

# REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8710090010 DOC. DATE: 87/10/02 NOTARIZED: YES DOCKET #  
 FACIL: 50-315 Donald C. Cook Nuclear Power Plant, Unit 1, Indiana & 05000315  
 50-316 Donald C. Cook Nuclear Power Plant, Unit 2, Indiana & 05000316  
 AUTH. NAME AUTHOR AFFILIATION  
 ALEXICH, M. P. Indiana Michigan Power Co.  
 RECIP. NAME RECIPIENT AFFILIATION  
 MURLEY, T. E. Document Control Branch (Document Control Desk)

SUBJECT: Responds to NRC Bulletin 87-001, "Thinning of Pipe Walls in Nuclear Power Plants." Response to action items, erosion/corrosion insp program, list of components replaced or scheduled for replacement & flow diagrams encl.

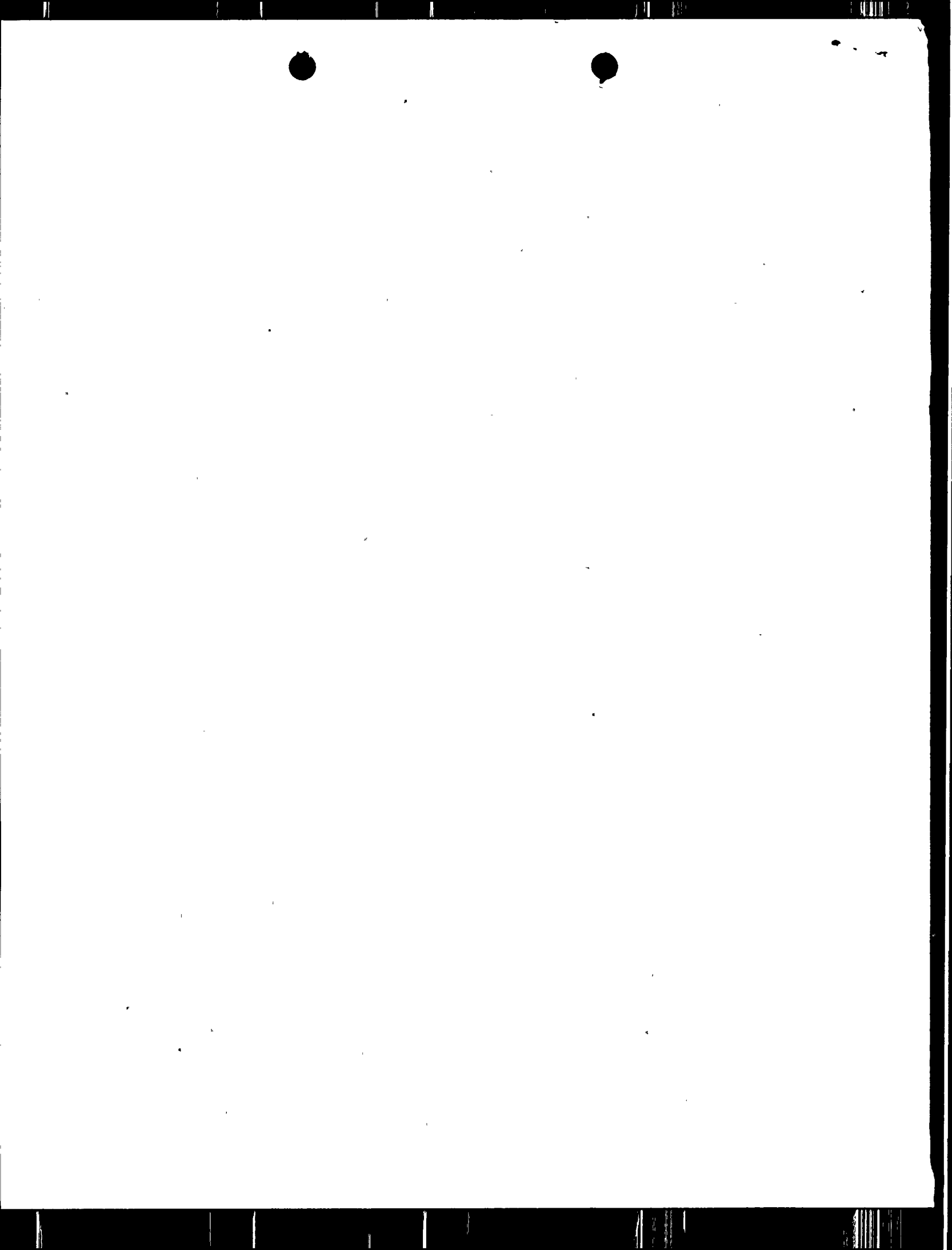
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AEP:NRC:1031

Donald C. Cook Nuclear Plant Units 1 and 2  
Docket Nos. 50-315 and 50-316  
License Nos. DPR-58 and DPR-74  
RESPONSE TO NRC BULLETIN 87-01  
THINNING OF PIPE WALLS IN NUCLEAR POWER PLANTS

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D.C. 20555

Attn: T. E. Murley

October 2, 1987

Dear Dr. Murley:

This letter responds to NRC Bulletin No. 87-01, "Thinning of Pipe Walls in Nuclear Power Plants." NRC Bulletin 87-01 requests information regarding the programs that monitor the wall thickness of pipe walls in high energy single phase and two-phase piping systems fabricated of carbon steel.

Attachment 1 to this letter contains our response to the NRC Bulletin 87-01 action items. Included in this attachment are (1) a figure of a typical ultrasonic (UT) examination grid, (2) a table summarizing our Erosion/Corrosion (E/C) Inspection Program, and (3) a table listing all components that have been replaced or are scheduled for replacement.

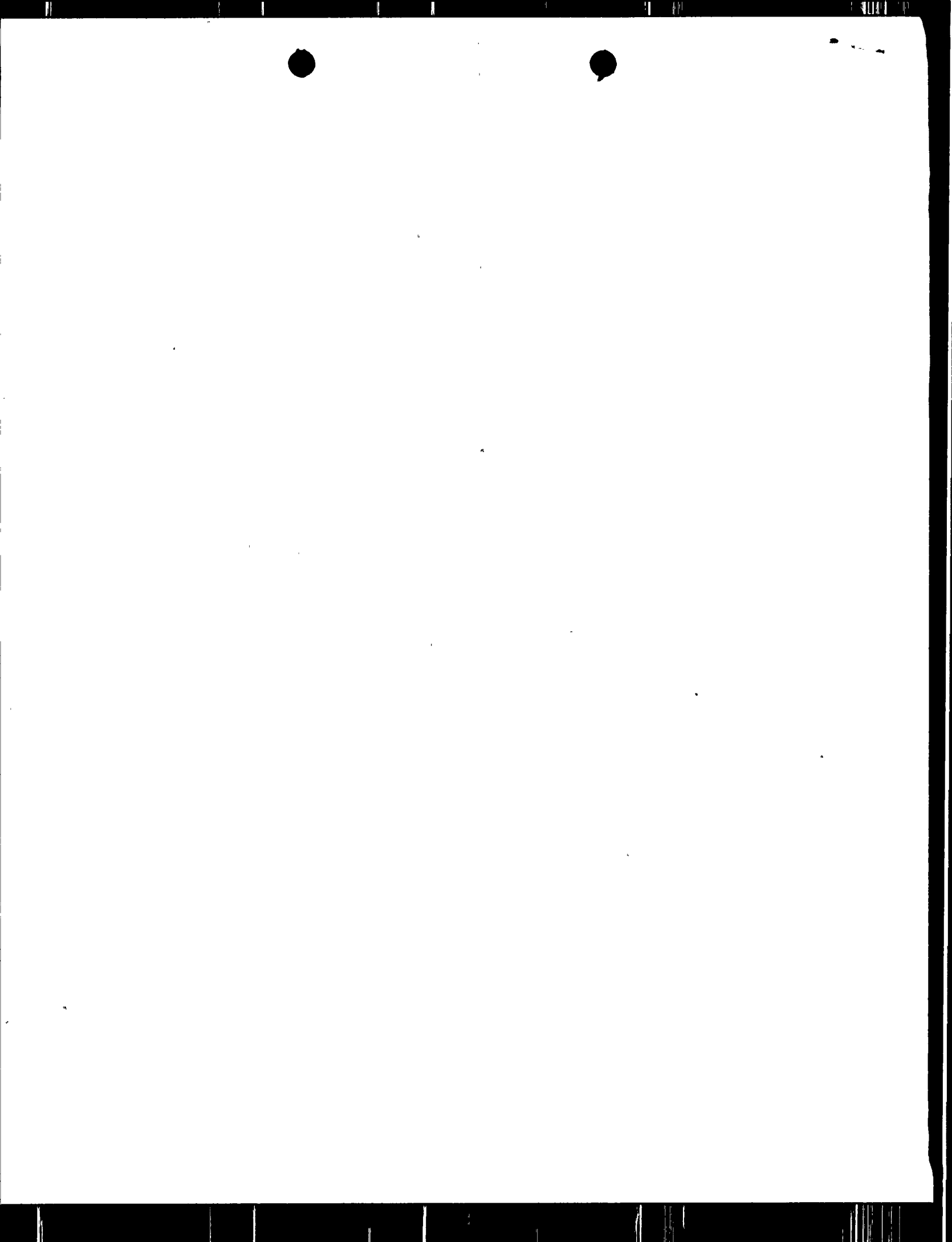
FSAR flow diagrams for the systems included in the D. C. Cook E/C Inspection Program have been provided in Attachment 2. These flow diagrams indicate the extent of the inspection program for these systems.

Attachment 3 contains the results of the inspections conducted under the D. C. Cook Nuclear Plant E/C Inspection Program for these systems. Categorized by system, each data package contains the

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Dr. T. E. Murley

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AEP:NRC:1031

pipng isometric which identifies the locations for examination, the dates the UT readings were taken, the UT results, an evaluation of the findings, and a summary report.

Sincerely,



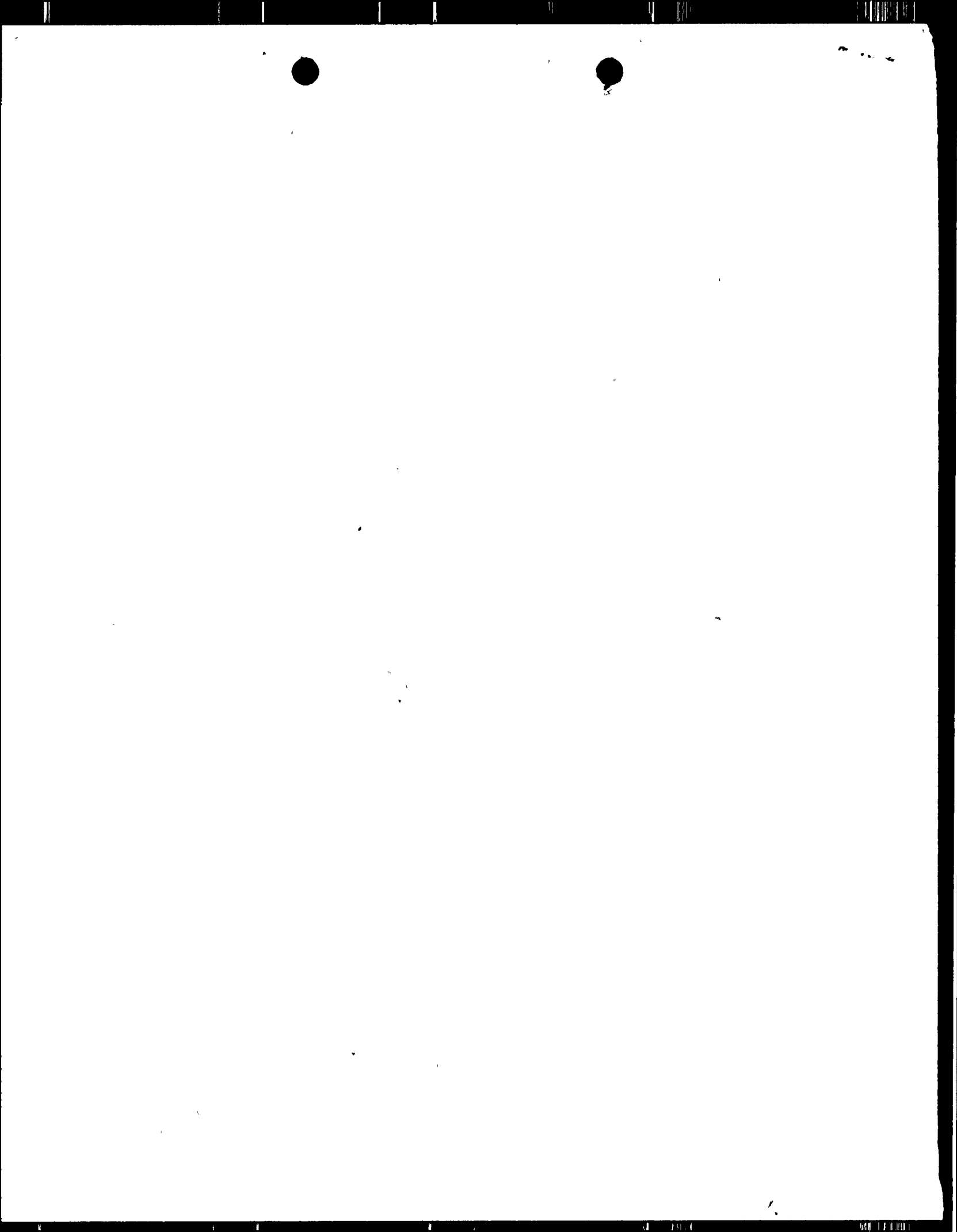
M. P. Alexich  
Vice President

cm

Attachments

cc: John E. Dolan  
W. G. Smith, Jr. - Bridgman  
R. C. Callen  
G. Bruchmann  
G. Charnoff  
NRC Resident Inspector - Bridgman  
A. B. Davis - Region III







Dr. T. E. Murley

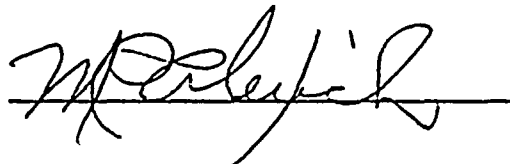
-4-

AEP:NRC:1031

STATE OF OHIO

COUNTY OF FRANKLIN

Milton P. Alexich, being duly sworn, deposes and says that he is the Vice President of licensee Indiana Michigan Power Company, that he has read the foregoing response to NRC Bulletin 87-01, "Thinning of Pipe Walls in Nuclear Power Plants," and knows the contents thereof; and that said contents are true to the best of his knowledge and belief.

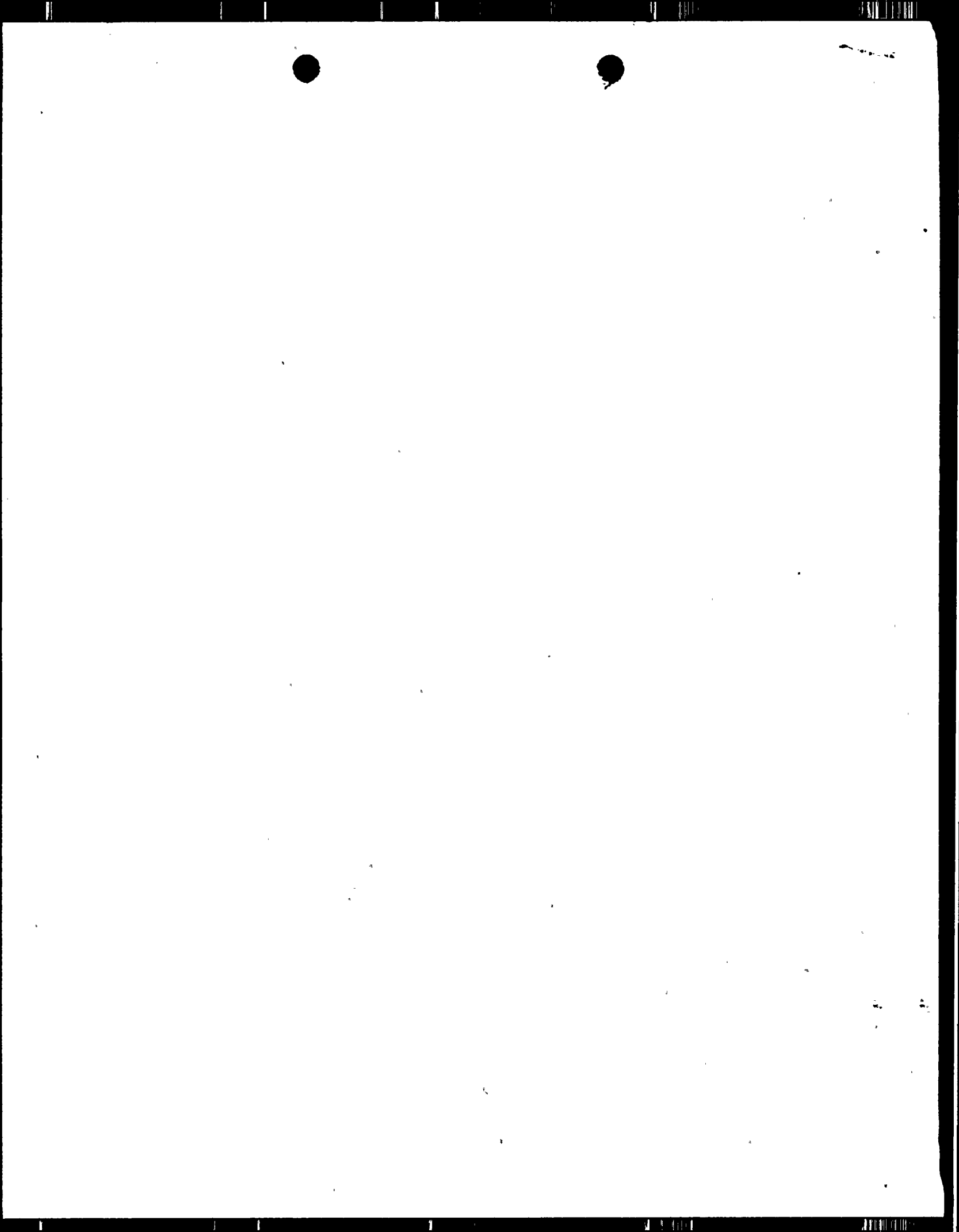


Subscribed and sworn to before me this 2nd day of October, 1987.

  
NOTARY PUBLIC

BARBARA ANN WINKLER  
NOTARY PUBLIC, STATE OF OHIO  
MY COMMISSION EXPIRES MARCH 12, 1991







Attachment 1 to AEP:NRC:1031

Response to NRC Bulletin 87-01

REGULATORY DOCKET FILE COPY

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RESPONSE TO ACTION ITEMS

Action Item 1: Identify the codes or standards to which the piping was designed and fabricated.

The piping at D. C. Cook Nuclear Plant was designed and fabricated in accordance with USAS B31.1.0-1967 Power Piping Code. The carbon steel piping in these high energy single and two-phase systems was purchased in accordance with the following ASTM Standards:

ASTM A-106 Grade B

ASTM A-155 Grade KC70 Class 1

ASTM A-234 Grade WPB



Action Item 2: Describe the scope and extent of your programs for ensuring that pipe wall thicknesses are not reduced below the minimum allowable thickness. Include in the description the criteria that you have established for:

- a. selecting points at which to make thickness measurements,
- b. determining how frequently to make thickness measurements,
- c. selecting the methods used to make thickness measurements and
- d. making replacement/repair decisions.

The Cook Nuclear Plant Erosion/Corrosion (E/C) Inspection Program was initiated as part of the review of I. E. Information Notice 82-22 and INPO SERs' 88-84 and 23-85. These documents describe instances of failures in pipes carrying steam and/or water caused by thinning of the pipe wall.

Initially, the E/C Inspection Program was established for two-phase flow. The information from EPRI Report No. NP-3944 entitled, "Erosion/Corrosion in Nuclear Plant Steam Piping: Causes and Inspection Program Guidelines," was used as the basis for determining the systems to be included and selecting the components to be examined. This report will be maintained in AEPSC files and is not included in this submittal. Specifically, the bleed steam (turbine extraction), turbine crossunder (high pressure turbine exhaust to low pressure turbine inlet) and feedwater heater drains were identified as potential two-phase flow systems to be examined for wall thickness degradation. These piping systems use carbon steel material, (chromium content was not used as an elimination criteria), transport fluids with relatively high moisture content and moderate temperatures.

Each location chosen for wall thickness inspection was prioritized based on Keller's Equation (EPRI Report No. NP-3944) and inspections were scheduled based upon its priority and unit availability. Components determined to require re-examination due to projected long term erosion/corrosion degradation are scheduled to be conducted prior to achieving the code minimum wall. The wall thickness was measured at many points on the selected components. Refer to Figure 1, which shows a typical grid at which measurements were taken on an elbow.

In August 1985, the E/C Inspection Program was expanded to include single-phase flow systems. The carbon steel piping systems with fluid temperatures greater than 140°F, and velocities greater than 10 feet per second were considered. Again, the chromium content of the carbon steel material was not used to eliminate piping systems from examinations.



Selection of components for examinations and the schedule for examining the components is done in a similar manner to the two phase piping systems.

For all of the systems included in the program, ultrasonic examination (UT) is used to determine the pipe wall thickness. UT's are scheduled both during plant operations and shutdowns.

Turbine crossunder and some bleed steam piping, because of their large diameter, is also visually inspected during outages.

The piping acceptability is evaluated based on the minimum wall thickness UT reading that was measured for the component. This value is compared to the original wall thickness (manufacturer's minimum allowable) of the pipe to determine acceptability. When the minimum wall thickness reading is below the manufacturer's minimum wall thickness allowable, a wall thinning rate is calculated based upon nominal wall. Re-examination, repairs, or replacement of the component is based on the projected time that the wall thickness would reach the code minimum required. Repairs and/or replacement of the component are scheduled prior to achieving minimum wall.

The high energy single and two-phase carbon steel piping systems included in the E/C Inspection Program are:

- Condensate
- Feedwater
- Feed pump Emergency Leakoff
- Bleed Steam
- Turbine Cross-Under
- Heater Drains and Vents

Attachment 2 contains the FSAR flow diagrams that indicate the extent of these systems in the Cook E/C Inspection Program.



Action Item 3: For liquid-phase systems, state specifically whether the following factors have been considered in establishing your criteria for selecting points at which to monitor piping thickness (Item 2a):

- a. piping material (e.g., chromium content)
- b. piping configuration (e.g., fittings less than 10 pipe diameters apart)
- c. pH of water in the system (e.g., pH less than 10)
- d. system temperature (e.g., between 190 and 500°F)
- e. fluid bulk velocity (e.g., greater than 10 feet/sec.)
- f. oxygen content in the system (e.g., oxygen content less than 50 ppb)

For liquid-phase systems, the Cook Plant E/C Inspection Program considered the following factors:

- a) Piping systems constructed with carbon steel material (regardless of chromium content).
- b) Piping configurations that have fittings less than ten pipe diameters apart or flow restrictions.
- c) Piping systems were not eliminated from the program based on either pH or oxygen content. We believe that using these two parameters would not influence the systems that were selected for inclusion in the Cook E/C Inspection Program.
- d) Piping systems with operating temperature greater than 140°F.
- e) Piping systems with bulk water velocity greater than 10 ft/sec.
- f) Refer to Item c), listed above.



Action Item 4: Chronologically list and summarize the results of all inspections that have been performed, which were specifically conducted for the purpose of identifying pipe wall thinning, whether or not pipe wall thinning was discovered, and any other inspection where pipe wall thinning was discovered even though that was not the purpose of that inspection.

- a. Briefly describe the inspection program and indicate whether it was specifically intended to measure wall thickness or whether wall thickness measurements were an incidental determination.
- b. Describe what piping was examined and how (e.g., describe the inspection instrument(s), test method, reference thickness, locations examined, means for locating measurement point(s) in subsequent inspections.
- c. Report thickness measurement results and note those that were identified as unacceptable and why.
- d. Describe actions already taken or planned for piping that have been found to have a nonconforming wall thickness. If you have performed a failure analysis, include the results of that analysis. Indicate whether the actions involve repair or replacement, including any change of materials.

Although the inspection program was informally started, UT readings specifically to determine pipe wall thickness have been taken since November, 1982. Table 1 is a summary of the inspection plan and results of the Cook Nuclear Plant E/C Inspection Program for high energy single and two-phase carbon steel piping systems.

Attachment 3 contains the results of the inspections conducted under the Cook Nuclear Plant E/C Inspection Program for these systems. By system, each data package contains the piping isometric which identifies the locations for examination, the dates the UT readings were taken, the UT results, an evaluation of the findings, and a summary report. The summary report makes recommendations regarding acceptance for the remaining life of the plant, re-examination schedule requirements or actions required for repair/replacement.

Instruments used for the erosion/corrosion program consist of standard pulse echo ultrasonic units. These units are both digital thickness instruments and instruments with a cathode ray tube and digital display. Dual transducers of a diameter adequate to allow proper surface contact on the component examined are normally used. Frequencies used are either 2.25 MHZ or 5.0 MHZ.



Calibration encompasses adjusting the unit to read accurately through a range consistent with the nominal thickness of the component to be examined. This is performed by using a reference standard made of the same or ultrasonically similar material with known thicknesses. The linearity of the unit is calibrated to as broad of a range as practical to assure that readings considerable lower or higher than nominal thickness will be as accurate as those in the mid-range of the calibration. Tolerances of data obtained from ambient, out of service, components is  $\pm .005$ ".

When examinations are performed during unit operation, components are generally examined at elevated temperatures. Calibration of instruments used for these examinations are performed in the same manner described above, except for the following: transducers and couplant designed specifically for high temperature use are employed and the reference standards are heated to approximately the same temperature of the component to be examined. Due to these elevated temperatures and component vibration and accuracy tolerance of  $\pm .020$ " is used for evaluating this data.

Data acquisition is performed in the following manner: 1) a diagram of the component is used to identify the location of examination and reference points, 2) a reference point on the component is identified as 0 degrees on the diagram, which also indicates direction of flow, and 3) readings are recorded at circumferential locations and axial locations throughout the area examined. Refer to Figure 1 for typical grid.

Table 2 is a listing of all components that have been replaced or are scheduled for replacement. It also indicates any change in material.







Action Item 5: Describe any plans either for revising the present or for developing new or additional programs for monitoring pipe wall thickness.

The Cook Nuclear Plant E/C Inspection Program has been expanded several times based on industry experience, operating experience at D. C. Cook Nuclear Plant, and findings in our current erosion/corrosion program. Recently, the inspections of the main feedwater pump suction piping was added to the program. This was done to assure ourselves that we were not susceptible to the same event as the Surry Plant. We are currently evaluating the need to perform pipe wall thickness measurements in the low pressure Auxiliary Steam (plant heating and miscellaneous non-nuclear services) System.



FLOW

WELD

TDC

G F E D C

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

90° ELBOW

WELD

	A	B	C	D	E	F	G
0°	1.031	1.026	1.013	1.027	1.009	1.027	1.098
30°	1.017	1.007	1.004	1.006	.971	.994	.991
60°	1.050	.992	.983	.993	1.008	.969	.972
90°	1.020	.976	1.005	1.024	.935	.950	.977
120°	1.043	1.021	.983	1.033	1.017	.957	.946
150°	1.025	.994	1.005	1.008	.979	.998	1.000
180°	1.010	1.059	1.095	1.067	1.030	1.039	1.029
210°	1.071	1.064	1.112	1.034	1.053	1.059	1.079
240°	1.012	1.061	1.109	1.044	1.067	1.088	1.048
270°	1.006	1.106	1.067	1.053	1.008	1.129	1.095
300°	1.002	1.074	1.049	1.119	1.070	1.119	1.108
330°	1.049	1.065	1.034	1.063	1.054	1.062	1.032

JOB ORDER # 015513  
ISO # 2-FW-62-SHT-2-F3 REV 3 (H)  
DATE: 1/2/87 TEMP: 248°F

FIGURE 1  
TYPICAL ULTRASONIC EXAMINATION GRID



TABLE 1  
SUMMARY OF EROSION/CORROSION PROGRAM

Page 1

SYSTEM	NO. OF COMPONENTS TO BE INSPECTED	NO. OF COMPONENTS INSPECTED	NO. OF COMPONENTS REPLACED	NO. OF COMPONENTS SCHEDULED FOR RE-INSPECTION	NO. OF COMPONENTS ACCEPTABLE	REMARKS
Bleed Steam	220	193	30	47	116	On going program - Remaining 27 components are being scheduled for inspection
Condensate	39	39	0	0	39	
Feedwater	49	49	0	0	49	
Feedwater Pump Emergency Leak Off	142	142	46	24	72	Since severe erosion/corrosion was found, more inspections will be scheduled.
Heaters, Drains, and Vents	65	65	4 Replaced 2 to be Replaced	5	58	
Turbine Cross-Under	The turbine cross-under pipe is large bore pipe. Initial inspection of the pipe is visual. If severe erosion/corrosion is observed, the locations in question are ultrasonically inspected. The erosion/corrosion that has been found thus far is in the form of tiger striping on straight lengths, and loss of wall thickness in the miter bends and weld areas. Corrective action taken has been the replacement of eight miter bends, and weld repair. A study on the effectiveness of spray coatings is being performed (this is corrective action for tiger striping).					







TABLE 2

Summary Listing Components which have been  
 . Replaced or are Scheduled for Replacement

<u>Isometric Drawing No.</u>	<u>Component ID</u>	<u>Component Description</u>	<u>Replacement Material</u>
Feedwater Pump Emergency Leak-Off System			
1-FW-60, Rev. 5	D	4"-90° ELBOW	STAINLESS STEEL
Sh. 2 of 2	E	4"-90° ELBOW	STAINLESS STEEL
1-FW-61, Rev. 9	D	4"-90° ELBOW	STAINLESS STEEL
Sh. 2 of 2	E	4"-90° ELBOW	STAINLESS STEEL
1-FW-59, Rev. 9	J	4"-90° ELBOW	STAINLESS STEEL
Sh. 2 of 2	M	4"-90° ELBOW	STAINLESS STEEL
	N	4"-90° ELBOW	STAINLESS STEEL
	N	4"-STRAIGHT PIPE	STAINLESS STEEL
1-FW-58, Rev. 5	E	4"-90° ELBOW	STAINLESS STEEL
Sh. 2 of 2	H	4"-90° ELBOW	STAINLESS STEEL
2-FW-82, Rev. 4	E	4"-90° ELBOW	STAINLESS STEEL
	F	4"-90° ELBOW	STAINLESS STEEL
	G	4"-90° ELBOW	STAINLESS STEEL
	K	4"-90° ELBOW	STAINLESS STEEL
	U	4"-90° ELBOW	STAINLESS STEEL
2-FW-83, Rev. 3	E	4"-90° ELBOW	STAINLESS STEEL
Sh. 1 of 2	F	4"-90° ELBOW	STAINLESS STEEL
2-FW-83, Rev. 1	B	4"-90° ELBOW	STAINLESS STEEL
Sh. 2 of 2	C	4"-90° ELBOW	STAINLESS STEEL
	F	4"-90° ELBOW	STAINLESS STEEL
	I	4"-90° ELBOW	STAINLESS STEEL
	J	4"-90° ELBOW	STAINLESS STEEL
2-FW-84, Rev. 4	A	4"-90° ELBOW	STAINLESS STEEL
	B	4"-90° ELBOW	STAINLESS STEEL
	C	4"-90° ELBOW	STAINLESS STEEL
	L	4"-90° ELBOW	STAINLESS STEEL
	S	4"-90° ELBOW	STAINLESS STEEL
2-FW-85, Rev. 2	A	4"-90° ELBOW	STAINLESS STEEL
Sh. 1 of 2	B	4"-90° ELBOW	STAINLESS STEEL
	H	4"-90° ELBOW	STAINLESS STEEL
2-FW-85, Rev. 4	C	4"-90° ELBOW	STAINLESS STEEL
Sh. 2 of 2	J	4"-90° ELBOW	STAINLESS STEEL
1-FW-58, Rev. 9	D	4"-90° ELBOW	STAINLESS STEEL
Sh. 2 of 2	F	4"-90° ELBOW	STAINLESS STEEL
	G	4"-90° ELBOW	STAINLESS STEEL
1-FW-59, Rev. 5	H	4"-90° ELBOW	STAINLESS STEEL
Sh. 2 of 2			



TABLE 2

Summary Listing Components which have been  
Replaced or are Scheduled for Replacement

<u>Isometric Drawing No.</u>	<u>Component ID</u>	<u>Component Description</u>	<u>Replacement Material</u>
1-FW-59, Rev. 1	H	4"-90° ELBOW	STAINLESS STEEL
Sh. 2 of 2	I	4"-90° ELBOW	STAINLESS STEEL
1-FW-60, Rev. 5	G	4"-90° ELBOW	STAINLESS STEEL
Sh. 1 of 2	I	4"-90° ELBOW	STAINLESS STEEL
1-FW-60, Rev. 9	A	4"-90° ELBOW	STAINLESS STEEL
Sh. 2 of 2	B	4"-90° ELBOW	STAINLESS STEEL
	C	4"-90° ELBOW	STAINLESS STEEL
1-FW-61, Rev. 5	F	4"-90° ELBOW	STAINLESS STEEL
Sh. 1 of 2	I	4"-90° ELBOW	STAINLESS STEEL
,	J	4"-90° ELBOW	STAINLESS STEEL

#### Heater Drains and Vents

1-HPD-12, Rev. 2	H	3"-90° ELBOW	STAINLESS STEEL
2-HPD-28, Rev. 1	T	4"-90° ELBOW	STAINLESS STEEL

#### Bleed Steam System

1-B-22, Rev. 3	A	16"-90° ELBOW	STAINLESS STEEL
	B	16"-90° ELBOW	STAINLESS STEEL
1-B-24, Rev. 5	A	16"-90° ELBOW	STAINLESS STEEL
	B	16"-90° ELBOW	STAINLESS STEEL
	C	16"-90° ELBOW	STAINLESS STEEL
	M	16"-90° ELBOW	STAINLESS STEEL
2-B-106, Rev. 6	C	18"-90° ELBOW	STAINLESS STEEL
	Downstream of HMO-405	18"-90° ELBOW	STAINLESS STEEL
2-B-107, Rev. 7	C	18"-90° ELBOW	STAINLESS STEEL
	D	20"-90° ELBOW	PADWELD
2-B-106, Rev. 6		5-18" STRAIGHT LENGTHS	STAINLESS STEEL
		2-18"-45° ELBOWS	STAINLESS STEEL
		2-18"-90° ELBOWS	STAINLESS STEEL
2-B-107, Rev. 7		6-18"-STRAIGHT LENGTHS	STAINLESS STEEL
		5-18"-90° ELBOWS	STAINLESS STEEL

#### Turbine Cross-Under Pipe

-----		8-60" MITER BENDS	STAINLESS STEEL
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Attachment 2 to AEP:NRC:1031

FSAR Flow Diagrams



Attachment 3 to AEP:NRC:1031

Erosion/Corrosion Inspection Results





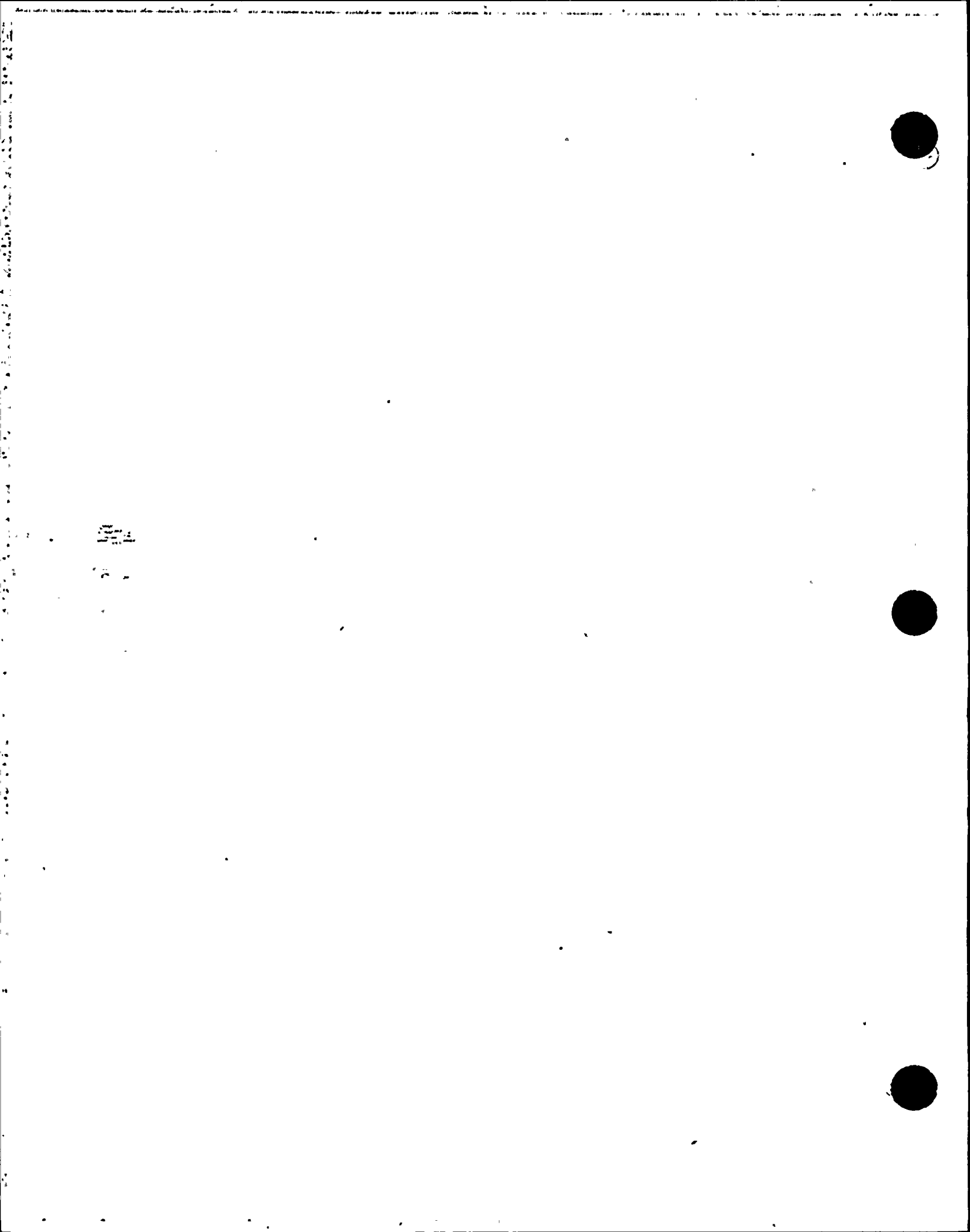


CONDENSATE  
SYSTEM

FEEDWATER PUMP EMERGENCY  
LEAK-OFF SYSTEM

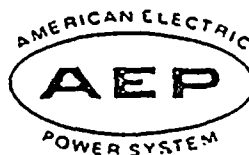
FEEDWATER  
SYSTEM







## AMERICAN ELECTRIC POWER SERVICE CORPORATION

DATE: SEPTEMBER 17, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 1  
       Steam Piping Erosion Program, SER No. 88-84  
  X   Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. J. A. Kobyra *HAL 9/18/87*  
 2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on SEPTEMBER 2, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
<u>1-FW-58</u>			
<u>Sh. 1 of 2 REV. 5</u>	<u>CS</u>	<u>A</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATIONS REQUIRED</u>
-----	<u>CS</u>	<u>B</u>	<u>" " " " "</u>
-----	<u>CS</u>	<u>D</u>	<u>ACCEPTABLE, RE-INSPECT IN 8 YEARS</u>
-----	<u>CS</u>	<u>E</u>	<u>" " IN 12 YEARS</u>
-----	<u>CS</u>	<u>F</u>	<u>" " IN 12 YEARS</u>
-----	<u>CS</u>	<u>G</u>	<u>" " IN 17 YEARS</u>
-----	<u>CS</u>	<u>I</u>	<u>" " IN 5 YEARS</u>
-----	<u>CS</u>	<u>K</u>	<u>" " IN 7 YEARS</u>
-----	<u>CS</u>	<u>L</u>	<u>" " IN 7 YEARS</u>
<u>1-FW-58</u>			
<u>Sh. 2 of 2 REV. 9</u>	<u>CS</u>	<u>A</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATIONS REQUIRED</u>

Anthony J. Lewandowski  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 J. F. Kurgan/H. B. Brugger  
 P. G. Schoepf

P & V File No. 4.6.3.15.2.5.2Sheet No. 1 of 3



D. C. Cook Nuclear Plant, Unit No. 1  
 Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering evaluation of Wall Thickness Measurements  
 Date: SEPTEMBER 17, 1987  
 Sheet No. 2 of 3

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPS Recommendation
<u>1-FW-58</u>			
<u>Sh. 2 of 2, REV. 9</u>	<u>CS</u>	<u>C</u>	<u>ACCEPTABLE, RE-INSPECT IN 6 YEARS</u>
-----	<u>CS</u>	<u>D</u>	<u>REPLACE</u>
-----	<u>CS</u>	<u>F</u>	<u>REPLACE</u>
-----	<u>CS</u>	<u>G</u>	<u>REPLACE</u>
<u>1-FW-59, REV. 5</u>	<u>CS</u>	<u>H</u>	<u>REPLACE</u>
<u>Sh. 1 of 2</u>	<u>CS</u>	<u>I</u>	<u>ACCEPTABLE, RE-INSPECT IN 13 YEARS</u>
-----	<u>CS</u>	<u>J</u>	<u>" " IN 6 YEARS</u>
<u>1-FW-59, REV. 1</u>	<u>CS</u>	<u>B</u>	<u>" " IN 3 YEARS</u>
<u>Sh. 2 of 2</u>	<u>CS</u>	<u>H</u>	<u>REPLACE</u>
-----	<u>CS</u>	<u>I</u>	<u>REPLACE</u>
<u>1-FW-60, REV. 5</u>	<u>CS</u>	<u>D</u>	<u>ACCEPTABLE, RE-INSPECT IN 3 YEARS</u>
<u>Sh. 1 of 2</u>	<u>CS</u>	<u>F</u>	<u>" " IN 10 YEARS</u>
-----	<u>CS</u>	<u>F</u>	<u>" " IN 4 YEARS</u>
-----	<u>CS</u>	<u>G</u>	<u>REPLACE</u>
-----	<u>CS</u>	<u>H</u>	<u>ACCEPTABLE, RE-INSPECT IN 5 YEARS</u>
<u>1-FW-60, REV. 9</u>	<u>CS</u>	<u>I</u>	<u>REPLACE</u>
<u>Sh. 2 of 2</u>	<u>CS</u>	<u>A</u>	<u>REPLACE</u>
-----	<u>CS</u>	<u>B</u>	<u>REPLACE</u>
-----	<u>CS</u>	<u>C</u>	<u>REPLACE</u>
<u>1-FW-61, REV. 5</u>	<u>CS</u>	<u>E</u>	<u>ACCEPTABLE, RE-INSPECT IN 4 YEARS</u>
<u>Sh. 1 of 2</u>	<u>CS</u>	<u>F</u>	<u>REPLACE</u>
-----	<u>CS</u>	<u>G</u>	<u>ACCEPTABLE, RE-INSPECT IN 3 YEARS</u>



Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
1-FW-61, REV. 5			
Sh. 1 of 2	CS	H	ACCEPTABLE, RE INSPECT IN 3 YEARS
	CS	I	REPLACE
	CS	J	REPLACE
1-FW-61, REV. 9			
Sh. 2 of 2	CS	G	ACCEPTABLE, NO FURTHER <del>EXAMINATION</del> INSPECTIONS REQUIRED
	CS	3 FT DOWN	" " " "
	CS	STREAM D	" " " "
	CS	3 FT. DOWN	" " " "
	CS	STREAM E	" " " "
	CS	3 FT. DOWN	" " " "
1-FW-60, REV. 9			
Sh. 2 of 2	CS	STREAM E	



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPSG Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 1

Evaluation Date: SEPTEMBER 16, 1987

SER No. 23-85 (Water) X  
12-5, 12-6-86

Years in service 11

UT Reading Transmitted on: SEPTEMBER 2, 1987

UT Reading Taken on: 4-8, 4-9-87

Isometric Dwg. NO. 1-FW-58, REV. 5, Sh. 10 of 2

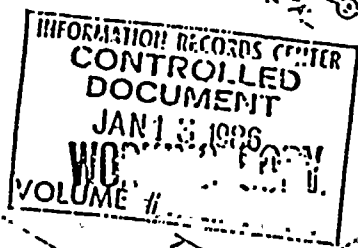
AEPSG Installed Mat'l Class L-31: ASTM A-106 GR. B

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd T <sub>min</sub>	Lowest Reading	Percent Eroded	COMMENTS
A	MAIN HEADER 6X6X3	.432	.378-.486	.346*	.435	0	STILL WITHIN MANUFACTURERS TOLERANCE
A	BRANCH 6X6X3	.300	.263-.338	.183*	.314	0	" " " "
B	MAIN HEADER 6X6X3	.432	.378-.486	.346*	.419	0	" " " "
B	BRANCH 6X6X3	.300	.263-.338	.183*	.307	0	" " " "
D	4"-90° ELL	.437	.382-.492	.235*	.330	13.6	RE-INSPECT IN 8 YEARS
E	4"-90° ELL	.437	.382-.492	.235*	.353	8.2	" IN 12 YEARS
F	4"-90° ELL	.437	.382-.492	.235*	.355	7.1	" IN 12 YEARS
G	4"-90° ELL	.437	.382-.492	.235*	.370	3.1	" IN 17 YEARS
J	4"-90° ELL	.437	.382-.492	.235*	.308	19.4	" IN 5 YEARS
K	4"-90° ELL	.437	.382-.492	.235*	.328	14.1	" IN 7 YEARS
L	4"-90° ELL	.437	.382-.492	.235*	.323	15.4	" IN 7 YEARS

\*  $t_m$  w/  $A=0$ :  $t_m = \frac{PD_o}{2(SF + WP)} + A$



CONS: 95838, 95839



IN	NO	CO	IN	MATERIAL DESCRIPTION	QTY	UNIT
1	1	1	3	CONCRETE WALL	1	CU YD
2	1	1	1	1500' SN SATE 14.12	1	CU YD
3	1	1	1	3000' SN S SATE 14.12	1	CU YD
4	1	1	1	1500' SN S SATE 14.12	1	CU YD
5	1	1	1	3000' SN S SATE 14.12	1	CU YD
6	1	1	1	3000' SN S SATE 14.12	1	CU YD
7	1	1	1	3000' SN S SATE 14.12	1	CU YD
8	1	1	1	3000' SN S SATE 14.12	1	CU YD
9	1	1	1	3000' SN S SATE 14.12	1	CU YD
10	1	1	1	3000' SN S SATE 14.12	1	CU YD
11	1	1	1	3000' SN S SATE 14.12	1	CU YD
12	1	1	1	3000' SN S SATE 14.12	1	CU YD
13	1	1	1	3000' SN S SATE 14.12	1	CU YD

REVISION RECORD			DATE	BY	REASON
1	10/10/70	10/10/70	10/10/70	10/10/70	10/10/70
2	10/10/70	10/10/70	10/10/70	10/10/70	10/10/70
3	10/10/70	10/10/70	10/10/70	10/10/70	10/10/70
4	10/10/70	10/10/70	10/10/70	10/10/70	10/10/70
5	10/10/70	10/10/70	10/10/70	10/10/70	10/10/70

110763

NOTES: REPLACE -  
D'NEAT OUT.

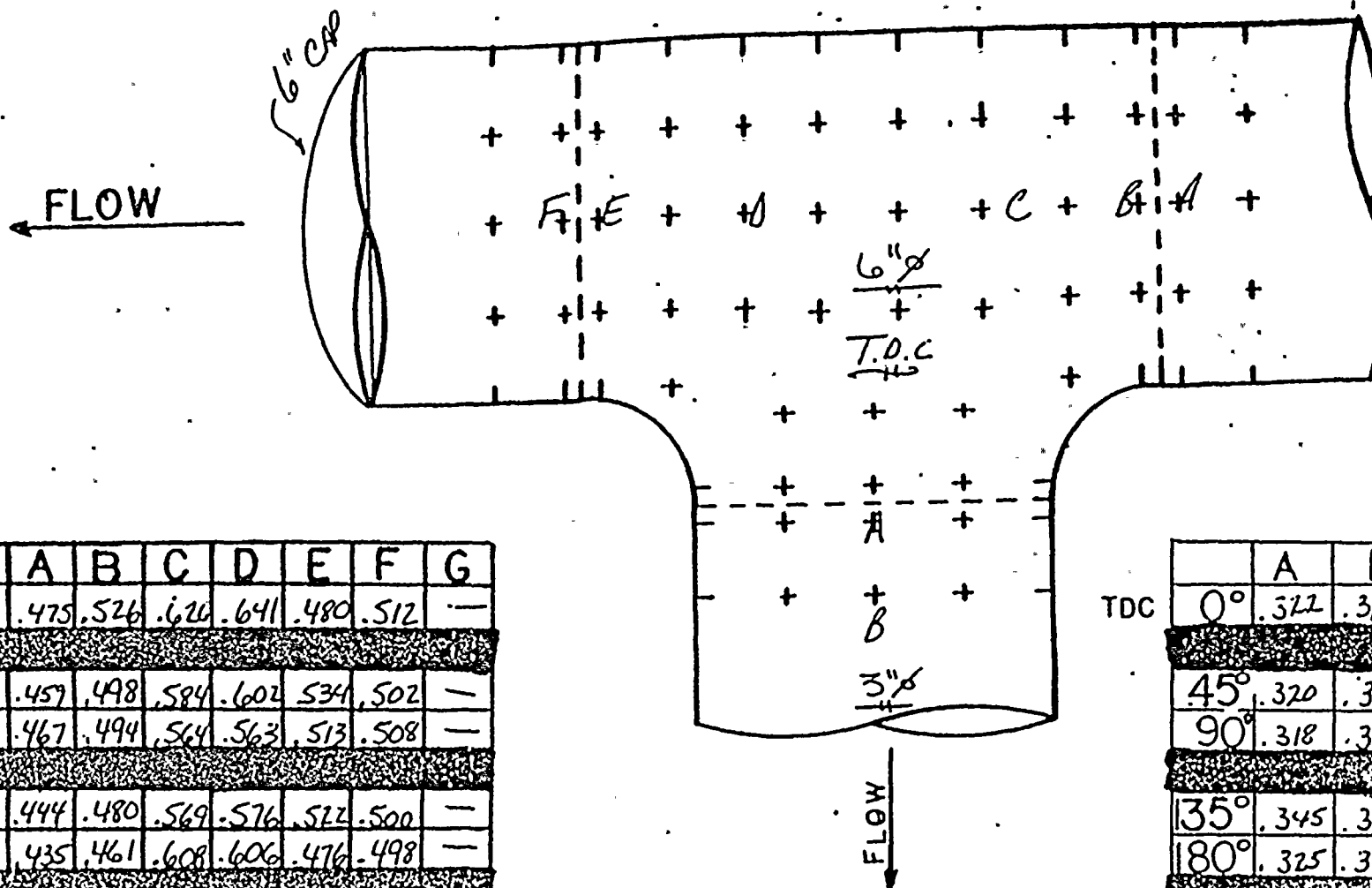
DRAWING APPROVED FOR

Size	Qty.	No
4" 102	6	
N 4	1	
8" 2	2	
1	1	1

Signature: <u>W. J. [illegible]</u> Title: <u>Chief of Police</u> FBIHQ Relationship: <u>2</u> Reporting Date: <u>12/12/78</u>		1. Name of subject 2. Address of subject 3. Date of birth 4. Sex 5. Race 6. Height 7. Weight 8. Eyes 9. Hair 10. Skin 11. Other		12. Date of arrest 13. Date of release 14. Date of conviction 15. Date of sentencing 16. Date of parole 17. Date of death 18. Date of burial 19. Date of cremation 20. Date of interment 21. Date of exhumation 22. Date of reburial 23. Date of reinterment 24. Date of reburial 25. Date of reinterment		26. Date of death 27. Date of burial 28. Date of cremation 29. Date of interment 30. Date of exhumation 31. Date of reburial 32. Date of reinterment 33. Date of reburial 34. Date of reinterment	
FBIHQ Relationship: <u>2</u> Reporting Date: <u>12/12/78</u>		1. Name of subject 2. Address of subject 3. Date of birth 4. Sex 5. Race 6. Height 7. Weight 8. Eyes 9. Hair 10. Skin 11. Other		12. Date of arrest 13. Date of release 14. Date of conviction 15. Date of sentencing 16. Date of parole 17. Date of death 18. Date of burial 19. Date of cremation 20. Date of interment 21. Date of exhumation 22. Date of reburial 23. Date of reinterment 24. Date of reburial 25. Date of reinterment		26. Date of death 27. Date of burial 28. Date of cremation 29. Date of interment 30. Date of exhumation 31. Date of reburial 32. Date of reinterment 33. Date of reburial 34. Date of reinterment	

FORM TOWNE INC. - <i>ETD</i> POURING COMPLETE DATE _____ FABRICATED BY <i>ETD</i>		FLUX DIAGRAM _____ WELD PROCEDURE _____	
MFS DESIGNS INC. NEW YORK, N.Y.		ENGINE & MECHANICAL DESIGN CO DONALD E. COE - NEW YORK STATE	
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.S.P.A.R.G.T. QWDS.		MATERIAL SPEC. # _____ COLD CH. 100°F. 7" SHEETS END BRG. 100°F. 7" <i>L.H. 58</i> <i>END WEL</i>	





TDC

	A	B	C	D	E	F	G
0°	.475	.526	.620	.641	.480	.512	—
45°	.457	.498	.584	.602	.534	.502	—
90°	.467	.494	.564	.563	.513	.508	—
135°	.444	.480	.569	.576	.522	.500	—
180°	.435	.461	.608	.606	.476	.498	—
225°	.436	.479	.694	.618	.460	.496	—
270°	.462	.512	.678	.622	.454	.492	—
315°	.453	.523	.633	.631	.445	.496	—

TDC

	A	B	C
0°	.322	.318	—
45°	.320	.314	—
90°	.318	.322	—
135°	.345	.331	—
180°	.325	.319	—
225°	.333	.314	—
270°	.321	.325	—
315°	.321	.318	—

JOB ORDER# 004985

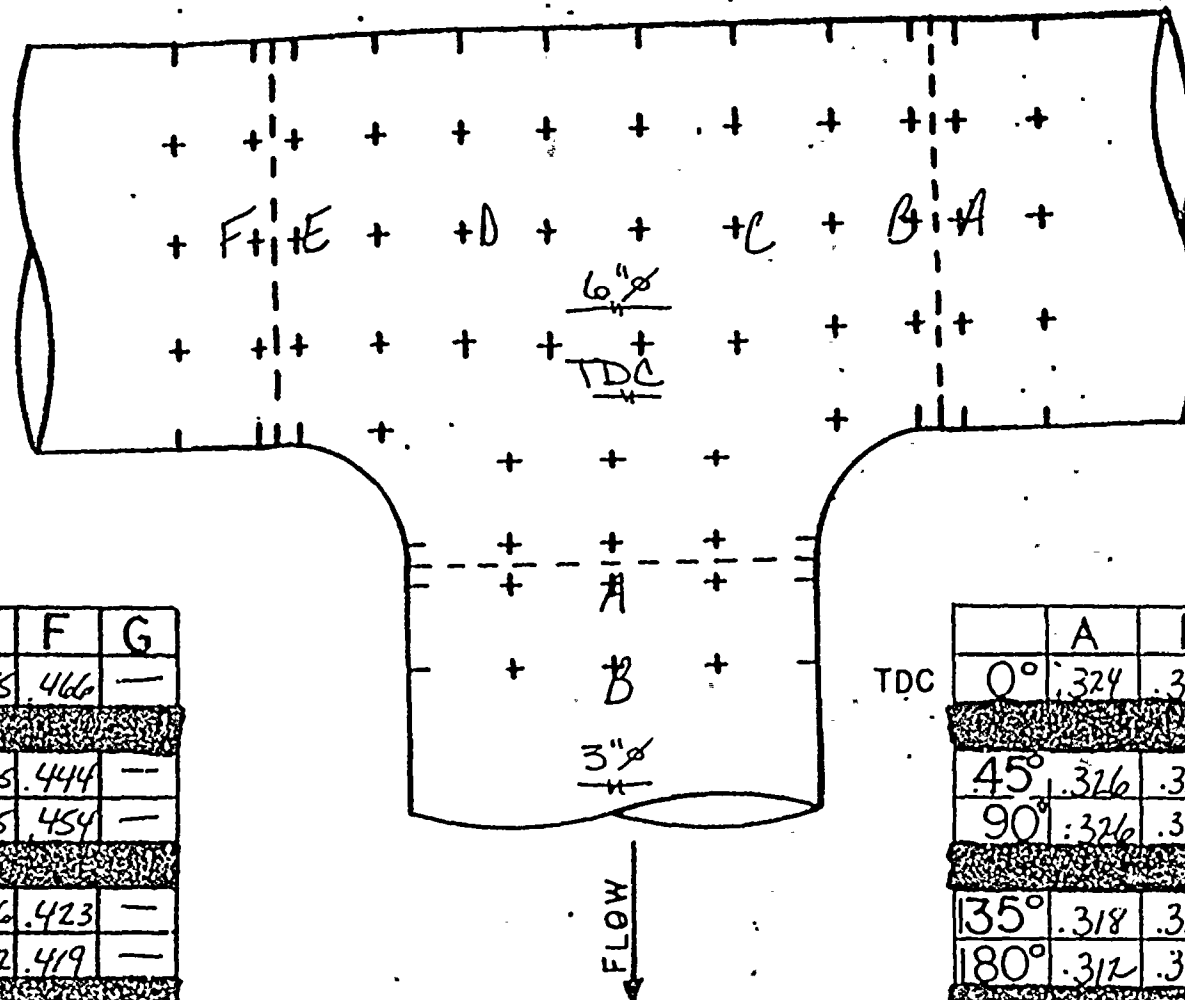
\*\* 1-FW-58 SH-1-F2 (A)  
DATE: 4/10/67 TEMP: 84° F

ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE

WITH FLOW.  
READINGS TAKEN BY:  
C. HARRIS & A. HARRIS



← FLOW



TDC

	A	B	C	D	E	F	G
0°	.445	.450	.610	.632	.455	.466	—
45°	.434	.505	.636	.653	.525	.444	—
90°	.431	.540	.667	.667	.525	.454	—
135°	.435	.483	.708	.693	.526	.423	—
180°	.439	.469	.657	.651	.452	.419	—
225°	.440	.469	.637	.567	.448	.430	—
270°	.437	.505	.603	.622	.454	.426	—
315°	.441	.500	.656	.688	.489	.445	—

TDC

	A	B	C
0°	.324	.319	—
45°	.326	.324	—
90°	.326	.318	—
135°	.318	.331	—
180°	.312	.316	—
225°	.316	.321	—
270°	.309	.307	—
315°	.320	.313	—

JOB ORDER# 004985

ISO\*\* 1-FW-58 SAT 1-F2 (B)

DATE: 4/9/87 TEMP: 86°F

ALL READINGS START AT

T.D.C. AND GO CLOCKWISE

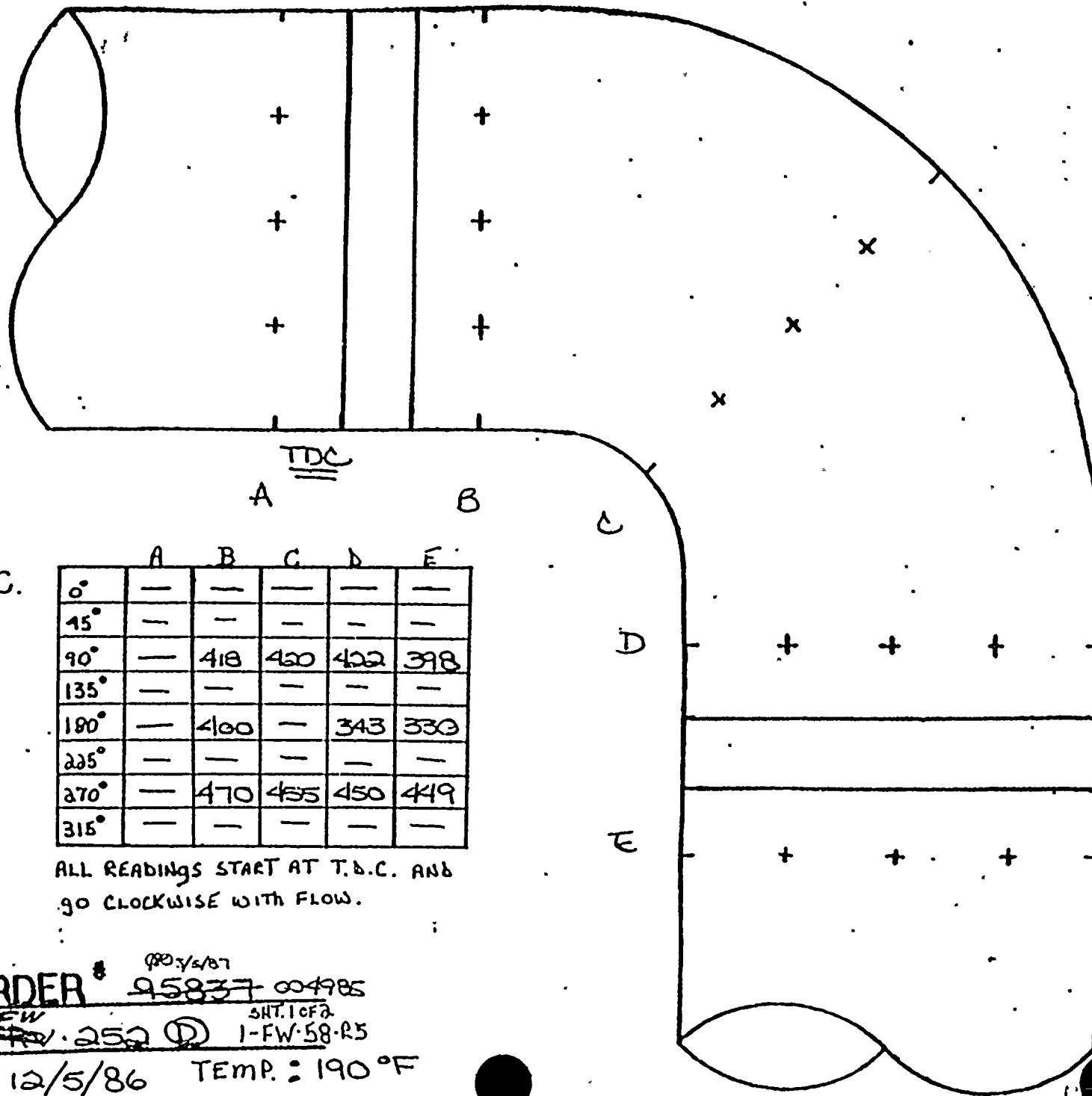
WITH FLOW.

READINGS TAKEN BY:

S. VARGO & A. HOLIDAY



FLOW →



T.D.C.

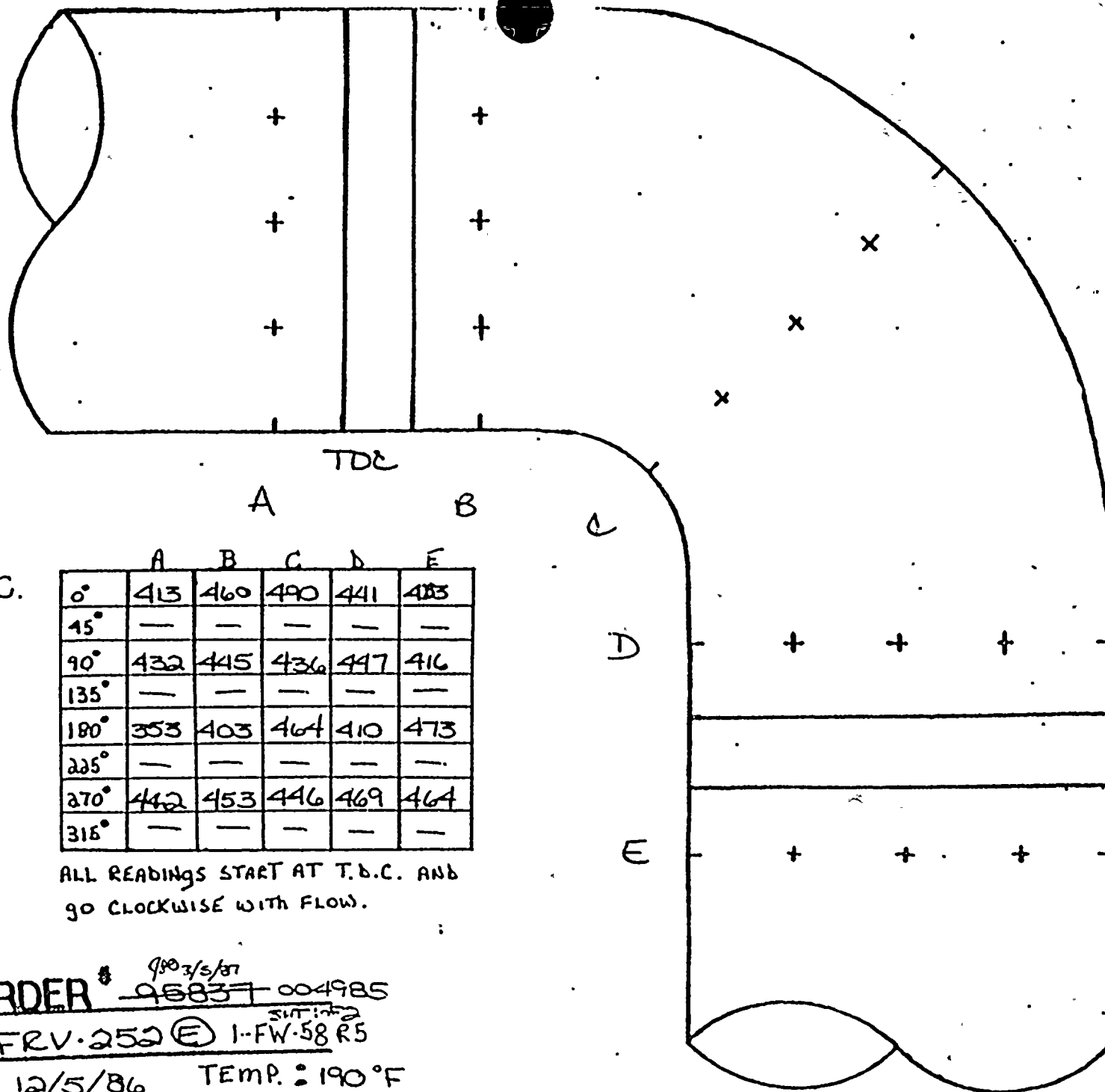
	A	B	C	D	E
0°	—	—	—	—	—
45°	—	—	—	—	—
90°	—	418	420	422	398
135°	—	—	—	—	—
180°	—	4100	—	343	330
225°	—	—	—	—	—
270°	—	470	455	450	419
315°	—	—	—	—	—

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

JOE ORDER # 980.74/87 95837 004985  
ISO # FW 252 ① SHT. 1 CF2 1-FW-58-R5  
TE: 12/5/86 TEMP: 190°F

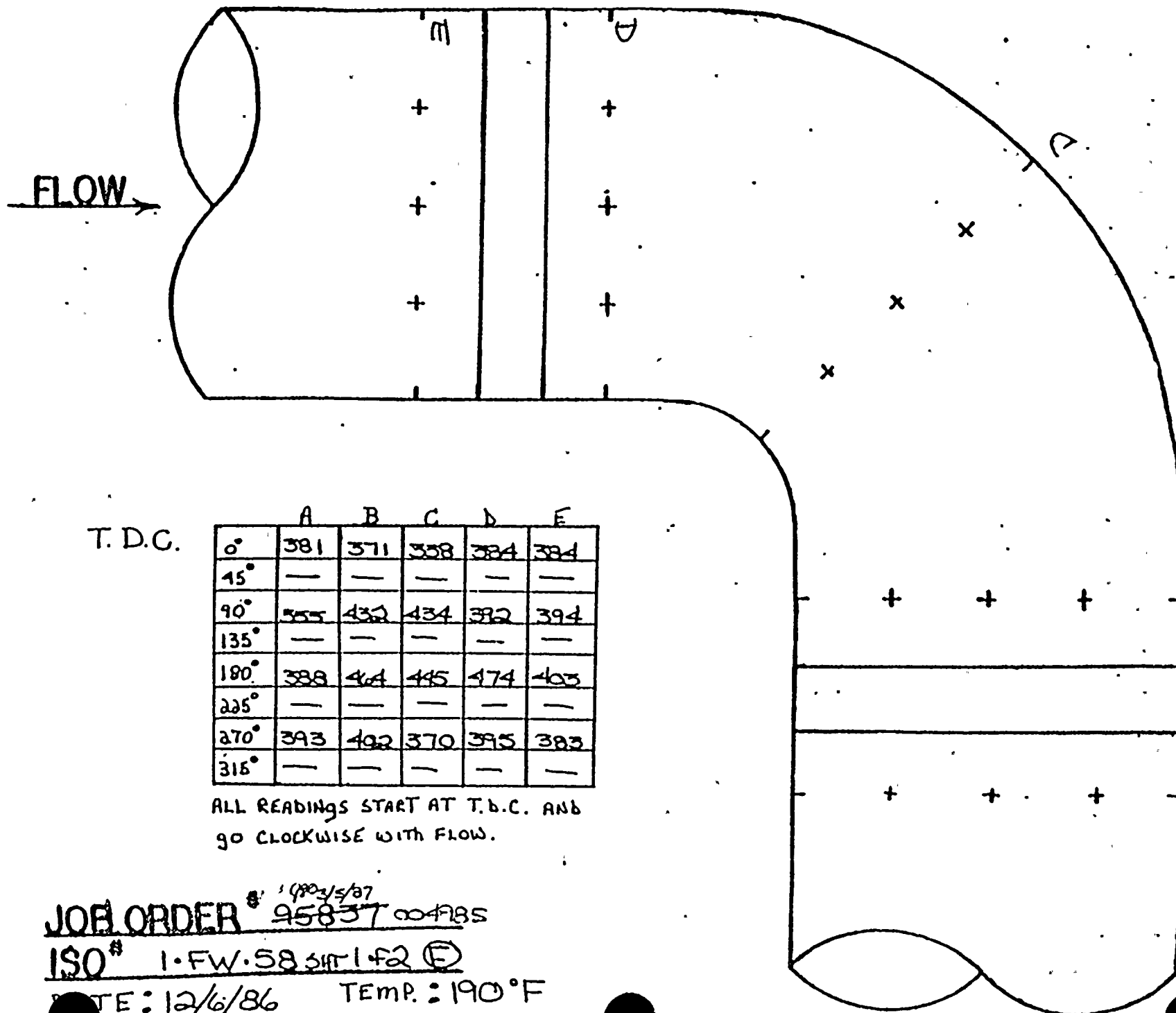


FLOW →



JOE ORDER # 9803/5/81  
 ISO # FRV-252 (E) 1-FW-58 R5  
 DATE: 12/5/86 TEMP.: 190°F





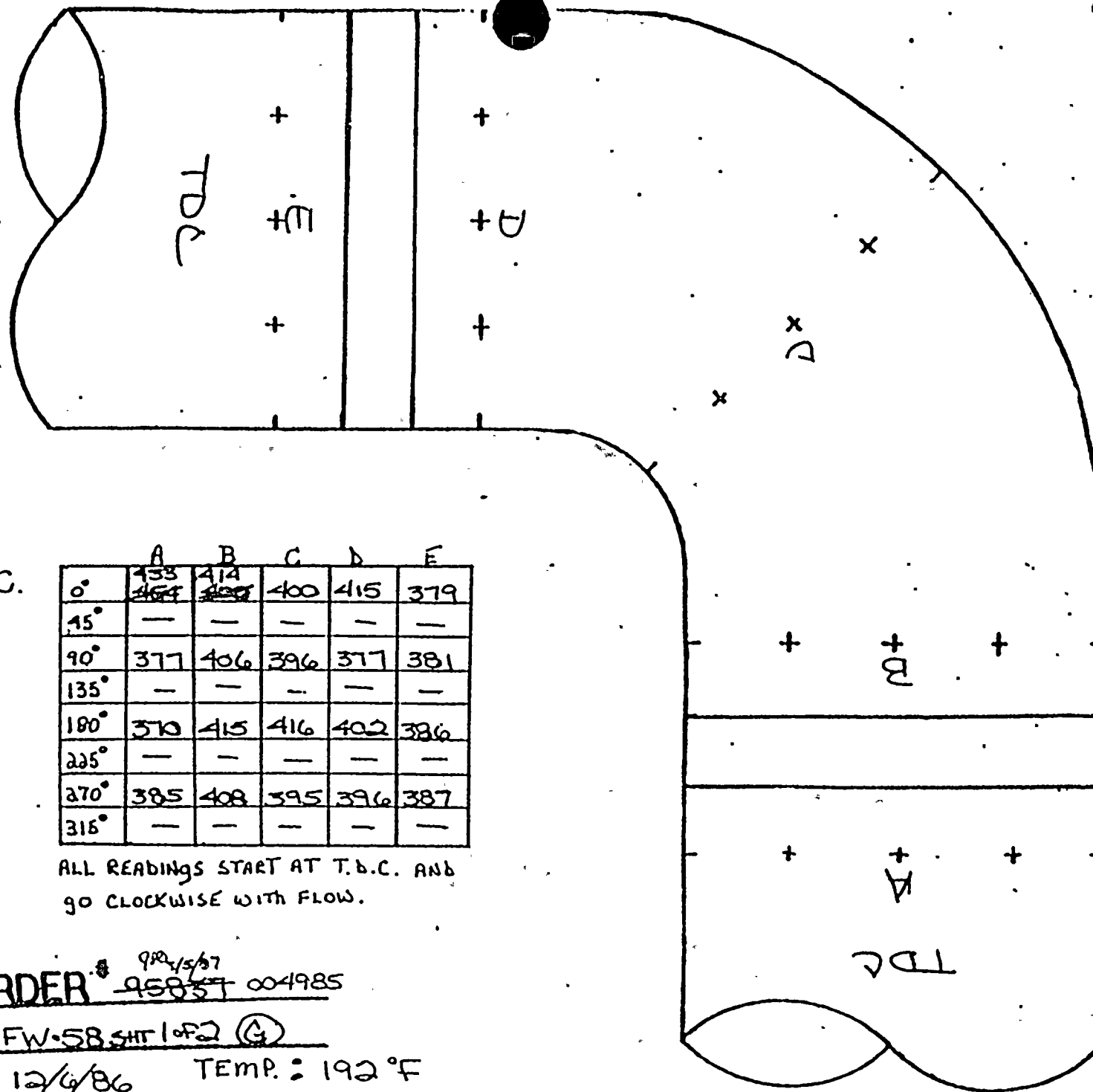
JOE ORDER # 95837 004185

ISO# 1-FW-58 3/11/82 (E)

DATE: 12/6/86 TEMP.: 190°F



FLOW →



T.D.C.

	A	B	C	D	E
0°	433 <del>464</del>	414 <del>400</del>	400	415	379
15°	—	—	—	—	—
90°	377	406	396	377	381
135°	—	—	—	—	—
180°	370	415	416	402	386
225°	—	—	—	—	—
270°	385	408	395	396	387
315°	—	—	—	—	—

ALL READINGS START AT T.D.C. AND GO CLOCKWISE WITH FLOW.

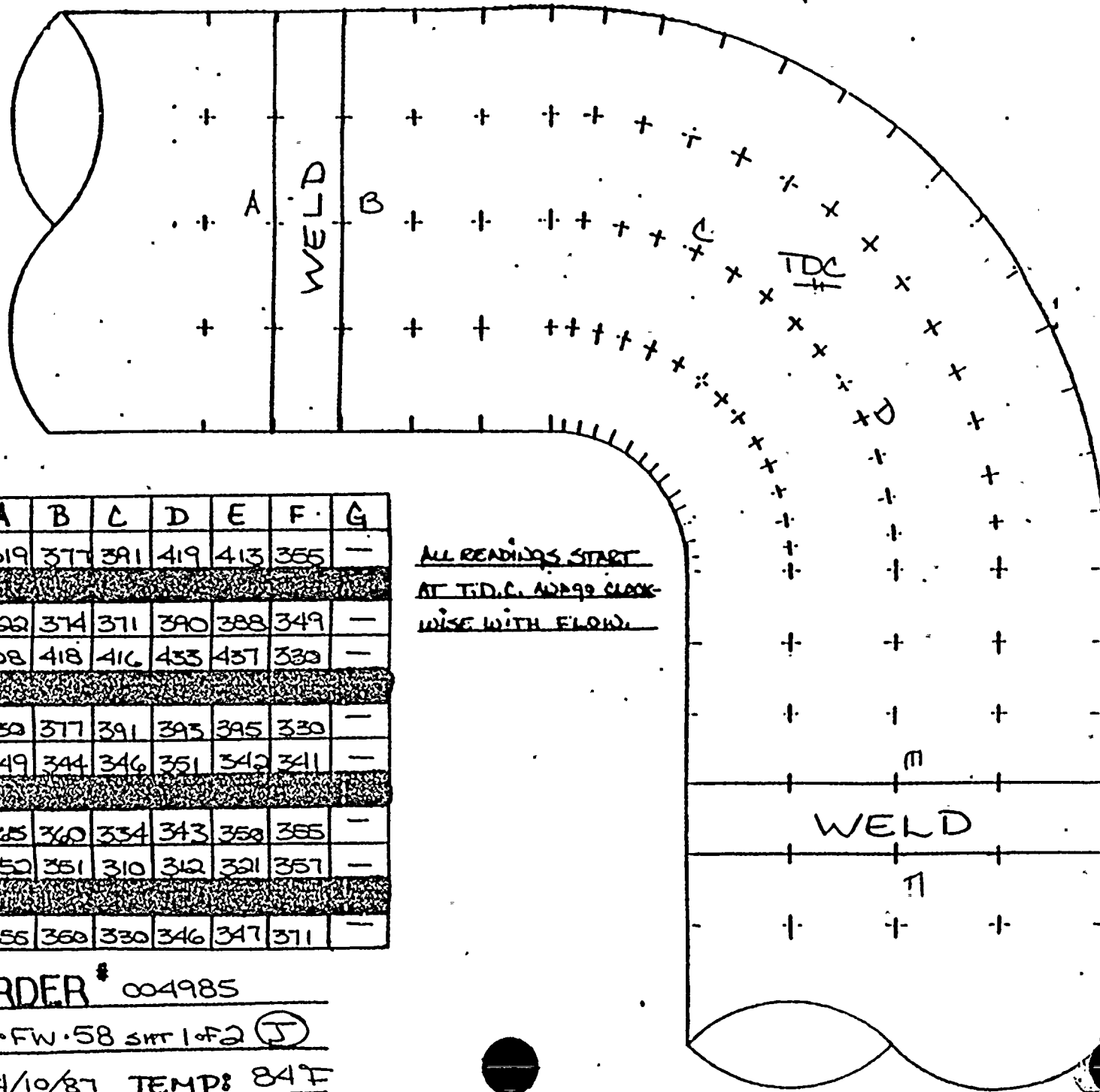
JOE ORDER # 912/5/87 95857 004985

ISO # 1-FW-58-SHT 1 OF 2 (G)

DATE: 12/4/86 TEMP.: 192°F



FLOW →



TDC

	A	B	C	D	E	F	G
0°	319	377	391	419	413	355	—
45°	322	374	371	390	388	349	—
90°	308	418	416	433	437	333	—
135°	330	377	391	395	395	330	—
180°	349	344	346	351	342	341	—
225°	365	360	334	343	350	355	—
270°	350	351	310	312	321	357	—
315°	356	360	330	346	347	371	—

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

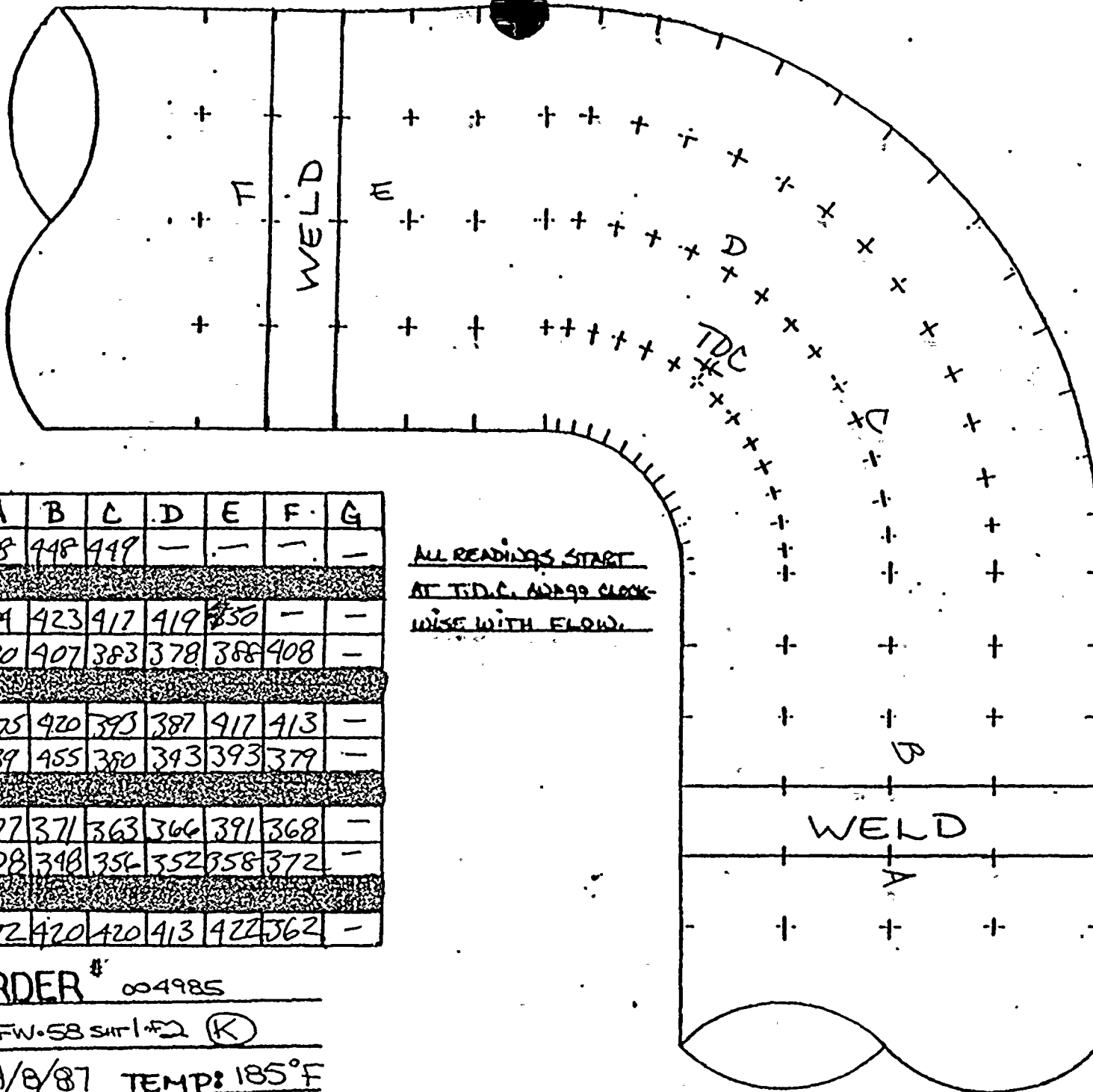
JOE ORDER # 004985

100# 1-FW-58 SMT 1 of 2 (J)

DATE: 4/10/87 TEMP: 84°F



← FLOW



ALL READINGS START  
AT T.D.C. 12:00 CLOCK-  
WISE WITH FLOW.

	A	B	C	D	E	F	G
0°	408	448	449	—	—	—	—
45°	384	423	417	419	350	—	—
90°	390	407	383	378	388	408	—
135°	375	420	393	387	417	413	—
180°	439	455	380	393	393	379	—
225°	377	371	363	366	391	368	—
270°	328	348	356	352	358	372	—
315°	372	420	420	413	422	362	—

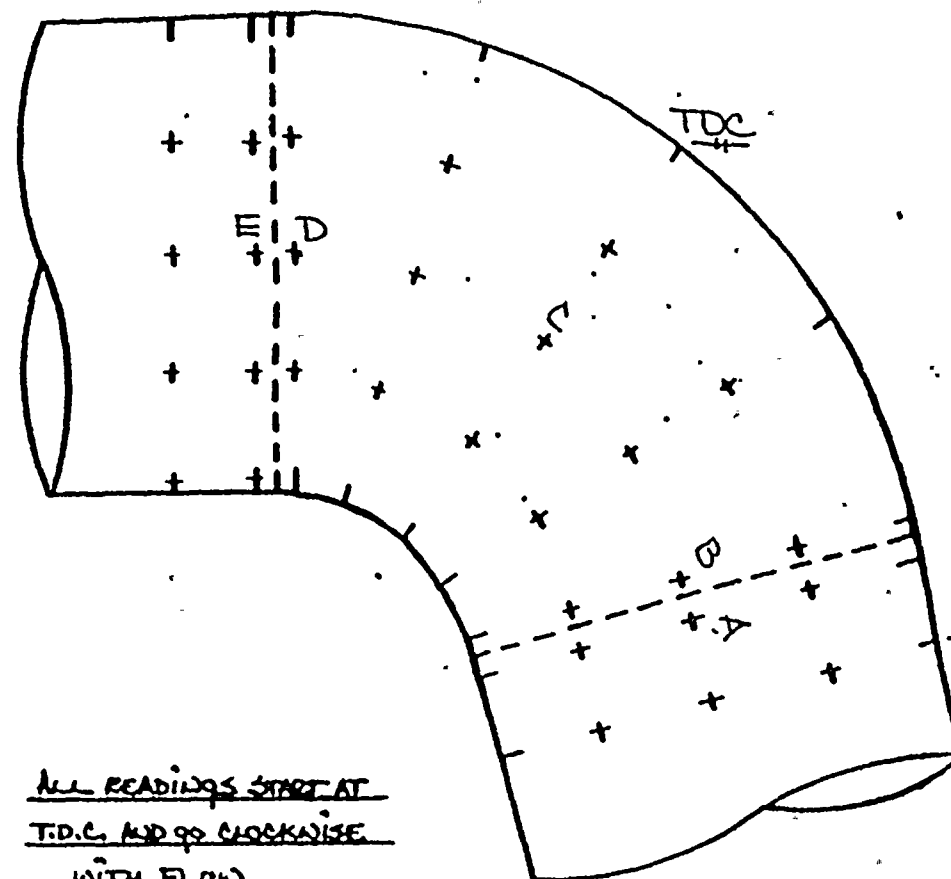
JOE ORDER # 004985

ISO # 1-FW-58 SUR 1 #2 (K)

DATE: 4/8/87 TEMP: 185°F



← FLOW



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

100

	A	B	C	D	E	F	G
0°	—	—	—	—	403	—	—
45°	391	361	323	327	415	—	—
90°	409	405	392	382	389	—	—
135°	376	415	—	436	422	—	—
180°	379	424	—	438	376	—	—
225°	407	392	—	428	373	—	—
270°	405	397	391	398	361	—	—
315°	401	390	396	371	393	—	—

JOB ORDER\*\* 004985

ISO\*\* 1. FW. 58 SHR 1. FD (1)

DATE: 4/8/87 TEMP: 185°F



# EROSION EVALUATION WORKSHEET

AEPSI Installed Mat'l Class L-31: ASTM A-106 GR.B

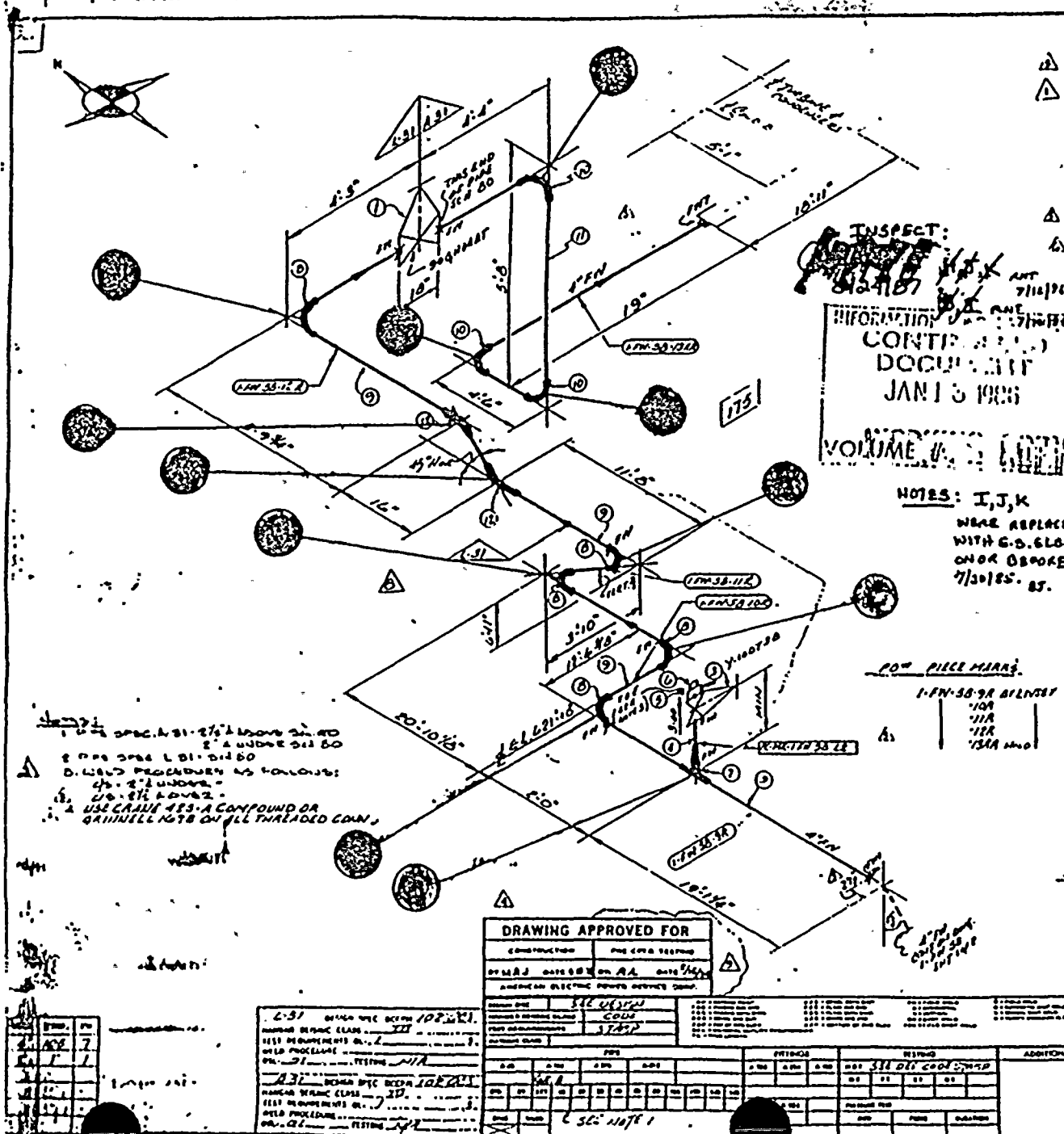
### COMMENTS

[illegible]

\*  $t_m$  WAS CALCULATED USING AN A VALUE OF ZERO.  $t_m = \frac{PD_0}{2(SE+YP)} + A$



DC: J.O.# 95837  
CONST: 95838, 95839



MATERIAL DESCRIPTION		150 SHI 40	150 SHI 40
1	1" 9000 AN GATE VALVE	150 SHI 40	150 SHI 40
2	1" 1500 C.S. GLOBE VALVE	150 SHI 40	150 SHI 40
3	2" 1" PIPE SCH 40 C.S. 5 MTS	150 SHI 40	150 SHI 40
4	2" 1" 9000 AN GATE VALVE	150 SHI 40	150 SHI 40
5	2" 1" 1500 C.S. GLOBE VALVE	150 SHI 40	150 SHI 40
6	2" 1" 9000 AN GATE VALVE	150 SHI 40	150 SHI 40
7	2" 1" 1500 C.S. GLOBE VALVE	150 SHI 40	150 SHI 40
8	2" 1" 9000 AN GATE VALVE	150 SHI 40	150 SHI 40
9	2" 1" 1500 C.S. GLOBE VALVE	150 SHI 40	150 SHI 40
10	2" 1" 9000 AN GATE VALVE	150 SHI 40	150 SHI 40
11	2" 1" 1500 C.S. GLOBE VALVE	150 SHI 40	150 SHI 40
12	2" 1" 9000 AN GATE VALVE	150 SHI 40	150 SHI 40

[illegible]

SITE PAGE 79E

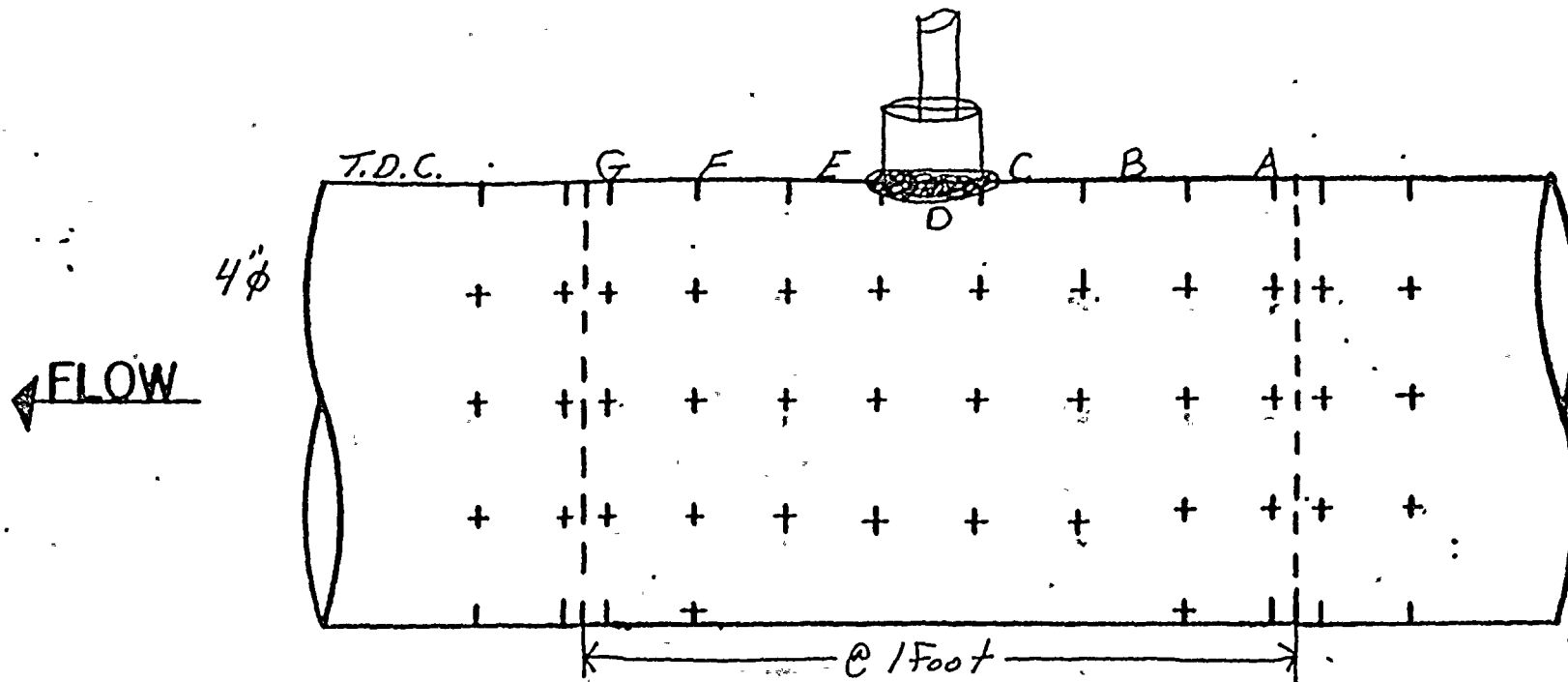
	1st	2nd	3rd
1-PM 50-61 VOID	BSC VOID	1-PM 50-61 VOID	VOID
1-FW-50 L2			
	22m		13R

DRAWING APPROVED FOR	
ENGINEER'S NAME	DATE OF APPROVAL
BY MAJ DATE 08/01/01	ON RA DATE 8/1/01
AND THE AIR FORCE ENGINEER'S OFFICE OF THE AIR FORCE.	

[illegible][illegible]

FOUR/ZONE NO. 725	FLOW DIAGRAM
REQUIRED COMPLETION DATE	O.S.I.
FABRICATED BY: HUNTER	WELD PROCEEDING
MPS DESIGNS INC. NEW YORK, N.Y.	DESIGNED BY: S. SCHWARTZMAN
	DESIGNED & FABRICATED AND ERECTED BY: LO DONALD E. COOK MARSHALL PLANT
FABRICATOR NOTE: PPLICATION MUST CONFORM TO LAST A.E.P. ARRG'T DWGS.	DATE: MAY 22
	TIME: 3:30 PM
	BY: [Signature]
	DATE: 5-22-53





ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

Readings taken by  
 J. Pauly and S. Shugarts.

TDC

	A	B	C	D	E	F	G
0°	366	365	367	—	345	380	342
45°	363	366	372	372	373	371	372
90°	369	369	368	373	356	376	351
135°	370	371	368	368	369	366	364
180°	345	365	342	335	358	366	363
225°	374	370	363	370	357	368	339
270°	387	379	358	379	382	385	365
315°	383	380	358	377	376	378	380

Item ①  
JOB ORDER # 004985

ISO # 1-FW-58 2 of 2

DATE: 4-15-87 TEMP: 78°F



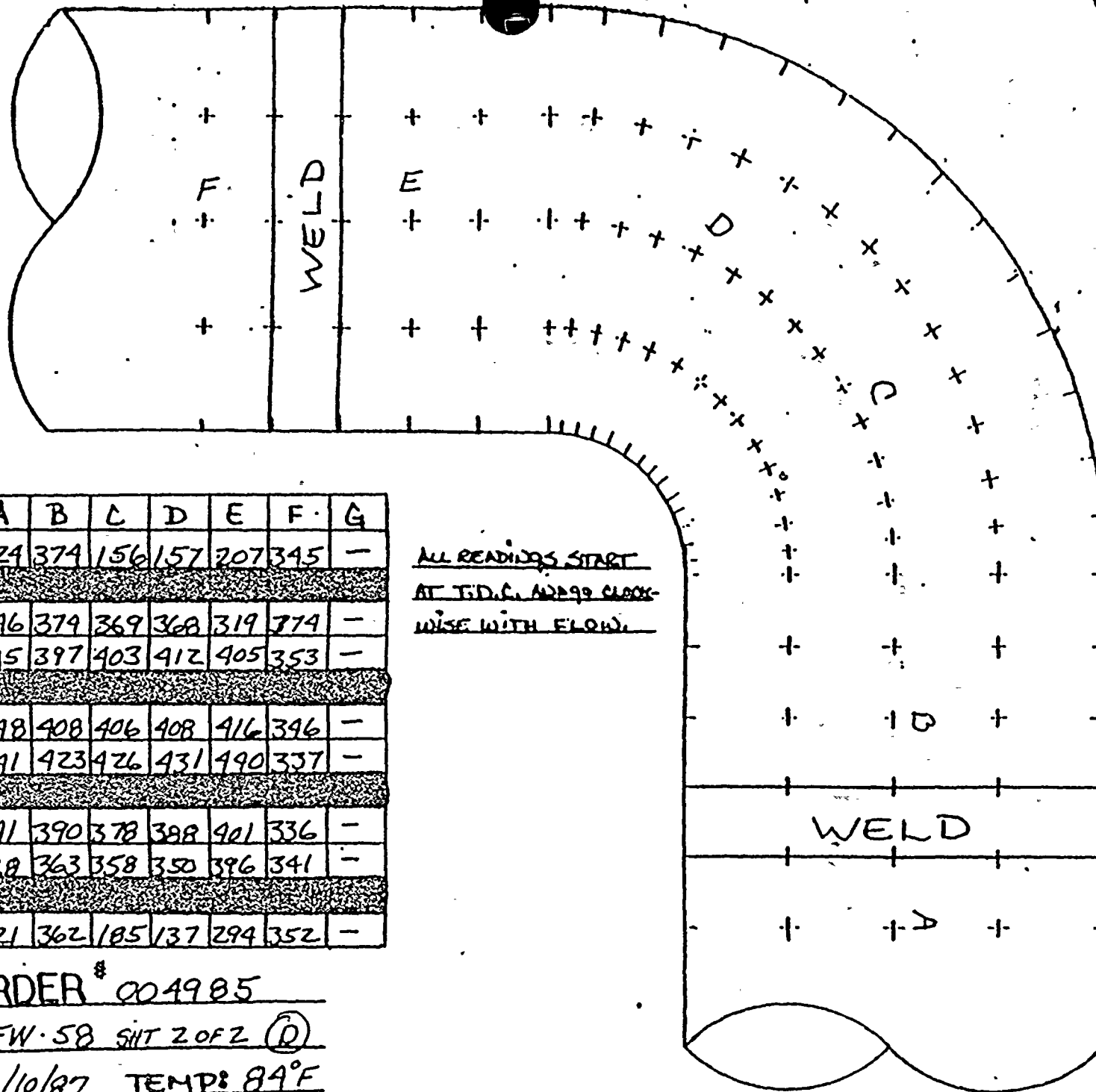


ALL READINGS START  
AT T.D.C. 12:30 CLOCK-  
WISE WITH FLOWN.  
READINGS TAKEN BY:  
S. VARGO & R. HOLIDAY

JOE ORDER # 004985  
ISO # 1-FW-58 SHIT 2 F2 (C)  
DATE: 4/9/87 TEMP: 82°F



← FLOW



T.D.C.

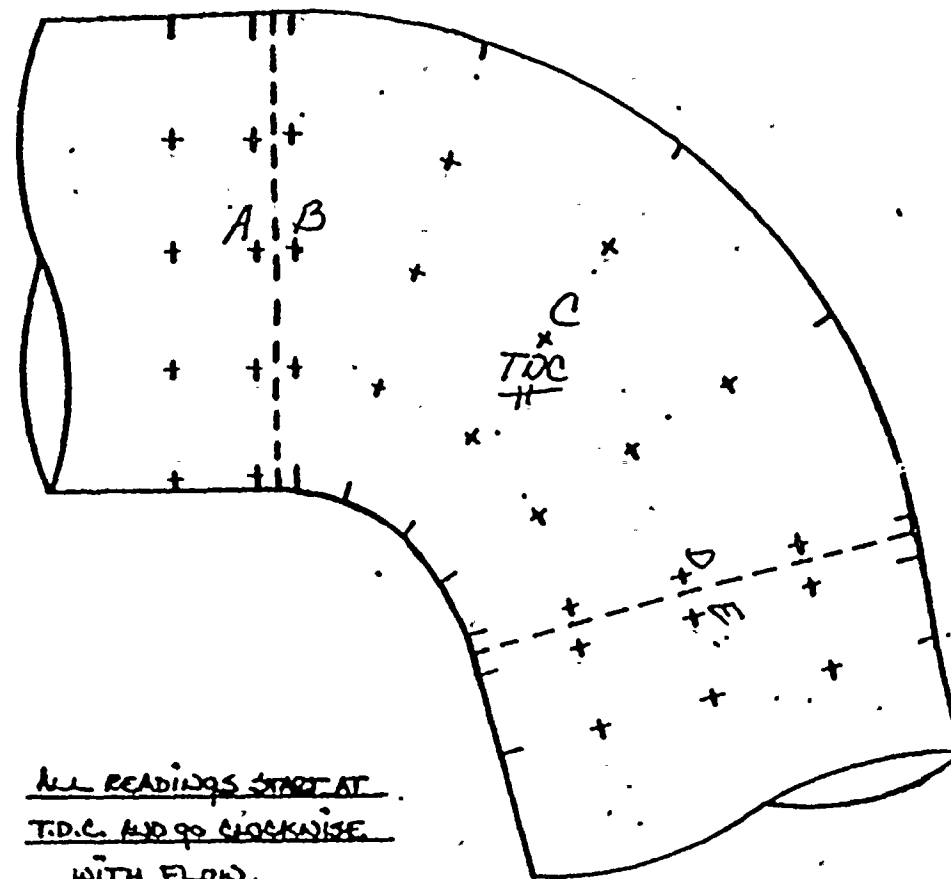
	A	B	C	D	E	F	G
0°	324	374	156	157	207	345	-
45°	346	374	369	368	319	374	-
90°	345	397	403	412	405	353	-
135°	398	408	406	408	416	346	-
180°	341	423	426	431	490	337	-
225°	341	390	378	388	401	336	-
270°	328	363	358	350	396	341	-
315°	321	362	185	137	294	352	-

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

JOB ORDER # 004985  
ISO # 1-FW-58 SHIT 2 OF 2 (D)  
DATE: 1/10/87 TEMP: 84°F



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TRC

	A	B	C	D	E	F	G
0°	329	361	351	359	361	—	—
45°	397	402	—	371	353	—	—
90°	391	378	—	373	342	—	—
135°	351	408	—	380	403	—	—
180°	351	372	357	331	324	—	—
225°	346	362	229	218	177	—	—
270°	338	373	162	136	268	—	—
315°	333	371	236	162	242	—	—

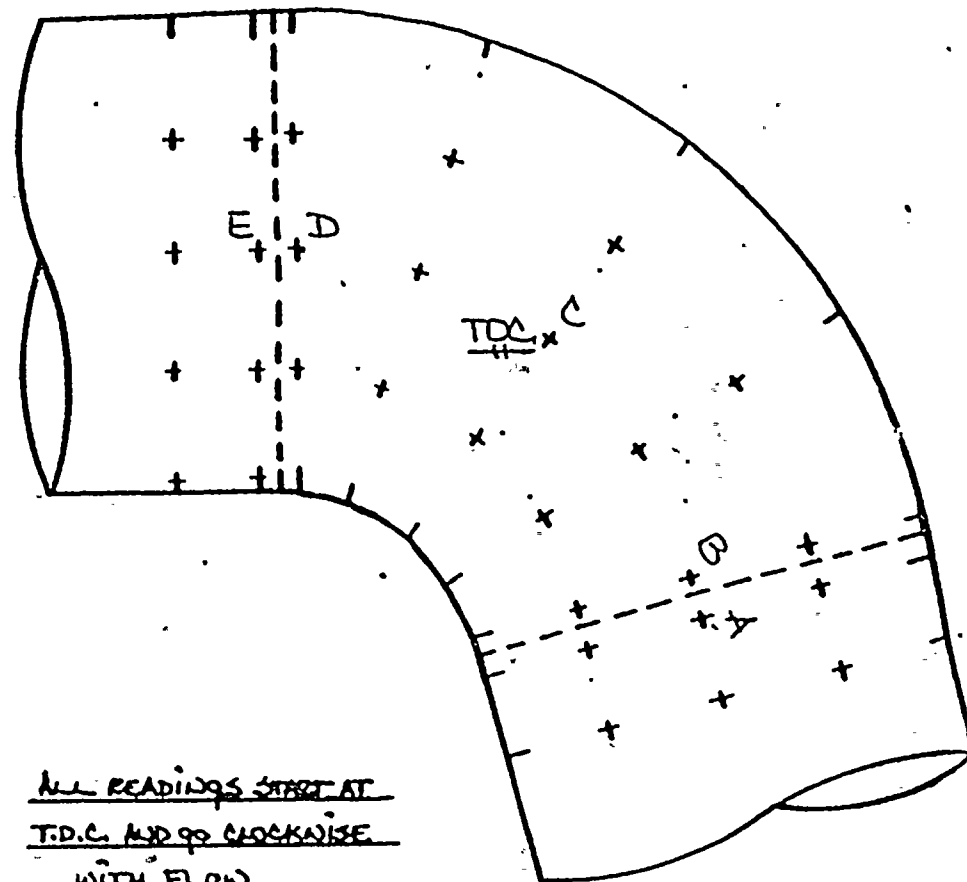
JOB ORDER\*\* 004985

ISO\*\* 1-FW. 58 SHT 2 OF 2 (F)

DATE: 9/10/87 TEMP: 84°F



← FLOW



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TQC

	A	B	C	D	E	F	G
0°	362	364	352	344	350	—	—
45°	354	329	281	298	310	—	—
90°	353	289	223	227	328	—	—
135°	350	340	281	234	322	—	—
180°	329	359	355	367	331	—	—
225°	313	326	—	403	337	—	—
270°	332	418	—	412	348	—	—
315°	386	395	—	390	359	—	—

JOB ORDER\*\* 004985

ISO\*\* 1.0FW.58 SHT 2.0F2 (4)

DATE: 4/10/87 TEMP: 84°F



## EMISSION EVALUATION WORKSHEET

Unit No. 1Years in service 11

UT Reading Transmitted on: SEPTEMBER 2, 1987 UT Reading Taken on: 4-8-4-10 87

Isometric Dwg. NO. 1-FW-59, REV. 5, Sh. 1 of 2 AEPSC Installed Mat'l Class 6-31: ASTM A-106 GR.B

## COMMENTS

## COMMENTS

H 4<sup>4</sup>90° FLL .437 .382-.492 .235\* .245 35.9 REPLACE IMMEDIATELY

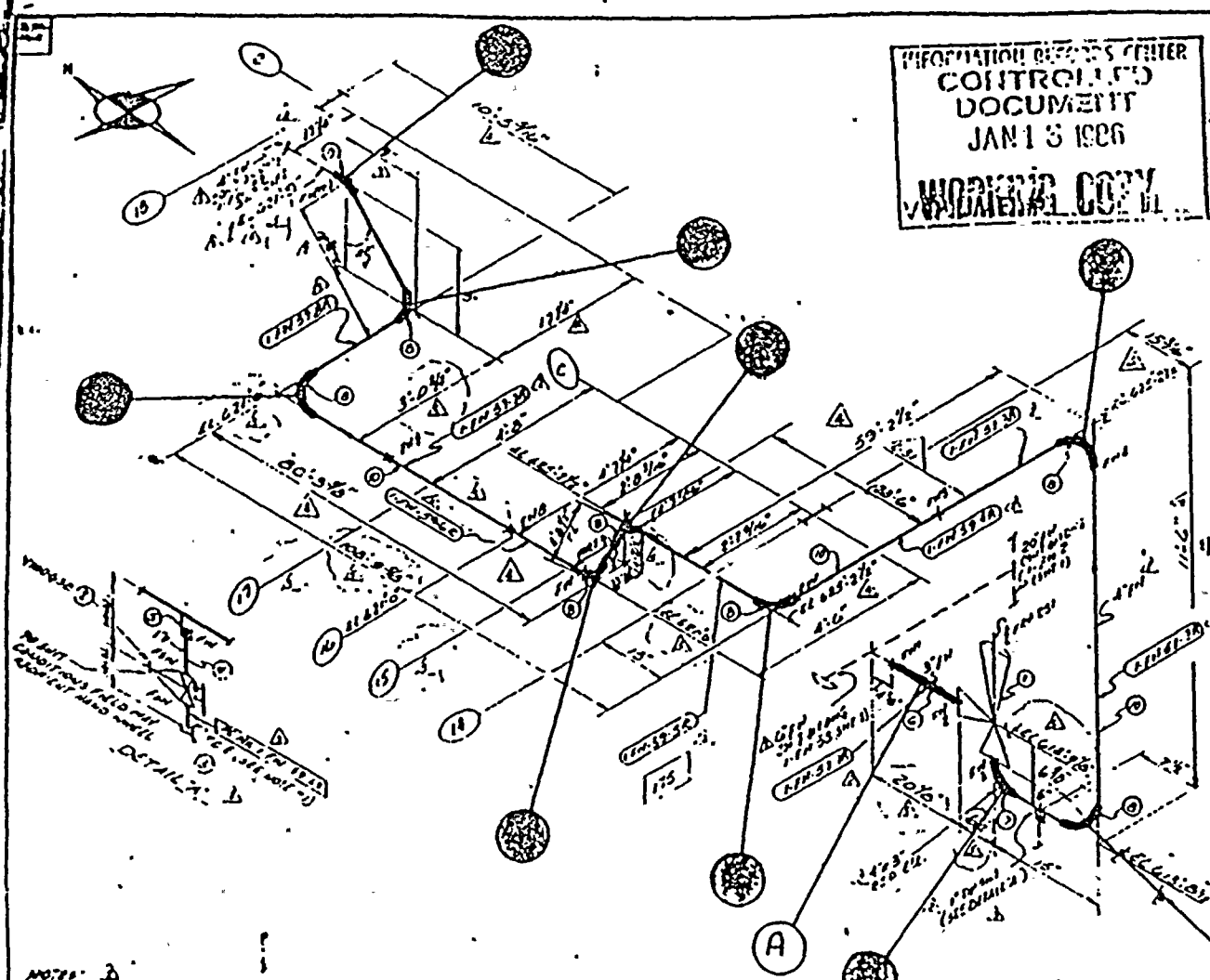
I 4"-90°ELL .437 .382-.492 .235\* .357 6.5 RE-INSPECT IN 13 YEARS

J 4'-45" ELL .437 .382-.492 .235\* .320 16.2 RE-INSPECT IN 6 YEARS

\* THE MINIMUM WALL ( $t_m$ ) WAS CALCULATED USING  $\sigma = 0$ .  $t_m = \frac{PD_o}{2(SF \cdot YP)} + A$



WEEK # 1  
QC: I.D. # 95837  
CONST: 95838, 95839



INFORMATION REPORTS CENTER  
CONTROLLED  
DOCUMENTS  
JAN 13 1986  
WORKING COPY

MATERIAL DESCRIPTION		QUANTITY	UNIT
1	5" CONTROL VALVE	1	EA
2	1" 1800" SW GATE VALVE CS	1	EA
3	1" 3000" STD. CIP C.S.	1	EA
4	1" PIPE (SCH 40) SMLS C.S.	1	EA
5	1" 3000" SW CS HALF COUPLER	1	EA
6	1" 3000" SMLS C.S.	1	EA
7	1" 3000" SMLS (SCH 40) C.S.	1	EA
8	1" 3000" SMLS (SCH 40) C.S.	1	EA
9	1" 3000" SMLS (SCH 40) C.S.	1	EA
10	1" 3000" SMLS (SCH 40) C.S.	1	EA

REVISION RECORD			REMARKS
NO.	DATE	BY	
1	3/4/50	RR	REVISION OF 11/24/49 WAS 100% REVISION 11/24/49 WAS 100% REVISION 11/24/49 WAS 100%
2	7/10/50	RR	REVISION 11/24/49 WAS 100% REVISION 11/24/49 WAS 100% REVISION 11/24/49 WAS 100%
3	7/10/50	RR	REVISION 11/24/49 WAS 100% REVISION 11/24/49 WAS 100% REVISION 11/24/49 WAS 100%
4	7/10/50	RR	REVISION 11/24/49 WAS 100% REVISION 11/24/49 WAS 100% REVISION 11/24/49 WAS 100%
5	7/10/50	RR	REVISION 11/24/49 WAS 100% REVISION 11/24/49 WAS 100% REVISION 11/24/49 WAS 100%
INSPECTED			7/10/50

INSPECT ~~7/11/86~~ ~~7/11/86~~ ~~2/28/87~~

NO. 2 2

1. ONE CRANE 450-A CAPTAIN  
OF GARNETT 1870 IN ALL  
THESE CONNECTIONS.

2. TWO APPROX. 40 FOLLOWERS  
OF 1870 UNDER 1870  
OF 1870 UNDER 1870  
OF 1870 UNDER 1870  
OF 1870 UNDER 1870  
OF 1870 UNDER 1870

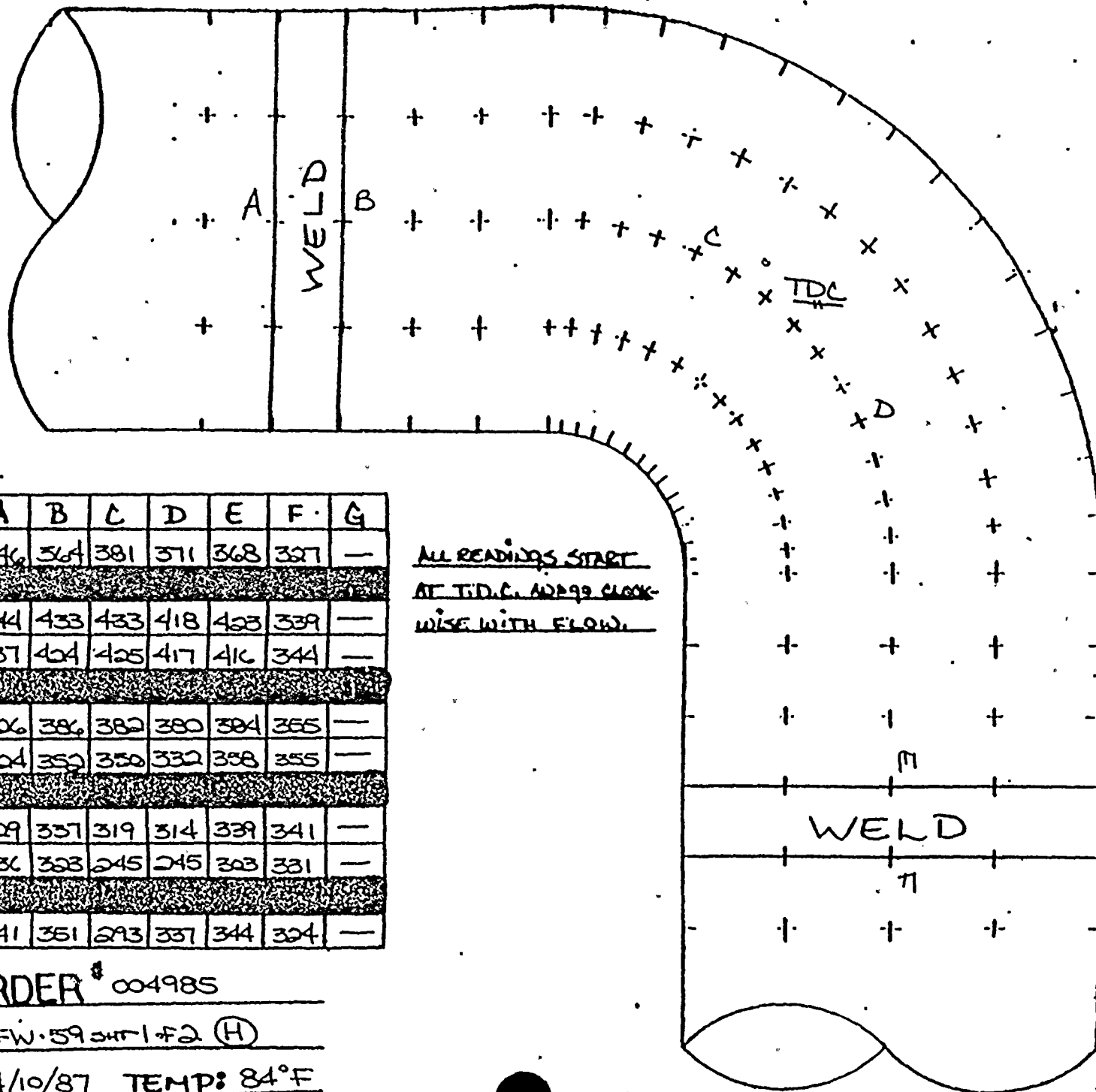
P.O. MILE MARKS		P.O. MILE MARKS		SITE #10, MILE MARKS	
1. 330 VOID	1-EN-39-1 VOID	1-EN-39-1A	(EVENING)		PCMR 1-EN-39 63
	2	2A			
	3	3A			
	4	4A			
	5	5A			
	6	6A			
	7	7A			
	8	8A			

[illegible]

FOURTH CORN 183 P/QMCD COMPLETION DATE FABRICATED BY CWSB	FLOW DIAGRAM 205 WELD PROCEDURE SEE PAGE 2
NPS DESIGNS INC. NEW YORK, N.Y.	INVEST & COMPANY INC. DESIGN & MANUFACTURING CO BOULEVARD E. FOUR MILE PLANT
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.P. ARMY DWGS.	TURAND 252 L-FAN-59 SOT MAR 72



FLOW →



TDC

	A	B	C	D	E	F	G
0°	346	364	381	371	368	327	—
45°	344	433	433	418	423	339	—
90°	387	424	425	417	416	344	—
135°	326	386	382	380	384	355	—
180°	324	352	350	332	338	355	—
225°	329	337	319	314	339	341	—
270°	336	323	245	245	323	331	—
315°	341	351	293	337	344	324	—

ALL READINGS START  
AT T.D.C. 12:00 CLOCK  
WISE WITH FLOW.

