On File
13th Floor of
High-Rise

## LIFTING DEVICE

DEVICE NAME: Spreader Bar for Lifting Muon Upgrade Chambers

ENGINEERING NOTE NUMBER: ~~MM~~ 52

APPLICABLE STANDARD: ANSI/ASME B30.20 -1985

RATED LOAD: 200 lb

TEST LOAD: 250 lb

TEST LOAD PERCENT: 125%

LAST LOAD TEST DATE: 10/2/90

COLOR: Yellow

STRESS CALCULATIONS:

Done by: Matthew R. Packheiser

Date: 10/4/90

Reviewed by: John Grimson

Date: 10/4/90

REMARKS:

IDENTIFICATION:

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

Exhibit A-1

# Below-the-Hook Lifting Device
# Engineering Note

Prepared By MATTHEW R. PACKHEISER Date 10/4/90 Div/Sect RD-CDF
Reviewed By John H. Grimson Date 10/4/90 Div/Sect RD-CDF
Div/Dept Head By R Kephart Date 10/4/90 Div/Sect RD-CDF

I. Identification and Verification of Compliance

Fill in the Fermilab Engineering Conformance Label Information below;
This below-the-hook lifting device conforms to Engineering Standard ????
Lifting Device Title Spreader bar for lifting muon upgrade chambers
Lifting Device Drawing Number DRAWING ATTACHED
Rated Maximium Load 200 pounds
Designer/Manufacturer UNKNOWN
Date Manufactured UNKNOWN
Proof Test Load 250 pounds Date 10/2/90 TESTOR: Darrin Alley
Director's signature (or designee) if lifting device requires an exception to the provisions of this standard. — WITNESS: Brett E Wyo

II. Description of the Lifting Device
Laboratory location code CDF
Laboratory property number —
Is a testing procedure necessary for the safe proof testing of this lifting device? No
If yes, supply the written procedure with this Engineering Note.
Is an operating procedure necessary for safe operation of this lifting device? No
If yes, supply the written procedure with this Engineering Note.
Welding Information
Has the lifting device been fabricated in a Fermilab Shop? YES
If yes, append a copy of the welding shop statement of welder qualifications. WELDER UNKNOWN

