MAXIMUM REACH ENTERPRISES
1853 Wellington Court
Henderson, NV 89014
Ph: 702 547 1564
kent.goodman @ cox.net
www.maximumreach.com

07 June 2012

THE MILLSTONE II
STEAM GENERATOR REPLACEMENT PROJECT
WATERFORD, CONNECTICUT

Millstone Nuclear Power Station

DESIGN OF WORK PLATFORMS FOR THE STEAM DRUMS

COMMENTS ON THE CALCULATIONS:

1. Work platforms were required for the steam drums during the time they were upside down in their temporary stands in containment while the workmen were replacing the tubes.
2. The 6 sheet check list is not included.
3. Presentation page 3 shows calculation sheet 16 which is a drawing of the work platforms around and between the two steam drums. It is shown as page 3 so the reader will get an upfront feel for the work platform configuration.
4. Presentation page 4 shows the calculation cover & signature sheet for the calculations.
5. Presentation page 5 shows 1 of 23 sheets of the actual calculations of the work platform.
6. These design calculations were listed as SC-0036 on our design calculation log.
7. Design references such as the AISC manual have not been included. If anyone wants to have any of the formulas explained, just let me know.

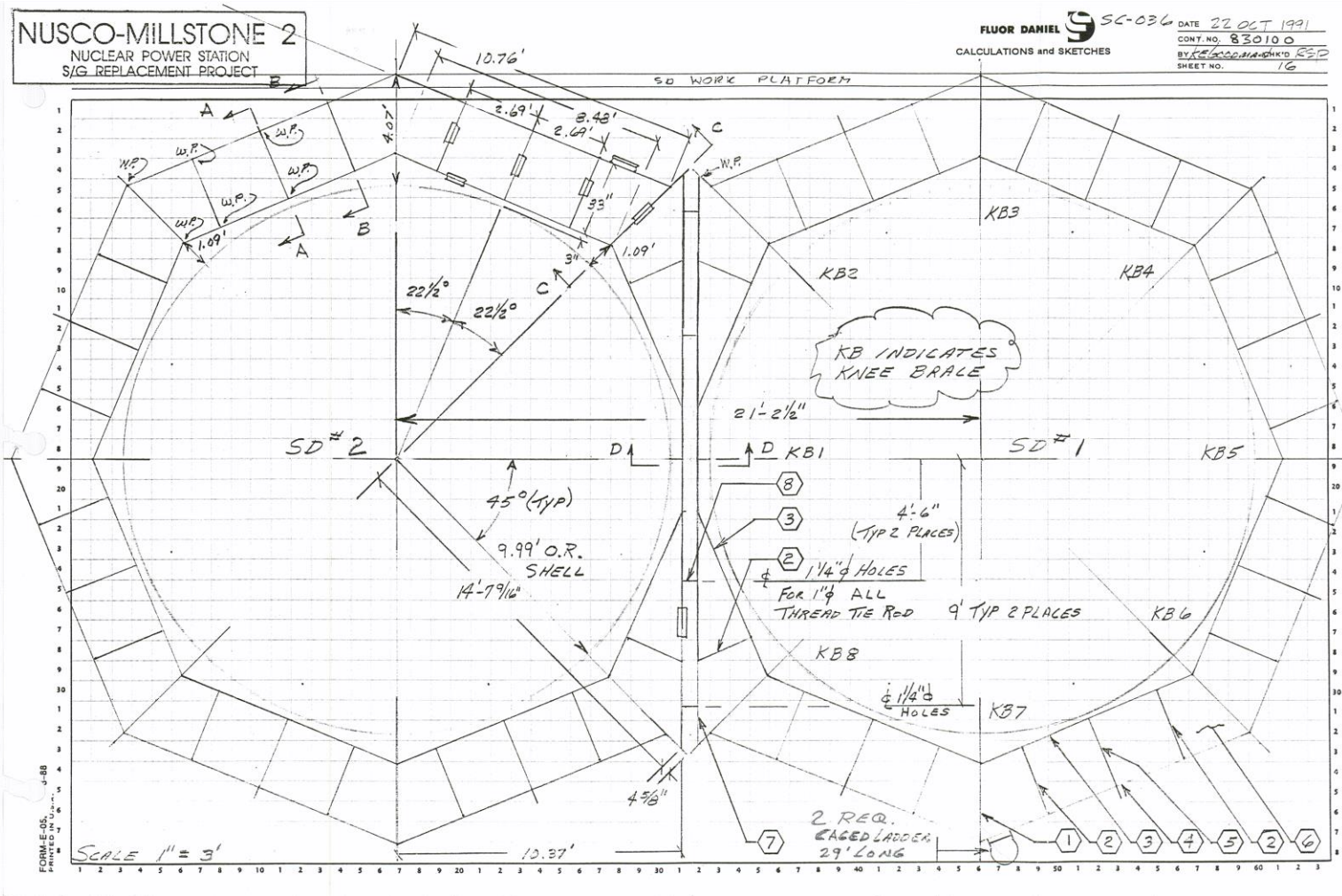
8. After sending out the "Scaffold Bracket Design", Mick Podolski commented that my use of wire rope for the hand rails would not be acceptable in Australia. He pointed out that hard pipe must be used that will withstand a lateral force of 121 lbs., plus toe or kick boards must be used. His comments show that the local codes are different for each country and are continually being updated. A designer must check to see if his design meets local codes.

   You will note that this design called for 3/8" wire rope for the hand rails. This was a 1991 design and the code probably calls for hard pipe now.
9. The instructions for the fabricator included the following notes:
   a. Assemble the two work platforms at the shop just as they would be used in the field, including the connection steel between them
   b. Dis-assemble and package them as Steam Drum 1 and Steam Drum 2 for shipping to the site
   c. Package and send the temporary support steel used in the assembly of the work platforms in 9a above
10. As soon as the fuel pool covers were installed in containment, the work platform steel for steam drum 1 was brought in and assembled on a corner of it using the temporary support steel. As soon as steam drum 1 was placed in its stand in the inverted position, the work platform was picked off the fuel pool covers and installed down around it. The process was repeated for the work platform for steam drum 2. The connecting steel between the work platforms was then installed.
11. Note on sheet 16 that two caged ladders were called for. In retrospect, we should have called for four, two for workmen going up to the work platform and two for going down. This would have eliminated any delays in workmen going up or down and the possibility of workmen going down stepping on someone going up.
12. The elevation of the top of the decking on the work platform relative to the bottom of the cone on the steam drum was set by the Superintendent's in charge of replacing the tubes. See the vertical 4.25" on sheet 3
13. I feel that for every manhour spent in the home office rigging engineering office on a design to make an operation in the field safer and more efficient, saves one crew manhour or around $2,000 on the average, depending on the amount of equipment involved. It took about 80 manhours to design, check and make the drawings for a total cost of say $50/hour*80 hours = $4,000. The cost to fabricate and ship the platforms to the site at say $3/lb*6,700 lbs*2 platforms = $40,000. In this instance, the work platforms were required and were used 24 hours per day for 50 days, so the actual benefit or savings was hard to measure. Was it worth 80 hours*$2,000 =$160,000. I would have to say yes.

NUSCO-MILLSTONE 2
NUCLEAR POWER STATION
S/G REPLACEMENT PROJECT

FLUOR DANIEL
CALCULATIONS and SKETCHES

SC-036 DATE 22 OCT 1991
CONT. NO. 830100
BY KE/GCC/DIA/THK'D RSD
SHEET NO. 16



FORM-E-05, J-88
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FLUOR DANIEL CALCULATION COVER SHEET

PROJECT: MILLSTONE 2, SGRP

CLIENT: NUSCO

PROJECT NO: 830100

FILE No.: 830100.4

ASSIGNMENT INFORMATION

Dept. Name STRUCTURAL

System No. SGR

Calc. No. SC-036 Work Item ———

Revision 1 Date 02/17/92

Title: WORK PLATFORM DESIGN FOR THE STEAM DRUMS.

Content: 6 PAGE CHECKLIST

REVISED CALCULATION SHEET NUMBERS: 6, 10, 11, 15 & 18

THE ABOVE LISTED SHEETS WERE REVISED DUE TO THE MATERIAL AVAILABILITY IN STEEL SHOP.

NSR: ☐ YES ☒ NO

	NAME	INITIAL	DATE
Designed/Calculated By:	KE GOODMAN	KEG	02/17/92
Checked By:	W. KACZYNSKI	W.K.	02/17/92
Reviewed BY:	W. KACZYNSKI	W.K.	02/17/92
Approved and Released By:	D. L. Oiler	DLP	2/19/92

Professional Engineer's Seal No. 81-4393 State of ILLINOIS CONNECTICUT LIC. APPLIED FOR.

QA Review: ———

Distribution:

Original to Project File

Copies To: ———

NOTE: This form must be legible and suitable for microfilming

Form CC-630 Rev. 4 4/2/91

RECEIVED FEB 26 1992 DOCUMENT CONTROL

SD WORK PLATFORM

1. PURPOSE & SCOPE

THE PURPOSE OF THIS CALCULATION IS TO DESIGN A WORK PLATFORM FOR THE STEAM DRUMS WHILE THEY ARE POSITIONED IN TEMPORARY SUPPORT STANDS.