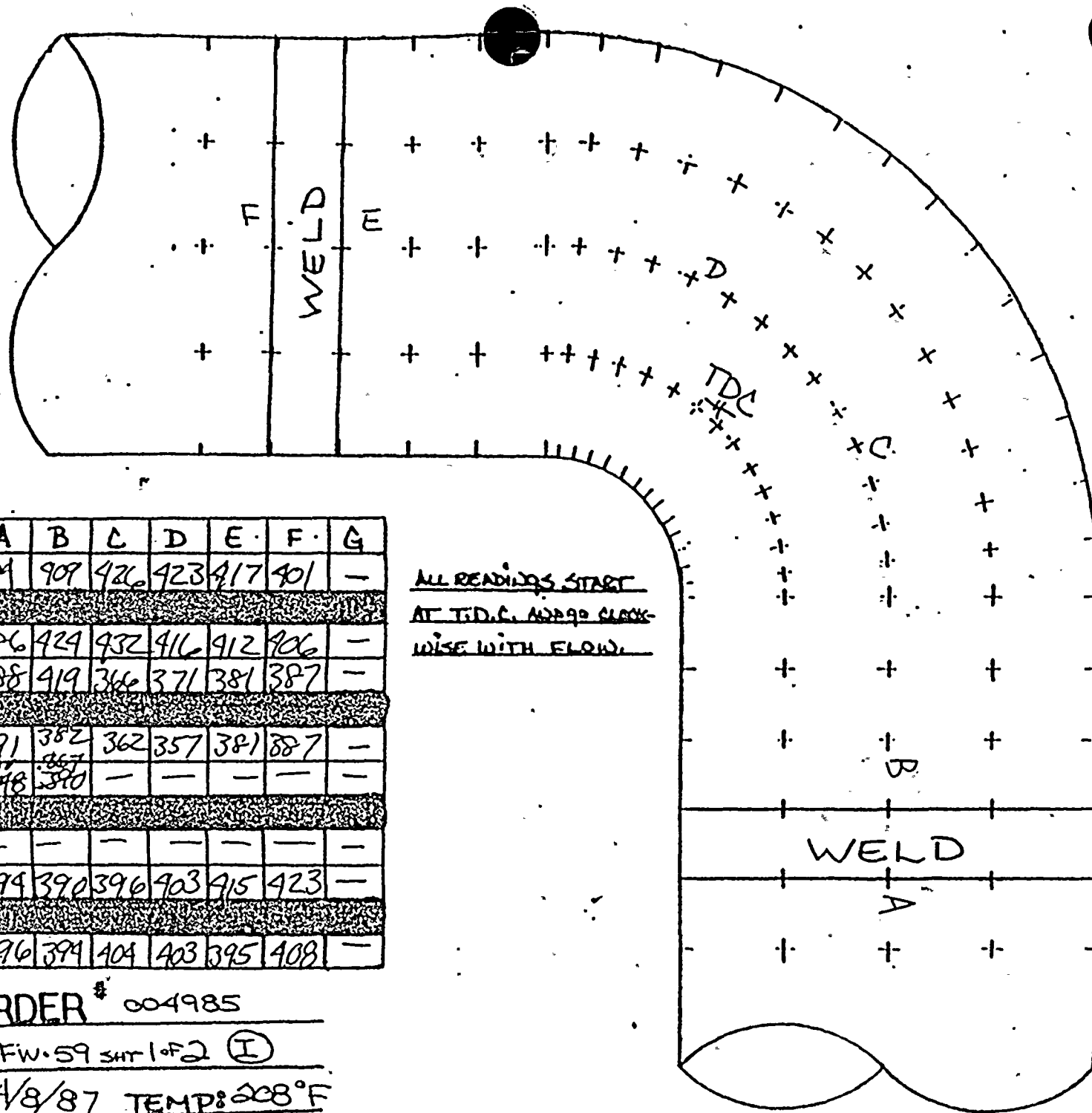
JOB ORDER # 004985

ISO # 1-FW-59-3471-42 (H)

DATE: 4/10/87 TEMP: 84°F



← FLOW



TDC

	A	B	C	D	E	F	G
0°	384	909	426	423	417	401	—
45°	386	424	932	416	412	906	—
90°	388	419	366	371	381	387	—
135°	391	382	362	357	381	887	—
180°	378	390	—	—	—	—	—
225°	—	—	—	—	—	—	—
270°	394	390	396	403	415	423	—
315°	396	394	404	403	395	408	—

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

JOB ORDER # 004985

ISO # 1-FW-59 SHR 1 of 2 (I)

DATE: 4/8/87 TEMP: 208°F



← FLOW

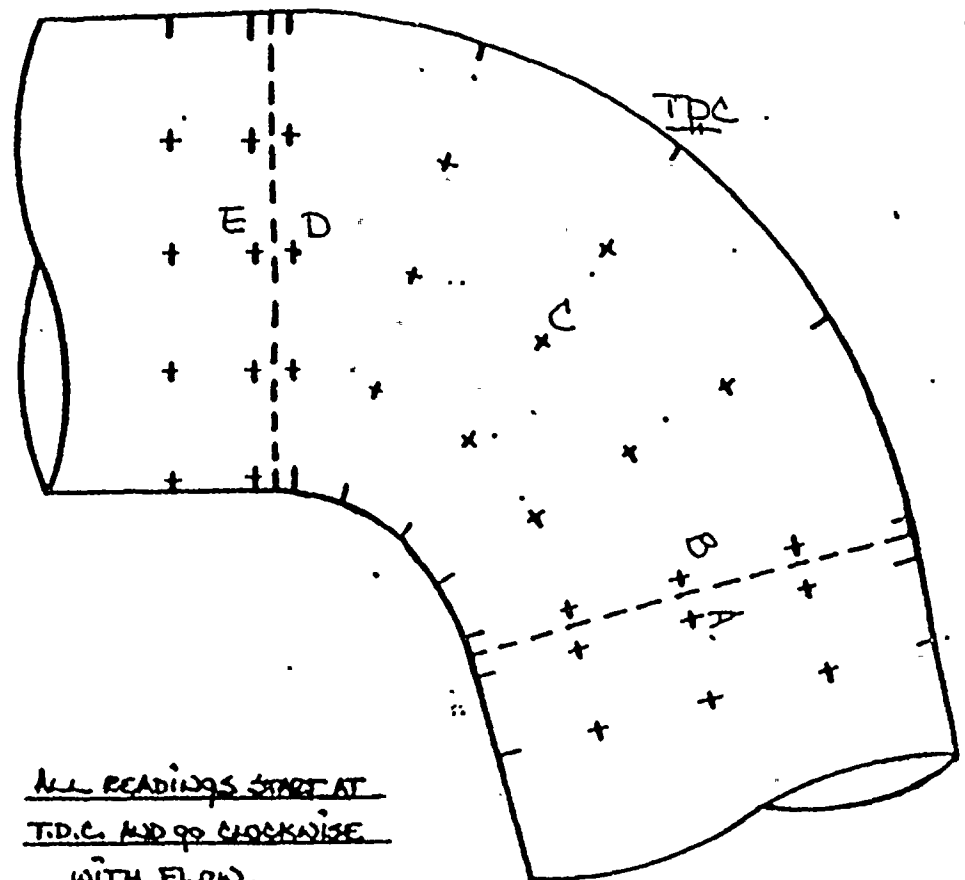
TQC

	A	B	C	D	E	F	G
0°	414	345	362	320	375	—	—
45°	406	368	353	356	411	—	—
90°	399	393	415	424	388	—	—
135°	398	443	—	445	381	—	—
180°	417	—	—	447	426	—	—
225°	415	445	—	440	424	—	—
270°	425	441	434	435	422	—	—
315°	412	396	360	393	400	—	—

JOB ORDER\*\* 004985

ISO\*\* 1-FW-59 SHR 1-F2 (J)

DATE: 4/8/87 TEMP: 208°F





## EROSION EVALUATION WORKSHEET

Unit No. 1Years in service 11

UT Reading Taken on: 4-15-87

AEPSO Installed Mat'l Class L-31: ASTM A-106 GR.B

Plant

(I.D.)

Component

Original

Original

Req'd

Lowest

Percent

## COMMENTS

(I.D.)  
Corp.

Component	Description
1	...
2	...
3	...
4	...
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99	...
100	...

Original  
Wall Thk.

Original  
Thk. Range

Req'd  
Tmin

Lowest Reading

Percent Eroded

COMMENTS

B

4" STRAIGHT  $\phi$

337 - -

295-379

235\*

262

11.2

RE-INSPECT IN 3 YEARS

H.

4"-90°ELL

337

295-379

.235\*

118

60.0

REPLACE IMMEDIATELY.

I

4" 90° ELL

337

.295-.379

.235\*

.104

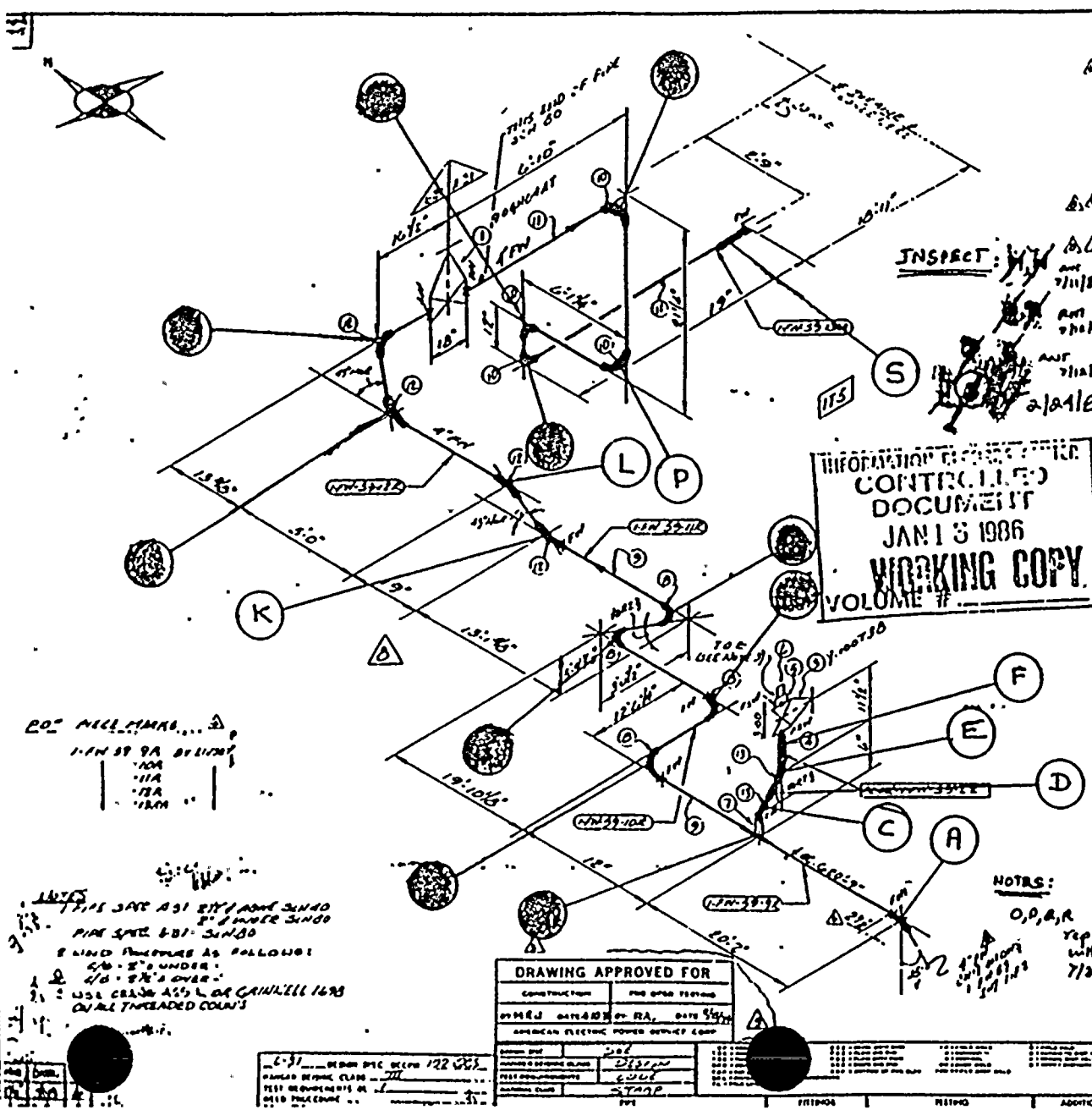
64.8

REPLACE IMMEDIATELY

\* THE MINIMUM WALL WAS CALCULATED USING  $A=0$  :  $t_m = \frac{PD_0}{2(S E_T \gamma P)} + A$



WEEK #13  
 95834  
 CONST: # 95888, 95839



NO. SHIP NO. 1742		MATERIAL DESCRIPTION		QUANTITY
1	1	900" RIG GATE VALVE (SHEETS) CS	RISHAN	1
2	1	1500" CS GLOBE VALVE	Y:0073A	1
3	1	1" AIR SHUTOFF CS SHUT	148.21A	1
4	1	1500" CS GLOBE VALVE	1500" CS	1
5	1	1500" CS GLOBE VALVE	1500" CS	1
6	1	1500" CS GLOBE VALVE	1500" CS	1
7	1	1500" CS GLOBE VALVE	1500" CS	1
8	1	1500" CS GLOBE VALVE	1500" CS	1
9	1	1500" CS GLOBE VALVE	1500" CS	1
10	1	1500" CS GLOBE VALVE	1500" CS	1
11	1	1500" CS GLOBE VALVE	1500" CS	1
12	1	1500" CS GLOBE VALVE	1500" CS	1
13	1	1500" CS GLOBE VALVE	1500" CS	1
14	1	1500" CS GLOBE VALVE	1500" CS	1
15	1	1500" CS GLOBE VALVE	1500" CS	1

REVISION RECORD				REMARKS
1	1	1	1	REVISED BY NPS DESIGN
2	1	1	1	REVISED BY NPS DESIGN
3	1	1	1	REVISED BY NPS DESIGN
4	1	1	1	REVISED BY NPS DESIGN
5	1	1	1	REVISED BY NPS DESIGN
6	1	1	1	REVISED BY NPS DESIGN
7	1	1	1	REVISED BY NPS DESIGN
8	1	1	1	REVISED BY NPS DESIGN
9	1	1	1	REVISED BY NPS DESIGN

NOTES:

1. 1500" CS GLOBE VALVE

2. 1500" CS GLOBE VALVE

3. 1500" CS GLOBE VALVE

4. 1500" CS GLOBE VALVE

5. 1500" CS GLOBE VALVE

6. 1500" CS GLOBE VALVE

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71. 1500" CS GLOBE VALVE

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89. 1500" CS GLOBE VALVE

90. 1500" CS GLOBE VALVE

91. 1500" CS GLOBE VALVE

92. 1500" CS GLOBE VALVE

93. 1500" CS GLOBE VALVE

94. 1500" CS GLOBE VALVE

95. 1500" CS GLOBE VALVE

96. 1500" CS GLOBE VALVE

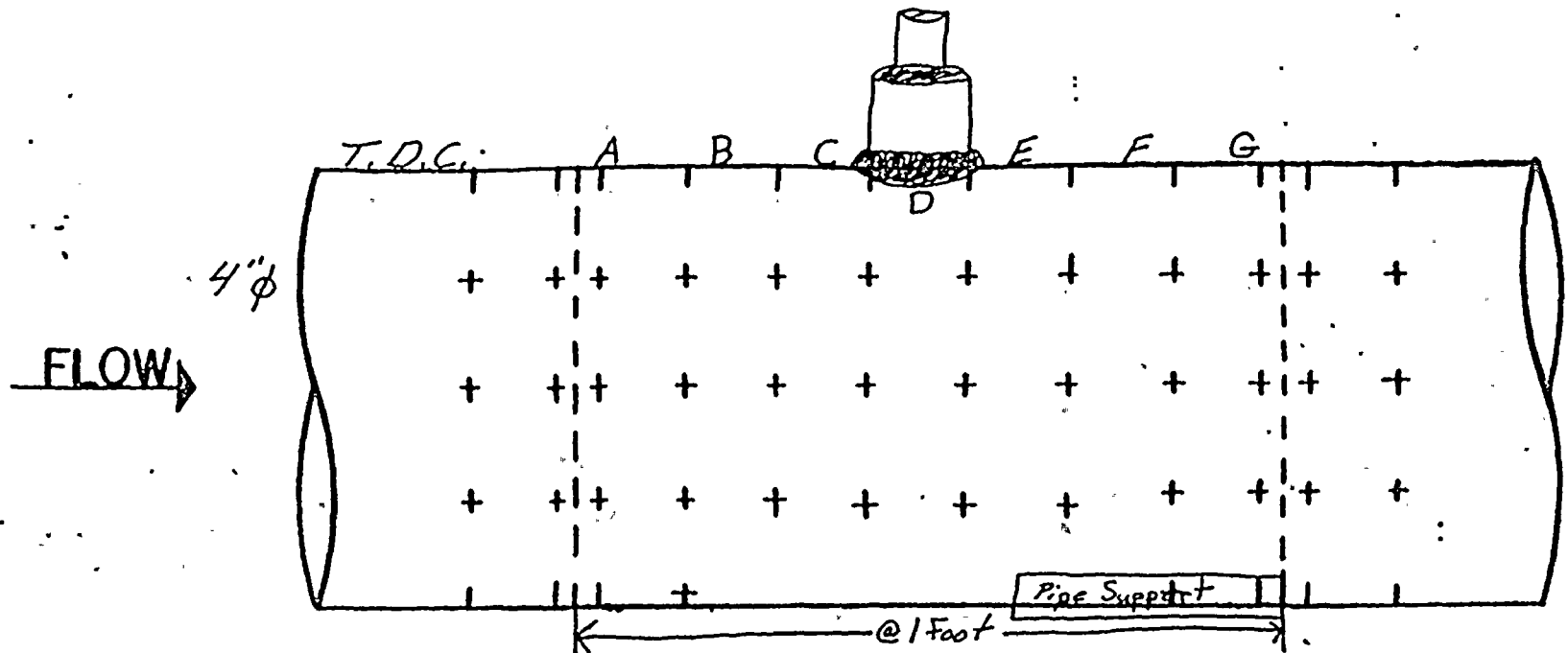
97. 1500" CS GLOBE VALVE

98. 1500" CS GLOBE VALVE

99. 1500" CS GLOBE VALVE

100. 1500" CS GLOBE VALVE





ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

Readings taken by J. Pauly  
 and S. H. Shugarts.

TDC

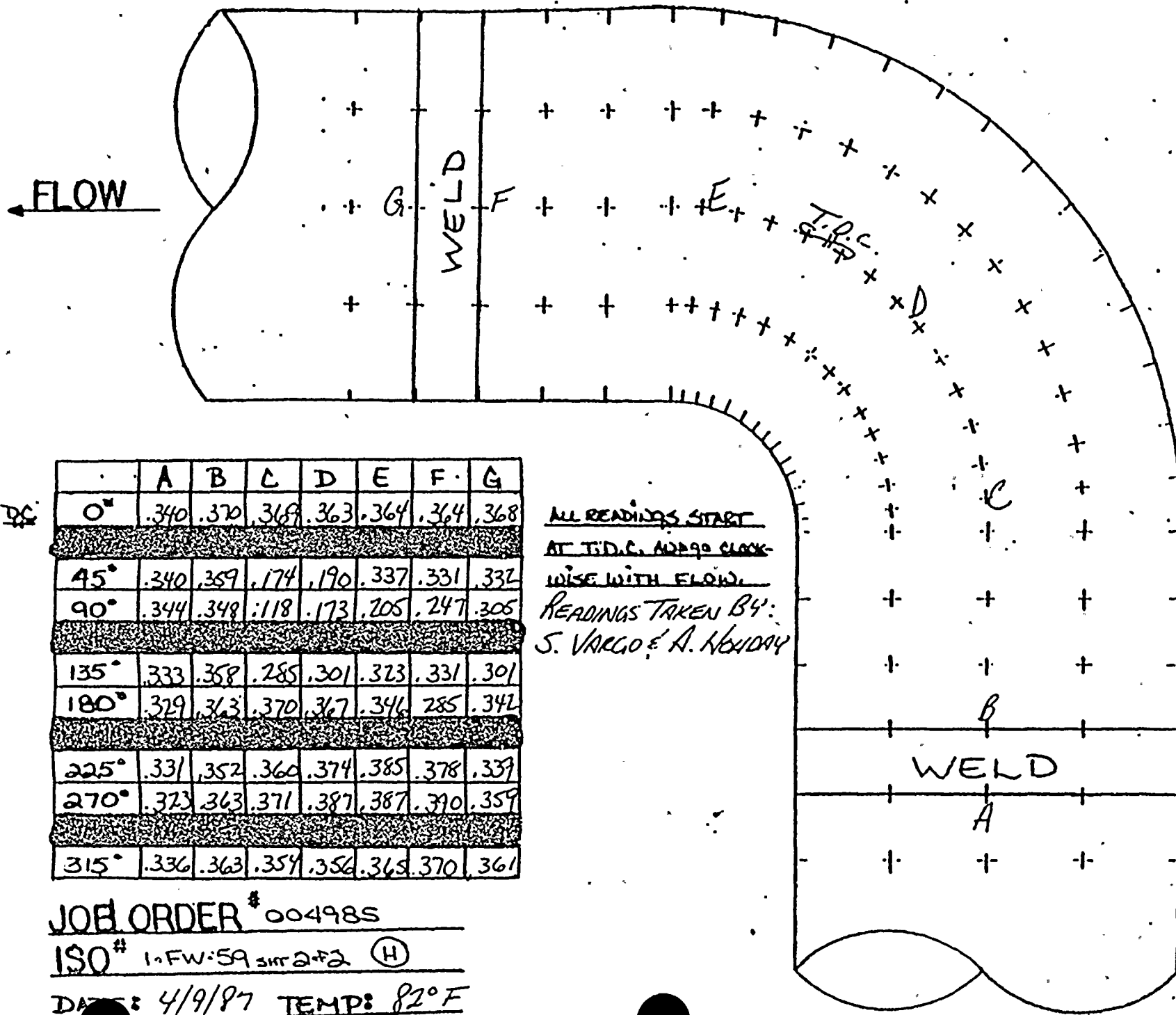
	A	B	C	D	E	F	G
0°	346	349	353	—	351	351	351
45°	355	362	377	351	360	356	358
90°	357	355	354	347	349	350	348
135°	346	351	342	346	340	344	336
180°	346	352	357	—	346	346	—
225°	362	362	360	362	363	384	352
270°	382	385	380	358	357	381	345
315°	373	368	351	343	345	345	342

Item ②  
 JOB ORDER # 004985

ISO # 1-FW-59 2 of 2

DATE: 4-15-87 TEMP: 78°F

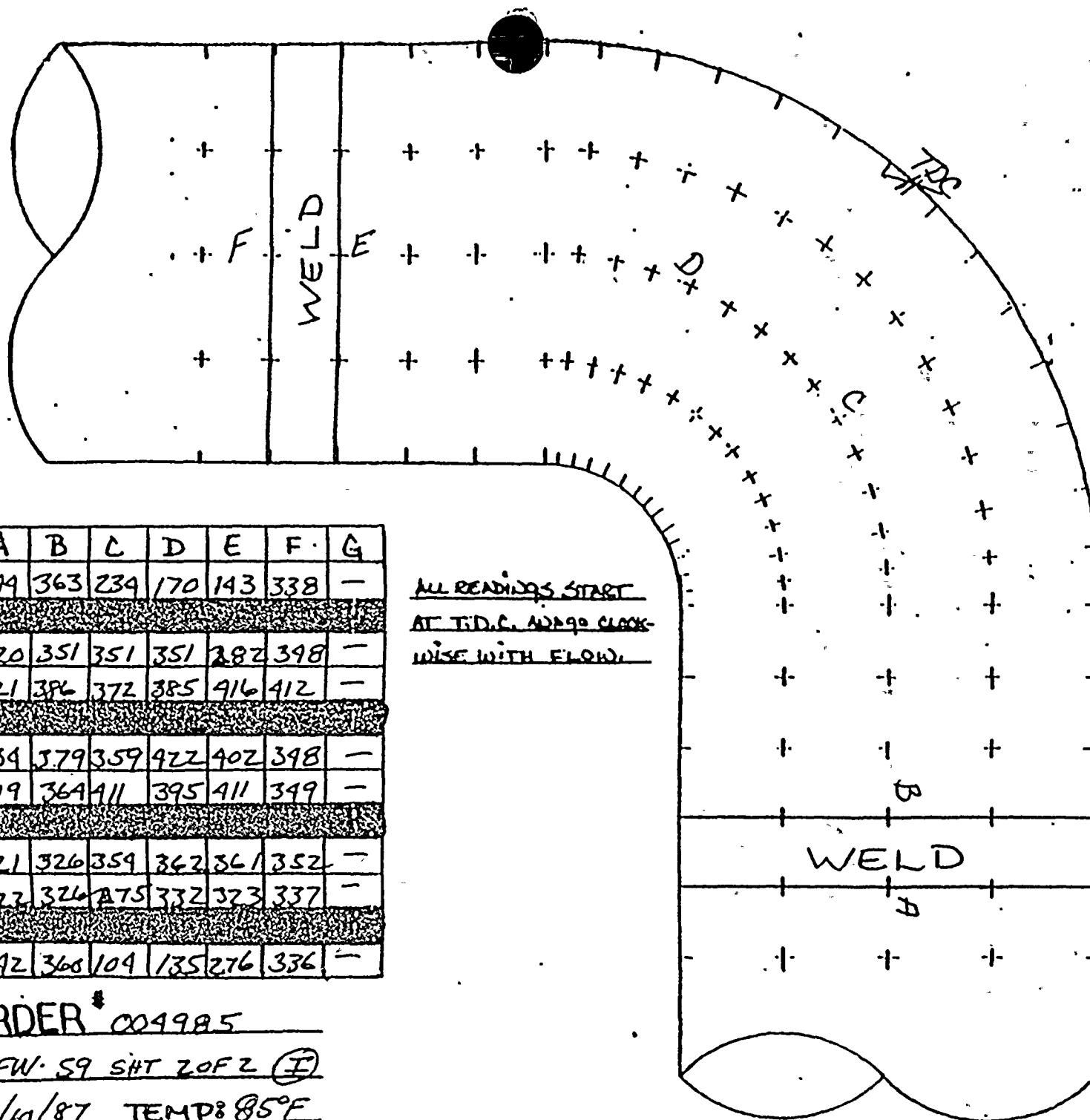




ALL READINGS START  
AT T.I.D.C. AND GO CLOCK-  
WISE WITH FLOW.  
READINGS TAKEN BY:  
S. VARGO & A. NEWDAY

JOEL ORDER # 004985  
ISO # 1. FW: 59  $\sin 2 + 2$  (H)  
DATE: 4/9/87 TEMP: 82°F





	A	B	C	D	E	F	G
0°	344	363	234	170	143	338	—
45°	320	351	351	351	282	398	—
90°	321	386	372	385	416	412	—
135°	334	379	359	422	402	398	—
180°	319	364	411	395	411	349	—
225°	321	326	359	342	361	352	—
270°	322	326	375	332	323	337	—
315°	342	368	104	135	276	336	—

ALL READINGS START  
AT T.D.C. 4:20 CLOCK-  
WISE WITH FLOW.

JOE ORDER # 004985

ISO# 1.FW.59 SHT 20F2 (I)

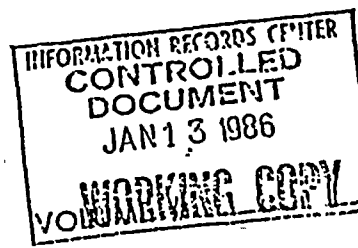
DATE: 4/10/87 TEMP: 85°F



## EROSION EVALUATION WORKSHEET

$$t_m = \frac{PD_0}{2(\delta F + VP)} + F$$





REVISION RECORD		
NO.	DATE	REVISION
1	1/1/55	REVISION 1
2	1/1/55	REVISION 2
3	1/1/55	REVISION 3
4	1/1/55	REVISION 4
5	1/1/55	REVISION 5

1-47W-R-04  
1-47C-F-03

1-FW-60  
Sh. 1 of 2

NOTES: REPLACE 'A' NEXT OUTAGE

[illegible]

PO# 331 1010  
 PIECE MARKS  
 1-PW-10 1-10-10  
 1  
 2  
 3  
 4  
 5  
 6  
 7  
 8

PO# 1010  
 PIECE MARKS  
 1-PW-10 1-10-10 (27-10-10)  
 1  
 2  
 3  
 4  
 5  
 6

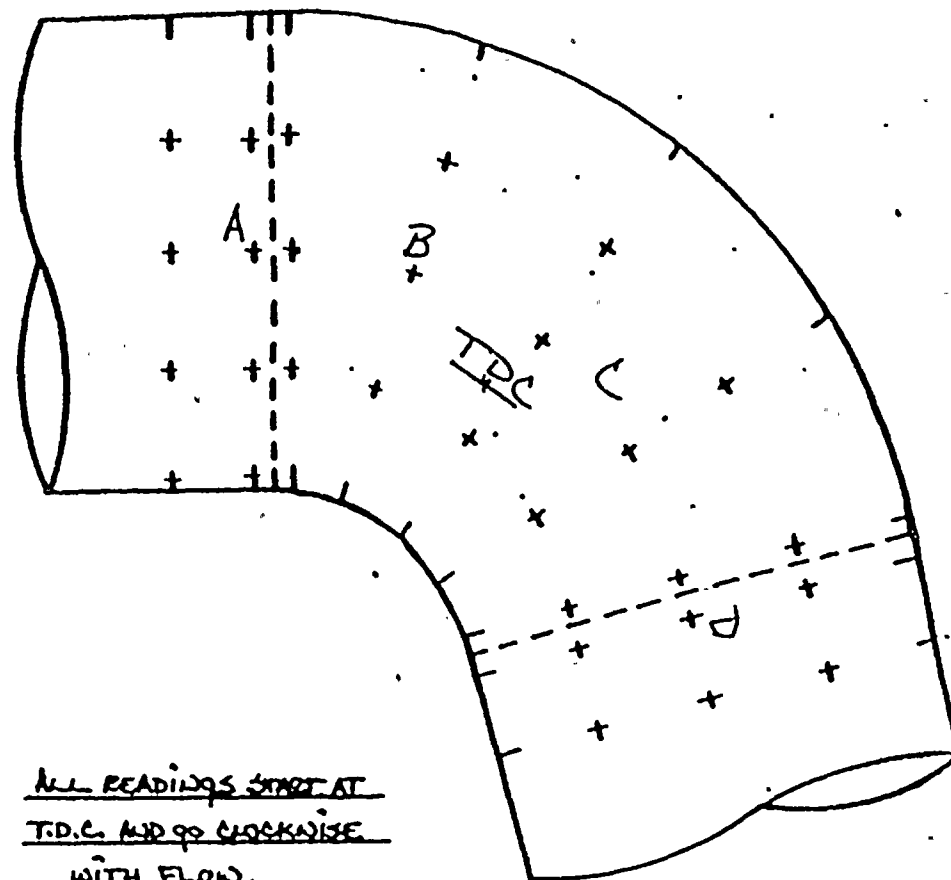
SITE FAD PIECE MARKS  
 1-10-10 1-10-10 1-10-10

PRIZING APPROVED FOR

[illegible]



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TQC

	A	B	C	D	E	F	G
0°	.374	.370	.393	.346	—	—	—
45°	.346	.410	.415	.346	—	—	—
90°	.335	.463	.453	.359	—	—	—
135°	.324	.425	.424	.358	—	—	—
180°	.331	.399	.412	.424	—	—	—
225°	.349	.369	.330	.380	—	—	—
270°	.347	.360	.280	.339	—	—	—
315°	.363	.364	.288	.324	—	—	—

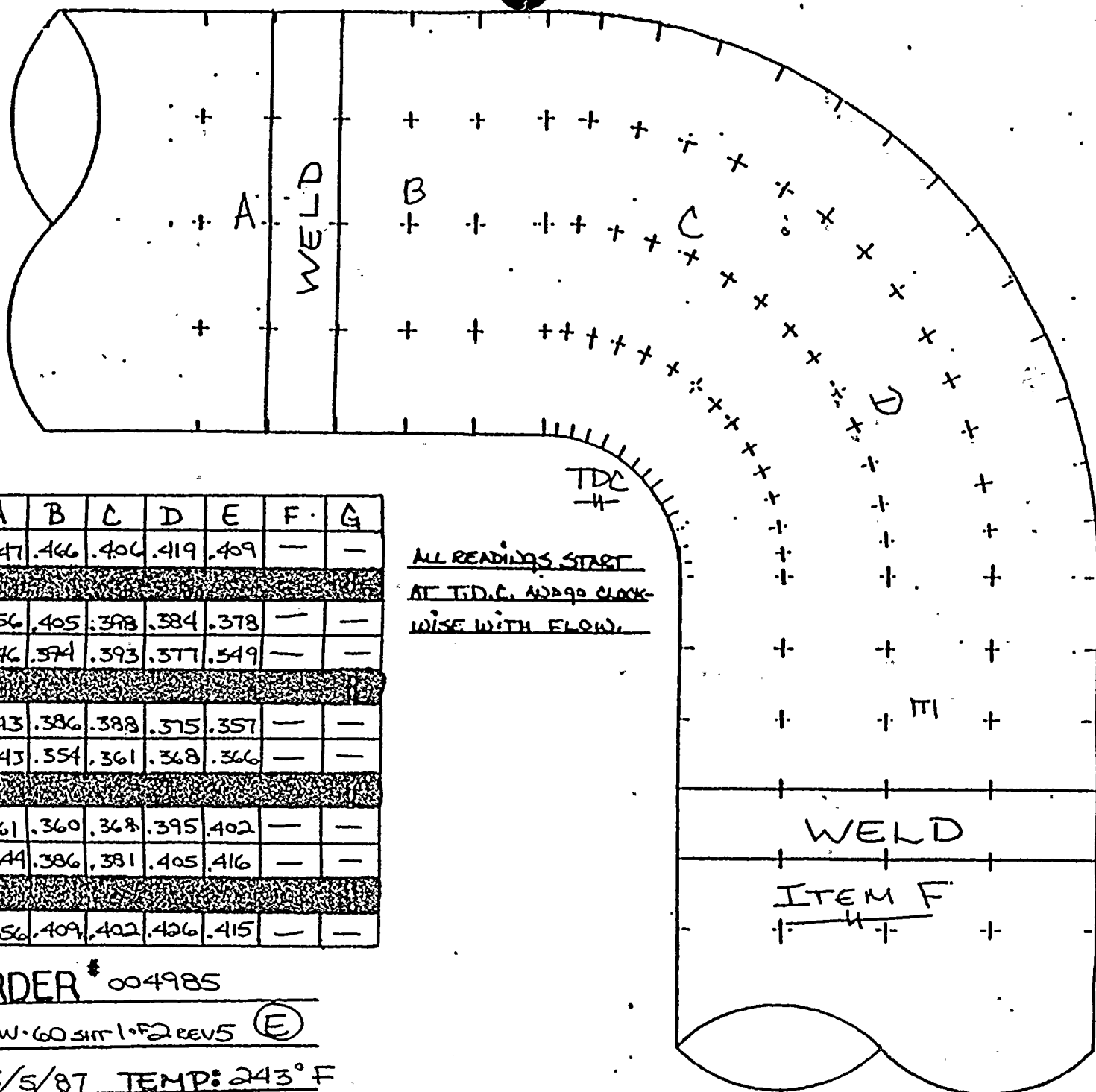
JOB ORDER\*\* 004985

ISO\*\* 1-FW-60 SURF-2 REVS (D)

DATE: 3/5/87 TEMP: 245°F



FLOW →



TDC

	A	B	C	D	E	F	G
0°	.347	.466	.406	.419	.409	—	—
45°	.356	.405	.398	.384	.378	—	—
90°	.346	.394	.393	.377	.349	—	—
135°	.343	.386	.388	.375	.357	—	—
180°	.343	.354	.361	.368	.366	—	—
225°	.361	.360	.368	.395	.402	—	—
270°	.344	.386	.381	.405	.416	—	—
315°	.356	.409	.402	.426	.415	—	—

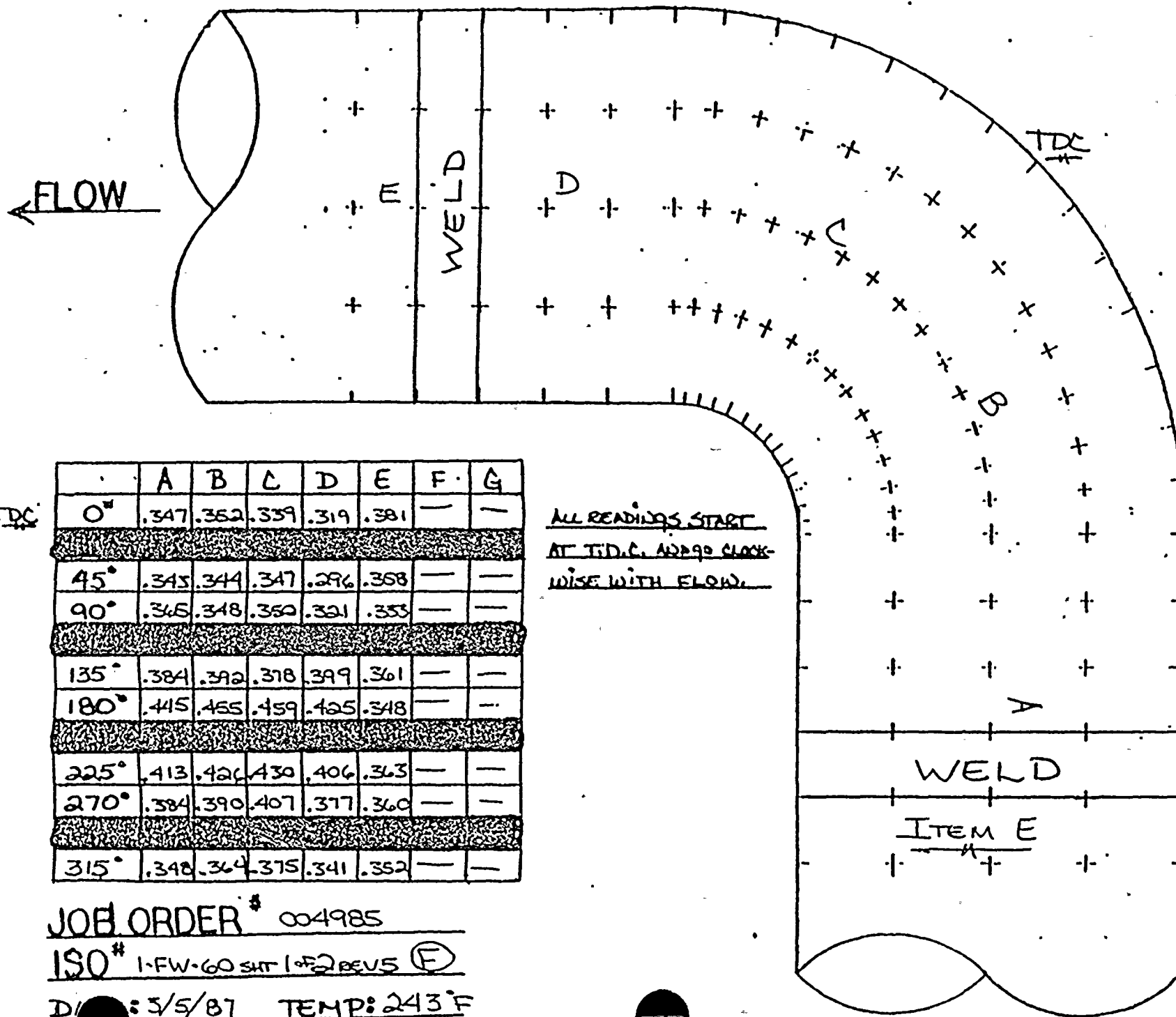
ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

JOB ORDER # 004985

ISO # 1-FW-60 SIM 1-F2 REV 5 (E)

DATE: 3/5/87 TEMP: 243° F



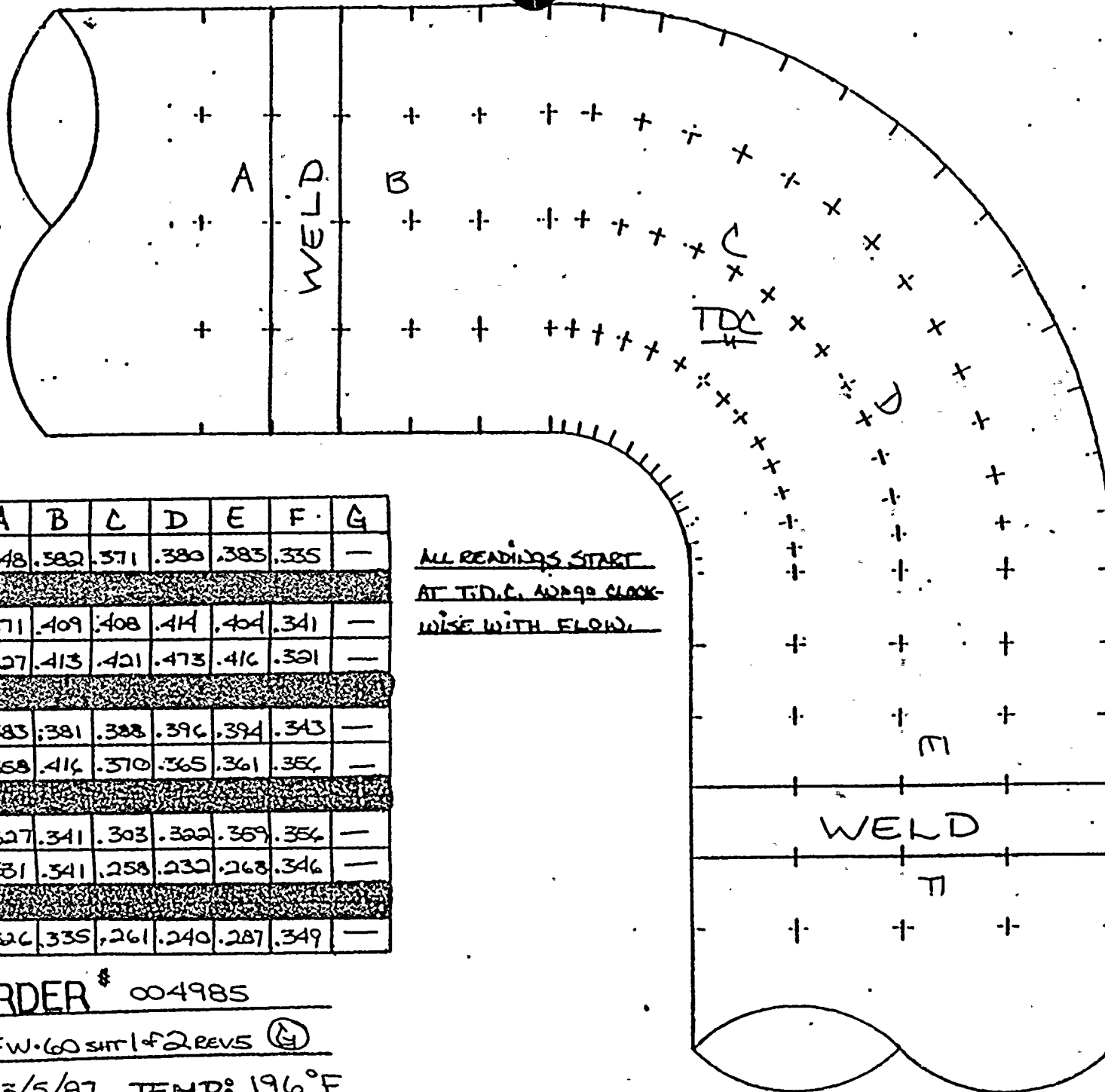


ALL READINGS START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.

JOE ORDER # 004985  
ISO # 1-FW-60 SHT 1-F2 REV 5 (F)  
D: 3/5/87 TEMP: 243°F



FLOW →



TDC

	A	B	C	D	E	F	G
0°	.348	.582	.571	.380	.383	.335	—
45°	.371	.409	.408	.414	.404	.341	—
90°	.427	.413	.421	.473	.416	.321	—
135°	.383	.381	.388	.396	.394	.343	—
180°	.368	.414	.370	.365	.361	.354	—
225°	.327	.341	.303	.322	.359	.354	—
270°	.331	.341	.258	.232	.268	.346	—
315°	.326	.335	.261	.240	.287	.349	—

ALL READINGS START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.

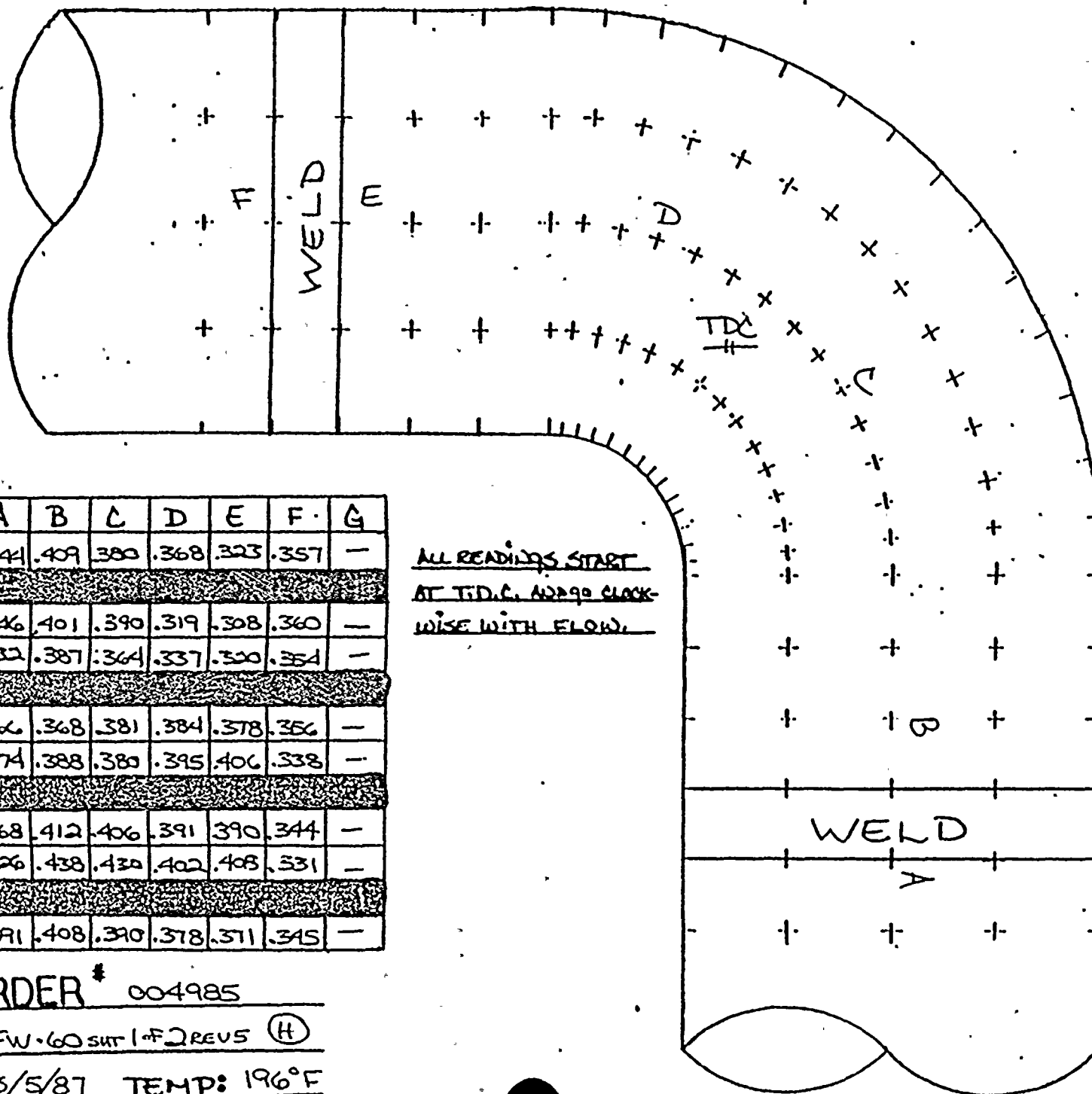
JOB ORDER # 004985

ISO # 1.FW.60 SHI 1 F2 REV5 (4)

DATE: 3/5/87 TEMP: 196°F



FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	.341	.409	.380	.368	.323	.357	—
45°	.346	.401	.390	.319	.308	.360	—
90°	.332	.387	.364	.337	.320	.354	—
135°	.366	.368	.381	.384	.378	.356	—
180°	.374	.388	.380	.395	.406	.338	—
225°	.368	.412	.406	.391	.390	.344	—
270°	.326	.438	.430	.402	.408	.331	—
315°	.391	.408	.390	.378	.371	.345	—

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

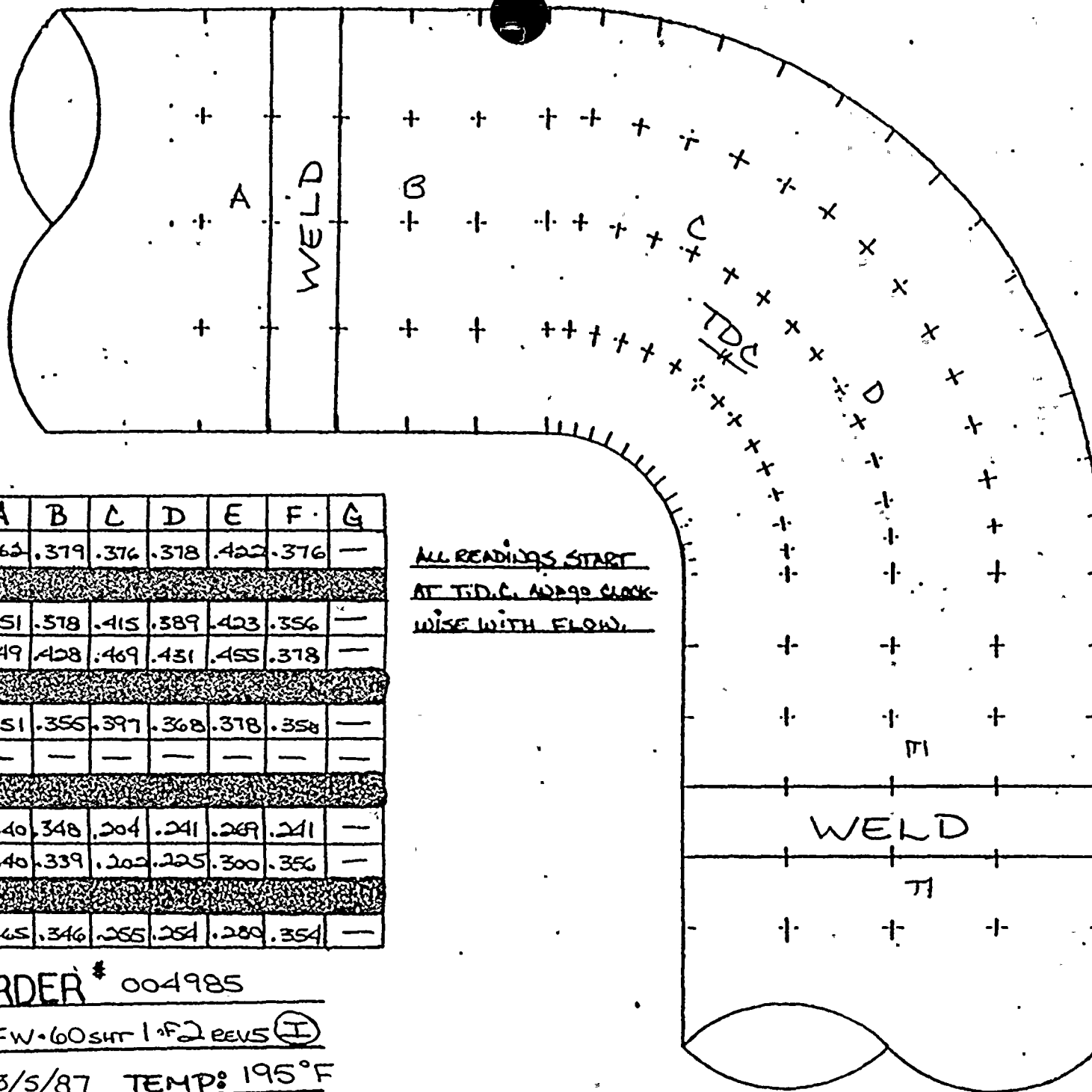
JOB ORDER # 004985

ISO # 1.FW.60 SUR 1.F.2 REVS (H)

DATE: 3/5/87 TEMP: 196°F



FLOW →



TDC

	A	B	C	D	E	F	G
0°	.362	.379	.376	.378	.422	.376	—
45°	.351	.378	.415	.389	.423	.356	—
90°	.349	.428	.469	.431	.455	.378	—
135°	.351	.355	.397	.368	.378	.358	—
180°	—	—	—	—	—	—	—
225°	.340	.348	.204	.241	.269	.241	—
270°	.340	.339	.202	.225	.300	.356	—
315°	.365	.346	.255	.264	.280	.354	—

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

JOB ORDER # 004985

ISO # 1-FW-60 SH-1-F2 REV 5 (I)

DATE: 3/5/87 TEMP: 195°F

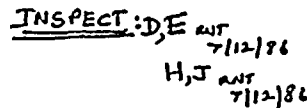


D. C. COOK NUCLEAR PLANT  
EMISSION EVALUATION WORKSHEET

\* THE MINIMUM WALL ( $t_m$ ) WAS CALCULATED USING  $t_m = \frac{PD_o}{2(\sigma_{\text{allow}} - P)} + A$



75839



no		DATE	BY	REVISION RECORD	REVISION
1	1/2	72	EE	REVISED BY NPS 011343S ACCORD TO A-121217 COULD PC-121217, 011343S TO 011343S LONG 1-5295	FIELD ACTION REQ
2	1/2	72	EE	REVISED BY NPS 011343S ACCORD TO A-121217 COULD PC-121217, 011343S TO 011343S LONG 1-5295	FIELD ACTION REQ
3	1/2	72	EE	REVISED BY NPS 011343S ACCORD TO A-121217 COULD PC-121217, 011343S TO 011343S LONG 1-5295	FIELD ACTION REQ
4	1/2	72	EE	REVISED BY NPS 011343S ACCORD TO A-121217 COULD PC-121217, 011343S TO 011343S LONG 1-5295	FIELD ACTION REQ
5	1/2	72	EE	REVISED BY NPS 011343S ACCORD TO A-121217 COULD PC-121217, 011343S TO 011343S LONG 1-5295	FIELD ACTION REQ
6	1/2	72	EE	REVISED BY NPS 011343S ACCORD TO A-121217 COULD PC-121217, 011343S TO 011343S LONG 1-5295	FIELD ACTION REQ
7	1/2	72	EE	REVISED BY NPS 011343S ACCORD TO A-121217 COULD PC-121217, 011343S TO 011343S LONG 1-5295	FIELD ACTION REQ
8	1/2	72	EE	REVISED BY NPS 011343S ACCORD TO A-121217 COULD PC-121217, 011343S TO 011343S LONG 1-5295	FIELD ACTION REQ
9	1/2	72	EE	REVISED BY NPS 011343S ACCORD TO A-121217 COULD PC-121217, 011343S TO 011343S LONG 1-5295	FIELD ACTION REQ

DRAWING APPROVED FOR

DATE	QW	P
L	40	2
L	L	L

2-31 DESIGN SPEC DECPH 102223  
MANAGER SCHEME CLASS III  
TEST REQUIREMENTS OF I  
FIELD PROCEDURE SEE NOTE 1  
QSA 01 TESTING NIA

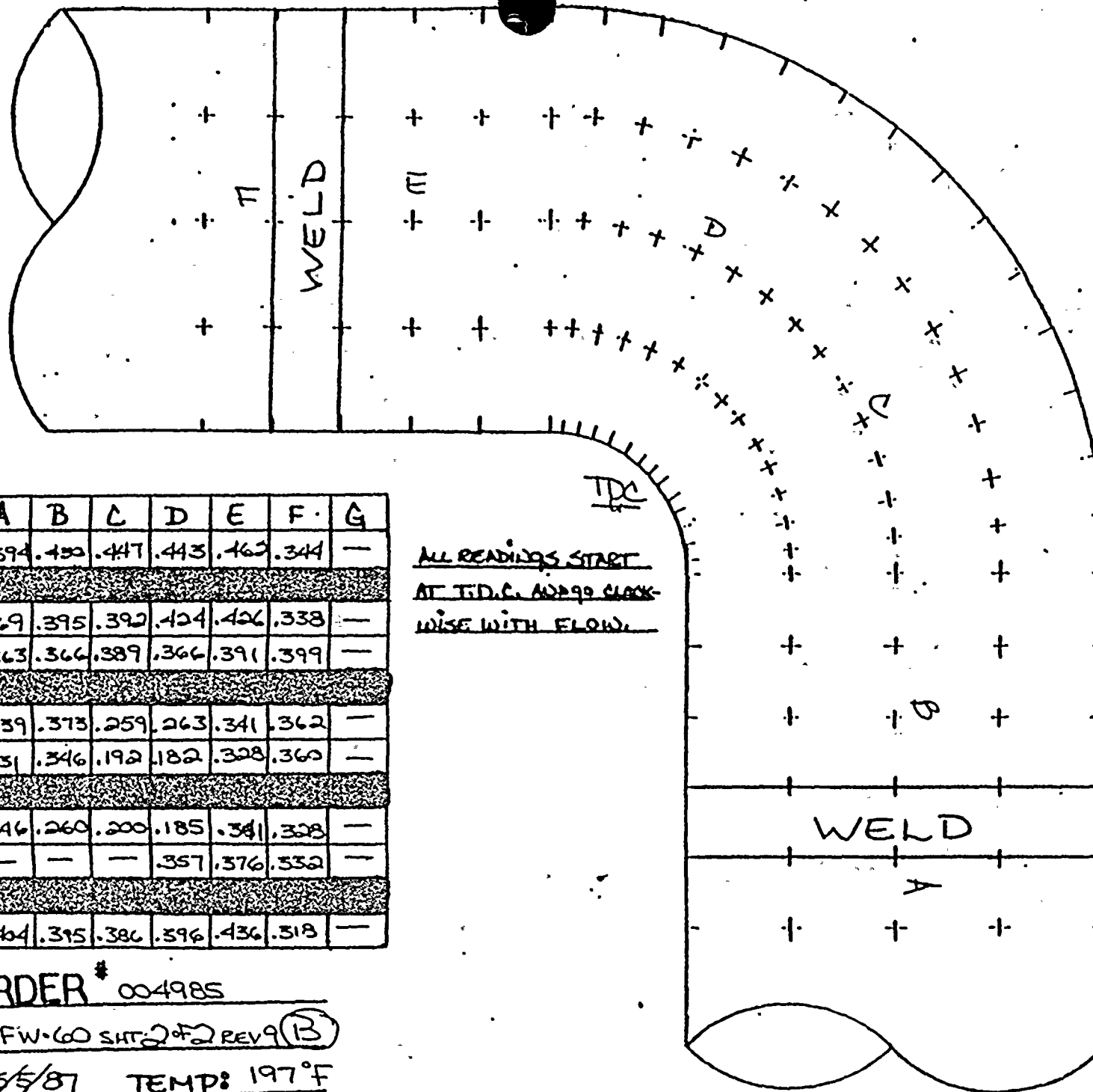
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A-31 DESIGN SPEC DECPH 102223  
MANAGER SCHEME CLASS III  
TEST REQUIREMENTS OF I  
FIELD PROCEDURE SEE NOTE 1  
QSA 01 TESTING NIA









	A	B	C	D	E	F	G
0°	.394	.430	.447	.443	.462	.344	—
45°	.369	.395	.392	.424	.426	.338	—
90°	.363	.366	.389	.366	.391	.399	—
135°	.339	.373	.259	.263	.341	.362	—
180°	.351	.346	.192	.182	.328	.365	—
225°	.346	.260	.200	.185	.341	.328	—
270°	—	—	—	.357	.376	.532	—
315°	.404	.395	.386	.396	.436	.318	—

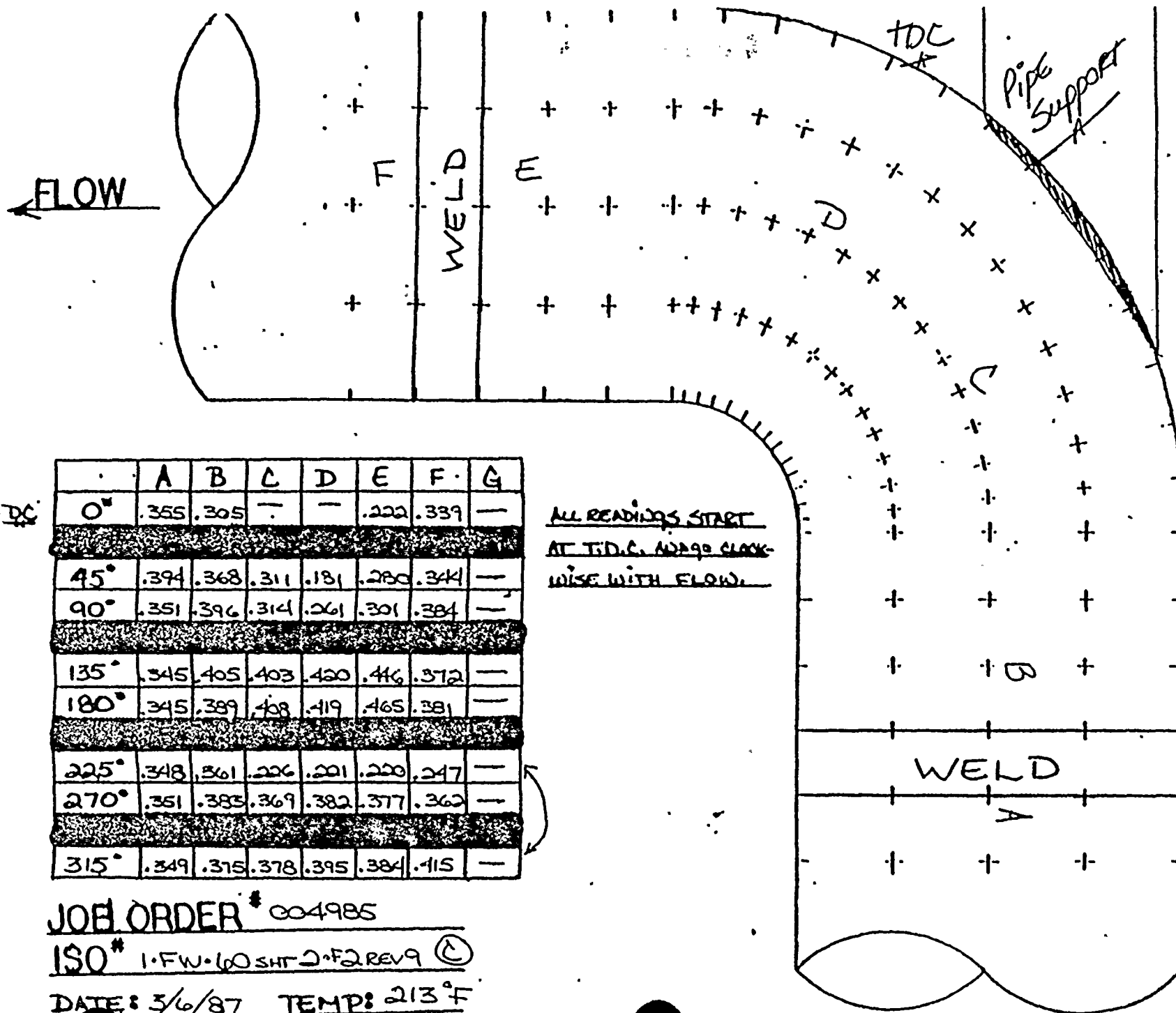
ALL READINGS START  
AT T.D.C. APPROX CLOCK-  
WISE WITH FLOW.

JOB ORDER # 004985

ISO# 1-FW-60 SHT: 2 of 2 REV 9 (B)

DATE: 3/5/87 TEMP: 197°F





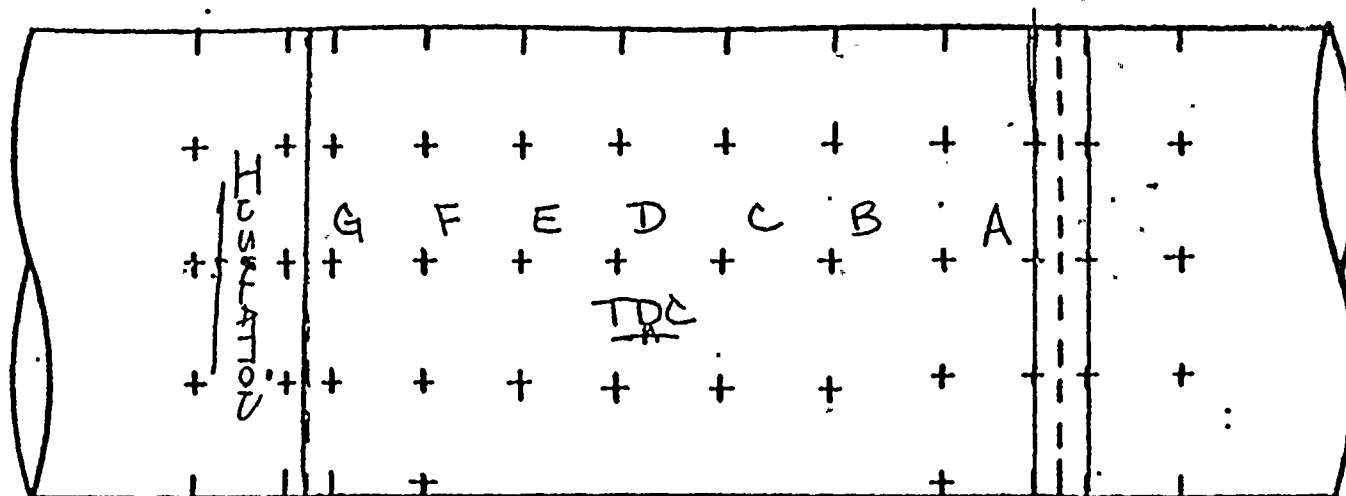
JOE ORDER # 004985

ISO # 1.FW.100 SHT 2.F2 REV 9 (C)

DATE: 5/6/87 TEMP: 213°F



← FLOW



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	.356	.345	.354	.354	.348	.350	.347
45°	.350	.337	.339	.337	.357	.350	.352
90°	.369	.354	.351	.355	.360	.335	.359
135°	.368	.376	.359	.368	.364	.370	.374
180°	.318	.354	.367	.366	.344	.344	.351
225°	.347	.345	.364	.360	.361	.364	.360
270°	.345	.341	.338	.346	.354	.345	.318
315°	.331	.332	.334	.352	.340	.358	.339

JOB ORDER #004985

ISO # 1-FW-60 SHF 2-F2 REV 9  
 (3FT. DOWNSTREAM OF E)

DATE: 3/4/87 TEMP: 213°F



## EROSION EVALUATION WORKSHEET

AEPSO Installed Mat'l Class L-31: ASTM A-106 GR.B

[illegible]

\* THE MINIMUM WALL ( $t_m$ ) WAS CALCULATED USING  $F=0$ :  $t_m = \frac{PD_0}{2(SEF_y P)} + A$



INFORMATION RECORDS CENTER  
CONTROLLED  
DOCUMENT  
JAN 13 1986  
WORKING COPY  
VOLUME 1

QTY.		UNIT		MATERIAL DESCRIPTION	PRICE	TOTAL
01	1	3		CONTRACT VALVE	\$4.00	\$4.00
1	1	1		1" 1500" SN GATE VALVE C.S.	11.00	11.00
9	1	1		1" 3000" TWIN GATE C.S.	21.00	21.00
4	1	1		PIPE (SCH. 40) 3/4" C.S.	1.00	1.00
5	1	1		CAP (SCH. 40) 1/2" C.S.	1.00	1.00
6	2	1		90° ELB (SCH. 40) 1/2" C.S.	1.00	2.00
7	1	1		PIPE (SCH. 40) 3/4" C.S.	1.00	1.00
8	1	1		90° ELB (SCH. 40) 1/2" C.S.	1.00	1.00
9	2	1		90° ELB (SCH. 40) 1/2" C.S.	1.00	2.00
10	1	1		90° RED ELB (SCH. 40) 1/2" C.S.	1.00	1.00
11	1	1		PIPE (SCH. 40) 3/4" C.S.	1.00	1.00
12	1	1		3000" SN GATE VALVE C.S.	21.00	21.00

[illegible]

INSPECT, C, D, E ANT 7/12/36  
H ANT 7/12/36

HANGER MARKING

15W- V83  
V84  
R86  
R87  
R91  
R93  
R95  
R96  
R98  
1-AFW- R902  
1-AFW- R906

NOTES: REPLACE 'C' NEXT-  
OUTAGE

**DRAWING APPROVED FOR**

DATE	TIME	DATE	TIME
BY MRJ DATE 2/72	BY GUS DATE 2/72		

POUR/ZONE No. 113 FLUX DIAGRAM 1-5-0-2-1-6  
REQUIRED COMPLETION DATE ..... USL 5/1  
FABRICATED BY CLVSEY WELD PROCEDURE W11-2772

**NPS DESIGNS INC.**  
**NEW YORK, N.Y.**

**FABRICATOR NOTE:  
FABRICATION MUST  
CONFORM TO LATEST  
A.E.P. ARRGT. OWGS.**

INDIANA & MCKINLEY ELECTRIC CO  
- DONALD C CUON NUCLEAR PLANT

DATE	TIME	NAME	NO.
10/10/50	1:00 PM	THE WILSONS	5

[illegible]

NOTES:

1. USE CRANE 425-A COMPOUND  
OR CRANELL 167B  
ON ALL THREADED CONNS.  
2. WELD PROCEDURE AS FOLLOWS:  
1/2" 3" 4" 6" 8" 10" 12" 14" 16" 18" 20" 22" 24" 26" 28" 30" 32" 34" 36" 38" 40" 42" 44" 46" 48" 50" 52" 54" 56" 58" 60" 62" 64" 66" 68" 70" 72" 74" 76" 78" 80" 82" 84" 86" 88" 90" 92" 94" 96" 98" 100" 102" 104" 106" 108" 110" 112" 114" 116" 118" 120" 122" 124" 126" 128" 130" 132" 134" 136" 138" 140" 142" 144" 146" 148" 150" 152" 154" 156" 158" 160" 162" 164" 166" 168" 170" 172" 174" 176" 178" 180" 182" 184" 186" 188" 190" 192" 194" 196" 198" 200" 202" 204" 206" 208" 210" 212" 214" 216" 218" 220" 222" 224" 226" 228" 230" 232" 234" 236" 238" 240" 242" 244" 246" 248" 250" 252" 254" 256" 258" 260" 262" 264" 266" 268" 270" 272" 274" 276" 278" 280" 282" 284" 286" 288" 290" 292" 294" 296" 298" 300" 302" 304" 306" 308" 310" 312" 314" 316" 318" 320" 322" 324" 326" 328" 330" 332" 334" 336" 338" 340" 342" 344" 346" 348" 350" 352" 354" 356" 358" 360" 362" 364" 366" 368" 370" 372" 374" 376" 378" 380" 382" 384" 386" 388" 390" 392" 394" 396" 398" 400" 402" 404" 406" 408" 410" 412" 414" 416" 418" 420" 422" 424" 426" 428" 430" 432" 434" 436" 438" 440" 442" 444" 446" 448" 450" 452" 454" 456" 458" 460" 462" 464" 466" 468" 470" 472" 474" 476" 478" 480" 482" 484" 486" 488" 490" 492" 494" 496" 498" 500" 502" 504" 506" 508" 510" 512" 514" 516" 518" 520" 522" 524" 526" 528" 530" 532" 534" 536" 538" 540" 542" 544" 546" 548" 550" 552" 554" 556" 558" 560" 562" 564" 566" 568" 570" 572" 574" 576" 578" 580" 582" 584" 586" 588" 590" 592" 594" 596" 598" 600" 602" 604" 606" 608" 610" 612" 614" 616" 618" 620" 622" 624" 626" 628" 630" 632" 634" 636" 638" 640" 642" 644" 646" 648" 650" 652" 654" 656" 658" 660" 662" 664" 666" 668" 670" 672" 674" 676" 678" 680" 682" 684" 686" 688" 690" 692" 694" 696" 698" 700" 702" 704" 706" 708" 710" 712" 714" 716" 718" 720" 722" 724" 726" 728" 730" 732" 734" 736" 738" 740" 742" 744" 746" 748" 750" 752" 754" 756" 758" 760" 762" 764" 766" 768" 770" 772" 774" 776" 778" 780" 782" 784" 786" 788" 790" 792" 794" 796" 798" 800" 802" 804" 806" 808" 810" 812" 814" 816" 818" 820" 822" 824" 826" 828" 830" 832" 834" 836" 838" 840" 842" 844" 846" 848" 850" 852" 854" 856" 858" 860" 862" 864" 866" 868" 870" 872" 874" 876" 878" 880" 882" 884" 886" 888" 890" 892" 894" 896" 898" 900" 902" 904" 906" 908" 910" 912" 914" 916" 918" 920" 922" 924" 926" 928" 930" 932" 934" 936" 938" 940" 942" 944" 946" 948" 950" 952" 954" 956" 958" 960" 962" 964" 966" 968" 970" 972" 974" 976" 978" 980" 982" 984" 986" 988" 990" 992" 994" 996" 998" 1000" 1002" 1004" 1006" 1008" 1010" 1012" 1014" 1016" 1018" 1020" 1022" 1024" 1026" 1028" 1030" 1032" 1034" 1036" 1038" 1040" 1042" 1044" 1046" 1048" 1050" 1052" 1054" 1056" 1058" 1060" 1062" 1064" 1066" 1068" 1070" 1072" 1074" 1076" 1078" 1080" 1082" 1084" 1086" 1088" 1090" 1092" 1094" 1096" 1098" 1100" 1102" 1104" 1106" 1108" 1110" 1112" 1114" 1116" 1118" 1120" 1122" 1124" 1126" 1128" 1130" 1132" 1134" 1136" 1138" 1140" 1142" 1144" 1146" 1148" 1150" 1152" 1154" 1156" 1158" 1160" 1162" 1164" 1166" 1168" 1170" 1172" 1174" 1176" 1178" 1180" 1182" 1184" 1186" 1188" 1190" 1192" 1194" 1196" 1198" 1200" 1202" 1204" 1206" 1208" 1210" 1212" 1214" 1216" 1218" 1220" 1222" 1224" 1226" 1228" 1230" 1232" 1234" 1236" 1238" 1240" 1242" 1244" 1246" 1248" 1250" 1252" 1254" 1256" 1258" 1260" 1262" 1264" 1266" 1268" 1270" 1272" 1274" 1276" 1278" 1280" 1282" 1284" 1286" 1288" 1290" 1292" 1294" 1296" 1298" 1300" 1302" 1304" 1306" 1308" 1310" 1312" 1314" 1316" 1318" 1320" 1322" 1324" 1326" 1328" 1330" 1332" 1334" 1336" 1338" 1340" 1342" 1344" 1346" 1348" 1350" 1352" 1354" 1356" 1358" 1360" 1362" 1364" 1366" 1368" 1370" 1372" 1374" 1376" 1378" 1380" 1382" 1384" 1386" 1388" 1390" 1392" 1394" 1396" 1398" 1400" 1402" 1404" 1406" 1408" 1410" 1412" 1414" 1416" 1418" 1420" 1422" 1424" 1426" 1428" 1430" 1432" 1434" 1436" 1438" 1440" 1442" 1444" 1446" 1448" 1450" 1452" 1454" 1456" 1458" 1460" 1462" 1464" 1466" 1468" 1470" 1472" 1474" 1476" 1478" 1480" 1482" 1484" 1486" 1488" 1490" 1492" 1494" 1496" 1498" 1500" 1502" 1504" 1506" 1508" 1510" 1512" 1514" 1516" 1518" 1520" 1522" 1524" 1526" 1528" 1530" 1

[illegible][illegible]

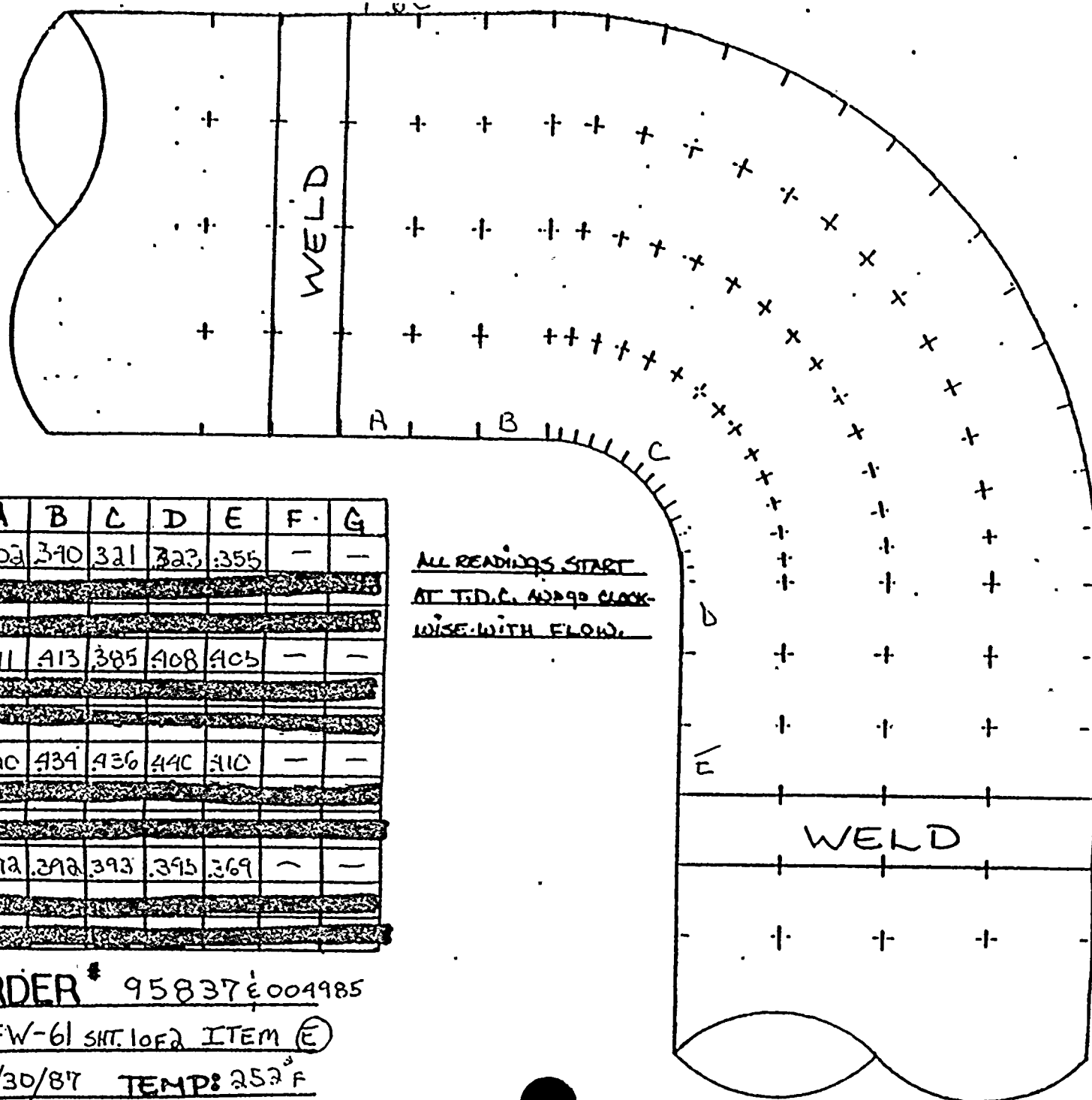
*ID#	QUAN	T*
6	5	2
8	191	5
9	1	2
7	1	1

IMPORT MARK NUMBERS  
SUGGESTION FOR  
ALLOCATION OF SUMMERS ONLY  
FOR CASE LOCATIONS SEE SUP  
SUMMER LISTING

INDICATES LOCATION OF FIVE  
SUPPORT AND SUPPORT DETAIL  
NUMBER



← FLOW



DC

	A	B	C	D	E	F	G
0°	.302	.310	.321	.323	.355	—	—
90°	.411	.413	.385	.408	.405	—	—
180°	.420	.434	.436	.440	.410	—	—
270°	.372	.392	.393	.395	.369	—	—

ALL READINGS START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.

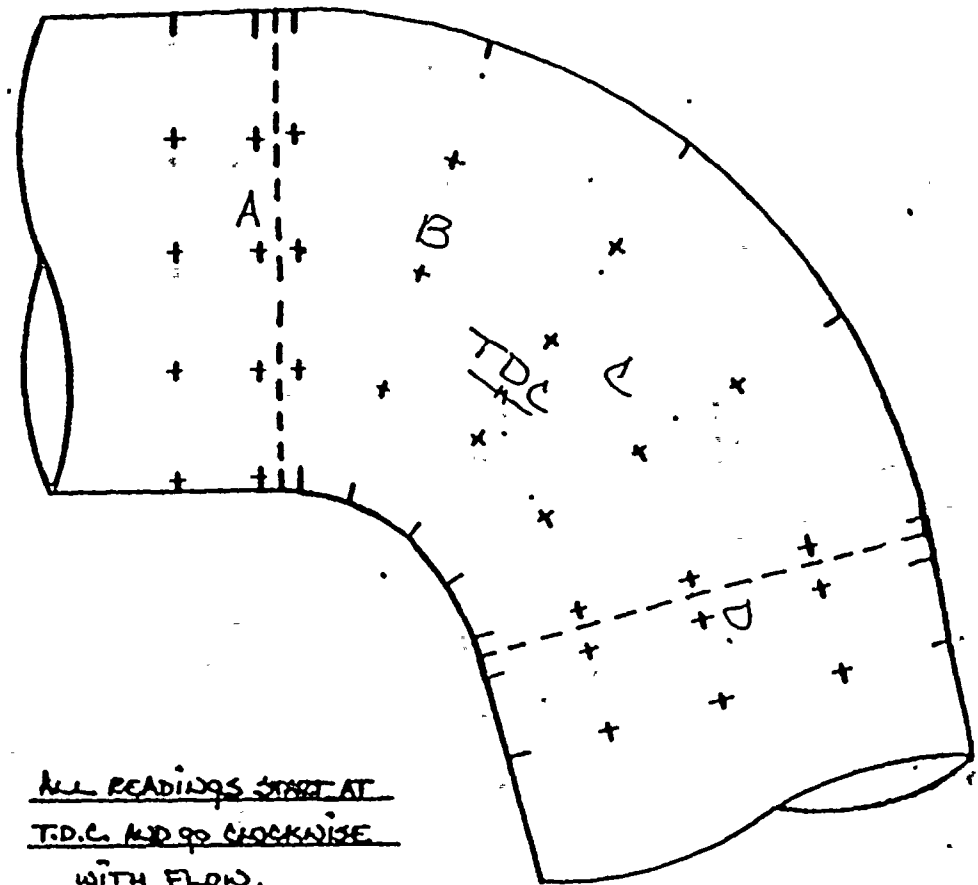
JOE ORDER # 95837E004985

ISO# 1-FW-61 SHT. 1 OF 2 ITEM (E)

DATE 1/30/87 TEMP: 252°F



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

	A	B	C	D	E	F	G
0°	.384	.362	.387	.357	—	—	—
45°	.331	.392	.435	.350	—	—	—
90°	.329	.420	.456	.335	—	—	—
135°	.341	.420	.415	.336	—	—	—
180°	.346	.400	.385	.335	—	—	—
225°	.342	.367	.359	.323	—	—	—
270°	.222	.186	.153	.179	—	—	—
315°	.217	.174	.326	.314	—	—	—

JOB ORDER\*\* 004985

ISO\*\* 1. FW-61 SH-1 OF 2 REVS (F)

DATE: 3/5/87 TEMP: 206°F



FLOW →

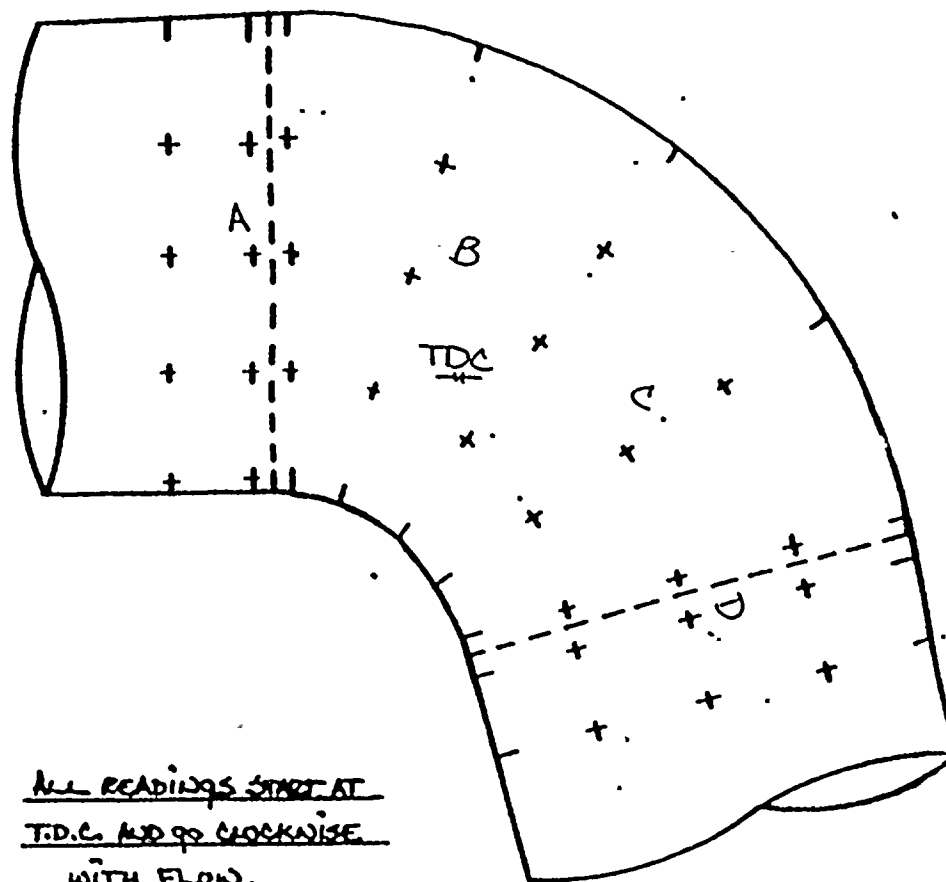
TQC

	A	B	C	D	E	F	G
0°	.352	.358	.359	.349	—	—	—
45°	.348	.426	.404	.359	—	—	—
90°	.351	.405	.408	.342	—	—	—
135°	.366	.402	.414	.353	—	—	—
180°	.349	.378	.368	.338	—	—	—
225°	.347	.356	.353	.344	—	—	—
270°	.346	.314	.291	.345	—	—	—
315°	.352	.351	.285	.356	—	—	—

JOB ORDER\*\* 004985

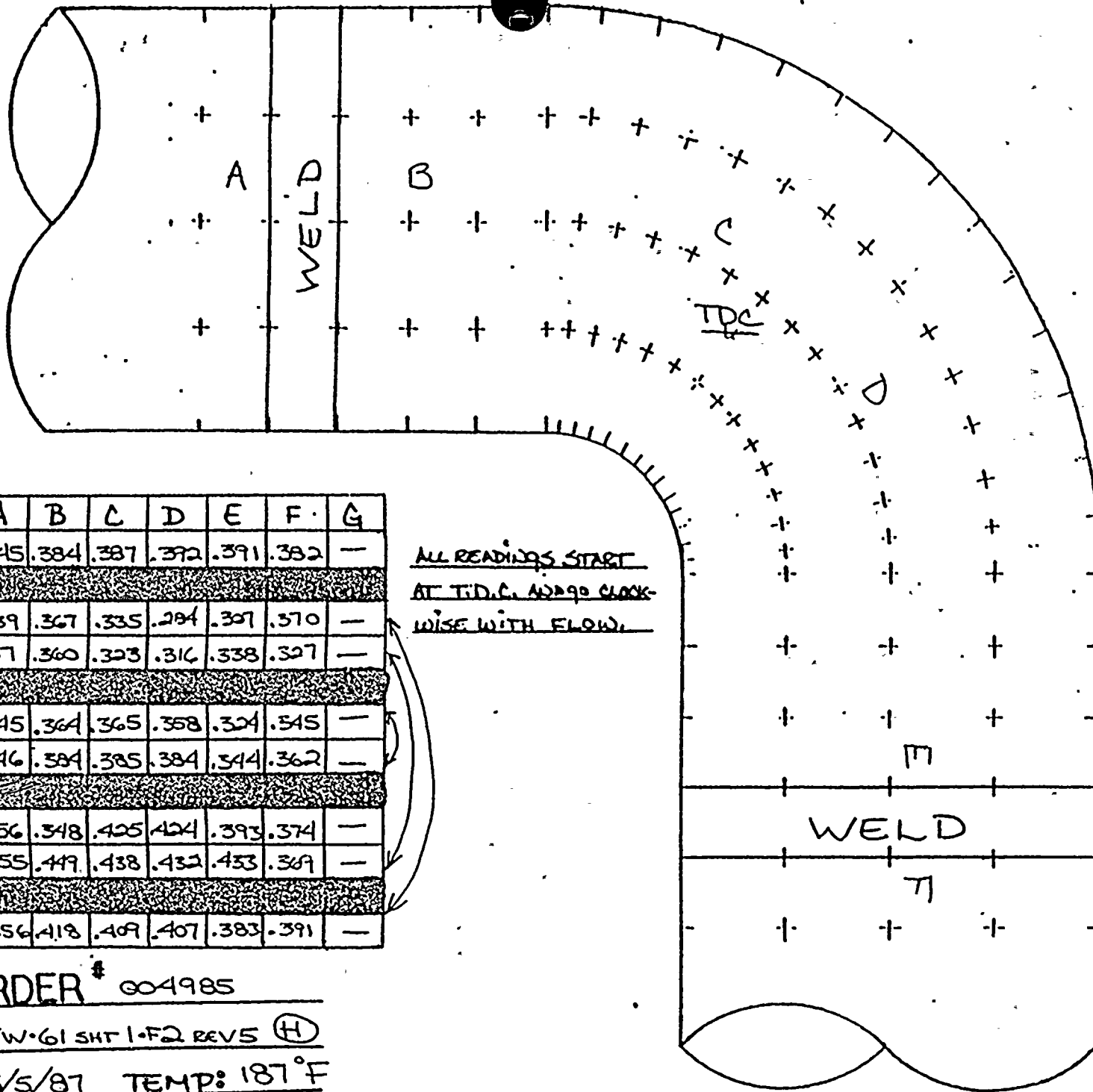
ISO\*\* 1FW-61 SMT 1 F2 REV 5 (4)

DA: 3/5/87 TEMP: 206°F





FLOW →



TDC

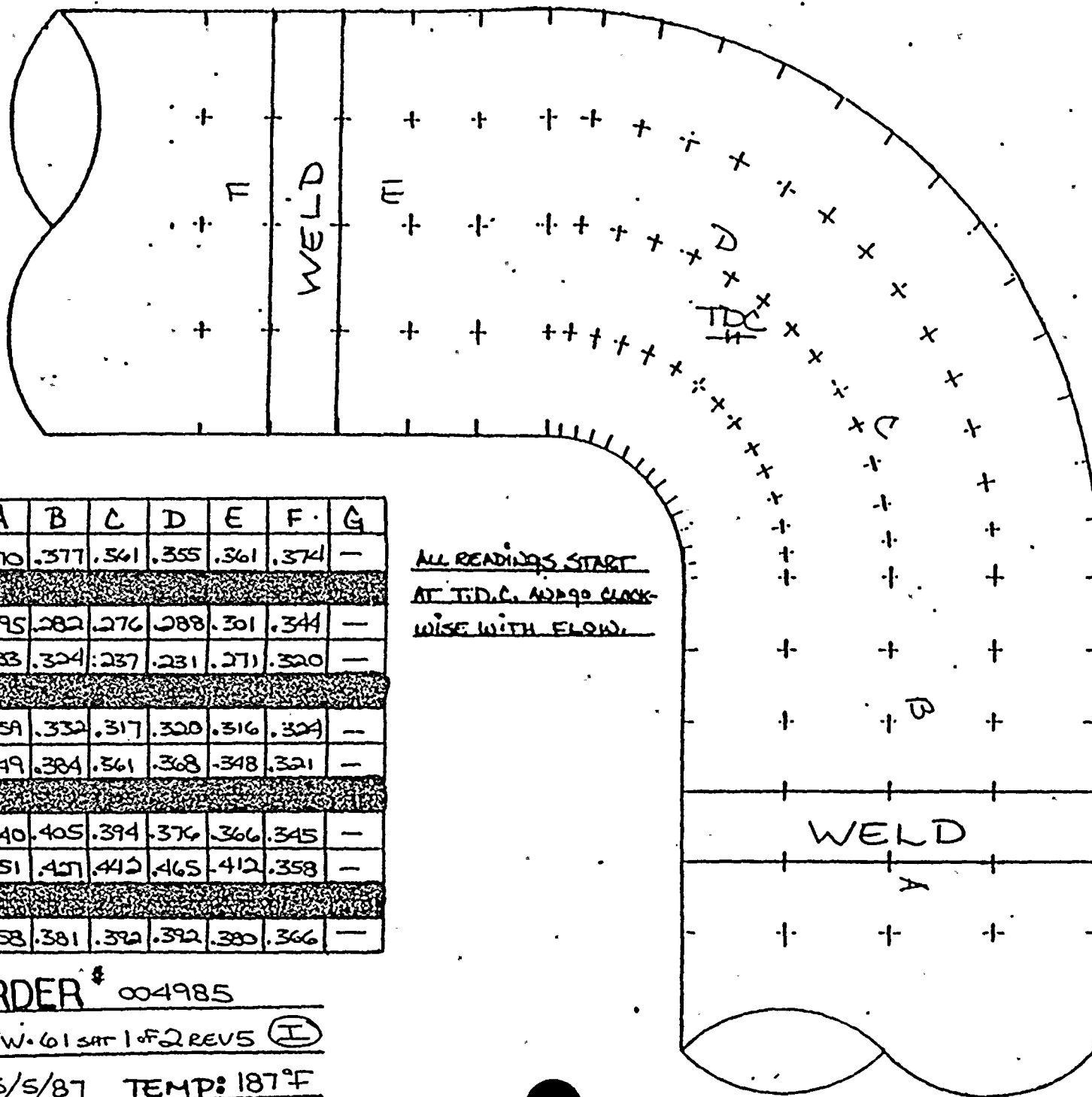
	A	B	C	D	E	F	G
0°	.345	.384	.387	.392	.391	.382	—
45°	.339	.367	.335	.294	.307	.370	—
90°	.337	.360	.323	.316	.338	.327	—
135°	.345	.364	.365	.358	.324	.345	—
180°	.346	.384	.385	.384	.344	.362	—
225°	.356	.348	.425	.424	.393	.374	—
270°	.355	.449	.438	.432	.453	.369	—
315°	.356	.418	.409	.407	.383	.391	—

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

JOB ORDER # 004985  
ISO# 1-FW-61 SHF 1-F2 REV5 (H)  
DATE: 3/5/87 TEMP: 187°F



← FLOW



TDC

	A	B	C	D	E	F	G
0°	.370	.377	.361	.355	.361	.374	—
45°	.295	.282	.276	.288	.301	.344	—
90°	.383	.324	.237	.231	.271	.320	—
135°	.389	.332	.317	.320	.316	.324	—
180°	.349	.384	.361	.368	.348	.321	—
225°	.340	.405	.394	.376	.366	.345	—
270°	.351	.427	.412	.465	.412	.358	—
315°	.358	.381	.392	.392	.380	.366	—

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

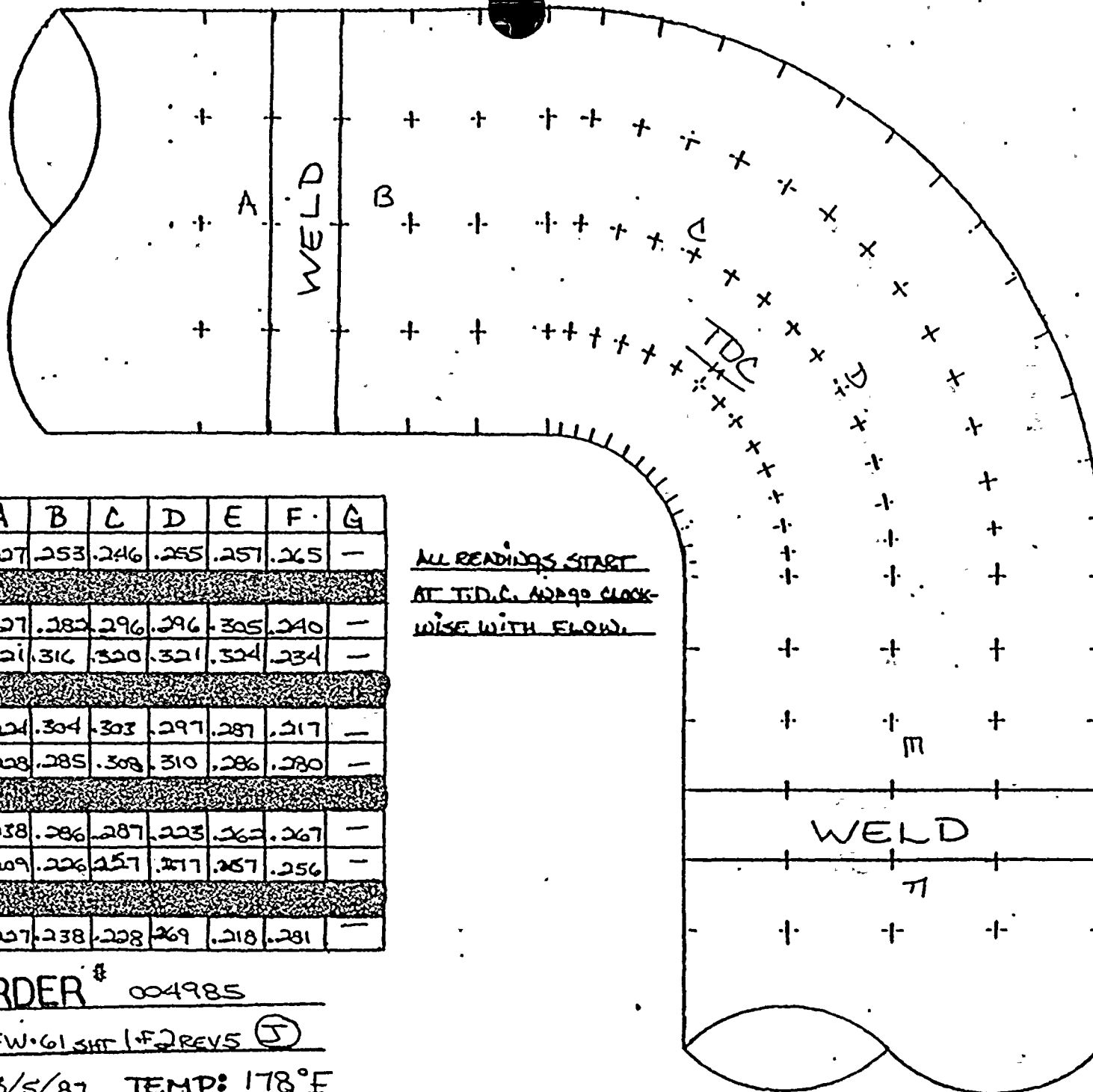
JOB ORDER # 004985

ISO # 1-FW-61 SAT 1 OF 2 REV 5 (I)

DATE: 3/5/87 TEMP: 187°F



FLOW →



TDC

	A	B	C	D	E	F	G
0°	.227	.253	.246	.255	.257	.265	—
45°	.227	.282	.296	.296	.305	.240	—
90°	.221	.316	.320	.321	.324	.234	—
135°	.224	.304	.303	.297	.287	.217	—
180°	.228	.285	.308	.310	.286	.280	—
225°	.238	.286	.287	.223	.262	.267	—
270°	.209	.226	.257	.217	.257	.256	—
315°	.227	.238	.228	.269	.218	.281	—

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

JOB ORDER # 004985

ISO # 1-FW-61-SHT 1-F2-REV5 (J)

DATE: 3/5/87 TEMP: 178°F



## EROSION EVALUATION WORKSHEET

Unit No. 1

Years in service //

UT Reading Taken on: \_\_\_\_\_

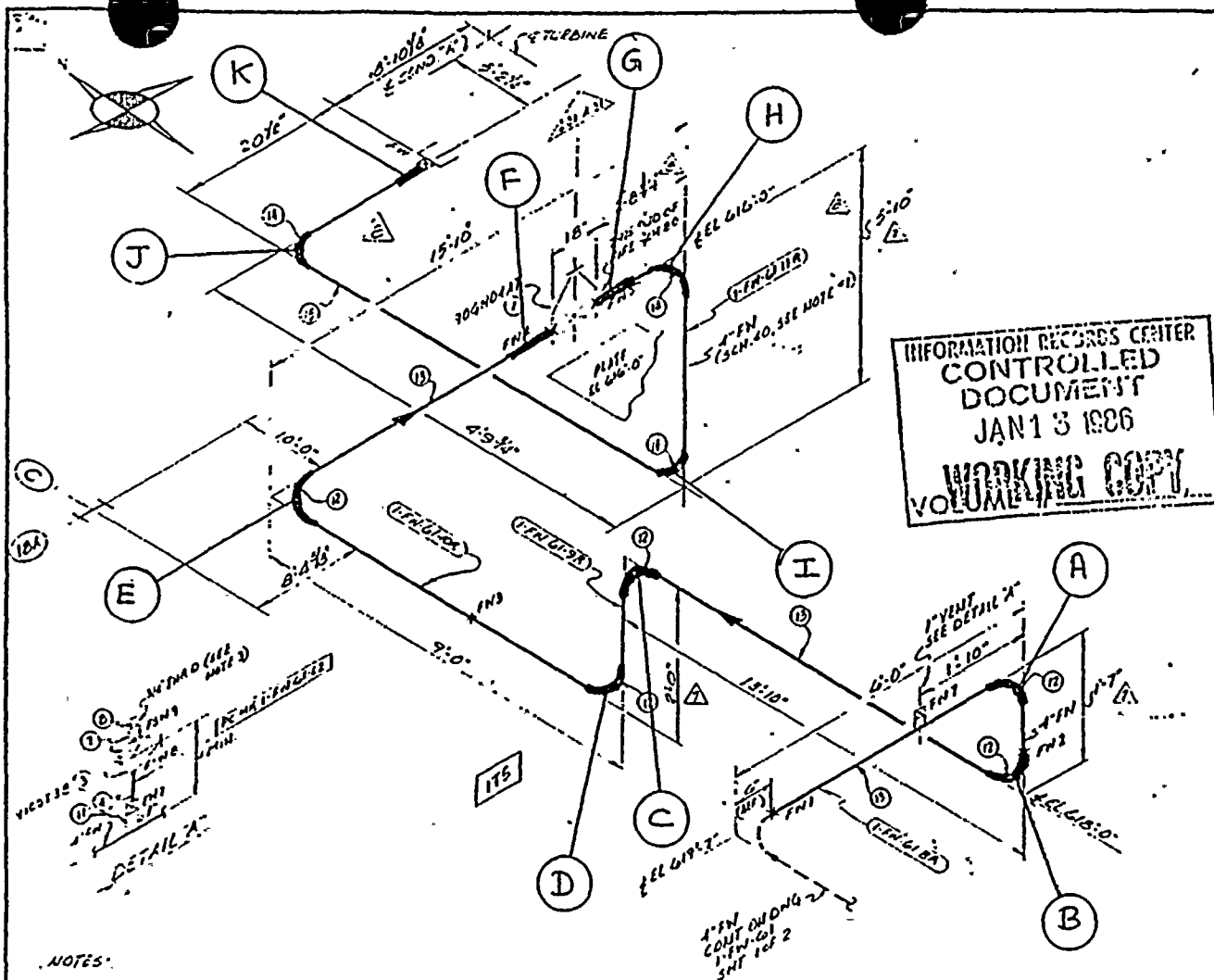
NEPSC Installed Mat'l Class 1-31: ASTM A-106 GR.B

## COMMENTS

G	4" STRAIGHT	0.337	0.295	0.379	0.235	0.332	0	STILL WITHIN MANUFACTURERS TOLERANCE
3 FT. DOWN STREAM OF								" " " "
D	4" STRAIGHT	0.337	0.295	0.379	0.235	0.330	0	
3 FT. DOWN STREAM OF								" " " "
E	4" STRAIGHT	0.337	0.295	0.379	0.235	0.321	0	

\* THE MINIMUM WALL ( $t_m$ ) WAS CALCULATED USING  $t_m = \frac{PD_o}{2(S_E + V_P)} + A$





NOTES:

1. PIPE SPEC A-31 2 1/2" THRU 10" SCH 40  
2" & UNDER SCH 80  
PIPE SPEC L-31 2 1/2" & UNDER SCH. 80

2 WELD PROCEDURE IS FOLLOWS:  
 1. 515 272" & UNDER CS-6  
 2. 43 3" & OVER UP TO 4" WALL CS-1 OR CS-2

3 USE CRANE 425-A OR GRINNELL  
139C ON ALL THREADED CONNECTIONS

SITE FAB PIECE MARKS	PC#	PIECE MARKS ID	PC#	PIECE MARKS ID
FC H4-1-FH-G1-G1 VOID	531 VOID	1-FH-G1-G1 VOID		1-FH-G1-G1 BLUNTY
-12		-11		-58
-13 VOID		-12	i	-709
		-13		-11A-2
	329	-14 VOID		
		-14A VOID		
	401			

NOTES - 11 T

NOTES: H, I, J WERE REPLACED  
WITH S.S. BEFORE 7/30/85

QTY	UNIT	QTY	UNIT	MATERIAL DESCRIPTION	PRICE	TOTAL
1	1	1	1	3000" SW CS	2.50	2.50
2	1	1	1	3000" SW CS	2.50	2.50
3	1	1	1	3000" SW CS	2.50	2.50
4	1	1	1	3000" SW CS	2.50	2.50
5	1	1	1	3000" SW CS	2.50	2.50
6	1	1	1	3000" SW CS	2.50	2.50
7	1	1	1	3000" SW CS	2.50	2.50
8	1	1	1	3000" SW CS	2.50	2.50
9	1	1	1	3000" SW CS	2.50	2.50
10	1	1	1	3000" SW CS	2.50	2.50
11	1	1	1	3000" SW CS	2.50	2.50
12	1	1	1	3000" SW CS	2.50	2.50
13	1	1	1	3000" SW CS	2.50	2.50
14	1	1	1	3000" SW CS	2.50	2.50
15	1	1	1	3000" SW CS	2.50	2.50

REVISION RECORD				REVISIONS
NO	DATE	BY	DESCRIPTION	REMARKS
1	10-12-73	JO	REVISED BY UPS. DESIGNS ADDED: 1" HP VENT CONN. P. 14 NO. 1 ITEMS 336 TO BHM. REV. 1 D.G. 1.5275	FIELD ACTION REQD.
2	11-14-73	JO	REMOVED: 2" P.D. 1.5275-1.5275 ADDED: 2" P.D. 1.5275-1.5275 REV. 2 D.G. 1.5275	FIELD ACTION REQD.
3	11-14-73	JO	REMOVED BY 1.5275 D.G. 1.5275 ADDED: 1.5275 D.G. 1.5275 REV. 2, 1.5275	NO ACTION REQD.
4	11-14-73	JO	ADDED 2" P.D. 1.5275-1.5275 VOIDED 1.5275-1.5275 REV. 2, 1.5275	FIELD ACTION REQD.
5	11-14-73	JO	1.5275 D.G. 1.5275-1.5275 ADDED: 1.5275 D.G. 1.5275 REV. 2, 1.5275	FIELD ACTION REQD.
6	11-14-73	JO	RELOCATED 3000 P. 14 NO. 1 ADDED: 1.5275 D.G. 1.5275 REV. 2, 1.5275	FIELD ACTION REQD.
7	11-14-73	JO	REVISED: CONFIRMED 1.5275 D.G. 1.5275 ADDED: 1.5275 D.G. 1.5275 REV. 2, 1.5275	FIELD ACTION REQD.
8	11-14-73	JO	REMOVED: 1.5275 D.G. 1.5275 ADDED: 1.5275 D.G. 1.5275 REV. 2, 1.5275	NO ACTION REQD.
9	11-14-73	JO	ADDED: 1.5275 D.G. 1.5275 REV. 2, 1.5275	FIELD ACTION REQD.

**INSPECT: J.E**      RPT 711215L

**DRAWING APPROVED FOR**

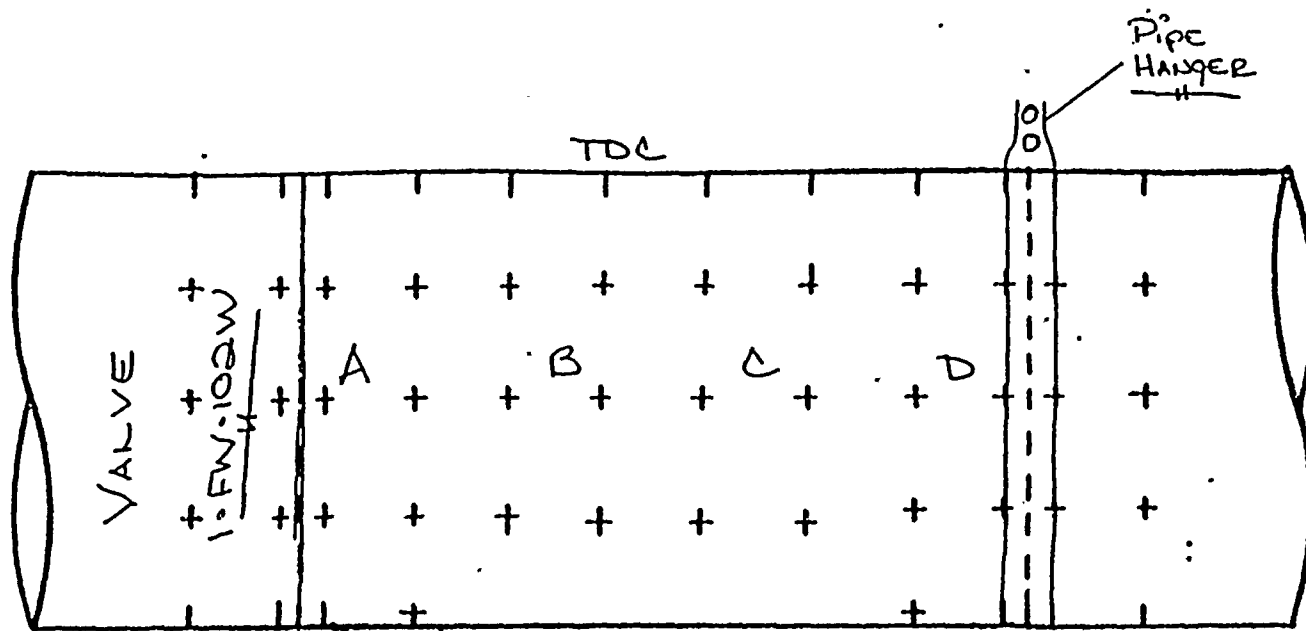
BY SA DATE 2/1/68 FILE 100-441111

FLUX DIAGRAMS			
WELD PROCEDURES			
INVEST & COMPANY INC			
DIAMOND & SPARKING MILLING CO			
DOWNSIDE & COOR MILLING PLANT			
DATE	TIME	NAME	NO.
10/1/55	1:30	1-FW-61	9
10/1/55	1:30	5-FW-62	

[illegible]



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

→  
TDC

	A	B	C	D	E	F	G
0°	359	355	349	342	—	—	—
45°	354	351	360	371	—	—	—
90°	345	349	360	351	—	—	—
135°	332	341	347	347	—	—	—
180°	345	353	355	345	—	—	—
225°	368	356	358	354	—	—	—
270°	—	—	—	—	—	—	—
315°	350	356	362	365	—	—	—

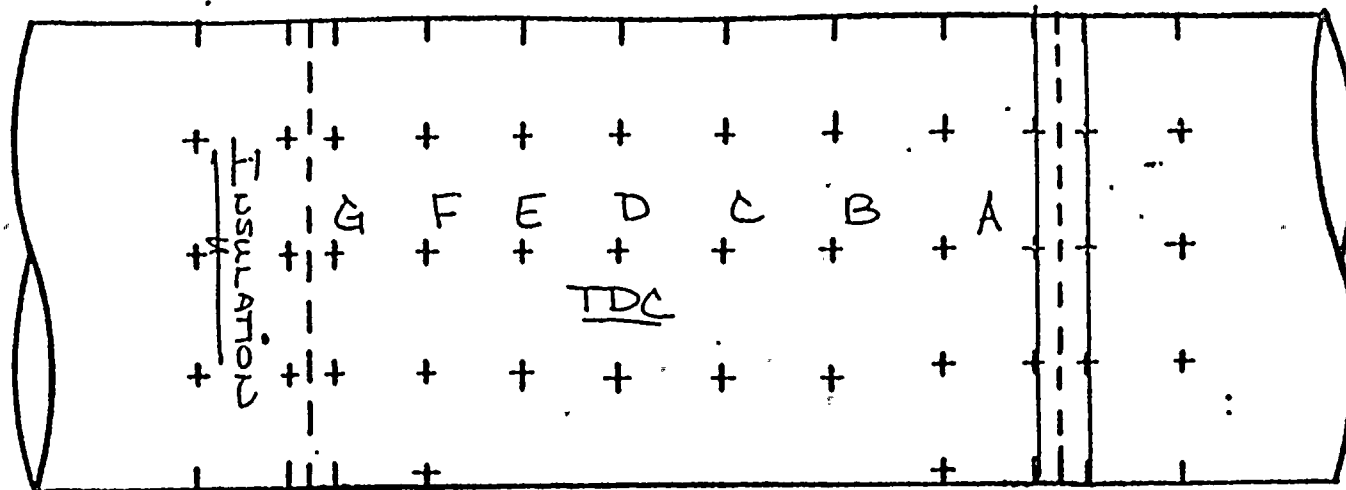
JOB ORDER # 004985

ISO # 1.0FW-6134T2 F2 (4)

DATE: 4/19/87 TEMP: 86°F



← FLOW



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	.380	.367	.357	.340	.356	.330	.385
45°	.358	.359	.352	.351	.366	.363	.359
90°	.367	.380	.348	.351	.347	.371	.351
135°	.368	.387	.343	.359	.334	.349	.362
180°	.389	.367	.357	.341	.353	.331	.357
225°	.361	.367	.358	.365	.362	.357	.346
270°	.367	.347	.364	.373	.360	.345	.350
315°	.361	.353	.355	.345	.359	.357	.376

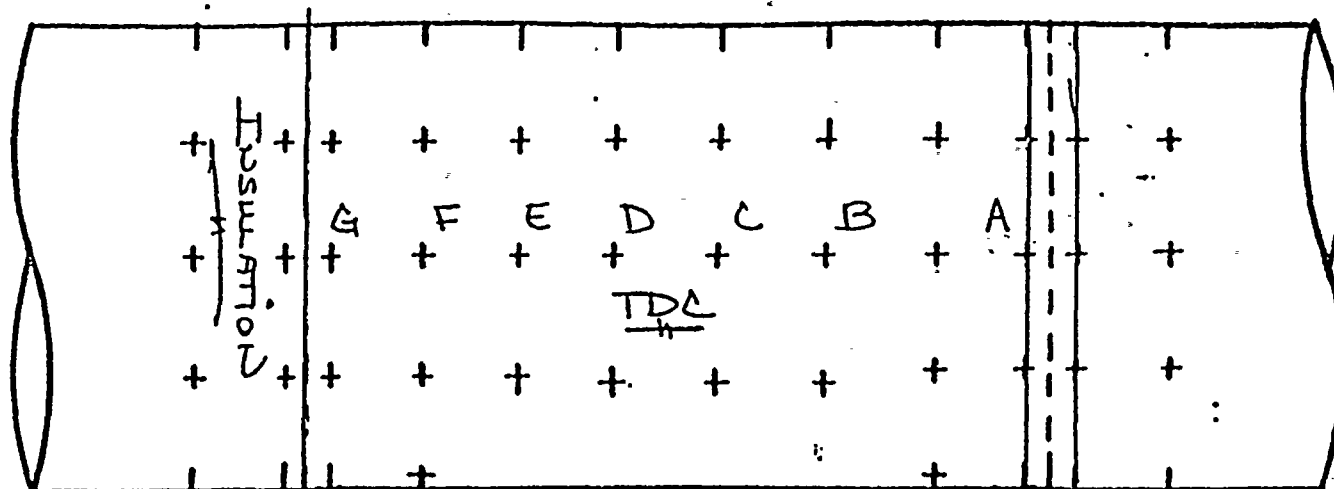
JOB ORDER # 004985

ISO # 1-FW-61 SHT 2-F2 REV 9

DATE: 3/6/81 TEMP: 213°F



← FLOW



ALL READINGS START AT  
TDC AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	.359	.359	.362	.360	.371	.367	.358
45°	.364	.366	.354	.356	.352	.361	.360
90°	.353	.359	.361	.357	.354	.359	.361
135°	.361	.368	.365	.362	.366	.372	.377
180°	.344	.343	.352	.357	.362	.345	.347
225°	.347	.325	.325	.328	.332	.333	.321
270°	.333	.332	.339	.338	.345	.344	.332
315°	.340	.349	.351	.349	.342	.343	.344

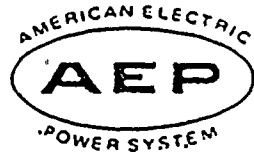
JOB ORDER # 004985

ISO # 1 FW 61 SHT 2 of 2 REV 9

DATE 3/4/87 TEMP 82.13°F



AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: MAY 27, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 1  
     Steam Piping Erosion Program, SER No. 88-84  
  X   Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. J. A. Kopyra *4/25/87*  
 2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on APRIL 24, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
<u>1-FW-4</u>			
<u>REV. 7</u>	<u>CS</u>	<u>B</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATIONS REQUIRED</u>
<u>1-FW-4</u>			<u>" " " "</u>
<u>REV. 7</u>	<u>CS</u>	<u>C</u>	<u>-----</u>
<u>-----</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>
<u>-----</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>
<u>-----</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>
<u>-----</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>
<u>-----</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>
<u>-----</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>
<u>-----</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>
<u>-----</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>

*Anthony J. Lewandowski*  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 46.3.15.2.5.2

Sheet No. 1 of 1



D. C. COOK N' T. EAR PLANT  
EROSION EVALUATION WORKSHEET

AEPSC Engineer: ANTHONY J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. 1

Evaluation Date: MAY 26, 1987

SER No. 23-85 (Water) X

Years in service 11

UT Reading Transmitted on: APRIL 24, 1987

UT Reading Taken on: 4-8-87

Isometric Dwg. NO. 1-FW-4, REV. 7

AEPSC Installed Mat'l Class CS: ASTM A-106 GR. B, SCH. 80

Plant

(I.D.)