| Amendment No.: | Reviewed By: | Date: |
|---|---|---|
| | | |
| | | |
| | | |

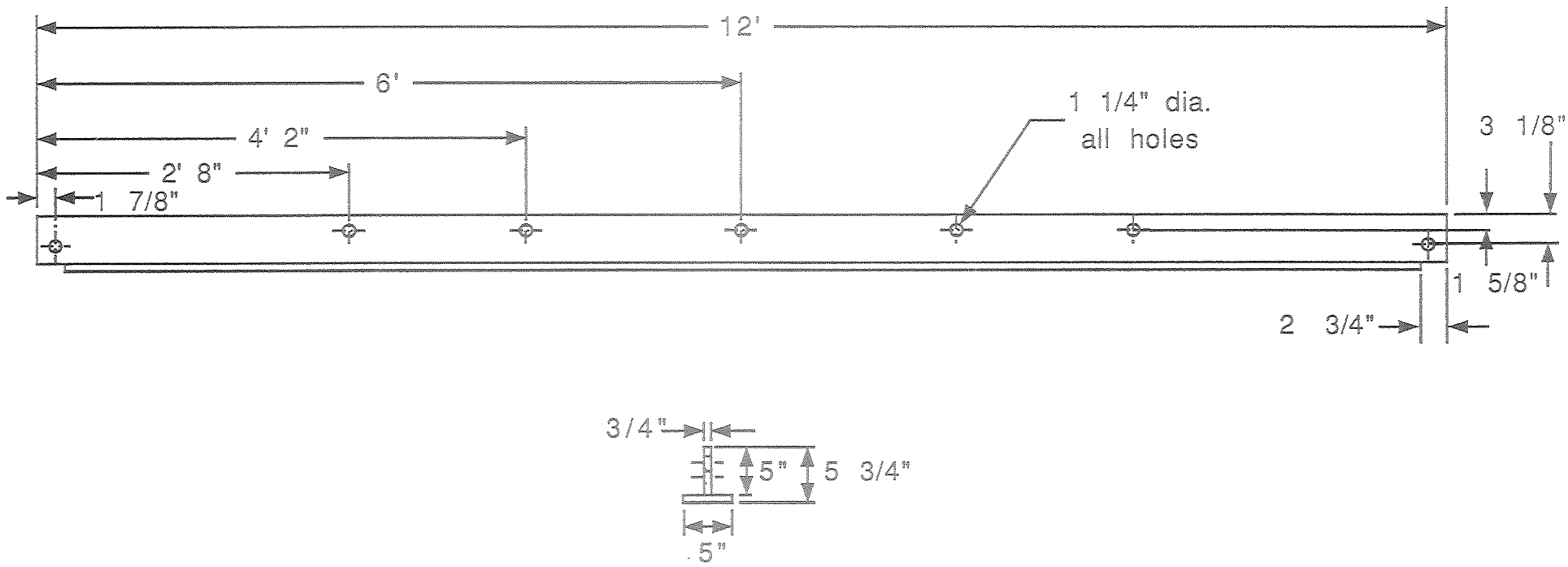
# Steel Spreader Bar

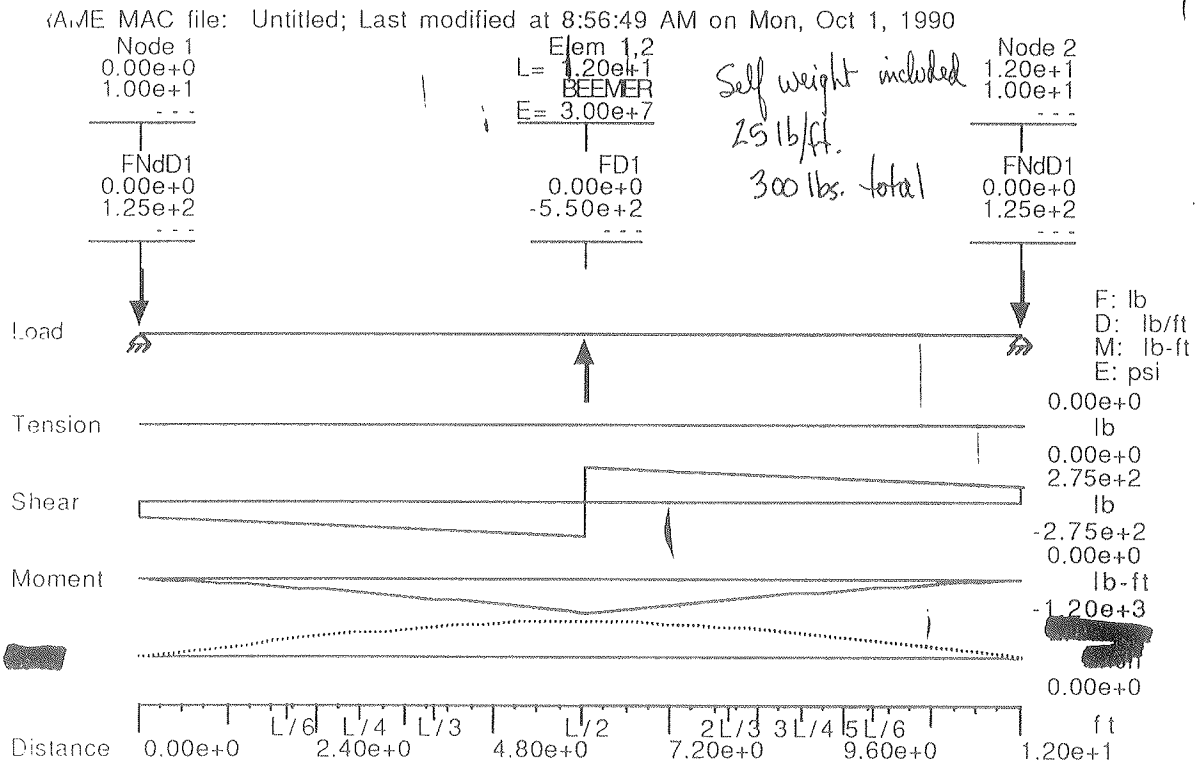
Wt. = 300 lbs.

