Dead Load Calcs: L_0-L_1 Span 5-7 NW

From Section: $A = 19.80\ in^2$

$L = 10'-7\ 9/16" = 10.63'$

$wt = (19.80\ in^2)(1\ ft^2/144\ in^2)(10.63\ ft)(0.49\ K/ft^3) = \boxed{0.7162\ K}$

Gus R's:

L_0: See shop dwg's for dimensions

1 R → 29½ x 7/16 x 3'-3½

$A = (29.5")(39.5") - 2(½)(21")(14") = 871.25\ in^2$

$V = 871.25\ in^2\ (0.4375\ in) = 381.17\ in^3$

1 R → 41 x 7/16 x 3'-3½

$A = (41")(39.5") - ½(11")(21") - ½(11")(11") - ½(21")(12") - ½(14")(21") =$

$A = 1170.5\ in^2$

$V = (1170.5\ in^2)(0.4375\ in) = 512.09\ in^3$

@ L_0 (NW)

1 Pin R → 13 x ¾ x 2'-6½ = (13")(0.75")(30.5") = $297.375\ in^3$

1 Fill R → 8½ x ⅛ x 3'-3½ = (8.5")(0.125")(39.5") = $41.9688\ in^3$

1 Pin R → 8½ x ¾ x 2'-6½ = (8.5")(0.75")(30.5") = $194.4375\ in^3$

$533.7813\ in^3$

Add 5% for Additional Fill R's etc.

$(533.7813\ in^3)(1.05) = 560.4704\ in^3$

Total L_0 → $381.17\ in^3 + 512.09\ in^3 + 560.4704\ in^3 = 1453.7304\ in^3$

$wt = 1453.7304\ in^3\ (1\ ft^3/1728\ in^3)(0.49\ K/ft^3) = \underline{0.4122\ K}$

Calculations for 1/8 US Grid

Dead Load Calcs: L_0-L_1

Span 5-7
NW

Gus R's: (cont'd)

L_1 Gus: See shop dwg for dimensions

2 R's → 43 x 1/16 x 4'-8 (Take 1/2 the weight of 2 plates → 1R)

$A = (43")(56") - \frac{1}{2}(7")(28") = 2310\ in^2$

$\forall = (2310\ in^2)(0.4375\ in) = 1010.625\ in^3$

$wt = (1010.625\ in^3)(1\ ft^3/1728\ in^3)(0.49\ K/ft^3) = 0.2866K$

Total wt of Guss R's:

$L_0 = 0.4122K$
$L_1 = 0.2866K$
] = 0.6988K

Lacing:

2 R 16 x 3/8 x 1'-6 1/2"	2(16")(0.375")(18.5") =	222 in³
1 R 16 x 3/8 x 1'-3"	(16")(0.375")(15") =	90 in³
1/2 R 16 x 3/8 x 1'-6"	1/2(16")(0.375")(18") =	54 in³
		366 in³

Bars → 10 + 14 = 24 bars 2 1/2 x 3/8 x 1'-1 7/8"

(24 bars)(2.5")(0.375")(13.875") = 312.1875 in³

Total $\forall$ = 366 in³ + 312.1875 in³ = 678.1875

$wt = (678.1875\ in^3)(1\ ft^3/1728\ in^3)(0.49\ K/ft^3) = 0.1923K$

Rivets:

L_0 Gus → 22 + 22 + 11 + 22 + 18 = 95

L_1 Gus → 14 + 23 + 20 = 57

Top of chord → 8 + 9 + 8 = 25
Bottom of chord → 8 + 13 + 5 = 26

Total = 203, SAY 200 Rivets x 0.0804 K/100 rivets = 0.1608K

Calculations for 1/8 US Grid

Dead Load Calcs: [Lo-L1]

[Span 5-7]

NW

Bump Up: Member Wt = 0.7162 K

Guss R's = 0.6988 K

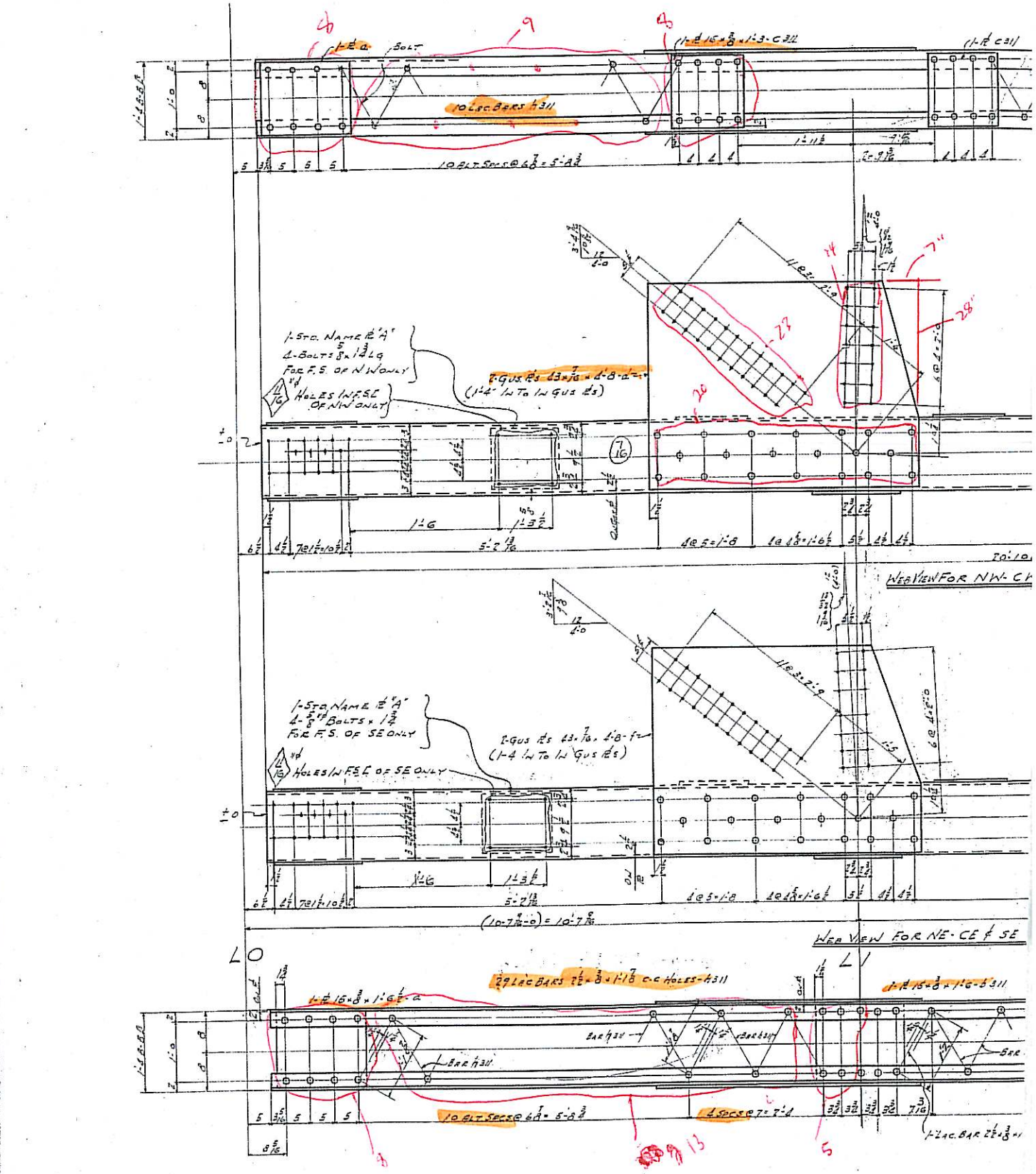
Lacing = 0.1923 K

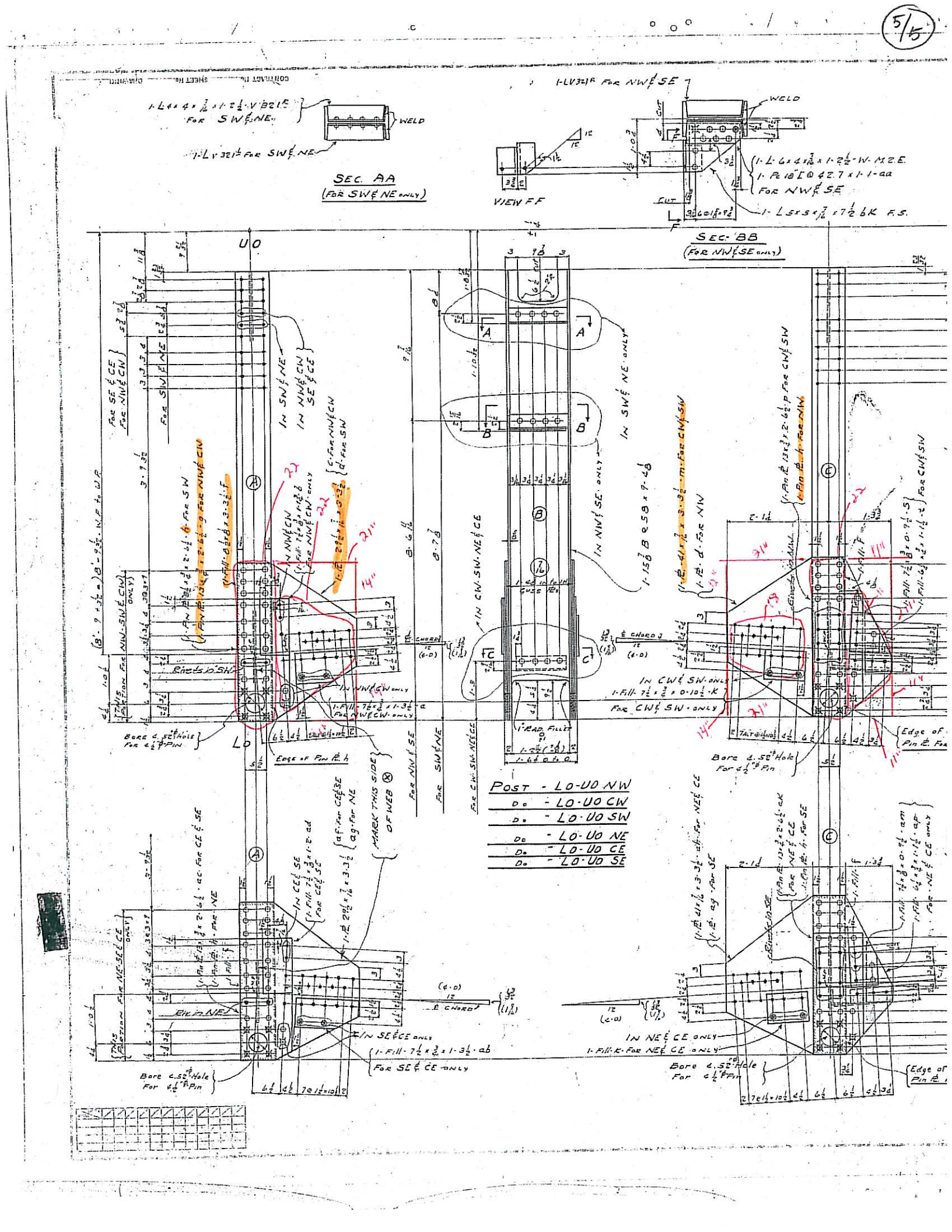
Rivets = 0.1608 K

1.7681 K

$\frac{1.7681\,K}{0.7162\,K} = [2.47]$

Calculations for 1/8 US Grid


1-STD. NAME PL "A"
4-BOLTS 8 x 1 3/4 LG
FOR F.S. OF NW ONLY
11/16 HOLES IN F.S. OF NW ONLY
2-GUSSETS 13 x 7/16 x 1'-8"
(1'-4" IN TO IN GUSSETS)
WEB VIEW FOR NW-CE
1-STD. NAME PL "A"
4-7/8" BOLTS x 1 3/4
FOR F.S. OF SE ONLY
11/16 HOLES IN F.S. OF SE ONLY
2-GUSSETS 13 x 7/16 x 1'-8"
(1'-4" IN TO IN GUSSETS)
WEB VIEW FOR NE-CE & SE
10 LAC BARS H311
29 LAC BARS 2 1/2 x 3/8 x 1'-1 7/8 C-C HOLES-H311
10 BLT SPCS @ 6 7/8 = 5'-0 3/8
4 SPCS @ 7" = 2'-4"
1-LAC BAR 2 1/2 x 3/8 x


SEC. AA
(FOR SW¼ NE¼ ONLY)
VIEW FF
SEC. BB
(FOR NW¼ SE¼ ONLY)
POST - LO-UO NW
Do - LO-UO CW
Do - LO-UO SW
Do - LO-UO NE
Do - LO-UO CE
Do - LO-UO SE
MARK THIS SIDE OF WEB
Edge of Pin Hole
Bore 4.52" Hole For 4½" Pin
1-RAD FILLET

Dead Load Calcs: L_1-L_2 Span 5-7

Member Wt: Same as L_0-L_1 → 0.7162K

Gus R's:

L_1 → From L_0-L_1 Calcs → 0.2866K

L_2 → see shop dwg's for dimensions

R5 → 38 x ½ x 5'-5

$A = (38")(65") - \frac{1}{2}(21")(21") = 2249.5 in^2$

$V = 2249.5 in^2 (0.5") = 1124.75 in^3$

$Wt = (1124.75 in^3)(1 ft^3/1728 in^3)(0.49K/ft^3) = 0.3189K$

Shelf plates = 0.0911K (from L_5-L_6 Calcs, Span 7-10)

$Wt = 0.3189K + 0.0911K = 0.41K$

Total Gus = 0.2866K + 0.41K = 0.6966K

Lacing:

Similar to L_0-L_1, use wt = 0.1923K

Rivets

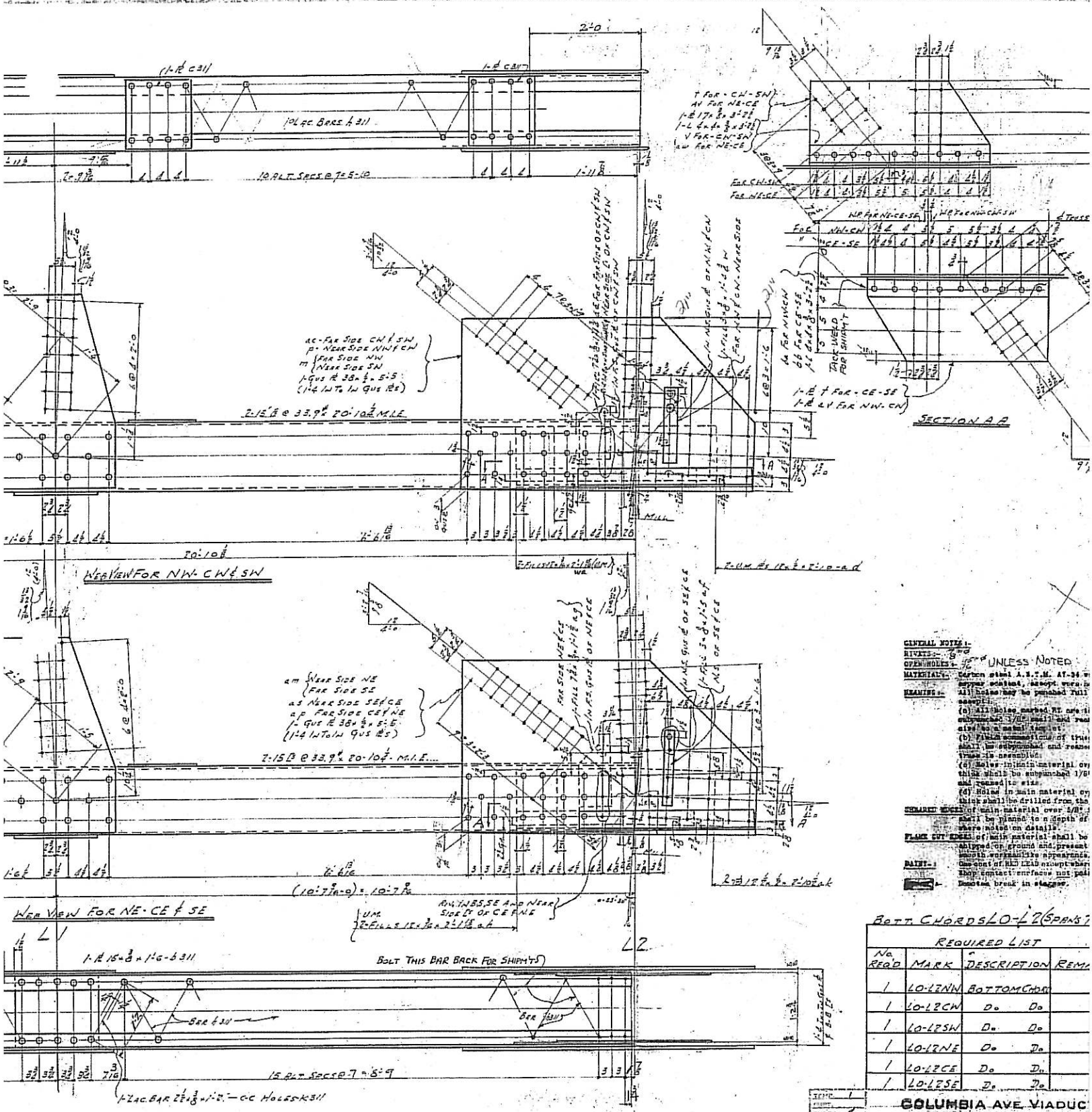
Similar to L_0-L_1, say 200 → 0.1608K

Bump Up:

Member wt	0.7162K
Gus	0.6966K
Lacing	0.1923K
Rivets	0.1608K
	1.7659K

$\frac{1.7659K}{0.7162K} = 2.47$

Calculations for 1/8 US Grid



BOTT. CHORDS L0-L2 (SPANS 7

REQUIRED LIST

No. REQ'D	MARK	DESCRIPTION	REMA
1	L0-L2NW	BOTTOM CHORD	
1	L0-L2CW	Do Do	
1	L0-L2SW	Do Do	
1	L0-L2NE	Do Do	
1	L0-L2CE	Do Do	
1	L0-L2SE	Do Do	

Shop must maintain clear distance between gussets and chords and cut to cut of web members as noted to insure pass in assembling.

COLUMBIA AVE. VIADUC
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WO
DETAILED STEEL CONSTRUCTION
Drawings at finish, fabrication
DRAWN ADAM. TRACED J.R.C.
CHECKED T.J.S. 7/13/37 TRACED J.E.P. 1/
REVISED
FC. TBC 3-537
CC 2587-3

15-8-5

Dead Load Calcs: L_2-L_3

Span 5-7
NW

Member Wt:

From Section: $A = 26.34 in^2$
$L = 10'-7\frac{15}{32}" = 10.6224'$

$wt = (26.34 in^2)(1 ft^2/144 in^2)(10.6224 ft)(0.49 K/ft^3) = \boxed{0.9521 K}$

Gus PL:

$L_2 =$ 0.411K
$L_3 =$ See shop dwg's for dimensions

37 x 7/16 x 4'-4 1/4

$A = (37")(52.25") - 1/2(8")(21") = 1849.25 in^2$

$V = (1849.25 in^2)(0.4375 in) = 809.0469 in^3$

$wt = (809.0469 in^3)(1 ft^3/1728 in^3)(0.49 K/ft^3) =$ 0.2294K

Total Wt = 0.411K + 0.2294K = $\boxed{0.6394K}$

Lacing and Rivets ⇒ say same as L_0-L_1:

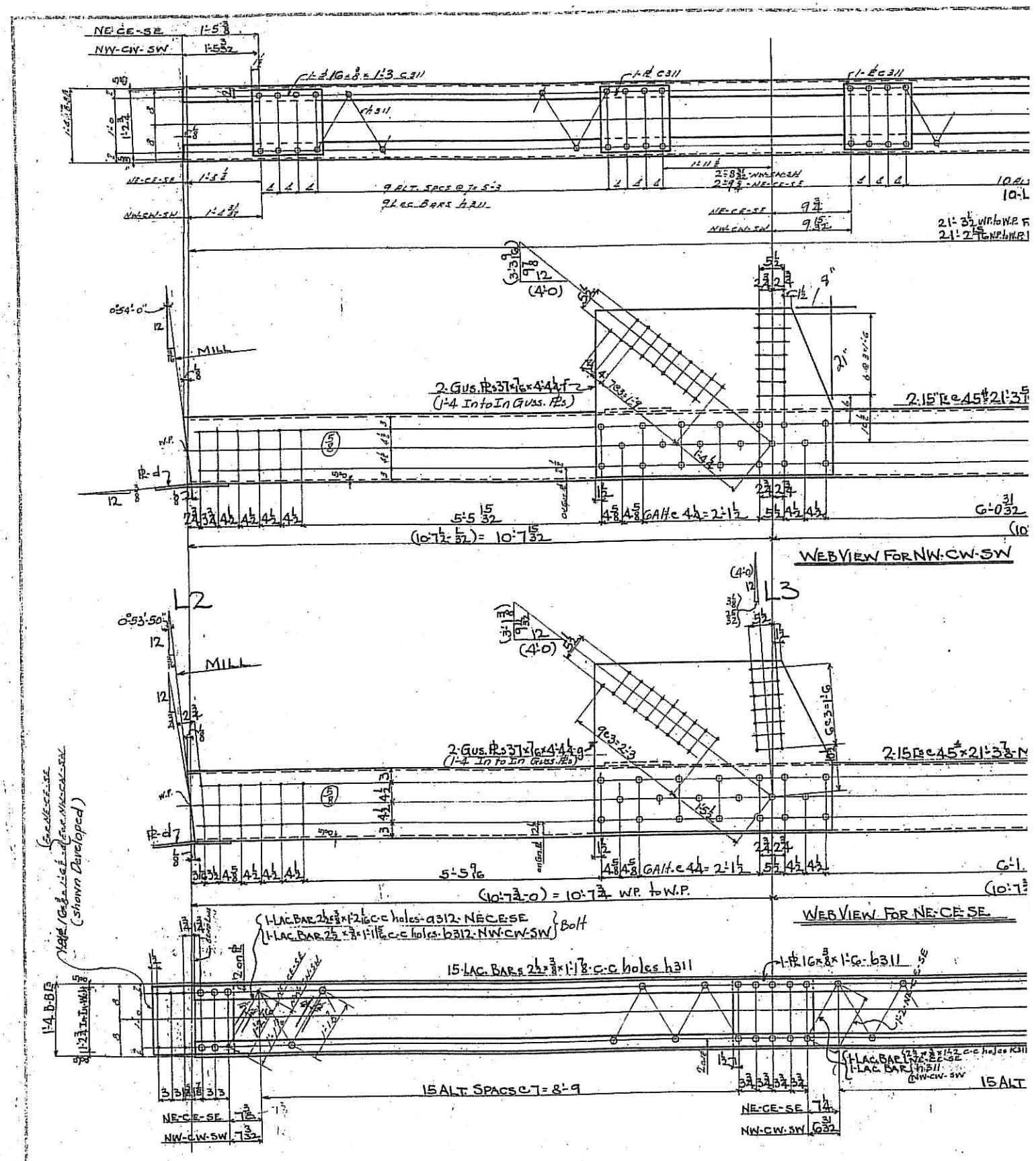
0.1923 K + 0.1608 K = $\boxed{0.3531 K}$

