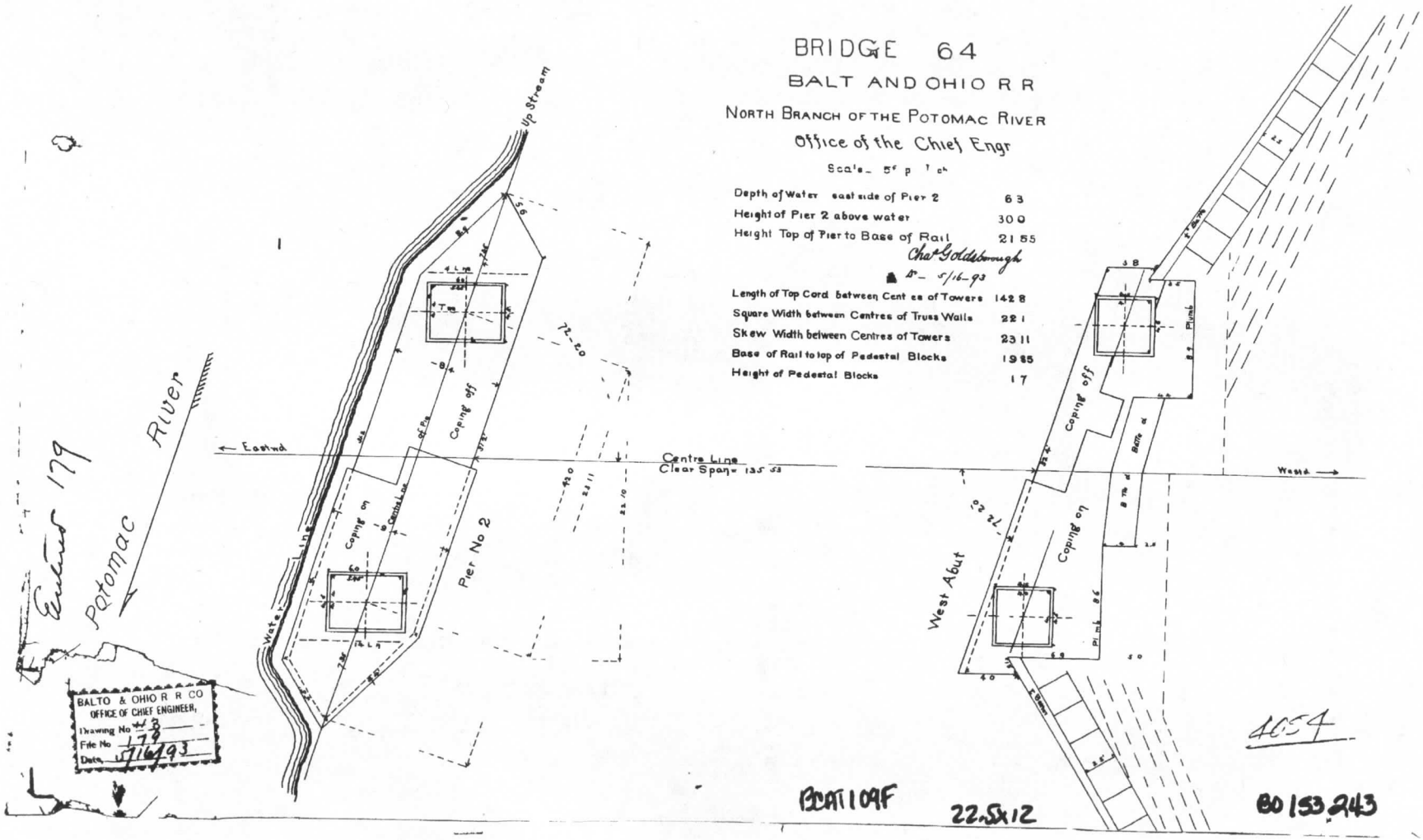
Scale - 5' p 1 ch

Depth of Water east side of Pier 2	6 3
Height of Pier 2 above water	30 0
Height Top of Pier to Base of Rail	21 55

Chas Goldsborough

Dr - 5/16-93

Length of Top Cord between Centres of Towers	142 8
Square Width between Centres of Truss Walls	22 1
Skew Width between Centres of Towers	23 11
Base of Rail to top of Pedestal Blocks	19 85
Height of Pedestal Blocks	1 7



4054

BCAT109F 22.5x12 B0153243

3000 5-7-7 28-3x—41c R 3 46—Spl.

Cumberland Div. Main Line
Bridge No. 64 North Branch, Md.
Calculations for Jacking @ Pier 2
Girder Span 48'-8" Truss 166'-0" c/c end pins.

N.D. 1/4/38
✓H.J. 1-13-38

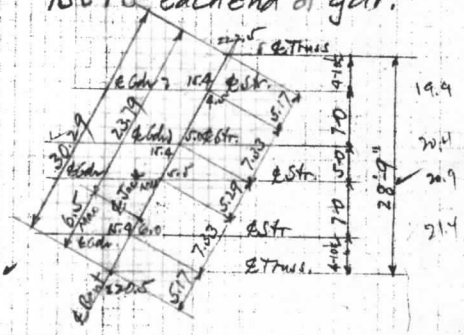
Total Dead Load.

Truss	742000	928000
Deck	186000	
2 Dl. Gdr Spans	68800	123000
Decks	54200	

4 | 1057000
262750 ✓ D.L. on shoe.

4 | 928000
232000 per shoe of Truss.

8 | 123000
15375 each end of gdr.



Load on Jack 6'-6" Max from Truss.

19.9 x 5.17	=	103
20.4 x 12.5	=	255
20.9 x 17.79	=	371
21.4 x 25.12	=	540
220.5 x 30.29	=	6681
		7950 ÷ 23.79
303.4	=	335 Kips Jacking Load ✓
322.7		
20.4		

✓ Cross Beams:- Use 6- 8x16

✓ Bearing on 14" Cov. of End Cross Gdr. or Fl. Bm.

✓ $\frac{335000}{6 \times 8 \times 14} = 500$ #/□" ✓

✓ Bending Jacking Bent - 3 Posts 12x12 @ 2'-8" Max. ctrs. ✓ - Post load = $\frac{335,000}{6 \times 2000}$ = 27.9 Tons

$\frac{335000 \times 16}{2 \times 6 \times 341} = 1310$ #/□" ✓

✓ Bearing Cross Bms to Cap [12x12 w.o. Caps]

✓ $\frac{335000}{2 \times 12 \times 48} = 290$ #/□" ✓

✓ Bearing: Caps to Posts, Posts to Sills. [12x12 W.O. Sills]

✓ $\frac{335000}{2 \times 12 \times 12 \times 3} = 390$ #/□" ✓

✓ Use 4-100 Ton Jacks.

✓ Bearing - Head on Sill of Bent

✓ $\frac{335000}{4 \times 76.7} = 1092$ #/□" Use 2" Bearing Plate under sill.
76.7 — for 9⅞" head on jack.

✓ Bearing:- Base on blocking or masonry.

✓ $\frac{335000}{4 \times 153.938} = 545$ #/□"
21" ⌀

✓ Suggest using 2-1" plates under jacks large enough for 2 jacks to rest on them.

When truss is jacked up and bearing stone is removed, timber blocking under shoe to carry L.L. + D.L.

D.L. — 263,000

L.L. $\frac{320}{225} \times 575 = 817,000$
1,080,000 ÷ (62x48) = 363 #/□"

73.8
229.6
16.25
319.65 x 22.9 = 575,000 (Ε50)

3000 5 7-37 28-B—41c R S 48—Spl.

Cumberland Div. Main Line
Bridge No. 64 North Branch, Md.

1/9/38
M.S. 1-13-38

Calculations for Grillage. - Line Rates 320 Bridge Rates 360

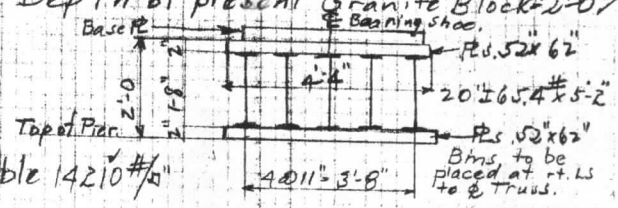
E50 Bridge

Load on shoe.

D.L.	262750
L.L(E50)	574400
I 39.3	225850
	1063000

Size of shoe 48"x62"

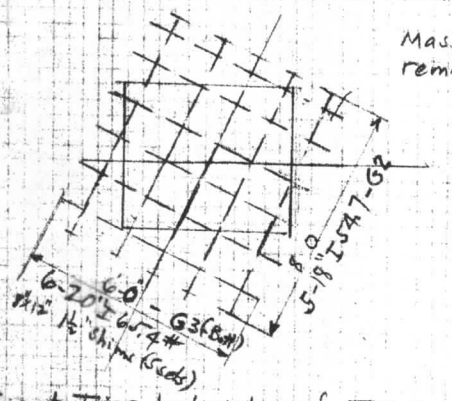
Depth of present Granite Block 2'-0"

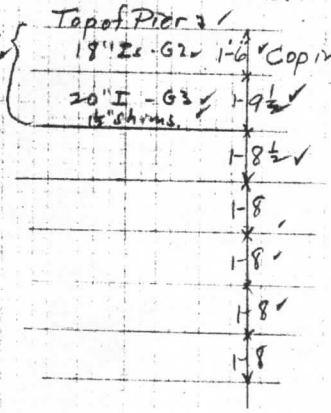


Buckling Stress

$\frac{1063000}{5 \times 62 \times .5} = 6850$ #/□" Allowable 14210 #/□"

Two courses of masonry under south truss bearing on Pier #2 are to be replaced with grillage encased in concrete. Also top of pier to south end and for a distance of 9'-9" ± from the ℄ of south truss toward center of Pier #2. ?





First Tier below top of Pier.

5-18" I 54.7# - 15" [33.9# Separators.

Buckling Stress

$\frac{1063000}{.46 \times [12+64+65+4+12+(5 \times 9)]} = 8820$ #/□" Allowable 14340

Shear First Tier to 2nd Tier. - Bearing Web

$\frac{1063000}{46 \times 6 \times (5 \times 6)} = 12{,}900$ #/□" OK.

2nd Tier - G3

6- 20" I 65.4 - 15" [33.9# Separators. - G3

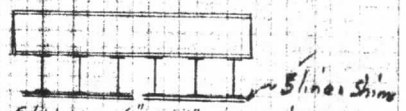
Buckling Stress.

$\frac{1063000}{.5 \times [15.5 \times 4 + \frac{20}{2}] \times 6} = 4900$ #/□"

Bearing on Masonry

Use Shims 6"x3'-6" - 10 shims

$\frac{1063000}{6 \times 42 \times 2 \times 5} = 420$ #/□"



2- Shims 6"x3'-6" under each of 1st. Tier b'ms.

3000 5-7-37 28-34—41c

H.S.
R S 48—8pl.
H.B.
6/2/38

Cumberland Div. Main Line
Bridge No. 64 North Branch Md

Calculations for Supporting: Double Track Structure - Alignment Tangent.
over Pier #2 both shoes.

Rating of Line 320 - Used "S1" Engine.

Load on shoe

DL.	263000
L.L. (S1 Engine)	704000
DL+LL.=	967000
Imp. 39.3%	277000
DL+LL.+I =	1244,000

1 span 590,000 Soil 1453 Val. Steel

APPROVED

Total Wgt. of 1 Truss Span = 734 000#
Total Wgt. of 1 Gird. Span (P.T.) 70 000#
Wgt. of 1 Shoe. Steel = 804000 ÷ 4 = 201000#
Deck @ 500#/□' of L.L. = (500 x 215) ÷ 2 = 54 000
255000
Use 263000# D.L.

5-15" I (7/16" web) x 9'-6" min. under each shoe, parallel to ℄ Pier.

Buckling Stress = $\frac{1244000}{[91+66+66+66+91+15\times5]\times4.1}$ = 9560 #/□" allowable 14720 #/□"

6-25 13/16" x 13 3/4" x 5/8" x 22'-0" Bms under each shoe for supporting.
15'-0" c/c. bearing-max.

Moment
1/4 1244000 x 15 = 4,660,000
SM of 6 Bms = 370.4 x 6 = 2222.4

Stress = $\frac{4660000 \times 12}{2222.4}$ = 25,100 #/□" with Full Imp.

Use 3 - 12x12 W.O. Blocking under bms.

Bearing = $\frac{1244000}{2\times(13.75\times6)\times36}$ = 210 #/□" with Imp.

$\frac{967000}{2\times(13.75\times6)\times36}$ = 163 #/□" No Imp.

Double Bent each side of pier for each shoe - 6 Posts per bent.
$\frac{967000}{2\times6\times2}$ = 40400 or 20.2 Tons per post.

Blocking to Cross Caps.
Bearing = $\frac{967000}{2\times3\times12\times(10\times12)}$ = 112 #/□" (No Imp.)

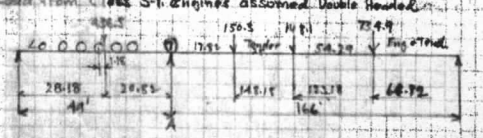
Cross Caps to Caps.
Bearing = $\frac{967000}{2\times12\times(12\times10)\times2}$ = 168 #/□"

Caps to Posts, Sills to Posts.
Bearing $\frac{967000}{2\times12\times12\times(6\times2)}$ = 280 #/□"

Soil Pressure
$\frac{967000}{2\times6\times14}$ = 5750 or 2.9 Tons.
Say 3.0 Tons.

D.L. of Bents. Steel = 21000
Timber = 43000
64000 ÷ (2x6x14) = 400#

Load from Class S-1 Engines assumed Double Header.



Reaction at "A"

436.5 x 28.18/49	=	250.0
734.9 x 64.72/166	=	288.0
145.1 x 122.18/166	=	110.0
150.5 x 145.15/166	=	134.0

Double Track.
789000 x .9 = 705000# over shoe.

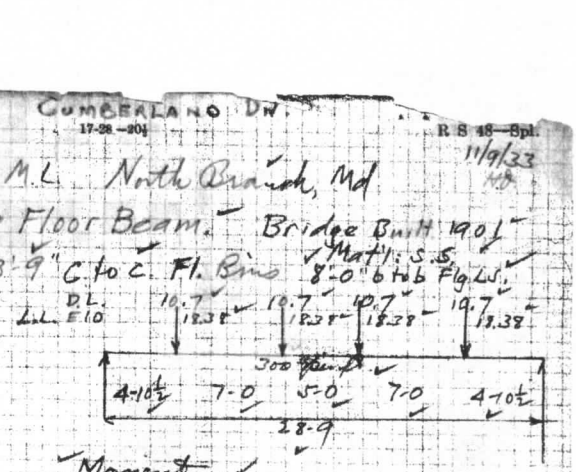
CUMBERLAND DIV.
17-28—20M
R S 48—Spl.

11/9/33

764 Cumberland Div M.L. North Branch, Md

Calculations for rating Floor Beam. Bridge Bu.H 19.01

28'-9" C to C. Trusses, 23'-9" C to C. Fl. Bms Mat'l: S.S. 8'-0" b to b Flg. Ls.



Shear

D.L. Str. 21.4
Fl. Bm 4.3 25.7

L.L. E10 36.75 x .9 = 33.1
Imp. 93%

Moment

D.L. 25.7 x 8.38 = 215000
L.L. 33.1 x 8.38 = 277000
Imp. 93% = 258000 } 535000

Compression Flange

Allowable Stress
24000 - 275 $\frac{84}{14}$ = 22350

Flange Section

⅛ web	4.5" gross
2 Ls - 6x6x⅝	14.22
½ (1 Cov 14x7/16) (Corr. 50%)	3.06
	21.78"

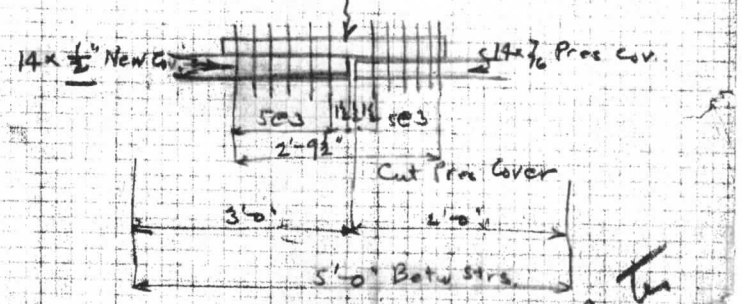
Res Mom.
21.78 x 22350 x 7.8 = 3,795,000'#
3795000 - 215000 = 3580000
3580000 ÷ 535000 = 6.7
6.7 x 45 = 302 rating of Compr. Flg. (Cov. 50% corroded away)

With no top cover Fl. Bm.

⅛ web	4.5
2 Ls - 6x6x⅝	14.22
	18.72

18.72 x 22350 x 7.75 = 3240000
3240000 - 215000 = 3025000
3025000 ÷ 535000 = 5.65
5.65 x 45 = 254 rating of Compr. Flg. (No cover.)

12 - 7/16" = $\frac{5.25\,(16000)}{7220}$ = 11.6 say 12 Riv.



Renew - Half of Cover Pls - 7 Fl. Bms.

G.H.D.
11/9/33

Rev. Br 360

3400 5-7-37 28-34-2.41c R S 48 - Spl.

10/2/37
H.D.

Cumberland Div. Main Line
Bridge No. 64 North Branch, Md.

Estimate of Weight - Repairs Drwg. No. 32174

V.F.W.T.

2 Bms - 36" WF 182# x 23-5 3/8			8540
16 Ls - 8x6x5/8 x F 11 3/8	@	28.5	890
8 Ls - 6x5x5/8 x 2-10	@	22.1	500
4 Fills - 3 1/2 x 3/4 x 1-11 1/2	@	2.93	70
Riv Hds			30
			10030

Field Rivets

30 - 7/8"ϕ - 2 1/2"	@ 67	20			
55	2 3/4	71	39		
20	3 1/8	77	15		
55	3 3/8	81	45		
15	3 1/2	84	13		
70	3 3/4	88	62		
25	3 7/8	90	23		
20	4 1/8	94	19		
15 ctsk	4 1/8	76	12		
80 - 1"ϕ	- 4 7/8	143	115	363	10393

Say
10400 lbs. ✓

3000 3-12-36 28-24—41c R.S 18—Spl.

A.J.W.
8/26/37

CUMBERLAND DIV. - M.L.

BR. No. 64 - NORTH BRANCH, MD.

A EST. COST TO REPAIR TWO PANELS OF STRINGERS by ADDING NEW TOP FLG. Ls., COV. PL. & STIFF. Ls.

Steelwork - Fabricated only	3600# @ .08			$ 288
" " Erect only				100
Rivets to Cut Out	454 @ .20			91
Rivets to Drive	562 @ .30			169
Redap Ties	20 @ $1.00			20
Paint (Two Coats)				7
				$ 675
			2070	135
				$ 810

B EST. COST TO REPAIR TWO PANELS OF STRINGERS by 36" WF Bm.

Steelwork - Fabricated only	8400# @ .06			$ 504
" " Erect only				150
Rivets to Cut Out	156 @ .20			31
Rivets to Drive	250 @ .30			75
Holes to Ream	60 @ .20			12
Paint (Two Coats)				18
20 New Ties @ $8.30 (SAILR 9-6)				166
				956
			2070	194
				$ 1150

A
Labor 387 x 1.2 = $464

B
Labor 286 x 1.2 = $350

3000.5.7.37 28-36-41c R.S.48-Spl.

EST. COST REPAIRS

CUMBERLAND DIV. - M.L.
BR. #64 NORTH BRANCH, MD.

A.J.W.
8-26-37

Dy 32174 A

A EST. COST TO REPAIR TWO PANELS OF STRINGERS BY ADDING NEW TOP FLG. Ls., COV. PL. & STIFF. Ls

Steelwork - Fabricated only	3800# @ .06¢		$ 228
" " - Erected only (incl. Removing Pres. Ls)			100
Rivets to Cut Out	454 @ .50¢		227
Rivets to Drive	562 @ .50¢		281
Redap Ties	40 @ $1.00		40
Paint (Two Coats)			14
			$ 890 ✓
		20%	180
			$ 1070

B EST. COST TO REPAIR TWO PANELS OF STRINGERS BY 36" WF Bm. @ 160#

Steelwork - Fabricated only	9000# @ 06¢		$ 540
" " - Erected only (incl. Removing Old S.W)			150
Rivets to Cut Out	232 @ 50¢		116
Rivets to Drive	300 @ 50¢		150
Holes to Ream	60 @ 50¢		30
Paint (Two Coats)			24
			1010 ✓
Note Pres. Ties. Reused		20%	200
			$ 1210

A

LABOR

S.W. ERECTING	$ 100
Rivets Cut & Dr.	508
Redap Ties	40
Paint	16
	$ 654 × 1.20 = $ 785

1/2

1210
1070
$ 140

B

LABOR

S.W. ERECTING -	$ 50 (Assume Loco. Crane is used)
Rivets Cut & Dr. -	266
Holes Ream	30
Paint	12
	$ 358 × 1.20 = $ 430

✓

8000 5-7-37 28-84—41c R S 48-Spl.

EST. WT.

CUMBERLAND DIV. M.L.
BR. # 64 - North Branch, Md.

A. J. W.
8-25-37

(A) Est. Wt. of Material to Repair Two Panels of Stringers by Adding New Top Flg Ls, Cov. Pl. & Stiff. Ls

4-Ls 6x6x7/16 x 23'-6 3/8 (17.2)	---	1620
2-Pls 13 x 1/2 x 23'-4 1/4 (22.1)	---	1030
20-Ls 3 1/2x3 1/2x3/8 x 3'-8 1/8 (8.5)	---	625
20-Fills 3 1/2x5/16 x 2'-8 1/4 (5.2)	---	280
		3555 #
		345
		3800

Rivets		
135 @ 2 1/2	-	90
260 @ 3	-	195
135 @ 3 7/8	-	120
70 @ 4 3/8	-	70
100 @ 4 3/4	-	105
700		585

Nds. 14+24 = 340

Rivets to Cut Out 454
" to Drive 562

Redap 40 Ties on One End.

(B) Est. Wt. of Material to Repair Two Panels of Stringers by replacing with Rolled Beam

2-36" WF @ 160# x 23'-6 1/2 (160)	--	7550
8-Ls 6x6x5/8 x 2'-9 (24.2)	--	530
Lat. Conns. Rivs. & Misc.		920
(Furnish Fills at Lat. pls on stringer line # 2)		9000 #

Rivets to Cut Out - 78+52+52+50 = 232
Rivets to Drive = 300 (Approx.)
Holes to Ream = 60

Rivs. Cut Out.-
Str. to Fl. Bm. 78
" Conn Ls 52
Both Lateral Conn 52
Str. Lat. System 50
232

2000 5-7-37 — 25-34—41c — R S 48—Spl.

R.R. Calculations — CUMBERLAND DIV. - M.L. — BR. # 6A - NORTH BRANCH, MD. — A.J.W. 9-21-37 ✓ F.W.T.

Stringers: - 23'9" c. to c. Fl. Bms. - E50 Loading

D.L. - Assumed 450#/Ft. - Line rates 320 - Bridge rates 360

SHEAR

D.L. = $\frac{450 \times 23.25}{2}$ = 5,350

L.L. = E50 = 68,800

I. = 98.1% = 67,500

141,650#

Rivets 1" - S.S. -

$\frac{141\,650}{9430 \times .75}$ = 20 Rivs.

Rivets 1" Bg on 11/16 web

$\frac{141\,650}{16500 \times .75}$ = 12 Rivs.

Say Use 13 Rivs.

MOMENT

D.L. = $\frac{450 \times 23.75^2}{8}$ = 31,800 '#

L.L. = 350,000

I. = 98.1% = 343,000

724,800 '#

S.M. = $\frac{724\,800}{16000} \times 12$ = 543 "³

1-36" WF @ 160# - S.M. = 541.0

Compr. Flg.

16000 - 150 $\frac{9.33}{1}$ = 14600 #/□" allowable

S.M. = $\frac{724\,800}{14600} \times 12$ = 596 "³

1-36" WF @ 182# S.M = 621.2

@ 170# S.M. = 579.1

Use - 36" WF @ 182# - web - 0.725

Flg. - 12.072 x 1.180

Rivets 7/8"φ on Web of B'm — 15,750 x 0.75 = 11813 brg. on ¾ web; 14,440 x 0.75 = 10,824 D.S.

$\frac{141\,650}{10824}$ = 13 rivs.

Rating - Allow Comp. Stress - 26000 - 300 $\frac{9.33}{1}$ = 23,200 #/□"

R.M. = 621.2 x 23200 ÷ 12 = 1203000

D.L. 31 800

1,171,200

$\frac{1171,200}{693000} \times 225$ = 380 Rating

20-1"φ Rivets - S.S. = 20 x 13 830 = 276 600

13-7/8"φ " D.S. = 13 x 21120 = 274 550

D.L. = 5350

269 200

$\frac{269\,200}{136\,300} \times 225$ = 444 Rating

36" WF @ 170# rates 352

✓

CALCULATIONS — CUMBERLAND DIV.
BR. #64 at NORTH BRANCH, MD.

11-10-38-H.S.
2/2/39/M.I.

Total Load on Jacking Bent.

Steel Girder Spans (E-50) = 35000 × 2 = 70000
Steel Bent (300×20) + 3400 Gls + (Con 30) Bents & Mills = 12000
Deck. 1000 × 50 = 50000
132000# ÷ 2 = 66000# per Jack.

Bent Reaction for Supporting Bent - Spans 13' + 41

Wheel ③
15.4
63.0
25.0
103.4 (E-50 per rail).

Live Load (320 Rating) = 103400 × 320/225 × 4 × .9 = 530000#
Dead Load = 132000 ÷ 2 = 66000#
596000 ÷ (14×2000) = 21 Tons. per post.

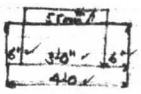
Double Caps. 2-12×12 - 4'-0" cc Posts.

Gird. Reaction
Live Load = 103.4 × 320/225 = 147000
Dead Load = 66000 ÷ 4 = 17000
164000 over 3'-0" = 55000#/1

Void

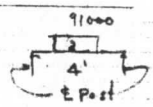
Mom = 82500 × (2 - .75) × .8 = 82500'#

Stress = 82500 × 12 / 2×288 = 1700#/□"



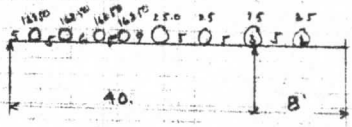
Cap on Jacking Bent.
5'-0" c to c. Post. Load = 33000#
Mom = 16500 × 2.5 = 41200 × 12 = 496000'#
Stress = 496000 × 6 / 12 × 12 × 12 = 1700#/□"

Caps on Supp. Bents
D.L. - 17000#/Gir
L.L. 320 163000
91000 182000
M = 45500 × (2 - .75) × .8 = 46000'#
Used - 2-12"×12" M Rio 2×36 = 72000'# Sig. o.k.



Bent Reaction for Supporting Bent - Spans. 39' + 9' Cantilever

Dead Load - per track.
Steel (48' E-50 Span) = 35000 ÷ 48 = 730#
Deck = 570
1300#/1 of track.



Bent Reaction - Double Track.
L.L. 326000 × 1.8 = 587000
D.L. 37000 × 2 = 74000
661000 ÷ (14×2000) = Say 23 Tons.

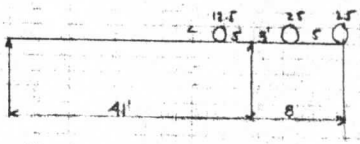
LL = 25.0 × 46/40 = 28.1
75.0 × 35/40 = 65.6
63.0 × 13/40 = 21.0
114.7 × 320/225 = 163000

D.L. 1300 × 48 × 24/40 = 37000#
326000 Per Track

Overturning - One Track.

Moments
Right.
L.L. = 50.0 × 5.5 × 2 × 320/225 = 780000
I. = 55% 662000
D.L. = 1300 × 8 × 4 = 41000
1483000

Left.
12.5 × 5 × 2 × 320/225 = 178000
= 152000
1300 × 41 × 20.5 = 1100000
1430000



✓ If overhang is made 8'-0" max. to ℄ Betw wedges and bearing is taken at ℄ of outside wedge - overhang would be 7'-6" and

L.L. = 50.0 × 5.5 × 2 × 320/225 = 718000
I. = 710000
D.L. = 1300 × 7.5 × 3.25 = 37000
1457000 ← O.K. 100% I

L.L. 12.5 × 5.5 × 2 × 320/225 = 196000
I. 196000
D.L. = 1300 × 48 × 20.25 = 1265000
1657000

L4-A (260 Rating) Engine
B. 1300
R1 40.5 7.5
L.L. R1 = 58.5 × 2 × 5 + 4 × 7.5 × 18.4
I. - 77%
D.R1 = 48 × 1300 × 16.5 / 41.5 = 25400

CALCULATIONS

28-84-41c

R 8 48—5pl.
1-18-39 H.S.
2/2/39 M.J.

BR #64 CUMBERLAND DIV M.L.

Proposed Pedestals at West End. E-60 Design 2-48' Spans

Dead Load - Steel @ 42000# per single trk span = 42000 × 2 = 84000

Deck @ 600# per ft of trk = 600 × 2 × 48 = 58000

Steel Bent and Cross Girder = 15000

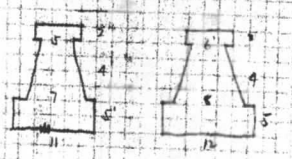
157000

Live Load - D.T.E 60 = (48 mile) = 31200 × 6 × 4 × .9 = 675000

832000 ÷ 2 = 416000# per pedestal

Wgt. of Pedestal = 890 cf @ 150 = 134000#

550000



Area base = 132 □'

550,000 ÷ 132 = 4160# = 2.1 Tons per sq. ft.

Calculations

Cumberland Division

C.E.S.
5-13-39

Bridge #64, North Branch.

Supports.

Supports at W. Bent - 2-Spans D.P. 48'-8"

		Pass. 260	Frt. 320
Dead load = 60000 × 24/40	=	36000	36,000
Cr. Gird. piles	=	15,000	15,000
Live load pass 210.2 × 256/225	=	241,100	300,000
		292000	351,000
Max pile load, tons		18.3	22.0

Supports at truss.

	Pass. 260	Frt. 320
Dead Load	316,000	316,000
Live Load 600 × 243/225	648,000 · 281/225	750,000
	964000	1066,000
Max. pile load, tons	20.2	22.2

B S 48—Spl.
28-84—410
3000 3-12-36

3060 3-12-38 28-34—41c R S 48—Spl.

Calculations
Rating

Cumberland Div. M.L.
Br #64 North Branch, Md.

J.E.L.
5-19-39

Rate = Bottom Flange = $\frac{43,500,000 - (188,200 \times 12)}{2,054,000 \times 12} = 1.67 \times 225 = 375$ ✓ (ESO)

Rate = Top Flange = $\frac{35,000,000 - (188,200 \times 12)}{2,054,000 \times 12} = 1.33 \times 225 = 300$ ✓

Actual Moment

7.23	7.23	7.98	Arm.
5.29	7.10	5.29	
7.23	7.98	7.98	
19.75		21.25	
1.5			
21.25			

BL 5/22/39.

DL 30000 × 7.98 = 239,000 1#

LLI 76.4 $\frac{156000 \times 1.9}{275000} \times 7.98 = 2,190,000$ 1#

S- Top = $\frac{61167}{41.84} = 1460$ "3

S Bott $\frac{61167}{36.53} = 1670$ "3

Top $\frac{M\ 12}{24000} = 1460 = 2,920,000$ 1#
239 000
$\frac{2,681,000}{2,190,000} \times 225 = 275$ Rating.

.9% 22 × I = 306 Rating.

✓

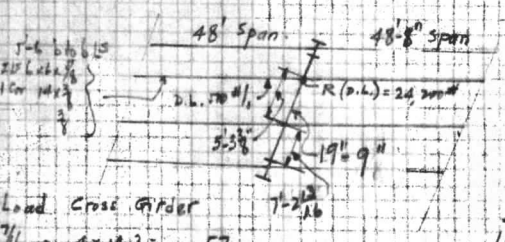
3000 3-12-38 28-34—41c B-3 13—Spl.

Calculations Rating.

Cumberland Div. M.L.
Br. #64

J.E.L.
5-19-39

Cross Girder 6'-6" b to b Ls 20'-9 7/8" b. to b. Col. Ls Bottom 18'-8 1/2 top
Ave. = 19'-9"



Reaction R (L.L.)

Wheel (12)	wheel (13)
58.3	69.0
73.6	63.3
25.0	25.0
156.9	157.3 (E50)

One Rail

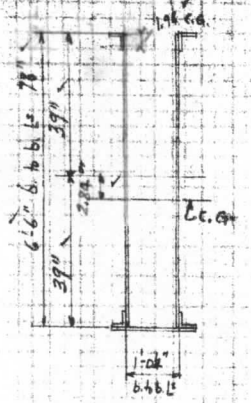
Dead Load Cross Girder

4 Ls 6x6x7/16	= 4 × 14.3 =	57
2 Web 78 × 3/8	= 2 × 71.45 =	200
1 Cov. 22 × 3/8	= 1 × 29.05 =	28
		285 Say 300 #/.

Dead Load Girder

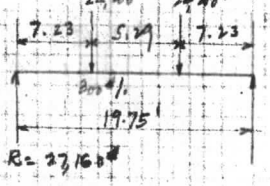
4 Ls 6x6x7/8	= 4 × 24.2 =	97
2 Cov 14 × 3/8	= 2 × 17.85 =	36
1 Web 66 × 3/8	= 1 × 84.15 =	84
		217

Say 250
Ties 250
500



D.L. Reaction

500 × 48/2 =	12,000
500 × 48.27/2 =	12,200
	24,200 #



R = 300 × 19.75 ÷ 2 = 2960 #
24,200
27,160 #

D.L.M. = 27,160 × 7.23 = 196,000
+ 300 × 7.23 × 3.61 = 7,800
✓ 188,200 '#

L.L.M. = (E50) = 157,300 × 7.23 = 1,144,000
L.L.I. = 79 % = 910,000
L.L. + I = ✓ 2,054,000 '#

	A	d	Ad	d	Ad		
(G) 2 Ls 6x4x7/16	8.36	× 37.04	= 310	× 37.04	= 11,500 + 31	=	11,531
2 Web 78 × 3/8	58.50	× 0	= 0	× 0	= 0 + 29,660	=	29,660
(N) 2 Ls 6x4x7/16	6.61	× 37.04	= 245	× 37.04	= 9,100 + 31	=	9,131
1 Cov. 22 × 3/8	7.50	× 39.19	= 294	× 39.19	= 11500 + 0	=	11,500
	80.97		229				61,822
			80.97 = 2.84	× 80.97		=	655
							61,167 = I

C = 39 + 2.84 = 41.84"
C = (39 + .375) + 2.84 = 36.535"

S = 26000 − 300 l/b
= 26000 − 300 × 7.23 × 12 / 22
✓ = 24,820

Bottom Flange R.M. = 26,000 × 61,167 / 36.535 = 43,500,000 '#

Top Flange R.M. = 24,000 × 61,167 / 41.84 = 35,000,000 '#

A.J.W.
7-17-39

Bridge No. 64 - North Branch, Md.
CUMBERLAND DIV. - M.L.

Broken Hanger at U1 - East End South Truss

D.L. = 28000#
L.L. = 262000 (320-Two Tracks)
I. (¼ Speed) = 61000
351000 # Total

Hanger 2-15" [@ 40# Gr. A. = 23.4 □"
Net A. = 20.4 □"

Say ¾ of Area Remaining = 15.3 □"

$f = \frac{351000}{15.3} = 23000$ #/□"

One Channel taking all load } $f = \frac{351000}{10.2} = 34400$ #/□"

One Channel taking all load with near track only loaded } $f = \frac{351000}{10.2} \times \frac{20.37}{28.75} = 24,100$ #

Elongation from ℄ Top Pin to Crack = $\frac{24400 \times 29''}{29000000} = .024''$

CALC 3000 11-9-38

CUMBERLAND DIV. - M.L.

BR. #64 - North Branch, Md.

R S 48-8pl.

7/31/39

A.J.W.

Floor Beam Reaction - 320 Rating

D.L. = 1000# × 23.75 = 23,750#

L.L. = 27000 × 320/45 = 263,000

I = 92.8% = 244,000

530,750# per Track

2-15" ⊐ @ 40# - Net Area = 20.0 ±

$f = \frac{530,750}{20.} = 26,540$ #/□"

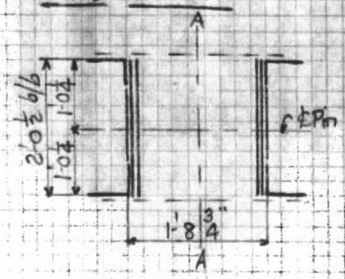
CALC. 3000 11-9-38 R 8 48—8pl

Br. # 64 - North Branch, Md.

CUMBERLAND DIV - M.L.

7/3/39
A.J.W.

