TranSystems

Made By:	KMW	Date:	12/31/08	Job No:	HAM-471-0025
Checked By:	CJM	Date:	2/27/09	Sheet No.	1 of 1

DEAD LOAD CALCS CALC FOR SPLICE PL's

FOR SPANS W/ TYP. SR's: [2 PL's @ 14" x 9/16" x 3' ; 1 PL @ 16" x 3/8" x 1'-9" ; 1 PL @ 16" x 9/16" x 2'-9"]

PL's

$2(14" \times 9/16" \times 3') = 2(1.1667' \times 0.0469' \times 3') = 2(0.1642\ ft^3)$

$= 0.3293\ ft^3 \times 0.490\ K/ft^3 = \underline{0.1614\ K}$

(+)

$16" \times 3/8" \times 1'-9" = 1.3333' \times 0.03125' \times 1.75' =$

$= 0.0729\ ft^3 \times 0.490\ K/ft^3 = \underline{0.0357\ K}$

(+)

$16" \times 9/16" \times 2'-9" = 1.3333' \times 0.0469' \times 2.75' =$

$= 0.17196\ ft^3 \times .490\ K/ft^3 = \underline{0.0843\ K}$

(=)

0.2814 K →

0.0179 K

0.2993 K

(+)

ADD 2, 14" x 1/8" x 18" FILL PL's

$2(1.1667' \times 0.01042' \times 1.5') = 0.03647\ ft^3$

$0.03647 \times 0.490\ K/ft^3 = \underline{0.0179\ K}$

RIVETS

ADDITIONAL TO NORMAL MEMBER RIVETS:

TOP = 36

2 SIDES = 40

BTM = APPROX. EQUAL TO BATTEN PL (REPLACES BATTEN PL)

∴ DO NOT ADJUST FOR BTM.

76 RIVETS (ADDITIONAL) (ASSUME 0.8# EACH)

$76 \times 0.8\# = 60.8\# \times \frac{1\ K}{1000\#} =$ **0.0608 K**

(=)

TOTAL ADDITIONAL WT. TO ADD FOR SR's

0.3601 K

Calculations for 1/8 US Grid

TranSystems®

Field Notes

PROJECT NO HAM-471-0025 BRIDGE NO
DATE 12/29/08 SHEET 1 of 3
CREW ① KMW ✓ CJM 3/11/09

DEAD LOAD CALC U0 U1 N. TRUSS SPANS 5-7

U0 - U1 14 = 14 PANELS @ 10'-7 9/16" = 10.630'

STEEL SECT. (W/O LACING)

$A = 26.4375\ in^2$

$$10.630' \times \frac{26.4375\ in^2}{144\ in^2/ft^3} \times 0.490\ K/ft^3 = \boxed{0.9563\ K}$$

LACING

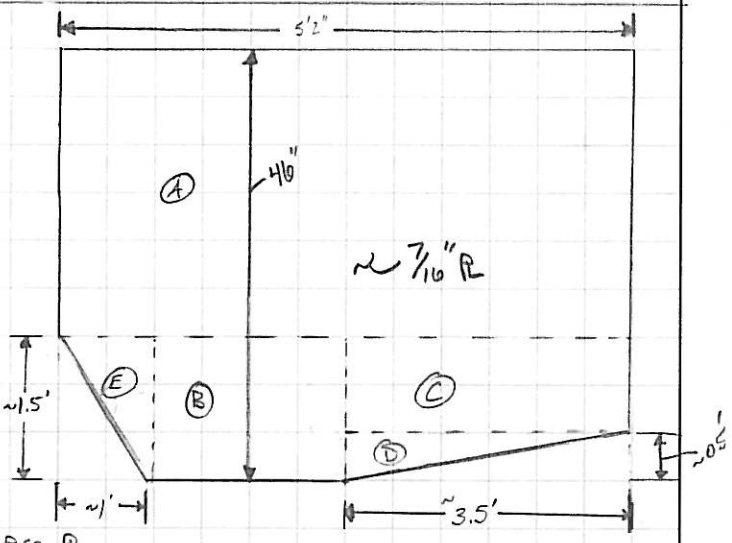
BARS EACH ⇒ 2 1/2 x 3/8" x 1'-0 11/16" ⇒ 0.208' x 0.0312 5' x 1.06' = 0.00689 ft³

0.00689 ft³ x 0.490/ft³ = 0.003376 K //

LACING BTW U0-U1 = 9 BARS ∴ 9 @ 0.003376 K = **0.03038 K //**

GUSSETS

USING LARGEST U0 PL



(A) 5.167' x 2.33' x 0.03646' = 0.439 ft³
(B) = 1.5' x 0.667' x 0.03646' = 0.03648 ft³
(C) = 1' x 3.5' x 0.03646' = 0.1276 ft³
(D) = ½ (C) ⇒ 0.0638 ft³
(E) ½ (1')(1.5') x 0.03646' = 0.0273 ft³

(A-E) = 0.6942 ft³ @ 0.490 K/ft³ = 0.340 K PER PL

N TRUSS HAS 2 GUSSETS ∴ 2 (0.340 K) = **0.680K**

REVISION 1	DATE	CREW	REVISION 2	DATE	CREW
REVISION 3	DATE	CREW	REVISION 4	DATE	CREW

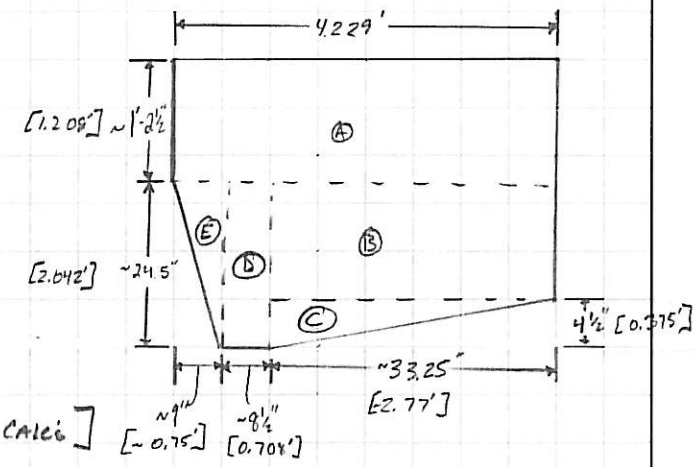
Calculations for 1/4 US Grid

D.L. CALC L0 L1 N. TRUSS SPANS 5-7

GUSSETS (CONT)

L1

7/16" PL = [0.03646']



(A) 4.229' x 1.208' x 0.03646' = 0.1863 ft³

(B) 2.77' x 1.67' x 0.03646' = 0.1687 ft³

(C) ½ (2.77')(0.375') x 0.03646' = 0.0189 ft³

(D) 2.042' x 0.708' x 0.03646' = 0.0527 ft³

(E) ½ (0.75')(2.042') x 0.03646' = 0.0279 ft³

(A-E) = 0.4545 ft³ @ 0.490 K/ft³ = **0.2227 K***

[* ACCOUNT FOR ONLY 1 L1 PL FOR L0-L1 CALCS]

INT. DIAPH.