Component

Original

Original

Req'd

Lowest

Percent

## COMMENTS

Сопр.

### Description

Wall Thk.

Thk. Range

 $T_{min}$ 

## Reading

Eroded

*B*

20x20x4 IEE

337

295-379

235

• 336

0%

STILL WITHIN MANUFACTURERS REQD TOLERANCE  
NO FURTHER EXAMINATIONS REQUIRED

C

4" 90° EL.

337

295-379

235

317

0%

11 11 11 11



J.B.H. 004753

INSPECT: H, L

2

(B, C mit 10 mg)

SITE EAD. N. N. 80<sup>th</sup> PIECE N. N.

[illegible][illegible]

INDIANA &amp; MICHIGAN ELECTRIC COMPANY

### 1. DONALD C. COOK NUCLEAR PLANT

**BROOKLYN**

**MEMBERSHIP**

UNIT NO. 1

[illegible]

**MATERIAL REQUIRED FOR  
FIELD REWORK**

**DRAWING APPROVED FOR**

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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SECRET

1960

1960 MD

224 254

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[illegible]

— *Journal of the American Medical Association*, 1967, 201: 1033-1034

1000



TDC

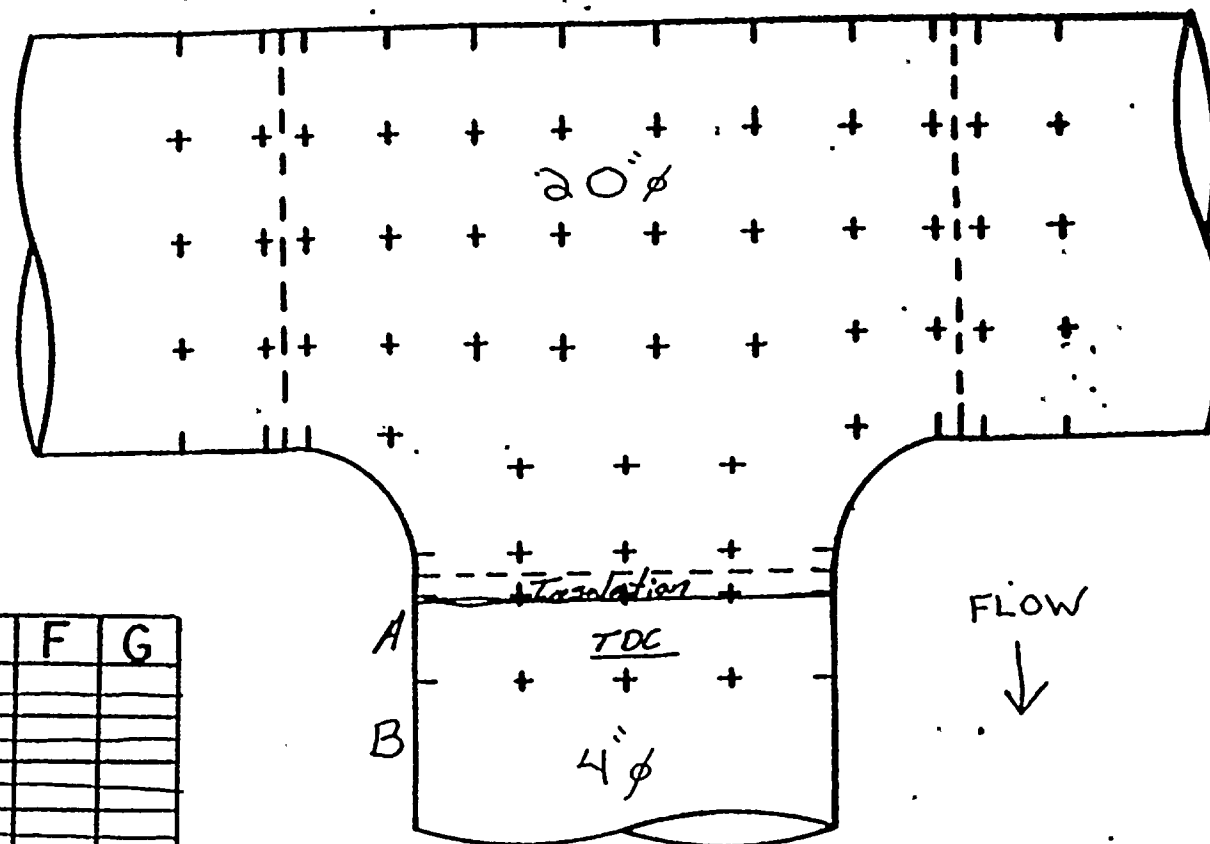
	A	B	C	D	E	F	G
0°	354	365					
30°	346	361					
60°	347	360					
90°	343	349					
120°	343	341					
150°	344	344					
180°	352	345					
210°	347	336					
240°	361	338					
270°	352	345					
300°	344	342					
330°	345	346					

JOB ORDER# 00

ISO\*\* 1-FW-4 Rev. 7 (B)

DATE 4-8-87 TEMP: 110°F

FLOW →



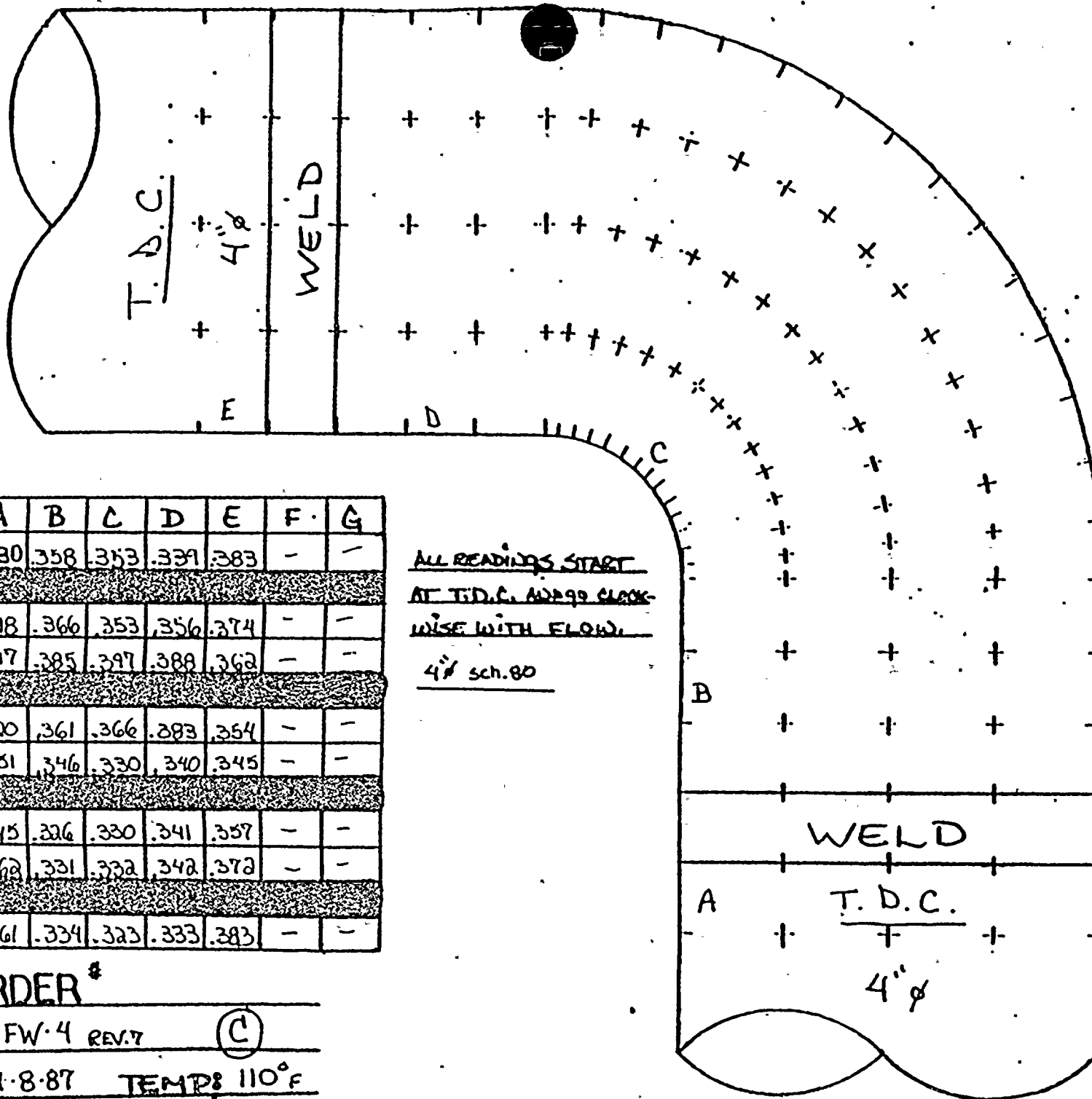
ALL READINGS START AT  
TDC AND 90° CLOCKWISE  
WITH FLOW.

20" sch. 80

4" sch. 80



← FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	.330	.358	.353	.331	.383	-	-
45°	.318	.366	.353	.356	.374	-	-
90°	.317	.385	.397	.388	.362	-	-
135°	.320	.361	.366	.383	.354	-	-
180°	.351	.346	.330	.340	.345	-	-
225°	.345	.326	.330	.341	.357	-	-
270°	.362	.331	.332	.342	.372	-	-
315°	.361	.334	.323	.333	.383	-	-

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.  
4" sch. 80

JOB ORDER #

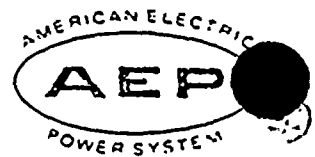
ISO # 1-FW-4 REV. 7

(C)

DATE: 4-8-87 TEMP: 110°F



AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: MARCH 10, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 1  
 Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. J. A. <sup>WJG/10/87</sup> ~~Boyle~~  
 2. R. Tella

PIPING. HVAC

SEP 17 1987

FIRE PROTECTION

We have reviewed the wall thickness measurements transmitted to us on FEBRUARY 13, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation				
1-C-4, REV. 0	CS	B	ACCEPTABLE, NO FURTHER EXAMINATIONS REQUIRED				
Sh. 1 of 2	CS	D'	"	"	"	"	"
1-FW-1, REV 4	CS	D'	"	"	"	"	"
Sh. 1 of 2	CS	A	"	"	"	"	"
1-FW-1, REV 7	CS	B	"	"	"	"	"
Sh. 2 of 2	CS	G	"	"	"	"	"

Anthony J. Lewandowski  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 4.6.3.15.2.5.2

Sheet No. 1 of 1



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

SER No. 88-84 (Steam)

Unit No. 1

SER No. 23-85 (Water) X

Years in service 11

UT Reading Taken on: 2-6-87

AEPSIC Installed Mat'l Class D-31: ASTM A-106 GR.B

(I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded
-----------------	--------------------------	-----------------------	------------------------	---------------	-------------------	-------------------

COMMENTS

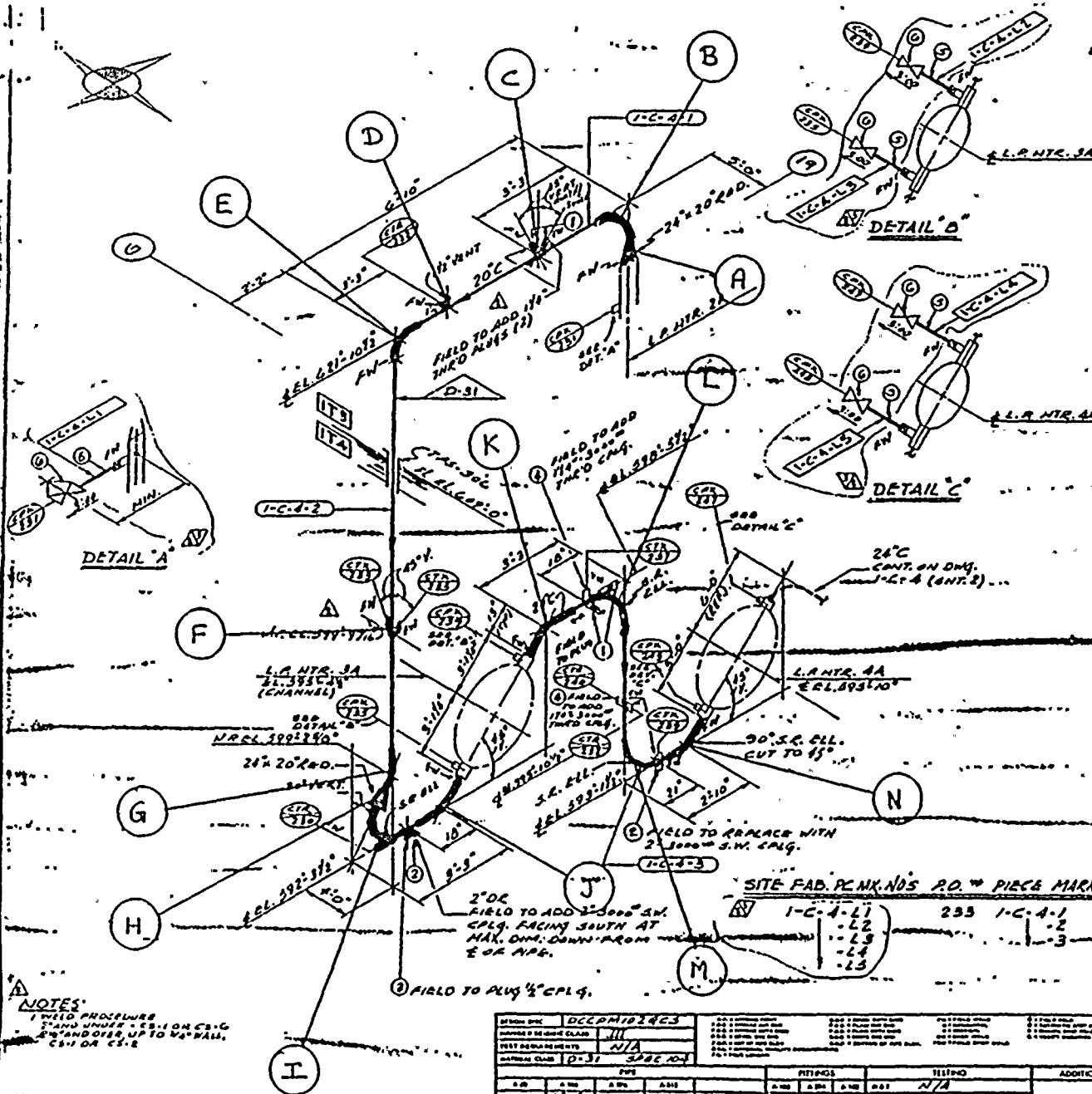
B 20" 90° FLL .500 .438-.563 .329 .502 0 STILL WITHIN MANUFACTURERS TOLERANCE



WEEK-15

COST JOB: 004954  
004953

DC-J.O.#: 004954



QTY	REV	DATE	BY	DESCRIPTION	15	154
01	1	4	12	3000" TND. PLUG.		
	2	2	2	3000" S.W. CPLG.		
	3	1	1/2	3000" S.W. PLUG		
	4	3	12	3000" TND CPLG.		
	5	1	1	PIPE, SCH. 80	SHLS	
	6	5	1	600" GLOBATA, S.W. C.S.	1100730	

NO.	DATE	BY	DESCRIPTION	REMARKS
1	1/11/54	W.D.	REVISION 1: 1/11/54	
2	1/11/54	W.D.	REVISION 2: 1/11/54	
3	1/11/54	W.D.	REVISION 3: 1/11/54	

INSPECT: B, I

UNCONTROLLED DOCUMENT

NOTES:  
1. WELD PROCEDURE  
2. WELD UNDER 1/4" O.D. C.S.  
3. WELD UNDER 1/4" O.D. C.S.  
4. WELD UNDER 1/4" O.D. C.S.

DATE	BY	DESCRIPTION	REVISION	DATE	BY	DESCRIPTION
1/11/54	W.D.	REVISION 1: 1/11/54				
1/11/54	W.D.	REVISION 2: 1/11/54				
1/11/54	W.D.	REVISION 3: 1/11/54				

DATE	BY	DESCRIPTION	REVISION	DATE	BY	DESCRIPTION
1/11/54	W.D.	REVISION 1: 1/11/54				
1/11/54	W.D.	REVISION 2: 1/11/54				
1/11/54	W.D.	REVISION 3: 1/11/54				







## EROSION EVALUATION WORKSHEET

APSC Engineer: A.J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. 1

RE-Evaluation Date: SEPTEMBER 17, 1987

SER No. 23-85 (Water) X

Years in service 11

UT Reading Transmitted on: N/A

UT Reading Taken on: 2-11-87

Isometric Day. NO. 1-FW-1, REV. 4 Sh. 1 of 2

AEPSO Installed Mat'l Class L-31: ASTM A-106 GR.B

Platz:

(I.D.)

Component

Original

Original

Req'd

Lowest

Percent

## COMMENTS

Corp.

### Description

Wall Thk.

Tnk. RangeTmin

## Reading

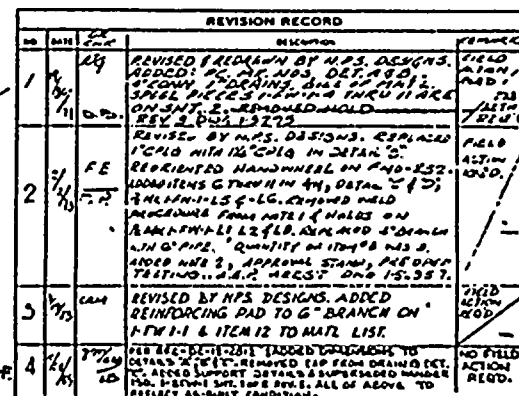
Eroded

D' 20" STRAIGHT d 1.831 - 1.902-1.16 .756 1.016 0 STILL WITHIN MANUFACTURERS TOLERANCE

STILL WITHIN MANUFACTURERS' TOLERANCE



QC - J.O.# 20493



INSPECT: A, D, I  
G ant 13818

UNCONTROLLED  
DOCUMENT

1. THE ABOVE PROCEDURE AS FOLLOWS:  
C 5 2" FUNDEN  
C 5 2" C O. 62

1954 GRAND 375-A COMPOUND  
ON JUVENILE NR 1628 ON  
ALL THREADED CONNS.

⑦ INDICATES LOCATION OF PIPE  
SUPPORT AND SUPPORT DETAIL  
NUMBER

SUPPORT MARK NUMBERS  
SQUAD ACTION  
REAL TIME/STATION LOCATION:  
IN JUNE, 2011  
ORDER PLACING/STATION  
SUPPORT STATION

[illegible]

FOUR/ZONE No. 1-2-3  
REQUIRED COMPLETION DATE  
FABRICATED BY NY22C0

NPS DESIGNS INC.  
NEW YORK, N.Y.

**FABRICATOR NOTE:  
FABRICATION MUST  
CONFORM TO LATEST  
A.E.P. ARROT. DWGS.**

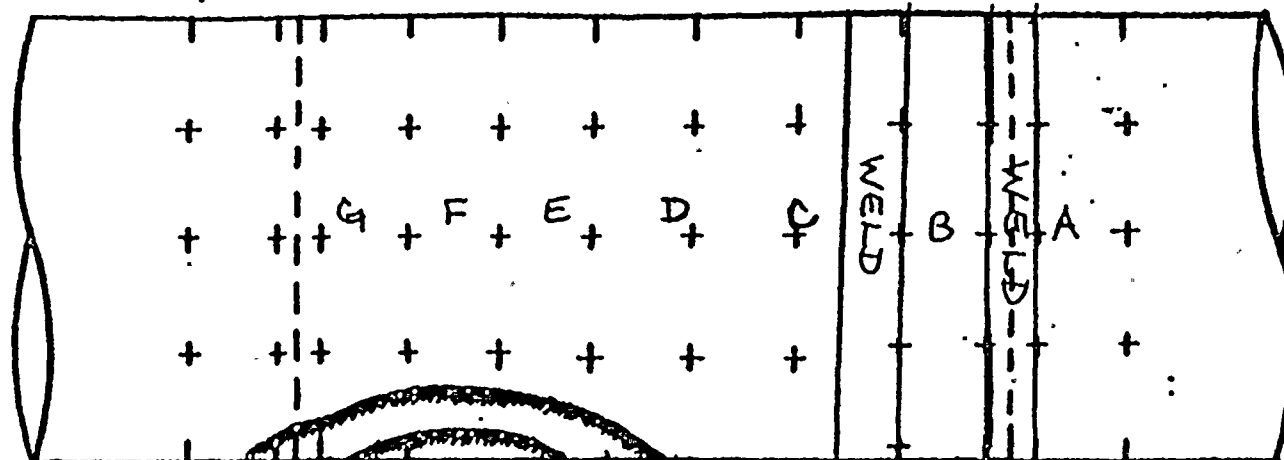
FLOW DIAGRAM 11-2-2006  
 US1 SL  
 WELD PROCEDURE PER. 4418

INDIANA & MICHIGAN ELECTRIC CO  
DONALD C COOR NUCLEAR PLANT

<u>NF</u>	<u>MAY 12-68</u>	TURKISH ARMY	Ques No	REF
<u>00000</u>	<u>MAY 14-71</u>	1-FW-		2
<u>NAME</u>		SIN 1002		
<u>ADDRESS</u>				



← FLOW



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	1.053	1.078	1.073	—	—	—	—
30°	1.016	1.120	1.081	—	—	—	—
60°	1.053	1.104	1.087	1.091	1.093	1.118	1.100
90°	1.046	1.064	1.081	1.069	1.054	1.023	1.081
120°	1.051	1.054	1.066	1.072	1.075	1.062	1.067
150°	1.066	1.065	1.071	1.039	1.044	1.074	1.091
180°	1.062	1.081	1.087	1.090	1.074	1.093	1.073
210°	1.065	1.078	1.048	1.071	1.053	1.081	1.093
240°	1.056	1.075	1.055	1.076	1.074	1.087	1.084
270°	1.081	1.079	1.073	1.094	1.083	1.091	1.093
300°	1.058	1.092	1.081	1.057	1.057	1.059	1.078
330°	1.088	1.085	1.091	—	—	—	—

JOB ORDER # 004954

1. FW. 1. SUT 1. F2 REV4 (D)

DATE: 2/1/87 TEMP: 293°F



# EROSION EVALUATION WORKSHEET

AEPS Engineer: A.J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No: 1

RE-Evaluation Date: SEPTEMBER 17 1987

SER No. 23-85 (Water) X

Years in service 71

UT Reading Transmitted on: N/A

UT Reading Taken on: 2-9-2-11-87

Isometric Dwg. NO. 1-FW-1 REV. 7 Sh. 2 of 2

AEPSIC Installed Mat'l Class L-31: ASTM A-106 GR.B

## Plan:

(I.D., Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded
-----------------	--------------------------	-----------------------	------------------------	---------------	-------------------	-------------------

COMMENTS

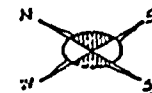
A	20" STRAIGHT $\phi$	1.031	.902	1.16	.756	1.037	0	STILL WITHIN MANUFACTURERS TOLERANCE
B	20" 90° ELL COLUMN A & G	1.280	1.12	1.44	.756	1.187	0	" " " "
B	20" 90° ELL	1.031	.902	1.16	.756	1.012	0	" " " "
G	20" 90° ELL COLUMN G	1.280	1.12	1.44	.756	1.084	3.2	---
G	20" 90° ELL	1.031	.902	1.16	.756	1.012	0	STILL WITHIN MANUFACTURERS TOLERANCE



CONST-1.0.2 952

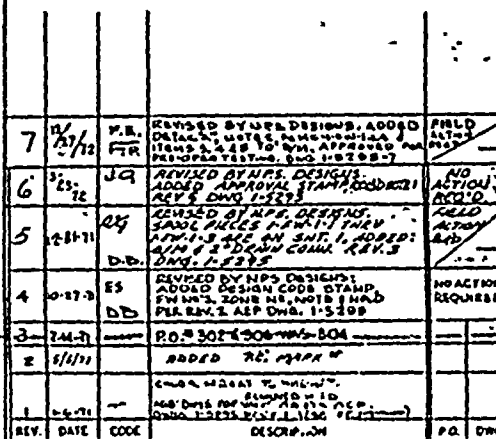
WEEK # 15

ISOMETRIC SHEET NO. 232



SITE NO	PIECE NO	PIECE NAME	TUBS
RM-1-FN-1-6A	302	1-FN-1-1	
	306	-5	
	306	-6	
	306	-7	
	302	-8	
		-9	
		-10	
		-11	

INSPECT: E, B, ANT,  
G, A



INDIANA & MICHIGAN ELECTRIC COMPANY

**DONALD C. COOK NUCLEAR PLANT**

BRIDGMAN

UNIT NO. 1

MICHIGAN

[illegible]

**MATERIAL REQUIRED FOR  
FIELD REWORK**

**DRAWING APPROVED FOR**

CONSTRUCTION	PRE-ORDER TESTING
00 11/11 2010 2011	00 11/11 2010 2011
AMERICAN ELECTRIC	POWER SOURCE CORP.

DWG NO :  
1-FW-1  
INT. 1 OF 2

NOTE:

WELDING PROCEDURE AS FOLLOWS:  
C.S. 2 1/2" OVER UPTO 1/4" WALL-  
C.S. OVER 1/4" WALL-

2-USE CRANE 425A COMPOUND ON ALL THREADED CONNS.

7/16/1940-1941: FABRICATION MUST CONFORM TO LATEST A.S.P. 1940-1941.

12-11 2015-11-11 10:00

UNION MUSIC CLASS

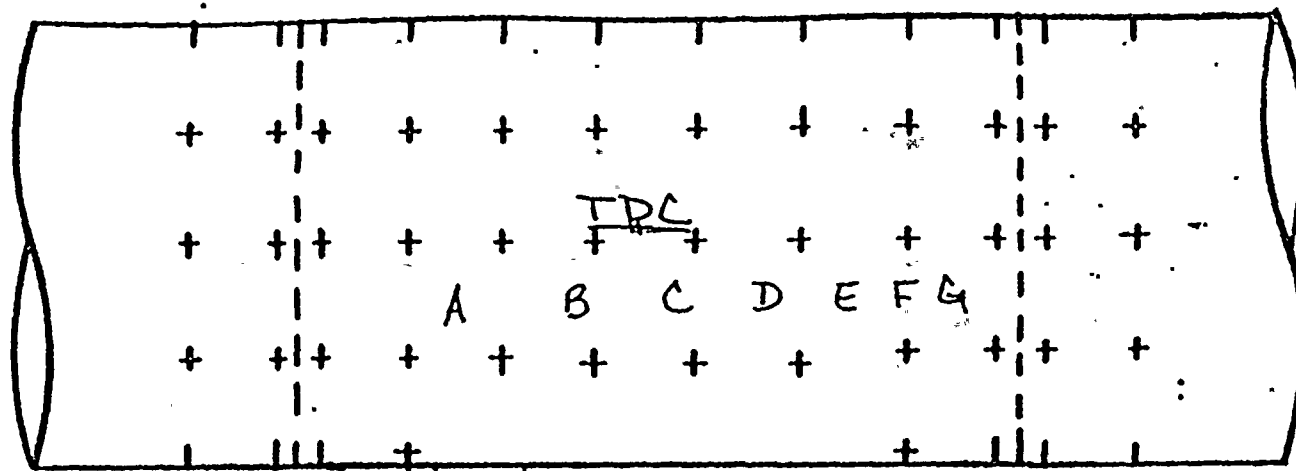
FIELD PROCEDURE SEE NOTE

[illegible]

**TUBECO**  
133 VARICK AVE.  
BROOKLYN, N. Y. 12



FLOW →



1. FW. 141W  
DEATH LINE

ALL READINGS START AT  
T.D.C. AND 90° COUNTERWISE.  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	1.037	1.060	1.048	1.099	1.085	1.074	1.060
30°	1.056	1.089	1.060	1.090	1.091	1.088	1.076
60°	1.047	1.063	1.079	1.103	1.107	1.086	1.084
90°	1.061	1.071	1.091	1.106	1.073	1.066	1.072
120°	1.081	1.089	1.100	1.106	1.096	1.087	1.075
150°	1.086	1.088	1.077	1.102	1.090	1.081	1.071
180°	1.084	1.091	1.090	1.086	1.085	1.083	1.092
210°	1.112	1.097	1.064	1.074	1.081	1.097	1.113
240°	1.093	1.083	1.070	1.068	1.080	1.104	1.102
270°	1.057	1.066	1.060	1.076	1.090	1.104	1.097
300°	1.088	1.061	1.055	1.063	1.083	1.074	1.070
330°	1.089	1.060	1.046	1.067	1.096	1.071	1.066

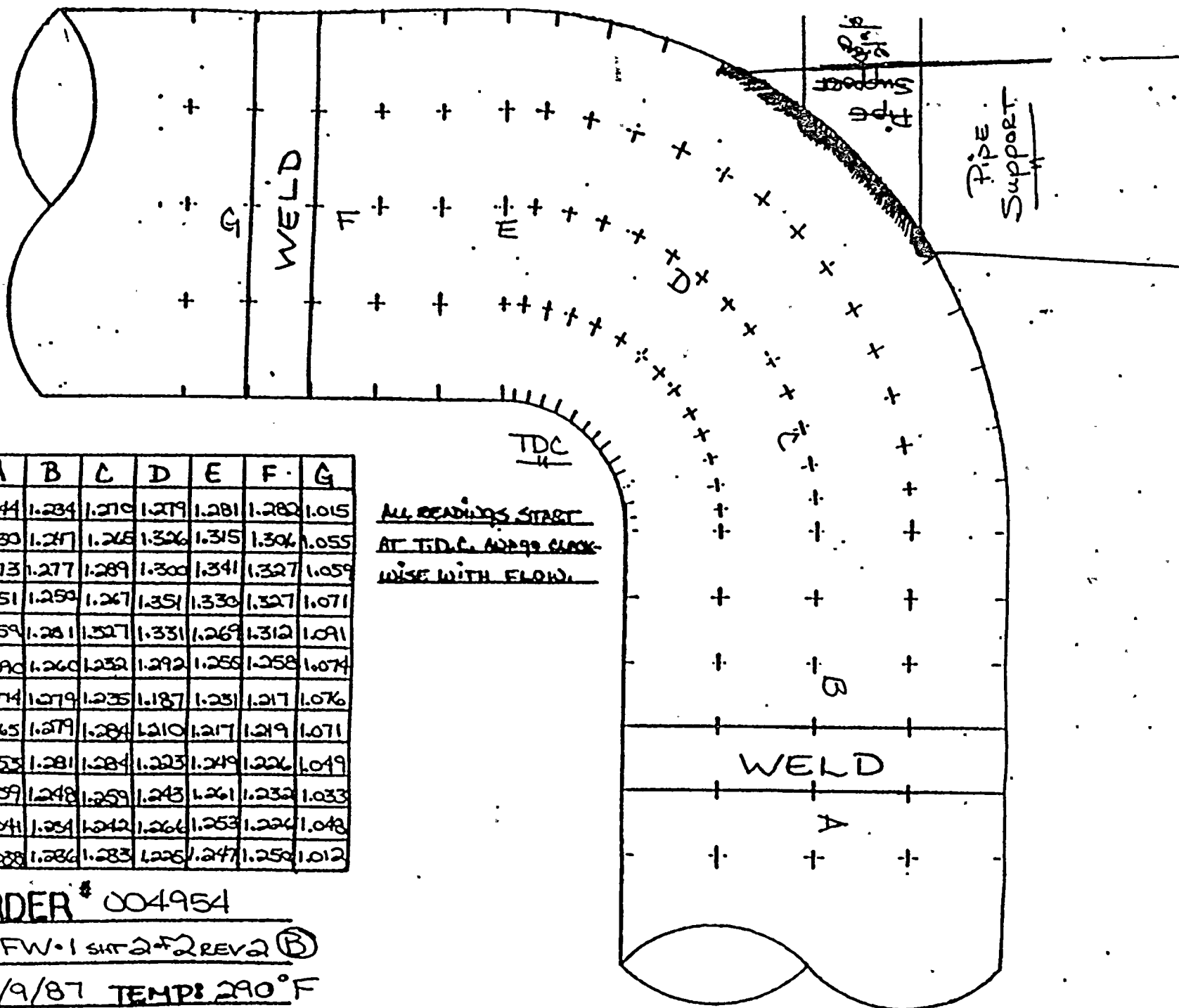
JOB ORDER # 004954

ISO # 1. FW. 1 SHT 2 F 2 REV 2 (A)

DATE: 2/9/87 TEMP: 290°F



← FLOW



	A	B	C	D	E	F	G
0°	1.044	1.234	1.210	1.279	1.281	1.282	1.015
30°	1.030	1.217	1.265	1.326	1.315	1.306	1.055
40°	1.013	1.277	1.289	1.300	1.341	1.327	1.059
90°	1.051	1.259	1.267	1.351	1.330	1.327	1.071
120°	1.059	1.281	1.327	1.331	1.269	1.312	1.091
150°	1.090	1.260	1.232	1.292	1.256	1.258	1.074
180°	1.074	1.279	1.235	1.187	1.231	1.217	1.076
210°	1.065	1.279	1.284	1.210	1.217	1.219	1.071
240°	1.055	1.281	1.284	1.223	1.249	1.226	1.049
270°	1.059	1.248	1.259	1.243	1.261	1.232	1.033
300°	1.041	1.254	1.242	1.266	1.253	1.226	1.048
330°	1.088	1.286	1.283	1.225	1.247	1.250	1.012

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

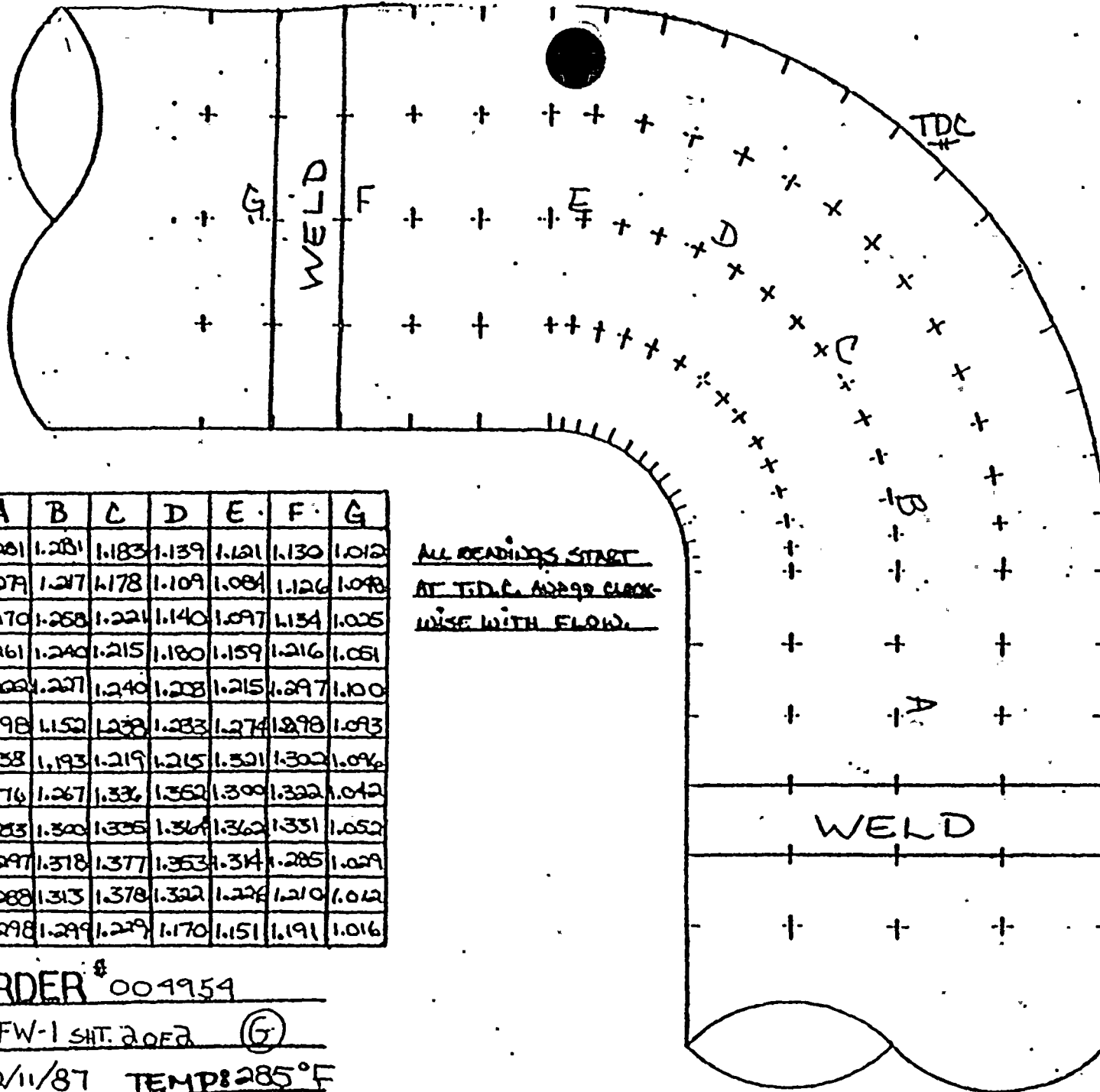
JOB ORDER # 004954

ISO\* 1-FW-1 SH-2-2 REV 2 (B)

DATE: 2/9/87 TEMP: 290°F



← FLOW



	A	B	C	D	E	F	G
0°	1.281	1.281	1.183	1.139	1.121	1.130	1.012
30°	1.279	1.217	1.178	1.109	1.084	1.126	1.098
60°	1.270	1.258	1.224	1.140	1.097	1.134	1.005
90°	1.261	1.240	1.215	1.180	1.159	1.216	1.061
120°	1.200	1.207	1.240	1.208	1.215	1.297	1.100
150°	1.198	1.152	1.238	1.233	1.274	1.298	1.093
180°	1.158	1.193	1.219	1.215	1.301	1.302	1.096
210°	1.176	1.267	1.336	1.352	1.300	1.322	1.042
240°	1.283	1.300	1.305	1.364	1.362	1.331	1.052
270°	1.297	1.318	1.377	1.353	1.341	1.285	1.029
300°	1.288	1.313	1.378	1.322	1.228	1.210	1.042
330°	1.298	1.299	1.229	1.170	1.151	1.191	1.016

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

JOE ORDER # 004954

ISO # 1-FW-1 SH. 2 OF 2 (5)

DATE: 2/11/87 TEMP: 285°F



AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: MARCH 9, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 1  
 Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. ~~J. A. Kobyrka~~ *AK 3/9/87*  
 2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on 2-13, 2-18, 2-23, 1-30, 2-17, 2-24, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
1-FW-1, REV. 4 Sh. 1 of 2	CS	D <sup>2</sup>	ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED
-----	CS	G	
-----	CS	I	
1-FW-1, REV. 7 Sh. 2 of 2	CS	E	
1-FW-2, REV. 7 Sh. 2 of 2	CS	A	
-----	CS	C	
1-FW-3, REV. 7	CS	A	
-----	CS	B	
1-FW-60, REV. 5 Sh. 1 of 2	CS	A	
-----	CS	B	
-----	-----	-----	
-----	-----	-----	

*Anthony J. Lewandowski*  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 4.6.3.15.2.5.2

Sheet No. 1 of 2



D. C. Cook Nuclear Plant, Unit No. \_\_\_\_\_  
 \_\_\_\_\_ Steam Piping Erosion Program, SER No. 88-84  
X \_\_\_\_\_ Water Piping Erosion Program, SER No. 23-85  
 Engineering evaluation of Wall Thickness Measurements  
 Date: MARCH 9, 1987  
 Sheet No. 2 of 2

X Water Piping Erosion Program, SER No. 23-85

## Engineering evaluation of Wall Thickness Measurements

Sheet No. 2 of 2

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
1-FW-60, REV. 5			
Sh. 1 of 2	CS	C	ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED
1-FW-60, REV. 9			
Sh. 2 of 2	CS	D	PAIWELD AND REPLACE AS SOON AS POSSIBLE
	CS	E	" " " " " "
	CS	H	ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED
	CS	J	
1-FW-61, REV. 5			
Sh. 1 of 2	CS	C	
	CS	D	
	CS	E	
1-FW-61, REV. 9			
Sh. 2 of 2	CS	D	PAIWELD & REPLACE AS SOON AS POSSIBLE
	CS	E	" " " " " "
	CS	H	ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED
	CS	I	" " " "



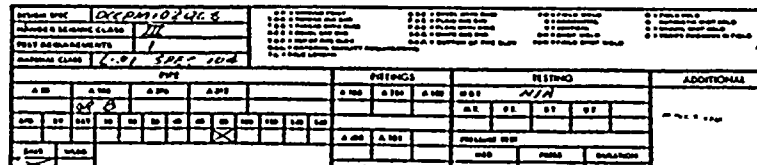
## EROSION EVALUATION WORKSHEET

AEPSO Installed Mat'l Class L-31: ASTM A-106 GR.B

[illegible]



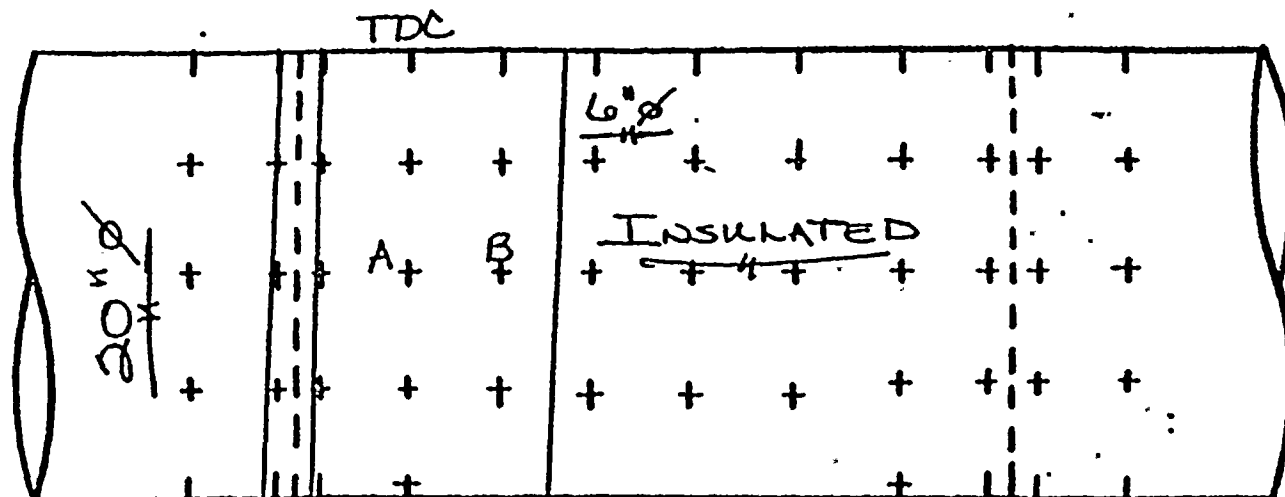
QC - J.O.# 2044



② INDICATES LOCATION OF PIPE  
SUPPORT AND SUPPORT UTM  
NUMBER



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

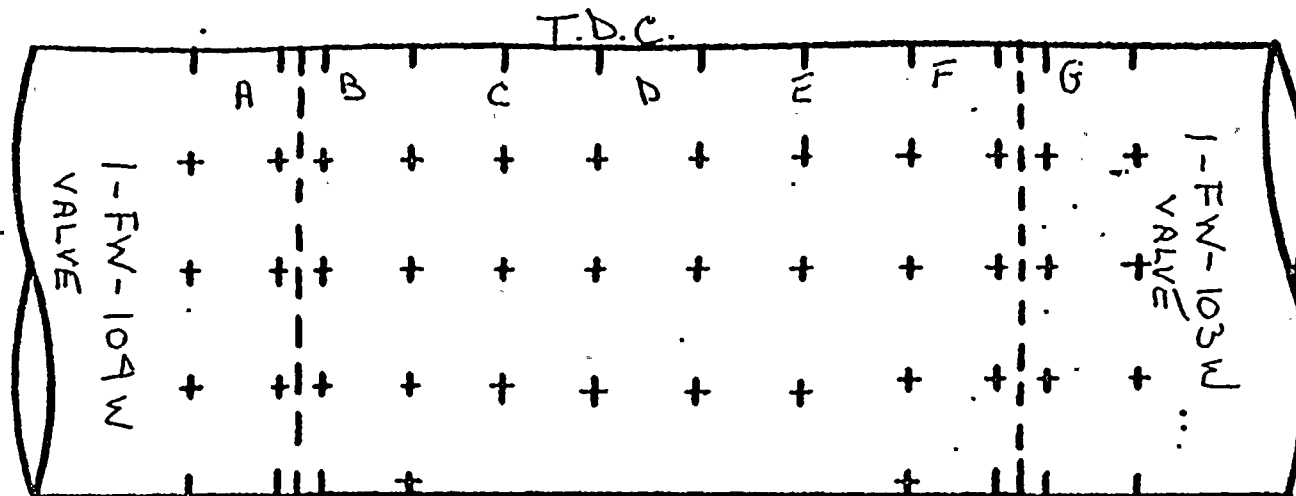
	A	B	C	D	E	F	G
0°	436	502	—	—	—	—	—
45°	462	491	—	—	—	—	—
90°	466	487	—	—	—	—	—
135°	510	503	—	—	—	—	—
180°	508	510	—	—	—	—	—
225°	506	491	—	—	—	—	—
270°	502	474	—	—	—	—	—
315°	500	494	—	—	—	—	—

JOB ORDER # 004954

# 1-FW-1-SHT 1-F2 REV4 (D<sup>2</sup>)



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	1013	1020	1047	1038	1025	1031	1049
30°	1017	1012	1041	1065	1028	1064	1025
60°	1012	1040	1056	1071	1057	1002	1006
90°	1004	1052	1058	1056	1053	1006	1017
120°	1018	1019	1071	1066	1057	1030	1003
150°	1068	1069	1061	1071	1083	1071	1018
180°	1107	1119	1052	1061	1112	1065	1111
210°	1109	1105	1048	1097	1055	1087	1090
240°	1107	1058	1029	1026	1083	1097	1096
270°	1082	1081	1077	1025	1074	1071	1110
300°	1108	1076	1075	1036	1031	1109	1065
330°	1043	1068	1048	1021	1036	1035	1071

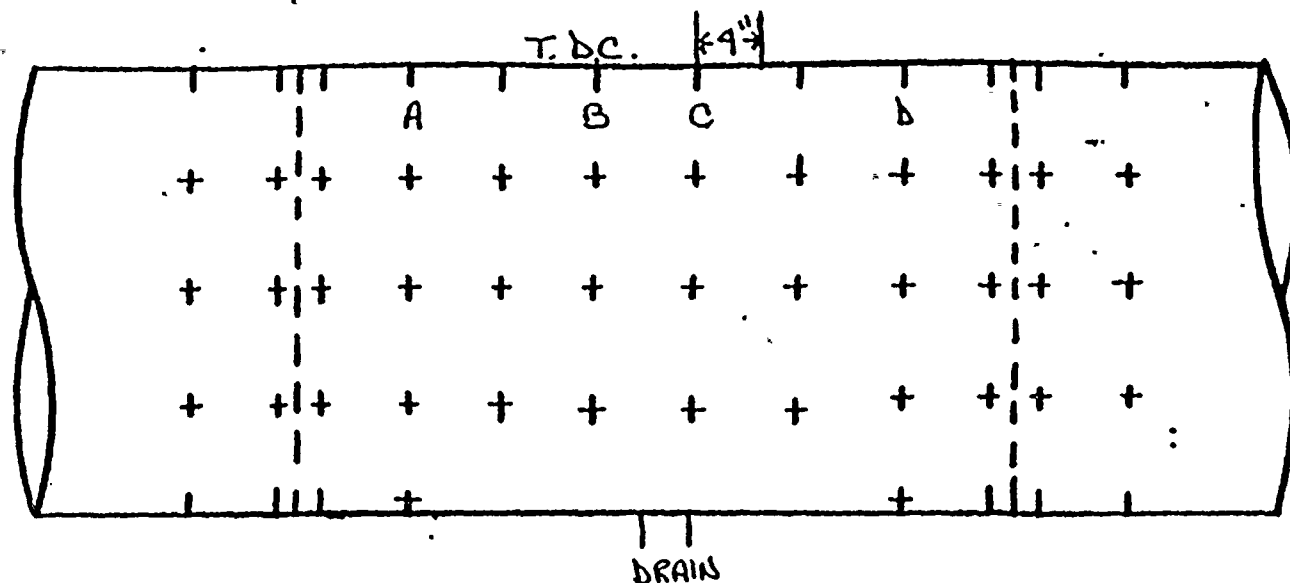
JOB ORDER # 004954

1-# 1-FW-1 SHT. 1022 (G)

DATE: 2/13/87 TEMP: 261°F



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	1.015	1.021	1.010	1.025	—	—	—
30°	1.027	1.017	1.040	1.043	—	—	—
60°	1.018	1.019	.998	.993	—	—	—
90°	1.081	1.077	1.030	1.003	—	—	—
120°	1.073	1.050	1.073	1.046	—	—	—
150°	1.085	1.072	1.089	1.038	—	—	—
180°	1.016	1.061	1.078	1.050	—	—	—
210°	1.061	1.081	1.086	1.079	—	—	—
240°	1.061	1.070	1.068	1.053	—	—	—
270°	1.051	1.066	1.057	1.047	—	—	—
300°	1.048	1.082	1.069	1.054	—	—	—
330°	1.070	1.050	1.050	—	—	—	—

JOB ORDER # 004954

# 1-FW-1 SHT. 1 OF 2 (I)

DATE: 12/10/60 TIME: 10:10



## EROSION EVALUATION WORKSHEET

Unit No. 1

Years in service 11

UT Reading Taken on: 2-18-87

AEPSIC Installed Mat'l Class L-31: ASTM A-106 GR.B

## COMMENTS

Eroded

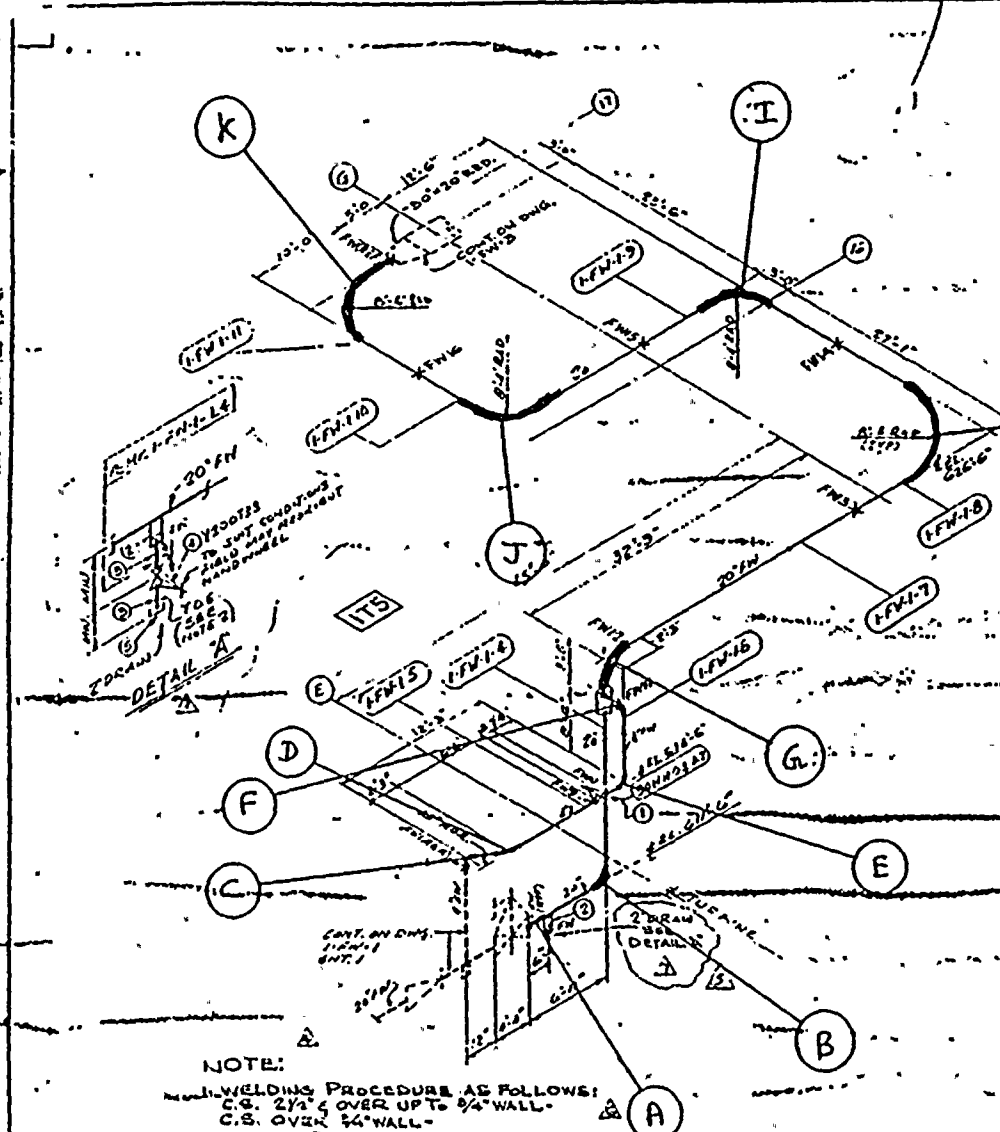
E 4" 90° ELL .337 .295-.379 .233 .353 0 STILL WITHIN MANUFACTURERS TOLERANCE



QC - J.O.# 4954  
CONST-J.O.# 952

WEEK #15

ISOMETRIC SHEET NO. 222



SITE	PIECE NO.	PIECE	HAZ	TUBECO
1-FW-14	302	1-FW-14		
306				
306				
302				

INSPECT: E, B, ANT  
G, A

REV.	DATE	CODE	DESCRIPTION	P.O.	DWG.
7	2/2/72	P.B.	REVISED BY NPS DESIGNS. ADDED DETAILS, NOTES, DIMENSIONS & ITEMS 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.		
6	2/2/72	JG	REVISED BY NPS DESIGNS. ADDED APPROVAL STAMP. APPROVED FOR REV. 1-5223		
5	2/2/72	QY	REVISED BY NPS DESIGNS. ADDED APPROVAL STAMP. APPROVED FOR REV. 1-5223		
4	10-17-72	ES	REVISED BY NPS DESIGNS. ADDED APPROVAL STAMP. APPROVED FOR REV. 1-5223		
3	2-11-72	DB	REVISED BY NPS DESIGNS. ADDED APPROVAL STAMP. APPROVED FOR REV. 1-5223		
2	1/11/72		REVISED BY NPS DESIGNS. ADDED APPROVAL STAMP. APPROVED FOR REV. 1-5223		
1	1-9-72		REVISED BY NPS DESIGNS. ADDED APPROVAL STAMP. APPROVED FOR REV. 1-5223		

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN MICHIGAN  
UNIT NO. 1

REV.	DATE	CODE	DESCRIPTION	P.O.	DWG.
1	1-9-72		REVISED BY NPS DESIGNS. ADDED APPROVAL STAMP. APPROVED FOR REV. 1-5223		

REV.	DATE	CODE	DESCRIPTION	P.O.	DWG.
1	1-9-72		REVISED BY NPS DESIGNS. ADDED APPROVAL STAMP. APPROVED FOR REV. 1-5223		

NOTE:  
WELDING PROCEDURE AS FOLLOWS:  
C.S. 2 1/2" & OVER UPTO 3/4" WALL.  
C.S. OVER 3/4" WALL.  
2-USE CRANE 425A COMPOUND ON  
ALL THREADED CONNS.

REV.	DATE	CODE	DESCRIPTION	P.O.	DWG.
1	1-9-72		REVISED BY NPS DESIGNS. ADDED APPROVAL STAMP. APPROVED FOR REV. 1-5223		

UNCONTROLLED  
DOCUMENT

MATERIAL REQUIRED FOR  
FIELD REWORK

DRAWING APPROVED FOR

CONSTRUCTION

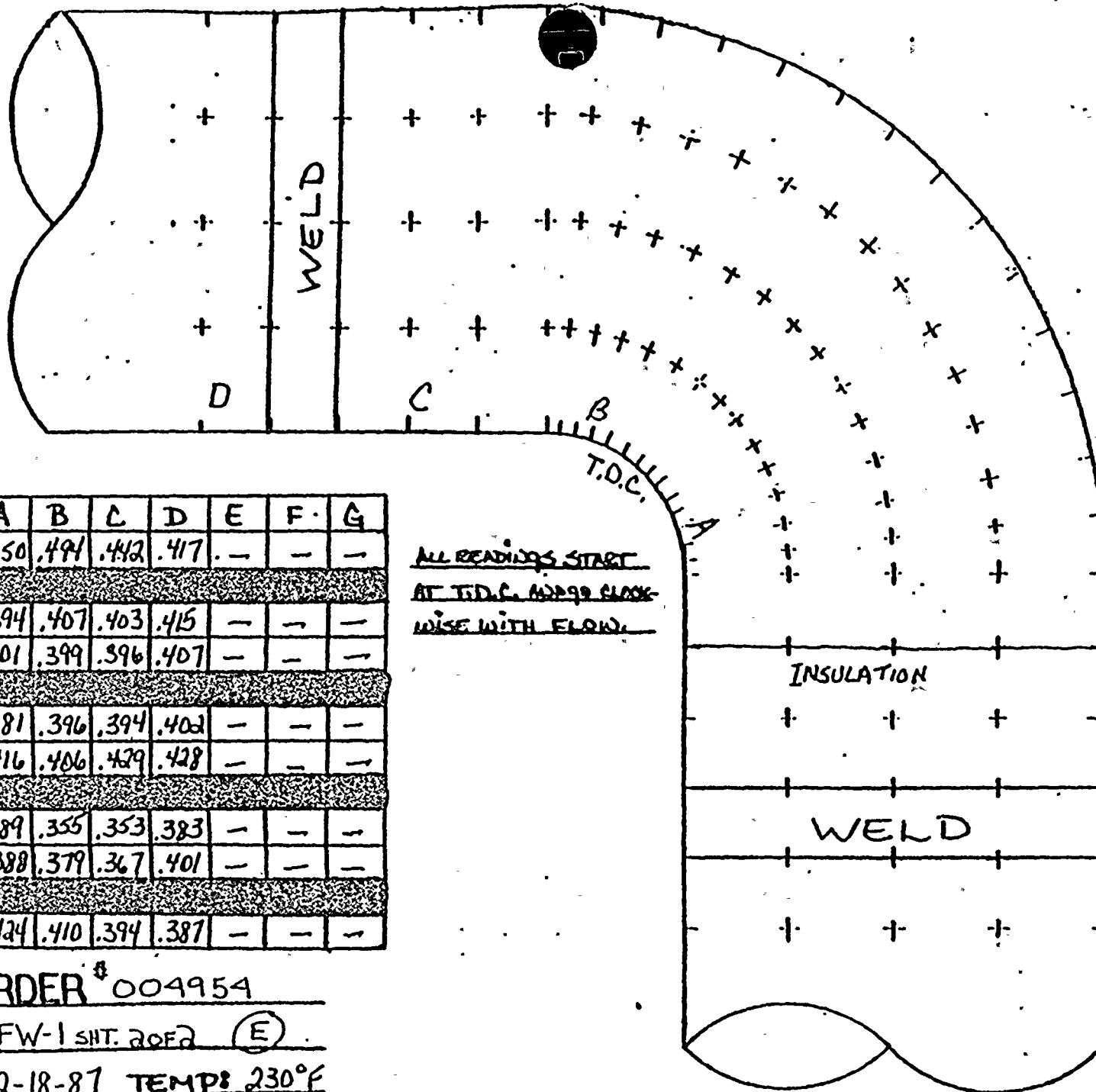
DATE 2/2/72

DWG NO  
1-FW-1  
REV. 2

TUBECO  
133 VANCE AVENUE  
BROOKLYN N.Y. 11213



← FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	.450	.494	.412	.417	—	—	—
45°	.394	.407	.403	.415	—	—	—
90°	.401	.399	.396	.407	—	—	—
135°	.381	.396	.394	.402	—	—	—
180°	.416	.406	.429	.428	—	—	—
225°	.389	.355	.353	.383	—	—	—
270°	.388	.379	.367	.401	—	—	—
315°	.424	.410	.394	.387	—	—	—

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

JOB ORDER # 004954

ISO # 1-FW-1 SHT. 20F2 (E)

DATE: 2-18-87 TEMP: 230°F



## EROSION EVALUATION WORKSHEET

Unit No. 1

Years in service 11

UT Reading Taken on: 2-20-87

AEPSIC Installed Mat'l Class L-31: ASTM A-106 GR.B

[illegible]

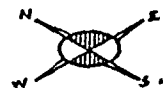


CONST-J.O.#004952      QC-J.O.      14954  
J.O.#004953

ISOMETRIC SHEET NO. 240

## NOTE

1. WELDING PROCEDURE AS FOLLOWS: -  
CS 2" & OVER UP TO 3/4" WALL  
CS OVER 3/4" WALL
2. USE CRANE 425A COMPOUND  
ON ALL THREADED CONN'S.




SITE	FAR	PIC	PIECE	MK**
R.M.K-1-FW-2-L6 A	302	1-FW-2-5	TUBECO	
	306	-6		
	302	-7		
		-8		
		-9		
		-10		
		-11		
		-12		

INSPECT: A, B, C

(D)

[illegible]

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN MICHIGAN  
UNIT NO. 1

A-53	A-100	A-225	A-312	S&B S		DATE BY SYC ON 2-78									
3-1-8						CHWD BY ALL ON 3-78									
STD	XY	317	15	20	30	40	50	60	100	120	140	160	180	CHWD	
C	PRICE	AREA	EQ.	QUAN	JOB	SHING	CODE							APPRD	ON
1	2.670	0.0646	7.1251	1.1376	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00		
005050														DRAWING NO. 1-2-82 RE-ANAL. 2-2-78	
DESCRIPTION															
FEED WATER PIPING-TURBINE LEAN															
PAINT BLAST BACK BONE															
STR. RELIEF INTDNG S.T.															
M.F. MT PT															
SPEC 1-51 103 QUN 1-3-78															
 TUBECO INC. 129 WAVER AVE GADSDEN, AL 36037															

**UNCONTROLLED DOCUMENT**

**MATERIAL REQUIRED FOR  
FIELD REWORK**

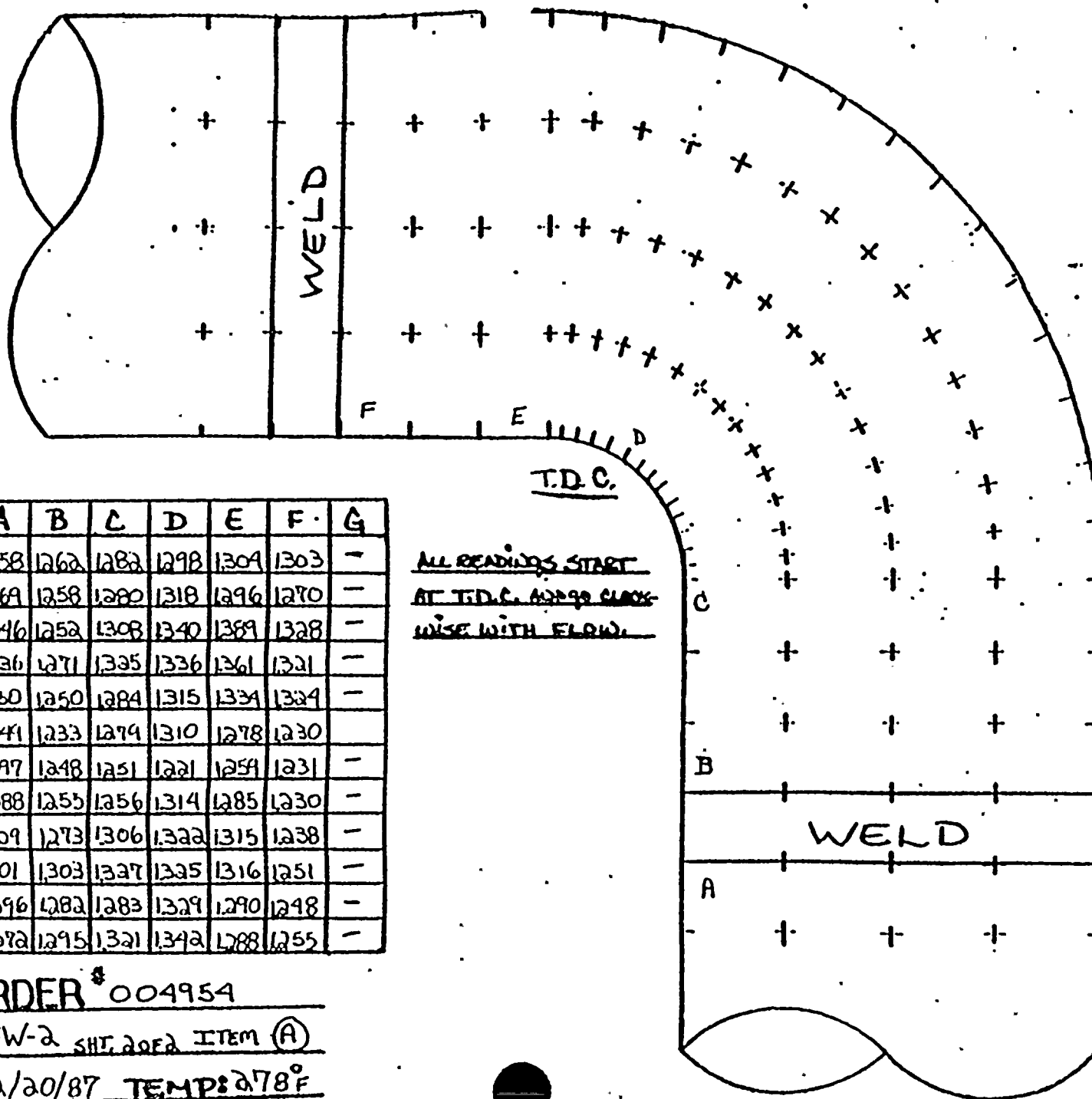
**DRAWING APPROVED FOR**

DWONG  
1-FW-2  
INT. 2 of 2

20° 14' 7"  
15° 13'



← FLOW



T.D.C.

ALL READINGS START  
AT T.D.C. 12:00 CLOCK  
WISE WITH FLOW.

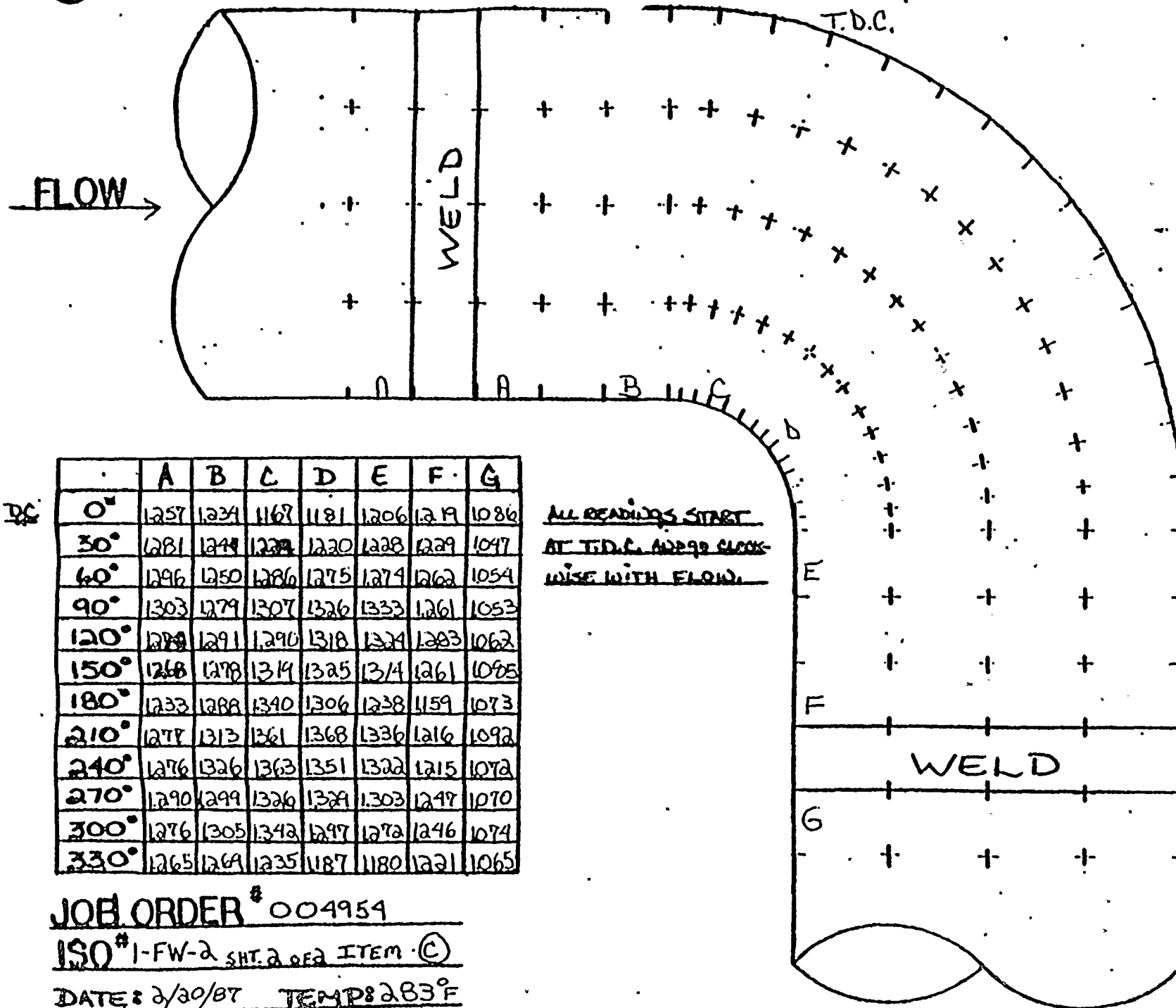
	A	B	C	D	E	F	G
0°	1058	1262	1282	1298	1304	1303	-
30°	1069	1258	1280	1318	1296	1270	-
60°	1046	1252	1308	1340	1389	1328	-
90°	1036	1271	1335	1336	1361	1321	-
120°	1050	1250	1284	1315	1334	1324	-
150°	1041	1233	1274	1310	1278	1230	-
180°	1097	1248	1251	1221	1254	1231	-
210°	1088	1255	1256	1314	1285	1230	-
240°	1109	1273	1306	1322	1315	1238	-
270°	1101	1303	1327	1325	1316	1251	-
300°	1096	1282	1283	1329	1290	1248	-
330°	1072	1295	1321	1342	1288	1255	-

JOB ORDER # 004954

ISO # 1-FW-2 SHL 2082 ITEM (A)

E: 2/20/87 TEMP: 278°F





JOB ORDER # 004954  
 ISO # 1-FW-2 SHT. 2 OF 2 ITEM (C)  
 DATE: 2/20/87 TEMP: 283°F



# EROSION EVALUATION WORKSHEET

Unit No. 1

Years in service 11

UT Reading Taken on: 277-87

AEPSC Installed Mat'l Class 1-31: ASTM A-106 GR.B

[illegible]

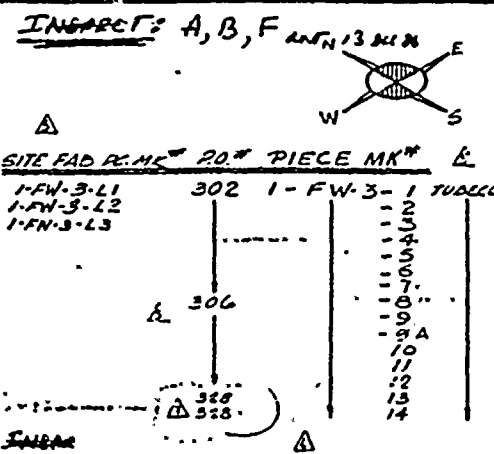
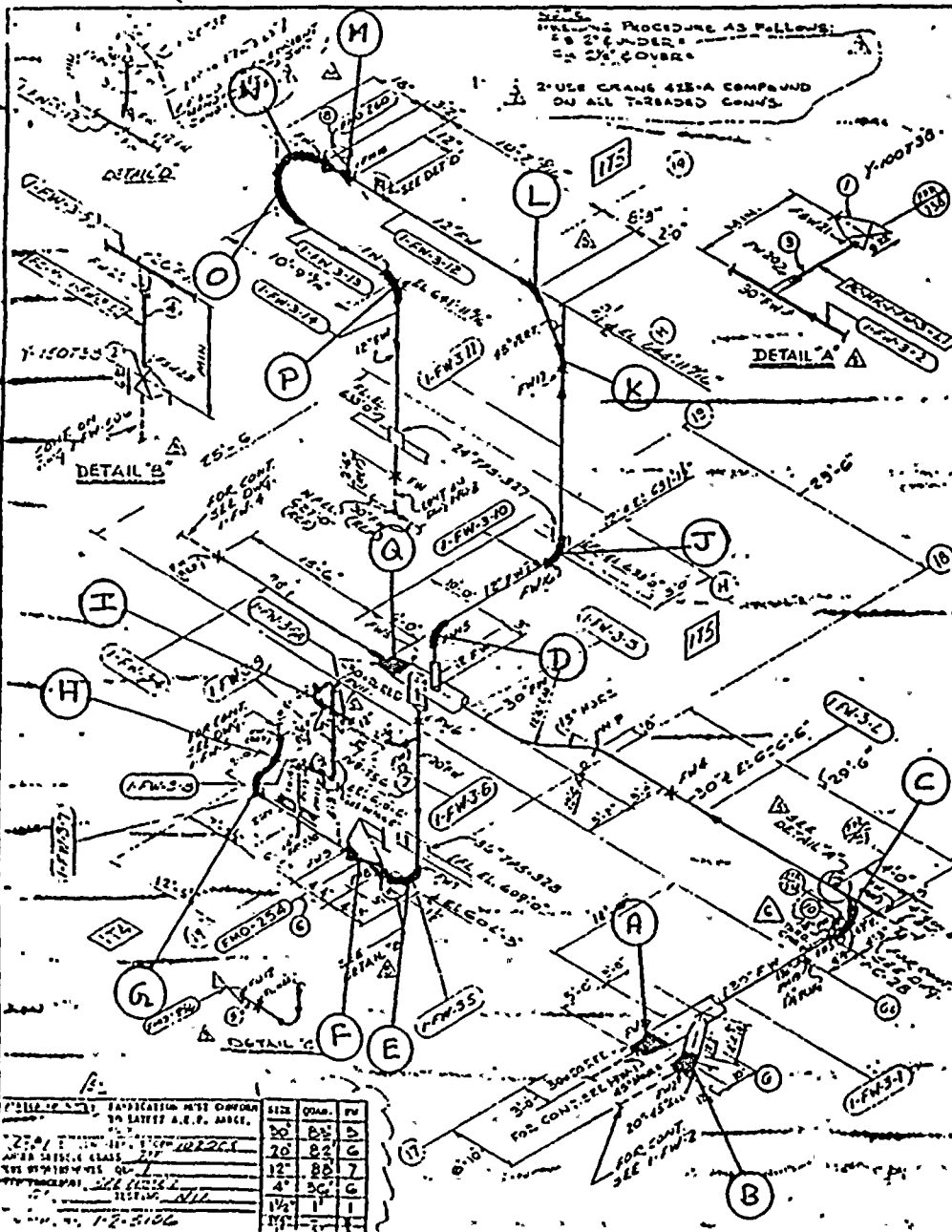


BC 10-#004954 CONST-1.0.# 2

1.0.# 004953

WEEK #15

ISOMETRIC SHEET NO. 241



REV.	DATE	CODE	DESCRIPTION	P.O.	DWG.
7	11-11-71	FE	REVISED BY NPS DESIGN. ADDED DET. OF ITEMS 2 & 3 IN A/C APPROX. STAGE 5/11. FW-3.1 IN BILCOA CONN. FOR FTR-518 PLUG IN CMO. REV 3 DNG 1-2222		
6	11-11-71	UQ	REVISED BY NPS DESIGN. ADDED DET. OF ITEMS 2 & 3 IN A/C APPROX. STAGE 5/11. FW-3.1 IN BILCOA CONN. FOR FTR-518 PLUG IN CMO. REV 3 DNG 1-2222		
5	11-11-71	UQ	REVISED BY NPS DESIGN. ADDED DET. OF ITEMS 2 & 3 IN A/C APPROX. STAGE 5/11. FW-3.1 IN BILCOA CONN. FOR FTR-518 PLUG IN CMO. REV 3 DNG 1-2222		
4	11-11-71	UQ	REVISED BY NPS DESIGN. ADDED DET. OF ITEMS 2 & 3 IN A/C APPROX. STAGE 5/11. FW-3.1 IN BILCOA CONN. FOR FTR-518 PLUG IN CMO. REV 3 DNG 1-2222		
3	11-11-71	UQ	REVISED BY NPS DESIGN. ADDED DET. OF ITEMS 2 & 3 IN A/C APPROX. STAGE 5/11. FW-3.1 IN BILCOA CONN. FOR FTR-518 PLUG IN CMO. REV 3 DNG 1-2222		
2	11-11-71	UQ	REVISED BY NPS DESIGN. ADDED DET. OF ITEMS 2 & 3 IN A/C APPROX. STAGE 5/11. FW-3.1 IN BILCOA CONN. FOR FTR-518 PLUG IN CMO. REV 3 DNG 1-2222		
1	11-11-71	UQ	REVISED BY NPS DESIGN. ADDED DET. OF ITEMS 2 & 3 IN A/C APPROX. STAGE 5/11. FW-3.1 IN BILCOA CONN. FOR FTR-518 PLUG IN CMO. REV 3 DNG 1-2222		

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN MICHIGAN  
UNIT NO. 1

DESCRIPTION	REV.	COMPL.	SB	WF
FEED WATER PIPING TUBE-3 ROOM				
FEED WATER PIPING TUBE-3 ROOM				
FEED WATER PIPING TUBE-3 ROOM				
FEED WATER PIPING TUBE-3 ROOM				
FEED WATER PIPING TUBE-3 ROOM				
FEED WATER PIPING TUBE-3 ROOM				
FEED WATER PIPING TUBE-3 ROOM				
FEED WATER PIPING TUBE-3 ROOM				
FEED WATER PIPING TUBE-3 ROOM				
FEED WATER PIPING TUBE-3 ROOM				

UNCONTROLLED DOCUMENT

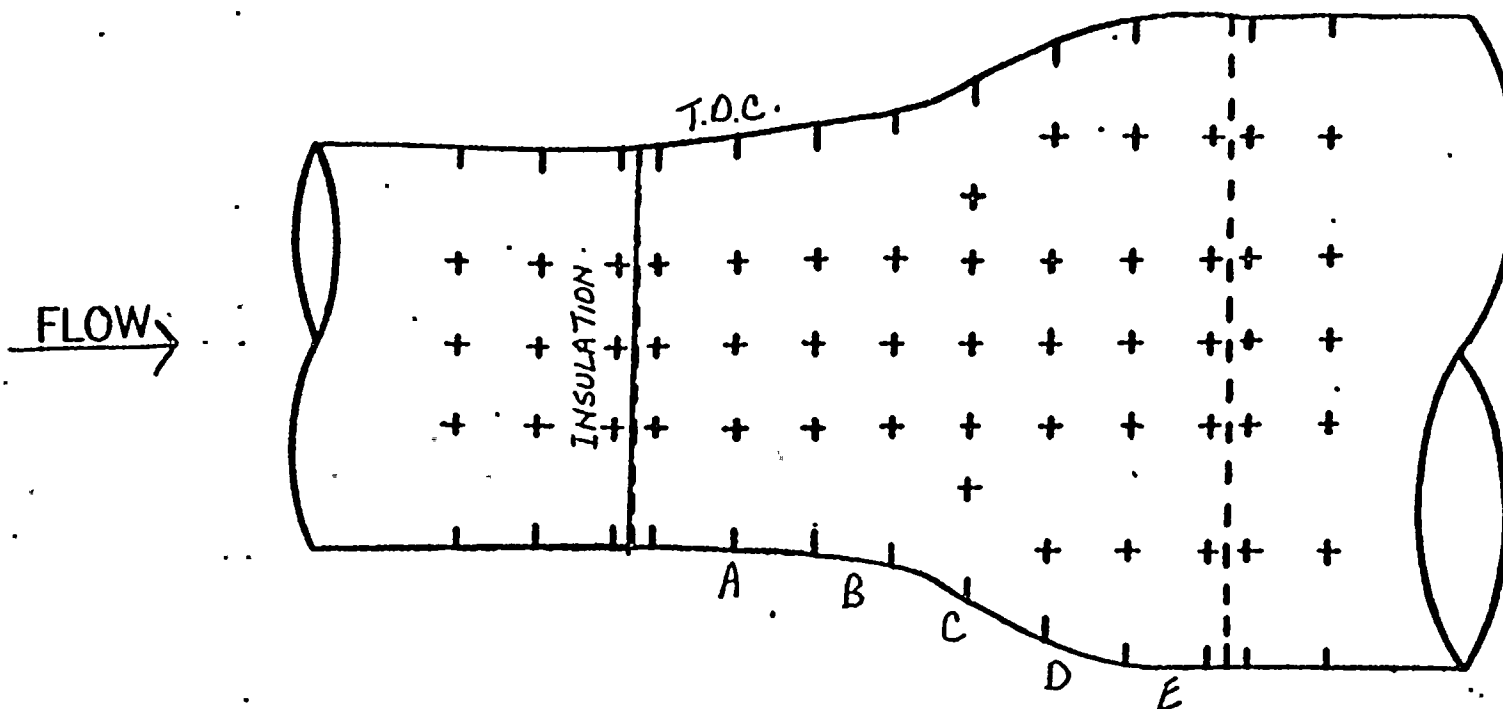
MATERIAL REQUIRED FOR FIELD REWORK

DRAWING APPROVED FOR

CONSTRUCTION  
BY M.E.A. GATSON  
AMERICAN ELECTRIC POWER SERVICE CORP.

DWG NO 11-FW-3 REV. 7





ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH  
FLOW.

TDC

	A	B	C	D	E	F	G
0°	1.422	1.430	1.405	1.406	1.336	—	—
30°	1.437	1.420	1.418	1.402	1.388	—	—
60°	1.413	1.409	1.404	1.403	1.338	—	—
90°	1.449	1.405	1.426	1.390	1.328	—	—
120°	1.416	1.405	1.397	1.418	1.334	—	—
150°	1.414	1.435	1.427	1.420	1.356	—	—
180°	1.420	1.414	1.408	1.421	1.346	—	—
210°	1.410	1.443	1.424	1.417	1.363	—	—
240°	1.420	1.448	1.405	1.414	1.354	—	—
270°	1.426	1.426	1.407	1.410	1.332	—	—
300°	1.419	1.412	1.406	1.405	1.331	—	—
330°	1.427	1.418	1.413	1.427	1.335	—	—

JOB ORDER\* 004954

60° 1-FW-3 REV. 7 ITEM (A)

DATE: 2-17-81 TEMP: 288°F



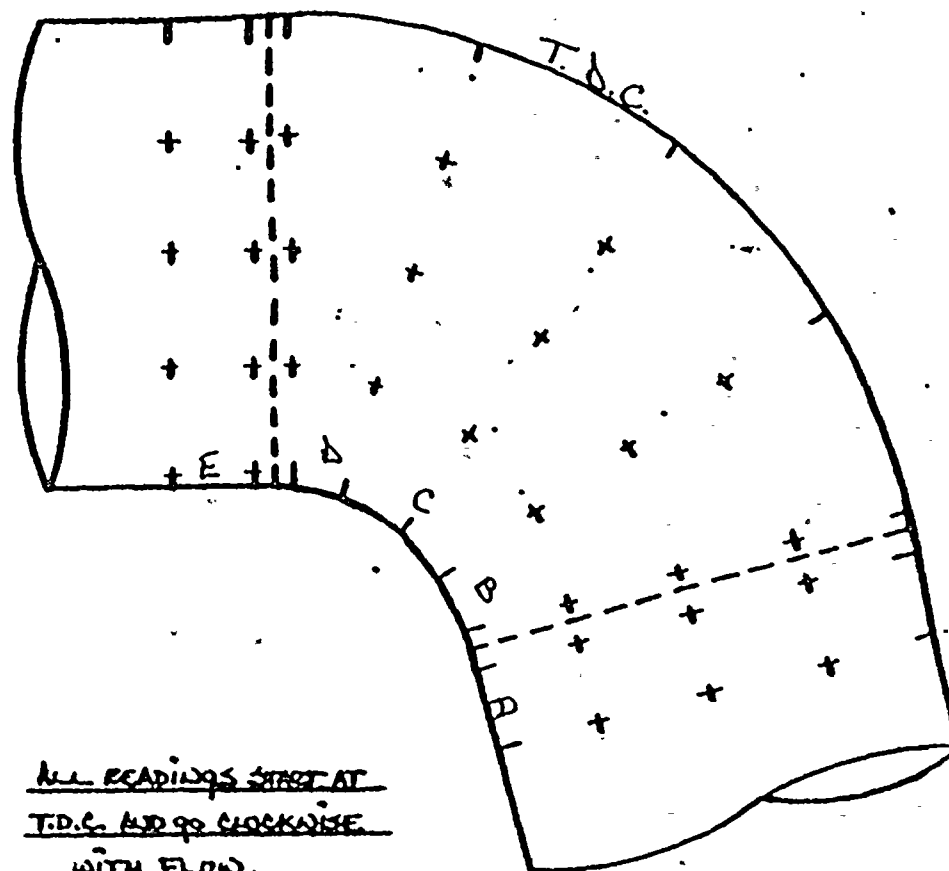
← FLOW

TQC		A	B	C	D	E	F	G
	0°	1.293	1.268	1.243	1.248	1.236	—	—
	30°	1.291	1.203	1.210	1.223	1.234	—	—
	60°	1.190	1.155	1.188	1.169	1.140	—	—
	90°	1.191	1.167	1.110	1.113	1.108	—	—
	120°	1.217	1.187	1.216	1.177	1.117	—	—
	150°	1.212	1.232	1.218	1.226	1.239	—	—
	180°	1.261	1.217	1.213	1.303	1.310	—	—
	210°	1.284	1.296	1.300	1.312	1.316	—	—
	240°	1.292	1.296	1.318	1.312	1.297	—	—
	270°	1.253	1.278	1.282	1.299	1.298	—	—
	300°	1.287	1.281	1.292	1.311	1.307	—	—
	330°	1.243	1.268	1.261	1.269	1.295	—	—

JOB ORDER\*\* 004954

ISO\*\* 1-FW-3 REV. 7 ITEM (B)

DATE: 2/17/81 TEMP: 288°F



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.



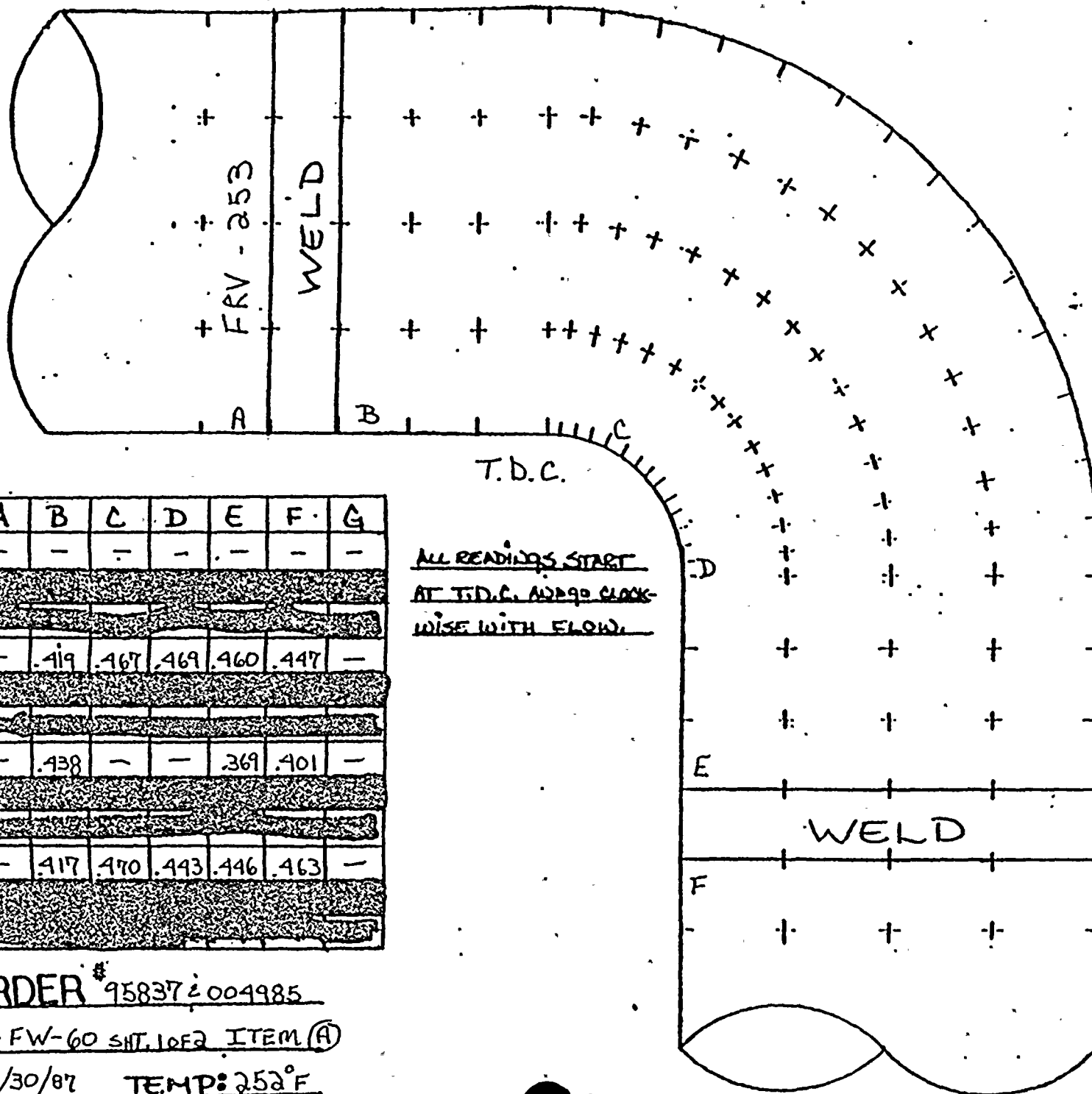




[illegible]



FLOW →



T.D.C.

	A	B	C	D	E	F	G
0°	-	-	-	-	-	-	-
90°	-	.419	.467	.469	.460	.447	-
180°	-	.438	-	-	.369	.401	-
270°	-	.417	.470	.443	.446	.463	-

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

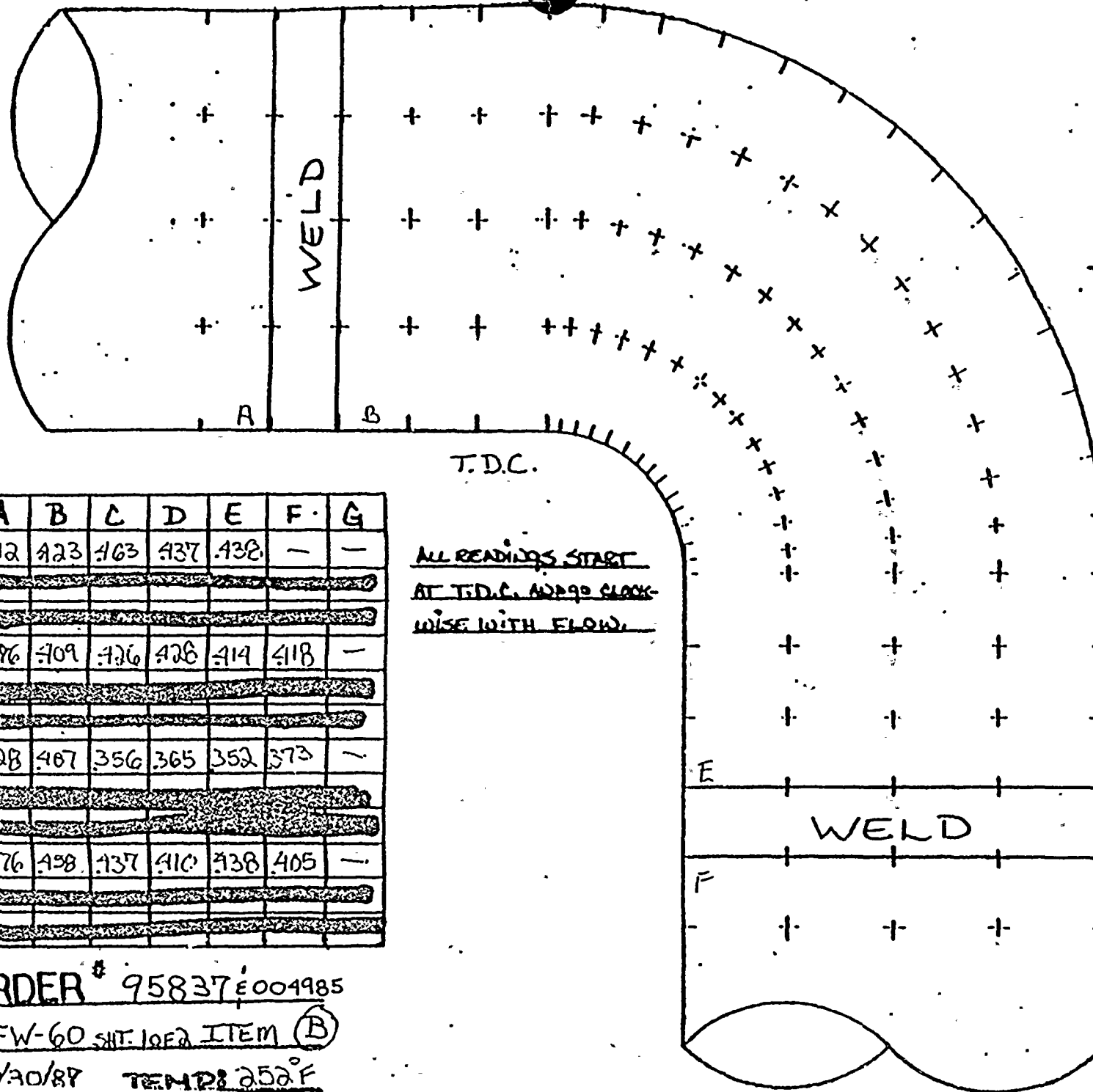
JOB ORDER # 958372004985

ISO# 1-FW-60 SHT. 1 OF 2 ITEM (A)

DATE: 1/30/87 TEMP: 252°F



FLOW →



DC

	A	B	C	D	E	F	G
0°	412	423	463	437	432	—	—
90°	386	409	426	428	414	418	—
180°	428	467	356	365	352	373	—
270°	376	438	437	410	438	405	—

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

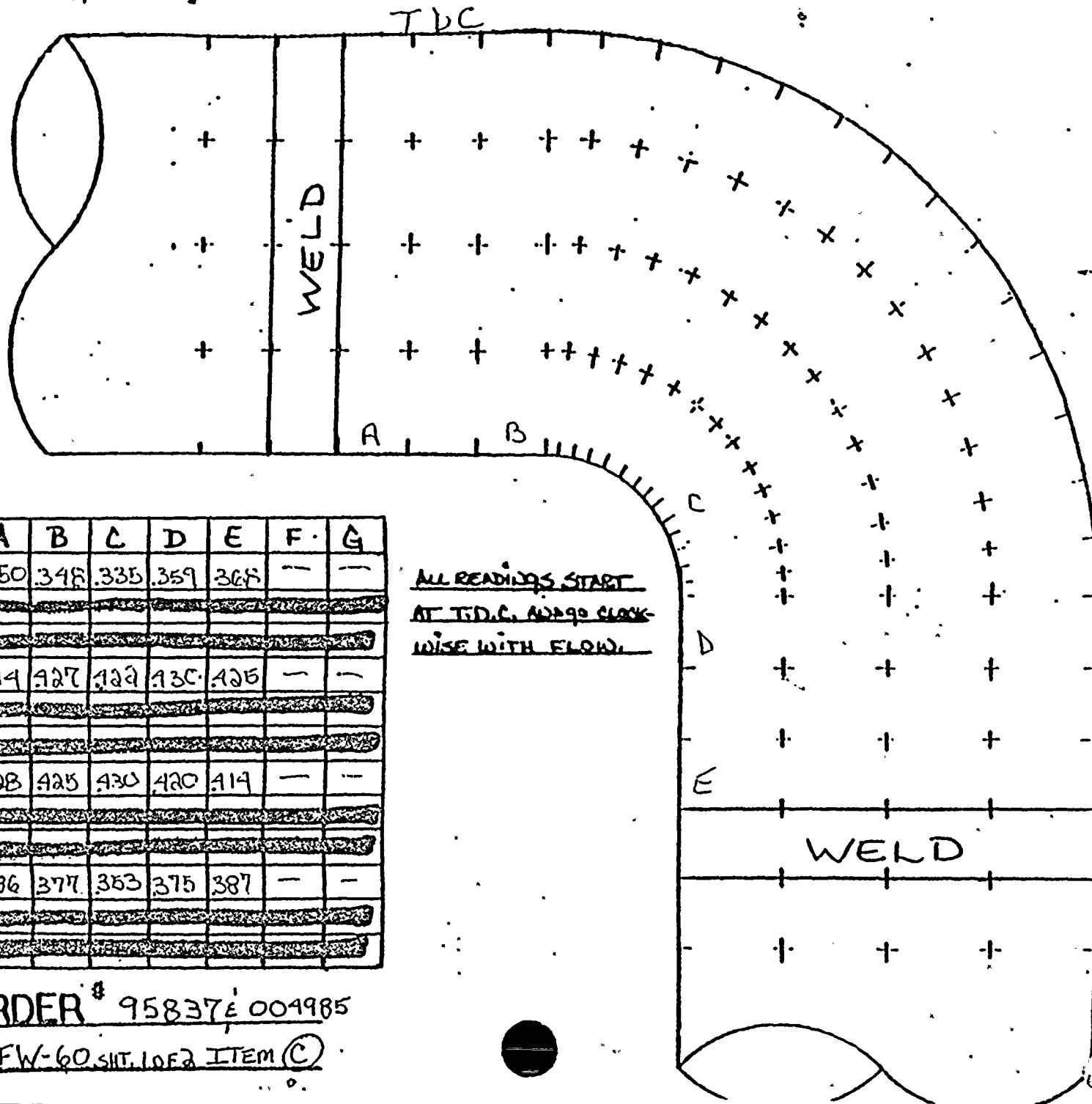
JOB ORDER # 95837 E004985

ISO # 1-FW-60 SH. JOE'S ITEM (B)

DATE: 1/30/87 TEMP: 252°F



← FLOW



DC

	A	B	C	D	E	F	G
0°	350	348	335	359	365	—	—
30°							
60°							
90°	414	427	422	430	425	—	—
120°							
150°							
180°	328	425	430	420	414	—	—
210°							
240°							
270°	386	377	353	375	387	—	—
300°							
330°							

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

JOE ORDER # 95837E 004985  
IS 1-FW-60 SHIT. 1 OF 2 ITEM (C)



## EAR PLANT

Unit No. 1

Years in service 11

UT Reading Taken on: \_\_\_\_\_

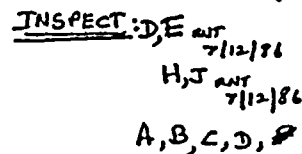
AEPSIC Installed Mat'l Class 1-31: *ASTM A-106 GR.B*

[illegible]

\*  $A=0$  IN THE MINIMUM WALL CALCULATION



CONF. - P.O. # 95 " 75839



PIPE SPEC. A-31 278" THRU 10" SCH 40  
2" UNDER SCH 80  
PIPE SPEC. L-31 24" UNDER SCH 80

SIX EAP FILE NOS

PC MX-1-FW-60-11 v810  
1 27  
C10A57

80- PIECE MARK

331 VOID 1-PA-60-9 VOID  
 ↓ ↓  
 329 11  
 801 VOID 12  
 13 VOID  
 13A VOID

**PO- PILE MARKS**

1-FN-60-7A BY LYNSEY  
-8A  
-9A  
-10A

[illegible]

**CONTROLLING DOCUMENT**

NOTAS: H, I, J, K WERE  
REPLACED WITH S  
BEFORE 7/30/85.

1501 DRAWING APPROVED FOR

CONFIDENTIAL	page 10 of 11
BY MAJ DATE 1/4/17	at P.A. case 742

POUR/ZONE No. 173 --- FLOW DIAGRAM L.S. 11-2167  
REQUIRED COMPLETION DATE --- USL 24 26  
FABRICATED BY LYSKY --- WELD PROCEDURE CODE STAND

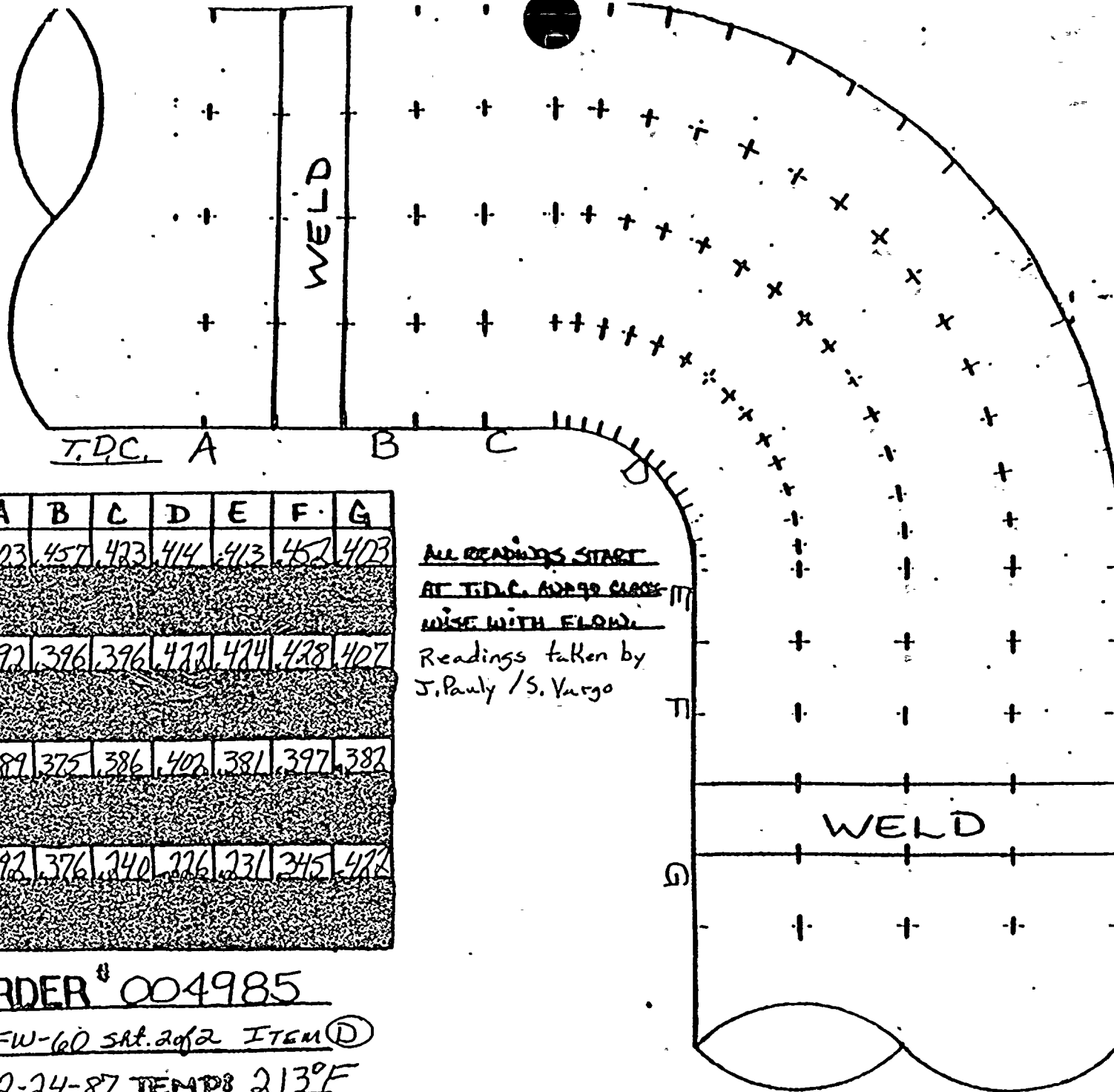
NPS DESIGNS INC. NEW YORK, N.Y.	10011 8 (Continued) on
	INDIANA & MICHIGAN ELECTRIC CO. DONALD C. COOK NUCLEAR PLANT

FABRICATOR NOTE:  
FABRICATION MUST  
CONFORM TO LATEST  
A.E.P. ARRGY. DWGS.

1



FLOW →



	A	B	C	D	E	F	G
0°	403	457	423	414	413	452	403
90°	392	396	396	412	424	428	407
180°	389	375	386	402	381	397	382
270°	392	376	340	326	331	345	422

ALL READINGS START  
AT T.D.C. AND 90 DEGREE  
WISE WITH FLOW.

Readings taken by  
 J. Pauly / S. Vargo

JOB ORDER # 004985

ISO # 1-FW-60 SAT. 2 of 2 ITEM ①

DATE: 2-24-87 TEMP: 213°F



FLOW →

T.D.C.

WELD

A

B

C

D

WELD

	A	B	C	D	E	F	G
0°	380	467	493	497	500	488	382
90°	348	417	417	416	418	423	382
180°	366	443	453	459	450	441	395
270°	393	443	469	475	409	434	362

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

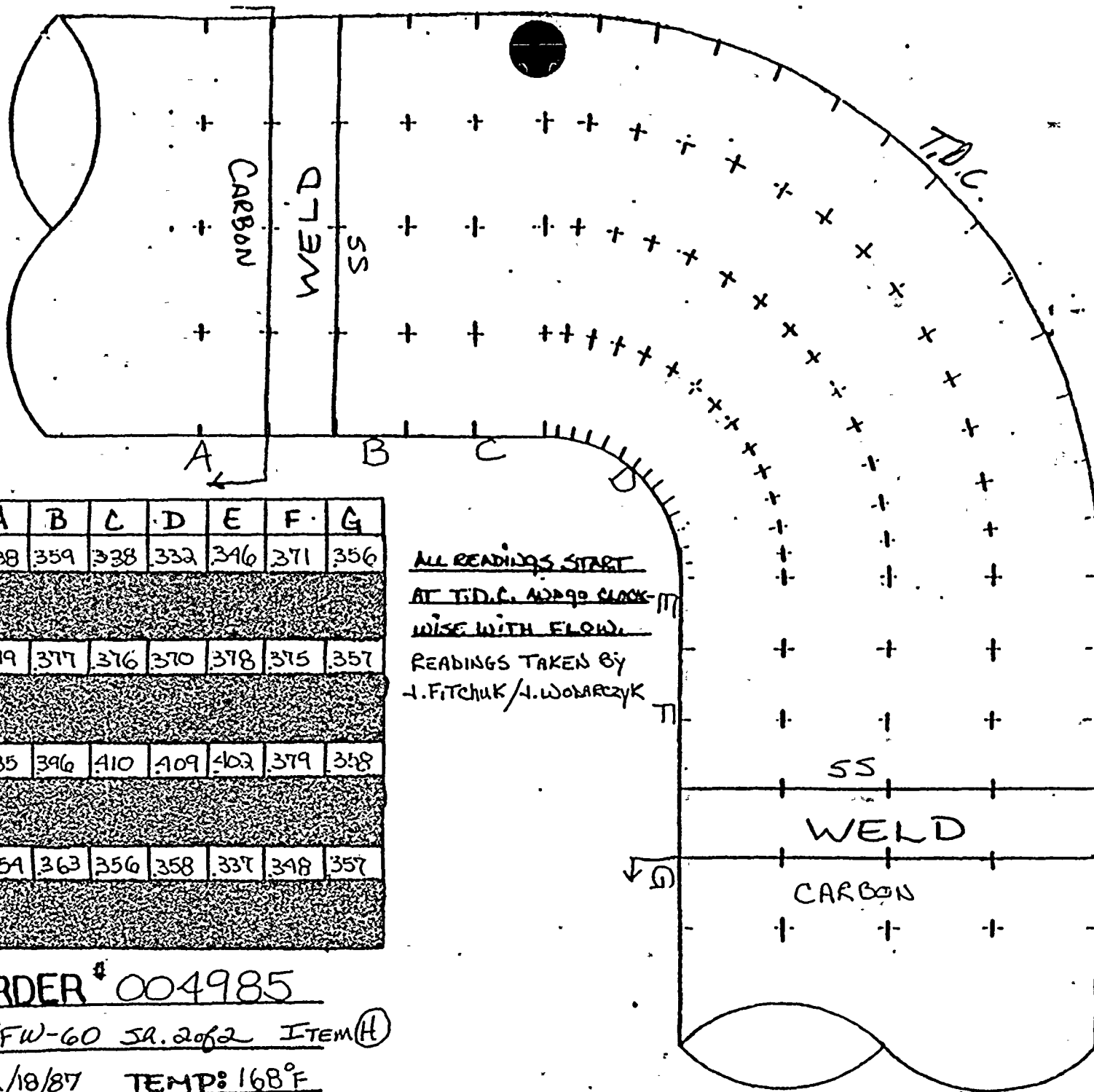
Readings taken by  
S. Pauly / S. Vargo

JOE ORDER # 004985

1911-1-10 SAT 2012 ITEM (E)



FLOW →



T.D.C.

	A	B	C	D	E	F	G
0°	338	359	338	332	346	371	356
90°	399	377	376	370	378	375	357
180°	335	396	410	409	402	379	358
270°	354	363	356	358	337	348	357

ALL READINGS START  
AT T.D.C. 12:00 CLOCK-  
WISE WITH FLOW.  
READINGS TAKEN BY  
J. FITCHUK / J. WOLARCZYK

↓ D

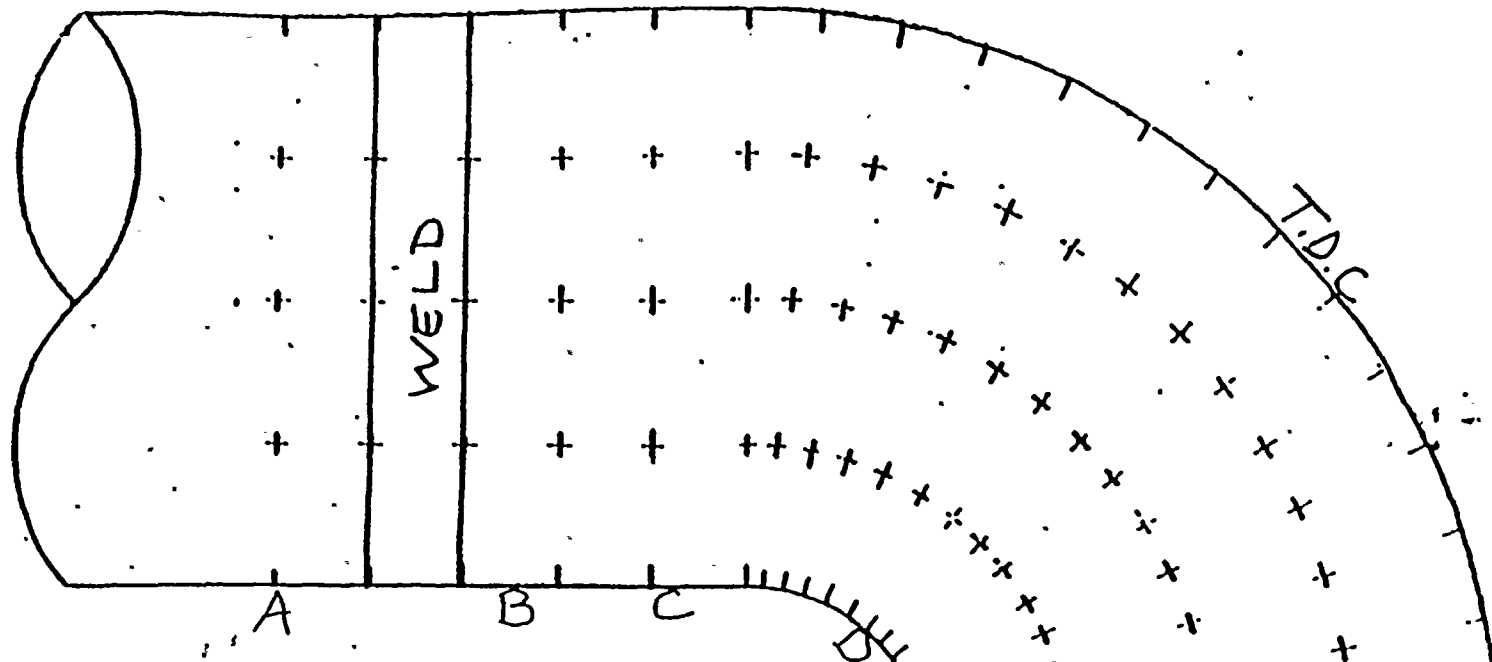
JOE ORDER # 004985

ISO # 1-FW-60 SA. 2 of 2 ITEM (H)

DATE: 2/18/87 TEMP: 168°F



FLOW →

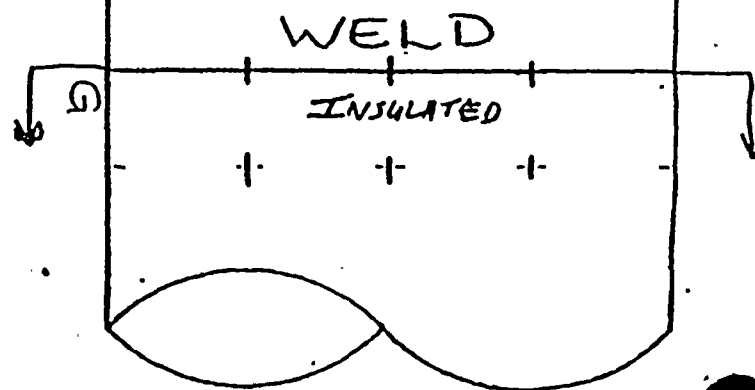


DC

	A	B	C	D	E	F	G
0°	.348	.406	.387	.337	.355	.410	-
90°	.356	.438	.390	.382	.382	.379	-
180°	.359	.430	.456	.460	.440	.421	-
270°	.358	.389	.388	.376	.385	.385	-

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

READINGS TAKEN BY  
J. PAULY / S. VARGOS



JOE ORDER # 004985

ISO # 1-FW-60 SR:2082 Item (J)

DATE: 2/17/87 TEMP: 152°F



D. C. COOK [REDACTED] EAR PLANT

SER No. 88-84 (Steam)

Unit No. 7

SER No. 23-85 (Water) X

Years in service 11

UT Reading Taken on: 1-30-87

AEPSIC Installed Mat'l Class L-31: ASTM A-106 GR.B

(I.D.)

Component

Original

Original

Req'd

Lowest

Percent

Comp.

### Description

Wall Thk.

