# Erection Plan Support Calculations
# BF-013-4(39)

## Waitsfield, Vermont

CEE 36-mi-16


Prepared for:
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By:
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DEMAG AC 180 ↓

## STAGE 2

SET FOOTINGS & WINGWALLS
WW1 CONTROLS 31.81 T = 63,620 lb
MAX RADIUS 59 ft
RATED LOAD = 65 000 lb
BOOM LENGTH = 98.1 ft

## STAGE 3

SET BACKWALL
BW2 CONTROLS = 12.487 = 24960 lb
MAX RADIUS = 85 ft
RATED LOAD = 39,400 lbs
BOOM LENGTH = 98.1 ft

## STAGE 4

SET APPROACH SLAB
AS3 CONTROLS = 17.81 T = 35,620 lb
MAX RADIUS = 85 ft
RATED LOAD = 39,400 lb

GIRDER SET

WEIGHT = 50,755 lb
MAX RADIUS = 72 ft
RATED LOAD = 51,800 lb

HL-150 T ↓

## STAGE 5

SET PILE CAPS & WW
PC3 CONTROLS 29.40 T = 58,800 lb
MAX RADIUS = 45 ft
RATED LOAD = 66,900 lb
BOOM LENGTH = 150 ft

FURTHEST AWAY PC 5
W = 22.65 T = 45300 lb
MAX RADIUS = 50 ft
RATED LOAD = 57,100 lb
BOOM LENGTH = 150 ft

## STAGE 6

SET BACKWALL
BW4 CONTROLS = 9.41 T = 18,820 lb
MAX RADIUS = 100 feet
RATED LOAD = 19,100 lb
BOOM LENGTH = 150 ft

## STAGE 7

SET APPROACH SLABS
AS3 CONTROLS = 17.817 = 35620 lb
MAX RADIUS = 60 feet
RATED LOAD = 43,200 lb
BOOM LENGTH = 150 ft

GIRDER SET

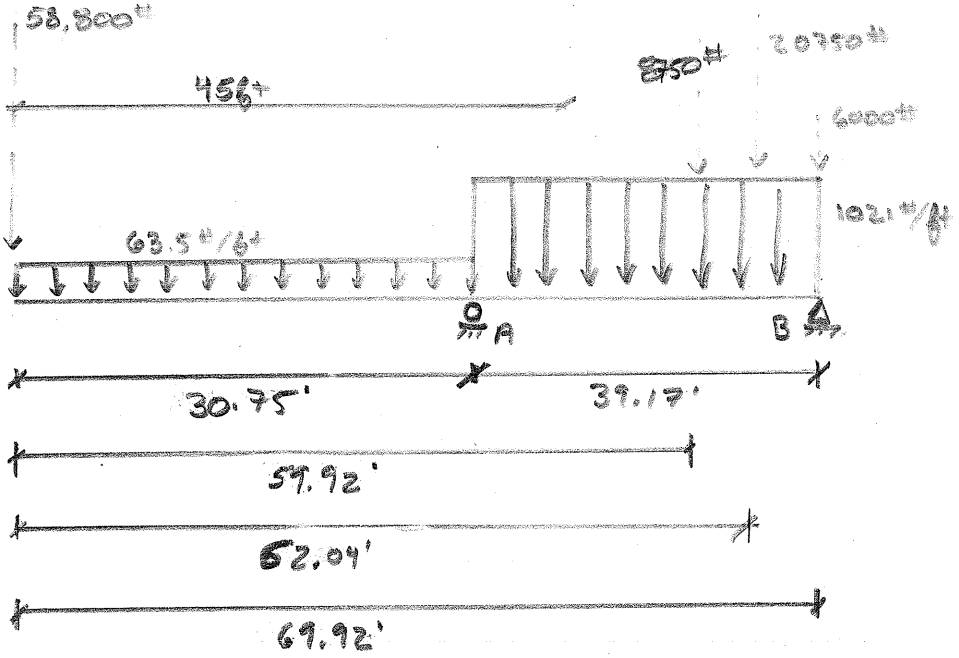
WEIGHT = 19,075 lb
MAX RADIUS = 90 ft
RAMED LOAD = 22,900 lb

COUNTER WEIGHTS: 6000 lbs @ 84.92'
20750 lbs @ 77.04'
8750 lbs @ 24.92'