4 x's @ 8" x 4" x 7/16" ⇒ 17.4 #/LF @ 1'-1" LONG [1.083'] 17.4 #/LF x 1.083 LF = 18.8# x4 = 75.2#

DIAPH. WEB 13" x 3/8" x 1'-1" ⇒ 1.083' x 0.03125' x 1.083' = 0.0367 ft³ @ 490 #/ft³ = 18#

(2) DIAPH. FILL PL's (2) x 7" x 3/8" x 1'-4½" ⇒ 2 x 0.583' x 0.03125' x 1.375' = 0.05 ft³ @ 490 #/ft³ = 24.5#

* RIVETS EXCLUSIVE TO DIAPH. QNTY = 8, ASSUME 0.8# RIVETS ⇒ 8 x 0.8# = 6.4#

DIAPH(EOT) = 124.1 #, or 0.1241 K/EACH → CALC FOR 1 WHOLE DIAPH. @ L0 + ½ DIAPH @ L1 ∴ **0.1862 K**

* ONLY RIVETS NOT ATTACHED TO CHORD INCLUDED HERE. ALL SHARED RIVETS MUST BE INCLUDED IN OVERALL CALC. ** SEE DIAPH CALC PAGE FOR FURTHER DETAILS

BATTEN PL's QNTY=2 @ 15" x 3/8" x 1'-3" ⇒ 1.25' x 0.03125' x 1.25' = 0.049 ft³ x QNTY(2) = 0.098 ft³

0.098 ft³ x 0.490 K/ft³ = **0.04802 K**

BEVELED FILL PL's L0 *USING ONLY THE LARGEST PL FOR ALL CHORDS

L0 Avg. T = (15/16" + 3/8") / 2 = 0.65625" ⇒ VOL. = 16" x 0.65625" x 1'-6" = 189 in³ x 0.490 K / 1728 in³ = **0.0536 K**

L1 Avg. T = (13/16" + 7/16") / 2 = 0.625" ⇒ VOL. = 16" x 0.625" x 11" = 110 in³ x 0.490 K / 1728 in³ = 0.0312 K**

** ONLY INCLUDE ½ L1 BEV. PL FOR L0-L1 CALCS ∴ L1 PL = ½ (0.0312 K) = **0.0156 K**

REVISION 1	DATE	CREW	REVISION 2	DATE	CREW
REVISION 3	DATE	CREW	REVISION 4	DATE	CREW

Calculations for 1/4 US Grid

TranSystems

Field Notes

PROJECT NO HAM-471-0025 BRIDGE NO
DATE 12/30/08 SHEET 3 OF 3
CREW (1) KMW VC JM 3/11/09

D.L. CALCS U0U1 N. TRUSS SPANS 5-7

FB SEAT ∠'S U0 -> 4"x4"x 3/8" ∠ = 9.72 #/LF @ 2.083' = 20.2 # (1K/1000#) = 0.0202 K

U1 -> 4"x4"x 3/8" ∠ = 9.72 #/LF @ 1.208' = 11.7 # (1K/1000#) = 0.0117 K

∠ (LOT) = 0.0319 K

RIVETS

U0 -> X

TOP OF TOP CHORD	= 41 RIVETS
2 SIDES OF TOP CHORD	= 96 RIVETS
2 SIDES VERT @ GUS.	= 36 RIVETS
2 SIDES DIAG @ GUS	= 46 RIVETS
BTM OF TOP CHORD	= 8 RIVETS
	227 RIVETS

X-U1

TOP OF TOP CHORD	= 36 RIVETS
2 SIDES OF TOP CHORD (UP TO GUS)	= 44 RIVETS
1 SIDE TOP CHORD (ON GUS)	= 38 RIVETS
1 SIDE VERT @ GUS	= 16 RIVETS
1 SIDE DIAG @ GUS	= 18 RIVETS
BTM OF TOP CHORD	= 16 RIVETS
	168 RIVETS

U0 U1 LOT = 395 RIVETS, ASSUME 0.8# EACH

∴ 395 @ 0.8# x (1K/1000#) = 0.316 K

WT OF MEMBER	= 0.9563 K
GUSSET PL'S	= 0.6800 K
	0.2227 K
INT. DIAPH.	= 0.1862 K
BATTEN PL'S	= 0.04802 K
BEVELED FILL PL'S	= 0.0536 K
	0.0156 K
LACING ∠'S	= 0.03038 K
	= 0.0319 K
RIVETS	= 0.316 K
	2.5407 K

BUMP UP = 2.5407 / 0.9563 = 2.66

Calculations for 1/4 US Grid

REVISION 1	DATE	CREW	REVISION 2	DATE	CREW
REVISION 3	DATE	CREW	REVISION 4	DATE	CREW

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Field Notes

PROJECT NO Ham-471-0025 BRIDGE NO
DATE 12/30/08 SHEET 1 OF 2
CREW ① KMW ✓CJM 2/27/09

DEAD LOAD CALCS U1U2 N. TRUSS SPANS 5-7

FROM SECTION A= 26.4375
LENGTH: 10'-7 9/16" [10.630']

$\frac{26.4375 in^2}{144 in^2} \times 10.630' \times \frac{0.490\ K}{ft^3} = 0.9563K$

GUSSET PLS *1 GUSSET @ EACH PANEL PT TAKEN

U1 = SAME AS U0U1 CALC FOR U1 GUSSET = * 0.2227 K
U2 = " " " " " " " " = * 0.2227 K

∴ U1U2 GUSSETS = 0.4464 K (EDC)

INT. DIAPH.

USE ½ OF DIAPH. @ U1 + ½ OF DIAPH. @ U2 = 1 DIAPH, SAME AS U0U1
DIAPH. CALCS = 0.1226 K

LACING

INDIVIDUAL BAR WEIGHT SAME AS CALC FOR U0U1 CALC. PER BAR = 0.003376K
U1U2 HAS 11 BARS ∴ 11 x 0.003376K = 0.03714 K

BATTEN PLS

QNTY = 2 PLS SAME AS U0U1 = 2 PLS = 0.04802 K

BEVELED FILL PLS

U1 + U2 BEVELED PLS ARE EQUAL ∴ ½ OF EACH PL = 1 WHOLE PL.
USE U1 CALC FROM U0U1 CALCS:

0.0312 K

REVISION 1	DATE	CREW	REVISION 2	DATE	CREW
REVISION 3	DATE	CREW	REVISION 4	DATE	CREW

Calculations for 1/4 US Grid

DEAD LOAD CALCS U1U2 N. TRUSS SPANS 5-7

SEAT #'S

NONE @ U2 ∴ USE ½ OF U1 #, USE CALC FROM U0U1 SHEETS:

½ OF 0.0117 K = 0.00585 K ↔ 0.0059

---

*SEE ATTACHED SHOP DRAWING

RIVETS

U1U2 *TOTAL : 270 ASSUME 0.8# / RIVET

∴ 270 x 0.8# = 216# $\left(\frac{1\ K}{1000\ \#}\right)$ = 0.2160K

WT OF MEMBER:	0.9563 K
GUSSET PL's:	0.4454 K
INT. DIAPH's:	0.1226 K
LACING :	0.0371 K
BATTEN PL's :	0.0480 K
BEVELED PL's :	0.0312 K
SEAT #'s :	0.0059 K
RIVETS :	0.2160 K
	1.8625 K

BUMP UP = $\frac{1.8625\ K}{0.9563\ K}$ = 1.948

Calculations for 1/8 US Grid

TranSystems

Made By: KMW	Date: 1/05/08	Job No: HAM-47100025	
Checked By: CJM	Date: 3/11/09	Sheet No. 1 OF 1	

DEAD LOAD CALC U2L3 N. TRUSS SPANS 5-7

THIS SECTION SIMILAR TO U1U2, USE OVERALL CALC FOR U1U2, IN ADDITION TO ADDING SR WEIGHT FROM SPLICE PL SHEET.