END POST



Mom. of Inertia abt. Axis "A-A"

4 - L's 6 x 4 x 5/8 =	23.44 x	12.40^2 =	3610
4 - Pls. 24 x 1/2 =	48.00 x	9.87^2 =	4670
2 - " 16 x 1/2 =	16.00 x	10.62^2 =	1810
	87.44		10,090 "4

$r = \sqrt{\frac{10090}{87.44}} = 10.75$ $\quad L = \sqrt{28.5^2 + 19^2} = 34.2'$

$\frac{l}{r} = \frac{34.2 \times 12}{10.75} = 38$

Allowable Compressive Unit Stress

$= 24000 - 80\frac{l}{r}$

$80\frac{l}{r} = 80 \times 38 = 3040$ #/□"

$f = \frac{Mc}{I}$ $\quad M = \frac{3040 \times 10{,}090}{16.37} = 1{,}875{,}000$ "#

$M = \frac{WL}{8} =$ $\quad W = \frac{8 \times 1{,}875{,}000}{34.2 \times 12} = 36{,}500$ #

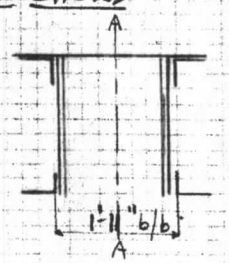
Moment in Hanger from End Post Column Action

$M = \frac{36500}{2} \times 30'' = 548{,}000$ "#

2 - 15" [s @ 40 - S.M. = 2 x 3.4 = 6.8

$f = \frac{548000}{6.8} = 80{,}000$ #/□" Ten. & Comp.

TOP CHORD



Mom. of Inertia abt. Axis "A-A"

1 - Cov. 32 x 1/2 =	16.00 x	$\_\_^2$ =	1365
2 - Ls 4 x 4 x 3/8 =	5.72 x	12.64^2 =	915
4 - Pls. 24 x 7/16 =	42.00 x	11.06^2 =	5140
2 - Ls 5 x 4 x 3/8 =	6.48 x	12.70^2 =	1045
2 - Pls. 6 x 7/8 =	10.50 x	13.50^2 =	1920
	80.70 □"		10385 "4

$r = \sqrt{\frac{10385}{80.70}} = 11.3$ $\quad \frac{L}{r} = \frac{23.75 \times 12}{11.3} = 25.2$

$80\frac{l}{r} = 80 \times 25 = 2000$ #/□"

Mom. $= \frac{2000 \times 10385}{16.00} = 1{,}300{,}000$ "#

$W = \frac{8 \times 1{,}300{,}000}{23.75 \times 12} = 36500$ #

Stress in Hanger from Top Chord Column Action

$f = \frac{36500}{2} \times \frac{30''}{6.8} = 80000$ #/□" Ten. & Comp.

✓

THE BALTIMORE & OHIO RAILROAD COMPANY
OFFICE OF ENGINEER OF BRIDGES AND BUILDINGS, BALTIMORE, MD.

Calc

DATE 8-25-53 MLR ✓ A.I.A. - 9-14-54

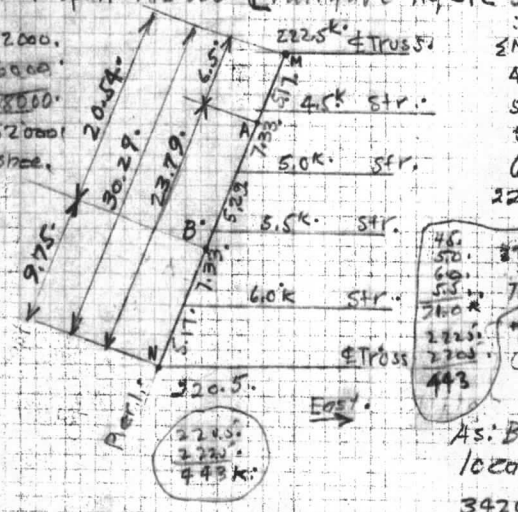
BRIDGE No. 64 · DIVISION Comb. BRANCH M.L. · LOCATION N. Branch Md.

Supporting @ Pier #1 Some details as Drwg 32633.

From Calc 1-4-38.

Wt 1-Span 742 000 [Val. gave figure 590,000# ~~[illegible]~~ (Locks down)]

Steel 742000.
Deck 186000.
4 | 928000.
232000 per shoe.



ΣM @ M

4.5 x 5.17	=	23.3
5.0 x 12.5	=	62.5
5.5 x 17.79	=	98.0
6.0 x 25.12	=	152.0
220.5 x 30.29	=	6681.0
		7016.8

46.
50.
60.
55.
76.0K
2225.
2220.
443

232 x 2 = 464K
Trusses 443 K.

7016.8 ÷ 20.54' = 342K @ "B"

See Calc. @ Pier 0 of 1-4-38.

Stresses in Timber etc.

As Bents not at Str. in "B" location, use 6-6x8 Stiffs (Timber)

342000 / 6x6x8. = 1185#/□". ✓

Load on Jacks @ A = 294,000# = 147T.
Load on Jacks @ B = 342000# = 171T. Note calc of 1-4-38. 335000# + 4-100T. Jacks

Pier R. DL 464,000# 2 shoes.
LL E50 884,000. 1 Trk.
I 39.4% 348,000
1,696,000 ÷ 400 = 4240 □".

A.R.E.A. Imp = 400.0 / (166+25) + 15 = 39.4%
Lurching = 100 ÷ 28.75 = 3.5%
39.4

24 shims 6"x28" = 4040.
2" 3"x28" = 168.
4208 □". O.K.

24 shims x 2 = 48 bearing points. Figure 7" on shim 6" wide.
1,696,000 ÷ 48 = 35,400#/Brg. ÷ 42 = 845#/□"
Bearing allow 24000 x ½(6") = 72,000# > 35,400# O.K.

ΣM @ N

4.5 x 25.12	=	113
5.0 x 17.79	=	89
5.5 x 12.5	=	69
6.0 x 5.17	=	30
222.5 x 30.29	=	6750
		7051

7051 ÷ 23.79 = 294K @ "A"

10-8-52

THE BALTIMORE & OHIO RAILROAD COMPANY
OFFICE OF ENGINEER OF BRIDGES AND BUILDINGS, BALTIMORE, MD.

Form 1590-B-SM.

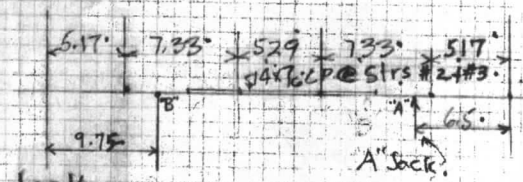
Calc.

DATE HLR 8-17-54
A.I.A. 9-14-54

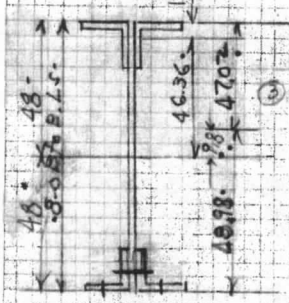
BRIDGE No. 64. **DIVISION** Cumberland **BRANCH** M.L. **LOCATION** North Branch, Md.

Dwg. # 40060 File 4054.

For Jacking. End Fl. Bm Pier "1". S-ff Steel.
220.5K. 6K. 5.5K. 5.K. 4.5K. 22215 See Calc 1-4-38.



Jack



	A.	d.	Ad.	Ad²	I_o	I.
2-6x6x⅜ LS	8.72	46.36	403.	18658	30.	18685.
Web 96x⅜.	36.00	—	—	—	—	27648.
③ 2-6x6x⅜ LS.	7.59	46.36	352.	16300	30.	16330.
	52.31.		51.			62,663.
						− 50.
						62,613.

$\frac{51.}{52.31} = .98$ $52.31 \times .98^2$

SM Comp $\frac{62613.}{47.02} = 1330.^{in^3}$ $\left(\frac{21000}{18000}\right)\left[18000 - 5 \times \left(\frac{7 \times 12}{12.2}\right)^2\right]$

Allow 3 Riv out. SM Ten $\frac{62613.}{48.98} = 1280.^{in^3}$ $= 20,700.$

Sketch upside down. $20,700 \times 1330 \div 12. = 2,298,000.$ RM.

RM (allow 21,000) $\times \frac{1280.}{12.} = 2,240,000'^{\#}$.

M @ "A" = 222500 x 6.5 = 1,450,000'#.
4500 x 1.33 = 6000.
1,456,000'# < 2,240,000'#. o.k.

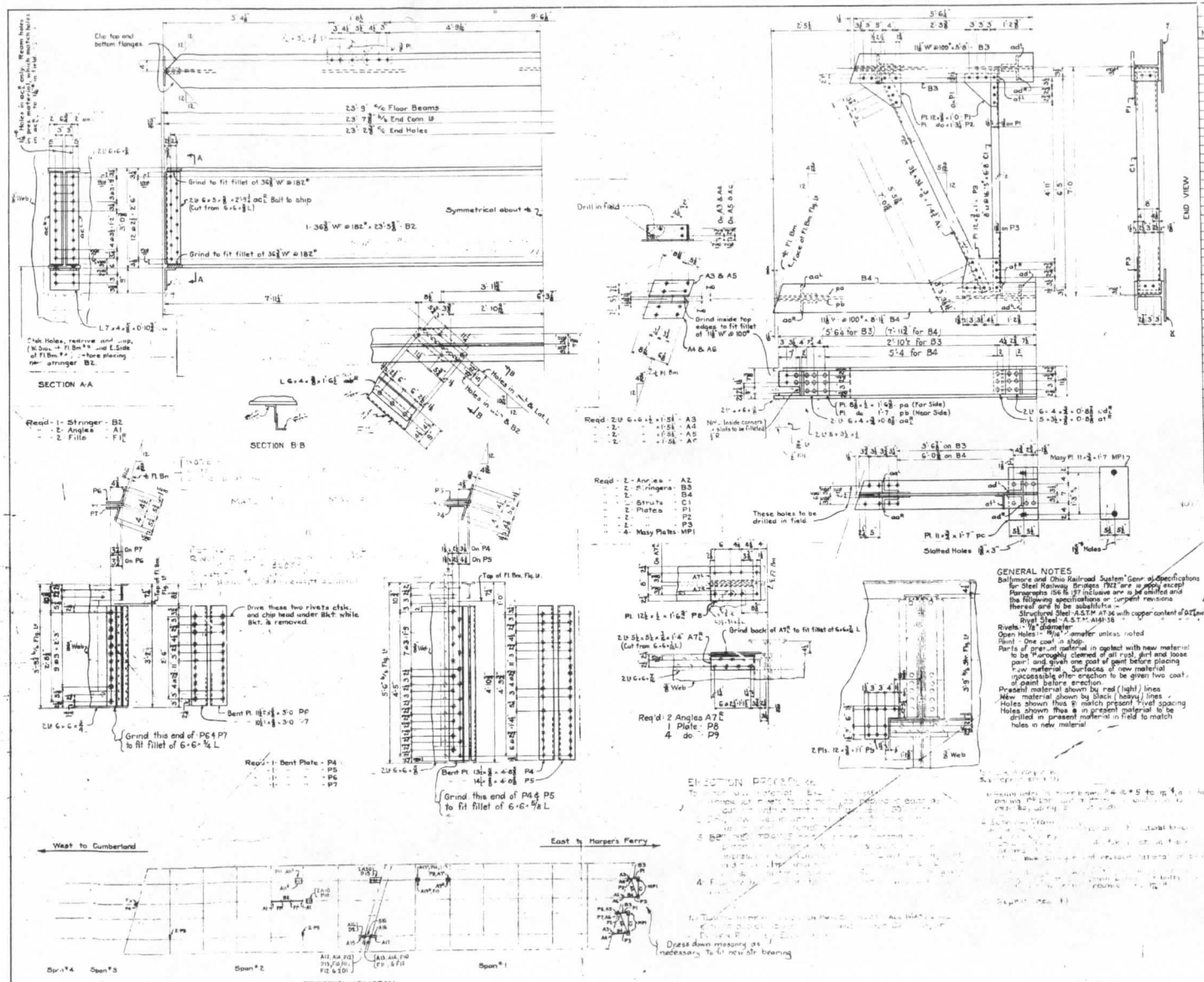
No. Cov Pl. M @ B: 220,500 x 9.75 = 2,150,000'#
6000 x 4.58 = 27,500.
2,177,500. < 2,240,000'# o.k.

No data as to end 7/16 Cov Pl.

Note No data on Riv. in Fl. Bm Conn to Truss.

For Val. Wt of Span 590000# + 186000 = 776000.
Jacking Load 294 x $\frac{776}{928}$ = 245,000# @ A.
342 x $\frac{776}{928}$ = 285,000# @ B.

B0153139.cit



ERECTION DIAGRAM

NOTE. For material shown on Erection Diagram but not detailed or billed on this sheet see Dwg. No. 32708A

Checked in the field by P. Petri 10-19-39 & 12-6-39

BILL OF MATERIAL

SHOP BILL Nº	Description	No. Pcs	Length	Mk	Remarks	SHIPPING BILL Nº	Description	Mk
1	36 1/2" W @ 182#	23	5 1/2	B2		1	Stringer	B2
2	U 6 × 5 × 3/8	2	9 1/2	ac*	Cf 6×6×3/8 L, Bill			
2	"	2	9 1/2	ac'				
2	1 1/2" W @ 100#	3	6	B3	Notch			
2	U 6 × 4 × 3/8	0	8 1/2	aa*	6 I.E.			
2	U "	0	8 1/2	aa'	"			
2	U "	0	8 1/2	ad*	"			
2	U "	0	8 1/2	ad'	"	2	Stringers	B3
2	U 5 × 3 1/2 × 1/2	0	8 1/2	at*	"			
2	Pls. 8 1/2 × 1/2	1	5 1/2	pa	" Notch			
2	Pls. "	1	7	pb	"			
2	Pls. 11 × 1/2	1	7	pc	"			
2	1 1/2" W @ 100	8	11	B4	Notch			
2	U 6 × 4 × 3/8	0	8 1/2	aa*	6 I.E.			
2	U "	0	8 1/2	aa'	"			
2	U "	0	8 1/2	ad*	"			
2	U "	0	8 1/2	ad'	"	2	Stringers	B4
2	U 5 × 3 1/2 × 1/2	0	8 1/2	at*	"			
2	Pls. 8 1/2 × 1/2	1	5 1/2	pa	" Notch			
2	Pls. "	1	7	pb	" "			
2	Pls. 11 × 1/2	1	7	pc				
2	U 7 × 4 × 3/8	0	10 1/2	A1		2	Angles	A1
2	U 3 1/2 × 3 1/2 × 1/2	1	4 1/2	A2		2	"	A2
2	U 6 × 6 × 1/2	1	5 1/2	A3		2	"	A3
2	U "	1	5 1/2	A4		2	"	A4
2	U "	1	5 1/2	A5		2	"	A5
2	U "	1	5 1/2	A6		2	"	A6
2	U 3 1/2 × 3 1/2 × 7/16	1	4	A7*	2 K 6 × 6 × 3/8 L	2	"	A7*
2	8" [@ 16.25#	6	8	C1		2	Struts	C1
2	U 6 × 4 × 3/8	1	6 1/2	b*		1	Fill	F1*
2	U "	1	6 1/2	a' 1/2		1	"	F1'
2	Pls. 12 × 3/8	1	6	P1		2	Plates	P1
2	Pls. "	1	3 1/2	P2		2	"	P2
2	Pls. "	1	2	P3		2	"	P3
1	Bent Pl. 13 1/2 × 3/8	4	6 1/2	P4	G I E	1	Bent Plate	P4
1	" " 14 1/2 × 3/8	4	6 1/2	P5	F I E			P5
1	" " 11 1/2 × 3/8	3	0	P6	G I E	1	"	P6
1	" " 10 1/2 × 3/8	3	0	P7	G I E	1	"	P7
1	Pl. " 12 1/2 × 3/8	1	6 1/2	P8		1	Plate	P8
4	Pls. 12 × 3/8	1	1	P9				
4	Pls. 11 × 3/8							

LIST OF FIELD RIVETS

ERECTOR'S LIST Nº	Dia.	Hd	Grip	Lgth	Remarks	SHIPPING LIST Nº	Dia.	Hd	Lgth
40	1"	Button	2 3/8	4 3/8	c.c. to Fl. Bm.	60	1"	Button	4 3/8
26	7/8	Button	2	3 3/8	ac to B2	50	7/8	Button	2 3/8
8	"	"	2 3/8	4 3/8	A1 to Fl. Bm.	20	"	"	2 3/8
4	"	"	2 3/8	3 7/8	Reamer at A1	45	"	"	2 3/8
4	"	"	1 3/8	3 1/8	F1 to B2	35	"	"	2 3/8
4	"	"	1 3/8	3 1/8	F1 to Lat. L				
8	"	"	1 3/8	3 3/8	B2 to Top Lat. Pl.	35	7/8	Button	3
4	"	"	1 3/8	3 3/8	" " & L	35	"	"	3 3/8
16	"	"	1 3/8	3 3/8	P1-2-3 to B3-4	40	"	"	3 3/8
8	"	"	1 3/8	3 3/8	" to A1, C1 to B3-4	50	"	"	3 3/8
32	"	"	1 3/8	3 3/8	P1-2-3 to A1, C1 to B3-4	20	"	"	3 3/8
32	"	"	1 3/8	3 3/8	B3-4 to Bkts.	15	"	"	3 3/8
8	"	"	1 3/8	4 3/8	A3-4-5-6 to Strs.	10	"	"	4 3/8
8	"	"	2 3/8	4 3/8	" to B3-4				
16	"	"	2 3/8	4 3/8	A3-4 to Fl. Bm. Flg. U	45	7/8	Button	4 3/8
16	"	"	1 3/8	5	" " & Cov.	20	"	"	4 3/8
11	"	"	3 1/8	5 1/8	P6-7 to Str.	70	"	"	4 3/8
12	"	"	1 3/8	3 3/8	" to Fl. Bm.	25	"	"	5 3/8
8	"	"	2 3/8	4 3/8	" & Bkt.				
2	"	"	1 3/8	3	Reamer in P6-7 under Bkt.				
20	"	"	2 3/8	4 3/8	P4-5 to Bdr.				
14	"	"	2 3/8	4 3/8	" to Fl. Bm. & 3½" U				
22	"	"	2 3/8	4 3/8	" & Str. Conn. U				
7	"	"	2 3/8	4	A7 to web				
3	"	"	1 3/8	3	" to Flg. & P8				
4	"	"	1 3/8	3 3/8	" & Lat. Pl.				
8	"	"	1 3/8	4	" " & L				
2	"	"	1 3/8	4 3/8	P8 to Flg.				
18	"	"	1 3/8	4 3/8	P9 to web				

GENERAL NOTES

Baltimore and Ohio Railroad System "General Specifications for Steel Railway Bridges 1912" are to apply except Paragraphs 156 to 197 inclusive are to be omitted and the following specifications or current revisions thereof are to be substituted:-

Structural Steel - A.S.T.M. A7-36 with copper content of 0.2% min.

Rivet Steel - A.S.T.M. A141-38

Rivets - 7/8" diameter

Open Holes - 15/16" diameter unless noted

Paint - One coat in shop.

Parts of present material in contact with new material to be "thoroughly cleaned of all rust, dirt and loose paint and given one coat of paint before placing new material. Surfaces of new material inaccessible after erection to be given two coats of paint before erection.

Present material shown by red (light) lines

New material shown by black (heavy) lines -

Holes shown thus ⊕ match present rivet spacing

Holes shown thus ⊕ in present material to be drilled in present material in field to match holes in new material

THE BALTIMORE & OHIO RAILROAD

THE BALTIMORE & OHIO RAILROAD CO.

CUMBERLAND DIV. MAIN LINE

BRIDGE NO. 64 NORTH BRANCH, MD.

STEEL REPAIRS

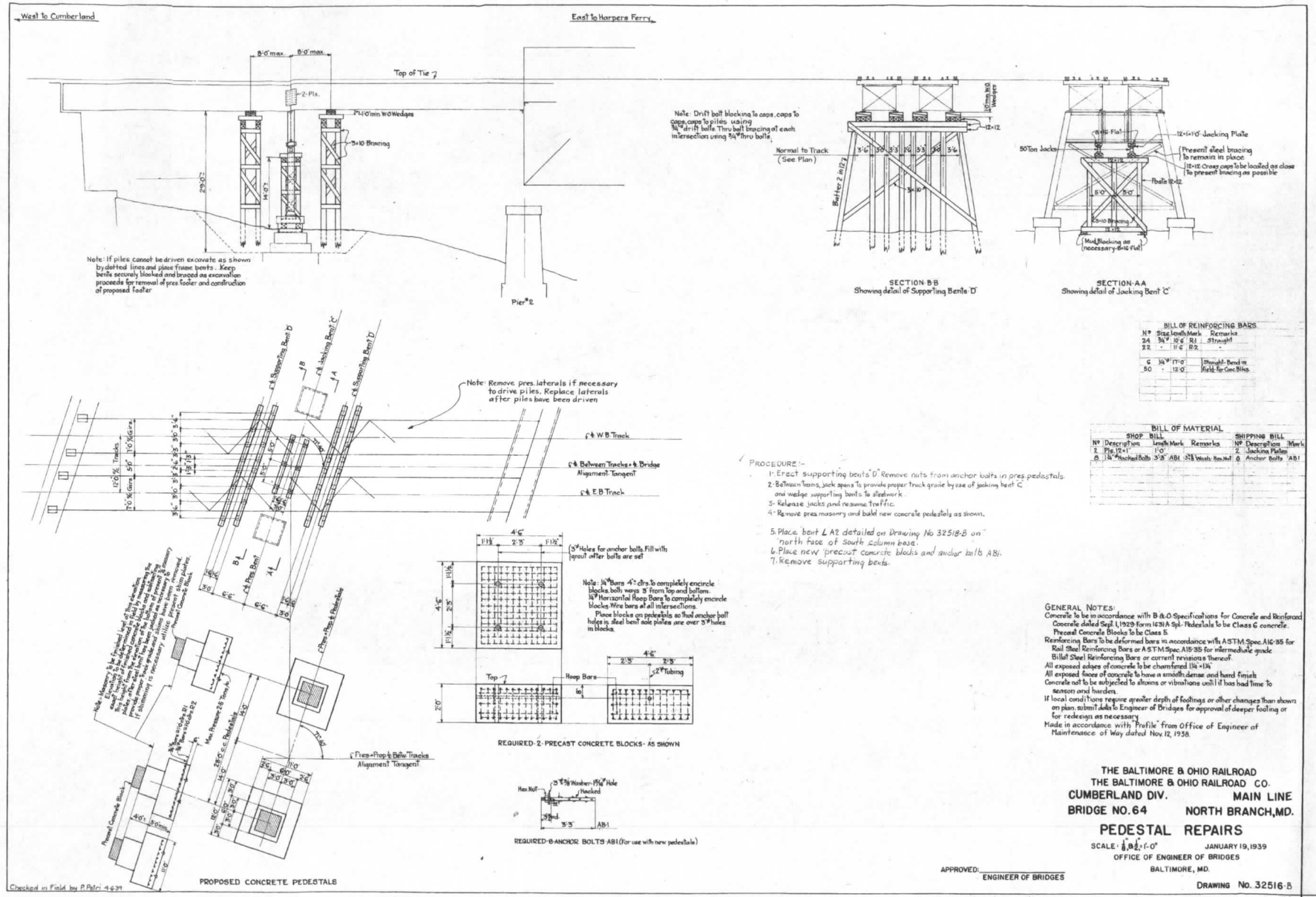
SCALE - 1/2" = 1'-0" SEPT 8, 1939

OFFICE OF ENGINEER OF BRIDGES

BALTIMORE, MD.

APPROVED: ENGINEER OF BRIDGES

DRAWING No. 32.665 E



BILL OF REINFORCING BARS

No	Size	Length	Mark	Remarks
24	¾"	10'-6"	R1	Straight
22	"	11'-6"	R2	"
6	¾"	17'-0"		Straight-Bend in field for Conc. Blks.
50	"	12'-0"		

BILL OF MATERIAL

SHOP BILL No	Description	Length	Mark	Remarks	SHIPPING BILL No	Description	Mark
2	Pls. 12"×1"	1'-0"			2	Jacking Plates	
8	¾" Hacked Bolts	3'-3"	AB1	⅝" Washers, Hex. Nut	8	Anchor Bolts	AB1

PROCEDURE:-

1. Erect supporting bents "D". Remove nuts from anchor bolts in pres. pedestals.
2. Between trains, jack spans to provide proper track grade by use of jacking bent C and wedge supporting bents to steelwork.
3. Release jacks and resume traffic.
4. Remove pres. masonry and build new concrete pedestals as shown.
5. Place bent L A2 detailed on Drawing No 32518-B on north face of South Column base.
6. Place new precast concrete blocks and anchor bolts AB1.
7. Remove supporting bents.

GENERAL NOTES:

Concrete to be in accordance with B.&O. Specifications for Concrete and Reinforced Concrete dated Sept. 1, 1929 form 1631-A Spl. Pedestals to be Class C concrete. Precast Concrete Blocks to be Class B.

Reinforcing Bars to be deformed bars in accordance with A.S.T.M. Spec. A16-35 for Rail Steel Reinforcing Bars or A.S.T.M. Spec. A15-35 for intermediate grade Billet Steel Reinforcing Bars or current revisions thereof.

All exposed edges of concrete to be chamfered 1¼"×1¼"

All exposed faces of concrete to have a smooth, dense and hard finish.

Concrete not to be subjected to shocks or vibrations until it has had time to season and harden.

If local conditions require greater depth of footings or other changes than shown on plan, submit data to Engineer of Bridges for approval of deeper footing or for redesign as necessary.

Made in accordance with "Profile" from Office of Engineer of Maintenance of Way dated Nov. 12, 1938.

THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.

CUMBERLAND DIV. — MAIN LINE

BRIDGE NO. 64 — NORTH BRANCH, MD.

PEDESTAL REPAIRS

SCALE: 1/8" = 1'-0" — JANUARY 19, 1939

OFFICE OF ENGINEER OF BRIDGES

BALTIMORE, MD.

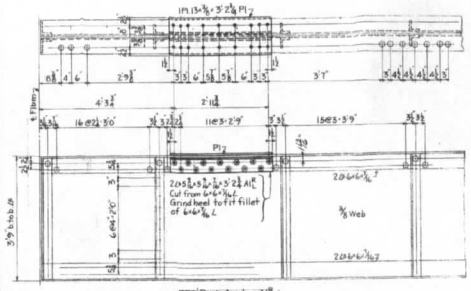
APPROVED: _____
ENGINEER OF BRIDGES

DRAWING No. 32516-B

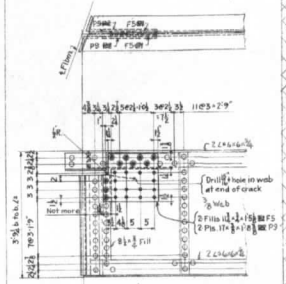
"A" Rev. for change of frame bents to pile bents. G.G. 2/16/39 .KS.
"B" - Field check of 4-6-39 A.L.M. 4-6-39 P.P. 4/10/39

34x23 BCRT 10AE 00153215 H.S. 7/2020 M.J.

4054

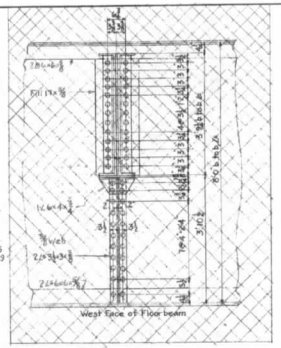


REQ'D: ~~1 Angle A1~~
~~1 Angle A1~~
~~1 Plate P1~~



REQ'D: 2 Plates ~~P8~~ P9
2 Fills ~~F4~~ F5

Reqd 6/20/39
For Bill of Material, List of Field Rivets; Erection Diagram and Erection Procedure see Dwg. 32595-A



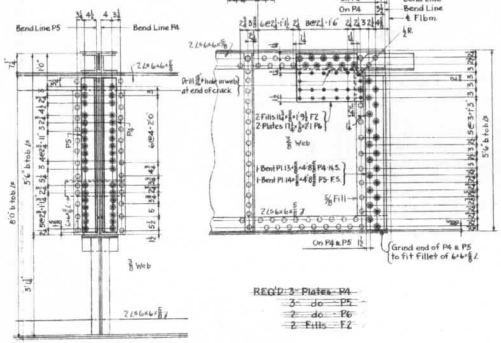
~~1 Pl F3~~

BILL OF MATERIAL

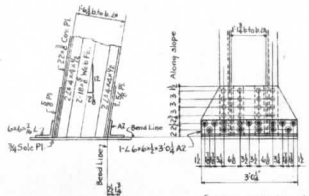
SHOP BILL No	Description	Pcs	Ins	Mark	Remarks	SHIPPING BILL No	Description	Mark
1	∠ 5"x3"x3/8"	3	2 1/4	~~A1*~~	~~6'-6 1/2" to drill~~	1	Angle	~~A1*~~
1	do	3	2 1/4	~~A1*~~	do	1	do	~~A1*~~
1	Pl 13"x3/8"	3	2 1/4	~~P1~~		2	Plate	~~P1~~
2	Pls 17"x3/8"	1	8 1/2	P2		2	do	P2
2	Fills 11 1/2"x3/8"	1	5 1/2	F1		2	Fills	F1
2	Fills 11 1/2"x3/8"	1	9 1/2	F2		2	do	F2
3	Bend Pls. 13"x3/8"	4	8 1/2	P4		3	Plates	P4
3	Bend Pls. 14"x3/8"	4	8 1/2	P5		3	do	P5
2	Pls. 13"x3/8"	2	1	P6		2	do	P6
1	Bend ∠ 6"x6"x7/8"	3	0 1/4	A2		1	Angle	A2

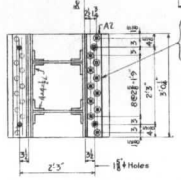
LIST OF FIELD RIVETS

ERECTORS LIST No	Dia.	Head	Grip	Lgth	Location	SHIPPING LIST No.	Dia.	Head	Lgth
13	7/8	Butt	2 1/4	4	A1 to Str. web & Fls/Fs	25	7/8	Csk.	3
18	"	"	1 1/4	2 1/2	A1 & P1 to Str. Flg 2x				
10	"	"	2 1/4	4 1/2	P2 to Str.	40	7/8	Butt	2 1/2
14	"	"	2 1/4	4 1/2	P2 & F1 to Str.	88	"	"	3 1/2
60	"	"	2 1/4	4 1/2	P4 & P5 to Girder	25	"	"	4
64	"	"	2 1/4	4 1/2	P4 & P5 to Fiber	25	"	"	4 1/2
12	"	"	2 1/4	4 1/2	do	25	"	"	4 1/2
30	"	"	1 1/4	2 1/2	do	25	"	"	4 1/2
11	"	"	2 1/4	4 1/2	P6 to Girder	25	"	"	4 1/2
18	"	"	2 1/4	4 1/2	P6 & F2 to Girder	25	"	"	4 1/2
8	"	"	1 1/4	2 1/2	A2 to Col Base	155	"	"	4 1/2
8	"	"	1 1/4	2 1/2	do				
11	"	Csk	1 1/4	3	do				



~~REQ'D: 3 Plates P4~~
~~3 do P5~~
~~2 do P6~~
~~2 Fills F2~~



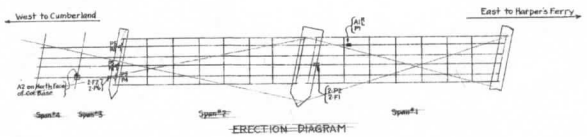


Note: Angle A2 to be placed when pedestals are rebuilt as shown on Drawing No. 32516-B. Angle to be placed before precast concrete block is placed.

~~REQ'D: 1 Angle A2~~

ERECTION PROCEDURE

To Place New Material
1. Knock out rivets to be removed replacing each as cut out with a bolt or drift pin using 50% of each.
2. Between trains, remove present material and place new material, replacing bolts and drift pins.
3. Using new material as templets drill new holes in present material and place bolts and drift pins in all new holes.
4. Replace bolts and drift pins one at a time with a driven rivet. No traffic to be allowed on bridge unless all material either old or new is in place and a drift pin, bolt or driven rivet is in every hole.



~~ERECTION DIAGRAM~~

GENERAL NOTES

Baltimore and Ohio Railroad System General Specifications for Steel Railway Bridges, 1927 are to apply except Paragraphs 156 to 197 inclusive and 216 to 224 inclusive are to be omitted and the following specifications or current revisions thereof are to be substituted:
Structural Steel: A.S.T.M. A 36 with copper content of 0.2% min.
Rivet Steel: A.S.T.M. A 141 36 with copper content of 0.2% min.
Rivets: 7/8" diameter
Open Holes: 15/16" diameter unless noted.
Paint: One coat in shop.
Parts of present material in contact with new material to be thoroughly cleaned of all rust, dirt and loose paint and given one coat of paint before placing new material. Surfaces of new material inaccessible after erection to be given two coats of paint before erection.
Present material shown by red (light) lines.
New material shown by black (heavy) lines.
Holes shown thus ⊕ match present rivet spacing.
Holes shown thus ⊕ in present material, to be drilled in present material in field to match holes in new material.

Work Completed April 1940 - M. of W. Record

THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.

CUMBERLAND DIV. — MAIN LINE
BRIDGE NO. 64 — NORTH BRANCH, MD.

STEEL REPAIRS

SCALE: 3/4" = 1'-0" — JAN. 20, 1939

OFFICE OF ENGINEER OF BRIDGES
BALTIMORE, MD.

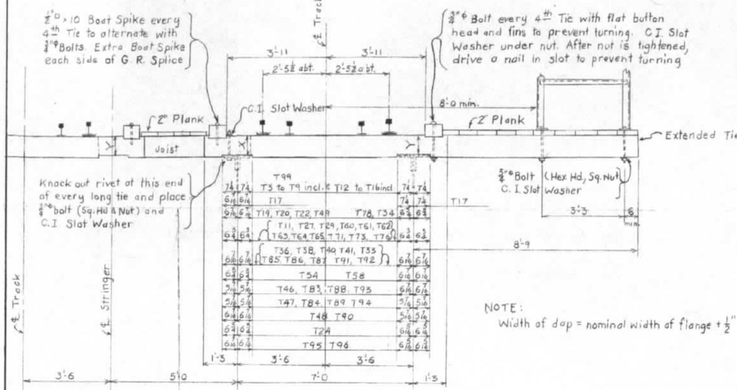
APPROVED: _____ ENGINEER OF BRIDGES

DRAWING No. 32518-C

A: Rev. and completed 6.6.22.5.39 F.J.S.
B: Rev. for hole check (6-6-39) Dwg. 32595 A.W.K.
C: Rev. to include P9 & F5 on Dwg. 32595-A H.N.W. 6-20-39

GRAT 10AC 3Yx23 BD 153170 6-20-39 J.S.L.

4054

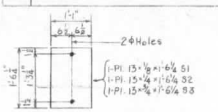


SKETCH NO.1

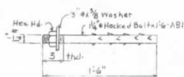
NOTE:
Width of dap = nominal width of flange + ½"

BILL OF HARDWARE

No.	Description
380	¾"φ Bolts x 1'-6 lg. 2½" th'd. flat button hd. with fins, Sq. Nut
400	3"φ x ¾" th'k. C.I. Slot Washers for ¾"φ Bolts
675	½"□ x 10" Boat Spikes (Chisel Point)
10	lbs. 10d Nails for Washers
40	lbs. 20d Nails for Planking
40	lbs. 60d Nails (Toe nail Joists to Ties)
6	¾"φ Bolts x 1'-1½ lg. 2½" th'd. Sq. Hd & Nut for Extended Ties
8	¾"φ Bolts x 1'-3½ lg. 2½" th'd. Hex Hd & Sq. Nut for Refuge Bays
2	Handrails for Refuge Bays (see Drwg. No 20464C)



REQ'D: 9 - Shims - S1
" : 8 - " - S2
" : 7 - " - S3



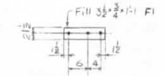
REQ'D: 8-Anchor Bolts- AB1

BILL OF TIMBER

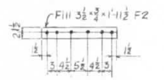
No.	Description	X	Y	Mark	Sketch No.	Remarks
8	Ties 8 x 11 x 9'-6	Not dapped		T1		W.O. or L.L.Y.P.
2	do	10¼	—	T2	2	do.
9	do	10¼	10½	T3	1	do.
5	do	9⅞	10½	T4	1	do.
9	do.	9⅞	10⅛	T5	1	do.
21	do.	10	10⅛	T6	1	do.
36	do.	10⅛	10⅛	T7	1	do.
27	do	10½	10⅛	T8	1	do
44	do.	10½	10⅛	T9	1	do.
2	do	10⅛	—	T10	2	do.
3	do	9⅝	10	T11	1	do.
1	do	9½	10⅛	T12	1	do.
2	do	9½	9¾	T13	1	do.
1	do	10	9¾	T14	1	do
2	do	9¾	10⅛	T15	1	do.
2	do	9¾	9¾	T16	1	do.
4	do.	10½	10⅜	T17	1	do
1	do	10½	10	T18	6	do.
2	do.	10½	10	T19	1	do.
6	do	10⅜	10	T20	1	do.
3	do.	10⅜	10	T21	6	do.
2	do	10¼	10	T22	1	do.
3	do.	10¼	10	T23	3	do.
20	do	9¾	10½	T24	1	do.
1	do.	10¼	10	T25	6	do.
3	do	9⅞	10	T26	6	do
6	do	9⅞	10	T27	1	Mark "Y" end NORTH
2	do.	9⅞	10	T28	4	W.O. or L.L.Y.P.
6	do.	9⅞	10⅛	T29	1	do.
2	do.	9⅞	10⅛	T30	4	do.
1	do	9⅞	10⅛	T31	6	do.
3	do.	10⅜	10½	T32	5	do.
7	Ties 8 x 11 x 9'-6	10⅛	10⅜	T33	1	W.O. or L.L.Y.P.
2	do.	10¼	9⅞	T34	1	do.
7	Ties 8 x 11 x 9'-6	10½	10½	T35	3	W.O. or L.L.Y.P.
46	do.	10½	10½	T36	1	do.
16	do.	10⅜	10⅜	T37	3	do.
93	do	10⅜	10⅜	T38	1	do.
6	do.	10¼	10¼	T39	3	do.
110	do.	10¼	10¼	T40	1	do.
10	do.	10⅜	10½	T41	1	Mark "Y" end NORTH
2	do.	10⅜	10½	T42	3	W.O. or L.L.Y.P.
1	do.	10⅜	10	T43	6	do.
6	do	10¼	9⅞	T44	3	do
4	do	10	10	T45	6	do.
2	do	10⅜	10½	T46	1	do.
2	do	10⅜	10½	T47	1	do.
2	do	10¼	10½	T48	1	do.
2	do	10⅜	10	T49	1	do
3	do.	10¼	9⅞	T50	6	do
1	Tie 8 x 11 x 9'-6	10¼	9¾	T53	6	W.O. or L.L.Y.P.
13	do.	9⅝	10⅜	T54	1	do
4	Ties 8 x 11 x 9'-6	9½	10⅜	T58	1	W.O. or L.L.Y.P.
3	Ties 8 x 11 x 9'-6	9½	9½	T60	1	W.O. or L.L.Y.P.
3	do.	9⅝	9⅝	T61	1	do.
4	do.	9¾	9¾	T62	1	do.
9	do	9⅞	9⅞	T63	1	do.
3	do.	10	10	T64	1	do.
4	do.	10⅛	10⅛	T65	1	do.
3	do.	9⅞	9⅞	T66	4	do.
2	do.	10	10	T67	4	do.
1	Tie 8 x 11 x 9'-6	10	10¼	T70	6	W.O. or L.L.Y.P.
3	do.	10	10¼	T71	1	do.
2	do.	10	10¼	T72	4	do.
6	do.	10	10¼	T73	1	do.
2	do	10	10¼	T74	6	do.