2. REFERENCES & DESIGN INPUT

A. AISC MANUAL OF STEEL CONSTRUCTION, 9TH ED
B. OSHA FOR CONSTRUCTION 29 CFR PART 1926
C. THE CROSBY PRODUCTS MANUAL
D. FLUOR RIGGING DESIGN MANUAL
E. FD DWG 86242-59330 REV B. - STEAM DRUM SUPPORT @ EL 38'-6
F. COMBUSTION ENGR DWG. 223-691 REV 6 - SG GEN. ASSEMBLY

3. SUMMARY OF RESULTS AND CONCLUSIONS

THE WORK PLATFORM CAN BE DESIGNED AND FABRICATED TO PROVIDE A SAFE SUPPORT FOR WORKERS BY ADHERING TO THE DESIGN CODES AND STANDARDS LISTED ABOVE.

4. CRITERIA AND ASSUMPTIONS

A. SAFE WORKING LOAD (SWL) FOR DESIGN OF COMMERCIAL RIGGING GEAR = 5:1 S.F.
B. DESIGN PLATFORM FOR 75 PSF, LIVE LOAD

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CALCULATIONS and SKETCHES

SC-036

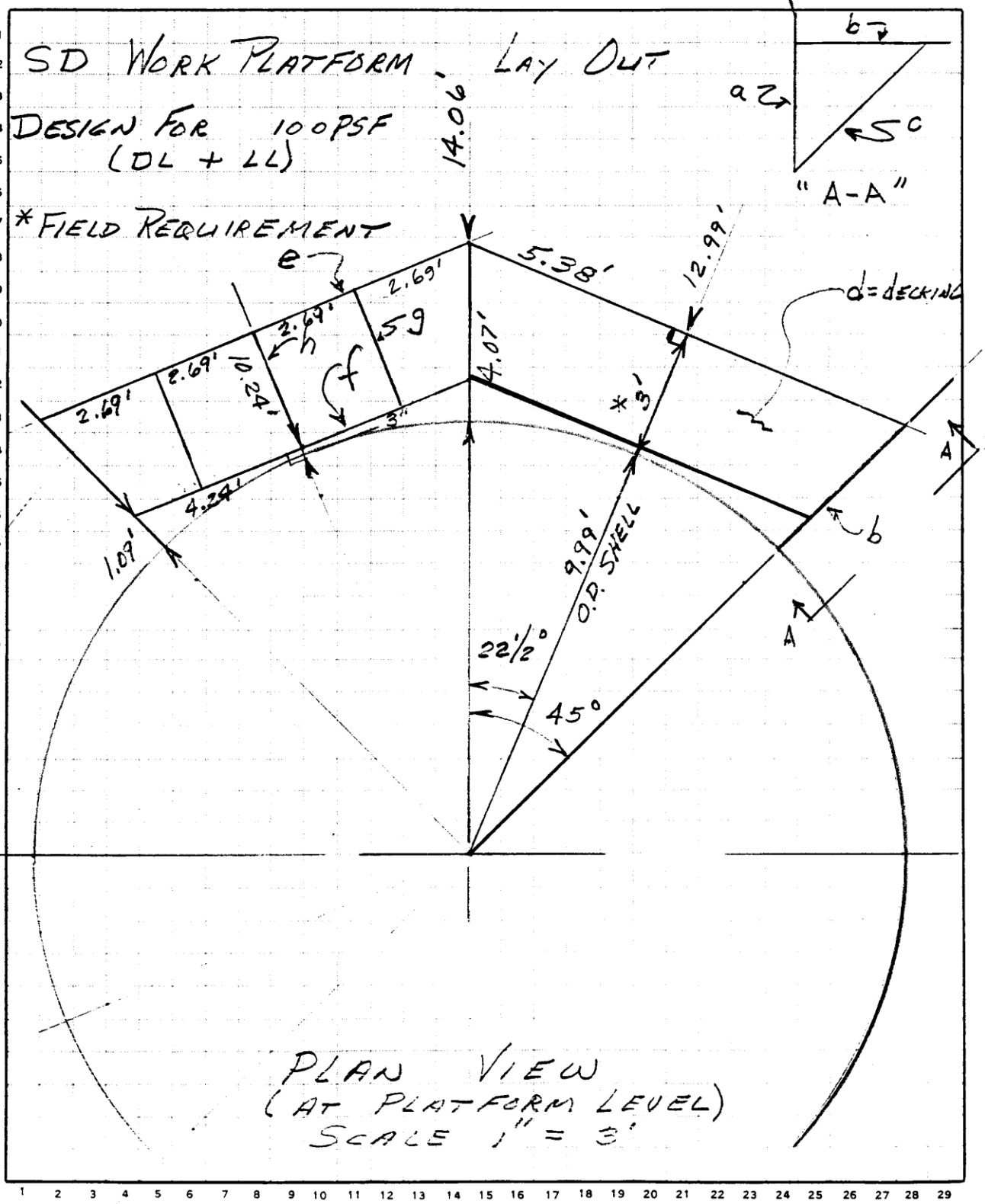
DATE 9 Oct 91
CONT. NO. E30160
BY REGOODMAN CHK'D RSP
SHEET NO. 2

SD WORK PLATFORM

SD Work Platform - Lay Out

DESIGN FOR 100PSF
(DL + LL)

*FIELD REQUIREMENT



PLAN VIEW
(AT PLATFORM LEVEL)
SCALE 1" = 3'

MW	gms/mol
16	C_1 6.40
30	C_2 9.67
44	C_3 10.44
58	IC_4 12.40
58	C_4 11.95
72	IC_5 13.88
72	C_5 13.74
86	IC_6 15.5
86	C_6 15.59
100	IC_7 17.2
100	C_7 17.49
114	C_8 19.41
28	$C_2^=$ 9.64
42	$C_3^=$ 9.67

MW	WSC gms/mol
44	CO_2 6.47
34	H_2S 5.18
28	N_2 4.16
2	H_2 3.38

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CALCULATIONS and SKETCHES

DATE [illegible]
CONT. NO: [illegible]
BY [illegible] CHK'D RSP
SHEET NO. 3

SD WORK PLATFORM

$P = 100\ PSF * \left(\frac{10.76' + 8.48'}{2}\right) * 3'$

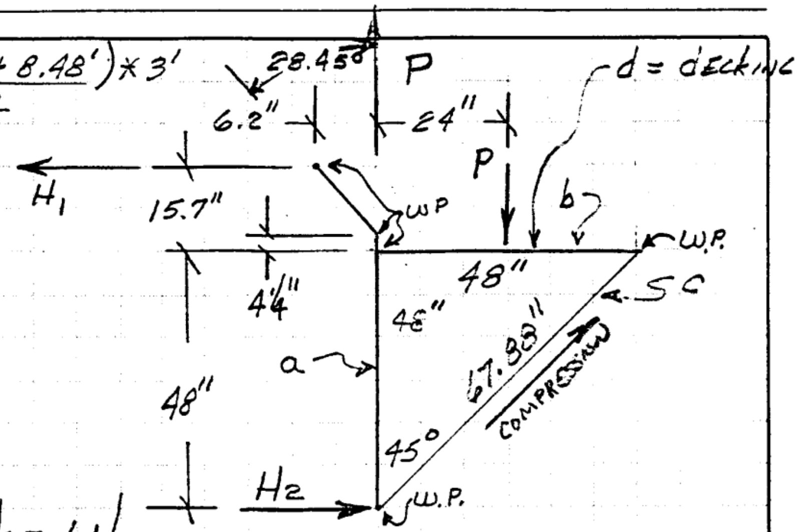
$= 2.9k$

$\Sigma M_{H_1} \circlearrowright + = 0$

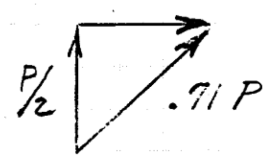
$63.7 H_2 = 24 P$

$H_2 = \frac{24 P}{63.7}$

$H_2 = H_1 = .38 * 2.9k = 1.1k$



Size Member 'b'



$M_{℄} = 24" * \frac{2.9}{2} k$

$= 34.8\ k\text{-in}$

$S = \frac{34.8\ k\text{-in}}{21.6\ KSI} = 1.61\ in^3$

Use 3/16"X4"X3" Struct. Tube $S = 2.62\ in^3 > 1.61\ in^3$ ok.
(Need 3" width for 2" hole for 1½" ϕ std wall pipe, OD = 1.9")

Size Member 'C'

Axial Load $= .71 * 2.9k = 2.06\ k$

Try 1/4"x2"x2" Struct Tube $A = 1.59\ in^2$ $r = .694\ in$
$k = 1$

$kl/r = \frac{68"}{.694\ in} = 97.98$

$F_A = 13.23\ KSI$

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SO WORK PLATFORM

$f_a = 2.05\ k / 1.59\ in^2 = 1.29\ KSI < 13.23\ ksi$ O.K.