Bump Up:

Member wt: 0.9521 K
Gus : 0.6394 K
Lacing/Rivets: 0.3531K
1.9446 K

$\frac{1.9446 K}{0.9521 K} = \boxed{2.04}$

Calculations for 1/8 US Grid


NE-CE-SE
NW-CW-SW
9 ALT. SPCS @ 7 = 5'-3
9 Lac. Bars h311
MILL
2-Gus. Pls 3/8 x 7/16 x 4'-4 1/2" f-2
(1'-4 Into In Guss. Pls)
2-15" Rc 45# 21'-3 5/32
WEB VIEW FOR NW-CW-SW
L2
L3
MILL
2-Gus. Pls 3/8 x 7/16 x 4'-4 1/2" g
(1'-4 In to In Guss. Pls)
2-15 Rc 45# x 21'-3 7/8"-N
(10'-7 3/4") = 10'-7 3/4" W.P. to W.P.
WEB VIEW FOR NE-CE-SE
1-Lac. Bar 2 1/2 x 3/8 x 1'-2 1/16" c-c holes-a312-NE-CE-SE
1-Lac. Bar 2 1/2 x 3/8 x 1'-1 15/16" c-c holes-b312-NW-CW-SW
Bolt
15-Lac. Bars 2 1/2 x 3/8 x 1'-1 7/8" c-c holes h311
1-Pl 16 x 3/8 x 1'-6 b311
15 ALT. SPACS @ 7 = 8'-9
15 ALT

TranSystems

Made By: KMW	Date: 2/26/09	Job No: HAM-471-0025	
Checked By: CJM	Date: 3/24/09	Sheet No. 1/4	

Dead Load Calcs: L3-L4 — Span 5-7 NW

Member WT: 0.952 K/F From L2-L3 Calcs

Gus PL's:

L3 = 0.2294 K from L2-L3 Calcs

L4 = See Shop dwg's for dimensions

PL → 47½ x 7/16 x 6'-3"

A = (47.5")(75") − ½(12")(32")

A = (3.9583')(6.25') − ½(1')(2.6667')

A = 23.4060 ft²

V = 23.4060 ft² x 7/16" (1ft/12") = 0.8533 ft³

WT = 0.8533 ft³ x 0.490 K / 1 ft³ = 0.4181 K

TOT = 0.6475 K

LACING

BARS EA. = 2½" x 3/8" x 1'-1⅜"

= 0.2083' x 0.03125' x 1.15625' = 0.0075 ft³ EACH

↳ WT = 0.0075 ft³ x 0.490 K / 1 ft³

WT = 0.003675 K EACH

25 BARS @ 0.003675 K/BAR = 0.0919 K

BATTEN PL's

TOP: 2 PL's @ 16" x 3/8" x 1'-3" = 180 in³

BTM: 2 - ½ PL's = 1 PL @ 16" x 3/8" x 1'-6" = 108 in³

180 in³ + 108 in³ = 288 in³ x 1 ft³ / 1728 in³ = 0.1667 ft³ @ 0.49 K/ft³ = 0.0817 K

TOT = 0.1736

RIVETS

ASSUME 0.8#/RIVET

207 RIVETS @ 0.8#/RIVET = 165.6# @ 0.49 K / 1000# = 0.1656 K

Calculations for 1/8 US Grid

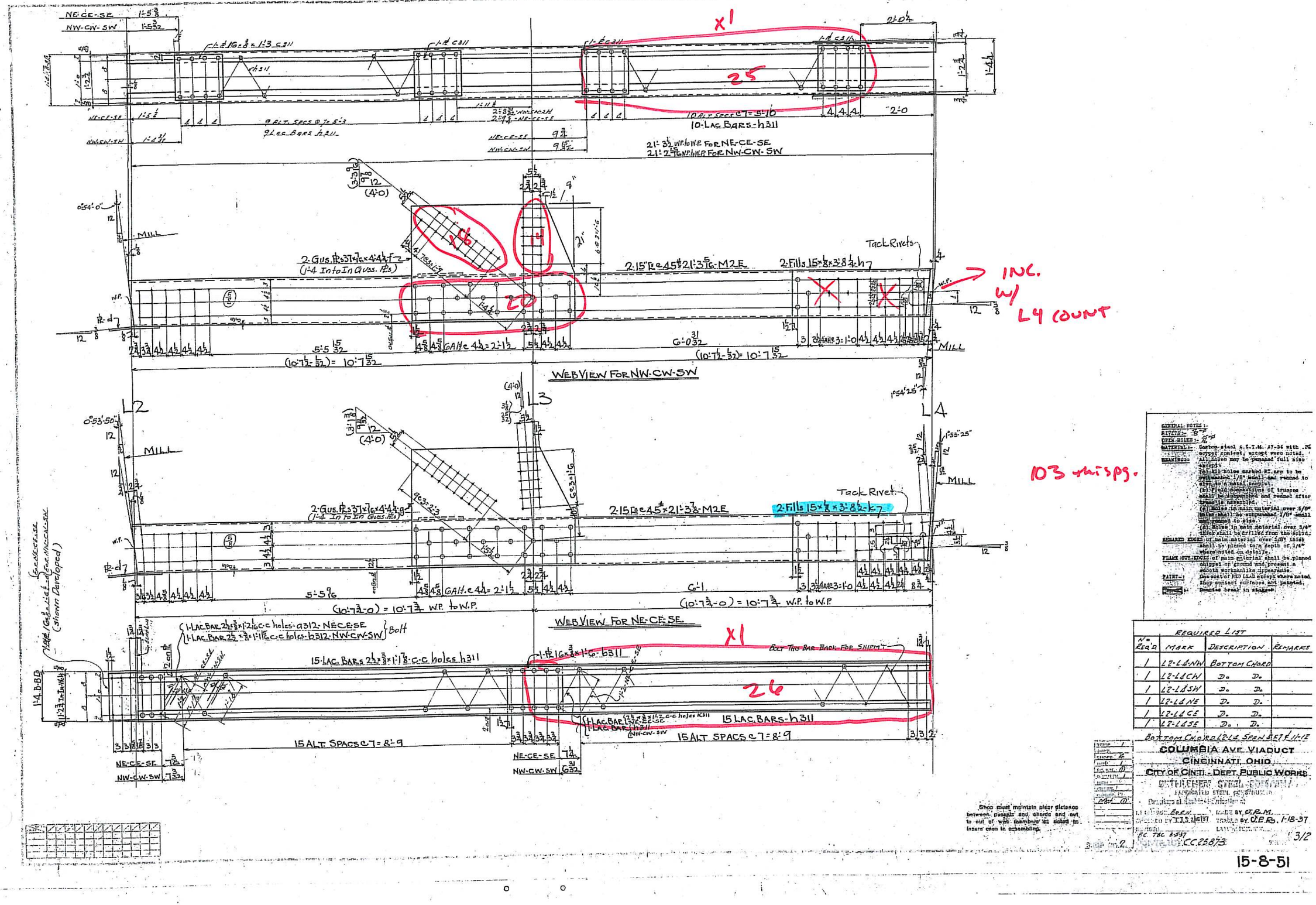
DEAD LOAD CALCS (CONT'D) SPAN 5-7

FILL PLS: 2 PLS @ 15" x 1/8" x 3'-8 1/4

$$2(15")(0.125")(44.25") \times \frac{0.49\ K}{1728\ in^3} = 0.0473\ K$$

WT OF MEMBER	= 0.9521 K
GUSSET PL	= 0.6475 K
LACING/BATTEN PL	= 0.1736 K
RIVETS	= 0.1656 K
FILL PL	= 0.0473 K
	1.9861 K

BUMP UP = $\frac{1.9861\ K}{0.9521\ K} = 2.09$



REQUIRED LIST			
No. Req'd	MARK	DESCRIPTION	REMARKS
1	L2-L4NW	BOTTOM CHORD	
1	L2-L4CW	Do. Do.	
1	L2-L4SW	Do. Do.	
1	L2-L4NE	Do. Do.	
1	L2-L4CE	Do. Do.	
1	L2-L4SE	Do. Do.	

BOTTOM CHORD L2-L4 SPAN SET F/ LINE

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CINCINNATI, OHIO.
CITY OF CINTI. DEPT. PUBLIC WORKS
INTERSTATE STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
DRAWN BY C.P.M.
CHECKED BY T.J.S. 2-6-37
TRACED BY C.P.R. 1-18-37
FC TBC 3-3-37
CC25873
3/2

15-8-51

4/4

DETAIL B-B NOT INCLUDED IN LOWER CHORD CALCS - GUSSET & RIVETS ARE INCLUDED

WEB VIEW FOR NW-CW-SW

WEB VIEW FOR NE-CE-SE

VIEW AA

SECTION BB

MAIN MATL NW-CW-SW

MAIN MATL NE-CE-SE

INC. W/ OTHER SHT

GENERAL NOTES:-
RIVETS:- ⅞"ø
OPEN HOLES:- 15/16"ø
MATERIAL:- Carbon steel A.S.T.M. A7-24 with .2% copper content, except where noted.
REAMING:- All holes may be punched full size except:-
(a) All holes marked RT are to be subpunched 1/8" small and reamed to size in a metal template.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in web material over 3/4" thick shall be drilled from the solid.
SHEARED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on details.
FLAME CUT EDGES of main material shall be planed, chipped or ground to present a smooth workmanlike appearance.
PAINT:- One coat of RED LEAD except where noted. Shop contact surfaces not painted.
- Denotes break in diagram.

REQUIRED LIST

No. Reqd.	Mark	Description	Remarks
1	14-LNW	Bottom Chord	
1	14-LCW	do	
1	14-LSW	do	
1	14-LNE	do	
1	14-LCE	do	
1	14-LSE	do	

BOTTOM CHORDS 14-L6 PANELS 5 & 10-12

COLUMBIA AVE VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WORKS
CINCINNATI BRIDGE COMPANY
FABRICATED STEEL CONSTRUCTION
Director of Highways & Publications
IN CHARGE Boen MADE BY J.R.M.
CHECKED BY T.J.S. 2/15/37 TRACED BY G.A.W. 1-27-37
REVISED FC TBC 3-5-37 NO. 25873

3/3

15-8-52

L4 L5 DEAD LOAD CALCS SPANS 5-7 LOWER CHORD

WT OF MEMBER

$A = 23.4000\ in^2$ $L = 10'-7\frac{3}{4}''$

$L = 10.6458'$

$10.6458' \times \frac{23.4000\ in^2}{144\ in^2} \times \frac{0.49\ k}{1\ ft^3} = \boxed{0.8477\ k}$

GUSSETS

L4 = USE L4 CALC FROM L3L4

$\therefore L4 = \boxed{0.4181\ k}$

L5: $R = (46\frac{1}{2}'' \times \frac{7}{16}'' \times 4'-1'') - \frac{1}{2}(3'' \times 34'' \times \frac{7}{16}'')$

OR

$= (3.875' \times 0.0364' \times 4.0833') - \frac{1}{2}(0.25' \times 2.8333' \times 0.0364')$

$= (0.5769\ ft^3) - 0.0258\ ft^3$

$L5\ VR = 0.5511\ ft^3$

$Wt = V \times \frac{.49\ k}{ft^3} = \boxed{0.2700\ k}$

GUSSET TOT = $\boxed{0.6881\ k}$

LACING

BARS = $2\frac{1}{2}'' \times \frac{3}{8}'' \times 1'-1\frac{1}{2}''$

$= 0.2083 \times 0.03125' \times 1.125' = 0.0073\ ft^3 \xrightarrow{\frac{.49\ k}{ft^3}} 0.003588\ k/BAR$

27 BARS @ 0.003588 K/BAR = $\boxed{0.096876\ k}$

BATTEN RS

SAME AS [L3L4]

$\therefore = \boxed{0.0817\ k}$

TOT = $\boxed{0.1786\ k}$

RIVETS

ASSUME 0.8#/RIVET

225 RIVETS @ 0.8#/RIVET = $180\#$ $\xrightarrow{\frac{1\ k}{1000\#}} = \boxed{0.180\ k}$

SPLICE

2 FILL RS @ $13\frac{1}{8} \times \frac{1}{2}'' \times 2'-11\frac{3}{4}'' \rightarrow 1.0938' \times 0.0417' \times 2.9792' = 0.2716\ ft^3$

+

2 RS @ $12' \times \frac{3}{16}'' \times 2'-3'' \rightarrow 1' \times 0.0156' \times 2.25' = 0.0702\ ft^3$

$= 0.3418\ ft^3 @ \frac{0.49\ k}{ft^3} = \boxed{0.1675\ k}$

Calculations for 1/8 US Grid

L4L5 SPAN 5-7 LOWER CHORD

WT OF MEMBER	= 0.8477 K
GUSSETS	= 0.6681 K
LACING	= 0.1786 K
RIVETS	= 0.180 K
SPLICE	= 0.1675 K
	2.0619 K

$$\text{BUMP UP} = \frac{2.0619\ K}{0.8477\ K} = \boxed{2.373}$$

Calculations for 1/8 US Grid

x1

11 Lac Bars sp 3/3

9 Lac Bars sp 3/3

1-R ah 3/3

1-R 16⅝ x 1⅛ ah 3/3

11 A.H. Spcs @ 6 1/16 = 6'-1 1/16

9 A.H. Spcs @ 6 1/16 = 5'-0 1/16

NW-CW-SW 1'-9 15/32

NE-CE-SE 1'-10 29/32

NW-CW-SW 1'-9 15/32

NE-CE-SE 1'-10 29/32

NW-CW-SW 1'-9 7/16

NE-CE-SE 1'-10 1/16

NW-CW-SW 1'-9 7/16

NE-CE-SE 1'-10 1/16

x1

1-Gus PL 47½ x ⅞ x 1'-3
14 L.L. In to In Gus. Rs

Near Side SW
Far Side NW
Far Side CW-CE SW
Near Side NW-CW

Rivets in Sw. & N. Sides
Rivets in Far Side CW-NW

2-Fills 12 3/16 x 1'-3 1/16

2-Sgl. Pl. 13 1/16 x 2'-11 1/16

Rivets in Far Side SE & CE
Rivets in NE Both Sides

2-Fills 12 1/16 x 2'-5 SW

MAIN MAT'L. NW-CW-SW

2-15"ⓑ @ 40 x 2'-1 4/16 M-2-E

2-PB 12 x ⅞ x 11'-9 15/16 - M-1-E (L5-L6)

2 Fills 15 4/16 x 3'-3 9/16 - eq E

2 Fills 12 4/16 x 2'-9 1/16 adj E Mill

1-14 In to In Gus. Rs

2-Gus PB 46 ½ x ⅞ x 1'-1-ab

11 A.H. @ 3 3/16 = 3'-1 13/16

4 A.H. @ 3 = 1'-0

8 A.H. @ 4 4/16 = 2'-10

11 A.H. @ 3 3/16 = 3'-1 13/16

(10'-7 3/16 + 1/16) = 10'-7 4/16

4 03-1'-0

8 3/16

Tack Rivets

W.P.

TACK WELD FOR SHIPMT

1-L 4 x 3 1/2 x 3'-2 1/4

1-R 16⅝ x 3'-2 1/4

aw - CW-SW

bw - NE-CE

CW-SW

NE-CE

L4 Truss NW-CW

CE-SE

W.P.

SECTION BB

TEE aw - SE-CE

TEE bw - NW-CW

x1

WEB VIEW FOR NW-CW-SW

22 5/16

49" - 15" = 34"

~3"

34"

1-Gus PL 47½ x ⅞ x 1'-3
14 L.L. In to In Gus. Rs

Near Side NE
Far Side SE
Far Side CE-NE
Near Side SE-CE

MAIN MATL. NE-CE-SE

2-15"ⓑ @ 40 x 2'-1 5/16 M-2-E

2-PB 12 x ⅞ x 11'-10 3/16 M-1-E (L5-L6)

2-Gus PB 46 ½ x ⅞ x 1'-1 6/16
14 L.L. In to In Gus. Rs

2-Fills 15 6/16 x 3'-3 9/16 adj E

2-Fills 12 4/16 x 2'-9 1/16 adj E

Mill

W.P.

Tack Rivets

4 A.H. @ 3 = 1'-0

8 A.H. @ 4 4/16 = 2'-10

12 A.H. @ 4 = 4'-0

(10'-8 9/16 + 1/16) = 10'-8 10/16

4 03-1'-0

8 3/16

1-Lac Bar 2½ x ⅜ x 1'-1½ c.c. holes - bh

1-Lac Bar 2½ x ⅜ x 10⅜ c.c. holes as 5'-3 NW-CW-SW

WEB VIEW FOR NE-CE-SE

x1

25

L4

L5

L6

1-R 16⅝ x 1'-1 6/16 am 3/3

1-Lac Bar bh - NE-CE-SE

1-Lac Bar as 5'-3 - NW-CW-SW

Bolt This Bar Back For Shipmt

Bend

1-R 16⅝ x 1'-1½ nat

Bend Line

A L

A

16 Alt. Spcs @ 6 1/16 = 8'-11

16 Lac Bars 2½ x ⅜ x 1'-1½ c.c. holes - ap 3/3

16 Lac Bars ap 3/3

16 A.H. Spcs @ 6 1/16 = 8'-11

5/16 NW-CW-SW

6/16 NE-CE-SE

5/16 NW-CW-SW

6/16 NE-CE-SE

VIEW AA

Shop must maintain clear distance between gussets and chords and cut to fit of web members as noted to insure ease in assembling.

GENERAL NOTES:-

RIVETS:- ⅝"ⓟ

OPEN HOLES:- 15/16"ⓟ

MATERIAL:- Carbon steel A.S.T.M. A7-34 with .2% copper content, except were noted.

REAMING:- All holes may be punched full size except:
(a) All holes marked ST are to be subpunched 1/8" small and reamed to size w/a metal template.
(b) Field connections of trusses shall be subpunched and reamed after trusses assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.

SHEARED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on details.

FLAME CUT EDGES of main material shall be planed, shipped on ground and present a smooth workmanlike appearance.

PAINT:- One coat of RED LEAD except where noted. Shop contact surfaces not painted.

Denotes break in stagger.

