Pg #9

LIFTING DEVICE

DEVICE NAME: TGT. GALLERIES / LIFT'G FIXT. ASSY

ENGINEERING NOTE NUMBER: 76

DRAWING NUMBER: 9210.300-ME-201832 & ME-201829

APPLICABLE STANDARD: BELOW THE HOOK LIFT'G DEVICES ANSI / ASME B30.20 - 1985 MANUAL OF STEEL CONSTRUCTION AISC 9 ed

RATED LOAD: 15 TON

TEST LOAD: 18.75 TON

TEST LOAD PERCENT: 125%

LAST LOAD TEST DATE: SEE Pg #10

COLOR: YELLOW

STRESS CALCULATIONS:

Done by: E. M. Villegas

Date: 7/8/93

Reviewed by: [signature]

Date: 7/27/93

REMARKS:

IDENTIFICATION:

Engineering Note Number & Rated Load Must be Clearly Marked On a Conspicuous Surface.

FERMILAB
ENGINEERING NOTE

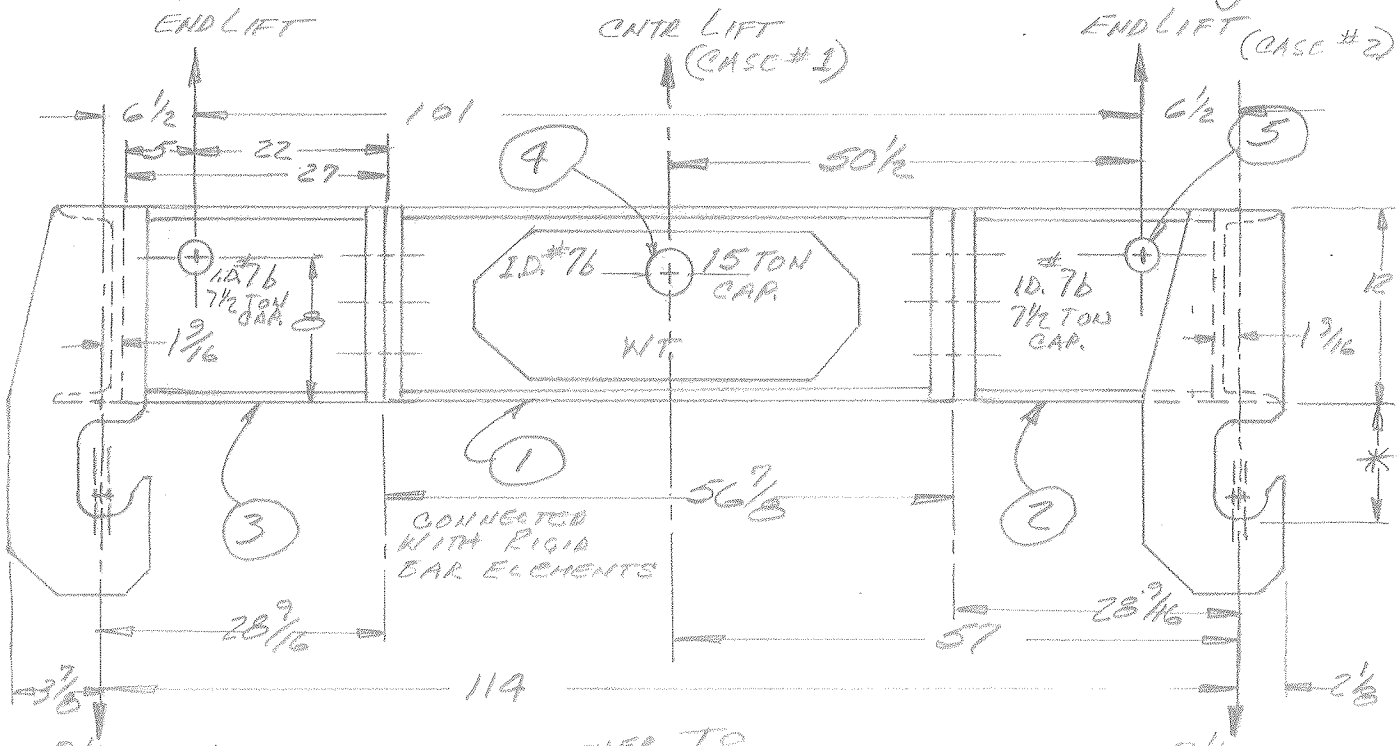
SECTION	PROJECT	SERIAL-CATEGORY	PAGE
			10