BILL OF TIMBER

No.	Description	X	Y	Mark	Sketch No.	Remarks
2	Ties 8 x 11 x 9'-6	10	10⅛	T75	4	W.O. or L.L.Y.P.
9	do.	10	10	T76	1	do.
2	do.	10¼	9¾	T77	6	do.
14	do.	10¼	9¾	T78	1	do
4	do.	10¼	9¾	T79	3	do.
2	Ties 8 x 11 x 9'-6	10¼	9¾	T81	6	W.O. or L.L.Y.P.
2	Ties 8 x 11 x 9'-6	10½	10½	T83	1	W.O. or L.L.Y.P.
5	do.	10½	10½	T84	1	do
28	do.	10⅛	10⅛	T85	1	do.
5	do.	10	10¼	T86	1	do
5	do	10¼	10⅜	T87	1	Mark "Y" end NORTH
2	do.	10⅛	10½	T88	1	W.O. or L.L.Y.P.
1	do	10¼	10½	T89	1	do.
2	do	10¼	10½	T90	1	do
9	do.	10⅛	10¼	T91	1	Mark "Y" end NORTH
10	do.	10	10	T92	1	W.O. or L.L.Y.P.
2	do	10½	10½	T93	1	do.
4	do	10½	10½	T94	1	do.
10	do	10½	10½	T95	1	do
10	do.	10⅜	10⅜	T96	1	do.
2	do.	10	10⅝	T97	5	do.
15	do.	Not dapped				do.
6	Ties 8 x 11 x 17'-0	10½	10½	T99	1	do
2	Joists 4 x 11 x 6'-0	Not dapped		J1		W.O. or L.L.Y.P.
8	do.	10½	10¼	J2	7	do.
1	do.	10⅛	9⅞	J3	7	do
4	do.	10⅛	10	J4	7	do.
1	do	9¾	10	J5	7	do.
6	do.	10⅛	10⅛	J6	7	do
6	do.	10½	10½	J7	7	do.
1	do.	9¾	10½	J8	7	do.
2	do	10¼	10½	J9	7	do
2	do	10⅛	10⅜	J10	7	do.
4	do	10⅛	10¼	J11	7	do.
5	do.	10¼	9⅞	J12	7	do.
6	do.	10⅛	9¾	J13	7	do.
8	do.	10½	10½	J14	7	do
8	do	10⅜	10⅜	J15	7	do.
26	do	10¼	10¼	J16	7	do
1	do	10⅜	10½	J17	7	do
4	do.	10⅜	10¼	J18	7	do
1	do	10⅜	10⅜	J19	7	do
6	do.	10⅜	10	J20	7	do
1	do	10⅛	10½	J21	7	do.
3	Joists 4 x 11 x 6'-0	10¼	9⅝	J22	7	W.O. or L.L.Y.P.
2	do.	10⅛	9⅝	J23	7	do.
3	Joists 4 x 11 x 6'-0	10	9½	J25	7	W.O. or L.L.Y.P.
2	do.	10	9⅝	J26	7	do
3	Joists 4 x 11 x 6'-0	10⅜	9⅞	J28	7	W.O. or L.L.Y.P.
6	do.	10⅜	9¾	J29	7	do.
3	do.	10¼	10	J30	7	do.
4	Joists 4 x 11 x 6'-0	10½	10	J32	7	W.O. or L.L.Y.P.
1	do.	10½	10½	J33	7	do.
1	do.	10½	10½	J34	7	do
1	do.	—	10½	J35	8	do.
2	do	Not dapped				do.
130	Guard-Rails 6 x 8 x 16'-0 Treated but not framed at Green Spring, W.Va.					L.L.Y.P.
3500	F.B.M. 2" Planking - 8 or 10" widths x 16'-0"					W.O. or L.L.Y.P.



REQ'D :- 4 FILLS F1



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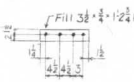
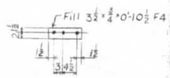
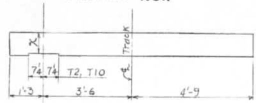


REQ'D :- 2 FILLS-F3



REQ'D:- 2 FILLS-F4



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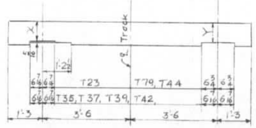

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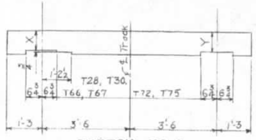

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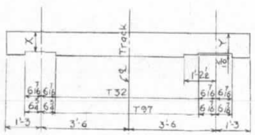

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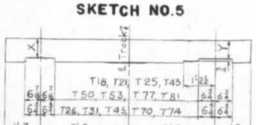

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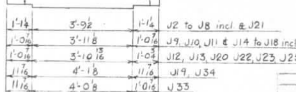
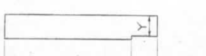


SKETCH NO.7
(Looking West)



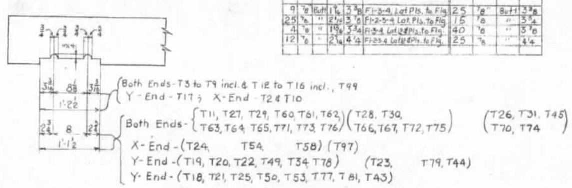
SKETCH NO.8

BILL OF MATERIAL

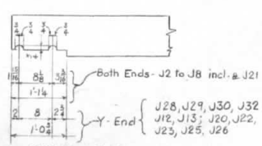
SHOP BILL						SHIPPING BILL		
No.	Description	Ft.	Ins.	Mk.	Remarks	No.	Description	Mk.
4	Fills 3½ x ¾	1	1	F1		4	Fills	F1
4	do	1	11½	F2		4	do	F2
2	do	1	2¾	F3		2	do	F3
2	do	0	10½	F4		2	do.	F4
9	Pls. 13 x ⅛	1	6¼	S1		9	Shims	S1
8	Pls. 13 x ¼	1	6¼	S2		8	do.	S2
7	Pls. 13 x ⅜	1	6¼	S3		7	do.	S3
8	1¼"φ Anchor Bolts	1	6	AB1	See Detail	8	Anchor Bolts	AB1

LIST OF FIELD RIVETS

ERECTORS LIST						SHIPPING LIST			
No.	Dia.	Hd.	Grip	L'gth	Location	No.	Dia.	Hd.	L'gth
9	⅞	Butt	1¼	3⅜	F1-3-4, Lat. Pls. to Flg.	25	⅞	Butt	3⅜
25	⅞	"	2 1/16	3⅞	F1-2-3-4 Lat. Pls. to Flg.	15	⅞	"	3¾
4	⅞	"	1 13/16	3¾	F1-3-4 Lat. & Fill Pls. to Flg.	40	⅞	"	3⅞
12	⅞	"	2¼	4¼	F1-2-3-4 Lat. & Fill Pls. to Flg.	25	⅞	"	4¼



DETAIL OF GROOVES IN TIES
FOR FLANGE RIVETS



DETAIL OF GROOVES IN JOISTS
FOR FLANGE RIVETS

NOTE:-
Rivets :- ⅞" diameter
Open Holes:- 15/16" diameter except as noted.
Shims and fills to be given one coat of paint in shop

NOTE:
Ties and joists that are not grooved are to be counterbored in field as necessary to clear rivet heads.
Ties that are grooved are to be counterbored in field as necessary to clear rivet heads in top lateral plates

NOTE:
For location of Fills see Drawing No 31 605 D
For location of ties and joists and Detail of Guard Rail Splice see Drawing No. 31 605 D
For location of shims & anchor bolts see Drwg. No. 31605 D

THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.
CUMBERLAND DIV. MAIN LINE
BRIDGE NO. 64 NORTH BRANCH, MD.

TIE PLAN

SCALE - ½" = 1'-0" JUNE 9, 1939

OFFICE OF ENGINEER OF BRIDGES
BALTIMORE, MD.

APPROVED: ____________
ENGINEER OF BRIDGES

DRAWING No. 32609A

Checked in Field by P. Petri 7-25-39.

J.C.I.
A.J.W. 7-12-39

"A" TRACED J.R.W. 6-20-55 ✓ J.B.L. 8-28-55 (Original paper Drawing destroyed)

33.5 x 23 BCATIDAF BD153 233

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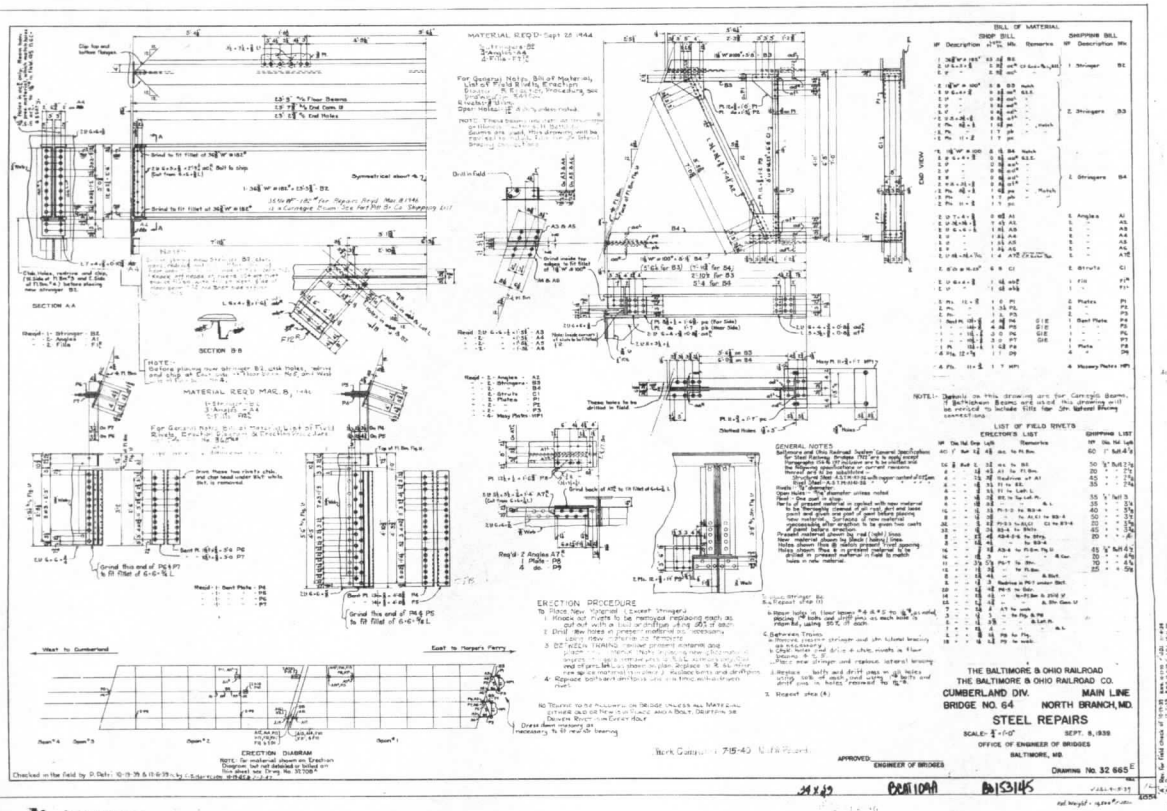

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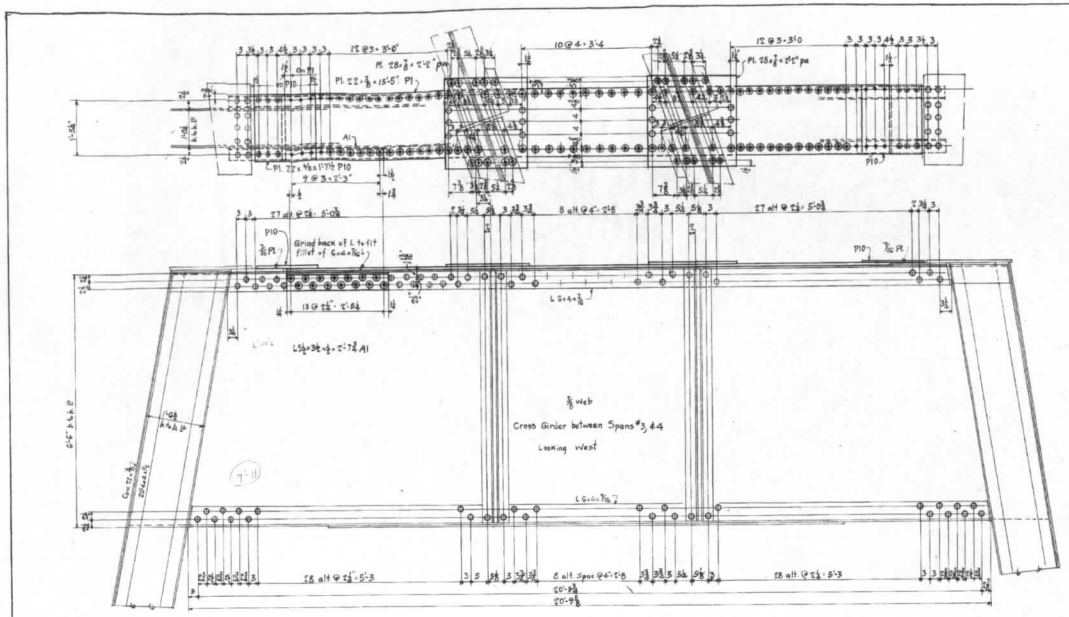
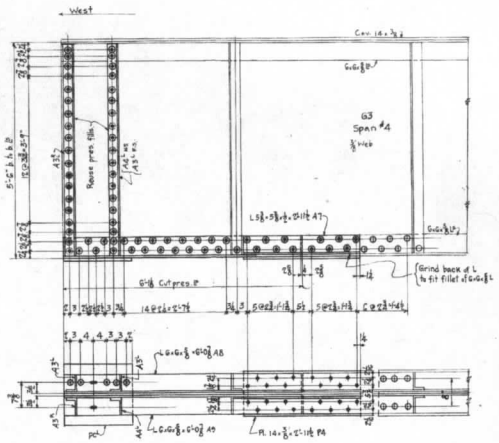
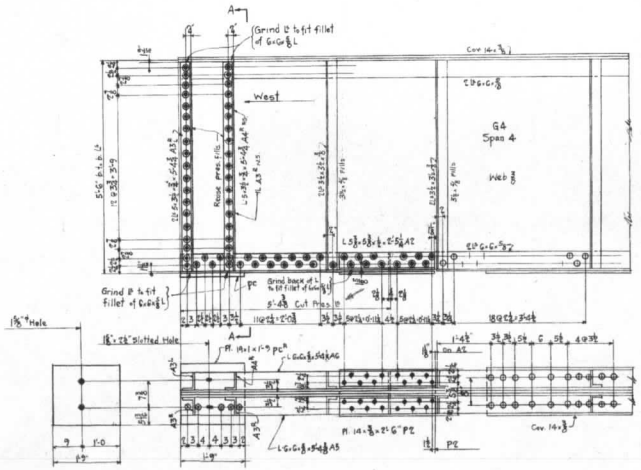
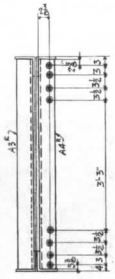
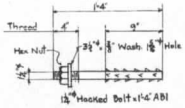
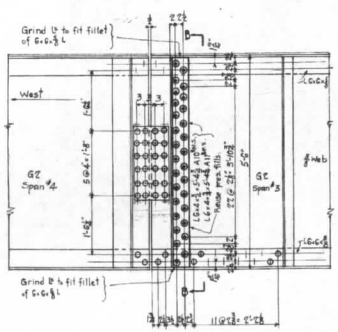


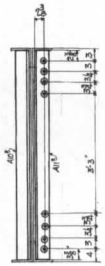












-REQUIRED-

1 - Angle	-	A1
2 - Angles	-	A2
3 - "	-	A3[R]
3 - "	-	A3[L]
1 - "	-	A4[R]
1 - Angle	-	A5
1 - "	-	A6
2 - Angles	-	A7
1 - Angle	-	A8
1 - "	-	A9
1 - "	-	A10[R]
1 - "	-	A11[R]
1 - Plate	-	P1
1 - "	-	P2
2 - Plates	-	P3
1 - Plate	-	P4
4 - Anchor Bolts	-	A81
1 - Angle	-	A4[L]
2 - Plates	-	P10

NOTE:- For Bill of Material, Erection Diagram List of Field Rivets & Erection Procedure see Drawing #32598[A]

Work Completed April 1940 M. of W. Record

THE BALTIMORE & OHIO RAILROAD

THE BALTIMORE & OHIO RAILROAD CO.

CUMBERLAND DIV. MAIN LINE

BRIDGE NO. 64 NORTH BRANCH, MD.

STEEL REPAIRS

SCALE: ¾" = 1'-0" MAY 29, 1939

OFFICE OF ENGINEER OF BRIDGES

BALTIMORE, MD.

APPROVED: ENGINEER OF BRIDGES

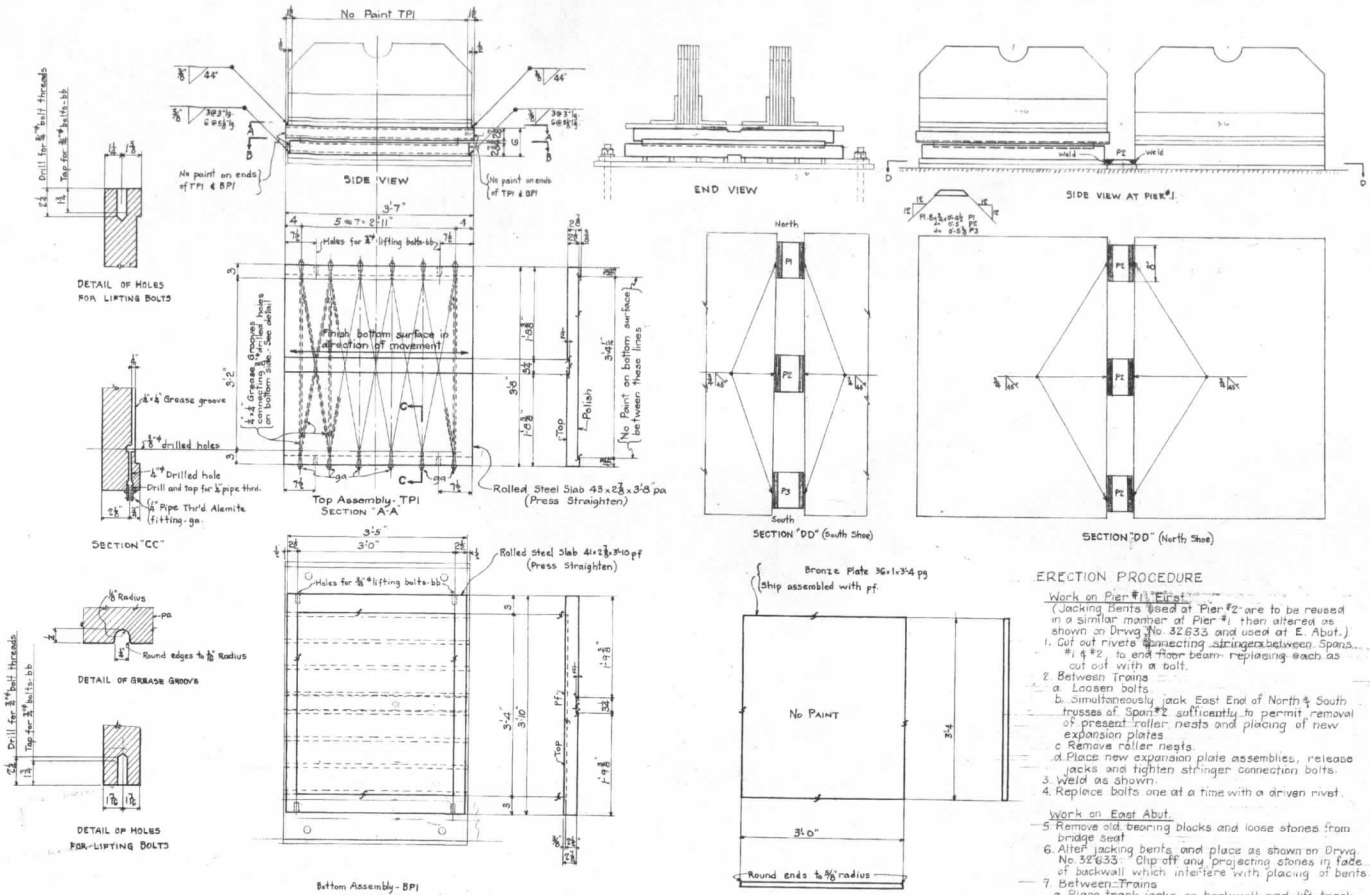
DRAWING No. 32597[A]

Checked in Field by F. Pohl. 6-24-39

A Rev. for Field Check of 6-24-39 - A.J.W. 7-1-39, also P10 added NW 7-2-39 rfc. 7/6/39

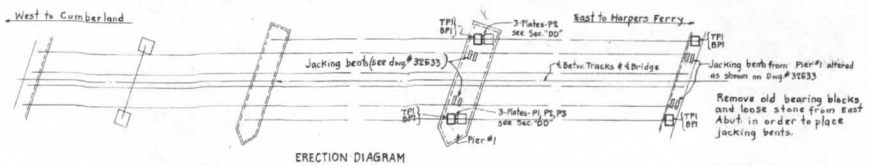
33.75 x 23 BCRT 10AE BD 13214

4054



REQ'D:- 4-Top Slabs - TPI
" 4-Bottom Slabs - BPI

NOTE:- Bronze plate to be flat, smooth and true to dimensions. Plate pg to be a tight fit in recess in plate pf and to be pressed into place in shop, care being taken to obtain good bearing of pg on bottom of recess in pf.
If bronze plates cannot be manufactured flat, smooth and true to dimensions, the fabricator is to make plate of sufficient dimensions to permit planing and polishing.



ERECTION DIAGRAM

Remove old bearing blocks and loose stone from East Abut. in order to place jacking bents.

ERECTION PROCEDURE

Work on Pier #1 First

(Jacking Bents used at Pier #2 are to be reused in a similar manner at Pier #1, then altered as shown on Drwg. No. 32633 and used at E. Abut.)

1. Cut out rivets connecting stringers between Spans #1 & #2, to end floor beam, replacing each as cut out with a bolt.
2. Between Trains
   a. Loosen bolts.
   b. Simultaneously jack East End of North & South trusses of Span #2 sufficently to permit removal of present roller nests and placing of new expansion plates.
   c. Remove roller nests.
   d. Place new expansion plate assemblies, release jacks and tighten stringer connection bolts.
3. Weld as shown.
4. Replace bolts one at a time with a driven rivet.

Work on East Abut.

5. Remove old bearing blocks and loose stones from bridge seat.
6. Alter jacking bents and place as shown on Drwg. No. 32633. Clip off any projecting stones in face of backwall which interfere with placing of bents.
7. Between Trains
   a. Place track jacks on backwall and lift track clear of end stringers.
   b. Jack East Ends of trusses of Span #1 as in Step 2. (b)
   c. Remove roller nests.
   d. Place new expansion plate assemblies, release main jacks and then release track jacks.
8. Weld as shown.

NO TRAFFIC to be allowed on bridge unless complete material either old or new is in place, or present shoes are blocked to pier or abut. with white oak blocking, and jacks are released.

BILL OF MATERIAL

SHOP BILL No	Description	Ft	In	Mark	Remarks	SHIPPING BILL No	Description	Mark
4	R.S. Slabs 43 x 2 7/8	3	8	pa	press straighten	4	Top slabs	TPI
48	1/2" Pipe Thrd Alemite Fitting			ga	Straight			
16	3/4" Bolts	0	3	bb	Hex Hd.			
4	Bronze Pls. 36 x 1	3	4	pg		4	Bottom Slabs	BPI
4	R.S. Slab 41 x 2 7/8	3	10	pf	Press straighten			
16	3/4" Bolts	0	3	bb	Hex Hd.			
1	Pls. 8 x 3/4	0	4 1/4	P1	Devel & Sides	1	Plates	P1
4	do	0	5	P2	" " "	4	"	P2
1	do	0	5 3/4	P3	" " "	1	"	P3

LIST OF FIELD RIVETS

ERECTORS LIST No	Dia	Hd	Grip	Lgth	Location	SHIPPING LIST No	Dia	Head	L'gth
24	7/8"	Butt	2 3/8	4 5/8	Ext. Str. Conn. Lt. to Fl. Bm	20	7/8"	Butt	3 5/8
8	7/8"	"	1 3/4	3 5/8	Ext. Str. Flg. Lt. to Shelf Lt.	15	7/8"	"	4 1/8
2	7/8"	"	2 1/4	4 1/8	Clip Lt. to Ext. Str.	40	7/8"	"	4 5/8
6	7/8"	"	2 7/8	4 3/4	do	20	7/8"	"	4 3/4

GENERAL NOTES:-

Baltimore & Ohio Railroad System "General Specifications for Steel Railway Bridges, 1928" are to apply except paragraphs 156 to 197 inclusive are to be omitted and the following specifications, or current revisions thereof are to be substituted.
Rivet Steel - A.S.T.M. A141-36 with copper content of 0.2% min.
Structural Steel - A.S.T.M. A7-36 with copper content of 0.2% min.
Carbon content .025% max., Mn content .100% max. by check analysis.

Bronze plates to be rolled phosphor bronze in accordance with A.S.T.M. Specifications B100-35T Class A or current revisions thereof.
Cramps Superstrength Bronze Grade B, rolled or forged; Kepper's D.H.S. #2 Bronze, rolled or forged; or an approved equal may be substituted for A.S.T.M. B100-35T Class A Bronze.

Welding to be in accordance with American Welding Society Specifications for Welded Highway and Railway Bridges dated 1938.
The electric arc process and coated electrodes shall be used.

Paint:- pg, pf and exposed parts of bolts to be shop painted one coat except as noted.
Finished bottom surface of plates pa to be coated with white lead and tallow.
Surfaces of plates, to be welded, to be cleaned in shop and to be free of dirt, grease, rust and paint. These surfaces to be shop coated with linseed oil.
Painted markings to be kept away from surfaces to be welded.
Bronze plates not to be painted.
Parts of present material in contact with new material to be thoroughly cleaned and, except at field welds, to be given one coat of paint before placing new material.
Present material at welds to be cleaned equivalent to sand blasting before welding.
Welds and unpainted material at welds to be given one coat of red lead paint after welding is completed.
After erection new material to be given one field coat.

The contact surfaces of the top slab and of the bronze plate to be cleaned in field and given one good coat of graphite grease before placing in position.
All threads to be right hand. Bolt threads to be American Standard Free Fit, Class 2.
Present material shown by red (light) lines.
New material shown by black (heavy) lines.
Finished surfaces marked thus ⊥.
See Drawing #32633 for jacking bents.

Work Complete 4-20-40 except gas welding on fillets.
P1-P2-P3 installed but not completely welded due to shrinkage

Work Completed 7-15-40 M. of W. Record

THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.
CUMBERLAND DIV. MAIN LINE
BRIDGE NO. 64 NORTH BRANCH, MD.

EXPANSION SHOE REPAIRS

SCALE: 1" = 1'-0" JULY 20, 1939
OFFICE OF ENGINEER OF BRIDGES.
BALTIMORE, MD.

APPROVED: ENGINEER OF BRIDGES

DRAWING No. 32631

J.E.L.
J.R.M.E. 7-24-39

34 X 23 BCRT 109B BD153154

D.L. Truss Span 580 over Mt.

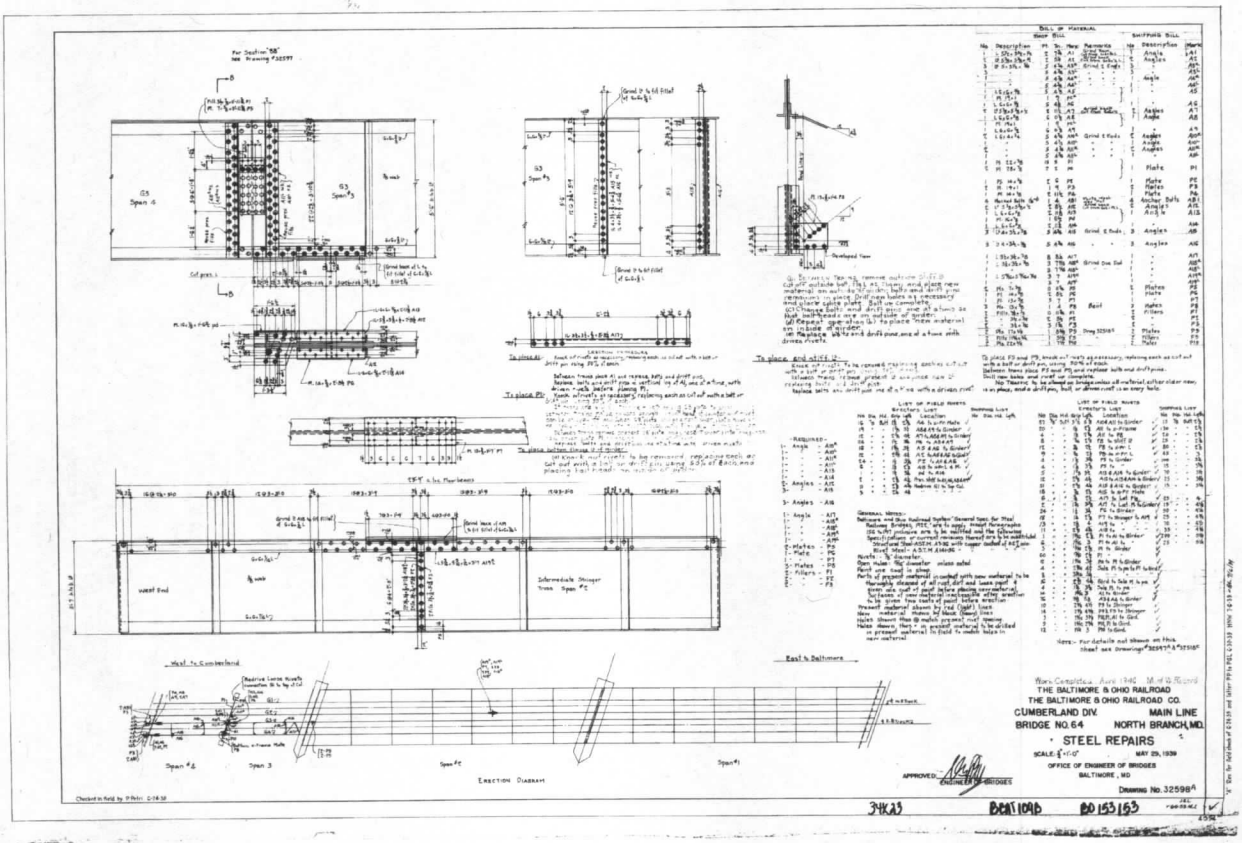
Chas. Ely, Bridge Co.

Est. Wt. BPI (less bronze pl.) = 1,360 lbs
TPI = 1,350 "
Bronze Pl. = 1,890 lbs.

Total Wt. - Steel = 10,800 lbs.
Bronze " = 1,890 lbs.

J.C.L. 7-26-39

4054



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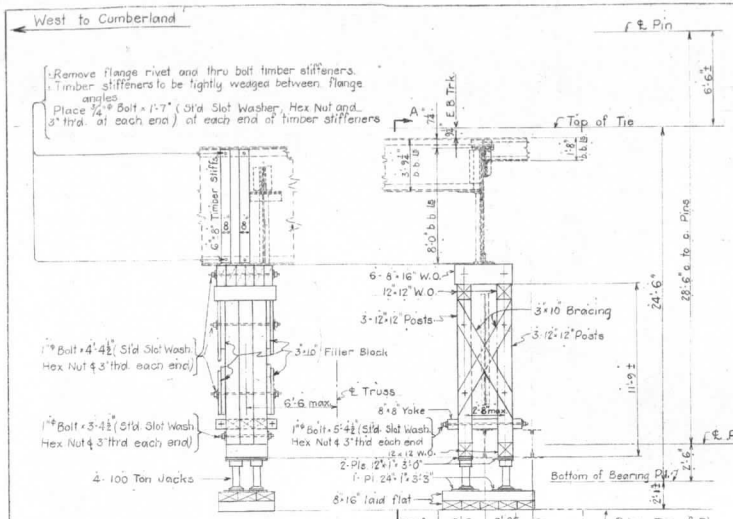
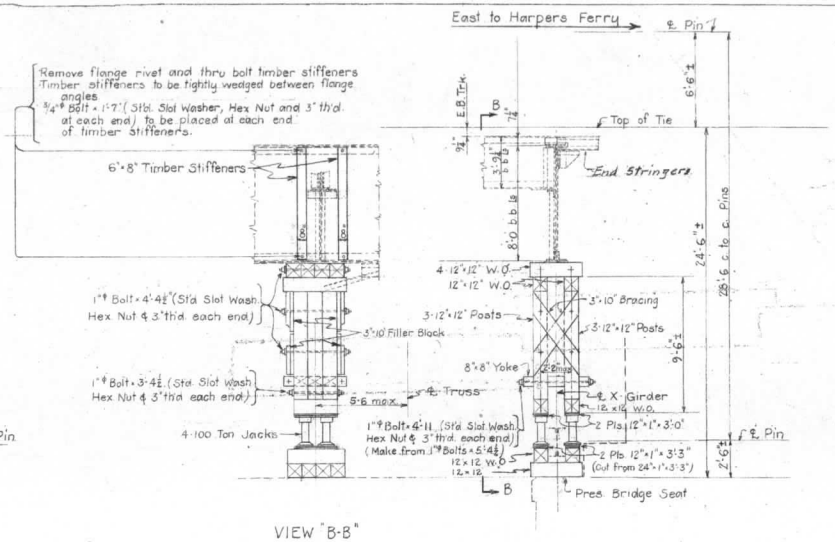


VIEW "A-A"

JACKING BENT AT PIER No. 1
For Dead Load only



VIEW "B-B"

JACKING BENT AT EAST ABUTMENT
For Dead Load only

Note:-
Drift bolt cross beams to caps, caps to posts posts to sills, and blocking to blocking using 3/4"φ drift bolts.
Thru bolt bracing at all intersections using 3/4"φ bolts.

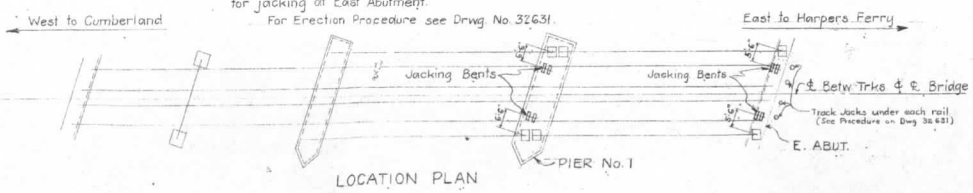
BILL OF MATERIAL FOR ONE JACKING BENT

No.	Description
2	1"φ Bolts - 5'-4½" (St'd. Slot Wash., Hex Nut & 3" th'd. each end)
6	1"φ " × 4'-4½" do.
2	1"φ " × 3'-4½" do.
4	3/4"φ " × 1'-7" do.
4	100 Ton Jacks
4	Pls. 12"×1"×3'-0" Plain
2	Pls. 24"×1"×3'-3" "

Note:-
Two Jacking Bents each using this amount of material are on hand at bridge site.

