

# CATEGORY 1

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       50-270 Oconee Nuclear Station, Unit 2, Duke Power Co.      05000270  
       50-287 Oconee Nuclear Station, Unit 3, Duke Power Co.      05000287  
 AUTH. NAME      AUTHOR AFFILIATION  
 HAMPTON, J.W.      Duke Power Co.  
 RECIP. NAME      RECIPIENT AFFILIATION  
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*See Reports*

SUBJECT: Forwards addl info in response to RAI re request for relief  
 96-01 for third 10-yr ISI interval.

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NRR/DE/EMCB	1 1	NRR/DE/EMEB	1 1
NUDOCS-ABSTRACT	1 1	OGC/HDS2	1 0
RES/DET/EMEB	1 1	RES/DSIR/EIB	1 1
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Duke Power Company  
Oconee Nuclear Site  
P.O. Box 1439  
Seneca, SC 29679

J. W. HAMPTON  
Vice President  
(864)885-3499 Office  
(864)885-3564 Fax



**DUKE POWER**

September 5, 1996

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

Subject: Duke Power Company  
Oconee Nuclear Station, Units 1, 2, and 3  
Docket Nos. 50-269, -270, and -287  
Third Ten Year Inservice Inspection Interval  
Request for Relief No. 96-01  
Response to Request for Additional Information

In a letter dated August 21, 1996, your staff requested additional information regarding Request for Relief 96-01. Please find attached the response to the request for additional information.

If there are any questions or further information is needed you may contact D. A. Nix at (864) 885-3634.

Very truly yours,

J. W. Hampton  
Site Vice President

Attachments

9609170269 960905  
PDR ADOCK 05000269  
Q PDR

100028

A047%

U. S. Nuclear Regulatory Commission  
September 5, 1996  
Page 2

xc (w/attch): Mr. D. E. LaBarge, Project Manager  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

Mr. S. D. Ebnetter  
Regional Administrator, Region II  
U. S. Nuclear Regulatory Commission

xc(w/o attch): Mr. M. A. Scott  
Senior NRC Resident Inspector  
Oconee Nuclear Station

Mr. Max Batavia  
Bureau of Radiological Health  
SC Dept. of Health & Environmental Control  
2600 Bull St.  
Columbia, SC 29201

U. S. Nuclear Regulatory Commission  
September 5, 1996  
Page 3

bxc (w/ attchs):     T. J. Coleman  
                         R. G. Rouse  
                         D. A. Nix  
                         J. O. Barbour  
                         ELL EC050  
                         R. L. Gill - EC12R  
                         ISI Relief Request File

bxc (w/o attchs):    B. W. Carney  
                         M. B. Chapman  
                         J. C. Shropshire

## Attachment 1

### Responses to RAI Questions

Q#1: Provide the coverage obtained by each scan performed on the subject welds. Also provide an explanation, including sketches if necessary, describing how the interference, joint configuration, and piping geometry prevent 100 percent coverage.

A: Pressurizer - Copies of the examination data (including sketches of the coverage obtained) are included as Attachments 2, 3, and 4. Due to the taper on the nozzle side of the weld, it is impossible to perform any examinations from this side. Therefore, all scans were performed from the pipe side of the weld.

Steam Generator Tube Sheet to Shell Weld - Copies of the examination data (including sketches of the coverage obtained) are included as Attachment 5. The examination coverage limitations are a result of the location of restraints and insulation brackets.

Q#2: The justification for this relief includes ultrasonic examination of the welds, including inside radii, to the extent practical within the limits of original design and construction. Are the nozzle inner radius sections to be addressed in this relief request? If so, the information requested in question number 1 will be required for the inner radius sections also.

A: Duke Power is not seeking relief for the examination of the nozzle inside radius sections.

## DUKE POWER COMPANY

Exam Start: 1401

Form NDE-UT-4A

## ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Finish: 1503

Revision 4

Station: Ocone

Unit: 1

Component/Weld ID: 1-P2R-WP33-2

Date: 11-16-95

Weld Length (in.): 36"

Surface Condition: AS Ground

Lo: 9.2.3

Surface Temperature: 74 ° F

Pyrometer S/N: MCNIDE 27021

Cal Due: 9/6/03

Examiner: Larry Mauldin

Level: III

Scans:

45 ☒ 55 dB 70 ☒ 65.5 dB

Examiner: J. L. Pamel

Level: I

45T ☒ 55 dB 70T ☒ 65.5 dBProcedure: NDE G20  
NDE G40 Rev: 2FC: 91-05  
95-18, 95-1960 ☒ 67 dB

Calibration Sheet No:

9501061 9501063

9501062 9501064

60T ☒ 67 dB

Other: 0° - 41 dB

Configuration: NOZ. WELD

S<sub>1</sub> Flow S<sub>2</sub>

HEAD to NOZZLE

Scan Surface: OD

Applies to NDE-680 only

Skew Angle: N/A

IND #	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir	Exam surf.	Scan	Damps
	DO NOT WRITE IN THIS SPACE				20% dac HMA	20% dac HMA	20% dac HMA	20% dac HMA	20% dac HMA	20% dac HMA	DO NOT WRITE IN THIS SPACE			
					50% dac	50% dac	50% dac	50% dac	50% dac	50% dac				
					100% dac	100% dac	100% dac	100% dac	100% dac	100% dac				
1	45°	50	6.99	5.2	20"	360	INT.				2	1	DX	No
2	60°	63	8.2	8.8	20"	360	INT.				2	1	DX	No
	45°/60°		No	OTHER	RECORDABLE INDICATIONS									
	0°/70°		No	RECORDABLE	INDICATIONS									

Remarks: 'W' LOCATION WAS MEASURED FROM NOZZLE

Limitations: (see NDE-UT-4) ☒90% or greater coverage obtained: yes ☐no ☒

Sheet 1 of 4

Reviewed By:

Level: II

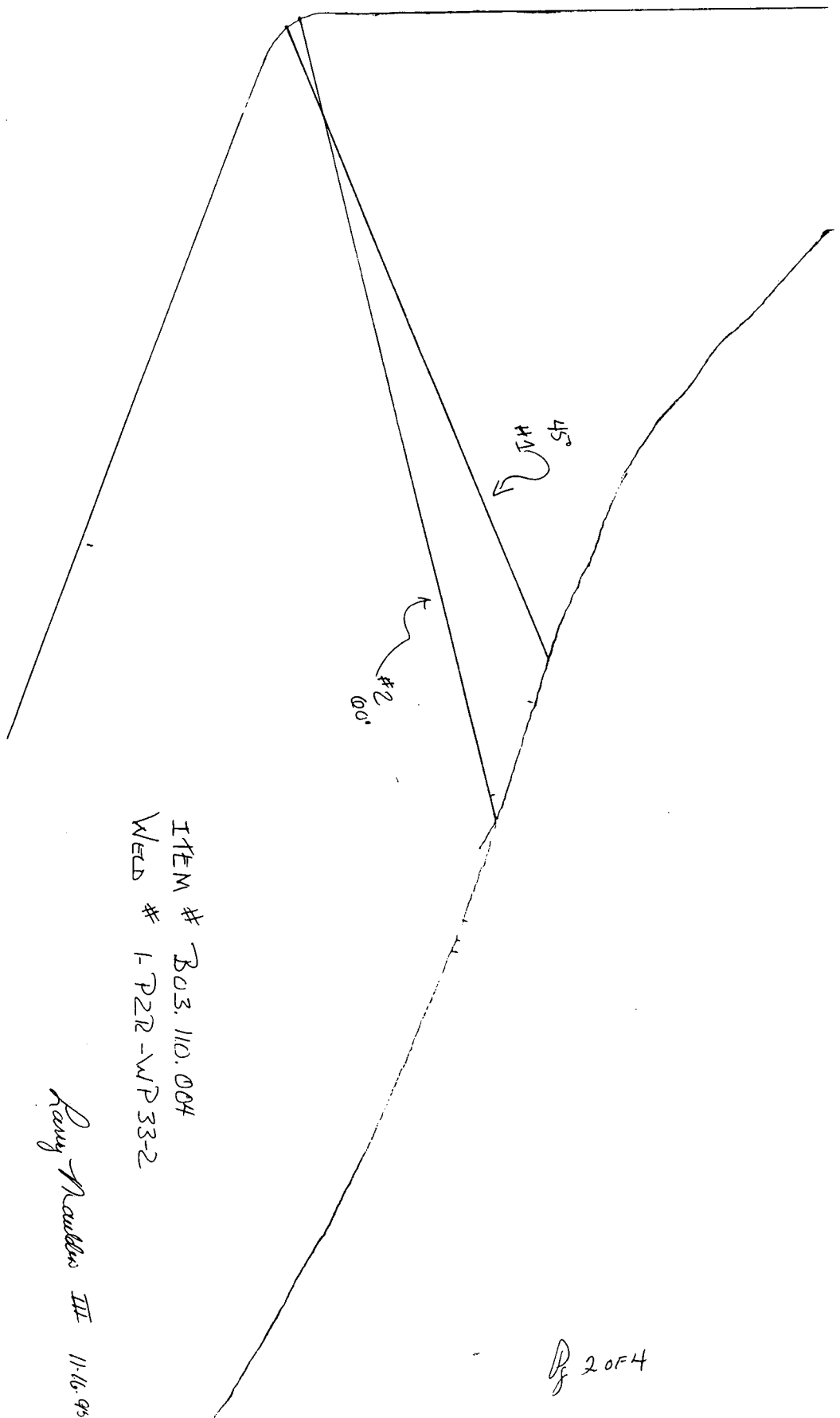
Date: 11-20-95

Authorized Inspector

Date: 11-24-95

Item No:

B03.110.004



ITEM # BO3.110.004  
WELD # 1-P222-WP33-2

Randy Moulton III 11-16-95

# DUKE POWER COMPANY

## ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: 1-P2R-WP 33-2 Item No: B03. 110.004

remarks:

lifting lug

DUE TO NOZZLE  
CONFIGURATION

Sketch(s) attached  
☐ yes ☒ no

☒ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw  
FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO 7.0" to BEYOND  
ANGLE: ☐ 0 ☒ 45 ☒ 60 other \_\_\_\_\_ FROM 150° DEG to 210° DEG

☒ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☒ cw ☐ ccw  
FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO 1.75" to BEYOND  
ANGLE: ☐ 0 ☒ 45 ☒ 60 other 70° FROM 0 DEG to 360 DEG

☐ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw  
FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO \_\_\_\_\_ to \_\_\_\_\_  
ANGLE: ☐ 0 ☐ 45 ☐ 60 other \_\_\_\_\_ FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

☐ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw  
FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO \_\_\_\_\_ to \_\_\_\_\_  
ANGLE: ☐ 0 ☐ 45 ☐ 60 other \_\_\_\_\_ FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

Prepared By: Larry Mauldin

Level: III Date: 11-16-95

Sheet 3 of 4

Reviewed By: Larry Moss

Date: 11-20-95

Authorized Inspector: 11/16/95

Date: 11-24-95



## DUKE POWER COMPANY

Form NDE-UT-8

## ULTRASONIC INDICATION RESOLUTION SHEET

Revision 1

## Acceptance Standard:

After reviewing previous data and plotting  
indications, it was determined that indications #1 & 2  
were geometric. This was due to inner radius  
geometry.

Acceptable Indications: 1 &amp; 2

## Rejectable Indications:

These indications have been compared with previous ultrasonic data

☒ yes☐ No previous data available

Examiner

Larry Mauldin

Level:

III

Date:

11-16-95

Sheet 4 of 4

Reviewer:

Gary Moss

Level:

ID

Date:

11-20-95

Authorized Inspector:

JMC

Date:

11-24-95

NDE-91-1

## Limited Examination Coverage Worksheet

Revision 0

### Examination Volume/Area Defined

Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius ☐

### Area Calculation

Sq AREA = 19.76 cm.

### Volume Calculation

LENGTH 36"

711.36 cu. ft.

## Coverage Calculations

[illegible]

Item No: B03,110.004

Prepared BY: Erin Mauldin

Level: III

**Date:** 11-19-95

Reviewed By: Jan. 11/2021

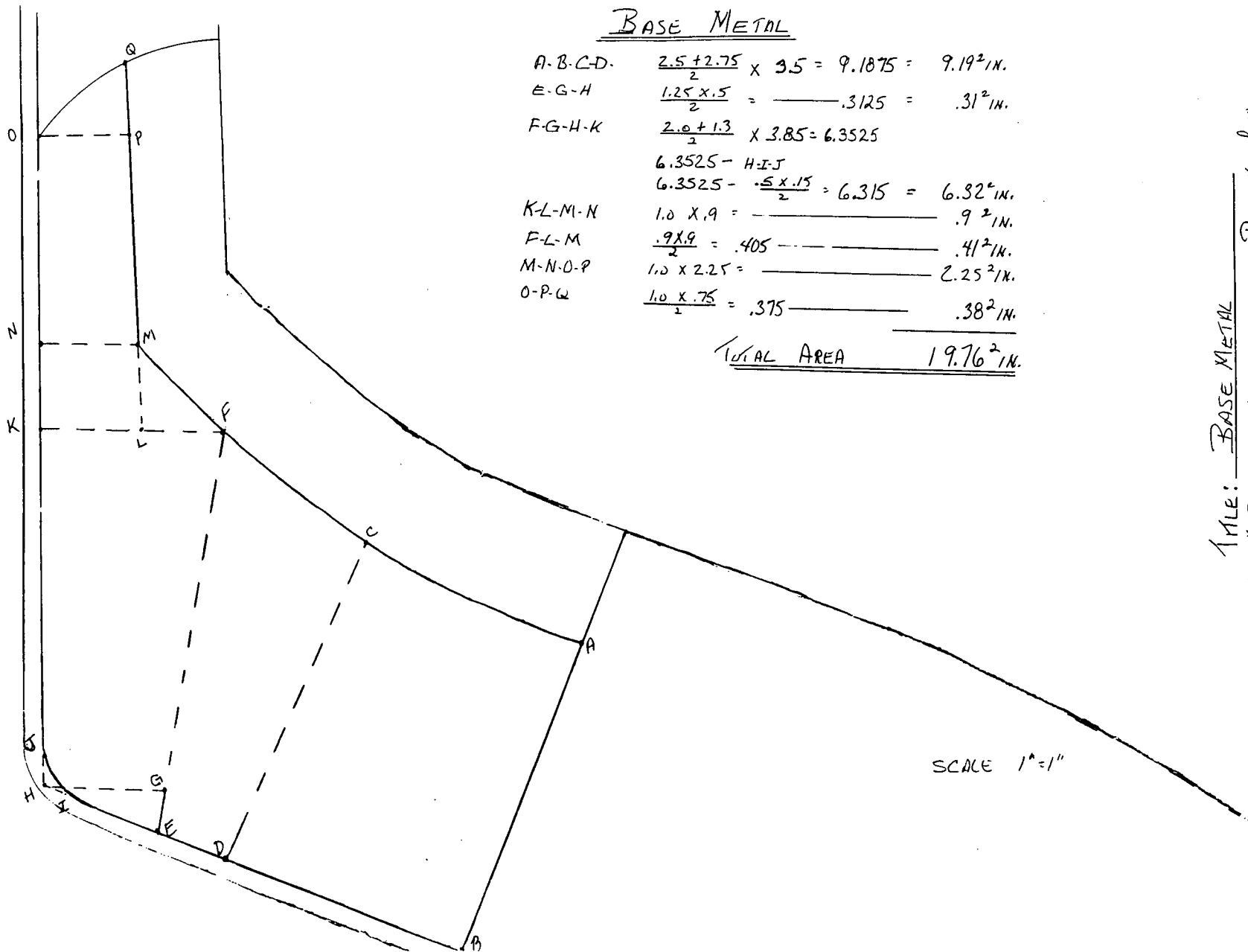
Level: 75

Date: 11-20-95

1 of 10







# BASE METAL

$$A-B-C-D. \frac{2.5+2.75}{2} \times 3.5 = 9.1875 = 9.19^2 \text{ IN.}$$

$$E-G-H \frac{1.25 \times 1.5}{2} = .3125 = .31^2 \text{ IN.}$$

$$F-G-H-K \frac{2.0+1.3}{2} \times 3.85 = 6.3525$$

$$6.3525 - H-I-J$$

$$6.3525 - \frac{.5 \times 1.5}{2} = 6.315 = 6.32^2 \text{ IN.}$$

$$K-L-M-N 1.0 \times .9 = .9^2 \text{ IN.}$$

$$P-L-M \frac{.9 \times .9}{2} = .405 = .41^2 \text{ IN.}$$

$$M-N-O-P 1.0 \times 2.25 = 2.25^2 \text{ IN.}$$

$$O-P-Q \frac{1.0 \times .75}{2} = .375 = .38^2 \text{ IN.}$$

$$\text{TOTAL AREA } 19.76^2 \text{ IN.}$$

SCALE 1"=1"

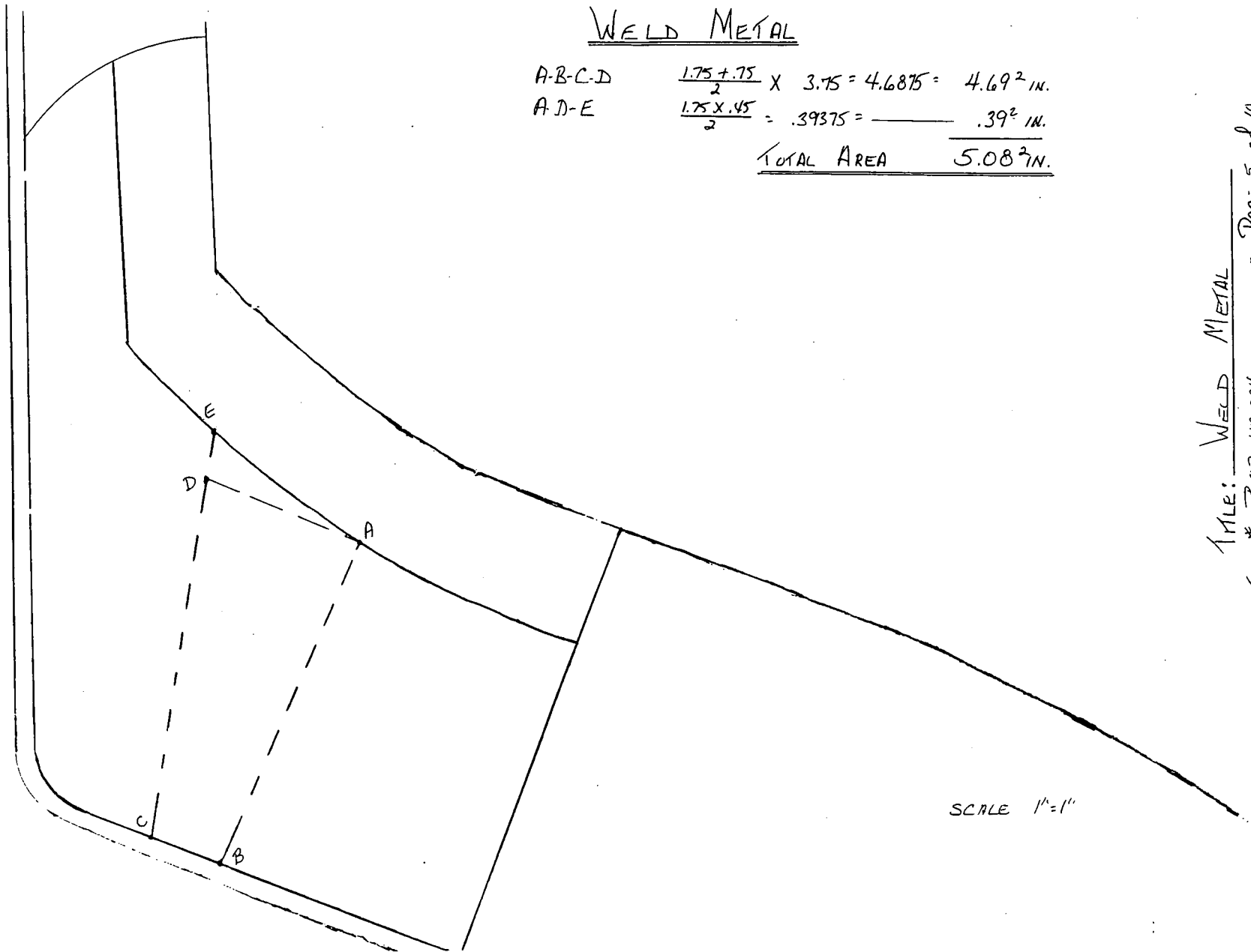
FILE: BASE METAL  
ITEM # 303.110.004  
By: Jimmy Moulton  
PAGE 4 of 10  
LEVEL # DATE 11-19-95