HL-1507 : 1.021 K/ft
Boom : 63.5 lb/ft

NOTE: HL-1507 w/ 150ft Boom IS RATED FOR 66,900 lb @ RADIUS 45ft

WORST LOAD CASE: MAX RADIUS: 45ft
LOAD: 58,800 lb




SUPPORT A: 134000 lb ← CONTROLS *CALCS DONE ON BEAMBOY
SUPPORT B: 2140 lb

P = 134 K

SEE PAGE 10

CHECK CRANE MAT CAPACITY FOR HL-1507 LOADED @ MAX RADIUS

ASSUMPTIONS & KNOWNS

- USE CRANE MATS TO DISTRIBUTE LOAD
- ASSUME (4) 4' x 12' x 8" CRANE MATS STACKED
- MOST LOADED OUTRIGGER: P = 134k FROM BEAMBOY

(D) DEPTH: 2'8"
(B) BASE: 4'
(L) LENGTH: 12'

$\gamma_{WOOD}$ = 50 pcf DENSE HARDWOOD
WALLOW = 5 ksf → STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES TABLE 4.11.4.1.4-1

$P_{DEAD} = D \cdot B \cdot L \cdot \gamma_{WOOD}$
$= (2'8")(4')(12')(50 pcf)$
$= 6.4$ kip

$w = \frac{(P + P_{dead})}{(L \cdot B)} = \frac{(134K + 6.4K)}{(12' \cdot 4')} = 2.925$ ksf

FS: $\frac{WALLOW}{w} = \frac{5 ksf}{3.07 ksf} = 1.62$ OK ✓

CHECK CRANE MAT MOMENT CAPACITY

MODEL AS A CANTILEVER SUPPORT @ CENTER OF CRANE MAT
ANALYZE ON A PER FOOT BASIS

$M_B = w \cdot \frac{L}{2} \cdot \frac{\left(\frac{L}{2}\right)}{2} \cdot 1ft$

$= (2.925 ksf) \cdot \left(\frac{12'}{2}\right) \cdot \frac{(12'/2)}{2} \cdot 1ft$

$= 52.65$ ft·k
$M_B = 631.8$ in·k

← NDS

CALCULATE CAPACITY (REF NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION)

$F_b$ = 1150psi ← MIXED OAK No. 1, NDS SUPPLEMENT TABLE 4D
$C_D$ = 1.25 ← NDS TABLE 2.3.2 FOR CONSTRUCTION LOADS
$C_m$ = 1.0
$C_t$ = 1.0 ← NDS TABLE 2.3.3
$C_L$ = 1.0 ← NDS 3.3.3
$C_F$ = 1.0 ← NDS 4.3.6
$C_{fu}$ = 1.0
$C_i$ = 1.0
$C_r$ = 1.0

$F'_b = F_b \cdot C_D \cdot C_m \cdot C_t \cdot C_L \cdot C_F \cdot C_r$
$F'_b = (1150 psi)(1.25)$
$F'_b = 1437.5$ psi

NEXT PAGE ⇒

$B = 16'$ ← B/C ANALYZING ON PER FOOT BASIS
$H = 8"$

$S_x = 4 \cdot \frac{BH^2}{6}$ (4) MATS STACKED ON TOP OF EACH OTHER

$= 4\frac{(16')(.667(6'))^2}{6}$

$S_x = .2966(6')^3 = 511.5 in^3$

$M_y = S_x \cdot F'_b$
$M_y = (511.5 in^3)(1437.5 psi)$
$M_y = 735.264 K \cdot in$

$FS = \frac{M_y}{M} = \frac{735.264 K \cdot in}{667.44 K \cdot in} = 1.1$ OK ✓

USE (4) 4'×12'×8" CRANE MATS

Grove HL 150

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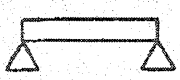
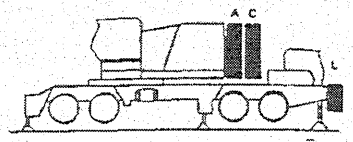
# 76A BOOM – ON OUTRIGGERS 360°
## 85% STABILITY