↳ 0.3601 K

U1U2 = U2L3 = 1.8625 K
+
0.3601 K
2.2226 K //

WT OF MEMBER = 0.9563 K //

U2L3

∴ BUMP UP = 2.2226 K / 0.9563 K = 2.321

Calculations for 1/8 US Grid

TranSystems

Made By: KMW	Date: 1/05/09	Job No: HAM 471.0025	
Checked By: CJM	Date: 3/11/09	Sheet No. 1 OF 1	

DEAD LOAD CALCS **L3L4** N. TRUSS SPANS 5-7

VERY SIMILAR TO L4L5 ∴ USE U4L5 CALS

L3L4 BUMP UP = **1.86**

Calculations for 1/8 US Grid

TranSystems

Made By:	KMW	Date:	12/31/08	Job No:	HAM-471-0025
Checked By:	CJM	Date:	3/11/09	Sheet No.	1 OF 2

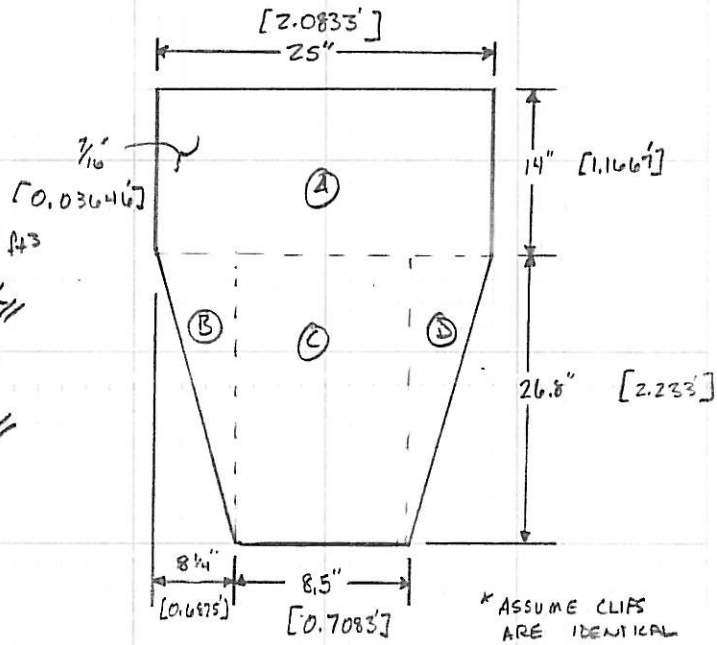
DEAD LOAD CALC'S L4L5 N. TRUSS SPANS 5-7

WT OF MEMBER

A= 26.4375" = SAME AS L0L1 CALCS ∴ 0.9563 K

GUSSET PL'S

L4



(A) 2.0833' x 1.1667' x 0.03646' = 0.0886 ft³

0.0886 ft³ x 0.490 K/ft³ = 0.0434 K //

(B) ½ (0.6875')(2.233') x 0.03646' = 0.0280 ft³

0.0280 ft³ x 0.490 K/ft³ = 0.0137 K //

(C) 0.7083' x 2.233' x 0.03646' = 0.0577 ft³

0.0577 x 0.490 K/ft³ = 0.0283 K //

(D) EQUAL TO (B) = 0.0137 //

(A-D) = *0.0991 K FOR L4

* ASSUME CLIPS ARE IDENTICAL

L4L5 R= 48" x 7/16 x 4'9" A= 2736 in² - 192.5 - 166.5 = 2377 in²

2377 in² (7/16")(0.419/1728) = 0.2949 K

INT. DIAPH. SAME CALC'S AS L1L2 ∴ DIAPH'S = 0.1226 K

LACING SAME BAR WT. AS USED IN PREV. CALC'S ⇒ PER BAR = 0.003376 K

L4L5 HAS 10 BARS ∴ 10 x 0.003376 K = 0.03376 K

BATTEN PLS SAME AS L0L1

∴ 2 PL'S = 0.0480 K

BEVELED FILL PL'S SIMILAR TO L1L2

∴ 0.0312 K

Calculations for 1/8 US Grid

DEAD LOAD CALCS L14L5 N. TRUSS SPANS 5-7

RIVETS * SEE ATTACHED SHOP DRAWING

236 RIVETS ASSUME 0.8#/RIVET

∴ $236 \times 0.8^{\#} \times \frac{1K}{1000^{\#}} = \boxed{0.1888\ K}$

WT. OF MEMBER	:	0.9563 K
GUSSET PLS	:	0.0991 K 0.2949 K
INT. DIAPH	:	0.1226 K
LACING	:	0.03376 K
BATTEN PLS	:	0.0480 K
BEVELED FILL PLS	:	0.0312 K
RIVETS	:	0.1888 K
		1.7747

BUMP UP $= \frac{1.7747}{0.9563} = \boxed{1.86}$

Calculations for 1/8 US Grid

DEAD LOAD CALCS L15 L16 N. TRUSS SPANS 5-7

WT. OF MEMBER

A: 26.4375 = SAME AS U0 U1 CALC = 0.9563 K

GUSSETS

L16 = [51" x 7/16 x 4'-8"] - [CLIPS]

CLIPS Lt = ~6½" / ~2'-9" ∴ ½ (.5417')(2.75') = 0.7448 ft² x 7/16" / 12"/ft

= 0.0272 ft³

+

Rt = ~37" / ~13" ∴ ½ (1.0833')(3.0833') x (7/16" / 12"/ft) = 0.0609 ft³

= 0.0881 ft³

0.0881 ft³ x 0.490 K / ft³ = 0.0432 K //

51" x 7/16 x 4'-8"

[4.25' x 0.0365' x 4.6667'] = 0.7239 ft³ x 0.490K / ft³ = 0.3547 K //

∴ L16 = 0.3547 K - 0.0432K = 0.3115 K

/R

L15 = SLIGHTLY SMALLER THAN L16, USE L16 CALC

∴ L15 = 0.3115 K

/R

USE 1 OF EACH R ∴ 0.3115K + 0.3115 K = 0.6230 K = TOTAL

INT. DIAPH/ SAME AS L1 L2 CALC ∴ = 0.1226 K

SPLICE R's/ FROM SPLICE R CALC SHEET ∴ = 0.3441 K

NOTE, THIS CALC INCLUDES THE SPLICE'S RIVETS - DO NOT COUNT THEM TWICE.

PAGE SUBTOTAL = 2.046 K

Calculations for 1/8 US Grid

DEAD LOAD CALCS L5L6 N.TRUSS SAMUS 5.7

LACING: LACING BARS SAME AS U0U1 = 0.00376 K/BAR

∴ 7 BARS @ 0.00376 K/BAR = 0.0263 K

BATTEN Rs: SAME AS U0U1 = 0.0480 K

BEVELED FILL Rs: USE U1U2 CALCS = 0.0312 K

RIVETS: ASSUME ALL ARE 0.8# EACH

*280 RIVETS @ 0.8#/RIVET = 224# × 1 K/1000# = 0.2240K

* RIVETS ON SIDES & TOP OF SPLICE R COUNTED W/ SPLICE R CALCS

WT OF MEMBER	=	0.9563 K
GUSSETS	=	0.6230 K
DIAPH	=	0.1226 K
SPLICE	=	0.3441 K
LACING	=	0.0263 K
BATTEN Rs	=	0.0480 K
BEVELED Rs	=	0.0312 K
RIVETS	=	0.2240K
		2.3755 K

Bump Up = 2.3755 K / 0.9563 K = 2.48

Calculations for 1/8 US Grid

DEAD LOAD CALCS L6L7 N. TRUSS SPANS 5-7

WT OF MEMBER

A= 31.6875 in^2 LENGTH = 10.630'

$$10.630' \times \frac{31.6875\ in^2}{144\ in^2}\ ft^2 = 2.3392\ ft^3 \ @\ \frac{0.490\ K}{ft^3} = 1.1462\ K$$

GUSSETS L6 = USE L6L6 CALC

L6 = 0.3115 K

(+)

L7 = USE L7L8 CALC

L7 = 0.3247 K

(=)