REQUIRED LIST

No. Reqd.	Mark	Description	Remarks
1	14-LNW	Bottom Chord	
1	14-LCW	do	do
1	14-LSW	do	do
1	14-LNE	do	do
1	14-LCE	do	do
1	14-LSE	do	do

BOTTOM CHORDS 14-L6 SPANS 5-7 & 10-12

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WORKS

DETAILED STEEL CONTRACT
FABRICATED STEEL CONTRACT

Drawings as Checked & Corrected as Noted

IN CHARGE: BARN. MADE BY: J.R.M.
CHECKED BY: T.J.S. 7/15/37 TRACED BY: G.A.W. 1-21-37
REVISED: MADE BY:
F.C. TO C 3-5-37
WORK UNIT CC 25873

SHOP NO. 2

3/3

15-8-52

TranSystems

Made By: KMW Date: 2/27/09 Job No: HAM 471-0025

Checked By: CJM Date: 3/17/09 Sheet No. 1/4

L5L6 DEAD LOAD CALCS SPANS 5-7

WT OF MEMBER A: 30.9000 IN² L = 10'-7¾" or 10.6458'

$10.6458' \times \frac{30.9000\ in^2}{144\ in^2} \times \frac{0.490\ K}{ft^3} = \boxed{1.1194\ K}$

GUSSETS L5 = USE [L4L5] CALCS

L5 = 0.2700 K

L6 = A = (54½" x 7/16" x 6'-6") - CLIPS

A = (4.5417' x 0.0365' x 6.5') - (½[16" x 7/16" x 46"]) - (½[26" x 7/16" x 36"])

A = (1.0775 ft³) - (½[1.3333' x 0.0365' x 3.8333']) - (½[2.1667' x 0.0365' x 3'])

A = (1.0775 ft³) - (0.0933) - (0.1186)

A = 0.8656 ft³

L6 WT = $0.8656\ ft^3 \times \frac{0.49\ K}{ft^3} = \boxed{0.4241\ K}$

TOT = 0.6941 K

LACING SAME BAR SIZES AS [L4L5]

25 BARS @ 0.003588 K/BAR = 0.0897 K

BATTEN PL. SAME AS [L4L5]

= 0.0817 K

TOT = 0.1714 K

RIVETS ASSUME 0.8 #/RIVET

330 RIVETS @ 0.8 #/RIVET = 264 # @ $\frac{1\ K}{1000\ \#}$ = 0.2640 K

SPLICE 4 PLs → 2 am or ap, 2 ah or ak * ONLY CALC FOR 1 OF EACH PL TYPE. DO THE SAME FOR L6L7 TO SPLIT THE SPLICE BTWN THE TWO.

ap = (17¼" x 7/16" x 3'-2½")

= (1.4375' x 0.0365' x 3.1875')

= 0.1673 ft³ @ $\frac{0.49\ K}{ft^3}$ = 0.0820 K

ah = (14¼" x ¾" x 4'-8¼")

= (1.1875' x 0.0625' x 4.6875')

= 0.3479 ft³ @ $\frac{0.49\ K}{ft^3}$ = 0.1705 K

TOT = 0.2525 K

Calculations for 1/8 US Grid

L5L6 DEAD LOAD CALC. SPANS 5-7

UT OF MEMBER	= 1.1194 K
GUSSETS	= 0.6941 K
LACING/BATTEN	= 0.1714 K
RIVETS	= 0.2040 K
SPLICE	= 0.2525 K
	2.5014 K

$$\text{Bump Up} = \frac{2.5014\ \text{K}}{1.1194\ \text{K}} = \boxed{2.2346}$$

Calculations for 1/8 US Grid

3/4

11 Lac Bars ap 313

9 Lac Bars ap 313

25

1-R ab 313

1-R 16⅝ x 1/2 ab 313

11 AH Spcs @ 6 11/16 = 6'-9 7/16

7 AH Spcs @ 6 11/16 = 5'-0 1/16

NW-CW-SW 1'-9 11/32

NE-CE-SE 1'-10 23/32

NW-CW-SW 1'-9 7/16

NE-CE-SE 1'-10 1/16

NW-CW-SW 1'-9 7/8

NE-CE-SE 1'-10 1/4

TACK WELD FOR SHIPM'T

L-L' 4 x 4 x 3/8 x 3'-2 1/4 av NE-CE

1-R 12 1/8 x 3'-2 1/4 aw CW-SW

bz NE-CE

CW-SW

NE-CE

L6 Truss NW-CW

CE-SE

W.P.

Tack Rivets

SECTION BB

L'-L' 4 x 4 x 3/8 x 3'-2 1/4 av NE-CE

1-R 12 1/8 x 3'-2 1/4 bz NW-CW

MAIN MAT'L. NW-CW-SW

2-15"B @ 40 x 21'-4 1/2 M-2-E

2-Pls 12 x 7/8 x 11'-9 1/2 - M-1-E (L5-L6)

2 Fills 15 x 1/2 x 3'-3 1/2 aq E

2 Fills 12 1/2 x 1/2 x 2'-9 1/2 aq E Mill

11 AH @ 4'-0 3/4

1-Gus R 47 1/2 x 1/2 x 1'-3 1/4 x 4'-1 in to in Gus Pls

{ Near Side SW, Far Side NW, Far Side CW & SW, Near Side NW & CW }

1-Gus R 47 1/2 x 1/2 x 1'-3 1/4 x 4'-1 in to in Gus Pls

{ Near Side NE, Far Side SE, Far Side CE-NE, Near Side SE-CE }

Rivets in SW-NW Sides

Rivets in Far Side CW-NW

Rivets in Far Side SE & CE Sides

Rivets in NE-NW Sides

2 Fills 12 3/4 x 1/2 x 2'-3 W

2 Fills 12 3/4 x 1/2 x 1'-8 3/4 E

2-Sel Rs 13 1/4 x 2 1/2 x 1'-11 3/4 d

WEB VIEW FOR NW-CW-SW

MAIN MAT'L. NE-CE-SE

2-15"B @ 40 x 21'-5 3/8 M-2-E

2-Pls 12 x 7/8 x 11'-10 3/8 - M-1-E (L5-L6)

216

49 x 2

98

20

12

32

2-Fills 15 x 1/2 x 3'-3 1/2 aq E

2-Fills 12 1/2 x 2'-5 1/2 ac E

2-Gus R 46 1/2 x 7/8 x 4'-1 bf

11 AH @ 4'-0 = 44'-0

WEB VIEW FOR NE-CE-SE

L4

L5

L6

1-Lac Bar 2 1/2 x 3/8 x 1'-11 1/2 c-c holes - bb

1-Lac Bar 2 1/2 x 3/8 x 10'-8 c-c holes as 313 NW-CW-SW

1-R 16 3/8 x 1/2 x 4'-0 1/2 - ak

Bend

Bend Line

16 Alt. Spcs @ 6 11/16 = 8'-11

16 Lac Bars 2 1/2 x 3/8 x 1'-11 1/2 c-c holes - ap 313

16 AH Spcs @ 6 11/16 = 8'-11

1-Lac Bar - bb - NE-CE-SE

1-Lac Bar as 313 - NW-CW-SW

Bolt This Bar Back For Ship'm't

26

NW-CW-SW

NE-CE-SE

VIEW AA

Shop must minimize clear distance between gussets and chords and set to get of web members as noted to insure ease in assembling.

GENERAL NOTE:-

RIVETS:- 15/16

OPEN HOLES:- 15/16

MATERIAL:- Carbon steel A.S.T.M. A7-34 with .2% copper content, except were noted.

REAMING:- All holes may be punched full size except:-

(a) All holes marked RT are to be subpunched 1/8" small and reamed to strg'r to a metal templet.

(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.

(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.

(d) Holes in main material over 3/4" thick shall be drilled from the solid.

SHEARED EDGES of main material over 5/8" thick, shall be planed to a depth of 1/4" where noted on details.

FLAME CUT EDGES of main material shall be planed, shipped on ground and present a smooth workmanlike appearance.

PAINT:- One coat of RED LEAD except where noted. Shop contact surfaces not painted.

Denotes break in stagger.

REQUIRED LIST

No. Req'd	Mark	Description	Remarks
1	L4-L6 NW	Bottom Chord	
1	L4-L6 CW	do do	
1	L4-L6 SW	do do	
1	L4-L6 NE	do do	
1	L4-L6 CE	do do	
1	L4-L6 SE	do do	

BOTTOM CHORDS L4-L6 SPANS 5-7 & 10-12

COLUMBIA AVE. VIADUCT

CINCINNATI, OHIO

CITY OF CINTI. - DEPT. PUBLIC WORKS

DESIGNED BY J.R.M. MADE BY J.R.M.

CHECKED BY T.J.S. 2/15/57 TRACED BY G.A.W. 1-21-57

REVISED FC-TRC 3-5-57

CONTRACT NO. CC 25873

313

15-8-52

4/4

4 stiffs

2 ak/loop
2 ak/ah

1/16" = 1'-0"

3/16" = 1'-0"

WEB VIEW FOR NW-CW-SW

WEB VIEW FOR NE-CE-SE

SECTION A-A

ASSEMBLE THIS END TO 1'-4 1/2" MARK

TACK WELD FOR SHIPM'T

BOLT

TACK RIVETS

TACK RIVETS IN MAIN MAT'L ONLY

MAIN MAT'L NW-CW-SW

2-15" ⌶ @ 50" x 20-11 3/8". M-2-E

2-PLS 15 x 1/2 x 20-11 3/8". M-2-E (U.M.)

2-PLS 12 x 1/2 x 11-3 7/16". M-1-E (U.M.) (L7-L8)

MAIN MAT'L NE-CE-SE

2-15" ⌶ @ 50" x 21-2 11/16" - M-2-E

2-PLS 15 x 1/2 x 21-2 11/16" - M-2-E (U.M.)

2-PLS 12 x 1/2 x 11-5 - M-1-E (U.M.) (L7-L8)

GENERAL NOTES:

RIVETS:- 7/8"

OPEN HOLES:- 1/16"

MATERIAL:- Carbon steel A.S.T.M. A7-36 with .12% copper content, except were noted.

PUNCHING:- All holes may be punched full size except:-

(a) All holes, carried AT, are to be subpunched 1/8" small and reamed to size to a metal template.

(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.

(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.

(d) Holes in main material over 3/4" thick shall be drilled from the solid.

SHEARED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on details.

PLANE OUT EDGES of main material shall be planed chipped or ground and present a smooth workmanlike appearance.

PAINT:- One coat of RED LEAD except where noted. Shop contact surfaces not painted.

Denotes break in stagger.

REQUIRED LIST

No Req'd	MARK	DESCRIPTION	REMARKS
1	L6-L8 NW	Bottom Chord	
1	L6-L8 CW	D. D.	
1	L6-L8 SW	D. D.	
1	L6-L8 NE	D. D.	
1	L6-L8 CE	D. D.	
1	L6-L8 SE	D. D.	

BOTTOM CHORD L6-L8 SPAN 5-7 @ 10-12

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. DEPT. PUBLIC WORKS
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings of Steel for Fabrication
IN CHARGE Beech DRAWN BY DEH
CHECKED BY T.S.S. 12/12/37 TRACED BY N.A.P. 12/31/37
FC: TSC 3-531
CONTRACT CC25873
314

Shop must maintain clear distance between gussets and sheets and cut to suit web members as noted to insure ends to assemble.

SHOP MK 2

15-8-53

TranSystems

Made By: KMW Date: 2/27/09 Job No: HAM 471-0025

Checked By: CJM Date: 3/24/09 Sheet No. 1 / 2

[L6L7] DEAD LOAD CALCS SPAN 5-7

WT OF MEMBER $A = 44.2904\ in^2$ $L = 10'-8\ 13/16"$ OR $10.7344'$

$$10.7344' \times \frac{44.2904\ in^2}{144\ in^2}\ ft^2 \times \frac{0.49\ K}{ft^3} = \boxed{1.6178\ K}$$

GUSSETS L6 = FROM [L5L6] = 0.4241 K

L7 = (40½" x ½" x 4'-3½") − ½(36" x 8" x ½")

= (3.375' x 0.0417' x 4.2917') − ½(3' x 0.6667' x 0.0417')

= (0.6040 ft³) − 0.0417 ft³

L7 = 0.5623 ft³ @ $\frac{0.49\ K}{ft^3}$ = 0.2756 K

TOT = 0.6996 K

LACING SLIGHTLY SMALLER THAN [L4L5] BARS, JUST USE THAT BAR WT.

EACH BAR = 0.003588 K

30 BARS @ 0.003588 K/BAR = 0.1076 K

BATTEN PL SAME AS [L5 L6]

= 0.0817 K

TOT = 0.1893

RIVETS ASSUME 0.8#/RIVET

549 300 RIVETS @ 0.8#/RIVET = 240 # @ $\frac{1\ K}{1000\ \#}$ = 0.240 K

SPLICE SAME AS [L5L6] = 0.2525 K

WT OF MEMBER	=	1.6178 K
GUSSETS	=	0.6996 K
LACING/BATTEN	=	0.1893 K
RIVETS	=	0.2400 K
SPLICE	=	0.2525 K
		2.9992

BUMP UP = $\frac{2.9992\ K}{1.6178\ K}$ = 1.85

Calculations for 1/8 US Grid

4 #8's

2 Am loop
2 ak/ah

28

1/10 = 4(2½)
5/16 = 4

WEB VIEW FOR NW-CW-SW

WEB VIEW FOR NE-CE-SE

SECTION AA

Assemble This End To 1+8

Main Matl. NW-CW-SW

2-15" [@ 50# x 20-11⅜ M-2-E
2-Pls 15 x ½ x 20-11⅜ M-2-E (UM)
2-Pls 12 x ½ x 11-3⅜ M-1-E (UM) (L7-L8)

Main Matl. NE-CE-SE

2-15" [@ 50# x 21-2½ M-2-E
2-Pls 15 x ½ x 21-2½ M-2-E (UM)
2-Pls 12 x ½ x 11-5 M-1-E (UM) (L7-L8)

Tack Rivets In Main Matl Only

Tack Rivets

Tack Weld For Shipm't

RT13

24 Alt Spcs @ 2'-6"

12 Alt Spcs @ 6'-6"

18 Alt Spcs @ 6'-9"

Bolt

Shop must maintain clear distance between gussets and chords and cut to out of web clearance as noted to insure ease in assembling.

General Notes:
Rivets:
Open Holes:
Material: Carbon steel A.S.T.M. A7-36 with .12% copper content, except were noted. All holes may be punched full size except:
(a) All holes marked RT-ream to be subpunched 1/8" small and reamed to size to a metal template.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 5/8" thick shall be drilled from the solid.
Sheared Edges of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on details.
Flame Cut Edges of main material shall be planed chipped or ground and present a smooth workmanlike appearance.
Paint: One coat of RED LEAD except where noted. Shop contact surfaces not painted.
Denotes break in stagger.

Required List

No. Req'd	Mark	Description	Remarks
1	L6-L8 NW	Bottom Chord	
1	L6-L8 CW	D. D.	
1	L6-L8 SW	D. D.	
1	L6-L8 NE	D. D.	
1	L6-L8 CE	D. D.	
1	L6-L8 SE	D. D.	

Bottom Chord L6-L8 Span 5-7 & 10-12

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WORKS
BETHLEHEM STEEL CORPORATION
FABRICATED STEEL CONSTRUCTION
Drawings of Steel for Fabrication of
DRAWN BY Pearl NAME OF JOB 9811
CHECKED BY T.J.S. 11-15-37 TRACED BY M.A.P. 12-21-37
CHECKED BY FC: TBC 3-5-37 DATE OF ALTERATION
CHECKED BY CC 2587.3

Sheet No. 2

314

15-8-53

L7L8 DEAD LOAD CALCS SPAN 5-7

WT OF MEMBER A: 56.2904 in² L = 10'-8 3/16" OR 10.7344'

$10.7344' \times \frac{56.2904\ in^2}{144\ in^2}\ ft^2 \times \frac{0.490\ K}{ft^3} = \boxed{2.0561K}$

GUSSETS L7 = USE [L6L7] CALCS = 0.2755K

L8 = TAKE ONLY HALF AT L8

½ OF L8 = ½(52' x 3/4" x 10'-0 1/4") − CLIPS (SEE SHT ATTACHED)

= ½(4.3333' x 0.0625' x 10.0208') − ½(4.3333' x 0.0625' x 0.75') − ½(4.3333' x 0.0625' x 2.375')

= (1.3570 ft³) − (0.1016 ft³) − (0.3216 ft³)

½ L8 = 0.9338 ft³ @ $\frac{0.491K}{ft^3}$ = 0.4576K x 2 PLS = 0.9152K

TOT = 1.1907K

LACING BARS 5" x 3/8" x 1'-5 5/16" EACH

= 0.4167' x 0.0313' x 1.4427'

BAR = 0.0188 ft³ @ $\frac{0.491K}{ft^3}$ = 0.0092 K/BAR

13 BARS @ 0.0092 K/BAR = 0.1196 K

BATTEN PL SIMILAR TO [L6L7]

= 0.0817K

TOT: 0.2013K

RIVETS ASSUME 0.8#/RIVET

370 RIV. @ 0.8#/RIVETS = 296 @ $\frac{1K}{1000\#}$ = 0.2960K

BRACING XS 2 XS @ 3½" x 3" x 5/16" x 4'-3 1/4" (4.2708') → 6.65 #/ft

2 x 4.2708' x 6.65 #/ft = 56.8021# @ $\frac{1K}{1000\#}$ = 0.0568K

PIN PLS 1 PL @ 18 1/2" x 3/8" x 3'-3"

*1 PL EACH SIDE (NEAR/FAR) CALC 1 FOR L7L8, 1 FOR L8L9.

= 1.5208' x 0.0313 x 3.25'

= 0.1547 ft³ @ $\frac{0.491K}{ft^3}$ = 0.0758 K

TOT = 0.1326K

Calculations for 1/8 US Grid

L7L8

WT OF MEMBER	= 2.0561	
GUSSETS	= 1.1907	
LACING/BATTEN	= 0.2013	
RIVETS	= 0.2960	BUMP UP $\frac{3.8767\ K}{2.0561\ K} = \boxed{1.89}$
MISC. K_S + R_S	= 0.1326	
	3.8767 K	

4 EQ R's

2 Am loop
2 ak/ah

WEB VIEW FOR NW-CW-SW

WEB VIEW FOR NE-CE-SE

SECTION A-A

ASSEMBLE THIS END TO 4'-8 1/2"

TACK WELD FOR SHIPM'T

TACK RIVETS

MAIN MAT'L NW-CW-SW

2-15" [s @ 50" x 20-11 3/8" - M-2-E
2-PLs 15 x 1/2 x 20-11 3/8" - M-2-E (UM)
2-PLs 12 x 1/2 x 11-3 7/16" - M-1-E (UM) (L7-L8)

MAIN MAT'L NE-CE-SE

2-15" [s @ 30" x 21-2 11/16" - M-2-E
2 PLs 15 x 1/2 x 21-2 11/16" - M-2-E (UM)
2 PLs 12 x 1/2 x 11-3 5/16" - M-1-E (UM) (L7-L8)

296 THIS PS

39
40
79
2
158

GENERAL NOTES:-
RIVETS:- 7/8"ø
OPEN HOLES:-
MATERIAL:- Carbon steel A.S.T.M. A7-36 with .2% copper content, except were noted.
REAMING:- All holes may be punched full size except:
(a) All holes marked R are to be subpunched 1/8" small and reamed to size to a metal template.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.
SHEARED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on details.
FLAME CUT EDGES of main material shall be planed chipped or ground and present a smooth workmanlike appearance.
PAINT:- One coat of RED LEAD except where noted. Shop contact surfaces not painted.
Denotes break in stagger.

REQUIRED LIST

No Req'd	MARK	DESCRIPTION	REMARKS
1	L6-L8 NW	Bottom Chord	
1	L6-L8 CW	D. D.	
1	L6-L8 SW	D. D.	
1	L6-L8 NE	D. D.	
1	L6-L8 CE	D. D.	
1	L6-L8 SE	D. D.	

Bottom chord L6-L8 Span c. to c. 10-10

Shop must maintain clear distance between gussets and chords and cut to out of web members as noted to insure same in assembling.

COLUMBIA AVE VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WORKS
BETHLEHEM STEEL CORPORATION
FABRICATED STEEL CONSTRUCTION
Shop drawings approved for fabrication
In charge of Board ... Date ... By ...
Checked by T.J.S. 1/5/37 Traced by E.A.P. 12-9-37
Approved ...
For C. & C. J-3-37
Contract No. CC25873

314

15-8-53

4/4

U8

BACK FLANGE

TACK RIVETS

POST L8-U8-SW
" L8-U8-CW
" L8-U8-NW

POST L8-U8-NE
" L8-U8-CE
" L8-U8-SE

DETAIL A

SECT. B-B

LAT. RATE LP5

SECT. C-C

LAT. RATE LP6

REQUIRED LIST			
No.	DESCRIPTION	MARK	REMARK
1	POST	L8-U8-NW	
1	"	L8-U8-CW	
1	"	L8-U8-SW	
1	"	L8-U8-NE	
1	"	L8-U8-CE	
1	"	L8-U8-SE	
4	LAT RATE	LP5	
4	" "	LP6	

GENERAL NOTES:-
RIVETS:- 7/8-P
OPEN HOLES:- 13/16-P
MATERIAL:- Carbon steel A.S.T.M. A7-36 with .2% copper content, except were noted.
REAMING:- All holes may be punched full size except:
(a) All holes marked RT are to be subpunched 1/8" small and reamed to size to a metal template.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size:
(d) Holes in main material over 3/4" thick shall be drilled from the solid.
BEVELED EDGES of main material over 1/8" thick shall be planed to a depth of 1/4" where noted on details.
FLAME CUT EDGES of main material shall be planed chipped or ground and present a smooth workmanlike appearance.
PAINT:- One coat of RED LEAD except where noted. Shop contact surfaces not painted.
Denotes break in stagger.

Shop must maintain clear distance between gussets and chords and cut to cut of web members as added to insure ease in assembling.

POSTS L8-U8 PIERS 6&11-(SPANS 5-7 & 10-12)

COLUMBIA AVE VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WORKS
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Hamilton-Fabrication
DETAILED BY Penn MADE BY G.S.
CHECKED BY T.I.S. 2/19/37 TURNED BY NOR 2-25-37
REVISED FC. JAC 3-5-37 LAST ASSEMBLY 1 of
CONTRACT NO. C.C. 5878 322

15-8-65

L8L9 DEAD LOAD CALCS SPAN 5-7

WT OF MEMBER

A = 56.2904 L = 10'-9 3/16"
10.7865'

$10.7865' \times \frac{56.2904\ in^2}{144\ in^2}\ ft^2 \times \frac{0.49\ K}{ft^3} = 2.0661\ K$

GUSSETS

L8 = USE [L7L8] CALCS = 0.9152 K

L9 = PL = 52 3/4" x 1/2" x 5'-3 1/4" - (SAY 5% FOR CLIPS)

= 4.3958' x 0.0417' x 5.2917' - (5%)

= 0.9700 ft³ - (5%)

= 0.9215 ft³ @ $\frac{0.49\ K}{ft^3}$ = 0.4515 K

TOT = 1.3667 K

LACING / BATTEN → SAY SAME AS [L7L8]

TOT = 0.2013 K

RIVETS

SAY SAME AS [L7L8]

TOT = 0.2960 K

MISC. X's / R's

SAME AS [L7L8]

TOT = 0.1326 K

WT OF MEMBER	=	2.0661 K
GUSSETS	=	1.3667 K
LACING / BATTEN	=	0.2013 K
RIVETS	=	0.2960 K
MISC. X's / R's	=	0.1326 K
		4.0627 K

BUMP UP = $\frac{4.0627\ K}{2.0661}$ = 1.97

Calculations for 1/8 US Grid

2/3

U8

Post L8-U8-SW
" L8-U8-CW
" L8-U8-NW

Post L8-U8-NE
" L8-U8-CE
" L8-U8-SE

REQUIRED LIST			
No.	DESCRIPTION	MARK	REMARK
1	Post	L8-U8-NW	
1	"	L8-U8-CW	
1	"	L8-U8-SW	
1	"	L8-U8-NE	
1	"	L8-U8-CE	
1	"	L8-U8-SE	
4	LAT PLATE	L P5	
4	" "	L P6	

GENERAL NOTES:-
RIVETS:- B.P.
OPEN HOLES:- P.E.
MATERIAL:- Carbon steel A.S.T.M. A7-36 with .2% copper content, except were noted.
REAMING:- All holes may be punched full size except:
(a) All holes marked RT are to be subpunched 1/8" small and reamed to size to a metal template.
(b) Field connections of members shall be subpunched and reamed after truck is assembled.
(c). Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.
BEVELED EDGES of main material over 5/8" thick shall be planed to a depth of 1/2" where noted on details.
FLAME CUT EDGES of main material shall be planed chipped or ground and present a smooth workmanlike appearance.
PAINT:- One coat of RED LEAD except where noted. Shop contact surfaces not painted.
RT:- Denotes break in stagger.