NOTE:-
First reuse Jacking Bents from Pier #2 at Pier #1. After work of Pier #1 is completed alter Bents as shown for jacking at East Abutment.
For Erection Procedure see Drwg. No. 32631.

NOTE:- 8-Pls. 12"×1"×3'-3" for use at E. Abut. to be cut from 4-Pls. 24"×1"×3'-3" and 4-1"φ Bolts × 4'-11" (St'd. Slot Wash., 1" Nut & 3" th'd. each) to be made from 1"φ Bolts × 5'-4½" after work of Pier #1 is complete



LOCATION PLAN

WORK COMPLETED 7-15-40 M. of W. RECORD

THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.
CUMBERLAND DIV. MAIN LINE
BRIDGE NO. 64 NORTH BRANCH, MD.

JACKING PLAN

SCALE:- 1/2"=1'-0" JULY 25, 1935
OFFICE OF ENGINEER OF BRIDGES
BALTIMORE, MD.

APPROVED: ENGINEER OF BRIDGES

DRAWING No.

BCM 109D 30.25 x 16.875 BD 153195 4054

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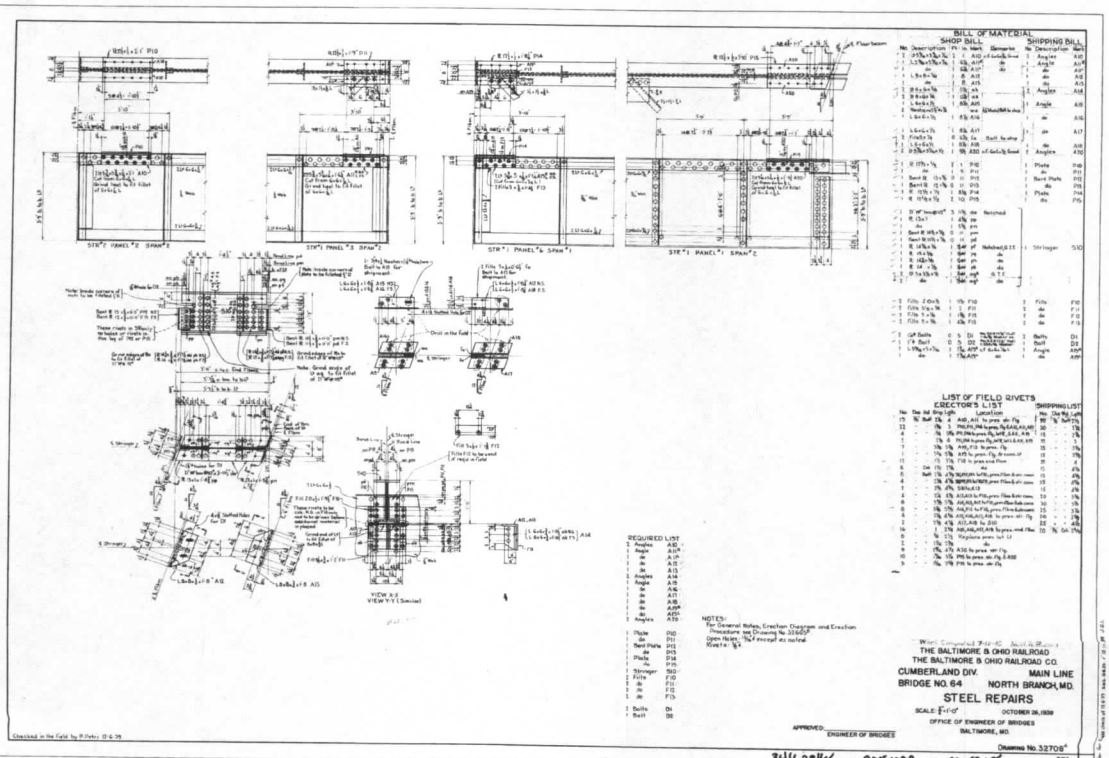

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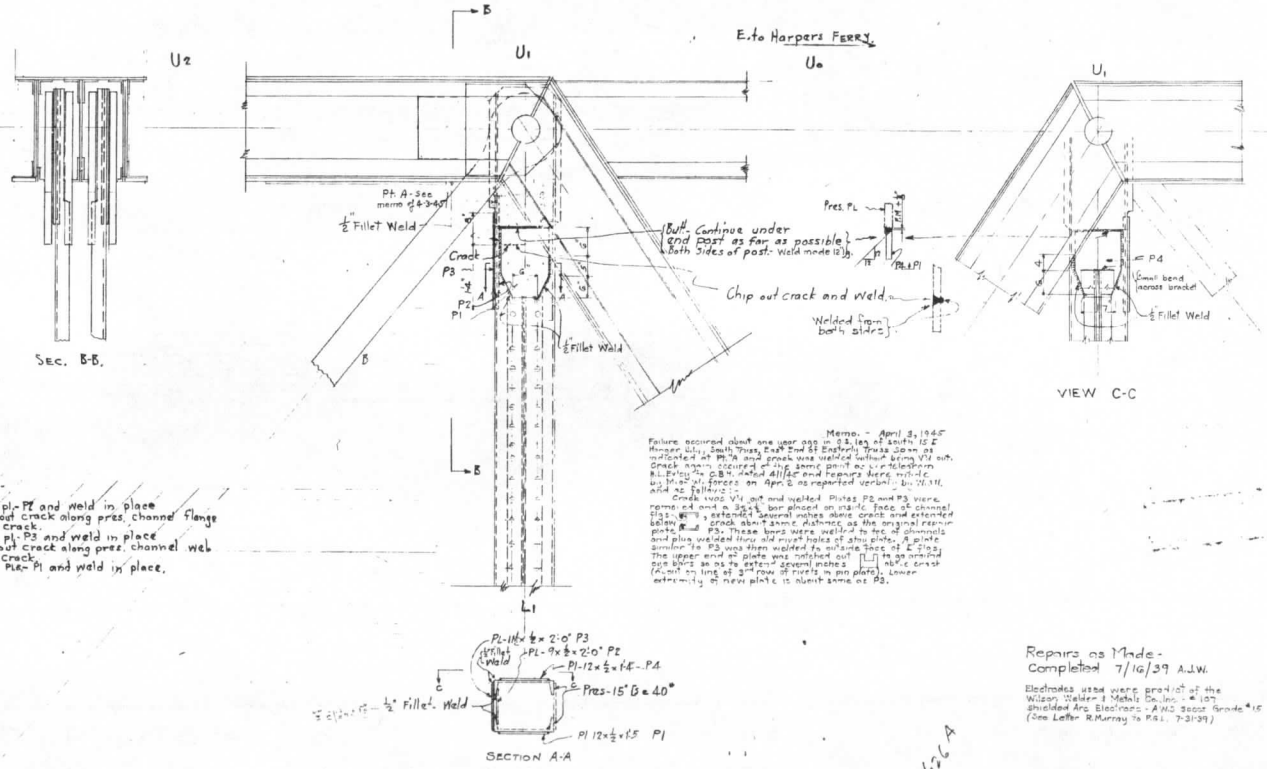

SEC. B-B.

VIEW C-C

Memo. - April 3, 1945

Failure occurred about one year ago in S.E. leg of south 15 E Hanger U1L1 South Truss, East End of Eastbound Truss Span as indicated at Pt. A and crack was welded without being V'd out. Crack again occurred of the same point as per telephone B.L. Ritzy to C.B.H. noted all fac and repairs here inside as that of forces on April 2 as reported verbally by W.H.H. and as follows:-

Crack was V'd out and welded. Plates P2 and P3 were removed and a 3½"x½" bar placed on inside face of channel flgs., extended several inches above crack and extended below crack about same. Distance as the original repair plate. P3. These bars were welded to face of channels and plug welded thru old rivet holes of shop plate. A plate similar to P3 was then welded to outside face of ∠ flgs. The upper end of plate was notched out ⊔ to an original rivet hole so as to extend several inches above crack (about on line of 3rd row of rivets in pin plate). Lower extremity of new plate is about same as P3.

PROCEDURE:-

① Place pl. - P2 and weld in place
② Chip out crack along pres. channel flange and weld crack.
③ Place pl. - P3 and weld in place
④ Chip out crack along pres. channel web and weld crack.
⑤ Place PL. - P1 and weld in place.

SECTION A-A

Note: Crack is on south side of Hanger U1 L1 - South Truss - of East Span - at East end.

Repairs as Made - Completed 7/16/39 A.J.W.

Electrodes used were product of the Wilson Welder & Metals Co. Inc. - #107 Shielded Arc Electrodes - A.W.S. Specs. Grade #15 (See Letter R. Murray to P.G.L. 7-31-39)

THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.
CUMBERLAND DIV. MAIN LINE
BRIDGE NO. 64 NORTH BRANCH, MD.

REPAIR PLAN

SCALE 1" = 1'-0" JULY 15, 1939

OFFICE OF ENGINEER OF BRIDGES
BALTIMORE, MD.

DWG. No. 326

APPROVED _____ ENGINEER OF BRIDGES.

BCATIME B0153209

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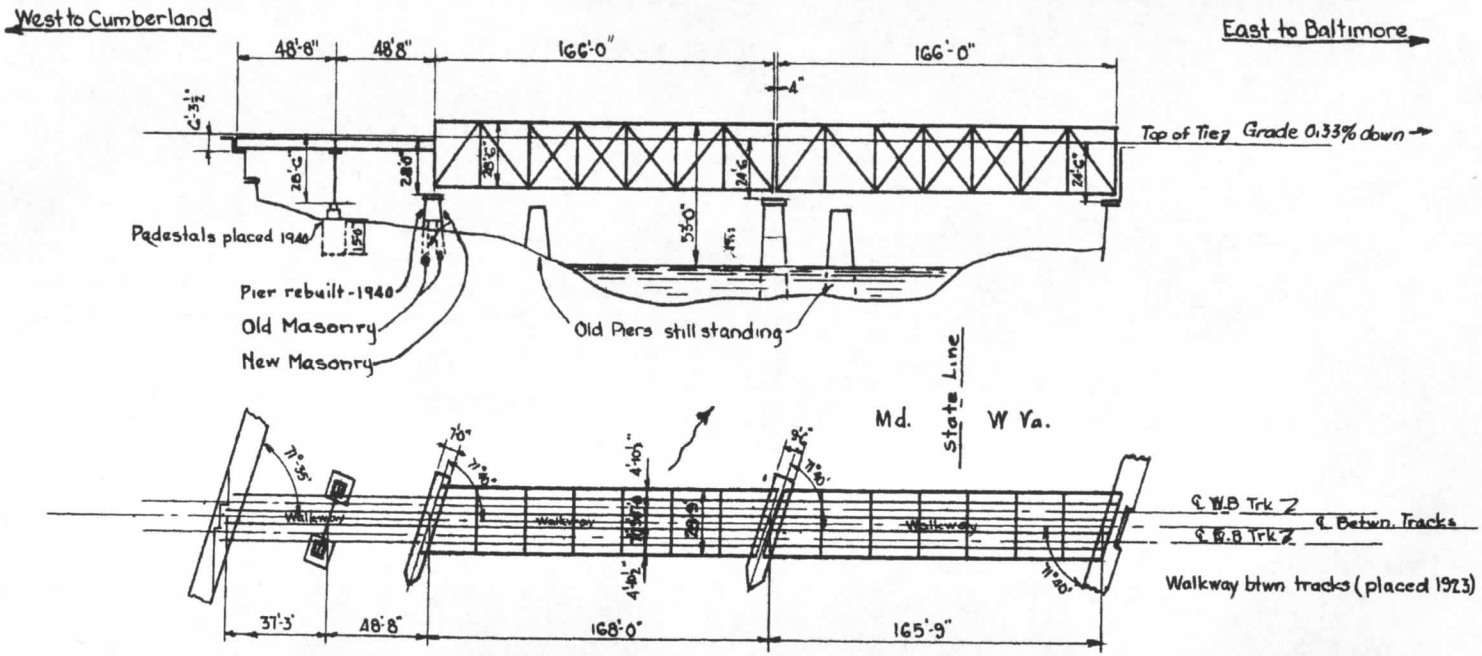

File 4054
Scale 1"=60'
7-1-37 RWG.

REMARKS:

PHYSICAL CONDITION:

Rev 10-8-41-FW.

STATION	North Branch Md	CLEAR HEAD	
CROSSING	Potomac River	CLEAR WIDTH	
MILE	172.5	BUILT	1901 by American Bridge Co
ALIGNMENT	Tangent	LIVE LOAD	
ANGLE	71°35' & 71°40'	MATERIAL	Steel

MDD01053

B. & O. R. R. CO.
RAILROAD BRIDGE

OLD NO 64 NEW NO.

CUMBERLAND DIVISION
Main Line

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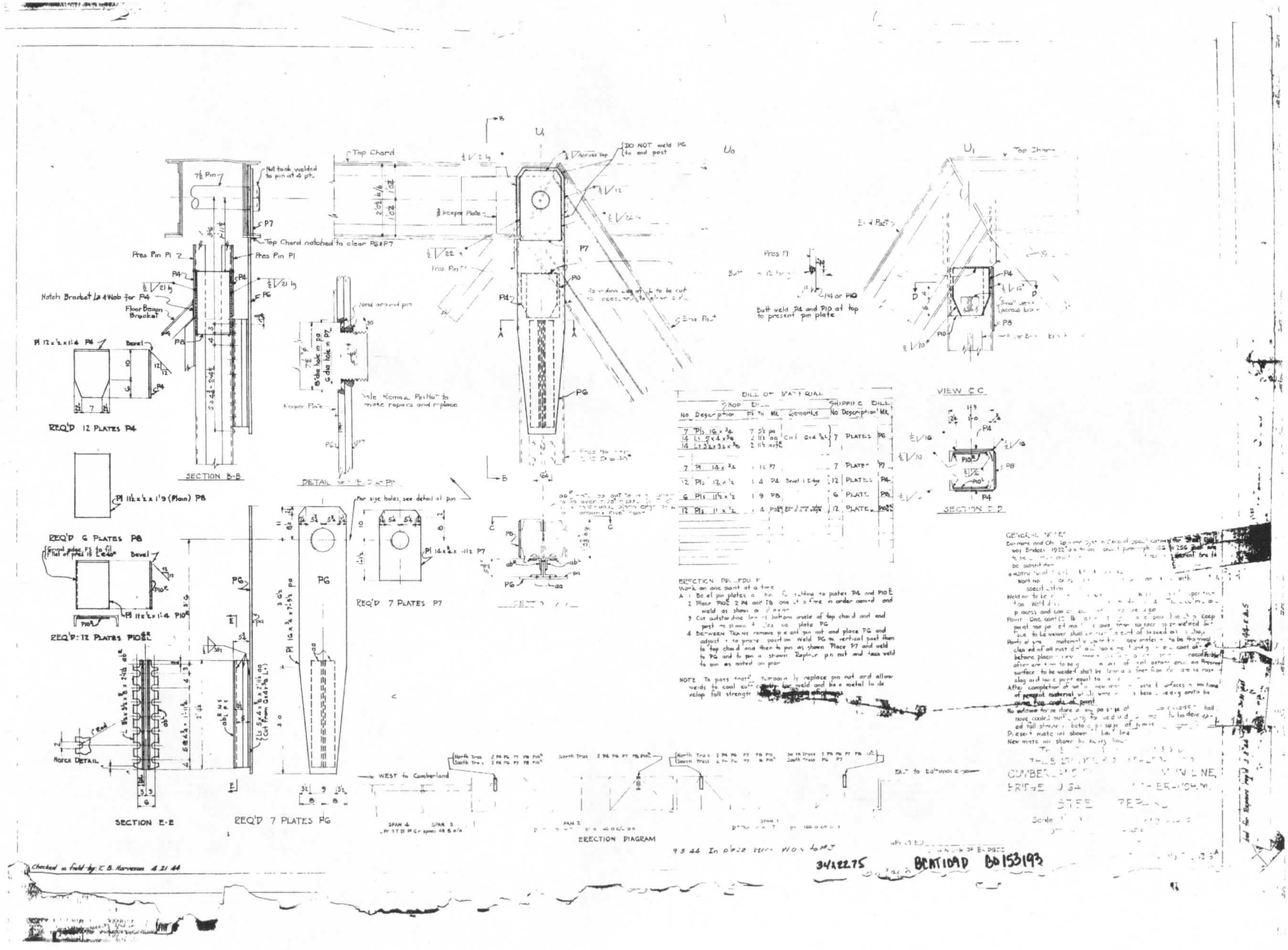

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ERECTION PROCEDURE

A To Place New Stringers

1. Knock out rivets to be removed replacing each as cut out with a bolt or drift pin using 50% of each.

2. Ream present 11/16" dia. holes in floor beams to 11/16" dia. as noted, placing 1" dia. bolts or drift pins in each hole as reamed, using 50% of each.

3 BETWEEN TRAINS support deck as necessary. Remove present stringers and lateral bracing as necessary. Countersink holes and drive countersunk head rivets, and cut off heads of rivets as noted on drawings. Place new stringers, new stringer struts, and lateral bracing, and replace present lateral bracing as necessary. Bolt-up complete.

4 Replace bolts and drift pins one at a time with driven rivets.

B To Place Remaining New Material

1. Knock out rivets to be removed replacing each as cut out with a bolt or drift pin using 50% of each.

2. BETWEEN TRAINS remove present material and place new material, replacing bolts and drift pins.

3 Replace bolts and drift pins one at a time with driven rivets.

NO TRAFFIC is to be allowed on bridge, unless all material, either old or new, is in place, and a bolt, drift pin, or driven rivet is in every hole.

LIST OF FIELD RIVETS

ERECTORS LIST						SHIPPING LIST			
No	Dia	Hd	Grip	Lgth	Location	No	Dia	Hd	Lgth
80	1	Butt	2 1/16	4 1/16	ac℄ to pres. Flams	30	1	Butt	3 1/2
15	"	"	1 3/16	3 1/16	pa-pb to pres Flam. app. str.	25	"	"	4
16	"	"	2 7/16	4 1/16	pa-pb to pres Flam. app fill	30	"	"	4 1/16
12	"	"	2 1/16	4	do	105	"	"	4 1/16
8	7/8	Csk	2 1/16	4 1/16	Redrive in pres. Flams. below B2-3-4	15	7/8	Csk	2 1/16
4	"	"	1	2 1/16	Redrive in pres. Flams. below pa-pb	20	"	"	4 1/16
52	7/8	Butt	2	3 1/16	ac℄ to B2-3-4	40	1	Butt	2 1/2
12	"	"	1 3/16	4 1/16	A4 to pres. Flams.	45	"	"	2 1/2
4	"	"	1 3/16	3 1/2	A6 to pres Flam.	35	"	"	2 1/16
4	"	"	2 1/16	4 1/2	Redrive under B3	55	"	"	2 1/16
4	"	"	1	2 1/16	Redrive under pa-pb	20	"	"	3
8	"	"	1 5/16	3 1/2	pa-pb to pres Flams	25	"	"	3 1/2
18	"	"	2 1/16	4	B3-4 to F1-2-4-5-7 & L1-2-3-4-7-8	20	"	"	3 1/16
8	"	"	2 1/16	4 1/16	do to do & L1-3	30	"	"	3 1/16
2	"	"	2 1/16	4 1/16	B3-4 to F2-5, LP2-4, & CS1	15	"	"	3 1/16
4	"	"	2 1/16	4 1/16	A3-4, 2 to, A8-10 to B3-4	70	"	"	3 1/16
4	"	"	1 1/16	3 1/2	B3 & P1-2 to pres. shelf angles	20	"	"	3 1/16
6	"	"	1	2 1/16	P1-2 to do	30	"	"	4
8	"	"	1	2 1/16	P1-2 to B3	15	"	"	4 1/16
4	"	"	1 1/16	3 1/16	pres. laterals to P1-2 & B3	15	"	"	4 1/16
4	"	"	1 1/16	2 1/2	do to P1-2	25	"	"	4 1/2
12	"	"	1 1/2	2 1/16	CS1 to B3-4	15	"	"	4 1/16
24	"	"	1 1/16	2 1/16	L1-3 to LP1-2-3-4-7-8	35	"	"	4 1/16
6	"	"	1	2 1/16	CS1 to LP2-4	15	"	"	4 1/16
4	"	"	2 1/16	4 1/16	A7-9 & A8-10 to pres. strs.	15	"	"	5 1/16
8	"	"	1 1/16	2 1/16	A7-8 to pres. Flam.				
8	"	"	1 1/16	3	A9-10 to do				
8	"	"	2 1/16	3 1/16	F20 to B2 & pres. lat. pls				
4	"	"	2 1/16	4 1/16	F20 to do & pres laterals.				
4	"	"	2 1/16	4 1/16	F21-22-23 to pres str. & lat pls				
4	"	"	3 1/16	3 1/16	do to do & pres. laterals				
8	"	"	1 1/16	3 1/16	F19-11-12 to B2-B4				
8	"	"	1 1/16	2 1/16	F19-11-12 to Lat Cl				
14	"	"	1	2 1/16	LP10-11 to Girder	1C			
5	"	"	1 1/16	3 1/16	LP11 to do	2C			
4	"	"	1 1/16	3 1/16	Lat Cl & LP10 to do	1C			
2	"	"	1 1/16	3 1/16	Lat Cl & LP11 to do	2C			
18	"	"	1 1/16	2 1/2	Lat Cl to LP10-11				

BILL OF MATERIAL

Dwg. No.	Shop Bill No	Description	Ft	In	Mk	Remarks	Shipping Bill No.	Description	Mk
36089	1	36 1/16 WF-182#	26	0 1/16	B3				
	2	Ls 6x3.5x 5/16	2	9 1/16	ac℄	Cut angles to conform to Shop Bill to ship			
	2	Ls 8x6x 5/16	1	10	af℄				
	2	Ls 8x5.5x 5/16	1	10	ag℄	Cut angles to conform to Shop Bill to ship			
	1	L 8x6x 5/16	2	1 1/16	ah		1	Stringer	B3
	1	L do	2	1 1/2	ak				
	1	L 8x5x 5/16	2	1 1/2	am	Cut angles to conform to Shop Bill to ship			
	1	L do	2	3 1/16	an	do			
	1	Bent Pl. 17 1/16 x 5/16	2	2 1/16	pn	Grind 1 End			
	1	Bent Pl. 18 x 5/16	2	2 1/16	pb	do			
	2	Fills 3 x 1/2	0	6 1/2	fa	Bolt to ship			
	1	Pl. 22 x 3/16	1	10 1/16	P1		1	Plate	P1
	1	Pl. do	2	5 1/16	P2		1	do	P2
	1	Fill 4 x 3/16	1	10	F1		1	Fill	F1
	1	Fill do	1	1	F2		1	do	F2
	1	Fill do	1	11	F7		1	do	F7
	1	Lat Pl. 12 x 3/16	1	10	LP1		1	Lateral Plate	LP1
	1	Pl do	1	1	LP2		1	do	LP2
	1	Pl. do	1	11	LP7		1	do	LP7
	2	Lat. Pl. 16 x 3/16	2	11	LP10		2	do	LP10
	1	Pl do	3	2 1/16	LP11	Notch	1	do	LP11
36090	1	36 1/16 WF-182#	24	3 1/2	B4				
	2	Ls			ac℄	Bolt to ship			
	1	Bent Pl			pa		1	Stringer	B4
	1	Bent Pl			pb				
	2	Fills			fa	Bolt to ship			
	1	Ls 6x4 x 5/16	1	1 1/16	A6		1	Angle	A6
	1	Ls 6.5x4 x 1/2	1	5 1/16	A7	Cut angles to conform to Shop Bill to ship	1	do	A7
	1	L do	1	5 1/16	A8	do	1	do	A8
	1	Ls 4.5x3 x 1/2	1	5 1/16	A9	do	1	do	A9
	1	L do	1	5 1/16	A10	do	1	do	A10
	1	Lat Pl. 12 x 1/2	0	10	LP3		1	Lateral Plate	LP3
	1	Pl do	2	3	LP4		1	do	LP4
	1	Pl do	1	0	LP8		1	do	LP8
	1	Fill 4 x 3/16	0	10	F4		1	Fill	F4
	1	Fill do	2	3	F5		1	do	F5
	1	Fill do	1	0	F8		1	do	F8
	3	Lat. L 3 1/2 x 3 1/2 x 5/16	8	5 1/16	L1		3	Lateral Angles	L1
	1	L do	9	1 1/16	L3		1	do	L3
	2	Fills 3 1/16 x 1/2	2	0	F20		2	Fills	F20
	1	15E-33.9#	6	10 1/16	cs		1	Cross Strut	CS1
	2	Ls 6x4 x 3/8	1	7 1/16	ac℄				
	4	Fills 2 1/16 x 3/16	1	1	F21		4	Fills	F21
	2	Ls 4x4 x 3/8	1	4 1/16	ac℄		1	Fill	F18
	2	Fills 3 1/16 x 3/16	0	10 1/16	F22		2	do	F22
	2	Ls 4x4 x 3/8	1	8 1/16	af℄		1	do	F11
	2	Fills 3 1/16 x 1/2	1	3	F23		2	Fills	F23
32665	1	36 1/16 WF-182#	23	5 1/16	B2		1	Stringer	B2
	4	Ls			ac℄	Bolt to Ship			
	4	Ls 4x3 x 3/8	1	6 1/16	ac℄		2	Fills	F12
	3	Ls 7x4 x 5/16	0	10 1/16	A4		3	Angles	A4

GENERAL NOTES

Specifications:

Baltimore and Ohio Railroad System "General Specifications for Steel Railway Bridges, 1922" paragraphs 1 to 7, incl, and 257 to 281, incl, are to apply.

C.M. Structural Steel:- A.S.T.M. A7-42.

Rivet Steel:- A.S.T.M. A 141-39.

Workmanship, except shop painting, to be in accordance with A.R.E.A. Specifications for Steel Railway Bridges, 1946."

Rivets:- 7/8" Diam. unless noted.

Open Holes:- 13/16" Diam. unless noted.

Paint:- One coat in shop.

Parts of present material in contact with new material to be thoroughly cleaned of all rust, dirt and loose paint, and given one coat of paint before placing new material. Surfaces of new material inaccessible after erection to be given two coats of paint before erection.

Present material shown by light lines.

New material shown by heavy lines.

Holes shown thus ⊕ match present rivet spacing.

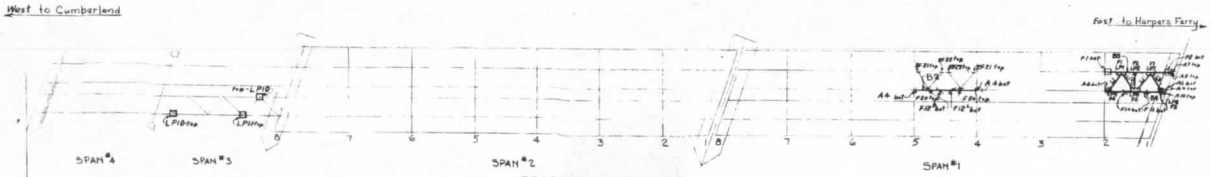
List of Drawings

36088A - This Drawing

36088B - Steel Repairs

36090 - do

32665 - do



ERECTION DIAGRAM

Spans #1 & 2 - 2-D.T. Deck Thru Truss Spans - 164'-0" c. to c. End Pins

Spans #3 & 4 - 2-D.T. Deck Plate Girder Spans - 48'-6" o. to o.

Checked in field C.B. Harveson - 2-3-47

APPROVED: C.E. Ashton
ENGINEER OF BRIDGES

THE BALTIMORE & OHIO RAILROAD

THE BALTIMORE & OHIO RAILROAD CO.

CUMBERLAND DIV. MAIN LINE

BRIDGE NO. 64 NORTH BRANCH, MD.

STEEL REPAIRS

SCALE:- 3/8" = 1'-0" JUNE 28, 1946

OFFICE OF ENGINEER OF BRIDGES

BALTIMORE, MD.

DRAWING No. 36088A

W.H.H. & F.W.

v 3-10-47 J.C.I.

34x23 BCMT1044 B0153138

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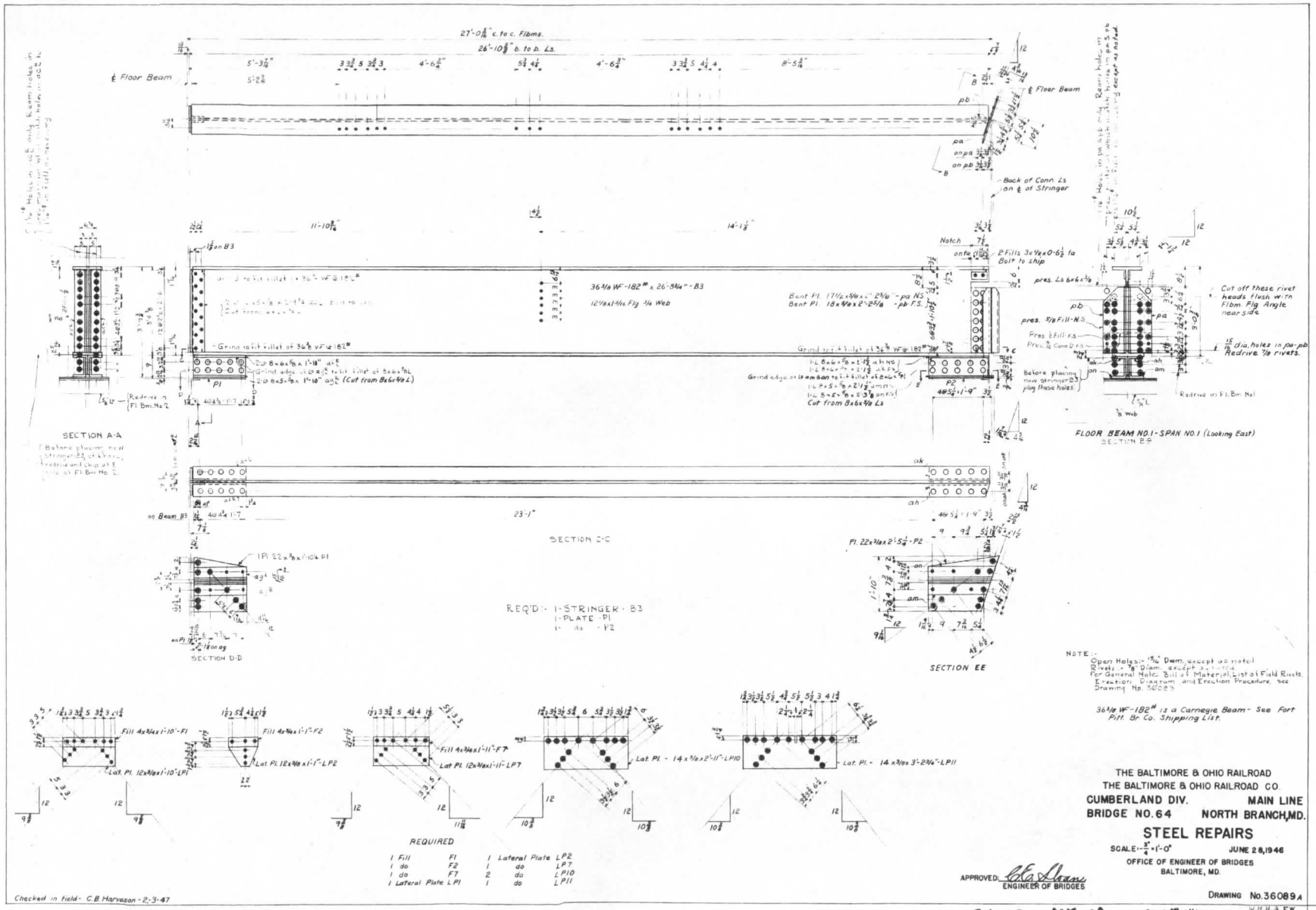

34x23 BCAT 109A BD 153140

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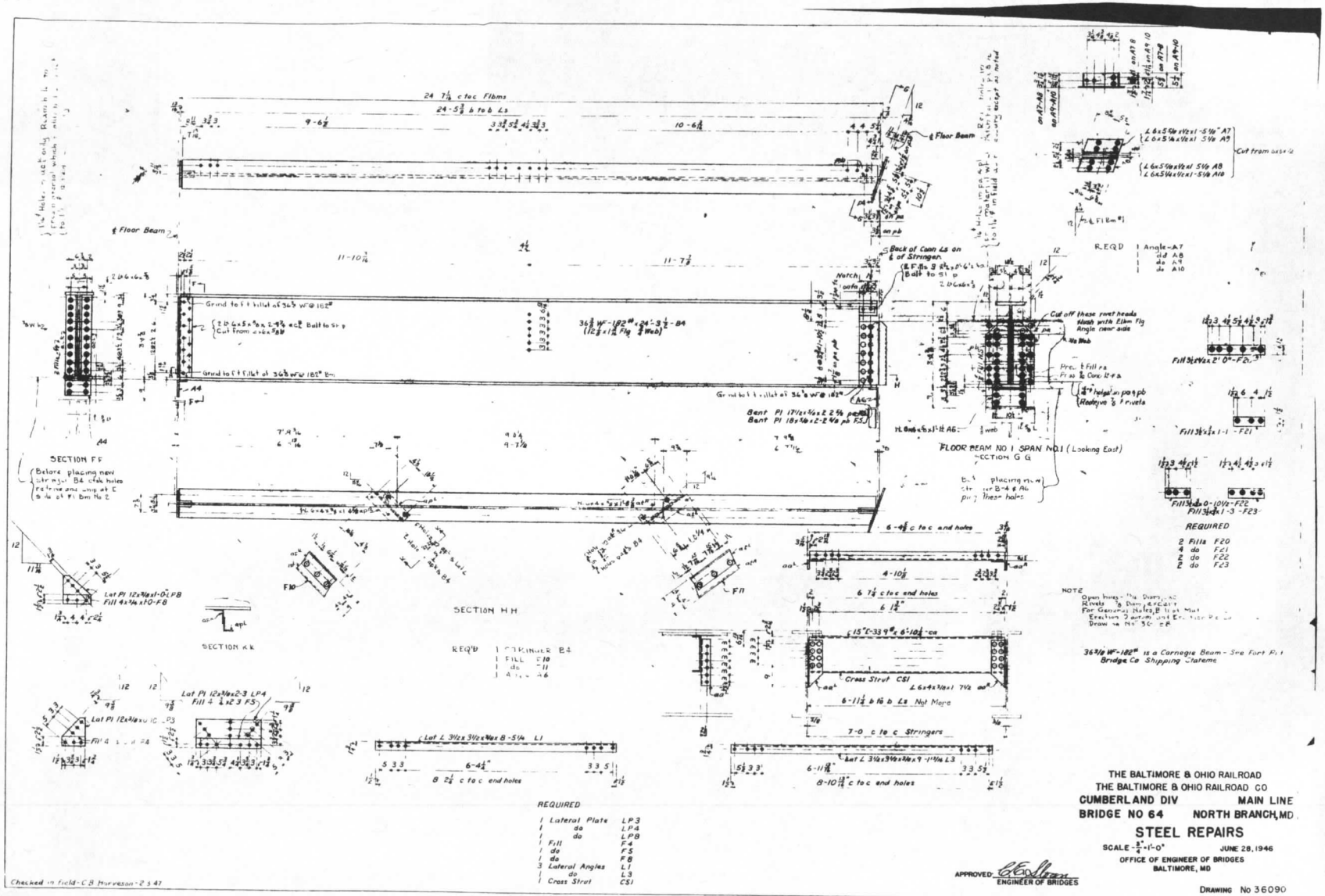


GENERAL NOTES:-

Specifications:-

Baltimore & Ohio Railroad System "General Specifications for Steel Railway Bridges-1922", paragraphs 1 to 7 incl., 257 to 268 incl. & 273 to 281 inclusive are to apply.

Welding to be in accordance with American Welding Society Specifications "Welded Highway & Railway Bridges-1956. The electric arc process & coated electrodes are to be used.

O.H. Structural Steel - A.S.T.M. A7-58T.

Rivet Steel - A.S.T.M. - A141-58

Workmanship to be in accordance with A.R.E.A. Specifications for Steel Railway Bridges - 1958; except all holes in new material 3/4" thick or less may be punched full size; and all holes in material more than 3/4" thick are to be drilled.

High Strength Steel Bolts, Nuts & Washers to be in accordance with A.S.T.M. Spec. A325-58T.

Rivets 7/8" ø except as noted. Open Holes 15/16" except as noted.

High Strength Steel Bolts to be placed in accordance with AREA Spec. for Assembly of Structural Joints using High Strength Steel Bolts in Steel Railway Bridges - 1957.

Shop Paint - One Coat of red lead paint to be in accordance with B. & O. RR. Co. Specification 979, Stock W-121. Field contact surfaces to be painted.