CAPACITY IN POUNDS
WITH A C + L COUNTERWEIGHTS

| BOOM LGTH | LOAD RAD | BOOM ANG | SHEAVE HGT | RATED LOAD |
|---|---|---|---|---|
| 40 | 12 | 82.7 | 47.1 | 300,000 |
| 40 | 13 | 81.3 | 46.9 | 294,600 |
| 40 | 14 | 79.8 | 46.6 | 272,900 |
| 40 | 15 | 78.3 | 46.3 | 254,300 |
| 40 | 16 | 76.8 | 46.0 | 237,800 |
| 40 | 17 | 75.3 | 45.7 | 223,400 |
| 40 | 18 | 73.8 | 45.3 | 210,500 |
| 40 | 19 | 72.2 | 44.9 | 199,100 |
| 40 | 20 | 70.7 | 44.5 | 188,700 |
| 40 | 25 | 62.6 | 41.8 | 149,300 |
| 40 | 30 | 53.7 | 38.1 | 122,900 |
| 40 | 35 | 43.4 | 32.9 | 99,500 |
| 40 | 40 | 29.9 | 24.9 | 81,000 |
| 50 | 13 | 83.0 | 57.0 | 293,800 |
| 50 | 14 | 81.9 | 56.9 | 272,100 |
| 50 | 15 | 80.7 | 56.6 | 253,500 |
| 50 | 16 | 79.5 | 56.4 | 237,000 |
| 50 | 17 | 78.3 | 56.1 | 222,600 |
| 50 | 18 | 77.1 | 55.8 | 209,700 |
| 50 | 19 | 75.9 | 55.5 | 198,300 |
| 50 | 20 | 74.7 | 55.2 | 187,900 |
| 50 | 25 | 68.6 | 53.2 | 148,500 |
| 50 | 30 | 62.1 | 50.5 | 122,200 |
| 50 | 35 | 55.1 | 46.9 | 99,700 |
| 50 | 40 | 47.3 | 42.4 | 81,100 |
| 50 | 45 | 38.2 | 36.2 | 67,900 |
| 50 | 50 | 26.2 | 27.0 | 58,000 |
| 60 | 15 | 82.3 | 66.8 | 253,100 |
| 60 | 16 | 81.3 | 66.6 | 236,600 |
| 60 | 17 | 80.3 | 66.4 | 222,300 |
| 60 | 18 | 79.3 | 66.2 | 209,300 |
| 60 | 19 | 78.4 | 65.9 | 197,900 |
| 60 | 20 | 77.4 | 65.7 | 187,500 |
| 60 | 25 | 72.3 | 64.0 | 148,100 |
| 60 | 30 | 67.2 | 61.8 | 121,900 |
| 60 | 35 | 61.7 | 59.1 | 99,900 |
| 60 | 40 | 55.9 | 55.7 | 81,300 |
| 60 | 45 | 49.7 | 51.5 | 68,100 |
| 60 | 50 | 42.7 | 46.1 | 58,300 |
| 60 | 60 | 23.6 | 28.8 | 44,500 |
| 70 | 17 | 81.7 | 76.6 | 222,000 |
| 70 | 18 | 80.9 | 76.4 | 209,100 |
| 70 | 19 | 80.1 | 76.2 | 197,700 |
| 70 | 20 | 79.2 | 76.0 | 187,300 |
| 70 | 25 | 75.0 | 74.6 | 147,900 |
| 70 | 30 | 70.6 | 72.8 | 121,700 |
| 70 | 35 | 66.1 | 70.5 | 100,000 |
| 70 | 40 | 61.5 | 67.8 | 81,400 |
| 70 | 45 | 56.6 | 64.4 | 68,200 |
| 70 | 50 | 51.3 | 60.4 | 58,400 |
| 70 | 60 | 39.2 | 49.5 | 44,700 |
| 70 | 70 | 21.6 | 30.5 | 35,500 |
| 80 | 18 | 82.0 | 86.6 | 208,600 |
| 80 | 19 | 81.3 | 86.4 | 197,200 |
| 80 | 20 | 80.6 | 86.2 | 186,800 |
| 80 | 25 | 76.9 | 85.0 | 147,400 |
| 80 | 30 | 73.2 | 83.4 | 121,200 |
| 80 | 35 | 69.3 | 81.5 | 100,000 |
| 80 | 40 | 65.4 | 79.2 | 81,300 |
| 80 | 45 | 61.3 | 76.4 | 68,100 |
| 80 | 50 | 57.0 | 73.1 | 58,300 |
| 80 | 60 | 47.7 | 64.7 | 44,600 |
| 80 | 70 | 36.4 | 52.7 | 35,400 |
| 80 | 80 | 20.0 | 32.1 | 28,900 |
| 90 | 19 | 82.3 | 96.6 | 197,000 |
| 90 | 20 | 81.6 | 96.4 | 186,600 |
| 90 | 25 | 78.4 | 95.3 | 147,400 |
| 90 | 30 | 75.1 | 93.9 | 121,100 |
| 90 | 35 | 71.7 | 92.3 | 100,000 |
| 90 | 40 | 68.3 | 90.2 | 81,400 |
| 90 | 45 | 64.8 | 87.8 | 68,100 |
| 90 | 50 | 61.1 | 85.1 | 58,400 |
| 90 | 60 | 53.4 | 78.1 | 44,700 |
| 90 | 70 | 44.7 | 68.8 | 35,600 |
| 90 | 80 | 34.2 | 55.7 | 29,200 |
| 90 | 90 | 18.7 | 33.6 | 24,200 |
| 100 | 21 | 81.9 | 106.4 | 176,900 |
| 100 | 25 | 79.6 | 105.6 | 147,000 |
| 100 | 30 | 76.6 | 104.3 | 120,600 |