L6+L7 = 0.6362

SPLICE Rs USE SPLICE R CALC SHEET

= 0.3441 K *

* DOES NOT INCLUDE BOTTOM Rs AND RIVETS, SEE "BATTEN R" + "RIVET" CALCS

INT. DIAPH. USE L/Ø L1 = 0.1226 K

LACING SAME BARS AS L/Ø L1 = 0.00376 K/BAR

∴ 6 BARS @ 0.00376 K/BAR = 0.02256 K

BATTEN Rs 2 Rs = SAME AS L/Ø L1 = 0.0490 K

Calculations for 1/8 US Grid

DEAD LOAD CALCS [W6W7] N. TRUSS SPANS 5-7

BEVELED FILLS

USE CALC FOR W1 BEVEL

$\frac{1}{2}(W6) + \frac{1}{2}(W7) = W1$ PL

$\therefore = \boxed{0.0312\ K}$

RIVETS ASSUME 0.8#/RIVET

296 RIVETS @ 0.8#/RIVET = 236.8# $\times \frac{1K}{1000\#} = \boxed{0.2368\ K}$

WT OF MEMBER	=	1.1462 K
GUSSETS	=	0.6362 K
SPLICE	=	0.3441 K
INT. DIAPH.	=	0.1226 K
LACING	=	0.02256 K
BATTEN PL's	=	0.0480 K
BEVELS	=	0.0312 K
RIVETS	=	0.2368 K
		2.5877 K

BUMP UP = $\frac{2.5877\ K}{1.1462\ K} = \boxed{2.26}$

Calculations for 1/8 US Grid

DEAD LOAD CALC'S U7U8 N. TRUSS SPANS 5-7

WT. OF MEMBER

$A = 43.7344\ in^2$

LENGTH = 10.630'

$10.630' \times \frac{43.7344\ in^2}{144\ in^2/ft^2} \times 0.490\ K/ft^3 = 1.5819\ K$

GUSSETS

Ⓐ $2.5417' \times 3.5833' \times 0.0417' = 0.3798\ ft^3$

Ⓑ $0.9167' \times 4.0833' \times 0.0417' = 0.1561\ ft^3$

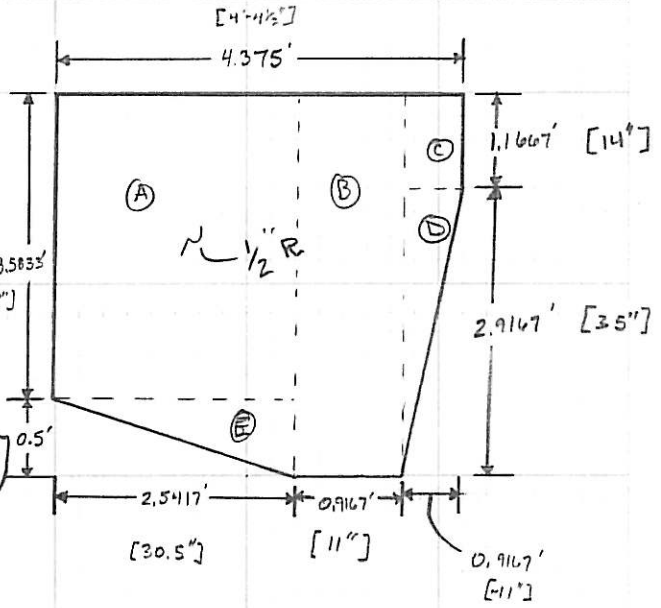
Ⓒ $0.9167' \times 1.1667' \times 0.0417' = 0.0446\ ft^3$

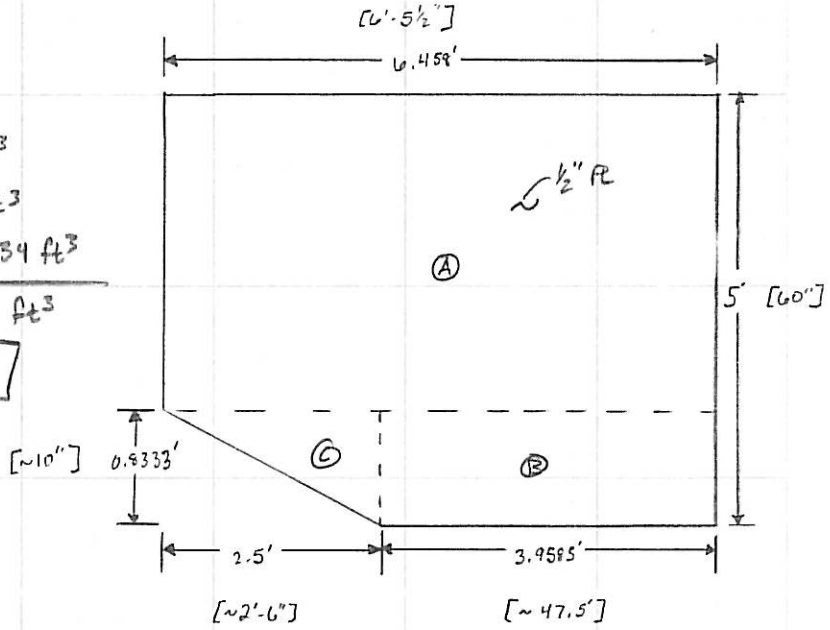
Ⓓ $\frac{1}{2}(0.9167')(2.9167') \times 0.0417' = 0.0557\ ft^3$

Ⓔ $\frac{1}{2}(2.5417')(0.5') \times 0.0417' = 0.0265\ ft^3$ [43"]

TOTAL: $0.6627\ ft^3$

L7 → $0.6627\ ft^3 \times 0.490\ K/ft^3 = 0.3247\ K$





Ⓐ $6.458' \times 4.167' \times 0.0417' = 1.122\ ft^3$

Ⓑ $3.958' \times 0.8333 \times 0.0417' = 0.138\ ft^3$

Ⓔ $\frac{1}{2}(2.5')(0.8333') \times 0.0417' = 0.0434\ ft^3$

$1.303\ ft^3$

$1.303\ ft^3 \times 0.490\ K/ft^3 = 0.639\ K$

Calculations for 1/8 US Grid

TranSystems

Made By: KMW Date: 1/2/09 Job No: HAM-471-0025

Checked By: CJM Date: 3/4/09 Sheet No. 2 of 2

DEAD LOAD CALC: U7U8 N. TRUSS SPANS 5-7

INT. DIAPH

SAME AS U0U1 ∴ 0.1226 K

LACING

INDIVIDUAL BAR = 0.003376 K (SEE U0U1 FOR ORIGINAL CALC)

11 BARS FOR U7U8 ∴ 11 x 0.003376 K = 0.0371 K

BATTEN PL

SAME AS U0U1 ∴ = 0.04802 K

BEVELED FILL PL'S USE ½ OF EACH PL (½ @ U7 & ½ @ U8), PL'S ARE EQUAL, SO USE 1 WHOLE PL

$16'' \times \left(\frac{11/16}{5/16}\right) \times 11''$ USE DIMENSIONS FROM BEVEL @ U7, SIMILAR PL

0.0312 K

RIVETS SEE ATTACHED SHOP DRAWING

425 RIVETS: ASSUME 0.8# EACH

$(425 \times 0.8\#) \times \frac{1\ K}{1000\#} = 0.3400\ K$

WT OF MEMBER:	1.5819 K
GUSSETS:	0.3247 K
	0.6390 K
INT. DIAPH:	0.1226 K
LACING/BATTEN PL	0.0371 K
	0.04802 K
BEVEL FILL PL	0.0312 K
RIVETS	0.3400 K
	3.1245 K

BUMP UP = $\frac{3.1245\ K}{1.5819\ K}$ = 1.975

Calculations for 1/8 US Grid

TranSystems

Made By:	KMW	Date:	1/6/09	Job No:	HAM-471-0025
Checked By:	CJM	Date:	3/4/09	Sheet No.	1 OF 2