# WELD METAL

$$A-B-C-D \quad \frac{1.75 + .75}{2} \times 3.75 = 4.6875 = 4.69^2 \text{ IN.}$$

$$A-D-E \quad \frac{1.75 \times .45}{2} = .39375 = \text{---} .39^2 \text{ IN.}$$

$$\text{TOTAL AREA} \quad \underline{\underline{5.08^2 \text{ IN.}}}$$



FILE: WELD METAL

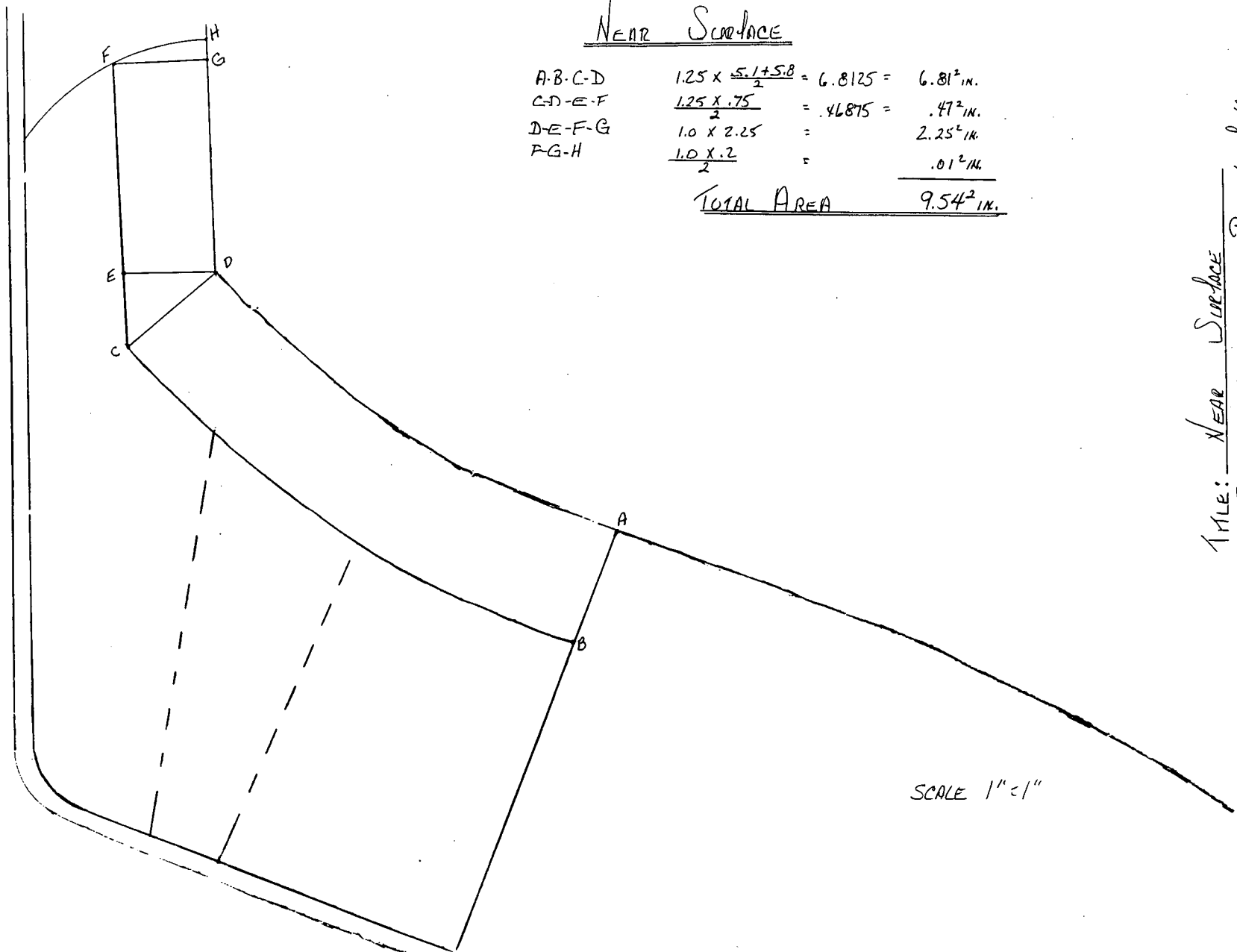
ITEM # BO3.110.004

PAGE 5 of 10

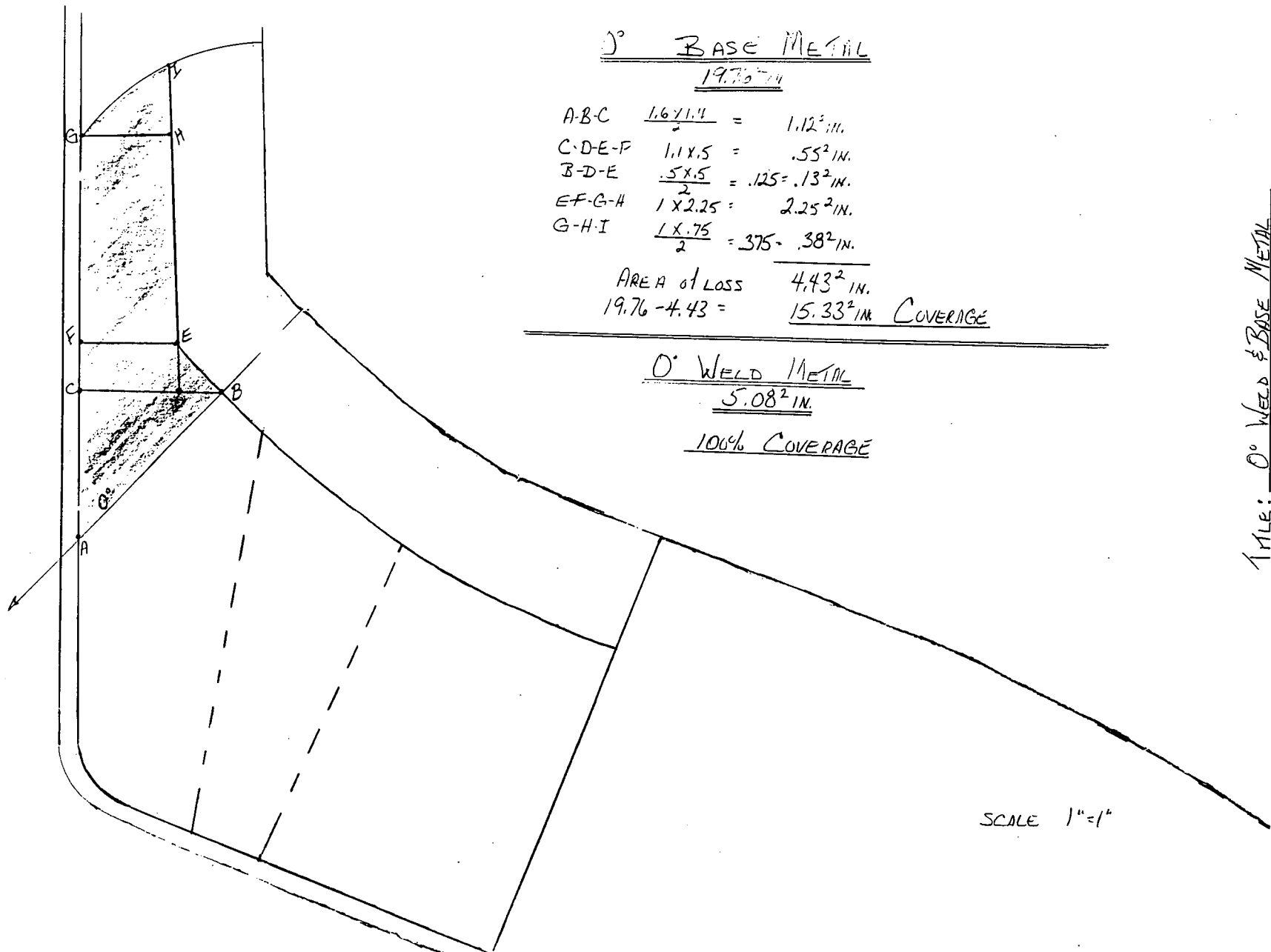
By: Barry Maudlin

LEVEL III

DATE 11/9/95



TITLE: NEAR SURFACE  
 ITEM # BOB 110.004 PAGE 6 of 10  
 By: Larry Maudlin LEVEL III DATE 11-19-95



0° BASE METAL

19.76<sup>2</sup> IN.

$$A-B-C \quad \frac{1.6 \times 1.4}{2} = 1.12^2 \text{ IN.}$$

$$C-D-E-F \quad \frac{1.1 \times .5}{2} = .55^2 \text{ IN.}$$

$$B-D-E \quad \frac{.5 \times .5}{2} = .125 = .13^2 \text{ IN.}$$

$$E-F-G-H \quad \frac{1 \times 2.25}{2} = 2.25^2 \text{ IN.}$$

$$G-H-I \quad \frac{1 \times .75}{2} = .375 = .38^2 \text{ IN.}$$

$$\text{AREA of LOSS} \quad 4.43^2 \text{ IN.}$$

$$19.76 - 4.43 = 15.33^2 \text{ IN. COVERAGE}$$

0° WELD METAL

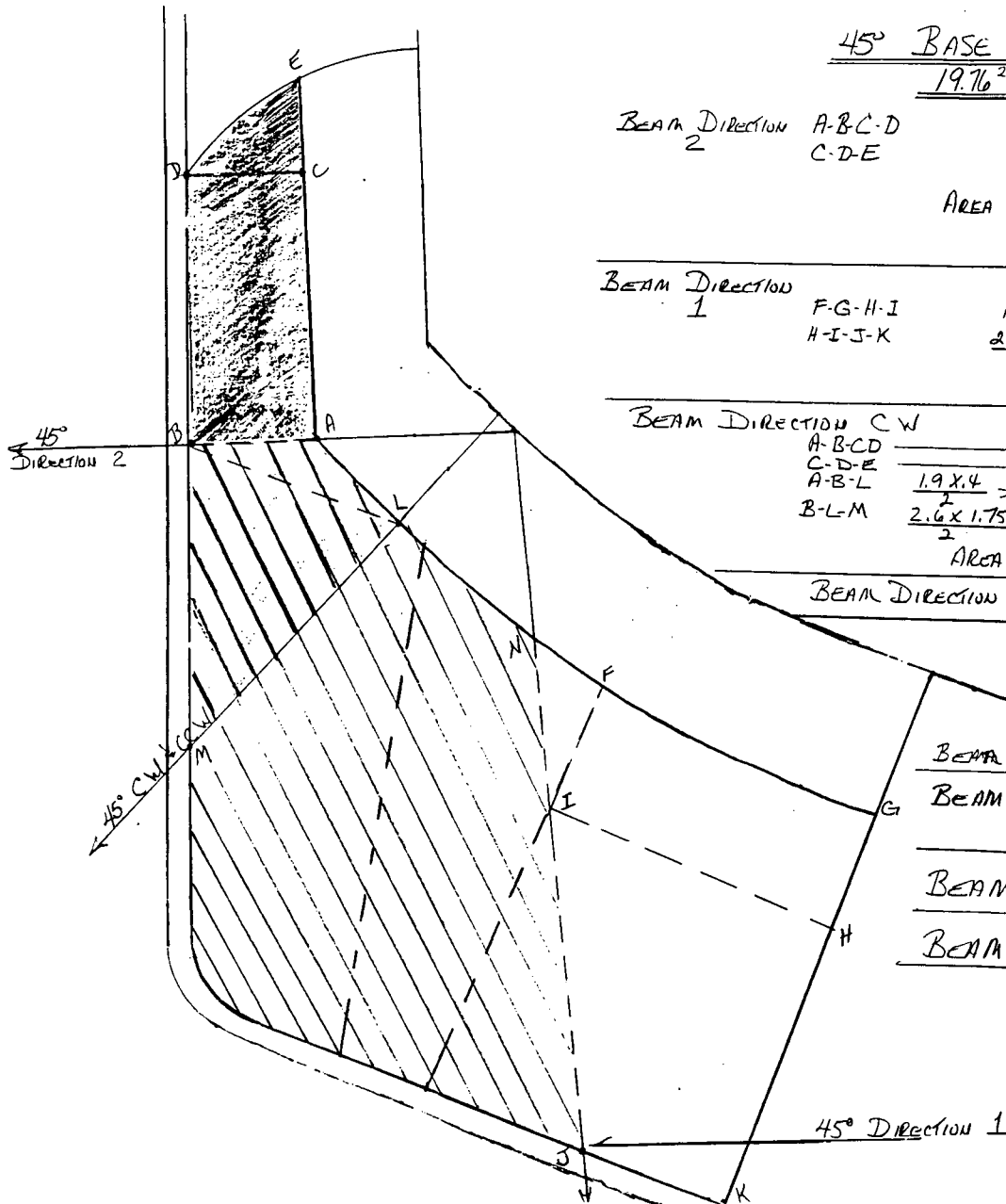
5.08<sup>2</sup> IN.

100% COVERAGE

SCALE 1"=1"

TITLE: 0° WELD & BASE METAL  
ITEM # 303.110.004  
BY: LARRY M. Moulder  
PAGE 2 of 10  
DATE 11/19/95





# 45° BASE METAL

19.76<sup>2</sup> IN.

BEAM DIRECTION 2  
A-B-C-D  
C-D-E

$$1.0 \times 2.25 = 2.25^2 \text{ IN.}$$

$$\frac{1.0 \times 7.5}{2} = .375 = .38^2 \text{ IN.}$$

AREA OF LOSS 2.63<sup>2</sup> IN.

$$19.76 - 2.63 = 17.13^2 \text{ IN. COVERAGE}$$

BEAM DIRECTION 1

F-G-H-I  
H-I-J-K

$$1.1 \times 2.55 = 1.4025 = 1.40^2 \text{ IN.}$$

$$\frac{2.55 + 1.3}{2} \times 2.55 = 4.90875 = 4.91^2 \text{ IN.}$$

6.31<sup>2</sup> IN. COVERAGE

BEAM DIRECTION CW

A-B-C-D

$$2.25^2 \text{ IN.}$$

$$19.76^2 \text{ IN.}$$

C-D-E

$$.38^2 \text{ IN.}$$

$$- 5.29^2 \text{ IN.}$$

A-B-L

$$\frac{1.9 \times 4}{2} =$$

$$.38^2 \text{ IN.}$$

B-L-M

$$\frac{2.6 \times 1.75}{2} = 2.275 = 2.28^2 \text{ IN.}$$

14.47<sup>2</sup> IN. COVERAGE

AREA OF LOSS 5.29<sup>2</sup> IN.

BEAM DIRECTION CCW SAME AS CW 14.47<sup>2</sup> IN. COVERAGE

## WELD METAL

5.08<sup>2</sup> IN.

BEAM DIRECTION 2 100% 5.08<sup>2</sup> IN. COVERAGE

BEAM DIRECTION 1 F-I-N  $\frac{1.4 \times .5}{2} = .35^2 \text{ IN. COVERAGE}$

BEAM DIRECTION CW 100% 5.08<sup>2</sup> IN. COVERAGE

BEAM DIRECTION CCW 100% 5.08<sup>2</sup> IN. COVERAGE

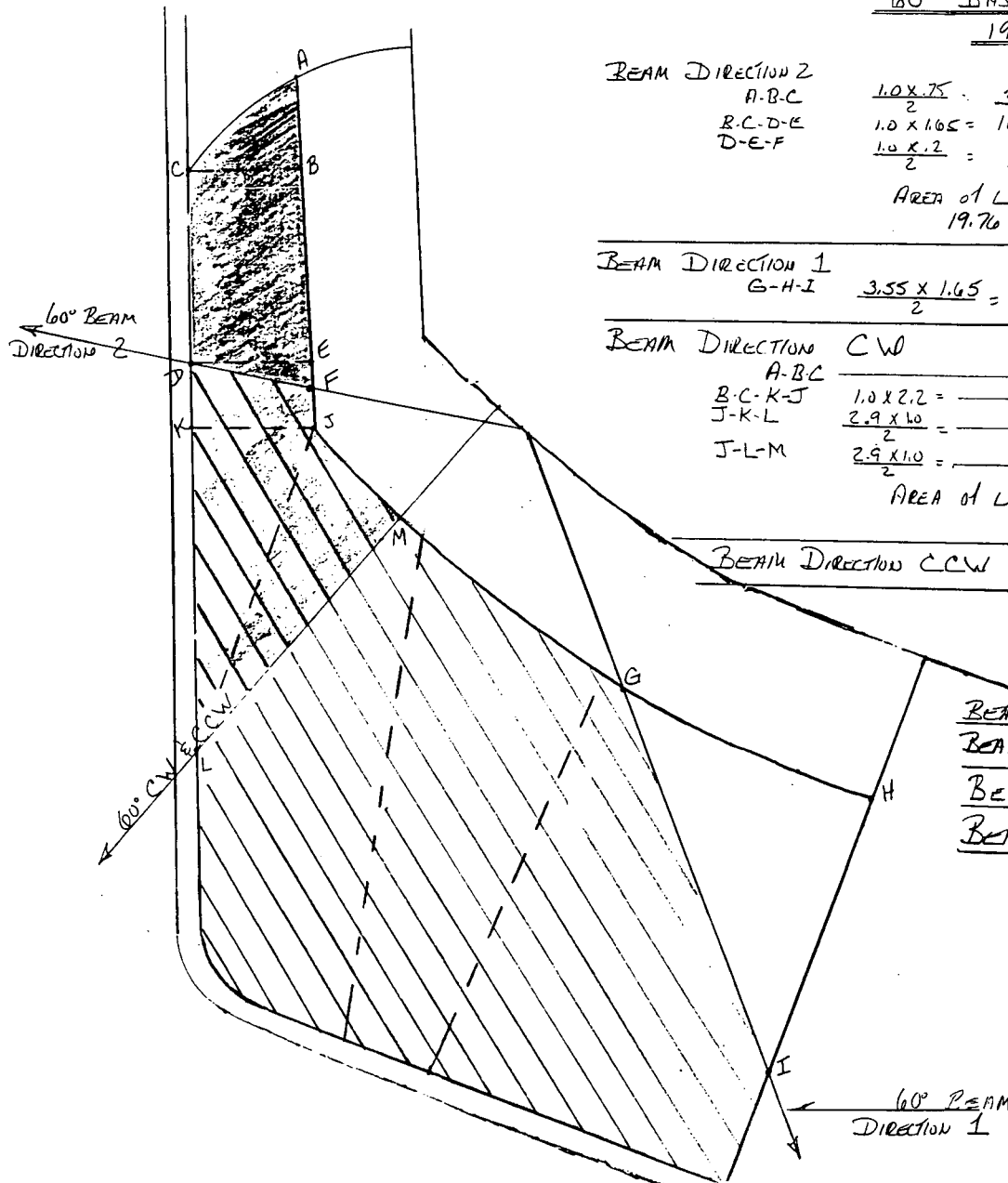
SCALE 1"=1"

FILE: 45° WELD & BASE METAL

ITEM # B.03.10.004 PAGE 8 of 10

By: Jimmy Moulden

Level III DATE 11-19-95



# 60° BASE METAL 19.76<sup>2</sup> IN.

BEAM DIRECTION 2			
A-B-C	$\frac{1.0 \times .75}{2} = .375$		.38 <sup>2</sup> IN.
B-C-D-E	$1.0 \times 1.65 = 1.65$		1.65 <sup>2</sup> IN.
D-E-F	$\frac{1.0 \times .2}{2} = .1$		.10 <sup>2</sup> IN.
AREA OF LOSS		2.13 <sup>2</sup> IN.	
19.76 - 2.13 =		17.63 <sup>2</sup> IN. COVERAGE	

BEAM DIRECTION 1			
G-H-I	$\frac{3.55 \times 1.65}{2} = 2.92875$		2.93 <sup>2</sup> IN. COVERAGE

BEAM DIRECTION CW			
A-B-C			.38 <sup>2</sup> IN.
B-C-K-J	$1.0 \times 2.2 =$		2.2 <sup>2</sup> IN.
J-K-L	$\frac{2.9 \times 1.0}{2} =$		1.45 <sup>2</sup> IN.
J-L-M	$\frac{2.9 \times 1.0}{2} =$		1.45 <sup>2</sup> IN.
AREA OF LOSS		5.48 <sup>2</sup> IN.	
19.76 - 5.48 =		14.28 <sup>2</sup> IN. COVERAGE	