SUBJECT: LIFTING FIXT. ASSY. ME-201832 & ME-201829 EQUIPMENT HANDLING, LIFTING DEVICES RD/MSD

NAME: E.M. Villegas

DATE: 1/12/23

REVISION DATE:



GRANDFATHER TO

TESTED @ MAS 12/22/93

TESTED @ MAS 1/4/94

TESTED @ MAS 12/23/93

ASSY. # ME-201832

12 1/4" INSIDE HOOKS

* 7 1/4" BOTTOM OF FIXT. TO PICK POINT ON HOOK

1" HOOK THICKNESS (USED 3/4" FOR MDL.)

1) CENTER FRAME — ME-201818
2) RT. END — ME-201837
3) LFT END — ME-201833
4) CENTER PIN, 2 7/8 ϕ — ME-201821
5) END PINS, 2" ϕ — ME-201822

ASSY. # ME-201829

9 1/4 INSIDE HOOKS

* 9 3/4 BOTTOM OF FIXT. TO PICK POINT ON HOOK

3/4" HOOK THICKNESS

1) CENTER FRAME — ME-201818
2) RT END — ME-201831
3) LFT END — ME-201830
4) CENTER PIN, 2 7/8 ϕ — ME-201821
5) END PINS, 2" ϕ — ME-201822

SDRC I-DEAS VI.i(s): FE_Modeling_&_Analysis 06-JUL-93 16:08:12
./engrg_notes/tgt_galleries

Group ID : CNTR_EL #HE-201818
Analysis Dataset : 2 - CASE 1,LOAD 1,STRESSES
Report Type : Contour Units : IN
Dataset Type : Stress Load Set : 1
Frame of Reference: Global Data Component: Von Mises
Surface Type : Bottom

	Max Prin	Mid Prin	Min Prin	Max Shear	Von Mises	ALLOWED
	477	375	642	477	898	
Maximum	1.065E+04	3.382E+03	3.207E+03	5.158E+03	1.033E+04	12×10^3 psi
	629	49	312	149	149	
Minimum	-3.162E+03	-2.417E+03	-1.052E+04	1.922E+00	3.374E+00	
Average	2.525E+03	3.285E+00	-2.247E+03	2.386E+03	4.805E+03	