DEAD LOAD CALC. L8 L9 N. TRUSS SPAN 5-7

WT OF MEMBER

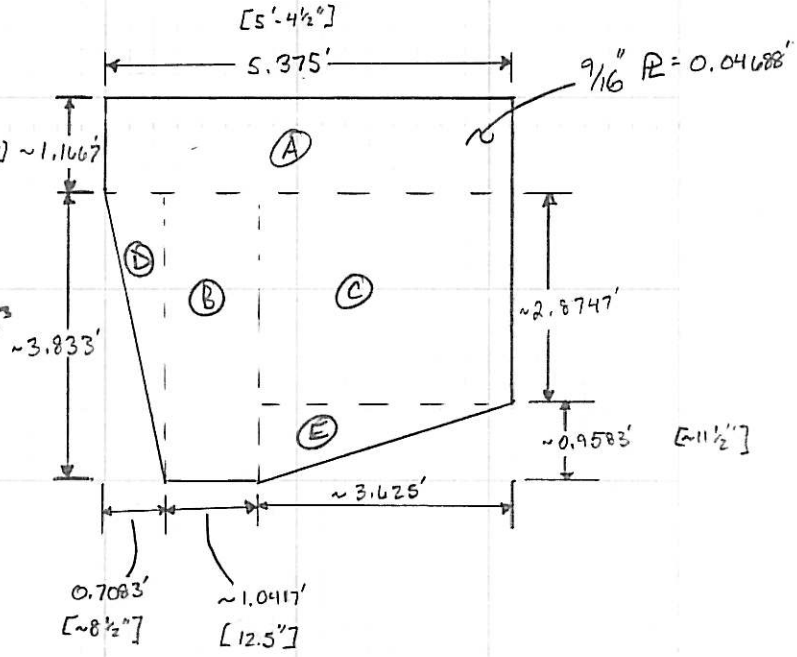
A= 36.9844 in^2 LENGTH = 10.630'

$10.630' \times \frac{36.9844\ in^2}{144\ in^2}\ ft^2 = 2.7302\ ft^3 \times \frac{0.490\ K}{ft^3} =$ **1.3378 K**

GUSSETS

L8 → USE L7L8 CALC = **0.639 K**

L9



(A) 5.375' × 1.1667' × 0.04688' = 0.2940 ft^3

(B) 1.0417' × 3.833' × 0.04688' = 0.1872 ft^3

(C) 3.625' × 2.8747' × 0.04688' = 0.4885 ft^3

(D) ½ (0.783')(3.833') × 0.04688' = 0.0703 ft^3

(E) ½ (3.625')(0.9583') × 0.04688' = 0.08143 ft^3

1.1214 ft^3

1.1214 ft^3 @ $\frac{.490\ K}{ft^3}$ = **0.5495 K**

INT. DIAPH. SAME AS L8 L1 = **0.1226 K**

LACING SAME BARS AS L8L1 = 0.003376 K/BAR

11 BARS @ 0.003376 K/BAR = **0.0371 K**

BATTEN PL's SAME AS L7L8 = **0.0480 K**

BEVELED FILLS SAME AS L7L8 = **0.0312 K**

Calculations for 1/8 US Grid

DEAD LOAD CALCS 1/8/09 N. TRUSS SPANS 5-7

RIVETS ASSUME 0.8#/RIVET

419 RIVETS @ 0.8#/RIVET = 335.2 # → $\times \frac{1\,K}{1000\,\#}$ = 0.3352 K

WT OF MEMBER	=	1.3378 K
GUSSETS	=	0.639 K
		0.5495 K
INT. DIAPH	=	0.1226 K
LACING/BATTEN	=	0.0371 K
		0.0480 K
BEVEL FILLS	=	0.0312 K
RIVETS	=	0.3352 K
		3.1004 K

$$\text{BUMP UP} = \frac{3.1004\ K}{1.3378\ K} = 2.32$$

Calculations for 1/8 US Grid

TranSystems

Made By: KMW Date: 1/6/09 Job No: HAM 471-0025

Checked By: CJM Date: 3/11/09 Sheet No. 1 OF 2

DEAD LOAD CALCS L9 L10 N. TRUSS SPANS 5-7

WT OF MEMBER

A: 27.9375 in^2 LENGTH = 10.630'

$10.630' \times \frac{27.9375\ in^2}{144\ in^2/ft^2} = 2.0623\ ft^3 \times \frac{0.490\ K}{ft^3} = \boxed{1.0105\ K}$

GUSSETS

L9 = USE CALC FROM U8L9 = 0.5495 K

L10 = R = 58" x ½" x 5'-½" - CLIPS

R = 1754.5 in^3 - 249 in^3

R = 1505.6

$\hookrightarrow \times \frac{1\ ft^3}{1728\ in^3} = 0.8712\ ft^3 @ \frac{0.49\ K}{ft^3} = 0.4269\ K$

CLIPS = ½" x ½(12" x 45½" + 10" x 45")

= ¼" (546 in^2 + 450 in^2)

= ¼" (996 in^2) = 249 in^3

SPLICE FROM SPLICE CALC. SHEET:

SPLICE R = 0.3441 K

INT. DIAPH. SAME THROUGHOUT

= 0.1226 K

LACING SAME BARS AS U0U1 = 0.003376 K/BAR

8BARS @ 0.003376 K/BAR = 0.0270 K

BATTEN R. SAME AS U6U7

= 0.0480 K

Calculations for 1/8 US Grid

DEAD LOAD CALC'S L9L10 N. TRUSS SPANS 5-7

BEVELED FILLS

SAME AS U7U8 = 0.0312 K

RIVETS

ASSUME 0.8#/RIVET

333 RIVETS @ 0.8#/RIVET = 266.4# → $\times \frac{1K}{1000\#}$ = 0.2664 K

WT OF MEMBER	= 1.0105 K
GUSSETS	= 0.5495 K
	0.4269 K
SPLICE	= 0.3441 K
DIAPH	= 0.1226 K
LACING / BATTEN	= 0.0270 K
	0.0480 K
BEVELED FILLS	= 0.0312
RIVETS	= 0.2664 K
	2.8262 K

$$\text{BUMP UP} = \frac{2.8262^{K}}{1.0105\ K} = 2.797$$

Calculations for 1/8 US Grid

TranSystems

Made By: KMW Date: 1/26/09 Job No: HAM-471-0025

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

DEAD LOAD CALCS L10 L11 N. TRUSS SPANS 5-7

WT. OF MEMBER

A = 27.9375 in^2 LENGTH = 10.630'

$$10.630' \times \frac{27.9375\ in^2}{144\ in^2/ft} \times \frac{0.490\ K}{ft^3} = 1.0105\ K$$

GUSSETS L10 = USE L9U10 CALC = 0.4269K

L11 PL = 53.5" x ½" x 4'7½" - CLIPS CLIPS = 296 in^3

PL = 1336.625 in^3

$$1188.628\ in^3 \times \frac{ft^3}{1728\ in^3} = 0.7735 \times \frac{0.49\ K}{ft^3} = 0.3790K$$

TOT = 0.8059K

INT. DIAPH SAME AS L11 L12

∴ = 0.1226 K

LACING INDIVIDUAL BARS SIMILAR TO L10L11 @ 0.003376 K/BAR

8 BARS TOTAL x 0.003376 K/BAR = 0.0270 K

BATTEN PL SAME AS L10L11

∴ 0.0480K

BEVELED FILL PLS SIMILAR TO L6L7

∴ L10L11 = 0.0312 K

SPLICE PLS

SEE SPLICE CALC = 0.3601 K

Calculations for 1/8 US Grid

DEAD LOAD CALC. L10-L11 N. TRUSS SPANS 6-7

RIVETS

SAY 310 RIVETS → ASSUME EACH = 0.8#/EACH

∴ 310 @ 0.8# = 248#

= 0.2480 K

WT OF MEMBER	=	1.0105 K
GUSSETS	=	0.8059 K
DIAPH.	=	0.1226 K
LACING/BATTENPL	=	0.0750 K
DEVELOD FILL PLS	=	0.0312 K
RIVETS	=	0.2480 K
SPLICE	=	0.3601 K
		2.6533 K

BUMP UP = $\frac{2.6533\ K}{1.0105\ K}$ = 2.63

Calculations for 1/8 US Grid

TranSystems

Made By: KMW Date: 1/27/09 Job No: HAM-471-0025

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

DEAD LOAD CALCS L11 L12 N. TRUSS SPANS 5-7

WT OF MEMBER

A = 38.0000 IN² LENGTH = 10.630'