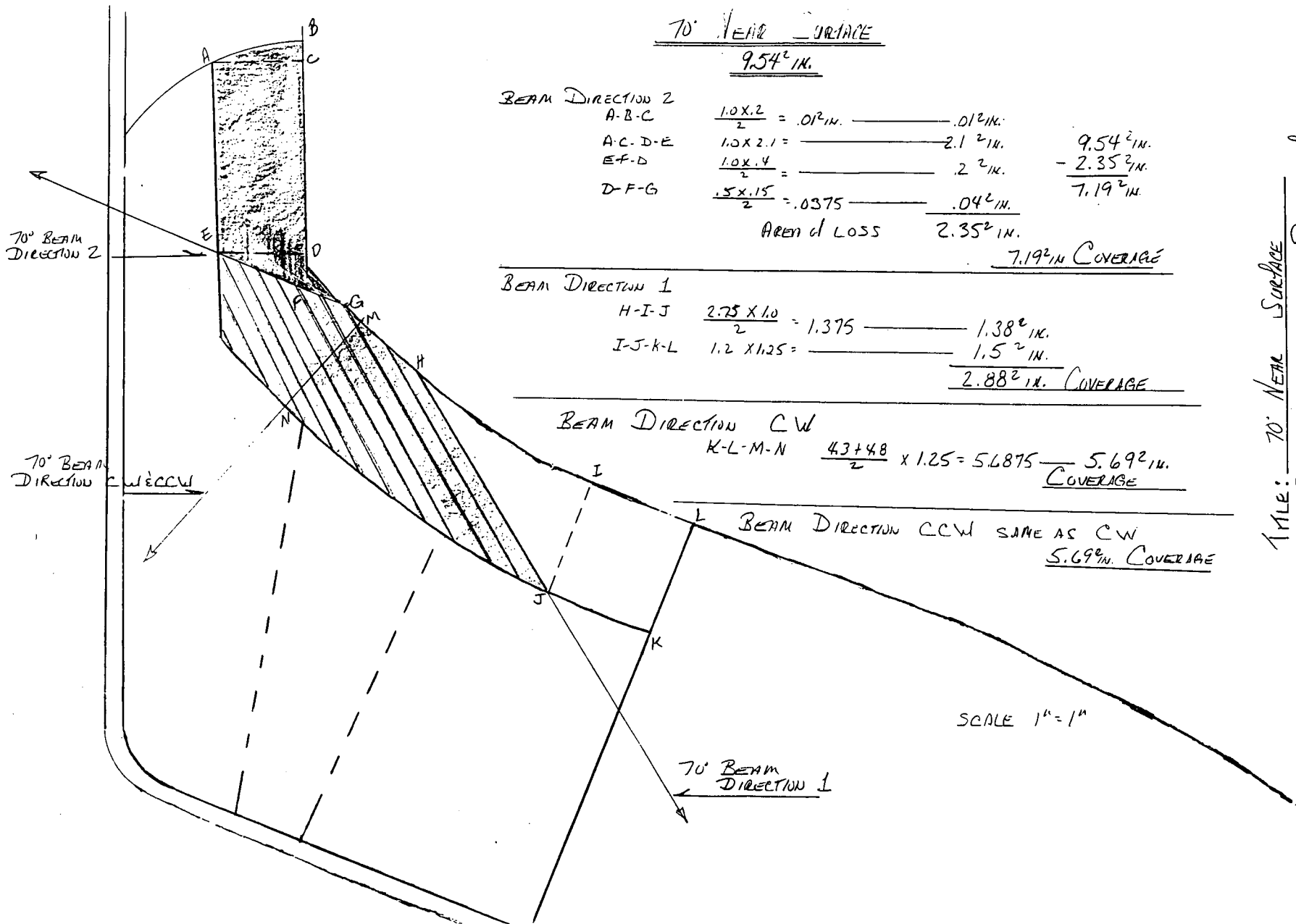
BEAM DIRECTION CCW SAME AS CW 14.28<sup>2</sup> IN. COVERAGE

# WELD METAL 5.08<sup>2</sup> IN.

BEAM DIRECTION 1	TOTAL LOSS	0.0 <sup>2</sup> IN. COVERAGE
BEAM DIRECTION 2	100%	5.08 <sup>2</sup> IN. COVERAGE
BEAM DIRECTION CW	100%	5.08 <sup>2</sup> IN. COVERAGE
BEAM DIRECTION CCW	100%	5.08 <sup>2</sup> IN. COVERAGE

SCALE 1"=1"

FILE: 60° WELD & BASE METAL  
ITEM # 303.110.004 PAGE 2 of 10  
BY: Larry Plaudine Level III DATE 11/9/95



70' NEAR SURFACE

9.54<sup>2</sup> IN.

BEAM DIRECTION 2

A-B-C

$$\frac{1.0 \times 2}{2} = .01^2 \text{ IN.} \quad .01^2 \text{ IN.}$$

A-C-D-E

$$\frac{1.0 \times 2.1}{2} = \quad .21^2 \text{ IN.}$$

9.54<sup>2</sup> IN.

E-F-D

$$\frac{1.0 \times .4}{2} = \quad .2^2 \text{ IN.}$$

- 2.35<sup>2</sup> IN.

D-F-G

$$\frac{.5 \times .15}{2} = .0375 \quad .04^2 \text{ IN.}$$

7.19<sup>2</sup> IN.

AREA of LOSS 2.35<sup>2</sup> IN.

7.19<sup>2</sup> IN. COVERAGE

BEAM DIRECTION 1

H-I-J

$$\frac{2.75 \times 1.0}{2} = 1.375 \quad 1.38^2 \text{ IN.}$$

I-J-K-L

$$1.2 \times 1.25 = \quad 1.5^2 \text{ IN.}$$

2.88<sup>2</sup> IN. COVERAGE

BEAM DIRECTION CW

$$K-L-M-N \quad \frac{43+48}{2} \times 1.25 = 5.6875 \quad 5.69^2 \text{ IN.}$$

COVERAGE

BEAM DIRECTION CCW SAME AS CW

5.69<sup>2</sup> IN. COVERAGE

FILE: 70' NEAR SURFACE

ITEM # 803.10.004

PAGE 10 of 10

By: Kelly Moulton

LEVEL III DATE 11/19/95

## DUKE POWER COMPANY

Exam Start: 1416

Form NDE-9A

## ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Finish: 1519

Revision 4

Station: Ocone

Unit: 1

Component/Weld ID: 1-P2R-WP33.3

Date: 11-16-95

Weld Length (in.): 36"

Surface Condition: As Ground

Lo: 9.2.3

Surface Temperature: 74 ° F

Examiner: Larry Moulton Level: III

Scans:

45 ☒ 55 dB 70 ☒ 65.5 dB

Pyrometer S/N: MCNDE 27021

Cal Due: 96 10 03

Examiner: J. J. Panel Level: I

45T ☒ 55 dB 70T ☒ 65.5 dB

Configuration: NOZZLE WELD

Procedure: NDE 620 2  
NDE 640 Rev: 1  
FC: 91-05  
95-18, 95-19S Flow S2  
HEAD to NOZZLECalibration Sheet No:  
9501061 9501063  
9501062 950106460 ☒ 67 dB  
60T ☒ 67 dB  
Other: 0° 41 dB

Scan Surface: OD

Applies to NDE-680 only

Skew Angle: N/A

IND #	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir	Exam surf.	Scan	Damps
	DO NOT WRITE IN THIS SPACE				20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	DO NOT WRITE IN THIS SPACE			
					50%dac	50%dac	50%dac	50%dac	50%dac	50%dac				
					100% dac	100% dac	100% dac	100% dac	100% dac	100% dac				
1	60	50	8.0	6.5	27"	360' IN.					2	1	AX	No
	100		No	OTHER	RECORDABLE	INDICATIONS								
	0/45°		No	RECORDABLE	INDICATIONS									
	70°		No	RECORDABLE	INDICATIONS									

Remarks: 'W' LOCATION WAS MEASURED FROM NOZZLE

Limitations: (see NDE-UT-4) ☒ 90% or greater coverage obtained: yes ☐ no ☒

Sheet 1 of 4

Reviewed By:

Level: II

Date: 11-20-95

Authorized Inspector

Date: 11-24-95

Item No:

B03.110.003

ITEM # 303.10.003  
WELD # 1-P22-WP33-3

Long Mueller III 11-16-95

2 of 4

60°  
T# 20

# DUKE POWER COMPANY

## ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: 1-P2R-WP33-3 Item No: B03.110.003

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☒ cw ☒ ccw  
 FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO 1.75 to Beyond  
 ANGLE: ☐ 0 ☒ 45 ☒ 60 other 70 FROM 0 DEG to 360 DEG

DUE TO NOZZLE  
CONFIGURATION

☐ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw  
 FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO \_\_\_\_\_ to \_\_\_\_\_  
 ANGLE: ☐ 0 ☐ 45 ☐ 60 other FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

☐ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw  
 FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO \_\_\_\_\_ to \_\_\_\_\_  
 ANGLE: ☐ 0 ☐ 45 ☐ 60 other FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

☐ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw  
 FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO \_\_\_\_\_ to \_\_\_\_\_  
 ANGLE: ☐ 0 ☐ 45 ☐ 60 other FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

Sketch(s) attached

☒ yes ☐ no

Prepared By: Randy Mueller

Level: III

Date: 11-16-95

Sheet 3 of 4

Reviewed By: Randy Moss

Date: 11-20-95

Authorized Inspector:

MBC

Date:

11-24-95

DUKE POWER COMPANY  
ULTRASONIC INDICATION RESOLUTION SHEET

Form NDE-UT-8

Revision 1

Acceptance Standard:

After receiving previous data and plotting  
indications, it was determined that indication #1  
were geometric. This was due to inner radius  
geometry.

WELD 1-PZR-WP 33-3

ITEM # B03. 110. 003

Acceptable Indications: #1

Rejectable Indications:

These indications have been compared with previous ultrasonic data ☒ yes ☐ No previous data available

Examiner Larry Mauldin

Level:

III

Date:

11-16-95

Sheet 5 of 4

Reviewer: Larry Moss

Level:

II

Date:

11-20-95

Authorized Inspector:

MBC

Date:

11-24-95

NDE-91-1

## Limited Examination Coverage Worksheet

Revision 0

### Examination Volume/Area Defined

Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius ☐

### Area Calculation

Sq AREA = 19.76  $\text{cm}^2$

### Volume Calculation

LENGTH 36"

711.36 сс. 14.

## Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
--------	-------	-------------------	------------------------------	----------------------------	--------------------------------	--------------------------------	------------------

	0°		15.33 <sup>2</sup> / <sub>N</sub>	36	551.88	711.36	77.58
Ax	45°	2	17.13 <sup>2</sup> / <sub>N</sub>	36	616.68	711.36	86.69
Ax	45°	1	6.31 <sup>2</sup> / <sub>N</sub>	36	227.16	711.36	31.93
CIRC	45	CW	14.47 <sup>2</sup> / <sub>N</sub>	36	520.92	711.36	73.23
Circ	45	CCW	14.47 <sup>2</sup> / <sub>N</sub>	36	520.92	711.36	73.23
Ax	60	2	17.63	36	634.68	711.36	89.22
Ax	60	1	2.93	36	105.48	711.36	14.83
CIRC	60	CW	14.28	36	514.08	711.36	72.27
CIRC	60	CCW	14.28	36	514.08	711.36	72.27

Item No: R03116 M03

Item No: B03.110.003

Prepared BY: East Thavdu

Level: III

**Date:** 11.19.95

Reviewed By: Dr. M. S. S. S.

Level: 7D

Date: 11-20-95



**NDE-91-1**

## Revision 0

Base Metal ☐ Weld ☒ Near Surface ☐ Bolting ☐ Inner Radius ☐

### Area Calculation

## Volume Calculation

Sq. AREA =  $5.08^2$  IN.

LENGTH 36"

102.88 см.м.

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
--------	-------	-------------------	------------------------------	----------------------------	--------------------------------	--------------------------------	------------------

	0		5.08 <sup>7</sup> / <sub>N</sub>	36	182.88	182.88	100
Ax	45	2	5.08 <sup>2</sup> / <sub>N</sub>	36	182.88	182.88	100
Ax	45	1	.35 <sup>2</sup> / <sub>N</sub>	36	12.6	182.88	6.9
Circ	45	CW	5.08 <sup>3</sup> / <sub>N</sub>	36	182.88	182.88	100
Circ	45	CCW	5.08 <sup>4</sup> / <sub>N</sub>	36	182.88	182.88	100
Ax	60	1	0	36	0	182.88	0
Ax	60	2	5.08 <sup>5</sup> / <sub>N</sub>	36	182.88	182.88	100
Circ	60	CW	5.08 <sup>6</sup> / <sub>N</sub>	36	182.88	182.88	100
Circ.	60	CCW	5.08 <sup>7</sup> / <sub>N</sub>	36	182.88	182.88	100

Item No: RA2 / 111 003

Item No: R03.110.003

**Prepared BY:**

**Level:** III

**Date:** 11-19-95

Reviewed By:

Level: 

**Date:** 11-20-95

2 of 10

## Limited Examination Coverage Worksheet

## Revision 0

Base Metal ☐ Weld ☐ Near Surface ☒ Bolting ☐ Inner Radius ☐

### Volume Calculation

343. 44 cell. m.

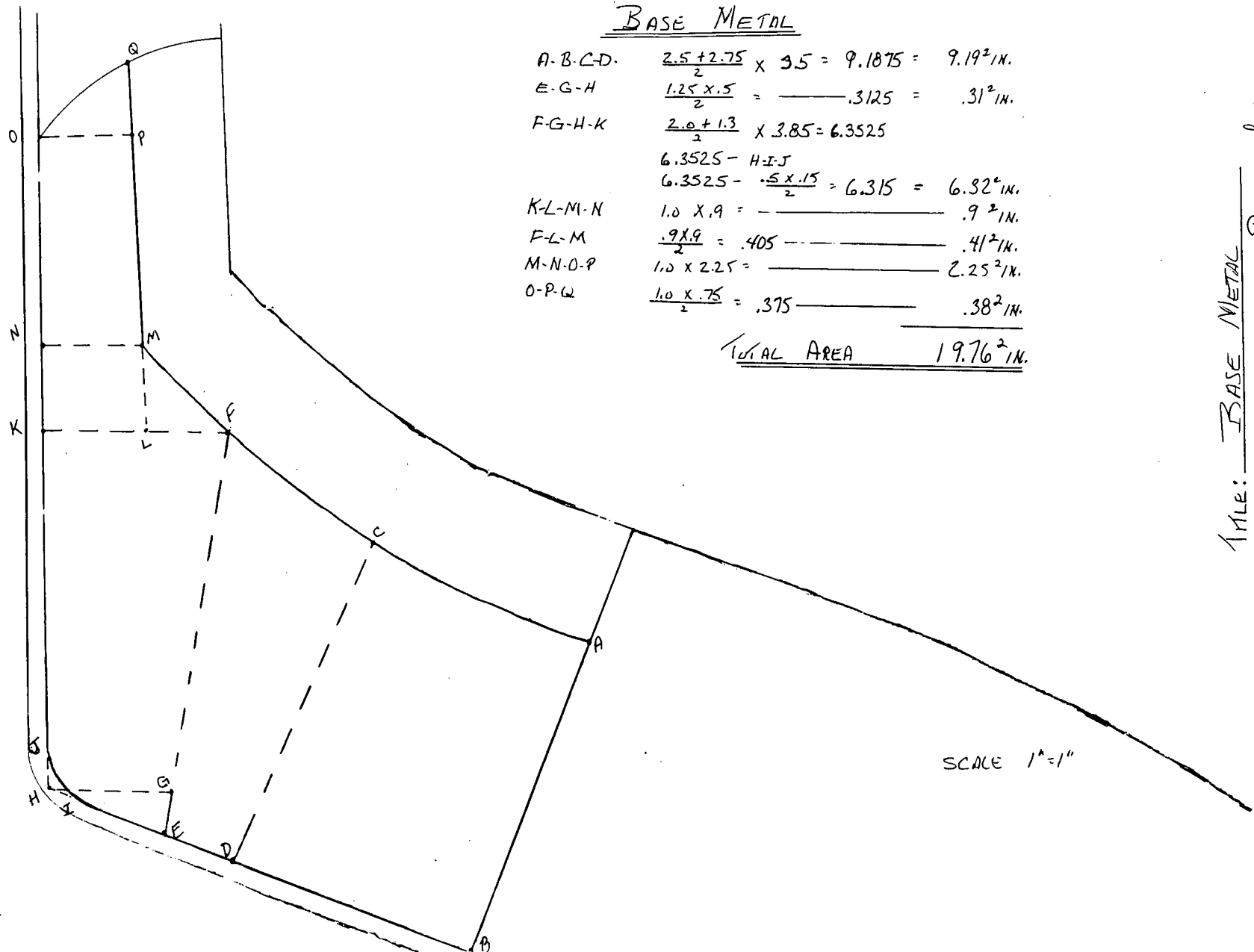
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
--------	-------	----------------	------------------------	----------------------	--------------------------	--------------------------	------------------

[illegible]

Item No: BO3.110.003

**Date:** 11-19-95

**Date:** 11-20-95



# BASE METAL

$$A-B-C-D \quad \frac{2.5 + 2.75}{2} \times 3.5 = 9.1875 = 9.19^2 \text{ IN.}$$

$$E-G-H \quad \frac{1.25 \times .5}{2} = \text{---} .3125 = .31^2 \text{ IN.}$$

$$F-G-H-K \quad \frac{2.0 + 1.3}{2} \times 3.85 = 6.3525$$

$$6.3525 - H-I-J$$

$$6.3525 - \frac{.5 \times .15}{2} = 6.315 = 6.32^2 \text{ IN.}$$

$$K-L-M-N \quad 1.0 \times .9 = \text{---} .9^2 \text{ IN.}$$

$$F-L-M \quad \frac{.9 \times .9}{2} = .405 \text{---} .41^2 \text{ IN.}$$

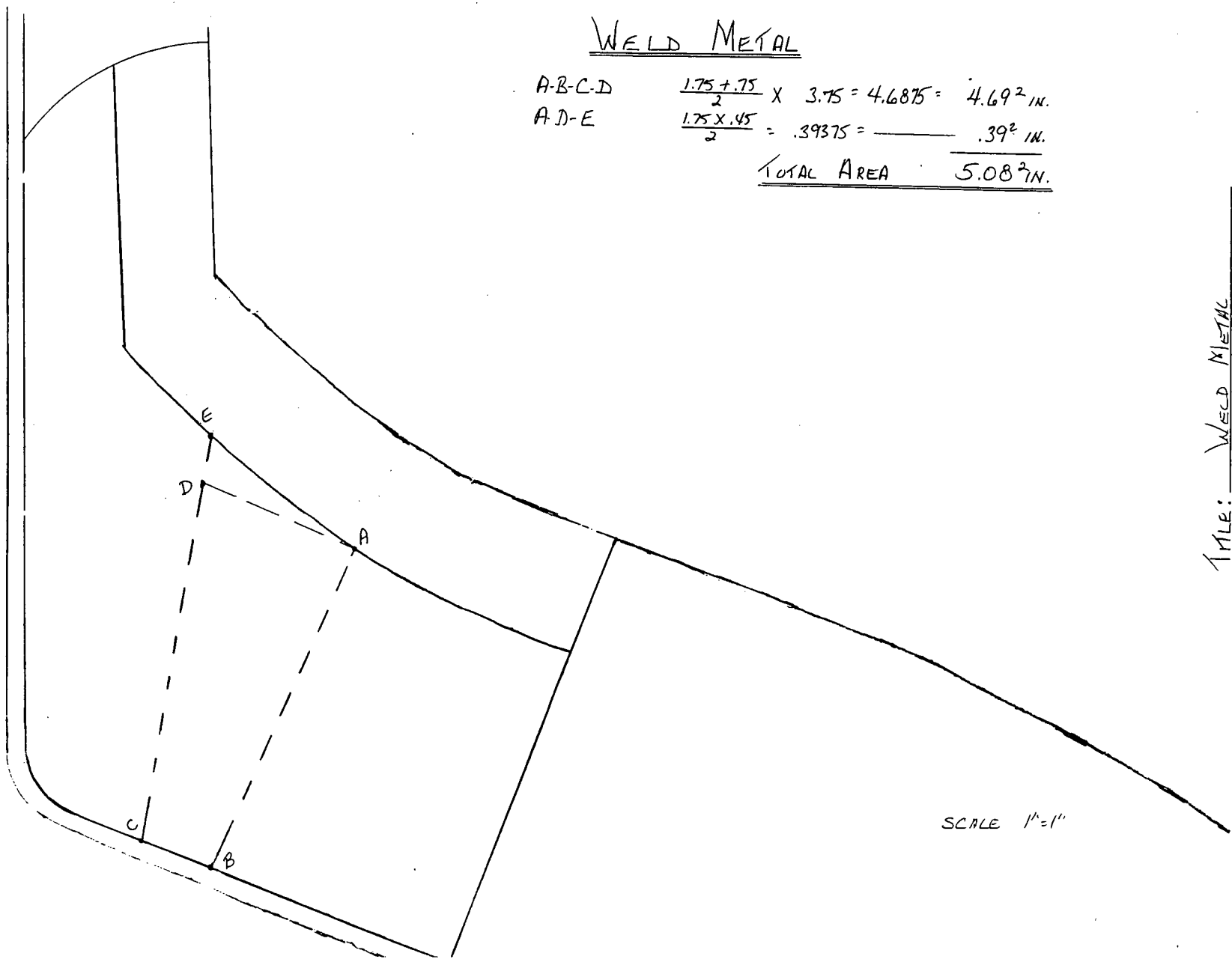
$$M-N-O-P \quad 1.0 \times 2.25 = \text{---} 2.25^2 \text{ IN.}$$

$$O-P-Q \quad \frac{1.0 \times .75}{2} = .375 \text{---} .38^2 \text{ IN.}$$

$$\text{TOTAL AREA} \quad 19.76^2 \text{ IN.}$$

SCALE 1"=1"