| 100 | 35 | 73.6 | 102.8 | 100,000 |
| 100 | 40 | 70.6 | 101.1 | 81,300 |
| 100 | 45 | 67.5 | 98.9 | 68,000 |
| 100 | 50 | 64.3 | 96.5 | 58,200 |
| 100 | 60 | 57.6 | 90.5 | 44,400 |
| 100 | 70 | 50.4 | 82.8 | 35,300 |
| 100 | 80 | 42.2 | 72.5 | 29,000 |
| 100 | 90 | 32.3 | 58.5 | 24,100 |
| 100 | 100 | 17.6 | 35.0 | 20,200 |
| 110 | 24 | 81.1 | 116.0 | 152,900 |
| 110 | 25 | 80.5 | 115.8 | 146,500 |
| 110 | 30 | 77.9 | 114.7 | 120,200 |
| 110 | 35 | 75.2 | 113.3 | 99,800 |
| 110 | 40 | 72.4 | 111.7 | 81,100 |
| 110 | 45 | 69.7 | 109.8 | 67,800 |
| 110 | 50 | 66.8 | 107.7 | 58,000 |
| 110 | 60 | 60.9 | 102.4 | 44,200 |
| 110 | 70 | 54.7 | 95.7 | 35,100 |
| 110 | 80 | 47.8 | 87.1 | 28,800 |
| 110 | 90 | 40.1 | 76.1 | 23,900 |
| 110 | 100 | 30.6 | 61.1 | 20,100 |
| 110 | 110 | 16.7 | 36.3 | 17,000 |
| 120 | 26 | 80.8 | 125.8 | 139,900 |
| 120 | 30 | 78.9 | 124.9 | 119,600 |
| 120 | 35 | 76.4 | 123.7 | 99,700 |
| 120 | 40 | 74.0 | 122.2 | 81,000 |
| 120 | 45 | 71.4 | 120.5 | 67,600 |
| 120 | 50 | 68.9 | 118.6 | 57,800 |
| 120 | 60 | 63.6 | 113.8 | 44,000 |
| 120 | 70 | 58.0 | 107.9 | 34,800 |
| 120 | 80 | 52.1 | 100.5 | 28,500 |
| 120 | 90 | 45.6 | 91.3 | 23,600 |
| 120 | 100 | 38.2 | 79.5 | 19,800 |
| 120 | 110 | 29.2 | 63.6 | 16,700 |
| 120 | 120 | 15.9 | 37.6 | 14,200 |
| 130 | 27 | 81.1 | 135.8 | 134,000 |
| 130 | 30 | 79.8 | 135.2 | 119,300 |
| 130 | 35 | 77.5 | 134.0 | 99,500 |
| 130 | 40 | 75.2 | 132.7 | 80,800 |
| 130 | 45 | 72.9 | 131.1 | 67,400 |
| 130 | 50 | 70.6 | 129.3 | 57,600 |
| 130 | 60 | 65.8 | 125.0 | 43,800 |
| 130 | 70 | 60.8 | 119.7 | 34,700 |
| 130 | 80 | 55.5 | 113.1 | 28,300 |
| 130 | 90 | 49.9 | 105.1 | 23,500 |
| 130 | 100 | 43.7 | 95.2 | 19,700 |
| 130 | 110 | 36.6 | 82.7 | 16,700 |
| 130 | 120 | 28.0 | 66.0 | 14,200 |
| 130 | 130 | 15.2 | 38.8 | 12,000 |
| 140 | 29 | 80.9 | 145.5 | 123,400 |
| 140 | 30 | 80.5 | 145.4 | 118,800 |
| 140 | 35 | 78.4 | 144.3 | 99,400 |
| 140 | 40 | 76.3 | 143.1 | 80,600 |
| 140 | 45 | 74.2 | 141.6 | 67,200 |
| 140 | 50 | 72.0 | 140.0 | 57,400 |
| 140 | 60 | 67.6 | 136.0 | 43,500 |
| 140 | 70 | 63.1 | 131.2 | 34,400 |
| 140 | 80 | 58.3 | 125.2 | 28,000 |
| 140 | 90 | 53.3 | 118.1 | 23,100 |
| 140 | 100 | 47.9 | 109.5 | 19,400 |
| 140 | 110 | 42.0 | 99.0 | 16,300 |
| 140 | 120 | 35.2 | 85.8 | 13,800 |
| 140 | 130 | 26.9 | 68.3 | 11,700 |
| 140 | 140 | 14.6 | 40.0 | 10,000 |
| 150 | 30 | 81.1 | 155.5 | 118,300 |
| 150 | 35 | 79.2 | 154.5 | 99,200 |
| 150 | 40 | 77.2 | 153.4 | 80,400 |
| 150 | 45 | 75.3 | 152.1 | 66,900 |
| 150 | 50 | 73.3 | 150.5 | 57,100 |
| 150 | 60 | 69.2 | 146.9 | 43,200 |
| 150 | 70 | 65.0 | 142.4 | 34,100 |
| 150 | 80 | 60.7 | 137.0 | 27,700 |
| 150 | 90 | 56.1 | 130.5 | 22,900 |
| 150 | 100 | 51.3 | 122.9 | 19,100 |
| 150 | 110 | 46.1 | 113.7 | 16,000 |
| 150 | 120 | 40.4 | 102.6 | 13,500 |
| 150 | 130 | 33.9 | 88.8 | 11,500 |
| 150 | 140 | 26.0 | 70.5 | 9,700 |
| 150 | 150 | 14.1 | 41.1 | 8,200 |