Thk. Range

Min

## Reading

Eroded

## COMMENTS

C	4"-90° ELL	.437	.382-.492	.235*	.367	3.9	ACCEPTABLE
D	4"-90° ELL	.337	.295-.379	.235*	.337	0	STILL WITHIN MANUFACTURERS TOLERANCE
E	4"-90° ELL	.337	.295-.379	.235*	.302	0	" " " "

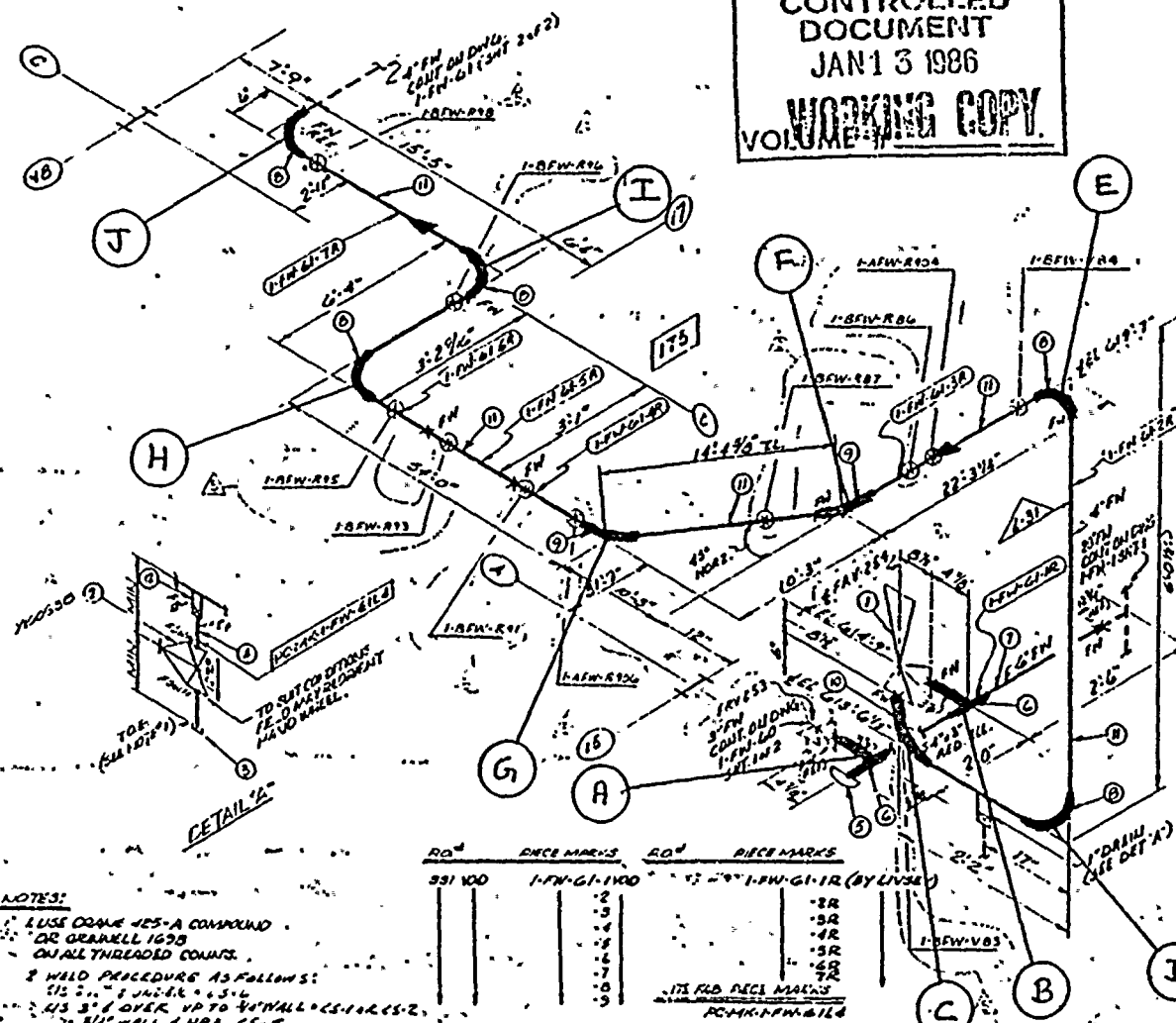
$A=0$  IN THE CALCULATION FOR MINIMUM WALL



INFORMATION RECORDS CENTER  
CONTROLLED  
DOCUMENT  
JAN 13 1986  
VOLUME 1  
WORKING COPY

QTY	UNIT	MATERIAL DESCRIPTION	ISO SHT. N.
1	3	CONTROL VALVE	FW-254
2	1	1500" SN GATE VALVE C.S.	FW-254
3	1	5000" THRU CIP C.S.	FW-254
4	1	PIPE (SCH.80) SMLS C.S.	FW-254
5	1	PIPE (SCH.80) SMLS C.S.	FW-254
6	2	2" X 2" (SCH.80) BOLL.	FW-254
7	1	PIPE (SCH.80) SMLS C.S.	FW-254
8	1	20" BOLL (SCH.80) BOLL.	FW-254
9	2	2" X 2" (SCH.80) BOLL.	FW-254
10	1	20" BOLL (SCH.80) BOLL.	FW-254
11	1	PIPE (SCH.80) SMLS C.S.	FW-254
12	1	5000" SMLS PIPE COUPLER	FW-254

NO.	DATE	BY	DESCRIPTION	REVISION
1	11/14/73	CS	DESIGNED BY A.P.S. DESIGNS, ADDED APPROVAL STAMP & CANCELED WITH 1-32295	NO ACTION REQ'D
2	11/14/73	CS	REVISED CONSTRUCTION PIPE SIZES 6" X 1/2" WAS 2" X 1/2" 6" X 1/2" WAS 2" X 1/2" 6" X 1/2" WAS 2" X 1/2" 6" X 1/2" WAS 2" X 1/2"	NO ACTION REQ'D
3	11/14/73	CS	REVISED HOLD FROM DETAIL "A" ADDED APPROVAL FOR A.P.S. DESIGNS	NO ACTION REQ'D
4	11/14/73	CS	REVISED BY A.P.S. DESIGNS, ADDED 1" X 1/2" 1" X 1/2" 1" X 1/2" 1" X 1/2" 1" X 1/2" 1" X 1/2"	NO ACTION REQ'D
5	11/14/73	CS	PER RFD 0012812 ADDED SUPPORT DETAILS & SUPERSEDED HGR 150 F.B.W. 111 REV 1 REVISED VALVE NUMBERS. ALL ABOVE TO REFLECT AS-BUILT CONDITION.	NO ACTION REQ'D



NOTES:  
1. USE CORN 425-A COMPOUND OR GRANELL 1639 ON ALL THREADED JOINTS.  
2. WELD PROCEDURE AS FOLLOWS:  
TIG 2.1.1 J.W.E. 4.3.4  
M3 3" OVER UP TO 1/4" WALL C.S. 1015-2  
4" WALL & UP 15-5

QTY	UNIT	RECE MARKS	QTY	UNIT	RECE MARKS
331	100	1-FW-G1-100	1	1	1-FW-G1-1R (BY LVS)
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		

INSPECT, C, D, E ANT 7/12/78  
H ANT 7/12/78  
F, G, I, J ANT 23/2/77

HANGER MARKS NO.  
1-BRV-V83  
V84  
R81  
R82  
R83  
R84  
R85  
R86  
R87  
R88  
1-AFW-R104  
1-AFW-R106

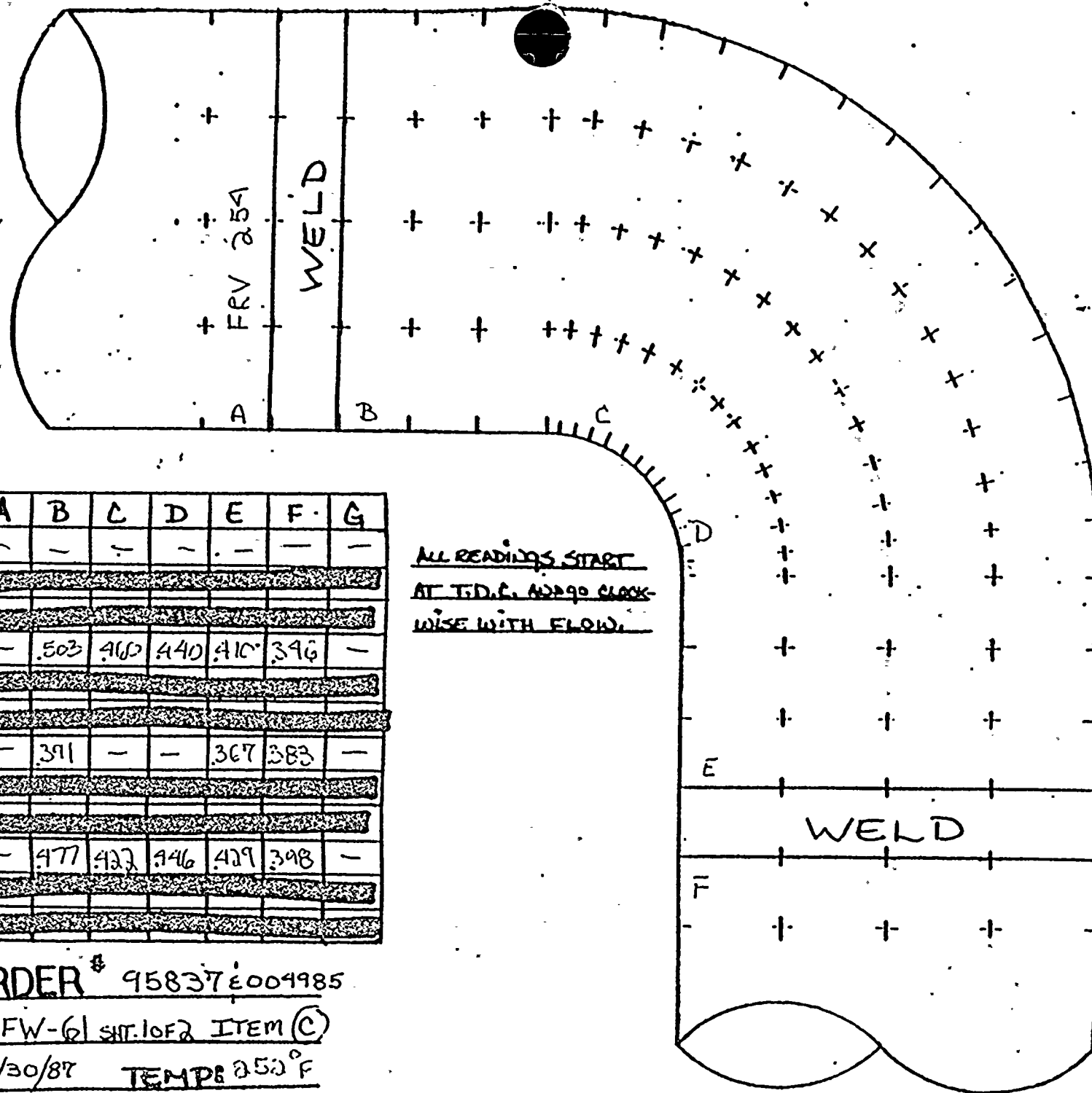
NOTES: REPLACE 'C' NEXT OUTRAE

DRAWING APPROVED FOR	
CONST. ITEM	PRELIM. DESIGN
BY M.B.J. DATE 11/14/73	BY G.G.G. DATE 11/14/73
AMERICAN ELECTRIC POWER TRANS. CORP.	

<b>REVISIONS</b> 1. 11/14/73 CS 2. 11/14/73 CS 3. 11/14/73 CS 4. 11/14/73 CS 5. 11/14/73 CS		<b>TESTING</b> 1. 11/14/73 CS 2. 11/14/73 CS 3. 11/14/73 CS 4. 11/14/73 CS 5. 11/14/73 CS		<b>ADDITIONAL</b> 1. 11/14/73 CS 2. 11/14/73 CS 3. 11/14/73 CS 4. 11/14/73 CS 5. 11/14/73 CS	
<b>REVISIONS</b> 1. 11/14/73 CS 2. 11/14/73 CS 3. 11/14/73 CS 4. 11/14/73 CS 5. 11/14/73 CS		<b>TESTING</b> 1. 11/14/73 CS 2. 11/14/73 CS 3. 11/14/73 CS 4. 11/14/73 CS 5. 11/14/73 CS		<b>ADDITIONAL</b> 1. 11/14/73 CS 2. 11/14/73 CS 3. 11/14/73 CS 4. 11/14/73 CS 5. 11/14/73 CS	



FLOW →



DC

	A	B	C	D	E	F	G
0°	-	-	-	-	-	-	-
90°	-	503	460	440	410	396	-
180°	-	391	-	-	367	383	-
270°	-	477	433	446	429	398	-

ALL READINGS START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.

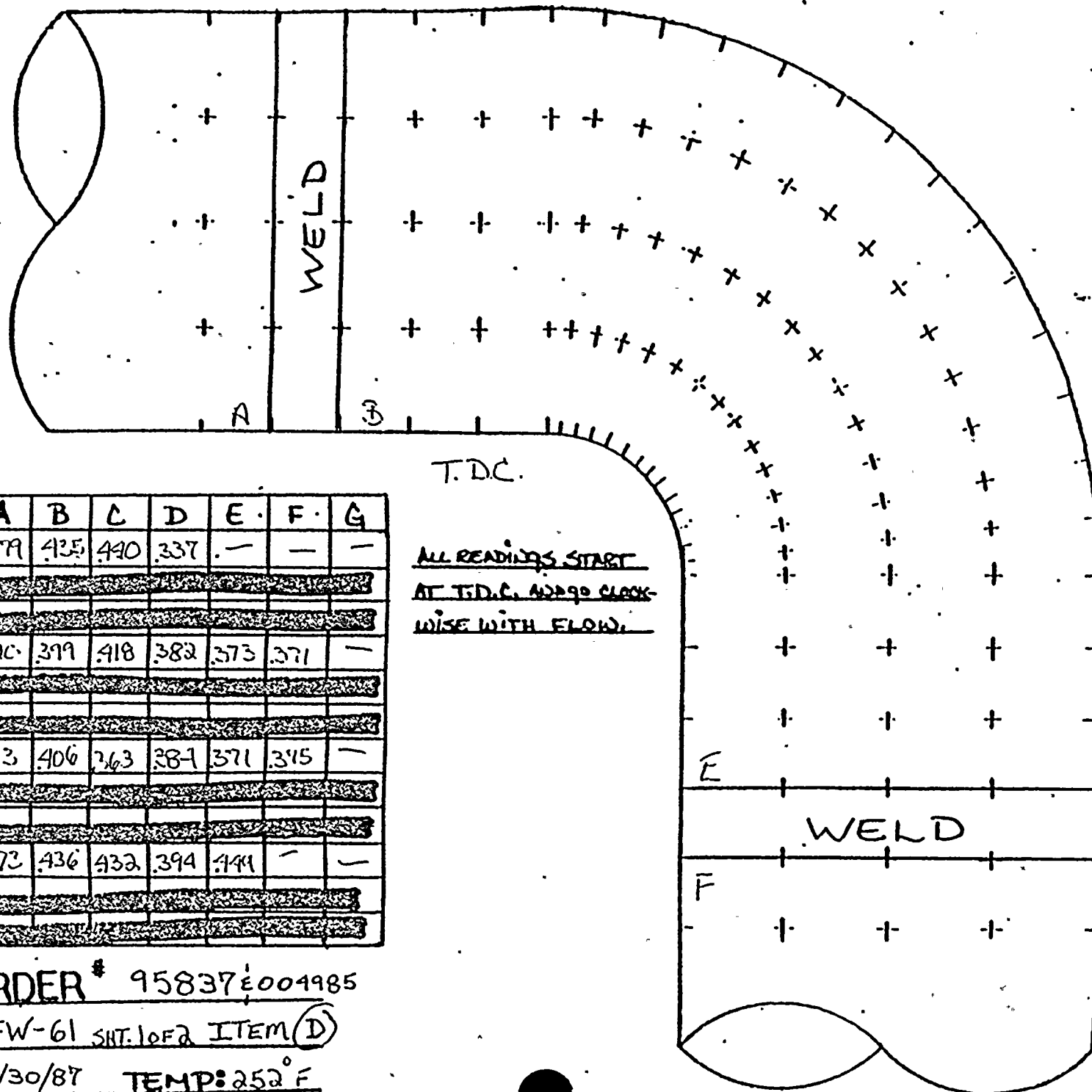
JOE ORDER # 95837E004985

ISO # 1-FW-61 SH. 10F2 ITEM (C)

DATE: 1/30/87 TEMPE: 252°F



FLOW →



DC

	A	B	C	D	E	F	G
0°	379	425	440	337	—	—	—
15°							
30°							
45°							
60°							
75°							
90°	420	379	418	382	373	371	—
105°							
120°							
135°							
150°	413	406	363	384	371	345	—
165°							
180°							
195°							
210°							
225°							
240°	373	436	432	394	444	—	—
255°							
270°							

T.D.C.

ALL READINGS START  
AT T.D.C. 420° CLOCK-  
WISE WITH FLOW.

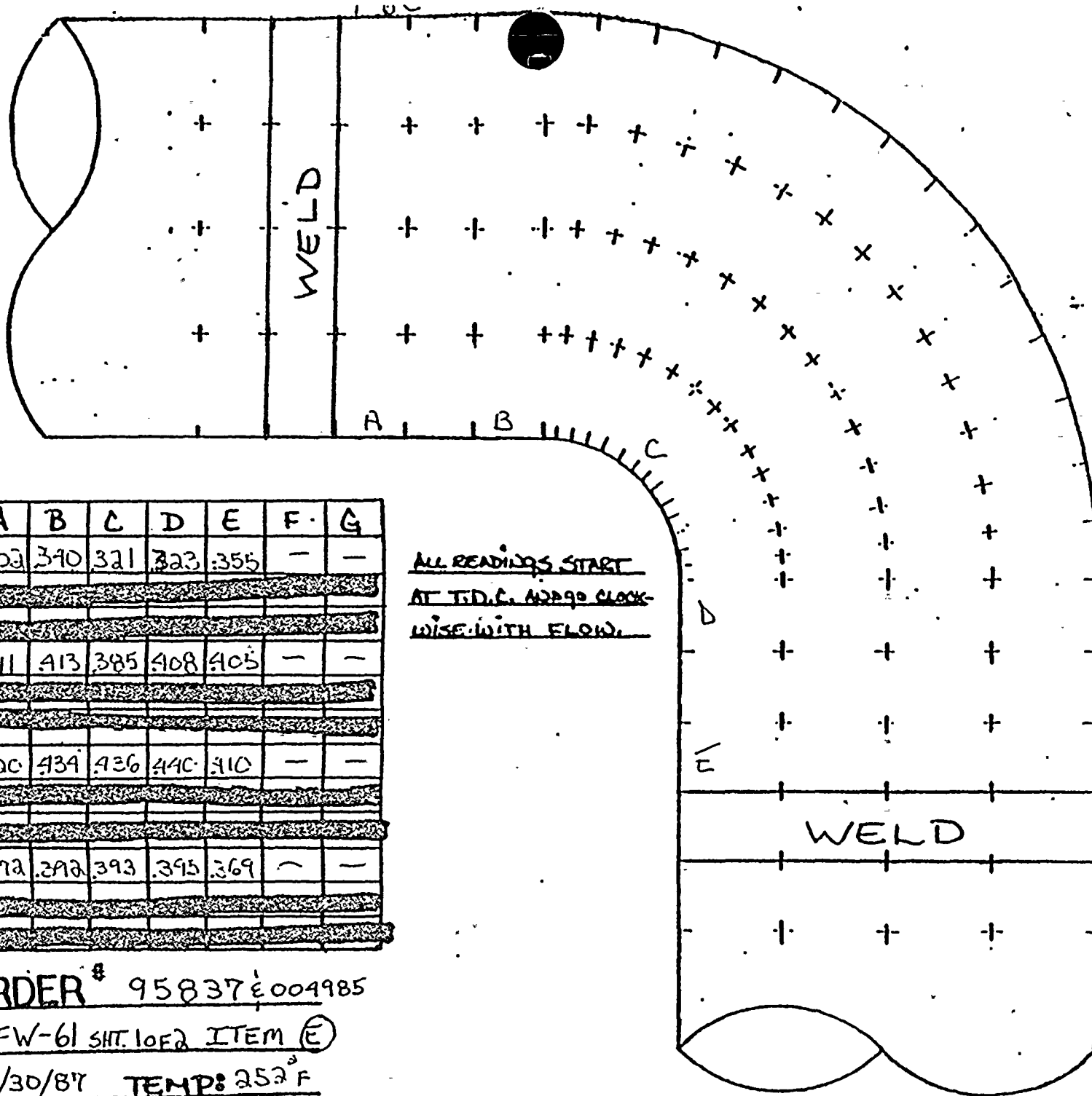
JOB ORDER # 95837E004985

ISO # 1-FW-61 SHT. 1 OF 2 ITEM (D)

DATE 1/30/87 TEMP: 252° F



← FLOW



DC

	A	B	C	D	E	F	G
0°	303	340	321	323	355	—	—
90°	411	413	385	408	405	—	—
180°	420	434	436	440	410	—	—
270°	372	392	393	395	369	—	—

ALL READINGS START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.

JOB ORDER # 95837E004985

ISO# 1-FW-61 SH. 1 OF 2 ITEM (E)

DATE: 1/30/87 TEMP: 252°F



## EROSION EVALUATION WORKSHEET

NEPSC Engineer: A.J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. 1

RE Evaluation Date: SEPTEMBER 17, 1987

SFR No. 23-85 (Water) X

Years in service 11

UT Reading Transmitted on: N/A

UT Reading Taken on: 9-3-6-87

Isometric Dwg. NO. 1-FW-61 Sh 2 of 2 REV-9

AEPSI Installed Mat'l Class L-31 : ASTM A-106 GR.B

Plant

(I.D.)

Component	Description
-----------	-------------

Original.  
Wall Thk.

Original  
Thk. Range

Req'd  
Tmin

Lowest  
Reading

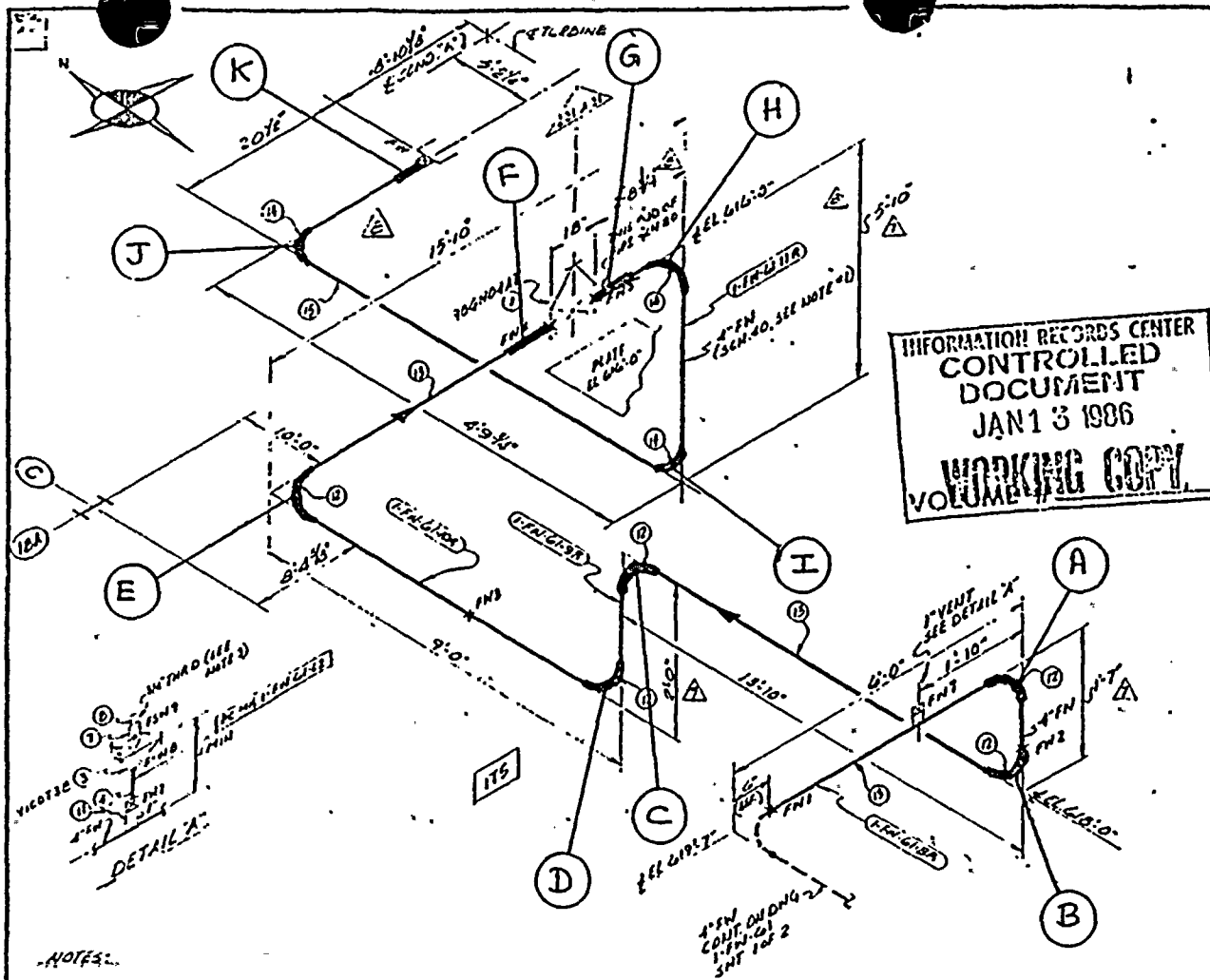
Percent Eroded

## COMMENTS

D	4"-90° FLL	.437	.382-.492	.235*	.174	54.5	REPLACE
E	4"-90° FLL	.437	.382-.492	.235*	.157	58.9	REPLACE
H	4"-90° FLL	.337	.295-.379	.049*	.325	0	STILL WITHIN MANUFACTURERS TOLERANCE
I	4"-90° FLL COLUMN A & G	.531	.465-.597	.049*	.423	9.0	ACCEPTABLE
I	4"-90° FLL	.437	.382-.492	.049*	.357	6.5	"

## A=0 MINIMUM WALL CALCULATIONS





- NOTES:
- PIPE SPEC. A-31 2 1/2" THRU 10" SCH 40  
2" & UNDER SCH 80  
PIPE SPEC. L-31 2 1/4" UNDER SCH. 80
  - WELD PROCEDURE AS FOLLOWS:  
45 2 1/2" & UNDER C.C.  
45 2" & UNDER UP TO 4" WALL C.S. & E  
45 1 1/2" & UNDER C.S. & E  
45 1 1/4" & UNDER C.S. & E
  - USE CANNE 45-A OR GANNWELL  
1870 ON ALL THREADED CONNECTIONS

SITE FAB. P.I.E.C. HKS	POW	PIECE MARKS	POW	PIECE MARKS
P.C. HKS. 1-FN-61-11 VOID	331	VOID	1-FN-61-10 VOID	
	12		11	
	13 VOID		12	
	329		13	
	801		14 VOID	
			15 VOID	
			16 VOID	

NOTES: H, I, J WERE REPLACED  
WITH S.S. BEFORE 7/30/85

150 51		MATERIAL DESCRIPTION	
1	1	1	1
2	1	1	1
3	1	1	1
4	1	1	1
5	1	1	1
6	1	1	1
7	1	1	1
8	1	1	1
9	1	1	1
10	1	1	1
11	1	1	1
12	1	1	1
13	1	1	1
14	1	1	1
15	1	1	1

REVISION RECORD			
NO	DATE	BY	REMARKS
1	10/10/80	JO	REVISED BY NPS. DESIGNS. ADDED: 1" HP VENT CONN. PC MC NO 8 ITEMS 38 & 10 B/M. REV 4 DWS. 1-5295
2	11/14/80	JO	REMOVED: 1" HP VENT CONN. PC MC NO 8 ITEMS 38 & 10 B/M. REV 4 DWS. 1-5295
3	11/14/80	JO	REMOVED: 1" HP VENT CONN. PC MC NO 8 ITEMS 38 & 10 B/M. REV 4 DWS. 1-5295
4	11/14/80	JO	REMOVED: 1" HP VENT CONN. PC MC NO 8 ITEMS 38 & 10 B/M. REV 4 DWS. 1-5295
5	11/14/80	JO	REMOVED: 1" HP VENT CONN. PC MC NO 8 ITEMS 38 & 10 B/M. REV 4 DWS. 1-5295
6	11/14/80	JO	REMOVED: 1" HP VENT CONN. PC MC NO 8 ITEMS 38 & 10 B/M. REV 4 DWS. 1-5295
7	11/14/80	JO	REMOVED: 1" HP VENT CONN. PC MC NO 8 ITEMS 38 & 10 B/M. REV 4 DWS. 1-5295
8	11/14/80	JO	REMOVED: 1" HP VENT CONN. PC MC NO 8 ITEMS 38 & 10 B/M. REV 4 DWS. 1-5295
9	11/14/80	JO	REMOVED: 1" HP VENT CONN. PC MC NO 8 ITEMS 38 & 10 B/M. REV 4 DWS. 1-5295

INSPECT: IE ANT 7/12/86  
D, H ANT 7/14/86  
A, B, C, E ANT 7/14/86

DRAWING APPROVED FOR

DESIGNER: [ ] DATE: [ ]

FORWARDED: [ ] DATE: [ ]

AMERICAN ELECTRIC POWER SERVICE CORP.

FOUR/ONE No. 123

REQUIRED COMPLETION DATE: [ ]

FABRICATED BY: [ ]

WELD PROCEDURE: [ ]

NPS DESIGNS INC. NEW YORK, N.Y.

FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRT. DWGS.

TURNER BLDG. 1-FN-61 SNT 2-2

9

DESIGN SPEC. DECEN 10/20/85

DESIGNER: [ ]

FORWARDED: [ ]

AMERICAN ELECTRIC POWER SERVICE CORP.

FOUR/ONE No. 123

REQUIRED COMPLETION DATE: [ ]

FABRICATED BY: [ ]

WELD PROCEDURE: [ ]

NPS DESIGNS INC. NEW YORK, N.Y.

FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRT. DWGS.

TURNER BLDG. 1-FN-61 SNT 2-2

9

DESIGN SPEC. DECEN 10/20/85

DESIGNER: [ ]

FORWARDED: [ ]

AMERICAN ELECTRIC POWER SERVICE CORP.

FOUR/ONE No. 123

REQUIRED COMPLETION DATE: [ ]

FABRICATED BY: [ ]

WELD PROCEDURE: [ ]

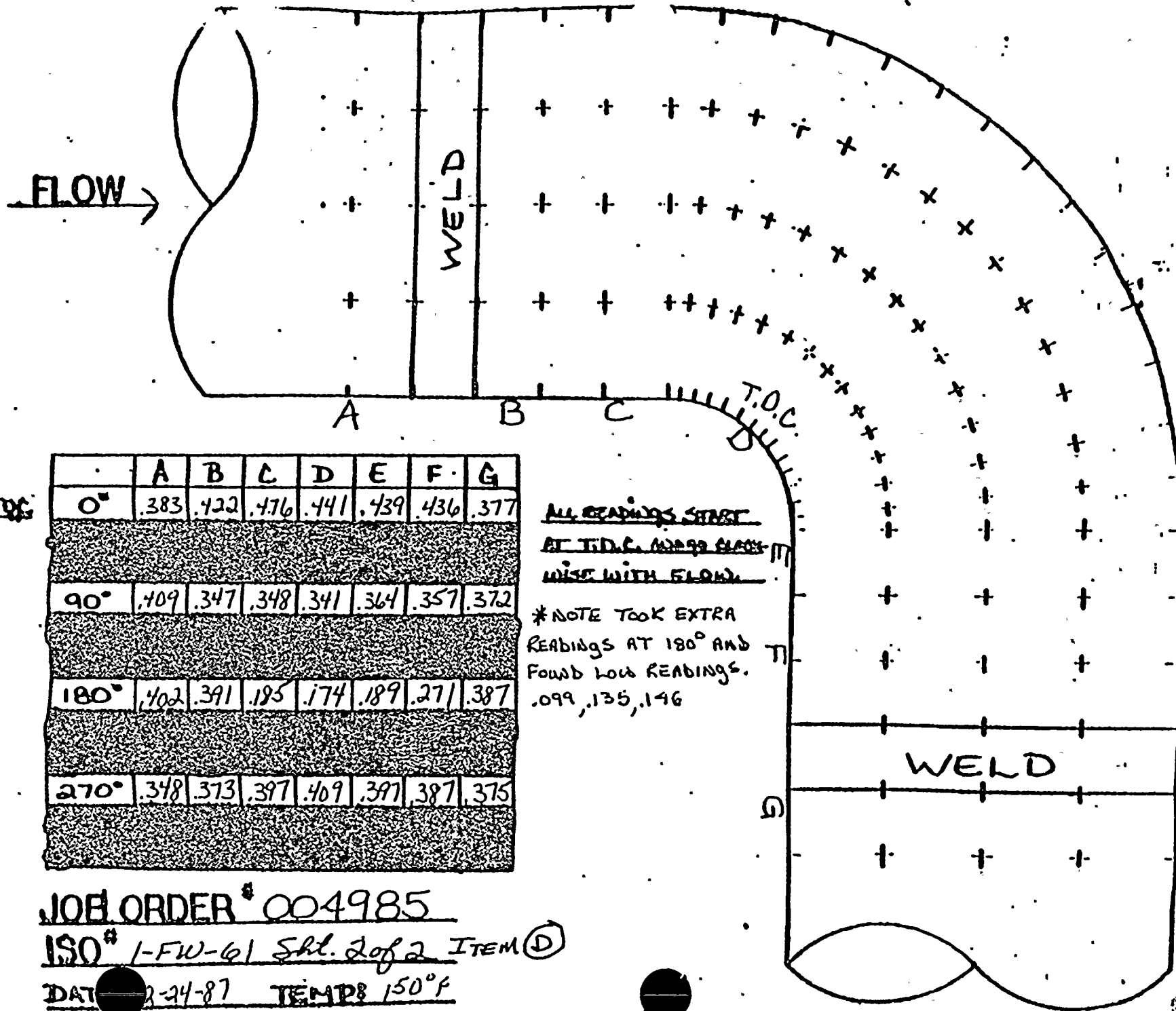
NPS DESIGNS INC. NEW YORK, N.Y.

FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRT. DWGS.

TURNER BLDG. 1-FN-61 SNT 2-2

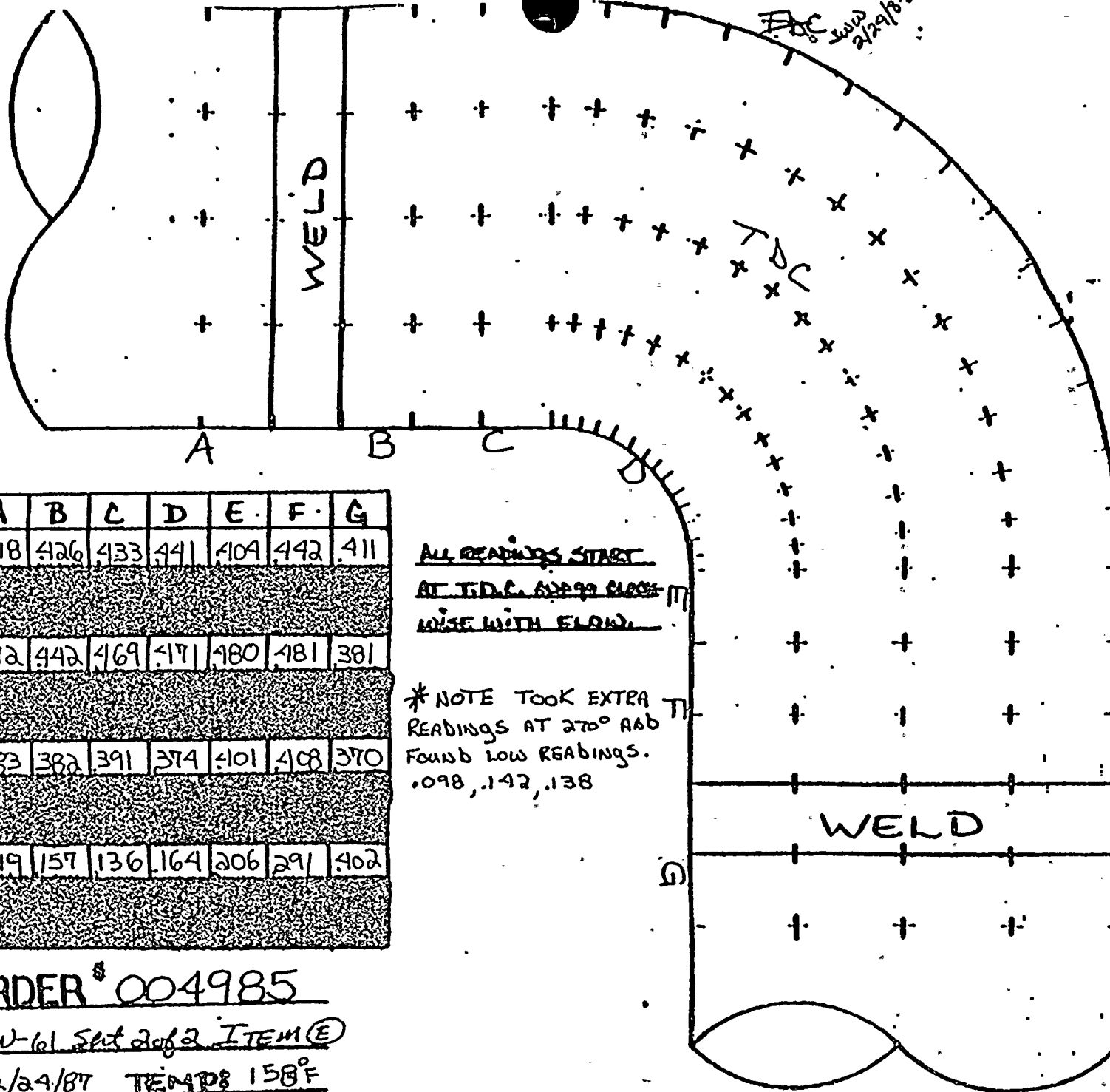
9







FLOW →



DC

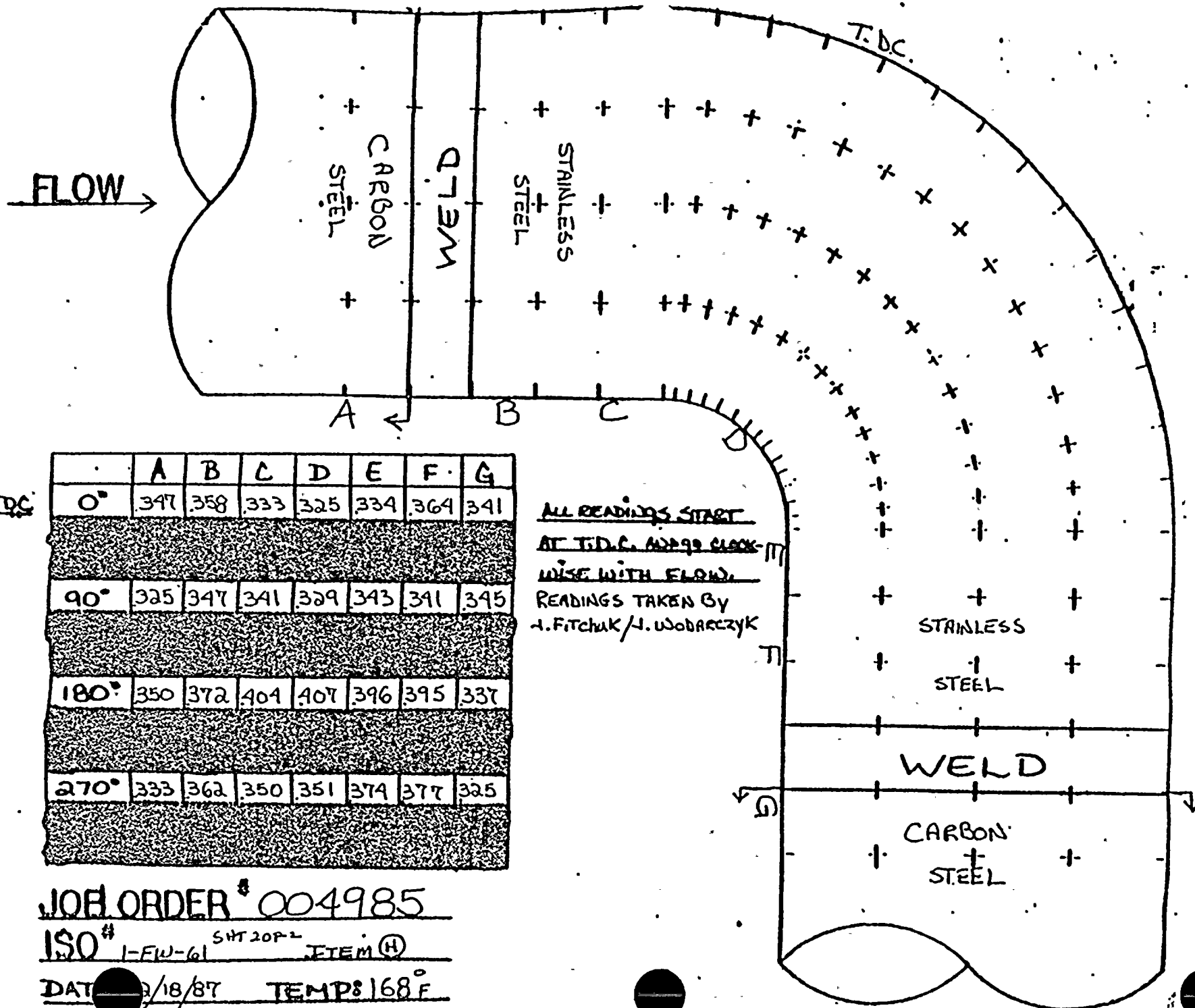
	A	B	C	D	E	F	G
0°	418	426	433	441	409	442	411
90°	372	442	469	417	480	481	381
180°	383	382	391	374	401	408	370
270°	319	157	136	164	206	291	402

ALL READINGS START  
AT T.D.C. AND GO CLOCK  
WISE WITH FLOW.

\* NOTE TOOK EXTRA  
READINGS AT 270° AND  
FOUND LOW READINGS.  
.098, .142, .138

JOE ORDER # 004985  
ISO # 1-FW-61 Spt 2 of 2 ITEM (E)  
DATE: 2/24/87 TEMP: 158°F





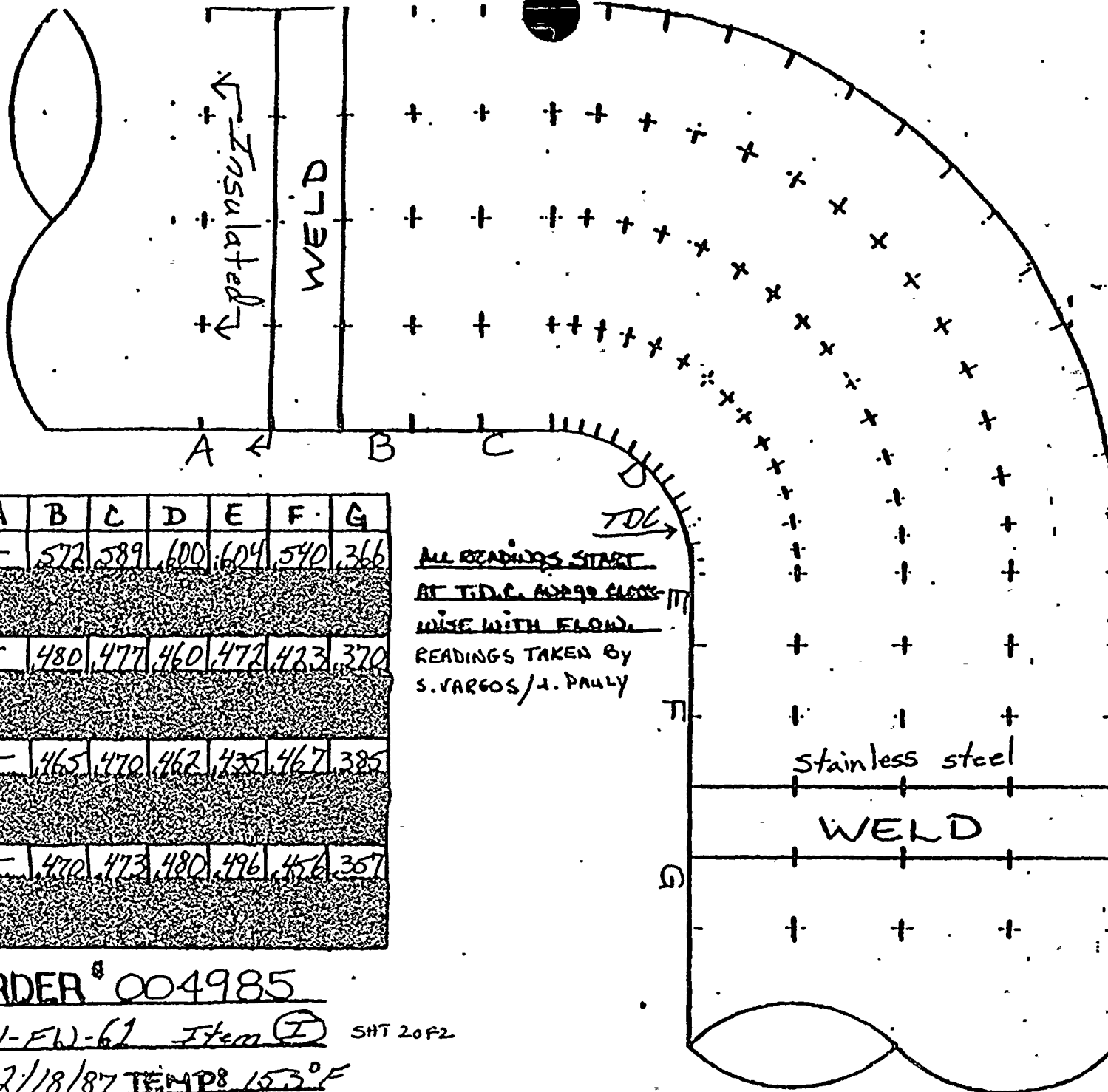
JOE ORDER # 004985

ISO # 1-FW-61 SHIP 20P-2 ITEM (H)

DATE 3/18/87 TEMP: 168°F



FLOW →



	A	B	C	D	E	F	G
0°	—	572	589	600	604	540	366
90°	—	480	477	460	472	423	370
180°	—	465	470	462	435	467	385
270°	—	470	473	480	496	456	357

ALL READINGS START  
AT T.D.C. 0000 CLOCK-  
WISE WITH FLOW.  
READINGS TAKEN BY  
S. VARGOS / J. PAULY

JOE ORDER # 004985

ISO# 1-FW-61 Item (I) SHT 20F2

DATE: 2/18/87 TEMP: 15.3°F



## AMERICAN ELECTRIC POWER SERVICE CORPORATION



RE:

FEBRUARY 17, 1987

SUBJECT:

D. C. Cook Nuclear Plant, Unit No. 1  
 Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM:

A. J. Lewandowski

TO:

1. ~~J. A. Kobayashi~~ 2/19/87
2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on FEBRUARY 5, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
<u>1-FW-4</u>			
<u>REV. 7</u>	<u>CS</u>	<u>L</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATIONS REQUIRED</u>
<u>1-FW-5</u>			
<u>REV. 6</u>	<u>CS</u>	<u>A</u>	
<u>1-C-1</u>	<u>CS</u>	<u>E</u>	
<u>REV. 8</u>	<u>CS</u>	<u>L<sup>1</sup></u>	
<u>1-C-2</u>	<u>CS</u>	<u>L<sup>2</sup></u>	
<u>REV. 7</u>	<u>CS</u>	<u>C</u>	
<u>1-C-4 REV 0</u>	<u>CS</u>	<u>M</u>	
<u>Sh. 2 of 2</u>	<u>CS</u>	<u>E</u>	
<u>1-C-56</u>			
<u>REV. 4</u>	<u>CS</u>	<u>E</u>	

A. J. Lewandowski  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 4.6.3.15.2.5.1

Sheet No. 1 of 1



## PLANT

# EROSION EVALUATION WORKSHEET

SER No. 88-84 (Steam)

Unit No. 7.

SER No. 23-85 (Water) X

Years in service 11

UT Reading Taken on: 2-4-87

AEPSI Installed Mat'l Class *CS: ASTM A-166 GR.B SCH.100*

(I.D.)

(I.D.)

Component

Original

Original

Req'd

Lowest

Percent

Comp.

### Description

Wall Thk.

Thk. Range

Min

## Reading

Eroded

## COMMENTS

1 20" 90° FL - 1.531 - 1.34 - 1.722 - .756 - 1.398 0% STILL WITHIN MANUFACTURERS REQUIRED TOLERANCE

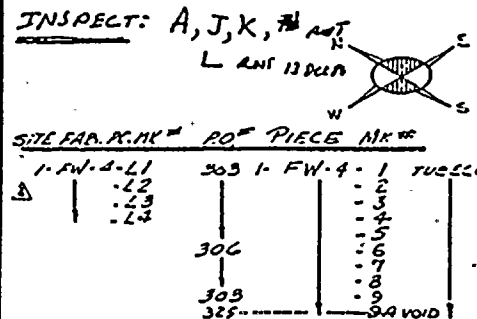


WEEK #15

..DC. J.O. # 004954

CONST 1.0.7 004952

J.O.# 004953

ISOMETRIC SHEET NO. 3-3[illegible]

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN MICHIGAN

UNIT NO. 1

A-33	A-108	A-335	A-312	SMS	CHN BY SH ON 9-11					
STD	27 281 50 20 30 40 60 80 100 120 140 160 180				CHN D BY H ON 9-13					
C	PRION	AREAR	750	QUAN	208	DWGNG	CORE	APPRD	ON	
	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	
				005050						
DESCRIPTION										
FEDWATERPIPING-TURBINE ROOM										
PLANT	BLAST	BACK RING								
ST	WELF	MYORO	RT.							
SP.	MT	P	E							
SPEC. 4-A				ALL DWG. 1-5356						

T

**TUBECO INC.**

123 VARICK AVENUE

BROOKLYN N. Y. 11238

**MATERIAL REQUIRED FOR  
FIELD REWORK**

**DRAWING APPROVED FOR**

Construction

1946

AYER'S ELECTRIC LIGHTS.

10-10-64

PLS-10

1-EN-100 R-1/2

RECEIVED

1998



← FLOW

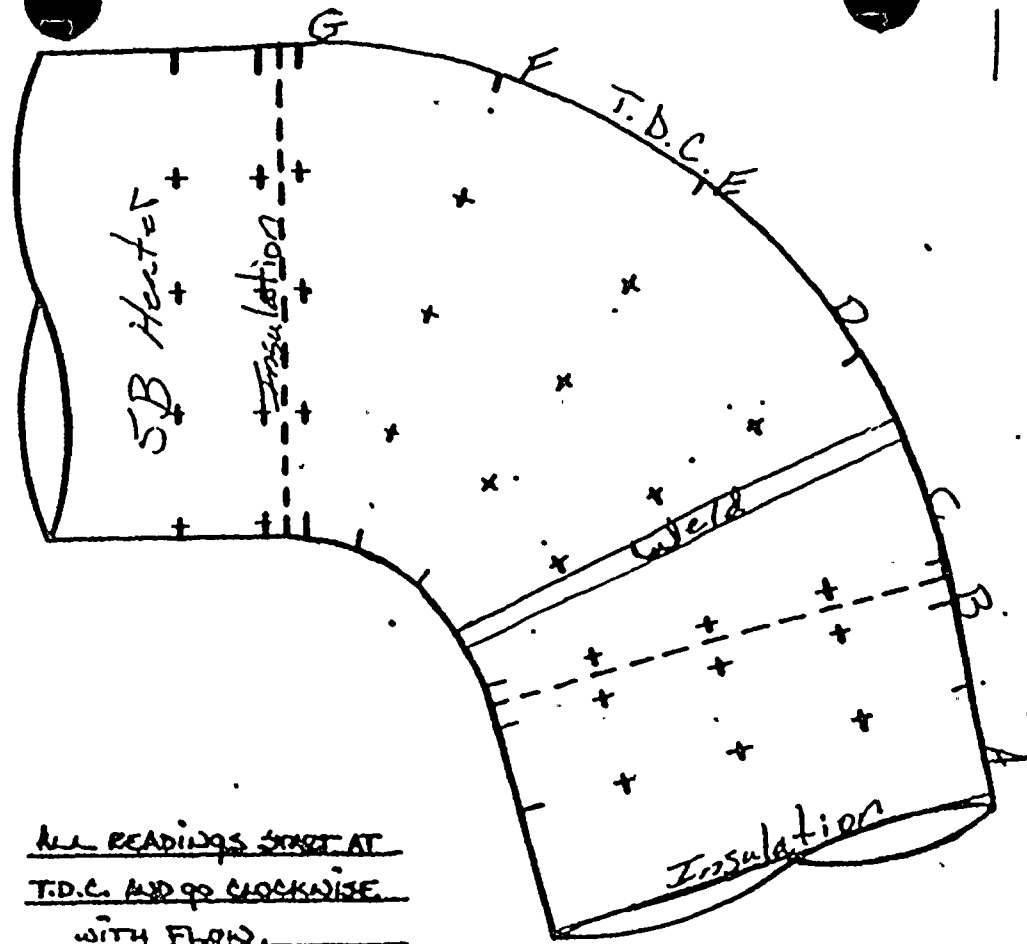
T.D.C.

	A	B	C	D	E	F	G
0°	1421	1428	1434	1408	1610	1620	1580
30°	1408	1426	1436	1503	1528	1479	1620
60°	1439	1428	1426	1569	1578	1464	1630
90°	1430	1419	1473	1478	1597	1486	1612
120°	1423	1420	1425	1505	1516	1634	1595
150°	1428	1418	1432	1402	1574	1526	1630
180°	1416	1418	1432	1574	1511	1603	1622
210°	1426	1434	1402	1535	1544	1583	1627
240°	1427	1397	1398	1588	1508	1581	1629
270°	1438	1428	1421	1516	1467	1637	1607
300°	1432	1406	1398	1530	1614	1614	1630
330°	1433	1407	1405	1521	1526	1608	1595

JOB ORDER\*\* 004954

ISO\*\* 1-FW-4 REV 7 ITEM (L)

DATE: 2/4/87 TEMP: 285°F





# EROSION EVALUATION WORKSHEET

AEPS Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. /

Evaluation Date: FEBRUARY 17, 1987

SER No. 23-85 (Water) X

Years in service 11

UT Reading Transmitted on: 2-5-87

UT Reading Taken on: 25-87

Isometric Dwg. NO. 1-FW-5, REV. 6

AFSC Installed Mat'l Class CS: ASTM A-166 SCH 80

[illegible]

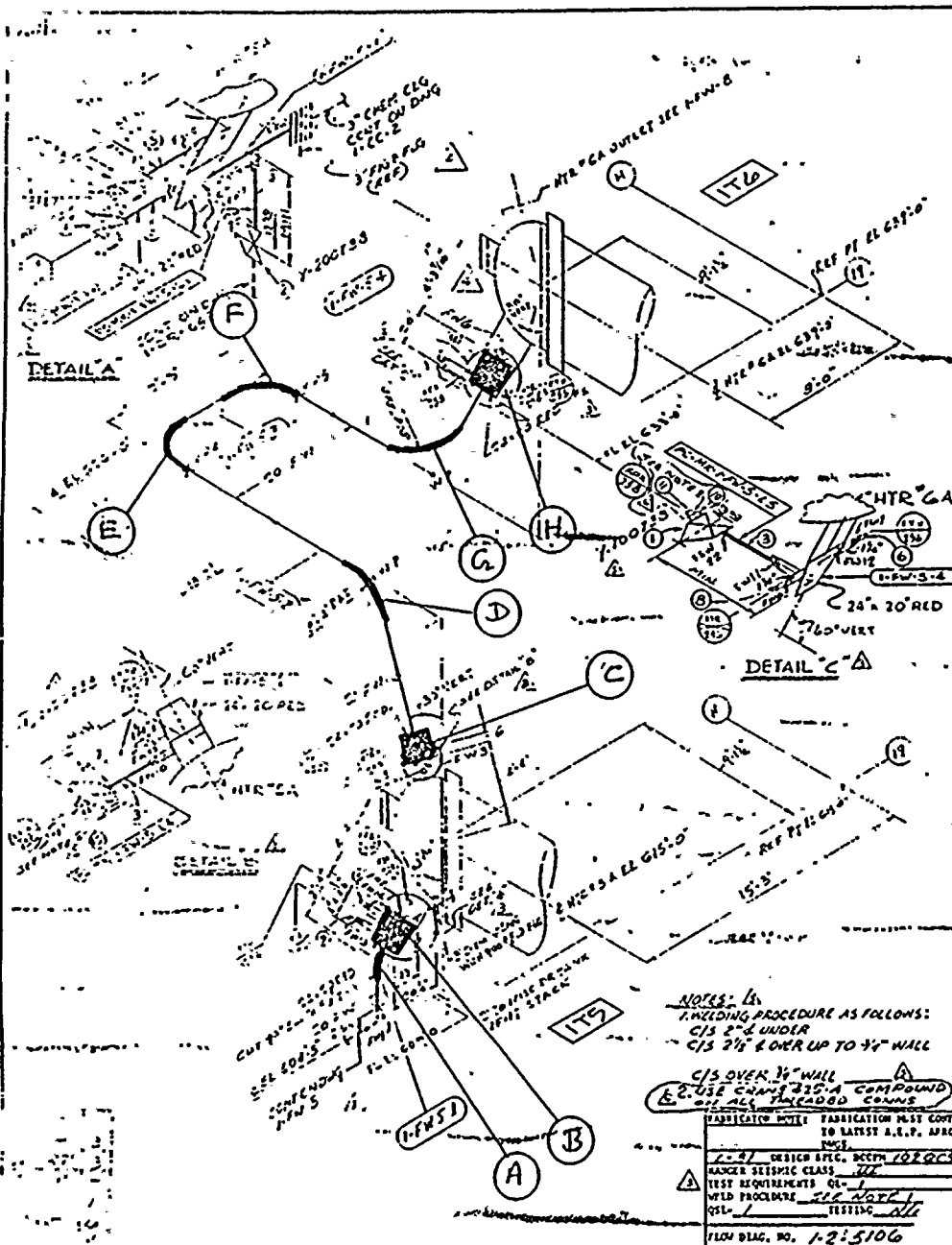


WEEK #15

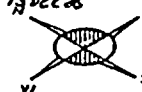
ISOMETRIC SHEET NO. 243

1-FW

Q.C. J.O. # 004954 CONST J.O. # 004952  
J.O. # 004953



INSPECT: A, B, E ANT 130000

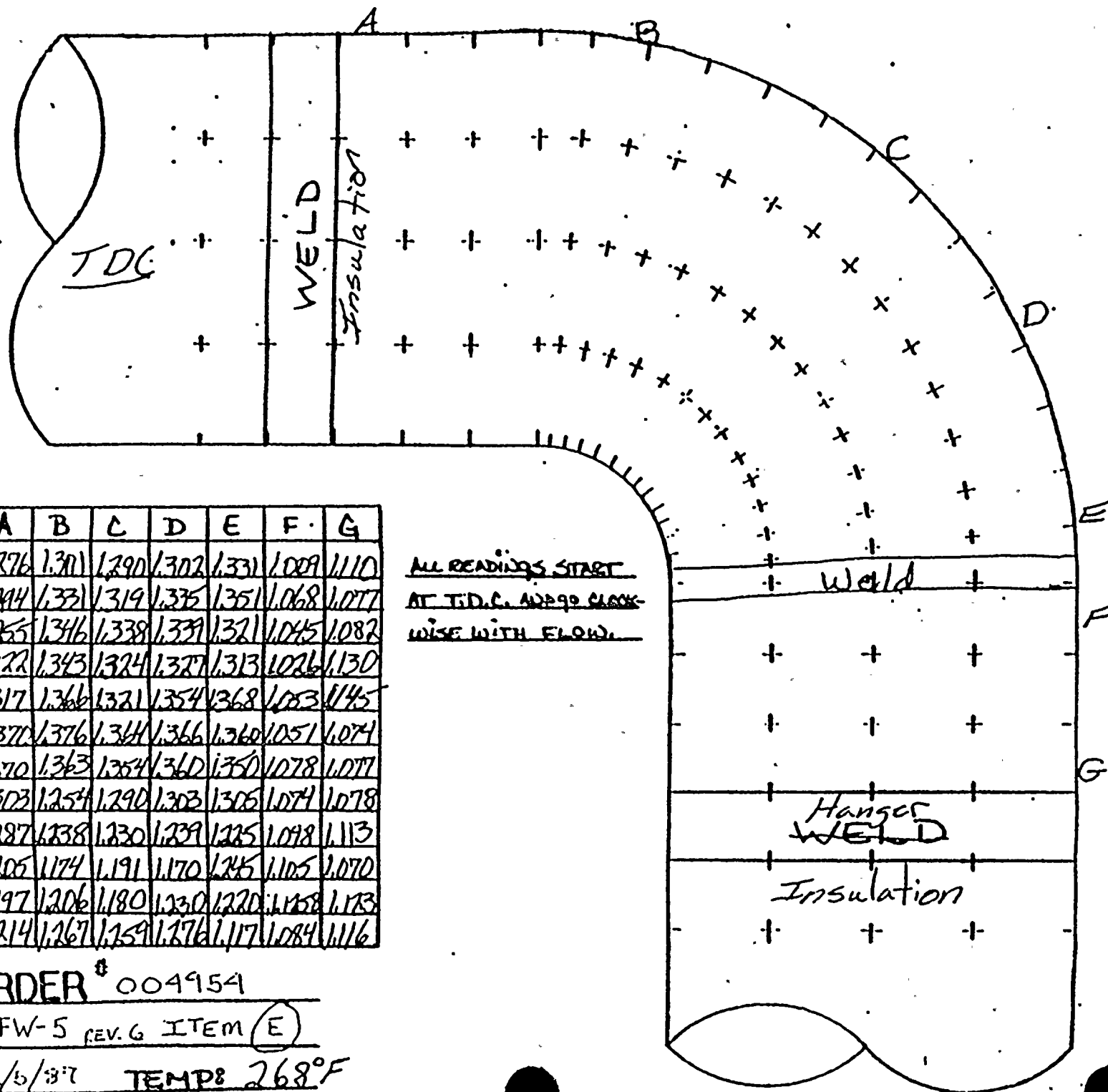


SITE FRB. PC MK. # P.O. # PIECE MK. #

1-FW-5-1 303 1-FW-5-1 TUBECO  
A 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 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1421 1422 1423 1424 1425 1426 1427 1428 1429 1430 1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469 1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482 1483 1484 1485 1486 1487 1488 1489 1490 1491 1492 1493 1494 1495 1496 1497 1498 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1560 1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573 1574 1575 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586 1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612 1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696 1697 1698 1699 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1766 1767 1768 1769 1770 1771 1772 1773 1774 1775 1776 1777 1778 1779 1780 1781 1782 1783 1784 1785 1786 1787 1788 1789 1790 1791 1792 1793 1794 1795 1796 1797 1798 1799 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1867 1868 1869 1870 1871 1872 1873 1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548 2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561 2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 2573 2574 2575 2576 2577 2578 2579 2580 2581 2582 2583 2584 2585 2586 2587 2588 2589 2590 2591 2



FLOW →



T.D.C.

	A	B	C	D	E	F	G
0°	1.276	1.301	1.290	1.302	1.331	1.029	1.110
30°	1.284	1.331	1.319	1.335	1.351	1.068	1.077
60°	1.255	1.346	1.338	1.339	1.321	1.045	1.082
90°	1.322	1.343	1.324	1.327	1.313	1.026	1.130
120°	1.317	1.366	1.321	1.354	1.368	1.053	1.145
150°	1.370	1.376	1.344	1.366	1.360	1.051	1.074
180°	1.370	1.363	1.354	1.360	1.350	1.078	1.077
210°	1.303	1.254	1.290	1.303	1.306	1.074	1.078
240°	1.287	1.238	1.230	1.239	1.225	1.048	1.113
270°	1.205	1.174	1.191	1.170	1.245	1.105	1.070
300°	1.197	1.206	1.180	1.230	1.220	1.158	1.173
330°	1.214	1.267	1.259	1.276	1.117	1.084	1.116

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

JOB ORDER # 004954

ISO # 1-FW-5 REV. G ITEM (E)

DATE 2/5/87 TEMP: 268°F



← FLOW

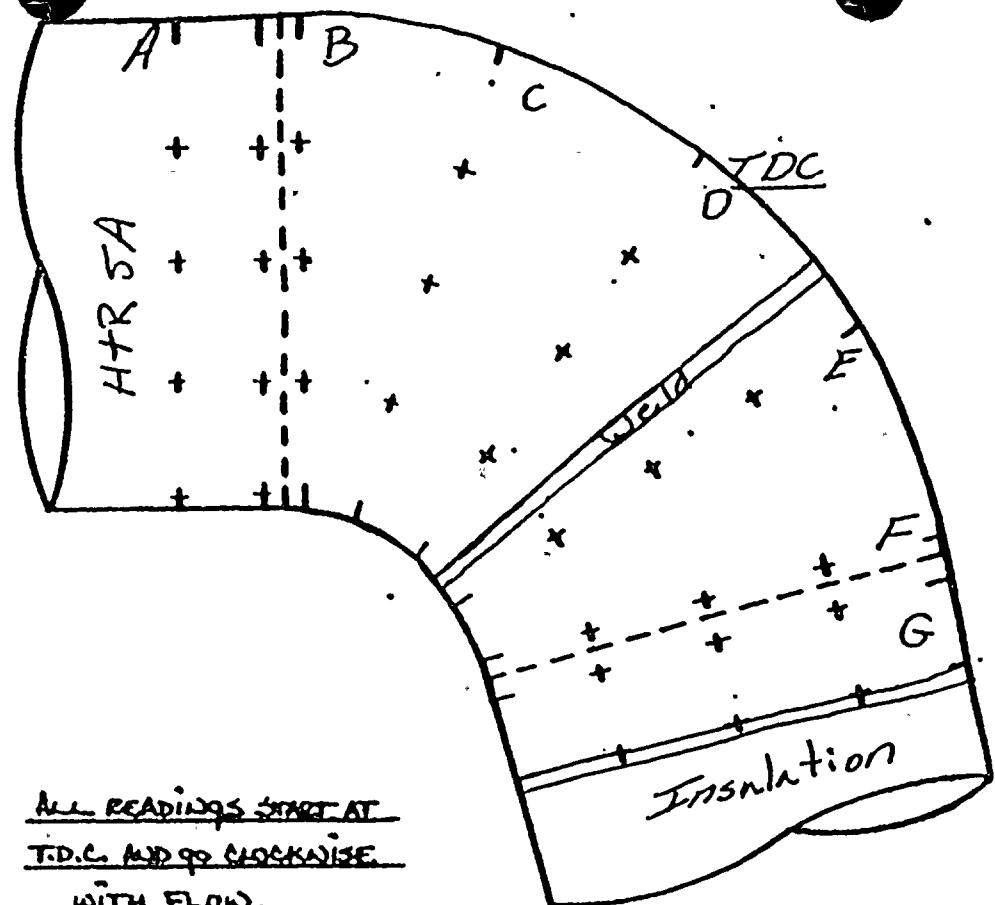
TDC

	A	B	C	D	E	F	G
0°	1.314	1.410	1.140	1.205	1.220	1.238	1.154
30°	1.468	1.414	1.158	1.345	1.211	1.191	1.179
60°	1.345	1.404	1.211	1.277	1.424	1.322	1.294
90°	1.325	1.413	1.149	1.205	1.325	1.376	1.382
120°	1.302	1.404	1.440	1.108	1.284	1.377	1.358
150°	1.306	1.397	1.415	1.135	1.343	1.331	1.303
180°	1.307	1.398	1.441	1.129	1.221	1.271	1.299
210°	1.308	1.391	1.430	1.273	1.242	1.276	1.184
240°	1.322	1.419	1.440	1.149	1.187	1.260	1.152
270°	1.316	1.404	1.382	1.115	1.208	1.248	1.190
300°	1.336	1.431	1.380	1.148	1.206	1.203	1.142
330°	1.342	1.384	1.145	1.126	1.173	1.160	1.144

JOB ORDER\*\* 004954

ISO\*\* 1-FW-5 Rev 6 Item (A)

DATE: 2/4/87 TEMP: 278°F





## EROSION EVALUATION WORKSHEET

Unit No. 7

Years in service   //  

UT Reading Taken on: 1-30-87

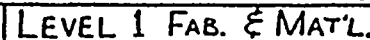
AEPSIC Installed Mat'l Class CS. ASTM A-106 GR.B SCH X-HVY

## COMMENTS

L <sup>1</sup>	34" <sup>HEADERS</sup> <del>BRANCH</del>	.625	.547	.703	.480	.639	0%	STILL WITHIN MANUFACTURERS REQUIRED TOLERANCE
L <sup>2</sup>	24" BRANCH	.500	.438	.563	.395	.519	0%	" " " " "



QC - J.O # - 004954  
CONST J.O # - 004952  
CONST J.O # - 004953



RAM TUGAS 140 400 158

SITE FAD PC MK MO

INSPECT: B, C, L or ANAL

[illegible]

LINE			
DESIGNATION	SPEC	QTY	UNIT
	D-91	2	PAIRS

PIPE: A-106 SML: SP.2  
16" TO 24" - ER HVY  
A-106 SCL-LO CLASS 15K-47  
FITTINGS: A-106 OR WPB (LW)  
2" FLANGES MATCH PIPE WALL  
1" & SMALLER 2000 SCL/W A-106

FRAGS

CHIEF ASST	BEND - ~ DIA
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	CNS	1960 delus map
11-5-71	B	REPSO BY NTS EXAMINER REP OWN 1960 DELUS SANDY

SEARCHED	INDEXED
SERIALIZED	FILED

6-12-4	224	General Encl. for Encl.
5-12-4	224	General Encl. for Encl.
224	224	General Encl. for Encl.

FILE NO. 12  
1-11-1950  
APPROVED BY  
DATE 12-16-54 11:15 AM

AKFA 174

SYSTEM: CONDENSATE

**SOUTHWEST FABRICATING  
& WELDING CO.**

8 WELDING CO.  
CHICAGO, ILL.

CUSTOMER: AMERICAN ELECTRIC CO.  
PHONE: 01778-831-1

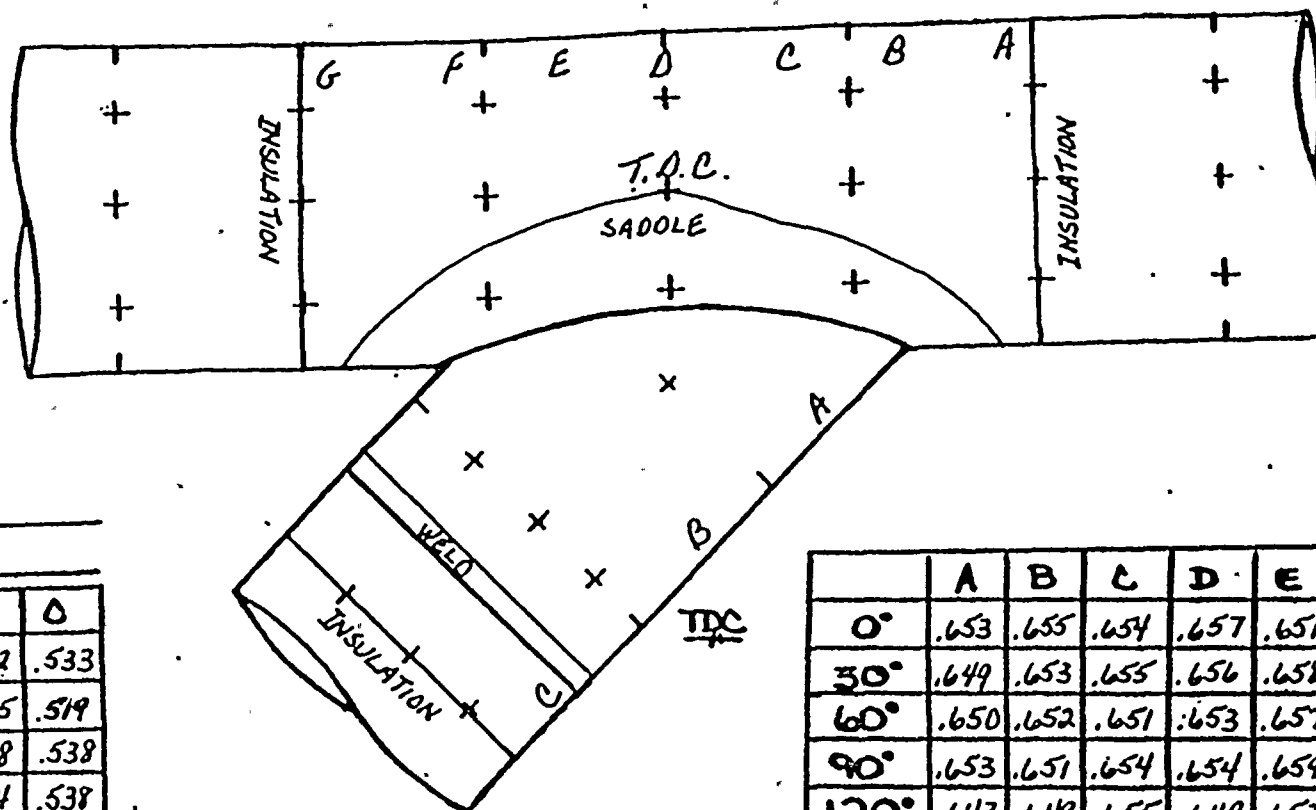
100-10230-1000-1-C-1, PRY.

**MATERIAL REQUIRED FOR  
UNCONTROLLED  
DOCUMENT**

DWG NO  
1-C-1, REV. 8



← FLOW



BRANCH  
CONNECTION

	A	B	0
0°	.946	.942	.533
30°	—	.955	.519
60°	—	.978	.538
90°	—	.964	.538
120°	—	.988	.532
150°	—	.982	.543
180°	1.017	.988	.521
210°	1.025	1.019	.531
240°	1.031	.992	.543
270°	1.025	.981	.541
300°	.981	.986	.542
330°	.986	.974	.542

24\*

ALL READING START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.

	A	B	C	D	E	F	G
0°	.653	.655	.654	.657	.651	.672	.650
30°	.649	.653	.655	.656	.658	.654	.652
60°	.650	.652	.651	.653	.657	.670	.649
90°	.653	.651	.654	.654	.659	.652	.650
120°	.643	.649	.655	.649	.653	.649	.652
150°	.640	.646	.650	.647	.651	.647	.650
180°	.639	.650	.655	.646	.660	.651	.649
210°	.668	.668	.663	—	.649	.645	.639
240°	.662	.667	—	—	—	.644	.647
270°	.662	—	—	—	—	—	.648
300°	.664	.664	—	—	—	.648	.656
330°	.658	.661	.661	—	.658	.667	.651

JOB ORDER# 004954

ISO# 1-C-1 REV. 8 ITEM (L)

DATE: 1-30-87 TEMP: 297°F.



D. C. COOK R

PLANT

## EROSION EVALUATION WORKSHEET

SER No. 88-84 (Steam)

Unit No. /

SER No. 23-85 (Water) X

Years in service //

UT Reading Taken on: 1-30-87

AEPSIC Installed Mat'l Class CS: ASTM A-106 GR.B X-MVY

(I.D.)

(I.D.)

Component	Description
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100	...

Original  
Wall Thk.

Original  
Thk. Range

Req'd  
Tmin

Lowest  
Reading

Percent Eroded

## COMMENTS

C	24" 90° FLL	.500	.438	.563	.395	.476	0%	STILL WITHIN MANUFACTURERS SPEC'D TOLERANCE
M	24" 90° FLL	.500	.438	.563	.395	.459	0%	-----



INSPECT: C, M, P, N

### SITE FIND PIECE MARKS

P.O. # PIECE MARKS

113

1

Notes

1) USE CRYSTAL 225-A COMPOUND ON ALL THREE CONT.

SUPPORT MARK NUMBERS  
SHOWN ARE FOR  
GENERAL AND SEQUENTIAL LOCATION  
OF SUPPORTS ONLY  
FOR EXACT LOCATIONS SEE PIPE  
SPECIFICATIONS

⊗ INDICATES LOCATION OF PIPE  
SUPPORT AND SUPPORT DETAIL  
NUMBER

7	4/5/65	RR RER	PER BPC-DC-12-1793 ADDED W. Y. BOODING & J. J. BOODING. REV. W. Y. BOODING & J. J. BOODING. ADDED SUPPORT DETAILS & SUPERSEDED BPC-DC-12-1793. REMS, TO REFLECT AS-BUILT CONDITIONS.	NO ACTION REQD.
6	4/11/71	HD	PER RFLC-11-1582 ADDED 2 EYEPASS AT VALVE ROOMS. FIELD AS-BUILT.	2011/11/11
5	5/8/71	J2 WLP	REVISED BY MFS DESIGN. ADDED INFORMATION FOR ORIGIN. REMS, TO REFLECT AS-BUILT CONDITIONS. REMS, TO REFLECT AS-BUILT CONDITIONS. REMS, TO REFLECT AS-BUILT CONDITIONS.	FIELD ACTION REQD.
4	6/17/71	ROC AS	REVISED BY MFS DESIGN. ADDED INFORMATION FOR ORIGIN. REMS, TO REFLECT AS-BUILT CONDITIONS. REMS, TO REFLECT AS-BUILT CONDITIONS. REMS, TO REFLECT AS-BUILT CONDITIONS.	FIELD ACTION REQD.
3	6/7/71		ADDED INFORMATION FOR ORIGIN. REMS, TO REFLECT AS-BUILT CONDITIONS. REMS, TO REFLECT AS-BUILT CONDITIONS. REMS, TO REFLECT AS-BUILT CONDITIONS.	FIELD ACTION REQD.
2	1/11/71		ADD R. MC'S, ISSUED RMC COMPT.	
1	1/1/71		ADDED BPC-12-1793 W. Y. BOODING & J. J. BOODING.	
REV.	DATE	CODE	DESCRIPTION	P.O. DWO

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN MICHIGAN  
UNIT NO. 1

A-53		A-900		A-220		A-913		SERIAL		DATE BY TC ON 1/1	
6										W/DO	
210	27	217	20	30	40	50	60	70	80	90	100
C	PTW	ANAL	ISO	QVAL	JOB	QVAL	CODE	DRAWING NO.			
1	210	210	210	210	210	210	210	1-C-2			
174		167		1005050							
DESCRIPTION										REV	COMPL.
CONDENSATE										1	1
REMARKS: PLASTIC BAG, BULKING VES.										2	2
TANK RELIEF - HYDRO - 85 -										3	3
WT. - HY. - P.T. - 101										4	4
SPEC. 0.51 all good 1.5000										5	5

T

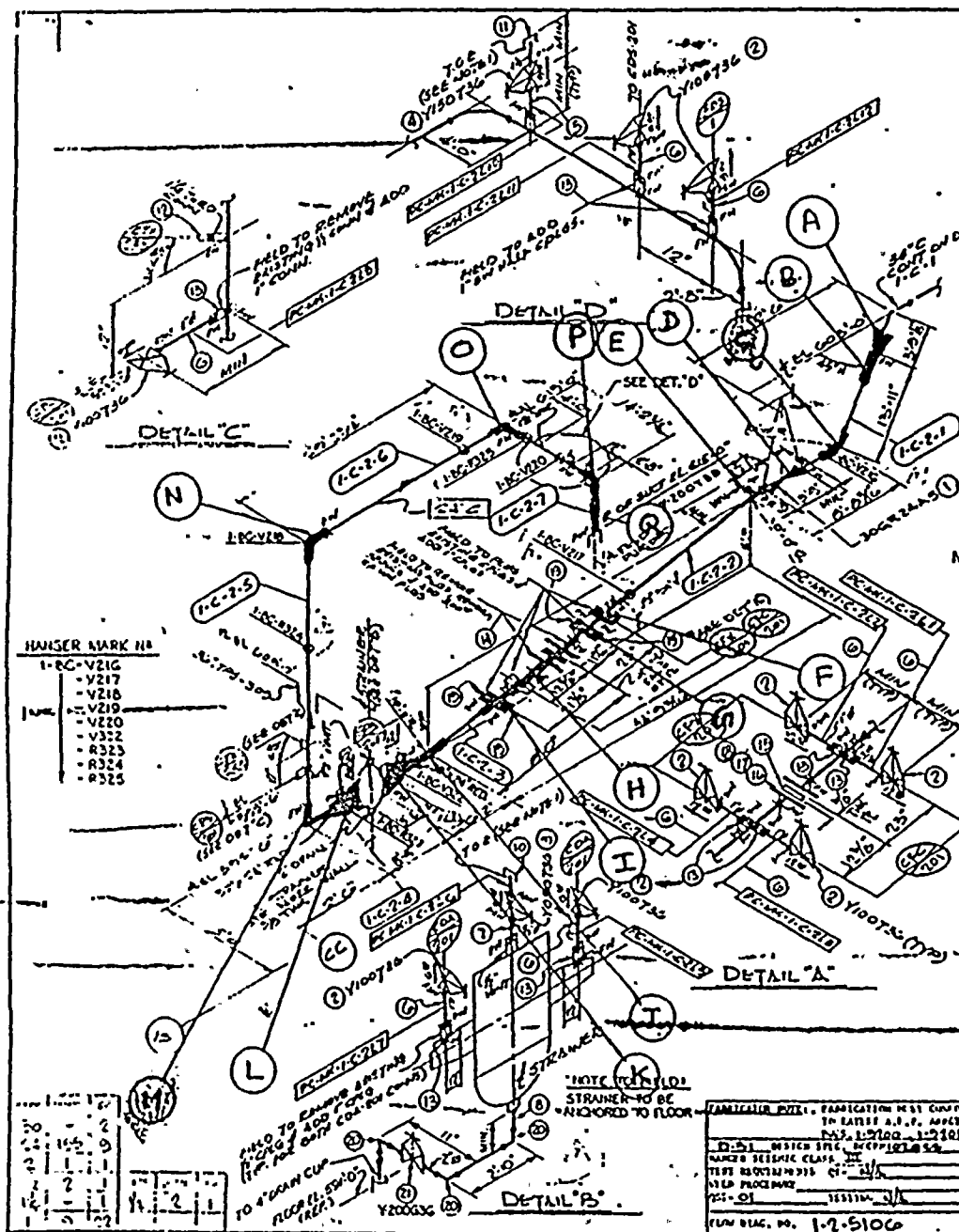
TUBECO

123 VALLEY AVENUE  
 BROOKLYN, N. Y. 11231

**MATERIAL REQUIRED FOR  
FIELD REWORK**

UNCONTROLLED  
DOCUMENT

DWG NO	REV
1-C-2	7





← FLOW

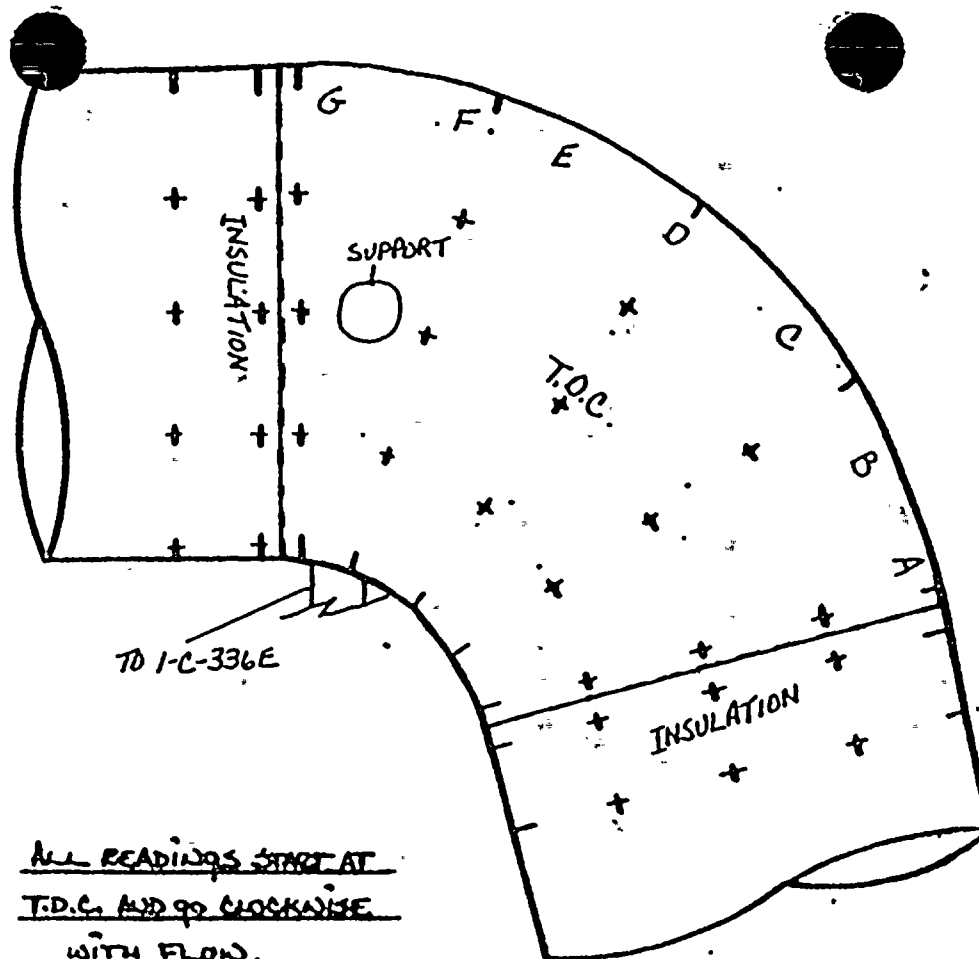
T.D.C.

	A	B	C	D	E	F	G
0°	.513	.520	.540	.530	.528	.528	.529
30°	.534	.540	.529	.521	.554	.549	.551
60°	.529	.550	.508	.522	.549	.564	.548
90°	.510	.527	.530	.559	.562	.538	.567
120°	.511	.537	.509	.533	.541	.520	.574
150°	.532	.547	.522	.549	.519	.518	.560
180°	.524	.535	.501	.540	.522	.534	.527
210°	.528	.518	.497	.529	.493	.526	.514
240°	.542	.530	.494	.518	.483	.507	.505
270°	.509	.512	.476	.505	.477	.480	.485
300°	.508	.515	.513	.511	.479	.480	.478
330°	.515	.537	.518	.490	.490	.487	.517

JOB ORDER\*\* 004954

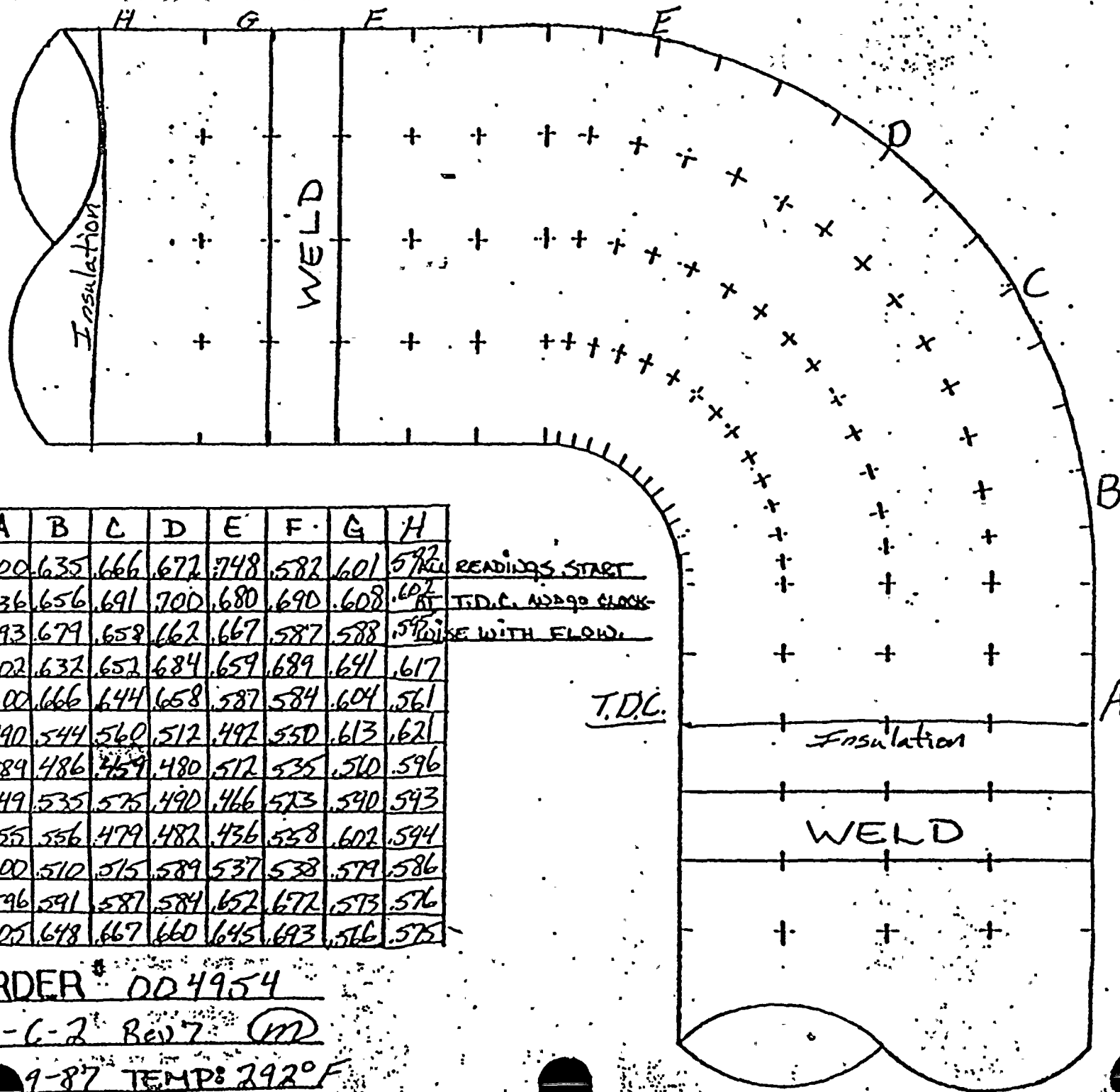
ISO\*\* 1-C-2 REV. 7 ITEM (C)

DATE: 1-30-87 TEMP: 307°F.





FLOW



	A	B	C	D	E	F	G	H
0°	700	635	666	672	748	582	601	592
30°	736	656	691	700	680	690	608	602
60°	693	679	658	662	667	587	588	590
90°	702	632	652	684	659	689	641	617
120°	600	666	644	658	587	584	604	561
150°	490	544	560	512	492	550	613	621
180°	589	486	459	480	512	535	510	596
210°	549	535	575	490	466	523	590	593
240°	455	556	479	482	436	558	602	594
270°	600	510	515	589	537	538	579	586
300°	596	591	587	584	652	672	573	576
330°	605	648	667	660	645	693	566	575

READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

T.D.C.

JOB ORDER # 004954

ISO# 1-C-2 Rev 7 (M)

DATE: 9-87 TEMP: 292°F



D. C. COOK 1

## PLANT

# EROSION EVALUATION WORKSHEET

AEPS Engineer: A.J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. 1

Evaluation Date: FEBRUARY 17, 1987

SER No. 23-85 (Water) Y

Years in service 11

UT Reading Transmitted on: 2-5-87

UT Reading Taken on: 1-16-87

Isometric Dwg. NO. FC-4, REV 0 Sh. 2 of 2

AEPSIC Installed Mat'l Class *CS: ASTM A106 GR B SCH 40*

Plant

(I.D.)

Component

Original

Original

Req'd

Lowest

Percent

Comp.

### Description

Wall Thk.

## Thk. Ränge

$$T_{\min}$$

## Reading

Eroded

## COMMENTS

F 20" STRAIGHT .500 .438-.563 .329 .525 0% STILL WITHIN MANUFACTURED REQUIRED TOLERANCE

\_\_\_\_\_

[illegible]

\_\_\_\_\_

\_\_\_\_\_

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	5
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[illegible][illegible][illegible][illegible][illegible]

*(continued)*

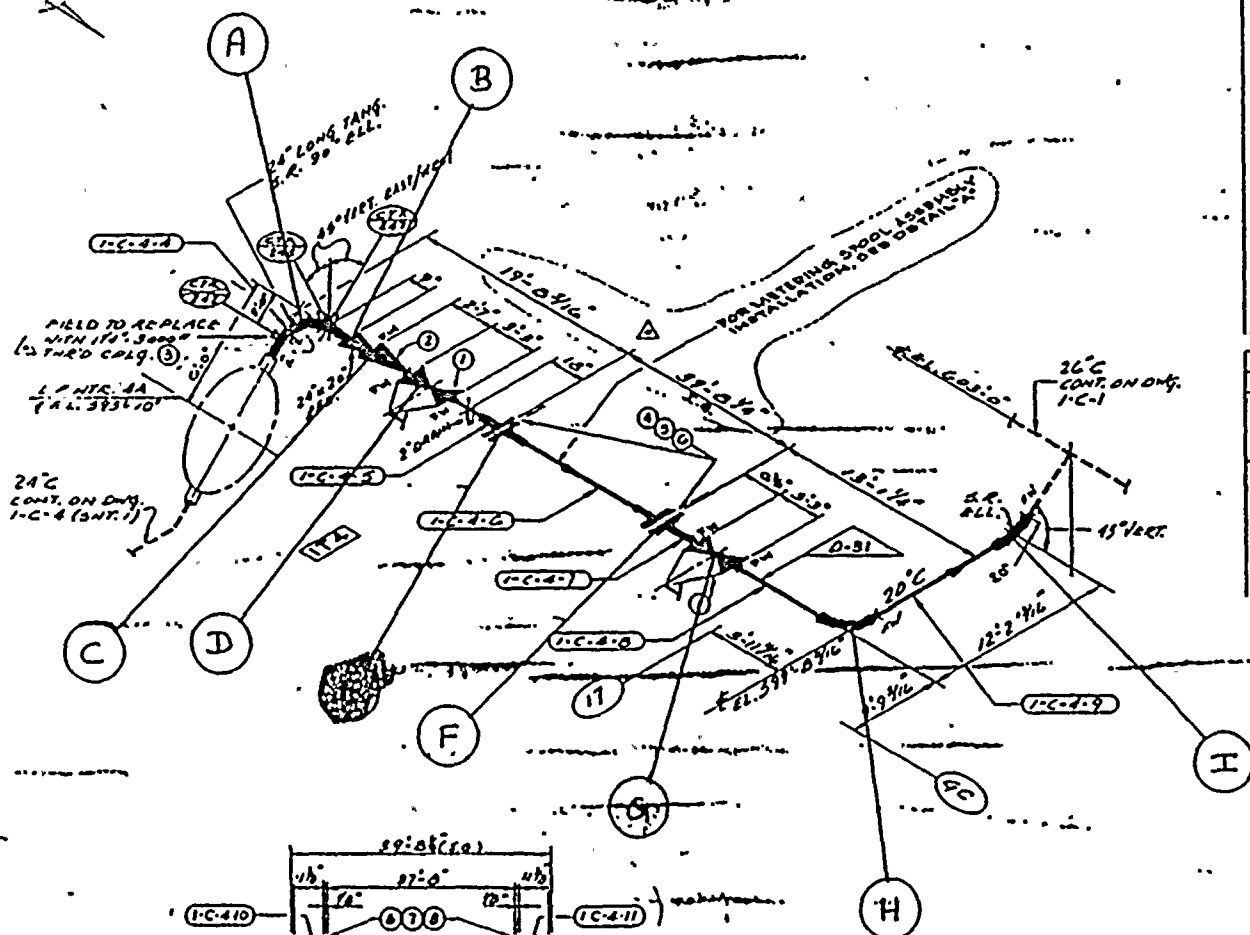


Q1 - 1.0 # 004954  
CONST - 1.0 # 004952  
1.0 # 004953

ISO SNT NO. 2042

[illegible]

UNCONTROLLED  
DOCUMENT



**DETAIL "A"** 

NOTE:  
1.5 + MATING SPOOL ASSEMBLY --  
AND PC MK. 1.5-4-40/1.5-4-41 ARE  
TO BE USED FOR UNIT #1 AND UNIT #2

P.O. "PIECE MARKS"

233 1-6-4-4

[illegible]

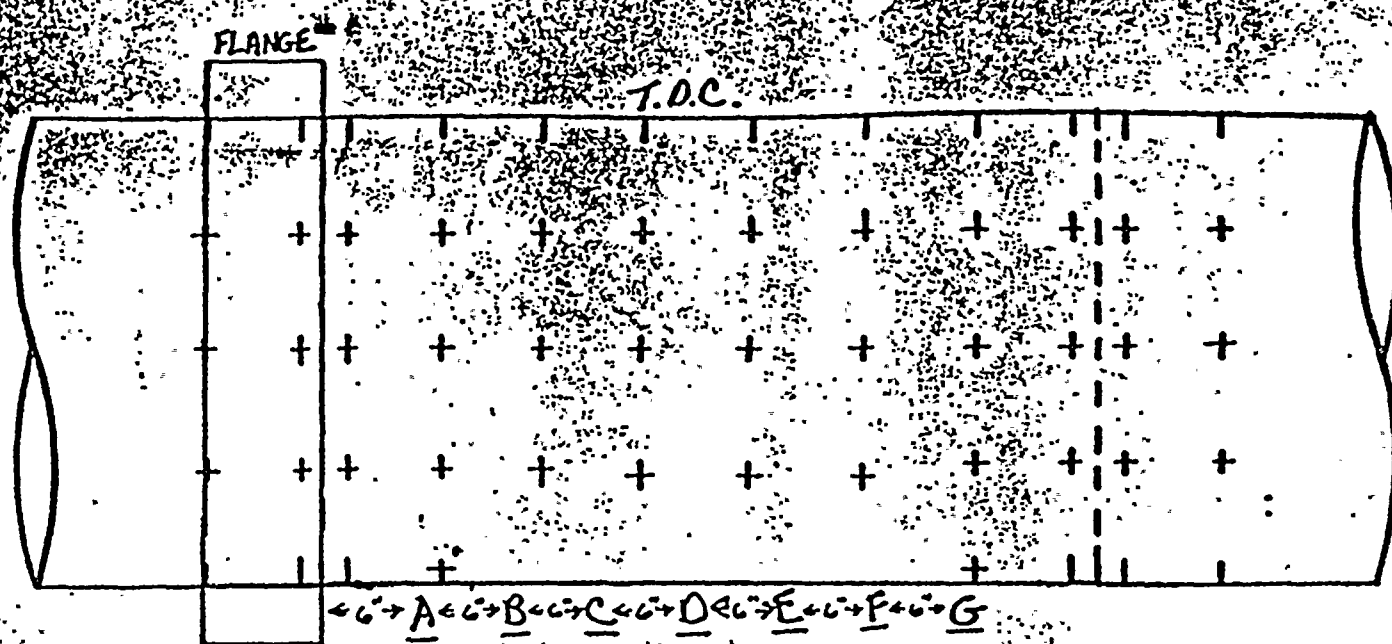
FOUR/ZONE No. 116 FLOW DIAGRAM J-5102A  
REQUIRED COMPLETION DATE \_\_\_\_\_ OSL 01  
PABRICATED BY PROACO WELDPROCEDURE CA-194CS-2

NPS DESIGNS INC. NEW YORK, N.Y.	IRVING & COMPANY, INC. INDIANA & MICHAEL ELECTRIC CO. DONALD C. COOK NUCLEAR PLANT
------------------------------------	--

FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRGT. DWGS.	DATE <i>REV</i>	DATE <i>12/16</i>	TURBINE BLDG	
	CHK <i>ENS</i>	DATE <i>6-72</i>	QWTS. NO.	REV
			<i>1-C-4</i>	<i>C</i>
			<i>11-1-52</i>	



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	.563	.569	.568	.573	.575	.580	.586
30°	.567	.576	.567	.511	.578	.577	.582
60°	.594	.590	.571	.572	.588	.579	.585
90°	.595	.591	.585	.577	.602	.584	.580
120°	.578	.587	.570	.576	.581	.583	.535
150°	.597	.597	.602	.563	.572	.574	.536
180°	.592	.594	.589	.588	.593	.575	.573
210°	.587	.532	.589	.589	.546	.578	.572
240°	.584	.573	.603	.587	.579	.587	.583
270°	.579	.566	.581	.584	.586	.577	.532
300°	.581	.573	.575	.578	.545	.571	.576
330°	.576	.571	.562	.571	.580	.573	.578

JOB ORDER # 004954

ISO # 1-C-4 SHT. 2 OF 2 REV. 0 (E)

DATE: 11/27/77 T.D.C. 202°C



D. C. COOK NUCLEAR PLANT  
EROSION EVALUAT. , WORKSHEET

AEPS Engineer: A.J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. /

Evaluation Date: FEBRUARY 17 1987

SER No. 23-85 (Water) X

Years in service //

UT Reading Transmitted on: 2-5-87

UT Reading Taken on: ~~4~~-16-87

Isometric Dwg. NO. 1-C-56 REV. 4

AEPSIC Installed Mat'l Class *ASTM-A106 GR.B X-NVY*

Plant

(I.D.)

Component

Original

Original

Req'd

Lowest

Percent

## COMMENTS

Comp.

### Description

Wall Thk.

Thk. Range

Trin

## Reading

Eroded

F 24" STRAIGHT .500 .438-.563 .395 .475 0% STILL WITHIN MANUFACTURERS REQ'D TOLERANCE



WEEK #15

CONTRACT # 004752  
J.O. # 004953

Q.L. - J.O. # 004953

# LEVEL 1 FAB. & MATL.

150 WPT 1001  
SITE FAB. PL. NIK. NO.  
I-C-56-11

INSPECT!

B, K, H, E AND 13K10

FIELD NOTE:  
STRAINER TO BE  
ANCHORED TO FLOOR

LINE	DESIGNATION	SPEC.	QUANTITY	UNIT	DATE
1	D-11	200' DIA.	1	AS	

LINE	DESIGNATION	SPEC.	QUANTITY	UNIT	DATE
1	D-11	200' DIA.	1	AS	

PIPE: A-106 3/4" O.D. B  
1/2" TO 24" - B.A. NUT.  
30" (1.500")  
FITTINGS: A-158 ORNIP (BW)  
1/2" FEMALE MATCH PIPE WALL  
A-158 3000" SCK/W  
FLANGES:  
300" WURE. A-181-I/II

CWART 1/2" BEND = 5 DIA. NUTS  
NOTES:

1/4	4	1/4" BPC-02-11-1133 NOTED A-158 3000" SCK/W (BW) 1/2" FEMALE MATCH PIPE WALL A-158 3000" SCK/W	NO	NO
1/4	3	1/4" BPC-02-11-1133 NOTED A-158 3000" SCK/W (BW) 1/2" FEMALE MATCH PIPE WALL A-158 3000" SCK/W	NO	NO
1/4	2	1/4" BPC-02-11-1133 NOTED A-158 3000" SCK/W (BW) 1/2" FEMALE MATCH PIPE WALL A-158 3000" SCK/W	NO	NO
1/4	1	1/4" BPC-02-11-1133 NOTED A-158 3000" SCK/W (BW) 1/2" FEMALE MATCH PIPE WALL A-158 3000" SCK/W	NO	NO

SYSTEM: CONDENSATE  
SOUTHWEST FABRICATING  
& WELDING CO.  
CUST. AMERICAN ELECTRIC POWER  
01772-471-1  
01772-471-1

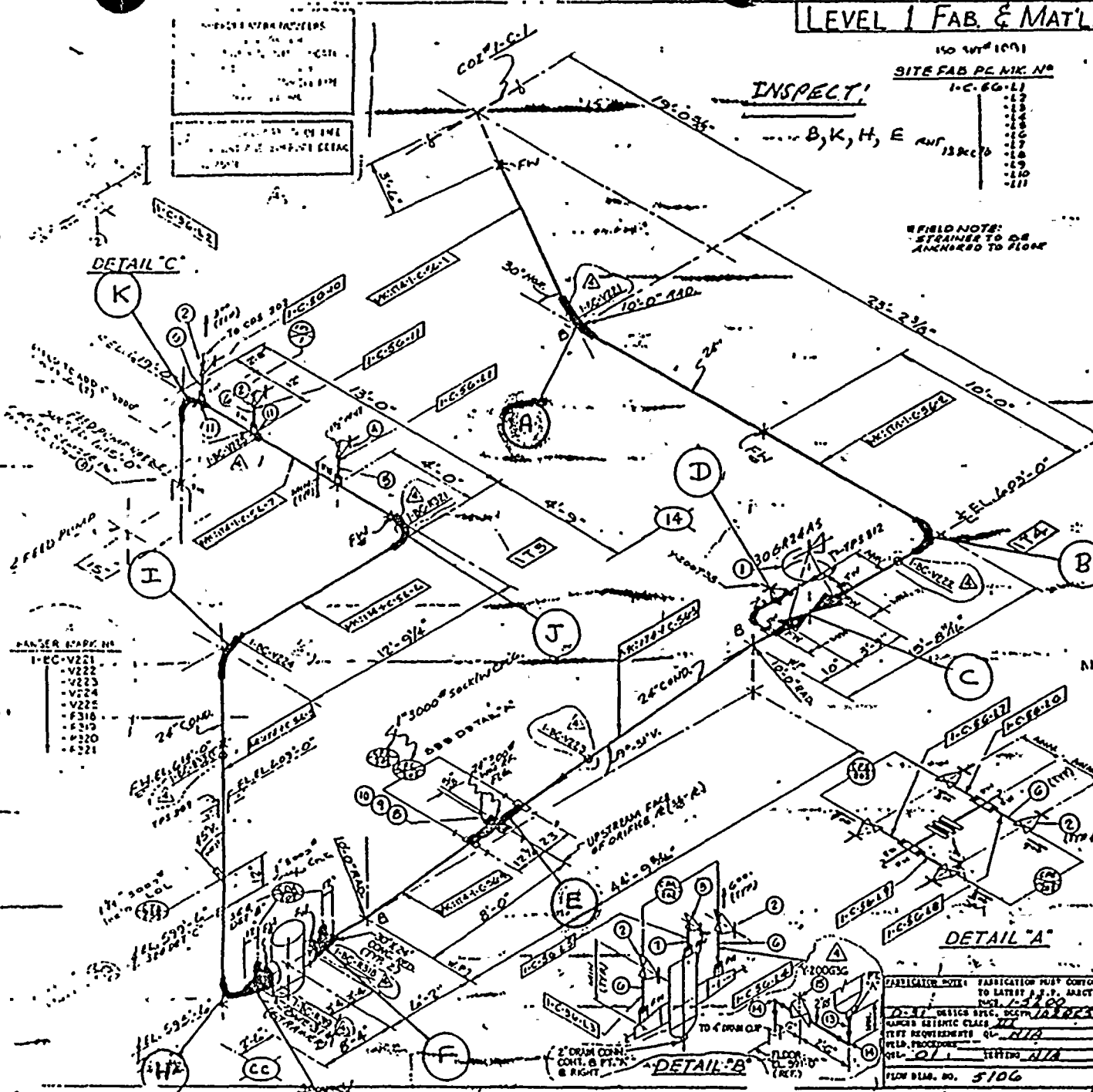
01772-471-1  
01772-471-1  
01772-471-1  
01772-471-1

MATERIAL REQUIRED FOR  
FIELD NETWORK  
UNCONTROLLED  
DOCUMENT

DWG NO  
I-C-56, REV. 4

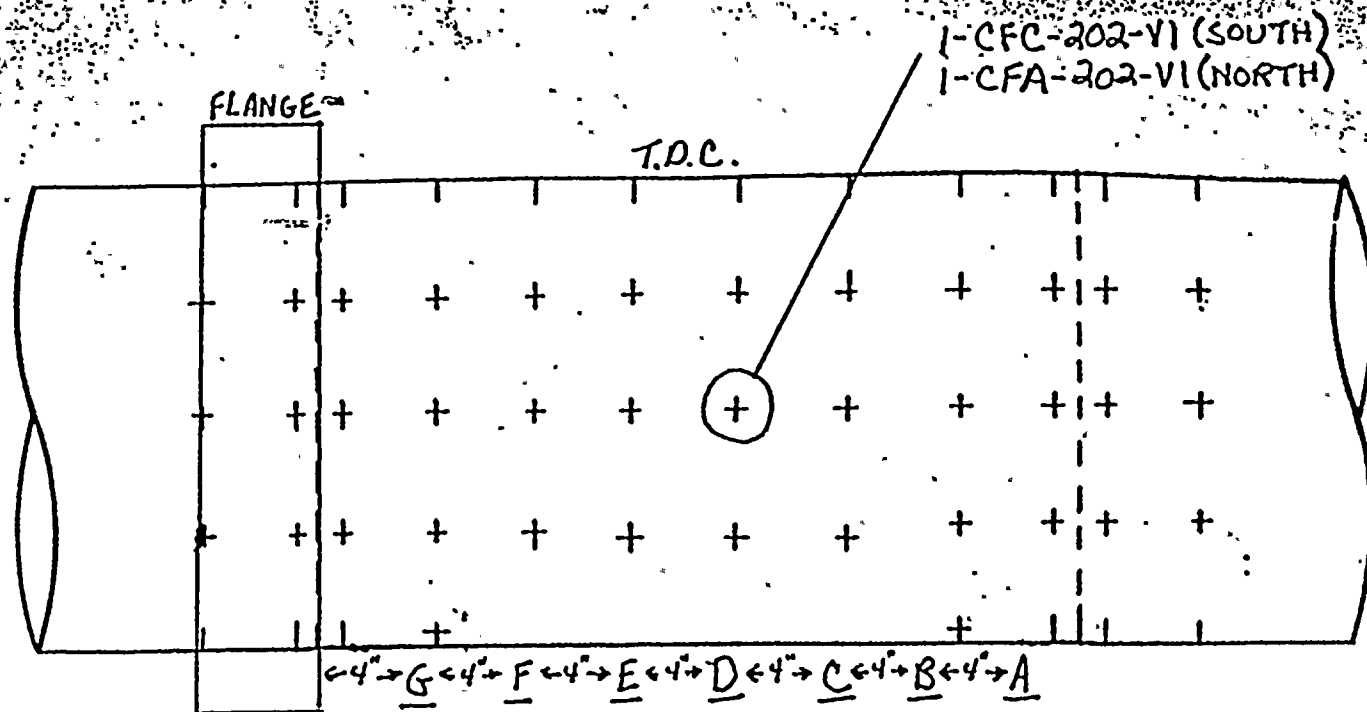
1	1" BPC-02-11-1133 NOTED A-158 3000" SCK/W (BW) 1/2" FEMALE MATCH PIPE WALL A-158 3000" SCK/W	NO	NO
2	1" BPC-02-11-1133 NOTED A-158 3000" SCK/W (BW) 1/2" FEMALE MATCH PIPE WALL A-158 3000" SCK/W	NO	NO
3	1" BPC-02-11-1133 NOTED A-158 3000" SCK/W (BW) 1/2" FEMALE MATCH PIPE WALL A-158 3000" SCK/W	NO	NO
4	1" BPC-02-11-1133 NOTED A-158 3000" SCK/W (BW) 1/2" FEMALE MATCH PIPE WALL A-158 3000" SCK/W	NO	NO

1	1" BPC-02-11-1133 NOTED A-158 3000" SCK/W (BW) 1/2" FEMALE MATCH PIPE WALL A-158 3000" SCK/W	NO	NO
2	1" BPC-02-11-1133 NOTED A-158 3000" SCK/W (BW) 1/2" FEMALE MATCH PIPE WALL A-158 3000" SCK/W	NO	NO
3	1" BPC-02-11-1133 NOTED A-158 3000" SCK/W (BW) 1/2" FEMALE MATCH PIPE WALL A-158 3000" SCK/W	NO	NO
4	1" BPC-02-11-1133 NOTED A-158 3000" SCK/W (BW) 1/2" FEMALE MATCH PIPE WALL A-158 3000" SCK/W	NO	NO





← FLOW



ALL READINGS START AT  
T.D.C. AND go CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	.575	.535	.557	.568	.569	.628	.585
30°	.516	.535	.596	.606	.607	.605	.604
60°	.497	.513	.528	.519	.568	.543	.563
90°	.576	.488	.481	.489	.515	.519	.475
120°	.490	.533	.522	.518	.519	.509	.518
150°	.501	.490	.538	.483	.525	.519	.528
180°	.583	.553	.493	.488	.533	.534	.553
210°	.584	.575	.570	.574	.578	.588	.584
240°	.614	.603	.594	.603	.615	.620	.578
270°	.635	.640	.615	.626	.625	.632	.634
300°	.611	.617	.621	.634	.682	.659	.647
330°	.623	.565	.525	.622	.642	.630	.637

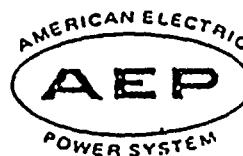
JOB ORDER # 004954

ISO # 156 REV. 4 (E)

DATE • 1.11.97 TEMP • 375°F



AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: FEBRUARY 5, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 1  
       Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. J. A. ~~Kayra~~ *THK 2/5/87*  
 2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on JANUARY 30, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation				
<u>I-FW-61, REV. 5</u>			<u>ACCEPTABLE, NO FURTHER EXAMINATIONS REQUIRED.</u>				
<u>Sh. 1 of 2</u>	<u>CS</u>	<u>E</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>      </u>	<u>CS</u>	<u>D</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>      </u>	<u>CS</u>	<u>C</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>I-FW-60, REV. 5</u>			<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>Sh. 1 of 2</u>	<u>CS</u>	<u>A</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>      </u>	<u>CS</u>	<u>B</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>      </u>	<u>CS</u>	<u>C</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>I-C-56, REV. 4</u>	<u>CS</u>	<u>A</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>      </u>							
<u>      </u>							
<u>      </u>							

A. J. Lewandowski  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 4.6.3.15.2.5.2

Sheet No. 1 of 1



## EROSION EVALUATION WORKSHEET

Unit No. 1

Years in service 11

UT Reading Taken on: 1-30-87

AEPSIC Installed Mat'l Class CS: A-106 GR.B SCH 80

[illegible]



CONST J.D. 245438,95839

CEN. STATION OFFICE NAME: MATERIAL DESCRIPTION				QUANTITY	REMARKS
01	1	3	CONTRACT VALVE	14V-244	
2	1	F	1500" 3W GATE VALVE C.S.	1100-03A	
3	1	F	3000" TAPER GSD C.S.	G.S.	
4	2	F	PIPE (SCH. 80) 30" C.S.	G.S.	
5	1	C	18" (SCH. 80) 2W C.S.	G.S.	
6	2	F	22" (SCH. 80) 2W C.S.	G.S.	
7	1	C	PIPE (SCH. 80) 30" C.S.	G.S.	
8	2	F	20" (SCH. 80) 2W C.S.	G.S.	
9	2	F	20" (SCH. 80) 2W C.S.	G.S.	
10	1	F	20" (SCH. 80) 2W C.S.	G.S.	
11	1	F	20" (SCH. 80) 2W C.S.	G.S.	
12	1	F	20" (SCH. 80) 2W C.S.	G.S.	

[illegible]

INSPECT, C, D, E RNT 7/12/76  
H RNT 7/12/76  
F, G, I, J RNT 23/2/77

HANGER AIRCRAFT

1E-IV. V23  
V34  
R86  
R87  
R91  
R93  
R95  
R96  
R98  
1-AFW- R90-  
1-AFW- R90-

NOTES : REFERENCE TO NEXT  
OUTLINE

**DRAWING APPROVED FOR**

CONTRACT NO.	PRE-ORDER DESIGN
BY <u>ARJ</u> DATE <u>2/72</u>	BY <u>GGG</u> DATE <u>5/72</u>
AMERICAN ELECTRIC POWER SYSTEM CORP.	

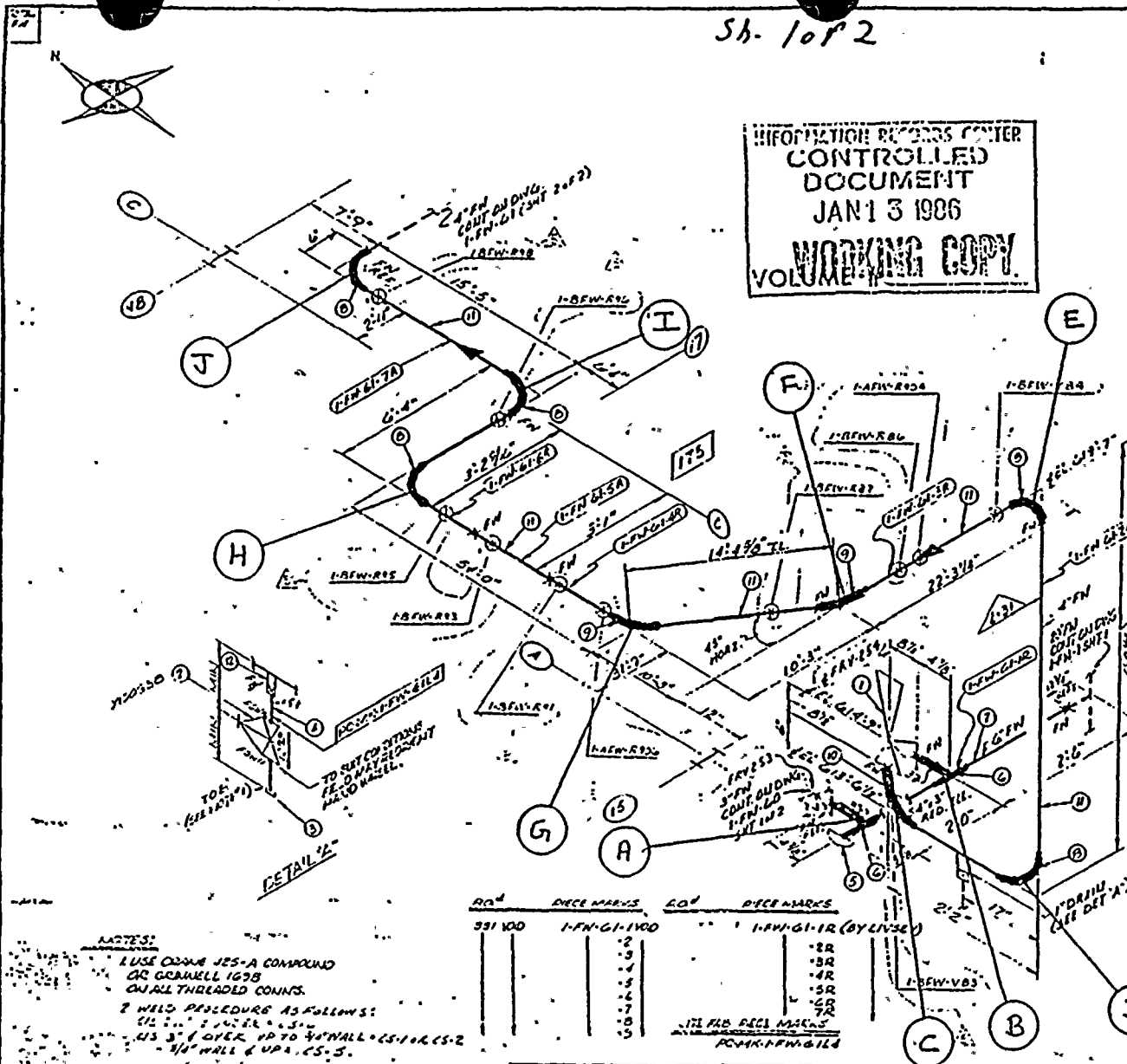
POURZONE No. 113 FLOW DIAGRAM L-310-2-L-351  
REQUIRED COMPLETION DATE Q51-01  
FABRICATED BY CNSBY WELD PROCEDURE SIF. 4112

NPS DESIGNS INC.  
NEW YORK, N.Y.

NEW YORK, NY.	JAN 10 1973	JAN 10 1973	JAN 10 1973	JAN 10 1973	JAN 10 1973
FABRICATOR NOTE:	JAN 10 1973	JAN 10 1973	JAN 10 1973	JAN 10 1973	JAN 10 1973

FABRICATION MUST  
CONFORM TO LATEST  
A.E.P. ARRG. DWGS.

1.



**NOTES:**

- USE ONLY J25-A COMPOUND
- OR GRANELL 1678
- ON ALL THREADED CONNS.

2. WELD PROCEDURE AS FOLLOWS:  
 1/2" ...  
 1/2" ...  
 1/2" ...

<u>RD</u>	<u>PICR MARKS</u>	<u>LD</u>	<u>PICR MARKS</u>
331 100	1-FN-GI-1000	" "	1-FN-GI-100 (BY LVS)
	.2		.2R
	.3		.3R
	.4		.4R
	.5		.5R
	.6		.6R
	.7		.7R
	.8		
	.9		
			LIFE LAB. PICR MARKS

17E FLB DECS MARKS  
PCVAX-PFW-6128

[illegible]

ՀԻՊԴՐՔԻ ԱԿՏԻ ՄՈՒԾՆՈՒԹՅՈՒՆ

**System 10:**

154:23:1' 154:10C

[illegible]

3. Of 2000 calls, 1000 were answered.

ਅੰਕ ੧੫-੧ : ਪ੍ਰਤੀਨਿਧਤਾ ਅਤੇ

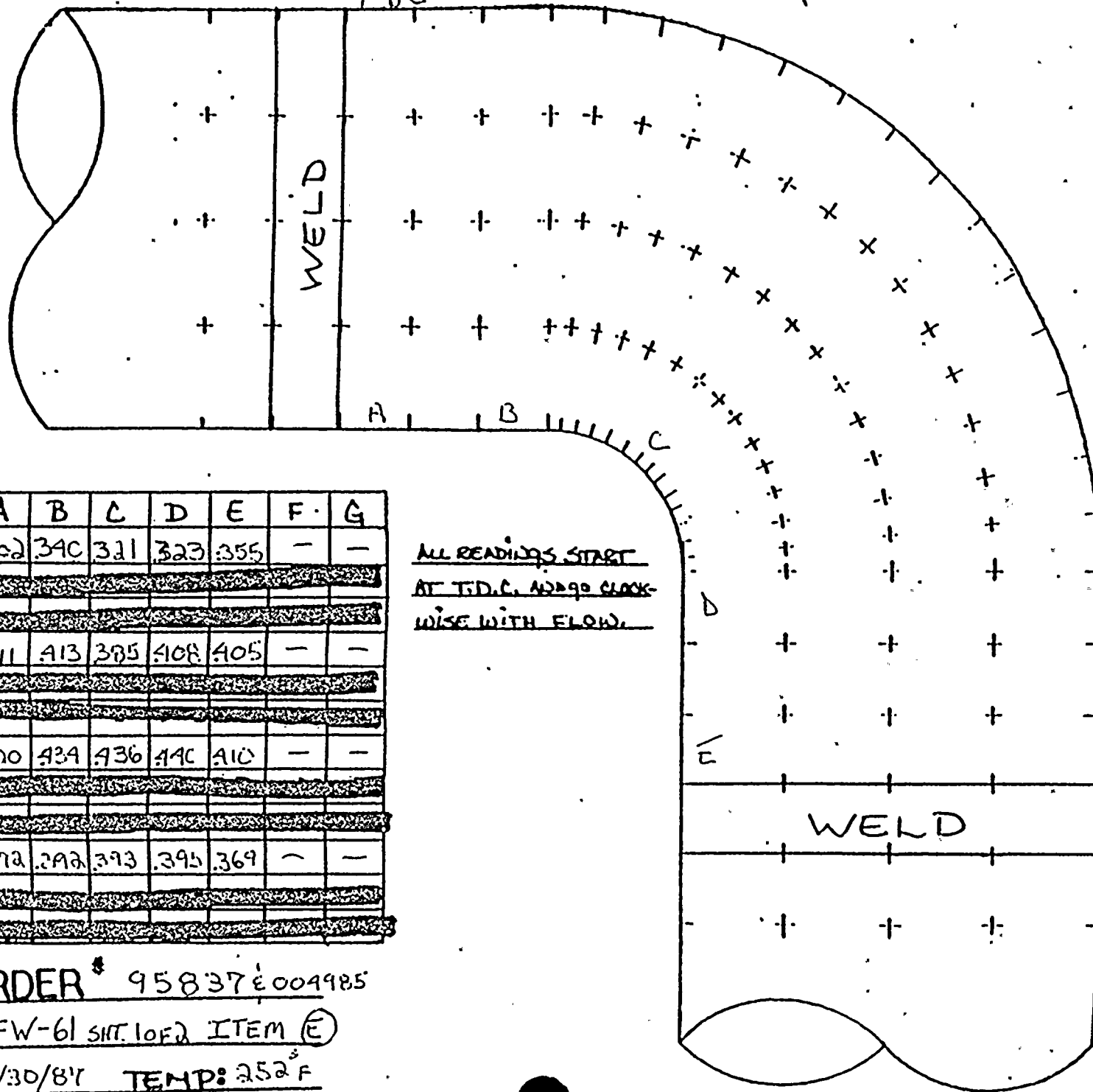
5045.1162174

\_\_\_\_\_

INDICATES LOCATION OF THE  
SUPPORT AND SUPPORT DETAIL  
NUMBER.



← FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	302	340	321	323	355	—	—
90°	411	413	385	408	405	—	—
180°	420	434	436	440	410	—	—
270°	372	292	373	395	369	—	—

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

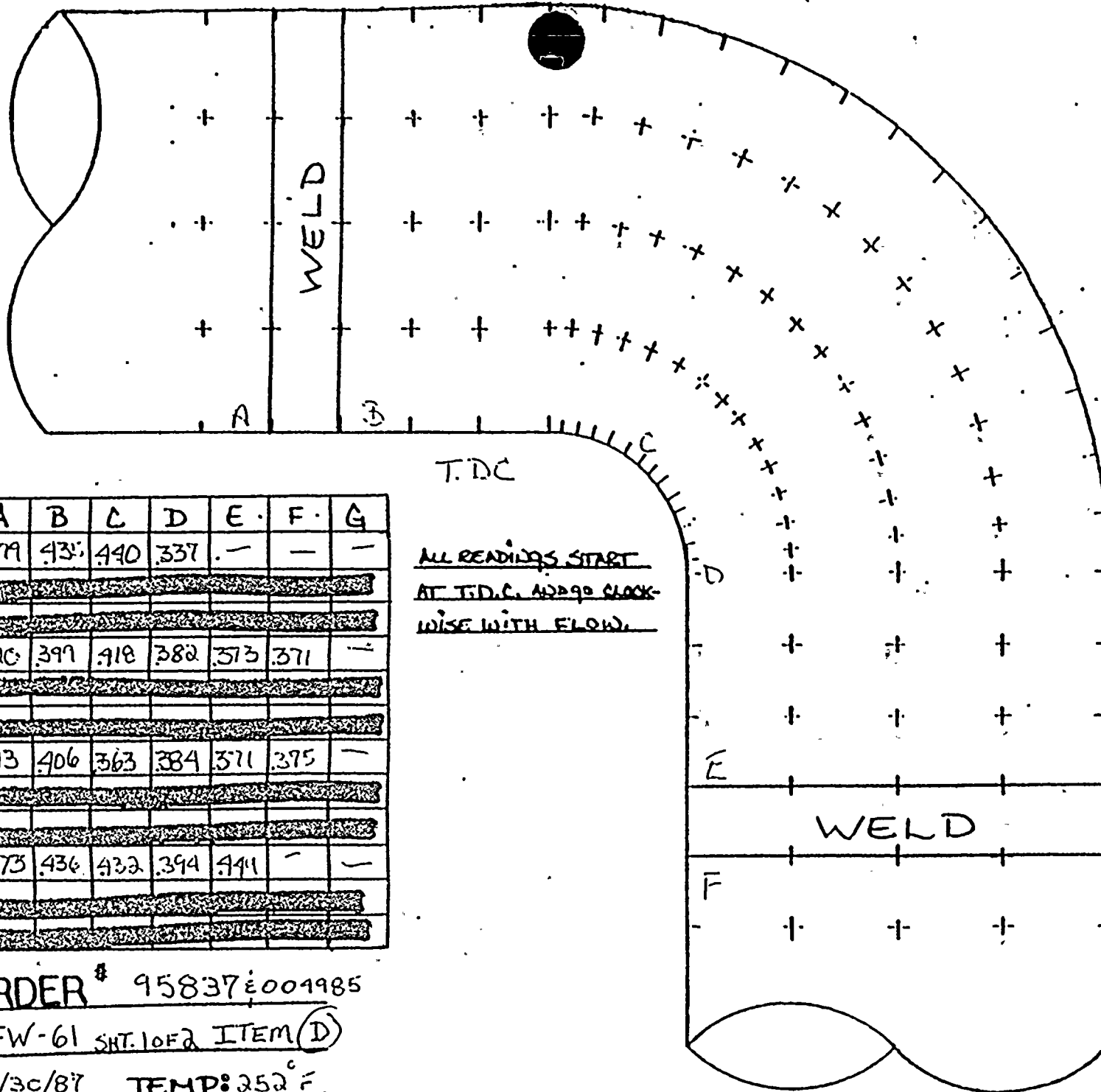
JOB ORDER # 95837E004985

ISO# 1-FW-61 SHT. 1 OF 2 ITEM (E)

DATE: 1/30/87 TEMP: 252°F



FLOW →



T.D.C

	A	B	C	D	E	F	G
0°	379	435	440	337	—	—	—
90°	420	399	418	382	373	371	—
180°	413	406	363	384	371	375	—
270°	373	436	432	394	411	—	—

T.D.C

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

E

WELD

F

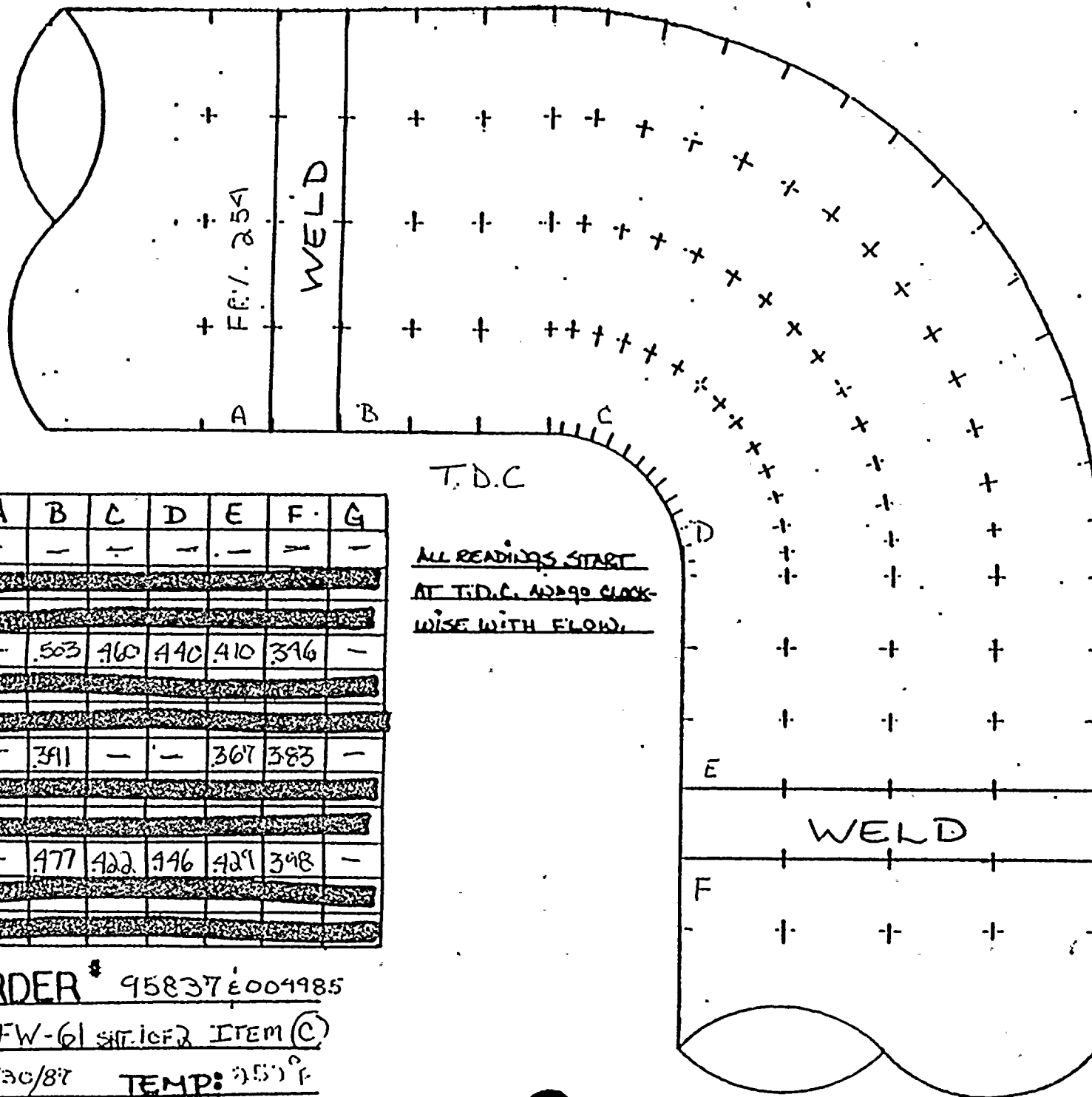
JOB ORDER # 95837E004985

ISO # 1-FW-61 SHT. 1 OF 2 ITEM (D)

DATE: 1/30/87 TEMP: 252°F



FLOW →



T.D.C

	A	B	C	D	E	F	G
0°	-	-	-	-	-	-	-
90°	-	503	460	440	410	396	-
180°	-	391	-	-	307	383	-
270°	-	477	422	446	429	398	-

T.D.C

ALL READINGS START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.

JOB ORDER # 95837 E 004985

ISO # 1-FW-61 SIT. ICF2 ITEM (C)

DATE: 1/30/87 TEMP: 250° F



# EROSION EVALUATION WORKSHEET

Unit No. 1

Years in service 11

UT Reading Taken on: 1-30-87

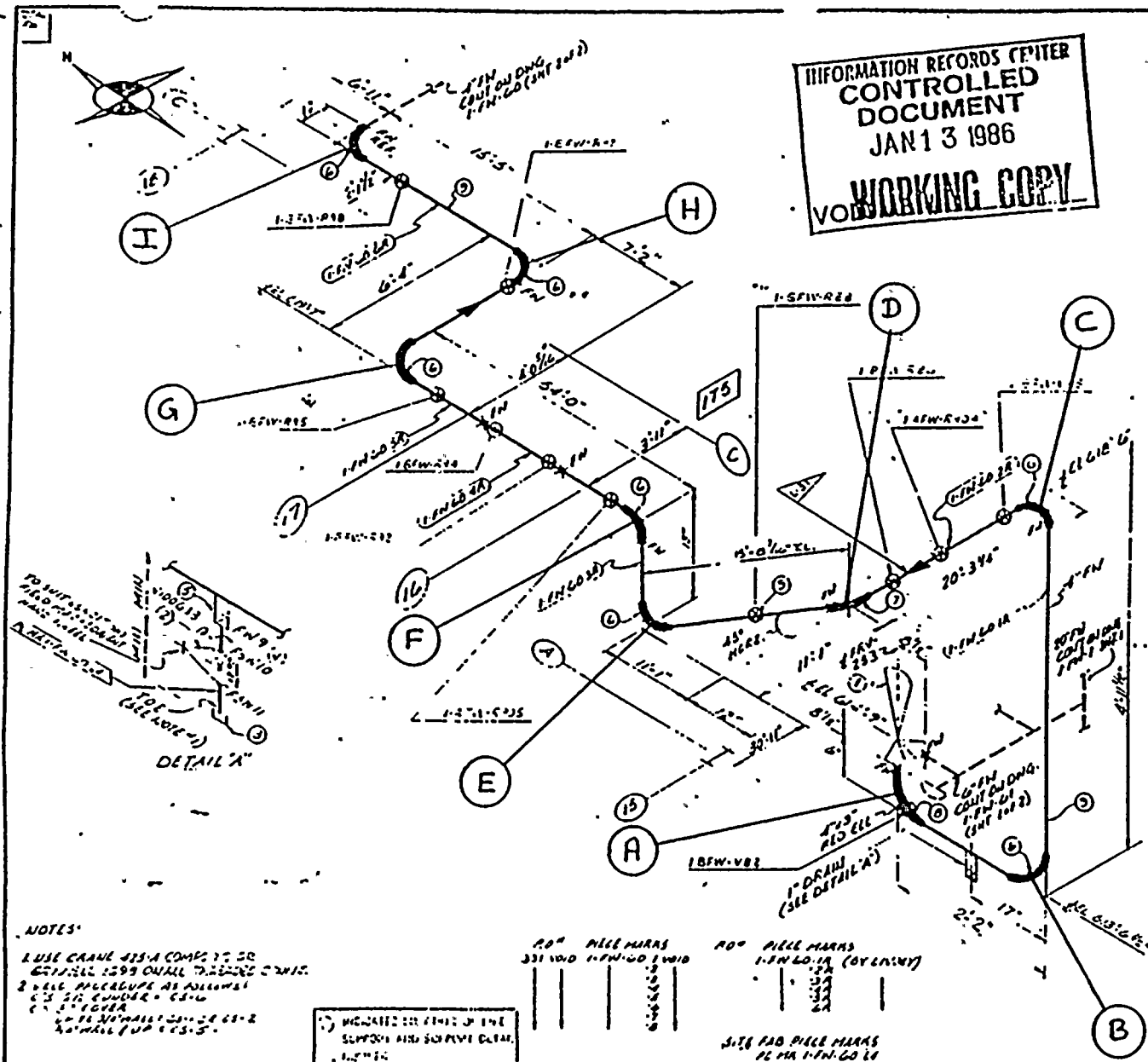
AEPSIC Installed Mat'l Class CS: A-106, GR. B, SCH. 80

Plant

[illegible]



INFORMATION RECORDS CENTER  
CONTROLLED  
DOCUMENT  
JAN 13 1986  
WORKING COPY



NO.	QTY.	UNIT	MATERIAL DESCRIPTION	REMARKS
01	1	1.3"	CONTR. VALVE	FR-233
2	1	1.550" SW 5/8" I.D.	505	FR-233
3	1	1.350" I.D. 1/2"	505	FR-233
4	1	1.350" I.D. 1/2"	505	FR-233
5	1	1.350" I.D. 1/2"	505	FR-233
6	1	1.350" I.D. 1/2"	505	FR-233
7	1	1.350" I.D. 1/2"	505	FR-233
8	1	1.350" I.D. 1/2"	505	FR-233
9	1	1.350" I.D. 1/2"	505	FR-233

1-FW-60 Sh. 1 of 2

NO.	REV.	DESCRIPTION	REMARKS
1	1	ISSUED FOR CONSTRUCTION	FIELD
2	1	REVISION TO DRAWING	FIELD
3	1	REVISION TO DRAWING	FIELD
4	1	REVISION TO DRAWING	FIELD
5	1	REVISION TO DRAWING	FIELD

INSPECT: A, B, C AND 7/12/86  
G AND 7/12/86

1-FW-60  
Sh. 1 of 2

NOTES: REPLACE 'A' NEXT OUTAGE

NOTES:  
1. USE CRANE 415-A COMPTON CO.  
2. USE CRANE 1299 ON ALL TOWER CRANE.  
3. USE CRANE 1299 ON ALL TOWER CRANE.  
4. USE CRANE 1299 ON ALL TOWER CRANE.  
5. USE CRANE 1299 ON ALL TOWER CRANE.

NO.	REV.	DESCRIPTION	REMARKS
1	1	ISSUED FOR CONSTRUCTION	FIELD
2	1	REVISION TO DRAWING	FIELD
3	1	REVISION TO DRAWING	FIELD
4	1	REVISION TO DRAWING	FIELD
5	1	REVISION TO DRAWING	FIELD

DRAWING APPROVED FOR

REV.	DATE	BY
1	1/1/86	1
2	1/1/86	2
3	1/1/86	3

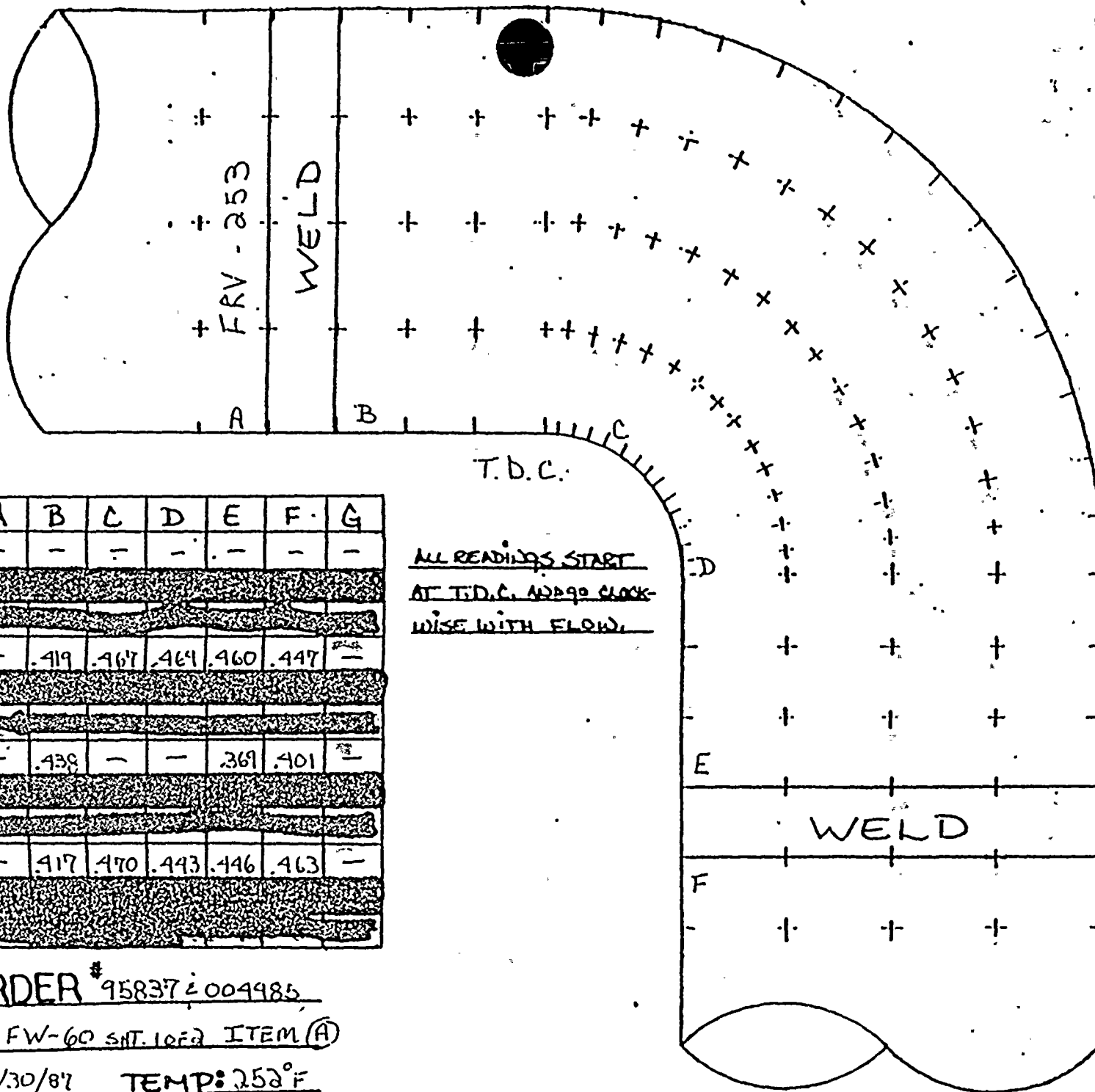
1. USE CRANE 415-A COMPTON CO.  
2. USE CRANE 1299 ON ALL TOWER CRANE.  
3. USE CRANE 1299 ON ALL TOWER CRANE.  
4. USE CRANE 1299 ON ALL TOWER CRANE.  
5. USE CRANE 1299 ON ALL TOWER CRANE.

NO.	REV.	DESCRIPTION	REMARKS
1	1	ISSUED FOR CONSTRUCTION	FIELD
2	1	REVISION TO DRAWING	FIELD
3	1	REVISION TO DRAWING	FIELD
4	1	REVISION TO DRAWING	FIELD
5	1	REVISION TO DRAWING	FIELD

NO.	REV.	DESCRIPTION	REMARKS
1	1	ISSUED FOR CONSTRUCTION	FIELD
2	1	REVISION TO DRAWING	FIELD
3	1	REVISION TO DRAWING	FIELD
4	1	REVISION TO DRAWING	FIELD
5	1	REVISION TO DRAWING	FIELD



FLOW →



T.D.C.

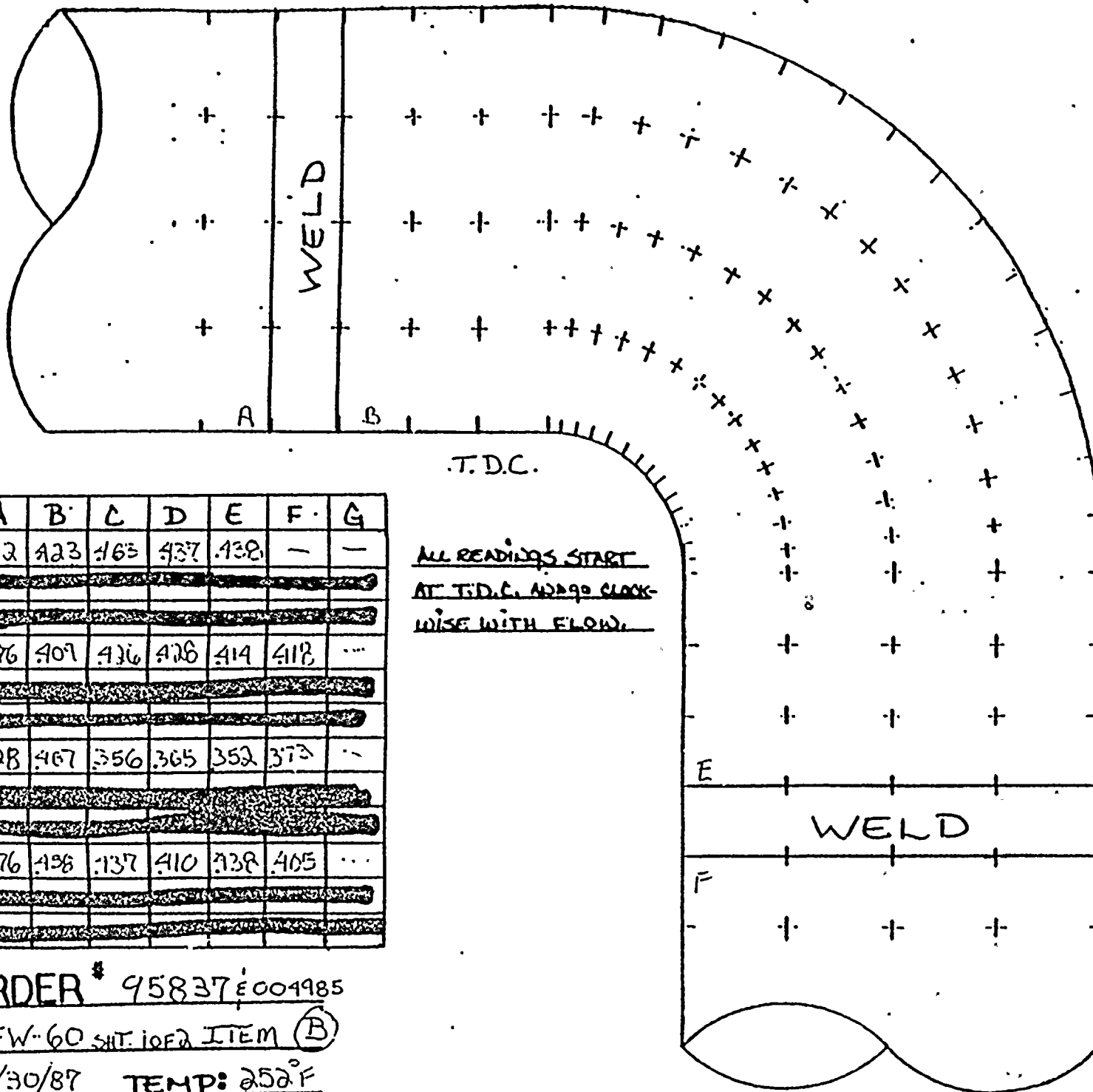
	A	B	C	D	E	F	G
0°	-	-	-	-	-	-	-
90°	-	.419	.467	.464	.460	.447	-
180°	-	.438	-	-	.369	.401	-
270°	-	.417	.470	.443	.446	.463	-

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

JOE ORDER # 95837 & 004985  
ISO # 1-FW-60 SHT. 1 OF 2 ITEM (A)  
DATE: 1/30/87 TEMP: 252°F



FLOW →



T.D.C.

	A	B	C	D	E	F	G
0°	412	423	463	437	438	—	—
90°	376	407	436	426	414	418	—
180°	428	467	356	365	352	373	—
270°	376	438	437	410	438	405	—

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

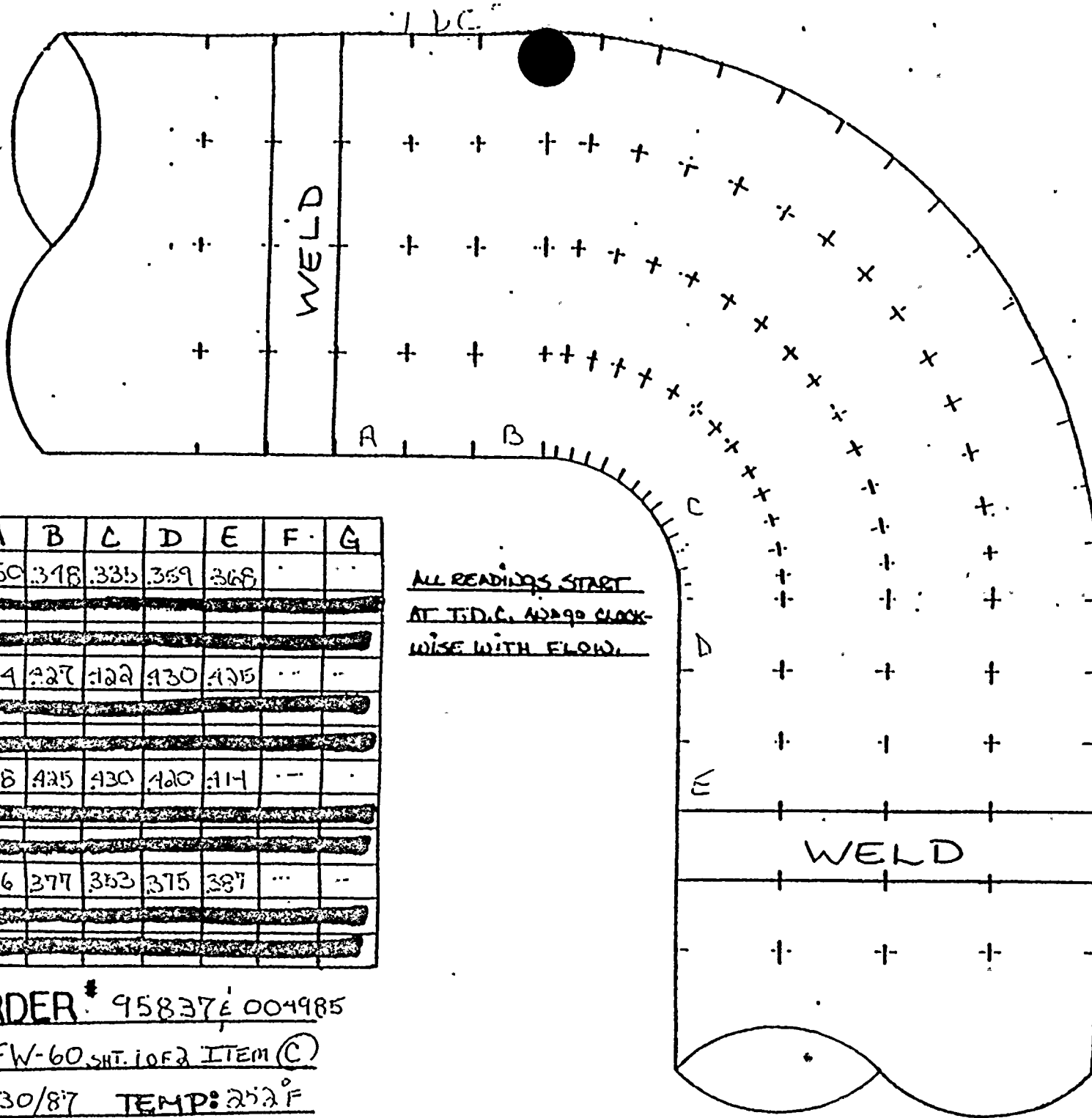
JOE ORDER # 95837 004985

ISO # 1-FW-60 SHIT. 10F2 ITEM (B)

DATE: 1/30/87 TEMP: 252°F



← FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	350	348	335	359	368		
30°							
60°							
90°	414	427	422	430	425		
120°							
150°							
180°	328	425	430	420	414		
210°							
240°							
270°	386	377	353	375	387		
300°							
330°							

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

JOB ORDER # 95837E 004985

ISO# 1-FW-60 SHT. 1 OF 2 ITEM (C)

DATE: 1/30/87 TEMP: 252°F



# EROSION EVALUATION WORKSHEET

Years in service //

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
A	24" 30° BEND	.500	.438 ~ .563	.395	.462	0%	STILL WITHIN MANUFACTURERS REQUIRED TOLERANCE

COMMENTS







← FLOW

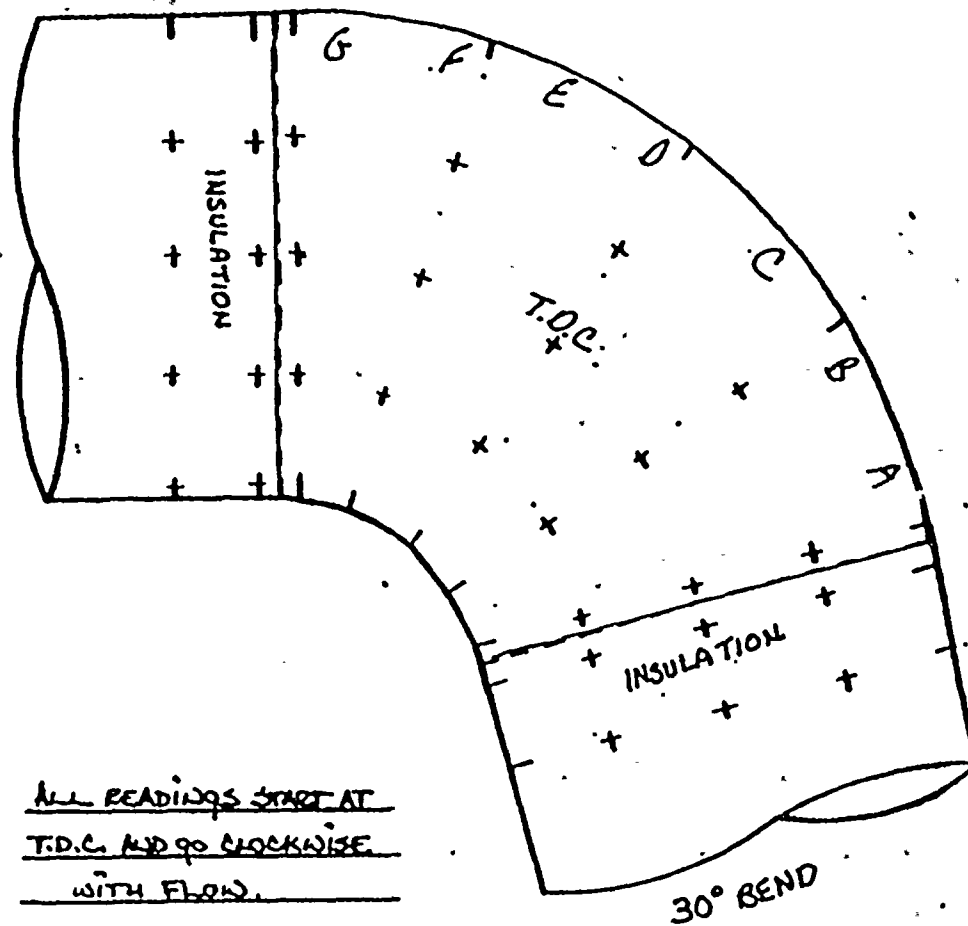
T.D.C.

	A	B	C	D	E	F	G
0°	.473	.490	.483	.470	.530	.524	.545
30°	.470	.485	.481	.484	.535	.523	.546
60°	.462	.488	.480	.471	.537	.512	.554
90°	.481	.481	.476	.467	.532	.515	.531
120°	.466	.516	.467	.474	.513	.517	.536
150°	.473	.496	.478	.498	.523	.533	.531
180°	.510	.486	.497	.534	.528	.543	.526
210°	.520	.497	.525	.537	.534	.544	.526
240°	.529	.522	.534	.533	.540	.560	.515
270°	.520	.519	.524	.549	.544	.549	.534
300°	.524	.517	.520	.520	.529	.538	.537
330°	.498	.510	.513	.495	.522	.530	.534

JOB ORDER\*\* 004964

ISO\*\* 1-C-56 REV. 4 ITEM (A)

DATE: 1-29-87 TEMP: 344°F





AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: JANUARY 28, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 1  
 Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO:

1. J. A. ~~Kobyra~~ *1/28/87*  
 2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on JANUARY 28, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation				
<u>1-FW-15</u>	<u>CS</u>	<u>B</u>	<u>ACCEPTABLE; NO FURTHER EXAMINATION REQUIRED</u>				
<u>REV. 15</u>	<u>CS</u>	<u>B</u>	"	"	"	"	"
<u>1-FW-17</u>	<u>CS</u>	<u>B</u>	"	"	"	"	"
<u>REV. 12</u>	<u>CS</u>	<u>B</u>	"	"	"	"	"
<u>1-C-1</u>	<u>CS</u>	<u>BRANCH</u>	"	"	"	"	"
<u>REV. 8</u>	<u>CS</u>	<u>B</u>	"	"	"	"	"
	<u>CS</u>	<u>MAIN LINE</u>	"	"	"	"	"
	<u>CS</u>	<u>C</u>	"	"	"	"	"
	<u>CS</u>	<u>D</u>	"	"	"	"	"
	<u>CS</u>	<u>BRANCH</u>	"	"	"	"	"
	<u>CS</u>	<u>D</u>	"	"	"	"	"
	<u>CS</u>	<u>MAIN LINE</u>	"	"	"	"	"
	<u>CS</u>	<u>BRANCH</u>	"	"	"	"	"
	<u>CS</u>	<u>L</u>	"	"	"	"	"
	<u>CS</u>	<u>MAIN LINE</u>	"	"	"	"	"
	<u>CS</u>	<u>L</u>	"	"	"	"	"

A. J. Lewandowski  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 4.6.3.15.2.5.2

Sheet No. 1 of 1



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

NEPSC Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. /

RE- Evaluation Date: SEPTEMBER 17, 1987

SER No. 23-85 (Water) X

Years in service //

UT Reading Transmitted on: N/A

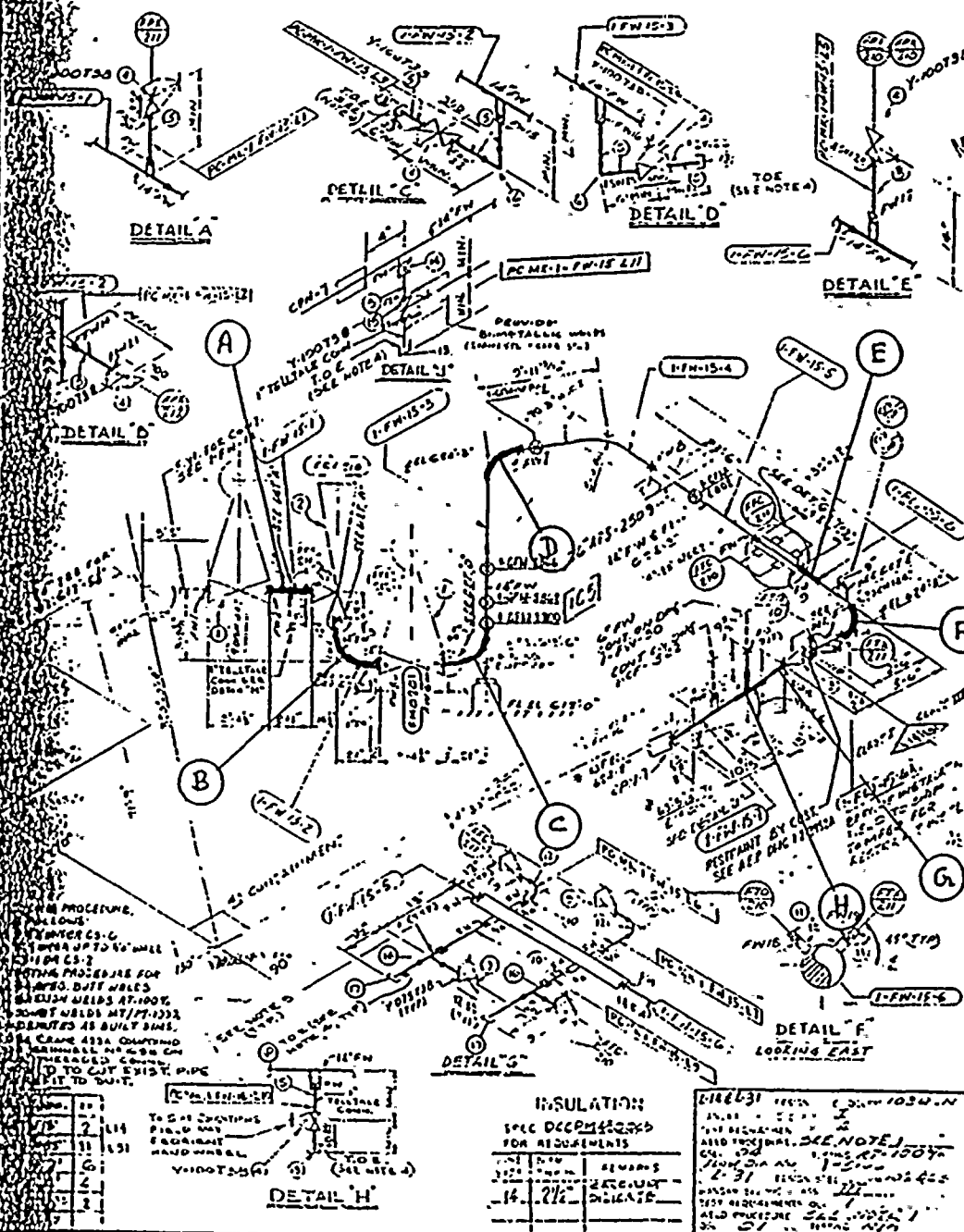
UT Reading Taken on: 1-22-87

Isometric Dwg. NO. 1-FW-15 REV.15

NEPSC Installed Mat'l Class L-31: ASTM A-106 GR B

[illegible]



[illegible]

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN MICHIGAN  
UNIT NO. 1

A-33	A-106	A-325	A-342	I	-SMLS	CWN BYT C	CM T55				
SIG	37	217110	30	30	40	60	100	170	160	160	WBLD
C	PRIO	AAEA-150	OVAN	J	JOB	DWG	CODE	APRD	CM		
	0000	000000	000000	0000	0000	0000	0000	0000	0000	0000	0000
005050											
DESCRIPTION											
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400 410 420 430 440 450 460 470 480 490 500 510 520 530 540 550 560 570 580 590 600 610 620 630 640 650 660 670 680 690 700 710 720 730 740 750 760 770 780 790 800 810 820 830 840 850 860 870 880 890 900 910 920 930 940 950 960 970 980 990 1000											
P = 0000 PIP = 0000 LANA = 0000											
PARTS BLAST BACK RMG											
250 RELEASE NYORO RT.											
UT. 77 PR RT.											
000000 RT. RMG PR RT.											

TUBECO INC.

1223 VARIER AVENUE  
ROCKFORD, ILL. 61117

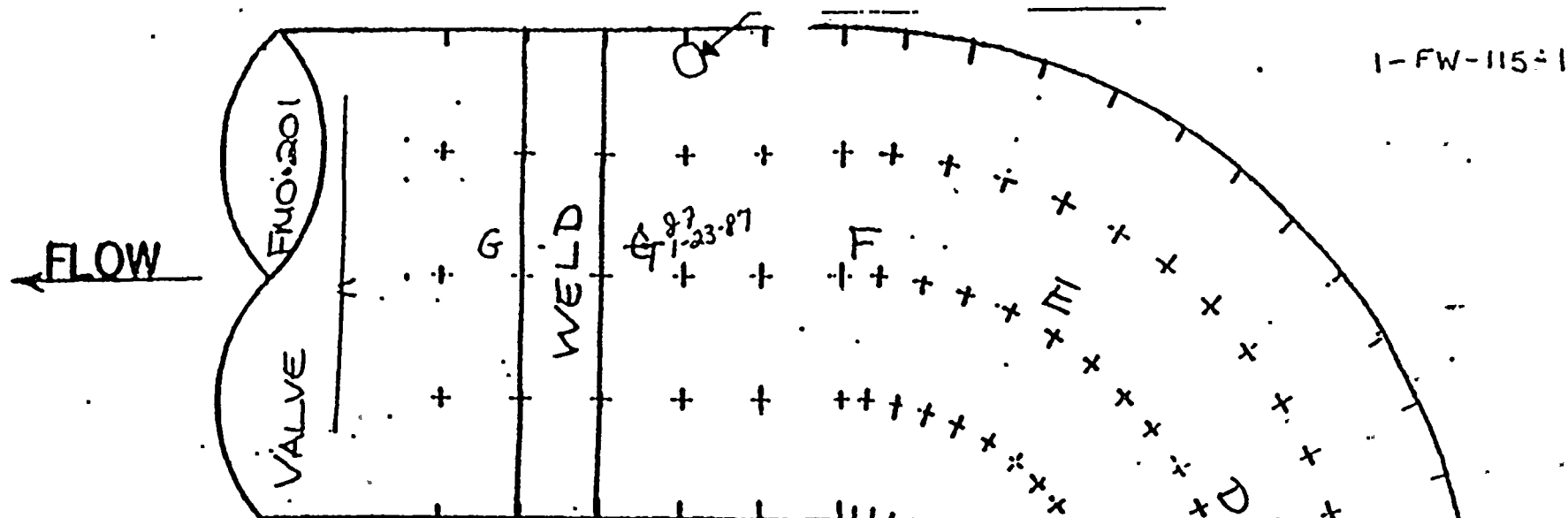
~~UNCONTROLLED  
DOCUMENT~~

**MATERIAL REQUIRED FOR  
FIELD REPAIR**

**DRAWING APPRENTICE . . .**

DWG NO  
1-FW-15 REV. 15





DC

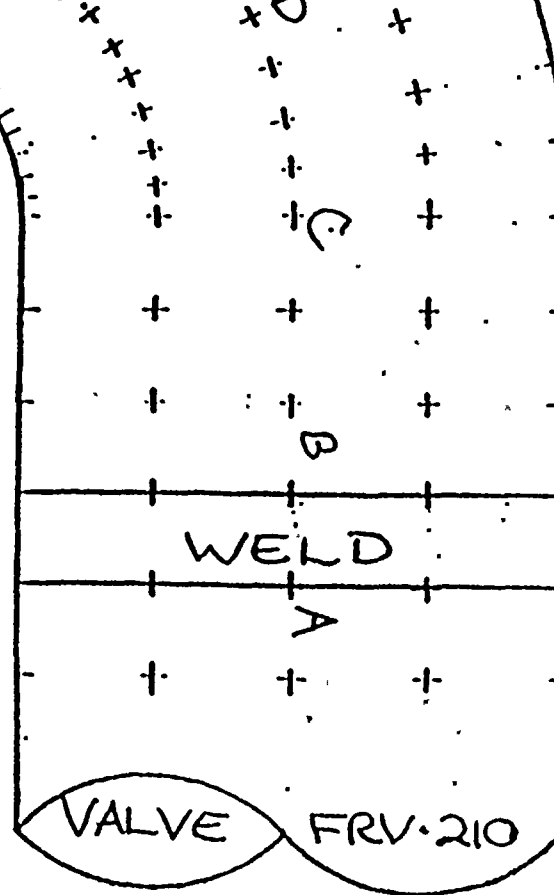
	A	B	C	D	E	F	G
0°	.870	.988	1.000	1.003	.944	.902	.832
30°	.821	.876	.947	.998	.995	.921	.802
60°	.886	.937	.999	1.003	.968	.970	.833
90°	.818	.935	.979	.999	.902	.917	.830
120°	.806	.905	.911	.932	.879	.949	.798
150°	.829	.926	.885	.850	.922	.906	.856
180°	.745	.914	.854	.909	.857	.951	.818
210°	.825	.907	.881	.888	.890	.879	.917
240°	.854	.905	.974	.895	.927	.896	.917
270°	.938	.944	.956	.998	.963	.928	.812
300°	.802	.946	1.005	.963	1.001	.954	.830
330°	.857	.958	1.020	.956	.940	.963	.840

ALL READINGS START  
AT T.D.C. 12:00 CLOCK-  
WISE WITH FLOW.

JOE ORDER # 004954

ISO # 1-FW-15 REV 15 (B)

E: 1/22/87 TEMP: 275 F





D. C. COOK [REDACTED] AR PLANT

## EROSION EVALUATION WORKSHEET

NEPSC Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. 1

RE Evaluation Date: SEPTEMBER 17, 1987

SER No. 23-85 (Water) X

Years in service //

UT Reading Transmitted on: N/A

UT Reading Taken on: 1-23-87

Isometric Dwg. NO. 1-FW-17, REV. 17

AEPSIC Installed Mat'l Class L-31: ASTM A-106 GR.B

Plant

(I.D.

Comp.

Component

### Description

Original

Wall Thk.

Original

Thk. Range

Req'd.

Tmin

Lowest

## Reading

Percent

Eroded

## COMMENTS

B 12" 90° FLL - 237 - .82 - 1.054 .592 .774 .5.6 ACCEPTABLE

B- <sup>COLUMBIA 6 & A</sup> 12" 90° EL - .750 - .656 - .844 - .592 - .790 - 0 STILL WITHIN MANUFACTURERS TOLERANCE

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

[illegible]

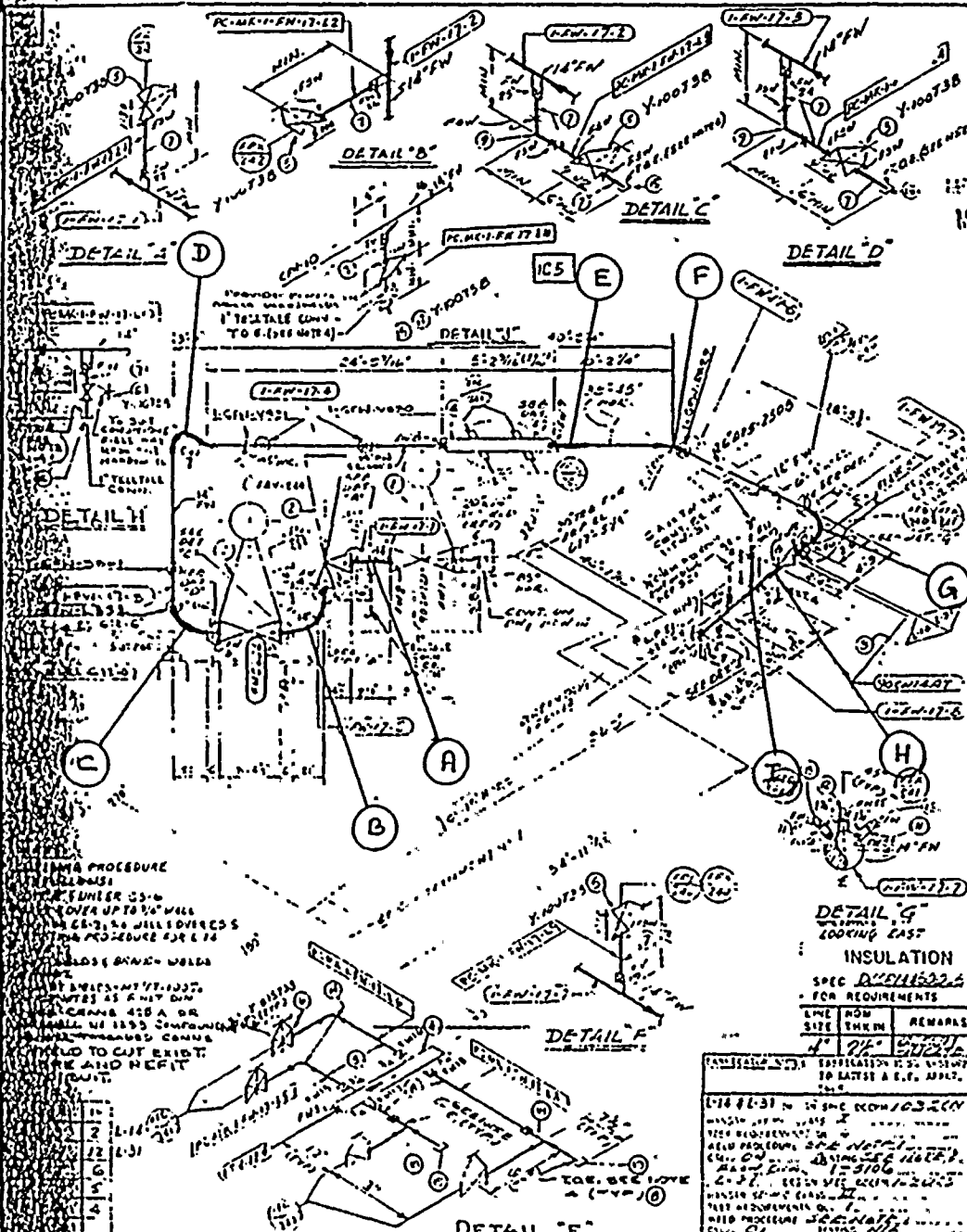
\_\_\_\_\_

**Table 1** Demographic characteristics of study population

\_\_\_\_\_

[illegible]





SITE TAG P. 1-1	Pipe	Spec	Mat.
1-1	1/2"	1-1	1-1
1-2	1/2"	1-1	1-1
1-3	1/2"	1-1	1-1
1-4	1/2"	1-1	1-1
1-5	1/2"	1-1	1-1
1-6	1/2"	1-1	1-1
1-7	1/2"	1-1	1-1
1-8	1/2"	1-1	1-1
1-9	1/2"	1-1	1-1
1-10	1/2"	1-1	1-1
1-11	1/2"	1-1	1-1

REV.	DATE	CODE	DESCRIPTION	P.O.	DWG.
15	7/1/53	A/S	PER REC. 12-1500, ALL 1" DRUM VALVE		
14	7/1/53	ED	PER REC. 12-1500, ALL 1" DRUM VALVE		
13	4/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
12	2/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
11	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
10	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
9	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
17	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		

HANGER MARK NO. 2 INSPECT: B AND 09 AND 07

INDICATES LOCATION OF PIPE SUPPORT AND SUPPORT DETAIL NUMBER

SUPPORT MARK NUMBERS SHOWN ARE FOR GENERAL AND SEQUENTIAL LOCATION OF SUPPORTS ONLY FOR EXACT LOCATIONS SEE PIPE SUPPORT DETAIL

REV.	DATE	CODE	DESCRIPTION	P.O.	DWG.
16	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		

INDIANA & MICHIGAN ELECTRIC COMPANY  
 DONALD C. COOK NUCLEAR PLANT  
 BRIDGMAN MICHIGAN  
 UNIT NO. :

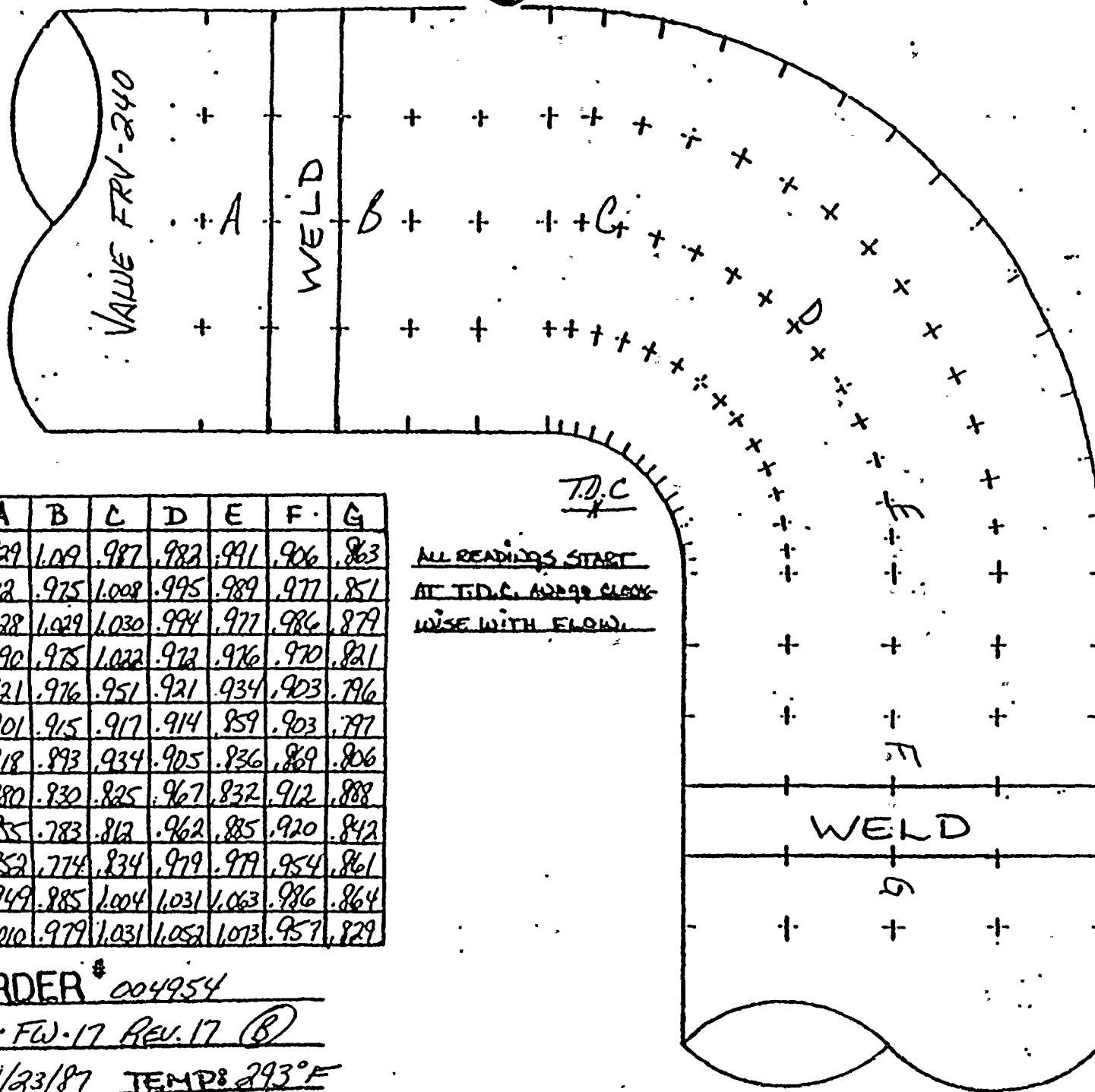
DRAWING NO. 1-FW-17/19

TUBECO INC.  
 122 VARICK AVENUE  
 BROOKLYN N. Y. 11217

REV.	DATE	CODE	DESCRIPTION	P.O.	DWG.
1	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
2	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
3	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
4	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
5	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
6	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
7	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
8	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
9	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
10	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
11	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
12	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
13	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
14	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
15	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
16	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
17	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
18	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
19	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
20	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
21	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
22	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
23	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
24	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
25	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
26	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
27	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
28	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
29	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		
30	7/1/53	DR	PER REC. 12-1500, ALL 1" DRUM VALVE		



FLOW →



T.D.C.

	A	B	C	D	E	F	G
0°	.929	1.009	.987	.982	.991	.906	.863
30°	.912	.975	1.008	.995	.989	.977	.851
60°	.828	1.029	1.030	.994	.977	.986	.879
90°	.790	.975	1.022	.972	.976	.970	.821
120°	.921	.976	.951	.921	.934	.903	.796
150°	.901	.915	.917	.914	.859	.903	.797
180°	.918	.893	.934	.905	.836	.869	.806
210°	.880	.830	.825	.967	.832	.912	.888
240°	.855	.783	.812	.962	.885	.920	.842
270°	.852	.774	.834	.979	.979	.954	.861
300°	.949	.885	1.004	1.031	1.063	.986	.864
330°	1.010	.979	1.031	1.052	1.073	.957	.829

T.D.C.  
X

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

JOB ORDER # 004954

ISO # 1-FW-17 REV. 17 (B)

DATE: 1/23/87 TEMP: 293°F



## EROSION EVALUATION WORKSHEET

NEPSC Engineer: A. J. LEWANDONSKI

SER No. 88-84 (Steam)

Unit No. 1

RE Evaluation Date: SEPTEMBER 17, 1987

SFR No. 23-85 (Water) X

Years in service 17

UT Reading Transmitted on: N/A

UT Reading Taken on: 1-27 & 1-30-87

Isometric Dwg. NO. 1-C-1 REV. 8

AEPSI Installed Mat'l Class D-31: ASTM A-106 GR. B

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
B	MAIN LINE 26X26X20	.500	.438-.563	.428*	.538	0	STILL WITHIN MANUFACTURERS TOLERANCE
B	BRANCH 26X26X20	.500	.438-.563	.391	.589	0	" " " "
C	34X26 RED. MAIN LINE	.625	.547-.703	.428*	.569	0	" " " "
D	34X34X16 BRANCH COL A	.625	.547-.703	.543	.630	0	" " " "
D	34X34X16 BRANCH COL B,C	.500	.438-.563	.326	.525	0	" " " "
D	34X34X16 MAIN LINE	1.031	.902-1.16	.326	.968	0	" " " "
L	34X34X24 BRANCH COL C	.625	.547-.703	.543	.639	0	" " " "
L	34X34X24 BRANCH COL A,B	.500	.438-.563	.395*	.519	0	" " " "
L	34X34X24	1.031	.902-1.16	.395*	.942	0	" " " "

\* ~~1~~ IN THE MINIMUM WALL CALCULATION

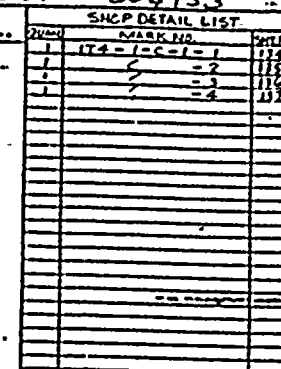


CONST 9.0# -004953

REP TUGAS 140 4014 158

SITE AREA PC MK. NO

SUBJECT: B, C, L or any  
D.



LINE			
DESIGNATION	SPEC.	ISSUED	ORDER
	N-1	PERMANENT	PERMANENT
		SERIES	

PIPE: A-106 SML'S GR.C  
16" TO 24" - EX. N.Y. ST. - 1/2" W.  
A-106 AC-60 CLAS 2 1/2" - 1/2" W.  
FITTINGS: A-106 GRWP 1/2" EOL -  
1/2" PLATE OR WATN PIPE WALL -  
2" SMALLER 20000 SML/W A-106-3  
51 AUG 52

GA: 887	BEND - ~ DIA	L24811
ALLOU		N0180

	CNS	1980-1981 1982
11/15/71	B	SPRINT SPINNY DYNAMICS (PUB SEP DIA, 1-1980 RE(1) : LAPOR - DYNAM COOL STAM EN HON, SEP 2, 1980(1) 6-D WOM 12 C 1st NOV-10 MID NOB HARRIS' A.C.S.

2-18-1981	RECEIVED, 11:00 PM
7-19-1981	Call for location & for M3A2E HAWAIIAN FILE

6-17-68	2	General En route
6-18-68	1,944	General En route
6-19-68	1,944	General En route

DATE	2		
TIME	3		
NAME			
ADDRESS			
PHONE			

AKA# 174

SYSTEM: CONDENSATE...  
SOUTHWEST FABRICATING

**WELDING CO.**  
SULLY, ILL.  
AMERICAN ELECTRIC CO.

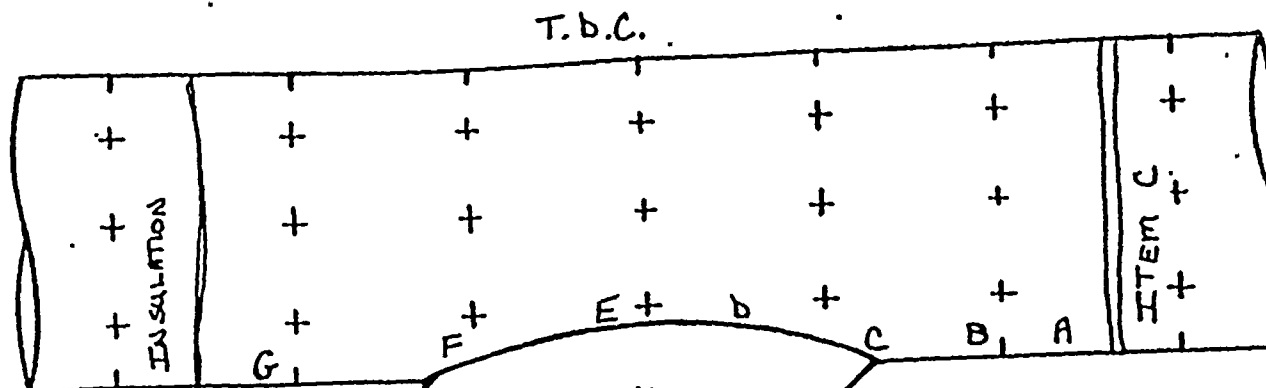
0177A-B31-1  
1-5-187A

~~MATERIAL REQUIRED FOR~~  
~~FILE~~ **UNCONTROLLED**  
**DOCUMENT**

DWG NO  
I-C-1, REV. 8:

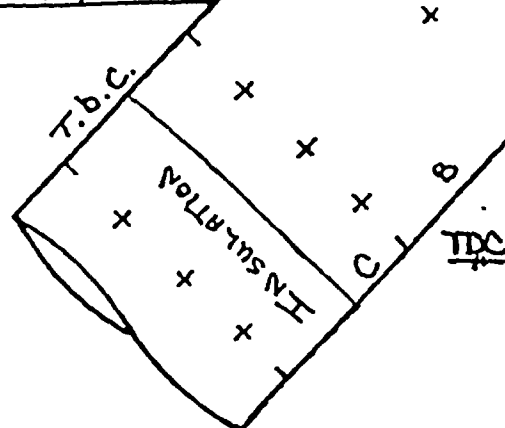


← FLOW



BRANCH  
CONNECTION

	A	B	C
0°	-	-	-
30°	-	.596	.689
60°	-	.618	.625
90°	-	.602	.617
120°	.619	.608	.607
150°	.612	.615	.625
180°	.594	.608	.631
210°	.607	.611	.622
240°	.604	.601	.601
270°	-	.605	.604
300°	-	.607	.592
330°	-	.605	.604



ALL READING START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.

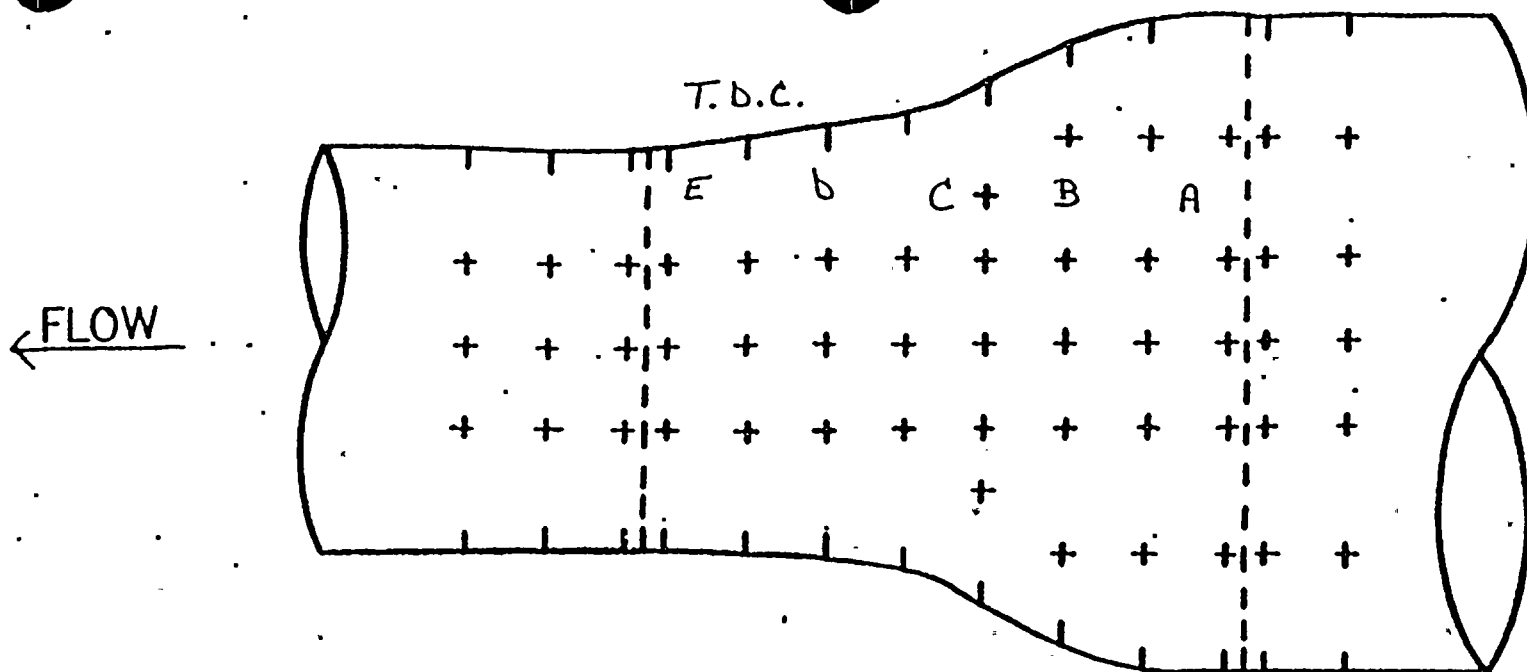
	A	B	C	D	E	F	G
0°	.594	.642	.666	.547	.546	.566	.561
30°	.665	.651	.564	.542	.545	.573	.568
60°	.574	.553	.558	.529	.541	.552	.563
90°	.553	.568	.557	.549	.549	.548	.552
120°	.538	.557	.563	.545	-	.541	.567
150°	.562	.547	.552	-	-	-	.567
180°	.553	.551	.554	-	-	-	.558
210°	.554	.552	.559	-	-	-	.539
240°	.556	.548	.561	.541	-	.552	.544
270°	.552	.557	.567	.567	.560	.562	.550
300°	.541	.558	.569	.558	.570	.542	.555
330°	.571	.553	.570	.556	.556	.553	.558

JOB ORDER # 004954

ISO# 1-C-1 REV.8 ITEM (B)

DATE: 1/27/87 TEMP: 300°F





ALL READINGS START AT TDC

AND GO CLOCKWISE WITH

FLOW.

TDC

	A	B	C	D	E	F	G
0°	.696	.697	.696	.706	.571	—	—
30°	.697	.707	.706	.694	.581	—	—
60°	.688	.707	.712	.676	.583	—	—
90°	.709	.710	.713	.668	.579	—	—
120°	.697	.708	.700	.690	.580	—	—
150°	.702	.711	.707	.698	.581	—	—
180°	.691	.705	.706	.667	.569	—	—
210°	.708	.709	.708	.669	.582	—	—
240°	.711	.701	.698	.663	.578	—	—
270°	.698	.700	.693	.656	.581	—	—
300°	.700	.696	.687	.678	.579	—	—
330°	.697	.698	.700	.689	.583	—	—

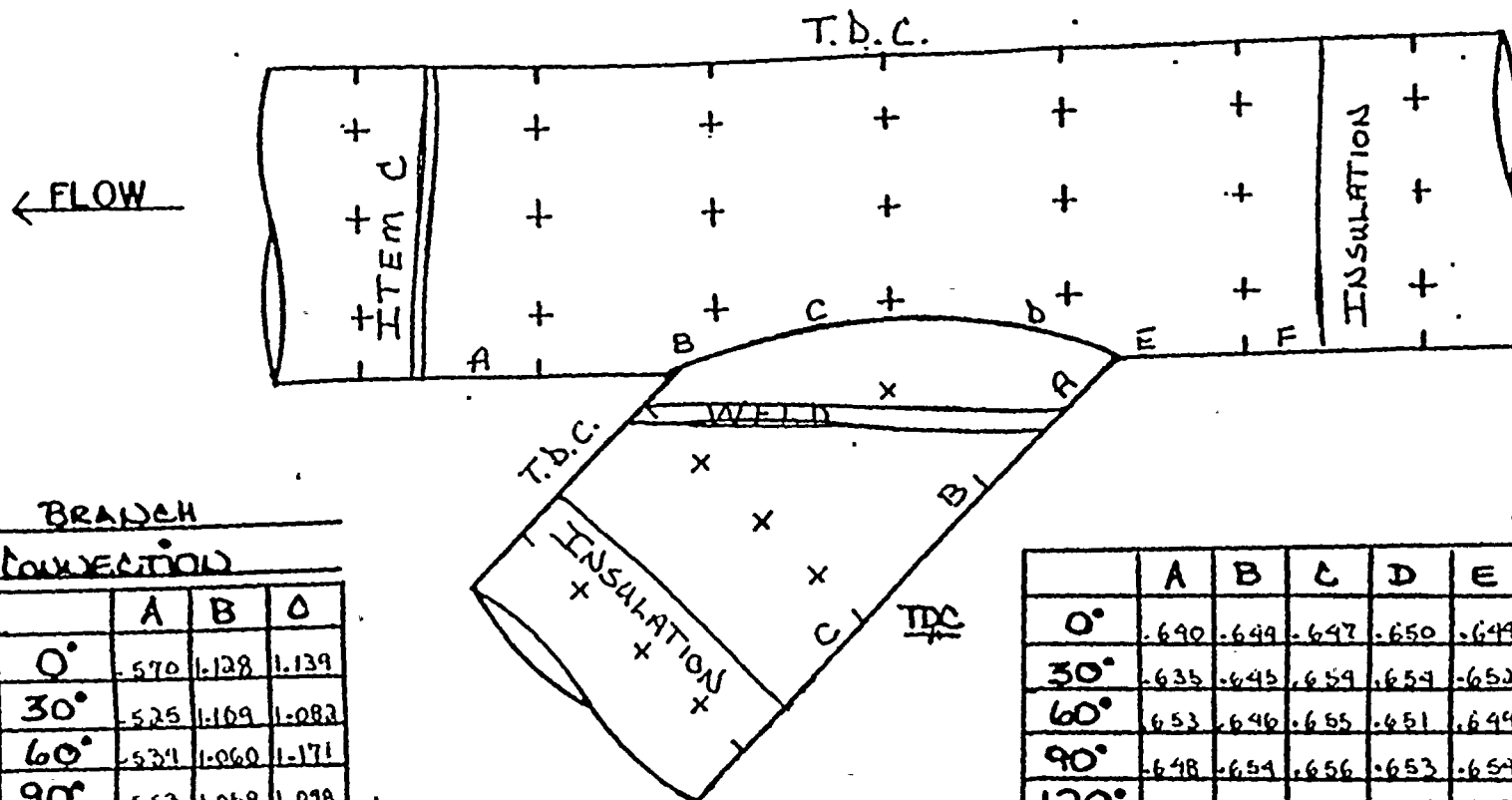
JOB ORDER\* 004959

ISO\* 1-C-1 REV.8 ITEM (C)

DATE: 1/1/60

TIME: 1:05





# BRANCH CONNECTION

	A	B	D
0°	.570	1.128	1.139
30°	.525	1.109	1.083
60°	.531	1.060	1.171
90°	.563	1.058	1.098
120°	.538	1.047	1.048
150°	.571	1.108	1.057
180°	.545	1.133	1.171
210°	.536	1.121	1.134
240°	.537	1.040	1.005
270°	.531	.970	1.009
300°	.538	.968	1.030
330°	.545	1.107	1.108

ALL READING START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.

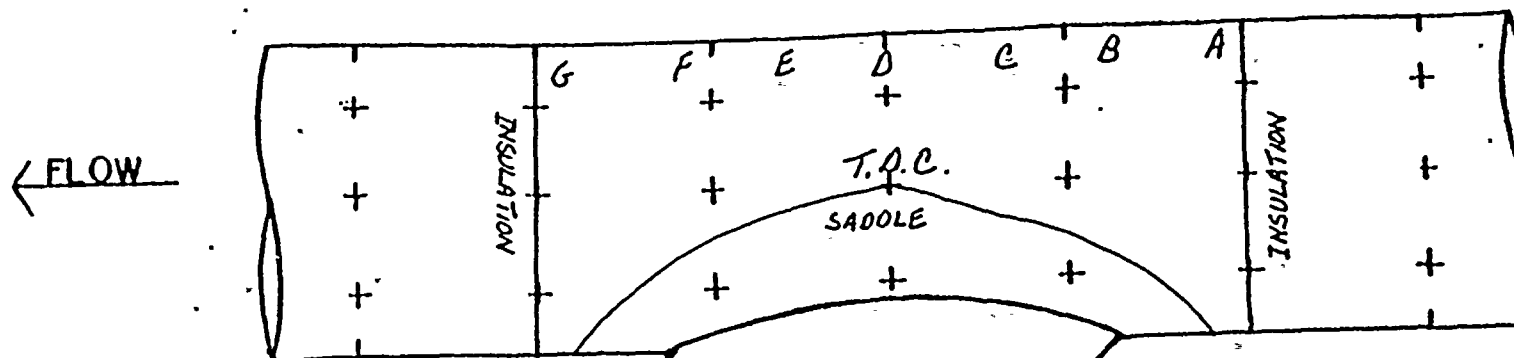
	A	B	C	D	E	F	G
0°	.640	.649	.647	.650	.649	.645	—
30°	.635	.645	.659	.659	.652	.650	—
60°	.653	.646	.655	.651	.649	.648	—
90°	.648	.654	.656	.653	.654	.643	—
120°	.644	.648	.651	.655	.653	.650	—
150°	.642	.653	—	—	.654	.643	—
180°	.663	.666	—	—	—	.651	—
210°	.645	.650	—	—	.656	.655	—
240°	.643	.645	.653	.655	.652	.653	—
270°	.651	.658	.650	.657	.649	.656	—
300°	.643	.644	.643	.645	.657	.656	—
330°	.630	.646	.636	.650	.653	.657	—

JOB ORDER# 004954

ISO# 1-C-1 REV. 8 ITEM (D)

DATE: 1/27/87 TEMP: 295°F





BRANCH  
CONNECTION

	A	B	C
0°	.946	.942	.533
30°	—	.955	.519
60°	—	.978	.538
90°	—	.964	.538
120°	—	.988	.532
150°	—	.982	.543
180°	1.017	.988	.521
210°	1.025	1.019	.531
240°	1.031	.992	.543
270°	1.025	.981	.541
300°	.981	.986	.542
330°	.986	.974	.542

ALL READING START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.

	A	B	C	D	E	F	G
0°	.653	.655	.654	.657	.651	.672	.650
30°	.649	.653	.655	.656	.658	.654	.652
60°	.650	.652	.651	.653	.657	.670	.649
90°	.653	.651	.654	.654	.659	.652	.650
120°	.643	.649	.655	.649	.653	.649	.652
150°	.640	.646	.650	.647	.651	.647	.650
180°	.639	.650	.655	.646	.660	.651	.649
210°	.668	.668	.663	—	.649	.645	.639
240°	.662	.667	—	—	—	.644	.647
270°	.662	—	—	—	—	—	.648
300°	.664	.664	—	—	—	.648	.656
330°	.658	.661	.661	—	.658	.667	.651

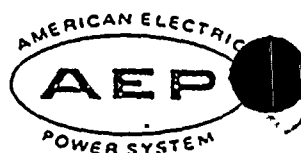
JOB ORDER # 004954

ISO # 1-C-1 REV 8 ITEM (L)

DATE: 1-30-87 TEMP: 297°F.



AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: JANUARY 23, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 1  
 Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. J. A. Kobyła <sup>1/24/87</sup>  
 2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on JANUARY 23, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPS Recommendation
<u>FC-4, REV. 0</u>			
<u>Sh. 2 of 2</u>	<u>CS</u>	<u>G</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
	<u>CS</u>	<u>H</u>	<u>" " " "</u>
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Anthony J. Lewandowski  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 4.6.3.15.2.5.2



## EROSION EVALUATION WORKSHEET

Unit No. /

Years in service //

UT Reading Taken on: 1-21-87

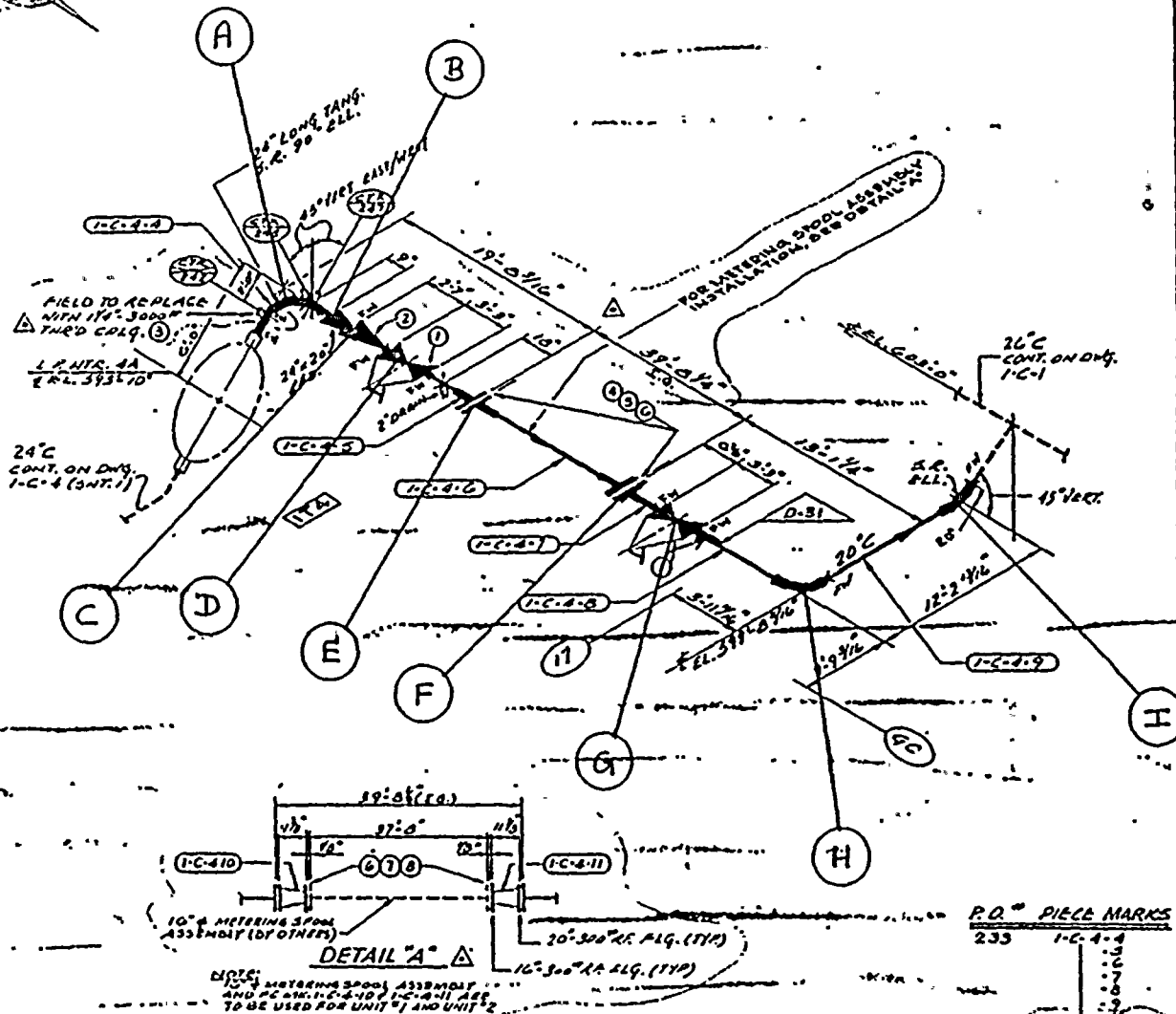
AEPSC Installed Mat'l Class D-31 : ASTM A-106 GR.B

Plant

COMMENTS

G	20" STRAIGHT $\phi$	.500	.438-.563	.391	.508	0	STILL WITHIN MANUFACTURERS TOLERANCE
H	20" 90° FLL	.500	.438-.563	.391	.532	0	" " " "





QTY	ITEM	REV	DATE	MATERIAL DESCRIPTION	ASSEMBLY	REVISION
01	1	2	20	300° GATE VAL, B.W., X-3/4"	306E2047	
	2	1	20	300° GATE VAL, B.W., X-3/4"	306E2047	
	3	1	15	3000° IND. C.F. 6. C. 6.	A-105, 6E. 2	
	4	2	20	GASKET, 1/2" THK, SPIRAL WOUND	STRE CG	
	5	15	15	STUD BOLTS, 8" LG.	A-105, 6E. 2	
	6	176	16	NUTS, HEAVY HEX HEAD	A-105, 6E. 2	
	7	2	16	GASKET, 1/2" THK, SPIRAL WOUND	STRE CG	
	8	10	15	STUD BOLTS, 7 1/4" LG.	A-105, 6E. 2	

[illegible]

INSPECT: E, G, H 7007 13 DEC 84

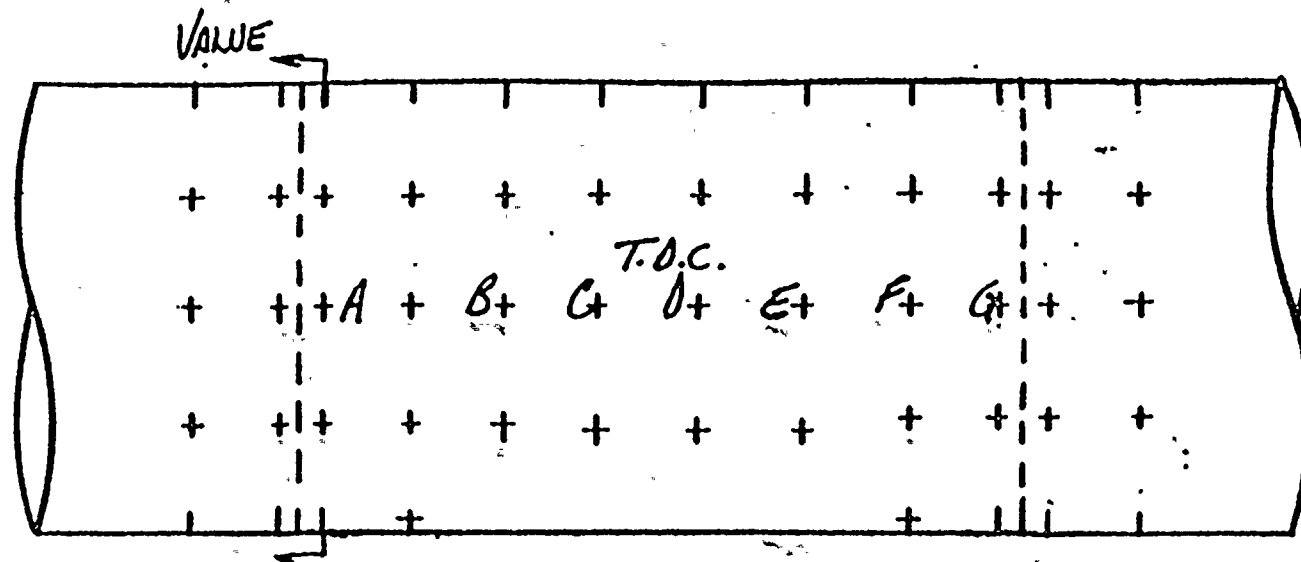
UNCONTROLLED  
DOCUMENT

[illegible]

POURZONE No. <u>112</u>	FLOW DIAGRAM <u>LEBTA</u>
REQUIRED COMPLETION DATE <u>03/10/72</u>	OST <u>0</u>
FABRICATED BY <u>LYDECO</u>	WELD PROCEDURE <u>CS-16CS-2</u>
NPS DESIGNS INC. NEW YORK, N.Y.	
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRG. DWGS.	
INMET & COMPANY, INC. INDIANA & MICHIGAN ELECTRIC CO. DONALD C. COOK NUCLEAR PLANT	
Drawn <u>WJH</u>	DATE <u>4/4</u> <b>TUESDAY BIDS.</b>
Comp. Cals	DATE <u>6</u> <b>6/25</b>
Checked	DATE <u>6/25</u>
Approved	DATE <u>6/25</u>
Rev. 1	DATE <u>6/25</u>
Rev. 2	DATE <u>6/25</u>
Rev. 3	DATE <u>6/25</u>
Rev. 4	DATE <u>6/25</u>
Rev. 5	DATE <u>6/25</u>
Rev. 6	DATE <u>6/25</u>
Rev. 7	DATE <u>6/25</u>
Rev. 8	DATE <u>6/25</u>
Rev. 9	DATE <u>6/25</u>
Rev. 10	DATE <u>6/25</u>
Rev. 11	DATE <u>6/25</u>
Rev. 12	DATE <u>6/25</u>
Rev. 13	DATE <u>6/25</u>
Rev. 14	DATE <u>6/25</u>
Rev. 15	DATE <u>6/25</u>
Rev. 16	DATE <u>6/25</u>
Rev. 17	DATE <u>6/25</u>
Rev. 18	DATE <u>6/25</u>
Rev. 19	DATE <u>6/25</u>
Rev. 20	DATE <u>6/25</u>
Rev. 21	DATE <u>6/25</u>
Rev. 22	DATE <u>6/25</u>
Rev. 23	DATE <u>6/25</u>
Rev. 24	DATE <u>6/25</u>
Rev. 25	DATE <u>6/25</u>
Rev. 26	DATE <u>6/25</u>
Rev. 27	DATE <u>6/25</u>
Rev. 28	DATE <u>6/25</u>
Rev. 29	DATE <u>6/25</u>
Rev. 30	DATE <u>6/25</u>
Rev. 31	DATE <u>6/25</u>
Rev. 32	DATE <u>6/25</u>
Rev. 33	DATE <u>6/25</u>
Rev. 34	DATE <u>6/25</u>
Rev. 35	DATE <u>6/25</u>
Rev. 36	DATE <u>6/25</u>
Rev. 37	DATE <u>6/25</u>
Rev. 38	DATE <u>6/25</u>
Rev. 39	DATE <u>6/25</u>
Rev. 40	DATE <u>6/25</u>
Rev. 41	DATE <u>6/25</u>
Rev. 42	DATE <u>6/25</u>
Rev. 43	DATE <u>6/25</u>
Rev. 44	DATE <u>6/25</u>
Rev. 45	DATE <u>6/25</u>
Rev. 46	DATE <u>6/25</u>
Rev. 47	DATE <u>6/25</u>
Rev. 48	DATE <u>6/25</u>
Rev. 49	DATE <u>6/25</u>
Rev. 50	DATE <u>6/25</u>
Rev. 51	DATE <u>6/25</u>
Rev. 52	DATE <u>6/25</u>
Rev. 53	DATE <u>6/25</u>
Rev. 54	DATE <u>6/25</u>
Rev. 55	DATE <u>6/25</u>
Rev. 56	DATE <u>6/25</u>
Rev. 57	DATE <u>6/25</u>
Rev. 58	DATE <u>6/25</u>
Rev. 59	DATE <u>6/25</u>
Rev. 60	DATE <u>6/25</u>
Rev. 61	DATE <u>6/25</u>
Rev. 62	DATE <u>6/25</u>
Rev. 63	DATE <u>6/25</u>
Rev. 64	DATE <u>6/25</u>
Rev. 65	DATE <u>6/25</u>
Rev. 66	DATE <u>6/25</u>
Rev. 67	DATE <u>6/25</u>
Rev. 68	DATE <u>6/25</u>
Rev. 69	DATE <u>6/25</u>
Rev. 70	DATE <u>6/25</u>
Rev. 71	DATE <u>6/25</u>
Rev. 72	DATE <u>6/25</u>
Rev. 73	DATE <u>6/25</u>
Rev. 74	DATE <u>6/25</u>
Rev. 75	DATE <u>6/25</u>
Rev. 76	DATE <u>6/25</u>
Rev. 77	DATE <u>6/25</u>
Rev. 78	DATE <u>6/25</u>
Rev. 79	DATE <u>6/25</u>
Rev. 80	DATE <u>6/25</u>
Rev. 81	DATE <u>6/25</u>
Rev. 82	DATE <u>6/25</u>
Rev. 83	DATE <u>6/25</u>
Rev. 84	DATE <u>6/25</u>
Rev. 85	DATE <u>6/25</u>
Rev. 86	DATE <u>6/25</u>
Rev. 87	DATE <u>6/25</u>
Rev. 88	DATE <u>6/25</u>
Rev. 89	DATE <u>6/25</u>
Rev. 90	DATE <u>6/25</u>
Rev. 91	DATE <u>6/25</u>
Rev. 92	DATE <u>6/25</u>
Rev. 93	DATE <u>6/25</u>
Rev. 94	DATE <u>6/25</u>
Rev. 95	DATE <u>6/25</u>
Rev. 96	DATE <u>6/25</u>
Rev. 97	DATE <u>6/25</u>
Rev. 98	DATE <u>6/25</u>
Rev. 99	DATE <u>6/25</u>
Rev. 100	DATE <u>6/25</u>



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

T.D.C.

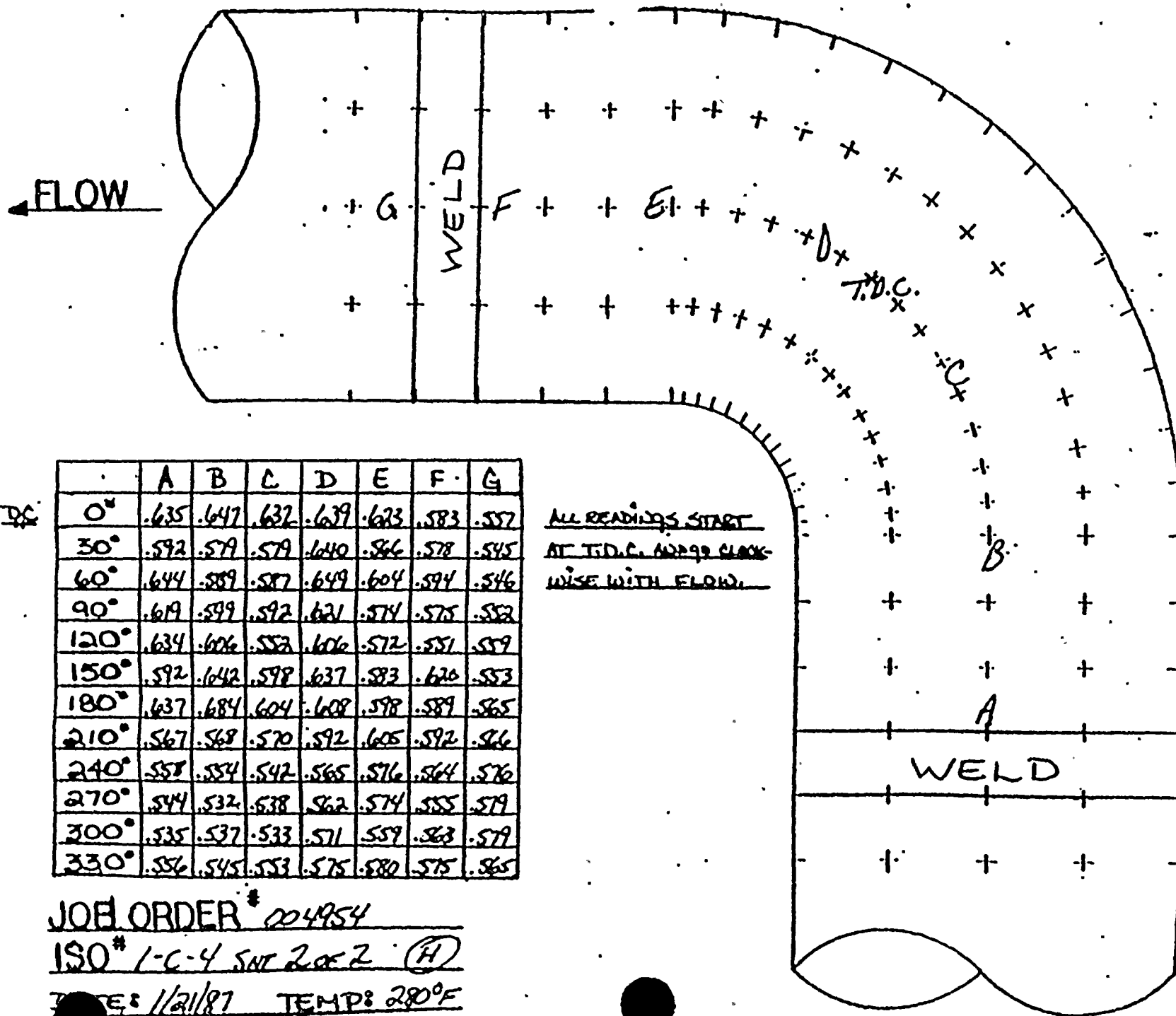
	A	B	C	D	E	F	G
0°	.532	.530	.508	.518	.515	.523	.511
30°	.536	.537	.530	.531	.516	.533	.521
60°	.542	.530	.548	.529	.535	.540	.523
90°	.549	.541	.541	.543	.525	.535	.522
120°	.543	.538	.546	.533	.531	.532	.520
150°	.540	.531	.543	.541	.529	.529	.519
180°	.559	.543	.570	.578	.568	.576	.562
210°	.551	.553	.577	.570	.565	.573	.567
240°	.562	.558	.570	.566	.566	.560	.574
270°	.544	.559	.566	.572	.568	.555	.571
300°	.563	.567	.560	.561	.564	.558	.570
330°	.562	.566	.559	.566	.563	.562	.560

JOB ORDER # 004954

ISO # 1-C-4 SNT 2 OF 2 (G)

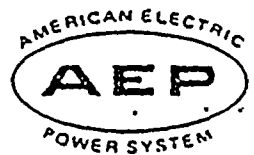
DATE: 11/10/07 TIME: 09:10 AM







AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: JANUARY 23, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 2  
       Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. J. A. Kobyra <sup>1/24/87</sup>  
 2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on JANUARY 23, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPS Recommendation
<u>2-FW-70, REV 3</u>			
<u>Sh. 1 of 2</u>	<u>CS</u>	<u>B</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
<u>2-FW-71, REV 4</u>	<u>CS</u>	<u>C</u>	<u>" " " "</u>
<u>Sh. 1 of 2</u>	<u>CS</u>	<u>B</u>	<u>" " " "</u>
	<u>CS</u>	<u>C</u>	<u>" " " "</u>

Anthony J. Lewandowski  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 4.6.3.15.25.2

Sheet No. 1 of 1



# EROSION EVALUATION WORKSHEET

Unit No. /

Years in service 11

UT Reading Taken on: 1-17-87

AEPSIC Installed Mat'l Class 1-31: ASTM A-106, GR.B

(I.D.)

(I.D.)

Comp.

Component

Description

Original

Wall Thk.

Original

Thk. Range

Req'd

Trin

Lowest

## Reading

Percent

Eroded

## COMMENTS

C 14" 90° ELL .750 .656-.844 .592 .737 0 STILL WITHIN MANUFACTURERS TOLERANCE



WEL-11.7

CONST: J.O. 01511, 12

MATERIAL DESCRIPTIC					ISS	DC	REMARKS
QTY	UNIT	SIZE	TYPE	DESCRIPTION			
1	5	1		1500" SN GLOBE VAL. C.S.			
2	2	14		120" DN GATE VAL. (SCH. 80)...			
3	1	14		DN REGULATING VAL.			
1	15	1		PIPE (SCH. 80) SMLS C.S.			
5	2	1		3000" TND. C.S. CAP			
6	3	1		3000" SN C.S. 90° ELL			
7	2	1		3000" C.S. TND. FLNG			
8	2	1		3000" 3/4" TND. RED. INSET C.S.			

REVISION RECORD					REMARKS
NO	DATE	BY	DESCRIPTION		
1	7/14/79	RE	RT. DIS. WAS RT. DIS. 2". ADDED APPROVAL STAMP. A.E.P. ARRGST DWG. 2-5286-1		NO ACTION REQ'D.
2	7/15/79	RE	REVISED BY PIPE DESIGNS: REMOVED HEDDING DETAIL B, DETAIL C 2-FW-70-12 AND Q'S ASSOCIATED ITEMS NO 318 TO 319 & 320. APPROVAL FOR PRE-OPS TESTING. PER AEP ARRGST DWG. 2-5286-2		FIELD ACTION REQ'D.
3	7/14/79	RE	REVISED BY NPS. DESIGNS. VALVE PHOTO WAS 906414 AT. ADDED INSULATION STAMP PER AEP. ARRGST. DWG. 2-5286-3		NO ACTION REQ'D.

INSPECT: B, C AND 4/1/80

**VOID**  
NOT FOR PLANT USE  
JR Lemon/BV  
1-9-87

E.T.S. FAB. ELEC. MAPS. RC. 17855 MAPS

2-FW-70-1 347 2-FW-70-1  
C.C. 2  
C.C. 3  
C.C. 4  
C.C. 5

2-FW-70  
HT 10F2:

DRAWING APPROVED FOR

CONSTRUCTION PRE OPS TESTING  
BY DC DATE 7/14/79 BY PA. DATE 5/75

AMERICAN ELECTRIC POWER SERVICE CORP.  
FLOW DIAGRAM 12-1786

FOURZONE No. 2-5286  
REQUIRED COMPLETION DATE: 05/1/80  
FABRICATED BY: TLECC WELD PROCEDURE: SEE NOTE 1

NPS DESIGNS INC.  
NEW YORK, N.Y.

FABRICATOR NOTE:  
FABRICATION MUST  
CONFORM TO LATEST  
A.E.P. ARRGST. DWGS.

DEKANA & MCKINAM ELECTRIC CO  
DONALD C. ECKE NUCLEAR PLANT

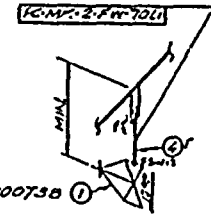
109 12-1786 CONTAINMENT V.I.C.  
DATE 7/14/79 BY 109

2-FW-70  
HT 10F2 3

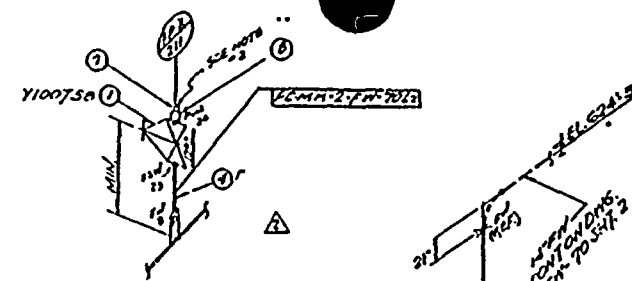
DESIGN SPEC		MATERIALS		WELDING		TESTING		ADDITIONAL	
DESIGN SPEC	2-FW-70-1	MATERIALS	2-FW-70-1	WELDING	2-FW-70-1	TESTING	2-FW-70-1	ADDITIONAL	2-FW-70-1
DESIGN SPEC	2-FW-70-1	MATERIALS	2-FW-70-1	WELDING	2-FW-70-1	TESTING	2-FW-70-1	ADDITIONAL	2-FW-70-1

1. WELD PROCEDURE AS FOLLOWS  
2. USE CRANE LIFTING ASSEMBLY 1670  
ON ALL THREADED CONNS

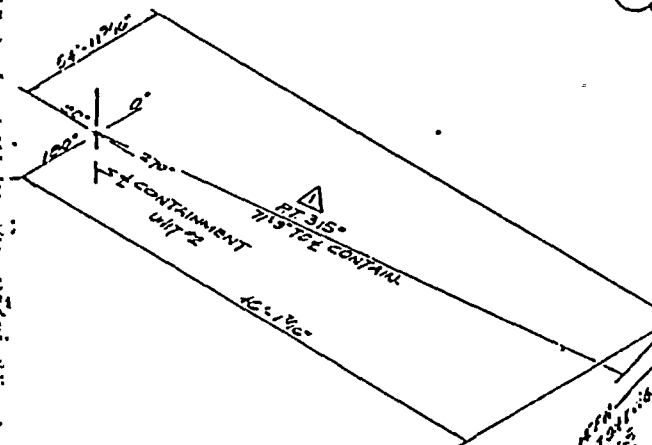
INSULATION		
SPEC. 12-1786 FOR REQUIREMENTS		
LINE	NO.	REMARKS
11	9 1/4"	2-1/2" CALZADON ALIATE



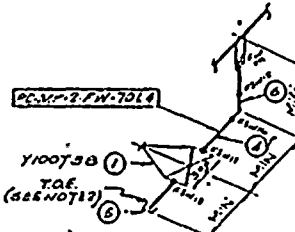
DETAIL 'A'



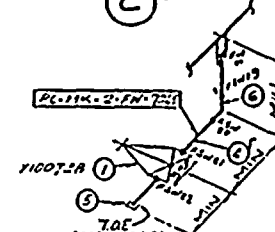
DETAIL 'B'



DETAIL 'C'



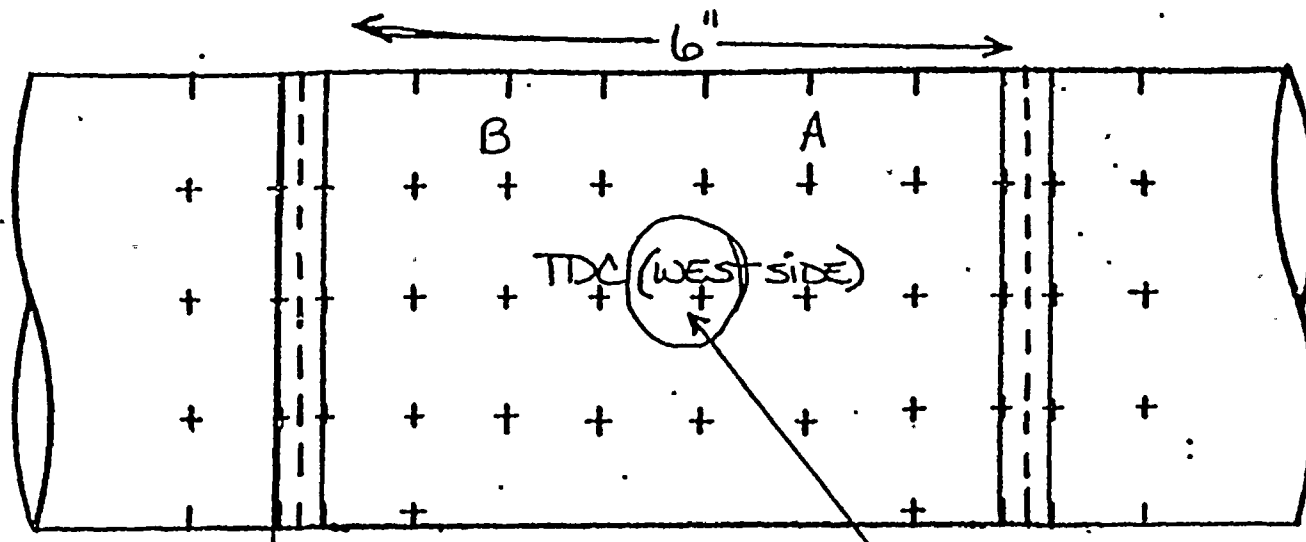
DETAIL 'D'



DETAIL 'E'



← FLOW



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	828	832	—	—	—	—	—
30°	804	826	—	—	—	—	—
60°	821	813	—	—	—	—	—
90°	827	836	—	—	—	—	—
120°	828	816	—	—	—	—	—
150°	815	814	—	—	—	—	—
180°	834	836	—	—	—	—	—
210°	832	833	—	—	—	—	—
240°	823	818	—	—	—	—	—
270°	812	810	—	—	—	—	—
300°	845	841	—	—	—	—	—
330°	811	810	—	—	—	—	—

2-FPX-242-VI

JOB ORDER # 015513

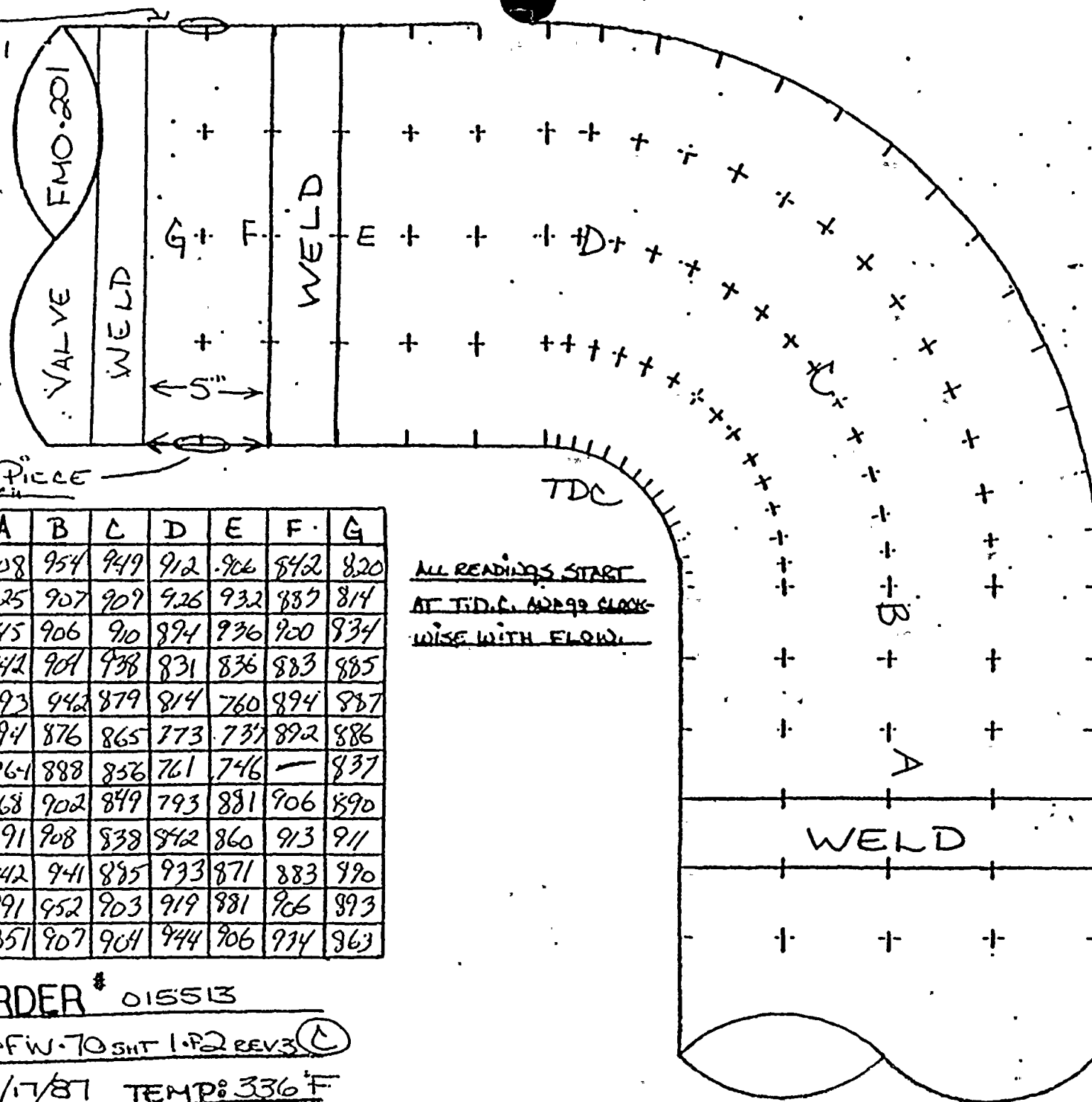
IS 2-FW-TO SHIT 1-F2 REV3 (B)

TEADS 2/2



2-FW 115-1

FLOW



TDC

	A	B	C	D	E	F	G
0°	908	954	949	912	906	842	820
30°	925	907	909	926	932	887	814
60°	945	906	910	894	936	900	934
90°	942	904	938	831	836	883	885
120°	893	942	879	814	760	894	887
150°	894	876	865	773	737	892	886
180°	864	888	856	761	746	—	837
210°	868	902	849	793	881	906	890
240°	891	908	838	842	860	913	911
270°	942	941	885	933	871	883	990
300°	891	952	903	919	881	966	893
330°	851	907	904	944	906	974	863

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

JOB ORDER # 015513

ISO # 2-FW-70 SHT 1-P2 REV3 (C)

DATE: 1/17/87 TEMP: 336°F



## EXPLOSION EVALUATION WORKSHEET

Unit No. 1

Years in service //

UT Reading Taken on: 1-16-87

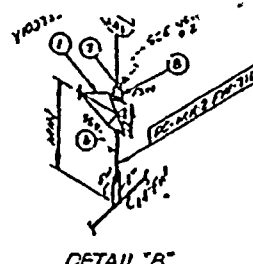
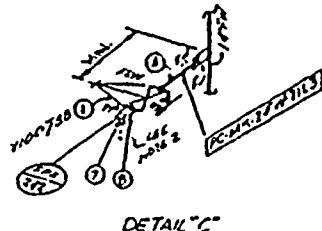
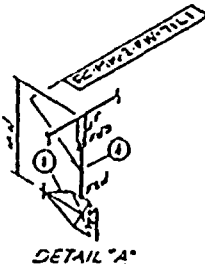
AEPSIC Installed Mat'l Class L-31: ASTM A-106 GR.B

[illegible]

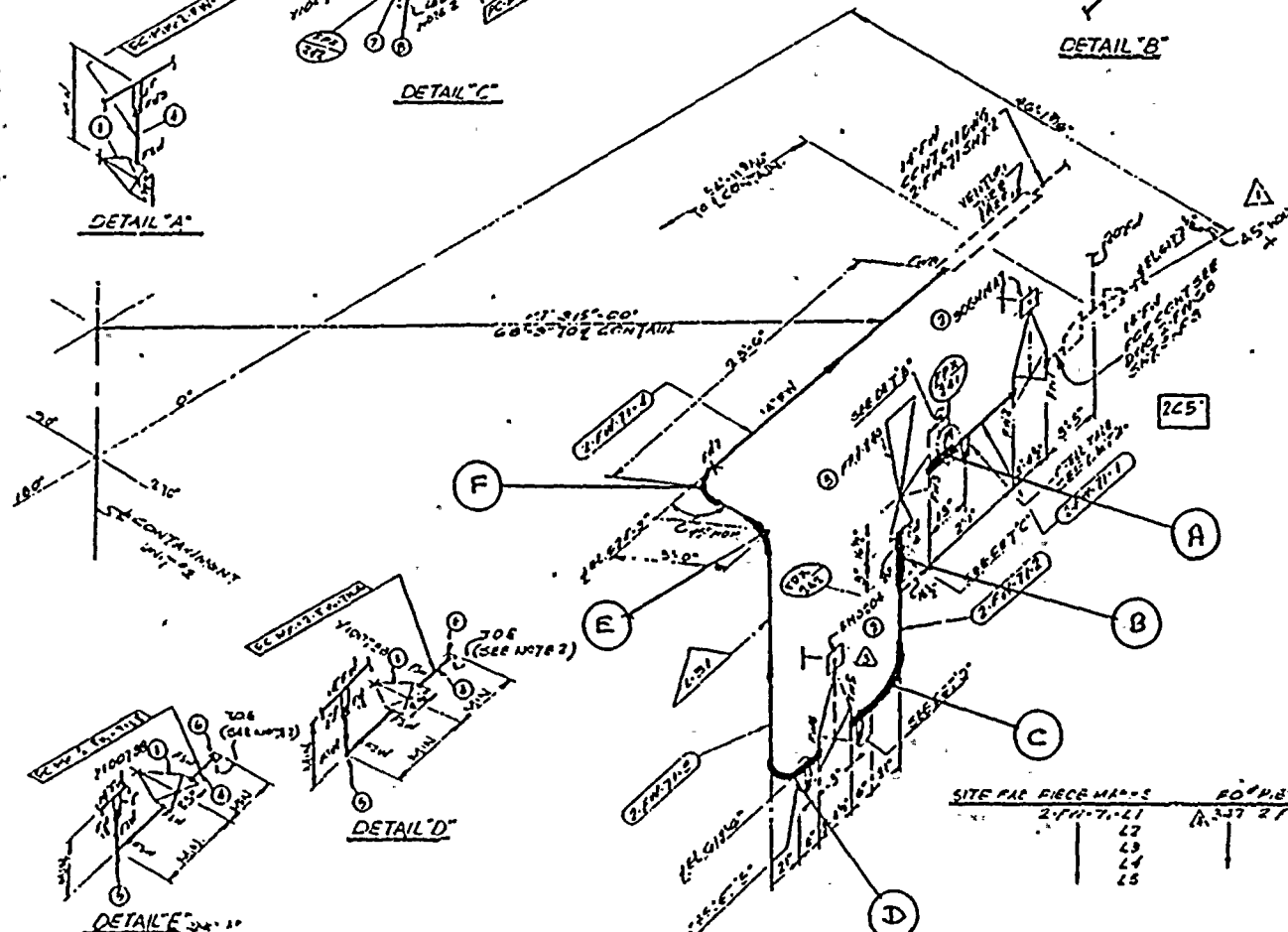


WEEK #14

R.C. CONST: J.D. # 015



NO	DATE	DESCRIPTION	REVISION
1	1/1/71	REVISION BY NPS DESIGNS INC. A.P. LWS 1-5136 REV 1. 45° WET & 45° DRY	NO ACTION REQ'D
2	1/1/71	REVISION BY NPS DESIGNS INC. A.P. LWS 1-5136 REV 2. 45° WET & 45° DRY	NO ACTION REQ'D
3	1/1/71	REVISION BY NPS DESIGNS INC. A.P. LWS 1-5136 REV 3. 45° WET & 45° DRY	NO ACTION REQ'D
4	1/1/71	REVISION BY NPS DESIGNS INC. A.P. LWS 1-5136 REV 4. 45° WET & 45° DRY	NO ACTION REQ'D



NO	DATE	DESCRIPTION	REVISION
1	1/1/71	REVISION BY NPS DESIGNS INC. A.P. LWS 1-5136 REV 1. 45° WET & 45° DRY	NO ACTION REQ'D
2	1/1/71	REVISION BY NPS DESIGNS INC. A.P. LWS 1-5136 REV 2. 45° WET & 45° DRY	NO ACTION REQ'D
3	1/1/71	REVISION BY NPS DESIGNS INC. A.P. LWS 1-5136 REV 3. 45° WET & 45° DRY	NO ACTION REQ'D
4	1/1/71	REVISION BY NPS DESIGNS INC. A.P. LWS 1-5136 REV 4. 45° WET & 45° DRY	NO ACTION REQ'D

INSPECT: B, C ANT 09 JAN 87

UNCONTROLLED DOCUMENT

SITE	PIECE	MARKS	NO	PIECE	MARKS
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5

2-FW-71  
SHT 1 OF 2

CONSTRUCTION	DATE	REVISION
1	1/1/71	1

CONSTRUCTION	DATE	REVISION
1	1/1/71	1

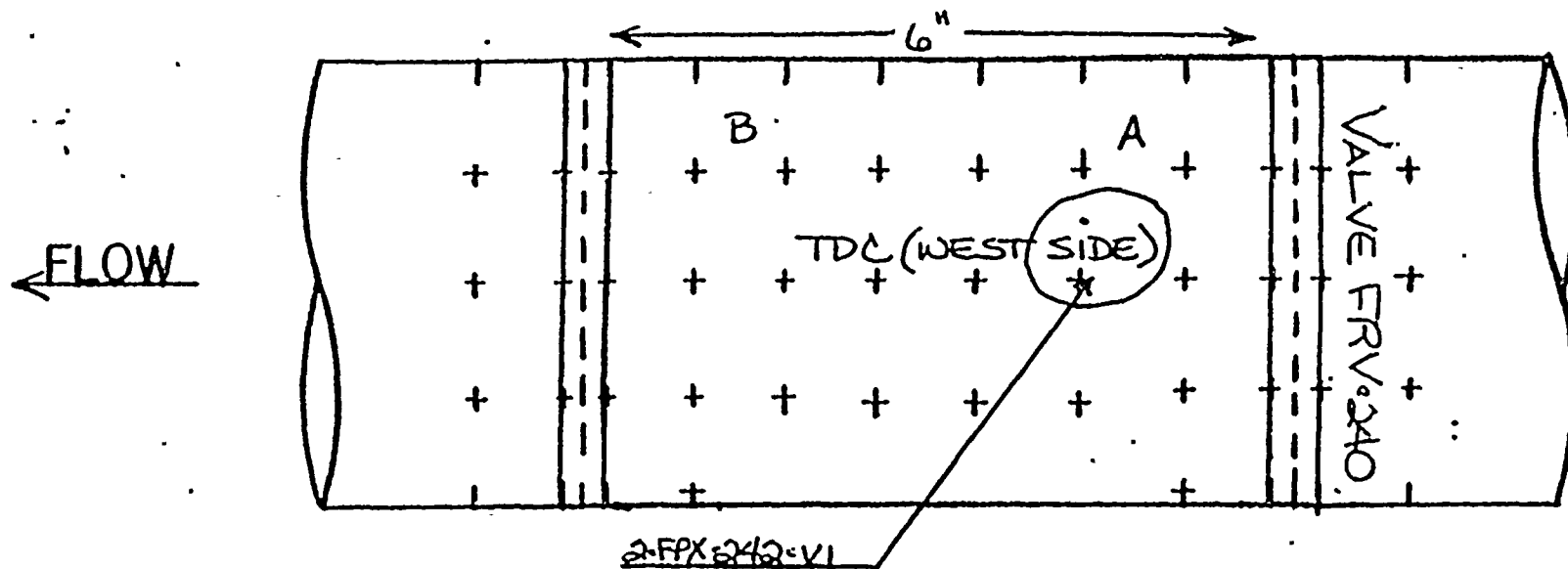
NOTE:  
1. WELD PROCEDURES AS FOLLOWS:  
C/S 2-111 OVER WET 51-  
C/S 2-111 OVER WET 51-  
2. USE CHANE 425-A IN CHANNELS  
ON ALL WELDED JOINTS.