Parts of present material in contact with new material to be thoroughly cleaned of all rust, dirt and loose paint and, except at field welds, given one coat of paint before placing new material.

Surfaces of new material inaccessible after erection to be given two coats of paint before erection.

After erection new material to be given two coats of field paint.

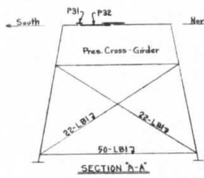
Paint & painted markings to be kept away from surfaces to be welded.

Present material at welds to be cleaned equivalent to sandblasting before welding.

Welds & unpainted material at welds to be given one coat of red lead paint after welding is completed.

Sequence of welding to be arranged so as to reduce shrinkage and residual stresses to a minimum.

Present Material shown by light lines.
New Material shown by heavy lines.
Holes shown thus ◉ match present rivet spacing.
Holes shown thus • in present material to be drilled in present material in field to match holes in new material.



SECTION "A-A"

Note:- Replace all lacing bars in Bottom Strut & both Diagonals of Bent.

LIST OF FIELD RIVETS

ERECTOR'S LIST						SHIPPING LIST			
No.	Dia.	Head	Grip	Lgth.	Location	No.	Dia.	Head	Lgth.
320	7/8	Butt	7/8	2 1/2	L1,L2,L3 to Str. Lat. Pls.	55	3/4	Butt	2 7/8
36	"	-	1 9/16	3 1/4	H1,H2,H3 to Str. Flanges	375	"	-	2 3/4
36	-	"	3/4	2 1/2	H1,H2,H3 to pres. str. bott. lat. ∟s				
224	"	"	2	3 3/4	Str. Conn. ∟s to stringer web	100	7/8	Butt	2 1/8
59	"	"	1 3/8	3	M1 & M2 to pres. str. webs	680	-	-	2 1/2
51	"	"	1 3/16	2 7/8	Plug Holes in Top Flg. of Pres. Strs.	120	-	-	2 5/8
48	"	"	1 3/16	2 7/8	S1 to Pres. Bott. Lateral Plates	1060	-	-	2 3/4
24	"	"	1 3/16	3 3/8	S1 to Pres. Bott. Lateral ∟s	740	-	-	2 7/8
24	"	"	1 3/16	2 3/4	P1,P2,P3,P4 to Stringers S3 or S6				
12	"	"	1 9/16	3 3/8	P1,P2,P3,P4 to Str. & pres. bott. Lat. ∟s	170	7/8	Butt	3
12	"	"	3/4	2 1/2	P1,P2,P3,P4 to pres. str. bott. Lat. ∟s	945	-	-	3 1/8
24	"	"	1	2 3/4	P1,P2,P3,P4 to pres. conn. ∟s	100	-	-	3 1/4
6	"	"	1 3/16	3 5/8	P2,P4 to stringer & pres. conn. ∟s	355	-	-	3 3/8
96	"	"	3/4	2 1/2	Redrive Rivets - pres. str. Lat. ∟s to Lat. Pls.	160	-	-	3 1/2
6	"	"	1	2 3/4	" - pres. str. Lat. Pls. to strut	230	-	-	3 5/8
2	"	"	2 5/16	5	" - pres. str. strut to str. flange	375	-	-	3 3/4
35	"	"	2 5/16	4 1/8	" - pres. str. Lat. Pls. to str. flange	60	-	-	3 7/8
34	"	"	1 3/16	3 3/8	"	80	-	-	4
16	"	"	2 1/16	4 5/8	" - pres. str. Lat. ∟s to str. flange	65	7/8	Butt	4 1/8
16	"	"	1 13/16	3 3/4	"	360	-	-	4 1/4
150	"	"	2 7/8	4 3/4	" - Str. Conn. to Flbm. - E.B. Track	60	-	-	4 1/2
10	"	"	3 3/8	5 5/8	"	100	-	-	4 5/8
5	"	"	2 3/8	4 1/2	"	235	-	-	4 3/4
20	"	"	3 1/8	5 1/8	"				
25	"	"	1 5/8	3 1/2	"	15	7/8	Butt	5
10	"	"	2 1/16	4 5/8	"	120	-	-	5 1/8
30	"	"	2 3/4	4 5/8	"	15	-	-	5 1/4
340	1"	"	2 7/8	4 7/8	S1-2-3-4-5-6 to Intermediate Flbms.	20	-	-	5 3/8
36	7/8	-	2 7/8	4 3/4	A1 to Flbms.				
12	"	-	2 1/4	4 1/8	Redrive Rivets in Flbm. #8-Span #2	70	1"	Butt	3 5/8
20	1"	-	2 1/4	4 1/4	S5 & S6 to Flbm. #8 - Span #2	35	-	-	4 1/4
32	"	-	2 7/8	4 7/8	"	25	-	-	4 5/8
24	7/8	"	1	2 3/4	Redrive Rivets in Flbm. #8-Span #1 & Flbm. #1-Span #2	25	-	-	4 3/4
48	1"	"	1 5/8	3 5/8	S3-4-5-6 to Flbm. #8-Span #1 & Flbm. #1-Span #2	440	-	-	4 7/8
32	"	"	3 1/8	5 1/4	"	50	-	-	5 1/4
12	"	"	2 5/8	4 5/8	S3, S4 to Flbm. #1 - Span #2				
12	"	"	2 3/4	4 3/4	S5, S6 to Flbm. #8 - Span #1				
76	7/8	"	3 1/8	5 5/8	A7 & A8 to Girder Web				
16	"	"	1 1/8	2 7/8	A8 to pres. X-Frame Plates				

Typical for all panels of Spans #1 & 2, replace all defective lacing bars as necessary in Bottom Truss Struts. Use 150-LB3 as needed.

Typical for all Panels of Spans #1 & 2, replace all defective lacing bars as necessary in Bottom Truss Laterals. Use 150-LB2 as needed.

BILL OF MATERIAL

Dr. No. 40455

SHOP BILL						SHIPPING BILL		
No.	Description	Ft.	In.	Mark	Remarks	No.	Description	Mark
4	Hacked Bolts 1 1/4" ø	1	4	AB1	See Detail	4	Anchor Bolts	AB1
6	Pls. 21 x 1/2	2	8 1/2	P16		6	Lateral Plates	P16
1	Pl. 14 x 1/2	2	6	P19		1	Splice Plate	P19
2	Mas. Pls. 18 x 1	1	8 1/2	MP1		2	Masonry Plates	MP1
4	∟s 3 1/2 x 3 1/2 x 3/8	30	0	A35	Plain	4	Angles	A35
1	Pl. 22 x 1/2	2	2	P34	do	1	Plate	P34
1	Pl. 36 x 1/2	4	0	P35	do	1	do	P35
1	Pl. 20 x 1/2	1	11	pc		1	Lateral Angle	A2
1	Fill 3 1/2 x 3/8	2	2 1/2	fb				
1	∟ 3 1/2 x 3 1/2 x 3/8	14	10 1/2	ag R				
1	∟			ag L		1	Lateral Angle	A3
1	Fill			fb				
1	∟ 6 x 6 x 5/8	5	4 1/8	A12		1	Flange Angle	A12
2	∟s 3 1/2 x 3 1/2 x 3/8	14	10 1/2	A4 R L		2	Lateral Angles	A4 R L
6	∟s 5 x 3 1/2 x 3/4	5	4 3/4	A7 3R 3L	Grind 2 Ends	6	Stiffener Angles	A7 3R 3L
2	∟s 5 x 3 1/2 x 3/4	5	4 3/4	A8 R L	do	2	do	A8 R L
1	∟ 6 x 6 x 5/8	5	4 1/8	A9		1	Flange Angle	A9
1	Pl. 18 x 1	1	8 1/2	pg R				
2	∟s 5 3/8 x 5 3/8 x 1/2	2	5 3/4	A10 R L	C.F. ∟s 6x6x1/2 Grind Heel	2	Splice Angles	A10 R L

Dr. No. 40456

SHOP BILL						SHIPPING BILL		
No.	Description	Ft.	In.	Mark	Remarks	No.	Description	Mark
10	∟s 5 3/8 x 5 3/8 x 3/8	4	4 1/2	A5 5R 5L	C.F. ∟s 6x6x3/8 Grind Heel	10	Flange Angles	A5 5R 5L
22	∟s 5 3/8 x 5 3/8 x 3/8	5	7 1/2	A6 11R 11L	do	22	do	A6 11R 11L
4	Pls. 14 x 1/2	10	10 1/2	P6		4	Cover Plates	P6
1	Pl. 14 x 1/2	11	3 3/4	P7		1	do	P7
3	Pls. 14 x 1/2	5	3 1/2	P8		3	do	P8
2	Pls. 14 x 1/2	22	2	P9		2	do	P9
9	Bent Pls. 10 x 3/8	1	3 1/2	P10		9	Bent Plates	P10
1	Pl. 11 x 3/8	1	0 5/8	P11	Bevel 3 Edges	1	Web Plate	P11
1	Pl. 9 x 3/8	1	0 5/8	P12	do	1	do	P12
12	Pls. 9 x 3/8	3	2 1/2	P13	do	12	Web Plates	P13
3	Pls. 12 x 3/8	1	2	P14	Bevel 2 Edges	3	do	P14
3	Pls. 14 x 3/8	1	6	P15	do	3	do	P15
14	Pls. 14 x 3/8	4	9	P17		14	Flange Plates	P17
1	Pl. 13 x 3/8	1	2	P18	Bevel 2 Edges	1	Flange Plate	P18
20	7/8" ø High Strength Bolts	0	2 1/4	T1		20	Bolts	T1
22	do	0	2 1/2	T2		22	do	T2
30	do	0	2 3/4	T3		30	do	T3
35	do	0	3	T4		35	do	T4
14	do	0	3 1/4	T5		14	do	T5
14	do	0	3 1/2	T6		14	do	T6
270	2 1/4" ø Hardened Washers (8 gage thick) for 7/8" ø bolts					2 per bolt		

BILL OF MATERIAL

Dr. No. 40454, Dr. No. 40455

SHOP BILL						SHIPPING BILL		
No.	Description	Ft.	In.	Mark	Remarks	No.	Description	Mark
1	∟ 6 x 6 x 1/2	1	5 1/2	A14		1	Conn. Angle	A14
1	do	1	5 1/2	A15		1	do	A15
1	do	1	5 1/2	A16		1	do	A16
1	do	1	5 1/2	A17		1	do	A17
1	do	1	6 1/4	A18		1	do	A18
1	do	1	6 1/4	A19		1	do	A19
1	do	1	6 1/4	A20		1	do	A20
1	do	1	6 1/4	A21		1	do	A21
1	do	1	6 5/8	A22		1	do	A22
1	do	1	4 1/2	A23		1	do	A23
2	36 3/8 WF 182#	22	6	S5		2	Stringers	S5
2	Bent Pls.			pa				
2	Bent Pls.			pb				
4	∟s			aa 2R 2L	Bolt to ship			
2	∟s			ab				
4	Fills			fa				
4	Pcs. 18 ⊔ 42.7#	1	9	mk				
2	36 3/8 WF 182#	20	0 1/2	S6		2	Stringers	S6
2	Bent Pls.			pa				
2	Bent Pls.			pb				
4	∟s			aa 2R 2L	Bolt to ship			
2	∟s			ab				
4	Fills			fa				
2	Pcs. 18 ⊔ 42.7#			mk				
4	Pcs. 18 ⊔ 42.7#	1	0	mm 2R 2L				
8	Pls.			pd				
2	Pcs. 18 1/8 WF 96#	2	0 3/8	mn				
2	Pcs. 18 1/8 WF 96#	2	0 1/2	mp				
8	∟s 4 x 4 x 7/16	7	4	L3		8	Stringer Laterals	L3
2	Pls. 21 1/4 x 3/8	2	1 1/4	P3		2	Lateral Plates	P3
2	Pls. 21 3/4 x 3/8	2	2 1/2	P4		2	do	P4
1	∟ 6 x 6 x 1/2	1	6 5/8	A24		1	Conn. Angle	A24
1	do	1	4 1/2	A25		1	do	A25
4	1" ø Bolts	0	5	B15	2 1/4" thick, H.H. & N. 2 for each bolt 1 3/8" ø Hole	4	Bolts	B15
8	3 1/4" x 1/8" thk Washers							
94	Lac. Bars 2 1/4 x 3/8	1	6 3/8	LB1	c. to c.	94	Lacing Bars	LB1
150	Lac. Bars 2 3/4 x 3/8	2	0 1/8	LB2	do	150	do	LB2
150	Lac. Bars 2 3/4 x 3/8	2	2 7/8	LB3	do	150	do	LB3
6	Pcs. 18" ⊔ 42.7#	1	0	M1 3R 3L		6	Str. Lateral Plates	M1 3R 3L
5	Pcs. 18" ⊔ 42.7#	1	9	M2		5	do	M2
1	Pl. 21 5/8 x 3/8	2	10	P5		1	Lateral Plate	P5

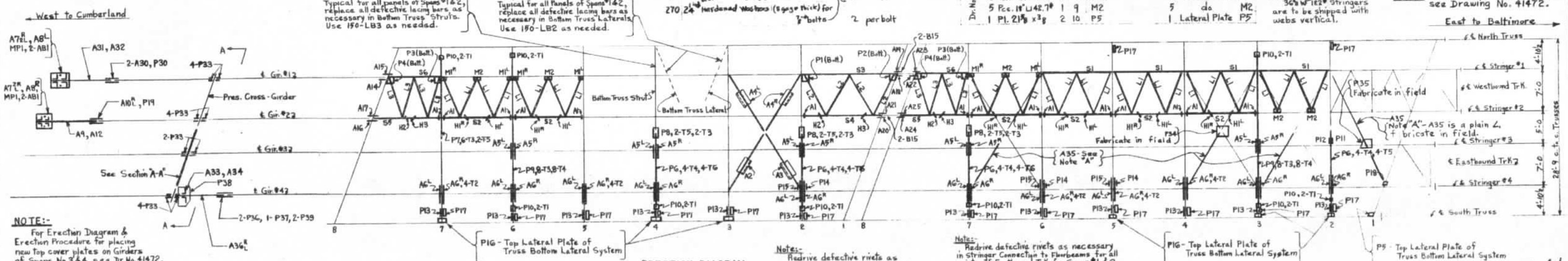
BILL OF MATERIAL

Dr. No. 40452, Dr. No. 40453

SHOP BILL						SHIPPING BILL		
No.	Description	Ft.	In.	Mark	Remarks	No.	Description	Mark
4	36 3/8 WF 182#	23	4 1/2	S1		4	Stringers	S1
16	∟s 8 x 5 x 5/8	2	8 1/2	aa 8R 8L	C.F. ∟s 8x6x5/8 Bolt 8 to ship			
8	∟s 3 1/2 x 3 x 3/8	0	4	ab				
8	Pcs. 18 ⊔ 42.7#	1	0	ma R L				
4	Pcs. 18 ⊔ 42.7#	1	9	mb				
16	Pls. 5 x 1/2	0	7 3/4	pd				
8	Pcs. 18 1/8 WF 96#	1	10 7/8	mc				
6	36 3/8 WF 182#	23	4 1/2	S2		6	Stringers	S2
24	∟s			aa 12R 12L	Bolt 12 to ship			
12	∟s			ab				
12	Pcs. 18 ⊔ 42.7#			mb				
15	∟s 7 x 4 x 5/8	0	10 3/4	A1		15	Seat Angles	A1
28	∟s 4 x 4 x 7/16	7	10 1/8	L1		28	Stringer Laterals	L1
24	∟s 6 x 4 x 3/8	1	6 3/4	ac 12R 12L		12	Hangers	H1 6R 6L
1	Pl. 21 1/4 x 3/8	1	10 1/4	P1		1	Lateral Plate	P1
1	Pl. 21 3/4 x 3/8	2	4 3/4	P2		1	do	P2
4	∟s 4 x 4 x 7/16	8	5	L2		4	Stringer Laterals	L2
1	36 3/8 WF 182#	26	8	S3		1	Stringer	S3
2	∟s			aa R L	Bolt to ship			
1	∟			ab				
2	Pc. 18 ⊔ 42.7#	1	0 1/2	md R L				
1	Pc. do	1	9 3/4	mf				
1	Pc. 18 1/8 WF 96#	1	9 3/8	mg				
1	Pc. do	2	3 3/4	mh				
2	Fills 3 x 1/2	0	6	fa				
4	Pls.			pd				
1	Bent Pl. 26 x 5/8	1	5 1/4	pa				
1	Bent Pl. do	1	6	pb				
1	Bent Pl.			pb				
1	36 3/8 WF 182#	24	2 3/4	S4		1	Stringer	S4
2	∟s			aa R L	Bolt to ship			
1	∟			ab				
2	Pcs. 18 ⊔ 42.7#			mf				
2	Fills			fa				
1	Bent Pl.			pa				
6	∟s 6 x 4 x 3/8	1	5 1/8	ad 3R 3L		3	Hangers	H2
6	∟s 6 x 4 x 3/8	1	8 1/2	af 3R 3L		3	do	H3

Shipping Note:- 36 3/8 WF 182# Stringers are to be shipped with webs vertical.

NOTE:- For Additional Bill of Material see Drawing No. 41472.



NOTE:- For Erection Diagram & Erection Procedure for placing new top cover plates on Girders of Spans No. 3 & 4 see Dr. No. 41472.

ERECTION DIAGRAM

Notes:- Redrive defective rivets as necessary in Stringer Top Lateral System of the Westbound Track for Spans #1 and 2.

Note:- Redrive defective rivets as necessary in Stringer Connection to Floorbeams for all points of Eastbound Trk. for Spans #1 & 2.

Work Completed 5-26-61

SPAN NO. 4
D.T. DK. Pl. Girder Span - 48'-8" o. to o.

SPAN NO. 3
D.T. DK. Pl. Girder Span - 48'-8" o. to o.

SPAN NO. 2
D.T. Half-Thru Truss Span - 166'-0 c. to c. End Pins

SPAN NO. 1
D.T. Half-Thru Truss Span - 166'-0 c. to c. End Pins

LIST OF FIELD RIVETS — ERECTOR'S LIST (Span No. 4)

No.	Dia.	Head	Grip	Lgth.	Location
17	7/8"	Butt	1 5/8	3 1/2	A9 & A12 to Girder Web
12	"	"	2 5/8	4 1/2	A10 to Girder Web
24	"	"	1 5/8	3 3/8	P19 to A10
297	"	"	2 3/8	4 1/4	A5 & A6 to Flbm. Web
18	"	"	3/4	2 1/2	P10 to Pres. Knee Brace
12	"	"	1 1/2	3 3/8	P10 to Top Cov. Plate
24	"	"	1 7/8	3 3/4	A6 to P10
196	"	"	1 1/8	2 7/8	P6, P7, P9 to Flbm. Flange
18	"	"	1 1/8	2 3/4	P7 & P9 to Flbm. Flange
18	"	"	1 5/8	3 1/2	P6 & P7 to Pres. Splice Plate
30	"	"	1 9/16	3 3/8	P8 to Flbm. Flange
24	"	"	2	3 7/8	P8 to A5
20	"	"	1 3/8	3 1/8	A6 to Pres. Bent Plate
30	"	"	1	2 5/8	A6 to Top Flg. ∟ (o.s. Leg)
36	"	"	1 1/2	3 1/4	A6 to Top Cov. Plate
122	"	"	1 1/2	3 3/8	A5 & A6 to Top Cov. Plate
88	"	"	1 3/8	3 1/8	A6 to Pres. Knee Brace

LIST OF FIELD RIVETS — ERECTOR'S LIST (Span No. 3)

No.	Dia.	Head	Grip	Lgth.	Location
4	3/4	Butt	13/16	2 3/8	LB1 to Bott. Strut - 1 Lac. Bar
48	"	"	1 1/16	2 3/4	LB1 to Bott. Strut - 2 Lac. Bars
4	"	"	3/4	2 3/8	LB1 to Bent Diagonal - 1 Lac. Bar
42	"	"	1 1/8	2 3/4	LB1 to Bent Diagonal - 2 Lac. Bars
30	"	"	3/4	2 3/8	LB2 to Bott. Truss Laterals - 1 Lac. Bar
225	"	"	1 1/8	2 3/4	LB2 to Bott. Truss Laterals - 2 Lac. Bars
75	7/8	"	3/4	2 3/8	LB3 to LB3
300	"	"	1 1/8	2 7/8	LB3 to Bott. Truss Strut
38	"	"	3/4	2 1/2	LB3 to Pres. Lac. Bar
12	"	"	7/8	2 1/2	A3 & A4 L to Lat. Angle A2
4	"	"	3/4	2 1/2	A4 R L to Pres. Str. Hanger
4	"	"	1 1/2	3 3/8	A2 & A3 to Pres. Stringer
8	"	"	3/4	2 1/2	A2, A3, A4 R L to Pres. Lat. Plates
4	"	"	1 3/8	3 1/8	A4 R L to Pres. Str. & Pres. Lat. Plate
4	"	"	1 1/2	3 3/8	A2 & A3 to Pres. Lat. Pl. & Stringer
48	"	"	7/8	2 5/8	P16 to Pres. Truss Lat. ∟s
48	"	"	1 1/4	3	P16 to Pres. Truss Strut ∟s

Checked in Field by C. R. Riley 11-26-56, J.A. Caywood 10-13-58.

LIST OF FIELD RIVETS — ERECTOR'S LIST (Spans No. 1 & 2)

No.	Dia.	Head	Grip	Lgth.	Location
10	7/8	Butt	3/4	2 1/2	P5 to Pres. Truss Strut ∟s
4	"	-	3/4	2 1/2	P5 to Pres. Truss Lat. ∟s
5	"	"	3/4	2 1/2	P5 to Pres. Conn. ∟
12	"	-	2 3/4	4 1/2	A14 to A25 incl. to Stringer Webs
8	"	-	2 3/4	4 5/8	A14 to A17 incl. & A22 to A25 incl. to Gird. Str. Web
8	"	-	1 9/16	3 3/8	A14 & A15 to Flbm.
8	"	-	1 1/2	3 3/4	A16 & A17 to Flbm.
16	"	-	7/8	2 3/8	A18, A19, A22 & A23 to Flbm.
16	"	-	1 5/16	3	A20, A21, A24 & A25 to Flbm.

NOTE:- For Additional List of Field Rivets see Dr. No. 41472.

ERECTION PROCEDURE:- (For Additional Erection Procedure see Dr. No. 41472)

A. To Place New Stringers S1 to S6 inclusive on Westbound Track of Spans No. 1 & 2.
Note:- Work in one panel of one span at a time completing all work in that panel before proceeding to the next panel.

1. Knock out rivets to be removed, replacing each as cut out with a bolt or drift pin using 50% of each.
2. Using Lateral Plates M1 R L & M2 as templets drill holes as necessary in webs of WF Stringers to remain in bridge placing a bolt or drift pin in each hole as drilled. Place M1 R L & M2 and bolt up completely.
3. BETWEEN TRAINS support deck as necessary. As necessary for replacement, remove present stringers, stringer lateral angles, stringer lateral plates, stringer hangers to the bottom laterals, and for the end stringers the bottom lateral plates and the connection angles between spans. (Note:- Take care to support the adjacent stringers). Before placing new stringers plug holes in the floorbeam webs as shown on Drs. No. 40452 & 40453. Place Shelf Angles A1, New WF Stringers S1, S2, S3, S4, S5 or S6, Stringer Lateral angles L1, L2 or L3, Hangers H1 R L, H2 or H3, and for the end stringers the bottom lateral plates P1, P2, P3 or P4 and the connection angles between spans A14 to A25 as necessary. Bolt up completely.
4. As work progresses across the bridge, ream the 15/16" ø holes in the stringer and connection angles and the floorbeam web as shown on Drs. No. 40452 & 40453 to 1 1/16" ø placing a 1" ø bolt or drift pin in each hole as reamed.
5. As work progresses across the bridge, replace bolts & drift pins one at a time with driven rivets or permanent Bolts - B15 except where additional new material is to be placed later.

B. To Place New Bottom Flange Angles A9 & A12 on West End of Girder No. 2 of Span No. 4.
1. Repeat Step A-1.
2. Using Splice Angles A10 R L as templets drill holes as necessary in that part of pres. bottom flange Angles to remain in place.
3. BETWEEN TRAINS cut present bottom flange angles as shown. Remove present end stiffener angles, cut off portion of present bottom flange angles and present masonry plate to be replaced. Place new bottom flange angles A9 & A12, End Stiffener Angles A7 R L & A8, Splice Material A10 R L & P19, and Masonry Plate MP1. Bolt up completely. Place Anchor Bolts AB1.
4. Replace bolts & drift pins one at a time with driven rivets.

C- To Place Remaining New Material
Note:- Work at one location at a time.
1. Repeat Step A-1.
2. BETWEEN TRAINS remove present material to be replaced and place new material. Place weld metal as shown and bolt up completely.
3. Using new material as a templet drill holes as necessary in present material placing a bolt or drift pin in each hole as drilled.
4. Replace bolts & drift pins one at a time with driven rivets or permanent bolts T1 to T6.

NOTE:- NO TRAFFIC is to be allowed on bridge unless all material, either old or new, is in place and a bolt, drift pin or driven rivet is in every hole, and completed welds have cooled sufficiently for weld and base metal to have developed full strength.

LIST OF DRAWINGS

Drawing No. 40451 - This Drawing
Drawing No. 40452 - Steel Repairs
Drawing No. 40453 - do
Drawing No. 40454 - do
Drawing No. 40455 - do
Drawing No. 40456 - do
Drawing No. 41472 - Steel Repairs ← Additional Bill of Material, Additional List of Field Rivets and Additional Erection Diagram & Erection Procedure.
Drawing No. 41473 - do
Drawing No. 41474 - do

THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.
CUMBERLAND DIV. MAIN LINE
BRIDGE NO. 64 NORTH BRANCH, MD.

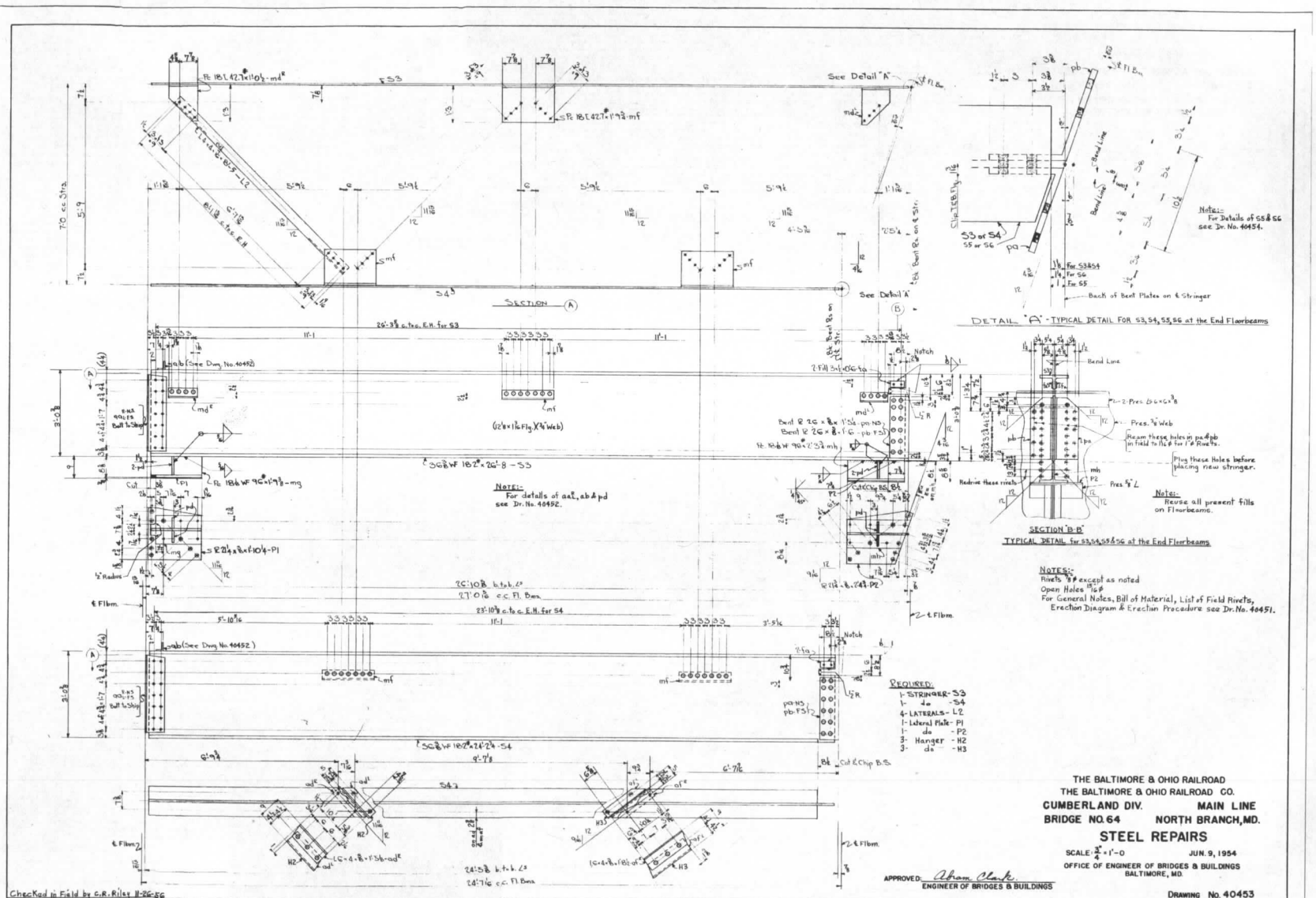
STEEL REPAIRS

SCALE: NONE JUN. 9, 1954
OFFICE OF ENGINEER OF BRIDGES & BUILDINGS
BALTIMORE, MD.

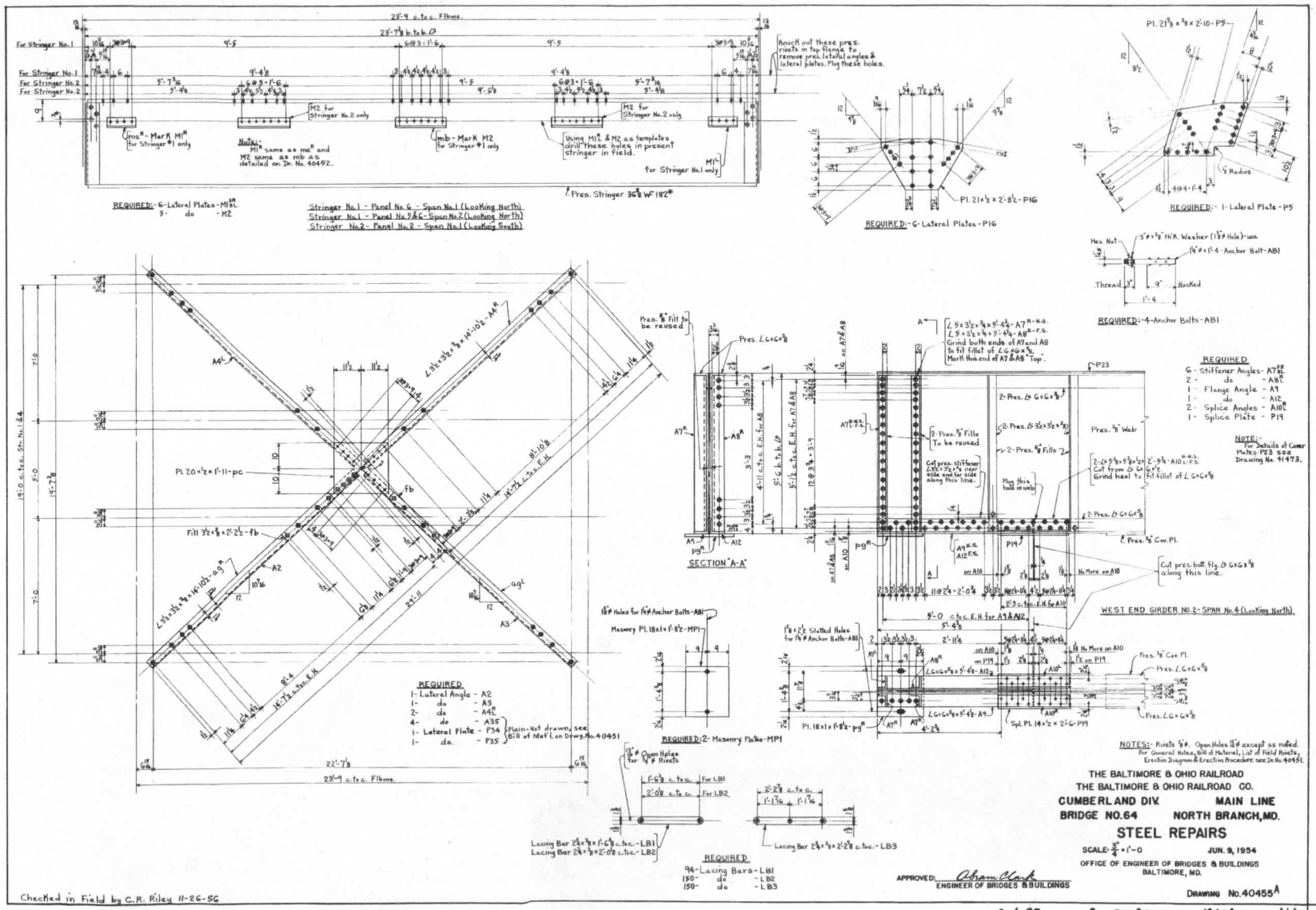
APPROVED: Abam Clark
ENGINEER OF BRIDGES & BUILDINGS

DRAWING No. 40451 B

34x23 BCAT109D B0153192 A.I.A. ✓HLR 9-10-54


SECTION (A)
See Detail "A"
DETAIL "A" - TYPICAL DETAIL FOR S3, S4, S5, S6 at the End Floorbeams
Notes:- For Details of S5 & S6 see Dr. No. 40454.
Back of Bent Plates on ℄ Stringer
Notes:- For details of aa℄, ab & pd see Dr. No. 40452.
Notes:- Reuse all present fills on Floorbeams.
SECTION "B-B"
TYPICAL DETAIL for S3, S4, S5 & S6 at the End Floorbeams
Notes:- Rivets ⅞ ø except as noted
Open Holes 15/16 ø
For General Notes, Bill of Material, List of Field Rivets, Erection Diagram & Erection Procedure see Dr. No. 40451.
REQUIRED:
1- STRINGER - S3
1- do - S4
4- LATERALS - L2
1- Lateral Plate - P1
1- do - P2
3- Hanger - H2
3- do - H3
THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.
CUMBERLAND DIV. MAIN LINE
BRIDGE NO. 64 NORTH BRANCH, MD.
STEEL REPAIRS
SCALE: 3/4" = 1'-0 JUN. 9, 1954
OFFICE OF ENGINEER OF BRIDGES & BUILDINGS
BALTIMORE, MD.
APPROVED: Adam Clark
ENGINEER OF BRIDGES & BUILDINGS
DRAWING No. 40453
Checked in Field by G.R. Riley 11-26-56
34x23
BEAT LOAD
B0153188
4054