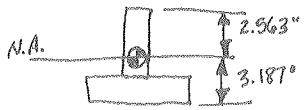
Yield stress = 36000 psi

Allowable stress = 21600 psi

(From section F1.3 of the AISC Manual of Steel Construction, Ninth Edition)

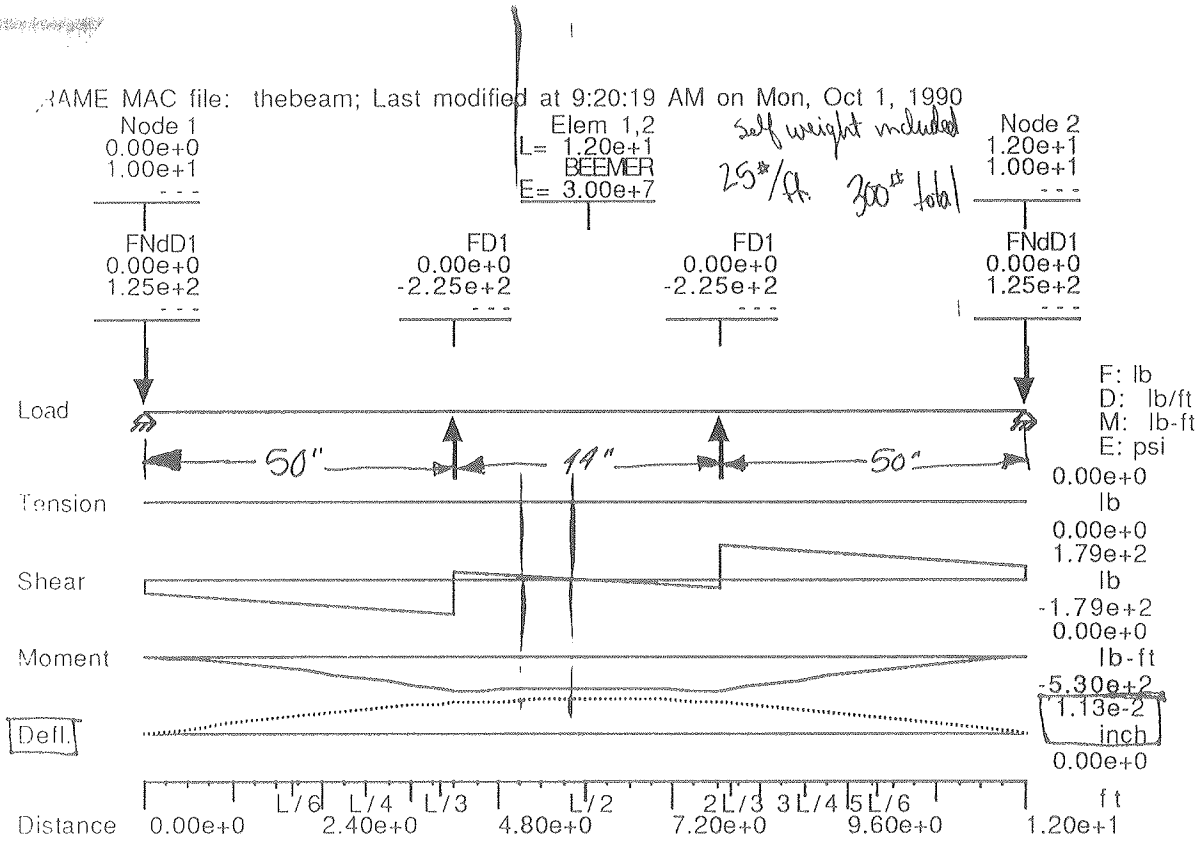




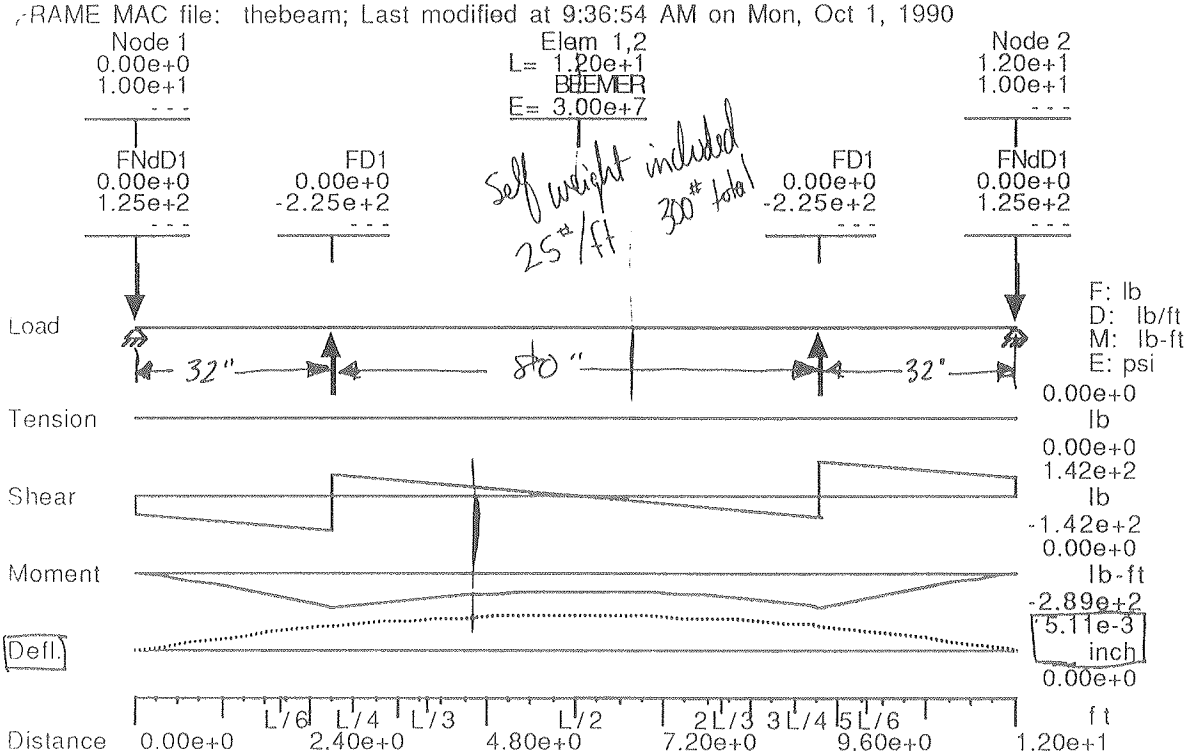

$I = 37.66 \text{ in}^4$

