INV RATING U1L3 = $\frac{44.76 - 43.27}{27.6^k}$ = 0.05 ⇒ 0.75 TON

OPP RATING U1L3 = $\frac{61.03 - 43.27}{27.6}$ = 0.64 ⇒ 9.6 TON

INV RATING U2L4 = $\frac{35.75 - 26.1}{23.7}$ = 0.41 ⇒ 6.1 TON

OPP RATING U2L4 = $\frac{48.75 - 26.1}{23.7}$ = 0.96 ⇒ 14.3 TON

INV RATING U3L5 = $\frac{25.02 - 8.74}{19.83}$ = 0.82 ⇒ 12.3 TON

OPP RATING U3L5 = $\frac{34.12 - 8.74}{19.83}$ = 1.28 ⇒ 19.2 TON

INV & OPP RATING OF L3U5 = 99.9 SINCE NO REVERSE DL OR LL SHEAR EXIST IN PANEL U3U4 THUS INV & OPP LL RATING = 99.9

SPI LOADING ⇒ 2F1 TRUCK ⇒ 15 TON

U2L4 DL = (15.24)(1.66) = 26.1^k

U2L4 LL+I = (14.3)(1.66) = 23.7

U2L4 DL = (18.8)(21/25.24) = 15.24^k

U2L4 LL+I = (17.1)(21/25.24) = 14.23^k

2F1 L. RATING INV = (.55)(26KSI)(2.5in²) − 26.1 / 23.7 = 0.41 ⇒ 6.1 TON U2L4

2F1 L. RATING OPP = (.75)(26)(2.5) − 26.1 / 23.7 = 0.96 ⇒ 14.3 TON U2L4

U1L3 DL = (35.96)(21/25.24) = 43.27^k; DL = (32.1)(21/25.24) = 35.96^k

U1L3 LL+I = (16.53)(21/25.24) = 27.6^k; LL+I = (19.9)(21/25.24) = 16.53^k

2F1 L. RATING INV = (.55)(26KSI)(8.13in²) − 43.27 / 27.6 = 0.05 ⇒ 0.75 TONS U1L3

2F1 L. RATING OPP = (.75)(26KSI)(8.13in²) − 43.27 / 27.6 = 0.64 ⇒ 9.6 TONS U1L3

2F1 L RATING U3L5 INV = (0.55)(26KSI)(1.75in²) − 8.74 / 19.83 = 0.82 ⇒ 12.3 TONS U3L5

2F1 L RATING U3L5 OPP = (0.75)(26KSI)(1.75in²) − 8.74 / 19.83 = 1.28 ⇒ 19.2 TONS U3L5

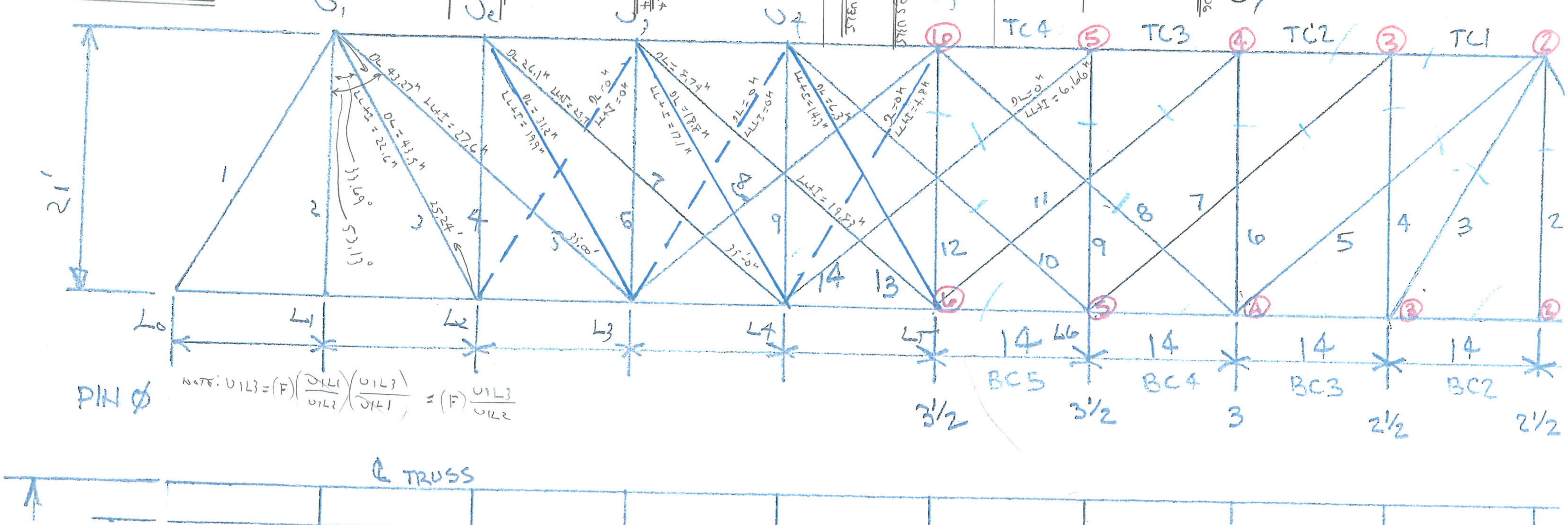
INV & OPP RATING OF L3U5 = 99.9; NO REVERSE DL or LL SHEAR EXISTS IN PANEL U3U4

OPP RATING L4U6 = (.75)(26KSI)(1.26in²) − 0 / 6.66 = 3.69 ⇒ 55.3 TONS L4U6

INV RATING L4U6 = (.55)(26)(1.26) − 0 / 6.66 = 2.70 ⇒ 40.5 TONS L4U6

INV RATING L4U6 = $\frac{18.01^k - 0^k}{6.66}$ = 2.7 ⇒ 40.5 TONS

OPP RATING L4U6 = $\frac{24.57^k - 0^k}{6.66}$ = 3.69 ⇒ 55.3 TONS



SP2 LOADING ⇒ 3 FT ⇒ 23 TONS

INV RATING U1L3 = $\frac{44.76^{k} - 43.27}{41.46}$ = 0.036 ⇒ 0.83 TON U1L3

OPP RATING U1L3 $\frac{61.03^{k} - 43.27}{41.46}$ = 0.42 ⇒ 9.85 TON U1L3

INV RATING U2L4 = $\frac{35.75^{k} - 26.1}{35.6}$ = 0.27 ⇒ 6.23 TON U2L4

OPP RATING U2L4 = $\frac{48.75^{k} - 26.1^{k}}{35.6^{k}}$ = 0.63 ⇒ 14.49 TON U2L4