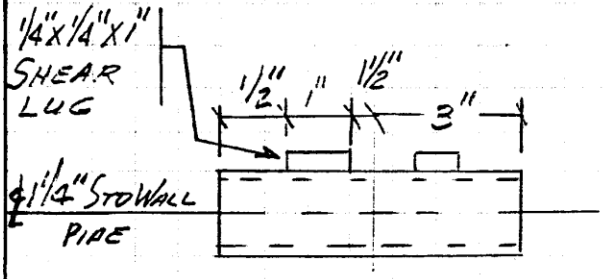
SIZE MEMBER 'a'

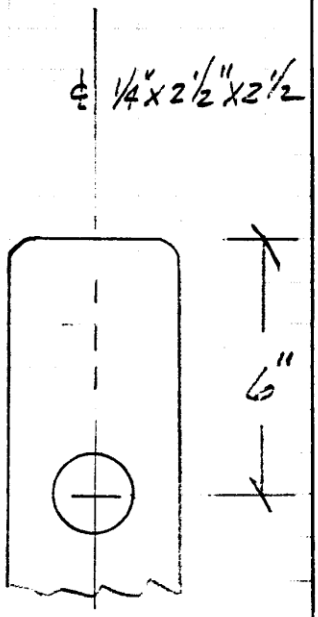
LOAD = $1.25 * P = 2.50\ k$

TRY 1/4" x 2 1/2 x 2 1/2 STRUCT. TUBE
$A = 2.09$ $S = 1.35\ in^3$

AREA REQ = $\frac{2.5\ k}{21.6\ KSI} = .12\ in^2$

AREA ACT = $2.09\ in^2 - 2 * .25 * 1\frac{1}{8}"\phi\ HOLE = 1.53\ in^2$





1 3/4" ϕ HOLE FOR A 1 1/4" ϕ STD WALL PIPE, 1.38" I.D. x 6" LONG SLEEVE FOR 1" ϕ WIRE ROPE

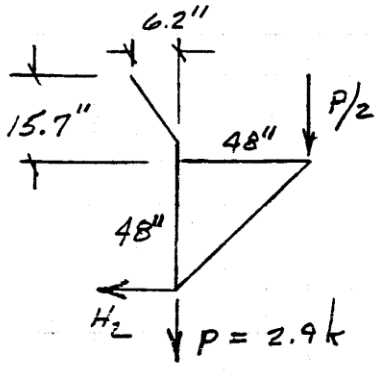
CHECK 'a' FOR BENDING

$M = 6.2" * P = 6.2" * 2.9k$

$= 17.98\ k\text{-}in$

$f_b = \frac{M}{S} = \frac{17.98\ k\text{-}in}{1.35\ in^3} = 13.32\ ksi$

$f_a = \frac{P}{A} = \frac{2.9\ k}{2.09\ in^2} = 1.39$



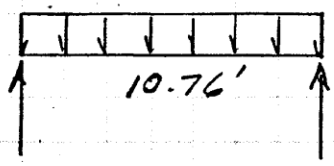
O.K. BY INSPECTION

SO WORK PLATFORM

SIZE MEMBER 'e' W = 1.5 F_T * .1 k/FT^2 = .15 k/FT

$$M_{MAX} = \frac{wL^2}{8} = \frac{.15\ k * 10.76^2 * FT^2}{FT * 8}$$

$$= 2.17\ K\text{-}FT = 26.05\ K\text{-}IN$$

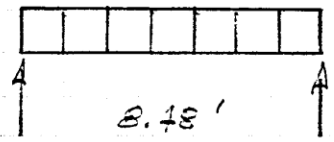


$$S = \frac{26.05}{21.6} = 1.21\ in^3$$

Use L 6"x4"x 7/16"
A = 4.18 in^2 S = 3.83 in^3

SIZE MEMBER 'f' W = .15 k/FT

$$M_{MAX} = \frac{.15\ k * 8.48^2 * FT^2}{FT * 8}$$



$$= 1.35 k\text{-}FT = 16.18 k\text{-}IN$$

$$S = \frac{16.18\ k\text{-}in}{21.6\ KSI}$$

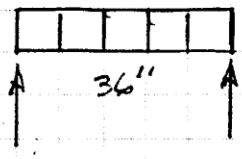
$$= .75\ in^3$$

Use 1/4" x 4" x 3 STRUCT TUBE
A = 3.09 in^2 S = 3.23 in^3

SD WORK PLATFORM

SIZE MEMBER 'g'

$W = 2.76\,Ft * .1\,k/ft^2 = .276\,k/Ft$



$$M_{MAX} = \frac{.276K * 3^2 * Ft^2}{Ft \quad 8}$$

$= .31\,k\text{-}ft = 3.73\,k\text{-}in$

$$S = \frac{3.73}{21.6} = .18\,in^3$$

Use $1/4" \times 2\frac{1}{2}" \times 2\frac{1}{2}"$ S-RECT. TUBE. △1
$A = 2.09\,in^2$ $S = 1.35\,in^3$

SIZE MEMBER 'd' (FLOOR PLATE)

REF: AISC 2-145 9TH EDIT

SPAN = 2.69' CROSS-SPAN = 3.0'

PSF = 75 LIVE LOAD

FROM AISC 2-145

ALLOWABLE LOAD FOR 9/16" FLOOR P
& 3' SPAN

= 83 PSF > 75 PSF OK

SD WORK PLATFORM

VERTICAL SUPPORT OF WORK PLATFORM

THE DESIGN OF THE WORK PLATFORM IS SIMILAR TO AN EXTERIOR RING TRUSS OR GIRDER & WILL MAINTAIN ITS SHAPE AROUND THE STEAM DRUM. THE VERTICAL MEMBER OF EACH KNEE BRACE IS SIZED TO CARRY THE VERTICAL LOAD WITH OUT BENDING & WILL THEREFORE SUPPORT THE WORK PLATFORM & ITS LOAD.

IN ORDER TO BE VERY CONSERVATIVE A 1" ϕ WIRE ROPE WILL BE THREADED THRU A HOLE IN THE TOP OF THE VERTICAL MEMBER OF EACH KNEE BRACE & SECURED WITH CABLE CLAMPS.

AS AN ADDITIONAL STEP TO ENSURE THAT THE WORK PLATFORM WILL NOT TIP & TO KEEP THE KNEE BRACES VERTICAL, A 3/8" ϕ WIRE ROPE WILL BE THREADED THRU A HOLE IN THE BOTTOM OF EACH KNEE BRACE & SECURED TO THE STEAM DRUM SUPPORT STAND DIRECTLY BELOW. IT WILL BE PULLED TO A SNUG CONDITION & CLAMPED WITH 3 CABLE CLAMPS AT EACH CONNECTION.

NUSCO-MILLSTONE 2
NUCLEAR POWER STATION
~~S/G REPLACEMENT PROJECT~~

FLUOR DANIEL
CALCULATIONS and SKETCHES

SC-036

DATE 10 Oct 91
CONT. NO. 830100
BY KEGOODMAN CHK'D RSP
SHEET NO. 8

SD WORK PLATFORM

REF
FD DRAWING
59330

9'-2
(9.17')

SD O.D. = 239.75"
r = 9.99'

r
9.99'

a

19'-1 1/2
(19.13')

b

1/4" x 4" x 3"
STRUCT. TUBE

4 1/2"

a = 21.21'

b = 21.21 - 2*9.99 = 1.23' = 14.75"

SD WORK PLATFORM

MW	gals/mol
16	C_1 6.40
30	C_2 9.67
44	C_3 10.44
58	IC_4 12.40
58	C_4 11.95
72	IC_5 13.88
72	C_5 13.74
86	IC_6 15.5
86	C_6 15.39
100	IC_7 17.2
100	C_7 17.49
114	C_8 19.41
28	$C_2^=$ 9.84
42	$C_3^=$ 9.87

MISC	
MW	gals/mol
44	CO_2 6.47
34	H_2S 5.18
28	N_2 4.16
2	H_2 3.38

BOLT DETAILS

∴ USE 2 EA - 3/4" ϕ A325 BOLTS/JOINT

ALLOW. TENSION/BOLT = 19.4 k
ALLOW SHEAR/BOLT = 7.5 k

FIELD SHALL PLACE/INSTALL SIGNS OR PLACARDS ON HANDRAIL ELEV. WHICH WARN OR LIMIT PLACEMENT OF HEAVY CONCENTRATED LOADS ON ANY PORTION OF SUBJECT PLATFORMS.