NO	DATE	REVISION
1	1/1/71	1

NO	DATE	REVISION
1	1/1/71	1

NO	DATE	REVISION
1	1/1/71	1





ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	819	830	—	—	—	—	—
30°	816	873	—	—	—	—	—
60°	883	870	—	—	—	—	—
90°	876	868	—	—	—	—	—
120°	882	873	—	—	—	—	—
150°	865	858	—	—	—	—	—
180°	867	846	—	—	—	—	—
210°	877	874	—	—	—	—	—
240°	841	853	—	—	—	—	—
270°	865	857	—	—	—	—	—
300°	874	888	—	—	—	—	—
330°	858	873	—	—	—	—	—

JOB ORDER # 015513

IS 2-FW-71 SHIT 1-F2 REV4 (B)



FLOW →

VALVE 2-FW-240

WELD

A

B

C

D

TDC

ALL READINGS START  
AT T.D.C. APPROX 99 CLOCK-  
WISE WITH FLOW.

	A	B	C	D	E	F	G
0°	.977	.974	.997	1.019	1.028	.845	.842
30°	.950	.994	1.022	1.066	1.038	.846	.849
60°	.973	.998	1.079	1.069	1.082	.836	.853
90°	1.057	.996	1.057	1.058	1.067	.870	.859
120°	.956	.973	.983	1.010	.987	.861	.933
150°	.924	.945	.967	.961	.958	.871	.885
180°	.934	.957	.976	.982	.987	.839	.852
210°	1.010	.961	.913	.976	.976	.820	.835
240°	1.017	.940	.916	.914	.914	.836	.841
270°	1.052	.998	1.017	.954	.954	.838	.828
300°	1.018	1.032	1.014	.922	.992	.834	.852
330°	.977	1.025	1.034	1.020	1.012	.819	.827

JOB ORDER # 015513

ISO # 2-FW-71 SHIT #2 REV 1

DATE: 1/16/87 TEMP: 315°F

WELD

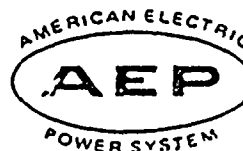
WELD

VALVE

FMO-204



AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: JANUARY 20, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 1  
       Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. J. A. Kobyra ✓ 1/21/87  
2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on DECEMBER 13, 1986, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
<u>1-PW-59, REV. 5</u>		<u>B-</u>	
<u>Sh. 1 of 2</u>	<u>CS</u>	<u>90° RED EL</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATIONS REQUIRE</u>
		<u>B</u>	
	<u>CS</u>	<u>STRAIGHT &amp;</u>	
		<u>C</u>	
	<u>CS</u>	<u>STRAIGHT &amp;</u>	
		<u>C</u>	
	<u>CS</u>	<u>90° ELL</u>	
		<u>C</u>	
	<u>CS</u>	<u>STRAIGHT &amp;</u>	
		<u>D</u>	
	<u>CS</u>	<u>90° ELL</u>	
		<u>D</u>	
	<u>CS</u>	<u>STRAIGHT &amp;</u>	
		<u>E</u>	
	<u>CS</u>	<u>90° ELL</u>	
		<u>E</u>	
	<u>CS</u>	<u>STRAIGHT &amp;</u>	
		<u>F</u>	
	<u>CS</u>	<u>STRAIGHT &amp;</u>	

Anthony J. Lewandowski  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 4.6.3.15.2.5.2

Sheet No. 1 of 4



D. C. Cook Nuclear Plant, Unit No. 1  
 Steam Piping Erosion Program, SER No. 88-84  
~~X~~ Water Piping Erosion Program, SER No. 23-85  
 Engineering evaluation of Wall Thickness Measurements  
 Date: JANUARY 20, 1987  
 Sheet No. 2 of 4

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
<u>1-FW-59, REV. 5</u>		<u>F</u>	
<u>Sh. 1 of 2</u>	<u>CS</u>	<u>90° ELL</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATIONS REQUIRED</u>
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>90° ELL</u>	
	<u>CS</u>	<u>STRAIGHT</u>	
<u>1-FW-59, REV. 9</u>		<u>G</u>	
<u>Sh. 2 of 2</u>	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>90° ELL</u>	
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>90° ELL</u>	<u>PAWELD &amp; REPLACE AS SOON AS POSSIBLE</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
	<u>CS</u>	<u>90° ELL</u>	<u>PAWELD &amp; REPLACE AS SOON AS POSSIBLE</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>90° ELL</u>	<u>PAWELD &amp; REPLACE AS SOON AS POSSIBLE</u>
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
	<u>CS</u>	<u>90° ELL</u>	
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>90° ELL</u>	
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>90° ELL</u>	



D. C. Cook Nuclear Plant, Unit No. 1  
 Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering evaluation of Wall Thickness Measurements  
 Date: JANUARY 20, 1987  
 Sheet No. 3 of 4

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
<u>8-FW-59, REV. 9</u>		<u>R</u>	
<u>SH 2 OF 2</u>	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
<u>1-FW-58, REV. 5</u>		<u>H</u>	
<u>SH 1 OF 2</u>	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>90° ELL</u>	
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>90° ELL</u>	
	<u>CS</u>	<u>STRAIGHT</u>	
<u>1-FW-58, REV. 5</u>		<u>B</u>	
<u>SH 2 OF 2</u>	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>90° ELL</u>	
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>90° ELL</u>	<u>PADWELD &amp; THEN REPLACE DURING NEXT OUTAGE</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>90° ELL</u>	<u>PADWELD &amp; THEN REPLACE DURING NEXT OUTAGE</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>90° ELL</u>	
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>90° ELL</u>	
	<u>CS</u>	<u>STRAIGHT</u>	
	<u>CS</u>	<u>STRAIGHT</u>	



Sheet No. 4 of 4

[illegible]



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: A.J. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 1

Evaluation Date: JANUARY 20, 1987

SER No. 23-85 (Water) X  
12-5-86, 12-8-86

Years in service 11

UT Reading Transmitted on: 12-13-86

UT Reading Taken on: 12-6-86

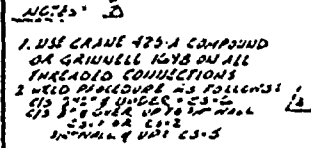
Isometric Dwg. NO. 1-FW-59, REV. 5, Sh. 1 of 2

AEPS Installed Mat'l Class CS: A-106 GR-B SCH. 80

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
B	3 1/2" RED. ELL	.337	.295-.379	.235	.345	0%	STILL WITHIN MANUFACTURERS TOLERANCE
B	4" STRAIGHT	.337	.295-.379	.235	.389	0%	-----
C	4" STRAIGHT	.337	.295-.379	.235	.392	0%	-----
C	4" 90° ELL	.337	.295-.379	.235	.377	0%	-----
C	4" STRAIGHT	.337	.295-.379	.235	.388	0%	-----
D	4" 90° ELL	.337	.295-.379	.235	.388	0%	-----
D	4" STRAIGHT	.337	.295-.379	.235	.366	0%	-----
E	4" 90° ELL	.337	.295-.379	.235	.385	0%	-----
E	4" STRAIGHT	.337	.295-.379	.235	.374	0%	-----
F	4" STRAIGHT	.337	.295-.379	.235	.385	0%	-----
F	4" 90° ELL	.337	.295-.379	.235	.302	0%	-----
F	4" STRAIGHT	.337	.295-.379	.235	.347	0%	-----
G	4" STRAIGHT	.337	.295-.379	.235	.354	0%	-----
G	4" 90° ELL	.337	.295-.379	.235	.281	4.7%	ABOVE Tm NO FURTHER EXAMINATIONS REQUIRED
G	4" STRAIGHT	.337	.295-.379	.235	.363	0%	STILL WITHIN MANUFACTURERS TOLERANCE



1-FW-59  
Sh. 7 of 2



P.O.	PIECE MARKS	P.O.	PIECE MARKS	SITE 518, PIECE MARKS
2330 VOID	1-FN-59-1 VOID	1-FN-59-1A (EVENING)		PC MK. 1-FN-59-23
	2	2A		
	3	3A		
	4	4A		
	5	5A		
	6	6A		
	7	7A		
	8	8A		

[illegible]

REVISION RECORD			
NO	DATE	DESCRIPTION	REMARKS
1	3/1/40	REMOVED BY 1114 0400W. 4000W REMOVED BY 1114 0400W. 4000W REMOVED BY 1114 0400W. 4000W	NO ACTION REQ'D
2	1/1/40	REMOVED BY 1114 0400W. 4000W REMOVED BY 1114 0400W. 4000W REMOVED BY 1114 0400W. 4000W	NO ACTION REQ'D
3	1/1/40	REMOVED BY 1114 0400W. 4000W REMOVED BY 1114 0400W. 4000W REMOVED BY 1114 0400W. 4000W	NO ACTION REQ'D
4	1/1/40	REMOVED BY 1114 0400W. 4000W REMOVED BY 1114 0400W. 4000W REMOVED BY 1114 0400W. 4000W	NO ACTION REQ'D
5	1/1/40	REMOVED BY 1114 0400W. 4000W REMOVED BY 1114 0400W. 4000W REMOVED BY 1114 0400W. 4000W	NO ACTION REQ'D

INSPECTOR: D. J. [Signature]

INSPECT: B, C, D 7/11/86  
E, G 7/12/86

NOTES: REPLACE, NEXT  
OUTSIDE WITH C.S.

**DRAWING APPROVED FOR**

DATE	08/11/97	TIME	0646
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FOUR/ZONE No. 173  
REQUIRED COMPLETION D  
FABRICATED BY. 2/15/57

NPS DESIGNS INC.  
NEW YORK, N.Y.

**FABRICATOR NOTE:  
FABRICATION MUST  
CONFORM TO LATEST  
A.E.P. ARRG.T. DWGS.**

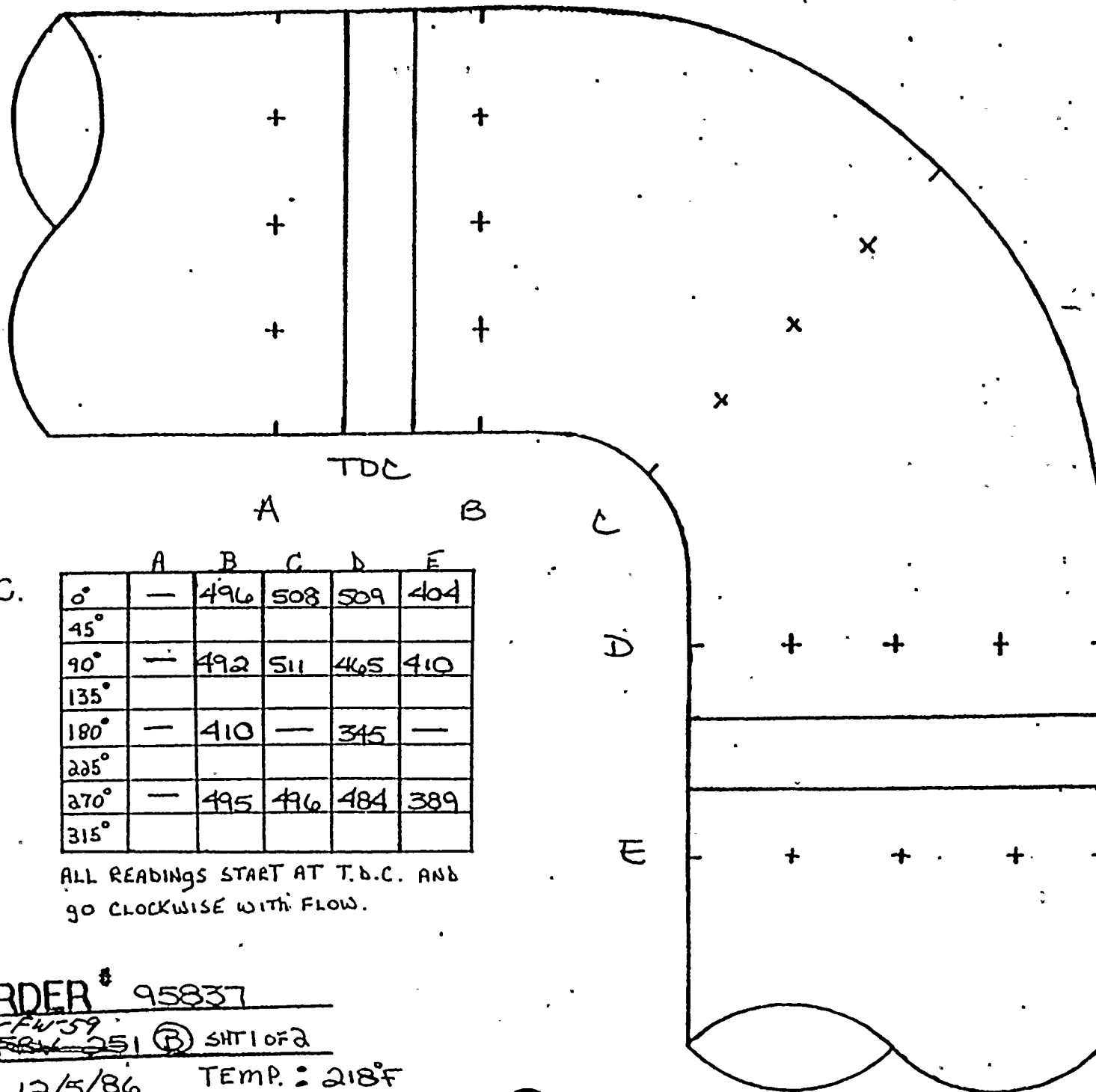
DATE \_\_\_\_\_ FLOW DIAGRAM \_\_\_\_\_  
WELD PROCEDURE \_\_\_\_\_

INTELL & COMPANY, INC.  
INDIANA & MICHIGAN ELECTRIC CO.  
DONALD C. COOK NUCLEAR PLANT

DATE 1/20	DATE 1/20	TURBINE	REV.
1000000	1000000	1-FN-59	5
DATE 1/20	DATE 1/20	SMT. 1002	



FLOW →



T.D.C.

	A	B	C	D	E
0°	—	496	508	509	404
45°					
90°	—	492	511	465	410
135°					
180°	—	410	—	345	—
225°					
270°	—	495	496	484	389
315°					

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

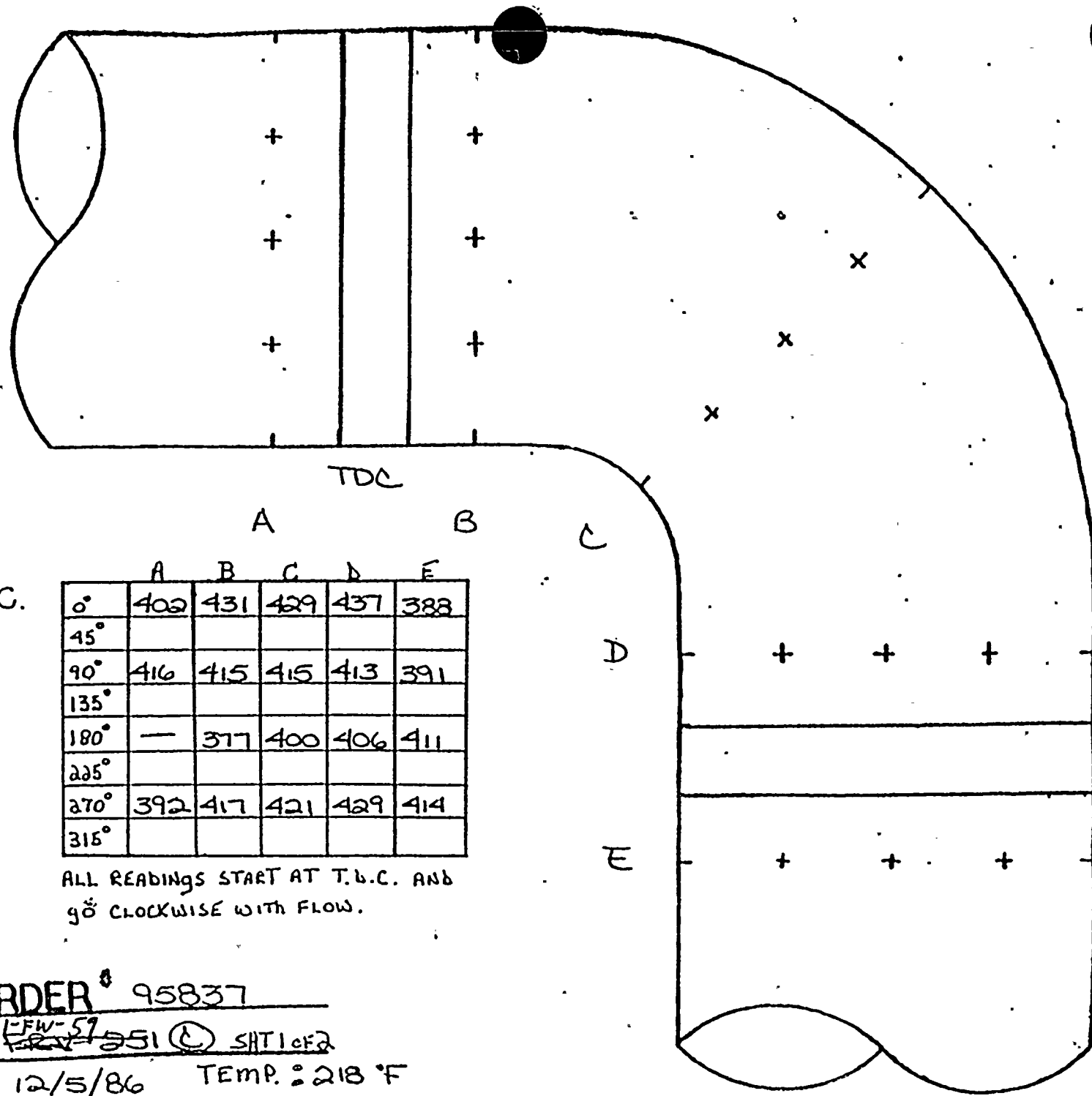
JOB ORDER # 95837

ISO # 1-FW-59  
F84-251 (B) SH1072

DATE: 12/5/86 TEMP.: 218°F



FLOW →



T.D.C.

	A	B	C	D	E
0°	402	431	429	437	388
45°					
90°	416	415	415	413	391
135°					
180°	—	377	400	406	411
225°					
270°	392	417	421	429	414
315°					

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

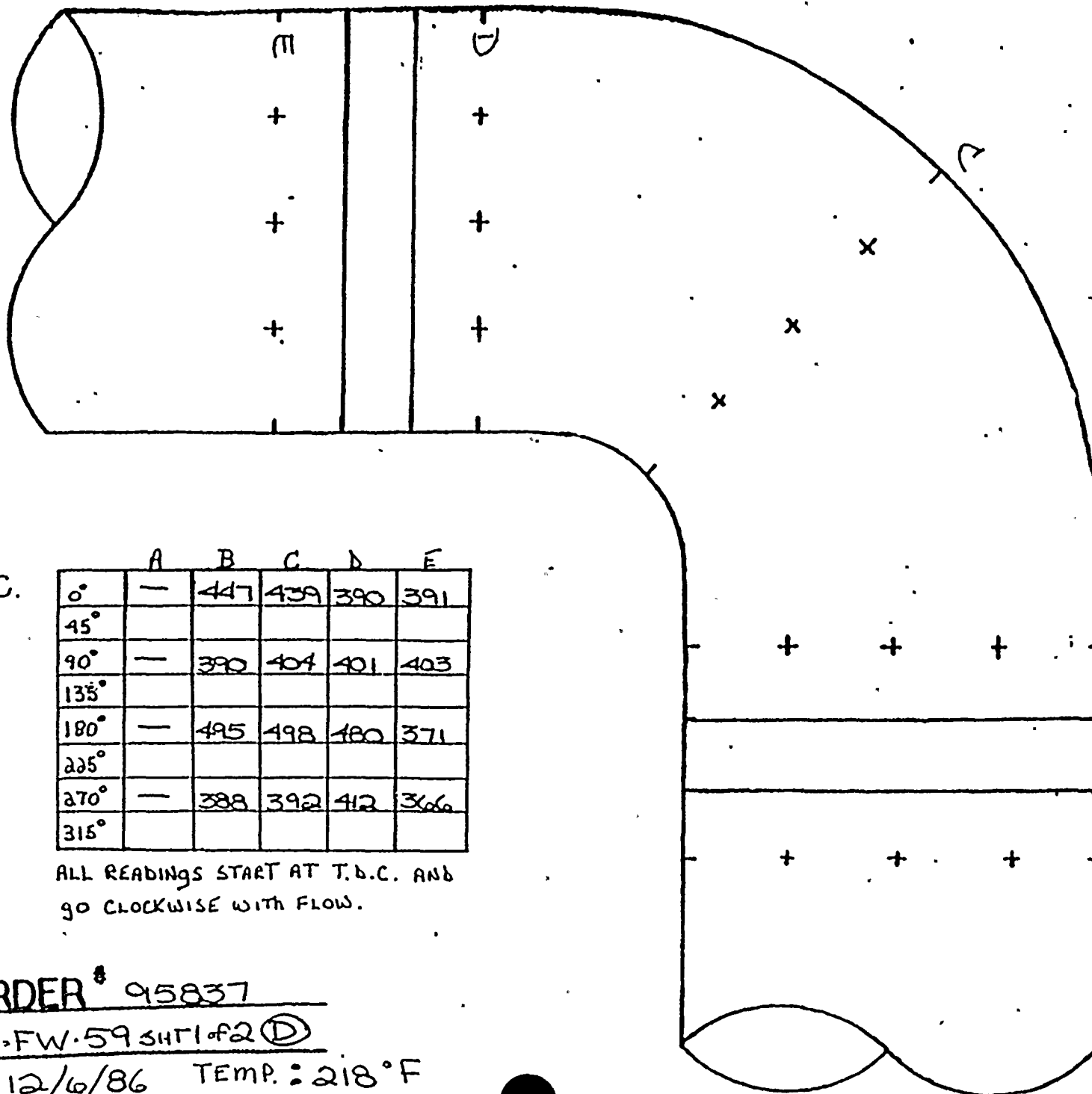
JOB ORDER # 95837

ISO # ~~FW-57~~ 551 (C) SHTICF2

DATE: 12/5/86 TEMP: 218 °F



FLOW →



T.D.C.

	A	B	C	D	E
0°	—	447	439	390	391
45°					
90°	—	390	404	401	403
135°					
180°	—	495	498	480	371
225°					
270°	—	388	392	412	366
315°					

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

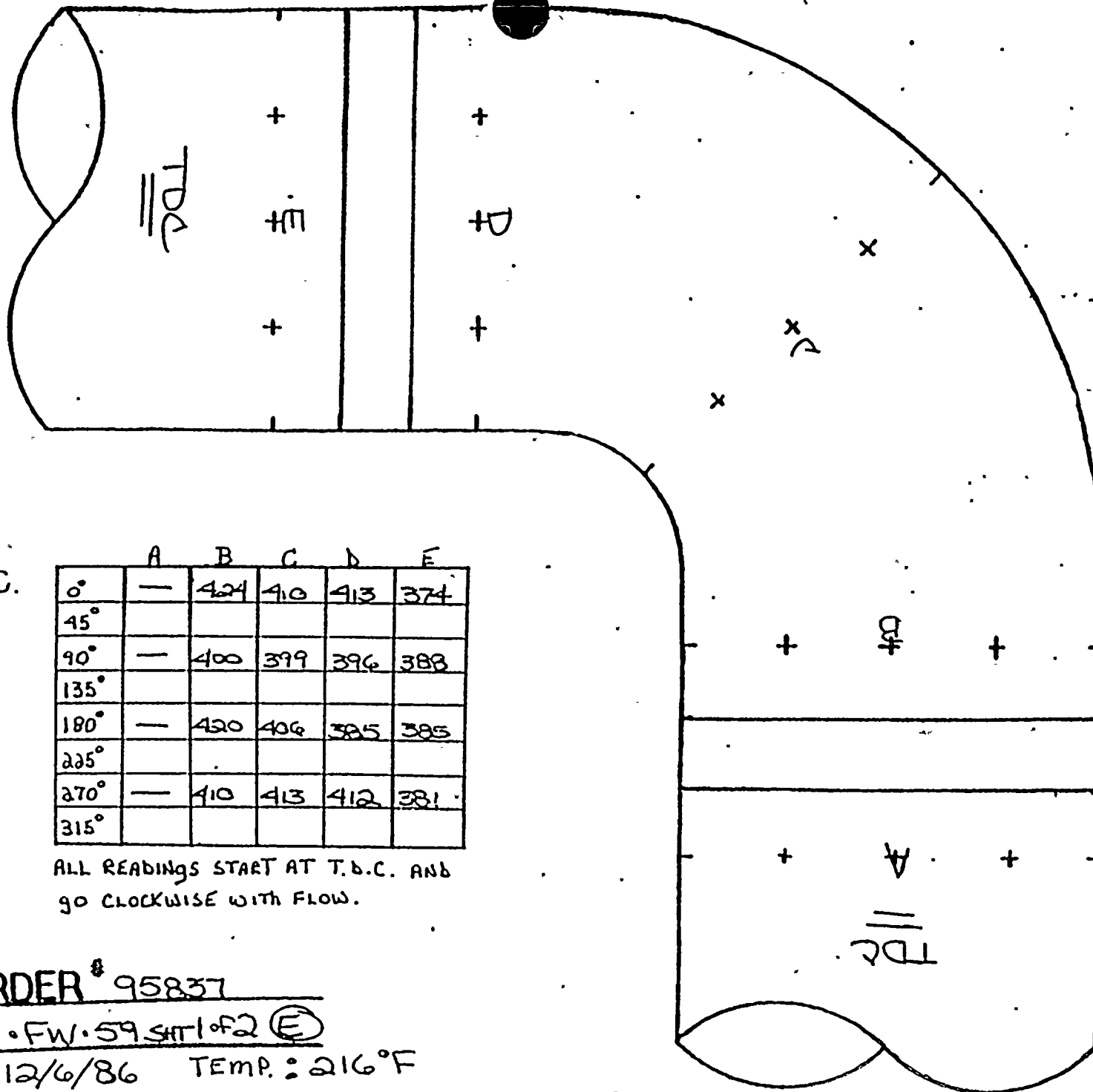
JOB ORDER # 95837

ISO # 1-FW-59 SHT 1 of 2 ①

DATE: 12/6/86 TEMP.: 218°F



FLOW →



T.D.C.

	A	B	C	D	E
0°	—	424	410	413	374
45°					
90°	—	400	399	396	388
135°					
180°	—	420	406	385	385
225°					
270°	—	410	413	412	381
315°					

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

JOB ORDER # 95837

ISO # 1. FW. 59 SH 1 of 2 (E)

DATE: 12/6/86 TEMP.: 216°F



← FLOW

T.D.C.

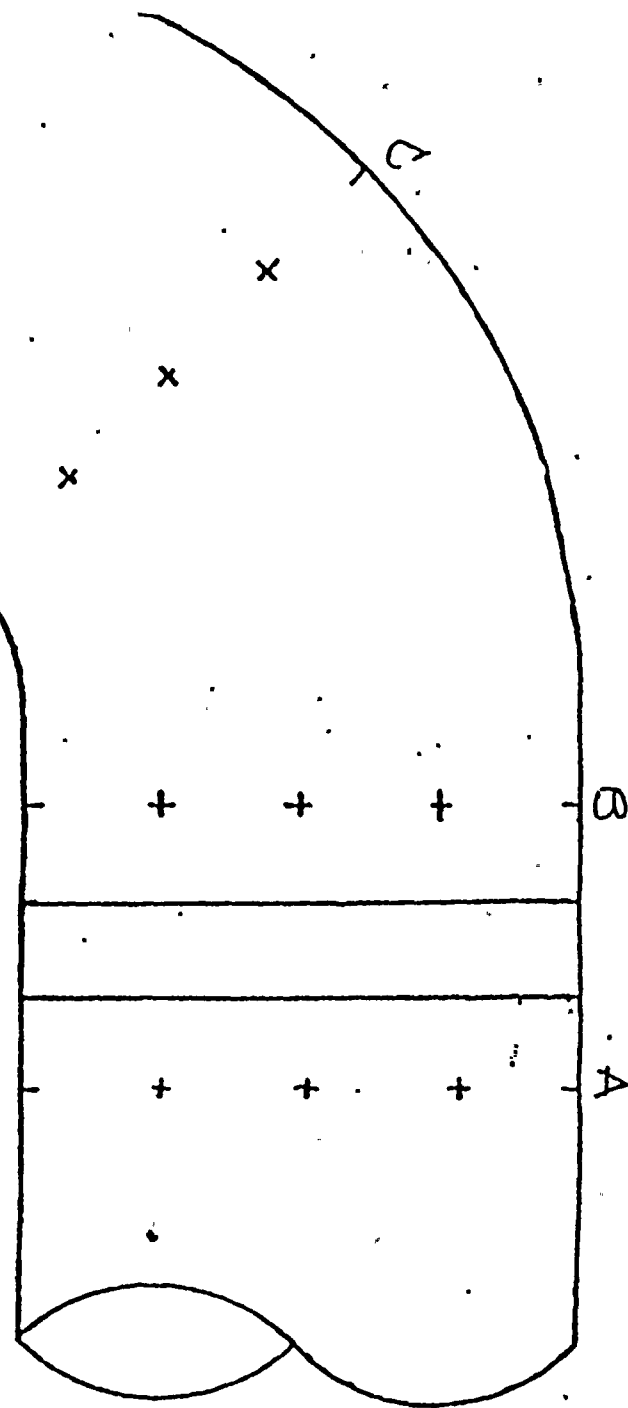
	A	B	C	D	E
0°	415	402	392	323	347
45°					
90°	399	404	394	395	390
135°					
180°	391	390	373	394	403
225°					
270°	385	402	389	403	400
315°					

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

JOB ORDER # 95837

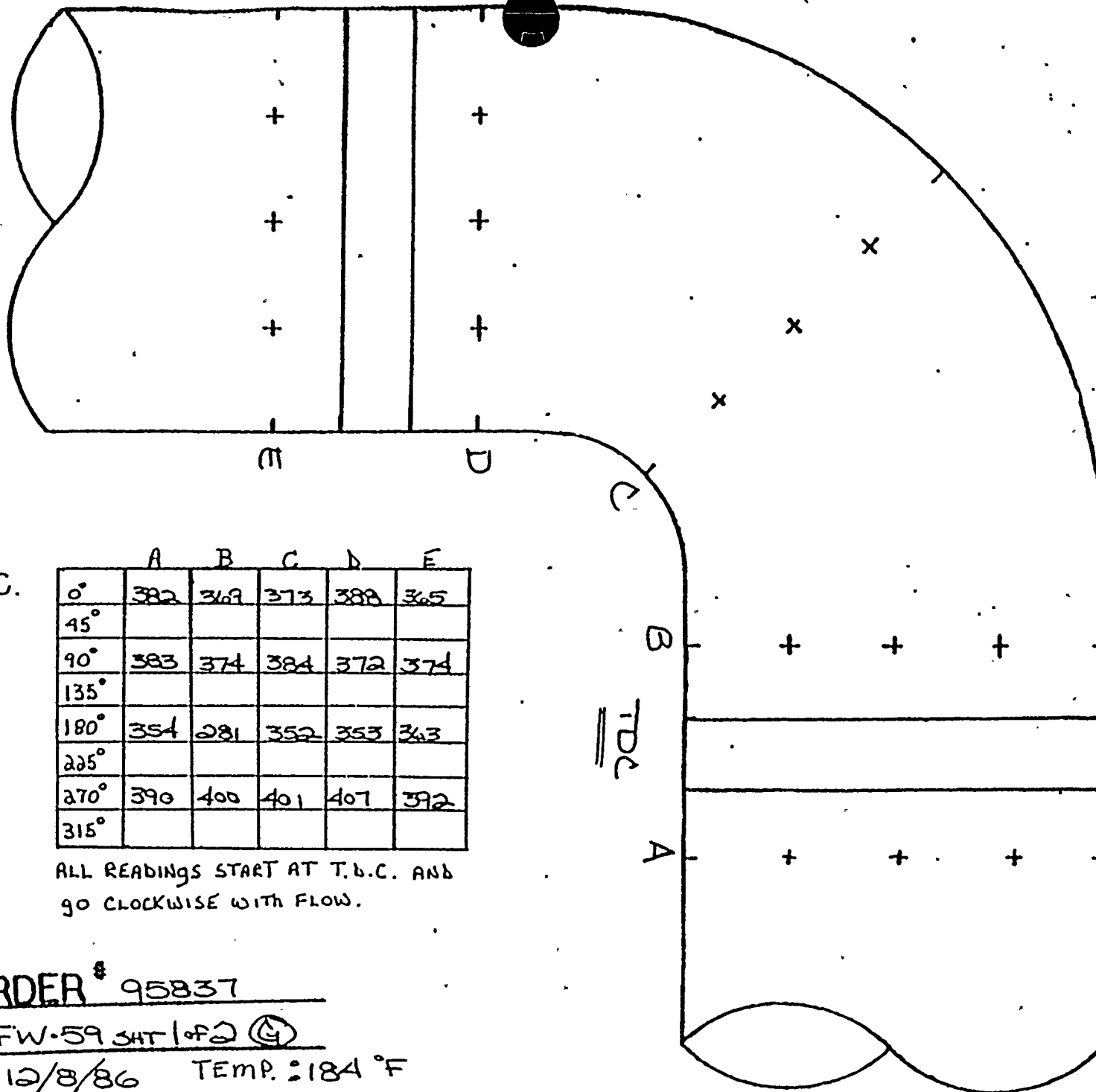
ISO# 1.FW.59 SHT 1 #2 (E)

DATE: 12/8/86 TEMP.: 184°F





← FLOW



T.D.C.

	A	B	C	D	E
0°	382	369	373	388	365
45°					
90°	383	374	384	372	374
135°					
180°	354	281	352	353	363
225°					
270°	390	400	401	407	392
315°					

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

JOB ORDER # 95837

ISO # 1-FW-59 SHT 1 of 2 (4)

DATE: 12/8/86 TEMP: 184 °F



D. C. COOK N° "LEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 1

Evaluation Date: JANUARY 20, 1987

SER No. 23-85 (Water) X

Years in service 11

UT Reading Transmitted on: 12-13-86

UT Reading Taken on: 12-8-86 12-10-86  
12-9-86 12-13-86

Isometric Dwg. NO. FW-59, REV. 9, Sh. 2 of 2

AEPS Installed Mat'l Class CS: A-106 GR B SCH. 40 & 80

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
G	4" STRAIGHT $\phi$	.337	.295-.379	.235	.320	0%	STILL WITHIN MANUFACTURERS TOLERANCE
G	4" 90° ELL	.337	.295-.379	.235	.290	1.7%	> Tm OK
G	4" STRAIGHT $\phi$	.337	.295-.379	.235	.347	0%	STILL WITHIN MANUFACTURERS TOLERANCE
J	4" STRAIGHT $\phi$	.337	.295-.379	.235	.351	0%	
J	4" 90° ELL	.337	.295-.379	.235	.223	24.4%	PAWELD & REPLACE
J	4" STRAIGHT $\phi$	.337	.295-.379	.235	.377	0%	STILL WITHIN MANUFACTURERS TOLERANCE
M	4" STRAIGHT $\phi$	.337	.295-.379	.235	.335	0%	
M	4" 90° ELL	.337	.295-.379	.235	.220	25.4%	PAWELD & REPLACE
<del>M</del>	<del>4" STRAIGHT <math>\phi</math></del>	<del>.337</del>	<del>.295-.379</del>	<del>.235</del>	<del>---</del>	<del>---</del>	<del>---</del>
N	4" STRAIGHT $\phi$	.337	.295-.379	.235	.333	0%	STILL WITHIN MANUFACTURERS TOLERANCE
N	4" 90° ELL	.337	.295-.379	.235	.199	32.5%	PAWELD & REPLACE
N	4" STRAIGHT $\phi$	.337	.295-.379	.235	.193	34.6%	
O	4" STRAIGHT $\phi$	.337	.295-.379	.049	.332	0%	STILL WITHIN MANUFACTURERS TOLERANCE
O	4" 90° ELL	.337	.295-.379	.049	.326	0%	
O	4" STRAIGHT $\phi$	.337	.295-.379	.049	.327	0%	



D. C. COOK N° PLANT  
EROSION EVALUATION WORKSHEET

AEPSC Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 1

Evaluation Date: JANUARY 20, 1987

SER No. 23-85 (Water) X

Years in service 11

UT Reading Transmitted on: 12-13-86

UT Reading Taken on: 12-9-86, 12-10-86, 12-13-86

Isometric Dwg. NO. 1-FW-59, REV. 9 Sh. 2 of 2

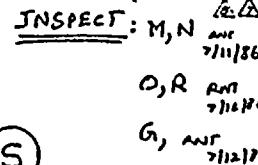
AEPSC Installed Mat'l Class CS: A-106 GR. B SCH. 40, 80

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
Q	4" 90° ELL	.332	.295-.379	.049	.338	0%	STILL WITHIN MANUFACTURERS TOLERANCE
Q	4" STRAIGHT d	.337	.295-.379	.049	.307	0%	
R	4" 90° ELL	.337	.295-.379	.049	.307	0%	
R	4" STRAIGHT d	.337	.295-.379	.049	.347	0%	

NOTE: THE AEPSC PIPE SPECIFICATION CALLS FOR SCH. 40 TO BE  
USED FOR COMPONENTS Q, Q & R. HOWEVER, UT RESULTS INDICATE  
SCH. 80 PIPE.



CONST:  $\neq 95838, 95839$



REVISION RECORD				DATE
NO	DATE	BY	DESCRIPTION	REMARKS
1	10/10/54	WJ	REVISED BY MRS. DESIGNS. ADDED: FNA VENT. COMP. PK. NO. 8 ITEMS 36.0 TO REV. 3.0 DWA 1-5225	FIELD NO. 36.0 REV. 3.0
2	10/11/54	WJ	REVISED BY MRS. DESIGNS. ADDED: WLS 10.0 REV. 3.0 DWA 1-5225	FIELD NO. 10.0 REV. 3.0
3	10/11/54	WJ	REVISED BY MRS. DESIGNS. ADDED: WLS 10.0 REV. 3.0 DWA 1-5225	FIELD NO. 10.0 REV. 3.0
4	10/11/54	WJ	REVISED BY MRS. DESIGNS. ADDED: WLS 10.0 REV. 3.0 DWA 1-5225	FIELD NO. 10.0 REV. 3.0
5	10/11/54	WJ	REVISED BY MRS. DESIGNS. ADDED: WLS 10.0 REV. 3.0 DWA 1-5225	FIELD NO. 10.0 REV. 3.0
6	10/11/54	WJ	REVISED BY MRS. DESIGNS. ADDED: WLS 10.0 REV. 3.0 DWA 1-5225	FIELD NO. 10.0 REV. 3.0
7	10/11/54	WJ	REVISED BY MRS. DESIGNS. ADDED: WLS 10.0 REV. 3.0 DWA 1-5225	FIELD NO. 10.0 REV. 3.0
8	10/11/54	WJ	REVISED BY MRS. DESIGNS. ADDED: WLS 10.0 REV. 3.0 DWA 1-5225	FIELD NO. 10.0 REV. 3.0
9	10/11/54	WJ	REVISED BY MRS. DESIGNS. ADDED: WLS 10.0 REV. 3.0 DWA 1-5225	FIELD NO. 10.0 REV. 3.0

[illegible]

O, P, Q, R

replace SITE #48 P. 5.5 175.  
with S. 6. 1-FN-59-61 HND  
7/30/25 1-FN-59-62  
BS.

RUN MISS MEAS  
330 VOID 174.57 V VOID Δ

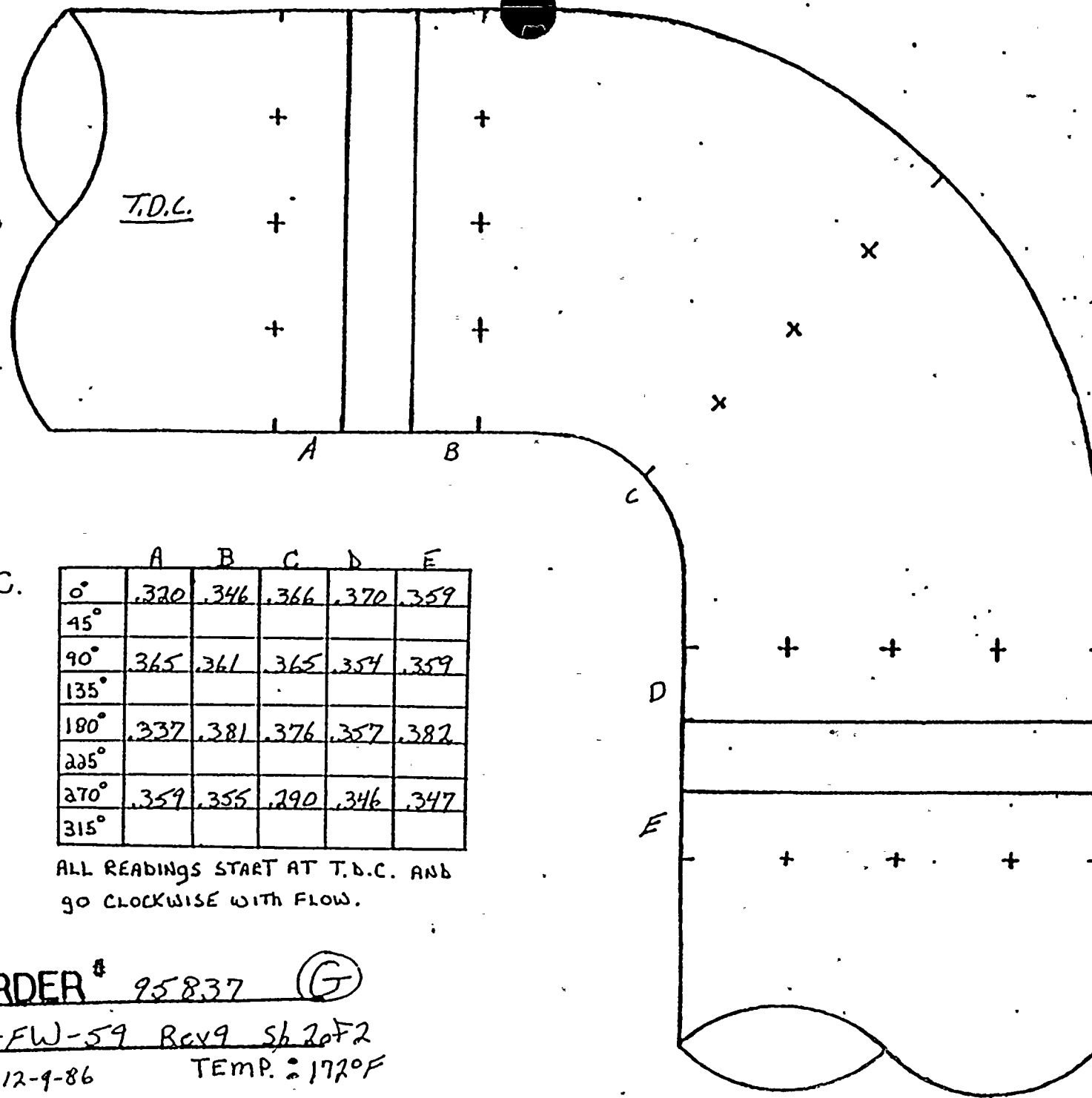
	1	.10	
		.11	
		.12	
329	—	13 VOID	
851		.152 VOID	

1. DESIGN SPEC. DECOM. <i>112 385</i> 2. HANICAR S.I. CLASS. <i>112</i> 3. TEST REQUIREMENTS OL. <i>112</i> 4. FIELD PROLOGUE. <i>112</i> 5. CAL. <i>112</i>		6. DESIGN SPEC. DECOM. <i>112 385</i> 7. HANICAR S.I. CLASS. <i>112</i> 8. TEST REQUIREMENTS OL. <i>112</i> 9. FIELD PROLOGUE. <i>112</i> 10. CAL. <i>112</i>		11. DESIGN SPEC. DECOM. <i>112 385</i> 12. HANICAR S.I. CLASS. <i>112</i> 13. TEST REQUIREMENTS OL. <i>112</i> 14. FIELD PROLOGUE. <i>112</i> 15. CAL. <i>112</i>		16. DESIGN SPEC. DECOM. <i>112 385</i> 17. HANICAR S.I. CLASS. <i>112</i> 18. TEST REQUIREMENTS OL. <i>112</i> 19. FIELD PROLOGUE. <i>112</i> 20. CAL. <i>112</i>		21. DESIGN SPEC. DECOM. <i>112 385</i> 22. HANICAR S.I. CLASS. <i>112</i> 23. TEST REQUIREMENTS OL. <i>112</i> 24. FIELD PROLOGUE. <i>112</i> 25. CAL. <i>112</i>		26. DESIGN SPEC. DECOM. <i>112 385</i> 27. HANICAR S.I. CLASS. <i>112</i> 28. TEST REQUIREMENTS OL. <i>112</i> 29. FIELD PROLOGUE. <i>112</i> 30. CAL. <i>112</i>		31. DESIGN SPEC. DECOM. <i>112 385</i> 32. HANICAR S.I. CLASS. <i>112</i> 33. TEST REQUIREMENTS OL. <i>112</i> 34. FIELD PROLOGUE. <i>112</i> 35. CAL. <i>112</i>		36. DESIGN SPEC. DECOM. <i>112 385</i> 37. HANICAR S.I. CLASS. <i>112</i> 38. TEST REQUIREMENTS OL. <i>112</i> 39. FIELD PROLOGUE. <i>112</i> 40. CAL. <i>112</i>		41. DESIGN SPEC. DECOM. <i>112 385</i> 42. HANICAR S.I. CLASS. <i>112</i> 43. TEST REQUIREMENTS OL. <i>112</i> 44. FIELD PROLOGUE. <i>112</i> 45. CAL. <i>112</i>		46. DESIGN SPEC. DECOM. <i>112 385</i> 47. HANICAR S.I. CLASS. <i>112</i> 48. TEST REQUIREMENTS OL. <i>112</i> 49. FIELD PROLOGUE. <i>112</i> 50. CAL. <i>112</i>		51. DESIGN SPEC. DECOM. <i>112 385</i> 52. HANICAR S.I. CLASS. <i>112</i> 53. TEST REQUIREMENTS OL. <i>112</i> 54. FIELD PROLOGUE. <i>112</i> 55. CAL. <i>112</i>		56. DESIGN SPEC. DECOM. <i>112 385</i> 57. HANICAR S.I. CLASS. <i>112</i> 58. TEST REQUIREMENTS OL. <i>112</i> 59. FIELD PROLOGUE. <i>112</i> 60. CAL. <i>112</i>		61. DESIGN SPEC. DECOM. <i>112 385</i> 62. HANICAR S.I. CLASS. <i>112</i> 63. TEST REQUIREMENTS OL. <i>112</i> 64. FIELD PROLOGUE. <i>112</i> 65. CAL. <i>112</i>		66. DESIGN SPEC. DECOM. <i>112 385</i> 67. HANICAR S.I. CLASS. <i>112</i> 68. TEST REQUIREMENTS OL. <i>112</i> 69. FIELD PROLOGUE. <i>112</i> 70. CAL. <i>112</i>		71. DESIGN SPEC. DECOM. <i>112 385</i> 72. HANICAR S.I. CLASS. <i>112</i> 73. TEST REQUIREMENTS OL. <i>112</i> 74. FIELD PROLOGUE. <i>112</i> 75. CAL. <i>112</i>		76. DESIGN SPEC. DECOM. <i>112 385</i> 77. HANICAR S.I. CLASS. <i>112</i> 78. TEST REQUIREMENTS OL. <i>112</i> 79. FIELD PROLOGUE. <i>112</i> 80. CAL. <i>112</i>		81. DESIGN SPEC. DECOM. <i>112 385</i> 82. HANICAR S.I. CLASS. <i>112</i> 83. TEST REQUIREMENTS OL. <i>112</i> 84. FIELD PROLOGUE. <i>112</i> 85. CAL. <i>112</i>		86. DESIGN SPEC. DECOM. <i>112 385</i> 87. HANICAR S.I. CLASS. <i>112</i> 88. TEST REQUIREMENTS OL. <i>112</i> 89. FIELD PROLOGUE. <i>112</i> 90. CAL. <i>112</i>		91. DESIGN SPEC. DECOM. <i>112 385</i> 92. HANICAR S.I. CLASS. <i>112</i> 93. TEST REQUIREMENTS OL. <i>112</i> 94. FIELD PROLOGUE. <i>112</i> 95. CAL. <i>112</i>		96. DESIGN SPEC. DECOM. <i>112 385</i> 97. HANICAR S.I. CLASS. <i>112</i> 98. TEST REQUIREMENTS OL. <i>112</i> 99. FIELD PROLOGUE. <i>112</i> 100. CAL. <i>112</i>		101. DESIGN SPEC. DECOM. <i>112 385</i> 102. HANICAR S.I. CLASS. <i>112</i> 103. TEST REQUIREMENTS OL. <i>112</i> 104. FIELD PROLOGUE. <i>112</i> 105. CAL. <i>112</i>		106. DESIGN SPEC. DECOM. <i>112 385</i> 107. HANICAR S.I. CLASS. <i>112</i> 108. TEST REQUIREMENTS OL. <i>112</i> 109. FIELD PROLOGUE. <i>112</i> 110. CAL. <i>112</i>		111. DESIGN SPEC. DECOM. <i>112 385</i> 112. HANICAR S.I. CLASS. <i>112</i> 113. TEST REQUIREMENTS OL. <i>112</i> 114. FIELD PROLOGUE. <i>112</i> 115. CAL. <i>112</i>		116. DESIGN SPEC. DECOM. <i>112 385</i> 117. HANICAR S.I. CLASS. <i>112</i> 118. TEST REQUIREMENTS OL. <i>112</i> 119. FIELD PROLOGUE. <i>112</i> 120. CAL. <i>112</i>		121. DESIGN SPEC. DECOM. <i>112 385</i> 122. HANICAR S.I. CLASS. <i>112</i> 123. TEST REQUIREMENTS OL. <i>112</i> 124. FIELD PROLOGUE. <i>112</i> 125. CAL. <i>112</i>		126. DESIGN SPEC. DECOM. <i>112 385</i> 127. HANICAR S.I. CLASS. <i>112</i> 128. TEST REQUIREMENTS OL. <i>112</i> 129. FIELD PROLOGUE. <i>112</i> 130. CAL. <i>112</i>		131. DESIGN SPEC. DECOM. <i>112 385</i> 132. HANICAR S.I. CLASS. <i>112</i> 133. TEST REQUIREMENTS OL. <i>112</i> 134. FIELD PROLOGUE. <i>112</i> 135. CAL. <i>112</i>		136. DESIGN SPEC. DECOM. <i>112 385</i> 137. HANICAR S.I. CLASS. <i>112</i> 138. TEST REQUIREMENTS OL. <i>112</i> 139. FIELD PROLOGUE. <i>112</i> 140. CAL. <i>112</i>		141. DESIGN SPEC. DECOM. <i>112 385</i> 142. HANICAR S.I. CLASS. <i>112</i> 143. TEST REQUIREMENTS OL. <i>112</i> 144. FIELD PROLOGUE. <i>112</i> 145. CAL. <i>112</i>		146. DESIGN SPEC. DECOM. <i>112 385</i> 147. HANICAR S.I. CLASS. <i>112</i> 148. TEST REQUIREMENTS OL. <i>112</i> 149. FIELD PROLOGUE. <i>112</i> 150. CAL. <i>112</i>		151. DESIGN SPEC. DECOM. <i>112 385</i> 152. HANICAR S.I. CLASS. <i>112</i> 153. TEST REQUIREMENTS OL. <i>112</i> 154. FIELD PROLOGUE. <i>112</i> 155. CAL. <i>112</i>		156. DESIGN SPEC. DECOM. <i>112 385</i> 157. HANICAR S.I. CLASS. <i>112</i> 158. TEST REQUIREMENTS OL. <i>112</i> 159. FIELD PROLOGUE. <i>112</i> 160. CAL. <i>112</i>		161. DESIGN SPEC. DECOM. <i>112 385</i> 162. HANICAR S.I. CLASS. <i>112</i> 163.	
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POURZONE No. 172 REQUIRED COMPLETION DATE FABRICATED BY: 14567	FLOW DIAGRAM 14567 WELD PROCEDURE 14567 NPS DESIGNS INC. NEW YORK, N.Y.	14567 & COMPANY, INC. POLARIS & MICHIGAN ELECTRIC CO. DONALD C. COOK, NUCLEAR PLANT
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRGT. DWGS.	DOW 14567 COW 14567 SHAW 14567 SHAW 14567	14567 14567 14567 14567



FLOW →



T.D.C.

	A	B	C	D	E
0°	.320	.346	.366	.370	.359
45°					
90°	.365	.361	.365	.354	.359
135°					
180°	.337	.381	.376	.357	.382
225°					
270°	.359	.355	.290	.346	.347
315°					

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

JOB ORDER # 95837 (G)

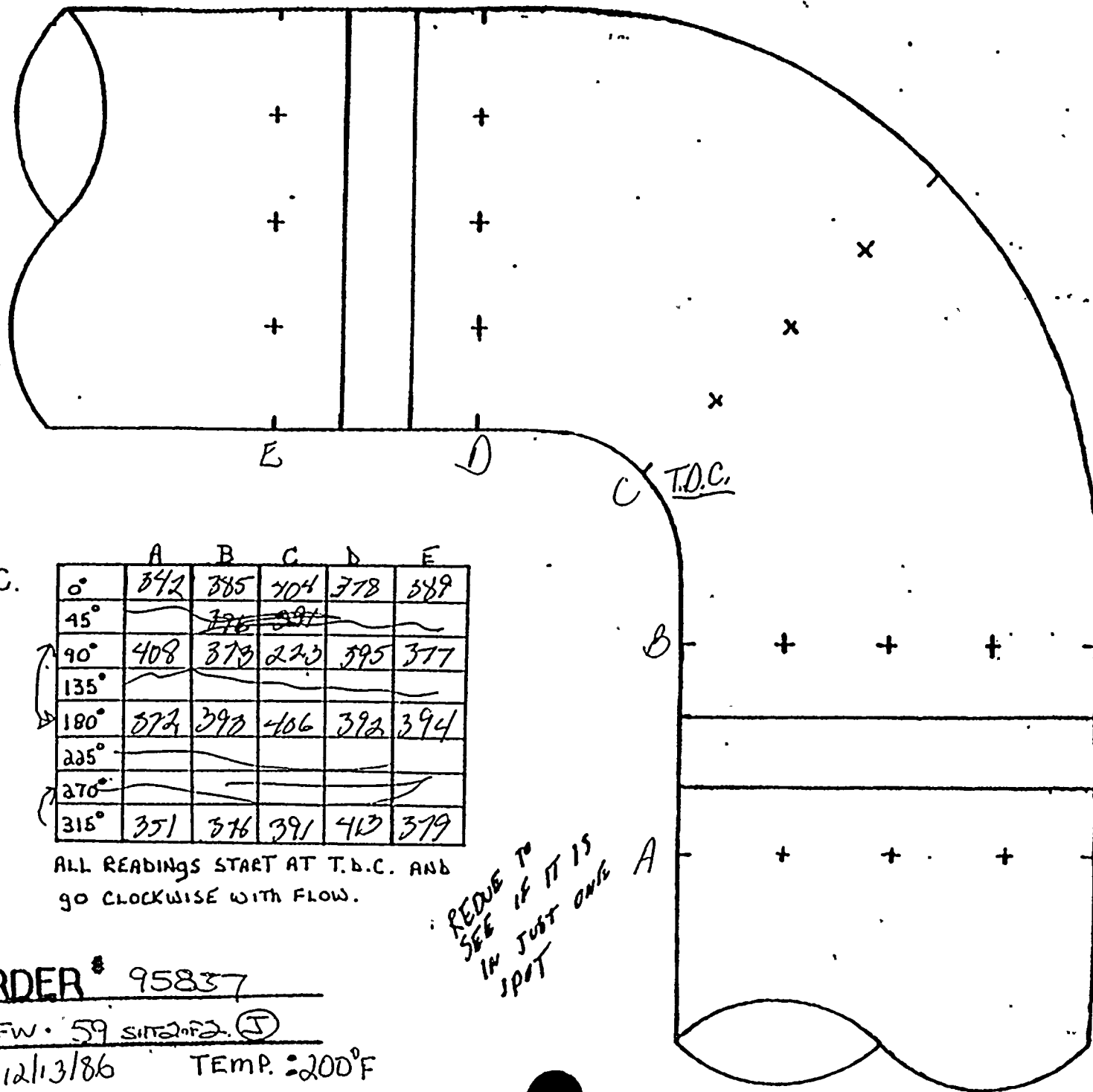
ISO # 1-FW-59 Rev 9 Sh 20F2

DATE: 12-9-86

TEMP.: 172°F



← FLOW



T.D.C.

	A	B	C	D	E
0°	342	385	404	378	389
45°		<del>376</del> <del>381</del>			
90°	408	373	223	395	377
135°					
180°	372	393	406	392	394
225°					
270°					
315°	351	376	391	413	379

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

REDUCE TO  
SEE IF IT IS  
IN JUST ONE A

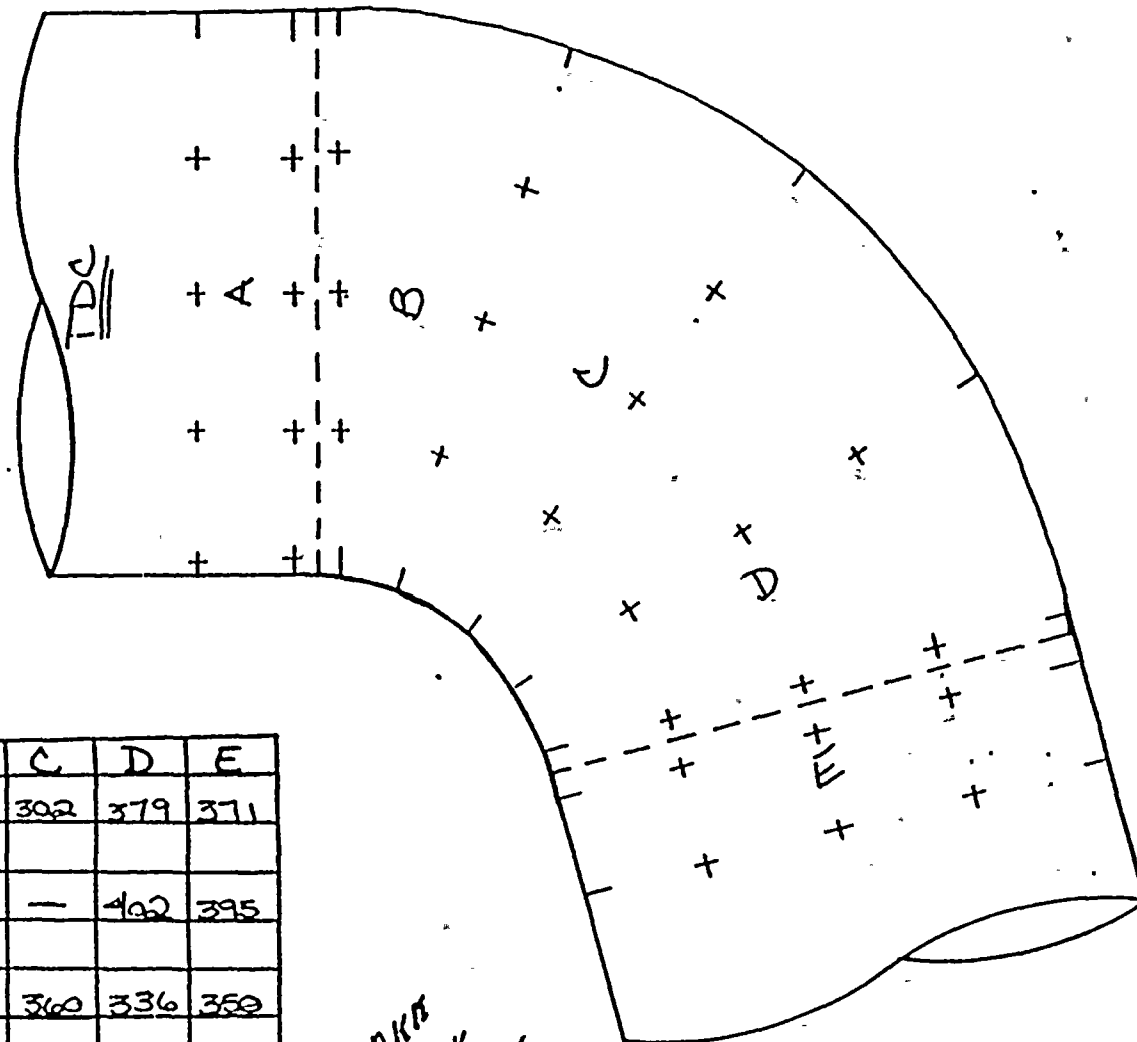
JOE ORDER # 95837

ISO # 1-FW 59 SHT 2 OF 2 (J)

DATE: 12/13/86 TEMP: 200°F



FLOW →



	A	B	C	D	E
0°	368	402	302	379	371
45°					
90°	350	381	—	402	395
135°					
180°	341	289	360	336	350
225°					
270°	335	327	247	220	229
315°					

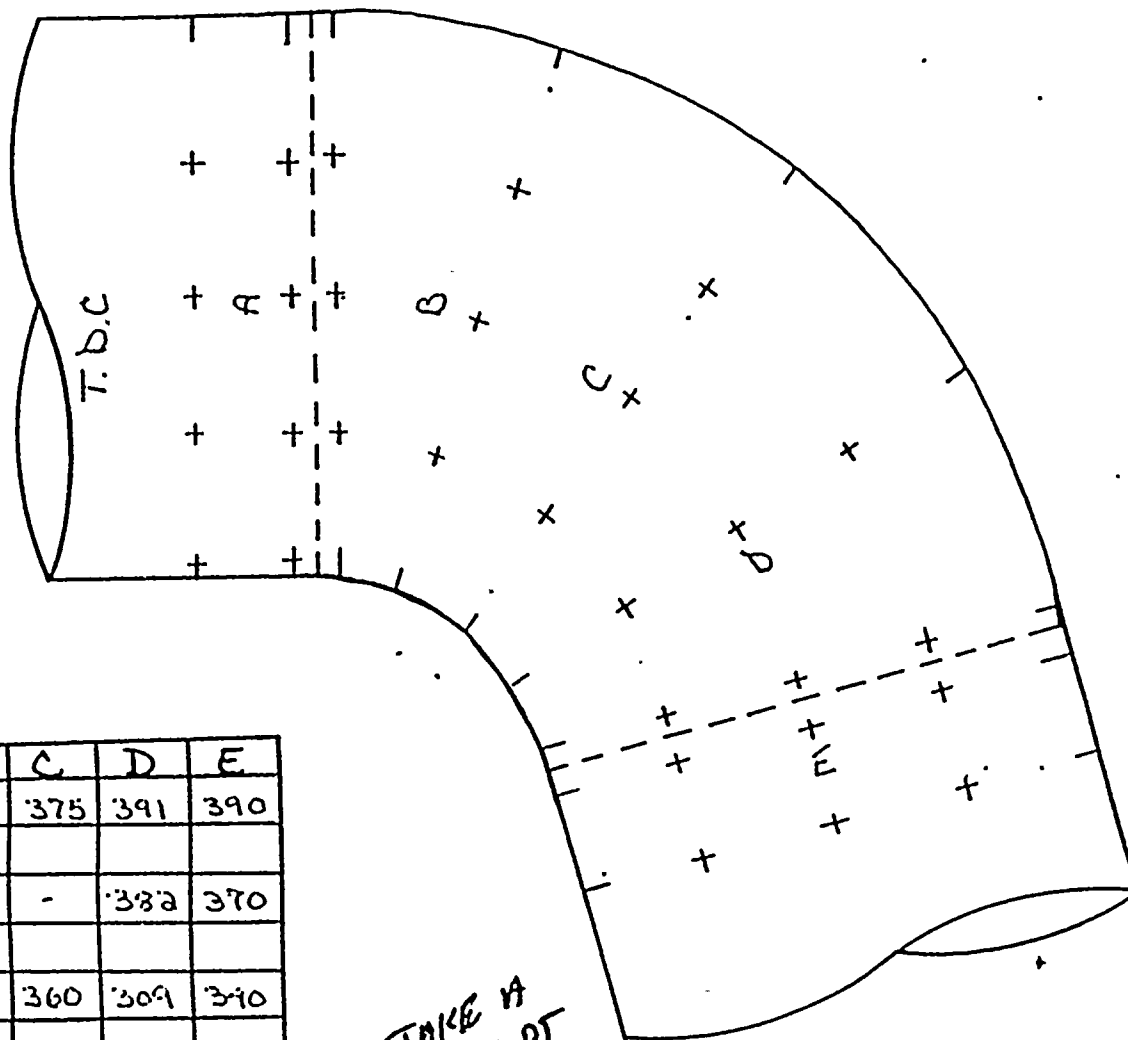
TAKA  
A LOOK  
AT SOME  
OTHER PTS

ALL READINGS START AT T.D.C. AND GO CLOCKWISE  
WITH FLOW.

JOB ORDER # 95837.  
ISO# 1-FW-59 SH 2-F2 (D)  
DATE: 12/8/86 TEMP: 201°F



FLOW →



T.D.C.

	A	B	C	D	E
0°	370	373	375	391	390
45°					
90°	333	378	-	382	370
135°					
180°	343	340	360	309	340
225°					
270°	362	270	203	199	193
315°					

ALL READINGS START AT T.D.C. AND GO CLOCKWISE WITH FLOW.

TAKE A  
LOOK AT  
SOME  
OTHER  
POINTS

JOB ORDER # 95837

ISO # 1-FW-59 SHT 2 OF 2 (N)

DATE: 12/8/86 TEMP: 201°F



FLOW

T.D.C.

T.D.C.

	A	B	C	D	E
0°	343	352	326	351	333
45°					
90°	332	351	340	355	350
135°					
180°	345	382	401	373	329
225°					
270°	347	380	361	352	327
315°					

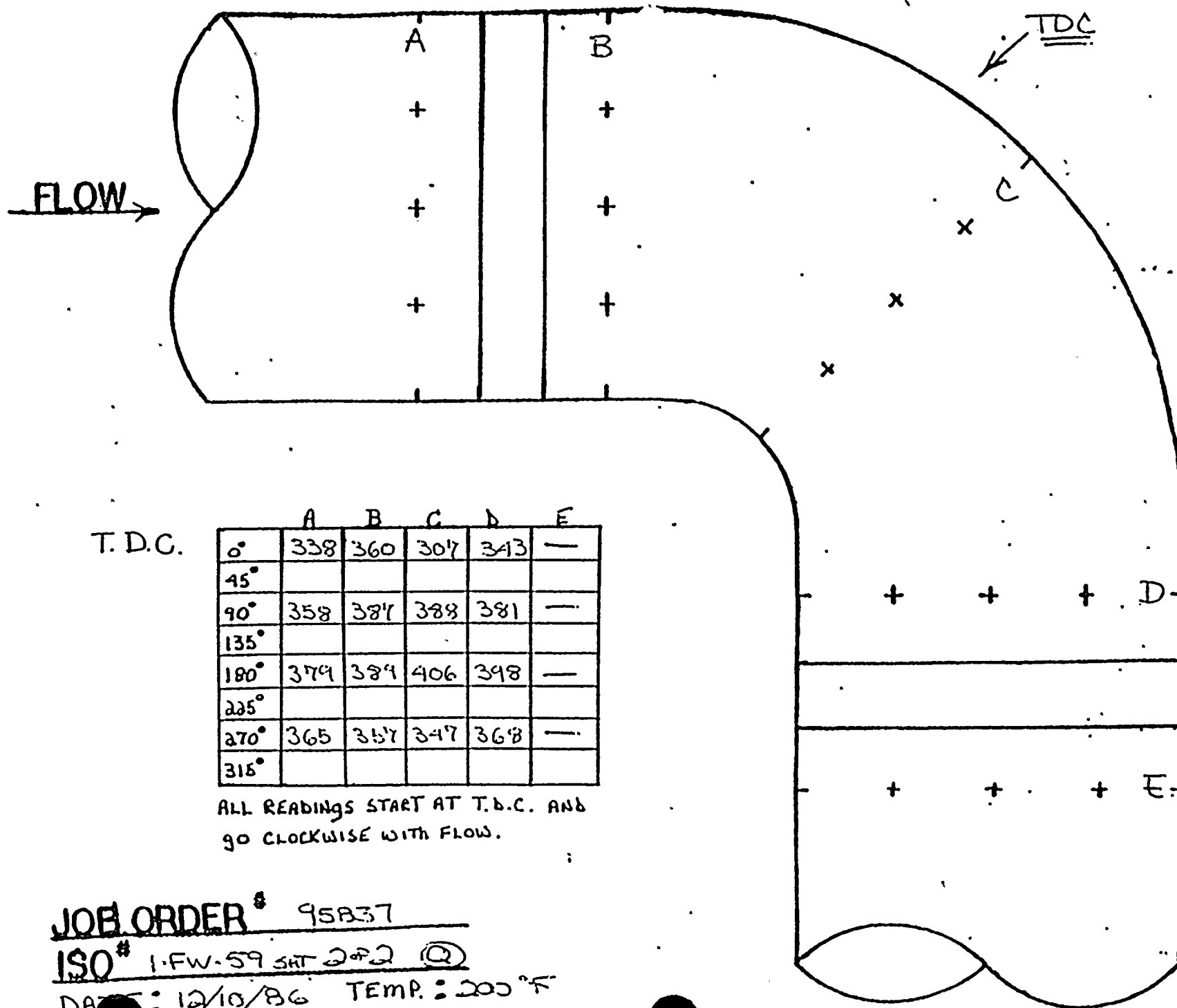
ALL READINGS START AT T.b.c. AND  
GO CLOCKWISE WITH FLOW.

JOB ORDER # 95837

ISO # 1-FW-59-2-2 ⑤

DATE: 12/19/86 TEMP: 200°F





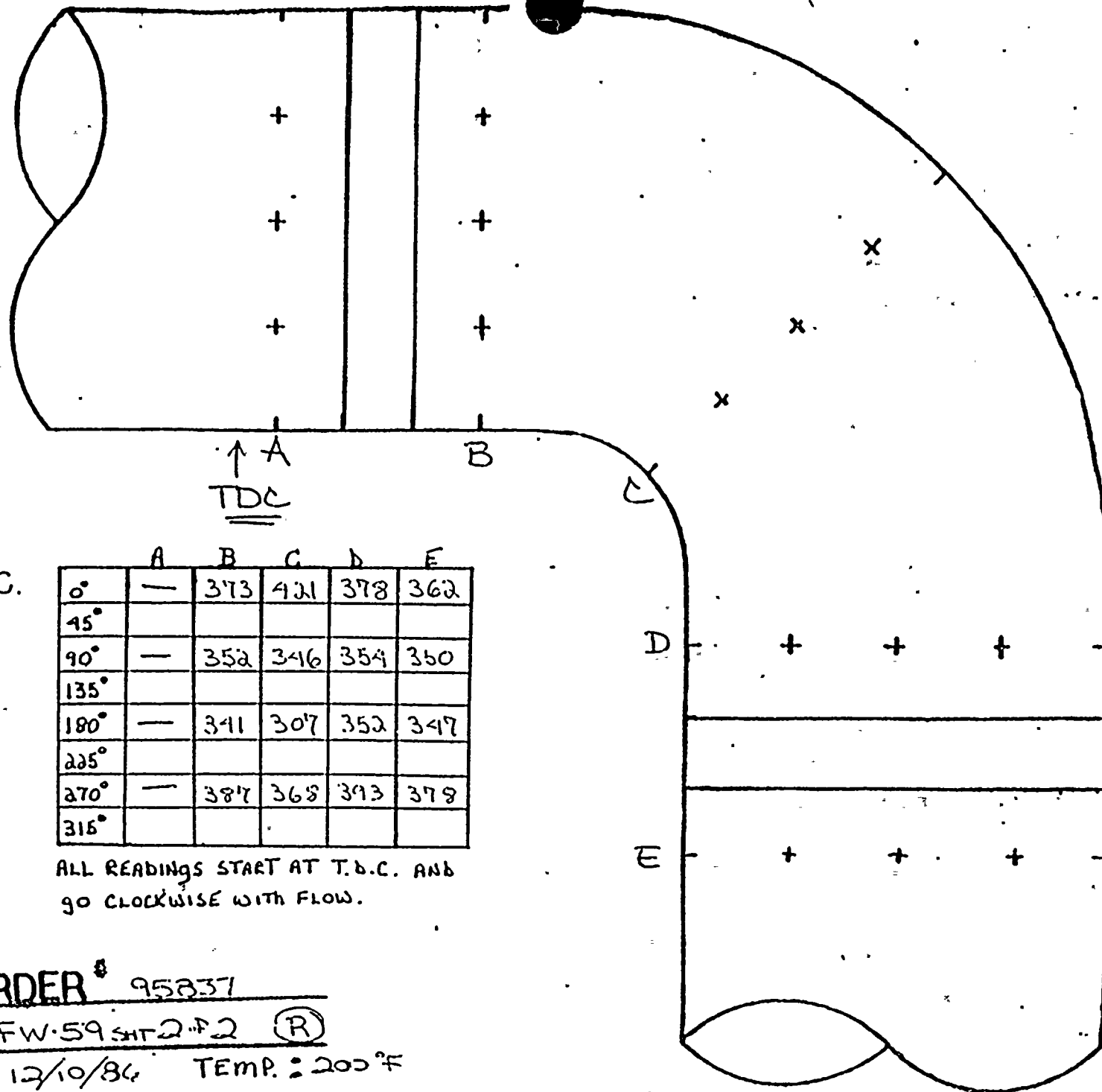
JOB ORDER # 95837

ISO# 1-FW-59 SHT 2 of 2 @

DATE: 12/10/86 TEMP.: 200°F



FLOW →



↑ A  
TDC

T.D.C.

	A	B	C	D	E
0°	—	373	421	378	362
45°					
90°	—	352	346	354	350
135°					
180°	—	341	307	352	347
225°					
270°	—	387	368	393	379
315°					

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

JOB ORDER # 95837

ISO # 1-FW-59 SH 2-P2 (R)

DATE: 12/10/84 TEMP: 200°F



D. C. COOK NUCLEAR PLANT  
EROSION EVALUAT. WORKSHEET

SER No. 88-84 (Steam)

Unit No. 1

SER No. 23-85 (Water) X

Years in service //

UT Reading Taken on: 12-8-86

Isometric Dwg. NO. 1-FW-58 REV.5 Sh.1 of 2 AEPSC Installed Mat'l Class CS:A-106 GR B SCH.80

## COMMENTS

H	4" STRAIGHT $\phi$	.337	.295-.379	.235	.355	0%	STILL WITHIN MANUFACTURERS TOLERANCE
H	4" <sup>90° ELL</sup> STRAIGHT $\phi$	.337	.295-.379	.235	.361	0%	
H	4" STRAIGHT $\phi$	.337	.295-.379	.235	.360	0%	
I	4" 90° ELL	.337	.295-.379	.235	.353	0%	
I	4" STRAIGHT $\phi$	.337	.295-.379	.235	.351	0%	



1-FW-58-5  
sh. 1 of 2

WEEK #13  
QC: 95838  
CONS: 95838, 95839

INSPECT: F, E, D ANT 7/11/76  
G, I ANT 7/11/76

CONTROLLED  
DOCUMENT  
JAN 18 1978  
VOLUME 1

MATERIAL DESCRIPTION	
1. 1" 3000 PSI GATE VALVE	Q100222
2. 1" 3000 PSI GATE VALVE	Q100222
3. 1" 3000 PSI GATE VALVE	Q100222
4. 1" 3000 PSI GATE VALVE	Q100222
5. 1" 3000 PSI GATE VALVE	Q100222
6. 1" 3000 PSI GATE VALVE	Q100222
7. 1" 3000 PSI GATE VALVE	Q100222
8. 1" 3000 PSI GATE VALVE	Q100222
9. 1" 3000 PSI GATE VALVE	Q100222
10. 1" 3000 PSI GATE VALVE	Q100222
11. 1" 3000 PSI GATE VALVE	Q100222
12. 1" 3000 PSI GATE VALVE	Q100222
13. 1" 3000 PSI GATE VALVE	Q100222

REVISION RECORD	
NO.	DESCRIPTION
1	1. 1" 3000 PSI GATE VALVE
2	2. 1" 3000 PSI GATE VALVE
3	3. 1" 3000 PSI GATE VALVE
4	4. 1" 3000 PSI GATE VALVE
5	5. 1" 3000 PSI GATE VALVE

NOTES:  
1. SEE CRANE AREA FOR LIFTING IN  
2. SEE CRANE AREA FOR LIFTING IN  
3. SEE CRANE AREA FOR LIFTING IN  
4. SEE CRANE AREA FOR LIFTING IN  
5. SEE CRANE AREA FOR LIFTING IN

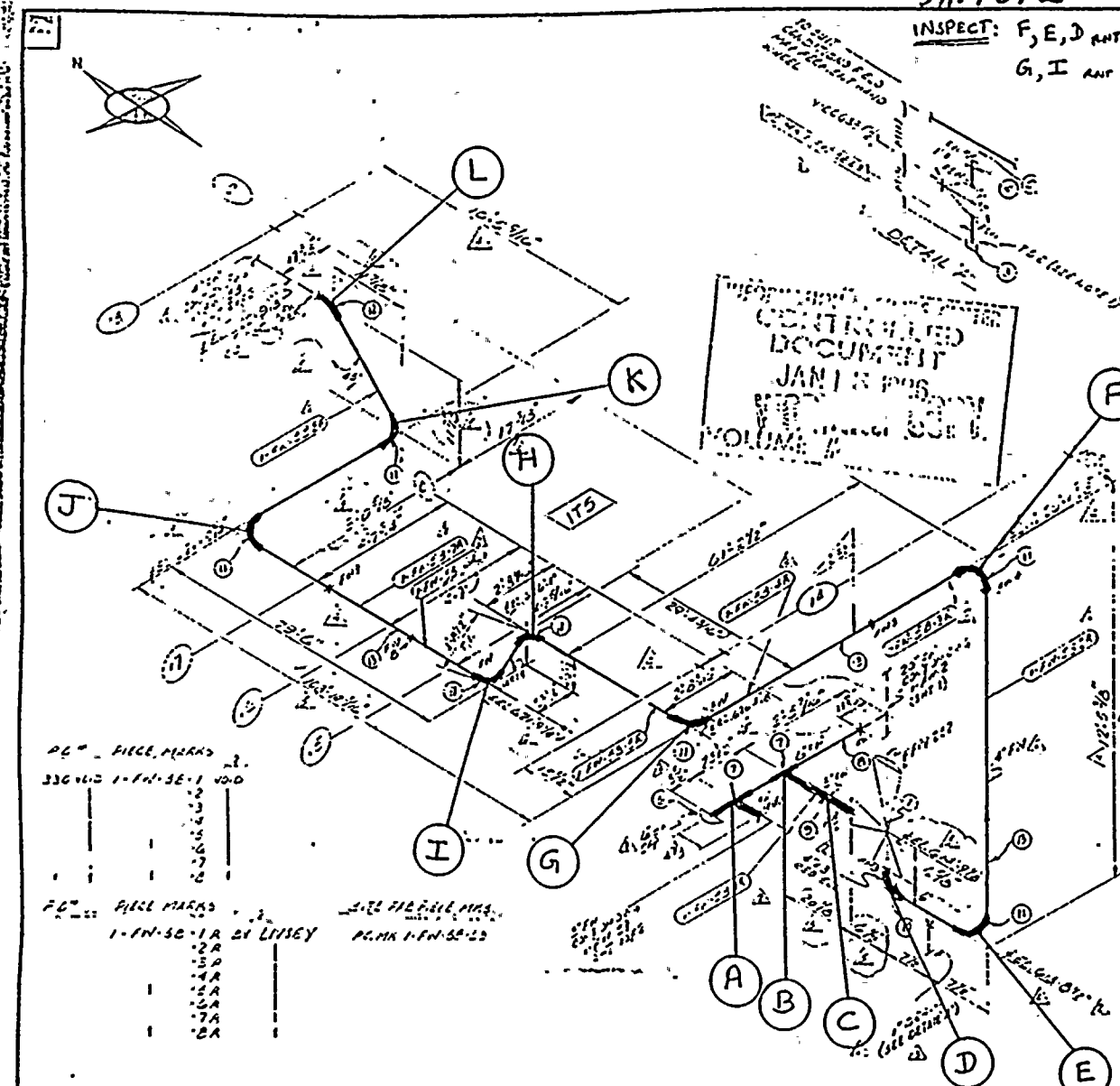
NOTES: REPLACE  
D'NEXT OUT.

DRAWING APPROVED FOR  
BY: [Signature]  
DATE: [Date]

FOUR-ZONE No. 1111  
REQUIRED COMPLETE DATE: [Date]  
FABRICATOR NOTE:  
FABRICATION MUST  
CONFORM TO LATEST  
A.E.P. ARRG. DWGS.

MATERIALS	
Q100222	1" 3000 PSI GATE VALVE
Q100222	1" 3000 PSI GATE VALVE
Q100222	1" 3000 PSI GATE VALVE
Q100222	1" 3000 PSI GATE VALVE
Q100222	1" 3000 PSI GATE VALVE
Q100222	1" 3000 PSI GATE VALVE
Q100222	1" 3000 PSI GATE VALVE
Q100222	1" 3000 PSI GATE VALVE
Q100222	1" 3000 PSI GATE VALVE
Q100222	1" 3000 PSI GATE VALVE

1111	1111
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1111	1111





← FLOW

T.D.C.

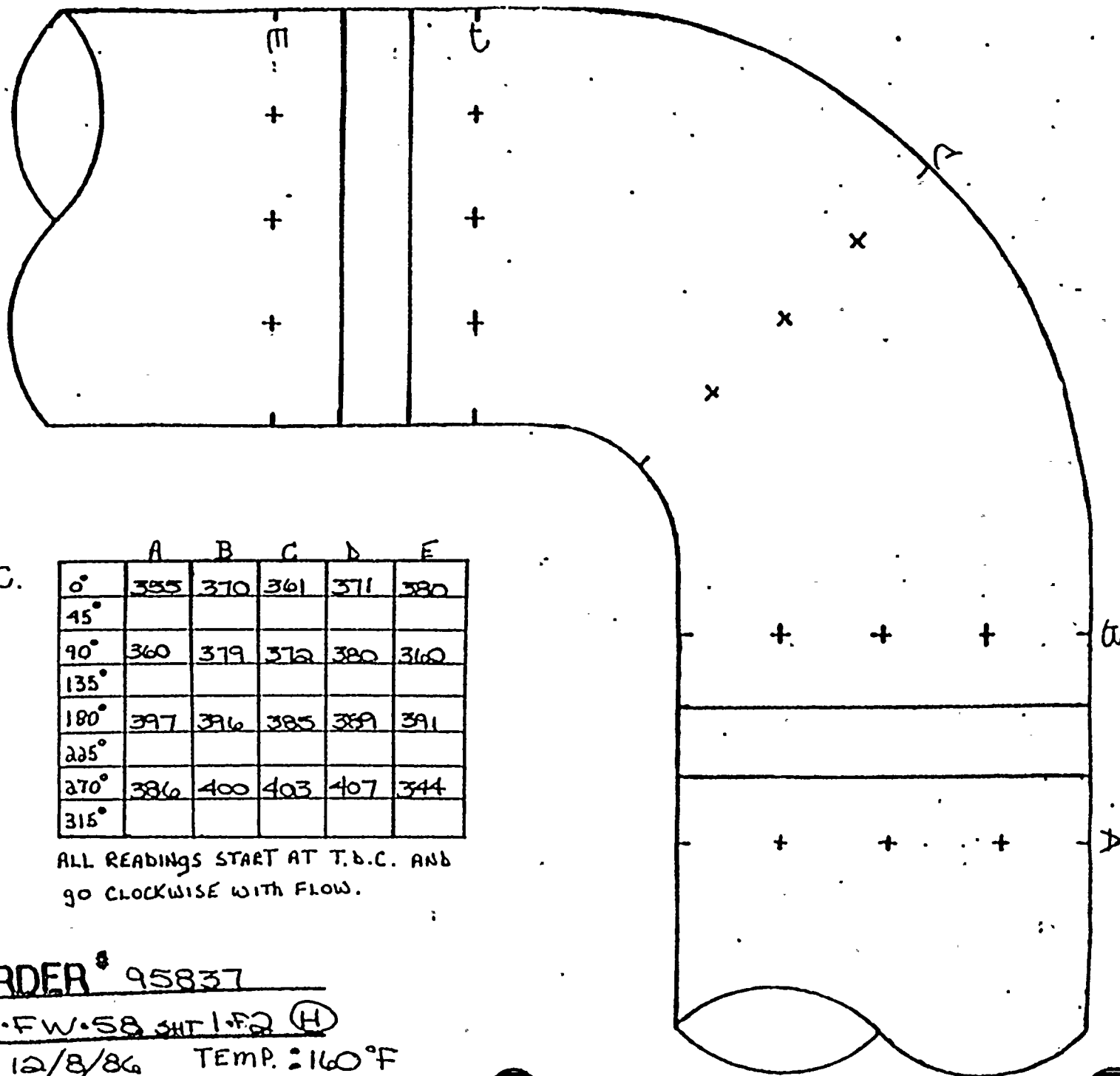
	A	B	C	D	E
0°	355	370	361	371	380
45°					
90°	360	379	372	380	360
135°					
180°	397	396	385	389	391
225°					
270°	386	400	403	407	344
315°					

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

JOB ORDER # 95837

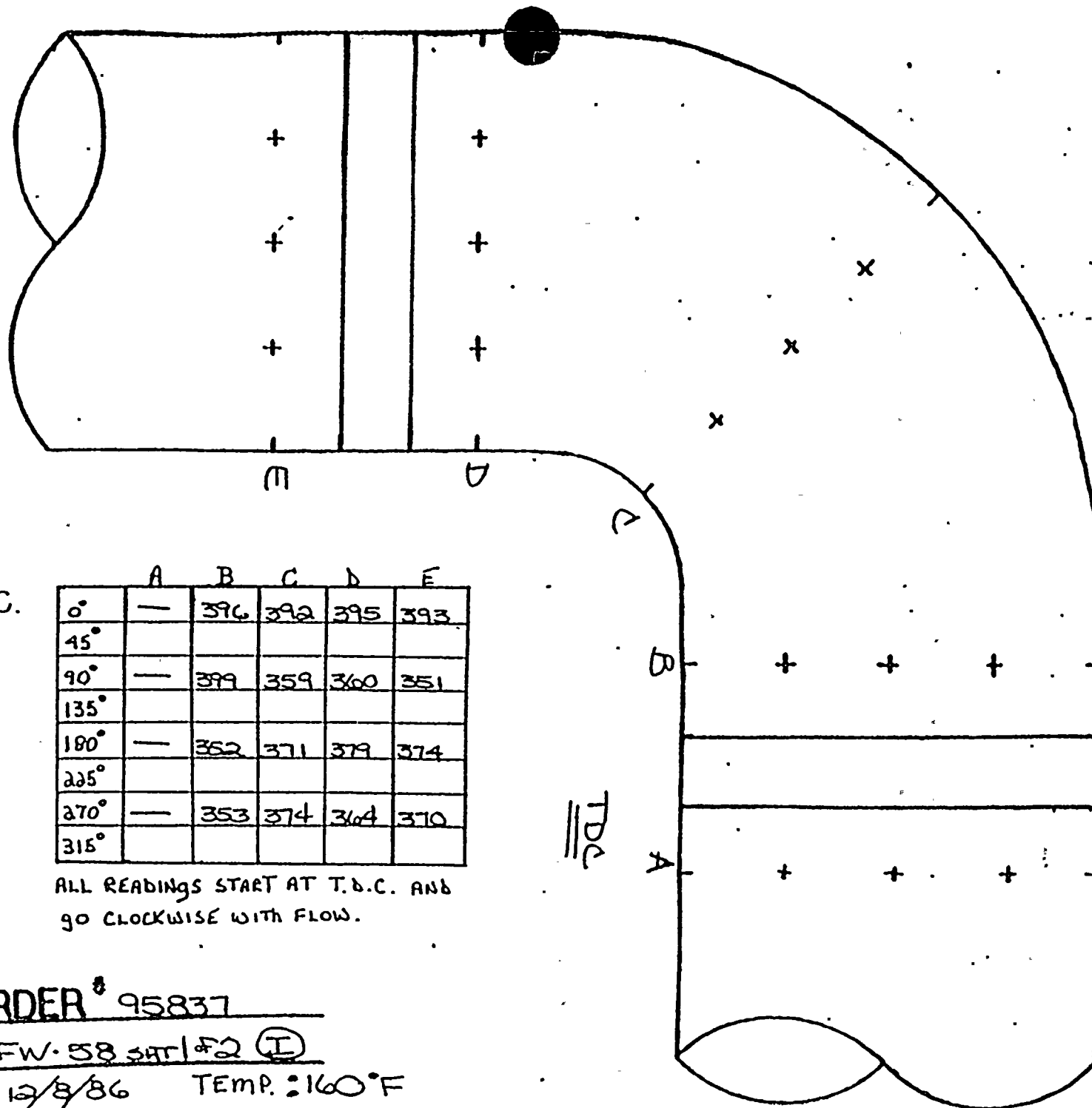
ISO # 1-FW-58 SH-1-F2 (H)

DATE: 12/8/86 TEMP: 160°F





← FLOW



T.D.C.

	A	B	C	D	E
0°	—	396	392	395	393
45°					
90°	—	399	359	360	351
135°					
180°	—	362	371	379	374
225°					
270°	—	353	374	364	370
315°					

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

JOB ORDER # 95837

ISO # 1-FW-58 SAT 1/2 (I)

DATE: 12/8/86 TEMP: 160°F



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 1

Evaluation Date: JANUARY 20, 1987

SER No. 23-85 (Water) X

Years in service 11

UT Reading Transmitted on: 12-15-86

UT Reading Taken on: \_\_\_\_\_

Isometric Dwg. NO. 1-FW-58, REV 9, Sh. 2 of 2

AEPS Installed Mat'l Class CS: A-106, GR. B - SCH. 40 F80

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
B	4" STRAIGHT $\phi$	.337	.295-.379	.235	.374	0%	STILL WITHIN MANUFACTURERS TOLERANCE
B	4" 90° ELL	.337	.295-.379	.235	.373	0%	-----
B	4" STRAIGHT $\phi$	.337	.295-.379	.235	.388	0%	-----
E	4" STRAIGHT $\phi$	.337	.295-.379	.235	.363	0%	-----
E	4" 90° ELL	.337	.295-.379	.235	.158	46.4%	PADWELD & REPLACE
E	4" STRAIGHT $\phi$	.337	.295-.379	.235	.366	0%	STILL WITHIN MANUFACTURERS TOLERANCE
H	4" STRAIGHT $\phi$	.337	.295-.379	.235	.331	0%	-----
H	4" 90° ELL	.337	.295-.379	.235	.188	36.3%	PADWELD & REPLACE
H	4" STRAIGHT $\phi$	.337	.295-.379	.235	.332	0%	STILL WITHIN MANUFACTURERS TOLERANCE
I	4" STRAIGHT $\phi$	.337	.295-.379	.049	.330	0%	-----
I	4" 90° ELL	.337	.295-.379	.049	.316	0%	-----
I	4" STRAIGHT $\phi$	.337	.295-.379	.049	.324	0%	-----
J	4" STRAIGHT $\phi$	.337	.295-.379	.049	.309	0%	-----
J	4" 90° ELL	.337	.295-.379	.049	.300	0%	-----
J	4" STRAIGHT $\phi$	.337	.295-.379	.049	.333	0%	-----



D. C. COOK PLANT

# EROSION EVALUATION WORKSHEET

SER No. 88-84 (Steam)

Unit No. 7

SER No. 23-85 (Water) X

Years in service 11

UT Reading Taken on: \_\_\_\_\_

AEPSIC Installed Mat'l Class CS: A-106-GR.B SCH. 40 980

(I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded
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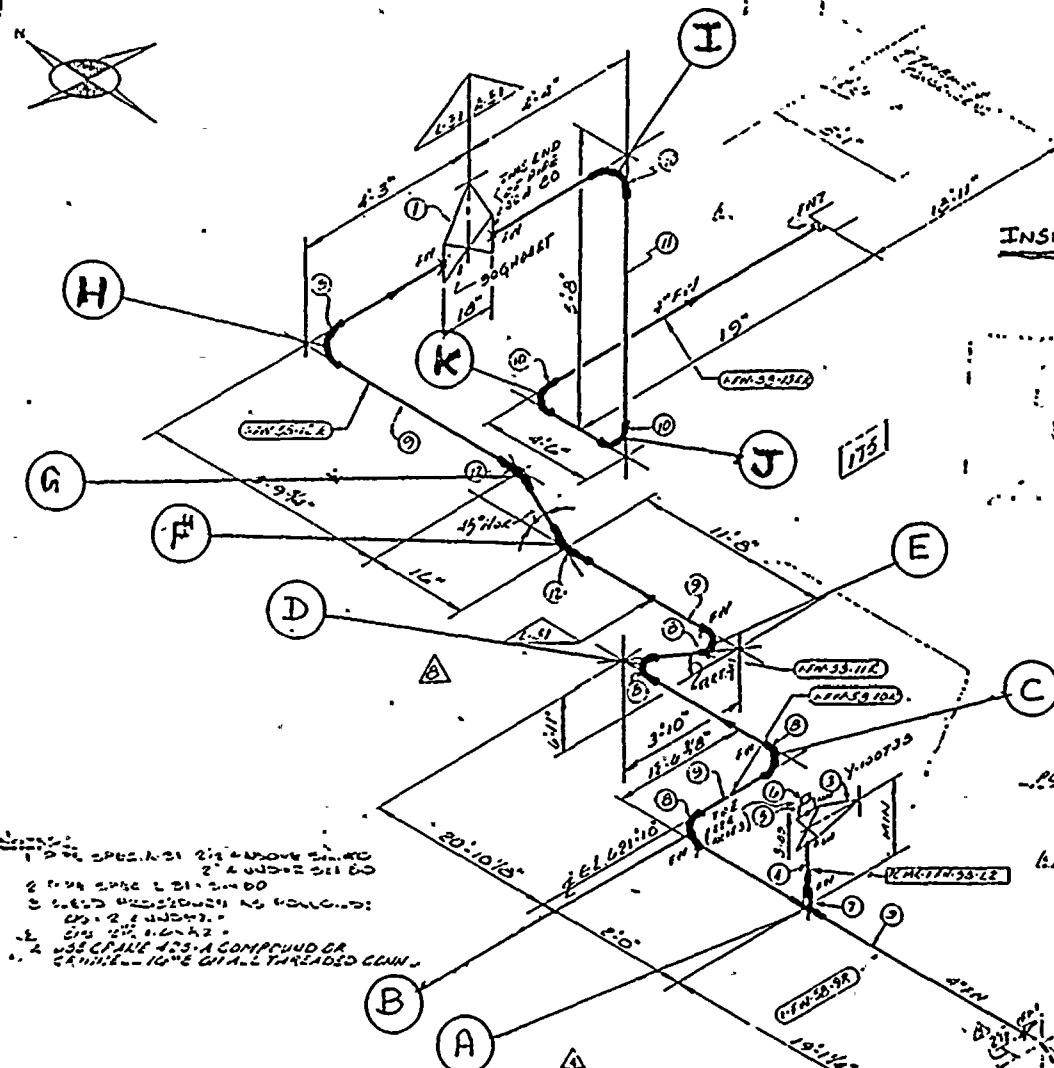
## COMMENTS

K	4" STRAIGHT Ø	.337	.295-.379	.049	.320	0%	STILL WITHIN MANUFACTURERS TOLERANCE
K	4" 90° FLL	.337	.295-.379	.049	.323	0%	-----
K	4" STRAIGHT Ø	.337	.295-.379	.049	.335	0%	-----



FW-38 2H, 2012

DC: J.D.# 95837  
CONST: 95838, 95839



ISO SMT. NO. 1740	
MATERIAL DESCRIPTION	
1	2" 1500° CS GLOSS ALVE. Y100T38
2	1" 1500° CS GLOSS ALVE. Y100T38
3	1" 1500° CS GLOSS ALVE. Y100T38
4	1" 1500° CS GLOSS ALVE. Y100T38
5	1" 1500° CS GLOSS ALVE. Y100T38
6	1" 1500° CS GLOSS ALVE. Y100T38
7	1" 1500° CS GLOSS ALVE. Y100T38
8	1" 1500° CS GLOSS ALVE. Y100T38
9	1" 1500° CS GLOSS ALVE. Y100T38
10	1" 1500° CS GLOSS ALVE. Y100T38
11	1" 1500° CS GLOSS ALVE. Y100T38
12	1" 1500° CS GLOSS ALVE. Y100T38

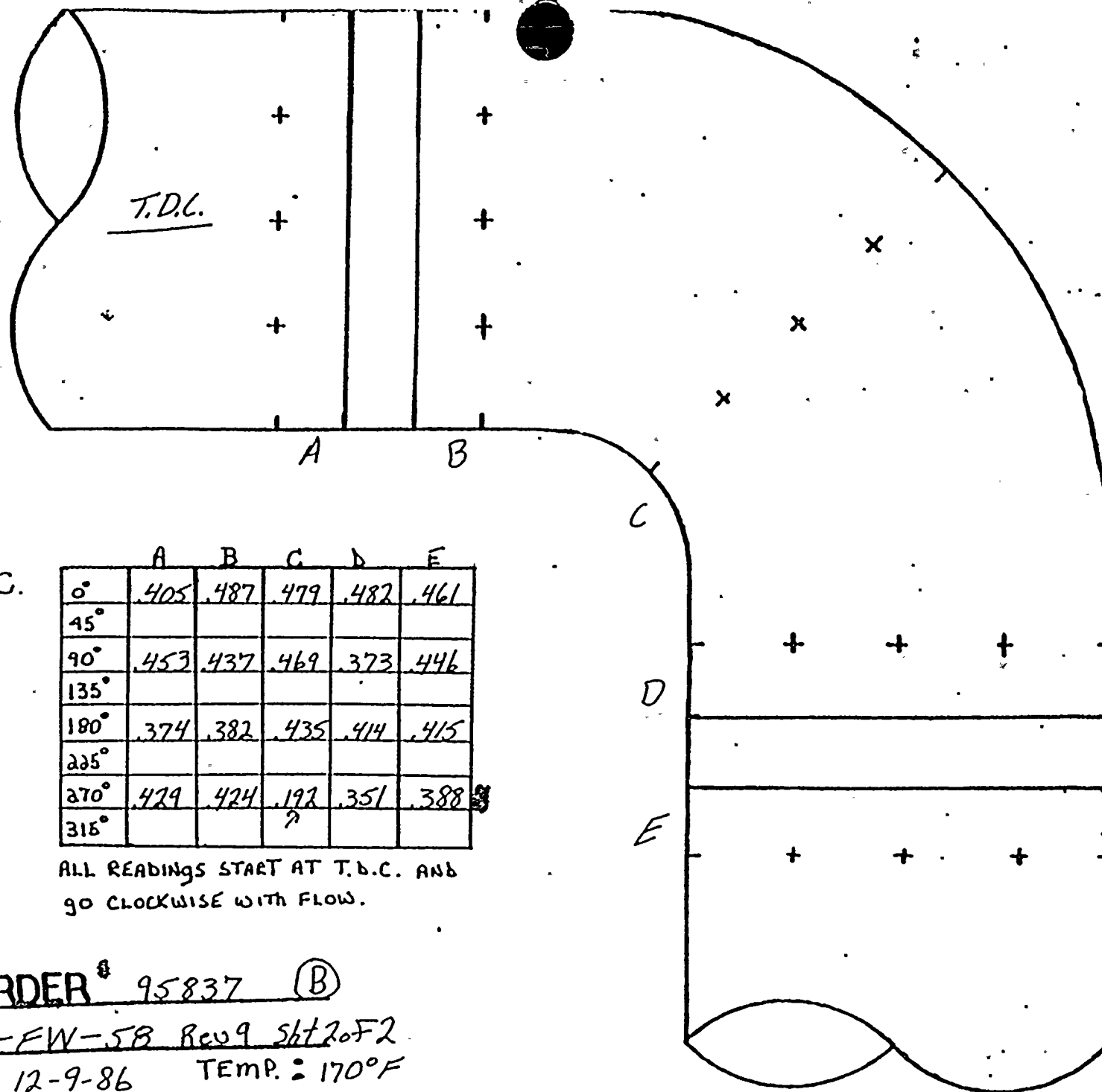
REVISION RECORD				
NO.	DATE	BY	DESCRIPTION	REVISION
1	7/14/76	BT	REVISED BY NPS DESIGNS. ADDED: 1" 1500° CS GLOSS ALVE. Y100T38	1
2	7/16/76	BT	REVISED BY NPS DESIGNS. ADDED: 1" 1500° CS GLOSS ALVE. Y100T38	2
3	7/16/76	BT	REVISED BY NPS DESIGNS. ADDED: 1" 1500° CS GLOSS ALVE. Y100T38	3
4	7/16/76	BT	REVISED BY NPS DESIGNS. ADDED: 1" 1500° CS GLOSS ALVE. Y100T38	4
5	7/16/76	BT	REVISED BY NPS DESIGNS. ADDED: 1" 1500° CS GLOSS ALVE. Y100T38	5
6	7/16/76	BT	REVISED BY NPS DESIGNS. ADDED: 1" 1500° CS GLOSS ALVE. Y100T38	6
7	7/16/76	BT	REVISED BY NPS DESIGNS. ADDED: 1" 1500° CS GLOSS ALVE. Y100T38	7
8	7/16/76	BT	REVISED BY NPS DESIGNS. ADDED: 1" 1500° CS GLOSS ALVE. Y100T38	8
9	7/16/76	BT	REVISED BY NPS DESIGNS. ADDED: 1" 1500° CS GLOSS ALVE. Y100T38	9

DRAWING APPROVED FOR  
CONSTRUCTION PRE-CIPAL TESTING  
BY MRS. DATE 7/14/76 BY RA. DATE 7/16/76  
AMERICAN ELECTRIC POWER SERVICE COOP.

Job begin time 5:05 PM		Job end time 5:05 PM		Job name 5:05 PM		Job status 5:05 PM		Job type 5:05 PM		Job priority 5:05 PM	
Job end time 5:05 PM		Job end time 5:05 PM		Job end time 5:05 PM		Job end time 5:05 PM		Job end time 5:05 PM		Job end time 5:05 PM	
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FLOW →



T.D.C.

	A	B	C	D	E
0°	405	487	479	482	461
45°					
90°	453	437	469	373	446
135°					
180°	374	382	435	414	415
225°					
270°	429	424	192	351	388
315°			?		

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

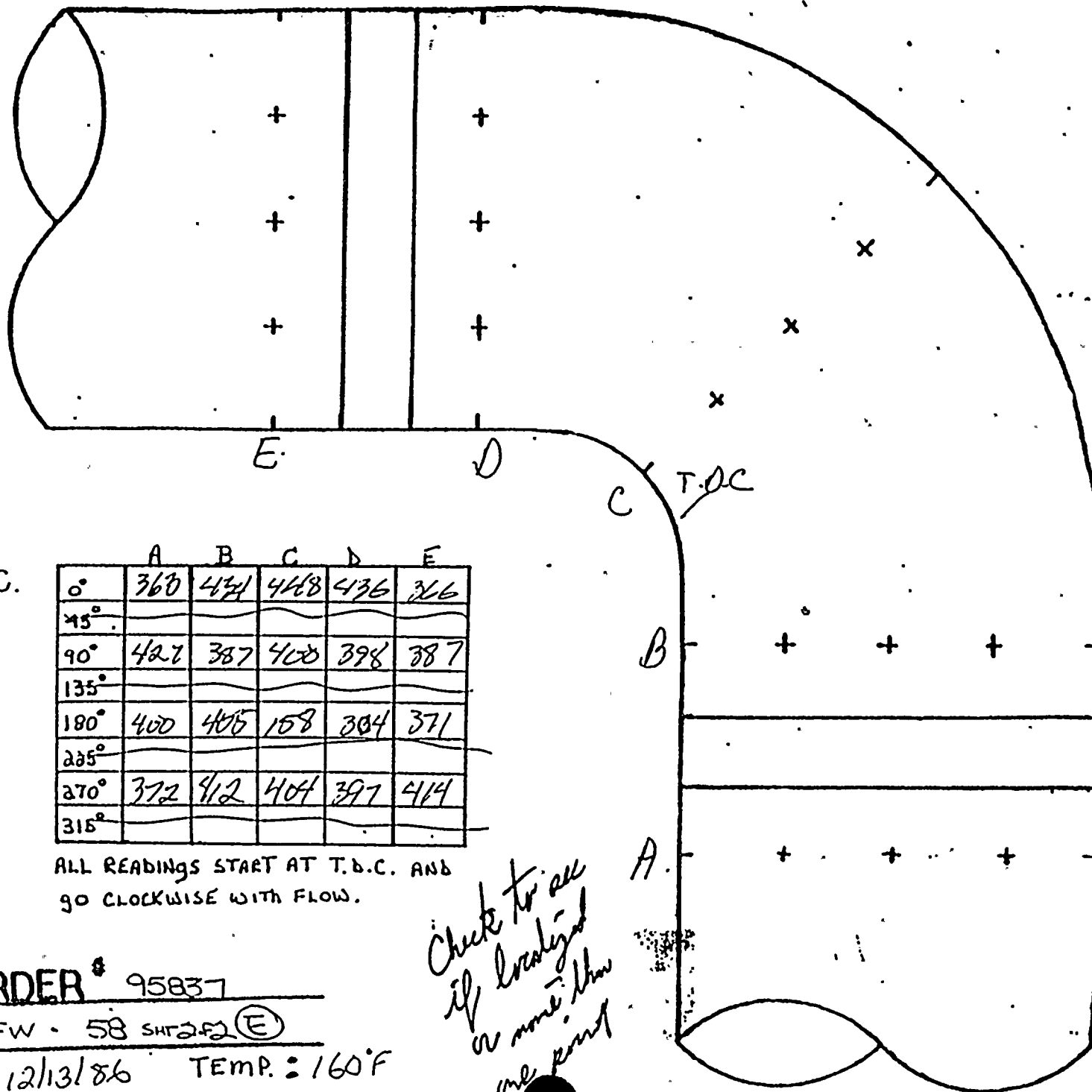
JOB ORDER # 95837 (B)

ISO# 1-FW-58 Rev 9 5/12/02

DATE: 12-9-86 TEMP: 170°F



← FLOW



T.D.C.

	A	B	C	D	E
0°	360	441	448	436	366
45°					
90°	427	387	400	398	387
135°					
180°	400	405	158	304	371
225°					
270°	372	412	404	397	414
315°					

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

JOE ORDER # 95837

ISO # 1-FW - 58 SHF2F2 (E)

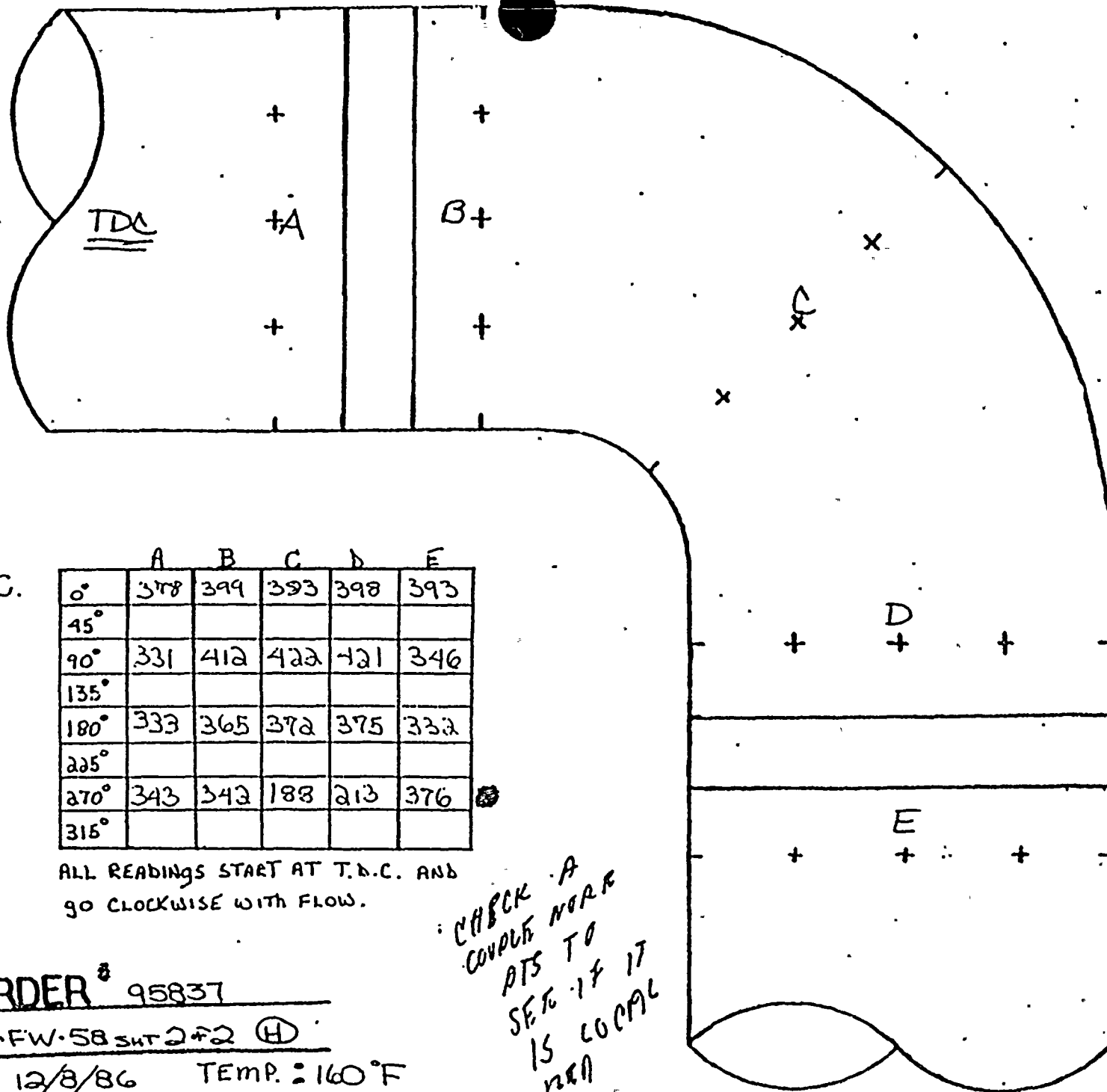
DATE: 12/13/86 TEMP: 160°F

*Check to see  
if localized  
a more than  
one point*

A



FLOW →



T. D. C.

	A	B	C	D	E
0°	378	399	393	398	393
45°					
90°	331	412	422	421	346
135°					
180°	333	365	372	375	332
225°					
270°	343	342	188	213	376
315°					

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

JOB ORDER # 95837

ISO# 1-FW-58 SHT 2 of 2 (H)

DATE: 12/8/86 TEMP: 160°F

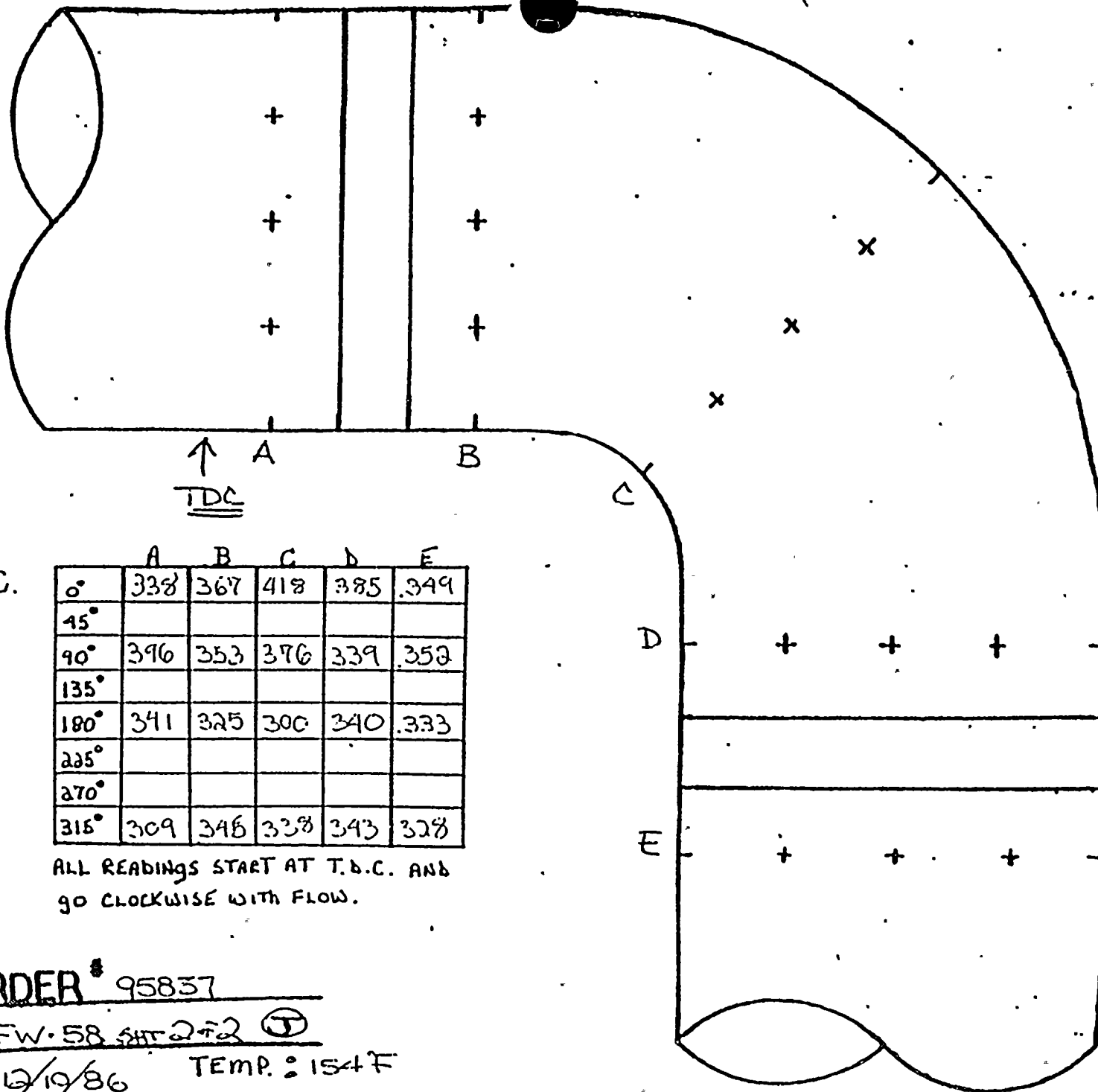
CHECK A  
COUPLE NO. 1  
PTS TO  
SEE IF IT  
IS LOCAL  
REA







FLOW



T. D. C.

	A	B	C	D	E
0°	338	367	418	385	349
45°					
90°	396	353	376	339	350
135°					
180°	341	325	300	340	333
225°					
270°					
315°	309	346	338	343	328

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

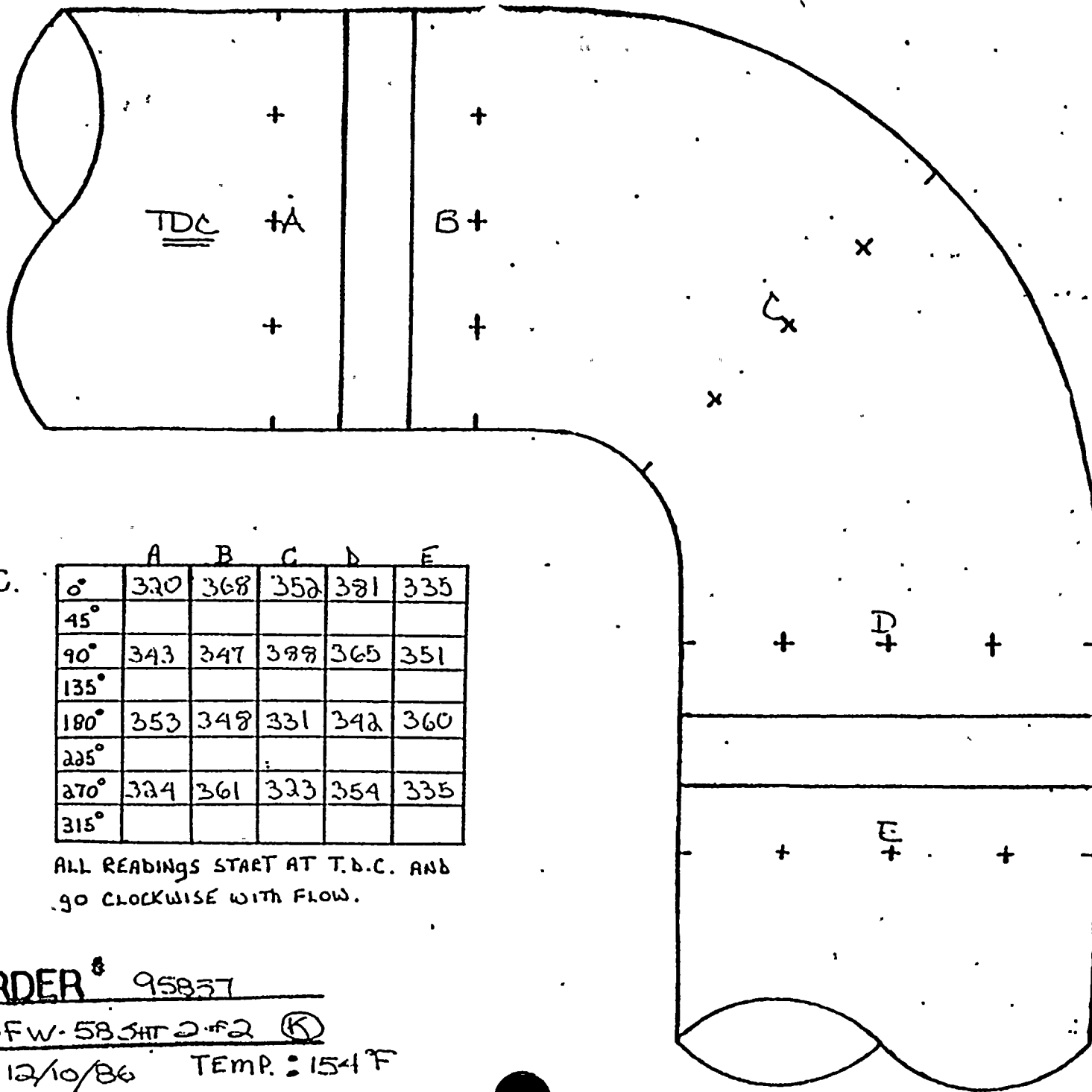
JOB ORDER # 95837

ISO # 1-FW-58 SHT 2 of 2 (1)

DATE: 12/19/86 TEMP: 154°F



FLOW →



T.D.C.

	A	B	C	D	E
0°	320	368	352	381	335
45°					
90°	343	347	388	365	351
135°					
180°	353	348	331	342	360
225°					
270°	324	361	323	354	335
315°					

ALL READINGS START AT T.D.C. AND  
GO CLOCKWISE WITH FLOW.