FILE: BASE METAL  
 ITEM # BOB 110.003 PAGE 4 of 10  
 BY: Long Hauler LEVEL III DATE 11/9/95



# WELD METAL

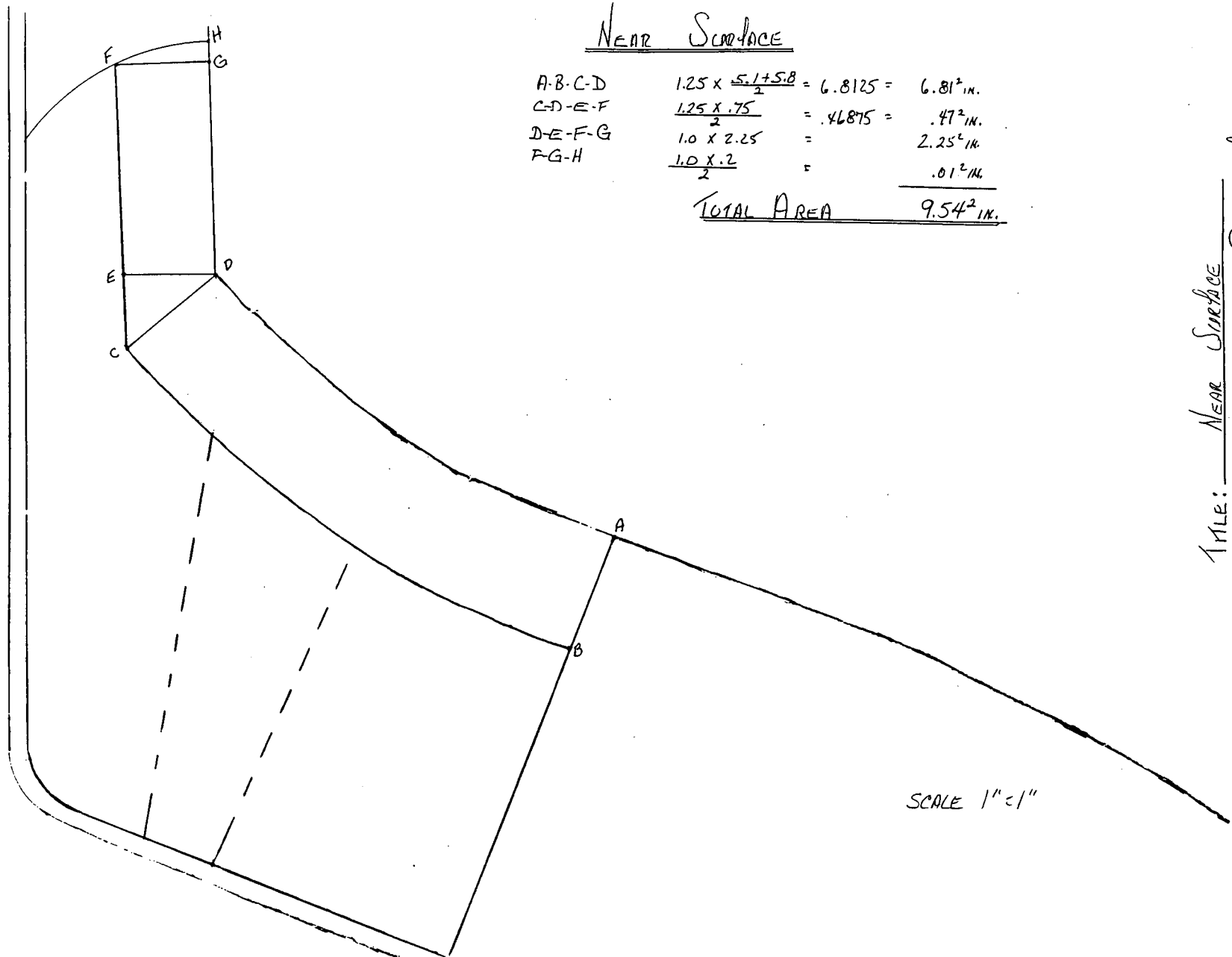
$$A-B-C-D \quad \frac{1.75 + .75}{2} \times 3.75 = 4.6875 = 4.69^2 \text{ IN.}$$

$$A-D-E \quad \frac{1.75 \times .45}{2} = .39375 = .39^2 \text{ IN.}$$

$$\text{TOTAL AREA} \quad 5.08^2 \text{ IN.}$$

SCALE 1"=1"

FILE: WELD METAL  
 ITEM # BO3.110.003 PAGE 5 OF 10  
 BY: Sam Maudlin LEVEL III DATE 11-14-95

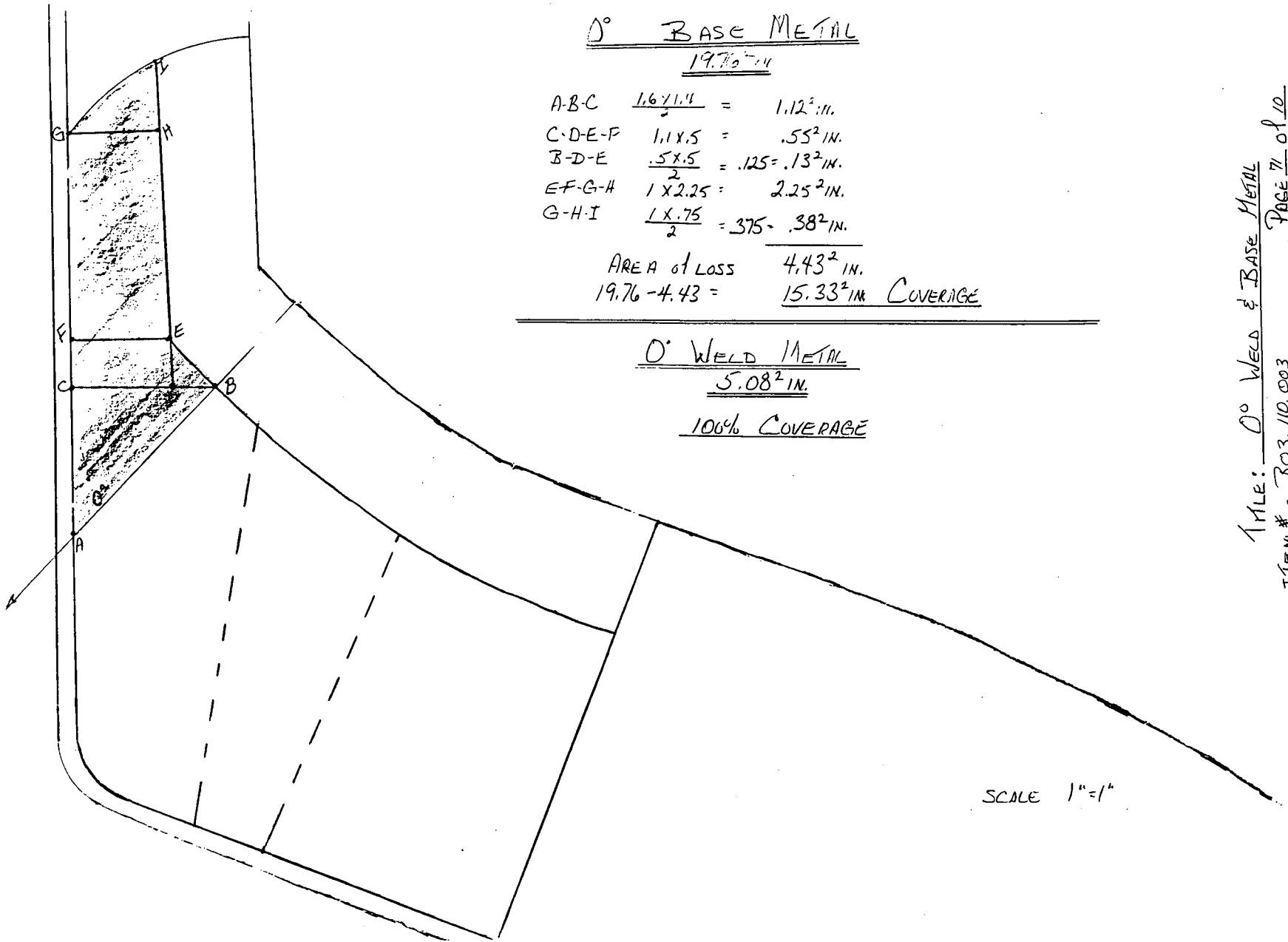


# NEAR SURFACE

A-B-C-D	$1.25 \times \frac{5.1+5.8}{2} = 6.8125 =$	$6.81^2 \text{ IN.}$
C-D-E-F	$\frac{1.25 \times .75}{2} = .46875 =$	$.47^2 \text{ IN.}$
D-E-F-G	$1.0 \times 2.25 =$	$2.25^2 \text{ IN.}$
F-G-H	$\frac{1.0 \times .2}{2} =$	$.01^2 \text{ IN.}$
<u>TOTAL AREA</u>		<u><math>9.54^2 \text{ IN.}</math></u>

SCALE 1"=1"

TITLE: NEAR SURFACE  
 ITEM # B03.110.003 PAGE 6 of 10  
 BY: Long Maule LEVEL III DATE 11/19/90



0° BASE METAL

19.76 IN.

$$A-B-C \quad \frac{1.6 \times 1.4}{2} = 1.12^2 \text{ IN.}$$

$$C-D-E-F \quad \frac{1.1 \times .5}{2} = .55^2 \text{ IN.}$$

$$B-D-E \quad \frac{.5 \times .5}{2} = .125 = .13^2 \text{ IN.}$$

$$E-F-G-H \quad \frac{1 \times 2.25}{2} = 2.25^2 \text{ IN.}$$

$$G-H-I \quad \frac{1 \times .75}{2} = .375 = .38^2 \text{ IN.}$$

$$\text{AREA of LOSS} \quad 4.43^2 \text{ IN.}$$

$$19.76 - 4.43 = 15.33^2 \text{ IN. COVERAGE}$$

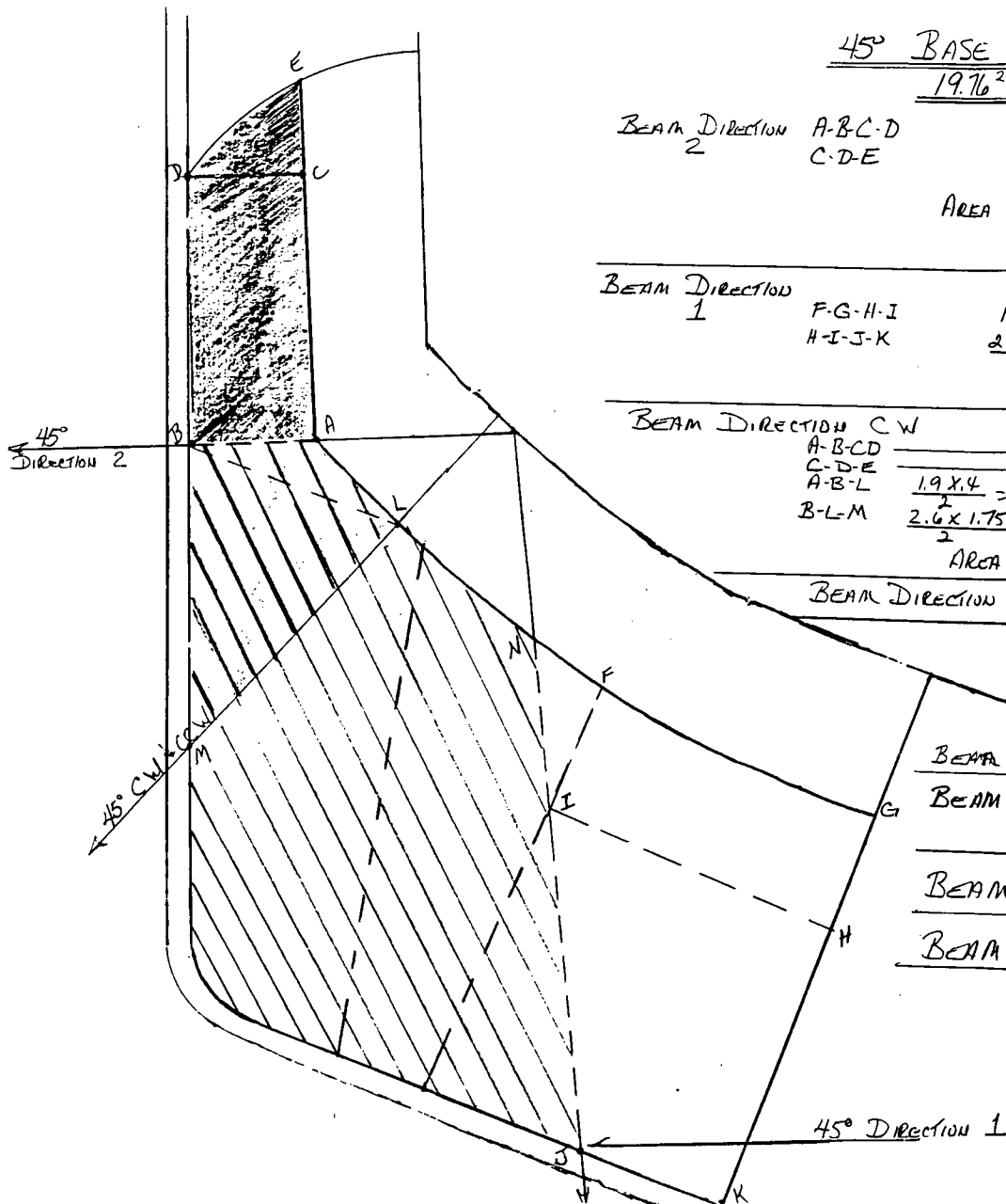
0° WELD METAL

5.08^2 IN.

100% COVERAGE

SCALE 1"=1"

TITLE: 0° WELD & BASE METAL  
 ITEM # 303.110.003 PAGE 71 of 10  
 BY: Larry Plauder LEVEL III DATE 11-19-90



# 45° BASE METAL

19.76<sup>2</sup> IN.

BEAM DIRECTION 2  
A-B-C-D  
C-D-E

$$1.0 \times 2.25 = 2.25^2 \text{ IN.}$$

$$\frac{1.0 \times 1.75}{2} = .375 = .38^2 \text{ IN.}$$

AREA of LOSS 2.63<sup>2</sup> IN.

$$19.76 - 2.63 = 17.13^2 \text{ IN. COVERAGE}$$

BEAM DIRECTION 1

F-G-H-I  
H-I-J-K

$$1.1 \times 2.55 = 1.4025 = 1.40^2 \text{ IN.}$$

$$\frac{2.55 + 1.3}{2} \times 2.55 = 4.90875 = 4.91^2 \text{ IN.}$$

$$6.31^2 \text{ IN. COVERAGE}$$

BEAM DIRECTION CW

A-B-C-D

$$2.25^2 \text{ IN.}$$

$$19.76^2 \text{ IN.}$$

C-D-E

$$.38^2 \text{ IN.}$$

$$- 5.29^2 \text{ IN.}$$

A-B-L

$$\frac{1.9 \times 1.4}{2} = .38^2 \text{ IN.}$$

B-L-M

$$\frac{2.6 \times 1.75}{2} = 2.275 = 2.28^2 \text{ IN.}$$

$$14.47^2 \text{ IN. COVERAGE}$$

AREA of LOSS 5.29<sup>2</sup> IN.

BEAM DIRECTION CCW SAME AS CW 14.47<sup>2</sup> IN. COVERAGE

# WELD METAL

$$5.08^2 \text{ IN.}$$

BEAM DIRECTION 2 100% 5.08<sup>2</sup> IN. COVERAGE

BEAM DIRECTION 1 F-I-N  $\frac{1.4 \times .5}{2} = .35^2 \text{ IN. COVERAGE}$

BEAM DIRECTION CW 100% 5.08<sup>2</sup> IN. COVERAGE

BEAM DIRECTION CCW 100% 5.08<sup>2</sup> IN. COVERAGE

SCALE 1"=1"

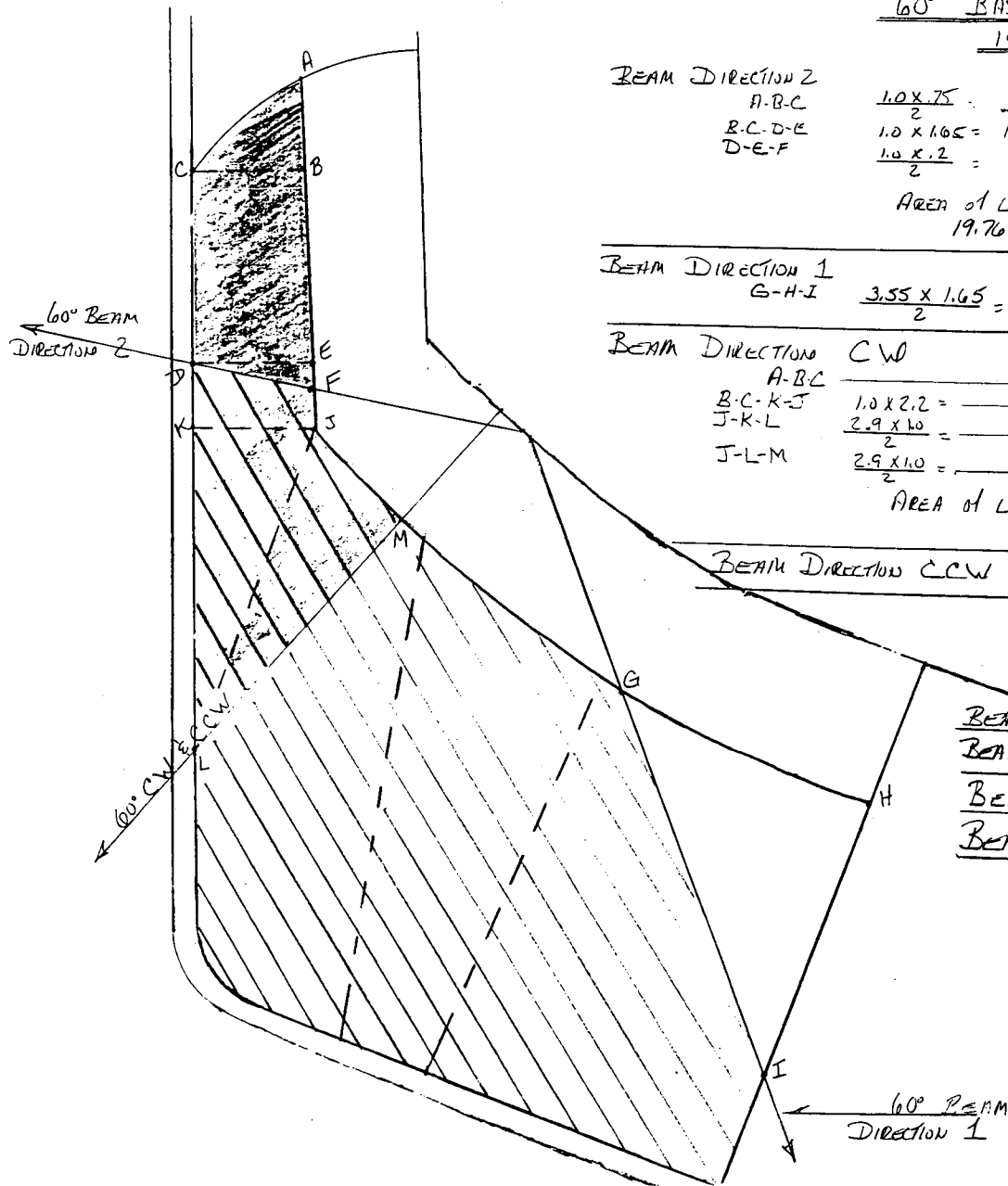
TITLE: 45° WELD & BASE METAL

ITEM # B03.10.003

PAGE 2 of 10

By: Larry Noulton

LEVEL III DATE 11/19/93



# 60° BASE METAL

19.76<sup>2</sup> IN.