COUNTERWEIGHT CONFIGURATION

RATED LOADS APPEARING IN SHADED AREAS ARE BASED ON STRUCTURAL OR OTHER FACTORS RATHER THAN STABILITY.

READ AND UNDERSTAND LIFTING CAPACITY NOTES ON A6-829-800214 LOCATED IN THE FRONT OF THIS MANUAL BEFORE OPERATING THIS MACHINE.

SERIAL NUMBER

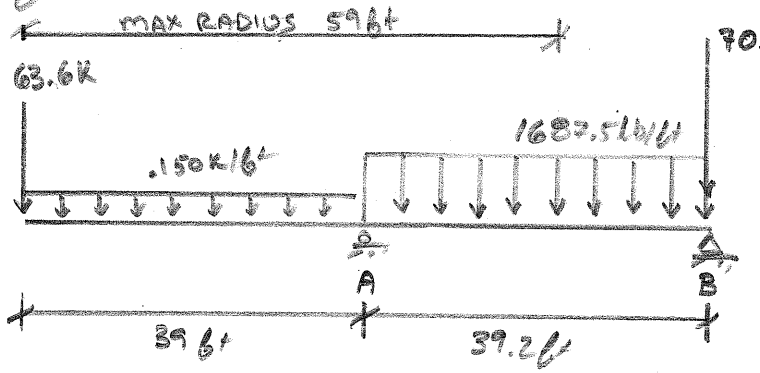
HL150T
IDENTIFICATION

COUNTER WEIGHT: 141 K / 2 = 70.5K

CRANE: $\frac{132,300 lb}{39.2 ft} \cdot \frac{1}{2} = 1687.5 lb/ft$

BOOM: 150 lb/ft

WORST LOAD CASE:
MAX RADIUS: 59 ft
LOAD: 63.6K




SUPPORT A: 169000 lb
SUPPORT B: 37400 lb

P = 169K ✓ SEE PAGE 11

NOTE: DEMAG AC180 w/ 98.1 ft BOOM IS RATED FOR A LOAD OF 65K @ 59'