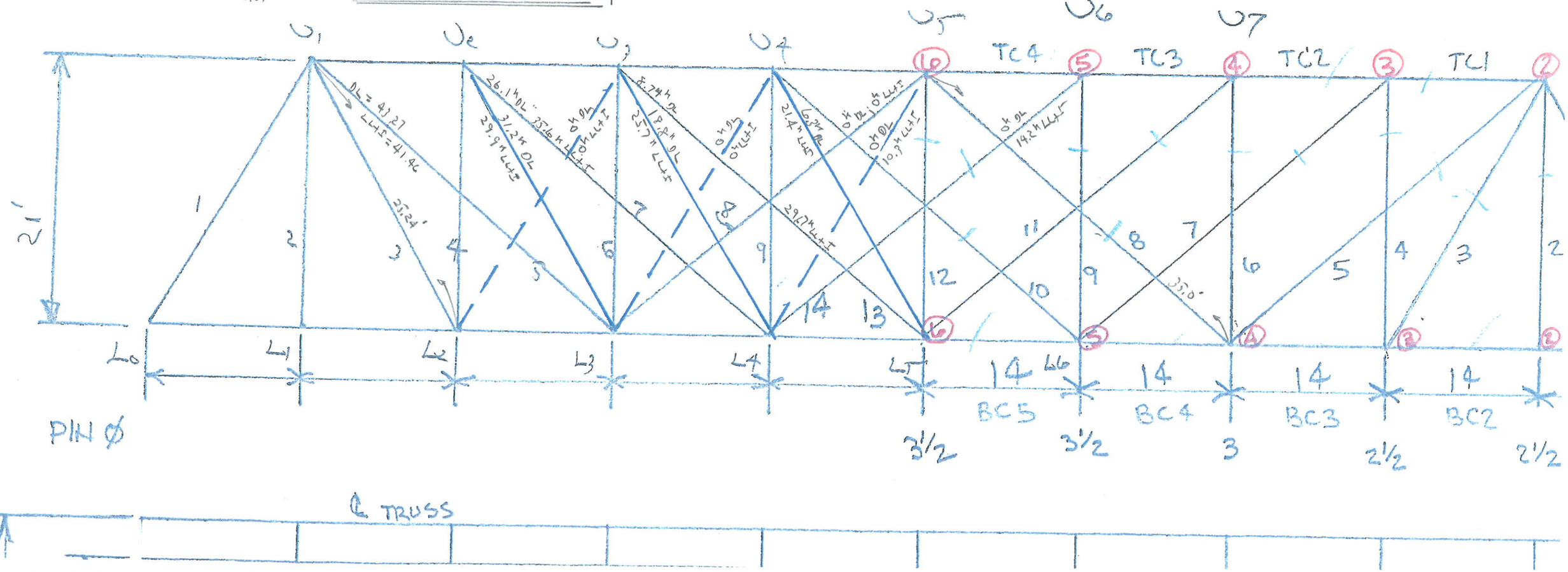
INV RATING U3L5 = $\frac{25.02^{k} - 8.74^{k}}{29.67^{k}}$ = 0.55 ⇒ 12.8 TONS U3L5