$$\sigma_{max} = \frac{Mc}{I} = \frac{(1200 \text{ ft.lbs})\left(\frac{12 \text{ in.}}{1 \text{ ft.}}\right)(3.187")}{(37.66 \text{ in}^4)} = 1218.6 \text{ psi}$$



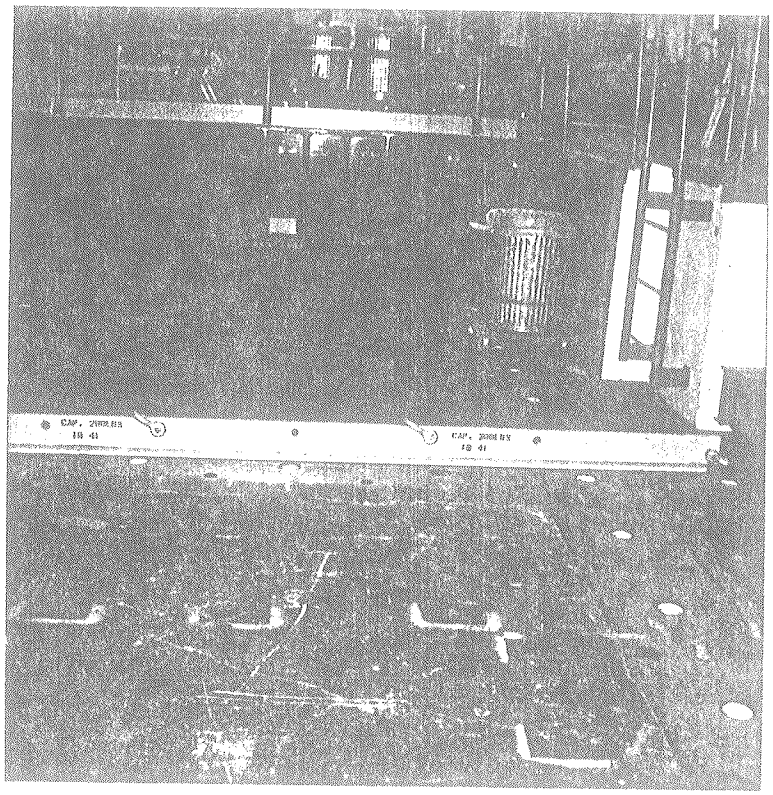

$$\sigma_{max} = \frac{M_{max}}{I} = \frac{(530 \text{ ft lbs})\left(\frac{12 \text{ in.}}{1 \text{ ft}}\right)(3.187")}{37.66 \text{ in}^4} = 538.2 \text{ psi}$$