SD WORK PLATFORM

SD WORK PLATFORM

WEIGHT TAKE OFF (1 PLATFORM)

7 KNEE BRACES KB2 - KB8

7 * 1/4" X 2 1/2 X 2 1/2" * 7.11 lb/FT * 6.19' TUBE a 309 lbs
7 * 1/4" X 4" X 3" * 10.51 * 4.85' " b 357
7 * 1/4" X 2" X 2" * 5.41 * 5.66' " c 215
3 * 1/4" * 4" * 4" * 500 lb/Ft³ / 1728 in³/Ft³ = .29 PL PADS 4

1 KNEE BRACE KB1

1 * 1/4" X 2 1/2" X 2 1/2" * 7.11 lb/FT * 2.44' TUBE a 18
2 * 1/4" * 4" * 4" * .29 PL PADS 3

6 DECK PANELS (FULL SIZED)

6 * 1/4" X 4" X 3" * 10.51 lb/FT * 8.48' TUBE f 535
6 * 7/16" X 6" X 4" * 14.30 * 10.76' ANGLE e 924
6 * 3/16" X 4" X 3" * 8.14 * 2.75' TUBE h 135
12 * 1/4" * 2 1/2" * 2 1/2" * 7.11 * 2.75' TUBE g 235 | 1
6 * 3/16" / 12 * (10.76' + 8.48') / 2 * 4' * 500 lb/Ft³ PL DECK 1,904

2 DECK PANELS (BETWEEN DRUMS)

1 * 1/4" X 4" X 3" * 10.51 lb/FT * 21.0' TUBE 221
2 * 1/4" X 4" X 3" * 10.51 * 6.5' TUBE 137
2 * 1/4" * 2 1/2" * 2 1/2" * 7.11 * 2.25' TUBE 32 | 1

HAND RAIL

13 * 2" ϕ X .5' STD WALL, BASE, 3.65 lb/Ft, PIPE 24
13 * 1 1/2" ϕ X 4.0' STD WALL, POST, 2.72 PIPE 142
6 * 1 1/2" ϕ X 10.76' " " TOP RAIL, 2.72 PIPE 176
6 * 1 1/2" ϕ X 10.76 " " BTM RAIL, 2.72 PIPE 176

5,447 | 1

NUSCO-MILLSTONE 2
NUCLEAR POWER STATION
S/G REPLACEMENT PROJECT

FLUOR DANIEL
CALCULATIONS and SKETCHES

SC-036

DATE 1-8-92
CONT. NO. 830100
BY KEGOODMAN CHK'D WK
SHEET NO. 11
REV. 1 - 02/17/92
BY: KEG
CHK'D : W.K.

SD WORK PLATFORM

WT TAKE OFF CONTINUED

BOLTED JOINTS

70 * 1/2" * 4" * 12" * .29	LB	486 lbs.	
160 * 3/4" ϕ X 6" * 1 lb/BOLT & NUT	BOLT	160	
WT FOR 1 PLATFORM		6,095	1
ADD 10% FOR WELDS, MAT'L OVERAGE, CLIPS, ETC		607	
TOTAL WEIGHT		6,702 lbs	1

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S/G REPLACEMENT PROJECT

FLUOR DANIEL
CALCULATIONS and SKETCHES

DATE 1-8-92
CONT. NO. 83019.0
BY KEGOODMA CHK'D PR
SHEET NO. 12

SD WORK PLATFORM

RIGGING FOR SD WORK PLATFORM

WT/PLATFORM 6.7 k

CAPACITY (MAX) OF RIGGING
= 8 * 5.2k * .3
(EYE BOLT)
= 12.5k > 6.7k
O.K.

1/2"φ X 30', IPS SLING
SWL = 4.4k
(8 REQ)

28.50'

30.32'

θ = 70.1°

3/4"φ EYE BOLT
SHOULDER NUT
CROSBY G-277
SWL = 5.2k

1"φ PIN SHACKLE
6½ TON CAP.
8 REQ

STEAM DRUM

10.35'

SCALE 1" = 4'-0"

SD WORK PLATFORM

STEAM DRUM WORK PLATFORM

FABRICATION NOTES:

1. TWO IDENTICAL WORK PLATFORMS ARE REQUIRED:
   ONE FOR SD #1
   ONE FOR SD #2
2. A COMMON WALK WAY IS SHARED BETWEEN THE STEAM DRUMS.
3. ALL MATERIAL IS A 36, A53 OR A500
4. ALL BOLTS ARE A325
5. CHECKER FLOOR PLATE EXTENDS FROM THE L 6"X4"X7/16 TOE PLATE TO WITHIN 1" OF THE SD SHELL (TYP. ALL AROUND BOTH STEAM DRUMS).
6. THE KNEE BRACES ARE TO BE SHOP WELDED TOGETHER.
7. THE FLOOR PANELS BETWEEN THE KNEE BRACES ARE TO BE SHOP WELDED, INCLUDING THE DECK PLATE.
8. THE FABRICATOR SHALL DETAIL THE BOLTED CONNECTIONS BETWEEN 6 & 7 ABOVE.
9. SIZE CHECKER PLATE BETWEEN DRUMS SO THAT THE 4- 1"ϕX 15" ALL THREAD TIE RODS CAN BE INSTALLED FROM THE TOP SIDE OF THE PLATFORM.
10. HAND RAIL POSTS ARE LOCATED ON THE END OF EVERY KNEE BRACE & AT THE END OF EACH FLOOR PANEL MEMBER (5), SEE SECTION 'A-A'

MW	gms/mol
16	C_1 6.40
30	C_2 9.67
44	C_3 10.44
58	IC_4 12.40
58	C_4 11.95
72	IC_5 13.86
72	C_5 13.74
86	IC_6 15.5
86	C_6 15.59
100	IC_7 17.2
100	C_7 17.49
114	C_8 19.41
28	$C_2^=$ 9.64
42	$C_3^=$ 9.67

MISC	
MW	gms/mol
44	CO_2 8.47
34	H_2S 5.18
28	N_2 4.16
2	H_2 3.36

SO WORK PLATFORM

FABRICATION NOTES CONT.

11. KNEE BRACES KB3 THRU KB7 ARE IDENTICAL TO KB2 & KB8 EXCEPT FOR:
    KB3 - KB7 HAVE A L 6"X4"X 7/16 TOE BOARD EXTENDING BOTH WAYS.
    KB2 & KB8 HAVE A TOE BOARD EXTENDING ONE WAY & A 1/4"X 4"X3 STRUCT. TUBE EXTENDING THE OTHER WAY.
    SECTION 'C-C' CAN BE USED FOR FABRICATING KB2 THRU KB8.
12. REMOVE ALL BURRS ON HANDRAIL SURFACES.
13. ALL DESIGN/FABRICATION SHALL BE PER AISC, 9TH ED.
14. STEEL SHALL BE PRIMED IN ACCORDANCE WITH SPEC No. 830100-05115 (1)
15. ALL BOLTED CONNECTIONS SHALL BE JAM NUTED.
16. PROVIDE 1"ϕX 90' LONG EIPS WIRE ROPE (PER DRUM)
17. PROVIDE 15 - 1"ϕ CROSBY CLIPS (PER DRUM)
18. PROVIDE 1 - CAGED LADDER, 29' LONG
19. ALL FIELD CONNECTIONS SHALL BE BOLTED.
20. PROVIDE 3/8"ϕX 500' IPS WIRE ROPE
21. PROVIDE 100 - 3/8"ϕ CROSBY CLIPS
22. PROVIDE 4 - 1"ϕX 15" ALL THREAD W/4 NUTS & 2-1/4"X4"X4" PLATE WASHERS.

MW	gms/mol
16	C_1 8.40
30	C_2 9.67
44	C_3 10.44
58	IC_4 12.40
58	C_4 11.95
72	IC_5 13.88
72	C_5 13.74
86	IC_6 15.5
86	C_6 15.59
100	IC_7 17.2
100	C_7 17.49
114	C_8 19.41
28	$C_2^=$ 9.64
42	$C_3^=$ 9.67

MISC	
MW	gms/mol
44	CO_2 8.47
34	H_2S 5.18
28	N_2 4.16
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NUSCO-MILLSTONE 2
NUCLEAR POWER STATION
S/G REPLACEMENT PROJECT

FLUOR DANIEL
CALCULATIONS and SKETCHES

SC-036

DATE 22 OCT 1991
CONT. NO. 830100
BY TE CADRIAN CHK'D RSP
SHEET NO. 15

REV. 1 - 02/17/92
BY: KEG
CHK'D: W.K.