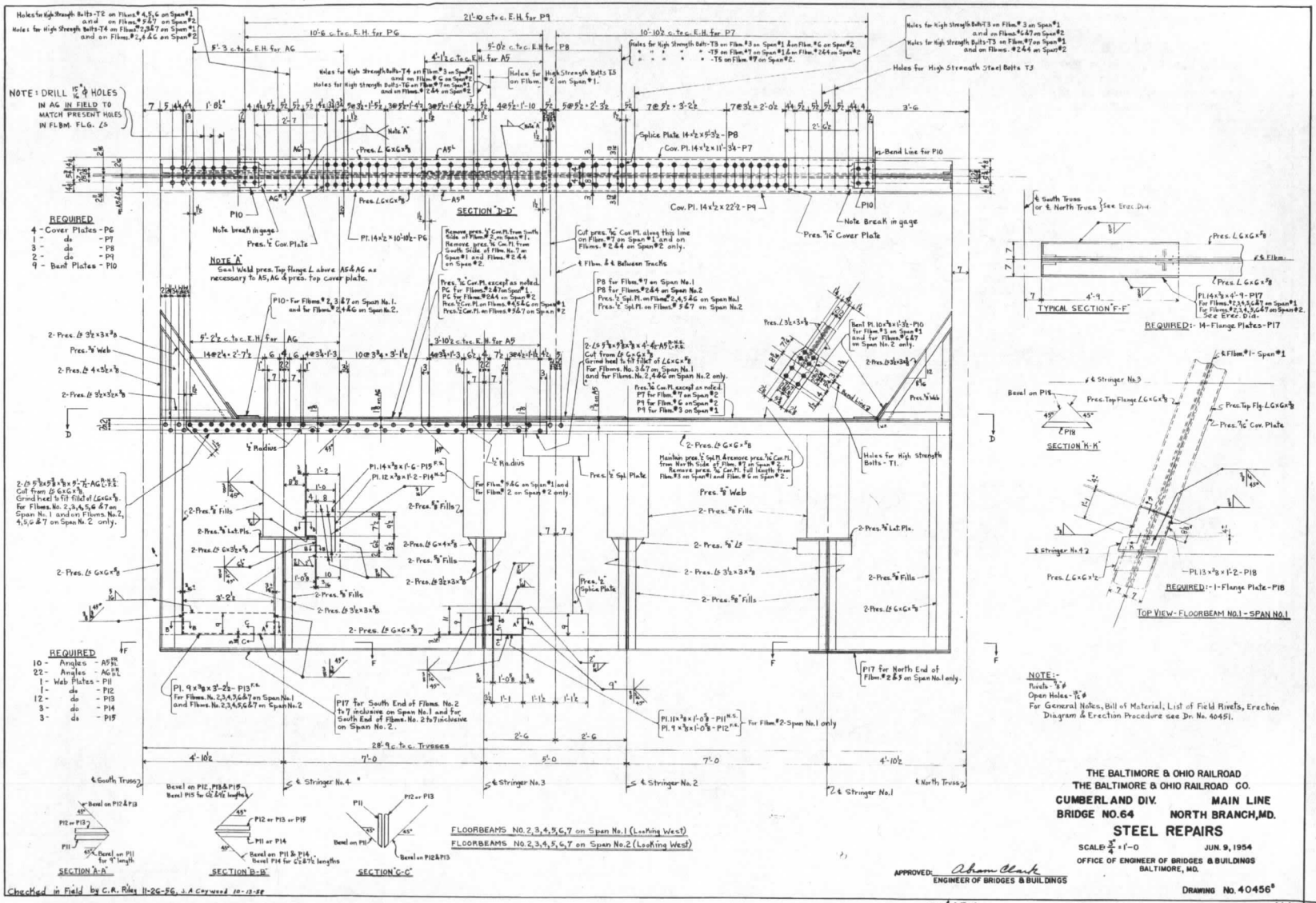
B0153189.CIT

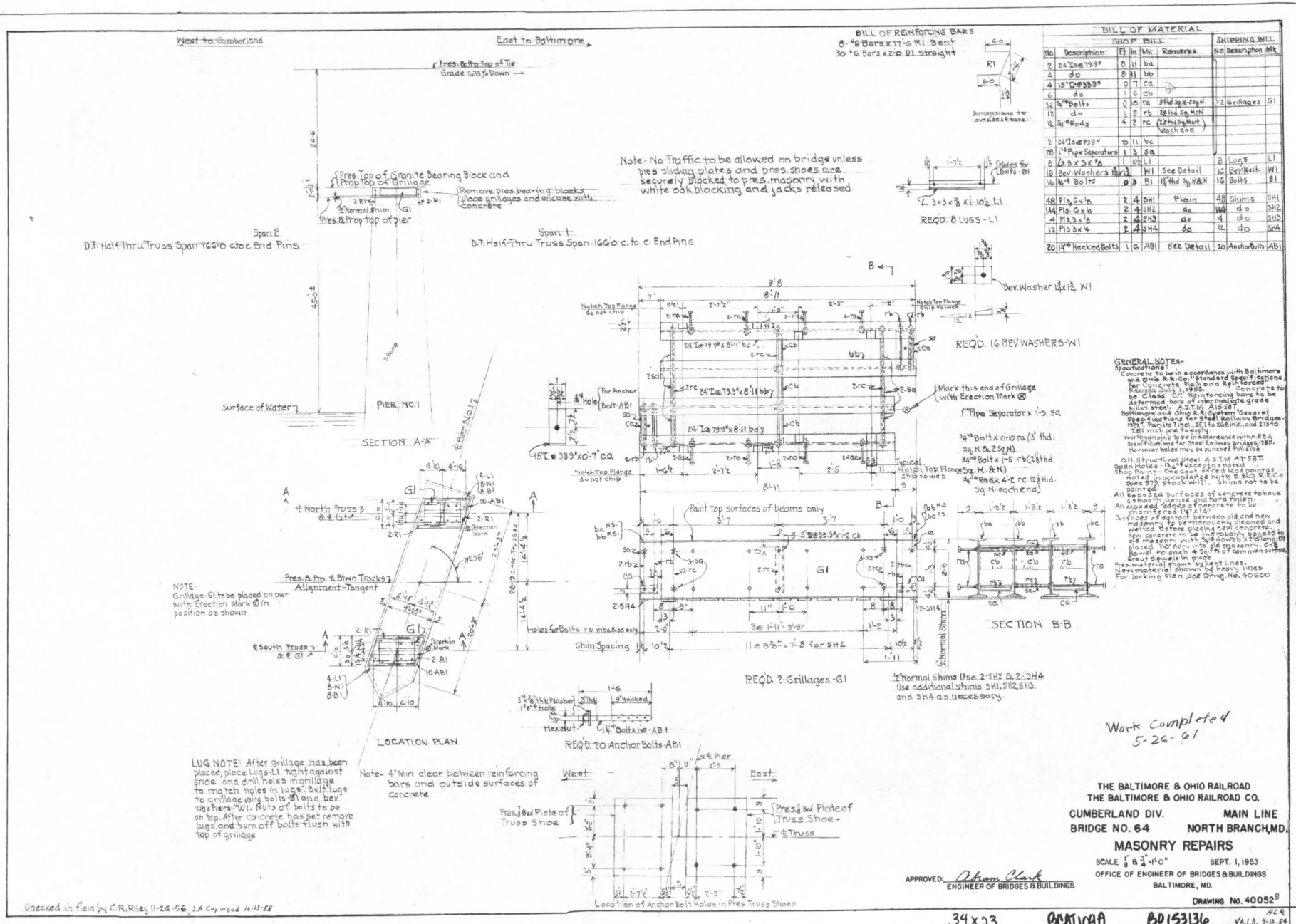


34x23 BRAT 109D B0153189 A.I.A. 4054

B0153191.CIT

10'-5 adds up now (11-5-57)





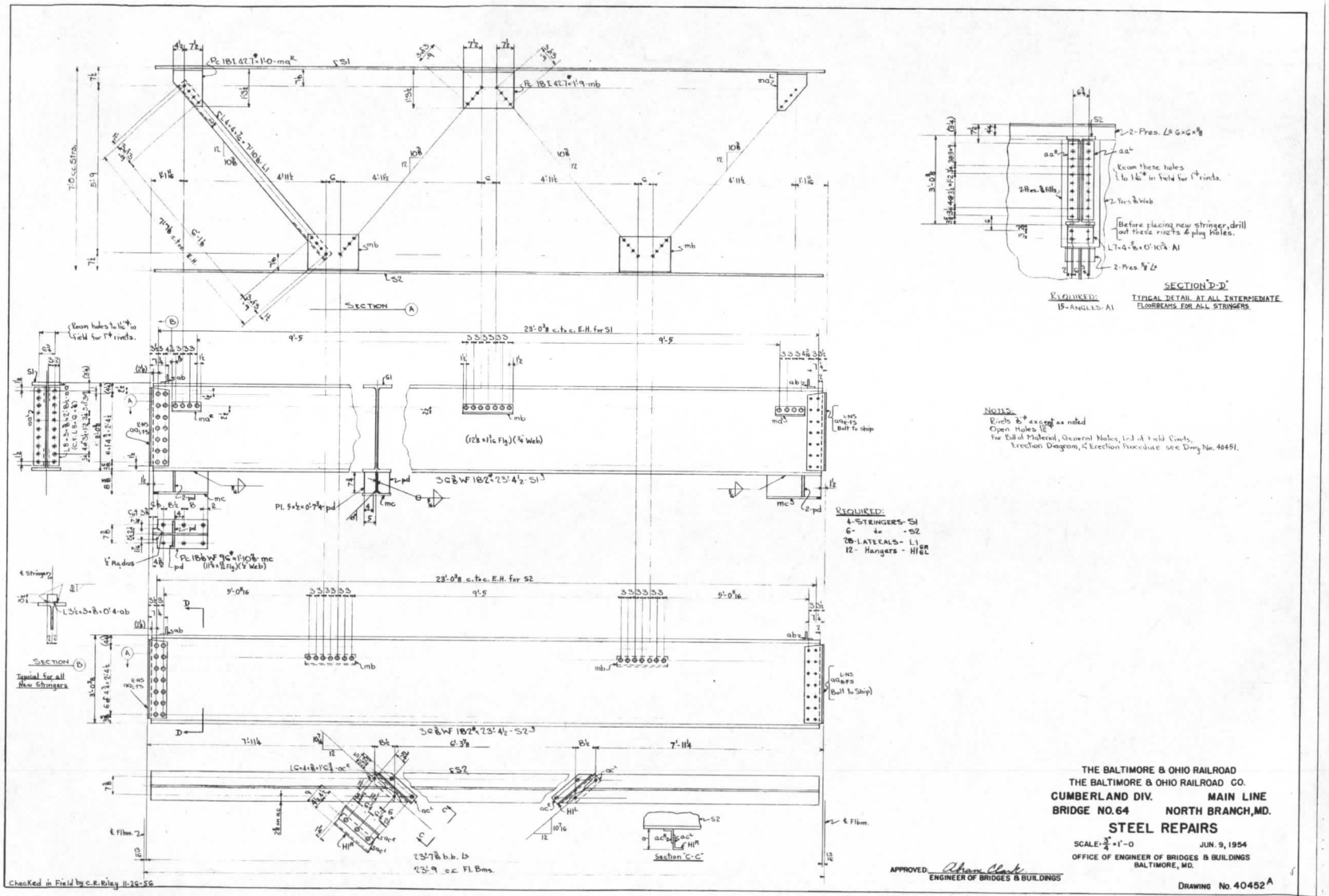
BILL OF MATERIAL

SHOP BILL						SHIPPING BILL		
No	Description	Ft	In	Mk	Remarks	No	Description	Mk
2	24" I @ 79.9#	8	11	ba				
4	do	8	11	bb				
4	15" C @ 33.9#	0	7	ca				
6	do	1	6	cb				
32	¾" Bolts	0	10	ra	3" Hd Sq. H-2" Sq. N	2	Grillages	G1
12	do	1	5	rb	2" Hd Sq. H-N			
12	¾" Rods	4	2	rc	(2" Hd Sq. Nut) each end			
2	24" I @ 79.9#	8	11	bc				
28	1" Pipe Separators	1	3	sa				
8	∠ 3 x 3 x 3/8	1	10½	L1		8	Lugs	L1
16	Bev. Washers 1¾ x 1¾			W1	See Detail	16	Bev. Wash.	W1
16	¾" Bolts	0	3	B1	1¾" Hd Sq. H & N	16	Bolts	B1
48	Pls. 6 x ⅛	2	4	SH1	Plain	48	Shims	SH1
144	Pls. 6 x ⅛	2	4	SH2	do	144	do	SH2
4	Pls. 3 x ⅛	2	4	SH3	do	4	do	SH3
12	Pls. 3 x ¼	2	4	SH4	do	12	do	SH4
20	1¼" Hacked Bolts	1	6	AB1	See Detail	20	Anchor Bolts	AB1

Field Check Heights of Brgs. to each shown to be varied.

A: Rev. for Field check & Spec. letter etc. 12-4-56 H.W. / A.A. W.O. of 10-11-58 as per

B0153187.CIT



THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.
CUMBERLAND DIV. MAIN LINE
BRIDGE NO. 64 NORTH BRANCH, MD.

STEEL REPAIRS

SCALE: 3/4" = 1'-0 JUN. 9, 1954

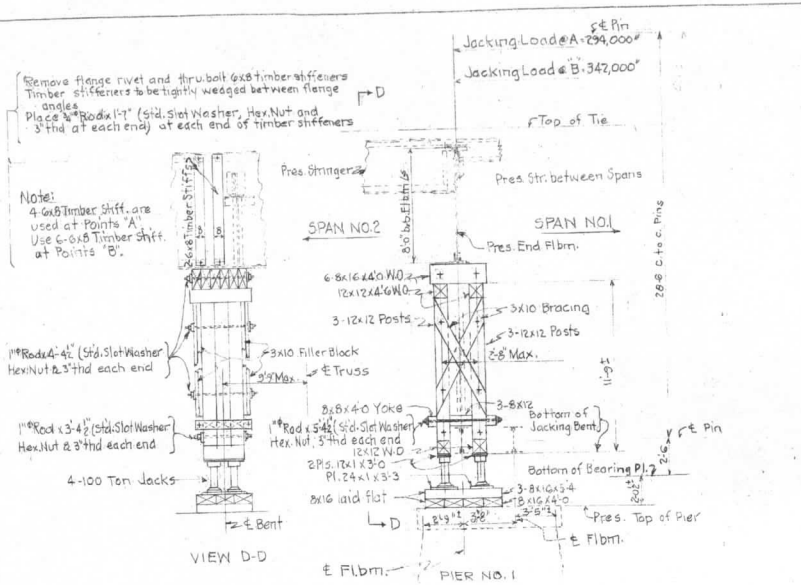
OFFICE OF ENGINEER OF BRIDGES & BUILDINGS
BALTIMORE, MD.

APPROVED: Adam Clark
ENGINEER OF BRIDGES & BUILDINGS

DRAWING No. 40452 A

34x23 BEATLAND BD 153189 A.I.A. WHITE-NEW

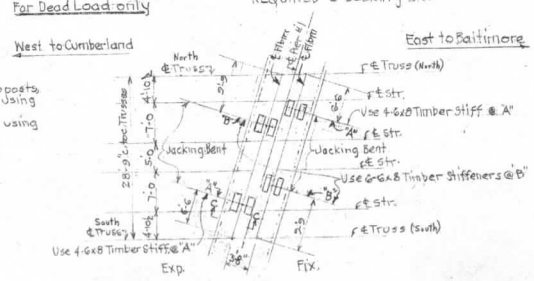
4054



JACKING BENT (Typical)
For Dead Load only

REQUIRED - 2 - Jacking Bents

NOTE:
Drift bolt crossbeams to caps, caps to posts, posts to sills and blocking to blocking using ¾" φ drift bolts
Thru bolt bracing at all intersections using ¾" φ bolts



LOCATION PLAN

Checked in field by C.R. Riley 11-26-56

BILL OF MATERIAL FOR ONE JACKING BENT

No.	Description
2	1"φ Rods x 5'-4½" (Std. Slot Wash., Hex. Nut, 3" thd each end)
8	1"φ Rods x 4'-4½" do
2	1"φ Rods x 3'-4½" do
4	100 Ton Jacks
4	Pls. 12x1 x 3'-0 Plain
2	Pls. 24x1 x 3'-3 do

BILL OF MATERIAL FOR TIMBER STIFFENERS

No.	Description
20	¾"φ Rods x 1'-7" (Std. Slot Wash., Hex. Nut, 3" thd. each end)

JACKING PROCEDURE

A-1- Place Jacking Bents and Timber Stiffeners as shown at South Trusses.
2- Remove shipping anchor bolts. Fasten bottom exp. shoe to top shoe.
B-1 BETWEEN TRAINS
a- Jack up trusses to remove Bearing Blocks.
b- Place grillages G1 and shims as necessary.
c- Clean and lubricate exp. shoe. Release Jacks.
2- If necessary to pass traffic during removal of granite blocks, the shoes are to be thoroughly blocked to masonry with W.O. Timber and JACKS RELEASED.
C-1- Remove Jacking bents
D-1- Place Jacking Bents and Timber Stiffeners as shown at North Trusses.
D-2- Repeat A-2, B-1 B-2 and C1.

NO TRAFFIC to be allowed on Bridge unless grillages are in place or shoes thoroughly blocked to masonry with W.O. Timber and JACKS RELEASED.

NOTES:
For Masonry Repairs, see Drwg. No. 40052

THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.
CUMBERLAND DIV. MAIN LINE
BRIDGE NO. 64 NORTH BRANCH, MD.

JACKING PLAN

SCALE: ¼" = 1'-0" SEPT. 2, 1954
OFFICE OF ENGINEER OF BRIDGES & BUILDINGS
BALTIMORE, MD.

APPROVED: Abram Clark
ENGINEER OF BRIDGES & BUILDINGS

DRAWING No. 40600 A

A - Rev. for Field Check 12-4-56 H.L.R. ✓ A.I.A. 1-30-57

30X17 BCAT109D 00153205 ✓ A.I.A. 9-15-54 HLR

4054

Ref # 32GKS # 4054

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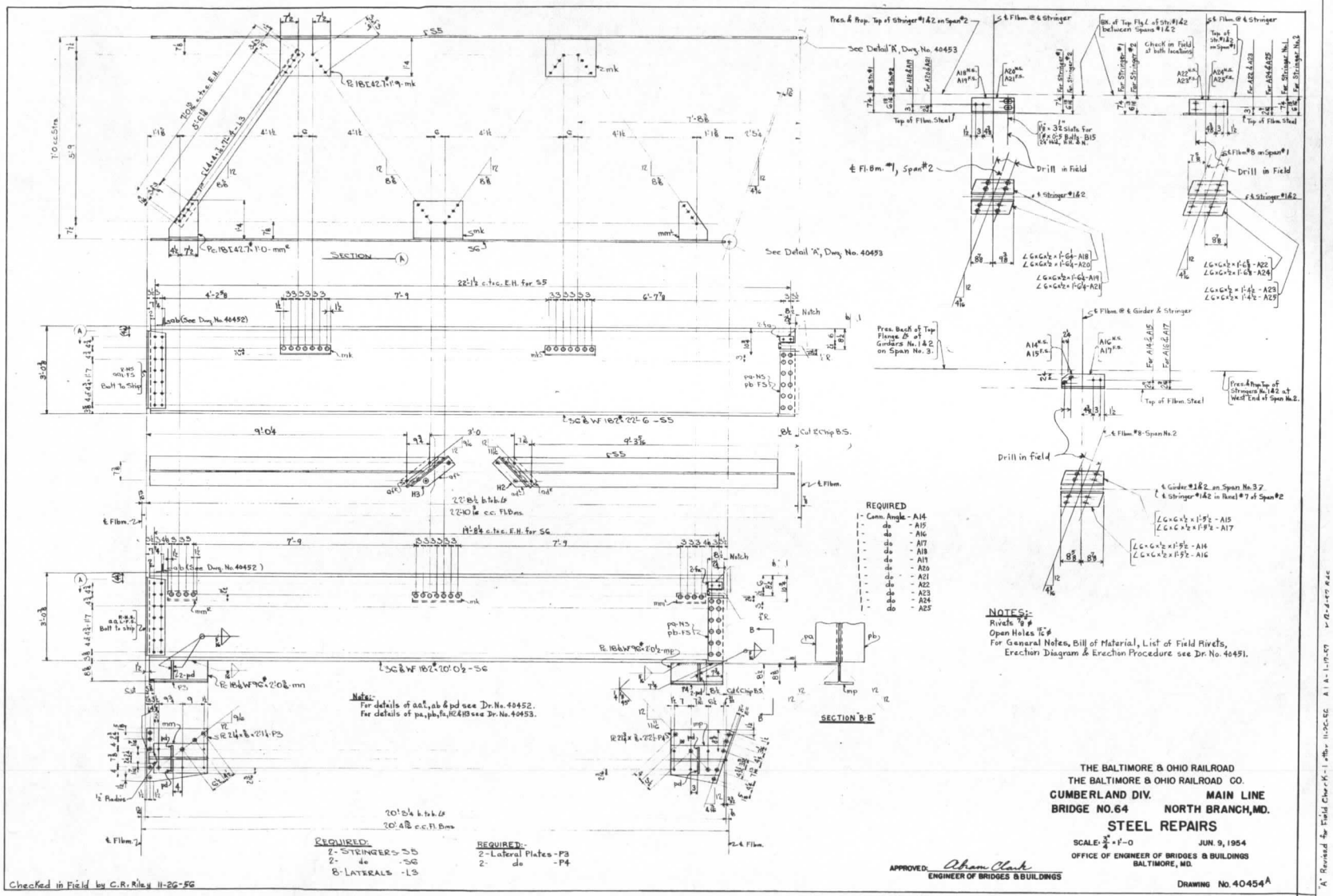

34423 BCRT 10 RD BD153186 A.I.A. V-12-4-57

4054

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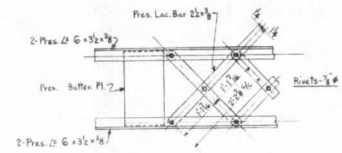
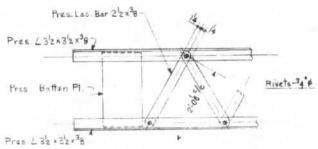
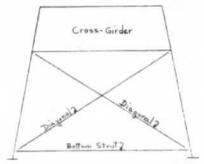


Sketch #1
(Bottom Truss Strut)

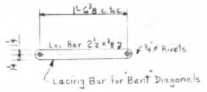
For Sketches #1 & 2:- Furnish from Field all dimensions & sizes of Lacing Bars for Bottom Truss Struts & Bottom Truss Laterals. Show arrangement of lacing bars on struts & laterals giving size & thickness of all material to which they connect, and show whether or not lacing bars connect to batten plates. Give size of connecting rivets for all lacing bars. Will the information as shown and as supplied from field, fit all conditions at all locations for all the bottom truss struts & laterals?



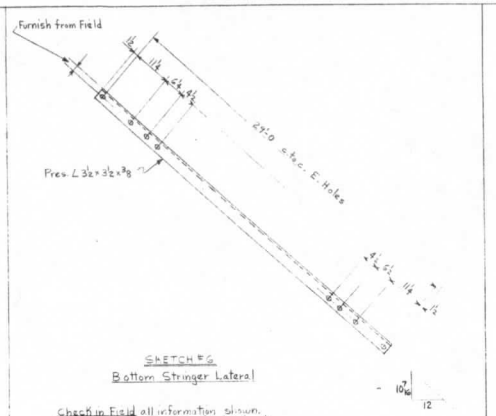
Sketch #2
(Bottom Truss Laterals)



Sketch #3
(Bent Between Spans No. 3 & 4)



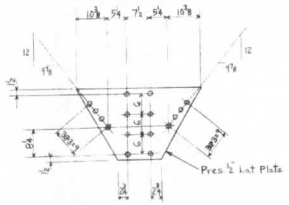
Furnish from Field:- Total number of lacing bars in both diagonals & in the bottom strut. Give sketch of Lacing Bars for both diagonals & bottom Strut, giving all dimensions & size of material. Show arrangement of lacing bars on diagonals & strut giving size & thickness of all material to which they connect, and show whether or not lacing bars connect to batten plates. Give size of all connecting rivets for Lacing Bars.



SKETCH #6
Bottom Stringer Lateral

Check in Field all information shown. Furnish completed sketch of lateral angle showing all rivet holes, dimensions, location & thickness of pres. connecting material, and whether or not it is a one piece or two piece lateral angle.

NOTE A:-
Furnish from Field the distance back of top floorbeam flg. ls to back of top flange ls of Stringers #1 and 2 at Flbm. #8 on Span No. 1 and at Floorbeams #1 & 8 on Span No. 2.

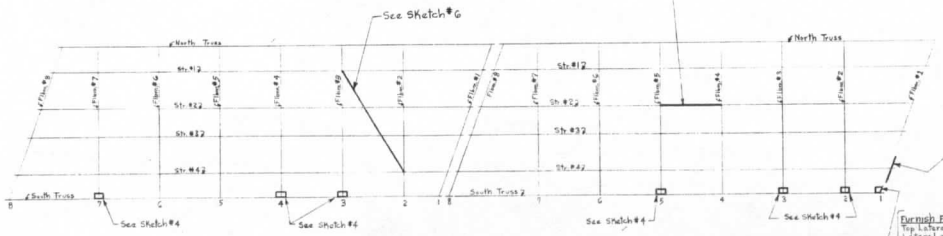


Sketch #4

Top Lateral Plate of Bottom Truss Lateral at Panel Points 2, 3 & 5 on South Truss of Span #1 and at Panel Points 3, 4 & 7 on South Truss of Span #2.

Furnish from Field:- Check of all details as shown. Will the details as shown fit all locations? Show arrangement, size & thickness of all pres. material to which the lateral plates are connected at all locations.

Inspector's Report requests new WF Stringer. According to our Dr. No. 36089A - Steel Repairs dated June 28, 1946 a new 36"WF#7 Stringer was furnished at that time. Was this stringer ever placed, and, if not, is the material at the bridge site?



SPAN NO. 2
D.T. Half-Thru Truss Span-165'-0 c. to c. End Pins

SPAN NO. 1
D.T. Half-Thru Truss Span - 165'-0 c. to c. End Pins

LOCATION PLAN

To repair defective top flange L of Flbm. #1 above Str. #4, furnish from field a complete sketch of both legs of the top flange ls between Stringer #3 and the South Truss. This Sketch & the information furnished should be similar to Sketch #5 on Sheet #2 and the information requested for the intermediate Flbms. Show all dimensions; rivet spacings; rivet gages; location, arrangement & size of all material to which the top flange ls connects the bent plate on the knee-brace; and the location & thickness of cover plates.

Furnish From Field:- Sketch of Top Lateral Plate of Bottom Truss Lateral giving all dimensions & thickness. Show arrangement, size & thickness of all pres. material to which the lateral plate is connected.

NOTE:-
For Sketch #5 (Floorbeams) see Sheet #2.

CUMBERLAND DIV. MAIN LINE
BRIDGE No. 64 NORTH BRANCH, MD.

SKETCHES FOR FIELD MEASUREMENTS

Scale:- ¼"=1'-0

APRIL 27, 1954 Sheet No. 1

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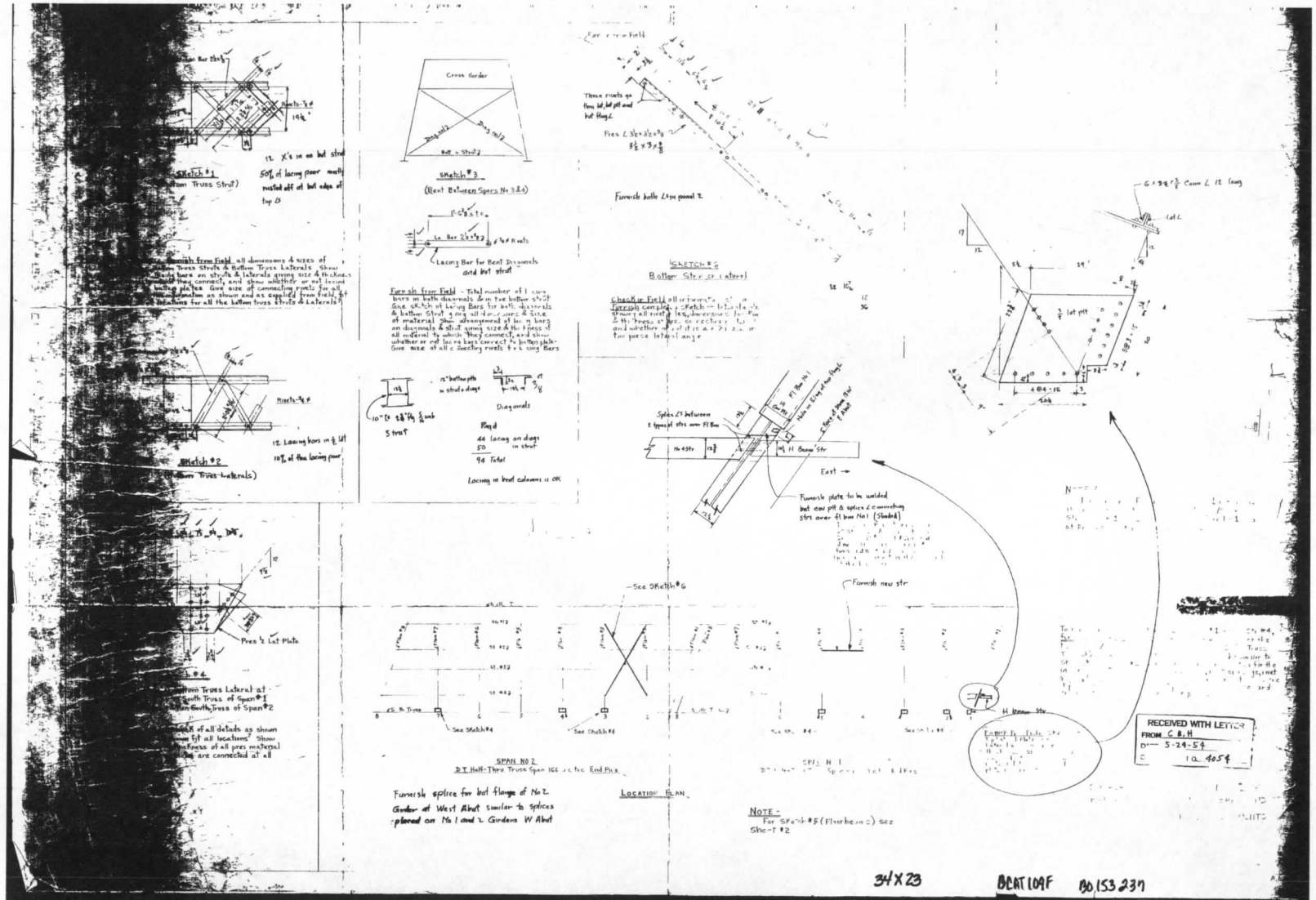

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LIST OF FIELD RIVETS
ERECTOR'S LIST

No	Dia	Head	Grip	Lgth	Location
817	7/8	Butt	1	2 3/8	P20,P21,P22,P24,P27,P28 Girder (G4)
642			1 3/8	3 1/8	P22 & P25 to Girder Flg (E Gir)
102			1 3/8	3 3/8	P26 to Girder Flange
98			1 3/8	3 1/8	P20,P21,P23,P24,P27,P28 Girder No Lat Pls
62			1 3/8	3 3/8	P22 & P25 to Pres Lat Pls
18			2 1/8	4	P26 to Pres Lat Pls
14			1 3/8	3 3/8	P20,P21,P24,P27,P28,P31 " Tie L's & L
40			2 1/8	4	P22 & P25 to Pres Lat & Lat Vert L
20			1 3/8	3 1/2	A31 & A32 to Girder Web
12			2 3/8	4 1/2	A30 to Girder Web
24			1 5/8	3 3/8	P30 to Girder Flg
6			1 4	3	P31 to Pres Tie Plate
3			1 1/16	2 1/8	P31 to Pres X Girder Flg L
3			1 1/16	3 1/2	P31 to Pres Reinforcing L
7			1 1/16	3	P32 " Pres Reinforcing L
19			1 1/16	2 1/2	P32 to Pres X-Girder Flg &
18			1 1/16	2 1/8	Splice Pl on P32 to X Girder Flg
2			7/8	2 1/2	Bearing Pl to P32 to X Girder Flg
6			1 1/16	3 1/2	Bearing Pl on P32 to X Girder Flg
4			3 1/16	5 1/16	P32 to Flg & of Girder No 3
8			2 1/8	4 1/4	P32 to Flg & of Girder No 3
2	"	"	1 3/8	3 1/8	P32 to Sole Pls of Track Girders
2	"	"	2 1/16	4 1/2	P32 to Sole Pls of Track Girders
34			1/2	3/4	A34 & G Gir Web
12	"	"	1 3/8	4 1/4	P39 to " "
4	"	"	2	3 3/8	P36 to Gir
16	"	"	2	3 1/8	do
2	"	"	1/2	3	P38 to Pres Pl
2	"	"	1/2	3 1/8	P38 to Pres L
6	"	"	1/2	3 1/8	P38 to Gir & L

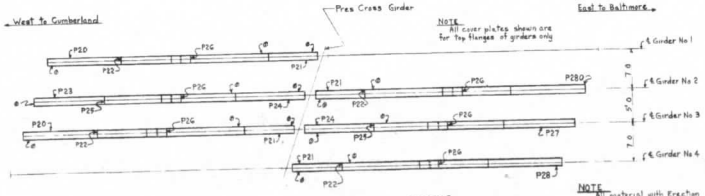
BILL OF MATERIAL
SHOP BILL

No	Description	Pt	Ins	Mark	Remarks
Drawing No 41473					
2	Cov Pls 14x3/8	24	1/2	P20	
4	C-Pls 14x3/8	24	G	P21	
4	C-Pls 14x3/8	26	4 1/2	P22	
1	C-Pl 14x3/8	24	6 1/4	P23	
2	Cov Pls 14x3/8	24	1/2	P24	
2	Cov Pls 14x3/8	23	G	P25	
G	Spl Pls 14x3/8	3	G	P26	
1	Cov Pl 14x3/8	24	7	P27	
1	C-Pl 14x3/8	24	1/4	P28	
1	Cov Pl 14x3/8	26	1	P29	
2	L 6x6x3/8	2	13	A36	
2	Pls 6-1/2	2	10 1/2	P35	
1	Pl 14x1/2	2	10 1/2	P37	
1	Pl 18x3/8	2	0	P38	
2	Pls 5x3/8	3	1	P39	G I.E.
2	Ø 5 3/8 x 5 3/8 x 1/2	3	G	A30	C.E. (Ø 5 x 5 1/2 x 1/2 Hole)
1	L 6x6x3/8	G	0 3/8	A31	
Drawing No 41474					
1	L 6x6x3/8	G	0 3/8	A32	
1	Sole Pl 18x1	1	8 1/2	pg 4	
1	Spl Pl 14x1/2	3	0	P30	
1	Cov Pl 22x3/8	1	7 1/2	P31	
1	Cov Pl 22x3/8	G	2	P32	
1	Spl Pl 28x3/8	5	2 3/4	pM	
1	Brg Pl 28x1/2	2	2	pm	
1	L 6x4x3/4	5	4 3/4	A33	Grind 2 Ends
1	L 6x4x3/4	5	4 3/4	A34	do
28	Pls 3x3/8	0	5	P33	Bevel 1 Edge

SHIPPING BILL

No	Description	Mark
2	Cover Plates	P20
4	do	P21
4	do	P22
1	do	P23
2	do	P24
2	do	P25
G	Splice Plates	P26
1	Cover Plate	P27
1	Cover Plate	P28
1	do	P29
2	Angles	A36
2	Plates	P35
1	do	P37
1	do	P38
2	do	P39
2	Splice Angles	A30
1	Flange Angle	A31
1	Flange Angle	A32
1	Splice Plate	P30
1	Cover Plate	P31
1	Cover Plate	P32
1	Stiffener Angle	A33
1	do	A34
28	Plates	P33

NOTE
For Shipping List of Field Rivets see Drawing No 40451



NOTE
All cover plates shown are for top flanges of girders only

SPAN No 4
D T Deck Plate Girder Span 48 8 o to o

SPAN No 3
D T Deck Plate Girder Span 48 8 o to o

NOTE
All material with Erection Mark 8 is to be placed on bridge, with Erection Mark 8 in position as shown

ERECTION DIAGRAM

Checked in field by J A Caywood 10 13 58

ERECTION PROCEDURE
(For Additional Erection Diagram and Additional Erection Procedure see Drawing No 40451)

D To Place New Bottom Flange Angles A31 & A32 on West End of Girder No 1 on Span No 4
1 Knock out rivets to be removed, replacing each as cut out with a bolt or drift pin using 75% of each
2 Using Splice Angles - A30 as a templet, drill holes as necessary in that part of present bottom flange angles to remain in bridge
3 Cut present intermediate stiffener angles as shown and remove cut off portions
4 BETWEEN TRAINS cut pres bottom flange angles as shown Remove present end stiffener angles, cut-off portion of present bottom flange angles and present masonry plate Place new bottom flange angles A31 & A32, End Stiffener Angles A7 & A8, Splice Material - A30 & P30, and Masonry Plate - MP1 Bolt up completely Place Anchor Bolts - A81
5 Replace bolts & drift pins one at a time with driven rivets
NOTE To Place New Butt Plg ¢ of W.E. of ⊕ Gr No 2, Span No 4 & ¢ of N.E. of ⊕ Gr No 4 Span N 3 use Steps similar to N 4 & D5

E To Place New Top Cover Plates on Girders of Spans No 3 and 4
Note - Work on one girder at a time completing all work on that girder before proceeding to another girder
1 Repeat Step D 1
2 BETWEEN TRAINS remove present 2nd Cover Plate and cut present 1st Cover Plate as shown Place new 2nd Cover Plate P22 or P25 and Splice Plate - P26 Bolt up completely
3 BETWEEN TRAINS remove present 1st Cover Plate from one end of girder and place new 1st Cover Plate. Bolt up completely
4 Repeat Step 3 for other end of girder
5 Repeat Step 2-5

F To Place New Top Cover Plate P32 on Cross-Girder Between Spans No 3 & 4
1 Repeat Step D 1
2 BETWEEN TRAINS cut present top cover plate as shown Remove cut off portion of present top cover plate and present bearing plate under Girder No 3 Place new Top Cover Plates P32 & P31 and bolt up completely Place weld metal as shown
3 Repeat Step D 5

NOTE - NO TRAFFIC is to be allowed on bridge unless all material, either old or new, is in place and a bolt, drift pin or driven rivet is in every hole and completed welds have cooled sufficiently for weld and base material to have developed full strength

APPROVED Adam Clark
ENGINEER OF BRIDGES & BUILDINGS

NOTES
Rivets 7/8 ø
Open Holes 15/16 ø

For General Notes, Additional Bill of Material, List of Drawings, Additional List of Field Rivets, Additional Erection Diagram and Additional Erection Procedure see Drawing No 40451

THE BALTIMORE & OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO
CUMBERLAND DIV — MAIN LINE
BRIDGE NO 64 — NORTH BRANCH, MD

STEEL REPAIRS

SCALE 3/4" = 1'-0 — JAN 20, 1957
OFFICE OF ENGINEER OF BRIDGES & BUILDINGS
BALTIMORE, MD

DRAWING No 41472A

A1A

A Rev for field - 4 8 10 15 58 RAC 4 18 58 - JWT

W Z

4054

BOATLOAD 34623 — 00153200

B0153147.cit

FURNISH FROM FIELD ALL RIVET SPACINGS SHOWN IN RED

West To Cumberland

East To Baltimore

℄ Floorbeam

℄ North Truss

℄ Pilaster

End ℄ Pilaster

℄ Stringer No. 1

Pres. L 5½×3½×⅜

Pres. L 5½×3½×⅜

REQUIRED for Panel #3

Check for each panel if this is a two piece lateral angle.