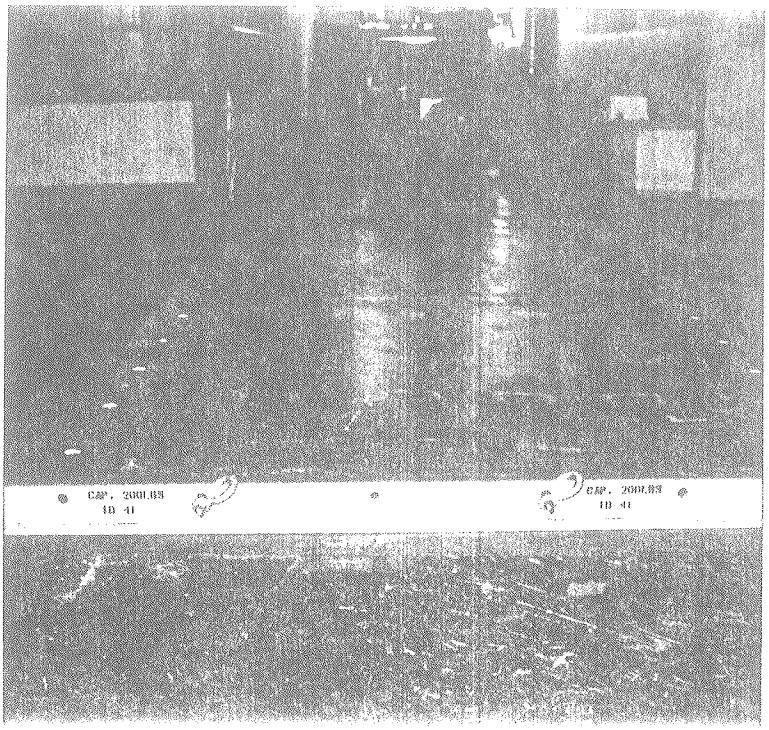
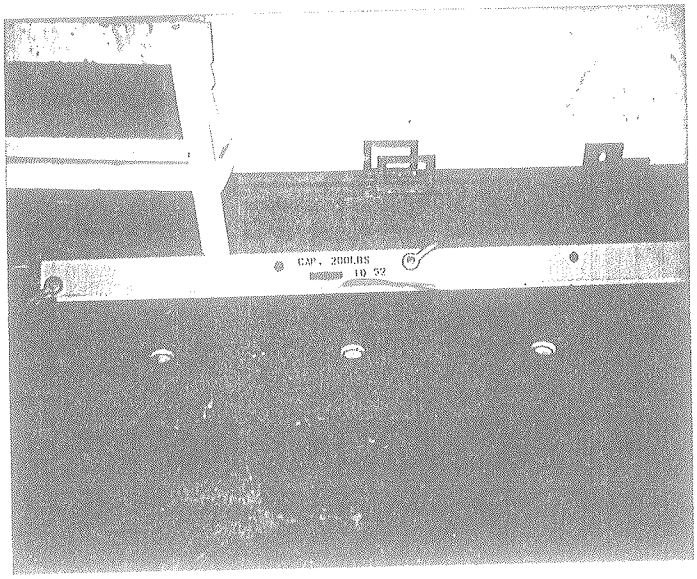
FRAME MAC file: thebeam; Last modified at 9:36:54 AM on Mon, Oct 1, 1990




$$\sigma_{max} = \frac{Mc}{I} = \frac{(289\ ft\text{-}lb)\left(\frac{12''}{1\ ft}\right)(3.187'')}{37.66\ in^4} = 293.5\ psi$$

| DATE | REVISION DATE |
| --- | --- |
| 8/26/92 | |






11/11/92