SD WORK PLATFORM

WORK PLATFORM DETAILS (STEAM DRUM)

LEGEND (REF SH 16)

(1) 3/16" X 4" X 3" STRUCT. TUBE, PART OF KNEE BRACE, | △1

(2) $1\frac{1}{4}$" x $2\frac{1}{2}$ x $2\frac{1}{2}$" " " |

(3) 1/4" X 4" X 3" " "

(4) L 6" X 4" X 7/16" ANGLE

(5) 3/16" X 4" X 3" STRUCT. TUBE

(6) 3/16" CHECKER DECK PLATE

(7) 1/4" X 4" X 3" STRUCT. TUBE

(8) 1" ϕ X 15" ALL THREAD W/ 4 NUTS & 2 - 1/4" X 4" X 4" ☐ WASHER

MW	gals/mol
16	C_1 8.40
30	C_2 9.67
44	C_3 10.44
58	IC_4 12.40
58	C_4 11.95
72	IC_5 13.88
72	C_5 13.74
86	IC_6 15.5
86	C_6 15.59
100	IC_7 17.2
100	C_7 17.49
114	C_8 19.41
28	$C_2^=$ 8.64
42	$C_3^=$ 9.87

MISC		
MW	gals/mol	
44	CO_2	6.47
34	H_2S	5.18
28	N_2	4.16
2	H_2	3.38

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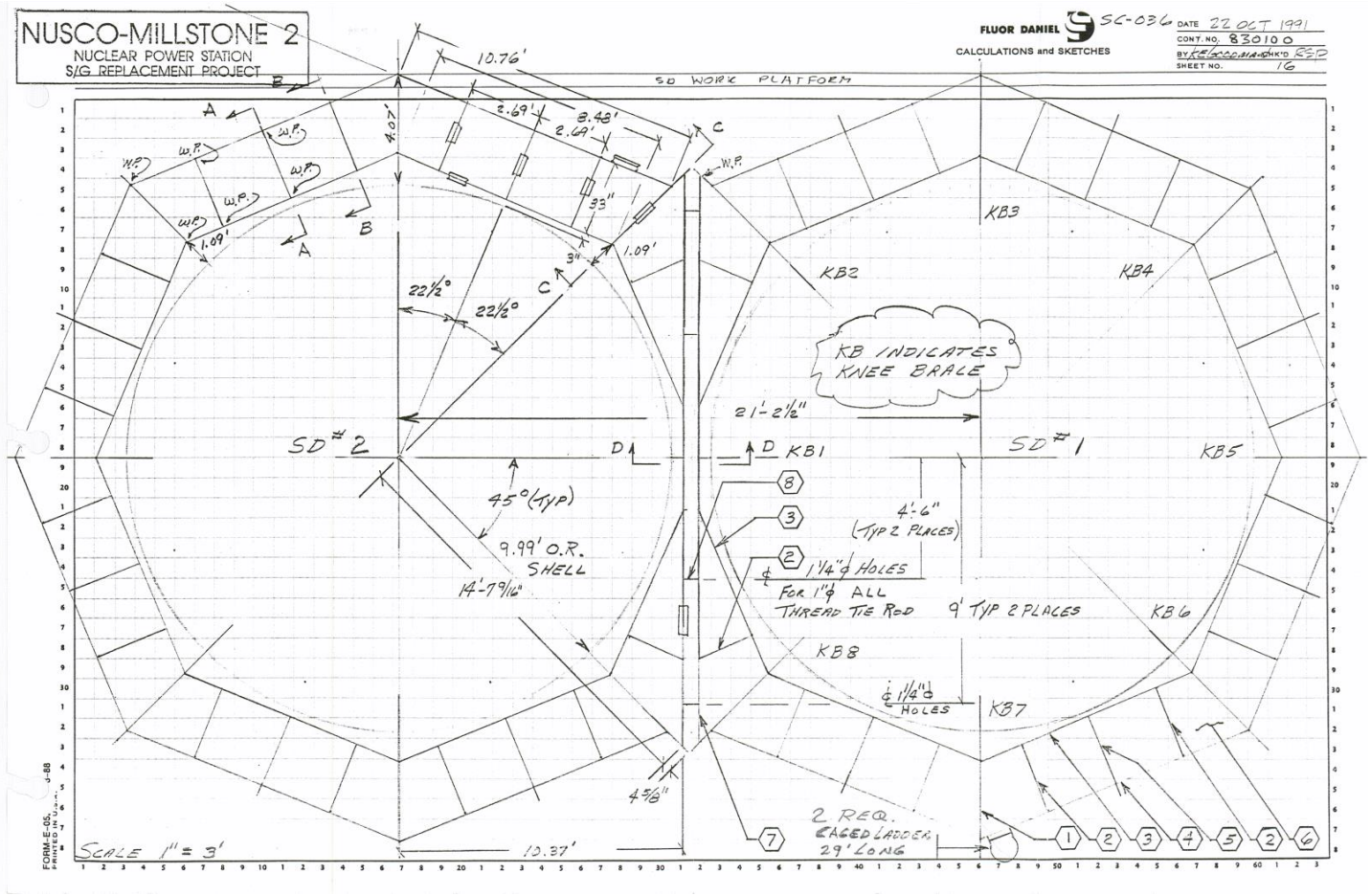
NUSCO-MILLSTONE 2
NUCLEAR POWER STATION
S/G REPLACEMENT PROJECT

FLUOR DANIEL SC-036 DATE 22 OCT 1991
CALCULATIONS and SKETCHES
CONT. NO. 830100
BY RE/CCC/BIA/HK'D RSD
SHEET NO. 16



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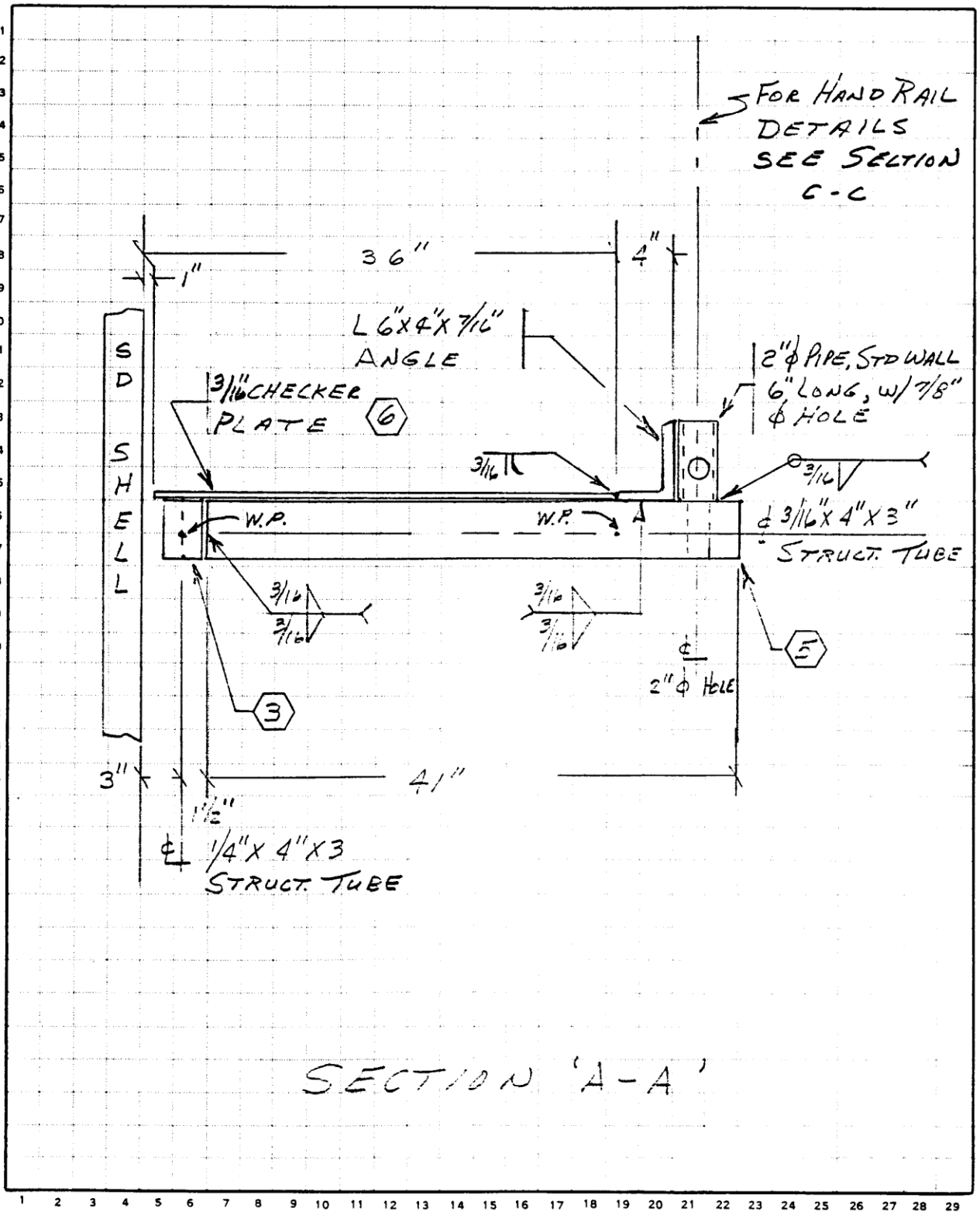
SD WORK PLATFORMS



SECTION 'A-A'

MW	gals/mol
16	C_1 6.40
30	C_2 9.07
44	C_3 10.44
58	iC_4 12.46
58	C_4 11.95
72	iC_5 13.88
72	C_5 13.74
86	iC_6 15.5
86	C_6 15.59
100	iC_7 17.2
100	C_7 17.49
114	C_8 19.41
28	$C_2^=$ 9.64
42	$C_3^=$ 9.67