LIFTING FIXT. ASSY #HE-201832

CENTER LIFT, 15 TON ON END HOOKS

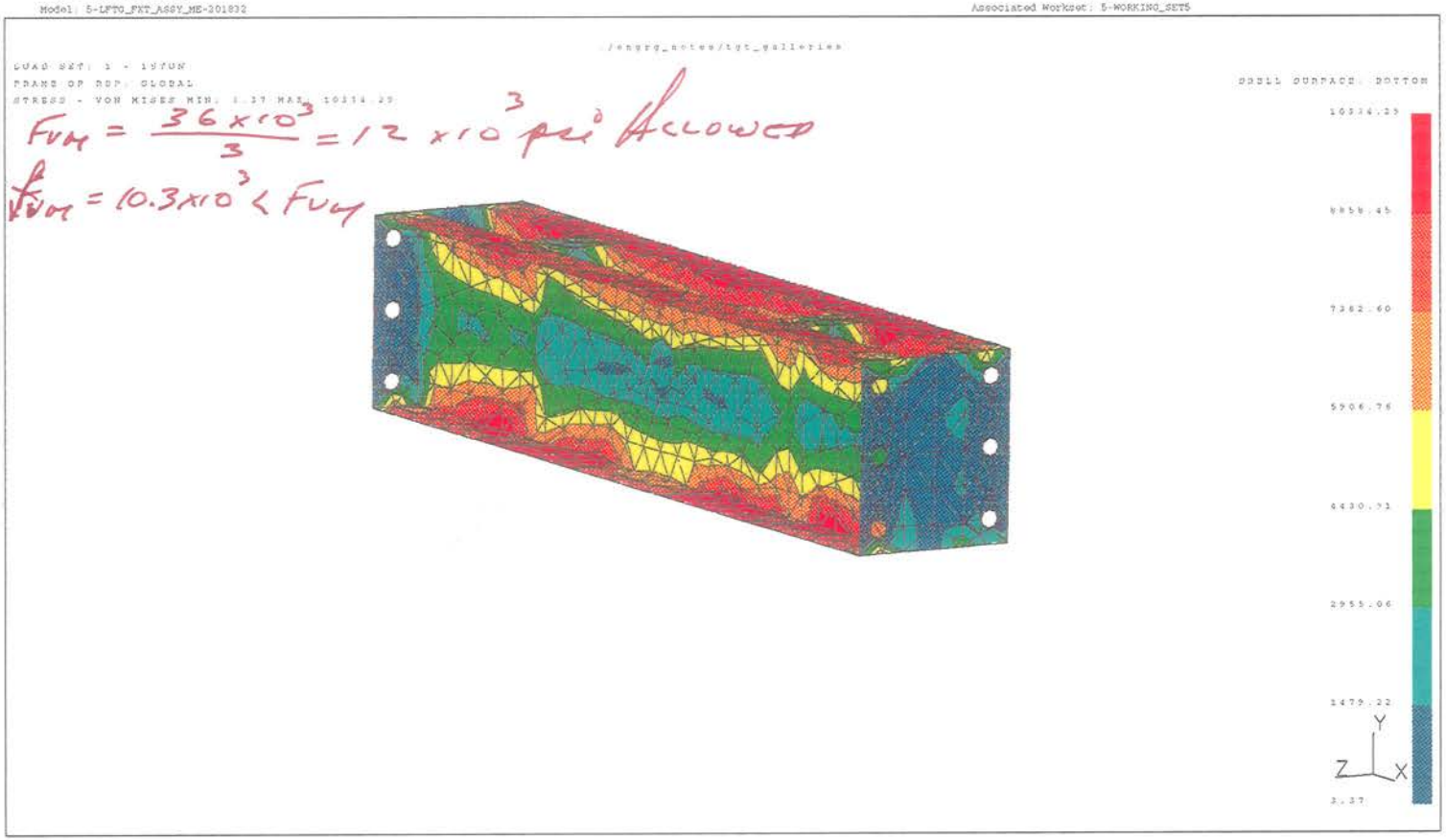
GRANDFATHER TO HE-201829

LIFTING FIXT. ASSY # ME-201832
GRANDFATHER TO ME-201829
CENTER LIFT, 15 TON ON END HOOKS
CENTER FRAME # ME-201818

SDRC I-DEAS VI.i(s): FE_Modeling_&_Analysis 06-JUL-93 15:42:31

Database: /engrg_notes/tgt_galleries
View : No stored View
Task: Post Processing
Model: 5-LFTG_FXT_ASSY_ME-201832

Units : IN
Display : No stored Option
Model Bin: 1-MAIN
Associated Workset: 5-WORKING_SET5