OPP RATING U3L5 = $\frac{34.12^{k} - 8.74}{29.67}$ = 0.85 ⇒ 19.5 TONS U3L5

INV RATING & OPP RATING L3U5 = 99.9 AS DL+LL+I REVERSE SHEAR IN PANEL U3U4 = 0

INV RATING L4U6 = $\frac{18.01^{k} - 0}{14.2^{k}}$ = 1.26 ⇒ 29 TON L4U6

OPP RATING L4U6 = $\frac{24.57 - 0}{14.2^{k}}$ = 1.73 ⇒ 39.79 TON L4U6



SP3 LOADING ⇒ 4F1 TRUCK 27 TONS

INV RATING U1L3 = $\frac{44.74 - 43.27}{47.70} = 0.03 \Rightarrow 0.84$ TON

OPP RATING U1L3 $\frac{61.03 - 43.27}{47.7} = 0.37 \Rightarrow 9.99$ TON

INV RATING U2L4 = $\frac{35.75^k - 26.1^k}{40.77^k} = 0.23 \Rightarrow 6.4$ TON

OPP RATING U2L4 = $\frac{48.75^k - 26.1^k}{40.77} = 0.55 \Rightarrow 15.0$ TON

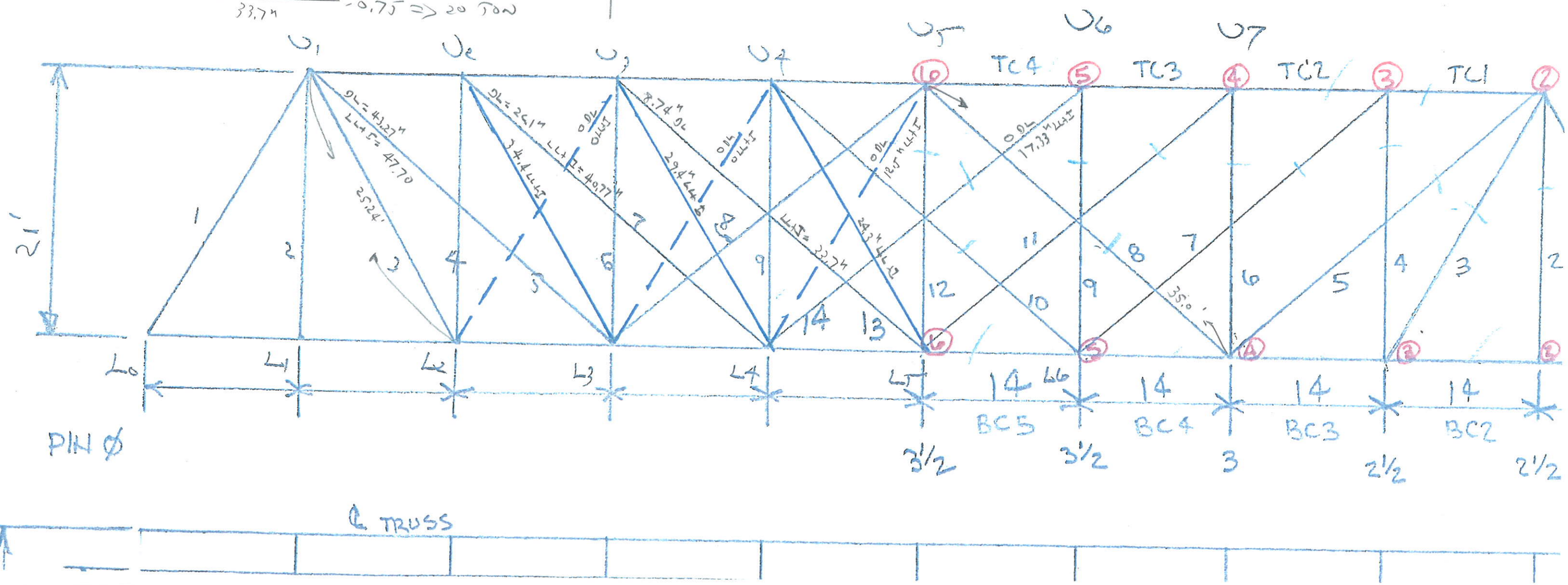
INV RATING U3L5 = $\frac{25.02^k - 8.74^k}{33.7^k} = 0.48 \Rightarrow 13$ TON

OPP RATING U3L5 = $\frac{34.12^k - 8.74^k}{33.7^k} = 0.75 \Rightarrow 20$ TON

INV & OPP RATING L3U5 = 99.9 AS DL & LL+I REVERSE SHEAR IN PAEL U3 U4 = 0

INV. RATING L4U6 = $\frac{18.01^k - 0^k}{17.33} = 1.04 \Rightarrow 28$ TON

OPP RATING L4U6 = $\frac{24.57 - 0}{17.33} 1.42 \Rightarrow 38.3$ TON



SP4 LOADING ⇒ SC1 TRUCK

INV RATING U1L3 = $\frac{44.76^k - 43.27^k}{57.27^k} = 0.026 \Rightarrow 1.04$ Ton

OPP RATING U1L3 = $\frac{61.03^k - 43.27^k}{57.27} = 0.31 \Rightarrow 12.4$ Ton

---

INV RATING U2L4 = $\frac{35.75^k - 26.1^k}{47^k} = 0.20 \Rightarrow 8.21$ Ton

OPP RATING U2L4 = $\frac{48.75^k - 26.1^k}{47.0^k} = 0.48 \Rightarrow 19.2$ Ton

---

INV RATING U3L5 = $\frac{25.02^k - 8.74^k}{36.33^k} = 0.448 \Rightarrow 17.9$ Ton

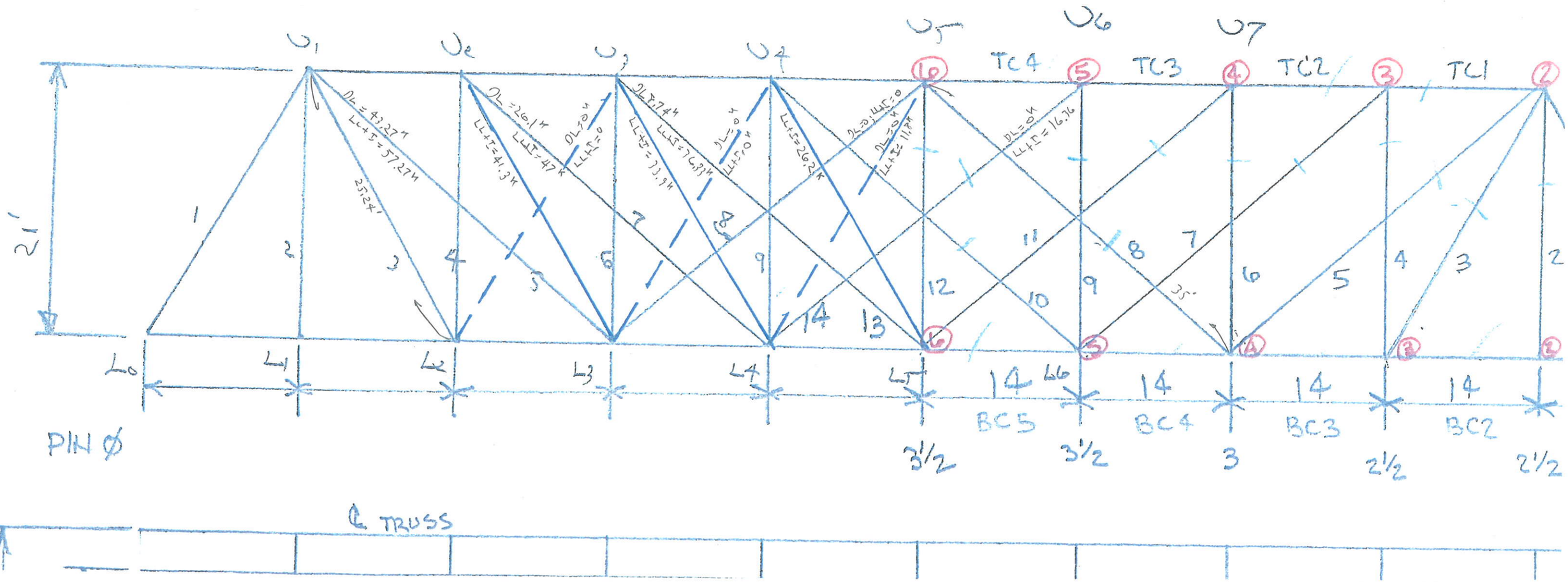
OPP RATING U3L5 = $\frac{34.12^k - 8.74^k}{36.33^k} = 0.70 = 28$ Ton