CHECK CRANE MAT CAPACITY FOR DEMAG AC 180 LOADED @ MAX RADIUS

ASSUMPTIONS & KNOWNS

- USE CRANE MATS TO DISTRIBUTE LOAD
- ASSUME (5) 4' x 12' x 8" CRANE MATS STACKED
- MOST LOADED OUTRIGGER: P = 169K FROM BEAMBOX

(D) DEPTH: 3'4"
(B) BASE: 4'
(L) LENGTH: 12'

$\gamma_{WOOD}$ = 50 pcf → DENSE HARDWOOD
$W_{ALLOW}$ = 5 ksf → STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES TABLE 4.11.4.1.4-1

$P_{DEAD} = (D \cdot B \cdot L)\gamma_{WOOD}$
$= (3'4" \cdot 4' \cdot 12')(50 pcf)$
$= 8000 lbs$

$w = \frac{(P + P_{DEAD})}{(L \cdot B)}$
$= \frac{(169K + 8000 lb)}{(12' \cdot 4')}$
$= 3.6875 ksf$

$F.S = \frac{W_{ALLOW}}{w} = \frac{5 ksf}{3.7 ksf} = 1.36$ OK ✓

## CHECK CRANE MAT MOMENT CAPACITY

MODEL AS A CANTILEVER SUPPORT @ CENTER OF CRANE MAT
ANALYZE ON A PER FOOT BASIS

$$M_B = w \cdot \frac{L}{2} \cdot \frac{\left(\frac{L}{2}\right)}{2} \cdot 1ft$$

$$M_B = (3.687\ ksf) \cdot \left(\frac{12ft}{2}\right) \cdot \frac{\left(\frac{12ft}{2}\right)}{2} \cdot 1ft$$

$$M_B = 796.5\ in \cdot k$$

CALCULATE CAPACITY (REF NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION) ← NDS

$F_b = 1150\ psi$ ← MIXED OAK NO. 1 NDS SUPPLEMENT TABLE 4D
$C_D = 1.25$ ← NDS TABLE 2.3.2 FOR CONSTRUCTION LOADS
$C_m = 1.0$
$C_t = 1.0$ ← NDS TABLE 2.3.3
$C_L = 1.0$
$C_F = 1.0$
$C_{fu} = 1.0$
$C_i = 1.0$
$C_r = 1.0$

$F'_b = F_b \cdot C_D \cdot C_m \cdot C_t \cdot C_L \cdot C_F \cdot C_r$
$F'_b = (1150\ psi)(1.25)$
$F'_b = 1437.5\ psi$

$B = 1ft$ ← BIG ANALYZING ON PER FOOT BASIS
$H = 8''$

$$S_x = 5 \cdot \frac{BH^2}{6} = 5 \cdot \frac{(1)(8'')^2}{6} = .37\ ft^3$$

$M_y = S_x \cdot F'_b$
$M_y = (.37ft^3)(1437.5\ psi)$
$M_y = 920\ in \cdot k$

$$FS = \frac{M_y}{M_B} = \frac{920\ in \cdot k}{796.5\ in \cdot k} = 1.16$$ OK ✓

USE (5) 4' × 12' × 8" CRANE MATS

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# Lifting capacities main boom