$10.630' \times \frac{38.0000\ in^2}{144\ in^2} ft^2 = 2.8051\ ft^3 \rightarrow @ \frac{0.490\ K}{ft^3} =$ **1.3745 K**

GUSSETS

L11 = USE L1ØL11 CALL = **0.3790 K**

L12 = USE L12L13 CALL = **0.3185 K** TOT = 0.6975 //

INT. DIAPH

SAME AS L12L2 ∴ **0.1226 K**

LACING

BARS SAME AS L1ØL1 @ 0.00376 K/BAR

12 BARS @ 0.00376 K/BAR = **0.0451 K**

BATTEN PLS

SAME AS L1ØL1 @ **0.0480 K**

BEVELED FILL

SIMILAR TO L1ØL11 ∴ **0.0312 K**

RIVETS

ASSUME 0.8#/RIVET

316 RIVETS @ 0.8#/RIVET = 252.8# → $\times \frac{1K}{1000\#} =$ **0.2528 K**

WT OF MEMBER	= 1.3745 K
GUSSETS	= 0.6976 K
INT. DIAPH	= 0.1226 K
LACING/BATTEN	= 0.0931 K
BEVELED FILL	= 0.0312 K
RIVETS	= 0.2528 K
	2.5718 K

$\text{JUMP UP} = \frac{2.5718\ K}{1.3745\ K} =$ **1.87**

Calculations for 1/8 US Grid

DEAD LOAD CALCS U12U13 N. TRUSS SPANS 5-7

WT. OF MEMBER

A = 53.3750 in^2 L = 10.630'

$10.630' \times \frac{53.3750\ in^2}{144\ in^2} = 3.9401\ ft^3 \times \frac{0.49\ K}{ft^3} = 1.9307\ K$

GUSSETS 1/2" = 0.0417'

U12 = 51" x 51" x 1/2"

(A) 4.25' x 1.1667' x 0.0417' = 0.2066 ft^3

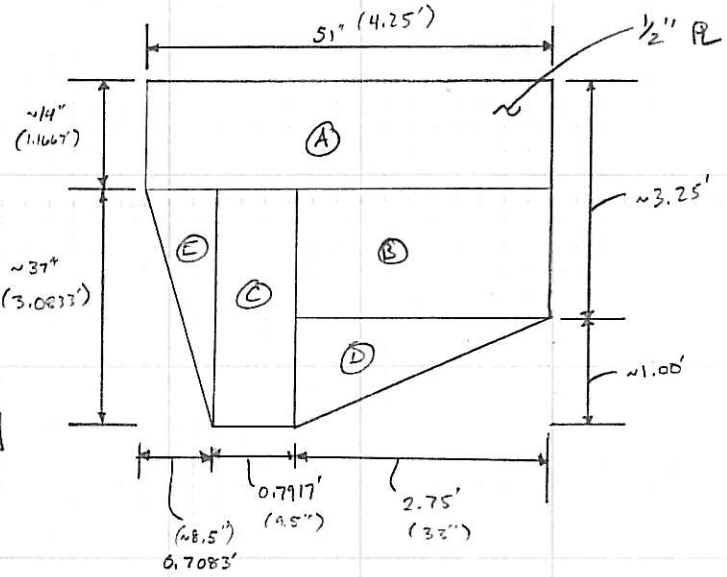
(B) (3.25' - 1.1667') x 2.75' x 0.0417' = 0.2389 ft^3

(C) 0.7917' x 3.0833' x 0.0417' = 0.1018 ft^3

(D) 1/2 (2.75' x 1.0') (0.0417') = 0.0573 ft^3

(E) 1/2 (0.7083' x 3.0833') (0.0417') = 0.0455 ft^3

0.6501 ft^3



U12 0.6501 ft^3 x 0.490 K/ft^3 = 0.3185 K

U13 → CALC'ED IN U13U14

U13 = 0.2839 K

INT. DIAPH SAME AS U13U14

∴ 0.1226 K

LACING BARS APPROX SAME AS U13U14

∴ EA. BAR = 0.01872 ft^3/BAR

3 BARS x 0.01872 ft^3/BAR = 0.0562 ft^3

⇒ x 0.490 K/ft^3 = 0.0275 K

BATTEN PL'S SAME AS U13U14

∴ 0.0480 K

Calculations for 1/8 US Grid

DEAD LOAD CALCS L112U3 W. TRUSS SPANS 5-7

BEVELED FILL PLS

SIMILAR TO U13 U14

∴ 0.0312 K

SPLICE

SIDE FILLS - 2 @ $12\frac{1}{2}" \times \frac{5}{16}" \times 30" = 234.75\ in^3$

TOP 1 @ $16" \times \frac{1}{2}" \times 51 = 408\ in^3$

1 @ $16 \times \frac{1}{2} \times 27 = 216\ in^3$

SIDE 2 @ $14" \times \frac{3}{4} \times 42" = 882\ in^3$

2 @ $12\frac{1}{2} \times \frac{11}{16} \times 30 = 515.625\ in^3$

SIDE FILLS 2 @ $14 \times \frac{1}{8} \times 24 = 84\ in^3$

BTM 1 @ $16 \times \frac{3}{8} \times 27" = 162\ in^3$

$2502.375\ in^3 \times \frac{0.49\ K}{1728\ in^3} = {}^{*}0.7096\ K$

*DOES NOT INCLUDE SPLICE RIVETS

WT OF MEMBER	=	1.9307 K
GUSSETS	=	0.6024 K
INT. DIAPH	=	0.1826 K
LACING/BATTEN PLS	=	0.0755 K
BEVELED FILLS	=	0.0312 K
SPL	=	0.7096 K
RIVETS	=	0.3600 K
		3.832 K

BUMP UP = $\frac{3.832\ K}{1.9307\ K} = 1.9848$

RIVETS ASSUME 0.8# EACH

SAY 450 RIVETS @ 0.8#/RIVET = 360# = 0.3600 K

Calculations for 1/8 US Grid

TranSystems

Made By: KMW Date: 1/2/08 Job No: HAM-471-0025

Checked By: CJM Date: 3/11/09 Sheet No. 1 OF 2

DEAD LOAD CALC U13 U14 N. TRUSS SPANS 5-7

WT. OF MEMBER

$A = 62.1875\ in^2$ LENGTH = $10'-7\frac{9}{16}'' \Rightarrow [10.630']$

$10.630' \times \frac{62.1875\ in^2}{144\ in^2/ft^2} \times 0.490\ K/ft^3 = \boxed{2.249\ K}$

GUSSETS

U13 = SIMILAR DIMENSIONS TO U7, WITH THE EXCEPTION OF PL THICKNESS, U13 = 7/16"

$\frac{7/16''}{1/2''} = 0.875 \rightarrow U7_{(tot\ ft^3)} = 0.6627\ ft^3$

$\therefore U13 = 0.6627\ ft^3 \times 0.8743 = 0.5799\ ft^3$

U13 → $0.5799\ ft^3 \times 0.490\ K/ft^3 = \boxed{0.2841\ K}$

U14 = SIMILAR TO U4, USE U4 CALCS

$\therefore \boxed{5.0991\ K}$

INT. DIAPH. USE 1/3 OF 1 DIAPH., DIAPH'S ONLY FOUND ON C.TRUSS FOR U13 U14

$\therefore \frac{1}{3} \times 0.1226\ K = \boxed{0.1226\ K}$

LACING 10 BARS @ $5'' \times \frac{3}{8}'' \times 1'-5\frac{1}{4}''$

$10\ BARS \times [0.4167' \times 0.03125' \times 1.4375']$

$10\ BARS \times 0.01872\ ft^3$

$= 0.1872\ ft^3 \times 0.490\ K/ft^3 = \boxed{0.0917\ K}$

BATTEN PLS SAME AS U0 U1

$\therefore \boxed{0.0480\ K}$

BEVELED FILL PLS USE U7 U8 CALC

$\therefore \boxed{0.0312\ K}$

Calculations for 1/8 US Grid

DEAD LOAD CALCS U13U14 N. TRUSS SPANS 5-7

RIVETS

ASSUME 0.8#/RIVET

$$268\ \text{RIVETS} \times 0.8\#/\text{RIVET} = 214.4\# \times \frac{1K}{1000\#} = \boxed{0.2144\ K}$$