Posts L8-U8 Piers 6&11 (Spans 5-7 & 10-12)

COLUMBIA AVE VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WORKS
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Hanlon-Fabrication at
DETAILED BY: Parker READ BY: C.S.
CHECKED BY: T.S. 2-18-37 TRACED BY: NOR 2-19-37
REVISED: FC-TDC 3-25-37 LAST REVISED: of
CONTRACT NO. CC 25878 DRWG. 382

Shoes must maintain clear distance between gussets and chords and not to cut of web members as noted to insure ease in assembling!

15-8-65

SAY 5% FOR CLIPS

MAIN MAT'L
2-15"ø 50 x 21'-0 3/4 M2E
2 Pls. 15 x 1/2 x 21'-0 3/4 M2E - OUTSIDE
2 Pls. 12 x 1/2 x 11'-11 - M1E - INSIDE (L8-L9)

2 Pls. - 52 3/4 x 1/2 x 5'-3 1/2 - b
(1'-6 1/2 in to in Guss. Pls.)

MAIN MAT'L.
2-15"ø 50 x 20'-10 1/32 - M2E
2 Pls. - 15 x 1/2 x 20'-10 1/32 - M2E Outside
2 Pls. - 12 x 1/2 x 11'-9 - M1E Inside (L8-L9)

2 Pls. - 52 3/4 x 1/2 x 5'-2 3/4 - a
(1'-6 1/2 in to in Guss. Pls.)

WEB VIEW - FOR NE-CE-SE

FOR NW-CW-SW
WEB VIEW

FOR NW-CW-SW
FOR NE-CE-SE

FOR NW-CW-SW
FOR NE-CE-SE

FOR NW-CW-SW
FOR NE-CE-SE

Tack Rivets

MILL

RT 13

L8

L9

L10

88°06'20"

91°53'40"

GENERAL NOTES:

Required List			
Nº	Description	Mark	Remarks
1	Bottom Chord	L8L10NW	
1		L8L10CW	
1		L8L10SW	
1		L8L10NE	
1		L8L10CE	
1		L8L10SE	

BOTTOM CHORDS L8-L10 SPANS 5-T-6 (D-15)

COLUMBIA AVE VIADUCT
CINCINNATI, OHIO
CITY OF CINTI., DEPT. PUBLIC WORKS

DESIGNED - BEN — TBC 1-12-37
DETAILED - T.A.S. — MDP. 1-16-37
CHECKED - TBC 2-5-37 — CC 25873 — 315

15-8-54

TranSystems

Made By: KMW Date: 2/27/09 Job No: HAM 471-0025

Checked By: CJM Date: 3/24/09 Sheet No. 1/3

L9L10 DEAD LOAD CALCS SPAN 5-7

WT OF MEMBER

$A = 44.2904\ in^2$ $L = 10' - 9\frac{3}{16}'' = 10.7865'$

$$10.7865' \times \frac{44.2904\ in^2}{144\ in^2}\ ft^2 \times \frac{0.49\ K}{ft^3} = \boxed{1.6256\ K}$$

GUSSETS

L9 USE [L8L9] = 0.4515 K

L10: A = 63" x ½" x 6'-9½" − CLIPS

= 5.25' x 0.0417' x 6.7917' − ½(4' x 3' x 0.0417') − ½(0.25' x 2.7917' x 0.0417')

= 1.4869 ft³ − (0.2502 ft³) − (0.0146 ft³)

VOLUME = 1.2221 ft³ @ $\frac{0.49\ K}{ft^3}$ = 0.5988 K

TOT = 1.0503 K

LACING BARS SIMILAR TO THOSE IN [L4L5]

= 0.003588 K/BAR

27 BARS @ 0.003588 K/BAR = 0.0969 K

BATTEN PL SAY SAME AS [L3L4] 0.0817 K

TOT = 0.1786 K

RIVETS ASSUME 0.8#/RIVET

SAY 400 RIVETS @ 0.8#/RIVET = 320 # @ $\frac{1\ K}{1000\#}$ = 0.3200 K

MISC ∠'S / PLS L10 ONLY

1 PL @ 15" x ¾" x 5'-2"	1.25' x 0.0625' x 5.1667' =	0.4036 ft³
1 PL @ 15" x ⅜" x 3'-1½"	1.25' x 0.0313' x 3.125' =	0.1223 ft³
1 PL @ 3" x ⅜" x 11¾"	0.25' x 0.0313' x 0.9792' =	0.0077 ft³
1 PL @ 6" x ⅜" x 1'-7½"	0.5' x 0.0313' x 1.625' =	0.0254 ft³
		0.559 ft³

@ $\frac{.49\ K}{ft^3}$ = 0.2739 K

WT OF MEMBER	= 1.6256 K
GUSSETS	= 1.0503 K
LACING/BATTEN	= 0.1786 K
RIVETS	= 0.3200 K
MISC. ∠'S / PL'S	= 0.2739 K
	3.4484 K

BUMP UP = $\frac{3.4484\ K}{1.6256\ K}$ = 2.12

Calculations for 1/8 US Grid

ASSEMBLE THIS END TO 1-4 3/8

FOR NW-CW-SW
FOR NE-CE-SE

MAIN MAT'L
2-15" ℄ 50 x 21'-0 3/4 M2E
2 PLS. 15 x 1/2 x 21'-0 3/4 M2E - OUTSIDE
2 PLS. 12 x 1/2 x 11'-11 - M1E - INSIDE (L8 - L9)

2 PLS. 52 3/4 x 1/2 x 5'-3 1/4 - b
(1'-6 1/2 IN TO IN GUSS. PLS.)

SAY 5% FOR CLIPS

11 Bars 2 1/2 x 3/8 x 1'-0 1/2 c.c. hats. a m315 @ 315

1 PL 16 x 3/8 x 1'-3 - a g315

5 Bars 5 x 3/4 x 1'-5 15/16 af 315

1 PL 16 x 3/8 x 1'-11 - a h315

MILL

Tack Rivets

88°06'20"

71°53'40"

SECT BB

L8 RT13

L9

L10

FOR NW-CW-SW
WEB VIEW

MAIN MAT'L.
2-15" ℄ 50 x 20'-10 1/32 - M2E
2 PLS. 15 x 1/2 x 20'-10 1/32 - M2E Outside
2 PLS. 12 x 1/2 x 11'-9 - M1E Inside (L8 - L9)

2 PLS. 52 3/4 x 1/2 x 5'-2 3/8 - a
(1'-6 1/2 IN TO IN GUSS. PLS.)

WEB VIEW - FOR NE-CE-SE

1 PL 16 x 3/8 x 1'-11 - a h315

7 Bars af 315

16 Bars am 315

(1 Bar 2 1/2 x 3/8 x 1'-0 1/2 c.c. holes - a basis for NW-CW-SW)
(1 Bar 2 1/2 x 3/8 x 11 1/8 c.c. holes bar for NE-CE-SE)

Cut This Bar Back For Shim 't

Shim must maintain clear distance between gussets and chords and cut to out of web members as noted to insure room in assembling.

GENERAL NOTES:
RIVETS - 7/8"ø
OVER HOLES - 1/16"ø
MATERIAL:- Carbon steel A.S.T.M. A7-36 with .25 copper content, except where noted.
DRAWING:- All holes may be punched full size except:
(a) All holes marked RT are to be subpunched 1/8" small and reamed to size - a total template.
(b) Holes in connections of trusses shall be subpunched and reamed after trusses are built.
(c) Holes in main material over 3/4" thick shall be subpunched 1/8" small and reamed to size.
(d) All holes in main material over 3/4" thick shall be drilled from the solid.
BEARING EDGES:- Main material shall be planed to a depth of 1/4" where noted on this table.
PLATE GIRDER EDGES:- All main material shall be planed, milled or ground and present a square and smooth edge.
PAINT:- One coat of red lead except where noted. Top contact surfaces not painted.
WELDING:- Welded from an elevator.

REQUIRED LIST

No	DESCRIPTION	MARK	REMARKS
1	BOTTOM CHORD	L8L10NW	
1		L8L10CW	
1		L8L10SW	
1		L8L10NE	
1		L8L10CE	
1		L8L10SE	

BOTTOM CHORDS L8 - L10 SPANS 5-7 & 10-12

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. DEPT. PUBLIC WORKS

SHEN TBC 1-12-37
T.J.S. 2/13/37 NDP 1-18-37
PC TBC 3537 CC 25873 315

15-8-54

SECT AA

FOR NE-CE-SE

FOR PARTS TO RIGHT OF LINE YY SEE SHEET 316

FOR NW-CW-SW

FOR PARTS TO RIGHT OF LINE XX SEE SHEET 316

L10

L10 L11

MILL

2°27'25"

2°25'55"

= TAKE 1 OF EACH FOR A.G

16 Allt. @ 2'-3"-0

12 Allt. @ 2'-3"

Tack Rivets in Main Mat'l & Fills at L only

2 Fills 12"×⅝"×4'-1½" at L MIE

Shop Rivets N.S. of NW & CW

Shop Rivets N.S. of SW & FS for All

Tack Weld for Shipping

Rivets W/ SHT 315 (L9)

16 Allt. @ 2'-3"-0

10'-8 W.P. to W.P.

21'-3 31/32 W.P. to W.P.

10'-7 17/32 W.P. to W.P.

NOTE:- WORK THIS SHEET WITH SHEET 316

L10-L12 - SPANS 5 to 7 & 10 to 12

COLUMBIA AVE VIADUCT
CINCINNATI, OHIO
CITY OF CINCINNATI - DEPT. OF PUBLIC WORKS
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Structural & Reinforced Concrete Detailing
DETAILED BORAH MADE BY TBC 1-19-37
CHECKED BY J.J.S. (illegible) TRACED BY CPKa 1-24-37
REVIEWED LAST REVISION bf
FCTRC Job No. CC25873 SHEET SHOP No. 2

15-8-56

L10 L11 DEAD LOAD CALC SPAN 5-7

WT OF MEMBER A = 23.4000 L = 10'-8" ↳ 10.66667'

$10.66667' \times \frac{23.4000\ in^2}{144\ in^2}\ ft^2 \times \frac{0.49\ K}{ft^3} = 0.8493\ K$

GUSSETS L10 = USE CALC FROM [L9 L10]
= 0.5988 K

L11 = SAY SAME AS [L9]
= 0.4515 K

TOT = 1.0503 K

LACING BARS SIMILAR TO [L9 L10] BAR = 0.003588 K/EACH
26 BARS @ 0.003588 K/BAR = 0.0897 K

BATTEN SIMILAR TO [L9 L10]
= 0.0817 K

TOT = 0.1714 K

RIVETS ASSUME 0.8#/RIVET
SAY 260 @ 0.8#/RIVET = 208# @ $\frac{1K}{1000\#}$ = 0.2080 K

MISC. Ks/Rs - L10 ONLY SAME AS [L9 L10] W/ 1 ADDITIONAL R
∴ 0.2739 K + 1 R 7" x 3/8" x 1'-1¼"
↓
0.5833' x 0.0313' x 1.0833' = 0.0198 ft³
@ $\frac{0.49\ K}{ft^3}$ = 0.0097 K

↳ 0.2739 K + 0.0097 K = 0.2836 K

WT OF MEMBER	=	0.8493 K
GUSSETS	=	1.0503 K
LACING / BATTEN	=	0.1714 K
RIVETS	=	0.2080 K
MISC. Ks / Rs	=	0.2836 K
		2.5626 K

BUMP UP = $\frac{2.5626\ K}{0.8493\ K}$ = 3.02

Calculations for 1/8 US Grid

SECT AA

FOR NE-CE-SE

FOR NW-CW-SW

FOR PARTS TO RIGHT OF LINE YY SEE SHEET 316

FOR PARTS TO RIGHT OF LINE XX SEE SHEET 316

L10

MILL

2°27'25"

NOTE:- WORK THIS SHEET WITH SHEET 316

L10-L12- SPANS 5 to 7 & 10 to 12

COLUMBIA AVE VIADUCT
CINCINNATI, OHIO
CITY OF CINTI., DEPT. PUBLIC WORKS
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Groupers & Bracket Platforms
DETAIL BORN. MADE BY TBC 1-19-37
CHECKED BY J.J.S. 2-11-37 TRACED BY C.P.B. 1-21-37
REVISED LAST REVISION bf
F.C. TBC 3-31 CONTRACT CC025873
SHOP No. 2 SHEET 316A

15-8-56

3/3

FOR DETAILS TO LEFT OF LINE XX & YY SEE SHEET No. 316A

WEB VIEW FOR NW-CW-SW

WEB VIEW FOR NE-CE-SE

MILL

WORK THIS SHEET WITH SHEET #316A
BOTTOM CHORDS L10-L12 SPAN 5-7 & SPAN 10-12

REQUIRED LIST			
No	DESCRIPTION	MARK	REMARK
1	BOTTOM CHORD	L10-L12 NW	
1	"	L10-L12 CW	
1	"	L10-L12 SW	
1	"	L10-L12 NE	
1	"	L10-L12 CE	
1	"	L10-L12 SE	

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. DEPT. PUBLIC WORKS
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION

DRAWN BY BORN | TRACED BY O.P.R. 1-19-37
CHECKED BY J.J.S. 1-19-37 | LAST CORRECT. NO. bb
REVISED: FC-TBC 3-5-37
CONTRACT CC 25873 | SHEET 316

15-8-55

L11 L12 DEAD LOAD CALCS SPAN 5-7

WT OF MEMBER

$A = 23.4000\ in^2$ $L = 10'-8"$

SAME AS [L10 L11]

$= 0.8493\ K$

GUSSETS

L11 = SEE [L10 L11] $= 0.4515\ K$

L12 = PL $= 50\frac{1}{2}" \times \frac{1}{2}" \times 6'-3\frac{1}{2}" - (CLIP)$

$= 4.2083' \times 0.0417' \times 6.2917' - (\frac{1}{2}[2.9583 \times 2.6042' \times 0.0417'])$ (35.5")

$= 1.1041\ ft^3 - (0.1606\ ft^3)$

L12 $= 0.9435\ ft^3$ @ $\frac{0.491\ K}{ft^3} = 0.4623\ K$

TOT $= 0.9138\ K$

LACING/BATTEN = SAME AS [L10 L11] $= 0.1714\ K$

RIVETS

ASSUME 0.8#/RIVET

344 RIVETS @ 0.8#/RIVET $= 275.2\#$ @ $\frac{1K}{1000\#} = 0.2752\ K$

MISC GS/PLS TAKE HALF OF ALL SHAPES @ L12

SHT 316

1 aw PL @ $12" \times \frac{9}{16}" \times 5'-5\frac{1}{2}" = 1' \times 0.0469' \times 5.4583' = 0.2560\ ft^3$

1 at PL @ $12" \times \frac{1}{2}" \times 4'-0\frac{1}{2}" = 1' \times 0.0417' \times 4.0417' = 0.1685\ ft^3$

SHT 317A

1 at PL @ $12" \times \frac{3}{4}" \times 4'-8\frac{3}{4}" = 1' \times 0.0625' \times 4.7297' = 0.2956\ ft^3$

1 v PL @ $15" \times \frac{3}{8}" \times 3'-0\frac{3}{4}" = 1.25' \times 0.0313' \times 3.0625' = 0.1198\ ft^3$

1 t PL @ $3\frac{1}{2}" \times \frac{3}{4}" \times 1'-7"$ $= 0.2917' \times 0.0313' \times 1.5833' = 0.0145\ ft^3$

½ ap PL @ $4" \times \frac{3}{8}" \times 7\frac{1}{2}"$ $= 0.3333' \times 0.0313' \times 0.625' = 0.0065\ ft^3$

$0.8609\ ft^3$

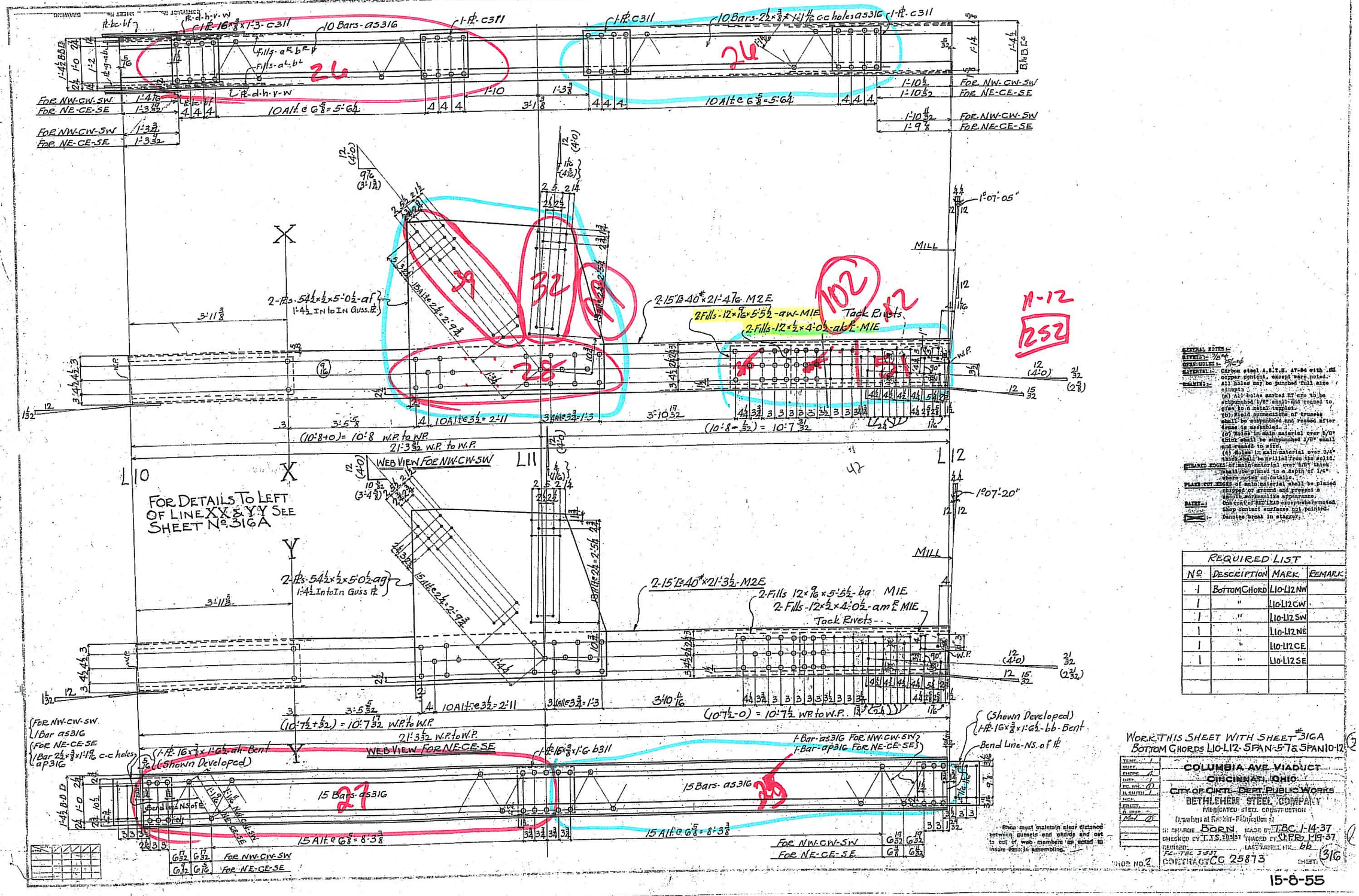
$0.8609\ ft^3$ @ $\frac{0.491\ K}{ft^3} = 0.4218\ K$

WT OF MEMBER	$= 0.8493\ K$
GUSSETS	$= 0.9138$
LACING/BATTEN	$= 0.1714\ K$
RIVETS	$= 0.2752\ K$
MISC. GS/PLS	$= 0.4218\ K$
	2.6315

BUMP UP $= \frac{2.6315\ K}{0.8493\ K} = 3.10$

Calculations for 1/8 US Grid

2/3



GENERAL NOTES:-

RIVETS:- ⅞ dia. 11/16 dia.

OPEN HOLES:-

MATERIAL:- Carbon steel A.S.T.M. A7-24 with .25% copper content, except were noted.