$F_{VM} = \frac{36 \times 10^3}{3} = 12 \times 10^3$ psi ALLOWED

$f_{VM} = 10.3 \times 10^3 < F_{VM}$

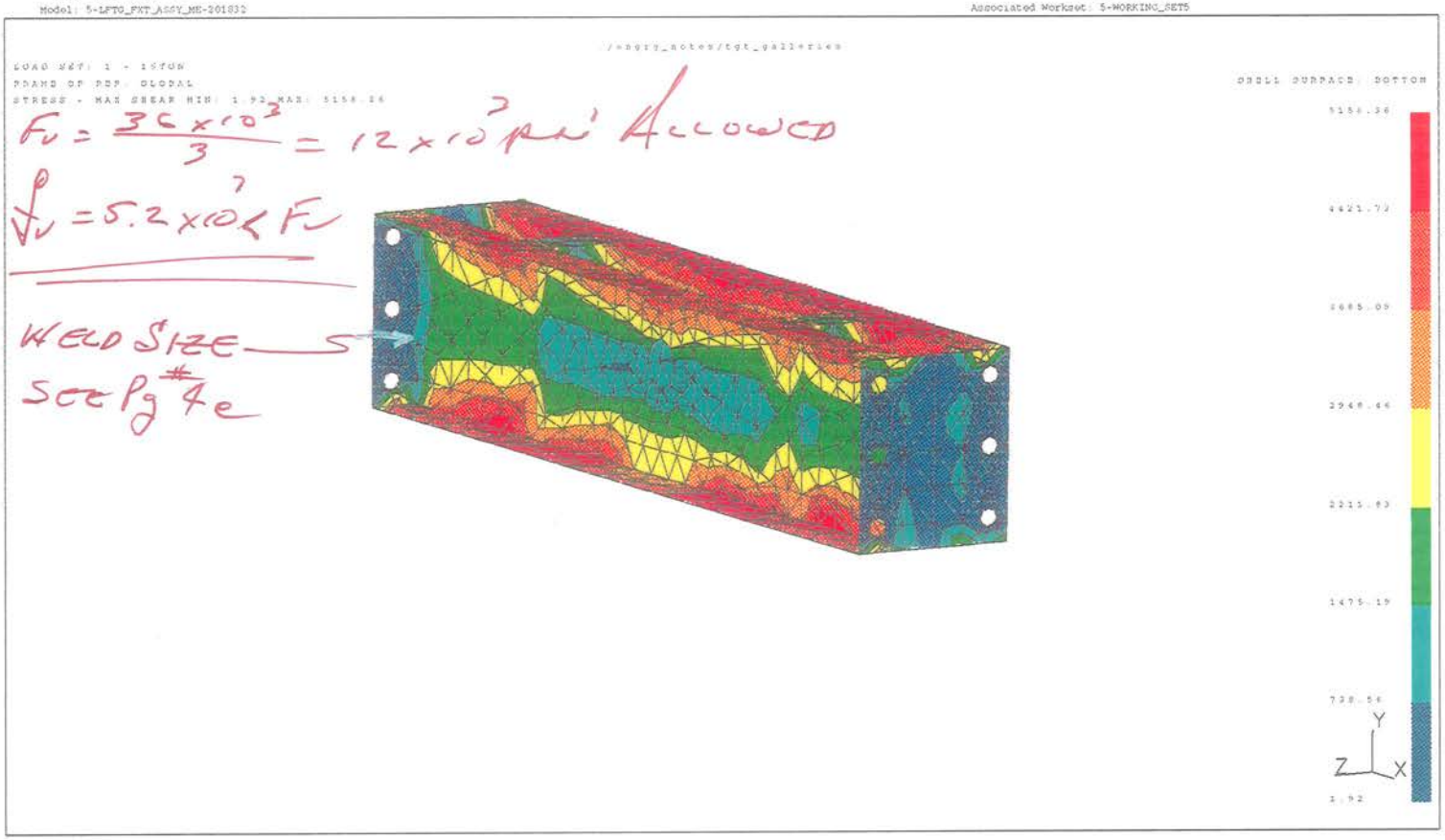
#106

LIFTING FIXT. ASSY # ME-201832
GRANDFATER TO ME-201829
CENTER LIFT, 15 TON ON END HOOKS
CENTER FRAME # ME-201818

SDRC I-DEAS VI.i(s): FE_Modeling_&_Analysis 06-JUL-93 15:44:47

Database: /engrg_notes/tgt_galleries
View : No stored View
Task: Post Processing
Model: 5-LFTG_FXT_ASSY_ME-201832