MISC

MW	gals/mol
44	CO_2 8.47
34	H_2S 5.18
28	N_2 4.16
2	H_2 3.38

NUSCO-MILLSTONE 2
NUCLEAR POWER STATION
S/G REPLACEMENT PROJECT

FLUOR DANIEL

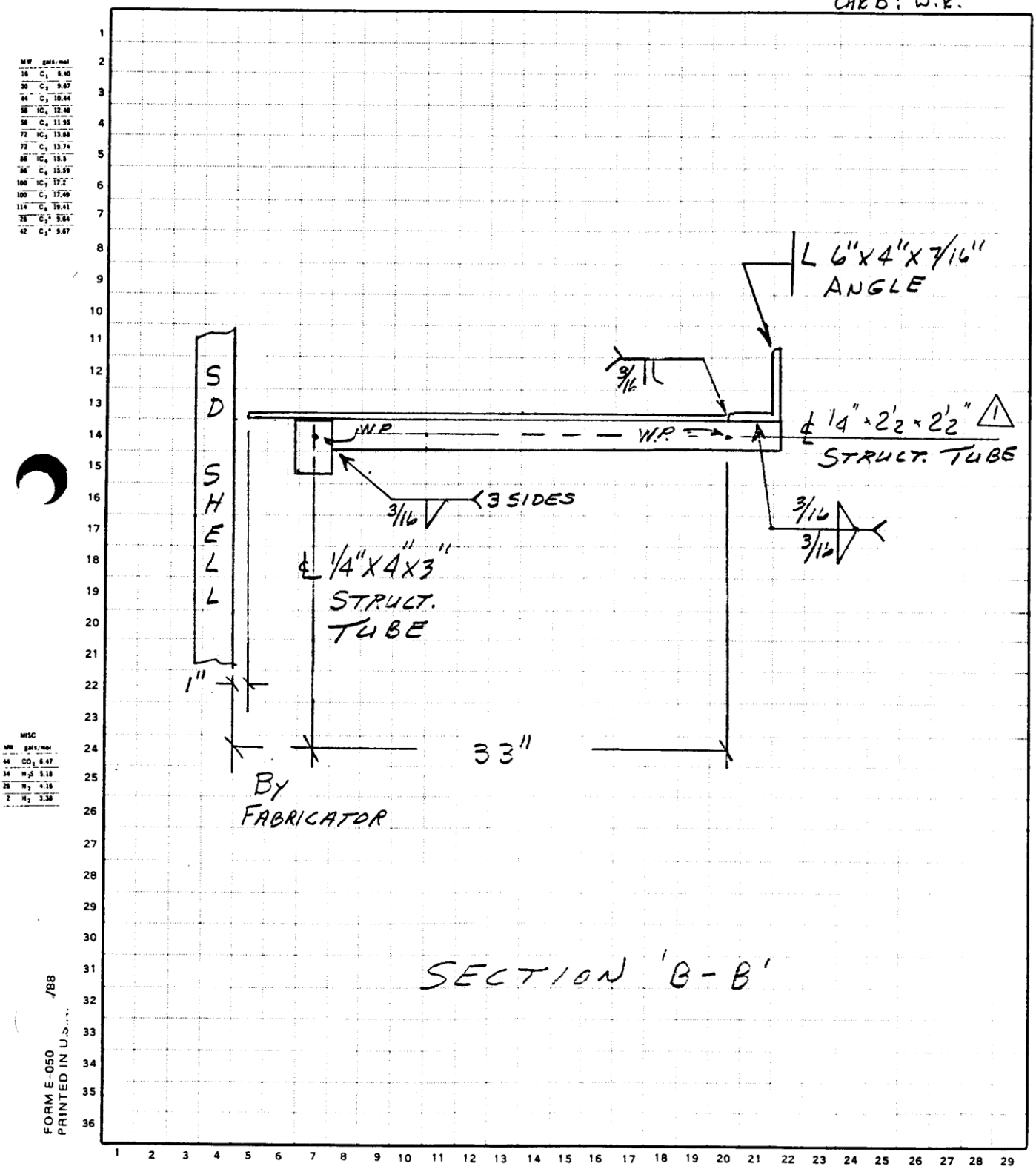
CALCULATIONS and SKETCHES

SC-036

DATE 22 OCT 1991
CONT. NO. 830100
BY KE GOODMAN CHK'D RSP
SHEET NO. 18

REV.1 - 02/17/92
BY: KEG
CHK'D: W.K.

SD WORK PLATFORM



SECTION 'B-B'

MW	gals/mol
16	C_1 6.40
30	C_2 9.67
44	C_3 10.44
58	IC_4 12.40
58	C_4 11.95
72	IC_5 13.88
72	C_5 13.74
86	IC_6 15.5
86	C_6 15.59
100	IC_7 17.2
100	C_7 17.49
114	C_8 19.41
28	$C_2^=$ 9.64
42	$C_3^=$ 9.67

MISC	
MW	gals/mol
44	CO_2 6.47
34	H_2S 5.18
28	N_2 4.16
2	H_2 3.38

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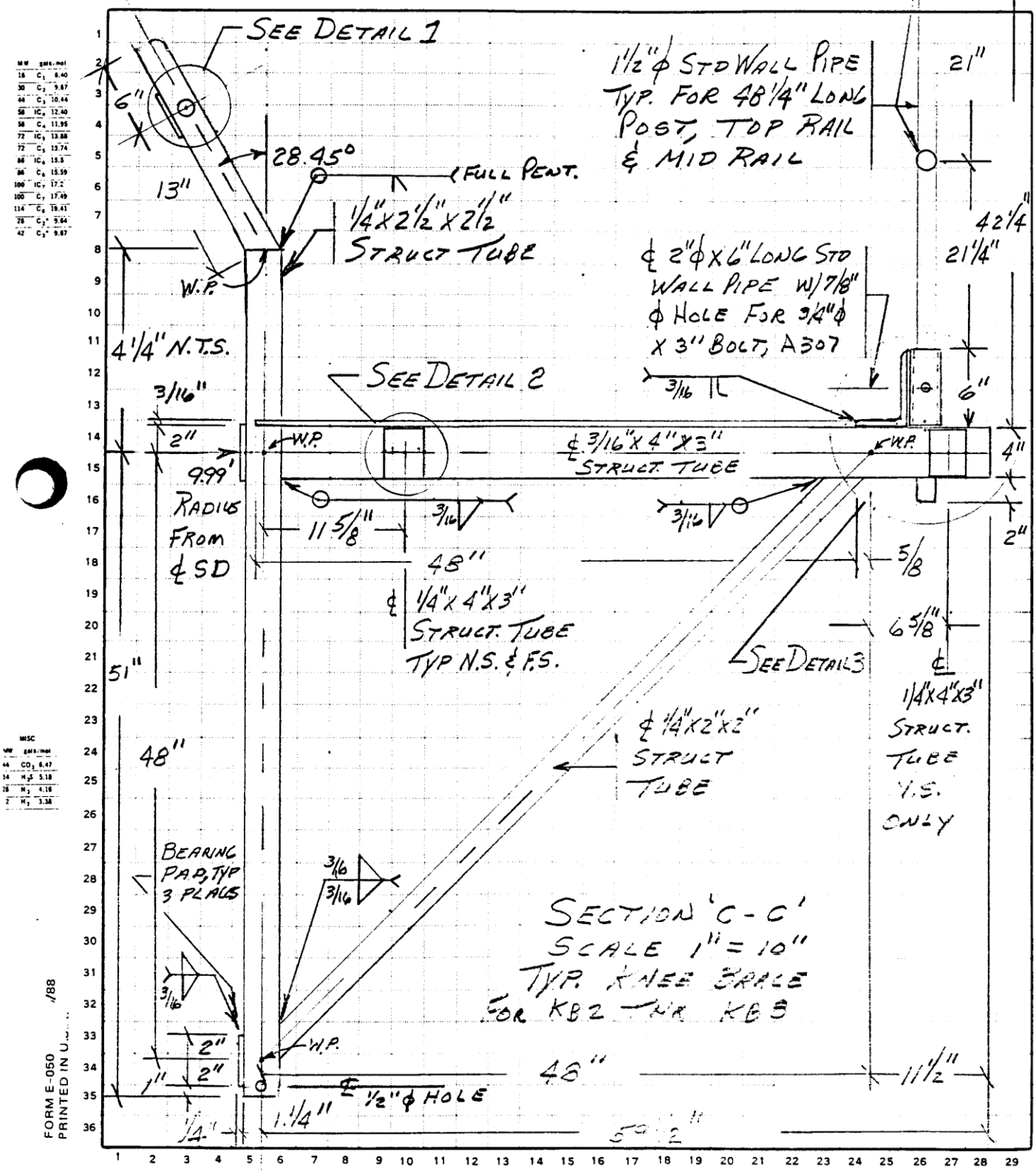
NUSCO-MILLSTONE 2
NUCLEAR POWER STATION
S/G REPLACEMENT PROJECT