DRAWING:- All holes may be punched full size except:-
(a) All holes marked RF are to be subpunched 1/8" small and reamed to size, to a metal template.
(b) Field connections of trusses shall be subpunched and reamed after trusses is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.

BEVELED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on details.

PLANE CUT EDGES of main material shall be planed chipped or ground and present a smooth, workmanlike appearance.

PAINT:- Coat(s) of RED LEAD except where noted. Shop contact surfaces not painted.

Denotes break in stagger.

REQUIRED LIST

No	Description	Mark	Remark
1	Bottom Chord	L10-L12 NW	
1	"	L10-L12 CW	
1	"	L10-L12 SW	
1	"	L10-L12 NE	
1	"	L10-L12 CE	
1	"	L10-L12 SE	

WORK THIS SHEET WITH SHEET 316A
BOTTOM CHORDS L10-L12-SPAN-5-7 & SPAN 10-12

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO.
CITY OF CINTI. - DEPT. PUBLIC WORKS
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Bucklin-Pennington &
IN CHARGE BORN MADE BY T.B.C. 1-14-37
CHECKED BY T.I.S. 1-19-37 TRACED BY V.F.R. 1-19-37
REVISED LAST REVISED MK. bb
FC-TBC 3537
CONTRACT CC 25873 SHEET 316

15-8-55

SECT-AA

1-Pl 17×3/8×3'-5 ad } FOR CW-SW
1-L 4×4×3/8×3'-5 af }
1-Pl 17×3/8×3'-5 ag } FOR NE-CE
1-L 4×4×3/8×3'-5 ah }
Tack Weld for Ship't

℄ of Truss

1-Pl ag
1-L 4×4×3/8×3'-5 ak } FOR NW-CW
1-Pl ad
1-L 4×4×3/8×3'-5 am } FOR CE-SE

FOR NW-CW
FOR CE-SE

FOR CW-SW
FOR NE-CE

FOR CW-SW
FOR NE-CE

N.S. - 1-Pl. 50 1/2 × 1/2 × G 3'-3 1/2 } P. FOR NE
F.S. - 1-Pl. } P. FOR SE
S - FOR NE-CE
(1-4 1/2 Into In Guss. Pls.)

Shop Rivet - N.S. of NE & CE
Open hole F.S. of NE & CE

1-Fill 3×3/8×1'-7-L - FOR CE
12 Fills 3 1/2 × 3/8 × 1'-7 - L - FOR CE
1-Fill - F.S. of NE & N.S. of SE
1-Fill 7×3/8×1'-1 1/2 ab - N.S. of SE & CE
- In Both Sides of CE - N.S. of SE & F.S. of NE
Shop Rivet F.S. of NE & CE
Open hole N.S. of SE & CE
9 At I-e 2 1/4 = 1'-8 1/2

2-Pls - 15 × 9/16 × 4'-7 7/8 mR - MIE
Shop Rivets - N.S. of NE & F.S. of all

2-Pls - 15 × 3/8 × 3'-0 3/4 - V
2-Pls 12 × 3/4 × 4'-8 3/4 av
3:3

1-Fill ap - F.S. of NE & CE
Tack Weld for Ship't

Tack Rivets in Main Mat'l & Pl's mE only.
7 @ 3 = 1'-9
3 1/2 4 4 5/16
10'-7 1/2 w.p. to w.p.
21'-3
4'-6 3/16
MILL

1°-07'-20"

L12

FOR NW-CE-SE

FOR PARTS TO RIGHT OF LINE
YY SEE SHEET 317

N.S. 1-Pl. 51 × 1/2 × G 3'-3 1/2 } C FOR SW
F.S. - 1 Pl. } C - FOR NW
(1-4 1/2 Into In Guss. Pls.) } d - FOR CW-SW

Shop Rivet - N.S. of NW & CW
1-Fill-3×3/8×1'-0 1/4 - h - F.S. of SW & CW
Tack Weld for Ship't

2-Fills 3×3/8×1'-7 - F - FOR CW
1-Fill-F-N.S. of NW & F.S. of SW
1-Fill 7×3/8×1'-0 3/4 g N.S. of NW & CW
- In Both Sides CW-N.S. of NW & F.S. of SW
Shop Rivet F.S. of SW & CW
Open Hole N.S. of NW & CW
9 At I-e 2 1/4 = 1'-8 1/2

2-Pls - 15 × 9/16 × 4'-7 7/8 k R. MIE
Shop Rivets - N.S. of SW & F.S. for all

1-Fill - ap - N.S. NW & CW

Tack Rivets Main Mat'l & Pl's k E only.
7 @ 3 = 1'-9
3 1/2 4 4 5/16
10'-7 1/2 w.p. to w.p.
21'-3 1/4
4'-6 3/16
MILL

1°-07'-05"

L12

FOR NW-CW-SW

FOR PARTS TO RIGHT OF LINE
XX SEE SHEET 317

NOTE:-
WORK THIS SHEET WITH SHEET 317

GENERAL NOTES:
RIVETS: 7/8"ø
OPEN HOLES: 15/16"ø
MATERIAL: Carbon steel A.S.T.M. 47-34 with .2% copper content, except were noted.
DRAWING: All holes may be punched full size except:
(a). All holes marked PT are to be subpunched 1/16" small and reamed to size in a metal template.
(b). Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in plate material over 5/8" thick shall be subpunched 1/16" small and reamed to size.
(d) Holes in web material over 3/4" thick shall be drilled from the solid.
BEVELED EDGES of plate material over 5/8" thick shall be planed to a depth of 1/16" as represented on details.
PLANE CUT EDGES of plate material shall be planed shipped to ground and present a smooth mechanical appearance.
PAINT: One coat of red lead except where noted. Shop contact surfaces not painted. Painted break at stagger.

Shop must maintain clear distance between gussets and chords and cut to cut of web members as noted to insure easy fit assembling.

SHOP No. 2

L12 - L14 - SPANS - 5 to 7 & 10 to 12

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WORKS
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Bethlehem, Pennsylvania
Detailed BOEN Traced by T.B.C. 1-20-37
Checked by T.J.S. Issued C.P.P.D. 7-22-37
Revised Last Corrected
As Built Sheet Contract CC 25873 317A

15-8-58

L12 L13 DEAD LOAD CALCS SPAN 5-7

WT OF MEMBER

$A = 38.4000\ in^2$ $L = 10'-7\frac{5}{8}"$ (10.6354')

$10.6354' \times \frac{38.4000\ in^2}{144\ in^2}\ ft^2 \times \frac{0.49\ K}{ft^3} = 1.3897\ K$

GUSSETS

L12 : USE CALC FROM [L11 L12] = 0.4623 K

L13 : PL = 43" x 3/16" x 3'-11½"

= 3.5833' x 0.0365' x 3.9375' − [CLIPS] (32½" x 8½" Δ)

= $0.5150\ ft^3 - [\frac{1}{2}(2.6875' \times 0.7083' \times 0.0365')]$

= $0.5150\ ft^3 - 0.0347\ ft^3$

= $0.4803\ ft^3 \rightarrow @ \frac{0.49\ K}{ft^3} = 0.2353\ K$

TOT = 0.6976 K

LACING SAY SAME BARS AS [L10L11] @ 0.003588 K/BAR

31 BARS @ 0.003588 K/BARS = 0.1112 K

BATTEN SAY SAME AS [L10L11]

@ 0.0817 K

TOT = 0.1929 K

RIVETS ASSUME 0.8#/RIVET

SAY 300 RIVETS @ 0.8#/RIVET = 240 # → $\frac{1\ K}{1000\#} = 0.2400\ K$

MISC. K's/PL's USE ALL IN [L11 L12] CALC PLUS 1 PL NOT SHARED, SEE ATTACHED SHEET.

SHARED = 0.4218 K//

SHARED // + EXTRA PL // = 0.4319 K

EXTRA PL = 7" x 3/8" x 1'-1½"

= 0.5833' x 0.0313' x 1.125'

= $0.0205\ ft^3 \rightarrow @ \frac{0.49\ K}{ft^3} = 0.0101\ K$//

WT OF MEMBER	=	1.3897 K
GUSSETS	=	0.6976 K
LACING / BATTEN	=	0.1929 K
RIVETS	=	0.2400 K
MISC	=	0.4319 K
		2.9521 K

$\text{BUMP UP} = \frac{2.9521\ K}{1.3897\ K} = 2.12$

Calculations for 1/8 US Grid

SECT-AA

FOR NW-CW-SW

FOR NE-CE-SE

FOR PARTS TO RIGHT OF LINE XX SEE SHEET 317

FOR PARTS TO RIGHT OF LINE YY SEE SHEET 317

NOTE:- WORK THIS SHEET WITH SHEET 317

L12-L14 - SPANS- 5 to 7 & 10 to 12

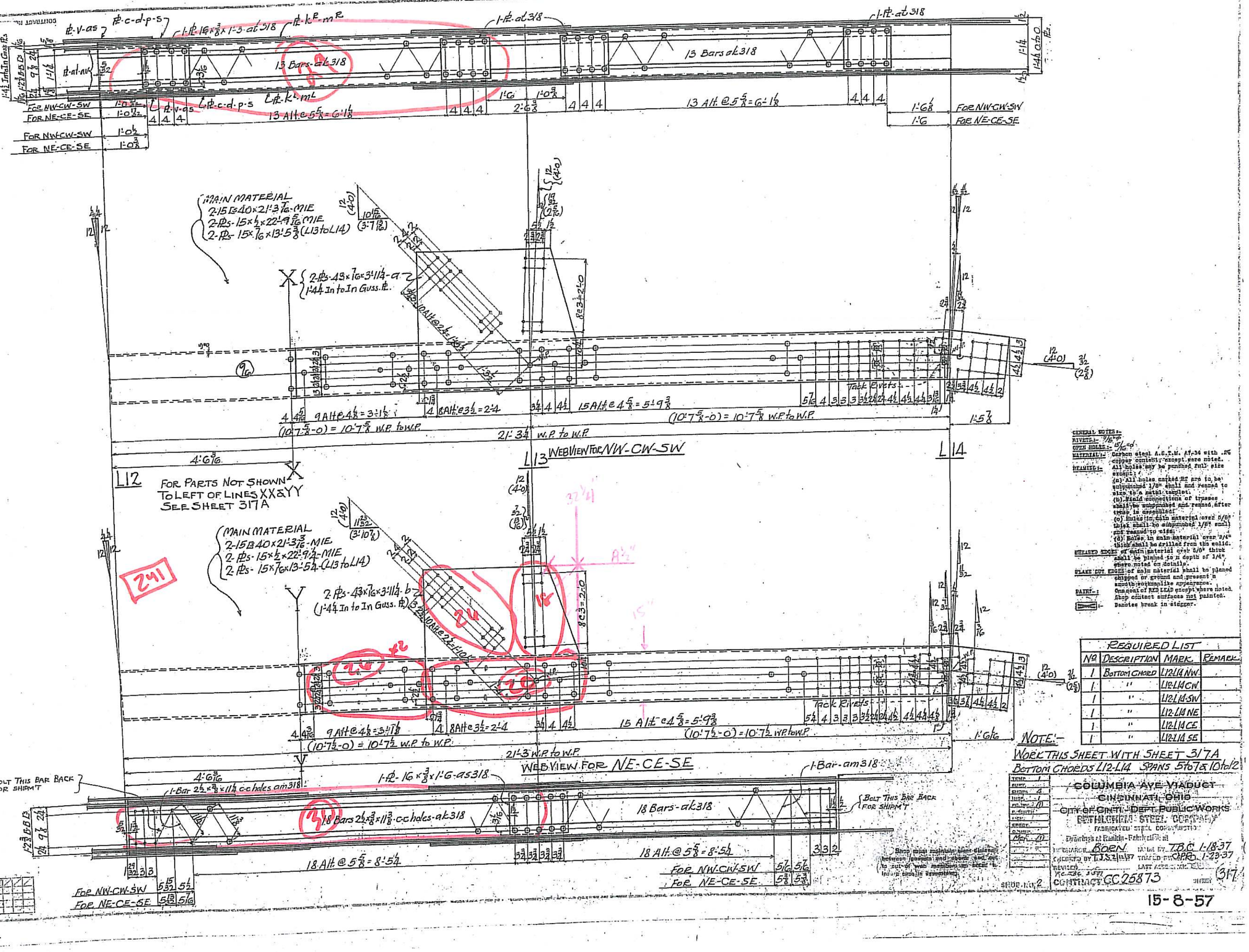
COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WORKS
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION

Drawn by BORN Traced by T.B.C. 1-20-37
Checked by T.J.S. 1-21-37 Approved by O.F.D. 1-22-37
Scale 1/4" = 1'-0" Contract CC 25873 317A

SHOP No. 2

15-8-58

3/3



GENERAL NOTES:-
RIVETS:- 7/8" ø
OPEN HOLES:- 15/16" ø
MATERIAL:- Carbon steel A.S.T.M. A7-36 with .2% copper content, except where noted. All holes may be punched full size except:-
(a) All holes marked PF are to be subpunched 1/8" small and reamed to size with a metal templet.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in plate material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.
SHEARED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4", where noted on details.
FLAME CUT EDGES of main material shall be planed chipped or ground and present a smooth machine appearance.
PAINT:- One coat of RED LEAD except where noted. Shop contact surfaces not painted.
Denotes break in stagger.

REQUIRED LIST

No	Description	Mark.	Remark
1	Bottom Chord	L12L14 NW	
1	"	L12L14 CW	
1	"	L12L14 SW	
1	"	L12L14 NE	
1	"	L12L14 CE	
1	"	L12L14 SE	

NOTE:- WORK THIS SHEET WITH SHEET 317A
BOTTOM CHORDS L12-L14 SPANS 5 to 7 & 10 to 12

COLUMBIA AVE VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. DEPT. PUBLIC WORKS
BETHLEHEM STEEL CORP.
FABRICATED STEEL CONSTRUCTION
Drawings at Raskin-Fabricational
DRAWN BY T.B.C. 1-18-37
CHECKED BY T.J.S. 2 1-37
TRACED BY CHKD. 1-23-37
REVISED LAST ADDITION
CONTRACT CC 25873
SHEET 317
SCALE 1/2"

15-8-57

TranSystems

Made By: KMW Date: 3/4/09 Job No: HAM 471-0025

Checked By: CJM Date: 3/24/09 Sheet No. 1/3

L13 L14 DEAD LOAD CALCS SPAN 5-7

WT OF MEMBER, $A = 51.5250\ in^2$ $L = 10'-7\frac{5}{8}''$ (10.6354')

$$10.6354' \times \frac{51.5250\ in^2}{144\ in^2}\ ft^2 \times \frac{0.49\ K}{ft^3} = \boxed{1.8647\ K}$$

GUSSETS

L13 = USE [L12L13] CALC = **0.2353 K** * SEE SHT FOR CLIP CALCS

L14: $R = 42\frac{1}{2}'' \times \frac{7}{16}'' \times 6'7'' - [\text{CLIPS}]$

$= 3.5417' \times 0.0365' \times 6.5833' - [0.0523'* + 0.0048' + 0.0209']$

$= 0.8510' - [0.078']$

$= 0.773\ ft^3 \rightarrow @\ \frac{0.49\ K}{ft} = \boxed{0.3788\ K}$

TOT = 0.6141 K

LACING/BATTEN = SAME AS [L12L13] = **0.1929 K**

RIVETS Assume 0.8#/RIVET

SAY 300 RIVETS @ 0.8#/RIVET = 240# = **0.2400 K**

MISC Rs/Ys

1 R@ 4" x 3/8" x 7" = 0.3' x 0.0313' x 0.5833' = 0.0061 ft³

* THERE ARE 2 OF EACH *'ED R, ONLY COUNT 1 FOR L13L14, OTHER FOR L14L15

(w) * 1 R@ 13" x 1 1/16" x 4'3½" = 1.0833' x 0.0583' x 4.2917' = 0.2710 ft³

(d) * 1 R@ 16" x 3/8" x 7'-7¾" = 1.3333' x 0.0313' x 7.6458' = 0.3191 ft³

(m) ½ R@ 6" x ¾" x 1'-4½" = 0.5' x 0.0625' x 1.375' = 0.0215 ft³

(E) 1 R@ 3" x 3/8" x 1'4" = 0.25' x 0.0313' x 1.3' = 0.0104 ft³

0.6281 ft³

(g) = 0.1818 (SEE L14 L15 CALCS)

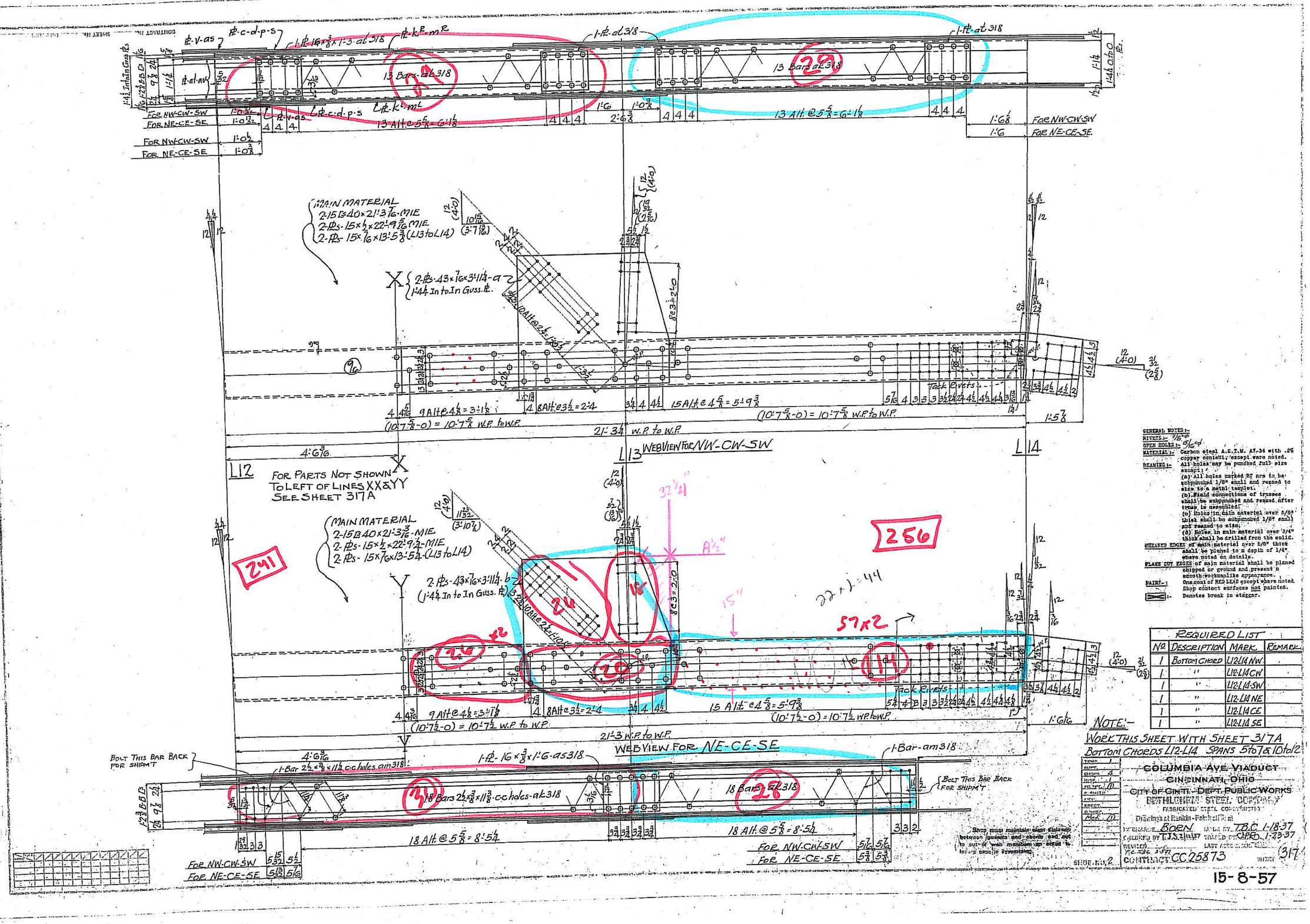
$\frac{0.7794}{0.6281}\ ft^3 \times \frac{0.49\ K}{ft^3} = \boxed{0.3819\ K}$

WT OF MEMBER	= 1.8647 K
GUSSETS	= 0.6141 K
LACING/BATTEN	= 0.1929 K
RIVETS	= 0.2400 K
MISC	= 0.3819 K
	3.2936 K

BUMP UP = $\frac{3.2936\ K}{1.8647\ K} = \boxed{1.77}$

Calculations for 1/8 US Grid

2/3



GENERAL NOTES:-
RIVETS:- 7/8" ø
OPEN HOLES:- 15/16" ø
MATERIAL:- Carbon steel A.S.T.M. A7-36 with .2% copper content, except were noted.
REAMED:- All holes may be punched full size except:
(a) All holes marked RF are to be subpunched 1/8" small and reamed to size to a metal templet.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.
SHEARED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on details.
FLAME CUT EDGES of main material shall be planed chipped or ground and present a smooth workmanlike appearance.
PAINT:- One coat of RED LEAD except where noted. Shop contact surfaces not painted.
Denotes break in stagger.