## BEAM DIRECTION 2

A-B-C	$\frac{1.0 \times .75}{2} = .375$	$.38^2 \text{ IN.}$
B-C-D-E	$1.0 \times 1.65 = 1.65$	$1.65^2 \text{ IN.}$
D-E-F	$\frac{1.0 \times .2}{2} = .1$	$.10^2 \text{ IN.}$
AREA of LOSS		$2.13^2 \text{ IN.}$

$19.76 - 2.13 = 17.63^2 \text{ IN. COVERAGE}$

## BEAM DIRECTION 1

G-H-I  $\frac{3.55 \times 1.65}{2} = 2.92875 = 2.93^2 \text{ IN. COVERAGE}$

## BEAM DIRECTION CW

A-B-C		$.38^2 \text{ IN.}$
B-C-K-J	$1.0 \times 2.2 =$	$2.2^2 \text{ IN.}$
J-K-L	$\frac{2.9 \times 1.0}{2} =$	$1.45^2 \text{ IN.}$
J-L-M	$\frac{2.9 \times 1.0}{2} =$	$1.45^2 \text{ IN.}$
AREA of LOSS		$5.48^2 \text{ IN.}$

$19.76 - 5.48 = 14.28^2 \text{ IN. COVERAGE}$

BEAM DIRECTION CCW SAME AS CW  $14.28^2 \text{ IN. COVERAGE}$

## WELD METAL

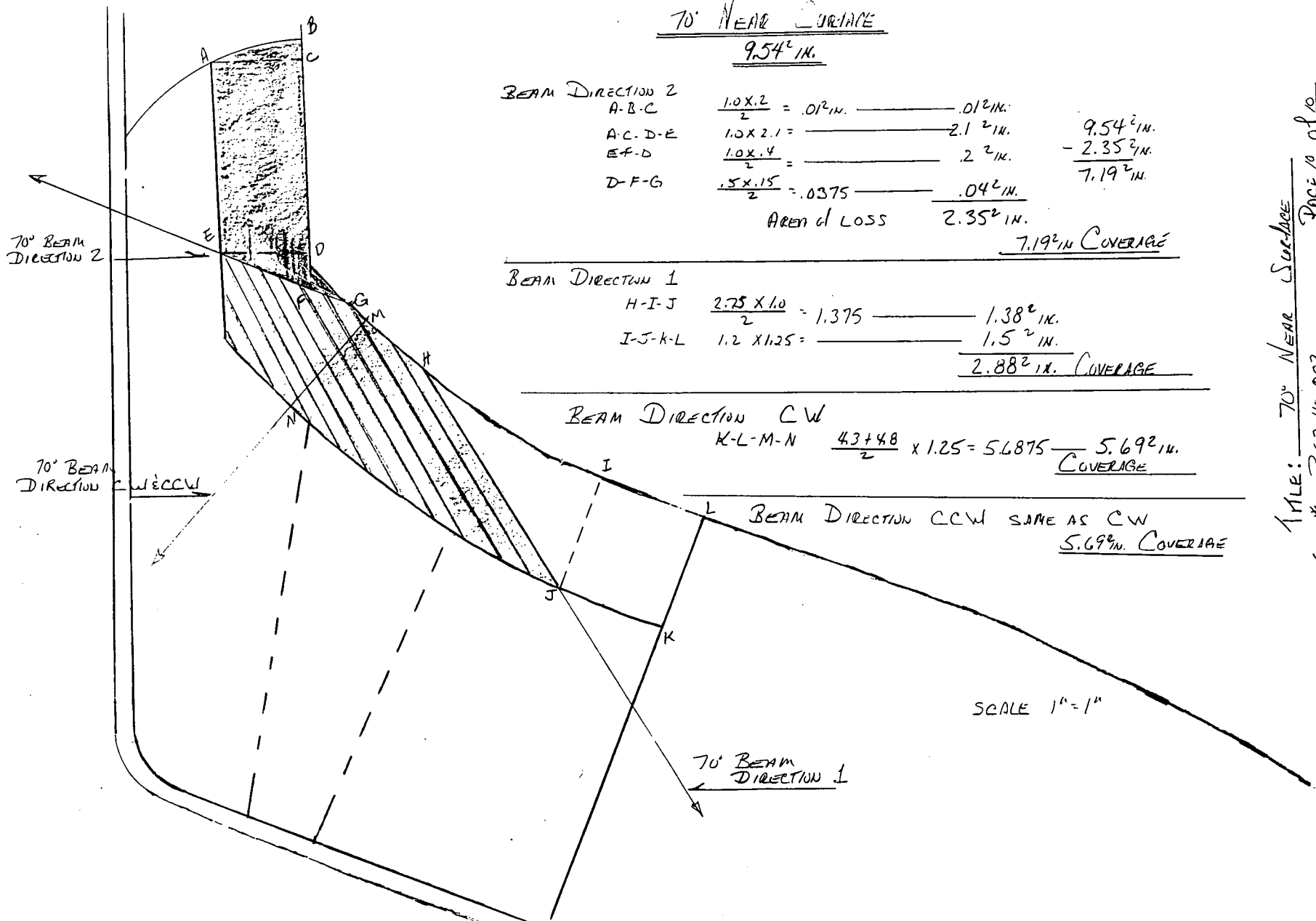
5.08<sup>2</sup> IN.

BEAM DIRECTION 1	TOTAL LOSS	0.0 <sup>2</sup> COVERAGE
BEAM DIRECTION 2	100%	5.08 <sup>2</sup> IN. COVERAGE
BEAM DIRECTION CW	100%	5.08 <sup>2</sup> IN. COVERAGE
BEAM DIRECTION CCW	100%	5.08 <sup>2</sup> IN. COVERAGE

SCALE 1"=1"

TITLE: 60° WELD & BASE METAL  
ITEM # B03.110.003  
By: Andy Nardner  
PAGE 1 of 10  
LEVEL III DATE 11/19/95





70° NEAR SURFACE

9.54<sup>2</sup> IN.

BEAM DIRECTION 2

A-B-C

$$\frac{1.0 \times 2}{2} = .0125 \text{ IN.}$$

A-C-D-E

$$\frac{1.0 \times 2.1}{2} = 2.1^2 \text{ IN.}$$

E-F-D

$$\frac{1.0 \times .4}{2} = 2^2 \text{ IN.}$$

D-F-G

$$\frac{.5 \times .15}{2} = .0375 \text{ IN.}$$

Area of Loss 2.35<sup>2</sup> IN.

9.54<sup>2</sup> IN.

- 2.35<sup>2</sup> IN.

7.19<sup>2</sup> IN.

7.19<sup>2</sup> IN COVERAGE

BEAM DIRECTION 1

H-I-J

$$\frac{2.75 \times 1.0}{2} = 1.375 \text{ IN.}$$

I-J-K-L

$$1.2 \times 1.25 = 1.5^2 \text{ IN.}$$

2.88<sup>2</sup> IN. COVERAGE

BEAM DIRECTION CW

$$K-L-M-N \quad \frac{4.3 + 4.8}{2} \times 1.25 = 5.6875 \text{ IN.}$$

5.69<sup>2</sup> IN. COVERAGE

BEAM DIRECTION CCW SAME AS CW

5.69<sup>2</sup> IN. COVERAGE

FILE: 70° NEAR SURFACE  
ITEM # B03.110.003  
By: Randy Shadler  
PAGE 2 of 2  
LEVEL III DATE 11/95

## DUKE POWER COMPANY

Exam Start: 1408

Form NDE-UT

## ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Finish: 1511

Revision 4

Station: Ocone

Unit: 1

Component/Weld ID: 1-P2R-WP34

Date: 11-16-95

Weld Length (in.): 36"

Surface Condition: As Ground

Lo: 9.2.3

Surface Temperature: 74 ° F

Pyrometer S/N: MCNDE 27021

Cal Due: 961003

Examiner: Larry Moulton Level: III

Scans:

45 ☒ 55 dB 70 ☒ 65.5 dB45T ☒ 55 dB 70T ☒ 65.5 dB60 ☒ 67 dB60T ☒ 67 dB

Other: 0° - 41 dB

Configuration: Nozzle Weld

S<sub>2</sub> Flow S<sub>1</sub>  
Nozzle to Head

Scan Surface: OD

Applies to NDE-680 only

Skew Angle: N/A

Examiner: J. L. Panel Level: I

Procedure: NDE 620 Rev: 2  
NDE 640 Rev: 19105  
FC:  
95-18, 95-19

Calibration Sheet No:

9501061 9501063

9501062 9501064

IND #	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir	Exam surf.	Scan	Damps
	DO NOT WRITE IN THIS SPACE				20% dac	20% dac	20% dac	20% dac	20% dac	20% dac				
					HMA	HMA	HMA	HMA	HMA	HMA	DO NOT WRITE IN THIS SPACE			
					50% dac	50% dac	50% dac	50% dac	50% dac	50% dac				
					100% dac	100% dac	100% dac	100% dac	100% dac	100% dac				
1	45°	63	6.9	5.15	21"	360° INT					2	1	AX	No
2	60°	70	8.25	8.9	21"	360° INT					2	1	AX	No
	45°/100°	No	OTHER RECORDABLE INDICATIONS											
	0°/70°	No	RECORDABLE INDICATIONS											

Remarks: 'W' LOCATION WAS MEASURED FROM NOZZLE

Limitations: (see NDE-UT-4) ☒ 90% or greater coverage obtained: yes ☐ no ☒

Sheet 1 of 4

Reviewed By:

Level: II

Date:

11-20-95

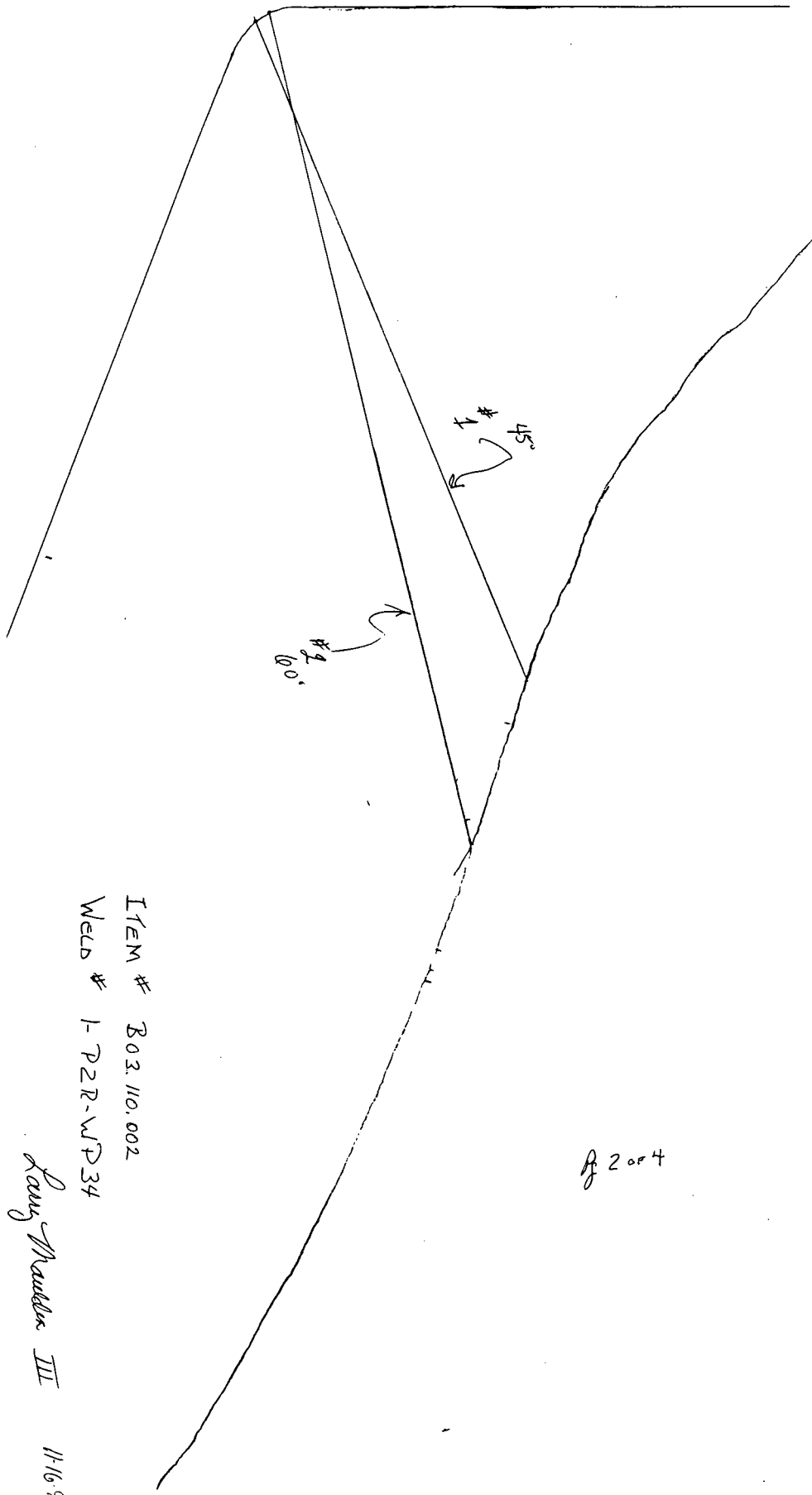
Authorized Inspector

Date

11-24-95

Item No:

B03.110.002



of 2 or 4

ITEM # B03.110.002  
WELD # 1-P2R-WP34

Larry Mueller III

11-16-5

# DUKE POWER COMPANY

## ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: 1-P2R-WP34 Item No: 803.110.002

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☒ cw ☐ ccw  
 FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO 1.75 to BEYOND  
 ANGLE: ☐ 0 ☒ 45 ☒ 60 other 70 FROM 0 DEG to 360 DEG

DUE TO NOZZLE  
CONFIGURATION

☐ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw  
 FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO \_\_\_\_\_ to \_\_\_\_\_  
 ANGLE: ☐ 0 ☐ 45 ☐ 60 other FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

☐ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw  
 FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO \_\_\_\_\_ to \_\_\_\_\_  
 ANGLE: ☐ 0 ☐ 45 ☐ 60 other FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

☐ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw  
 FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO \_\_\_\_\_ to \_\_\_\_\_  
 ANGLE: ☐ 0 ☐ 45 ☐ 60 other FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

Sketch(s) attached

☒ yes ☐ no

Prepared By: Ray Madden

Level: III

Date: 11-16-95

Sheet 3 of 4

Reviewed By: Sam Moss

Date: 11-20-95

Authorized Inspector: JMB

Date: 11-24-95

## DUKE POWER COMPANY

Form NDE-UT-8

## ULTRASONIC INDICATION RESOLUTION SHEET

Revision 1

## Acceptance Standard:

After reviewing previous data and plotting the indications, it was determined that indications 1 & 2 were geometric. This was due to inner radius geometry.

ITEM # B03.110.002

WELD # 1-P2R-WP34

## Acceptable Indications:

1 &amp; 2

## Rejectable Indications:

These indications have been compared with previous ultrasonic data

☒ yes☐ No previous data available

Examiner

Larry Mauder

Level:

III

Date:

11-16-95

Sheet 4 of 4

Reviewer:

Gary Moss

Level:

ID

Date:

11-20-95

Authorized Inspector:

MBC

Date:

11-24-95

## DUKE POWER COMPANY

NDE-91-1

## Limited Examination Coverage Worksheet

Revision 0

## Examination Volume/Area Defined

Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius ☐

## Area Calculation

## Volume Calculation

Sq. AREA = 21.14 sq. in.

LENGTH = 36"

761.04 cu. in.

## Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
	0°		17.33 <sup>2</sup> / <sub>in.</sub>	36"	623.88	761.04	81.98
Ax	45°	2	18.71	36"	673.56	761.04	88.5
Ax	45°	1	8.98	36"	323.28	761.04	42.48
Circ.	45°	CW	16.4	36"	590.4	761.04	77.58
Circ.	45°	CCW	16.4	36"	590.4	761.04	77.58
Ax	60°	2	18.95	36"	682.2	761.04	89.64
Ax	60°	1	4.2	36"	151.2	761.04	19.87
Circ.	60°	CW	16.4	36"	590.4	761.04	77.58
Circ.	60°	CCW	16.4	36"	590.4	761.04	77.58

Item No: B03.110.002

Prepared BY: Larry Mauldin

Level: III

Date: 11-18-95

Reviewed By: Mary Moss

Level: B

Date: 11-20-95

NDE-91-1

## Revision 0

Base Metal ☐ Weld ☒ Near Surface ☐ Bolting ☐ Inner Radius ☐

### Volume Calculation

Sq. AREA 5.51 Sq. ft.

WELD LENGTH 36"

198.36 cel. 14.

