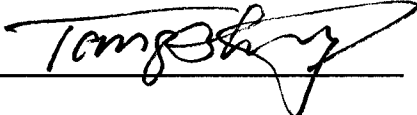


ENGINEERING NOTE
3823.130-EN-545

B LAYER PIXEL MOVER SUPPORT
NORTH A LAYER SIDE
ANALYSIS

DRAWING No. 3823.130-MB-399167

Written by: Tony Levand October 31, 2000

Checked by:  Date 10-31-00



SUBJECT

B LAYER PIVEL SUPPORT - A LAYER SIDE
WORTH

NAME

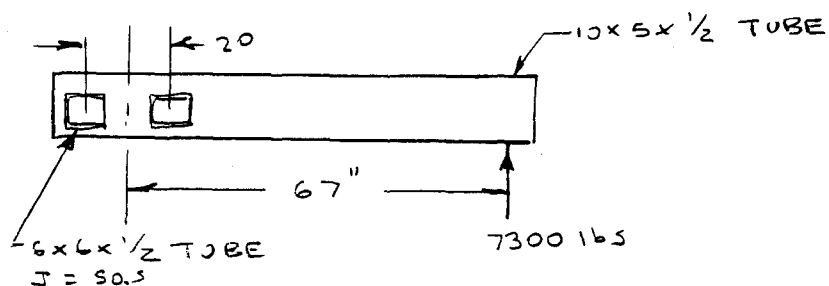
Tony Levand

DATE

10/31/00

REVISION DATE

SUPPORTS REACTS MOMENT OF THE B LAYER PIVEL MOVER.



MATERIAL:

ASTM A-500 TUBE

FTY = 46 KSI

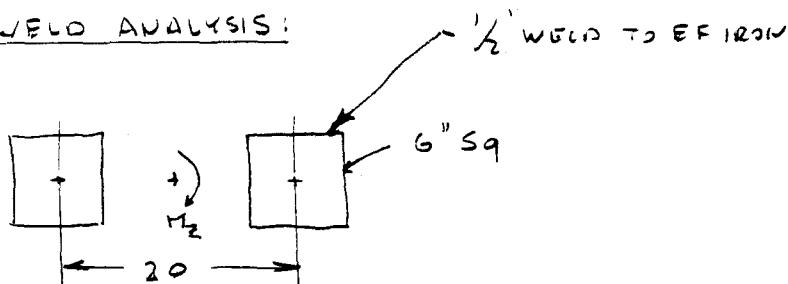
FB: 46x.66 = 30 KSI

$$M_z = 7300 \times 68 = 496 \text{ KIP-IN}$$

$$M_y = 7300 \times 6.45 = 47 \text{ KIP-IN}$$

$$f_b = \frac{496}{31.6} = 15.7 \text{ KSI} < 30 \text{ KSI}$$

WELD ANALYSIS:



$$A = 6 \times 8 \times \frac{.5}{\sqrt{2}} = 17 \text{ in}^2 \rightarrow f_{s_y} = \frac{7300}{17} = 429 \text{ PSI}$$

$$I = \frac{50.5 \times 2}{\sqrt{2}} = 71 \text{ in}^4 \rightarrow f_{s_x} = \frac{47}{16.8 \times 2} \sqrt{2} = 2 \text{ KSI}$$

$$J = \left[20.9 + 10.4 \times 10^2 \right] \frac{2}{\sqrt{2}} = 1500 \text{ in}^4 \rightarrow f_{s_z} = \frac{496}{1500} \times 13 = 4.2 \text{ KSI}$$

$$f_s = .429 + 2 + 4.2 = 6.7 \text{ KSI}$$



SUBJECT

B LAYER PIXEL SUPPORT - FLAYER SIDE
NORTH

NAME

Tony Lejand

DATE

10/31/02

REVISION DATE

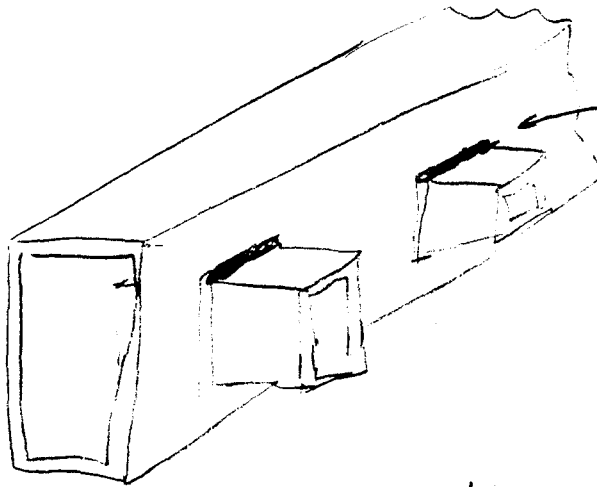
Deflection:

$$\delta = \frac{PL^3}{3EI} = \frac{7300 \times 67^3}{3 \times 30 \times 10^6 \times 158} = .154 \text{ in}$$

$$\theta = \frac{TL}{JG} = \frac{489 \times 10^3 \times 3.95}{1507 \times 11.4 \times 10^6} = 113 \times 10^{-6} \text{ Rad}$$

$$\delta = .154 + 113 \times 10^{-6} \times 67 = .161 \text{ in}$$

FEA:

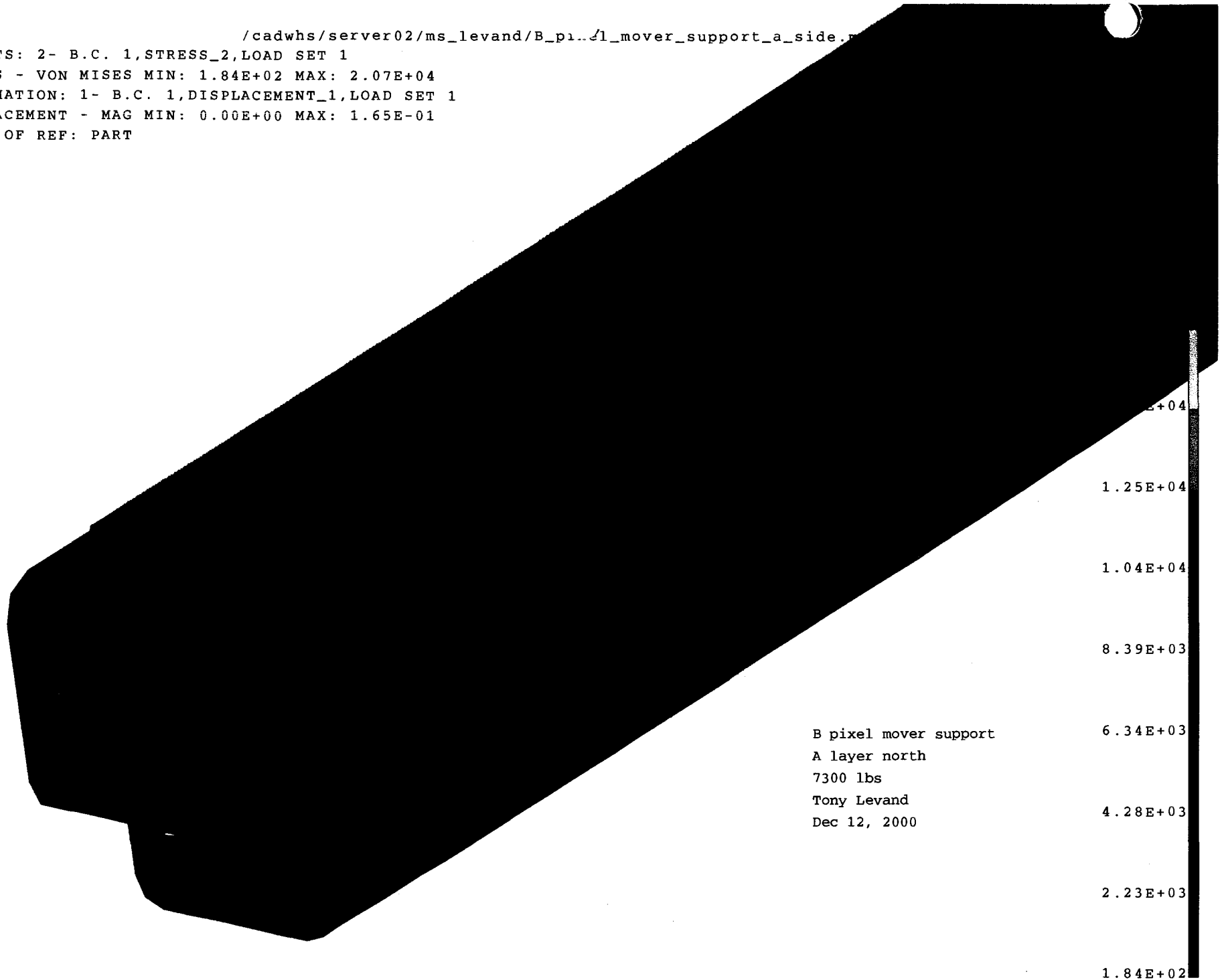


Square holes
cut thru beam
and standards
welded all around
on outside and
only on dip on
inside

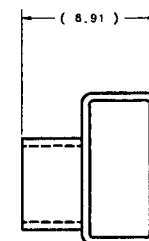
$$\sigma_{\text{Max}} = 22 \text{ ksi}$$


/cadwhs/server02/ms_levand/B_pixel_mover_support_a_side.p

RESULTS: 2- B.C. 1, STRESS_2, LOAD SET 1
STRESS - VON MISES MIN: 1.84E+02 MAX: 2.07E+04
DEFORMATION: 1- B.C. 1, DISPLACEMENT_1, LOAD SET 1
DISPLACEMENT - MAG MIN: 0.00E+00 MAX: 1.65E-01
FRAME OF REF: PART



B pixel mover support
A layer north
7300 lbs
Tony Levand
Dec 12, 2000



2	COML	8 X 6 X 5 WALL X 3.91 LG ASTM-A-500 STEEL TUBE	2
1	COML	10 X 5 X 5 WALL X B2 LONG ASTM-A-500 STEEL TUBE	1
ITEM NO.	PART NO.	DESCRIPTION OR SIZE	QTY. REQ.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED:		ORIGINATOR	TONY LEVAND
MATERIAL		TONY LEVAND	10/31/2000
SIZE		TONY LEVAND	10/31/2000
FINISH		TONY LEVAND	10/31/2000
1. BROWN ALK. PHOSP. SERIES		APPROVED	TONY LEVAND
2. DIMENSIONS IN INCHES		DATE	10/31/2000
3. ALL DIMENSIONS ARE IN INCHES.		MATERIAL	
✓ USE ALL SPECIFIED DIMENSIONS		STEEL - SEE PARTS LIST	
 FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY			
PPD/MECHANICAL SUPPORT B LAYER PIXEL MOVER SUPPORT NORTH A LAYER SIDE			
SCALE	DRAWING NUMBER	SHEET NO.	REV.
.25	3823.130-MB-399167	1 OF 1	