REQUIRED LIST

No	DESCRIPTION	MARK	REMARK
1	BOTTOM CHORD	L12-L14 NW	
1	"	L12-L14 CW	
1	"	L12-L14 SW	
1	"	L12-L14 NE	
1	"	L12-L14 CE	
1	"	L12-L14 SE	

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. DEPT. PUBLIC WORKS
BETHLEHEM STEEL CORPORATION
FABRICATED STEEL CONSTRUCTION
Drawings at Ramsay-Fahnestock
DRAWN BY BORN TRACED BY T.B.C. 1-18-37
CHECKED BY T.J.S. 1-21-37 CHKD. 1-23-37
REVISED LAST ADDITION
Rec. Apr. 5/37
CONTRACT CC 25873 SHEET 317

15-8-57

FOR CW-SW { 1-Pl-ba
1-L 4×4×3/8×3'-2½-bc

FOR NE-CE { 1-Pl-av
1-L 4×4×3/8×3'-2½-bd

Tack Weld for Shipm't

FOR NW-CW { 1-Pl-17×3/8×3'-2½-av
1-L 4×4×3/8×3'-2½-aw

FOR CE-SE { 1-Pl-17×3/8×3'-2½-ba
1-L 4×4×3/8×3'-2½-bb

FOR CW-SW
FOR NE-CE
FOR NW-CW
FOR CE-SE
℄ of Truss

SECT. A-A

N.S.-1-Pl-42½×7/16×G'-7 { h FOR NE
P-FOR SE-CE

F.S.-1-Pl { h-FOR SE
P-FOR NE-CE
(1'-4¼ In to In Guss. Pl.)

1-Fill-4×3/8×1'-4½-m
F.S. of NE&CE

Shop Rivet N.S. of SE&CE
Open hole F.S. of NE&CE

In N.S. NE&CE
In N.S. SE&CE

1-Fill-6×3/8×1'-4½-n
N.S. of SE&CE-F.S. of NE&CE

Shop Rivet F.S. NE&CE
Open hole N.S. SE&CE

1-Fill-3×3/8×1'-4¾-k-N.S. of SE&CE

2-Pls-16×3/8×3'-7½-g
2-Pls-13×7/16×4'-3½-f
2-Pls-16×3/8×7'-7¾-d
2-Fills-C318

1-Fill-1-Fs of NE&CE
Tack Weld for Ship't

Tack Rivets in Main Mat'l only

10'-7 25/32 W.P. to W.P.
21'-3 19/32 W.P. to W.P.
5'-1 25/32

L14

FOR NE-CE-SE

FOR PARTS NOT SHOWN TO RIGHT OF LINE YY - SEE SHEET 318

Shop must maintain clear distance between gussets and chords and set to out of web members as noted to insure room to accomplish.

1-Fill-6×3/8×7½-b F.S. of CW&SW
Tack Weld for Ship't

Shop Rivet N.S. of NW&CW
Open hole F.S. of CW-SW

In N.S. of NW-CW
In F.S. of SW-CW

1-Fill-3×3/8×1'-4¼-ad
F.S. of CW&SW

1-Fill-6×3/8×1'-4½-ae
N.S. of NW-CW & F.S. of SW-CW

Shop Rivet F.S. of CW-SW
Open hole N.S. of CW-NW

1-Fill-3×3/8×1'-4-ab N.S. of NW&CW

N.S. 1-Pl-42½×7/16×G'-7¼ { af FOR SW
ag-FOR NW

F.S. 1-Pl { ag FOR SW-CW
af FOR NW
(1'-4¼ In to In Guss. Pl.)

2-Pls-16×3/8×3'-7½-aa
2-Pls-13×7/16×4'-3½-w
2-Pls-16×3/8×7'-7¾-v
2-Fills-15×7/16×1'-10½-C318

Tack Rivets in Main Mat'l only

10'-7 15/32 W.P. to W.P.
21'-2 15/16 W.P. to W.P.
5'-1 15/32

L14

FOR NW-CW-SW

FOR PARTS NOT SHOWN TO RIGHT OF LINE XX - SEE SHEET 318

GENERAL NOTES:-
RIVETS:- ⅞"ø
OPEN HOLES:- 15/16"ø
MATERIAL:- Carbon steel A.S.T.M. A7-36 with .2% copper content, except were noted.
REAMING:- All holes may be punched full size except:-
(a) All holes marked R? are to be subpunched 1/8" small and reamed to size in a metal templet.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 3/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.
PLANED EDGES of main material over 3/8" thick shall be planed to a depth of 3/4" where noted on details.
PLANED END BEARINGS of main material shall be planed straight to ground and present a smooth workmanlike appearance.
PAINT:- One coat red lead paint where noted. Shop contact surfaces not painted. Besides prime in stringer.

NOTE!-
WORK THIS SHEET WITH SHEET 318

BOTTOM CHORD L14-L16 SPANS 5-7 & 10-12

COLUMBIA AVE VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WORKS

BETHLEHEM STEEL COMPANY
FABRICATED STEEL STRUCTURES
Bethlehem, Pa. U.S.A.

IN CHARGE BORN | MADE BY T.B.C. 1-21-57
CHECKED T.J.S. 2-1-57 | TRACED BY S.F.D. 1-25-57
REVISED | LAST REVISED
SHOP NO. 2 CONTRACT CC25875 | DRAWING 318A

15-8-59

L14 L15 DEAD LOAD CALCS SPAN 6-7

WT OF MEMBER $A = 62.0250\ in^2$ $L = 10'-7\frac{1}{2}'' = 10.625'$

$$10.625' \times \frac{62.0250\ in^2}{144\ in^2} \times \frac{0.49\ K}{ft^3} = 2.2425\ K$$

GUSSETS

L14 USE [L13 L14] CALCS = 0.3788 K

L15 ~15% SMALLER R THAN L13 W/ SIMILAR CLIPS

∴ L15 = 0.85 (L13 WT)

L15 = 0.85 (0.2353 K) = 0.2000 K

TOT = 0.5788 K

LACING / BATTEN = SAME AS [L13 L14] = 0.1929 K

RIVETS ASSUME 0.8#/RIVET

291 RIVETS @ 0.8#/RIVET = 232.8# = 0.2328 K

MISC PL/ANGS

(w)	1 PL SEE [L13 L14] for PL W CALCS →	= 0.2710 ft³
(d)	1 PL " " " PL d " →	= 0.3191 ft³
(m)	½ PL " " " PL m " →	= 0.0215 ft³
(k)	1 PL " " " PL k " →	= 0.0104 ft³
(g)	1 PL @ 16" x ⅜" x 3'-7½" = 1.3' x 0.0313' x 3.625' = →	= 0.1513 ft³
(c318)	2 PL @ 15" x 7/16" x 1'-10½" = 1.25' x 0.0365' x 0.875' = → x2 =	= 0.1711 ft³
		0.9444 ft³

$0.9444\ ft^3 @ \frac{0.49\ K}{ft^3} = 0.4628\ K$

WT OF MEMBER	= 2.2425 K
GUSSETS	= 0.5788 K
LACING / BATTEN	= 0.1929 K
RIVETS	= 0.2328 K
MISC	= 0.4628 K
	3.7098 K

BUMP UP = $\frac{3.7098\ K}{2.2425\ K} = 1.6543$

Calculations for 1/8 US Grid

FOR CW-SW { 1-Fill-b a
1-L 4×4×3/8×3'-2½ bc

FOR NE-CE { 1-Fill-a v
1-L 4×4×3/8×3'-2½ bd

Tack Weld for Shipm't

FOR NW-CW { 1-Fill-17×3/8×3'-2½ av
1-L 4×4×3/8×3'-2½ aw

FOR CE-SE { 1-Fill-17×3/8×3'-2½ ba
1-L 4×4×3/8×3'-2½ bb

FOR CW-SW
FOR NE-CE
FOR NW-CW
FOR CE-SE
℄ of Truss

SECT. A-A

½(2.2917)(1.25)(0.0215)

½(1.25)(0.175)(6.0)(.05)

½(2.2917)(0.5")(0.0215")

N.S.-1 Fill-42½×7/16×G-74 { h FOR NE / P-FOR SE-CE
F.S.-1 Fill { h-FOR SE / P-FOR NE-CE
(1'-44 In to In Guss. Fl.)

Shop Rivet N.S. of NW&CW
Open hole F.S. of CW-SW
1-Fill 3×3/8×1'-44 ad
F.S. of CW&SW

Shop Rivet F.S. of CW-SW
Open hole N.S. of CW-NW
1-Fill-3×3/8×1'-44 ab N.S. of NW&CW

N.S. 1 Fill 42½×7/16×G-74 { af FOR SW / ag-FOR NW&CW
F.S. 1 Fill { ag FOR SW-CW / af FOR NW
(1'-44 In to In Guss. Fl.)

2-Fills-16×3/8×3'-7½ aa
2-Fills-13×7/16×4'-3½ w
2-Fills-16×3/8×7'-7¾ v
2 Fills-15×7/16×1'-10½ c318

½ EACH

1-Fill-6-F.S. of NE&CE
Tack Weld for Shipm't

Shop Rv. N.S. of SE&CE
Open hole F.S. of NE&CE
1-Fill-3×3/8×1'-44 ae
F.S. of NE&CE

In F.S. NE&CE
In N.S. SE&CE

1-Fill-6×3/8×1'-44 ac
N.S. of SE&CE

Shop Rv. F.S. of NE-CE
Open hole N.S. of SE&CE
1-Fill-3×3/8×1'-44 ac-N.S. of SE&CE

In N.S. of NW-CW
In F.S. of SW-CW
1-Fill-6×3/8×1'-44 ad
N.S. of NW-CW & F.S. of SW-CW

8@3'-2'-0

42½-15" = (27½")

2-Fills-16×3/8×3'-7½ g
2-Fills-13×7/16×4'-3½ f
2-Fills-16×3/8×7'-7¾ d
2 Fills-c318
×2

Tack Rivets in Main Mat'l only

1-Fill-6-F.S. of NE&CE
Tack Weld for Shipm't

10'-7 25/32 W.P. to W.P.
21'-3 19/32 W.P. to W.P.
5'-1 25/32

10'-7 15/32 W.P. to W.P.
21'-2 7/16 W.P. to W.P.
5'-1 15/32

L14

FOR NW-CW-SW

FOR NE-CE-SE

FOR PARTS NOT SHOWN TO RIGHT OF LINE YY - SEE SHEET 318

FOR PARTS NOT SHOWN TO RIGHT OF LINE XX - SEE SHEET 318

Shop must maintain clear distance between gussets and chords and cut to suit of web members as noted to insure access to assembling.

14-15
151

NOTE!-
WORK THIS SHEET WITH SHEET 318

GENERAL NOTES:-
RIVETS:- 7/8"ϕ
OPEN HOLES:- 15/16"ϕ
MATERIAL:- Carbon steel A.S.T.M. A7-36 with .2% copper content, except were noted.
DRAWING:- All holes may be punched full size except:
(a) All holes marked RT are to be subpunched 1/8" small and reamed to size, to a metal template.
(b) Field connections of trusses shall be subpunched and reamed after trusses is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.
FINISHED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on details.
PLANED EDGES of main material shall be planed, chipped or ground and present a smooth workmanlike appearance.
PAINT:- One coat of red lead except where noted. Shop contact surfaces not painted.
Bundles front in stagger.

BOTTOM CHORD L14-L16 SPANS 5-7 & 10-12

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WORKS
STRUCTURAL STEEL DRAWING
FABRICATED STEEL CONSTRUCTION
Division of Bridges & Buildings
IN CHARGE BORN DRAWN BY T.B.C. 1-21-57
CHECKED T.J.S. JR. TRACED BY S.M.D. 1-25-57
REVISED K.C. T.B.C. 3-59 LAST MARKED
CONTRACT CC25875 SHEET 318A

15-8-59

100

2032

1726

FOR NW-CW-SW
FOR NE-CE-SE

13 Bars-ak318

Fill c318

13 Alt. e 5⅝ = 6'-1⅛

MAIN MAT'L
2-15B40 × 21'-3⅞
2-PL's-15 × ⅞ × 21'-3 23/32
2-PL's-15 × ½ × 18'-3⅜
2-PL's-12 × ⅞ × 16'-3⅜

2-Fills 15 × ⅞ × 140½ c318

Tack Rivets

2-PL's-38 × ⅞ × 3'-8½-a
(1'-4½ In to In Guss. PL)

2-PL's-39 × ⅞ × 3'-8¾-b
(1'-4½ In to In Guss. PL)

11 Alt. e 5 = 4'-7

7 Alt. e 5⅛ = 2'-11⅞

(10'-7½ - 1/32) = 10'-7 15/32 W.P. to W.P.

(10'-7½ - 5/32) = 10'-7 25/32 W.P. to W.P.

(10'-7 13/16 - 0) = 10'-7 13/16 W.P. to W.P.

21'-2 15/16 W.P. to W.P.

21'-3 19/32 W.P. to W.P.

WEB VIEW FOR NW-CW-SW

WEB VIEW FOR NE-CE-SE

FOR DETAILS TO LEFT OF LINE XX & YY SEE SHEET 318A

1-Bar 2½ × ⅜ × 11¼ cc holes-am318

18 Bars-2½ × ⅜ × 11⅜ cc holes-ak318

1-Bar am318

18 Bars-ak318

18 Alt. e 5⅝ = 8'-5⅝

18 Alt. e 5 1/16 = 8'-5⅝
FOR NW-CW-SW
FOR NE-CE-SE

Bend Line N.S. of ℄

Bolt This Bar Back For Shipment

Shop-rivet maintain clear distance between gussets and chords and cut to suit of web members as noted to insure ease in assembling.

SECT. BB

GENERAL NOTES:-
RIVETS:- ⅞" ø
OPEN HOLES:- 15/16" ø
MATERIAL:- Carbon steel A.S.T.M. A7-34 with .25% copper content, except were noted.
REAMING:- All holes may be punched full size except:
(a) All holes marked RR are to be subpunched 1/8" small and reamed to size to a metal templet.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.
SHEARED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on drawing.
FLAME CUT EDGES of main material shall be planed chipped or ground and present a smooth workmanlike appearance. One coat of RED LEAD except where noted. Shop contact surfaces not painted.
PAINT:- Denotes break in stagger.

REQUIRED LIST

NO	DESCRIPTION	MARK	REMARKS
1	BOTTOM CHORD	L14-L16 NW	
1	"	L14-L16 SW	
1	"	L14-L16 NE	
1	"	L14-L16 CE	
1	"	L14-L16 SE	

BOTTOM CHORD L14-L16 SPAN 5-7⅝ 10-12

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. DEPT. PUBLIC WORKS
MOELLMITG-MARSHALL CONSTRUCTION CO.
Drawings of Bethlehem Fabricators at

IN CHARGE	BOR N
CHECKED BY	H.S. 2/24/57
REVISED	RC, TBC 3-5-57
MADE BY	T.B.C. 1/16/57
TRACED BY	CHEC. 1/19/57
LAST ALTERN. NO.	2A

SHOP NO. 2 CONTRACT CC. 25873

318

15-8-60

TranSystems

Made By: KMW Date: 3/4/09 Job No: HAM 471-0025

Checked By: CJM Date: 3/20/09 Sheet No. 1/4

L15 L16 DEAD LOAD CALCS SPAN 5-7

WT OF MEMBER

SAME AS [L14 L15] = 2.2425 K

GUSSETS

L15 USE [L14 L15] CALL = 0.2000 K

L16 PL: 51" x 7/16" x 6'-7½" - CLIPS (SHOWN ON ATTACHED SHT # 319A)

PL = 4.25' x 0.0365' x 6.625' - (0.1814 ft³ + 0.0259 ft³ + 0.0844 ft³)

PL = 1.0277 ft³ - (0.2917 ft³)

PL = 0.7360 ft³ → @ $\frac{0.49\,K}{ft^3}$ = 0.3606 K

TOT = 0.5606 K

LACING/BATTEN = SAME AS [L14 L15] = 0.1929 K

RIVETS ASSUME 0.8#/RIVET

294 RIVETS @ 0.8#/RIVET = 235.2# = 0.2352 K

MISC #s/Rs SEE SHTS 319 + 319A FOR PL LOCATIONS / DIMENSIONS (GREEN HIGHLIGHTS)

*= SHARED W/ [L16 L17]

(ab) *1 PL @ 16" x 3/8" x 7'-8" = 1.3̄' x 0.0313' x 7.6̄' = → = 0.3199 ft³

(ac) *1 PL @ 16" x 3/8" x 3'-8" = 1.3̄' x 0.0313' x 3.6̄' = → = 0.1530 ft³

(c) *1 PL @ 6" x 3/4" x 1'-4½" = 0.5' x 0.0625' x 1.375' = → = 0.0480 ft³

(f) 1 PL @ 3" x 3/8" x 1'-4 1/4" = 0.25' x 0.0313' x 1.3542' → = 0.0106 ft³

(w) *1 PL @ 14 1/4" x 11/16" x 4'-4" = 1.875' x 0.0573' x 4.3̄' = → = 0.2948 ft³

0.8213 ft³

0.8213 ft³ @ $\frac{0.49\,K}{ft^3}$ = 0.4024 K

WT OF MEMBER	= 2.2425 K
GUSSETS	= 0.5606 K
LACING/BATTEN	= 0.1929 K
RIVETS	= 0.2352 K
MISC	= 0.4024 K
	3.6336 K

BUMP UP = $\frac{3.6336\,K}{2.2425\,K}$ = 1.6203

Calculations for 1/8 US Grid

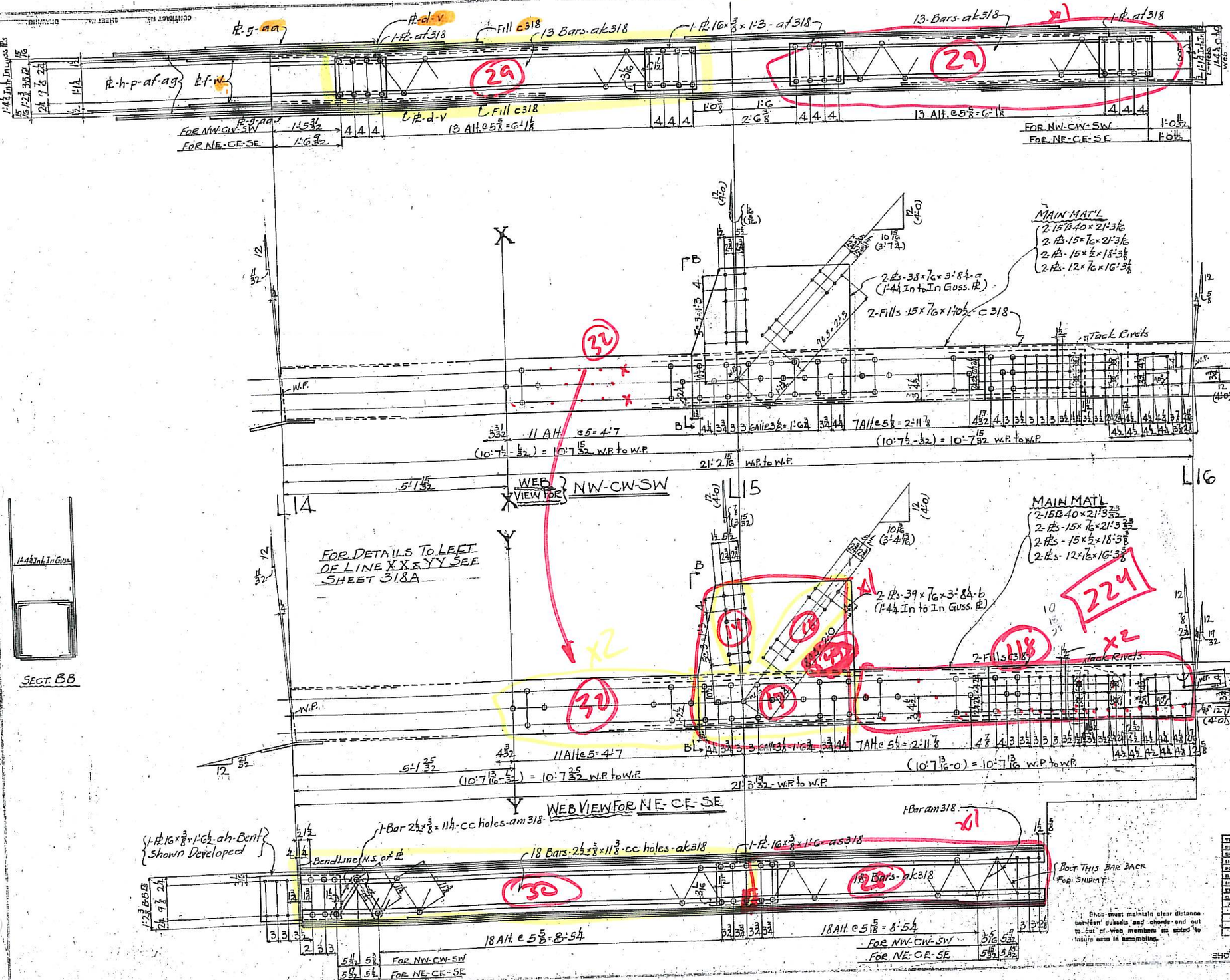
100

2032

1726

99

56



REQUIRED LIST			
NO	DESCRIPTION	MARK	REMARKS
1	BOTTOM CHORD	L14-L16 NW	
1	"	L14-L16 CW	
1	"	L14-L16 SW	
1	"	L14-L16 NE	
1	"	L14-L16 CE	
1	"	L14-L16 SE	

GENERAL NOTES:-
RIVETS:- 7/8"ø
OPEN HOLES:- 15/16"ø
MATERIAL:- Carbon steel A.S.T.M. A7-36 with .2% copper content, except were noted. All holes may be punched full size except:
(a) All holes marked RT are to be subpunched 1/8" small and reamed to size to a metal templet.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.
REAMING:-
SHEARED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on details.
FLAME CUT EDGES of main material shall be planed, chipped or ground and present a smooth workmanlike appearance.
PAINT:- One coat of RED LEAD except where noted. Shop contact surfaces not painted.
Denotes break in stagger.