WT OF MEMBER :	2.249 K
GUSSETS :	0.2841 K
	0.0991 K
DIAPH.	0.1226 K
LACING/BATTEN PL	0.0917 K
	0.0480 K
BEVEL PL	0.0312 K
RIVETS	0.2144 K
	3.1401

$$\frac{3.1401}{2.249} = \boxed{1.3962}$$

Calculations for 1/8 US Grid

TranSystems

Made By: KMW Date: 1/27/09 Job No: HAM.471-0025

Checked By: CJM Date: 3/11/09 Sheet No. 1 OF 1

DEAD LOAD CALC U14U15 N. TRUSS SPANS 5-7

WT OF MEMBER

A = 62.1875 LENGTH = 10.630'

$$10.630' \times \frac{62.1875\ in^2}{144\ in^2}\ ft^2 = 4.5906\ ft^3 \ @\ \frac{0.49K}{ft^3} = 2.2494K$$

GUSSETS USE U13U14 FOR U14 CALC

U14 = 0.0991 K

U15 = CLIP = ~150 IN^2 → A R = 89 in × 49.25 in − 150 IN^2

A R = 1770 IN^2 @ 7/16" THICK = 774.7 IN^3

$$774.7\ in^3 \times \frac{1\ ft^3}{1728\ in^3} \times \frac{0.49K}{ft^3} = 0.2197K$$

TOT = 0.3188 K

INT. DIAPH SAME AS U13U14

∴ = 0.1226 K

LACING SAME AS U13U14

∴ 0.0917 K

BATTEN RS SAME AS U13U14

∴ 0.0480K

BEVELED FILL RS SIMILAR TO U13U14

∴ 0.0312 K

RIVETS ASSUME 0.8#/RIVET

277 RIVETS @ 0.8#/RIVET = 221.6# → $\times \frac{1K}{1000\#}$ = 0.2216 K

WT OF MEMBER	= 2.2494 K
GUSSETS	= 0.3188 K
INT. DIAPH.	= 0.1226 K
LACING/BATTEN	= 0.1397 K
FILL RS	= 0.0312 K
RIVETS	= 0.2216 K
	3.0833 K

BUMP UP = $\frac{3.0833K}{2.2494K}$ = 1.3707

Calculations for 1/8 US Grid

TranSystems

Made By:	KMW	Date:	1/27/09	Job No:	#4m-471-0025
Checked By:	CJM	Date:	3/11/09	Sheet No.	1 OF 2

DEAD LOAD CALCS U15U16 N. TRUSS SPANS 5-7

NT OF MEMBER

A= 62.1875 SAME AS U13 U14

∴ 2.2490 K

GUSSETS USE [U14 U15] CALC FOR U15

U15 = 0.2197 K

U16 = SAME AS U15 = 0.2197 K

TOTAL = 0.4394 K

INT. DIAPH. SAME AS U10/U11

= 0.1226 K

LACING SIMILAR BARS TO THOSE IN U13 U14, USE THOSE CALCS

EACH BAR = 0.0091728 K

3 BARS @ 0.0091728 K = 0.0275 K

BATTEN PLS SAME AS U13 U14

= 0.0480 K

BEVEL USE U13 U14 CALC

= 0.0312 K

PLS = TOP: $16" \times \frac{1}{2}" \times 57" = 456\ in^3$

$16" \times \frac{1}{2}" \times 27" = 216\ in^3$

SIDES: $2(14")(\frac{1}{2}")(48") = 672\ in^3$

$2(14")(\frac{1}{2}")(30") = 420\ in^2$

$2(12.5")(0.6875")(36") = 618.75\ in^3$

BTM: $16" \times 0.375" \times 35" = 198\ in^3$

SPLICE

*0.7318K

* DOES NOT INCLUDE RIVETS

RIVETS

ASSUME 0.8# / RIVET

SAY 450 RIVETS @ 0.8#/RIVET = 360# = 0.3600 K

Calculations for 1/8 US Grid

DEAD LOAD CALC L15L16 N. TRUSS SPANS 5-7

WT OF MEMBER	= 2.249 K
GUSSETS	= 0.4394 K
INT. DIAPH	= 0.1226 K
LACING/BATTEN	= 0.0755 K
BEVELED PLS	= 0.0312 K
SPLICE	= 0.7318 K
RIVETS	= 0.3600 K
	4.0095 K

BUMP UP = $\frac{4.0095\text{K}}{2.2490\text{K}}$ = 1.7820

Calculations for 1/8 US Grid

TranSystems

Made By: KMW Date: 1/27/09 Job No: HAM 471-0025

Checked By: CJM Date: 3/11/09 Sheet No. 1 OF 1

DEAD LOAD CALCS [U16 U17] N. TRUSS SPANS 5-7

WT OF MEMBER

A = 62.1875 SAME AS U16 U16 ∴ 2.2490K

GUSSETS

U16 = USE [U15 U16] CALC = 0.2197 K.

U17 = SIMILAR TO [U12]; USE [U12 U13] CALC, W/ THE EXCEPTION THAT U17 IS A 7/16" PL, WHILE U12 IS 1/2" PL

∴ $U17 = U12 \times \frac{7/16"}{1/2"}$ OR 0.3185K x (0.875) = 0.2787 K

GUSSET TOT = 0.4984 K

INT. DIAPH. SAME AS [U15 U16]

∴ = 0.1226 K

LACING SAME BARS AS [U13 U14]

EACH BAR = 0.01872 ft^3

U16 U17 HAS 5 BARS ∴ 5 (0.01872 ft^3) x $0.490 K/ft^3$ = 0.0459 K

BATTEN PLS SAME AS [U15 U16]

∴ = 0.0480K

LAC/BAT TOT = 0.0939K

BEVELED FILL PLS SIMILAR TO [U15 U16]

∴ 0.0312 K

RIVETS ASSUME 0.8#/RIVET, 324 TOTAL @ 0.8# = 259.2#

↳ x $\frac{1 K}{1000 \#}$ = 0.2592 K

WT OF MEMBER	= 2.2490 K
GUSSETS	= 0.4984 K
DIAPH	= 0.1226 K
LACING / BATTEN	= 0.0939 K
BEVEL PLS	= 0.0312 K
RIVETS	= 0.2592 K
	3.2543 K

BUMP UP = $\frac{3.2543 K}{2.2490 K}$ = 1.4470

Calculations for 1/8 US Grid

TranSystems

Made By: KMW Date: 2/26/09 Job No: HAM 471-0025

Checked By: CJM Date: 3/11/09 Sheet No. 1/2

DEAD LOAD CALC's U17 U18 N. TRUSS SPANS 5-7

WT OF MEMBER

A: 45.5625 in^2 LENGTH = 10.630'

$10.630' \times \frac{45.5625\ in^2}{144\ in^2/ft^2} \times \frac{.490\ K}{ft^3} = 1.6481\ K$

GUSSETS

U17 = USE [U16 U17] CALC = 0.2787 K

CLIPS = ~ 188 in^3

U18 = 53" x 54 1/2" x 1/2" − CLIPS

= 1444.25 in^3 − 188 in^3

= 1256.25 in^3

↳ $1256.25\ in^3 \times \frac{1\ ft^3}{1728\ in^3} \times \frac{0.49\ K}{ft^3} = 0.3562\ K$