FLUOR DANIEL
CALCULATIONS and SKETCHES

SC-026

DATE 18 Oct 91
CONT. NO. 830100
BY KE Loodin CHK'D
CHECKED RSP
SHEET NO. 19

SD WORK PLATFORM



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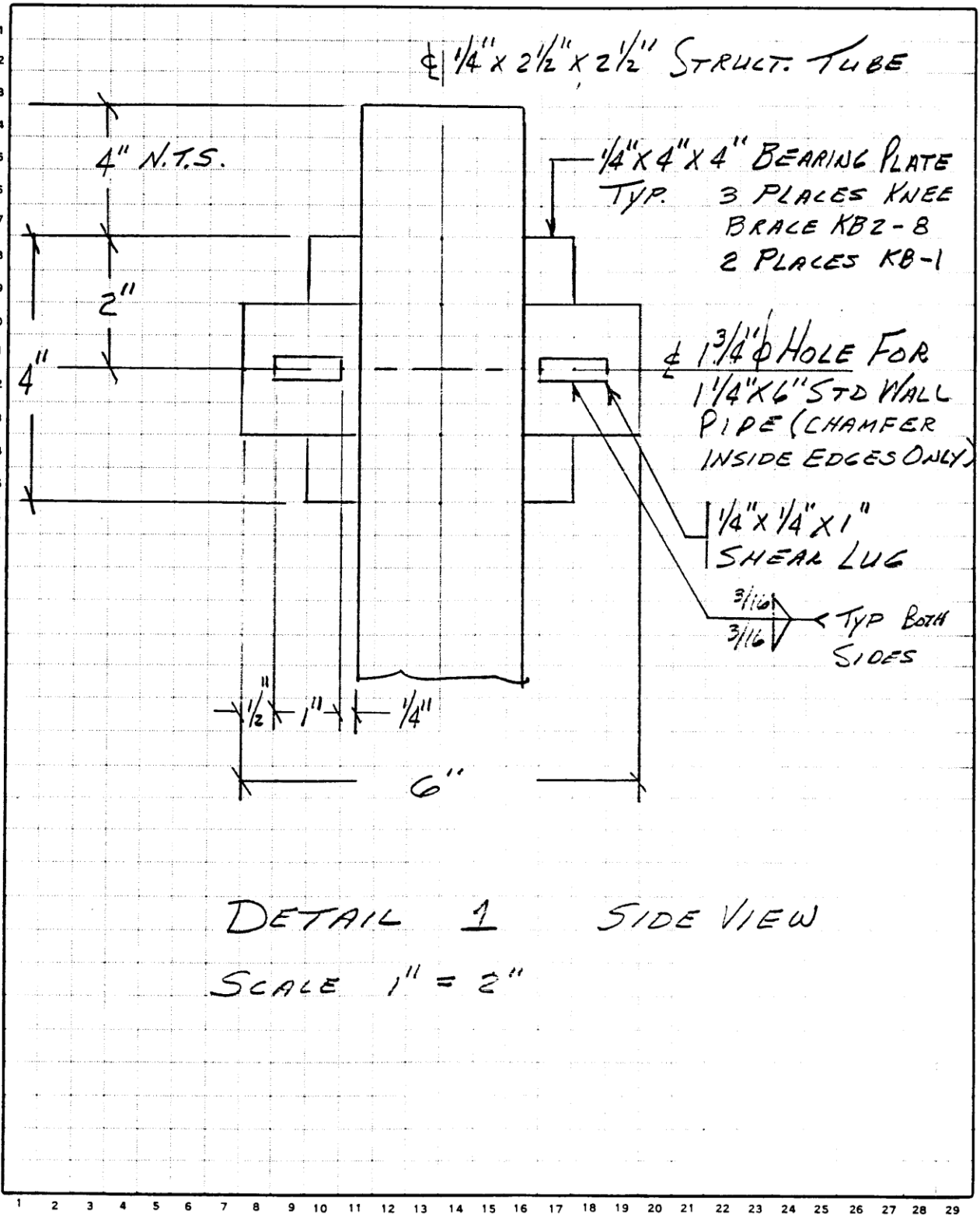
NUSCO-MILLSTONE 2
NUCLEAR POWER STATION
S/G REPLACEMENT PROJECT

FLUOR DANIEL
CALCULATIONS and SKETCHES

SC-036

DATE 21 OCT 91
CONT. NO. 230100
BY KEGOODMAN CHK'D RSP
SHEET NO. 20

SD WORK PLAT FORM



DETAIL 1 SIDE VIEW

SCALE 1" = 2"

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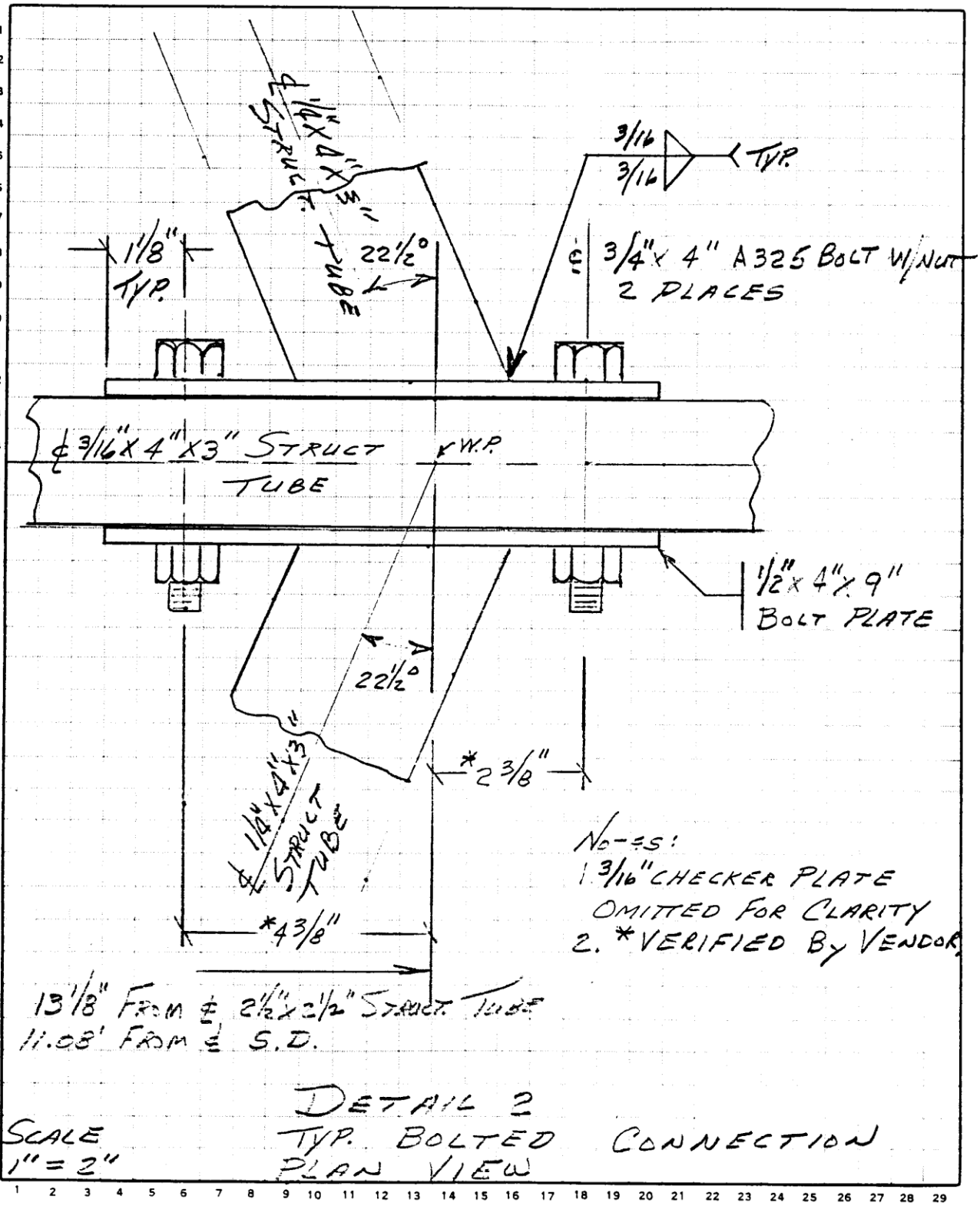
NUSCO-MILLSTONE 2
NUCLEAR POWER STATION
S/G REPLACEMENT PROJECT

FLUOR DANIEL
CALCULATIONS and SKETCHES

SC-036

DATE 22 OCT 1991
CONT. NO. 830100
BY K.E. GOODMAN CHK'D RSD
SHEET NO. 21

SD WORK PLATFORM



NOTES:
1. 3/16" CHECKER PLATE OMITTED FOR CLARITY
2. *VERIFIED BY VENDOR

DETAIL 2
TYP. BOLTED CONNECTION
PLAN VIEW

SCALE
1" = 2"