BOTTOM CHORD L14-L16 SPAN 5-7⅝ 10-12

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. DEPT. PUBLIC WORKS
McCLINTIC-MARSHALL COMPANY
Drawings at Benkin-Fehlig Dept.
IN CHARGE BOR. N
CHECKED BY T.S.2 6-37
REVISED F.C. TBC 3-5-37
MADE BY T.B.C. 11-6-37
TRACED BY C.P.R. 1-19-37
LAST ALTERN. NO. 20
SHOP NO. 2
CONTRACT CC. 25873

318

15-8-60

SECTION A-A

L16 FOR NE-CE-SE

L16 FOR NW-CW-SW

FOR REQUIRED LIST SEE SHEET 3/9

WORK THIS SHEET WITH SH 3/9

GENERAL NOTES:-
RIVETS:- 7/8"
OPEN HOLES:- 15/16"
MATERIAL:- Carbon steel A.S.T.M. A7-36 with .2% copper content, except were noted.
REAMING:- All holes may be punched full size except:
(a) All holes marked RF are to be subpunched 1/8" small and reamed to size to a metal templet.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.
SHEARED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on details.
PLANE CUT EDGES of main material shall be planed chipped or ground and present a smooth workmanlike appearance.
PAINT:- One coat of RED LEAD except where noted. Shop contact surfaces not painted.
Denotes break in stringer.

Shop must maintain clear distance between gussets and chords and cut to out of web members as noted to insure ease in assembling.

BOTH CHORD L16-L18 (SCALE: 1" = 1'-0 1/2")

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. DEPT. PUBLIC WORKS
STRUCTURAL STEEL DETAILS
FABRICATED STEEL CONSTRUCTION
Checked by T.J.R. 11/27/62 Traced by E.R.P. 11/27/62
Designed by T.J.R. 11/27/62 Detailed by J.E.M. 11/27/62
Revised FC 7.26.63 T Last Assembly
CONTRACT CC25878
SHOP NO. 2

3/19

15-8-62

4/4

INCLUDE IN [L16L17] CALC ONLY

CONTRACT No. SHEET No. DRAWING

1-L4 6x3/8 319

12 PL-SPCS @ 6'-0 = 12 L.C. BARS 6x3/8 319

12 PL-SPCS @ 6'-0 = 12 L.C. BARS 6x3/8 319

NE-CE-SE	1'-7 7/8
NW-CW-SW	1'-6 31/32
NE-CE-SE	1'-8
NW-CW-SW	1'-6 31/32

NE-CE-SE	1'-1 7/8
NW-CW-SW	1'-0 31/32
NE-CE-SE	1'-2 1/8
NW-CW-SW	1'-0 31/32

MAIN MATERIAL
2-15"B @ 33.9# x 21'-4 7/16 M-1-E
2-PLS 15 x 7/16 x 13'-9 (L16-L17)
2-PLS 15 x 1/2 x 22'-10 7/16 M-1-E

(1'-4 1/2 INTO 1/4 GUSS PL)
2-GUS PLS 53 1/2 - 7/16 x 4'-8 1/2 AW

2-FILLS 15 - 7/16 x 4'-8 1/2 - 66 MIE

TACK RIVETS

2-54-30

2-41-45

MILL

11 SPCS @ 5'-2" = 57'-7
(10'-8 1/2 - 1/2) = 10'-8 3/32

4 SPCS @ 1'-6 | 4 SPCS @ 3 3/4 = 15 | 3 SPCS @ 3'-9 | 9 SPCS @ 3'-7 1/2 = 32'-10 1/2
(10'-8 1/2 - 1/2) = 10'-8 3/32

2'-5 5/16

FOR PART TO LEFT OF LINE X-X SEE SHEET #319A

WEB VIEW FOR NW-CW & SW

L17

L16

L18

MAIN MATERIAL
2-15"B @ 33.9 x 21'-7 7/8 M-1-E
2-PLS 15 x 7/16 x 13'-10 (L16-L17)
2-PLS 15 x 1/2 x 22'-0 3/4 M-1-E

2-GUS PLS 55 1/2 - 7/16 x 4'-8 1/2 AW
(1-4 1/2 INTO 1/4 GUSS PL)

2-FILLS 15 - 9/16 x 4'-8 1/2 - 66 MIE

2.09-45

MILL

TACK RIVETS

11 SPCS @ 5'-2" = 57'-7
(10'-9 7/16 - 1/2) = 10'-9 3/32

6 SPCS @ 1'-6 | 4 SPCS @ 3 3/4 = 15 | 3 SPCS @ 3'-9 | 9 SPCS @ 3'-7 1/2 = 32'-10 1/2
(10'-9 7/16 - 1/2) = 10'-9 3/32

2'-5 5/16

FOR PART TO LEFT OF LINE Y-Y SEE SHEET #319A

WEB VIEW FOR NE-CE-SE

1-L4 6x3/8 319 FOR NE-CE-SE
1-L4 6x3/8 319 FOR NW-CW-SW

BOLT THIS BAR BACK FOR SHIPMT

BEVEL TO 2-16 x 3/8 WELDMENT

NO. OF 1/4 @ WELDLINE

NE-CE-SE
NW-CW-SW

1-L4C BAR 2 1/2 x 3/8 x 0'-11 7/16 CC HOLES 6x3/8 NE-CE-SE
1-L4C BAR 2 1/2 x 3/8 x 0'-11 7/16 CC HOLES 6x3/8 NW-CW-SW

1Ø 16 x 3/8 x 1'-6 - 6x3/8

18 BLT SPCS @ 6'-0 = 2'-0
18 L4C BARS 2 1/2 x 3/8 x 1'-0 CC HOLES - 6x3/8

18 BLT SPCS @ 1'-9 = 2'-0
18 L4C BARS 6x3/8

NE-CE-SE 5 3/8
NW-CW-SW 4 7/8

Shop must maintain clear distance between gussets and chords and cut to out of web members as noted to insure ease in assembling.

GENERAL NOTES:-
RIVETS:- 7/8"Ø
OPEN HOLES:- 15/16"Ø
MATERIAL:- Carbon steel A.S.T.M. A7-24 with .2% copper content, except were noted.
All holes may be punched full size except:
(a) All holes marked RT are to be subpunched 1/8" small and reamed to size to a metal template.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.
PLANED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on details.
PLANE CUT EDGES of main material shall be planed chipped of ground and present a smooth workmanlike appearance.
PAINT:- One coat of RED LEAD except where noted. Shop contact surfaces not painted.
Denotes break in stagger.

REQUIRED LIST

No. Req'd	Mark	Description	Remarks
1	L16-L18NW	Bottom Chord	
1	L16-L18CW	D.	D.
1	L16-L18SW	D.	D.
1	L16-L18NE	D.	D.
1	L16-L18CE	D.	D.
1	L16-L18SE	D.	D.

WORK THIS SHEET WITH SHEET #319A
- BOTTOM CHORD L16-L18 SPAN (57'-7 3/16")

TOTAL	1
PCS.	1
STOCK	4
INCH	1
SQ. INS.	10
W. UNITS	1
LBS.	
ERECT.	1
DETAIL	1
WGT.	10

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WORKS
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Franklin Fabrication
IN CHARGE B.R.W. DESIGN BY T.C.M.
CHECKED BY J.J.S. 11/57 TRACED BY J.E.P. 11/27/57
REVISED FOR SHOP CONTRACT C.C. 25873
SHOP NO. 2 SHEET 319

15-8-61

TranSystems

Made By: KMW Date: 3/4/09 Job No: HAM 471-0025

Checked By: CJM Date: 3/24/09 Sheet No. 1/3

L16 L17 DEAD LOAD CALCS SPAN 5-7

WT OF MEMBER A = 47.9250 IN² L = 10'-8¼" = 10.6875'

$10.6875' \times \frac{47.9250\ in^2}{144\ in^2}\ ft^2 \times \frac{0.49\ K}{ft^3} = \boxed{1.7429\ K}$

GUSSETS

L16 USE [L15L16] CALC = 0.3606 K

L17 PL: 55¼" x 7/16" x 4'-8½" - CLIPS (SAY 5% FOR CLIPS)

= (4.6042' x 0.0365' x 4.7083') x 0.95

= 0.7517 ft³ → @ $\frac{0.49\ K}{ft^3}$ = 0.3683 K

TOT = 0.7289 K

LACING/BATTEN = SIMILAR TO [L15L16], SAY 0.1929 K

RIVETS ASSUME 0.8#/RIVET

280 RIVETS @ 0.8#/RIVET = 224 # = 0.2240 K

MISC

SHARED PLs FROM [L15L16] → PLs (ab), (aa), (c), (w) = 0.3199 ft³ + 0.1530 ft³ + 0.0430 ft³ + 0.2948 ft³

SHARED PLs = 0.8107 ft³

L16 L17 ONLY PLs = (v) 12" x ⅛" x 1'-10½" = 1' x 0.0104' x 1.875 = + 0.0195 ft³

(bm) SIMILAR TO (f) ON [L15L16] SAY = + 0.0106 ft³

(s) 4" x ⅜" x 7½" = + 0.0065 ft³

0.8453 ft³

$0.8453\ ft^3 \times \frac{0.49\ K}{ft^3} = \boxed{0.4152\ K}$

WT OF MEMBER	= 1.7429 K
GUSSETS	= 0.7289 K
LACING/BATTEN	= 0.1929 K
RIVETS	= 0.2240 K
MISC	= 0.4152 K
	3.3039

BUMP UP = $\frac{3.3039}{1.7429\ K}$ = 1.9

Calculations for 1/8 US Grid

SECTION A-A

L/G FOR NE-CE-SE

L/G FOR NW-CW-SW

70 SHARED

GENERAL NOTES:-
RIVETS:- 7/8"ø
OPEN HOLES:- 15/16"ø
MATERIAL:- Carbon steel A.S.T.M. A7-36 with .2% copper content, except were noted.
REAMING:- All holes may be punched full size except:
(a) All holes marked RT are to be subpunched 1/8" small and reamed to size to a total template.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.
SHEARED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on details.
FLAME CUT EDGES of main material shall be planed chipped or ground and present a smooth workmanlike appearance.
PAINT:- One coat of RED LEAD except where noted. Shop contact surfaces not painted.
Denotes break in stringer.

Shop must maintain clear distance between gussets and chords and cut to cut of web members as erected to insure ease in assembling.

FOR REQUIRED LIST SEE SHEET #319

WORK THIS SHEET WITH SH. #319

BOTT. CHORD L/G-L/R (SPANS 7 & 8)

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WORKS
ENGINEER: [illegible]
FABRICATED STEEL CONSTRUCTION
Drawing Completed
DESIGNED: [illegible] DRAWN: [illegible] TRACED: [illegible]
CHECKED BY T.J.S. 11/8/57 TRACED BY E.E.P. 12/17
REVISED FC TAC 3/6/57 LAST INSPECTED
CONTRACT CC 6258-73 SHEET 318

SHOP NO. 2

15-8-62

INCLUDE IN [L16L17] CALC ONLY

3/3

MAIN MATERIAL
2-15"ϕ @ 33.9# x 21'-4 13/16 M-1-E
2-PLS 15 x 7/16 x 13'-9 (L16-L17)
2-PLS 15 x 1/2 x 28'-10 7/16 M-1-E

(1'-4 1/2 INTO 1/4 GUSS IE)
2-GUS ES 53 1/2 x 7/16 x 4'-8 1/2 CLW

MAIN MATERIAL
2-15"ϕ @ 33.9# x 21'-7 7/8 M-1-E
2-PLS 15 x 7/16 x 13'-10 (L16-L17)
2-PLS 15 x 1/2 x 23'-0 3/4 M-1-E

2-GUS ES 55 1/2 x 7/16 x 4'-8 1/2 CLW
(1-4 1/2 INTO 1/4 GUSS IE)

WEB VIEW FOR NW-CW & SW

WEB VIEW FOR NE-CE-SE

L16

L17

L18

FOR PART TO LEFT OF LINE X-X SEE SHEET #319A

FOR PART TO LEFT OF LINE Y-Y SEE SHEET #319A

16-17
181

19 x 2

x1

x1

50

50

BOLT THIS BAR BACK FOR SHIPM'T

TACK RIVETS

GENERAL NOTES
RIVETS — 7/8"ϕ
OPEN HOLES — 15/16"ϕ
MATERIAL — Carbon steel A.S.T.M. A7-36 with .20% copper content, except were noted. All holes may be punched full size except;
(a) All holes marked RR are to be subpunched 1/8" small and reamed to size to a total template.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid where noted on details.
FLAME CUT EDGES of main material shall be planed to a depth of 1/32" except where noted.
PAINT — Shop contact surfaces not painted. Denotes break in stagger.

REQUIRED LIST

No Req'd	MARK	DESCRIPTION	REMARKS
1	L16-L18NW	Bottom Chord	
1	L16-L18CN	D.	D.
1	L16-L18SW	D.	D.
1	L16-L18NE	D.	D.
1	L16-L18CE	D.	D.
1	L16-L18SE	D.	D.

WORK THIS SHEET WITH SHEET #319A
- BOTTOM CHORD L16-L18 SPAN (E.T.) & (LINE)

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI - DEPT. PUBLIC WORKS
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawing at Pencin Fabrication at
IN CHARGE Earley — DESIGN BY T.E.M.
CHECKED BY J.J.S. 11/1/37 — TRACED BY I.E.P. 11/27/37
REVISED — DETAILED —
P.O. No. 7697
CONTRACT CC25873

SHOP NO. 2

SHEET 319

10

15-8-61

TranSystems

Made By: KMW Date: 3/4/09 Job No: HAM 471-0025

Checked By: CJM Date: 3/24/09 Sheet No. 1/3

L17 L18 DEAD LOAD CALCS SPAN 5-7

WT OF MEMBER A= 34.8000 in² L= 10'-8¼" = 10.6875'

$10.6875' \times \frac{34.8000\ in^2}{144\ in^2}\ ft^2 \times \frac{0.49\ K}{ft^3} = 1.2656\ K$

GUSSETS

L17 = WSE [L16L17] CALC = 0.3683 K

L18 PL = 60" x 9/16" x 5'-7" - CLIPS

= 5' x 0.0469' x 5.583' - (0.1657 ft³ + 0.0309 ft³ + 0.0733 ft³)

= 1.3093 ft³ - (0.2699 ft³)

= 1.0394 ft³

↳ @ $\frac{0.49\ K}{ft^3}$ = 0.5093 K

L18 CLIPS = (L TO R) ① Δ 45½" x 22 3/8"

9/16" THICK = ½ (3.7917' x 1.8646' x 0.0469')

① = 0.1657 ft³

② Δ 5½" x 34½"

② = ½ (0.4583' x 2.875' x 0.0469')

= 0.0309 ft³

③ = Δ 10" x 45"

= ½ (0.8333' x 3.75' x 0.0469')

= 0.0733'

TOT = 0.8776 K

LACING BARS SIMILAR TO [L18L11] @ 0.003588 K/BAR

26 BAR @ 0.003588 K/BAR = 0.0933 K

BATTEN SAME AS [L18L11] = 0.0817 K

TOT = 0.175 K

RIVETS ASSUME 0.8#/RIVET

335 @ 0.8#/RIVET = 268.0# = 0.2680 K

MISC

(bb) 2 PLs @ 15" x 9/16" x 4'-5¾" = 0.553 ft³ →

(V) 2 PLs @ 14.25" x 11/16" x 5'-6½" = 1.1875' x 0.0573' x 5.0208' = 0.3416 x 2 GUSSETS = 0.6832 ft³

(aa) 1 PL @ 3" x ¾" x 1'-4" = 0.25' x 0.0313' x 1.3' = ~~0.10~~ 0.0109 ft³

1.2471 ft³

1.2471 ft³ @ $\frac{0.49\ K}{ft^3}$ = 0.6111 K

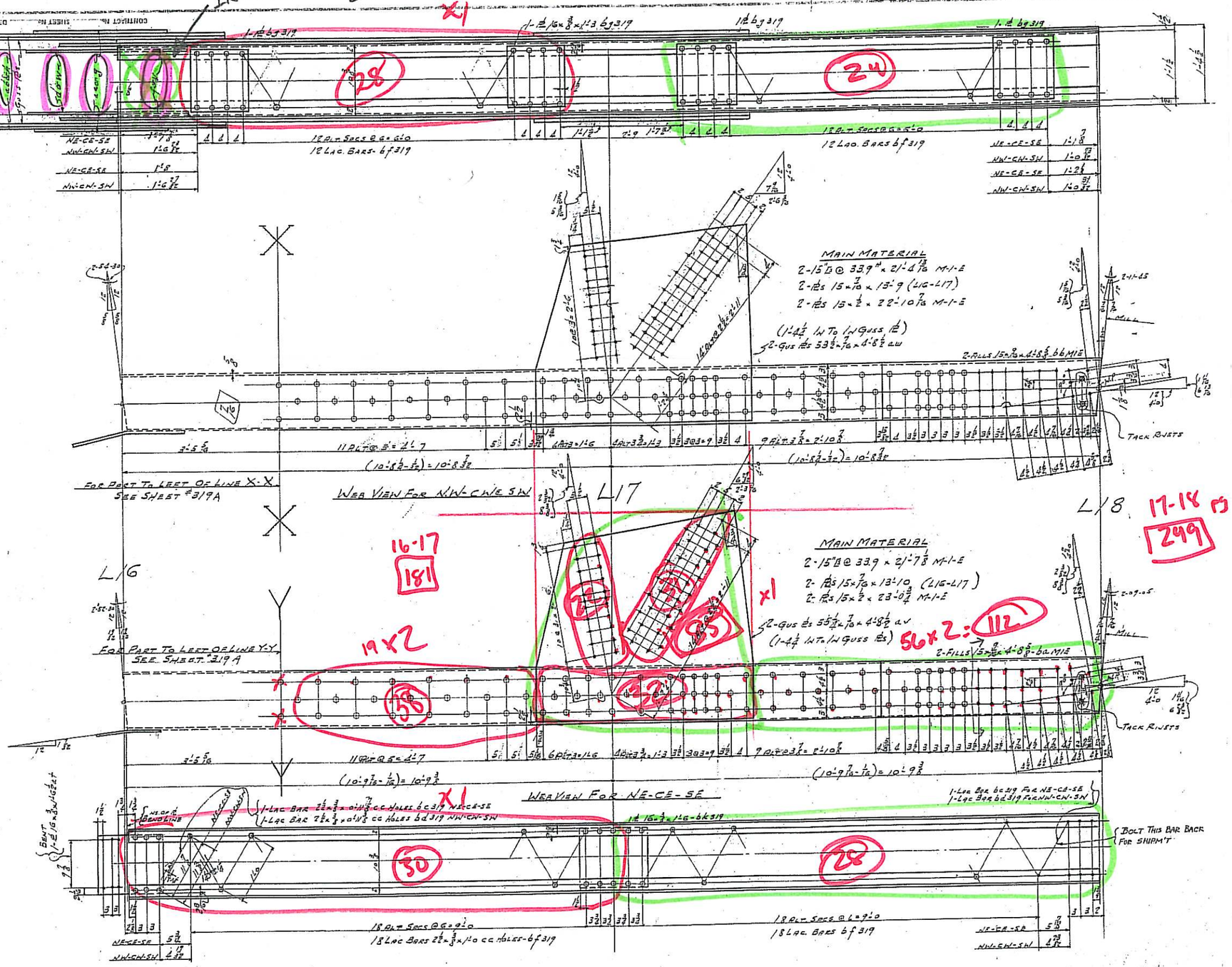
WT OF MEMBER	= 1.2656 K
GUSSETS	= 0.8776 K
LACING/BATTEN	= 0.1750 K
RIVETS	= 0.2680 K
MISC	= 0.6111 K
	3.1973 K

BUMP UP = $\frac{3.1973}{1.2656\ K}$ = 2.53

Calculations for 1/8 US Grid

INCLUDE IN [L16L17] CALC ONLY

2/3


MAIN MATERIAL
2-15"□ @ 339# × 21'-4 13/16 M-1-E
2-PLS 15×7/16 × 13'-9 (L16-L17)
2-PLS 15×1/2 × 22'-10 7/16 M-1-E
(1-4 1/2 I/W TO I/W GUSS PL)
2-GUS PLS 53 1/2×7/16×4'-8 1/2 a/w
2-FILLS 15×3/8×4'-8 3/8 P-BA MTE
MAIN MATERIAL
2-15"□ @ 33.9 × 21'-7 1/8 M-1-E
2-PLS 15×7/16 × 13'-10 (L16-L17)
2-PLS 15×1/2 × 23'-0 3/4 M-1-E
(1-4 1/2 INT. I/W GUSS PLS)
2-GUS PLS 55 1/2×7/16×4'-8 1/2 a/w
2-FILLS 15×3/8×4'-8 3/8 P-BA MTE
TACK RIVETS
BOLT THIS BAR BACK FOR SHIPM'T
FOR PART TO LEFT OF LINE X-X SEE SHEET #319A
FOR PART TO LEFT OF LINE Y-Y SEE SHEET #319A
WEB VIEW FOR NW-CW-E SW
WEB VIEW FOR NE-CE-SE
L16
L17
L18
NE-CE-SE
NW-CW-SW
NE-CE-SE
NW-CW-SW
18 PLT SPCS @ 6 @ 9'-0
18 LAC BARS 6 f 319
18 PLT SPCS @ 6 @ 5'-0
18 LAC BARS 6 f 319
18 PLT SPCS @ 6 @ 9'-0
18 LAC BARS 2 1/2 × 3/8 × 1'-0 CC HOLES - 6 f 319
18 PLT SPCS @ L = 9'-0
18 LAC BARS 6 f 319
1-L2 6 f 319
1-L2 6 f 319
1-L2 6 f 319
1-L2 6 f 319
1-L2 6 f 319
1-L2 6 f 319
1-LAC BAR 2 1/2 × 3/8 × 0'-11 3/16 CC HOLES 6 f 319 NE-CE-SE
1-LAC BAR 2 1/2 × 3/8 × 0'-11 3/16 CC HOLES 6 f 319 NW-CW-SW
1-LAC BAR 6 f 319 FOR NE-CE-SE
1-LAC BAR 6 f 319 FOR NW-CW-SW
1 PL 16 × 3/4 × L16-L18 f 319
1 PL 16 × 3/4 × L16-L18 f 319
1 PL 16 × 3/4 × L16-L18 f 319
1 PL 16 × 3/4 × L16-L18 f 319
11 PLT @ 5" = 21'-7
(10'-8 1/2 - 5/8") = 10'-8 3/8"
11 PLT @ 5" = 21'-7
(10'-9 7/16 - 1/16") = 10'-9 3/8"
9 PLT @ 7/8" = 21'-10 1/8"
(10'-8 1/2 - 5/8") = 10'-8 3/8"
9 PLT @ 7/8" = 21'-10 1/8"
(10'-9 7/16 - 1/16") = 10'-9 3/8"
2-L2 6 f 319
2-L2 6 f 319
2-L2 6 f 319

3/3

WEB VIEW FOR NW-CW-SW

WEB VIEW FOR NE-CE-SE

SECT. B-B

SECT. A-A

SECT. C-C.