JOB ORDER # 95837

ISO # 1-FW-583HT 2-F2 (K)

DATE: 12/10/86 TEMP: 154°F



AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: JANUARY 19, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 1  
 Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. J. A. Kobayashi / AK 1/19/87  
 2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on JANUARY 19, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation				
<u>I-C-4, REV. 3</u>							
Sh. 1 of 2	CS	I	ACCEPTABLE, NO FURTHER INSPECTION REQUIRED				
↓	CS	J	"	"	"	"	"
<u>I-C-44, REV. 2</u>							
Sh. 1 of 1	CS	E	"	"	"	"	"
↓	CS	G	"	"	"	"	"
<u>I-C-56, REV. 4</u>	CS	K	"	"	"	"	"

*Anthony J. Lewandowski*  
 Piping Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schaepef  
 H. B. Brugger  
 P & V File No. 4.6.3.15.2.5.2

Sheet No. 1 of 1



D. C. & N. TEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPSG Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. /

Evaluation Date: JANUARY 19 1987

SER No. 23-85 (Water) X

Years in service //

UT Reading Transmitted on: 1-16-87

UT Reading Taken on: 1-15-67

Isometric Dwg. NO. *1-C-4 REV. 3 Sh. 1 of 2*

AEPSIC Installed Mat'l Class CS: A-106 GR.B X-HVY

[illegible]

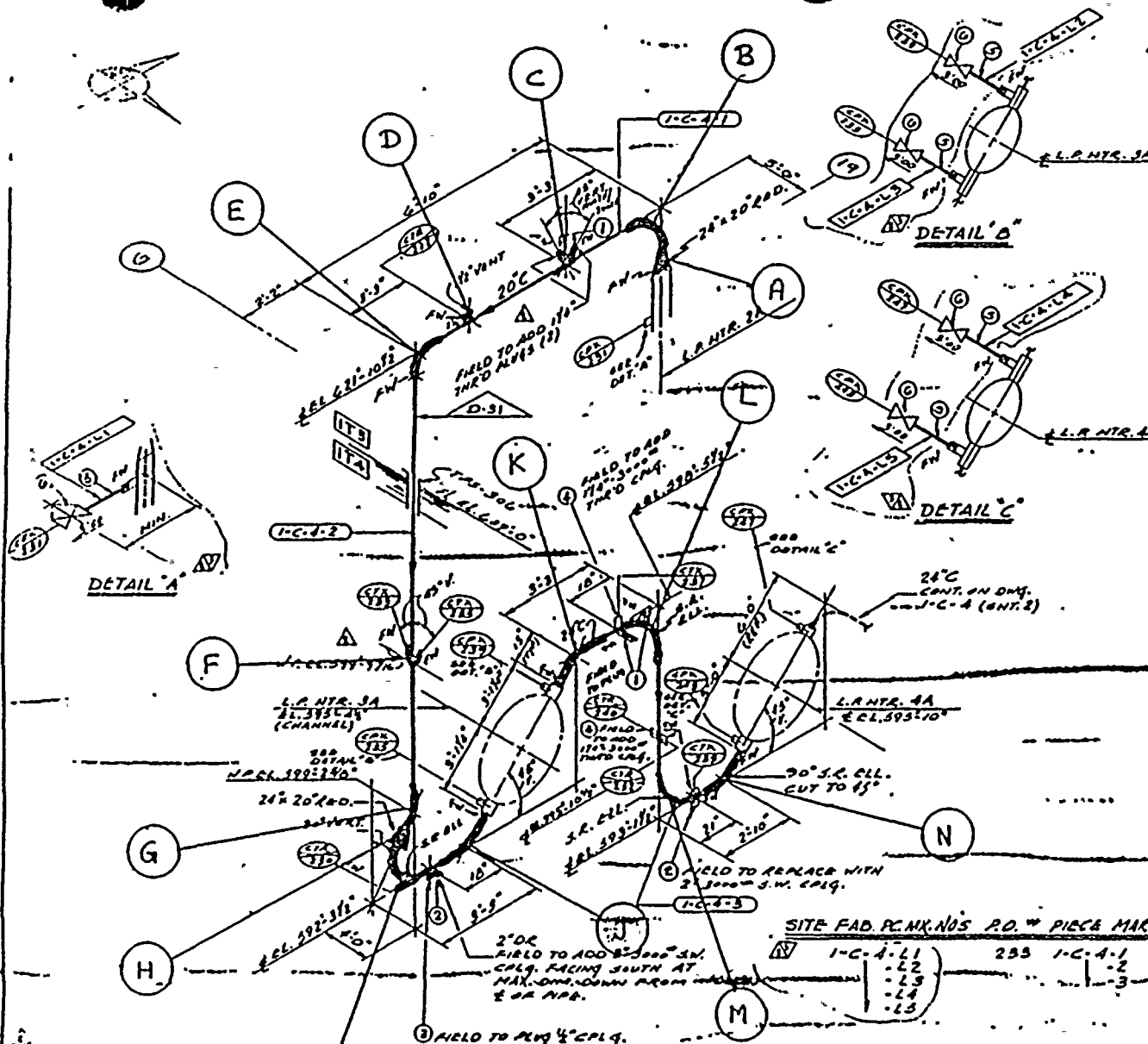


WEEK-15

COST JOB #: 004952  
004953

QC-J.O.#: 00

110 SHT. NO. 104



MATERIAL DESCRIPTION					QUANTITY	UNIT	REMARKS
1	4	1/2	3000	THD. PLUG.			
2	2	2	3000	S.W. CPG.			
3	1	1/2	3000	S.W. PLUG			
4	3	1/2	3000	THD. CPG.			
5	1	1	PIPE, SCH. 80	SALES			
6	5	1	Good	GLOBE, 3/4\"			

REVISION RECORD			REVISION	REMARKS
1	11/15		REVISION 11/15/53	FIELD ACTION
2	11/15		REVISION 11/15/53	FIELD ACTION
3	11/15		REVISION 11/15/53	FIELD ACTION

INSPECT: B, G, H, I AND

UNCONTROLLED  
DOCUMENT

NOTES  
FIELD PROCEEDURES  
FIELD UNDER 1" OR CPG.  
BY HAND OVER UP TO 1/2" DIA.  
ON OR CPG.

SITE FAB. PLANK NOS. P.O. # PIECE MARKS

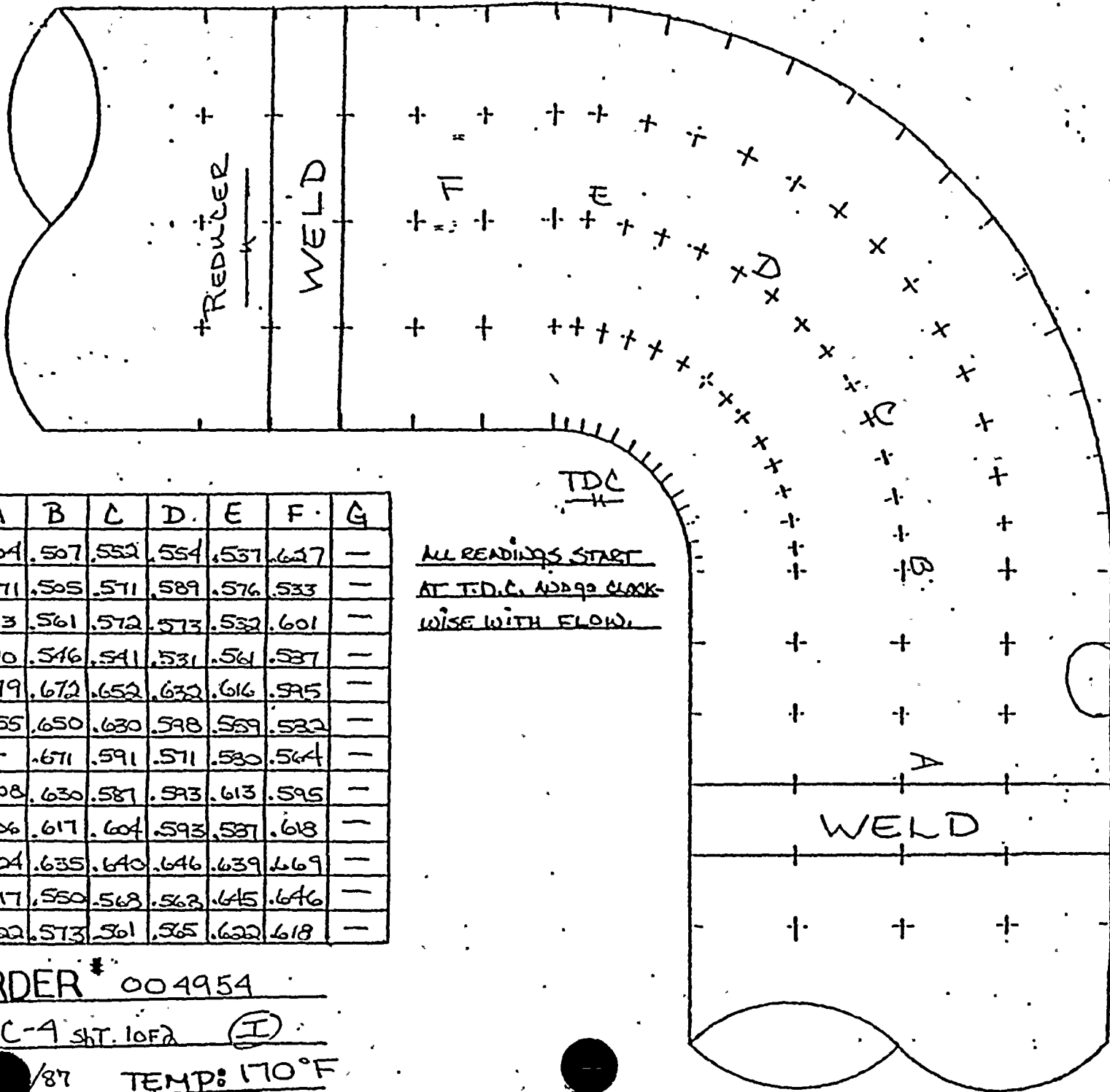
1-C-4-1	255	1-C-4-1
1-C-4-2		1-C-4-2
1-C-4-3		1-C-4-3

DEC 11 1953 11/15/53 11/15/53 11/15/53		FOUR/ZONE No. 11/15/53 REQUIRED COMPLETION DATE FABRICATED BY 11/15/53		FLOW DIAGRAM 11/15/53 QSL 11/15/53 WELD PROCEDURE 11/15/53	
NPS DESIGNS INC. NEW YORK, N.Y.		NPS DESIGNS INC. NEW YORK, N.Y.		NPS DESIGNS INC. NEW YORK, N.Y.	
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.P. ARROY, DWGS.		FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.P. ARROY, DWGS.		FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.P. ARROY, DWGS.	



← FLOW →

30  
4/86



	A	B	C	D	E	F	G
0°	.504	.507	.552	.554	.537	.627	—
30°	.571	.505	.571	.589	.576	.533	—
60°	.613	.561	.572	.573	.532	.601	—
90°	.610	.546	.541	.531	.561	.537	—
120°	.679	.672	.652	.632	.616	.595	—
150°	.655	.650	.630	.598	.539	.532	—
180°	—	.671	.591	.571	.530	.564	—
210°	.608	.630	.587	.593	.613	.595	—
240°	.626	.617	.604	.593	.537	.618	—
270°	.624	.635	.640	.646	.639	.669	—
300°	.617	.550	.563	.563	.645	.646	—
330°	.522	.573	.561	.565	.622	.618	—

TDC  
+  
ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

JOB ORDER # 004954

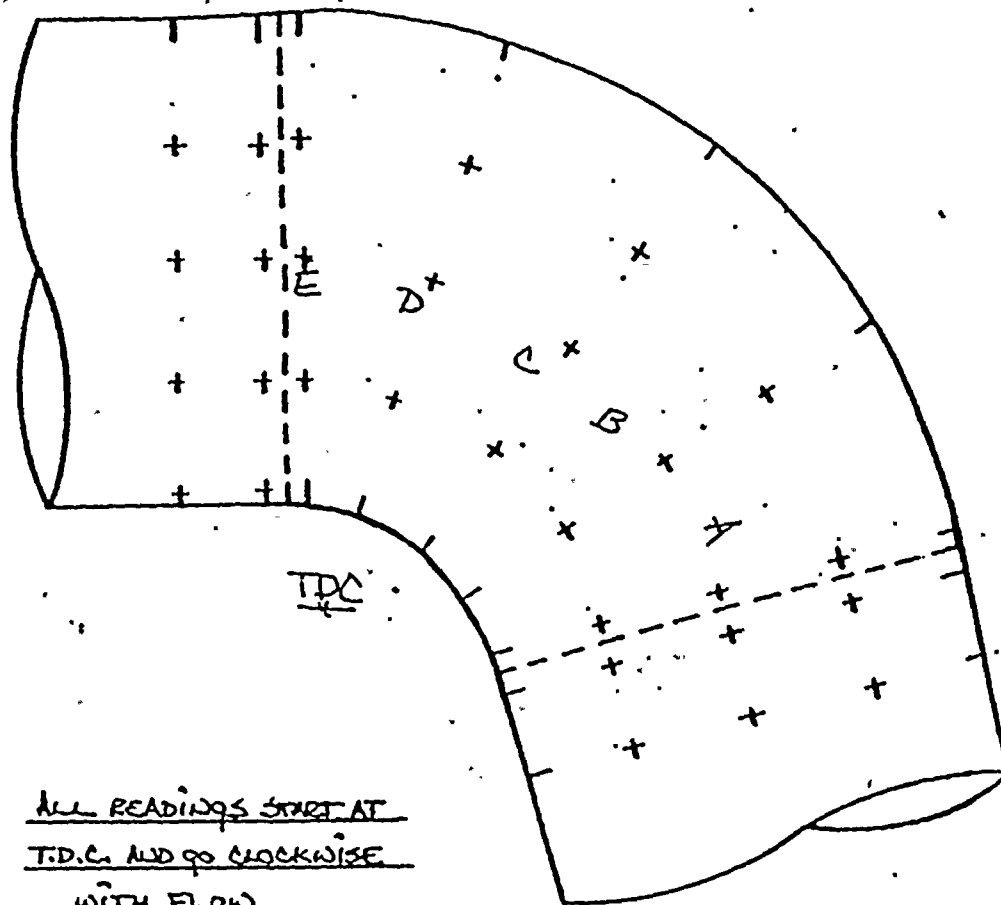
ISO# 1-C-4 SHT. 1 OF 2 (I)

DATE: 1/87 TEMP: 170°F

I-C-201-3A



← FLOW



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

	A	B	C	D	E	F	G
0°	.625	.557	.548	.547	.562	—	—
30°	.606	.634	.646	.652	.632	—	—
60°	.625	.624	.627	.626	.649	—	—
90°	.625	.627	.620	.642	.639	—	—
120°	.622	.622	.582	.611	.604	—	—
150°	.611	.613	.643	.615	.607	—	—
180°	.567	.591	.563	.571	.562	—	—
210°	.597	.545	.575	.589	.560	—	—
240°	.532	.602	.597	.562	.554	—	—
270°	.597	.529	.532	.590	.548	—	—
300°	.596	.599	.575	.574	.554	—	—
330°	.579	.539	.540	.556	.594	—	—

JOB ORDER\* 004954

ISO\* 1-C-4 SH.T. 10F2 (J)

DATE: 1/14/87 TEMP: 170°F



D. C. & N. YEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: A.J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. 1

Evaluation Date: JANUARY 19, 1987

SER No. 23-85 (Water) X

Years in service //

UT Reading Transmitted on: 1-16-87

UT Reading Taken on: 1-15-87

Isometric Dwg. NO. *1-C-44:REV.2*

AEPSC Installed Mat'l Class *CS: A-106 GR.B - X-HVY*

[illegible]

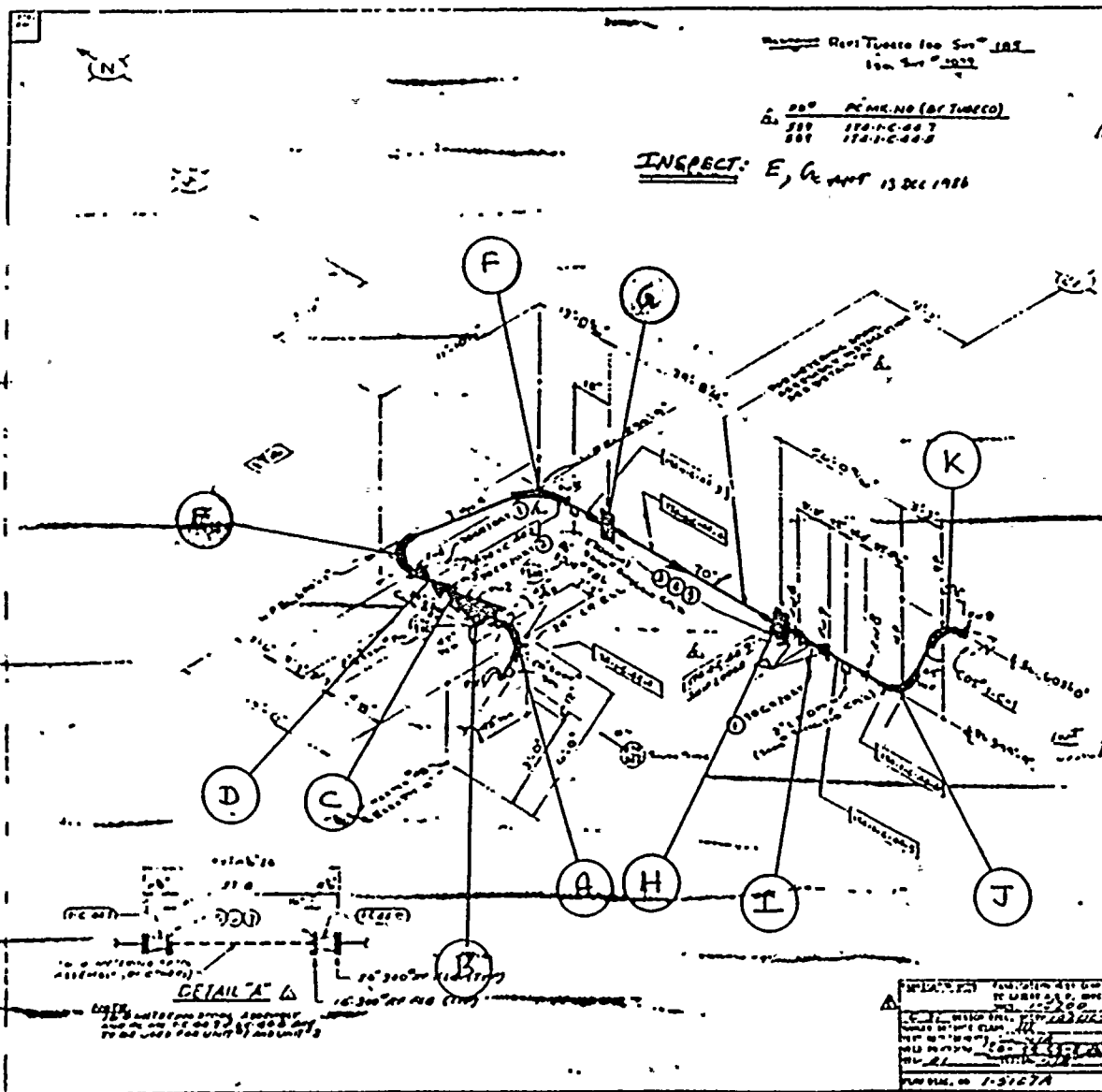


WEEK #15

QC → J.O.A 0049.54

CONST  $\rightarrow$  1.0.4 004952

1.0.#004953



**WESTERN FABRICATING & WELDING CO.**

**ATTENTION: ENGINEER**

**0-178-21-1**

**ST-212-2000**

**H-66-890**

UNCONTROLLED  
DOCUMENT

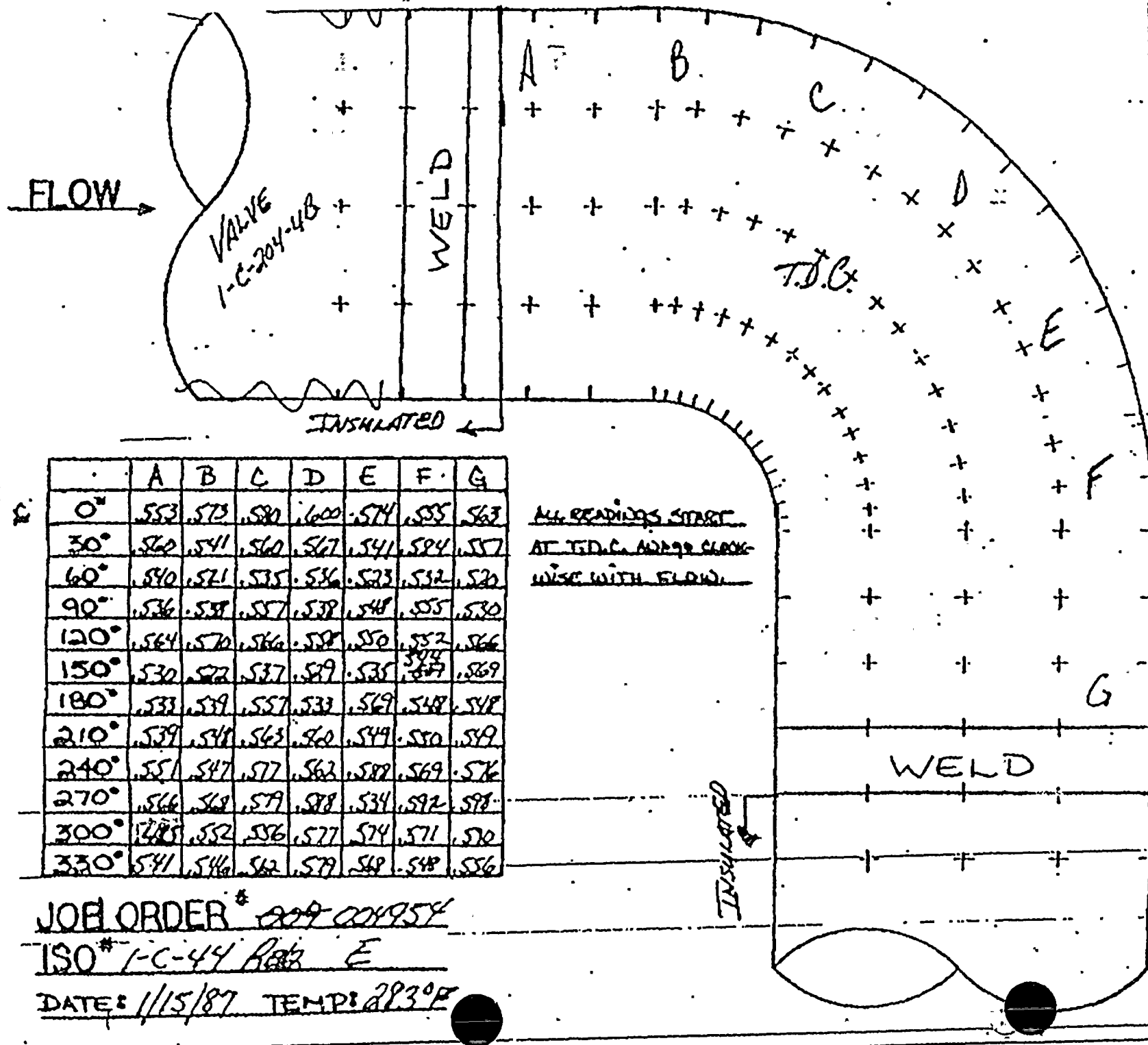
MAINTAIN ACQUIRED FROM  
FIELD PLWORS

DATE NO  
1-C-44, REV. 2



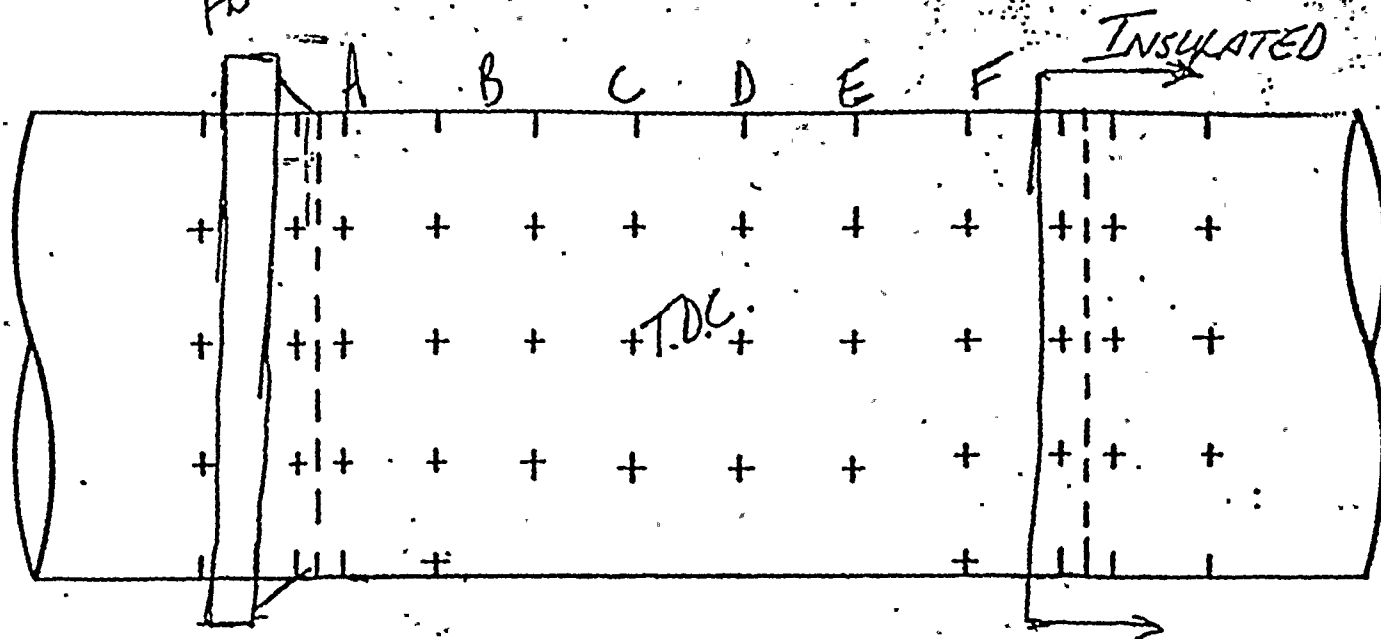
NO. 12 PAGE 5  
(FRI) 01.16. '87 16:42

FROM D. C. COOK FLT





FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

T.D.C.

	A	B	C	D	E	F	G
0°	.579	.557	.564	.551	.552	.551	}
30°	.579	.595	.600	.596	.599	.600	
60°	.577	.590	.605	.594	.589	.593	}
90°	.580	.590	.553	.600	.594	.596	
120°	.537	.592	.585	.592	.596	.590	}
150°	.585	.585	.578	.589	.577	.605	
180°	.592	.550	.579	.585	.588	.586	}
210°	.588	.589	.597	.577	.585	.587	
240°	.589	.596	.593	.598	.592	.592	}
270°	.557	.600	.602	.595	.592	.583	
300°	.591	.608	.600	.604	.603	.593	}
330°	.597	.609	.610	.602	.585	.605	

JOB ORDER # 004954

ISO # 1-C-44 REV. 2 G

DATE: 1/15/87 TEMP: 22°C

.602



D. C. COOK NUCLEAR PLANT  
EROSION EVAL. AT WORKSHEET

SER No. 88-84 (Steam)

Unit No. 1

SER No. 23-85 (Water) X

Years in service 11

UT Reading Taken on: 1-18-87

AEPSK Installed Mat'l Class CS: A-106 GR. B, X-HVY

## COMMENTS

K  $90^{\circ}24''$  EL .500 .438 .563 .395 .300 0% STILL WITHIN MANUFACTURERS TOLERANCE



Q.L. 1.0 # 4-54

 $\dots B, K, H, E \dots$ 

FIELD NOTE:  
STRAINER TO BE  
ANCHORED TO FLOOR

DETAIL "C"

DANGER MARK NO

DETAIL "A"

DETAIL "B"

LINE				
DESIGNATION	SPEC	QTY	UNIT	QTY
		REQD	TIME	TIME
	Q-11	100	HAS	

PIPE: A-106 SML'S OR-B  
16 TO 24" - EX. H.V.  
30-1.500 W/  
FITTINGS: A-234 OR NPS (BW)  
1/2" & LARGER MATCH PIPE WALL  
1" & SMALLER 3000# 100K/W/  
A-108-B  
FLANGES:  
300# WURE A-181-I/II

BASKET	1" x 1"	BEND - 3 DW	LINE
ALLOW	1/8"		NOT
NOTES:			

[illegible]

DATE	TIME	LOCATION	REMARKS
11/11/74	11:00	174 ITS	CONDENSATE

SOUTHWEST FABRICATING  
A WELDING CO.  
MONTANA 59101  
CUSTOMER: AMERICAN ELECTRIC POWER  
ORDER NO. 0177A-871-1  
P.C. C-1039 MFG. NO. 11C-56 REV.

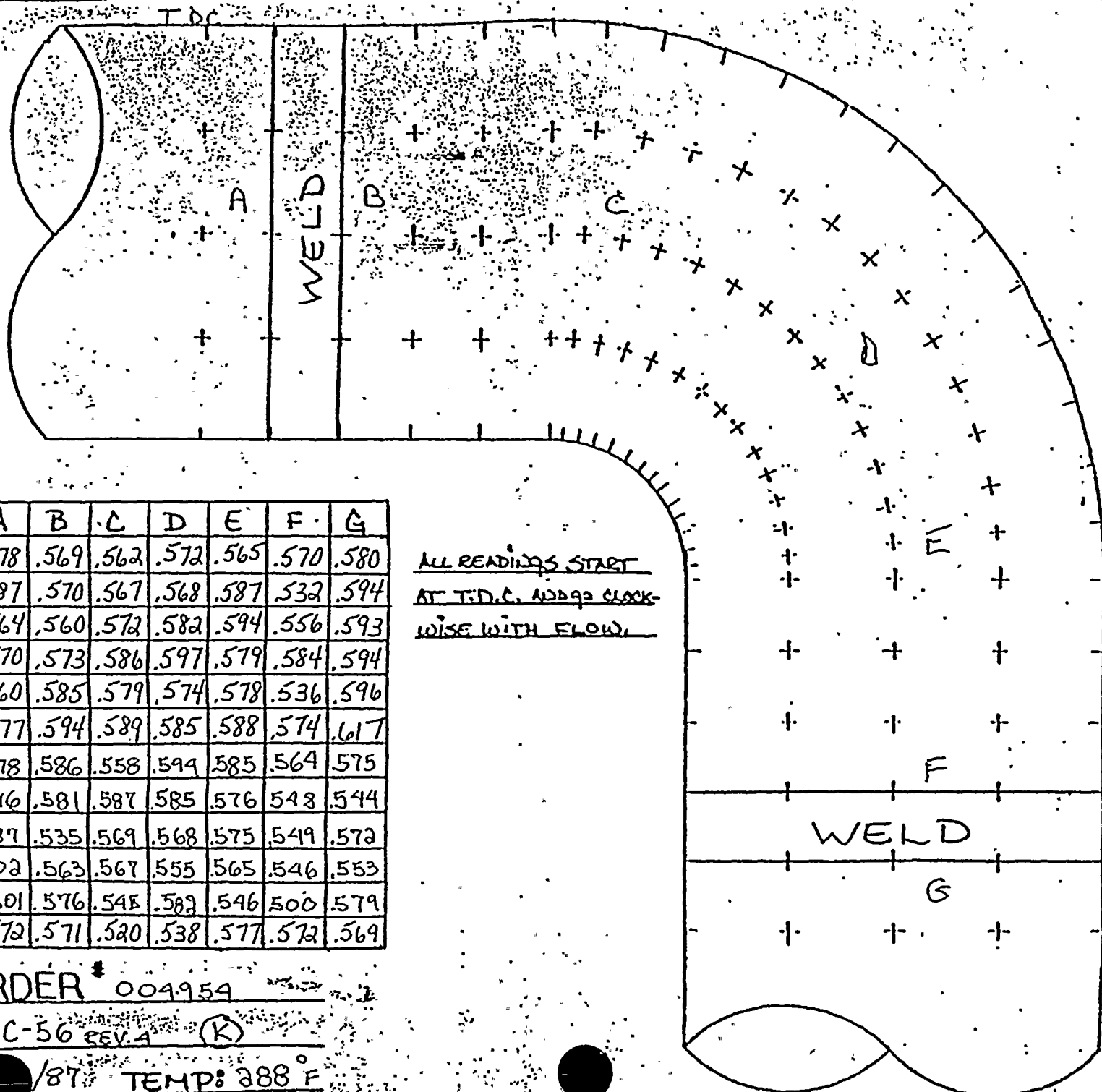
**MATERIAL REQUIRED FOR  
FIELD REWORK**

UNCONTROLLED  
DOCUMENT

DWG NO  
1-C-56, REV. 4



← FLOW



	A	B	C	D	E	F	G
0°	.578	.569	.562	.572	.565	.570	.580
30°	.587	.570	.567	.568	.587	.532	.594
60°	.564	.560	.572	.582	.594	.556	.593
90°	.570	.573	.586	.597	.579	.584	.594
120°	.560	.585	.579	.574	.578	.536	.596
150°	.577	.594	.589	.585	.588	.574	.617
180°	.578	.586	.558	.599	.585	.564	.575
210°	.596	.581	.587	.585	.576	.548	.544
240°	.587	.535	.569	.568	.575	.549	.572
270°	.602	.563	.567	.555	.565	.546	.553
300°	.601	.576	.548	.582	.546	.500	.579
330°	.572	.571	.520	.538	.577	.572	.569

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

JOB ORDER # 004954

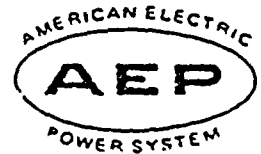
ISO # 1-C-56 REV. 4 (K)

DATE: 1/87 TEMP: 388° F



Entered into Artemis  
7 Feb 87

AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: JANUARY 19, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 2  
Steam Piping Erosion Program, SER No. 88-84  
2 Water Piping Erosion Program, SER No. 23-85  
Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. J. A. ~~Kayra~~ *JAL 1/21/87*  
2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on SEPTEMBER 18, 1986, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
<u>2-FW-82</u> <u>REV. 4</u>	<u>SS</u>	<u>E</u>	<u>THIS FLOW HAS ALREADY BEEN REPLACED WITH</u> " " " " " "
---	<u>SS</u>	<u>F</u>	--- " " " " " "
---	<u>SS</u>	<u>G</u>	--- " " " " " "
---	<u>CS</u>	<u>I</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
---	<u>CS</u>	<u>K</u>	<u>REPLACE WITHIN NEXT 5 YEARS</u>
---	<u>CS</u>	<u>T</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
---	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
---	<u>CS</u>	<u>90° ELL</u>	<u>BAD WELD &amp; THEN REPLACE AT NEXT OUTAGE.</u>
---	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, RE-EXAM IN 20 YEARS</u>
---	<u>CS</u>	<u>J</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>

*Anthony J. Lewandowski*  
Piping & Valves Section

cc: S. H. Steinhart  
W. G. Smith, Jr. - Bridgman  
C. A. Erikson  
P. G. Schoepf  
H. B. Brugger  
P & V File No. 4.6.3.15.2.5.2



D. C. Cook Nuclear Plant, Unit No. 2  
 Steam Piping Erosion Program, SER No. 83-84  
~~X~~ Water Piping Erosion Program, SER No. 23-85  
 Engineering evaluation of Wall Thickness Measurements  
 Date: JANUARY 19, 1987  
 Sheet No. 2 of 4

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
<u>2-FW-83, REV. 3</u>		<u>E</u>	
<u>Sh. 1 of 3</u>	<u>CS</u>	<u>STRAIGHT</u>	<u>NO UT RESULTS</u>
	<u>SS</u>	<u>90° ELL</u>	<u>THIS ELBOW HAS ALREADY BEEN REPLACED WITH</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQ.</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>" " " "</u>
	<u>SS</u>	<u>90° ELL</u>	<u>THIS ELBOW HAS ALREADY BEEN REPLACED WITH SS</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>" " " "</u>
	<u>CS</u>	<u>90° ELL</u>	<u>" " " "</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>" " " "</u>
	<u>CS</u>	<u>90° ELL</u>	<u>" " " "</u>
<u>2-FW-83, REV. 1</u>	<u>CS</u>	<u>90° ELL</u>	<u>" " " "</u>
<u>Sh. 2 of 2</u>	<u>CS</u>	<u>STRAIGHT</u>	<u>" " " "</u>
	<u>CS</u>	<u>90° ELL</u>	<u>ACCEPTABLE, RE-EXAMINE IN 10 YEARS</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQ.</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>" " " "</u>
	<u>CS</u>	<u>90° ELL</u>	<u>PAD WELD &amp; THEN REPLACE DURING THE NEXT</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
	<u>CS</u>	<u>90° ELL</u>	<u>PAD WELD &amp; THEN REPLACE DURING THE NEXT OUT</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQ.</u>
	<u>CS</u>	<u>90° ELL</u>	<u>PAD WELD &amp; THEN REPLACE DURING THE NEXT AT</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED</u>
	<u>CS</u>	<u>STRAIGHT</u>	<u>" " " "</u>
	<u>CS</u>	<u>90° ELL</u>	<u>REPLACE WITHIN 5 YEARS</u>



D. C. Cook Nuclear Plant, Unit No. 2  
 Steam Piping Erosion Program, SER No. 88-84  
 X Water Piping Erosion Program, SER No. 23-85  
 Engineering evaluation of Wall Thickness Measurements  
 Date: JANUARY 19, 1987  
 Sheet No. 3 of 4

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
2-FW-83, REV. 1		I	
Sh. 2 of 2	CS	J	STRAIGHT & ACCEPTABLE, RE-EXAMINE IN 20 YEARS
---	CS	J	STRAIGHT & ACCEPTABLE, NO FURTHER EXAMINATION REQ'D.
---	CS	J	90° ELL REPLACE WITHIN 5 YEARS
---	CS	J	STRAIGHT & ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED.
2-FW-84 REV. 4	SS	A	THIS ELBOW HAS ALREADY BEEN REPLACED WITH S
---	SS	B	" " " " " " " "
---	SS	C	" " " " " " " "
---	CS	G	ACCEPTABLE, RE EXAMINE IN 20 YEARS
---	CS	L	STRAIGHT & ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED
---	CS	L	90° ELL REPLACE WITHIN NEXT 5 YEARS
---	CS	S	STRAIGHT & ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED.
---	CS	S	STRAIGHT & " " " " " "
---	CS	S	90° ELL REPLACE NEXT OUTAGE
2-FW-85, REV. 2	CS		STRAIGHT & ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED
Sh. 1 of 2	SS	A	THIS ELBOW HAS ALREADY BEEN REPLACED WITH B
---	CS	B	STRAIGHT & ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED
---	SS	B	90° ELL THIS ELBOW HAS BEEN REPLACED WITH SS.
---	CS	E	STRAIGHT & ACCEPTABLE, NO FURTHER EXAMINATION REQUIRED.
---	CS	F	STRAIGHT & " " " " " "
---	CS	F	90° ELL " " " " " "
---	CS	H	STRAIGHT & " " " " " "
---	CS	H	90° ELL REPLACE WITHIN 2 YEARS



D. C. Cook Nuclear Plant, Unit No. 2  
 \_\_\_\_\_ Steam Piping Erosion Program, SER No. 83-84  
X \_\_\_\_\_ Water Piping Erosion Program, SER No. 23-85  
 Engineering evaluation of Wall Thickness Measurements  
 Date: JANUARY 19, 1987  
 Sheet No. 4 of 4

[illegible]



D. C. COOK NUC PLANT  
EROSION EVALUAT. WORKSHEET

AEPS Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 2

Evaluation Date: JANUARY 19, 1987

SER No. 23-85 (Water) X

Years in service 9

UT Reading Transmitted on: 9-18-86

UT Reading Taken on: 3-6-86, 9-12-86  
3-7-86  
9-4-86

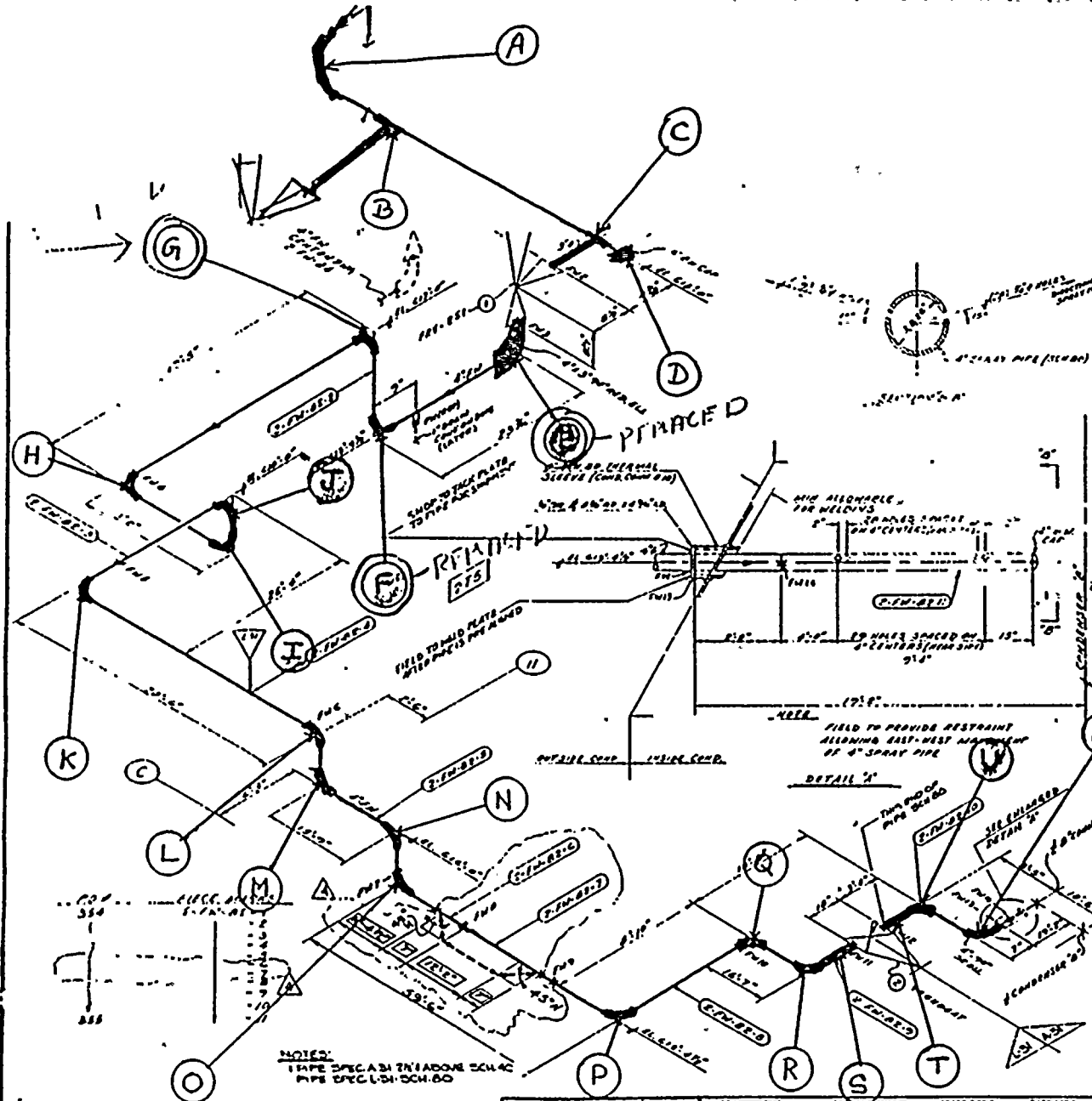
Isometric Dwg. NO. 2-FW-82 REV. 4

AEPS Installed Mat'l Class CS: A-106, G.R.B SCH. 40 980

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
E	4" 90° ELL	.337	.295-.379	.235	.111	62.4%	PAD WELD AND THEN REPLACE DURING NEXT OUTAGE. THIS ELLON HAS BEEN REPLACED
F	4" 90° ELL	.337	.295-.379	.235	.318	0%	STILL WITHIN MANUFACTURERS TOLERANCE
G	4" 90° ELL	.337	.295-.379	.235	.316	0%	" " " "
I	4" 90° ELL	.337	.295-.379	.235	.320	0%	" " " "
K	4" 90° ELL	.337	.295-.379	.235	.265	11.3%	STILL WITHIN Tm REPLACE WITHIN NEXT 10 YEARS
I	4" STRAIGHT	.337	.295-.379	.235	.315	0%	STILL WITHIN MANUFACTURERS TOLERANCE
U	4" STRAIGHT	.237	.207-.267	.049	.312	0%	STILL WITHIN MANUFACTURERS TOLERANCE
U	4" 90° ELL	.237	.207-.267	.049	.034	88.5%	BELOW MINIMUM WALL PAD WELD AND THEN REPLACE AT EARLIEST TIME
U	4" STRAIGHT	.237	.207-.267	.049	.230	22.0%	RE EXAM 20 YEARS
J	4" 90° ELL	.337	.295-.379	.235	.325	0%	STILL WITHIN MANUFACTURERS TOLERANCE

NOTE: PLANT (I.D.) COMP.'S E, F AND G HAVE BEEN REPLACED  
WITH STAINLESS STEEL PIPE. ALSO, THE UT READINGS INDICATE  
ITEM U IS SCH. 80. IT SHOULD BE SCH. 40 PER DECPV1049CS.





NO.	DATE	BY	DESCRIPTION	REMARKS
1	10/1/82	W.B.	ADDED APPROVAL STAMP PER AEP ARRGT DWGS 2-FW-82-B	
2	10/1/82	W.B.	ADDED ENDRS IN DETAIL AS REPAIR RESISTANCE PER AS 2-FW-82-B	
3	10/1/82	W.B.	ADDED APPROVAL FOR PRE-OPER. TESTING PER AEP ARRGT DWGS 2-FW-82-B	
4	10/1/82	W.B.	PER AEP ARRGT DWGS 2-FW-82-B	

NO.	DATE	BY	DESCRIPTION	REMARKS
1	10/1/82	W.B.	ADDED APPROVAL STAMP PER AEP ARRGT DWGS 2-FW-82-B	
2	10/1/82	W.B.	ADDED ENDRS IN DETAIL AS REPAIR RESISTANCE PER AS 2-FW-82-B	
3	10/1/82	W.B.	ADDED APPROVAL FOR PRE-OPER. TESTING PER AEP ARRGT DWGS 2-FW-82-B	
4	10/1/82	W.B.	PER AEP ARRGT DWGS 2-FW-82-B	

INSPECT: E, F, K, T & U AS NEEDED  
I, 140011 AND

NOT UTD

2-FW-82, REV 4

CONTRACT NO.	REV. NO.
109122	4

CONTRACT NO.	REV. NO.
109122	4

CONTRACT NO.	REV. NO.
109122	4

ITEM	QTY	UNIT
1	1	EA
2	1	EA
3	1	EA
4	1	EA

ITEM	QTY	UNIT
1	1	EA
2	1	EA
3	1	EA
4	1	EA

ITEM	QTY	UNIT
1	1	EA
2	1	EA
3	1	EA
4	1	EA

ITEM	QTY	UNIT
1	1	EA
2	1	EA
3	1	EA
4	1	EA

ITEM	QTY	UNIT
1	1	EA
2	1	EA
3	1	EA
4	1	EA

ITEM	QTY	UNIT
1	1	EA
2	1	EA
3	1	EA
4	1	EA

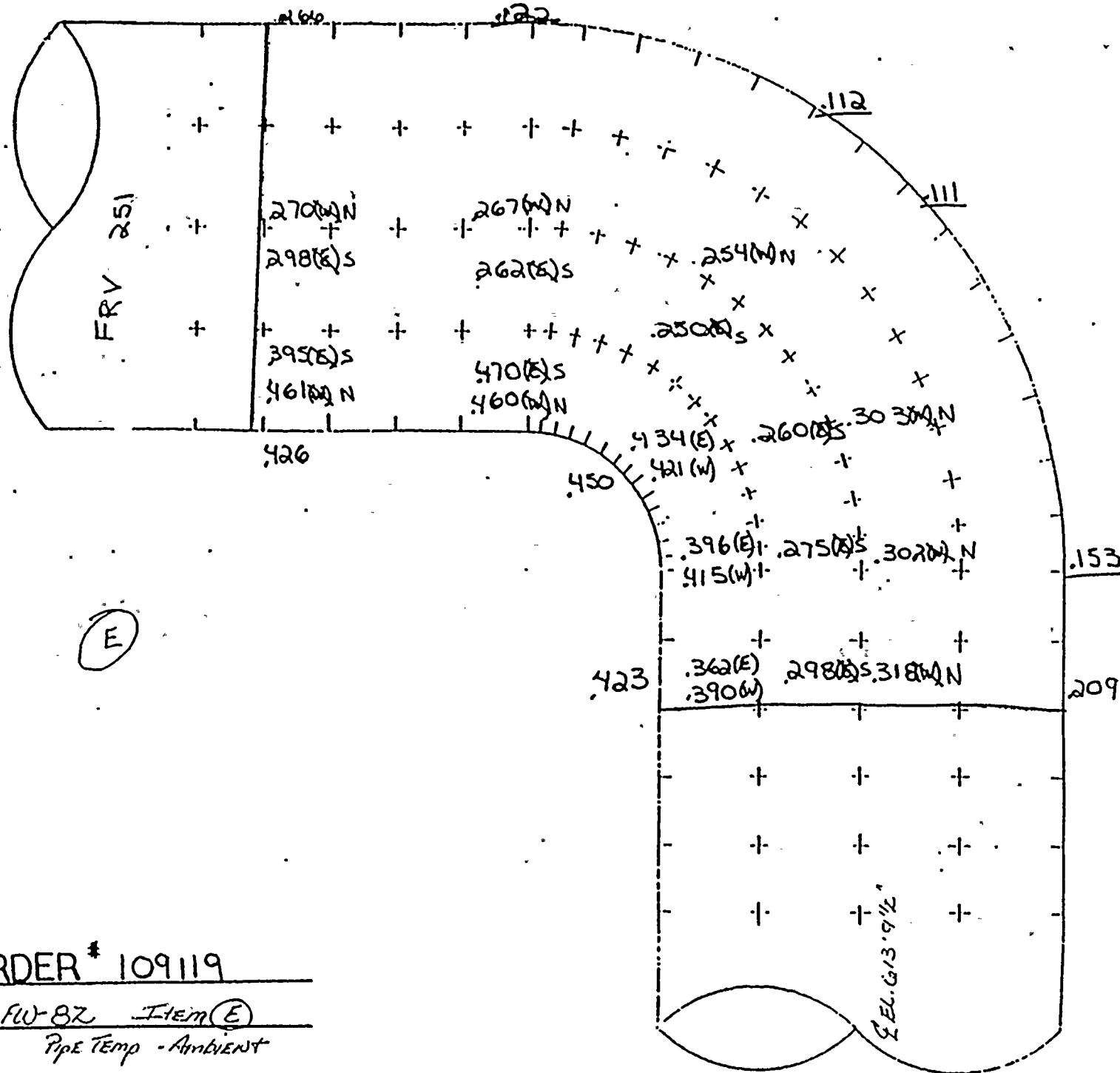
ITEM	QTY	UNIT
1	1	EA
2	1	EA
3	1	EA
4	1	EA

S.O. # 109122 (QC) - 109122 / 109123 (CONST)

CONST/QC - WEEK - 6



FLOW →



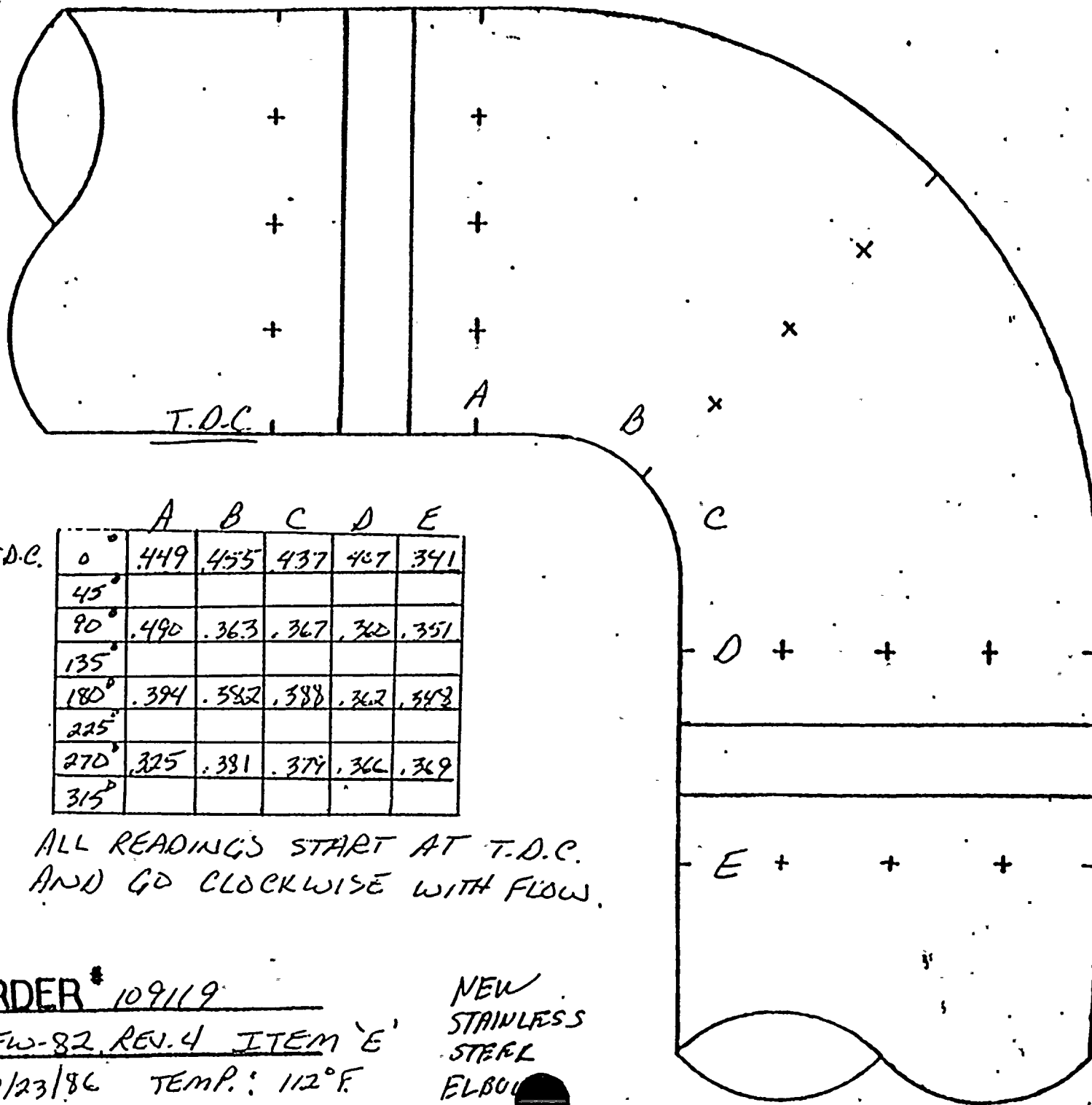
JOB ORDER # 109119

ISO # 2-FW-8Z Item (E)

3-6-80 Pipe Temp - Ambient



FLOW →



T.D.C.	A	B	C	D	E
0°	.449	.455	.437	.467	.341
45°					
90°	.490	.363	.367	.360	.351
135°					
180°	.394	.382	.388	.362	.343
225°					
270°	.325	.381	.374	.366	.369
315°					

ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

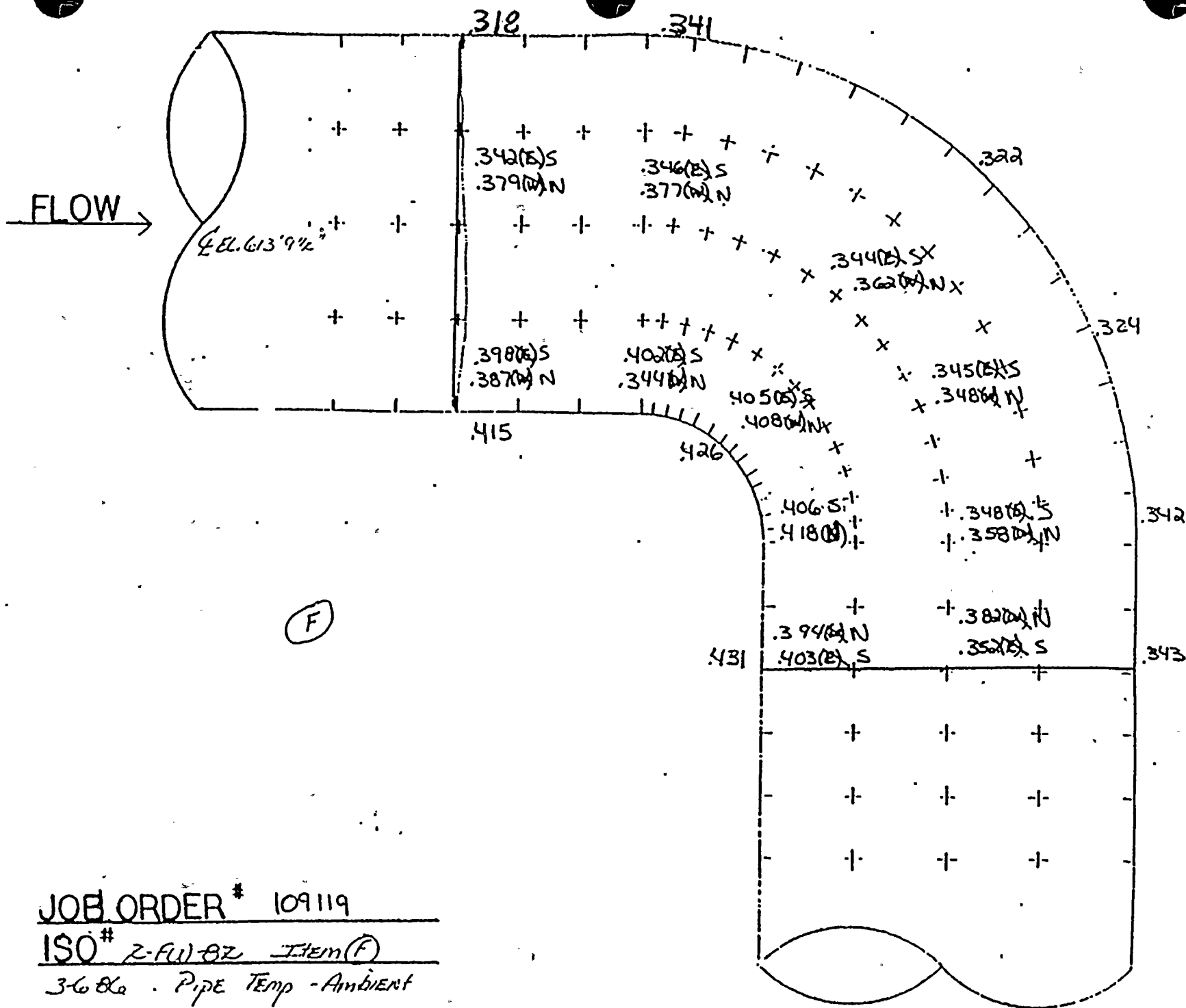
JOB ORDER # 109119

ISO # 2-FW-82 REV. 4 ITEM 'E'

DATE 9/23/86 TEMP.: 112°F

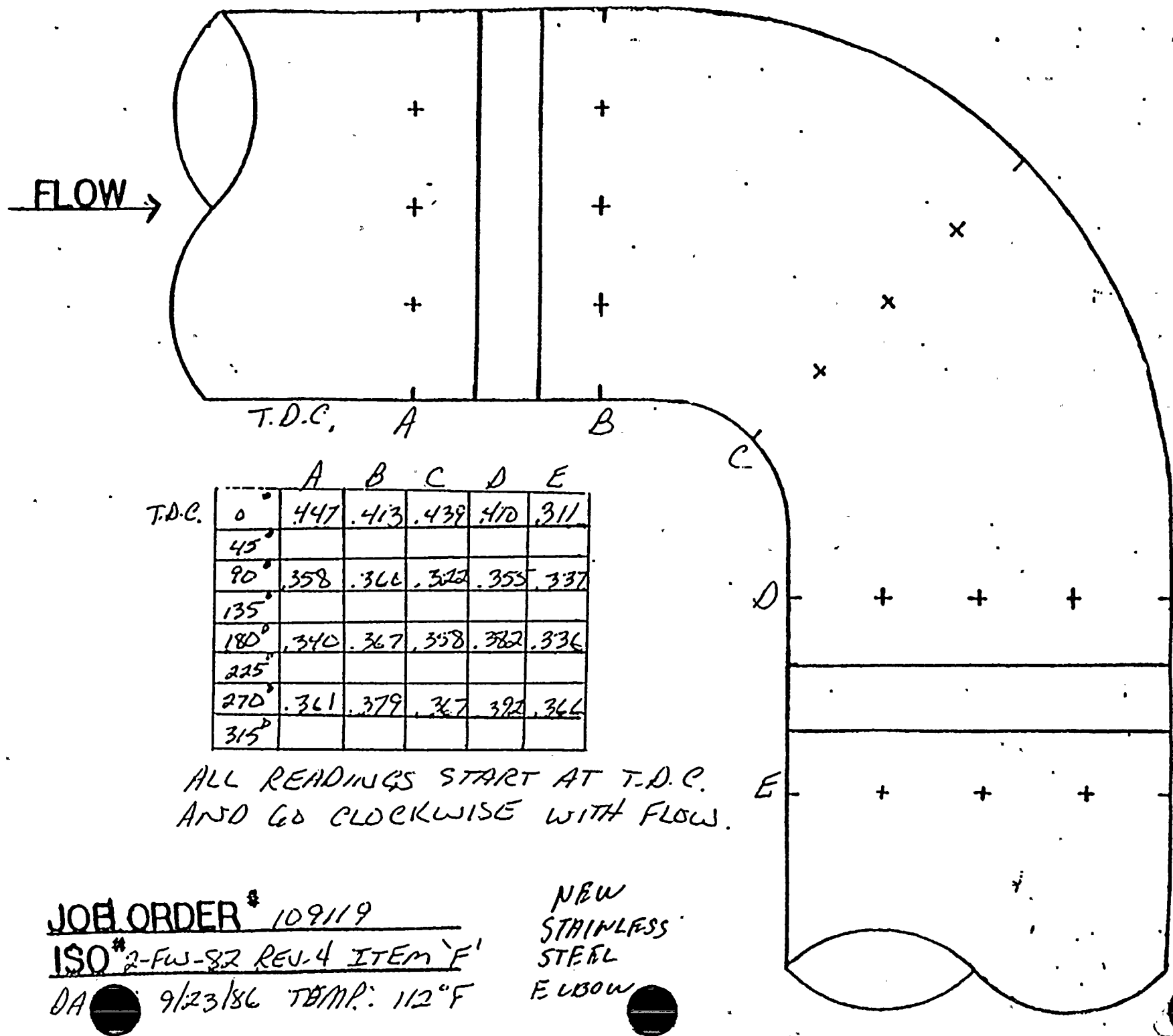
NEW  
STAINLESS  
STEEL  
ELBOW



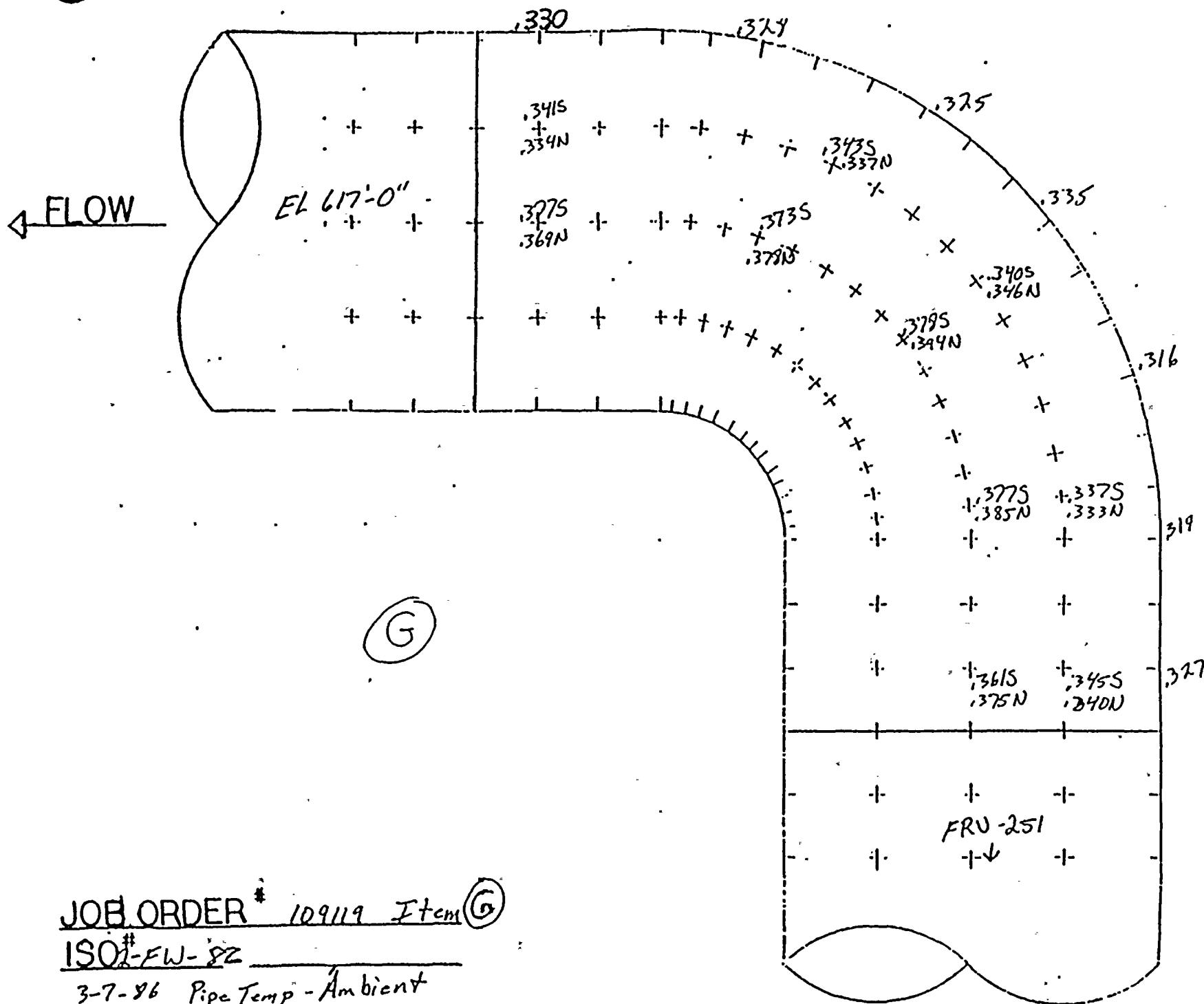


JOB ORDER # 109119  
 ISO# 2-FW-BZ ITEM(F)  
 3-6-86 Pipe Temp - Ambient



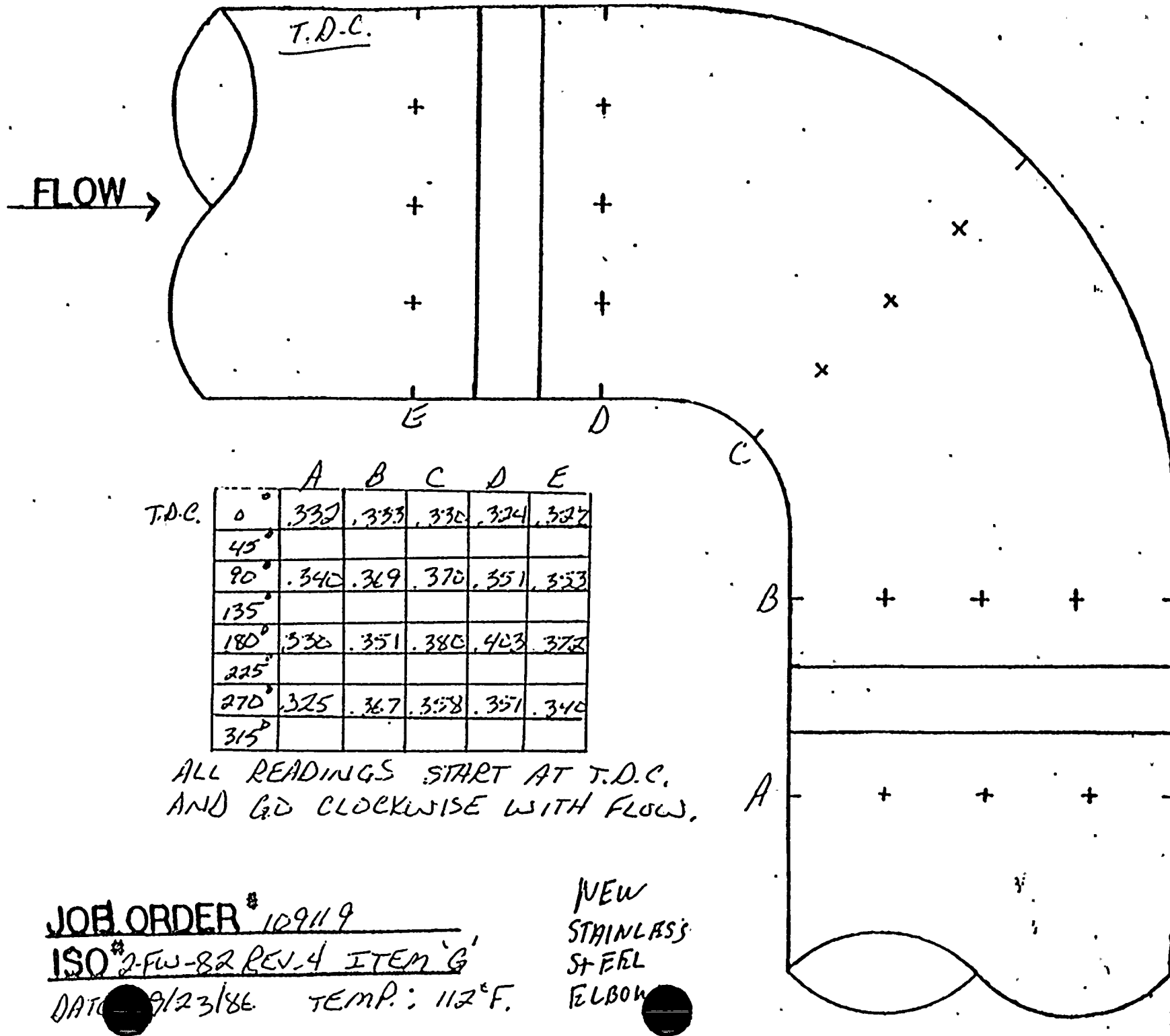






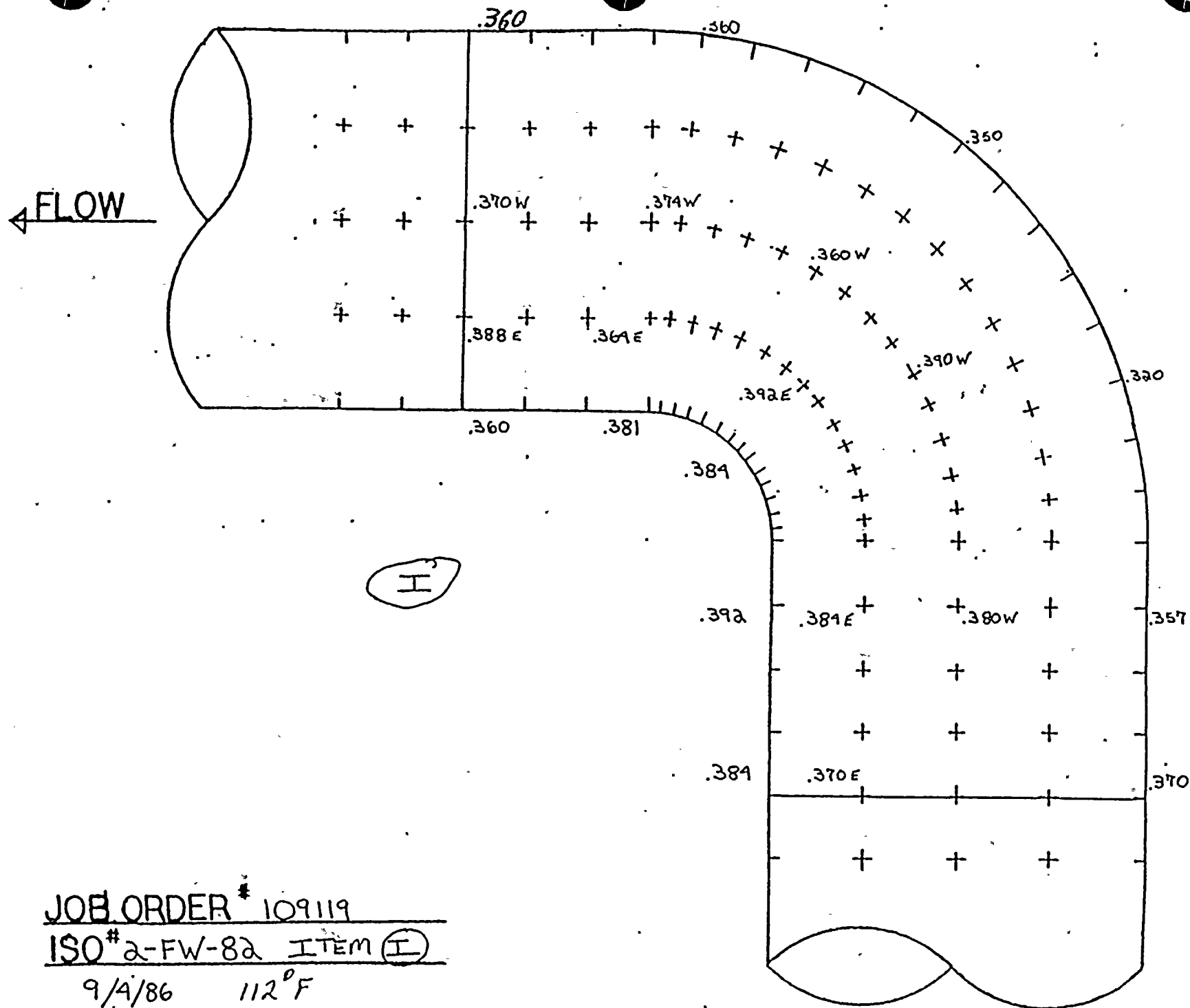
JOB ORDER # 109119 Item (G)  
 ISO# FW-82  
 3-7-86 Pipe Temp - Ambient





JOB ORDER # 109119  
 ISO # 2-FW-82 REV. 4 ITEM 'G'  
 DATE 9/23/86 TEMP.: 112°F.

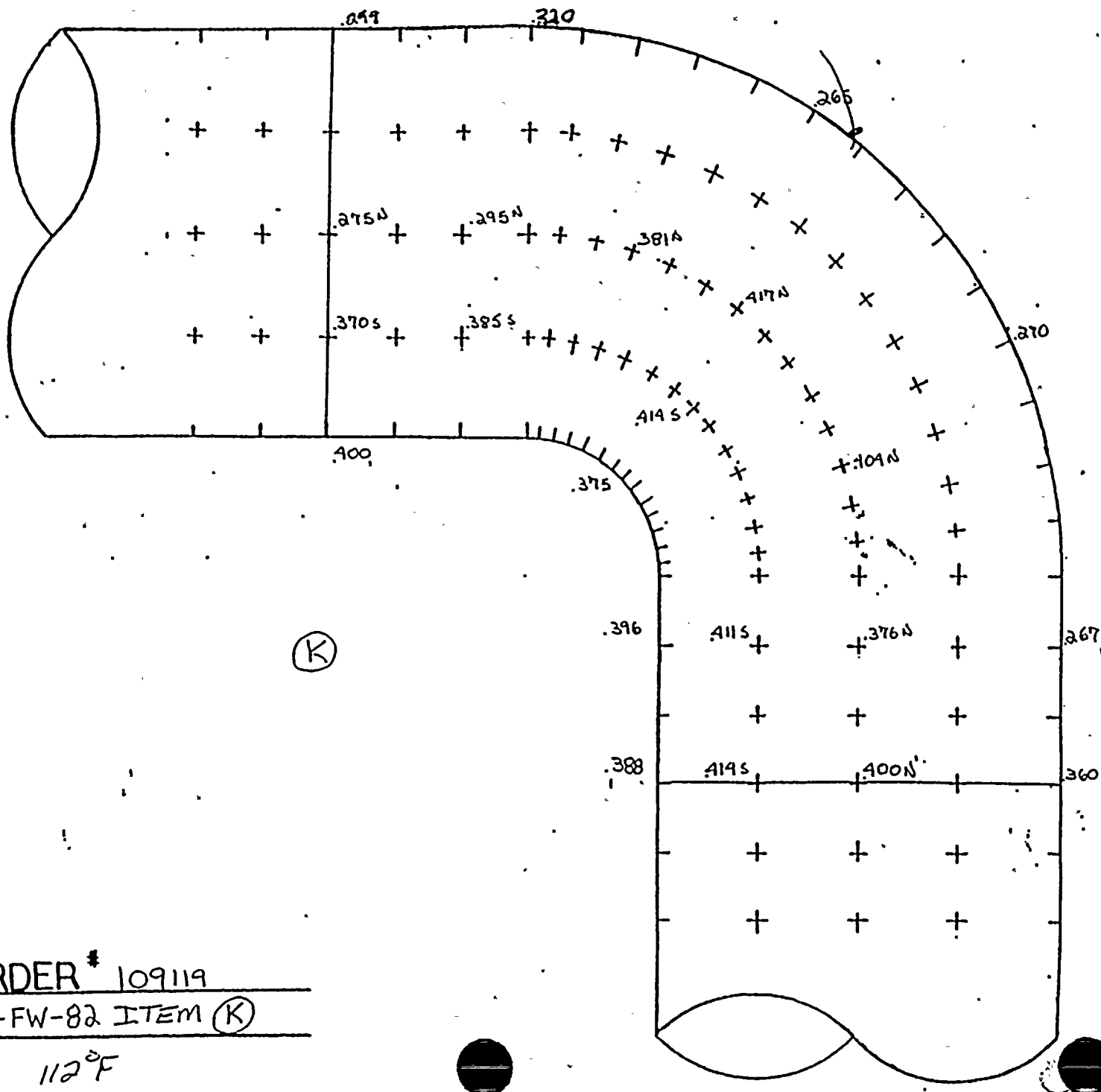




JOB ORDER # 109119  
ISO # 2-FW-82 ITEM (I)  
9/4/86 112°F



← FLOW



JOB ORDER # 109119

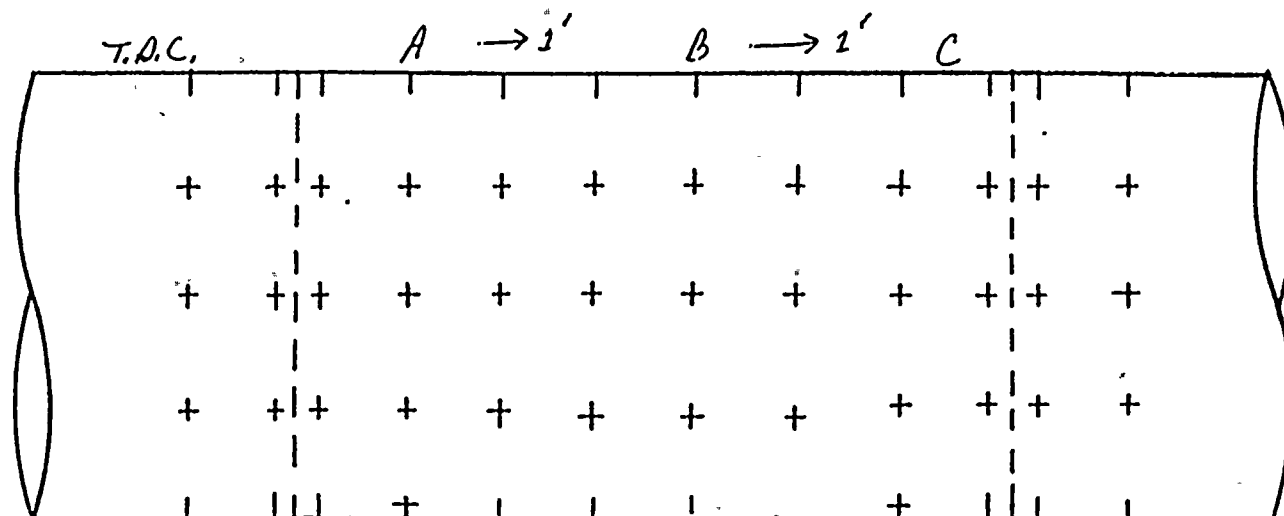
ISO # 2-FW-82 ITEM (K)

9/4/86

112°F



FLOW →



T.D.C.	A	B	C		
0°	.328	.345	.350		
45°	.339	.347	.343		
90°	.324	.340	.338		
135°	.336	.355	.335		
180°	.332	.346	.320		
225°	.327	.342	.315		
270°	.324	.333	.322		
315°	.322	.336	.324		

ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

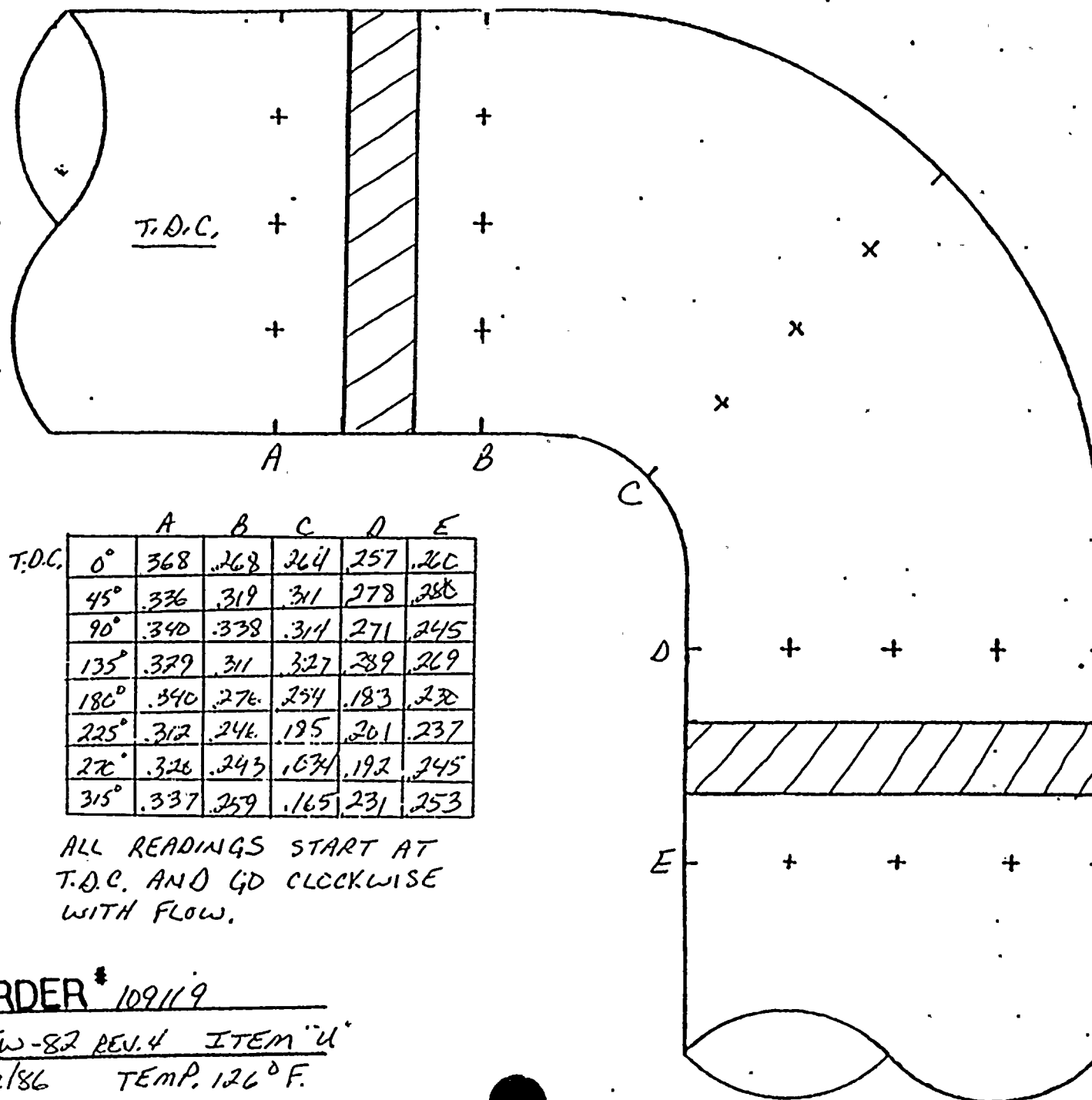
JOB ORDER # 109119

ISO # 2FW-82 REV. 4 SHT. ITEM "T"

DATE 9/12/86 TEMP. 126°F



FLOW →



T.D.C.		A	B	C	D	E
0°		368	268	264	257	260
45°		336	319	311	278	288
90°		340	338	314	271	245
135°		329	311	327	289	269
180°		340	276	254	183	220
225°		312	246	195	201	237
270°		326	243	167	192	245
315°		337	259	165	231	253

ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

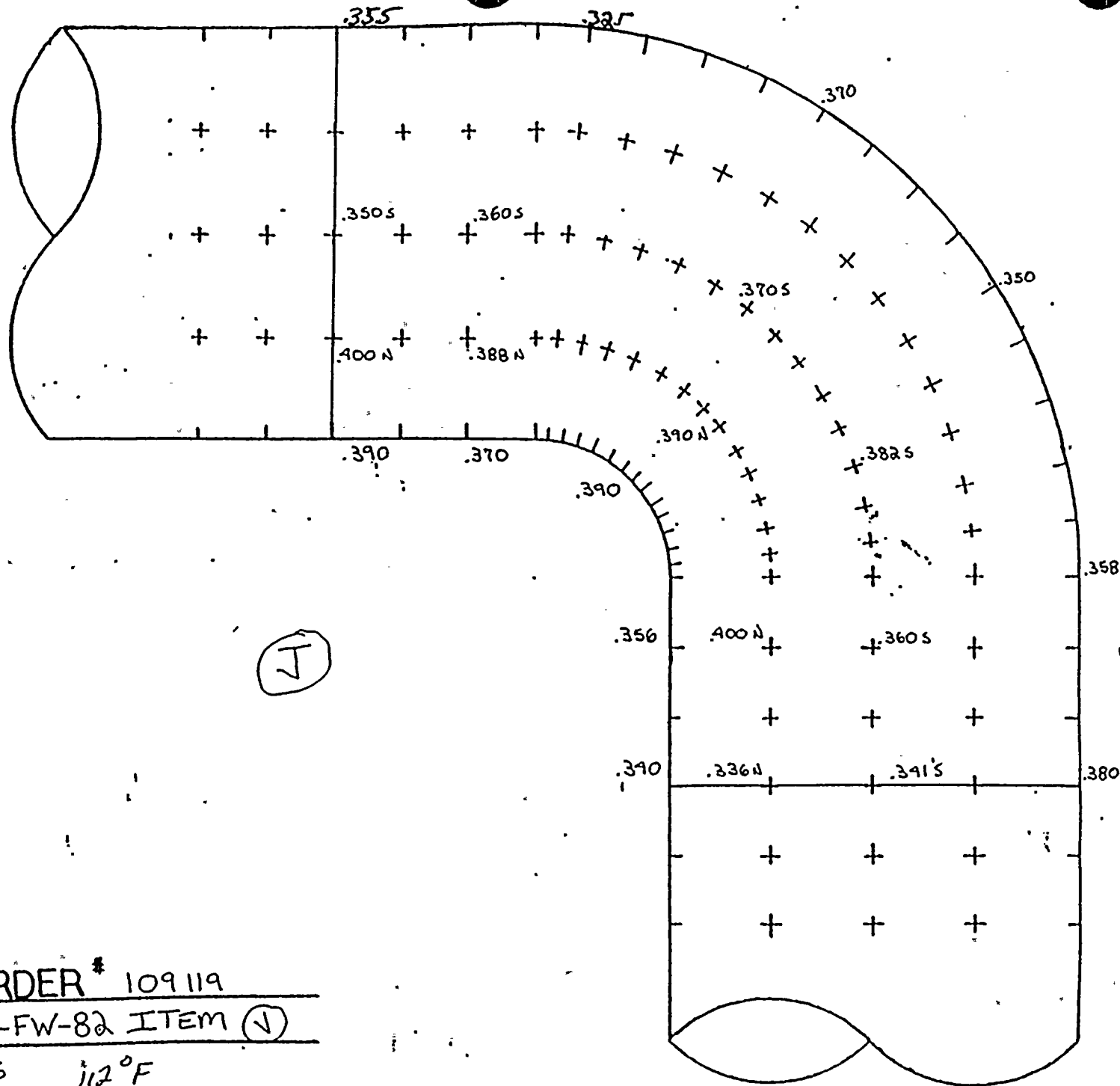
JOB ORDER # 109119

ISO # 2-FW-82 REV. 4 ITEM "U"

DATE 9/12/86 TEMP. 126° F.



FLOW



JOB ORDER # 109119  
ISO # 2-FW-82 ITEM (J)  
9/4/86 112°F



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPSC Engineer: A.J. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 2

Evaluation Date: JANUARY 19, 1987

SER No. 23-85 (Water) X

Years in service 9

UT Reading Transmitted on: 9-18-86

UT Reading Taken on: 3-7-86  
3-5-86  
3-11-86

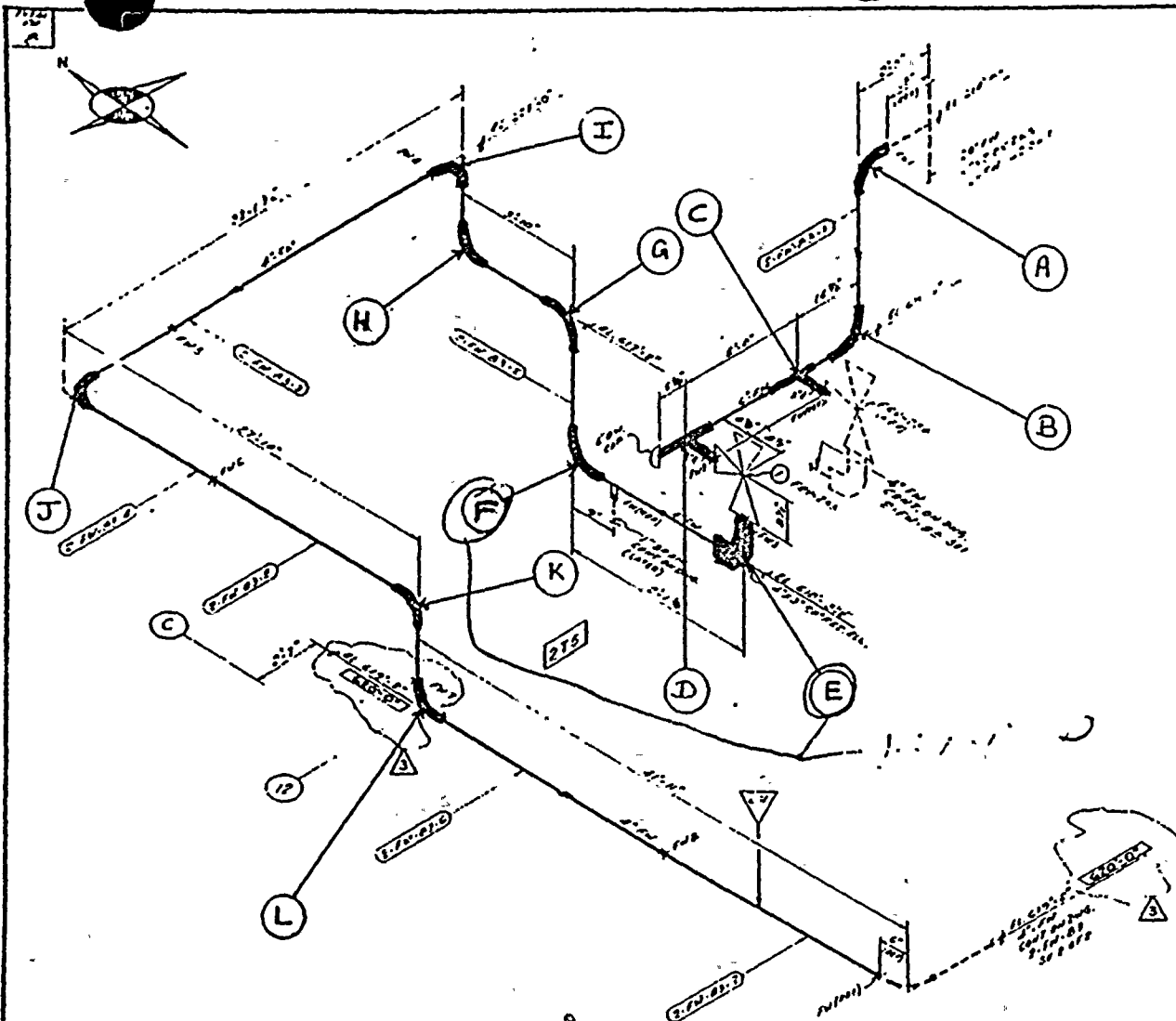
Isometric Dwg. NO. 2FW-83, REV. 3, Sh: 1 of 2

AEPSC Installed Mat'l Class CS: A-106 GR.B. SCH. 80

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
E	4" STRAIGHT	.337	.295-.379	.235	---	---	REPLACED WITH SS.
E	4" 90° ELL	.337	.295-.379	.235	.314	0%	STILL WITHIN MANUFACTURERS TOLERANCE
E	4" STRAIGHT	.337	.295-.379	.235	.314	0%	STILL WITHIN MANUFACTURERS TOLERANCE
F	4" STRAIGHT	.337	.295-.379	.235	.321	0%	" " " "
F	4" 90° ELL	.337	.295-.379	.235	.330	0%	" " " "
F	4" STRAIGHT	.337	.295-.379	.235	.300	0%	" " " "
H	4" STRAIGHT	.337	.295-.379	.235	.331	0%	" " " "
H	4" 90° ELL	.337	.295-.379	.235	.306	0%	" " " "
H	4" STRAIGHT	.337	.295-.379	.235	.327	0%	" " " "
L	4" 90° ELL	.337	.295-.379	.235	.300	0%	" " " "

NOTE: REPLACED PLANT (ID) COMP. S E, E WITH  
STAINLESS STEEL ELBOWS.



$$Q/C \} \text{CONST} - W'$$
[illegible]

REVISION RECORD				
NO	DATE	BY	DESCRIPTION	REMARKS
1	10/1/54	J.C.	ADDED APPROVAL STAMP PER AFB ACCTG DWG. 2-5-50-3	ATTN CDD
2	10/1/54	J.C.	ADDED APPROVAL FOR E-OR TESTING PER AFB ACCTG DWG. 1-9-50-5	ATTN CDD
M3	10/1/54	J.C.	PER RUM-HC-DBS-ADDED AS BUILT DIM.	ATTN CDD

INSPECT: E, F, & H OSMAARI  
L 14/11/81

2-FN-83  
SIT 1 OF 2.

DRAWING APPROVED FOR	
CONSTRUCTION	PRE-OPER TESTING
STG.G. DASTIG, D.L.D.	C. J. H. N. D.
AMERICAN ELECTRIC POWER RANGER SYSTEM	

[illegible]

FOUR/ZONE No. 273  
REQUIRED COMPLETION DAT  
FABRICATED BY TVCCO

**NPS DESIGNS INC.**  
**NEW YORK, N.Y.**

**FABRICATOR NOTE:  
FABRICATION MUST  
CONFORM TO LATEST  
A.E.P. 888GT.DWGS.**

ST. J. & COMPANY, INC.  
INDIANA & MICHIGAN ELECTRIC CO  
DONALD C COOK NUCLEAR PLANT

DATE	TIME	LOCATION	REMARKS
10-11-53	10:00	2-FIV-53	7

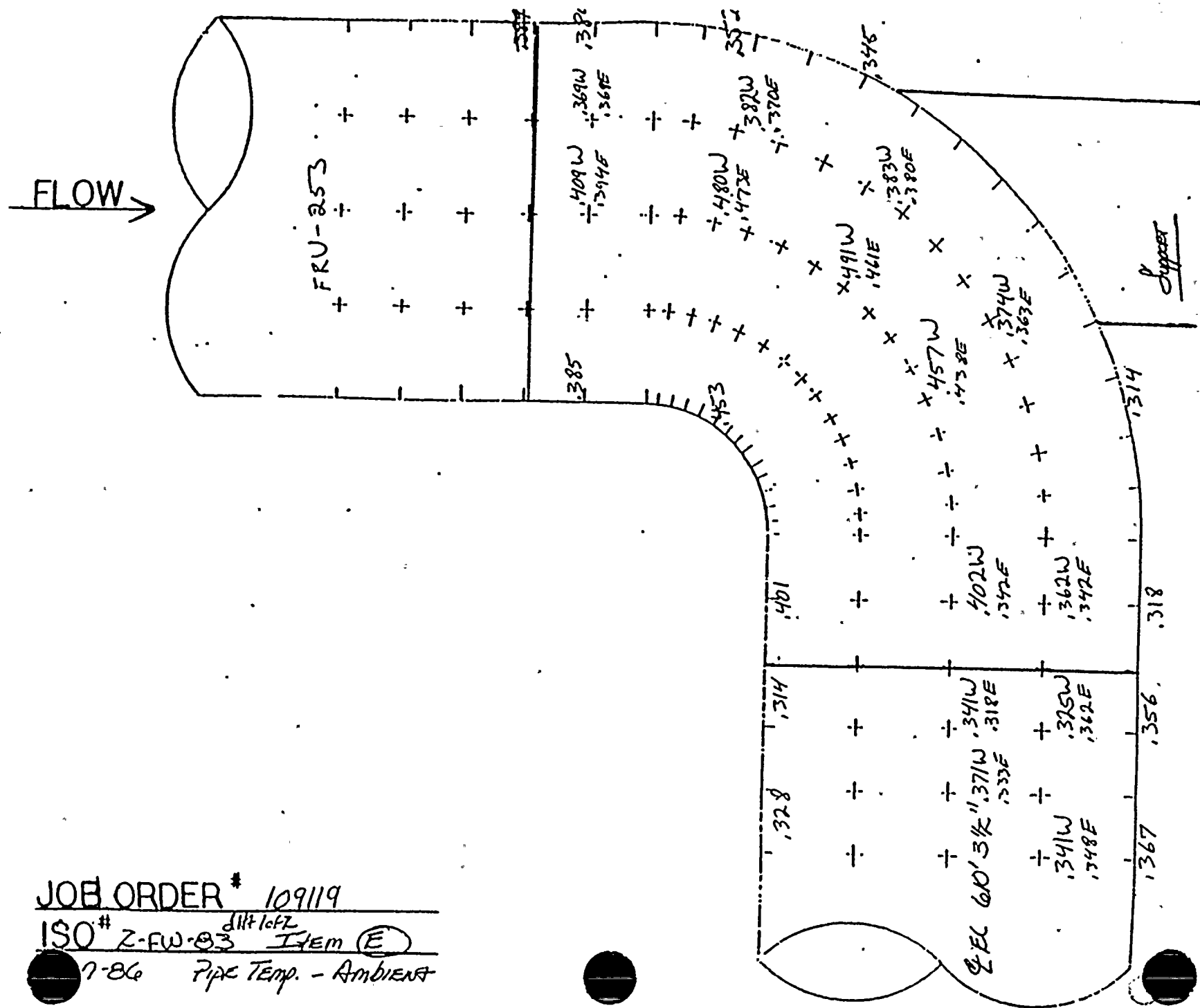
## QC / CONSTRUCTION



JOB ORDER # 109119

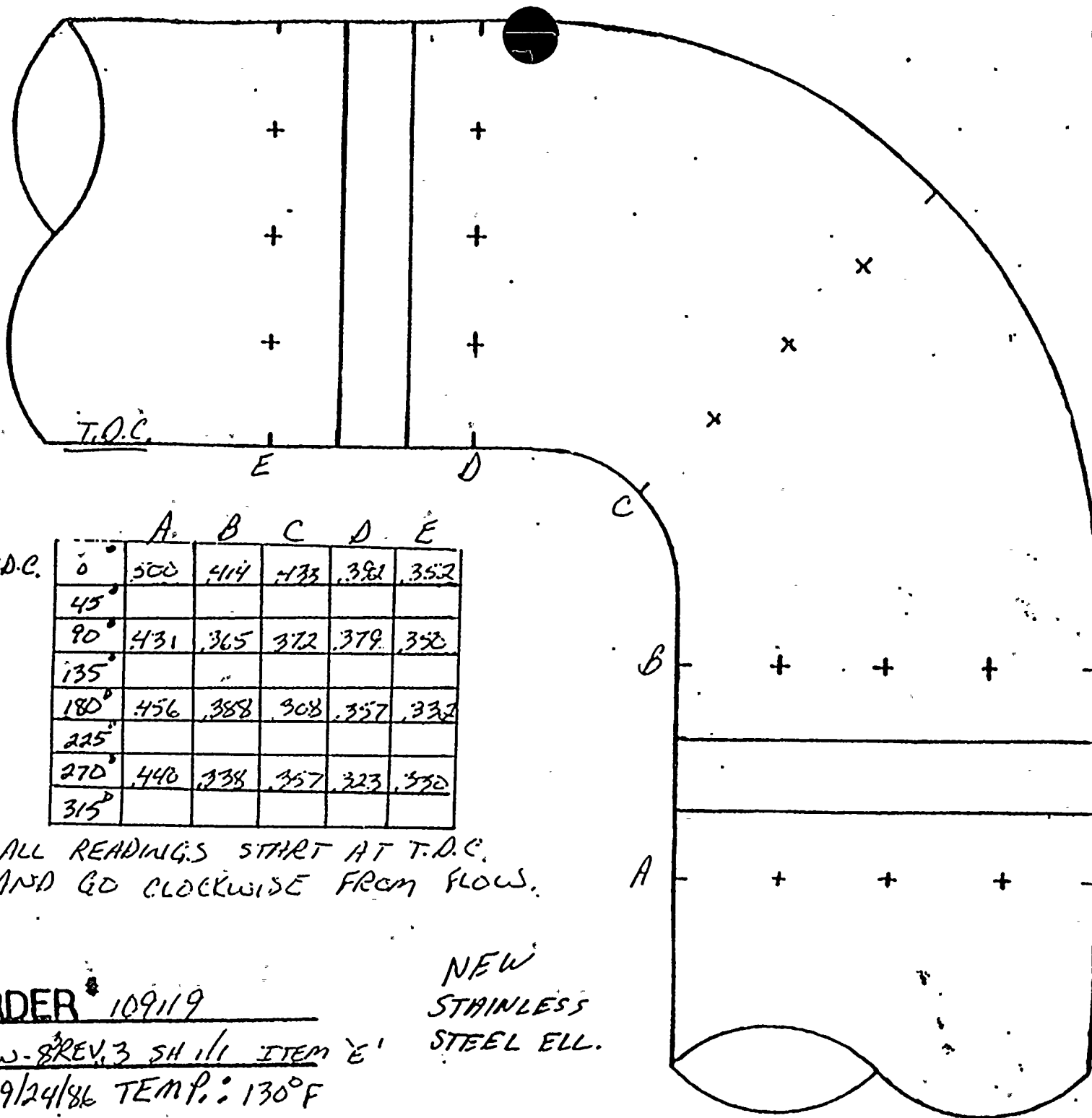
ISO # <sup>dlh 1672</sup> Z-FW-83 Item (E)

7-86 Pipe Temp. - Ambient





← FLOW



T.O.C.	A	B	C	D	E
0°	500	414	433	381	352
45°					
90°	431	365	372	379	350
135°					
180°	456	388	408	357	332
225°					
270°	440	338	357	323	320
315°					

ALL READINGS START AT T.O.C.  
AND GO CLOCKWISE FROM FLOW.

JOB ORDER # 109119

ISO# 2FW-8REV.3 SH 1/1 ITEM 'E'

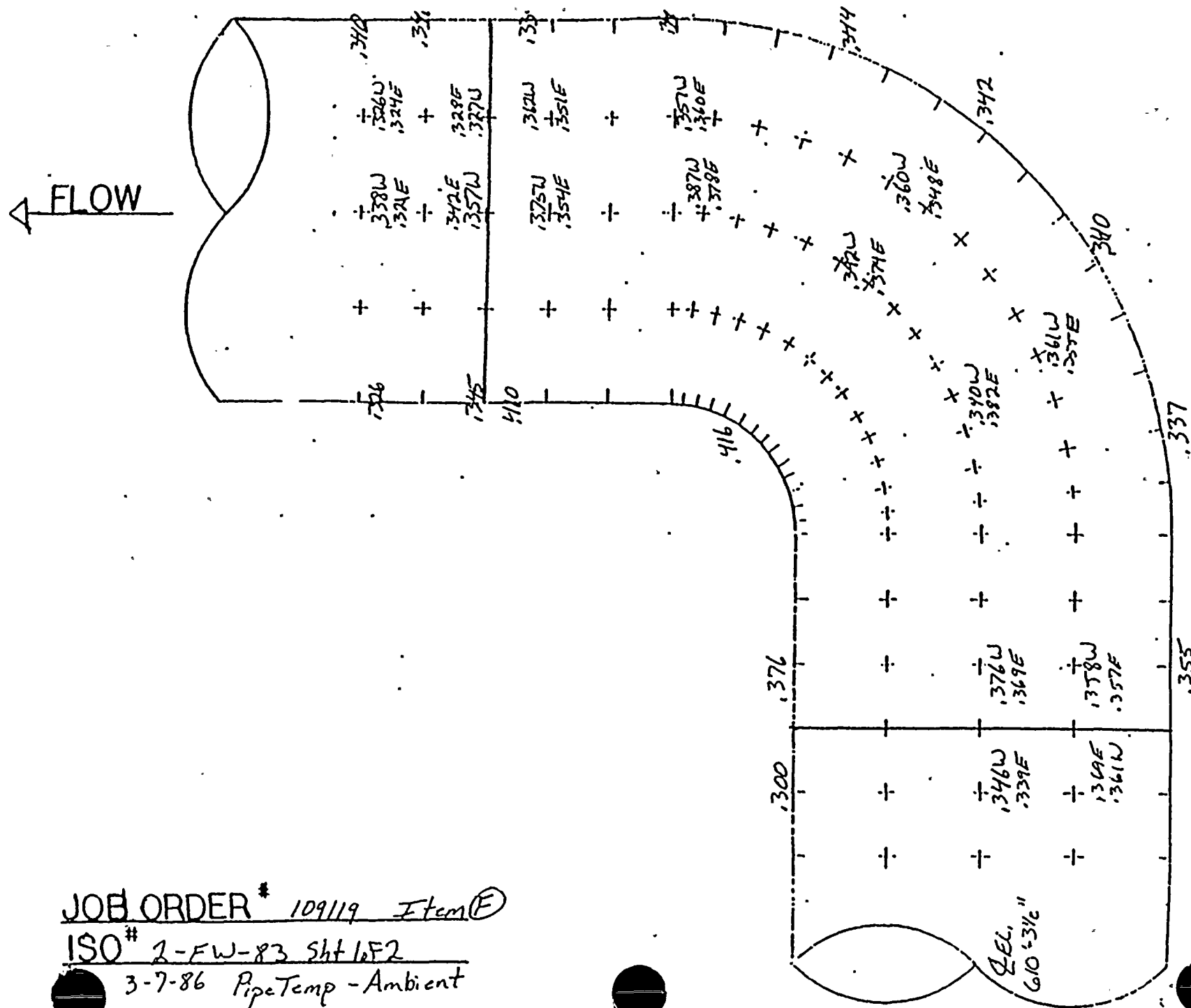
DATE: 9/24/86 TEMP.: 130°F

NEW  
STAINLESS  
STEEL ELL.



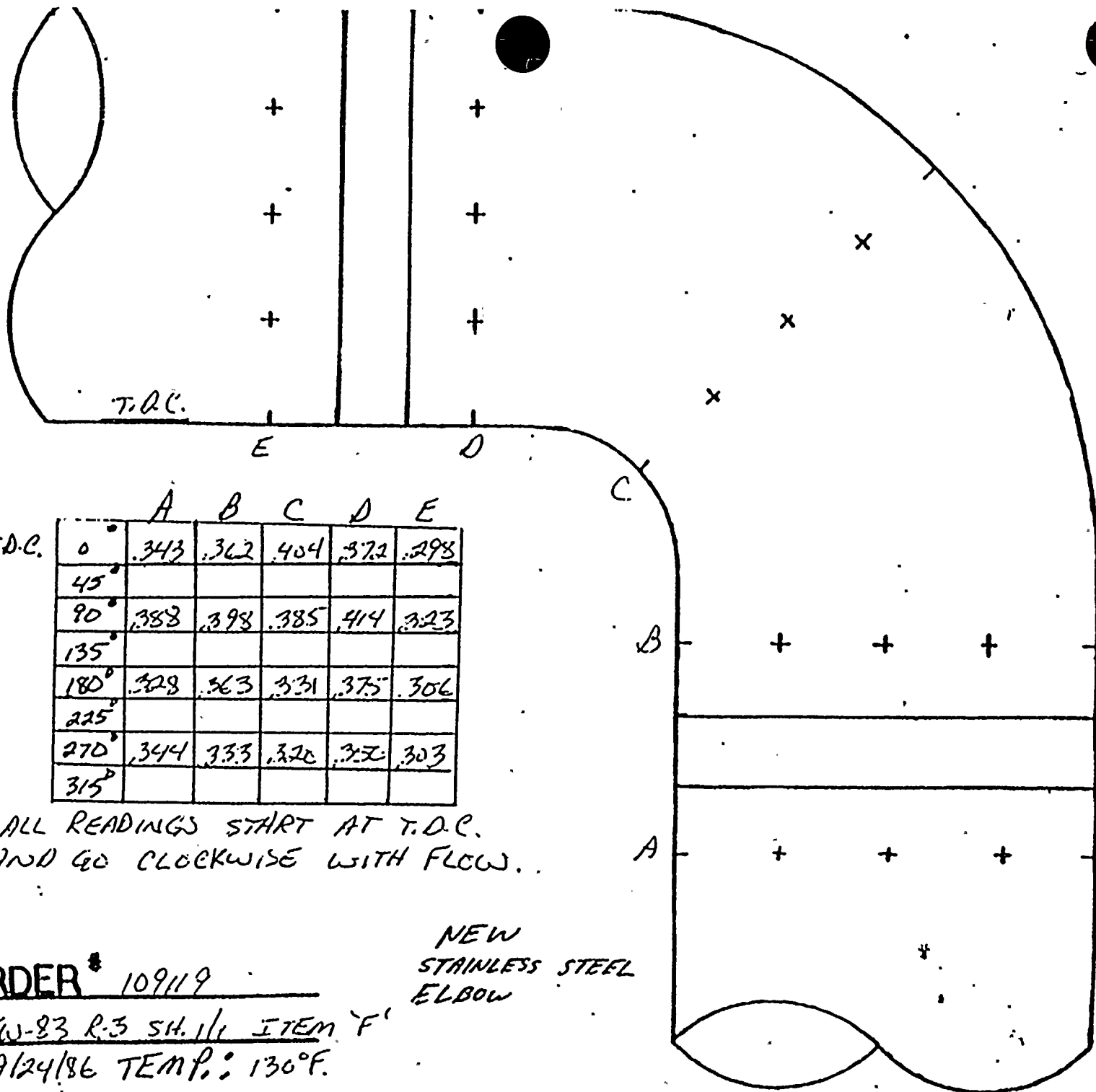
ISO# 2-FW-83 Sht 1 of 2

3-7-86 Pipe Temp - Ambient





← FLOW



T.D.C.		A	B	C	D	E
0°		.343	.362	.404	.372	.298
45°						
90°		.388	.398	.385	.414	.323
135°						
180°		.328	.363	.331	.375	.306
225°						
270°		.344	.333	.320	.377	.303
315°						

ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

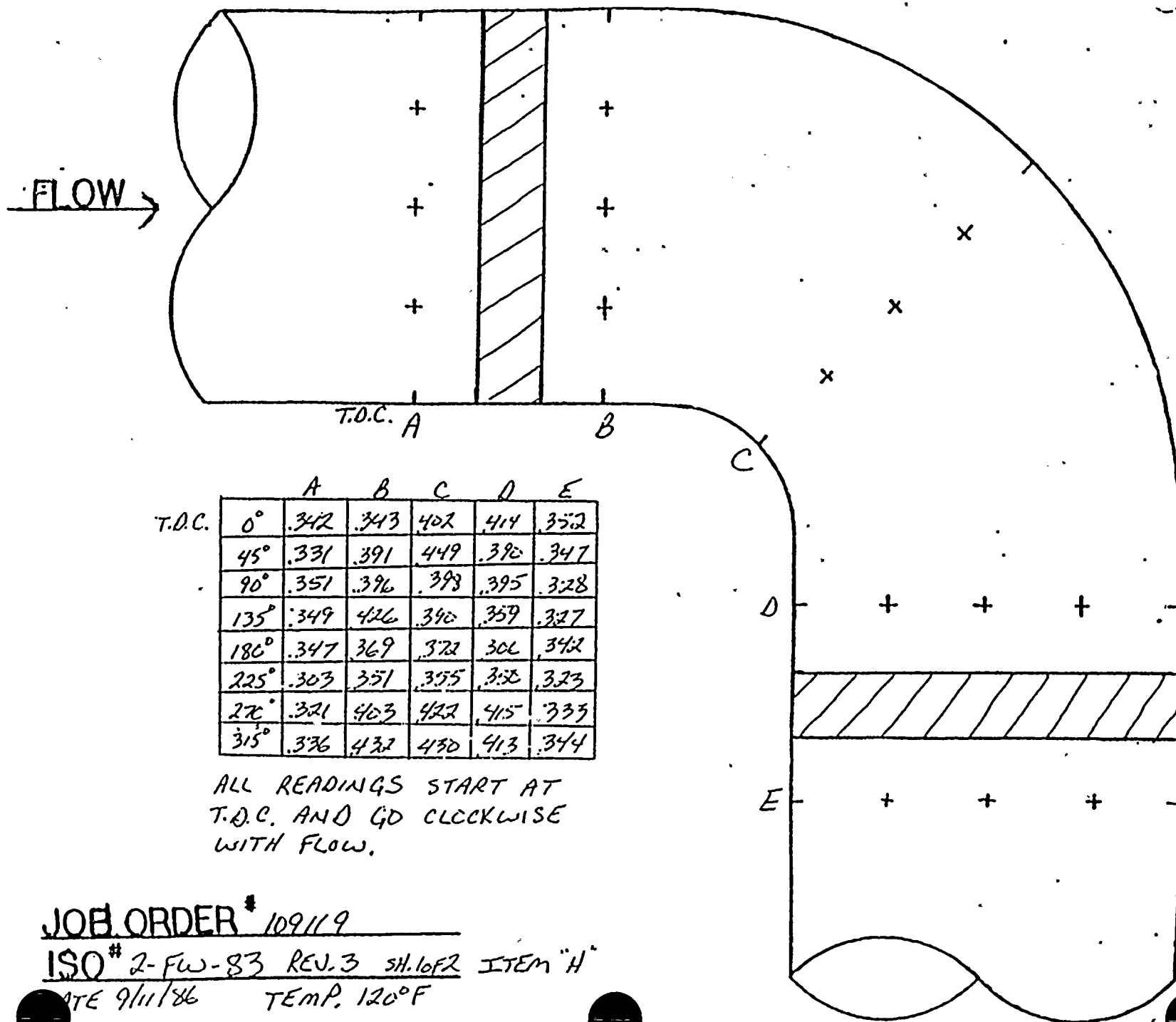
JOE ORDER # 109119

ISO # 2-FW-83 R-3 SH. 1/1 ITEM 'F'

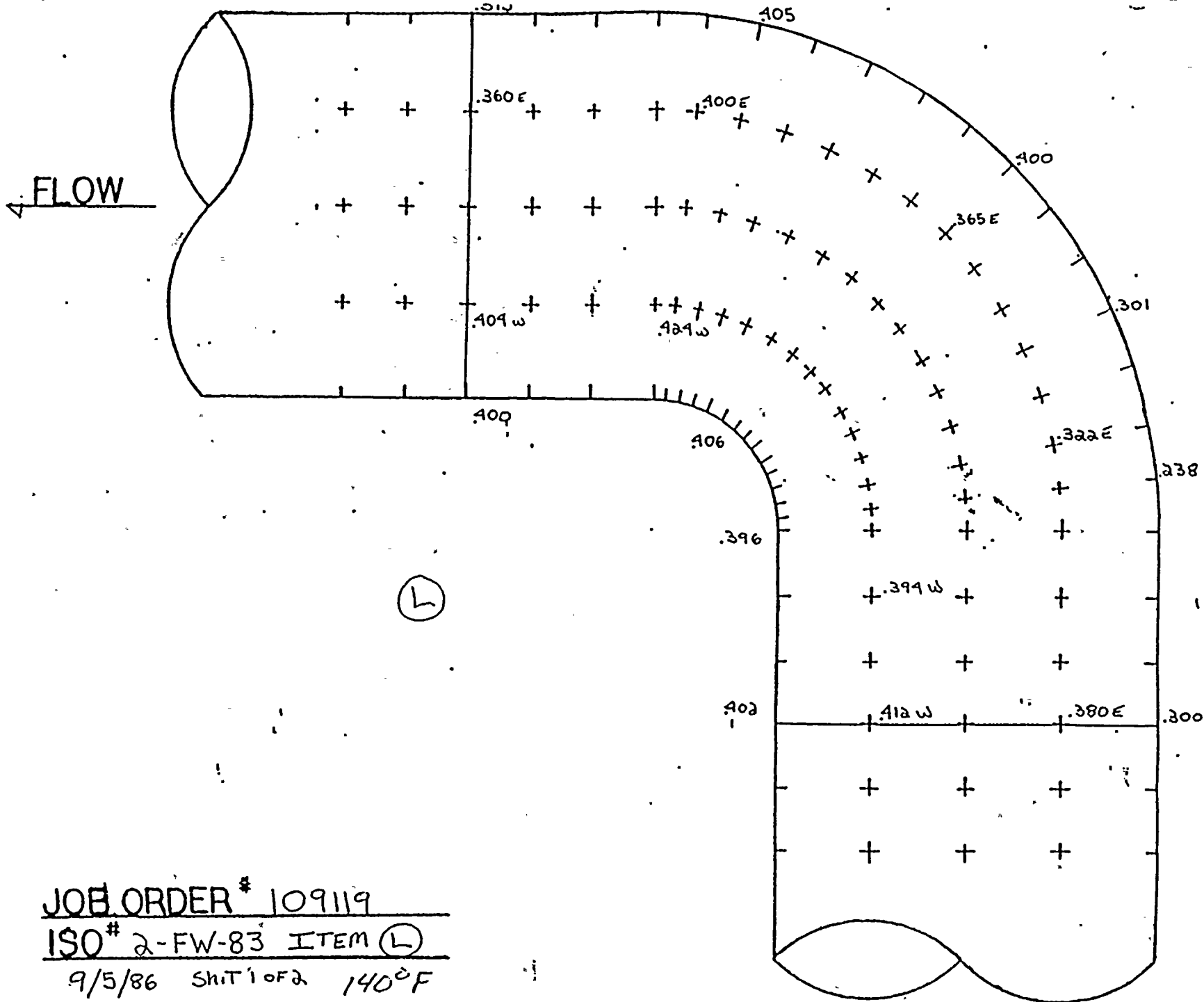
DATE: 9/24/86 TEMP.: 130°F.