Check for each panel if the vertical leg of the angle is shown in its proper location.

Pres. L 5½×3½×⅜

Pres. L 5½×3½×⅜

Pres. L 5½×3½×⅜

Is this a one piece lateral angle continuous across the panel?

Check if the vertical leg of angle is shown in its proper location.

℄ Stringer No. 2

Pres. ⅜" Connection Plate (Check in Field at Panels No. 2,3 & 6)

REQUIRED for Panel #3

Furnish from Field complete sketch of this connection Plate showing all dimensions and rivet spacings.

Pres. ⅜" Connection Plate Check in Field

REQUIRED for Panel #1

Furnish from Field complete sketch of this connection Plate showing all dimensions & rivet spacings.

℄ Stringer #3

Pres. L 5½×3½×⅜

REQUIRED for Panels No. 2,3 & 6

Pres. L 5½×3½×⅜

REQUIRED for Panel #1

Is this a two piece lateral angle?

Check if the vertical leg of angle is shown in its proper location.

Is this a one piece lateral angle continuous across the panel?

Check for each panel if the vertical leg of angle is shown in its proper location.

℄ Stringer No. 4

237'-7 c/to c. Pilaster.

Panels No. 2,3 & 6 - Span No. 1

19'-8⅝

Panel No. 1 - Span No. 1

℄ South Truss

West To Cumberland

Truss Bottom lateral angle. Top Connection Plate. Furnish from Field complete sketch of this plate showing all dimensions, location and dimensions of all rivet holes, and thickness. Show arrangement, size & thickness of all gusset material to which this plate is connected.

Stringer bottom lateral angle Connection Plate. Furnish from Field complete sketch of each plate showing all dimensions, location of all rivet holes and thickness.

East To Baltimore

Panel #6

Panel #5

Panel #2

Panel #1

Truss bottom lateral angle

SPAN NO. 2

D.T. Half-Thru Truss Span: 166'-0" c. to c. End Pins

Truss Bottom Lateral System only is shown.

LOCATION PLAN

SPAN NO. 1

D.T. Half-Thru Truss Span: 166'-0" c. to c. End Pins

Stringer Bottom Lateral System only is shown.

CUMBERLAND DIV. MAIN LINE

BRIDGE NO. 64 NORTH BRANCH, MD.

SKETCH FOR FIELD MEASUREMENTS

Scale: ¼" = 1'-0"

JANUARY 30, 1997

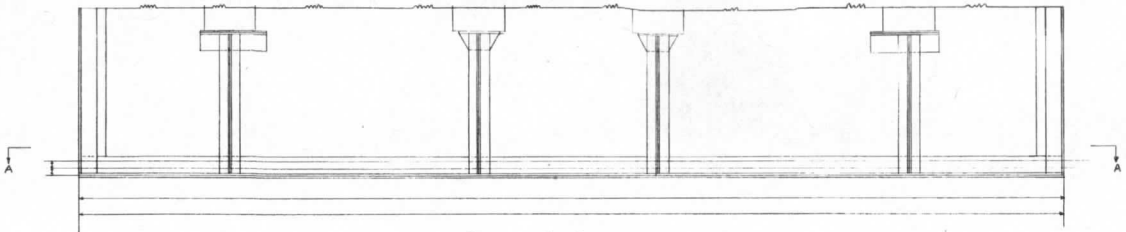
A.L.A.

BERT 1048 B0153147

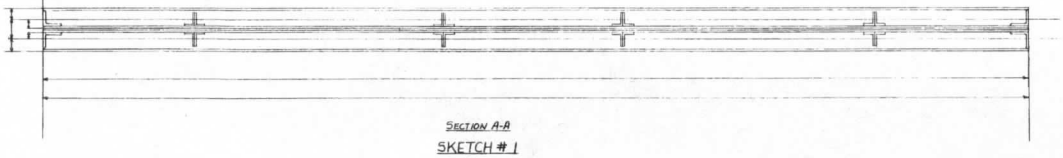
34X23½

4054

B0153194.CIT

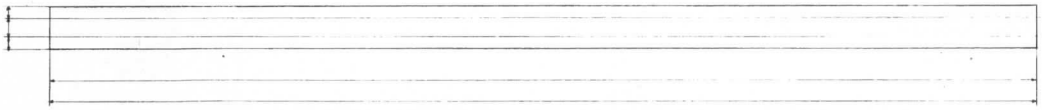


ELEVATION OF FLOOR BEAMS



SECTION A-A

SKETCH # 1



SKETCH #2 FOR BOTTOM COV. & ON GIRDERS

NOTES FOR FIELD MEASUREMENTS

NOTE 'A': Need size and all rivet spacings for bottom cover plates on these Girders. (See Sketch #2)

NOTE 'B': Required sizes of top lateral plates as shown, size of top lateral angles and sizes of top cross frame angles as shown. Also give sizes of any other top plate or angle which are bad. These members to be shipped blank and to be fabricated in field.

NOTE 'C': Required, sizes and complete detail of the bottom flange angles and bottom cover plates on these floor beams. Show how much of it has gone bad. Specify in percentage the section loss on various places. All rivet spacing is needed. Please check to see if the spacings will add up to end hole to end hole distance see sketch 1 for diagram. Please show all spacings.

NOTE 'D': Need more information about reinforcing plates for web. Please show the sizes req'd and % section loss of web.

NOTE 'E': Details for these stringers are available. Check to see if these are the only bad stringers. Top flange angles need replacement as shown from information available.

NOTE 'F': Please mark on drawing any other pieces that are bad and need replacement. Show the size of the piece if it is lateral plate or angle or cross frame. Show complete detail if the piece is flange angles or cover plate or any other piece.

NOTE 'G': Required the sizes of different pieces to make up this bracing including angles and laces. To be shipped blank and to be fabricated in field.

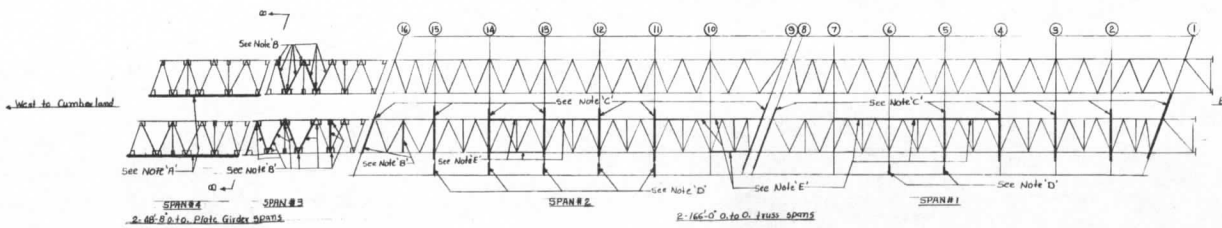
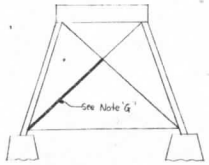


DIAGRAM FOR FIELD MEASUREMENTS



SECTION B-B

Recommended For Approval: _____ Engineer of Bridges

Approved: _____ Chief Engineer

REVISIONS	THE BALTIMORE AND OHIO RAILROAD COMPANY ENGINEERING DEPARTMENT		
	BRIDGE # 64		
	FIELD MEASUREMENTS REQ'D		
	NORTH BRANCH		MD.
	CUMBERLAND DIV.		MAIN LINE
CORR. FILE NO. H 9709	SCALE: NONE DATE: 5-6-74 DESIGN: DRAWN: C.R.S. CHECKED:	VAL. SEC. V 40-1	DRAWING NO. 49951

34x23 OCAT 10AD B0153194 BRIDGE FILE NO. 6056

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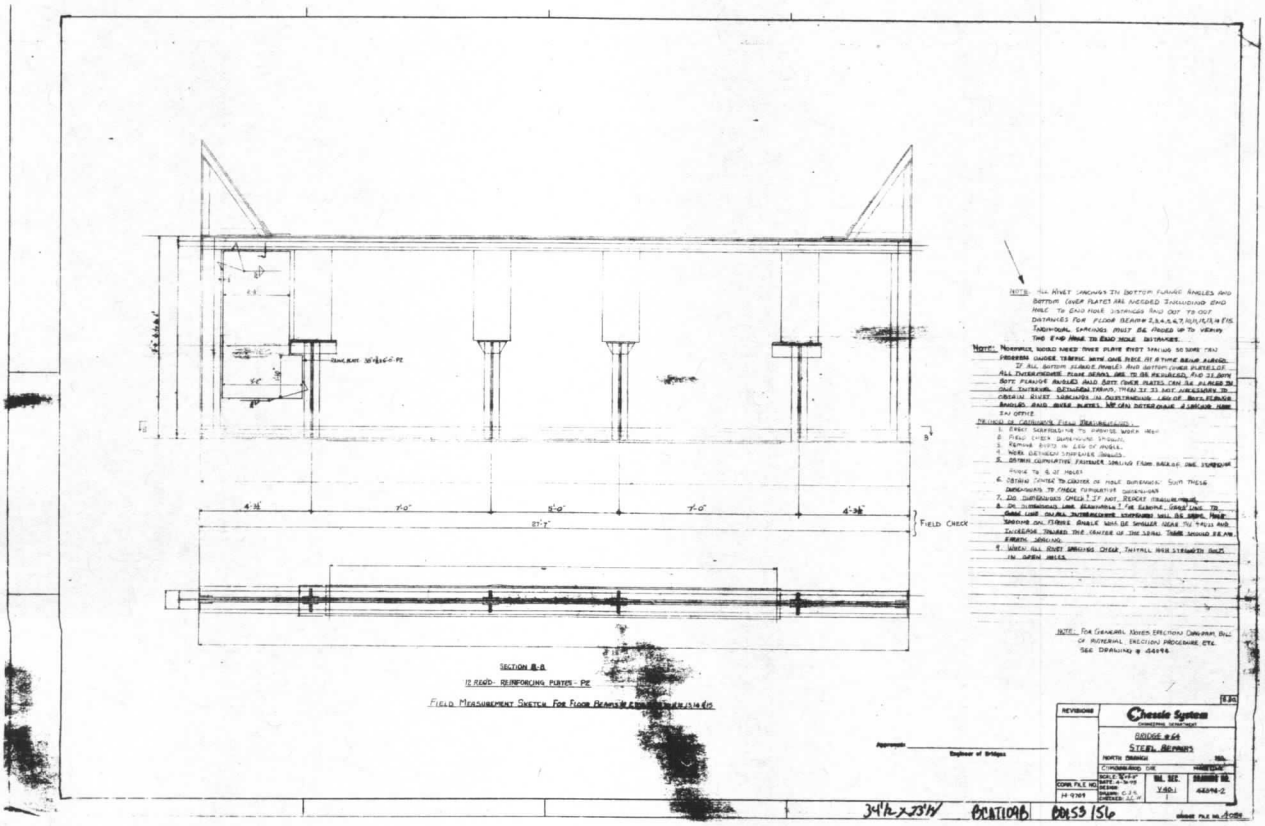


LIST OF HIGH STRENGTH FIELD BOLTS

Erector's List: No.	Size	Grip	Length	Location	Shipping List: No.	Size	Length
518	7/8φ	1 3/8	3 1/4	Bot. Rt. [illegible] to web			
29	"	2 5/8	4	" " " [illegible]	1,440	7/8φ	2 1/2"
14		3 3/8	4 1/2	" " " [illegible]	1,145	"	3"
68		1 3/8	3 1/4	[illegible] to [illegible]	805		3 1/4
33		2 5/8	3 3/4	" " " [illegible]			
412		1 3/8	3 1/4	[illegible] to web	155		3 3/4
12		2 5/8	4	" " " [illegible]	70		4"
2		3 3/8	4 1/2	" " " [illegible]	60	"	4 1/2"
4		3 3/8	4 1/2	" " "	25	7/8φ	4 1/2"
18		1 3/8	3 1/4	[illegible]			
10		2 1/4	3 3/4	" " " [illegible]			
				FOR FLOOR BEAMS # 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14 & 15 (Supplementary F.B.)			
1,046		1 3/8	3	Bot. [illegible] to web			
56		2 1/2	3 3/4	" " " [illegible]			
48	"	2 3/4	4 1/4	" " " [illegible]			
184	3/4φ	1 1/2	2 1/2	Bot. [illegible] to Cover Plate			
	NOTE:			H.S.S. BOLTS FOR F.B.# 1, 8, 9 & 16 ARE NOT INCLUDED DUE TO LACK OF INFORMATION			

- Hardened Steel Washers for 7/8" φ Bolts.
- Hex. Nuts, 7/8" φ tap.

LIST OF FIELD RIVETS REQ'D

Erectors List: No.	Size	Grip	Length	Location	Shipping List: No.	Size	Length
				FOR REPLACEMENT OF RIVETS IN TOP OF FLGS. OF FLOOR BEAMS # 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14 & 15			
480	7/8φ	1 1/2		Top [illegible] to [illegible]			
205	7/8φ	1 1/2		" " " [illegible]			
24	7/8φ	1 5/8		" " " [illegible]			

BILL OF MATERIAL

Dwg. No.	Shop Bill: No.	Description	Ft.	In.	Mk.	Remarks	Shipping Bill: No.	Description	Mk.
44094-1	6	L 6x6x 5/8	23	[illegible]	A1		6	Top flange L's	A1
	6	-do-	23	[illegible]	A2		5	-do-	A2
	1	-do-	23	[illegible]	A3		1	-do-	A3
	1	-do-	23	[illegible]	A4		1	-do-	A4
	1	-do-	22	[illegible]	A5		1	-do-	A5
	1	-do-	22	[illegible]	A6		1	-do-	A6
	1	-do-	20	[illegible]	A7		1	-do-	A7
	1	-do-	28	1 1/2	A8		1	-do-	A8
44094-2	4	PL 39x 5/8	6	0	P1		4	Rebel. Plates	P1
44094-3	12	PL 38x 5/8	6	0	P2		12	-do-	P2

High Strength Steel Bolts with Nuts and Washers as listed.

EXECUTION PROCEDURE: To place new material work at one place at a time.
1. Remove exist. rivets as necessary to place new material replacing each as removed with a bolt or drift pin using [illegible] of each.
2. Between trains and without interference to traffic, remove exist. material to be replaced, place new material and replace bolts and drift pins.
3. Remove bolts and drill pins one at a time replacing each as removed with a H.S.S. Bolt.

GENERAL NOTES:

Workmanship: A.R.E.A. Specifications for Steel Railway Bridges dated 1973 except holes may be punched full size.

Material: Structural Steel, A.S.T.M. A36, High Strength Steel Bolts, A.S.T.M. A 325, Type 3.

High Strength Steel Bolts: 7/8" φ

Open Holes: 15/16" φ, unless noted. All holes to be free of burrs.

Shop Paint: One coat of red lead meeting Federal Specifications TT-P-86a, Type I, dated 3-31-67. Field contact surfaces shall be painted. Surfaces within 2" inches of any field weld location shall be free of paint. Parts denoted by N.P. (No Paint) shall not be painted.

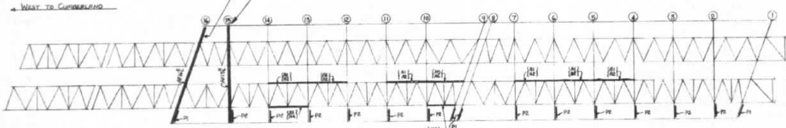
Field Paint: Parts of present material in contact with new material shall be thoroughly cleaned of all rust, dirt, grease, and loose paint and shall be given one coat of red lead before placing new material. Surfaces of new material inaccessible after erection shall be given two coats of paint prior to erection. All other new material shall be given two coats of paint after erection; first coat to be red lead and second coat to be black bridge paint.

[SEE DWG # 44094-5 FOR DETAILS OF AF15 & P1]

SEE DWG # 44094-4 FOR DETAILS OF AF15 & P2

← WEST TO CUMBERLAND

EAST TO BALTIMORE →



SPAN # 4 — 48'-8" O. to O. D.P.G. SPAN

SPAN # 3 — 48'-8" O. to O. D.P.G. SPAN

SPAN # 2 — 166'-0" O. to O. Truss Span

SPAN # 1 — 166'-0" O. to O. Truss Spans

ERECTION DIAGRAM

LIST OF DRAWINGS

44094 - ERECTION DIA. & GENERAL NOTES
44094-1 - STEEL REPAIRS
44094-2 - STEEL REPAIRS
44094-3 - STEEL REPAIRS
44094-4 - STEEL REPAIRS
44094-5 - -do-

NOTE TO ERECTOR:

NO TRAFFIC to be allowed on bridge unless all material, either old or new is in place and a bolt, drift pin, driven rivet or high strength bolt is in every hole and all welds have had sufficient time to cool.

Approved: ____________________
Engineer of Bridges

REVISIONS	Chessie System — Engineering Department		
	BRIDGE # 64		
	ERECTION DIAGRAM & GENERAL NOTES		
	NORTH BRANCH		MD.
	CUMBERLAND DIV.		MAIN LINE
CORR. FILE NO. H-9909	SCALE: NONE; DATE: 4-30-75; DESIGN:; DRAWN: C.T.S.; CHECKED: J.C.W.	VAL. SEC. V40-1	DRAWING NO. 44094

B64

59 3/6 8.23 1/8   BCAT 109B   BD 153161

BRIDGE FILE NO. 4054

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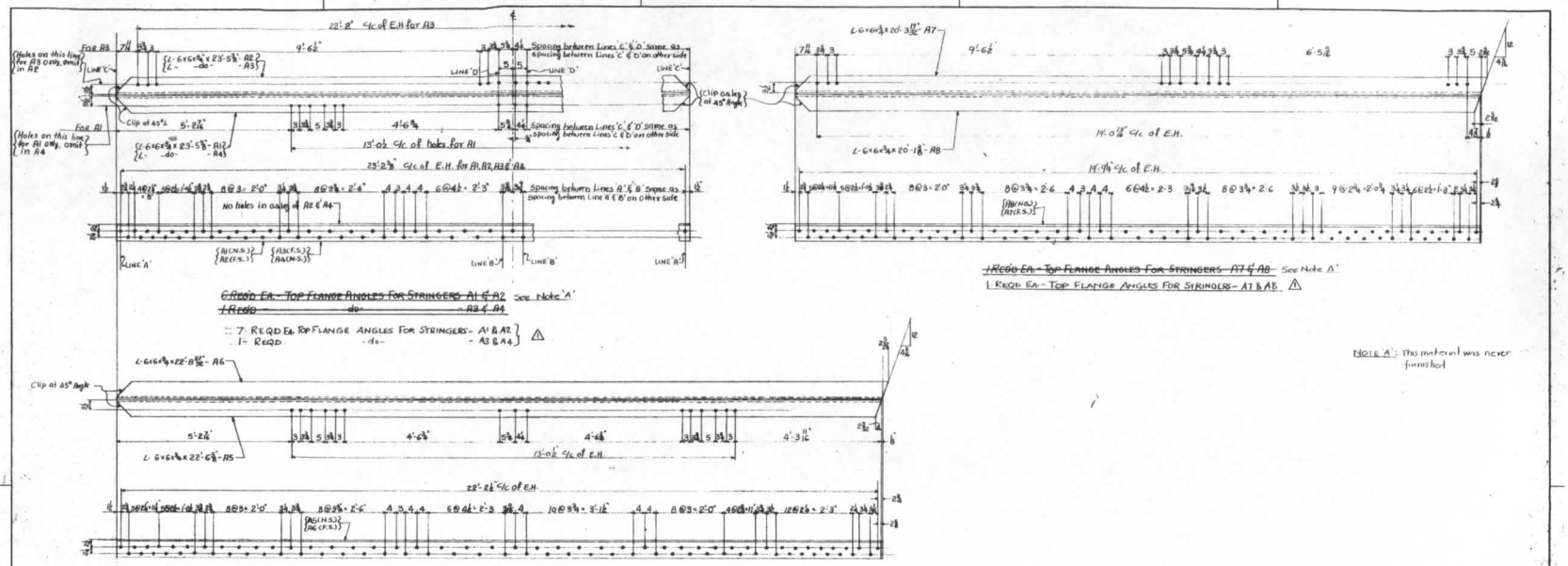

NOTE 'A': This material was never furnished

OK CWH

NOTE: FOR GENERAL NOTES, ERECTION DIAGRAM, ERECTION PROCEDURE, BILL OF MATERIAL ETC SEE DRAWING # 44094-6 (As of 4-30-75)

Recommended For Approval: _____ Engineer of Bridges

Approved: _____ Chief Engineer

REVISIONS	THE BALTIMORE AND OHIO RAILROAD COMPANY ENGINEERING DEPARTMENT
△ 5-4-80	BRIDGE #64 STEEL REPAIRS
	NORTH BRANCH MD.
	CUMBERLAND DIV. MAIN LINE
CORR. FILE NO. H-9709	SCALE: ¼"=1'-0" DATE: 4-30-75 DESIGN: DRAWN: C.S.S. CHECKED: J.C.W. VAL. SEC. V461 1 DRAWING NO. 44094-1

Checked in field by: C.W. Henry 5-23-80

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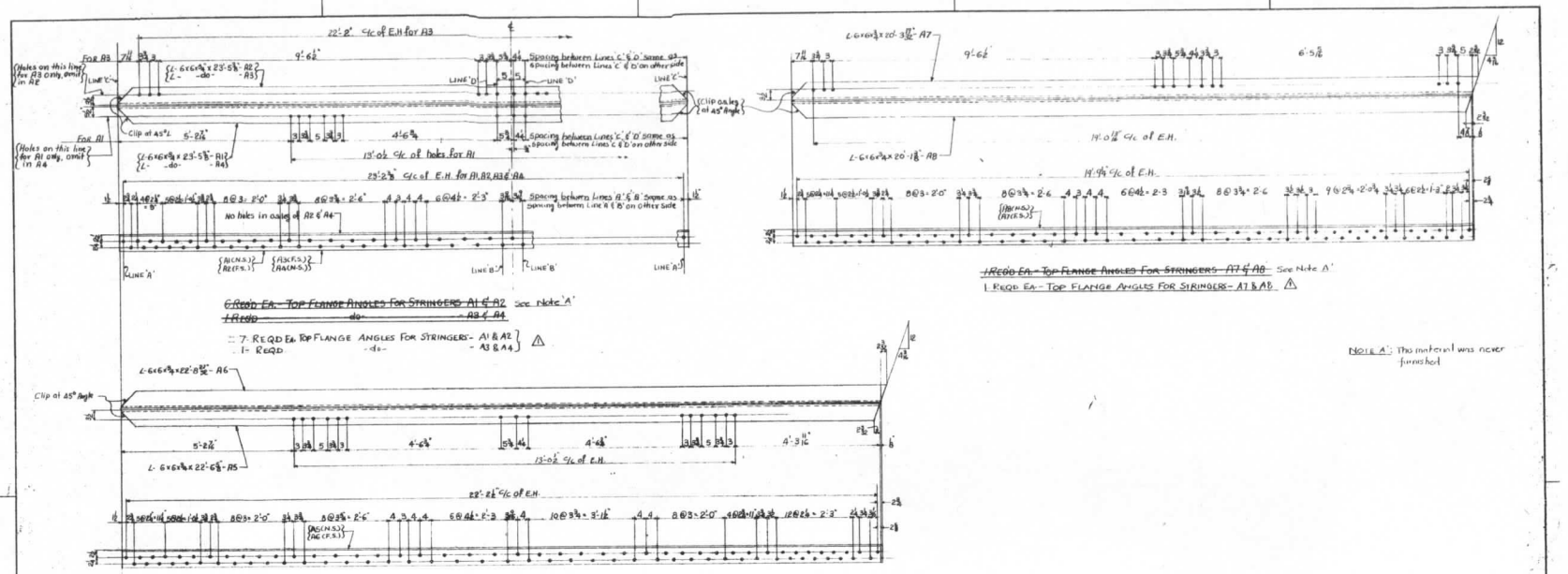

Note 'A': This material was never furnished

OK CWH

Note: For General Notes, Erection Diagram, Erection Procedure, Bill of Material etc. see Drawing # 44094-6 (As of 4-30-75)

Recommended For Approval: _____ Engineer of Bridges

Approved: _____ Chief Engineer

Checked in field by: C.W. Henry 5-23-80

REVISIONS	THE BALTIMORE AND OHIO RAILROAD COMPANY ENGINEERING DEPARTMENT	
3 4-80	BRIDGE #64 STEEL REPAIRS	
	NORTH BRANCH MD.	
	CUMBERLAND DIV.	MAIN LINE
CORR. FILE NO. H-9709	SCALE ¼"=1'-0" DATE: 4-30-75 DESIGN: DRAWN: C.J.S. CHECKED: J.C.W.	VAL. SEC. V461 1 / DRAWING NO. 44094-1

BCAT 109 B

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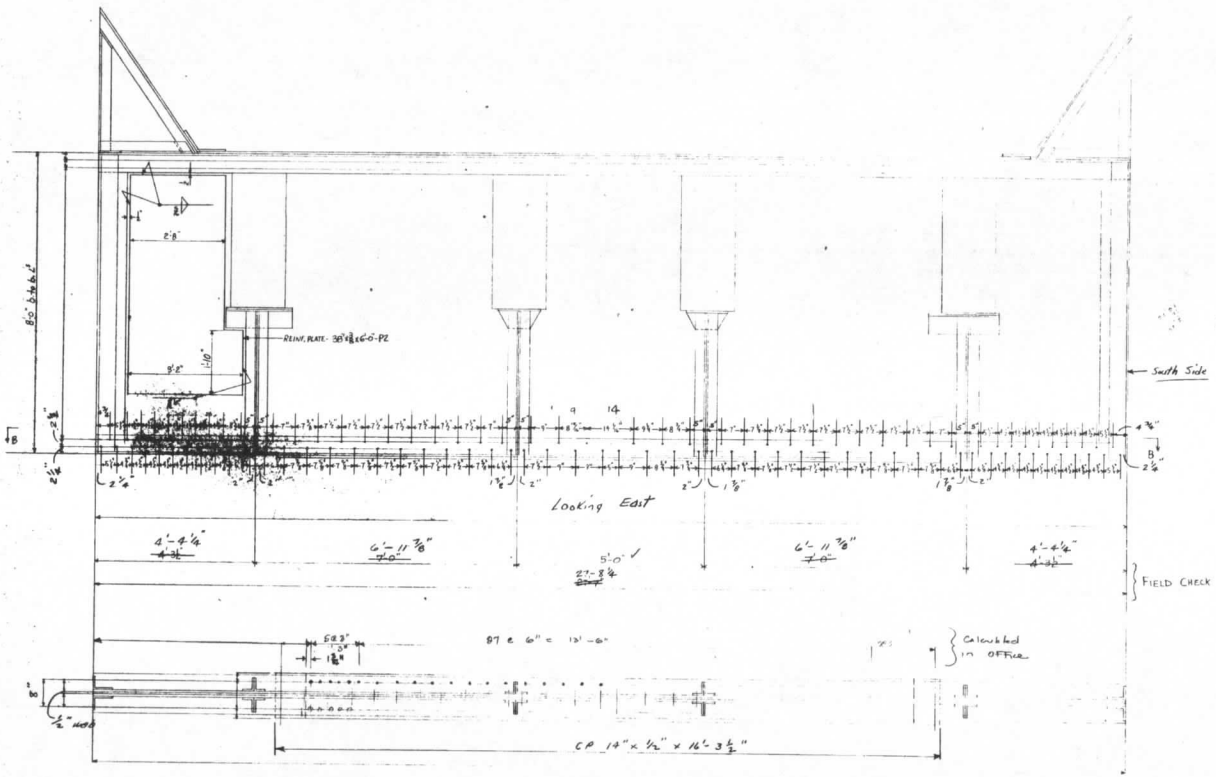

SECTION B-B

12 REQ'D - REINFORCING PLATES - P2

These dimensions for

FIELD MEASUREMENT SKETCH FOR FLOOR BEAMS # 2,3,4,5,6,7,10,11,12,13,14 & 15

NOTE: ALL RIVET SPACINGS IN BOTTOM FLANGE ANGLES AND BOTTOM COVER PLATES ARE NEEDED INCLUDING END HOLE TO END HOLE DISTANCES AND OUT TO OUT DISTANCES FOR FLOOR BEAMS # 2,3,4,5,6,7,10,11,12,13,14 & 15. INDIVIDUAL SPACINGS MUST BE ADDED UP TO VERIFY THE END HOLE TO END HOLE DISTANCES

NOTE: NORMALLY, 100% FIELD COVER PLATE RIVET SPACING SO WORK CAN PROGRESS DURING TRAFFIC WHEN ONE PIECE OF STEEL BEING PLACED. IF ALL BOTTOM FLANGE ANGLES & BOTTOM COVER PLATES OF ALL DIMENSIONS FOR A BEAM ARE CORRECTED, AND IF BOTH BOTTOM FLANGE ANGLES AND BOTTOM COVER PLATES CAN BE PLACED IN ONE INTERVAL DURING TRAFFIC THEN IT IS NOT NECESSARY TO OBTAIN RIVET SPACINGS IN DIMENSIONS LEG OF BOTT. FLANGE ANGLES AND COVER PLATES AS THIS DETERMINES A SPACING HERE IN OFFICE.

METHOD OF OBTAINING FIELD MEASUREMENTS:

1. ERECT SCAFFOLDING TO REACH WORK AREA
2. FIELD CHECK DIMENSIONS
3. REMOVE RIVETS IN LEG OF ANGLE
4. WORK DETAILS TO REMOVE RIVETS
5. OBTAIN CONSISTENT DISTANCE OF RIVET FROM BACK OF ONE STIFFENER ANGLE TO 4 OF RIVET
6. OBTAIN CENTER TO CENTER OF HOLE DIMENSIONS. SUM THESE DIMENSIONS TO CHECK CONSISTENT DIMENSION
7. DO DIMENSIONS CHECK? IF NOT, REPEAT MEASUREMENTS
8. DO DIMENSIONS LOOK REASONABLE? FOR EXAMPLE, GAUGE LINE TO GAUGE LINE OF THE INTERMEDIATE STIFFENER WILL BE SAME HOLE SPACING OF FLOOR BEAMS. HOWEVER, MAY BE SLIGHTLY OVER THE TRUSS AND INCREASE TOWARD THE CENTER OF THE SPAN. THERE SHOULD BE NO CONSTANT CHANGE.
9. WHEN ALL RIVET SPACING CHECK, INSTALL HIGH STRENGTH BOLTS IN DRIFT PINS.
10. REPORT INFORMATION TO BRIDGE OFFICE

NOTE: FOR ENGINEERING NOTES, ERECTION DIAGRAM, BILL OF MATERIAL, ERECTION PROCEDURE ETC. SEE DRAWING # 44094

Any questions contact A.D. Keidel Balto Ext. 3803

Approved: _____
Engineer of Bridges

REVISIONS	Chessie System ENGINEERING DEPARTMENT		
	BRIDGE # 64 STEEL REPAIRS		
	NORTH BRANCH		MD.
	CUMBERLAND DIV.		MAIN LINE
CORR. FILE NO. H-9709	SCALE: 1/4"=1'-0" DATE: 4-3-75 DESIGN: DRAWN: C.J.S. CHECKED: J.C.W.	VAL. SEC. V40-1	DRAWING NO. 44094-2

B.&O.

34.375 x 23.125 BCAT1049D B0153197

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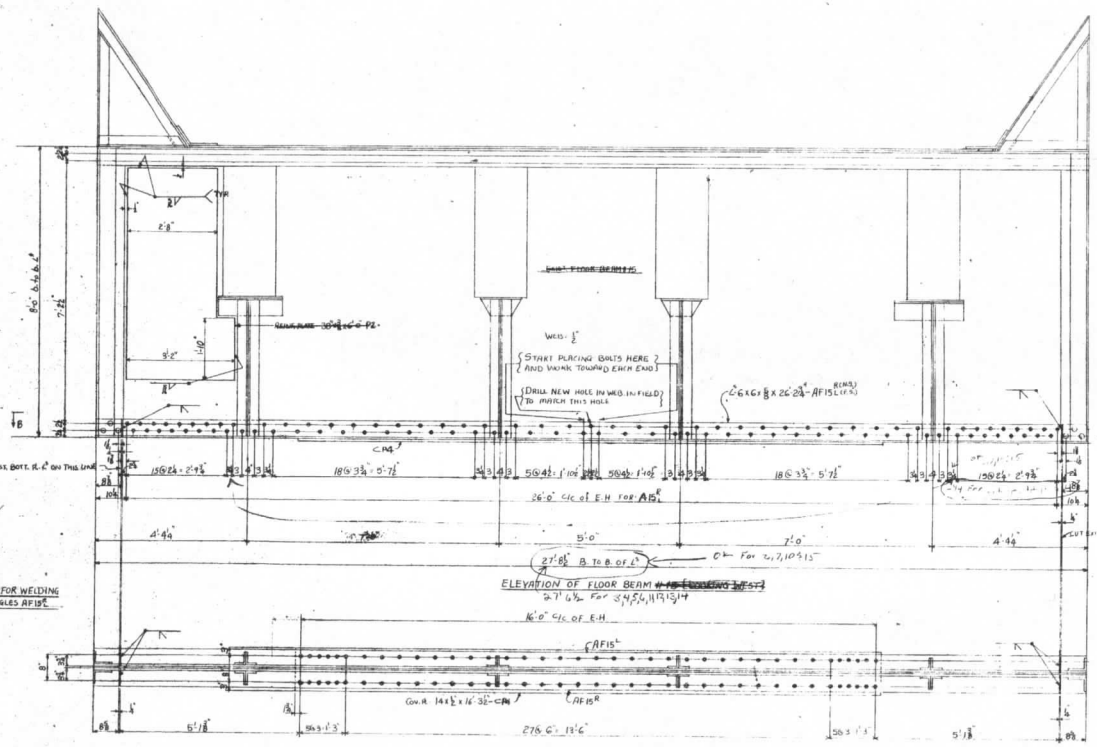

DETAIL OF BEVEL FOR WELDING EACH END OF ANGLES AF15

~~1 REQD. REINFORCING PLATE - P2~~

~~2 REQD. BOTTOM FLANGE ANGLES - AF15~~ R&R

20 REQ'D. BOTTOM FLANGE ANGLES - AF15 INL

NOTE: CP2 TO BE BOLTED TO AF15 IN SHOP USING ⅞ ϕ H.S. BOLTS - TORQUE FOR PERMANENT CONNECTIONS WITH HEAD OF BOLT AGAINST FLANGE ANGLE

10 REQD COVER PLATES - CP4

Checked in field by: C.W. Henry 5-23-80

NOTE: THE MATERIAL WAS FURNISHED & ERECTED IN 1975

BILL OF MATERIAL

DWG. NO.	SHOP BILL NO.	DESCRIPTION	FT.	IN.	MARK	REMARKS	SHIPPING BILL NO.	DESCRIPTION	MARK
44094-4	1	Reinf. Pl. - 38 x ⅜	6	0	P2		1	REINF. PLATE	P2
	2	∠ 6 x 6 x ⅝	26	2¾	AF15		2	BOTT. FLANGE ∠	AF15
	1	Gov. Pl. 14 x ½	16	3½	CP4				

LIST OF HIGH STRENGTH FIELD BOLTS

ERECTOR'S LIST NO.	SIZE	GRIP	REMARKS	LOCATION	SHIPPING LIST NO.	SIZE	REMARKS
87	⅞ ϕ	1⅞	3¾	AF15 to Web	45	⅞ ϕ	2¼
8	⅞ ϕ	2¼	4	" " & 2 BOTT. ∠	100	⅞ ϕ	3¾
38	⅞ ϕ	1⅞	2½	AF15 to rev. PL.	15	⅞ ϕ	4"

NOTE: REPORT TO BRIDGE OFFICE LOCATION OF HOLES THAT DO NOT MATCH EXISTING HOLES.

TRAFFIC CAN BE PASSED PRIOR TO MAKING BUTT WELDS AT ENDS OF FLANGE ANGLES.