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
--------	-------	-------------------	------------------------------	----------------------------	--------------------------------	--------------------------------	------------------

	0°		5.51	36	198.36	198.36	100
AX	45	1	2.49	36	89.64	198.36	45.19
AX	45	2	5.51	36	198.36	198.36	100
Circ.	45	CW	5.51	36	198.36	198.36	100
Circ.	45	CCW	5.51	36	198.36	198.36	100
AX	60	2	5.51	36	198.36	198.36	100
AX	60	1	.01	36	.36	198.36	.18
Circ.	60	CW	5.51	36	198.36	198.36	100
Circ.	60	CCW	5.51	36	198.36	198.36	100

Item No: B13 110 002

Item No: B03.110.002

Prepared BY: Larry Thawden

Level: III

Date: 11.18.95

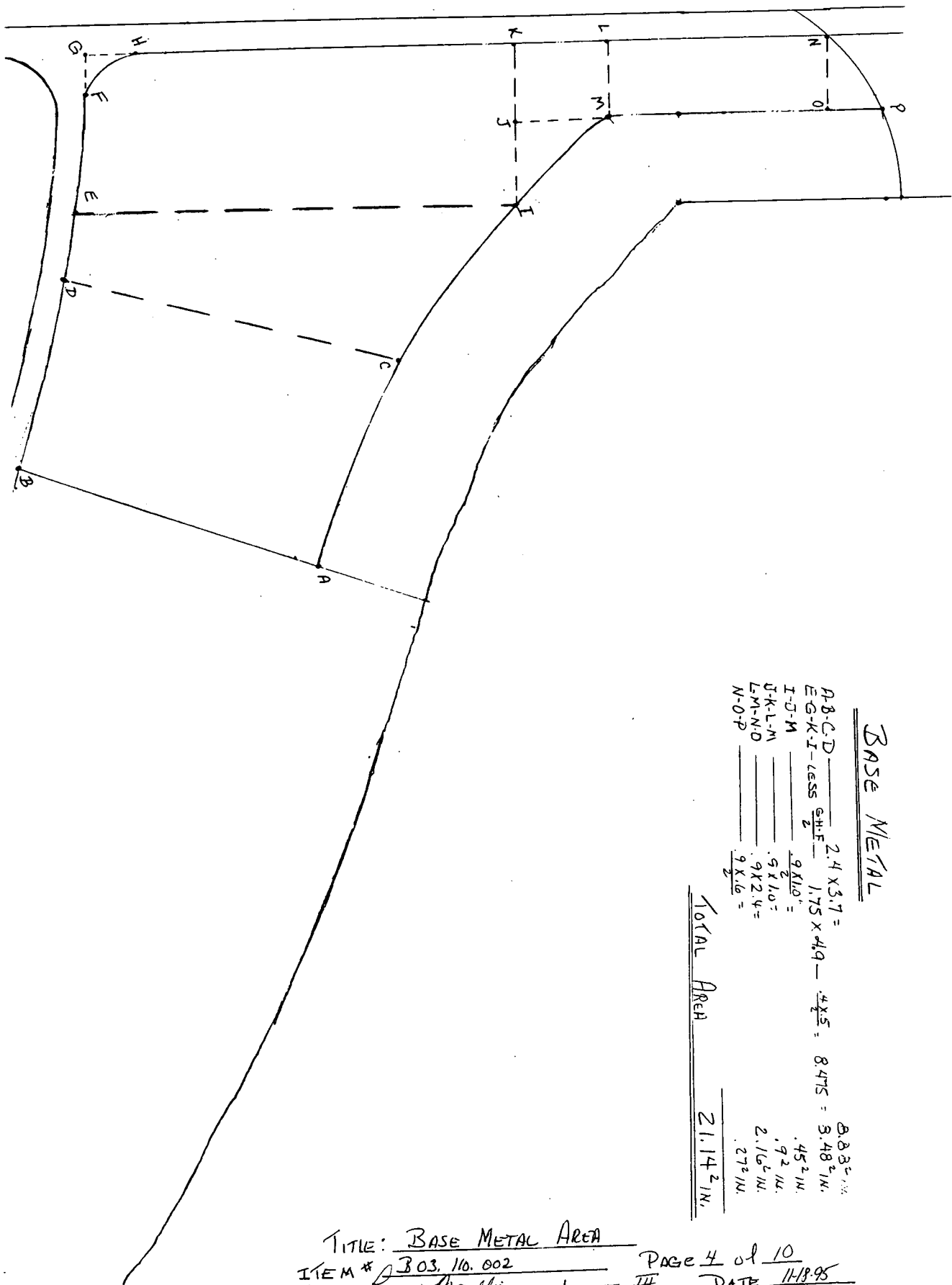
Reviewed By: Daryl Massey

Level: IB

Date: 11-20-95







BASE METAL

A-B-C-D	$\frac{2.4 \times 3.7}{2}$	=	8.85 IN.
E-G-H-I	$\frac{6.4 \times 5}{2}$	=	16.00 IN.
I-J-M	$\frac{9 \times 1.0}{2}$	=	4.50 IN.
J-K-L-N	$\frac{9 \times 1.0}{2}$	=	4.50 IN.
L-M-N-O	$\frac{9 \times 2.4}{2}$	=	10.80 IN.
N-O-P	$\frac{9 \times 1.6}{2}$	=	7.20 IN.

Total Area 21.14 IN.

TITLE: BASE METAL AREA  
 ITEM # 303.110.002 PAGE 4 of 10  
 BY: Larry Mankin LEVEL III DATE 11/8/95



# 70° NEAR SURFACE AREA

$$A-B-C-D \text{ --- } 1.25' \times 5.3' = 6.625 = 6.63' \text{ IN.}$$

$$C-D-E \text{ --- } \frac{1.0' \times .75'}{2} = .375 = .38' \text{ IN.}$$

$$D-E-F-G \text{ --- } 1.0' \times 2.25' = 2.25 = 2.25' \text{ IN.}$$

$$F-G-H \text{ --- } \frac{1.0' \times .175'}{2} = .0875 = .09' \text{ IN.}$$

$$\underline{\underline{9.35 \text{ sq. in.}}}$$

TITLE: NEAR SURFACE AREA

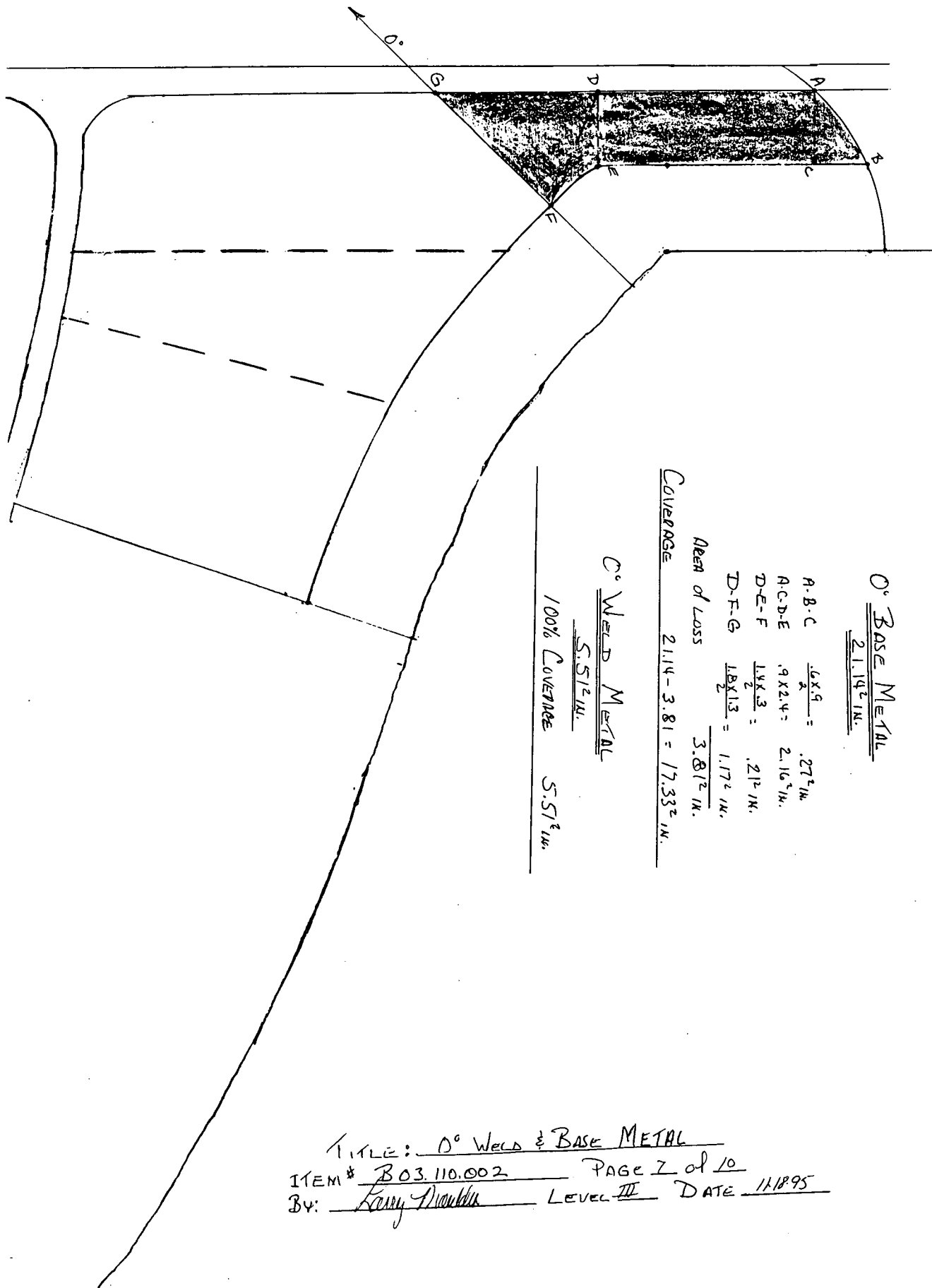
ITEM # B03.110.002

By: Arly Haula

Level III

Page 6 of 10

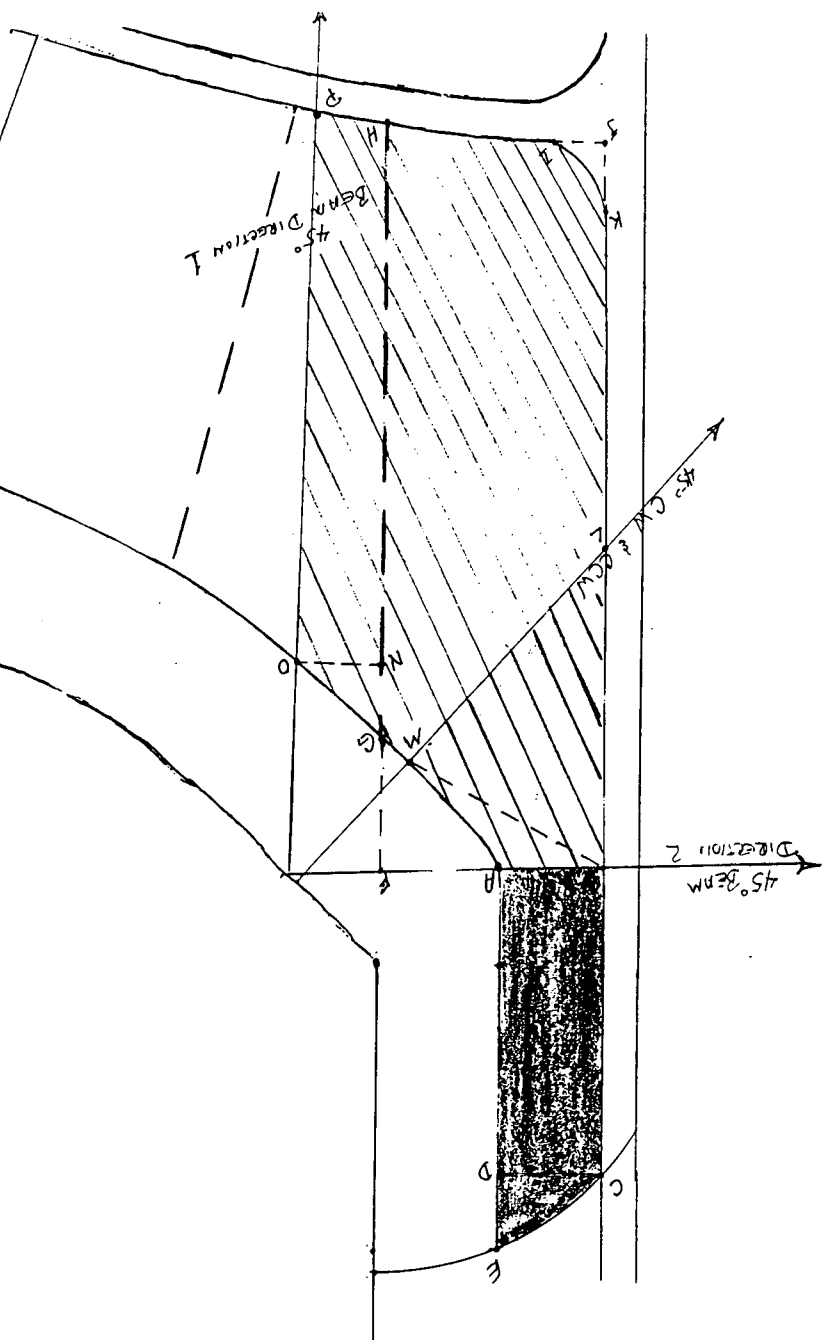
DATE 11/8/95



TITLE: 0° WELD & BASE METAL

ITEM # B03.110.002 PAGE 2 of 10

BY: Larry Moulton LEVEL III DATE 11/18/95



WELD METAL  
5.51<sup>2</sup> IN

45° BEAM DIRECTION 2	100% COVERAGE	5.51 <sup>2</sup> IN
45° BEAM DIRECTION 1	100% COVERAGE	5.51 <sup>2</sup> IN
45° BEAM DIRECTION C W	100% COVERAGE	5.51 <sup>2</sup> IN
45° BEAM DIRECTION C W	100% COVERAGE	5.51 <sup>2</sup> IN
AREA OF LOSS	3.02 <sup>2</sup> IN	
COVERAGE	5.51 - 3.02 = 2.49 <sup>2</sup> IN	

SCALE 1" = 1"

45° BEAM DIRECTION C W  
SAME AS C W

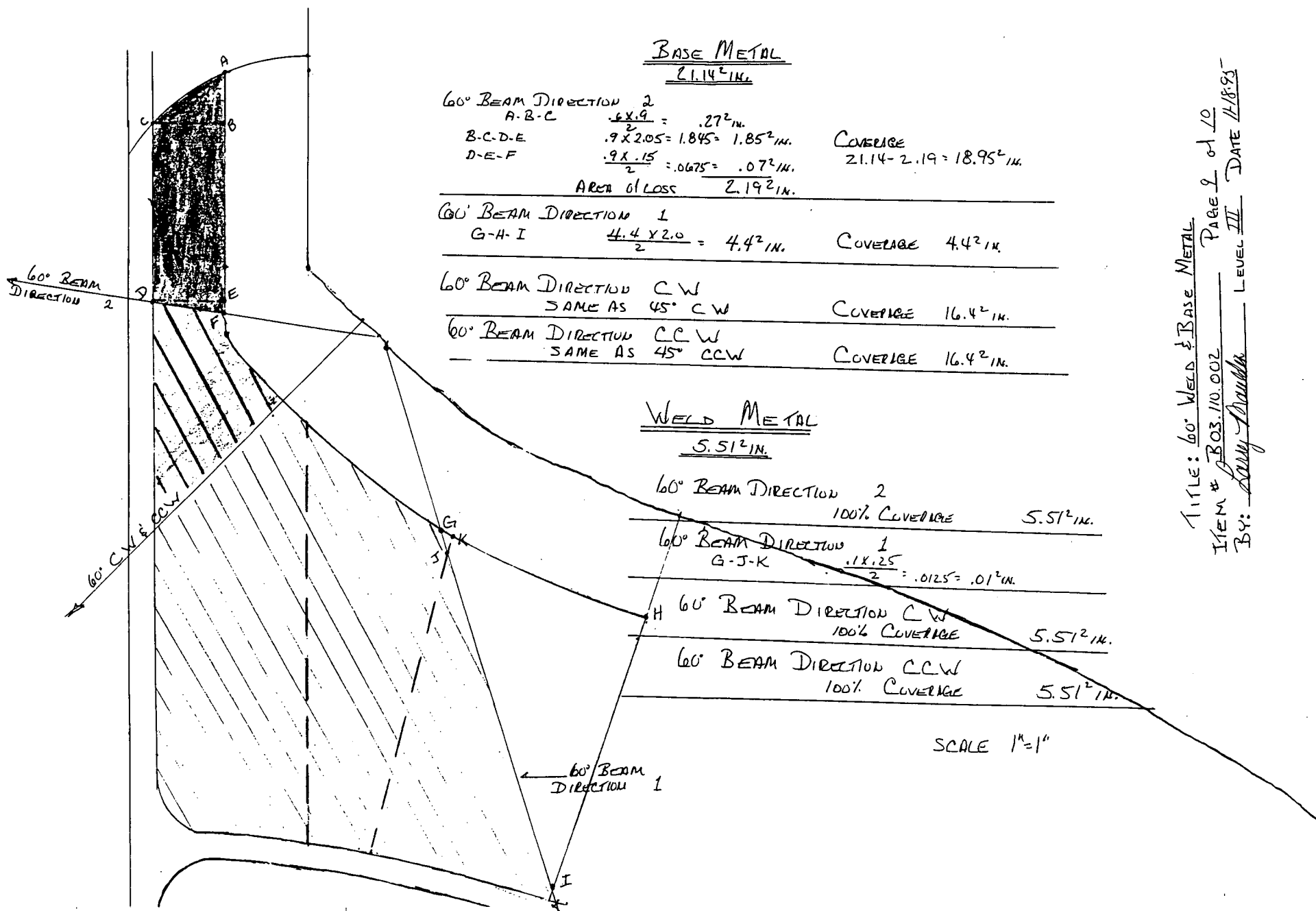
COVERAGE 16.4<sup>2</sup> IN

45° BEAM DIRECTION 2	100% COVERAGE	5.51 <sup>2</sup> IN
45° BEAM DIRECTION 1	100% COVERAGE	5.51 <sup>2</sup> IN
45° BEAM DIRECTION C W	100% COVERAGE	5.51 <sup>2</sup> IN
45° BEAM DIRECTION C W	100% COVERAGE	5.51 <sup>2</sup> IN
AREA OF LOSS	4.74 <sup>2</sup> IN	
COVERAGE	21.14 - 4.74 = 16.4 <sup>2</sup> IN	

BASE METAL  
21.14<sup>2</sup> IN

45° BEAM DIRECTION 2	100% COVERAGE	5.51 <sup>2</sup> IN
45° BEAM DIRECTION 1	100% COVERAGE	5.51 <sup>2</sup> IN
45° BEAM DIRECTION C W	100% COVERAGE	5.51 <sup>2</sup> IN
45° BEAM DIRECTION C W	100% COVERAGE	5.51 <sup>2</sup> IN
AREA OF LOSS	2.43 <sup>2</sup> IN	
COVERAGE	21.14 - 2.43 = 18.71 <sup>2</sup> IN	

TITLE: 45° WELD & BASE METAL  
ITEM # B03.110.002  
BY: Barry Moulton  
LEVEL III  
DATE 11/8/95



TITLE: 60" WELD & BASE METAL. PAGE 2 of 10  
ITEM # B03.110.002  
BY: Larry Brundage LEVEL III DATE 11/8/95-



## DUKE POWER COMPANY

## ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1015

Form NDE-U

Exam Finish: 1244

Revision 4

Station: CONEE

Unit: 1

Component/Weld ID: 1-SGA-WG60

Date: 11-20-95

Weld Length (in.): 474"

Surface Condition: AS GROUND

Lo: "W" AXIS

Surface Temperature: 71 ° E

Pyrometer S/N: MCNDE27021

Cal Due: 961003

Examiner: B. Dale Gally

Level: III I

Scans:

45 ☒ 64.2 dB 70 ☒ 62 dB

Examiner: D. R. Parle

Level: II I

45T ☒ 64.2 dB 70T ☒ 62 dB

Configuration: CIRC

Flow

TUBE SRT. to SHELL

Procedure: NDE640 Rev: 1  
NDE620 Rev: 2

FC:

95-18

95-19

60 ☒ 70.5 dB 0° ☒ 45.5 dB

Scan Surface: OD

Applies to NDE-680 only

Calibration Sheet No:  
9501086, 9501085, 9501088  
9501087, 9501089

95-01

60T ☒ 70.5 dB

Other: 35 AXIAL: 52, CIRC: 52 dB

Skew Angle: NA

IND #	Max % Rel	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir	Exam surf.	Scan	Damps
					20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA				
					50%dac	50%dac	50%dac	50%dac	50%dac	50%dac				
					100% dac	100% dac	100% dac	100% dac	100% dac	100% dac				
0°					NO RECORDABLE INDICATIONS									
35°					NO RECORDABLE INDICATIONS									
45°					NO RECORDABLE INDICATIONS									
60°					NO RECORDABLE INDICATIONS									
70°					NO RECORDABLE INDICATIONS									

Remarks: SEE LIMITATION REPORT

Limitations: (see NDE-UT-4) ☒ 90% or greater coverage obtained: yes ☐ no ☐

Sheet 1 of 3

Reviewed By: Gary Moss

Level: II

Date: 11-22-95

Authorized Inspector: YMB

Date: 11-27-95

Item No:

Col.030.001



# DUKE POWER COMPANY

## ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: 1-SGA-WG60 Item No: 001.030.001

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw  
 FROM L 65" to L 110" INCHES FROM WO 5" to BEYOND  
 ANGLE: ☐ 0 ☒ 45 ☐ 60 other 70°/35° FROM n/a DEG to n/a DEG

RESTRAINT

☒ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw  
 FROM L 173 to L 218 INCHES FROM WO 4 1/4 to BEYOND  
 ANGLE: ☐ 0 ☒ 45 ☐ 60 other 35/70° FROM n/a DEG to n/a DEG

RESTRAINT

☒ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw  
 FROM L 250 to L 295 INCHES FROM WO 3.6" to BEYOND  
 ANGLE: ☐ 0 ☒ 45 ☐ 60 other 35/70° FROM n/a DEG to n/a DEG

RESTRAINT

☒ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☐ cw ☐ ccw  
 FROM L 250 to L 295 INCHES FROM WO 3.0" to BEYOND  
 ANGLE: ☐ 0 ☐ 45 ☐ 60 other 70° FROM n/a DEG to n/a DEG

RESTRAINT

Sketch(s) attached

☒ yes ☐ no

Prepared By: Gamon W Setzer

Level: III

Date: 11-27-95

Sheet 2 of 3

Reviewed By: Ray Moss

Date: 11-22-95

Authorized Inspector:

MBC

Date:

11-27-95

# DUKE POWER COMPANY

## ISI LIMITATION REPORT

FORM NDE- UT-4

Revision 1

Component/Weld ID: L.SGA.WG60 Item No: COI.030.001

remarks:

☒ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw  
 FROM L 358 to L 403 INCHES FROM WO 6 to BEYOND  
 ANGLE: ☐ 0 ☒ 45 ☐ 60 other 70° FROM n/a DEG to n/a DEG

RESTRAINT

☒ NO SCAN SURFACE BEAM DIRECTION  
☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw  
 FROM L 450 to L 21 INCHES FROM WO 5 3/4 to BEYOND  
 ANGLE: ☐ 0 ☒ 45 ☐ 60 other 90 FROM n/a DEG to n/a DEG

RESTRAINT

☐ NO SCAN SURFACE BEAM DIRECTION  
☒ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☐ cw ☐ ccw  
 FROM L n/a to L n/a INCHES FROM WO 7 1/2 to <sup>sub</sup> 8 9 1/2"  
 ANGLE: ☐ 0 ☒ 45 ☐ 60 other 35 FROM n/a DEG to n/a DEG

9  
EQUALLY SPACED  
INSULATION BRACKETS

☐ NO SCAN SURFACE BEAM DIRECTION  
☒ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☐ cw ☐ ccw  
 FROM L n/a to L n/a INCHES FROM WO 7 1/2 to 9 1/2  
 ANGLE: ☐ 0 ☒ 45 ☐ 60 other 35 FROM n/a DEG to n/a DEG

3 EQUALLY SPACED  
HANGER SUPPORT

Sketch(s) attached  
☒ yes ☐ no

Prepared By: Jamarcus Sietze

Level: III

Date: 11-22-95

Sheet 3 of 3

Reviewed By: Gary Moss

Date: 11-22-95

Authorized Inspector: MBC

Date: 11-27-95

Station OCONEE Unit 1 Rev. \_\_\_\_\_ File No. \_\_\_\_\_ Sheet \_\_\_\_\_ Of \_\_\_\_\_  
Subject LIMITED EXAM.  
By James W. Sledge Date 11-22-95  
Prob No. COI-030-001 Checked By \_\_\_\_\_ Date \_\_\_\_\_

COVER SHEET  
FOR

ITEM # COI-030-001 UPPER TUBE SHEET TO SHELL

SUMMARY OF EXAM.