Demag AC 180

**141,000 lb**   **360°** **85%**

| | Main boom | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Radius | 48.2 ft** | 48.2 ft | 65.6 ft | 81.7 ft | 98.1 ft | 114.8 ft | 114.8 ft | 131.6 ft | 148.0 ft | 164.7 ft | 181.1 ft | 197.0 ft |
| ft | 1,000 lb | | | | | | | | | | | |
| 10 | 400.0[1)] | 338.0 | 294.0 | 208.0 | – | – | – | – | – | – | – | – |
| 11 | 375.0[1)] | 321.0 | 290.0 | 203.0 | – | – | – | – | – | – | – | – |
| 13 | 333.0[1)] | 290.0 | 282.0 | 195.5 | – | – | – | – | – | – | – | – |
| 15 | 300.0[1)] | 264.0 | 263.0 | 185.0 | 146.5 | – | – | – | – | – | – | – |
| 16 | 285.0[1)] | 253.0 | 251.0 | 180.0 | 143.5 | – | – | – | – | – | – | – |
| 19 | 241.0 | 224.0 | 224.0 | 167.0 | 135.0 | 125.5 | 109.0 | – | – | – | – | – |
| 23 | 198.0 | 193.5 | 192.0 | 150.5 | 124.0 | 111.0 | 101.0 | 98.0 | – | – | – | – |
| 26 | 175.5 | 175.5 | 174.0 | 140.5 | 117.0 | 102.0 | 96.0 | 91.5 | 83.0 | – | – | – |
| 29 | 159.0 | 159.0 | 159.0 | 131.5 | 110.0 | 94.5 | 91.0 | 85.5 | 78.0 | 64.5 | – | – |
| 33 | 142.0 | 142.0 | 141.0 | 120.5 | 102.0 | 85.5 | 85.5 | 79.0 | 71.0 | 61.5 | 50.5 | 39.6 |
| 39 | – | – | 118.0 | 105.5 | 91.0 | 74.5 | 76.5 | 68.5 | 64.0 | 56.7 | 46.5 | 38.8 |
| 46 | – | – | 95.5 | 92.0 | 80.0 | 63.5 | 68.0 | 60.0 | 56.1 | 51.5 | 42.5 | 37.6 |
| 52 | – | – | 82.5 | 81.0 | 72.0 | 56.5 | 62.0 | 53.2 | 50.3 | 47.3 | 39.4 | 36.0 |
| 59 | – | – | – | 68.0 | 65.0 | 49.6 | 56.0 | 46.7 | 44.5 | 42.8 | 36.1 | 33.3 |
| 65 | – | – | – | 59.1 | 59.8 | 44.6 | 51.4 | 42.3 | 40.5 | 39.1 | 33.7 | 30.8 |
| 72 | – | – | – | – | 51.8 | 39.8 | 47.0 | 38.0 | 36.4 | 35.5 | 31.1 | 28.0 |
| 79 | – | – | – | – | 44.5 | 35.8 | 43.3 | 34.0 | 32.9 | 32.2 | 29.0 | 25.7 |
| 85 | – | – | – | – | 39.4 | 32.7 | 40.6 | 31.2 | 30.1 | 29.6 | 27.2 | 23.6 |
| 92 | – | – | – | – | – | 29.7 | 36.7 | 28.1 | 27.2 | 27.0 | 25.3 | 21.5 |
| 98 | – | – | – | – | – | 27.7 | 33.1 | 25.9 | 25.2 | 25.0 | 23.9 | 20.1 |
| 105 | – | – | – | – | – | – | – | 23.5 | 22.9 | 22.9 | 22.2 | 18.2 |
| 111 | – | – | – | – | – | – | – | 21.9 | 21.3 | 21.3 | 20.8 | 17.0 |
| 118 | – | – | – | – | – | – | – | – | 19.4 | 19.4 | 19.4 | 15.6 |
| 124 | – | – | – | – | – | – | – | – | 18.0 | 18.2 | 18.0 | 14.6 |
| 131 | – | – | – | – | – | – | – | – | 16.1 | 16.8 | 16.7 | 13.4 |
| 138 | – | – | – | – | – | – | – | – | – | 15.3 | 15.3 | 12.5 |
| 144 | – | – | – | – | – | – | – | – | – | 14.3 | 14.3 | 11.7 |
| 151 | – | – | – | – | – | – | – | – | – | – | 13.4 | 10.7 |
| 157 | – | – | – | – | – | – | – | – | – | – | 12.6 | 9.9 |
| 164 | – | – | – | – | – | – | – | – | – | – | 11.4 | 9.2 |
| 170 | – | – | – | – | – | – | – | – | – | – | – | 8.4 |
| 177 | – | – | – | – | – | – | – | – | – | – | – | 7.5 |

Boom extension sequence in %

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tele 1 | 0 | 0 | 23 | 45 | 45 | 90 | 45 | 90 | 90 | 90 | 90 | 100 |
| Tele 2 | 0 | 0 | 23 | 45 | 45 | 90 | 45 | 90 | 90 | 90 | 90 | 100 |
| Tele 3 | 0 | 0 | 0 | 0 | 45 | 0 | 45 | 45 | 90 | 90 | 90 | 100 |
| Tele 4 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 45 | 90 | 100 |