---

INV & OPP RATING L3U5 = 99.9 AS DL & LL'S REVERSE SHEAR = 0^k IN PANEL U3U4

INV RATING L4U6 = $\frac{18.01 - 0}{16.36} = 1.10 \Rightarrow 44$ Ton

OPP RATING L4U6 = $\frac{24.57 - 0}{16.36} = 1.50 \Rightarrow 60.0$ Ton



SPS LOADING = H520 DESIGN TRUCK

INV RATING U1L3 = $\frac{44.76^k - 43.27^k}{61.98^k} = 0.024 \Rightarrow 0.86$ TON

OPP RATING U1L3 = $\frac{61.03^k - 43.27^k}{61.98^k} = 0.28 \Rightarrow 10.1$ TON

INV RATING U2L4 = $\frac{35.75^k - 26.1^k}{52.8^k} = 0.18 \Rightarrow 6.5$ TON

OPP RATING U2L4 = $\frac{48.73^k - 26.1^k}{52.8^k} = 0.43 \Rightarrow 15.5$ TON

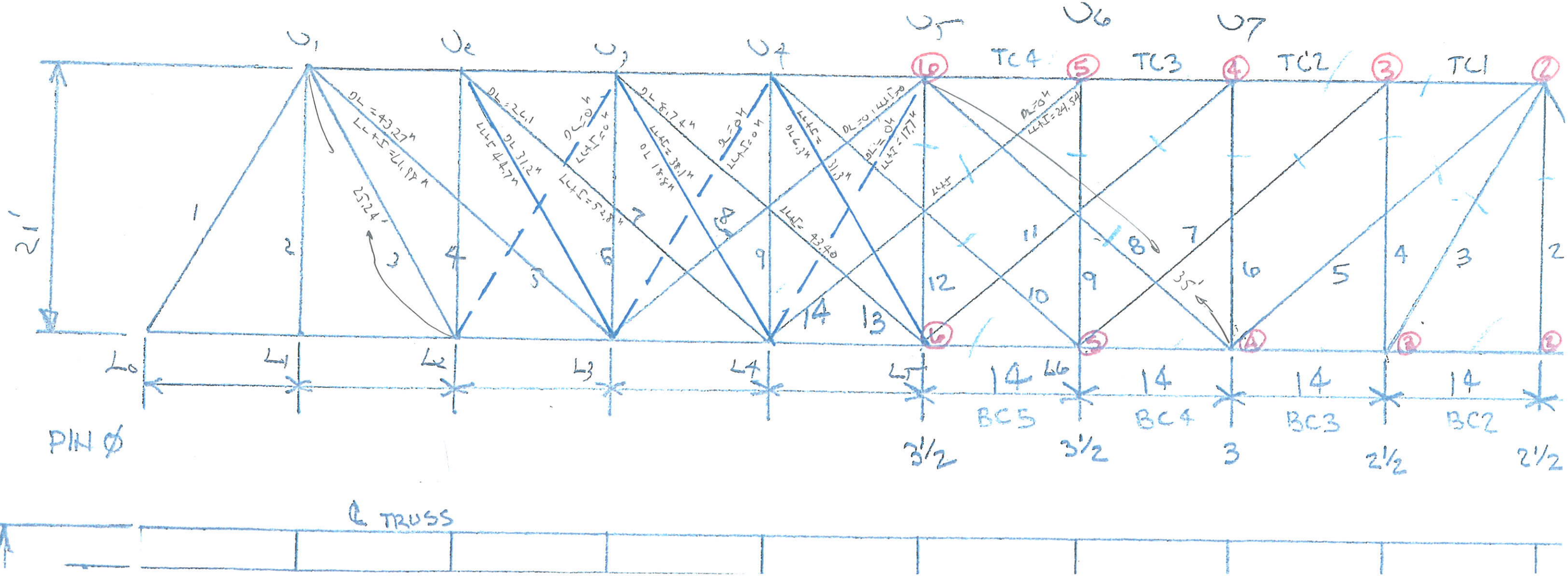
INV RATING U3L5 = $\frac{25.02^k - 8.74^k}{43.40^k} = 0.375 \Rightarrow 13.5$ TONS

OPP RATING U3L5 = $\frac{34.12^k - 8.74^k}{43.40^k} = 0.58 \Rightarrow 20.9$ TONS

INV & OPP RATING L3U5 = 99.9 AS DL AND LLIT REVERSE SHEAR = 0^k IN PANEL U3U4

INV RATING L4U6 = $\frac{18.01^k - 0^k}{24.54^k} = 0.73 \Rightarrow 26.3$ TON

OPP RATING L4U6 = $\frac{24.57^k - 0^k}{24.54^k} = 1.0 \Rightarrow 36$ TON



NO ASPHALT OPTION

KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
2244 Baton Rouge, Lima, Ohio 45805 419-227-1135