WELD EXAM IS LIMITED DUE TO RESTRAINTS PLACED AROUND IN 5 EQUALLY SPACED LOCATIONS. THEY ARE 45" LONG (PARALLEL TO WELD AXIS). HOWEVER THEY ARE AT DIFFERENT "W" DIMENSION THIS RESULTING IN A DIFFERENT PERCENT OF COVERAGE OR LOSS OF COVERAGE PER EACH RESTRAINT.

WELD WAS SCANNED ALSO WITH A 60° SHEAR WAVE IN THE AREAS WHERE THE INSULATIONS BRACKETS ARE AND HANGERS ARE LOCATED, (12 EQUALLY SPACED LOCATIONS).

THE ADDITIONAL SCAN (60°) GAVE 100% COVERAGE IN THESE AREAS, OF BASE WELD METAL

## DUKE POWER COMPANY

NDE-91-1

## Limited Examination Coverage Worksheet

Revision 0

## Examination Volume/Area Defined

Base Metal ☐ Weld ☒ Near Surface ☐ Bolting ☐ Inner Radius ☐

## Area Calculation

10.63 sq in

## Volume Calculation

LENGTH 45"

46"

## Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.) MISSED	Length Examined (in)	Volume Examined (cu.in.) MISSED	Volume Required (cu.in.)	Percent Coverage Loss
S/G RESTRAINT @ 65"							
AX	45	2	.23	46	10.58	488.9	2%
	35	2	2.6	46	119.6	488.9	24%
S/G RESTRAINT @ 173"							
AX	45	2	2.48	45	111.6	478.35	23%
	35	2	2.15	45	96.75	478.35	20%
S/G RESTRAINT @ 250"							
AX	45	2	9.59	45	431.5	478.35	90%
	35	2	7.63	45	343	478.35	71%
S/G RESTRAINT @ 358"							
AX	45	2	1.0	45	45	478.35	9%
S/G RESTRAINT @ 450"							
AX	45	2	1.08	45	48.6	478.35	10%

Item No: C01-030-001

Prepared BY: James W. Setzler

Level: III

Date: 11-22-95

Reviewed By: Ray Moss

Level: II

Date: 11-22-95

pg 2 of 12

NDE-91-1

## Limited Examination Coverage Worksheet

## Revision 0

### Examination Volume/Area Defined

Base Metal ☒

Weld ☐Near Surface ☐

**Bolting** ☐

Inner Radius ☐

## Area Calculation

18.08

## Volume Calculation

$$18.08 \times 45 = 813.6$$

LENGTH = 45"

SEE Pg. — of —

## Coverage Calculations

[illegible]

Item No: C01.030-001

**Prepared BY:**

Prepared BY: Samuel W. Setzer

Level: III

Level: III

Date: 11-22-95

Reviewed By:

Reviewed By: Gary Mass

Level: *II*

Level: *II*

**Date:** 11-22-95

18 3 of 12

## DUKE POWER COMPANY

NDE-91-1

## Limited Examination Coverage Worksheet

Revision 0

## Examination Volume/Area Defined

Base Metal ☐Weld ☐Near Surface ☒Bolting ☐Inner Radius ☐

## Area Calculation

9.20 sq.in

SEE Pg — of —

## Volume Calculation

$$9.20 \times 45 = 414$$

$$9.20 \times 46 = 423$$

## Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.) MISSSED	Length Examined (in)	Volume Examined (cu.in.) MISSSED	Volume Required (cu.in.)	Percent Coverage Loss
S/G RESTRAINT @ 65"							
AX	70	2	2.24	46	103	423	24%
S/G RESTRAINT @ 173"							
AX	70	2	3.6	45	162	414	39%
S/G RESTRAINT @ 250"							
AX	70	2	5.29	45	238	414	57%
	70	1	.13	45	5.85	414	1%
S/G RESTRAINT @ 358"							
AX	70	2	1.45	45	65	414	16%
S/G RESTRAINT @ 450"							
AX	70	2	1.18	45	53.1	414	13%

Item No: C01.030.001

Prepared BY: James W. Stitzer

Level: III

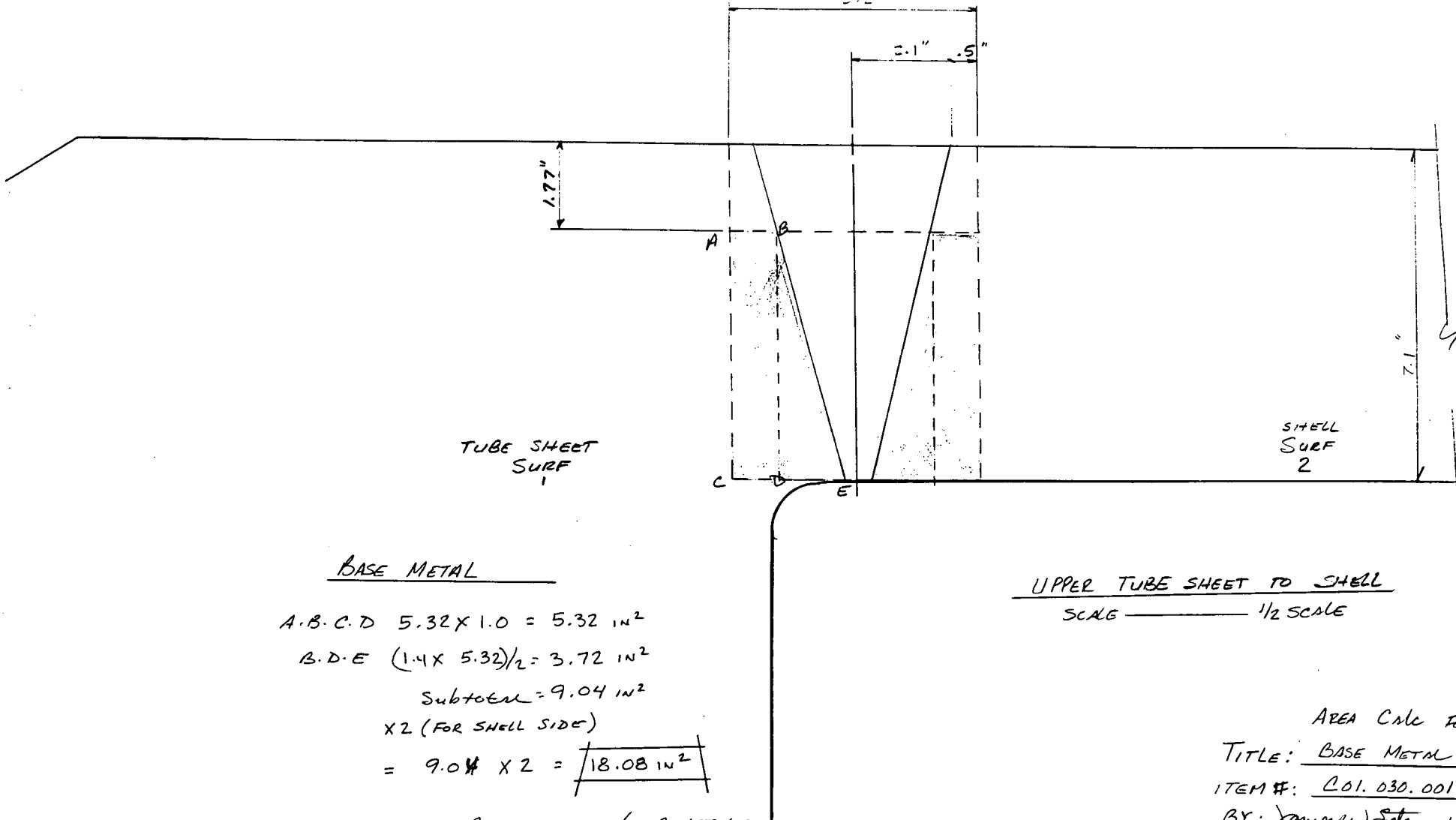
Date: 11.22.95

Reviewed By: Gary Moss

Level: II

Date: 11.22.95

4 of 12



### BASE METAL

$$A.B.C.D \ 5.32 \times 1.0 = 5.32 \text{ IN}^2$$

$$B.D.E \ (1.4 \times 5.32)/2 = 3.72 \text{ IN}^2$$

$$\text{Subtotal} = 9.04 \text{ IN}^2$$

X 2 (FOR SHELL SIDE)

$$= 9.04 \times 2 = \boxed{18.08 \text{ IN}^2}$$

BASE METAL RECEIVED 100% COVERAGE.  
AS PER NDE-91-R.O

### UPPER TUBE SHEET TO SHELL

SCALE 1/2 SCALE

AREA Calc FOR

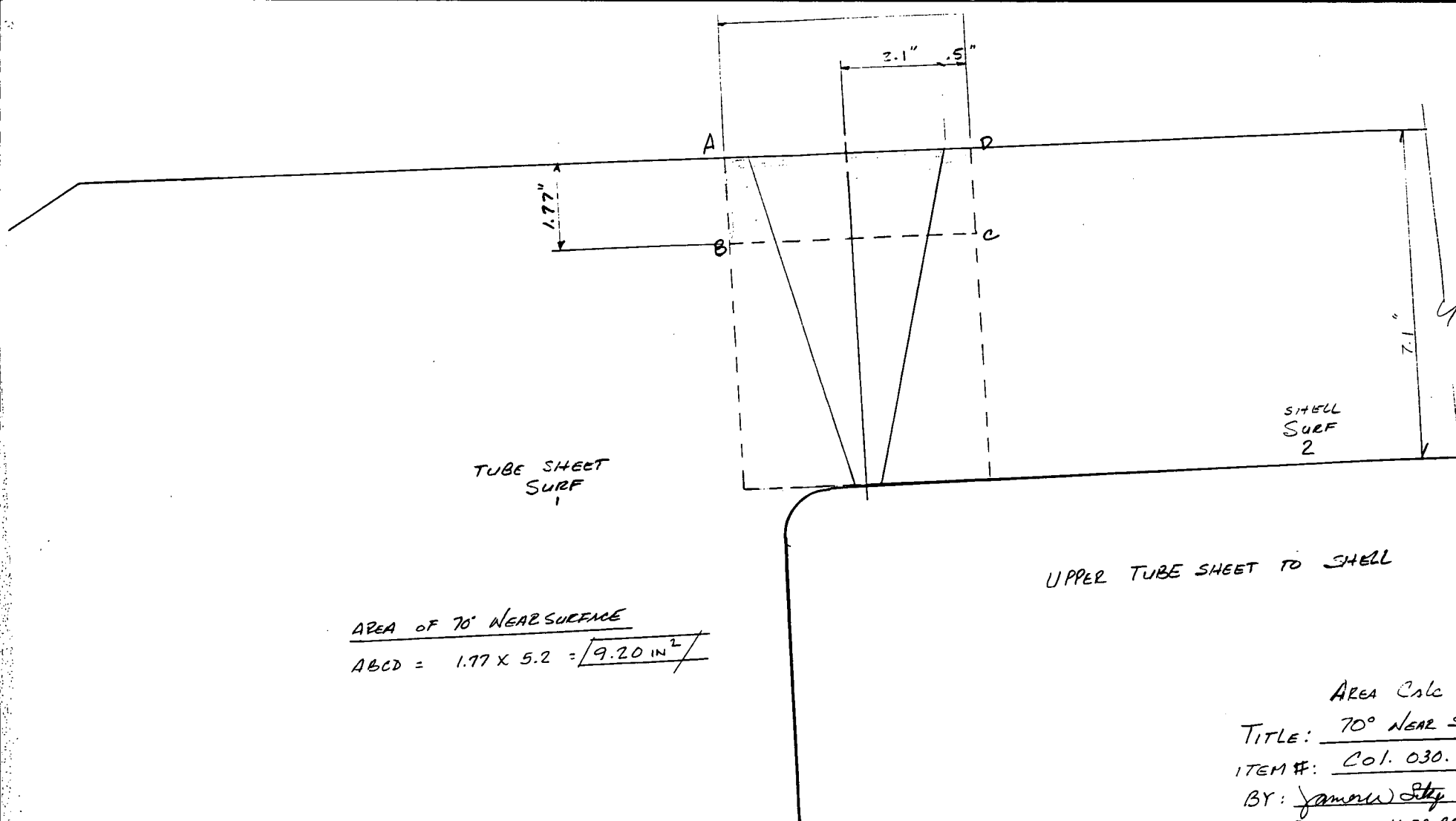
TITLE: BASE METAL

ITEM #: 201.030.001

BY: James W. Steyer Level III

DATE: 11-22-95

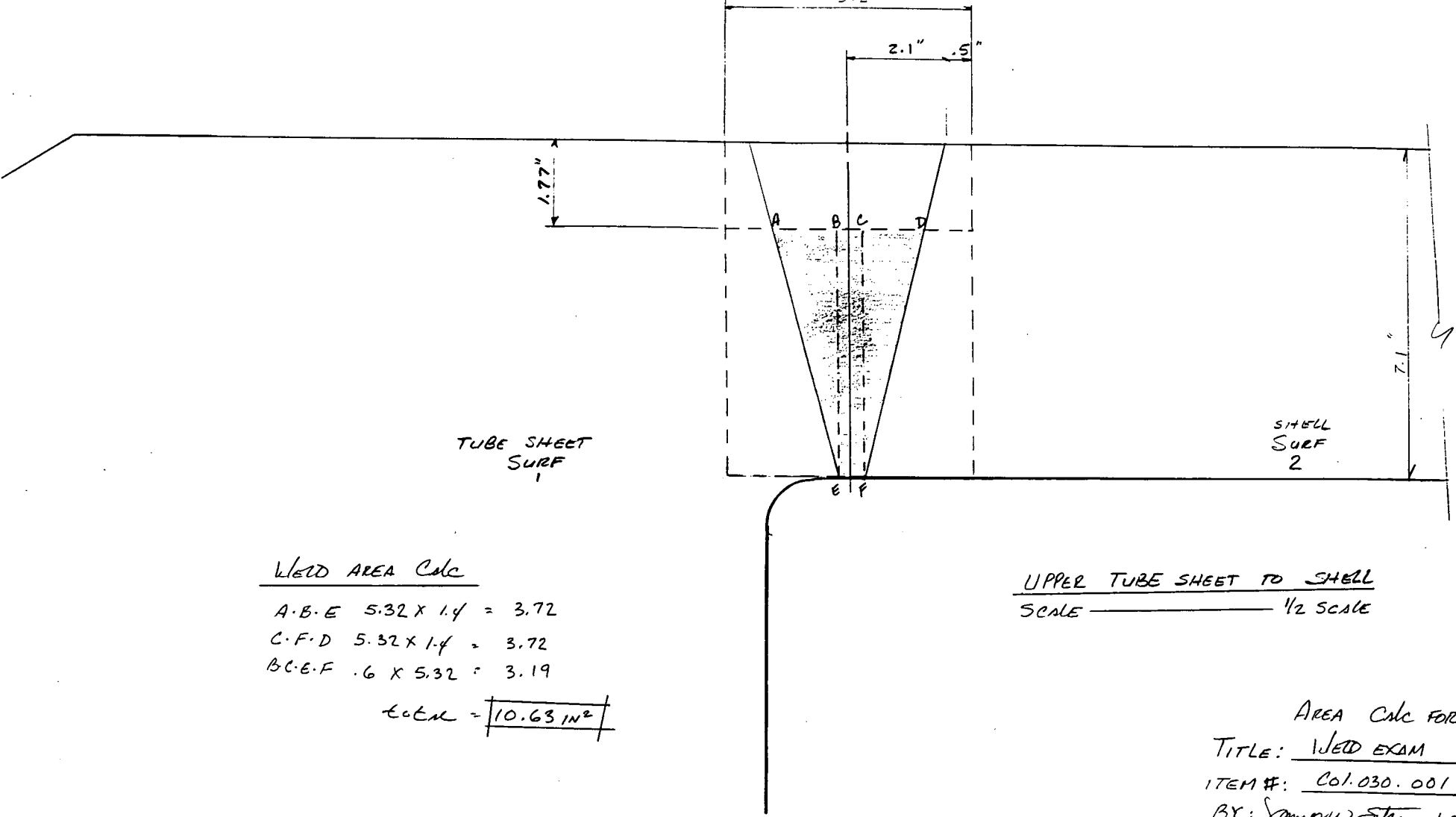
PAGE 5 of 12



AREA CALC FOR  
 TITLE: 70° NEAR SURFACE  
 ITEM #: COL. 030.001  
 BY: Yamori Step LEVEL III  
 DATE: 11-22-95

PAGE 6 OF 12





WELD AREA Calc

A-B-E  $5.32 \times 1.4 = 3.72$

C-F-D  $5.32 \times 1.4 = 3.72$

B-C-E-F  $.6 \times 5.32 = 3.19$

WELD AREA = 10.63 IN<sup>2</sup>

UPPER TUBE SHEET TO SHELL

SCALE \_\_\_\_\_ 1/2 SCALE

AREA Calc FOR

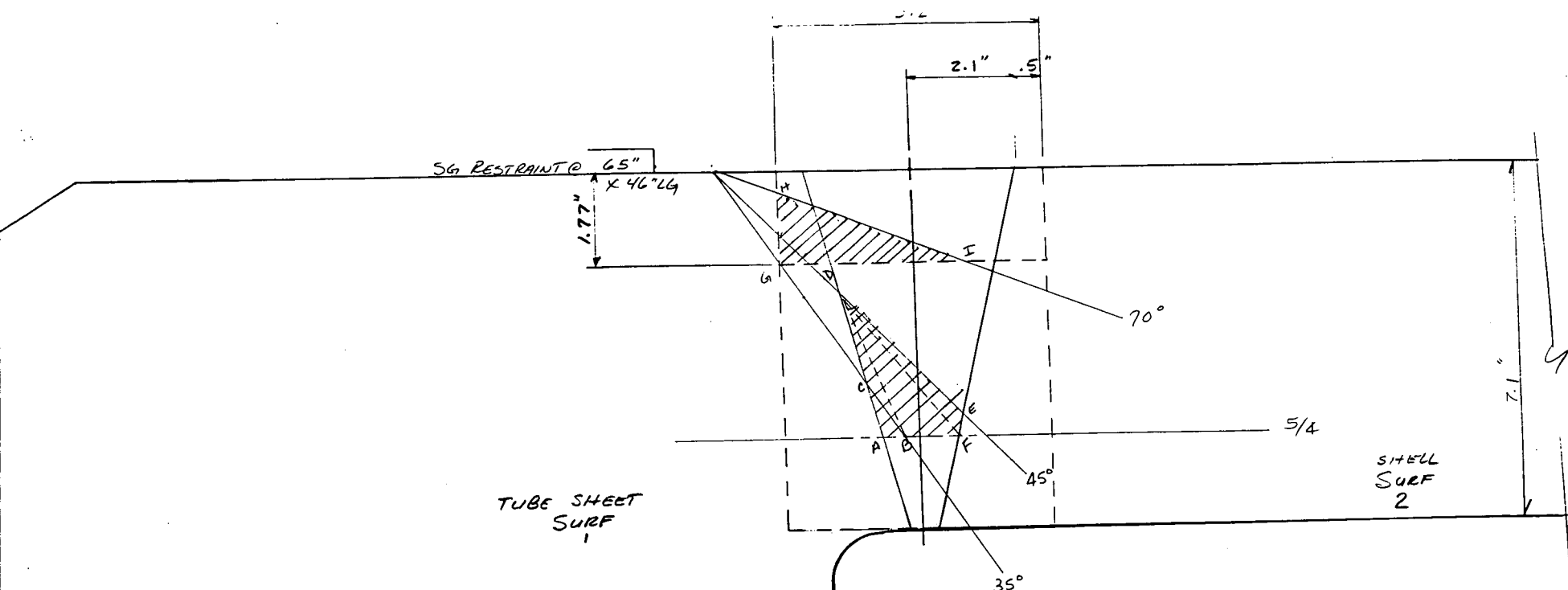
TITLE: WELD EXAM

ITEM #: Col. 030.001

BY: Samuel W. Styer LEVEL III

DATE: 11.22.95

PAGE 7 of 12



TUBE SHEET  
SURF  
1

SHELL  
SURF  
2

UPPER TUBE SHEET TO SHELL  
1/2 SCALE

35° WELD  
 $A \cdot B \cdot C (1.3 \times .35) / 2 = .23$   
.23" = AREA MISSED  
 AREA COVERED = 10.63  
 - .23  
 = 10.40 in<sup>2</sup>