SECTION D-D

L18

L19

L20

REQUIRED LIST			
Nº	DESCRIPTION	MARK	REMARKS
1	Bottom Chord	L18-L20NW	
1	do	L18-L20CW	
1	do	L18-L20SW	
1	do	L18-L20NE	
1	do	L18-L20CE	
1	do	L18-L20SE	

BOTTOM CHORD L18-L20-SPAN 5-7 & SPAN 10-12

COLUMBIA AVE. VIADUCT

CINCINNATI, OHIO

CITY OF CINTI. - DEPT. PUBLIC WORKS

BORN T.B.C. 1-22-57, T.J.S. 2-11-57, W.E.B. 1-29-57

F.C. T.B.C. 3-5-57

CC25873

320

15-8-63

595
323
270
115.5
718

TranSystems

Made By: KMW Date: 3/4/09 Job No: HAM-471-0025

Checked By: CJM Date: 3/24/09 Sheet No. 1/2

L18 L19 DEAD LOAD CALCS SPAN 5-7

WT OF MEMBER $A = 19.8000\ in^2$ $L = 10'-9\ 11/16" = 10.8073'$

$$10.8073' \times \frac{19.8000\ in^2}{144\ in^2}\ ft^2 \times \frac{0.49\ K}{ft^3} = \boxed{0.7281\ K}$$

GUSSETS L18 USE [L17L18] CALC = 0.5093 K

L19 CLIPS = $\triangle$ $\frac{1}{2}(46.5" \times 4" \times \frac{1}{2}") = \frac{1}{2}(3.875' \times 0.\bar{3}' \times 0.0417') = 0.0269\ ft^3$

$\triangle$ $\frac{1}{2}(36.5" \times 8" \times \frac{1}{2}") = \frac{1}{2}(3.0417' \times 0.\bar{6}' \times 0.0417') = 0.0423\ ft^3$

$\triangle$ $\frac{1}{2}(46.5" \times 8\frac{1}{2}" \times \frac{1}{2}") = \frac{1}{2}(3.875' \times 0.7083' \times 0.0417') = 0.0572\ ft^3$

CLIPS = $0.1264\ ft^3$

L19 PL = $49" \times \frac{1}{2}" \times 5'-1\frac{1}{2}"$ − (CLIPS)

$= 4.0833' \times 0.0417' \times 5.0417' - (0.1264\ ft^3)$

$= 0.7321\ ft^3 \rightarrow @ \frac{0.49\ K}{ft^3} = \boxed{0.3587\ K}$

TOT = 0.8680 K

LACING / BATTEN = SAME AS [L17L18] = 0.1750 K

RIVETS ASSUME 0.8#/RIVET

SAY 300 RIVETS @ 0.8#/RIVET = 240# = 0.2400 K

MISC

1 PL	$6" \times \frac{3}{8}" \times 1'-0\frac{1}{4}"$ (a4)	$= 0.5' \times 0.0313' \times 1.0208' =$	$= 0.0160\ ft^3$
2 PLs	$12" \times \frac{1}{2}" \times 3'-6\frac{3}{4}"$ (a1)	$= (1' \times 0.0417' \times 3.5625') \times 2$	$= 0.2969\ ft^3$
2 PLs	$12" \times \frac{9}{16}" \times 4'-9\frac{3}{4}"$ (a5)	$= (1' \times 0.0469' \times 4.8125') \times 2$	$= 0.4512\ ft^3$
			$0.7641\ ft^3$

$0.7641\ ft^3 @ \frac{0.49\ K}{ft^3} = \boxed{0.3744\ K}$

WT OF MEMBER	= 0.7281 K
GUSSETS	= 0.8680 K
LACING / BATTEN	= 0.1750 K
RIVETS	= 0.2400 K
MISC	= 0.3744 K
	2.3855 K

BUMP UP = $\frac{2.3855\ K}{0.7281\ K} = \boxed{3.28}$

Calculations for 1/8 US Grid

WEB VIEW FOR NW-CW-SW

WEB VIEW FOR NE-CE-SE

SECT. B-B

SECT. A-A

SECT. C-C

SECTION D-D

REQUIRED LIST			
Nº	DESCRIPTION	MARK	REMARKS
1	Bottom Chord	L18-L20NW	
1	do	L18-L20CW	
1	do	L18-L20SW	
1	do	L18-L20NE	
1	do	L18-L20CE	
1	do	L18-L20SE	

BOTTOM CHORD L18-L20-SPAN 5-7 & SPAN 10-12

COLUMBIA AVE VIADUCT
CINCINNATI, OHIO
CITY OF CIN'TI.-DEPT. PUBLIC WORKS

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION

BY BORN T.E.G. 1-22-57
CHKD. T.J.S. 2-11-57 W.E.B. 1-29-57
APP'D. CONTRACT CC25873 320

15-8-63

TranSystems

Made By: KMW Date: 3/5/09 Job No: KAM 411-0025

Checked By: CJM Date: 3/24/09 Sheet No. 1/3

L19 L20 DEAD LOAD CALCS SPAN 5-7

WT. OF MEMBER

SAME AS [L18 L19]

∴ 0.7281 K

GUSSETS

L19 = USE [L18 L19] CALC = 0.3587 K

L20 = USE THE LARGER OF THE 2 L20 A's

CLIPS = ½ (19 1/8")(10 ½")(7/16") = ½ (1.5938')(0.875')(0.0365') = 0.0255 ft³

½ (19 1/8")(24 ½")(7/16") = ½ (1.5938')(2.0417')(0.0365') = 0.0594 ft³

L20 R = 30 ¾" x 7/16" x 4'-2" − (CLIPS) CLIPS = 0.0849 ft³

= 2.5625' x 0.0365' x 4.1667' − 0.0849 ft³

= 0.3048 ft³ @ 0.49 K/ft³ = 0.149 K → 2 Pcs ∴ x2 = 0.2987

TOT = 0.6574 K

LACING/BATTEN = SAY SAME AS [L18 L19] MINUS 5 LACING BARS

BARS SAME SIZE AS [L18 L19] = 0.003588 K/BAR

L18L19 = 0.1750K, ∴ L19L20 = 0.1750 K − 5(0.003588 K)

= 0.1571 K

RIVETS

ASSUME 0.8#/RIVET

167 → SAY 200 FOR VARIED CONFIGS BTW TRUSSES

200 RIV. x 0.8#/RIVETS = 160# = 0.1600 K

MISC

2 pcs { 1 PL = 9" x 5/8" x 1'-2 5/8" = → = 0.0476 ft³

1 PL = 6" x 5/8" x 5" = 0.5' x 0.0521' x 0.4167' = 0.0109 ft³

1 R = 6" x ¾" x 11 7/8" = 0.5' x 0.0625' x 0.9896' = 0.0309 ft³ } x2 = 0.0836 ft³

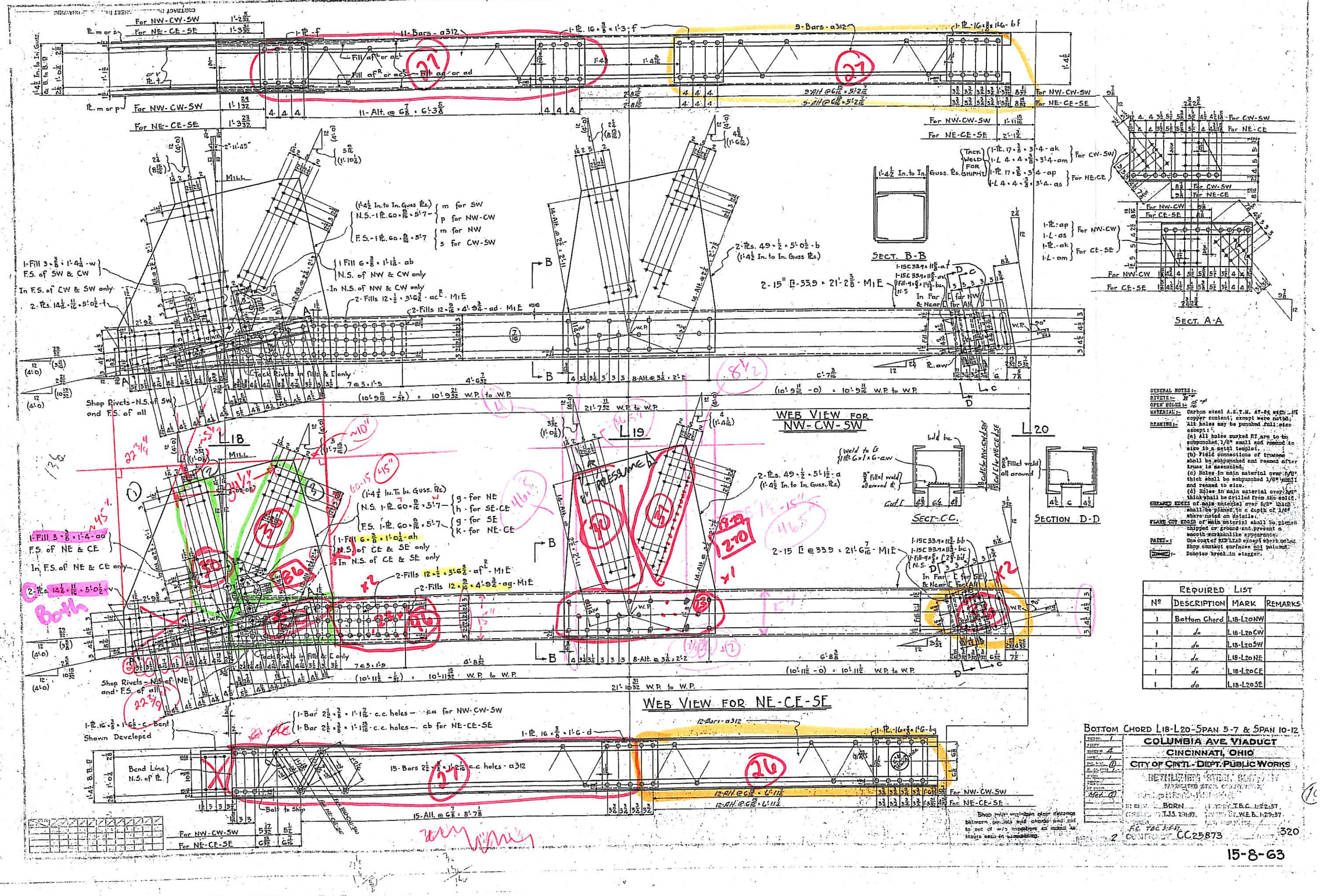
PIN PLs 2 Pcs: 2(11 5/8" x ¾" x 3'-11½") = 2(0.9688' x 0.0625' x 3.9583') = 0.4794 ft³

∴ 0.0476 ft³ + 0.0836 ft³ + 0.4794 ft³ = 0.5630 ft³ @ 0.49 K/ft³ = 0.2992 K

WT OF MEMBER	= 0.7281 K
GUSSETS	= 0.6574 K
LACING/BATTEN	= 0.1571 K
RIVETS	= 0.1600 K
MISC.	= 0.2992 K
	2.0018 K

BUMP UP = 2.0018 K / 0.7281 K = 2.75

Calculations for 1/8 US Grid



GENERAL NOTES:-
RIVETS:- Ø 7/8"
OPEN HOLES:- Ø 13/16"
MATERIAL:- Carbon steel A.S.T.M. A7-46 with .1% copper content; except were noted. All holes may be punched full size except:-
(a) All holes marked RI are to be subpunched 1/8" small and reamed to size in a metal templet.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over 3/4" thick shall be drilled from the solid.
SHEARED EDGES of main material over 5/8" thick shall be planed, to a depth of 1/16" where noted on details.
FLAME CUT EDGES of main material shall be planed, chipped or ground and present a smooth workmanlike appearance.
PAINT:- One coat of RED LEAD except shop rivet and shop contact surfaces not painted.
- Denotes break in stagger.

REQUIRED LIST			
Nº	DESCRIPTION	MARK	REMARKS
1	Bottom Chord	L18-L20NW	
1	do	L18-L20CW	
1	do	L18-L20SW	
1	do	L18-L20NE	
1	do	L18-L20CE	
1	do	L18-L20SE	

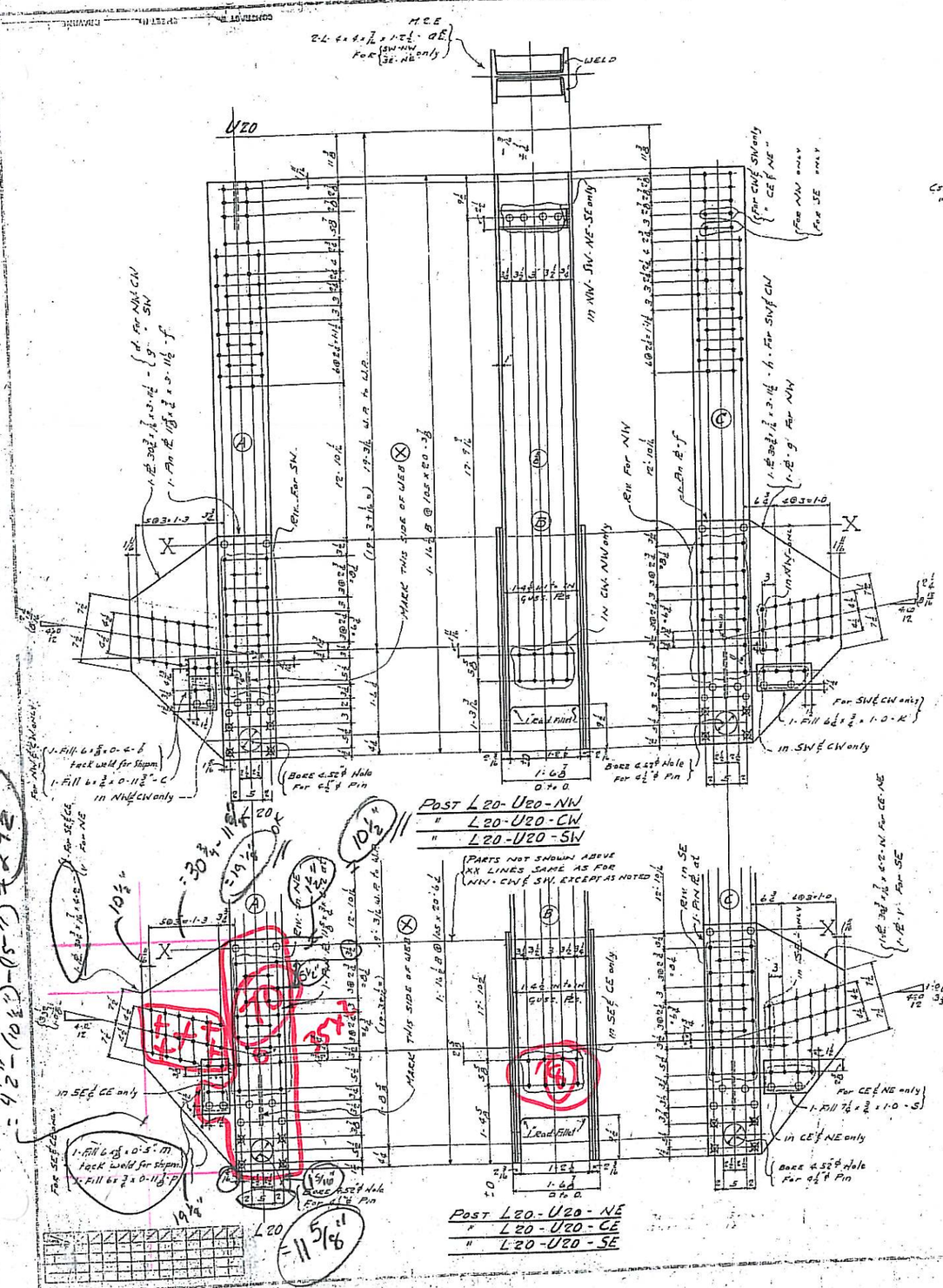
BOTTOM CHORD L18-L20-SPAN 5-7 & SPAN 10-12

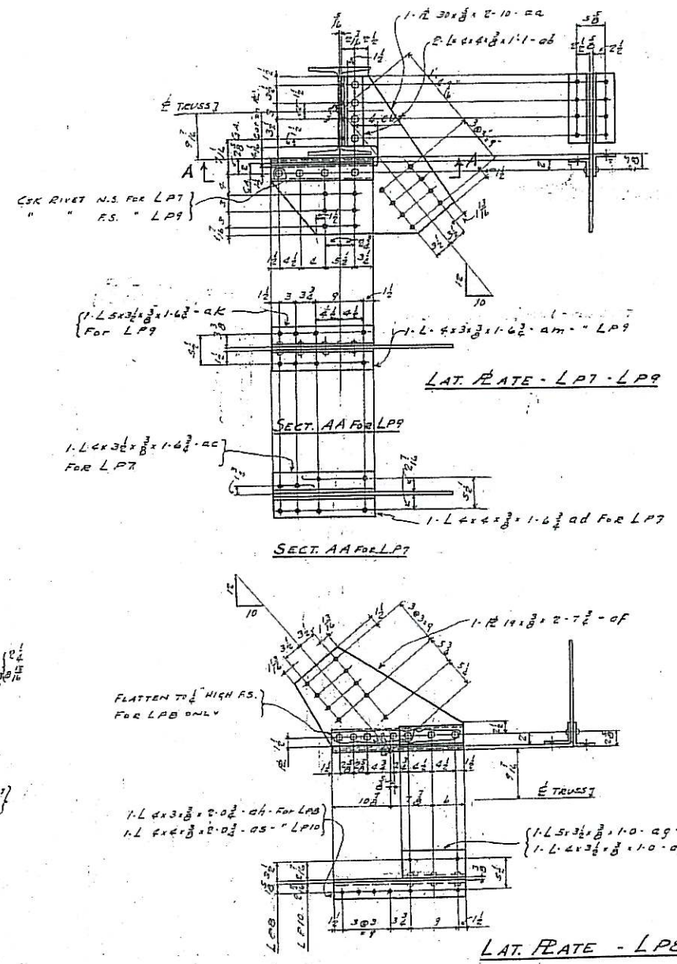
COLUMBIA AVE VIADUCT
CINCINNATI, OHIO
CITY OF CIN'TI. - DEPT. PUBLIC WORKS

DESIGNED BY BORN. TRACED BY T.B.C. 1-22-37.
CHECKED BY T.J.S. 2-11-37. DETAILED BY W.E.B. 1-29-37.
APPROVED BY F.C. TBC 3-5-37.
CONTRACT NO. CC25873 320

15-8-63

3/3





GENERAL NOTES:-
RIVETS:- ⅞" ϕ
OPEN HOLES:- 1" ϕ
MATERIAL:- Carbon steel A.S.T.M. A7-34 with .2% copper content, except were noted.
REAMING:- All holes may be punched full size except:-
(a) All holes marked RF are to be subpunched 3/8" small and reamed to size in metal templet.
(b) Field connections of trusses shall be subpunched and reamed after truss is assembled.
(c) Holes in main material over 5/8" thick shall be subpunched 1/8" small and reamed to size.
(d) Holes in main material over ¾" thick shall be drilled from the solid.
SHEARED EDGES of main material over 5/8" thick shall be planed to a depth of 1/4" where noted on details.
FLAME CUT EDGES of main material shall be planed chipped or ground and present a smooth workmanlike appearance.
PAINT:- One coat of RED LEAD except where noted. Shop coatmust surfaces not painted.
Bevelled break in stagger.

Shop must maintain clear distance between gussets and chords and cut to cut of web members as noted to insure ease in assembling.

REQUIRED LIST			
No	DESCRIPTION	MARK	REMARK
1	Post	L20-U20-NW	
1	"	L20-U20-CW	
1	"	L20-U20-SW	
1	"	L20-U20-NE	
1	"	L20-U20-CE	
1	"	L20-U20-SE	
2	LAT. PLATE	LP7	AT L20 NW & E CW
2	" "	LP8	AT L20 CW & SW PER 7
2	" "	LP9	AT L20 PER 10 SE & CE
2	" "	LP10	AT L20 CE & NE PER 10

Posts L20-U20 Piers 7 & 10 (SPANS: S-7-10-12)

COLUMBIA AVE. VIADUCT
CINCINNATI, OHIO
CITY OF CINTI. - DEPT. PUBLIC WORKS

Sheet No. 323

100.4
234.28
334.68

15-8-66