BRIDGE LOAD RATING REPORT

BRIDGE NO.	Logan Co.; Pleasant Twp.; CR21-1.00 over Miami River	SFN	4631838
BRIDGE DESCRIPTION	Whipple (Double Intersection Pratt Truss) Through Truss		
WORK DETAILS	CEAO Fracture Critical Load Rating Program		
SPANS (C/C BEARINGS)	140' -0"		
BRIDGE PLAN INFORMATION	None		
MATERIAL STRENGTHS	Unknown		
RATING SOFTWARE	BRIDGE TRUSS - WS STRINGERS & FLOOR BEAMS - WS & LF	BARS 7 PDOT	
	GUSSETS: WELDED - FASTENED GUSSET PLATE ANALYSIS & RATING SPREAD SHEET - WORKING STRESS BY ODOT CENTRAL OFFICE		
	GUSSETS: RIVETED/BOLTED GUSSET PLATE ANALYSIS & RATING SPREAD SHEET - WORKING STRESS BY ODOT CENTRAL OFFICE		
SPECIAL ASSUMPTIONS	Bridge built 1882 - Assumed Fy=26KSI, Fu=52KSI per AASHTO Manaul for Bridge Evaluation Table 6B.6.2.1 - NO ASPHALT OPTION		

STRUCTURE RATING ANALYSIS

DESIGN LOADS

HS 20-44 INVENTORY		WS		LOAD FACTOR		CONTROLLING MEMBER
		RF	TONS	RF	TONS	
	TRUSS	0.32	11.5			U1L3
	STRINGERS	0.91	32.8			
	FLOOR BEAMS	0.93	33.5			
	GUSSET					

HS 20-44 OPERATING		WS		LOAD FACTOR		CONTROLLING MEMBER
		RF	TONS	RF	TONS	
	TRUSS	0.58	20.9			U1L3
	STRINGERS	1.28	46.1			
	FLOOR BEAMS	1.37	49.3			
	GUSSET					

STRUCTURE RATING ANALYSIS

OHIO LEGAL LOADS

2 FI OPERATING		WS		LOAD FACTOR		CONTROLLING MEMBER
		RF	TONS	RF	TONS	
	TRUSS	1.30	19.5			U1L3
	STRINGERS	2.04	30.6			
	FLOOR BEAMS	2.10	31.5			
	GUSSET					

3FI OPERATING		WS		LOAD FACTOR		CONTROLLING MEMBER
		RF	TONS	RF	TONS	
	TRUSS	0.87	20.0			U1L3
	STRINGERS	1.65	38.0			
	FLOOR BEAMS	1.48	34.0			
	GUSSET					

4FI OPERATING		WS		LOAD FACTOR		CONTROLLING MEMBER
		RF	TONS	RF	TONS	
	TRUSS	0.75	20.3			U1L3
	STRINGERS	1.57	42.4			
	FLOOR BEAMS	1.41	38.1			
	GUSSET					

5CI OPERATING		WS		LOAD FACTOR		CONTROLLING MEMBER
		RF	TONS	RF	TONS	
	TRUSS	0.62	24.8			U1L3
	STRINGERS	1.65	66.0			
	FLOOR BEAMS	1.56	62.4			
	GUSSET					

CONTROLLING RATING TONS	19.5 OP Rate	2FI	BRIDGE DESIGN LIVE LOAD	Unknown	Date Built 1882 / Ohio Legal Load 62%
	11.4 Inv. Rate	HS20			

RATED BY: DGB DATE: 8/13/2011

NO ASPHALT OPTION

RECOMMENDED
LIVE LOAD POSTING

General

Item -

Type –

66. Operational Status

The operational status of the bridge should be coded using the following:

"A" Open, no restriction

"B" Open, posting recommended but not legally implemented (all signs not in place)

Load Posting Signs: Verify that the Load Rating Sign matches the posted signage. Record the signed load posting in tonnage in the comments and compare with the inventory. If changes exist then update the BMS inventory.

"C" Under construction, half of the existing bridge is open to traffic (half-width construction)

"D" Open, would be posted or closed except for temporary shoring, etc. to allow for unrestricted traffic

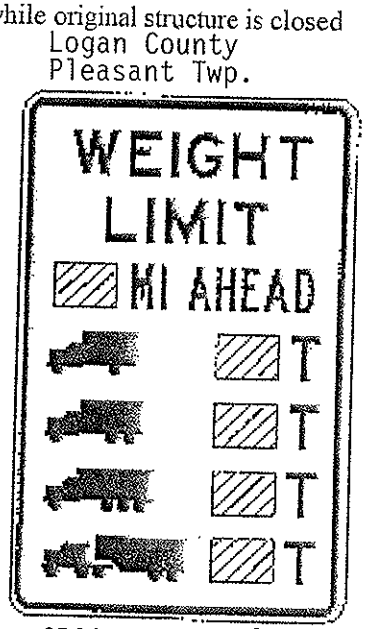
"E" Open, temporary structure in place to carry legal loads while original structure is closed and awaiting replacement or rehabilitation.

"G" New structure not yet open to traffic

"K" Bridge closed to all traffic

"P" Posted for load-carrying capacity restriction (may include other restrictions)

Load Posting Signs: Verify that the Load Rating Sign matches the posted signage. State Routes are posted on the Operating Rating when the rating factor is less than 92.5%. Record the signed load posting in tonnage in the comments and compare with the inventory. If changes exist then update the BMS.



"R" Posted for other than load-carrying capacity restriction (speed, number of vehicles on bridge, etc.).

"X" Bridge closed for reasons other than condition or load-carrying capacity.