Units : IN
Display : No stored Option
Model Bin: 1-MAIN
Associated Workset: 5-WORKING_SET5



$F_v = \frac{36 \times 10^3}{3} = 12 \times 10^3$ PSI ALLOWED

$f_v = 5.2 \times 10^7 < F_v$

WELD SIZE — 5
SEE Pg # 4e

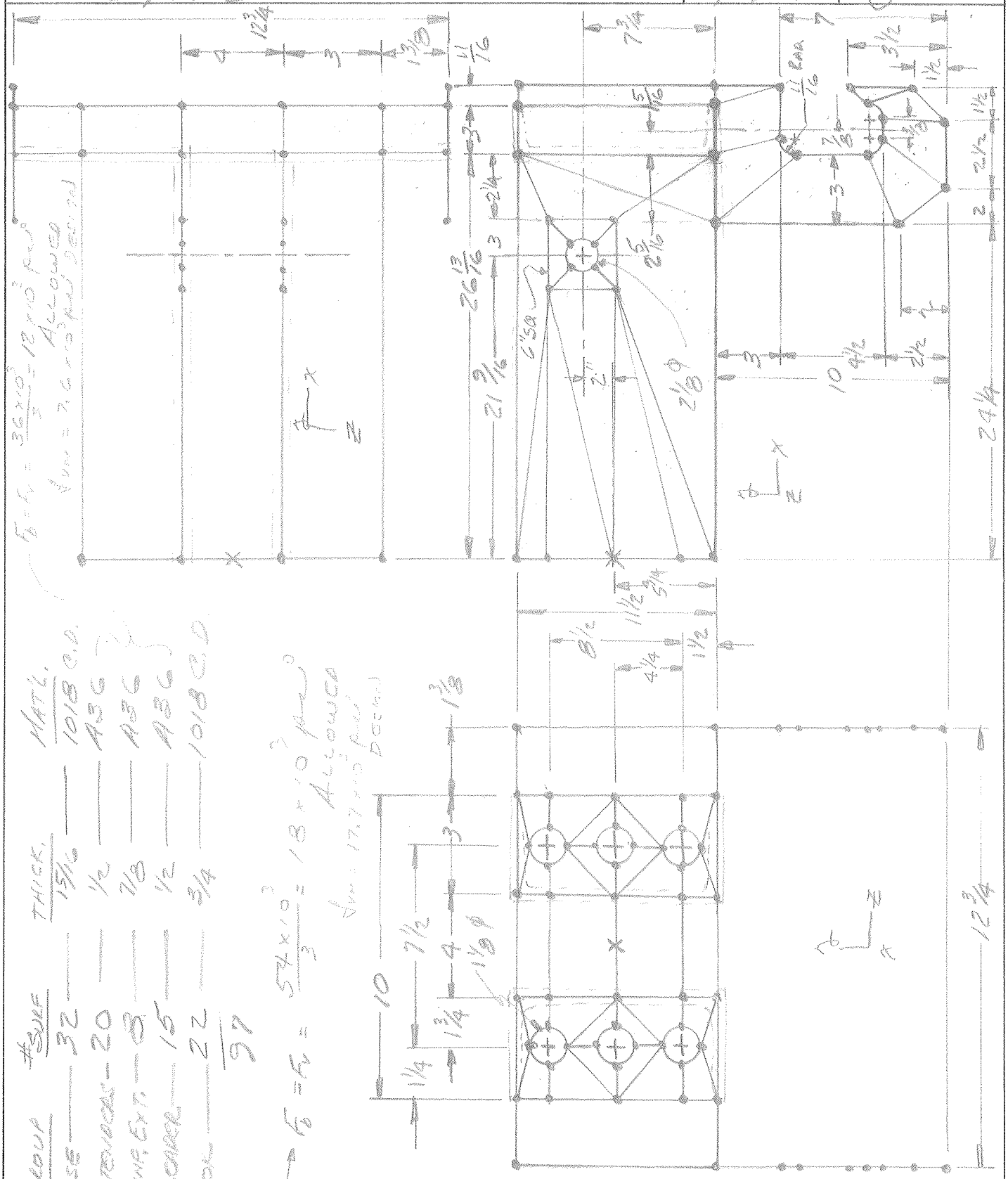
Pg # 10e

FERMILAB
ENGINEERING NOTE

SECTION	PROJECT	SERIAL-CATEGORY	PAGE
			11

SUBJECT: RT. END, MDL, ME-201837
EQUIP. HANDLING, LIFTING DEVICES
RD/M3D

NAME: E M Villegas
DATE: 1/12/93
REVISION DATE:



SDRC I-DEAS VI.i(s): FE_Modeling_&_Analysis 06-JUL-93 16:08:48
./engrg_notes/tgt_galleries

Group ID : LFT_END_EL #ME-201838
Analysis Dataset : 2 - CASE 1,LOAD 1,STRESSES
Report Type : Contour Units : IN
Dataset Type : Stress Load Set : 1
Frame of Reference: Global Data Component: Von Mises
Surface Type : Bottom

	Max Prin	Mid Prin	Min Prin	Max Shear	Von Mises	ALLOWED HOOKS ONLY
	1774	1838	1774	2148	2148	
Maximum	1.871E+04	2.306E+03	5.319E+03	8.678E+03	1.768E+04	18×10^3 psi
	1704	1694	1921	1816	1816	
Minimum	-2.246E+03	-1.494E+03	-7.029E+03	6.858E+00	1.856E+01	
Average	1.667E+03	-2.744E-01	-1.009E+03	1.338E+03	2.645E+03	

LIFTING FIXT. ASSY #ME-201832

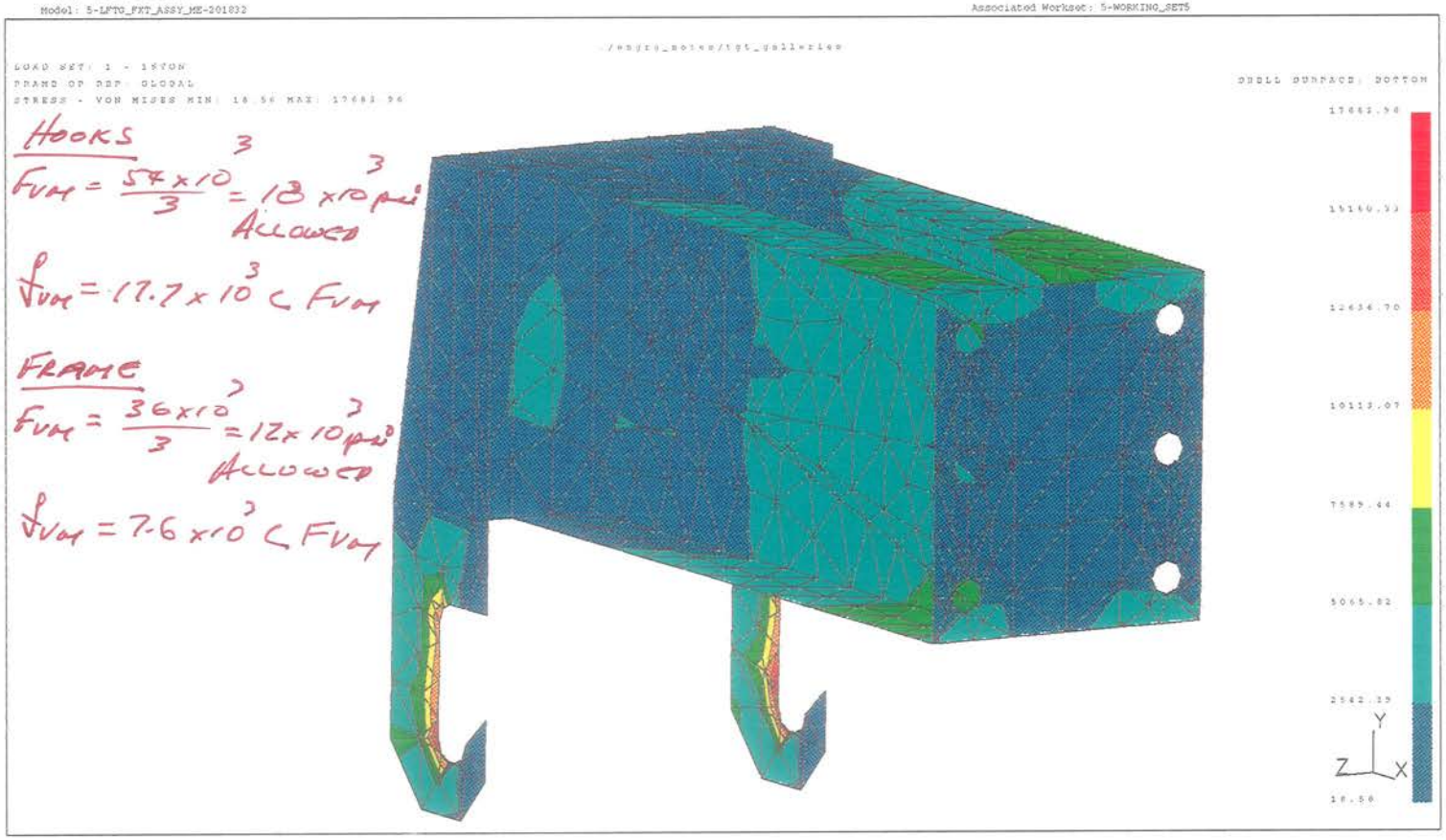
CENTER LIFT, 15 TON ON END HOOKS

LIFTING FIXT. ASSY # ME-201832
GRANDFATHER TO ME-201829
CENTER LIFT, 15 TON ON END HOOKS
LEFT END # ME-201833

SDRC I-DEAS VI.1(s): FE_Modeling_&_Analysis 06-JUL-93 15:52:39

Database: /engrg_notes/tgt_galleries
View : No stored View
Task: Post Processing
Model: 5-LFTG_FXT_ASSY_ME-201832

Units : IN
Display : No stored Option
Model Bin: 1-MAIN
Associated Workset: 5-WORKING_SET5