NOTE: FOR GENERAL NOTES, ERECTION DIAGRAM, ETC. OF MATERIAL SEE DWG. "44094-1" & "44094-2" (8-4-80)

Approved: _____ Engineer of Bridges

REVISIONS	Chessie System ENGINEERING DEPARTMENT
△ 5-4-80	BRIDGE # G4
	STEEL REPAIRS - FLOOR BEAM #15
	NORTH BRANCH — MD.
	CUMBERLAND DIV. — MAIN LINE
CORR. FILE NO. H-9704	SCALE: ¾"=1'-0" DATE: 8-21-75 DESIGN: DRAWN: C.J.S. CHECKED: R.H.K. — VAL. SEC. V 40-1 1 — DRAWING NO. 44094-4

B-80

B0153166 BR. FILE # 4054

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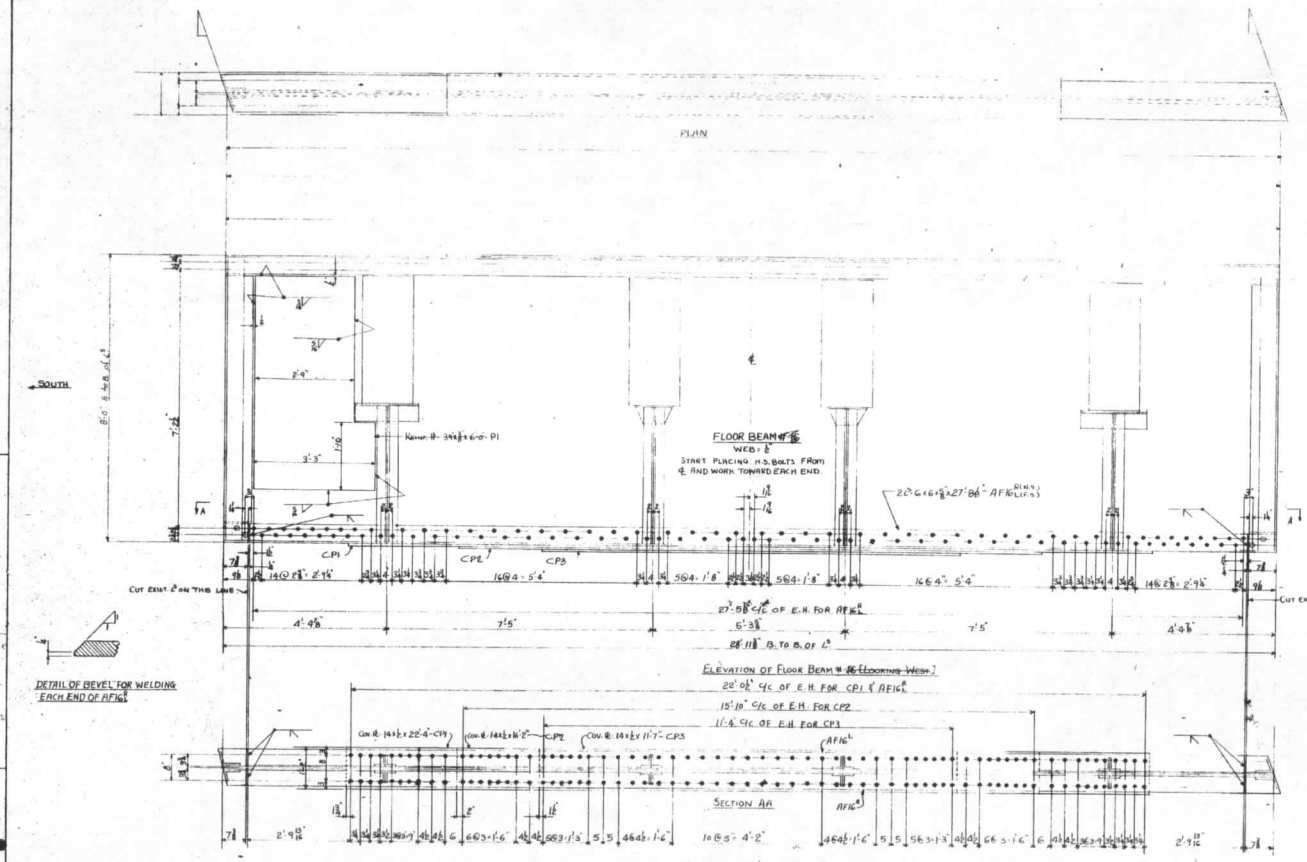

DETAIL OF BEVEL FOR WELDING EACH END OF AF16

~~1 REQD. REINFORCING PLATES PL~~
~~2 REQD. BOTTOM FLANGE ANGLES AF16~~
6 - REQD. TOP FLANGE ANGLES - AF16
3 - REQD. COVER PLATE - CP1
3 - REQD. COVER PLATE - CP2
3 - REQD. COVER PLATE - CP3

OK C.W.H.

Approved: W. L. Mills
Engineer of Bridges

Checked in field by C.W. Henry 5-23-80

Note: [illegible] section in H.B.

BILL OF MATERIAL

44094-5	No.	Description	Shop Bill Pl.	In.	Mark	Remarks	Shipping Bill No.	Description	Mark
	1	L-6×6×5/8	27	8 5/8	AF16				
	1	Cov. PL 14×1/2	22	4	CP1				
	1	do.	16	2	CP2		1	Bott. PL L	AF16
	1	do.	11	7	CP3				
	1	L-6×6×5/8	27	8 5/8	AF16		1	do.	AF16

LIST OF HIGH STRENGTH FIELD BOLTS

Erector's List No.	Size	Grip	Length	Location	Shipping List No.	Size	Length
92	5/8	1 1/4	3 1/2	AF16 to web	25	5/8	2 1/2
8		1 1/2	4	" " " 2-1/2" L	25		3
20		1 1/2	2 1/2	AF16 to Cov. PL	100		3 1/2
16		1 1/2	3	" " 2 "	40		3 1/2
53	5/8	1 1/2	3 1/2	" " 3 "	15	5/8	4

205 - ~~Hardened~~ Steel Washers for 5/8 Bolts
205 - ~~Nut~~ Nuts, 5/8 Tap

NOTE: REPORT TO BRIDGE OFFICE LOCATION OF HOLE THAT DO NOT MATCH EXISTING HOLES.

TRAFFIC CAN BE ~~REVISED~~ PRIOR TO MAKING BUTT WELDS AT ENDS OF FLANGE ANGLES.

NOTE: FOR GENERAL NOTES, ERECTION DIAGRAM, ERECTION PROCEDURE, BILL OF MATERIAL SEE DWG. 44094-5

REVISIONS	Chessie System Engineering Department	
5-4-80	BRIDGE #64 STEEL REPAIRS	
	NORTH BRANCH, CUMBERLAND DIV.	MD. PENN LINE
CORR. FILE NO. 4-9707	SCALE 1/4"=1'0" DATE 9-29-75 DESIGN: DRAWN C.T.S. CHECKED R.H.K.	VOL. SEC. V401 1
		DRAWING NO. 44094-5

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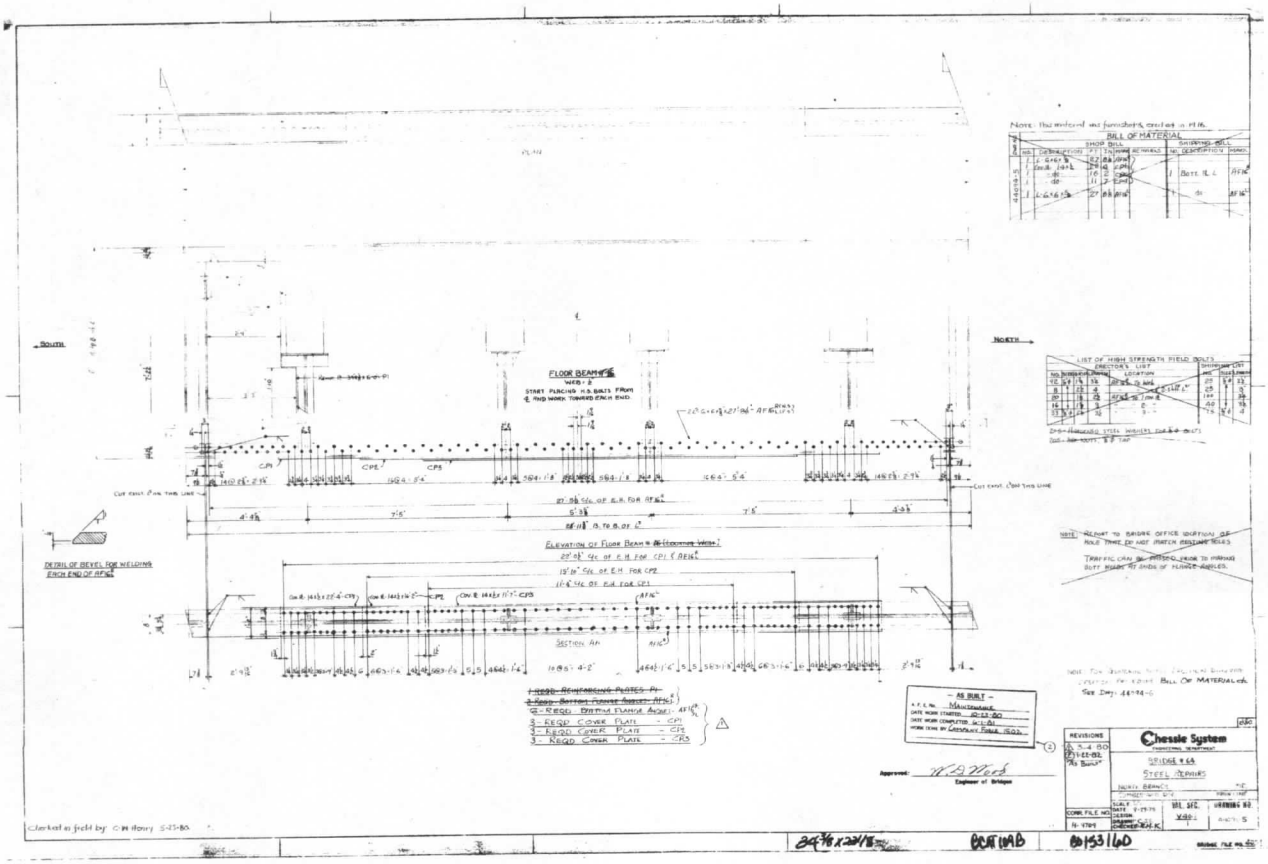

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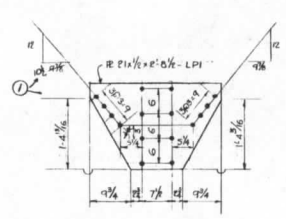
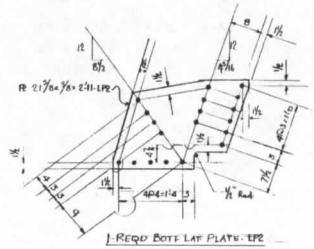
LIST OF HIGH STRENGTH FIELD BOLTS

Erector's List No.	Size	Grip	Length	Location	Shipping List No.	Size	Length
2314	7/8	1	2 1/2	Flange L and Cover PL	10	7/8	2 1/4
1824	♦	1 3/8	2 3/4	Flange L & 2 cover plates	2295	♦	2 1/2
911		1 1/4	3 1/4	Flange L & 3 Cover PL	1895		2 3/4
208		1 1/4	2 1/4	Flange L, CP & Lat PL	235		3
42		1 1/4	3 1/4	Flange L, 2CP & Lat PL	2414		3 1/2
124		1 1/2	3 1/2	Flange L, 3CP & Lat PL	576		3 1/2
214		1 1/4	3 1/4	Flange L, CP, Lat PL & Lat L	55		3 3/4
22		1 3/8	3 1/2	Flange L, 2CP, Lat PL & Lat L	1 1/8		4
600		1 1/2	3 1/4	A1 & A2, A3 & A4 to Inch	5	♦	4 1/4
24		1 1/2	4	do + 2 Stiff Lg	20	7/8	4 1/2
16		1 1/2	4 1/2	do + Cover Ls			
75		1 1/8	3 1/2	Also A5 to Lat PL & Fill			
40		1 1/2	3 1/2	do + Lat L			
149		1 1/2	3 1/4	A7 & A8 or A9 & A10, to prev.			
13		1 1/2	4	do + 2 Stiff Lg			
7		1 1/2	4 1/2	do + 2 Cover Ls			
4		1 1/2	4 1/2	do			
18		1 1/2	3 1/2	A3 or A7 to Lat. PL to Fill			
10		1 1/4	3 1/2	do + Lat L			
1215		1 1/2	3 1/4	for 1B5 2-7, 11-13 to 1B6 to Inch			
80		1 1/2	4	do + Still Ls			
700		1 1/8	2 1/2	Bolt Flg Ls to Cover PL			
272		1 1/4	2 1/4	For 1B5: 1, 8, 9 Size to Inch			
144		1 1/2	4	do + 2 Stiff Ls			
1210		1 1/2	2 1/2	Flg Ls to Cover PL			
96		1 1/4	3	do + 2CP			
148		1 1/4	3 1/2	do + 3CP			
116		1 1/4	2 1/2	LP4, LP5 to Stringer			
134		1 1/2	3	do + Lat L			
170		1 1/2	2 1/2	LP4, LP5 to end brac L			
4		3/4	2 1/4	LP7 to Lat L or CP L			
5	♦	1 1/2	2 1/2	LP7 to fill to Stringer			
8	7/8	2 1/2	2 1/2	do + Lat L			

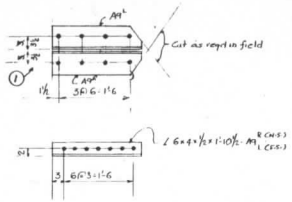
B635-Hardened Steel Washers for 7/8" ø Bolts.
B736-Hex. Nuts, 7/8" ø top.



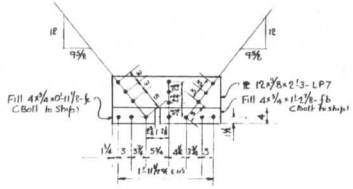
7-Reqd Bott Lat Plates-LP1



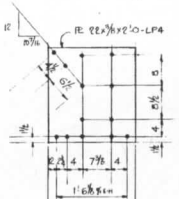
1-Reqd Bott Lat Plate-LP2



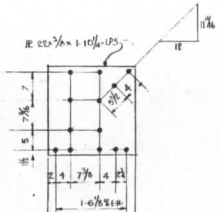
18-Reqd Angles-A9



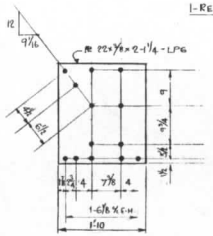
1-Reqd Top Lat Plate-LP7



31-Reqd Bott Lat Plates-LP4



1-Reqd Bott Lat Plates-LP5



2-Reqd Bott Lat Plates-LP6

BILL OF MATERIAL

Dwg. No.	Shop Bill No.	Description	Pc.	Lg.	Mk.	Remarks	Shipping Bill No.	Description	Mk.
44014-1	1	PL 14x3/8	54	0	P1	Blank Material	1	Pl-Fc	P1
	7	L 6x6x3/4	23	3 5/8	A1		1	Sp Pin-Angle	A1
	7	do	23	3 5/8	A1		7		A2
	1	do	23	3 5/8	A3		1		A3
	1	do	25	3 5/8	A4		1		A4
	1	do	29	3 5/8	A5		1		A5
	1	do	22	3 5/8	A6		1		A6
	1	do	20	3 5/8	A7		1		A7
		do	20	3 5/8	A8				A8
44014-5	18	L 6x4x3/8	1	8 1	A9 R		18	Conn Ls	A9 R
	7	PL 21x1/2	2	8 3/4	LP1		7	Bott Lat PL	LP1
	1	PL 21 7/8x3/8	2	11	LP2		1	do	LP2
	2	PL 21x1/2	2	7 3/4	LP3	Blank Material	2	do	LP3
	31	PL 22x3/8	2	0	LP4		31	do	LP4
	1	PL 22x3/8	1	10 1/4	LP5		1	do	LP5
	2	PL 22x3/8	2	12 1/4	LP6		2	do	LP6
	1	Fill 4x3/4	0	10 1/2	fc	Bolt to Stringer			
	1	Fill 4x3/4	1	11 1/2	fb	do			
	1	PL 12x3/8	2	3	LP7		1	Top Lat PL	LP7
44014-4	20	L 6x6x3/8	8 6	3 3/4	A10 R		20	Bolt Flg Ls	A10 R
	10	PL 14x1/2	16	3 1/2	CP1		10	Cover Plates	CP1
44014-3	6	L 6x6x3/8	27	3 5/8	A11 R		6	Bolt Flg Ls	A11 R
	3	PL 14x1/2	19	4	CP2		3	Cover PL	CP2
	3	PL 14x1/2	16	1	CP3		3	do	CP3
	3	PL 14x1/2	11	7	CP3		3	do	CP3

High Strength Steel Bolts with Nuts and Washers as listed.

GENERAL NOTES:

Workmanship: A.R.E.A. Specifications for Steel Railway Bridges dated 1928 except holes may be punched full size.

Material: Structural Steel, A.S.T.M. A36, High Strength Steel Bolts, A.S.T.M. A 325, Type 3.

High Strength Steel Bolts: 7/8" ø
Open Holes: 15/16" ø unless noted. All holes to be free of burrs.
Shop Paint: One coat of red lead meeting Federal Specifications TT-P-86a, Type I, dated 3-31-67. Field contact surfaces shall be painted. Surfaces within 2" inches of any field weld location shall be free of paint. Parts denoted by N.P. (No Paint) shall not be painted.

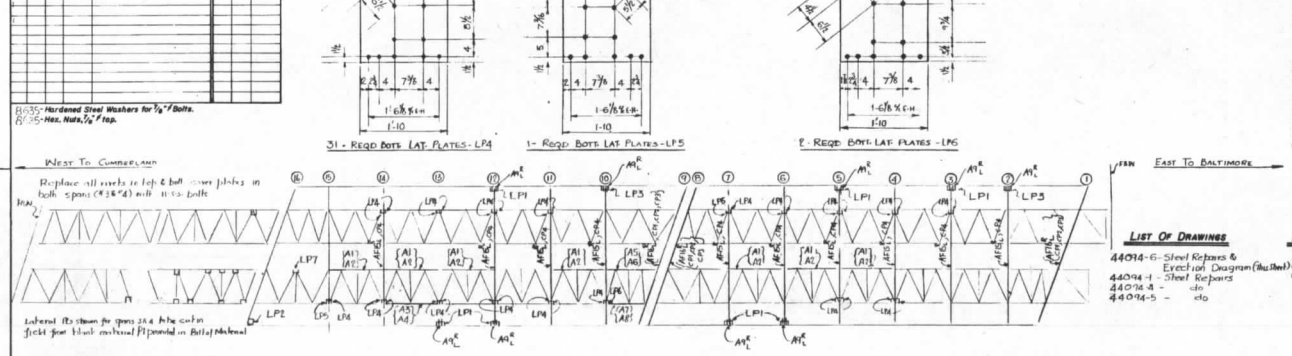
Field Paint: Parts of present material in contact with new material shall be thoroughly cleaned of all rust, dirt, grease, and loose paint and shall be given one coat of red lead before placing new material. Surfaces of new material inaccessible after erection shall be given two coats of paint prior to erection. All other new material shall be given two coats of paint after erection; first coat to be red lead and second coat to be black bridge paint.

ERECTION PROCEDURE

A) To place new material work at one point at a time.
1) Remove rivets as necessary to place new material, replacing each as removed with a bolt or drift pin using 50% of each.
2) Between trains and without interference to traffic, remove existing material to be replaced, place new material and replace bolts and drift pins.
3) Remove bolts and drift pins one at a time, replacing each as removed with its bolt.

NOTE TO ERECTOR:

NO TRAFFIC to be allowed on bridge unless all material, either old or new is in place and a bolt, drift pin, driven rivet or high strength bolt is in every hole and all welds have had sufficient time to cool.



Erection Diagram
(No Scale)

Checked in field by: C.W. Henry 5-23-80

List Of Drawings

44014-6 - Steel Repairs & Erection Diagram (this sheet)
44014-1 - Steel Repairs
44014-4 - do
44014-5 - do

— AS BUILT —
A.F.E. No. Maintenance
DATE WORK STARTED 10-12-80
DATE WORK COMPLETED Oct. 81
WORK DONE BY Company Force 1502

Approved: M.P. Wood
Engineer of Bridges 7/14/81

REVISIONS	Chessie System Engineering Department	
(1) 9-22-82 "As Built"	Bridge #64 Steel Repairs & Erection Diagram North Branch	
	Allegany Co. Md	
	Maryland Div at Cumberland SD	
CORR. FILE NO. H-9709	SCALE: None DATE: 5-4-80 DESIGN: M.S.D. DRAWN: M.S.D. CHECKED: C.J.S.	VAL. SEC. V-481 / 1 — DRAWING NO. 44014-6

BRIDGE FILE NO. 405

BEAT IDAB AD 153 163

34-81 23 18

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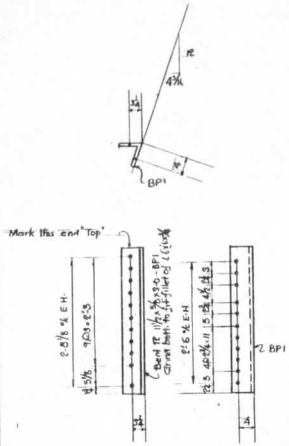
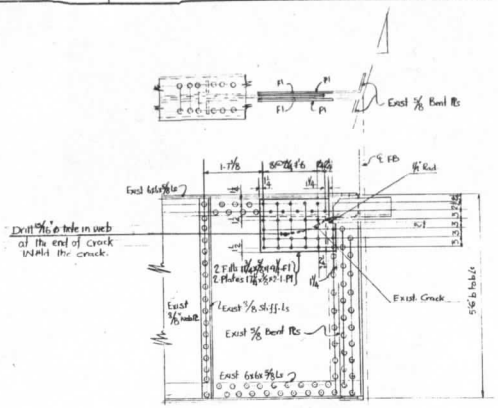
LIST OF HIGH STRENGTH FIELD BOLTS

Erector's List					Shipping List		
No.	Size	Grip	Length	Location	No.	Size	Length
87	7/8	2 7/8	3 1/4	Web Patch Pls to Fills 1/16 to Web	90	7/8	3 3/4
11	7/8	3/8	4 1/2	BP1 to exist Flg/Fills to web	15	7/8	4 1/2
				and exist Bent Pl	15	7/8	4 1/2
11	7/8	2 7/8	4 1/2	BP1 to exist Flg/Fills of FD			
				to exist Bent Pl			

PD - Hardened Steel Washers for 7/8" ø Bolts.
ND - Hex. Nuts, 7/8" ø tap.



1- Reqd Bent Plate - BP1



6- Reqd Web Patch Plates - P1
6- Reqd Fill Plates - F1

BILL OF MATERIAL

Shop Bill							Shipping Bill		
No.	Description	Ft	In.	Min.	Remarks		No.	Description	Wt.
1	Bent Pl 1 1/8 x 5/8	3	0	BP1			1	Bent Plate	BP1
6	Pl 17 1/2 x 3/8	8	1	P1			6	Web Patch Pls	P1
6	Fills 17 1/2 x 5/16	1	7 1/2	F1			6	Fills	F1

High Strength Steel Bolts with Nuts and Washers as listed.
700 lbs of Structural Steel

GENERAL NOTES:

Workmanship: A.R.E.A. Specifications for Steel Railway Bridges dated 1978 except holes may be punched full size.

Material: Structural Steel, A.S.T.M. A36, High Strength Steel Bolts, A.S.T.M. A 325, Type 3.

High Strength Steel Bolts: 7/8" ø

Open Holes: 15/16" ø, unless noted. All holes to be free of burrs.

Shop Paint: One coat of red lead meeting Federal Specifications TT-P-86a, Type I, dated 3-31-67. Field contact surfaces shall be painted. Surfaces within 2" inches of any field weld location shall be free of paint. Parts denoted by N.P. (No Paint) shall not be painted.

Field Paint: Parts of present material in contact with new material shall be thoroughly cleaned of all rust, dirt, grease, and loose paint and shall be given one coat of red lead before placing new material. Surfaces of new material inaccessible after erection shall be given two coats of paint prior to erection. All other new material shall be given two coats of paint after erection; first coat to be red lead and second coat to be black bridge paint.

ERECTION PROCEDURE

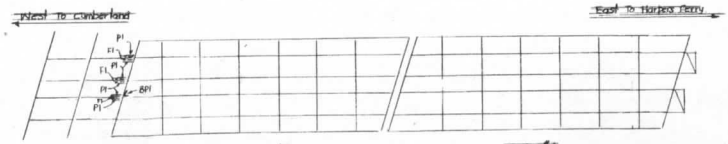
A) To place new material work at one point at a time
1.) Remove rivets as necessary to place new material, replacing each as removed with a bolt or drift pin using 50% of each.
2.) Between trains and without interference to traffic remove exist. material to be replaced place new material and replace bolts and drift pins.
3.) Remove bolts and drift pins one at a time replacing each as removed with a H-3 bolt

NOTE TO ERECTOR:

NO TRAFFIC to be allowed on bridge unless all material, either old or new is in place and a bolt, drift pin, driven rivet or high strength bolt is in every hole and all welds have had sufficient time to cool.

LIST OF DRAWINGS

44545 Steel Repairs & Erection Diagr.
Also: See Dwgs: 24028 A, 24029 A, 32665 E, 32518 C, & 44094 thru 44094-6 for reference.



ERECTION DIAGRAM
(Not to Scale)
(2- 48'-8 Deck PR Girder Spans & 2- 166'- Truss Spans)

① — AS BUILT —
A.F.E. No. MAINTENANCE
DATE COMPLETED 7-23-81
WORK DONE BY CONTRACT FORCES 1502

Approved: M D Mood
Engineer of Bridges

REVISIONS	Chesapeake System Engineering Department	
① 6-7-82 "As Built"	Bridge #64 Steel Repairs & Erection Diagram North Branch	
	Allegany Co. MD	
	Maryland Div N Cumberland S.D.	
CORR. FILE NO. H-9709	SCALE: 3/16" = 1'-0" DATE: 4-28-81 DESIGN: D.S.D. DRAWN: D.S.D. CHECKED: C.J.S.	VAL. SEC. V-401 / 1 — DRAWING NO. 44545

Checked in field by: C.W. Henry Jr. 5-15-81

Cumberland Div N Main Line — BRIDGE FILE NO. 4054

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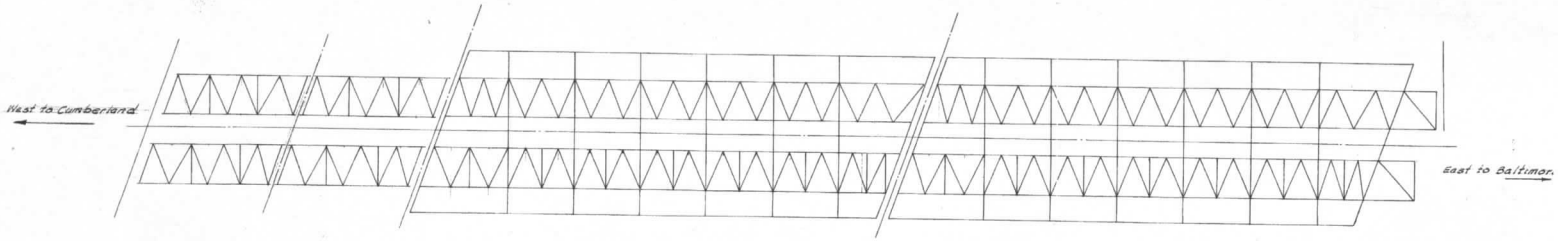

SPAN #4
48'-8" o. to o. DPG Span

SPAN #3
48'-8" o. to o. D.P.G. Span

SPAN #2
166'-0" o. to o. Truss Span

SPAN #1
166'-0" o. to o. Truss Span

ERECTION PLAN
Scale: None

BRIDGE # 64
MARYLAND DIV. - CUMBERLAND S.-D.
NORTH BRANCH, MD.

27 3/4 x 10 3/8 BCAT104B BD153162 Dwg. # E. 3/11/82, N.L.H.

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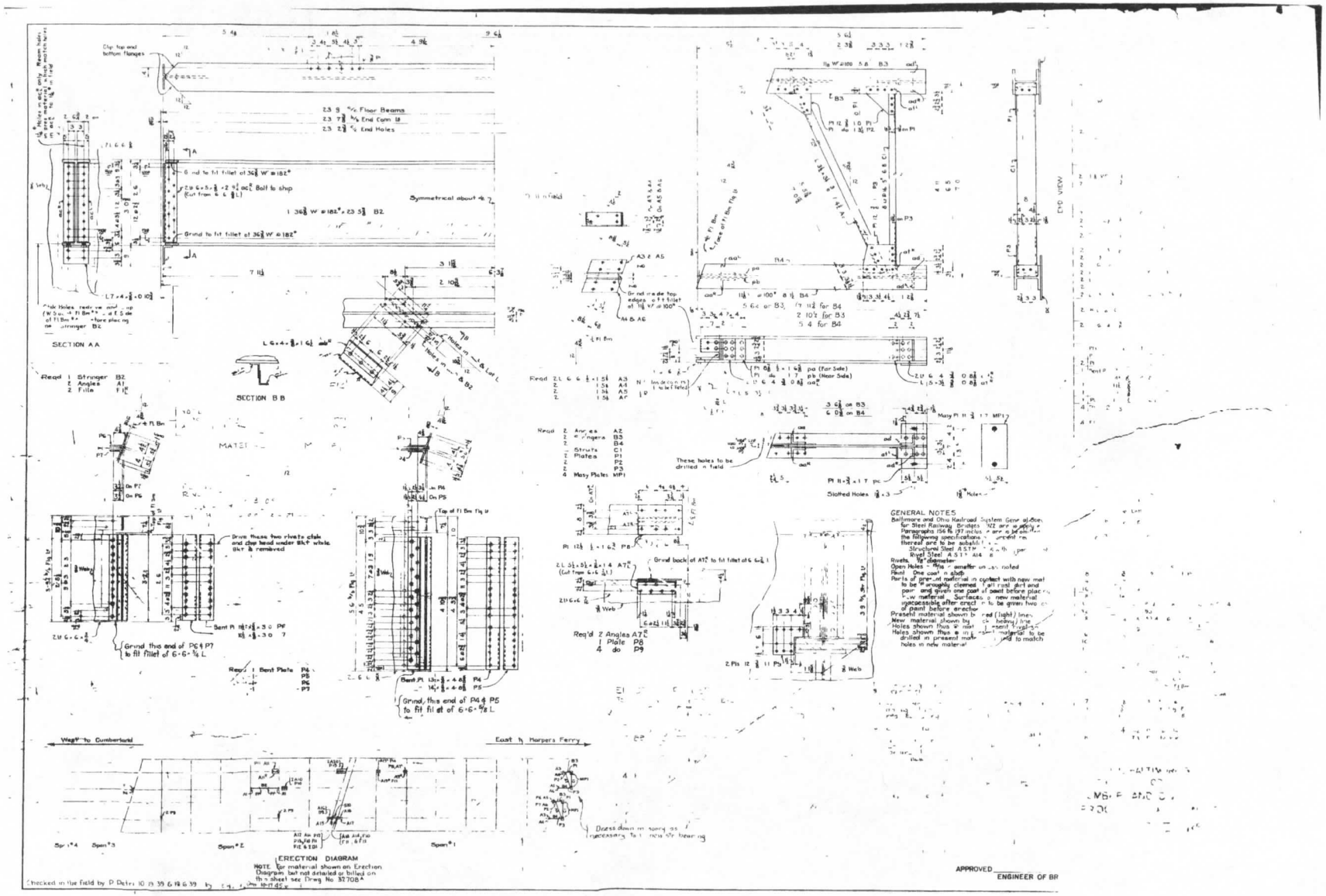

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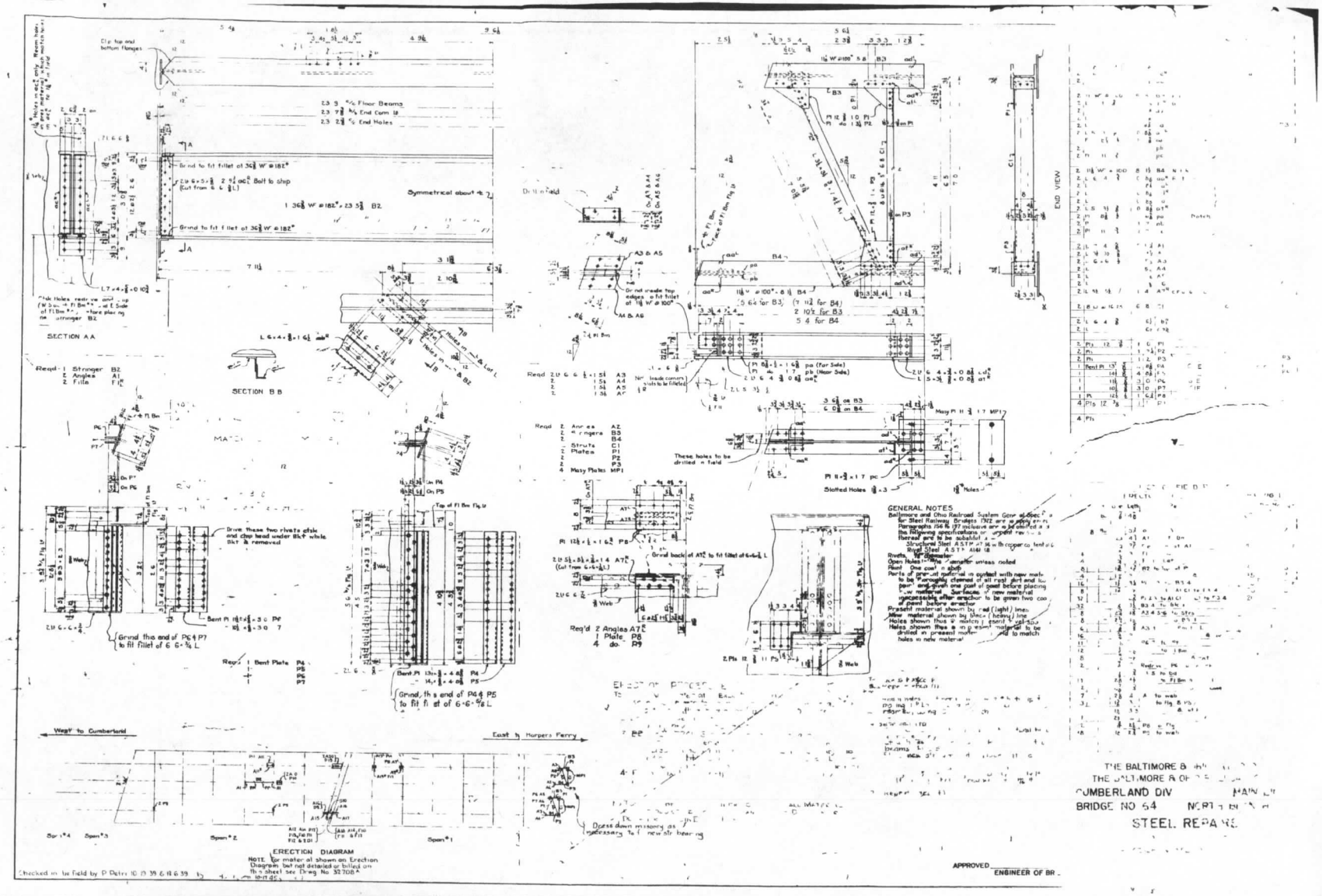

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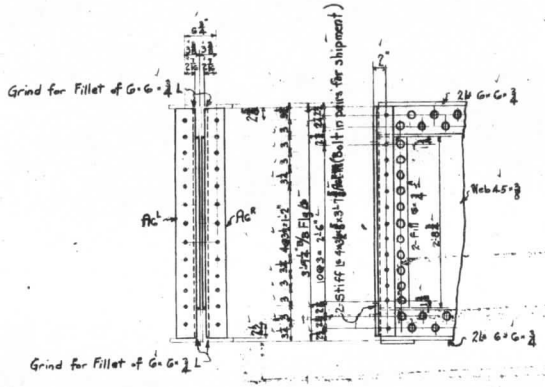
Bill of Material

Shop Bill

Nº	Description	Ft	in	Mk	Shipping Nº	Remarks
6	Ls 4"×3½"×5/8"	3	7 15/16	A6R		Bolt in pairs for Shipment
6	Ls "	3	7 15/16	A6L		

Shipping List

Nº	Description	Mk
6	Angles	A6R
6	"	A6L



GENERAL NOTES
Material:- O.H. Structual Steel
Specifications - B.&O.R.R 1922
Rivets:- 7/8" ϕ
Open Holes:- 15/16" ϕ
Paint- One coat in shop

THE BALTIMORE AND OHIO RAILROAD
THE BALTIMORE & OHIO RAILROAD CO.
CUMBERLAND DIV MAIN LINE
BRIDGE Nº 64 NORTH BRANCH, MD.
REPAIRS

Scale 1"=1'0 July 8, 1°
Office of Engineer of Bridges
Baltimore, Md.
Dr.

Approved:-
Engineer of Bridges

21.875x17

BCAT109D

AD153196

Dr. No. 30331

AL-111-B-181
CSX Bridge BA 172.3
West elevation
Sarah Michailof 1/19/2013

AL-111-B-181
CSX Bridge BA 172.3
Detail of Vertical Endpost
West Elevation
Sarah Michailof 1/19/2013

AL-111-B-181
CSX Bridge BA 172.3
East Elevation, plate girder spans
Sarah Michailof 1/19/2013

AL-111-B-181
CSX Bridge BA172.3
View south toward northernmost pier
Sarah Michailof 1/19/2013

AL-111-B-181
CSX Bridge BA 172.3
East elevation, looking south
Sarah Michailof 1/29/2013