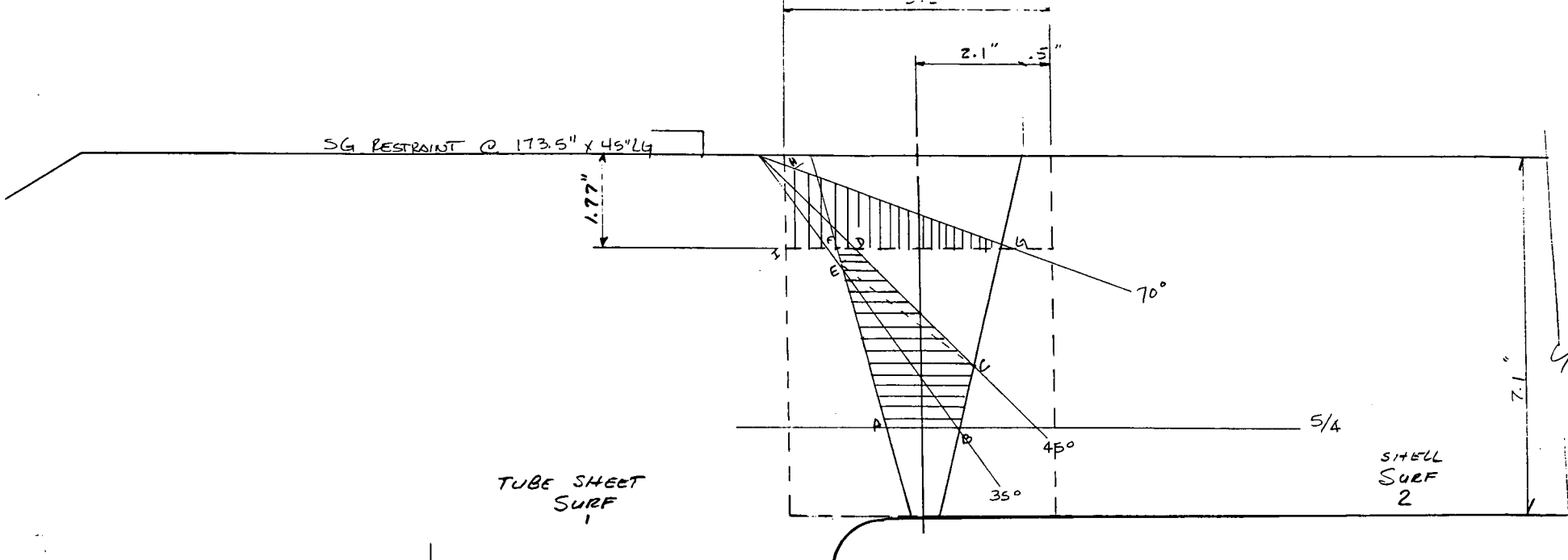
45° WELD  
 $B \cdot C \cdot D (3.2 \times .3) / 2 = .48$   
 $D \cdot B \cdot F (3.7 \times .8) / 2 = 1.48$   
 $D \cdot F \cdot E (3.7 \times .35) / 2 = .64$

AREA MISSED 2.6  
 AREA COVERED = 10.63  
2.60  
 = 8.03 in<sup>2</sup>  
 .23 (For 35°)

70° NEAR SURFACE  
 AREA MISSED =  $G \cdot H \cdot I$   
 $(3.2 \times 1.4) / 2 = 2.24 \text{ sq in}$

7.80 in<sup>2</sup> total AREA COVERED.  
2.83 in<sup>2</sup> AREA MISSED

TITLE: WELD COVERAGE.  
 ITEM #: COL. 030. 001  
 BY: James W. Schaefer Level III  
 DATE: 11.22.95



35°  
 A-B-E  $(3.9 \times 1.1)/2 = 2.15$

AREA MISSED =  $\boxed{2.15 \text{ in}^2}$   
 AREA COVERED = 10.63  
 - 2.15  
 8.48

45°  
 B-E-C  $(.9 \times 3.9)/2 = 1.76$   
 F-E-D  $(.4 \times .3)/2 = .06$   
 E-D-C  $(3.3 \times .4)/2 = .66$   
 = 2.48 in<sup>2</sup>

AREA COVERED = 10.63  
 - 2.48  
 - 2.15 (35°)

AREA COVERED = 6.00 in<sup>2</sup>

TOTAL  
 AREA MISSED = 2.15 + 2.48 =  $\boxed{4.63 \text{ in}^2}$

70° NEAR SURFACE  
 UPPER TUBE SHEET TO SHELL  
 1/2 SCALE  
 AREA LOSS =  $(4.5 \times 1.65)/2 = \boxed{3.6 \text{ in}^2}$

TITLE: WELD COVERAGE  
 ITEM #: COI. 030.001  
 BY: James W. Sipe, Level III  
 DATE: 11.22.85

0°

AREA MISSED = K · L · M · N

$2 \times 7.1 = 1.42 \text{ sq in MISSED LWS.}$

$2 \times 5.25 = \boxed{1.05 \text{ sq in}}$

TUBE SHEET  
SURF.  
1

35°

AREA COVERED =

A · D · E

$(3.0 \times 2.0)/2 = 3.0$

AREA MISSED = 10.63

$\frac{3.00}{7.63 \text{ in}^2}$

45°

AREA COVERED =

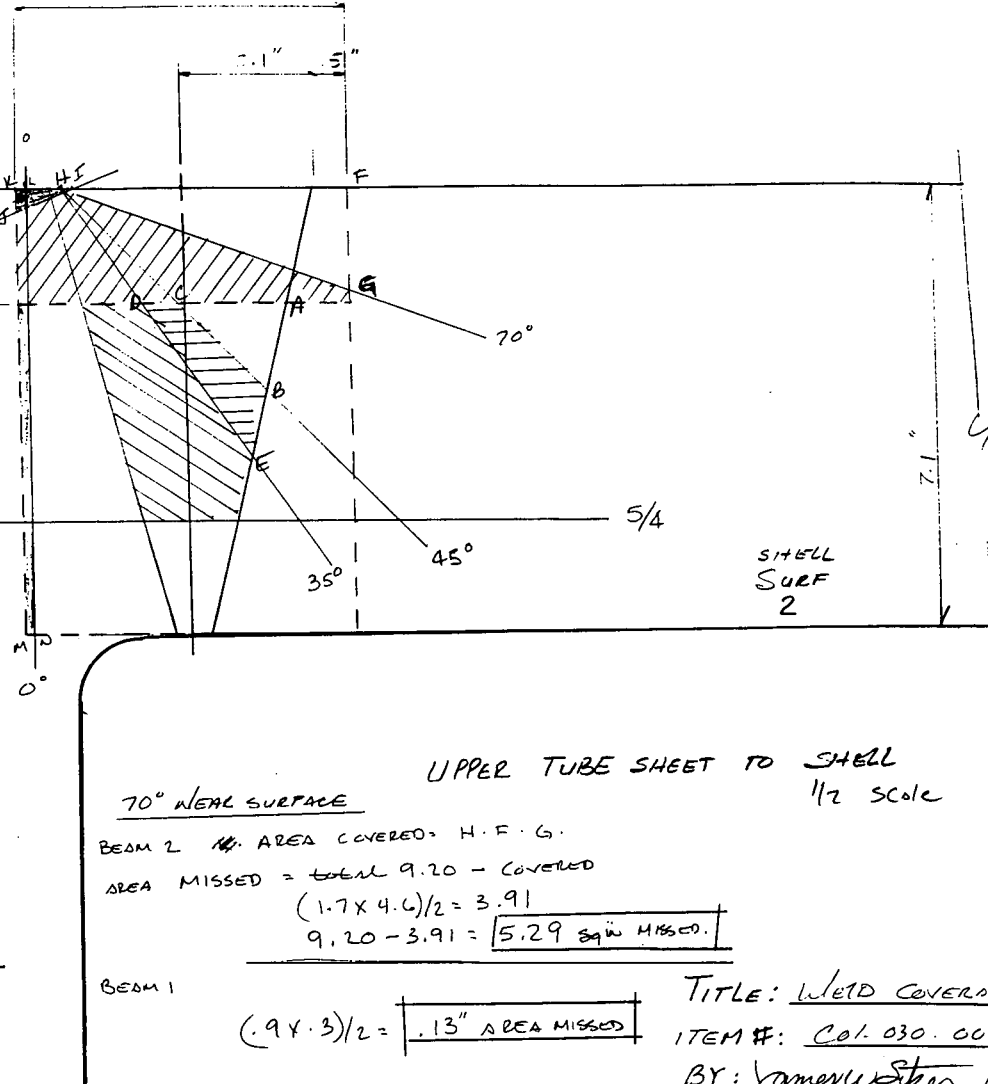
A · B · C

$(1.1 \times 1.9)/2 = 1.04$

AREA MISSED = 10.63

$- 1.04$

$\boxed{9.59 \text{ in}^2}$



70° WELD SURFACE

UPPER TUBE SHEET TO SHELL

1/2 SCALE

BEAM 2 AREA COVERED = H · F · G.

AREA MISSED = TOTAL 9.20 - COVERED

$(1.7 \times 4.6)/2 = 3.91$

$9.20 - 3.91 = \boxed{5.29 \text{ sq in MISSED.}}$

BEAM 1

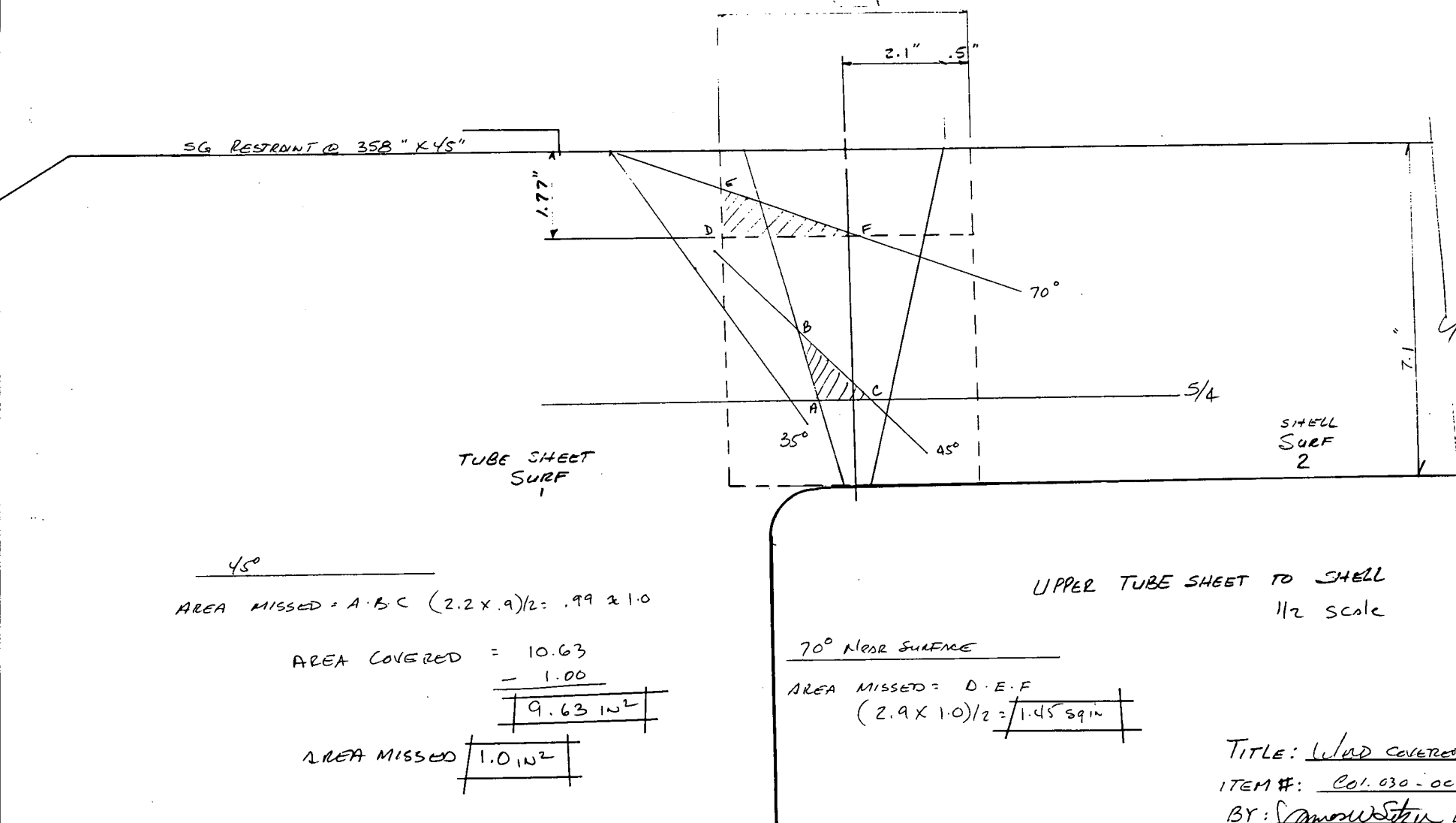
$(.9 \times .3)/2 = \boxed{.13 \text{ AREA MISSED}}$

TITLE: WELD COVERAGE

ITEM #: COL. 030. 001

BY: JAMES W. STEIN LIND III

DATE: 11.22.95

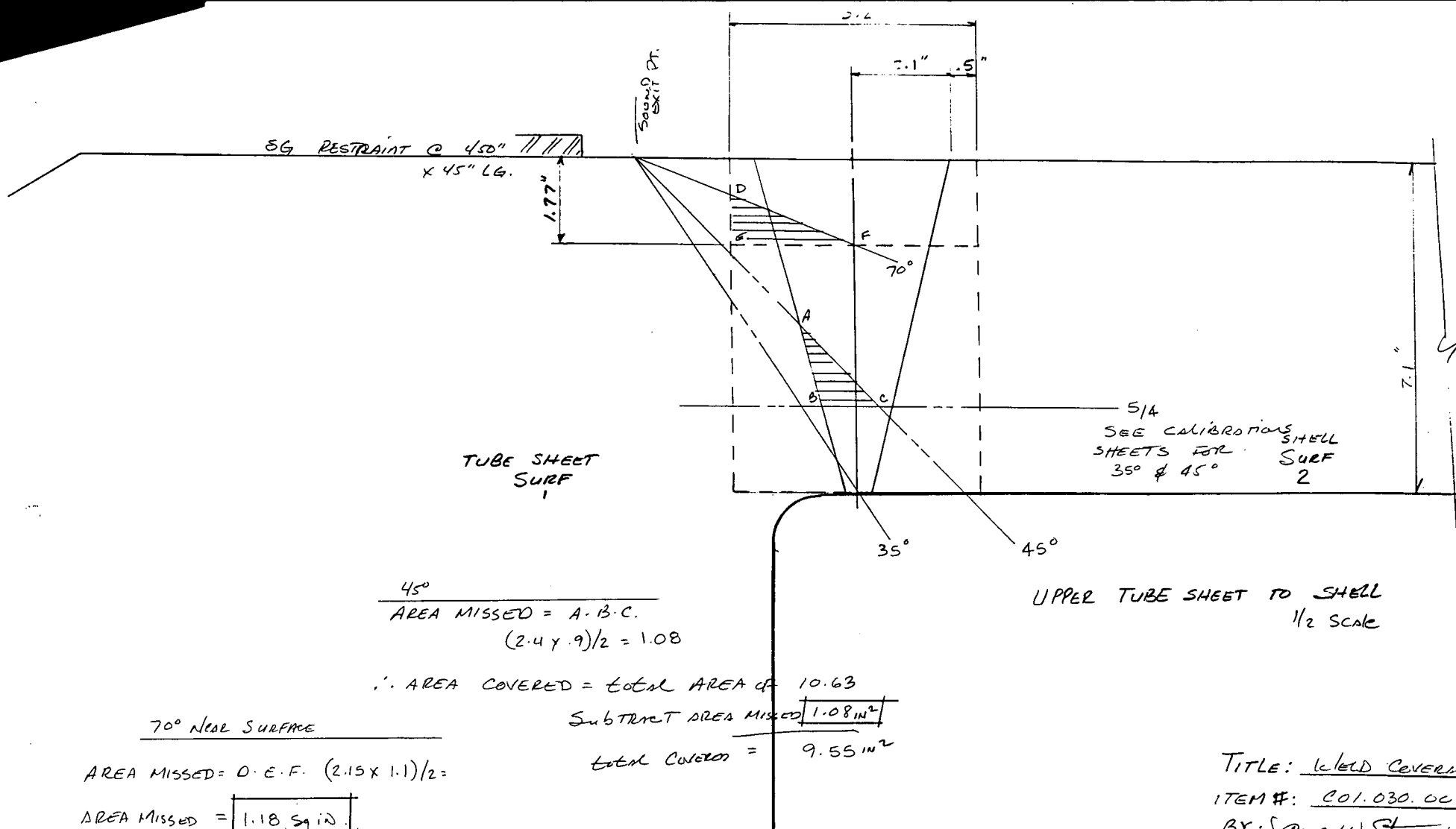


TITLE: Weld COVERED

ITEM #: COI. 030-001

BY: James W. Schyn Level III

DATE: 11.22.95



$$\begin{aligned} & \frac{45^\circ}{\text{AREA MISSED} = A \cdot B \cdot C.} \\ & (2.4 \times .9) / 2 = 1.08 \end{aligned}$$

$$\begin{aligned} \therefore \text{AREA COVERED} &= \text{TOTAL AREA OF } 10.63 \\ \text{SUBTRACT AREA MISSED } & \boxed{1.08 \text{ IN}^2} \\ \text{TOTAL COVERED} &= 9.55 \text{ IN}^2 \end{aligned}$$

$$\begin{aligned} & \frac{70^\circ \text{ NEAR SURFACE}}{\text{AREA MISSED} = D \cdot E \cdot F. (2.15 \times 1.1) / 2 =} \\ \text{AREA MISSED} &= \boxed{1.18 \text{ Sq IN.}} \end{aligned}$$

TITLE: WELD COVERAGE.  
ITEM #: COI.030.001  
BY: James W. Sibley Level III  
DATE: 11.22.95