DEAD LOAD CALCULATIONS
FOR
BARS 7 INPUT

17.29

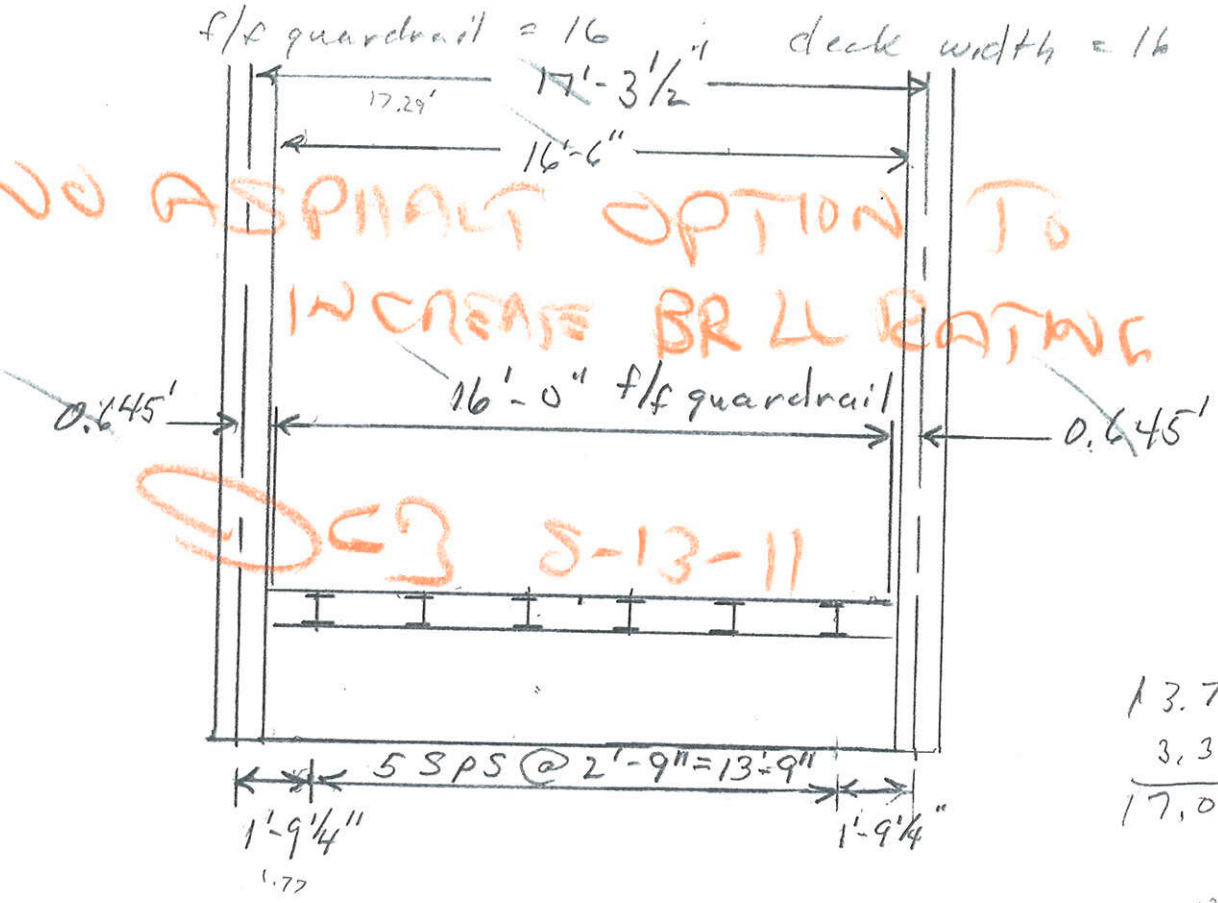
Form #2

KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
2244 Baton Rouge Ave., Lima, Ohio 45805

Calculations For Logan County CR 21-1.00
Load Rating Analysis

Computed By THH Date 2-9-11 Sheet 1 of 8

Checked By JCB Date 7-29-11



13.75
3.34
17.09

13.75
3.54
17.29

Distribution Factor for Shear

D_{FV} = 1WL = 0.50 Axle

Distribution Factor for Moment

$$D_{FM} = \frac{S}{5.25} = \frac{2.75}{5.25} = 0.51$$

$$(0.51)(0.50) = 0.26 \text{ Axle}$$

Distribution Factor for Deflection

$$D_F = \frac{(N^o \text{ Lanes}) \text{ reduction factor}}{N^o \text{ Beams}}$$

$$= \frac{1(1)}{6} = 0.17 \text{ Axle}$$

KOHLI & KALIHER ASSOCIATES, INC.
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Form #2

Calculations For Logan County CR 21-1.00
Load Rating Analysis

Computed By THH Date 2-10-11 Sheet 2 of 8
Checked By DGS Date 7-29-11

Guardrail

Deep Beam Guardrail

7.9 #/ft - one truss

15.8 #/ft - two truss

3" x 6" Wood Strip Floor

$(5\frac{1}{2}/12)\ 16.0'\ (45\ \#/ft^3) = 330\ \#/ft$

Asphalt Wearing Surface

$(3.35/12)(16.0')\ 145\ \#/ft^3 = 647.67\ \#/ft$

2.6" - Edge of Deck
$8(3/16) + 2.6 = 4.1$"
$\left(\frac{2.6+4.1}{2}\right) = 3.35$"

Total DL = 15.8 + 330 + 647.67 = 993.47 /ft

Stringer DL = $\frac{993.47}{6} = 165.58\ \#/ft$

Truss Loads pg 5-48, 7-44 Bar 7

panel number pp = 0 ; Location Lo

floor beam: $\left(\frac{0.25}{12}\right)\left(\frac{24.25}{12}\right) + \left(\frac{2.625}{12}\right)\left(\frac{0.5}{12}\right)4 + \left(\frac{3.125-0.5}{12}\right)\left(\frac{0.5}{12}\right)4$

$0.115\ ft^2\ (490\ \#/ft^3) = 56.35\ \#/ft$

$(18.08')(56.35\ \#/ft) = 1018.81\ \#$

4.DL
5.25

stringers: $\left(\frac{5.75}{12}\right)\left(\frac{0.418}{12}\right)2 + \left(\frac{10.375}{12} - 2\left(\frac{.418}{12}\right)\right)\frac{0.256}{12}$