GUSSET TOT. = 0.6349 K

INT. DIAPH SIMILAR TO [U16 U17] ∴ = 0.1226 K

LACING BARS SIMILAR TO [U0 U1] @ 0.003376K/BAR

U17U18 = 7 BARS @ 0.003376 K/BAR = 0.0236 K

BATTEN PLS SAME AS [U16 U17] ∴ = 0.0480 K

L/B TOTAL = 0.0716 K

SPLICE

USE [U15 U16] CALC FOR SPLICE

= 0.7318 K

BEVEL PL's USE U7 U8 CALC = 0.0312 K

Calculations for 1/8 US Grid

DEAD LOAD CALCS CONT. [W17W18] N. TRUSS SPANS 5-7

[RIVETS]

ASSUME 0.8#/RIVET

W17W18 = SAY 475 RIVETS @ 0.8#/RIVET = 380 #

= 380 # × 1K/1000# = [0.3800 K]

WT OF MEMBER	= 1.6481 K
GUSSETS	= 0.6349 K
DIAPH.	= 0.1226 K
LACING/BATTEN	= 0.0716 K
SPLICE	= 0.7318. K
BEVEL PL	= 0.0312 K
RIVETS	= 0.3800 K
	3.6202 K

BUMP UP = 3.6202 K / 1.6481 K = [2.200]

Calculations for 1/8 US Grid

TranSystems

Made By: KMW Date: 2/26/09 Job No: HAM 471-0025

Checked By: CJM Date: 3/11/09 Sheet No. 1 1

DEAD LOAD CALC. L18 L19 N. TRUSS SPANS 6-7

WT OF MEMBER:

A = 31.6875 in² LENGTH = 10.630

SAME AS L6 L7

= 1.1462 K

GUSSETS

USE [L17 L18] CALCS FOR:

L18 = 0.3562 K

USE [L19 L20] CALCS FOR: GUSSET TOT = 0.7331 K

L19 = 0.3769 K

INT. DIAPH SAME AS [L17 L18] = 0.1226 K

LACING BARS SAME AS [L17 L18], EACH 0.003376 K/BAR

L18 L19 = 12 BARS @ 0.003376 K/BAR = 0.0405 K

BATTEN PL: SAME AS [L17 L18];

0.0480 K TOT = 0.0885 K

BEVEL PLS USE [L17 L18] CALC 0.0312 K

RIVETS ASSUME 0.8# RIVETS

339 RIVETS @ 0.8#/RIVET = 271.2# → × 1K/1000# = 0.2712 K

WT OF MEMBER	= 1.1462 K
GUSSETS	= 0.7331 K
DIAPH	= 0.1226 K
LACING/BATTEN	= 0.0885 K
BEVEL PL	= 0.0312 K
RIVETS	= 0.2712 K
	2.3928 K

BUMP UP = 2.3928 K / 1.1462 K = 2.0876

Calculations for 1/8 US Grid

DEAD LOAD CALCS L19 L20 N. TRUSS SPANS 5-7

WT. OF MEMBER

$A = 31.6875\ in^2$ LENGTH = 10.630'

$$10.630' \times \frac{31.6875\ in^2}{144\ in^2}\ ft \times \frac{.490\ K}{ft^3} = 1.1462\ K$$

GUSSETS

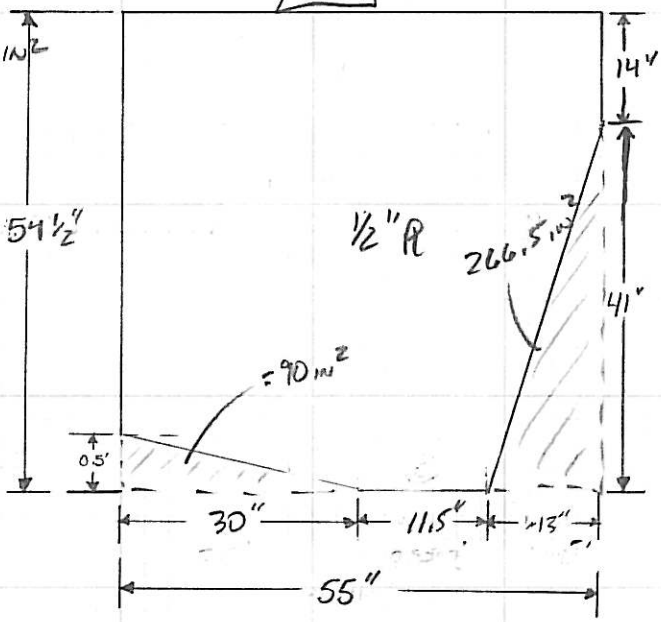
L19

$54\frac{1}{2}" \times 55" - (266.5\ in^2 + 90\ in^2) = 2641\ in^2$

$2641\ in^2 \times \frac{1}{2}" = 1320.5\ in^3$

$1320.5\ in^3 \xrightarrow[1728\ in^3]{0.490\ K} = 0.3744\ K$

L19



L20 (A) $4.0' \times 2.375' \times 0.04167' = 0.3959\ ft^3$

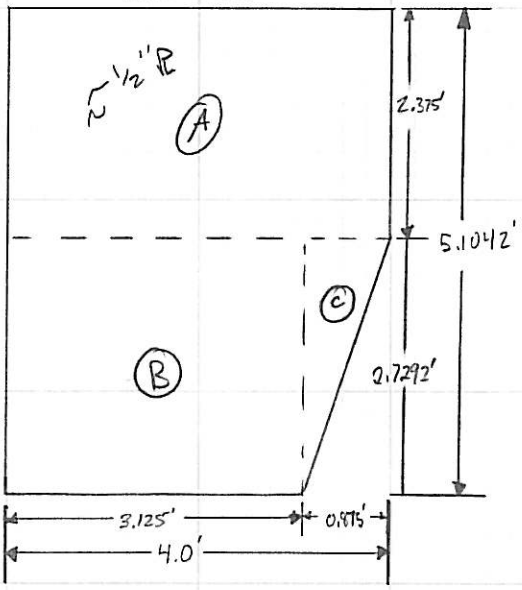
(B) $3.125' \times 2.7292 \times 0.04167' = 0.3554\ ft^3$

(C) $\frac{1}{2}(0.875' \times 2.7292') \times 0.04167' = 0.0498\ ft^3$

$0.8011\ ft^3$

L20 $\rightarrow 0.8011 ft^3 \times \frac{0.490\ K}{ft^3} = 0.3925\ K$

L20



TOT: 0.7669 K

DEAD LOAD CALCS L19 L2Ø N. TRUSS SPANS 5-7

INT. DIAPH. SAME AS LØL1, USE LØL1 CALCS, ADD ½ ADDITIONAL DIAPH. FOR L19.

L19 = 0.0613 K
+
L2Ø 0.1226 K
0.1839 K

BEVELED FILL PLG SIMILAR TO LØL1, USE LØL1 CALCS

∴ L19L2Ø = 0.0536K + 0.0156K = **0.0692 K**

LACING LACING BARS SIMILAR TO LØL1, @ 0.003376 K/BAR

12 BARS × 0.003376 K/BAR = **0.0405 K**

BATTEN PL SAME AS LØL1

∴ **0.0480 K**

FB SEAT ∠'S ∠S 4×4×3/8 ⇒ 9.72 #/LFT

L19 → 1∠ @ 1'-5½" OR 1.4583' × 9.72 #/FT = 14.175 #

L2Ø 1∠ @ 1'-11½" OR 1.9583' × 9.72 #/FT = 19.035 #

33.21 #

$33.21\,\# \times \frac{1\,K}{1000\,\#} =$ **0.0332 K**

RIVETS ASSUME 0.8 # PER RIVET 340 RIVETS × 0.8 # × $\frac{1\,K}{1000\,\#}$ = **0.272 K**

WT OF MEMBER	:	1.1462 K
GUSSETS	:	0.7669 K
DIAPH	:	0.1839 K
BEVEL	:	0.0692 K
LACING/BATTEN	:	0.0885 K
∠'S	:	0.0332 K
RIVETS	:	0.0272 K
		2.3157 K

$\frac{2.3157\,K}{1.1462\,K} =$ **2.02**

Calculations for 1/8 US Grid