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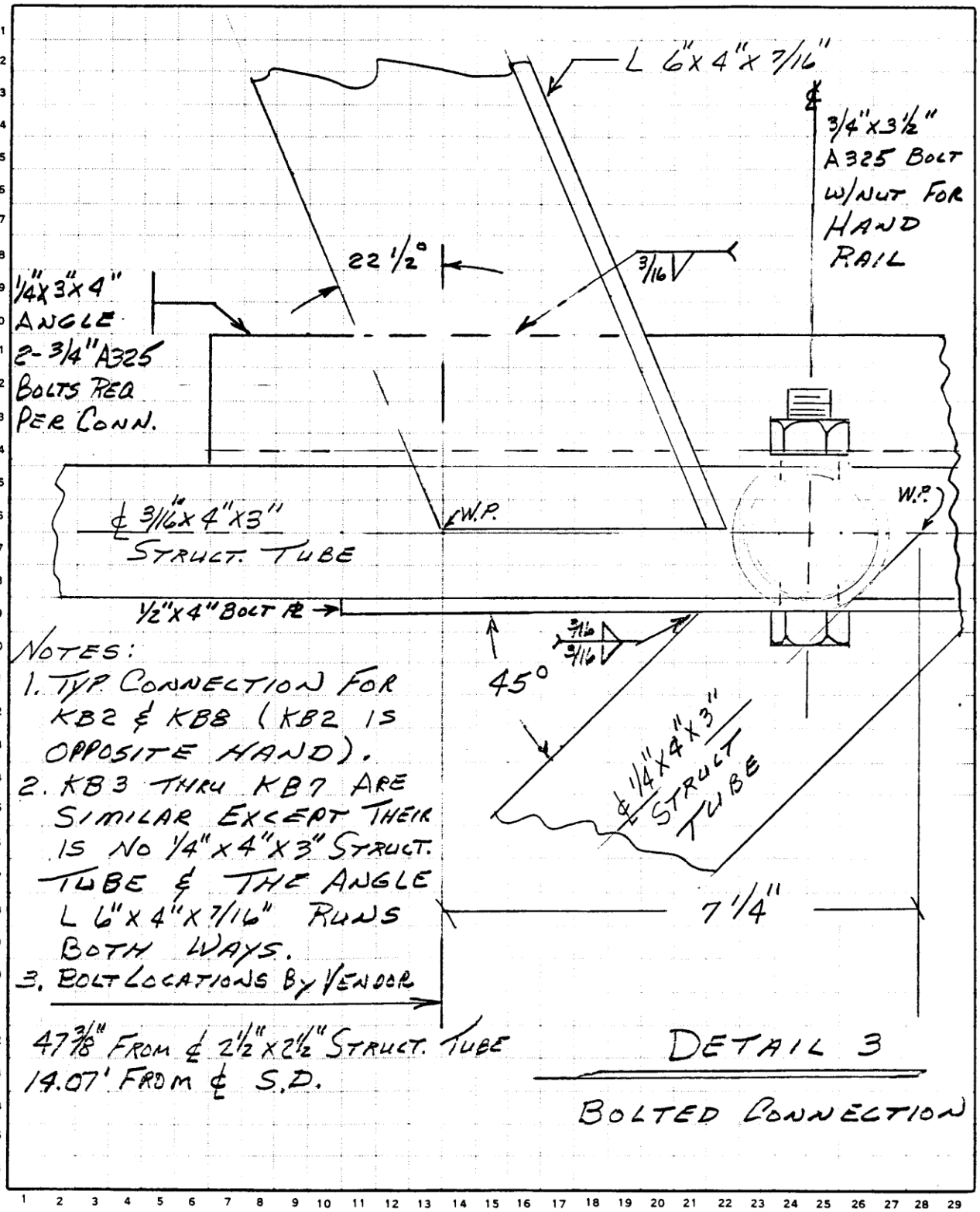
NUSCO-MILLSTONE 2
NUCLEAR POWER STATION
S/G REPLACEMENT PROJECT

FLUOR DANIEL
CALCULATIONS and SKETCHES

DATE 22 OCT 1991
CONT. NO. 830100
BY TE CHK'D RSP
SHEET NO. 22

SD WORK PLATFORM



NOTES:

1. TYP. CONNECTION FOR KB2 & KB8 (KB2 IS OPPOSITE HAND).
2. KB3 THRU KB7 ARE SIMILAR EXCEPT THEIR IS NO 1/4"x4"x3" STRUCT. TUBE & THE ANGLE L 6"x4"x7/16" RUNS BOTH WAYS.
3. BOLT LOCATIONS BY VENDOR

47 3/8" FROM ℄ 2½"x2½" STRUCT. TUBE
14.07' FROM ℄ S.D.

DETAIL 3

BOLTED CONNECTION

MW	gas/mol
16	C_1 8.40
30	C_2 9.67
44	C_3 10.44
58	IC_4 12.40
58	C_4 11.95
72	IC_5 13.84
72	C_5 13.74
86	IC_6 15.5
86	C_6 15.59
100	IC_7 17.2
100	C_7 17.49
114	C_8 19.41
78	$C_6^=$ 9.64
42	$C_3^=$ 9.67

MISC

MW	gas/mol
44	CO_2 6.47
34	H_2S 5.18
28	N_2 4.16
2	H_2 3.38

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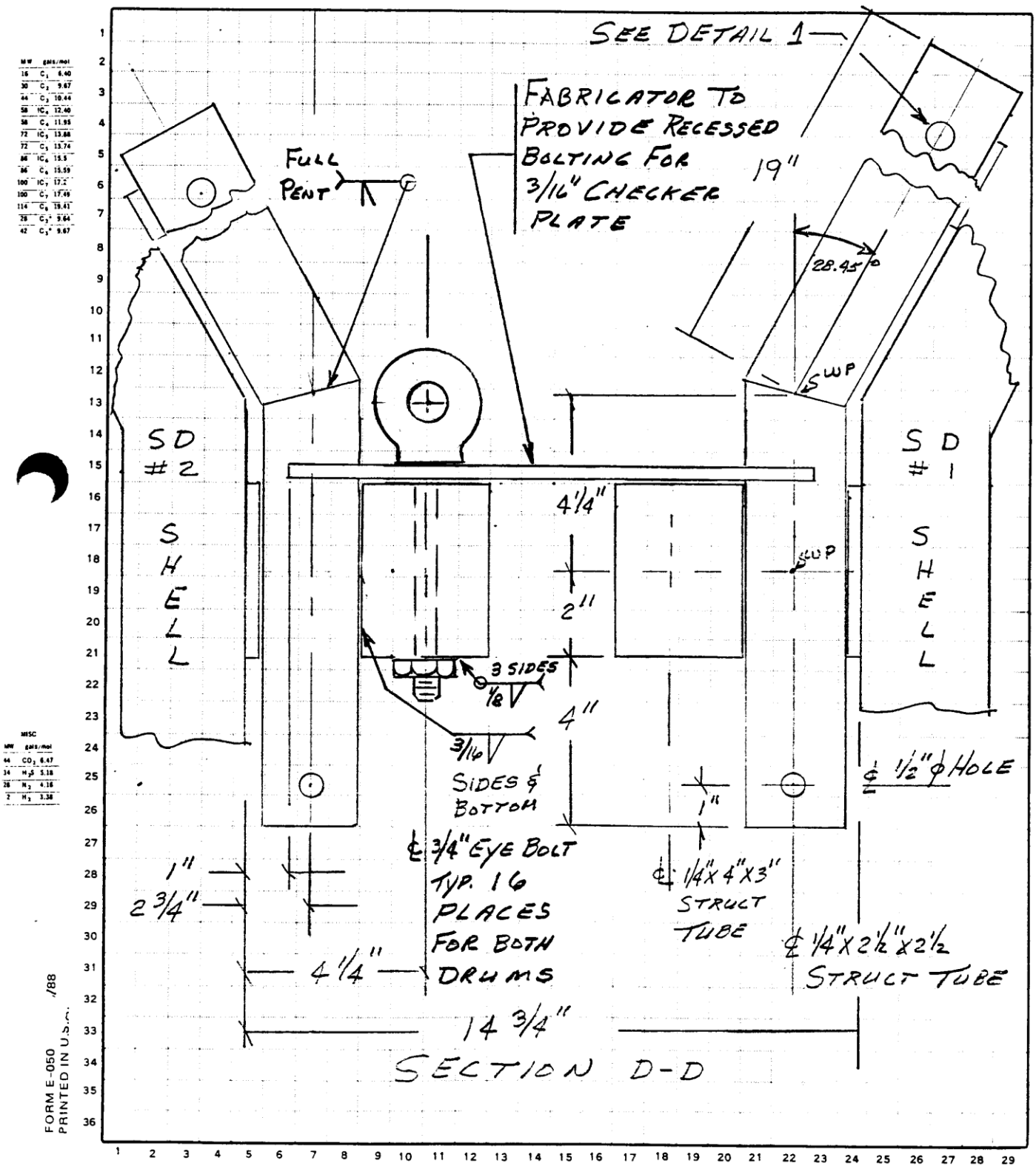
NUSCO-MILLSTONE 2
NUCLEAR POWER STATION
S/G REPLACEMENT PROJECT

FLUOR DANIEL
CALCULATIONS and SKETCHES

SC-036

DATE 22 OCT 1991
CONT. NO. 830100
BY TE-JOHNAN CHK'D RSP
SHEET NO. 23

SD WORK PLATFORM



MW	gms/mol
16	C_1 6.40
30	C_2 9.67
44	C_3 10.44
58	iC_4 12.40
58	C_4 11.95
72	iC_5 13.88
72	C_5 13.74
86	iC_6 15.5
86	C_6 15.59
100	iC_7 17.2
100	C_7 17.49
114	C_8 19.41
28	$C_2^=$ 9.64
42	$C_3^=$ 9.67

MISC	
MW	gms/mol
44	CO_2 8.47
34	H_2S 5.18
28	N_2 4.16
2	H_2 3.38

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