$= 0.05\ ft^2\ (1\ ft)\ 490\ \#/ft^3 = 24.48\ \#/ft$

$24.48\ \#/ft\ (6\ Ea) = 146.88\ \#/ft$

$(21^2+28^2)^{1/2} = 35$

KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
2244 Baton Rouge Ave., Lima, Ohio 45805

Form #2

Calculations For Logan County CR 21-1.00
Load Rating Analysis

Computed By THH Date 2-10-11 Sheet 3 of 8
Checked By DCB Date 7-30-11

1 $L_0 U_1$ (2 Ea) C 10 X 15.3
(1 Ea) $\left(\frac{3/8 \times 15\ 1/8}{144}\right) 490\ \#/ft^3$
$= 19.3\ \#/ft$
$2(15.3) + 19.3 = 49.9\ \#$
use for Sum Properties sheet
52.5
$49.9\left(14^2+21^2\right)^{1/2} = 1325.42\ \#$

2 $L_1 U_1$ 2 Ea $\left(\frac{1.75}{12}\right)\left(\frac{0.50}{12}\right) + \frac{\pi(0.5)^2}{144}$
$= 0.017\ ft^2$
$0.017\ ft^2\left(\frac{490\ \#}{ft^3}\right) = 8.55\ \#/ft$
$8.55(21) = 179.60\ \#$

3 $U_1 L_2$ 2 Ea $\left(\frac{2.5}{12}\right)\left(\frac{0.625}{12}\right) 490\ \#/ft^3$
$= 10.63\ \#/ft$
$10.63\left(14^2+21^2\right)^{1/2} = 268.29\ \#$

4 $L_2 U_2$ C 6 X 8.2
$(2)(8.2) = 16.4\ \#/ft$
use for Sum Properties sheet
18.2
$16.4(21) = 344.4\ \#$

5 $U_1 L_3$ 2 Ea $\left(\frac{2.5}{12}\right)\left(\frac{0.625}{12}\right) 490\ \#/ft^3$
$= 10.63\ \#/ft$
$10.63\left(21^2+28^2\right)^{1/2} = 372.05$

6 $L_3 U_3$ C 5 X 6.7
$2(6.7) = 13.4\ \#/ft$
use for Sum Properties sheet
17.0
$13.4(21) = 281.4$

7 $U_2 L_4$ 2 Ea $\left(\frac{2.5}{12}\right)\left(\frac{0.5}{12}\right) 490\ \#/ft^3 =$
$= 8.51\ \#/ft$
$8.51\left(21^2+28^2\right)^{1/2} = 297.85$

8 $L_3 U_5$ $\left(\frac{1}{12}\right)^2 490\ \#/ft^3 =$
$= 3.40\ \#/ft$
$3.40\left(21^2+28^2\right)^{1/2} = 119.10\ \#$

9 L_4U_4 C5x6.7 $2(6.7) = 13.4\ \#/ft$ Use 17 See Section Properties Sheet ~~13.4~~ #/ft (21') = 357 ~~281.4~~ #

10 U_4L_4 ~~L_4U_4~~ 7/8" Dia Bar

$2\left(\frac{7/16}{2}\right)^2\pi = 1.20\ in^2$

$1.20\left(\frac{490\ \#/ft^3}{144\ in^2/ft^2}\right) = 4.08\ \#/ft$

$(21^2+28^2)^{1/2}(4.08\ \#/ft) = 142.8\ \#$

Fill U_3L_5 $2\ Ea\left(\frac{1.75}{12}\right)\left(\frac{0.5}{12}\right)490\ \#/ft^3 = 5.95\ \#/ft$

$5.95(21^2+28^2)^{1/2} = 208.25\ \#$

12 L_5U_5 C5x6.7 $2(6.7) = 13.4\ \#/ft$ Use 17 See Section Properties Sheet ~~13.4~~ #/ft (21') = 357 ~~281.4~~ #

14 L_4U_4 ~~U_4L_4~~ $\left(\frac{1.125}{12}\right)^2(490\ \#/ft^3) = 4.31\ \#/ft$

$4.31\ \#/ft\ (21^2+28^2)^{1/2} = 150.73\ \#$

TC1 TC (2 Ea) C10x15.3

$1\ Ea\left(\frac{3/8 \times 15\ 1/8}{144}\right)490\ \#/ft^3 = 19.3\ \#/ft$

$2(15.3)+19.3 = 49.9\ \#$

Use 12 ~~49.9~~ (14) = 728 ~~698.6~~ #

BC1 L_0L_1

BC2 L_1L_2 & L_1L_2 $1\ Ea\left(\frac{3/4 \times 3}{12}\right)\frac{490}{12} = 15.31\ (14) = 214.38\ \#$

BC3 L_2L_3 $2\ Ea\left(\frac{3/4 \times 3.5}{12}\right)\frac{490}{12} = 17.86\ (14) = 250.04\ \#$

KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
2244 Baton Rouge Ave., Lima, Ohio 45805

Form #2

Calculations For Logan County CR21-100
Load Rating Analysis

Computed By TMH Date 2-10-11 Sheet 5 of 8
Checked By DGS Date 2-20-11

B-4 L_3 L_4 $2\left(\frac{4\frac{1}{4}}{12} \times \frac{7}{12}\right) 490$ (14) ~~22.71~~ 25.31 = ~~317.87~~ 355 #

B-5 L_4 L_5 $2\left(\frac{5}{12} \times \frac{1}{12}\right) 490$ (14) 34.03 = 476.39 #

wt. top strut: 2 - C 4×5.4 => (2)(5.4 lbs/LF)(10.1') = 109 lbs

D.L @ L_o

Truss: $\frac{L_oU_1}{2} + \frac{L_oL_1}{2} = \frac{1325}{2}\frac{259.42}{} + \frac{214.38}{2} = \frac{770}{736.9}$