HOOKS

$F_{VM} = \frac{57 \times 10^3}{3} = 18 \times 10^3$ psi ALLOWED

$f_{VM} = 17.7 \times 10^3 < F_{VM}$

FRAME

$F_{VM} = \frac{36 \times 10^3}{3} = 12 \times 10^3$ psi ALLOWED

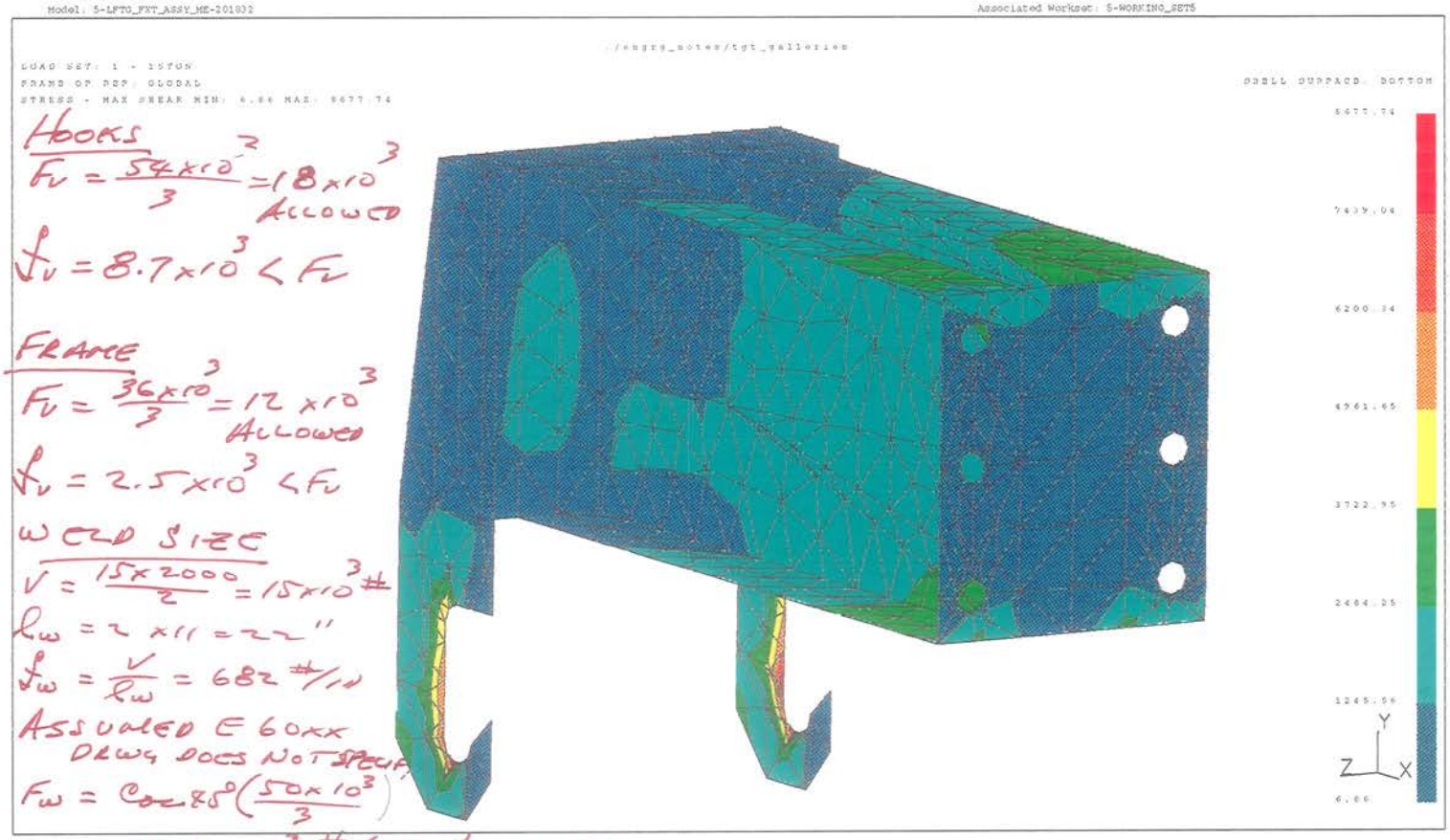
$f_{VM} = 7.6 \times 10^3 < F_{VM}$

LIFTING FIXT. ASSY # ME-201832
GRANDFATHER TO ME-201829
CENTER LIFT, 15 TON ON END HOOKS
LEFT END # ME-201833

SDRC I-DEAS V1.i(s): FE_Modeling_&_Analysis 06-JUL-93 15:54:11

Database: /engrg_notes/tgt_galleries
View : No stored View
Task: Post Processing
Model: 5-LFTG_FXT_ASSY_ME-201832

Units : IN
Display : No stored Option
Model Bin: 1-MAIN
Associated Workset: 5-WORKING_SET5



HOOKS

$F_v = \frac{54 \times 10^2}{3} = 18 \times 10^3$ ALLOWED

$f_v = 8.7 \times 10^3 < F_v$

FRAME

$F_v = \frac{36 \times 10^3}{3} = 12 \times 10^3$ ALLOWED

$f_v = 2.5 \times 10^3 < F_v$

WELD SIZE

$V = \frac{15 \times 2000}{2} = 15 \times 10^3$ #

$l_w = 2 \times 11 = 22''$

$f_w = \frac{V}{l_w} = 682$ #/IN

ASSUMED E 60XX
DRWG DOES NOT SPECIFY

$F_w = \cos 45^\circ \left(\frac{50 \times 10^3}{3}\right)$

$= 11.8 \times 10^3$ #/IN ALLOWED

$w = \frac{f_w}{F_w} = .058''$ FILLET LEG SIZE REQ'D.

DRWG CALLS FOR 1/4 FILLET

Pg # 11c