**Remarks**

** special equipment required

1) only 0° over rear

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JOB

SHEET NO. 9 OF 11

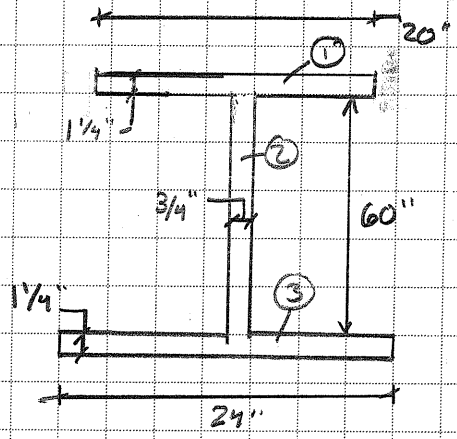
CALCULATED BY DATE

CHECKED BY DATE

SCALE

# CRANE MAT CALCS FOR GIRDER PICK-UPS

## CROSS-SECTION 1




AREA

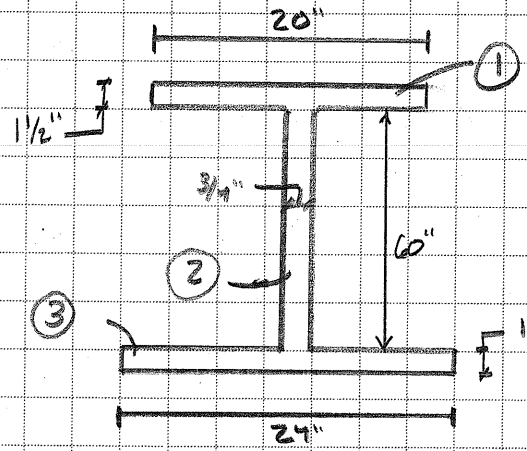
1). (1¼")(20") +
2). (3/4")(60") +
3). (1¼")(24")
Σ 100 in²

DENSITY OF STL:
.284 lb/in³

DEAD LOAD:
= 100 in² · .284 lb/in³
= 28.40 lb·in
= 340.80 plf

FACTOR LOAD UP BY 10% = 375 plf

## CROSS SECTION 2




AREA

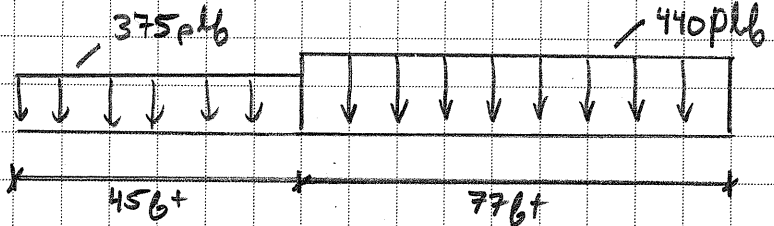
1). (20")(1½")
2). (60")(3/4")
3). (24")(1¾")
Σ 117 in²

DENSITY OF STL
.284 lb/in³

DEAD LOAD:
= 117 in² · .284 lb/in³
= 33.23 lb·in
= 398.7 plf

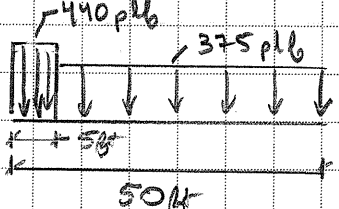
FACTOR LOAD UP BY 10% = 440 plf

## GIRDER A




WEIGHT = 440(77) + 375(45)
= 50,755 lbs

## GIRDER B




WEIGHT = (440)(5) + 375(45)
= 19,075 lbs

BEAMBOY V2.0 REPORT

HL-150T SUPPORT REACTIONS

LOAD CONFIGURATION

Point Loads

6000 lb., x=69.9 ft.
20800 lb., x=62 ft.
8750 lb., x=59.9 ft.
58800 lb., x=0 ft.

Distributed Loads

Start=1020 lb./ft., x=30.8 ft.; End=1020 lb./ft., x=69.9 ft.
Start=63.5 lb./ft., x=0 ft.; End=63.5 lb./ft., x=30.8 ft.

Moments

Supports

Simple support; 30.8 ft., Reaction=134000 lb.
Simple support; 69.9 ft., Reaction=2140 lb.

6/6/2016

BEAMBOY V2.0 REPORT

DEMAG AC180 SUPPORT REACTIONS

LOAD CONFIGURATION

Point Loads

70500 lb., x=78.2 ft.
63600 lb., x=0 ft.

Distributed Loads

Start=1690 lb./ft., x=39 ft.; End=1690 lb./ft., x=78.2 ft.
Start=150 lb./ft., x=0 ft.; End=150 lb./ft., x=39 ft.

Moments

Supports

Simple support; 39 ft., Reaction=169000 lb.
Simple support; 78.2 ft., Reaction=37400 lb.

6/6/2016