Guardrail: 7.9 (14.0/2) = 55.3

~~792.2~~ 825.3

D.L @ U_1

$\frac{L_oU_1}{2} + \frac{U_1L_2}{2} + \frac{U_1L_3}{2} + \frac{U_1U_2}{2} + U_1L_1 (+\frac{1}{2}$ Top Strut$) =$

$\frac{1325}{2}\frac{259.42}{} + \frac{286.29}{2} + \frac{372.05}{2} + \frac{598.6}{2} + \frac{180+180}{2} = \frac{1611}{1308.18}$#

D.L @ L_1

$\frac{L_oL_1}{2} + \frac{L_1L_2}{2} + \cancel{L_1U_1}$

$\frac{214.38}{2} + \frac{214.38}{2} + \cancel{179.60} = \frac{215}{393.98}$#

Guard Rail = 7.9#/ft (14) = 110.6

Asphalt = ~~(550#/ft) 1/2 (14)~~ = ~~4,550~~ 4,060

Timber Deck = (330#/ft) 1/2 (14) = 2,310

Floor Beam = 1018.81/2 = 509.41

Stringer = (146.88#/ft) 1/2 (14) = 1028.16

8509 ~~8018.17~~

215 + ~~393.98~~

~~8412.15~~#

~~5724~~ 4469

No Asphalt DGS 8-13-11

KOHLI & KALIHER ASSOCIATES, INC.
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Calculations For Logan County CR 21-100
Load Rating Analysis

Computed By THH Date 2-10-11 Sheet 7 of 8
Checked By DGB Date 2-20-11

D_L @ L_2

GR + Asphalt + Deck + Floor Beam + Stringer = ~~8018.17~~ 4454 (NO ASPHALT) 8509

Truss: $\frac{L_1L_2}{2} + \frac{L_2L_3}{2} + \frac{U_1L_2}{2} + L_2U_2$

$\frac{214.38}{2} + \frac{250.04}{2} + \frac{268.29}{2} + ~~344.4~~ 383 = ~~710.76~~ 750\#$

~~8728.93~~ 9259

D_L @ U_2

(NO ASPHALT 5204)

$\frac{U_1U_2}{2} + \frac{U_2U_3}{2} + \frac{U_2L_4}{2} + \frac{1}{2}$ TOP STRUT

$\frac{~~698.6~~ 728}{2} + \frac{~~698.6~~ 728}{2} + \frac{297.85}{2} + \frac{180}{2} = ~~847.53~~ 967\#$

D_L @ U_3

$\frac{U_2U_3}{2} + \frac{U_3U_4}{2} + \frac{U_3L_5}{2} + \frac{1}{2}$ TOP STRUT

$\frac{~~698.6~~ 728}{2} + \frac{~~698.6~~ 728}{2} + \frac{208.25}{2} + \frac{180}{2} = ~~802.73~~ 922\#$

D_L @ L_3

GR + Asphalt + Deck + Floor Beam + Stringers = ~~8018.17~~ 4454 (NO ASPHALT) 8509

Truss:

$\frac{L_2L_3}{2} + \frac{L_3L_4}{2} + \frac{U_1L_3}{2} + \frac{L_3U_5}{2} + L_3U_3 =$

$\frac{250.04}{2} + \frac{~~317.87~~ 355}{2} + \frac{372.05}{2} + \frac{119.10}{2} + ~~281.4~~ 357 = ~~810.93~~ 905\#$

~~8829.1~~ 9414

D_L @ L_4

(NO ASPHALT 5360)

GR + Asphalt + Deck + Floor Beam + Stringers = ~~8018.17~~ 8509 (NO ASPHALT) 4454

Truss:

$\frac{L_3L_4}{2} + \frac{L_4L_5}{2} + \frac{U_2L_4}{2} + \frac{L_4U_4}{2} + L_4U_4 =$

$\frac{~~317.87~~ 355}{2} + \frac{476.39}{2} + \frac{297.85}{2} + \frac{~~442.8~~ 451}{2} + ~~281.4~~ 357 = ~~646.60~~ 998\#$

(NO ASPHALT 5452) ~~9507~~ ~~8663.77~~

KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
2244 Baton Rouge Ave., Lima, Ohio 45805

Calculations For Logan County CR21-1.00
Load Rating Analysis

Computed By THH Date 2-10-11 Sheet 8 of 8
Checked By DGB Date 7-30-11

DL @ U4

$$\frac{U_3U_4}{2} + \frac{U_4U_5}{2} + \frac{U_4L_6}{2} + \tfrac{1}{2}\text{TP STRGT} =$$

$$\frac{728}{\cancel{698.6}} + \frac{728}{\cancel{698.6}} + \frac{143}{\cancel{150.73}} + \frac{180}{2} = \cancel{773.97}^{\#}\ 890$$

DL @ U5

$$\frac{U_4U_5}{2} + \frac{U_5U_6}{2} + \frac{L_3U_5}{2} + \frac{U_5L_7}{2} + \tfrac{1}{2}\text{TP STRGT} =$$

$$\frac{728}{698.6} + \frac{728}{\cancel{698.6}} + \frac{119.0}{2} + \frac{119.0}{2} + \frac{180}{2} = \cancel{817.6}^{\#}\ 937$$

DL @ L5

$$\frac{L_4L_5}{2} + \frac{L_5L_6}{2} + \frac{U_3L_5}{2} + \frac{L_5U_7}{2} + L_5U_5 =$$

$$\frac{476.39}{2} + \frac{476.39}{2} + \frac{208.25}{2} + \frac{208.25}{2} + \cancel{281.4}^{357} = \cancel{966.04}\ 1042$$

GR + Asphalt + Deck + Floor Beam + Stringers = $\cancel{\cancel{5599}\ 8018.17}$ 4454

$\cancel{8984.21}$ 9551

NO ASPHALT 5496

DG3 8-13-11