NEW  
STAINLESS STEEL  
ELBOW









JOB ORDER # 109119  
 ISO # 2-FW-83 ITEM (L)  
 9/5/86 SHIT 1 OF 2 140°F



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPSC Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 2

Evaluation Date: JANUARY 19, 1987

SER No. 23-85 (Water) X

Years in service 9

UT Reading Transmitted on: 9-18-86

UT Reading Taken on: 9-5-86  
9-11-86  
9-12-86  
9-10-86

Isometric Dwg. NO. 2-FW-83, Sh. 2 of 2

AEPSC Installed Mat'l Class CS: A-106, GR. B, SCH. 40 & 80

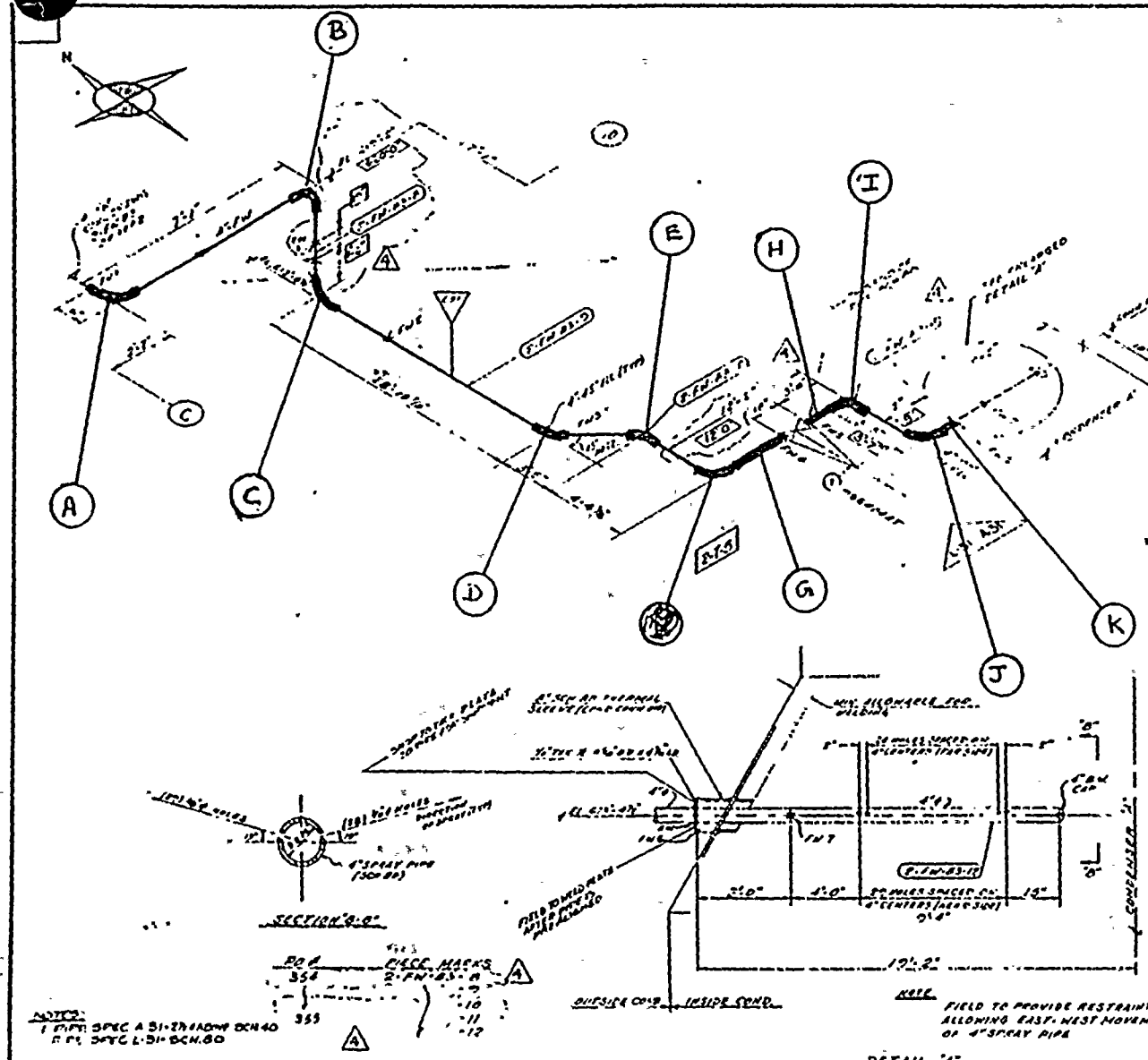
Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
A	4" STRAIGHT	.337	.295-.379	.235	.336	0%	STILL WITHIN MANUFACTURERS TOLERANCE
A	4" 90° ELL	.337	.295-.379	.235	.278	5.8%	EXAMINE REPLACE WITHIN NEXT 10 YEARS
A	4" STRAIGHT	.337	.295-.379	.235	.321	0%	STILL WITHIN MANUFACTURERS TOLERANCE
B	4" STRAIGHT	.337	.295-.379	.235	.315	0%	" " " "
B	4" 90° ELL	.337	.295-.379	.235	.243	17.6%	PAD WELD & REPLACE AS SOON AS POSSIBLE
B	4" STRAIGHT	.337	.295-.379	.235	.324	0%	STILL WITHIN MANUFACTURERS TOLERANCE
C	4" 90° ELL	.337	.295-.379	.235	.250	15.3%	REPLACE AT YOUR EARLIEST CONVENIENCE
F	4" STRAIGHT	.337	.295-.379	.235	.327	0%	STILL WITHIN MANUFACTURERS TOLERANCE
F	4" 90° ELL	.337	.295-.379	.235	.211	28.5%	PAD WELD & REPLACE AT EARLIEST CONVENIENCE
F	4" STRAIGHT	.337	.295-.379	.235	.338	0%	STILL WITHIN MANUFACTURERS TOLERANCE
I	4" STRAIGHT	.337	.295-.379	.049	.322	0%	" " " "
I	4" 90° ELL	.337	.295-.379	.049	.160	45.8%	REPLACE IN 5 YEARS
I	4" STRAIGHT	.337	.295-.379	.049	.209	29.2%	RE EXAMINE IN 20 YEARS
J	4" STRAIGHT	.337	.295-.379	.049	.313	0%	STILL WITHIN MANUFACTURERS TOLERANCE
J	4" 90° ELL	.337	.295-.379	.049	.150	49.2%	REPLACE IN 5 YEARS
J	4" STRAIGHT	.337	.295-.379	.049	.245	16.9%	ACCEPTABLE, NO NEED TO EXAM

NOTE: ITEMS I & J ARE SUPPOSE TO BE SCH. 40 BUT IT APPEARS PER UT READING  
THE SCH IS 80. FOR THE



S.O.# 109119 (QC) - 109122 123 (CONST)

QC/CONST - WE.



MATERIAL DESCRIPTION	
1	1/2" SCH 40S STEEL PIPE
2	1/2" SCH 40S STEEL PIPE
3	1/2" SCH 40S STEEL PIPE
4	1/2" SCH 40S STEEL PIPE
5	1/2" SCH 40S STEEL PIPE
6	1/2" SCH 40S STEEL PIPE
7	1/2" SCH 40S STEEL PIPE
8	1/2" SCH 40S STEEL PIPE
9	1/2" SCH 40S STEEL PIPE
10	1/2" SCH 40S STEEL PIPE

REVISION RECORD	
NO.	DATE
1	10/15/83
2	10/15/83
3	10/15/83
4	10/15/83

INSPECT: B, F, J OF WARE ANTIFP.  
A, C, I 141128 ANT

2-FW-83  
SHEET 2 OF 2

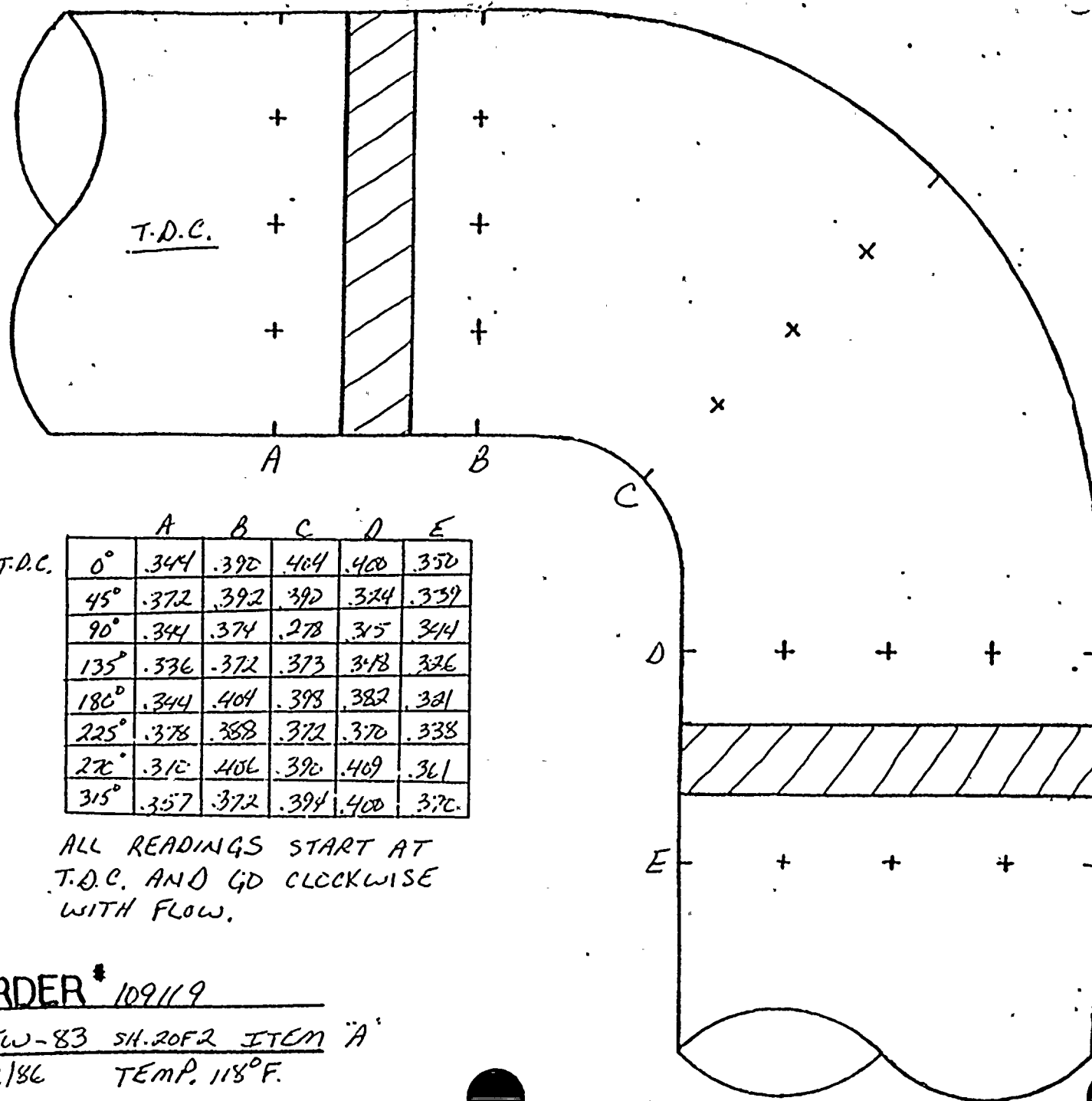
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

DESIGN SPEC	
DESIGN SPEC	DESIGN SPEC
DESIGN SPEC	DESIGN SPEC
DESIGN SPEC	DESIGN SPEC
DESIGN SPEC	DESIGN SPEC
DESIGN SPEC	DESIGN SPEC
DESIGN SPEC	DESIGN SPEC
DESIGN SPEC	DESIGN SPEC
DESIGN SPEC	DESIGN SPEC
DESIGN SPEC	DESIGN SPEC
DESIGN SPEC	DESIGN SPEC

FOUR/ZONE No. 2-FW-83	REQUIRED COMPLETION DATE
FABRICATED BY JSCC	WELDING PROCEDURE
NPS DESIGNS INC.	INSPECTION
NEW YORK, N.Y.	INSPECTION
FABRICATOR NOTE:	INSPECTION
FABRICATION MUST	INSPECTION



FLOW →



T.D.C.		A	B	C	D	E
0°		.344	.390	.404	.400	.350
45°		.372	.392	.390	.324	.339
90°		.344	.374	.278	.315	.344
135°		.336	.372	.373	.318	.326
180°		.344	.404	.398	.382	.381
225°		.378	.388	.372	.370	.338
270°		.310	.406	.390	.409	.361
315°		.357	.372	.394	.400	.370

ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

JOB ORDER # 109119

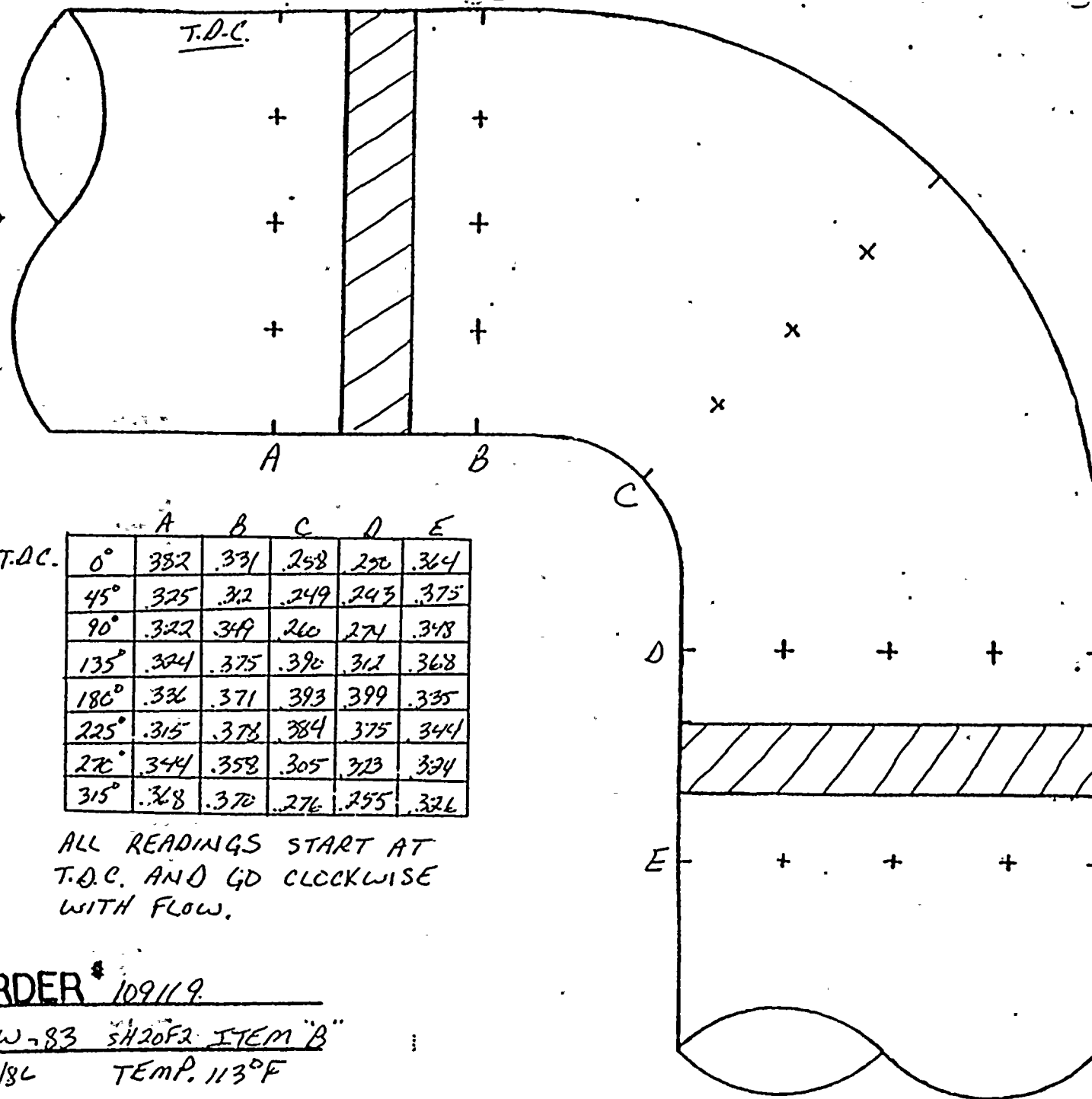
ISO # 2-FW-83 SH.20F2 ITEM "A"

DATE 9/12/86

TEMP. 118°F.



FLOW →

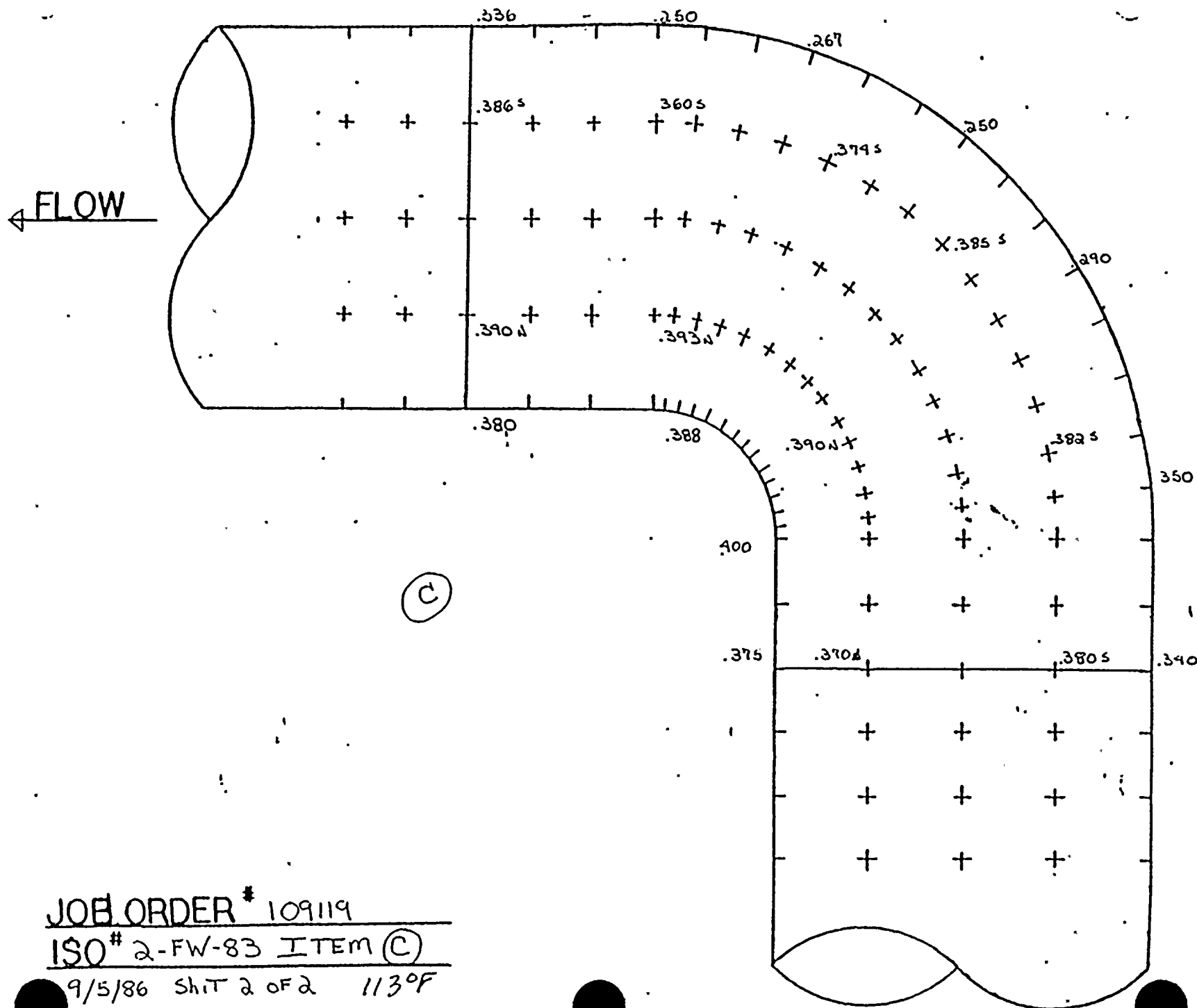


JOB ORDER # 109119

ISO # 2-FW-83 SH20F2 ITEM "B"

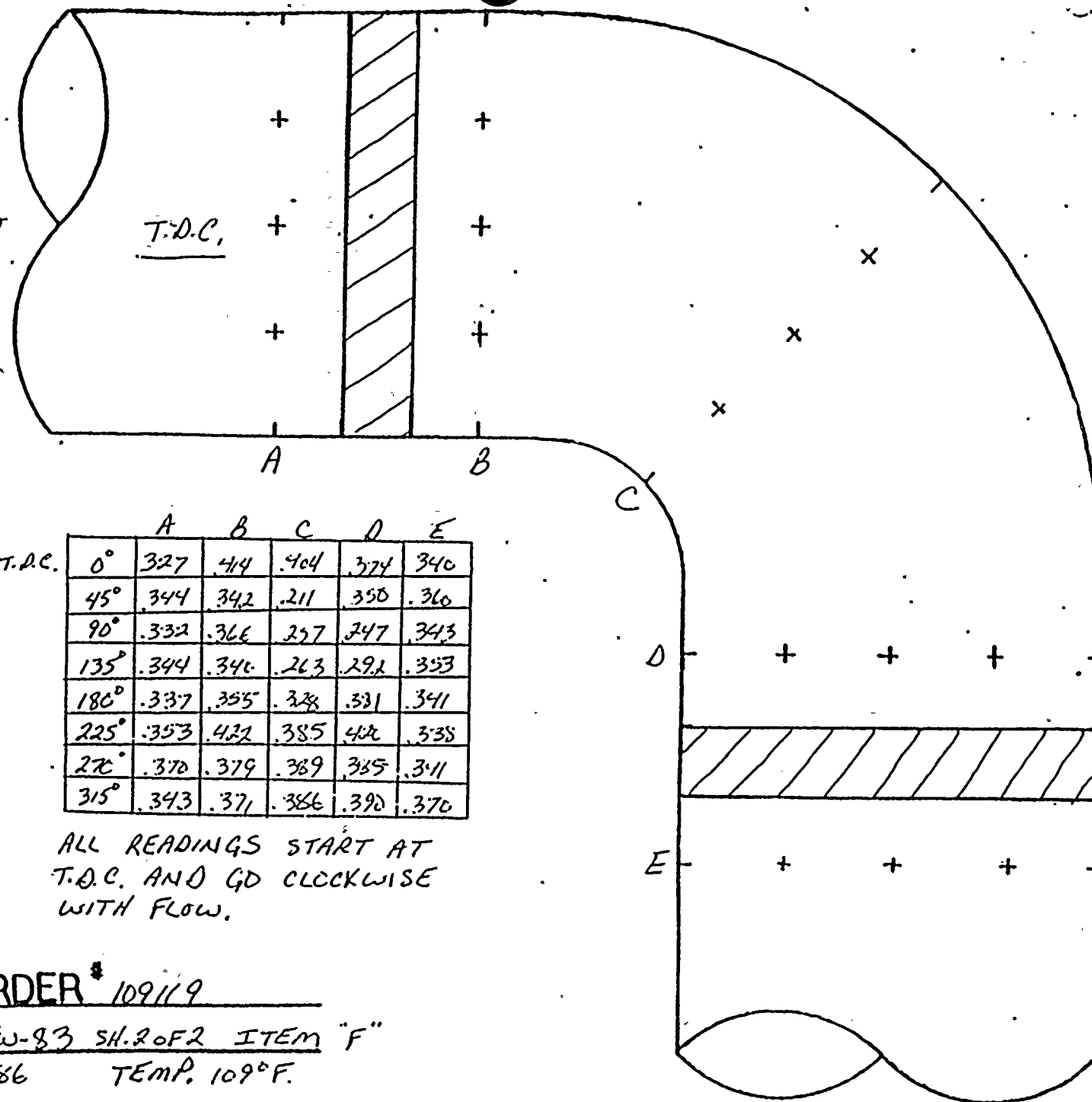
DATE 9/10/86 TEMP. 113°F







FLOW →



T.D.C.		A	B	C	D	E
0°		327	414	404	374	340
45°		344	342	211	350	360
90°		332	366	237	247	343
135°		344	340	263	291	353
180°		337	355	328	331	341
225°		353	422	385	402	338
270°		370	379	369	365	311
315°		343	371	386	390	370

ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

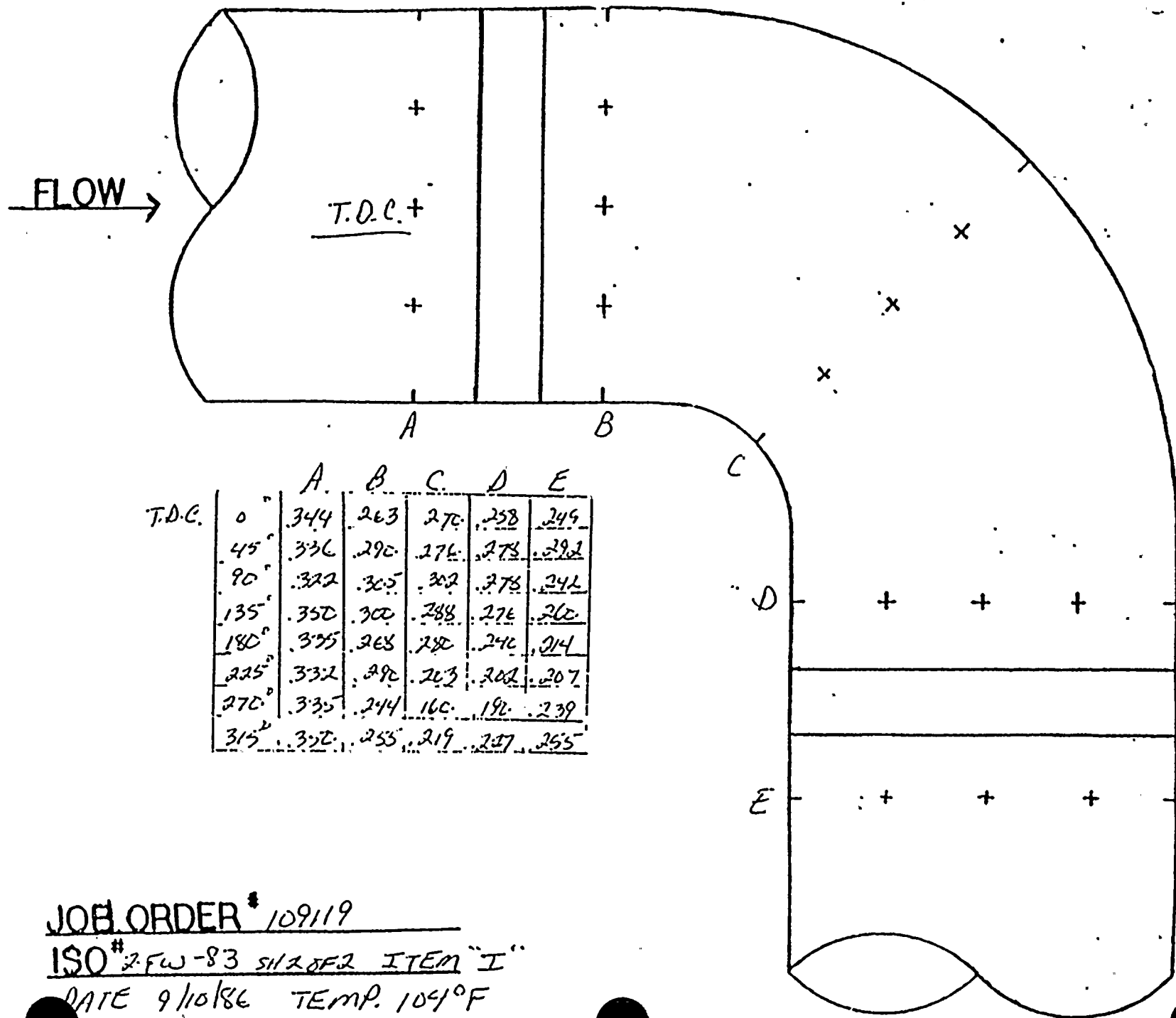
JOE ORDER # 109119

ISO # 2-FW-83 SH. 20F2 ITEM "F"

DATE 9/11/86

TEMP. 109°F.



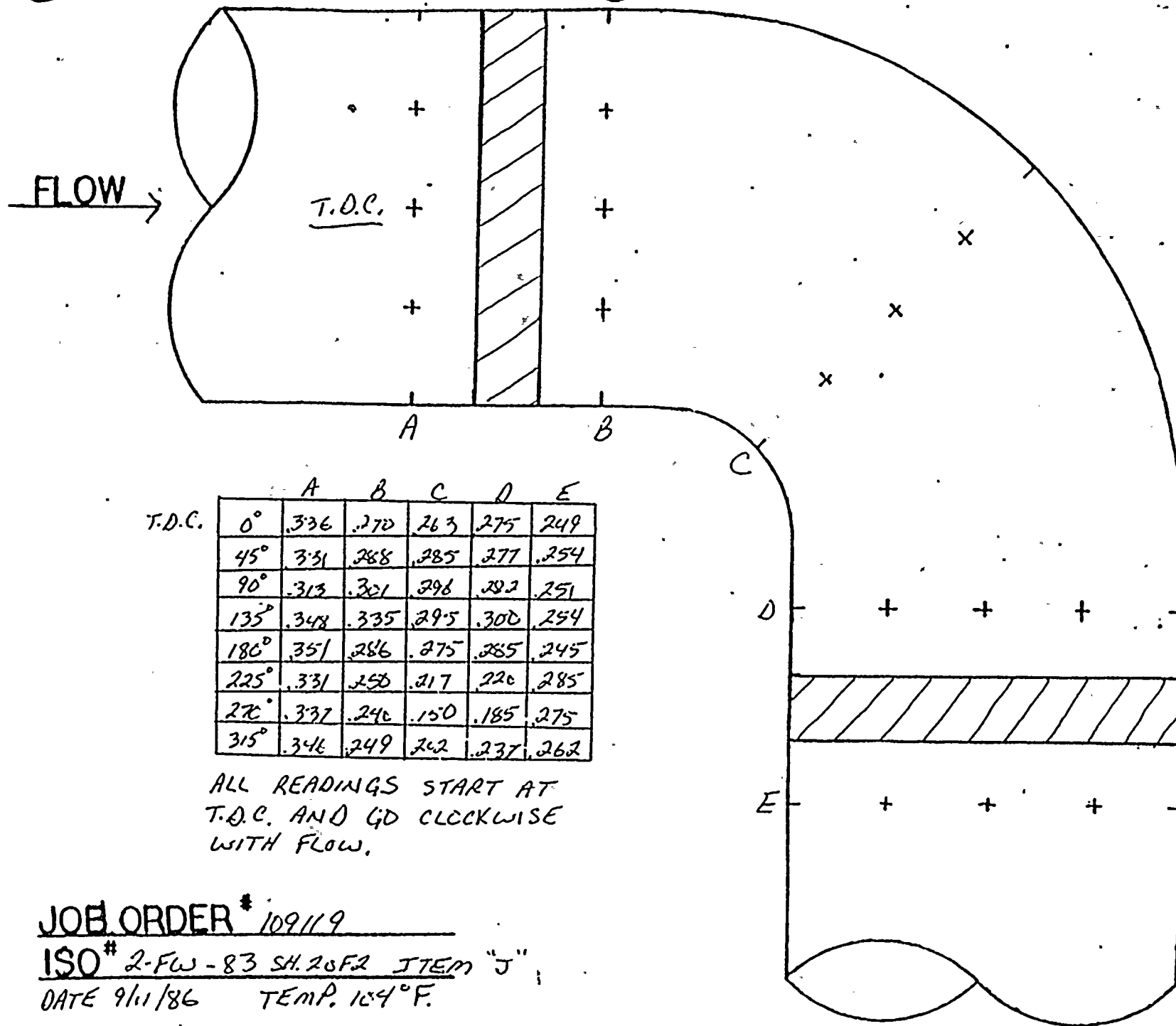


JOB ORDER # 109119

ISO # 2FW-83 SH 20F2 ITEM "I"

DATE 9/10/86 TEMP. 104°F







D. C. COOK 'LEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: A.J. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 2

Evaluation Date: JANUARY 19, 1987

SER No. 23-85 (Water) X

Years in service 9

UT Reading Transmitted on: 9-18-86

UT Reading Taken on: 3-6-86, 9-12-86  
3-7-86, 9-15-86

Isometric Dwg. NO. 2-FW-84 REV. 4

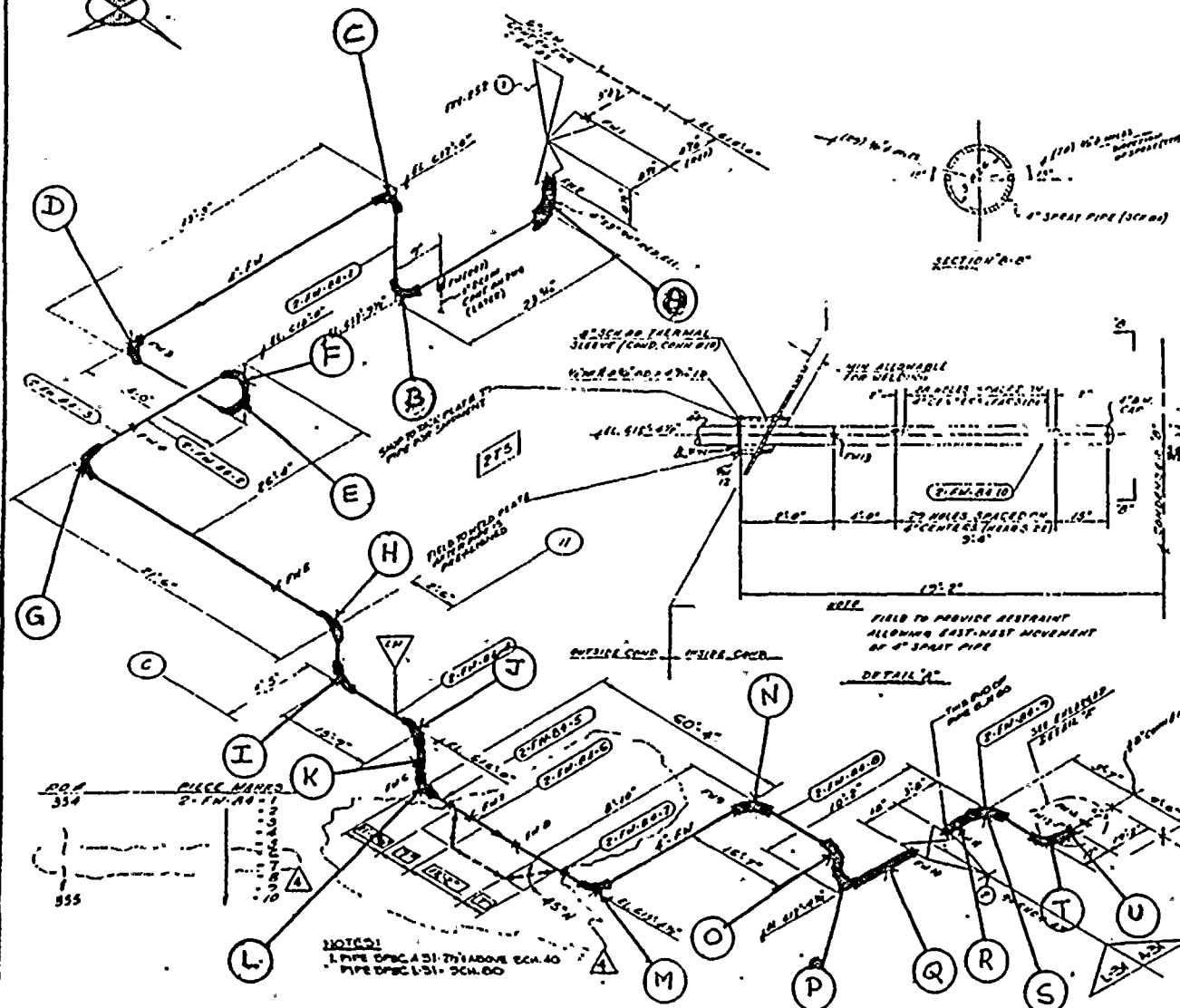
AEPS Installed Mat'l Class CS: A-106 GR-B SCH. 40 & 80

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
A	4"-90°ELL	.337	.295-.379	.235	.122	58.6%	REPLACE STILL SATISFIES TM
B	4"-90°ELL	.337	.295-.379	.235	.290	1.7%	RE-EXAM RE-EXAM WITHIN 10 YEARS
C	4"-90°ELL	.337	.295-.379	.235	.301	0%	STILL WITHIN MANUFACTURERS TOLERANCE STILL SATISFIES TM
D	4"-90°ELL	.337	.295-.379	.235	.282	4.4%	RE-EXAM WITHIN 20 YRS.
L	4" STRAIGHT	.337	.295-.379	.235	.310	0%	STILL WITHIN MANUFACTURERS TOLERANCE STILL SATISFIES TM
L	4"-90°ELL	.337	.295-.379	.235	.248	15.9%	REPLACE
L	4" STRAIGHT	.337	.295-.379	.235	.327	0%	STILL WITHIN MANUFACTURERS TOLERANCE " " "
S	4" STRAIGHT	.337	.295-.379	.049	.310	0%	" " "
S	4"-90°ELL	.337	.295-.379	.049	.094	68%	REPLACE NEXT OUTAGE
S	4" STRAIGHT	.337	.295-.379	.049	.244	17.3%	OK, NO FURTHER EXAMINATION REQD

NOTE: REPLACED COMP ID# A,B,C WITH STAINLESS STEEL ELBOW. ALSO,  
COMPONENT S IS SUPPOSE TO BE SCH. 40 BUT IT APPEARS PER  
UT THAT IT IS SCH. 80



REPLACED A, B & C with SS



SECTION A-A



FIELD TO PROVIDE RESTRAINT ALLOWING EAST-WEST MOVEMENT OF 4" SPRAY PIPE

DETAIL A

NO.	REV.	DATE	DESCRIPTION	APPROVED BY
1	1	1	REV. REGULATING VALVE	PER 252
2	1	1	252" B.V. GATE VALVE (S.C.R.O.)	PER 252

NO.	DATE	DESCRIPTION	REMARKS
1	1/1/79	ADDED APPROVAL STAMP PER APP. ARTIST DWG. 2-5755-B	
2	1/1/79	ADDED APPROVAL STAMP PER APP. ARTIST DWG. 2-5755-B	
3	1/1/79	ADDED APPROVAL STAMP PER APP. ARTIST DWG. 2-5755-B	
4	1/1/79	ADDED APPROVAL STAMP PER APP. ARTIST DWG. 2-5755-B	

INSPECT: A, B & C OSHA 80-107  
L, S 1410180 AS

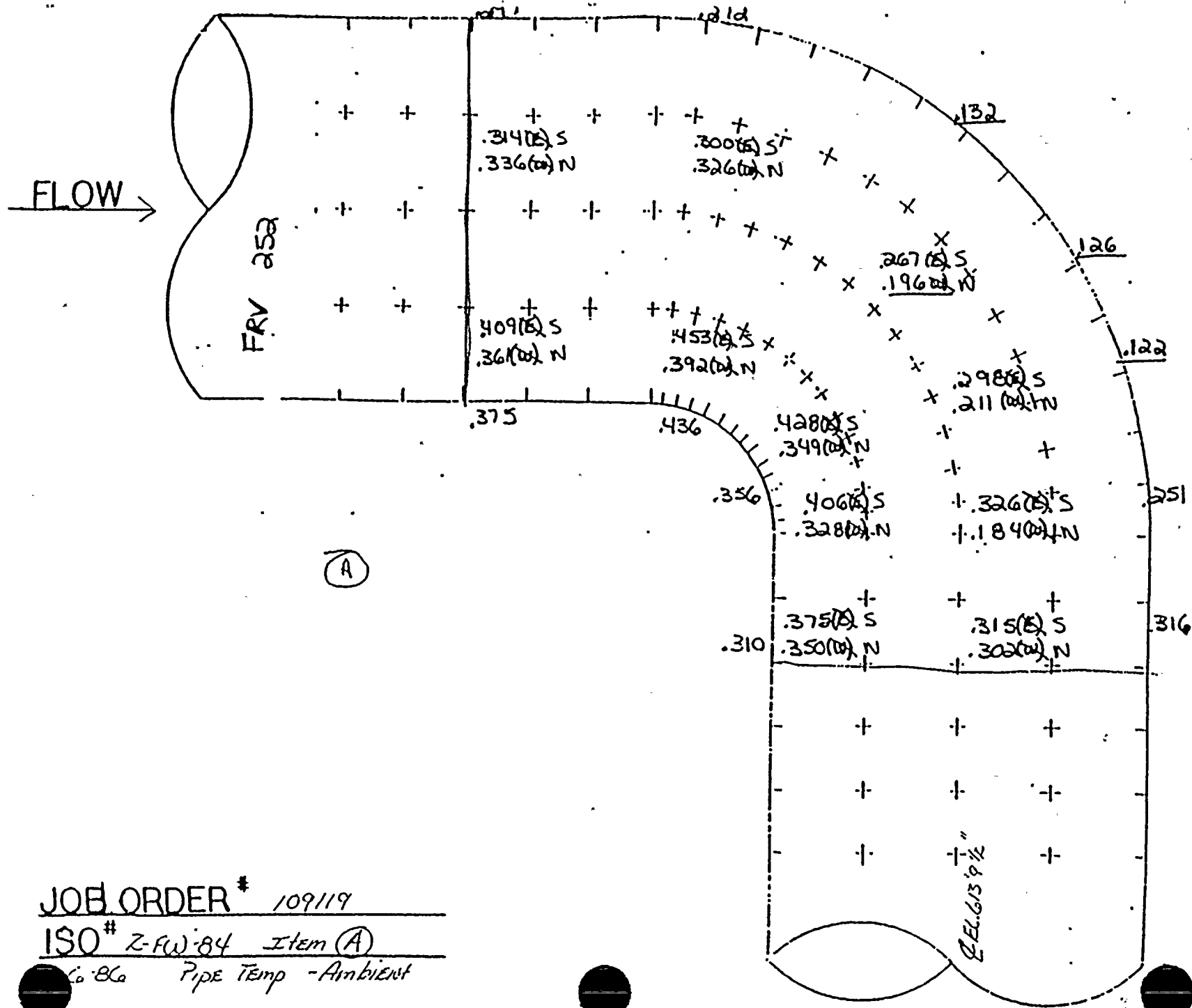
2-FW-84, REV. 4

DRAWING APPROVED FOR	
CONSTRUCTION	PRELIMINARY TESTING
BY GGG, DATE 1/1/79	BY L.D., DATE 1/1/79
AMERICAN ELECTRIC POWER COMPANY	

NO.	REV.	DATE	DESCRIPTION	APPROVED BY
1	1	1	REV. REGULATING VALVE	PER 252
2	1	1	252" B.V. GATE VALVE (S.C.R.O.)	PER 252

CONSTRUCTION / QC - WEEK 6 J.O. #3109119 (QC) - 109122 & 109123 (CONST.)





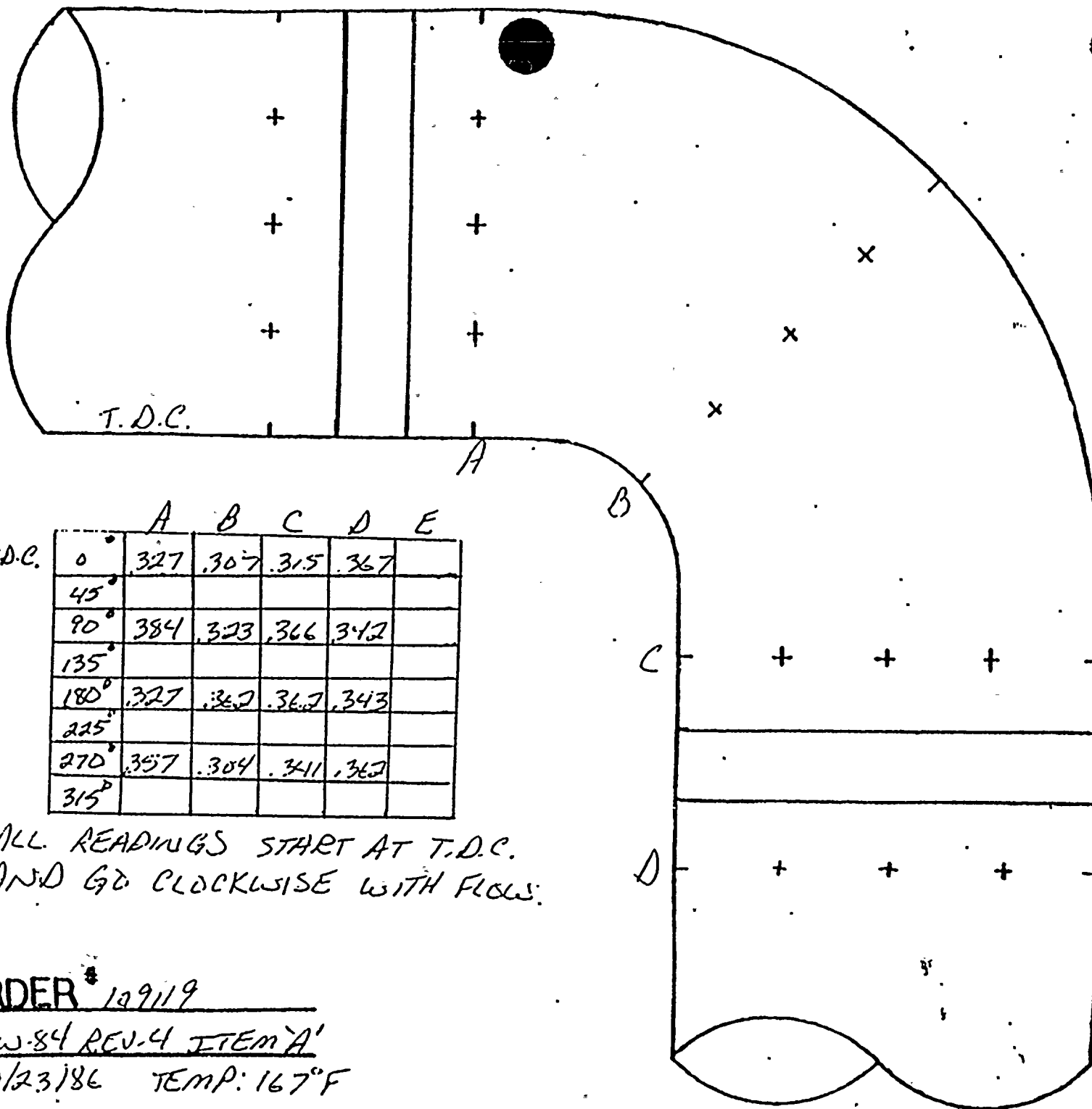
JOB ORDER # 109119

ISO# Z-FW-84 Item (A)

Co. BG Pipe Temp - Ambient



FLOW →

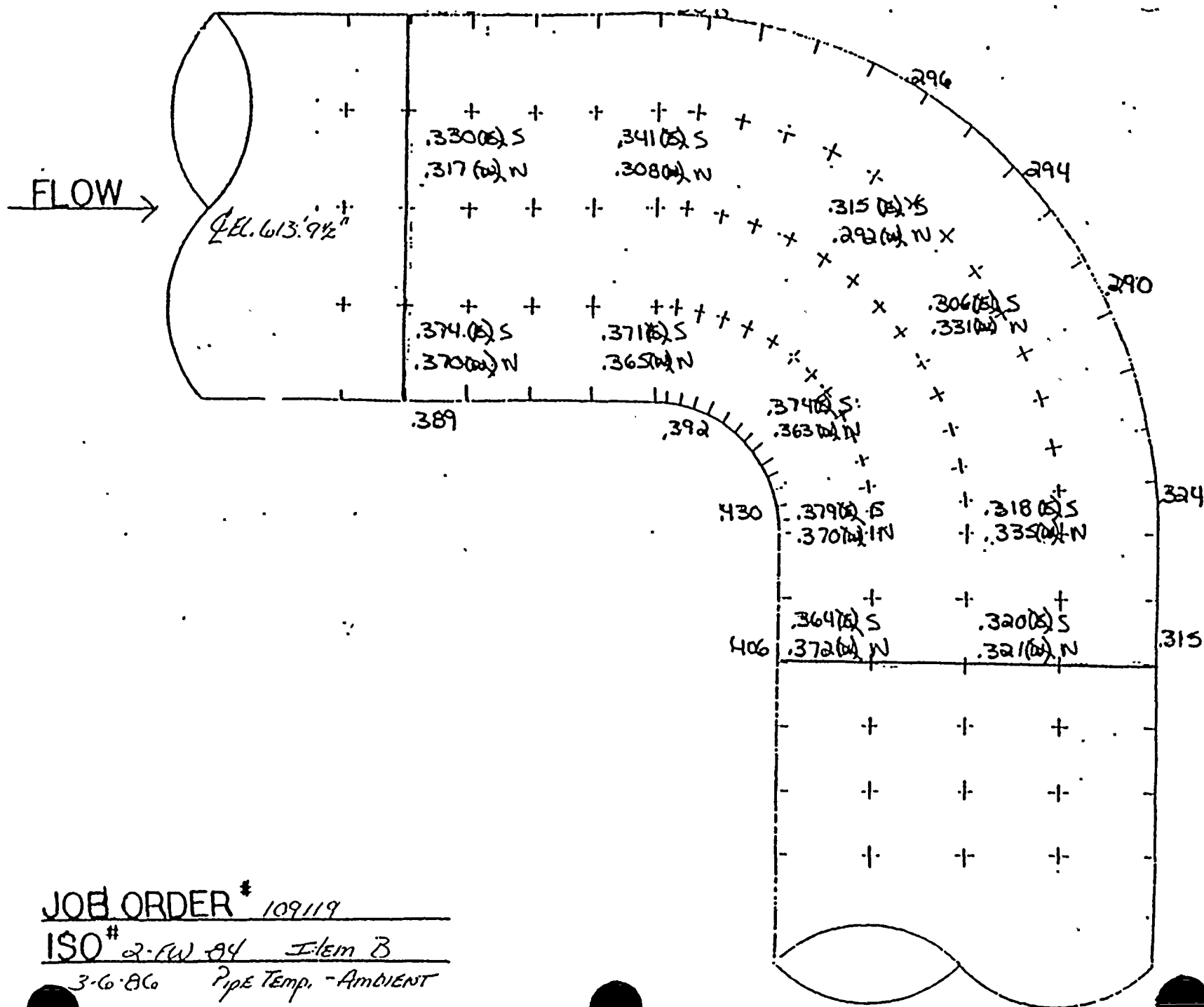


T.D.C.	A	B	C	D	E
0°	327	307	315	367	
45°					
90°	384	323	366	342	
135°					
180°	327	362	362	343	
225°					
270°	357	304	341	362	
315°					

ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

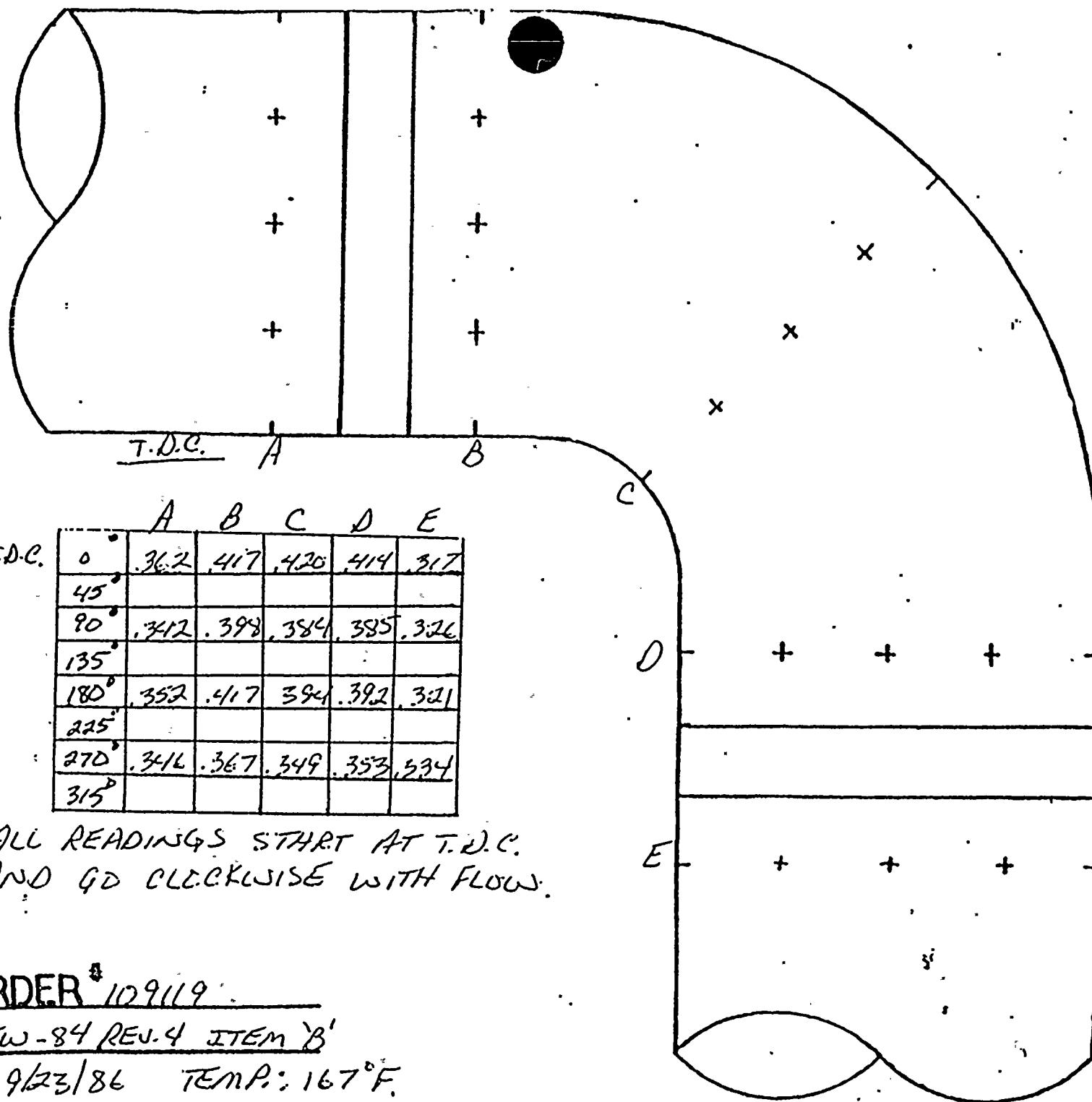
JOB ORDER # 129119  
ISO # 2-FW-84 REV-4 ITEM 'A'  
 DATE: 9/23/86 TEMP: 167°F  
 NEW SS φ







FLOW →



T.D.C.	A	B	C	D	E
0°	.362	.417	.420	.414	.317
45°					
90°	.342	.398	.384	.385	.326
135°					
180°	.352	.417	.394	.392	.321
225°					
270°	.346	.367	.349	.353	.334
315°					

ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

JOB ORDER # 109119

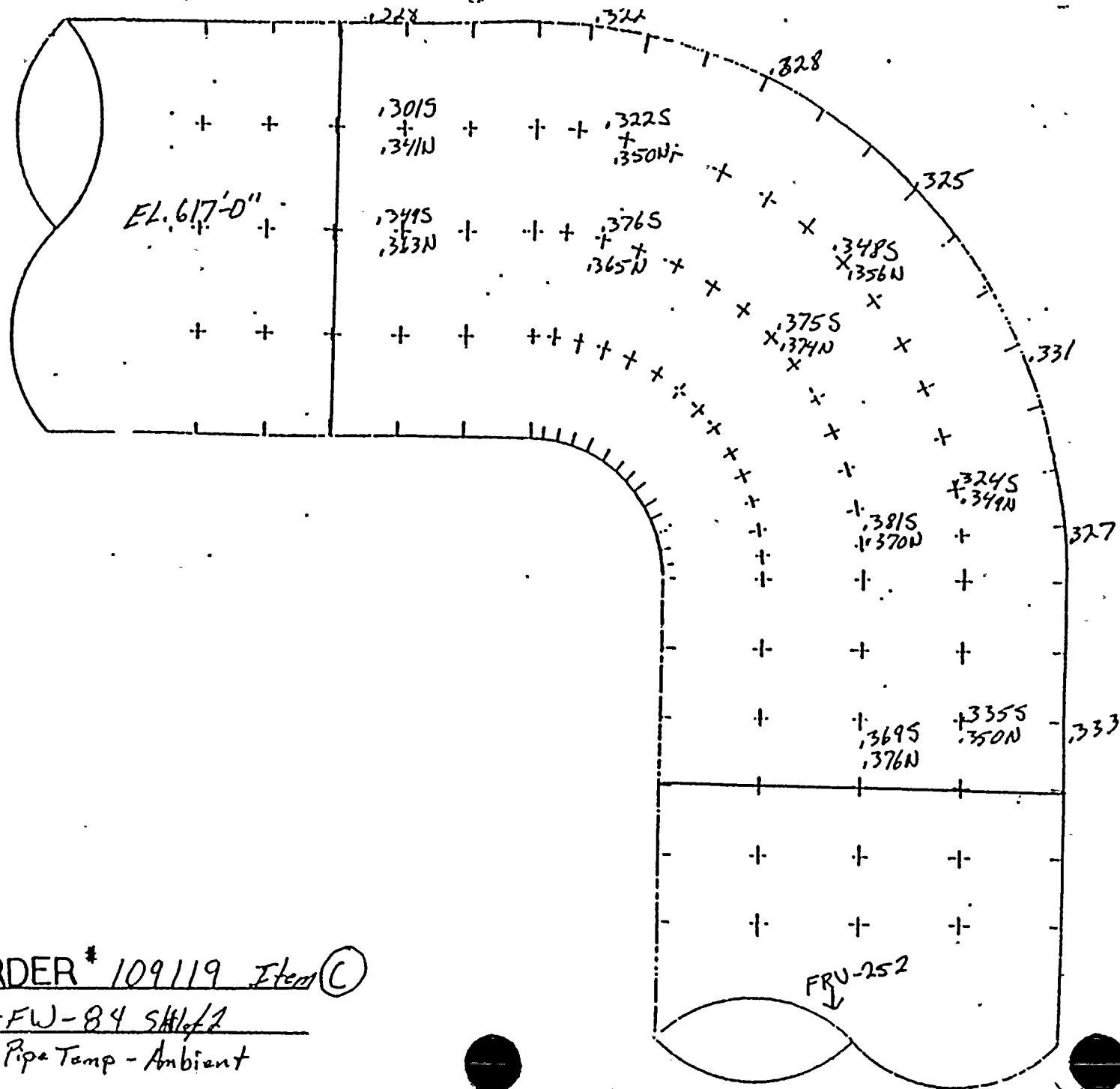
ISO # 2-FW-84 REV. 4 ITEM 'B'

DATE: 9/23/86 TEMP: 167°F

NEW SS PIPE



↓ FLOW

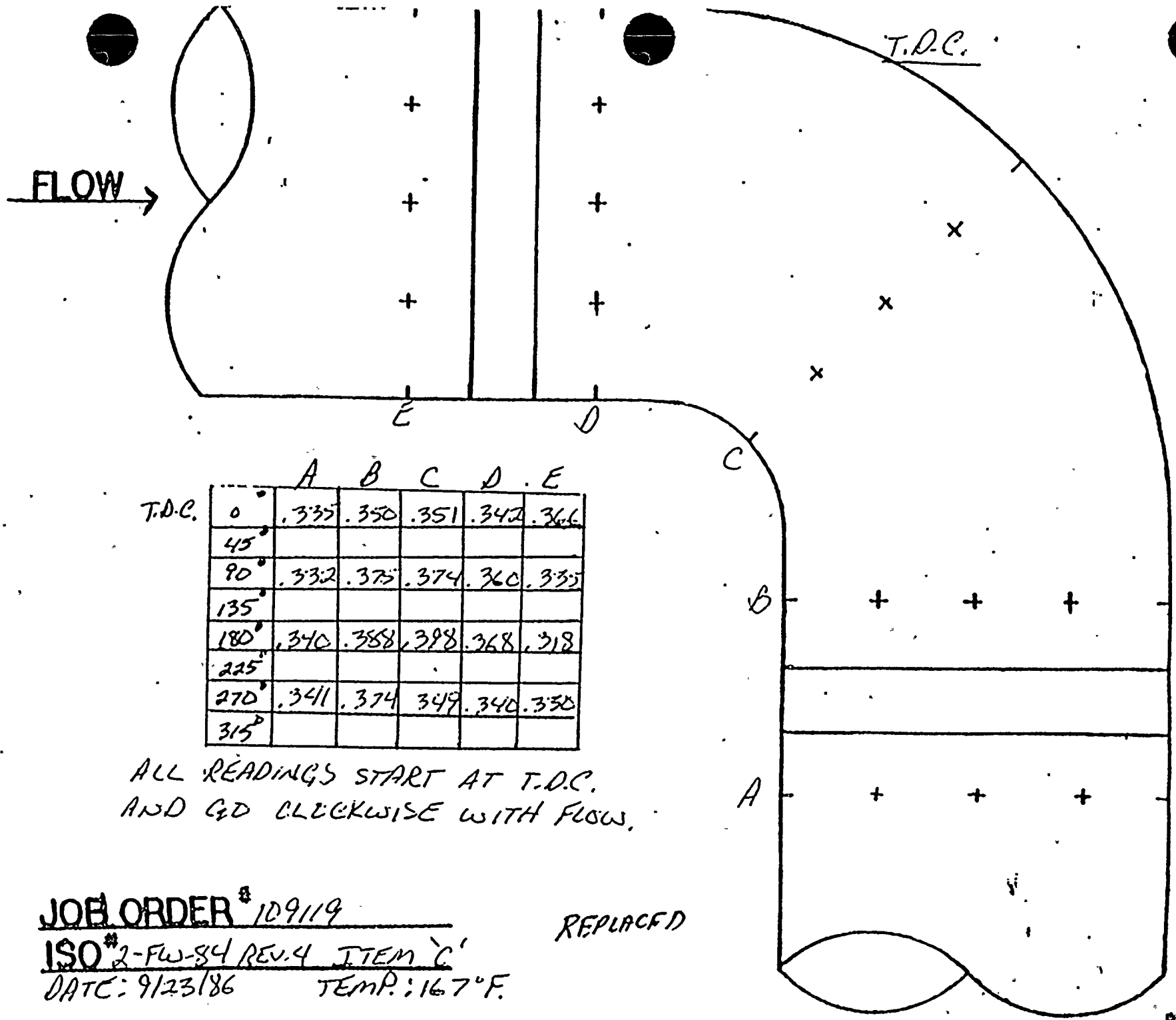


JOB ORDER # 109119 Item (C)

ISO # 2-FW-84 SH1/2

-7-86 Pipe Temp - Ambient





T.D.C.	A	B	C	D	E
0°	.335	.350	.351	.342	.366
45°					
90°	.332	.375	.374	.360	.335
135°					
180°	.340	.358	.398	.368	.318
225°					
270°	.341	.374	.349	.340	.350
315°					

ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

JOB ORDER # 109119

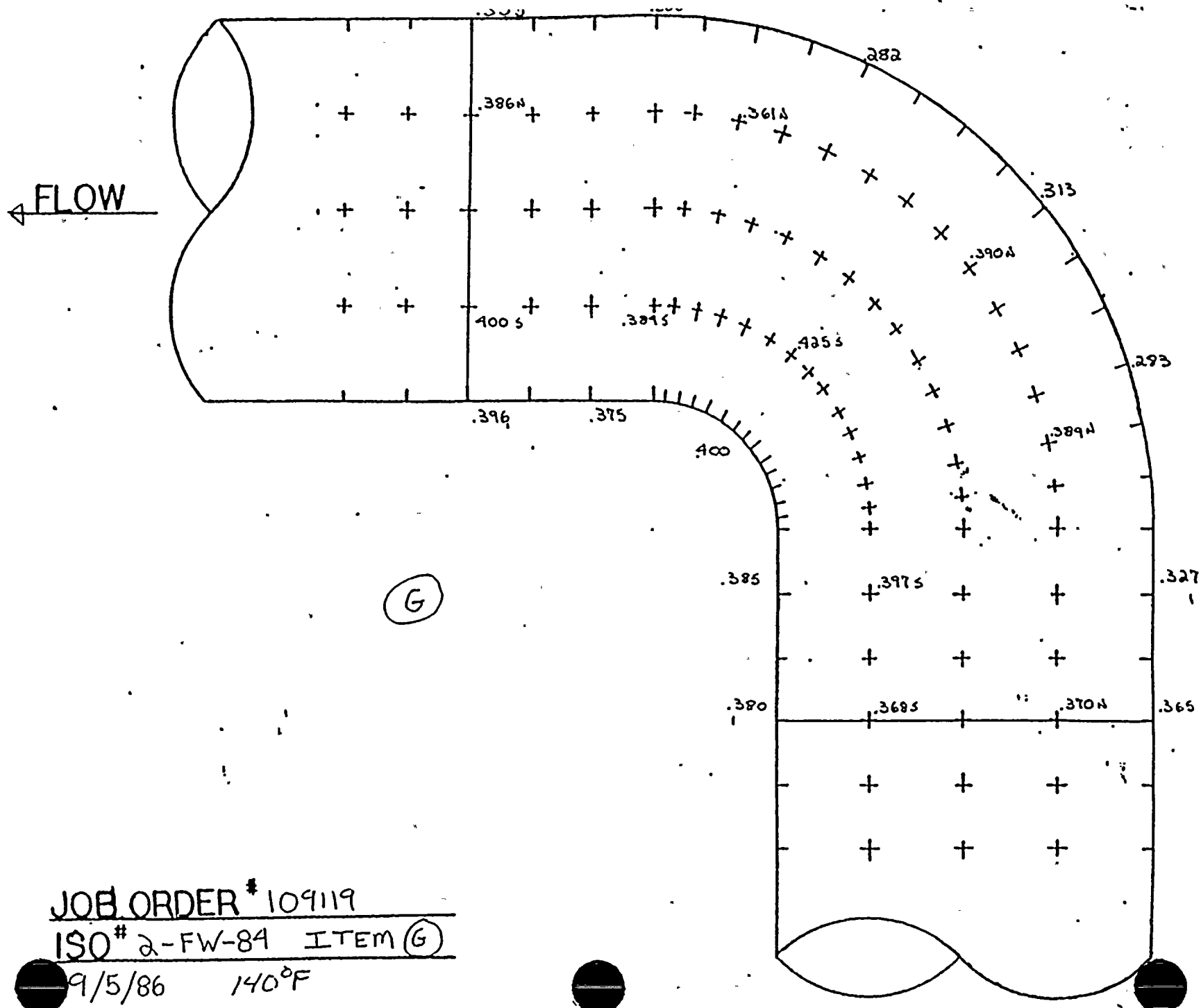
ISO #2-FW-84 REV. 4 ITEM 'C'

DATE: 9/23/86

TEMP: 167°F

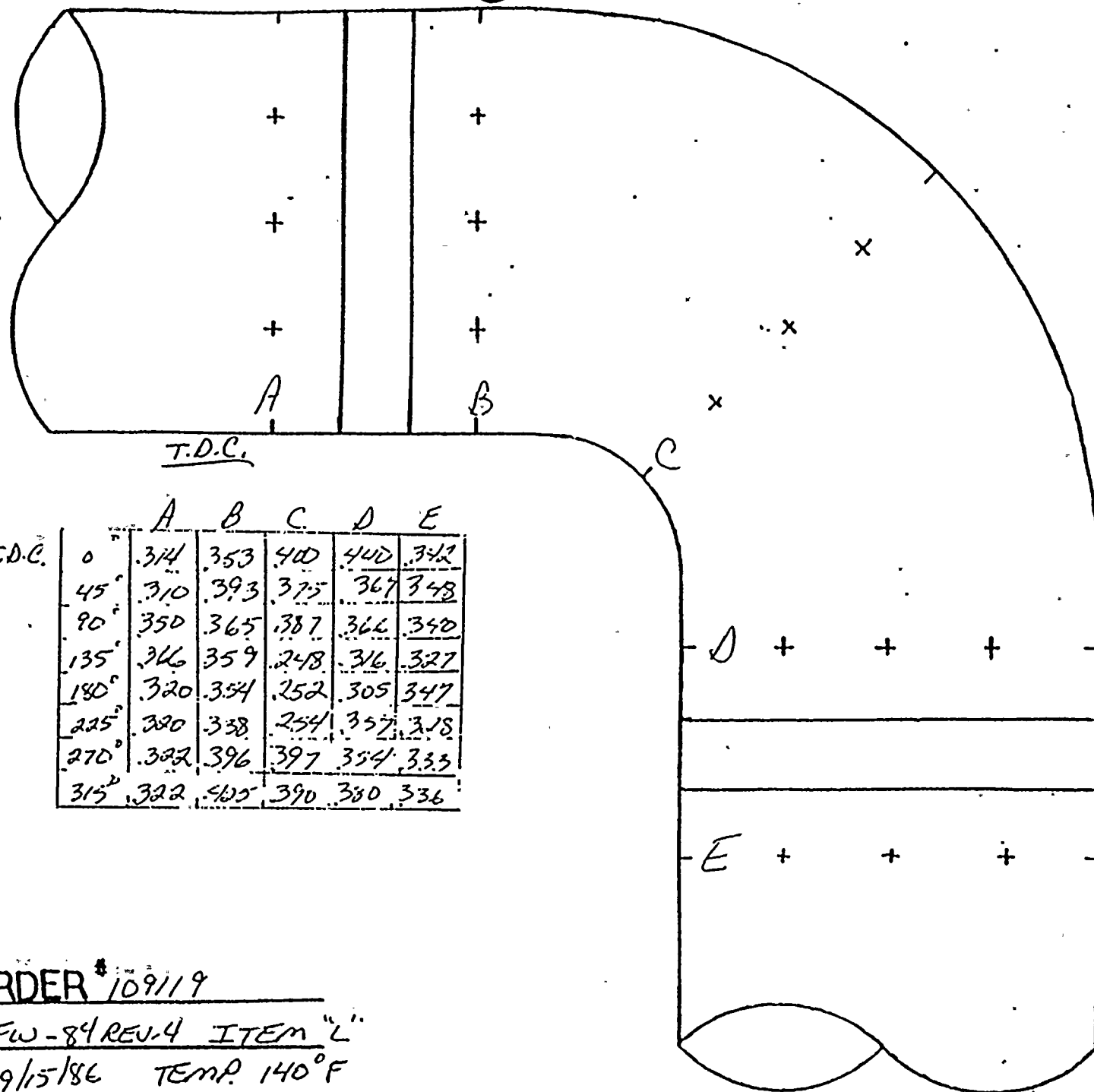
REPLACED







FLOW →



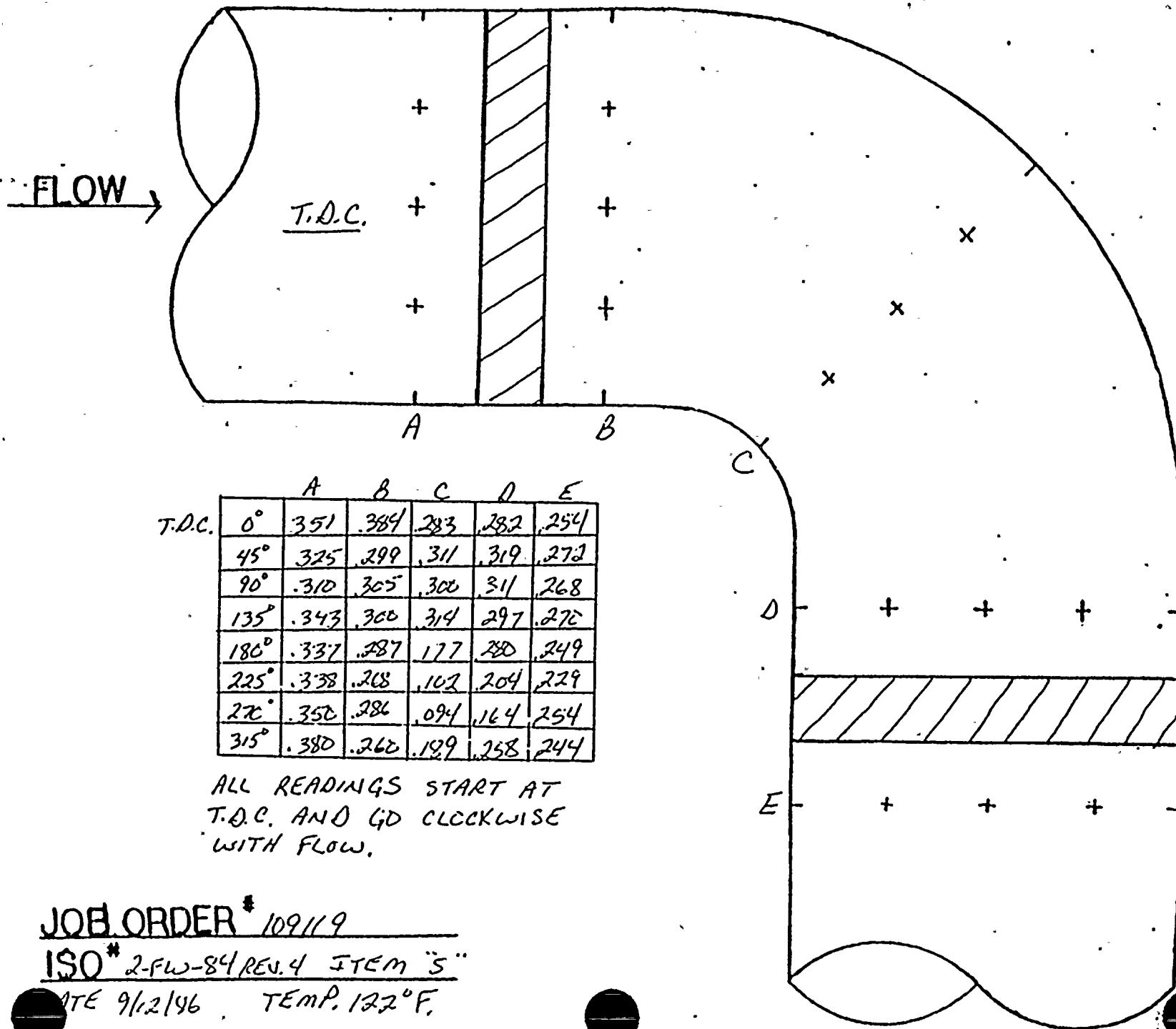
T.D.C.		A	B	C	D	E
0°		314	353	410	440	342
45°		310	393	375	367	348
90°		350	365	387	366	340
135°		346	359	248	316	327
180°		320	354	252	305	347
225°		320	338	254	357	318
270°		322	396	397	354	333
315°		322	405	390	380	336

JOB ORDER # 109119

ISO # 2-FW-84 REV. 4 ITEM "L"

DATE 9/15/86 TEMP 140°F







D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 2

Evaluation Date: JANUARY 19, 1987

SER No. 23-85 (Water) X

Years in service 9

UT Reading Transmitted on: 9-18-86

UT Reading Taken on: 3-7-86  
9-5-86  
9-11-86

Isometric Dwg. NO. 2-FW-85 REV. 2 Sh. 1 of 2

AEPS Installed Mat'l Class CS: A-106, GR. B SCH. 80

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
A	---	---	---	---	---	---	NO READINGS: SCHED. FOR REPLACEMENT
B	4" STRAIGHT	.337	.295-.379	.235	.342	0%	STILL WITHIN MANUFACTURERS TOLERANCE
B	4"-90° ELL	.337	.295-.379	.235	.316	0%	" " " "
B	4" STRAIGHT	.337	.295-.379	.235	.338	0%	" " " "
E	4" STRAIGHT	.337	.295-.379	.235	.328	0%	" " " "
E	4"-90° ELL	.337	.295-.379	.235	.326	0%	" " " "
E	4" STRAIGHT	.337	.295-.379	.235	.325	0%	" " " "
H	4"-90° ELL	.337	.295-.379	.235	.247	16.3%	STILL WITHIN TM REPLACE WITHIN 2 YRS

NOTE: REPLACED COMPONENTS A, B WITH STAINLESS STEEL E



REPLACED 99B WITH SS

INSPECT: A, B, E & H

0544286

ISO SHF. NO. 3478

[illegible]

REVISION RECORD			
NO.	DATE	BY	REMARKS
1	7/10/70	AG	ADDED APPROVAL STAMP PER AMP APPROV DWS 7-10-70-5
2	7/11/70	AG	ADDED APPROVAL FOR PKE OF TESTING PER AMP APPROV DWS 7-11-70-5
3	7/11/70	AG	PER EDM-MC-0585 ADDED 15-QUIET D.M.

2-FN-85  
SH 10F2

**DRAWING APPROVED FOR**

Expenditures, 1920

00666. 001311- LD. 1984

SLON DIAGRAM - 7/26 2:14

WILDERPROCEURE

INVEST & COMPANY, INC

INDIANA & MICHIGAN ELECTRIC CO  
DONALD C. COOK NUCLEAR PLANT

CD	W. E. J.	TURBINE BLDG
----	----------	--------------

100-256144-100

CONST/UC - WEEK 6

J.O.#3 109119 (QL)  
109122 (CONS)  
109123 (CONS)

[illegible]

FOUR/TONE No. 223  
REQUIRED COMPLETION DAY  
FABRICATED BY FLORCO

NPS DESIGNS INC.  
NEW YORK, N.Y.

**FABRICATOR NOTE:  
FABRICATION MUST**

1. THE STATE OF TEXAS



FLOW →

FRV-254

\* No Records taken. This Elbow has  
been patched and is scheduled for  
Replacement

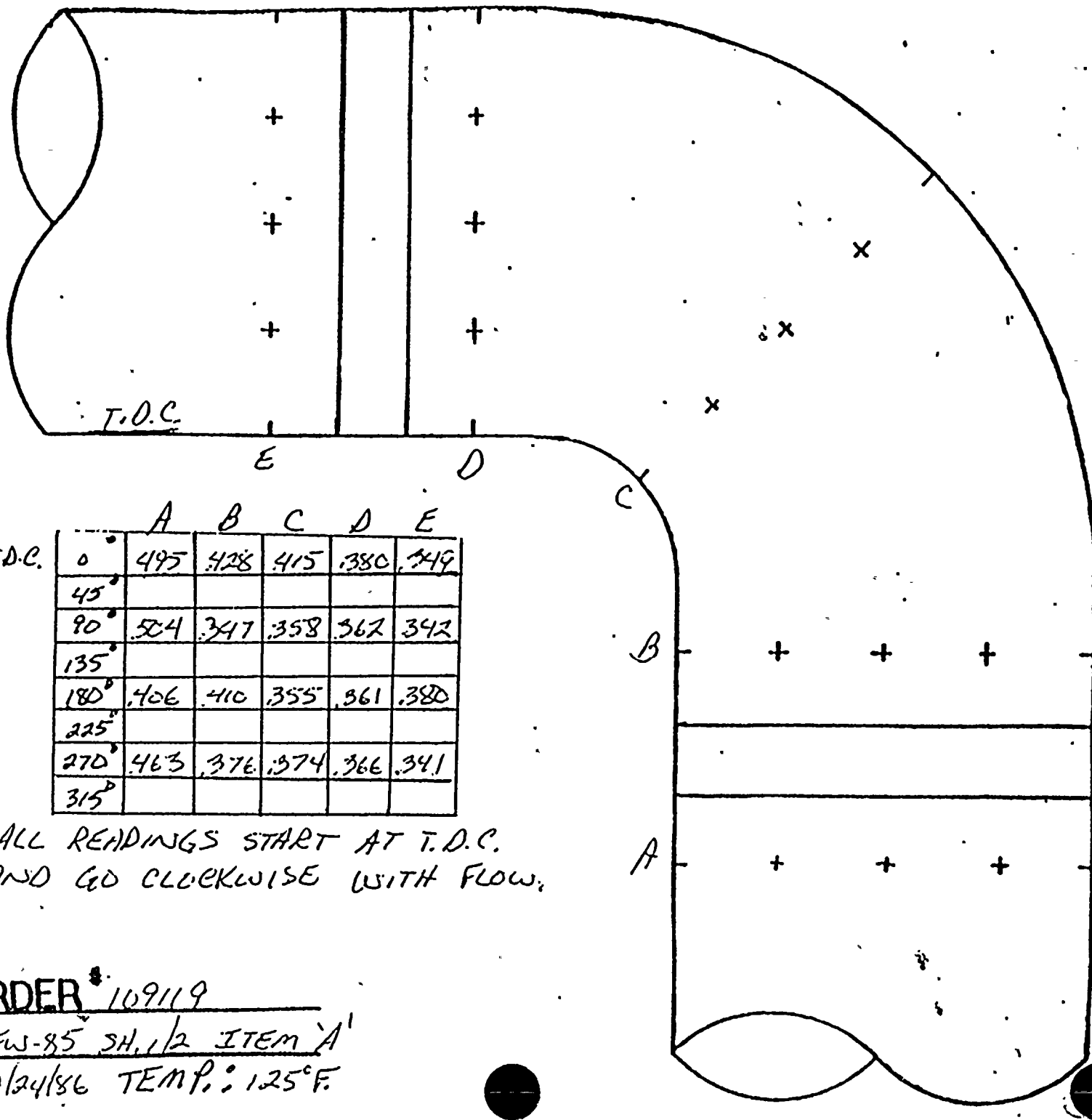
JOB ORDER # 109119

ISO# 2-FW-85 441 16Z Item (A)

3786



← FLOW



T.O.C.		A	B	C	D	E
0°		495	428	415	380	349
45°						
90°		504	347	358	362	342
135°						
180°		406	410	355	361	380
225°						
270°		463	376	374	366	341
315°						

ALL READINGS START AT T.O.C.  
AND GO CLOCKWISE WITH FLOW.

JOE ORDER # 109119

ISO # 2-FW-85 SH. 1/2 ITEM 'A'

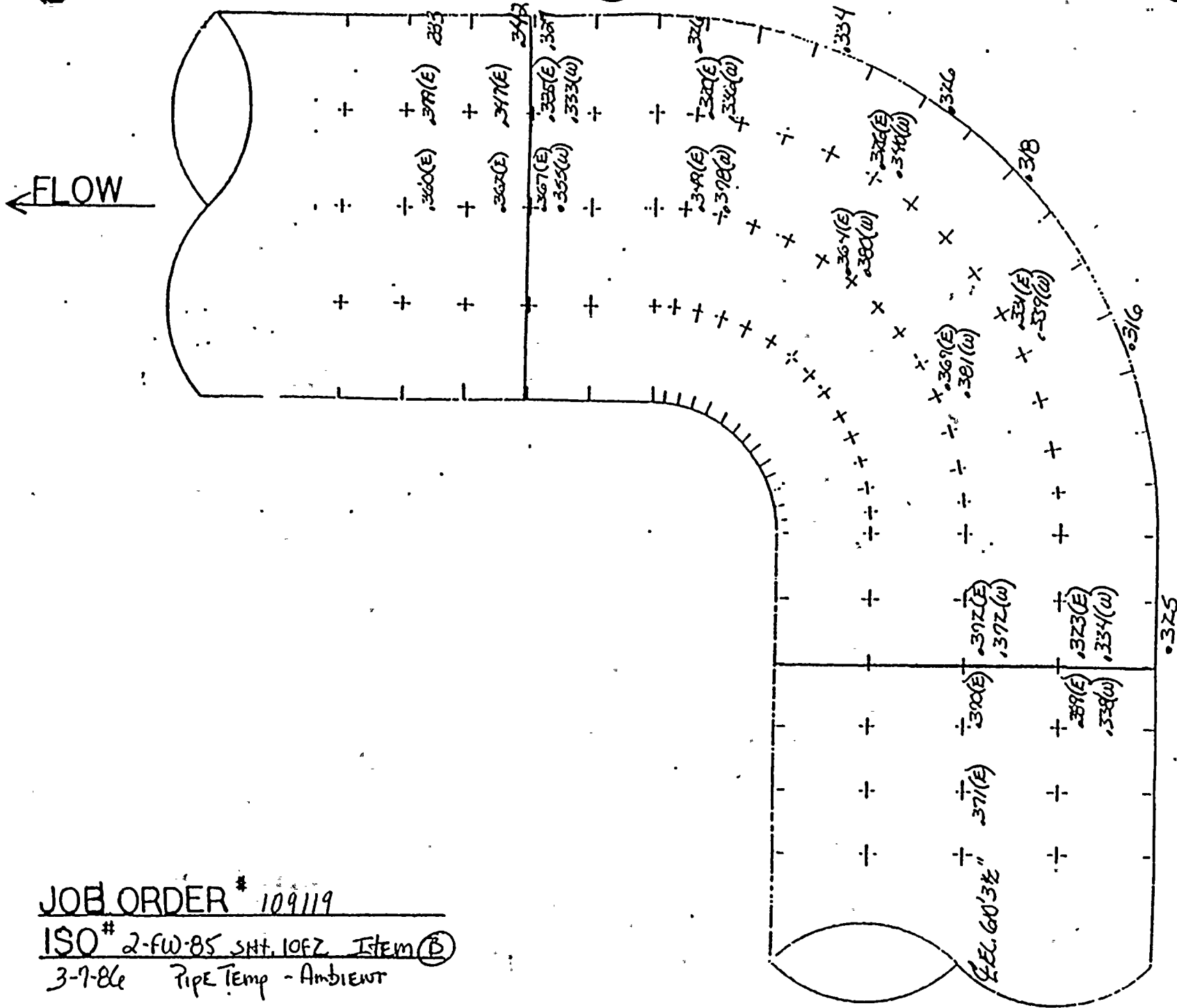
DATE: 9/24/86 TEMP.: 125°F



JOB ORDER # 109119

ISO # 2-FW-85 SH. 10FZ ITEM (B)

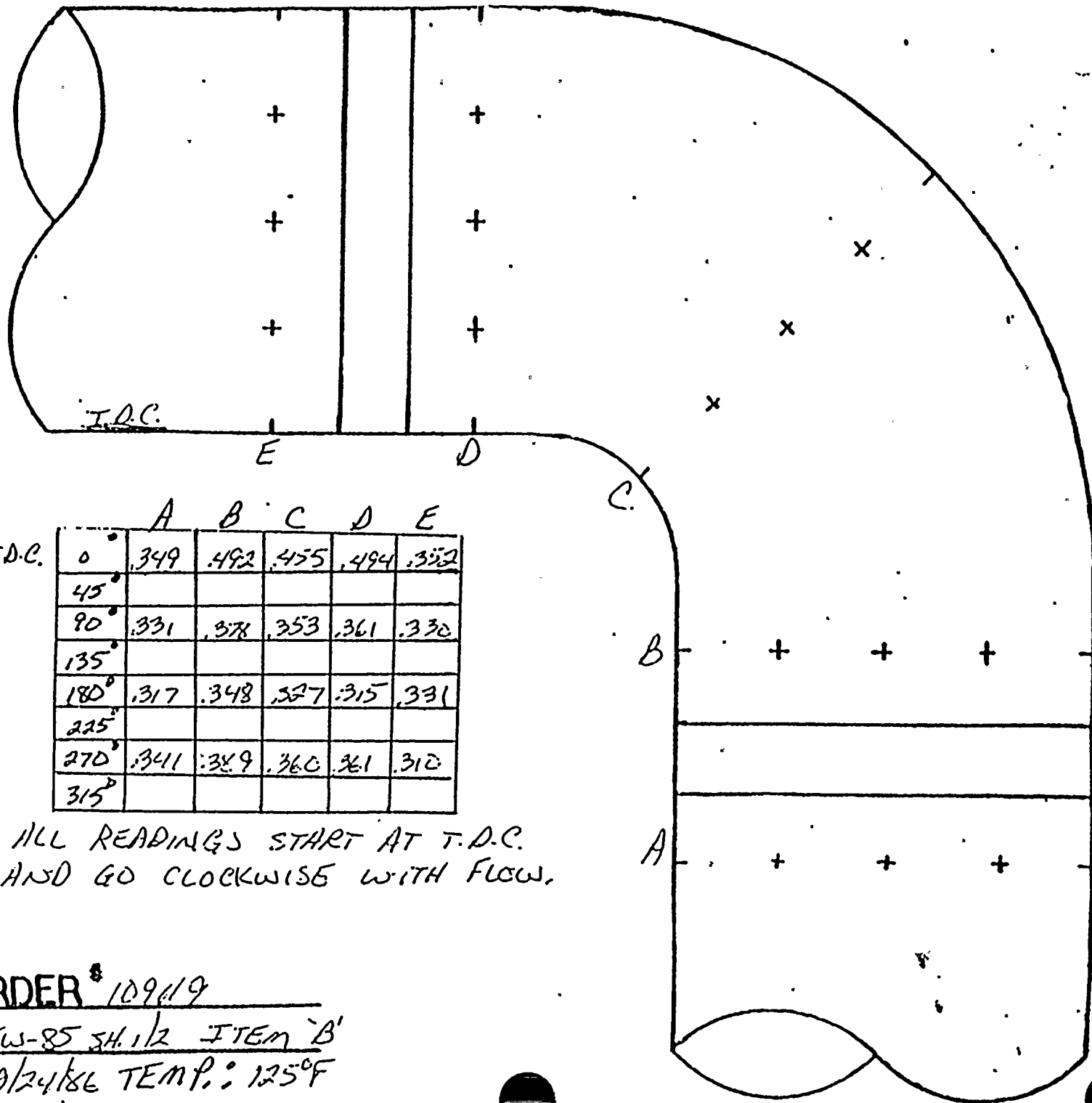
3-7-86 PIPE Temp - Ambient



NO OTHER READINGS TAKEN DUE TO SURFACE  
CONDITION OF THE PIPE.



← FLOW



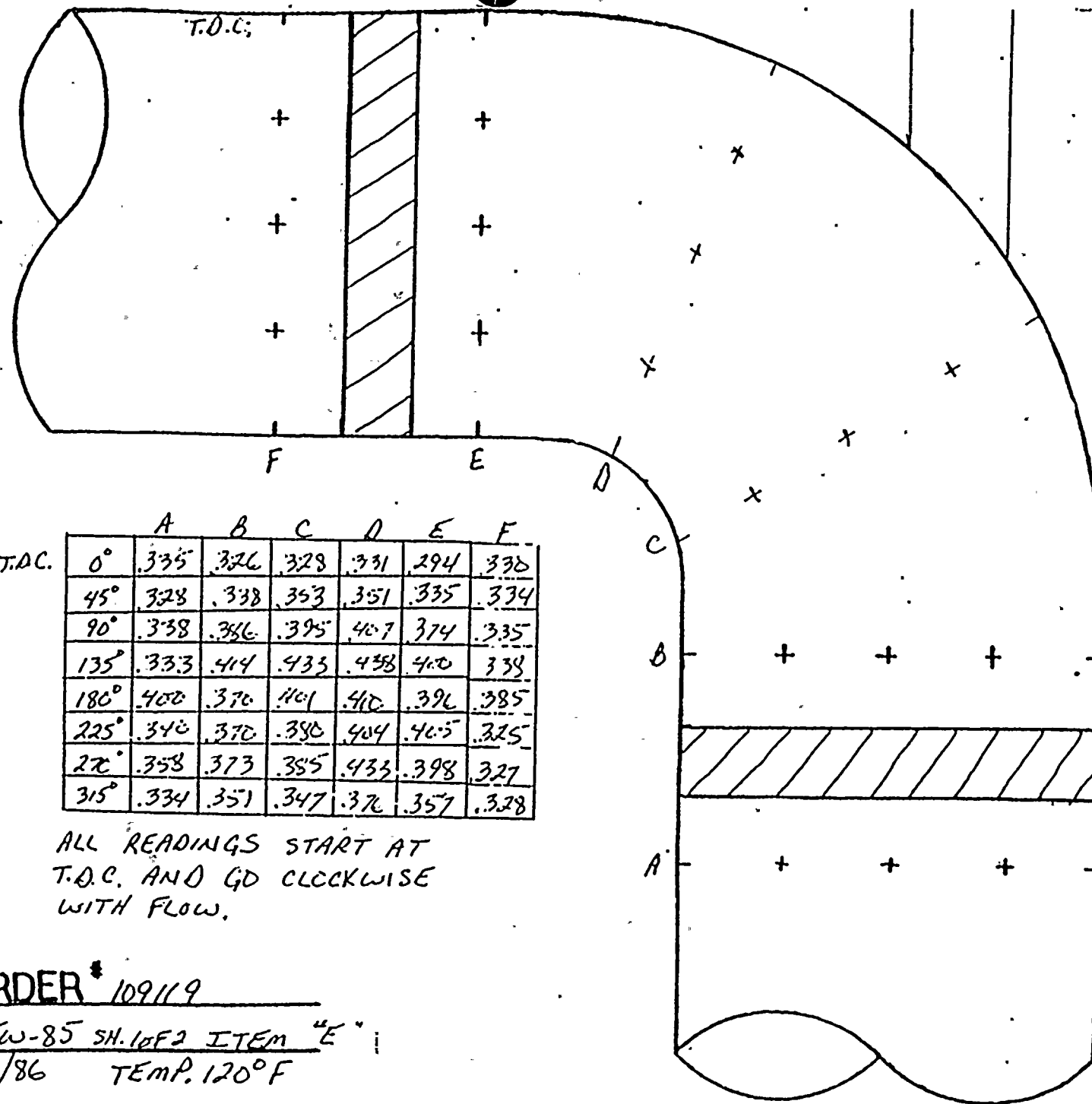
T.D.C.		A	B	C	D	E
0°		349	492	455	494	352
45°						
90°		331	378	353	361	330
135°						
180°		317	348	327	315	331
225°						
270°		341	389	360	361	310
315°						

ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

JOE ORDER # 109419  
ISO # 2-FW-85 SH. 1/2 ITEM 'B'  
DATE: 9/24/86 TEMP.: 125°F



← FLOW



T.D.C.		A	B	C	D	E	F
0°		335	326	328	331	294	338
45°		328	338	353	351	335	334
90°		338	336	395	407	374	335
135°		333	414	433	438	400	338
180°		400	370	401	410	396	385
225°		340	370	380	404	405	325
270°		358	373	385	433	398	327
315°		334	351	347	370	357	328

ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

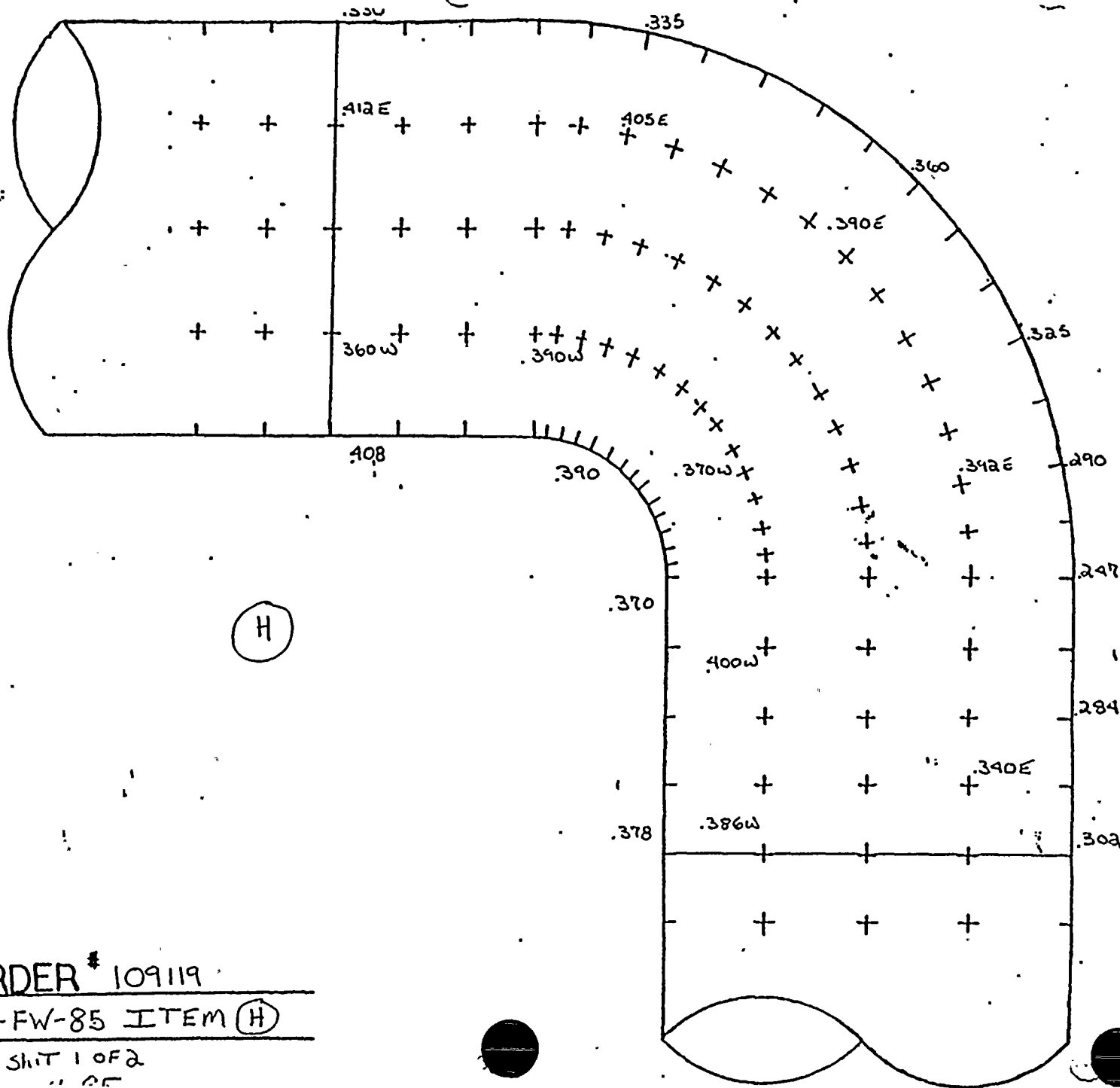
JOB ORDER # 109119

ISO # 2-FW-85 SH. 10F2 ITEM "E"

DATE 9/11/86 TEMP. 120°F



OW



JOB ORDER # 109119

# 2-FW-85 ITEM (H)

7/5/86 SHIT 1 OF 2



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: A.J. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 2

Evaluation Date: JANUARY 19, 1987

SER No. 23-85 (Water) X

Years in service 9

UT Reading Transmitted on: 9-18-86

UT Reading Taken on: 9-5-86  
9-10-86

Isometric Dwg. NO. 2FW-85, REV. 4 Sh. 2 of 2

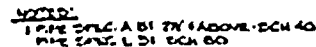
AEPS Installed Mat'l Class CS: A-106, GRB SCH. 40 80

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
C	4" 90° ELL	.337	.295-.379	.235	.150	49.2%	REPLACE
G	4" STRAIGHT	.337	.295-.379	.235	.299	0%	STILL WITHIN MANUFACTURERS TOLERANCE STILL WITHIN TM
G	4" 90° ELL	.337	.295-.379	.235	.215	3.4%	RE EXAMINE IN 10 YEARS
G	4" STRAIGHT	.337	.295-.379	.235	.283	4.1%	" " " "
I	4" STRAIGHT	.337	.295-.379	.235	.309	0%	STILL WITHIN MANUFACTURERS TOLERANCE
J	4" STRAIGHT	.337	.295-.379	.049	.304	0%	" " " "
J	4" 90° ELL	.337	.295-.379	.049	.086	70.8%	REPLACE NEXT OUTAGE
J	4" STRAIGHT	.337	.295-.379	.049	.239	18.9%	OK

NOTE: COMP. ID ~~BY~~ LETTER J IS SUPPOSE TO BE SCH. 40. HOWEVER,  
UT'S INDICATE SCH. 80.



109/221 NIT)  
109/221 2



REVISION RECORD			DESCRIPTION	REMARKS
1	1	1	ADDED APPROVAL STAMP PER ASP ARKGT DMC 7-2388-B	ADDED APPROVAL STAMP PER ASP ARKGT DMC 7-2388-B
2	2	2	ADDED APPROVAL STAMP PER ASP ARKGT DMC 7-2388-B	ADDED APPROVAL STAMP PER ASP ARKGT DMC 7-2388-B
3	3	3	ADDED APPROVAL FOR PRE OPER TESTING. PER ASP ARKGT DMC 7-2388-B	ADDED APPROVAL FOR PRE OPER TESTING. PER ASP ARKGT DMC 7-2388-B
4	4	4	PER ROM-KC-0386-ADDID (AS-BUILD) DMC	PER ROM-KC-0386-ADDID (AS-BUILD) DMC

INSPECT: IJT 05 MAR 81 ANT

66

2-FN-85  
SH 20F2

DRAWING APPROVED FOR	
CONSTRUCTION	PPE (OVER TESTING)
BY C.G.G. 2/1/73	BY L.B. 2/1/73
AMERICAN ELECTRIC	INDIANA & MICHIGAN ELECTRIC CO
DATE _____ CP _____	
FLOW DIAGRAM _____ WELD PROCEDURE _____ INSPECTION COMPANY _____ INDIANA & MICHIGAN ELECTRIC CO DONALD E. COE NUCLEAR PLANT	
DRAWN BY _____ CHECKED BY _____ DATE _____	TURNING BLEND 2.FW-65

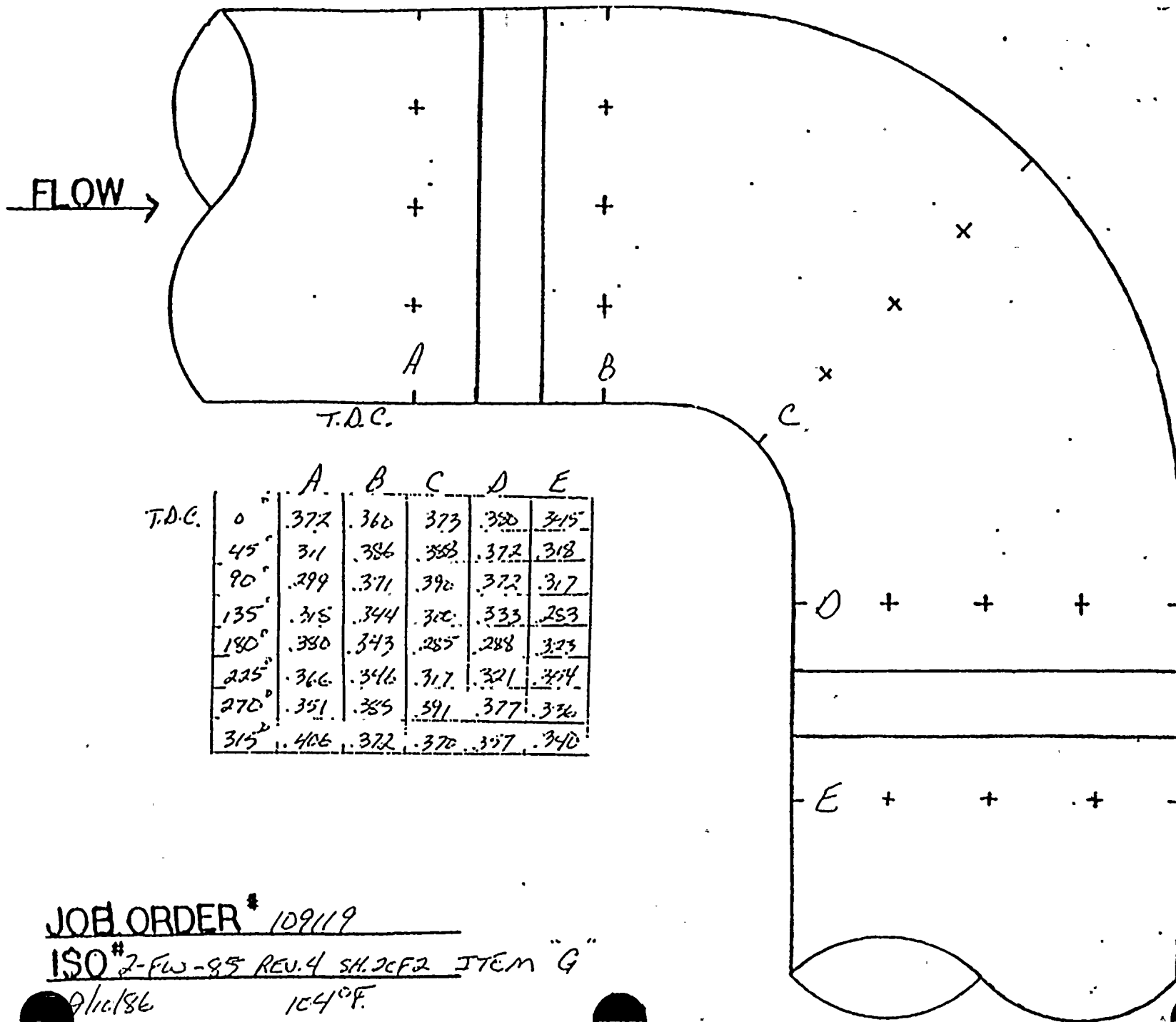
[illegible]



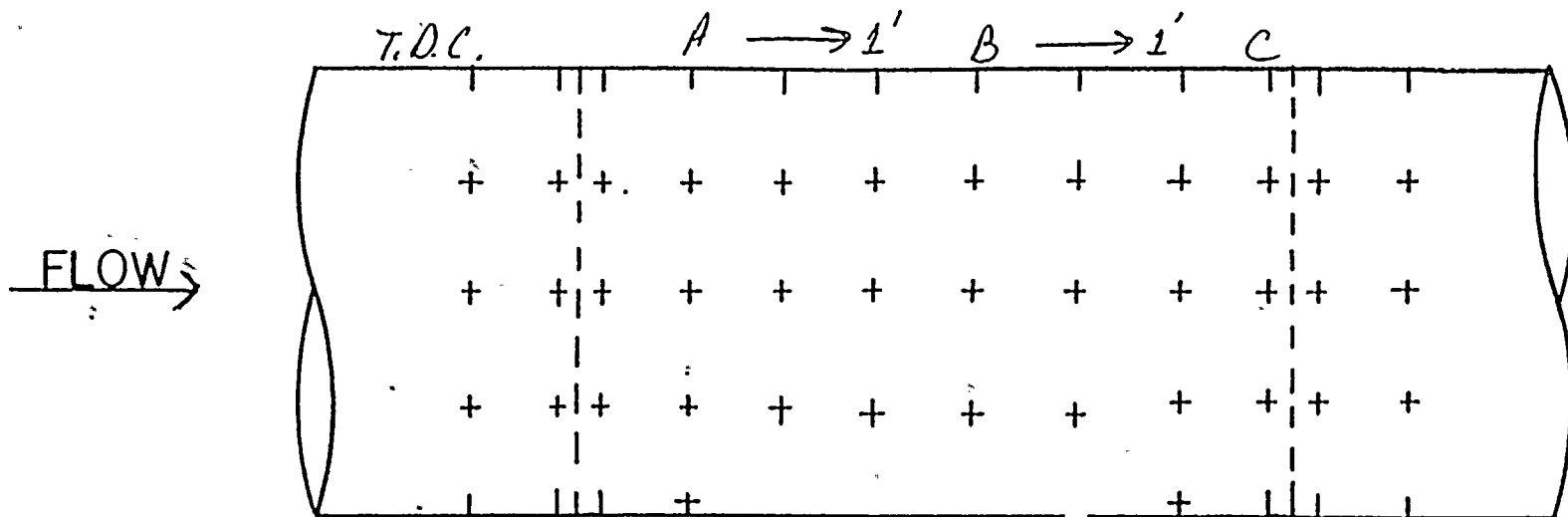
[illegible]

140°F









T.D.C.	A	B	C		
0°	344	343	344		
45°	343	348	335		
90°	341	329	320		
135°	340	332	312		
180°	317	315	313		
225°	315	317	330		
270°	309	327	329		
315°	339	331	358		

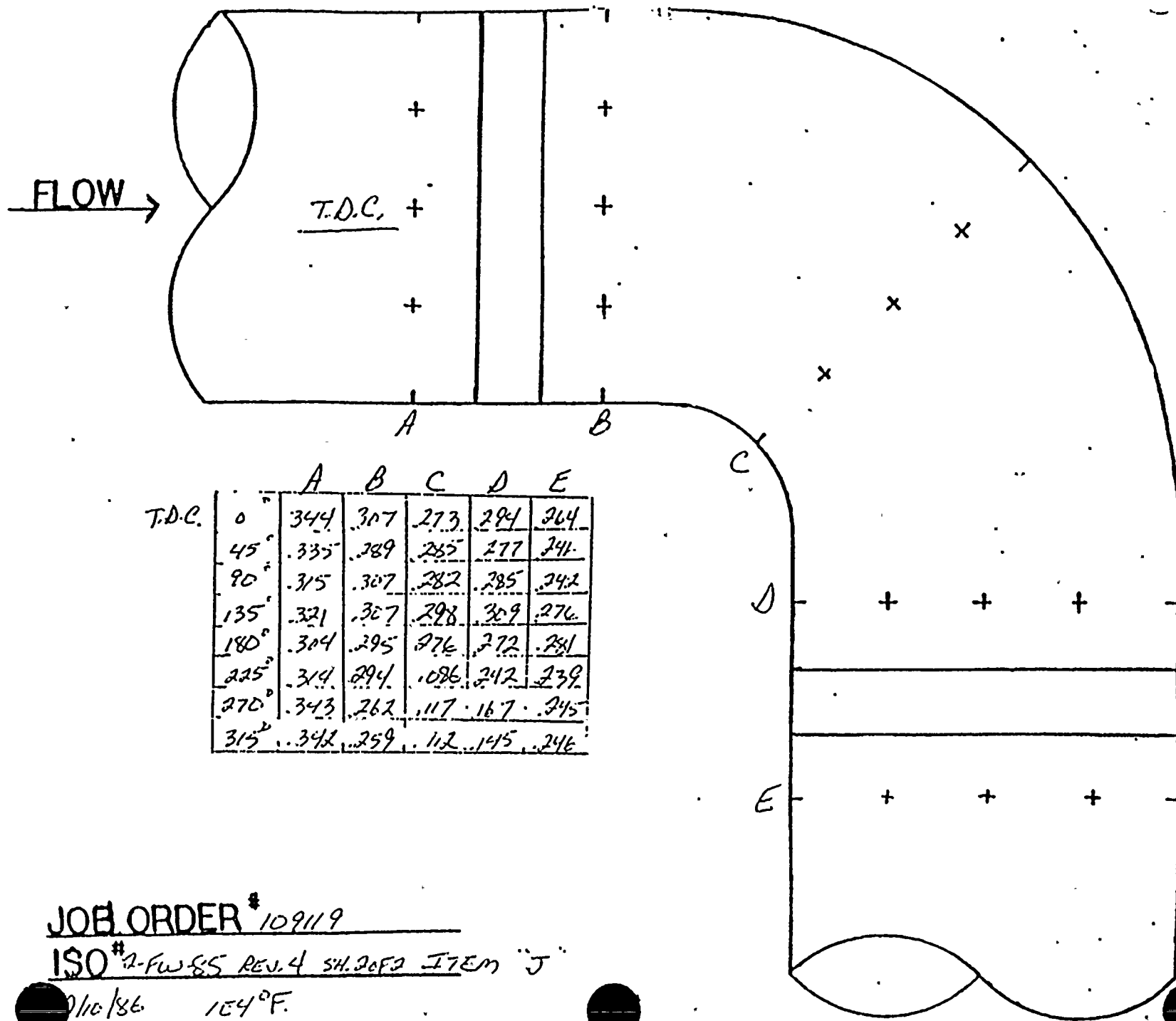
ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

JOB ORDER # 109119

ISO # 2-FLW-85 REV. 4 SH. 20F2 ITEM I

DATE 9/10/86 TEMP. 104°F





JOB ORDER # 109119

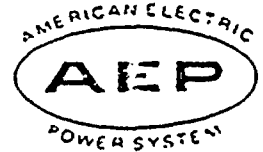
ISO # 2-FW 85 REV. 4 SH. 20F2 ITEM "J"

1/10/86

154°F.



## AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: JANUARY 13, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 2  
 Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. ~~J. A. Kobayashi~~ *AK* 1/12/87  
 2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on JANUARY 6, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
<u>2-FW-62</u>			
<u>REV. 6, Sh. 1 of 3</u>	<u>CS</u>	<u>B</u>	<u>ACCEPTABLE, NO FURTHER ACTION REQUIRED</u>
↓	<u>CS</u>	<u>D</u>	
↓	<u>CS</u>	<u>E</u>	
<u>2-FW-62</u>			
<u>REV. 3, Sh. 2 of 3</u>	<u>CS</u>	<u>D</u>	
↓	<u>CS</u>	<u>H<sup>1</sup></u>	
↓	<u>CS</u>	<u>H<sup>2</sup></u>	
↓	<u>CS</u>	<u>I</u>	
<u>2-FW-62</u>			
<u>REV. 2, Sh. 3 of 3</u>	<u>CS</u>	<u>C</u>	
↓	<u>CS</u>	<u>E</u>	
↓	<u>CS</u>	<u>G</u>	

A. J. Lewandowski  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 4.6.3.15.2.5.2

Sheet No. 1 of 2



Sheet No. 2 of 2

[illegible]



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

SER No. 88-84 (Steam)

Unit No. 2

SER No. 23-85 (Water) X

Years in service 9

UT Reading Taken on: 1-5-87

UT Reading Taken on: 12-30-86, 1-8-87  
1-5-87

AEPSC Installed Mat'l Class CARBON STEEL SCH. 80

AEPSI Installed Mat'l Class CARBON STEEL SCH. 80

(I.D.)

Comp.

Original  
Wall Thk.

Req'd  
Tmin

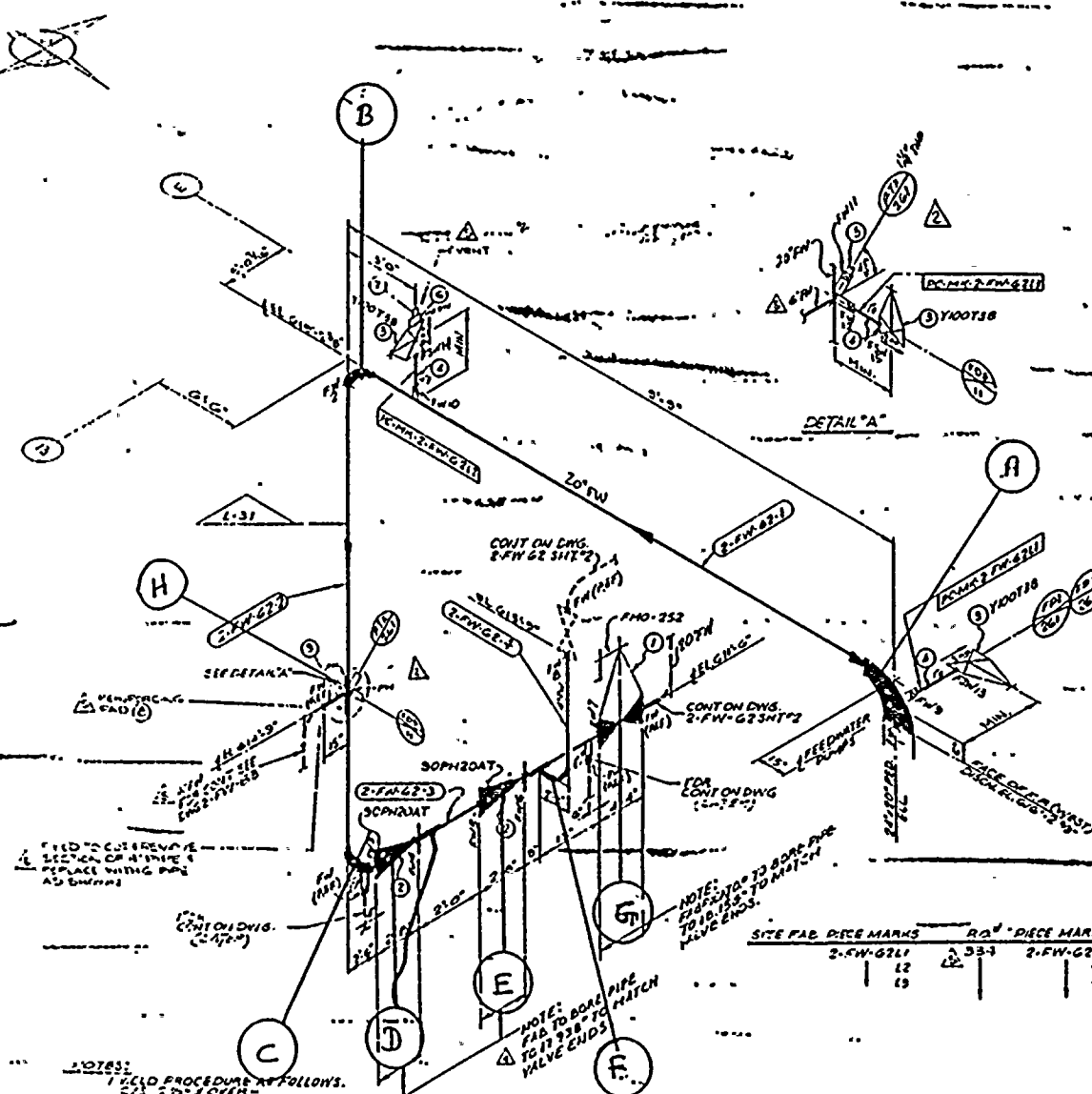
Percent Eroded

## COMMENTS

[illegible]



Q.C. J.O.# 015513  
CONST. J.O.# 015511  
" J.O.# 015512



MATERIAL DESCRIPTION		ISO SHE NO	QTY
1	100' E.N. WATER CANN GATT AL.	MS-552	
2	100' E.N. POLYESTER CANN WLS	MS-547	
3	100' E.N. GLOVE W.C.E.	MS-578	
4	100' E.N. (SHEED) W.C.E.	MS-578	
5	100' E.N. WELL NO. 0	MS-541	
6	100' E.N. 100' E.N. WELLS	MS-578	
7	100' E.N. 100' E.N. WELLS	MS-578	
8	100' E.N. 100' E.N. WELLS	MS-578	
9	100' E.N. 100' E.N. WELLS	MS-578	
10	100' E.N. 100' E.N. WELLS	MS-578	
11	100' E.N. 100' E.N. WELLS	MS-578	
12	100' E.N. 100' E.N. WELLS	MS-578	
13	100' E.N. 100' E.N. WELLS	MS-578	
14	100' E.N. 100' E.N. WELLS	MS-578	
15	100' E.N. 100' E.N. WELLS	MS-578	
16	100' E.N. 100' E.N. WELLS	MS-578	
17	100' E.N. 100' E.N. WELLS	MS-578	
18	100' E.N. 100' E.N. WELLS	MS-578	
19	100' E.N. 100' E.N. WELLS	MS-578	
20	100' E.N. 100' E.N. WELLS	MS-578	
21	100' E.N. 100' E.N. WELLS	MS-578	
22	100' E.N. 100' E.N. WELLS	MS-578	
23	100' E.N. 100' E.N. WELLS	MS-578	
24	100' E.N. 100' E.N. WELLS	MS-578	
25	100' E.N. 100' E.N. WELLS	MS-578	
26	100' E.N. 100' E.N. WELLS	MS-578	
27	100' E.N. 100' E.N. WELLS	MS-578	
28	100' E.N. 100' E.N. WELLS	MS-578	
29	100' E.N. 100' E.N. WELLS	MS-578	
30	100' E.N. 100' E.N. WELLS	MS-578	
31	100' E.N. 100' E.N. WELLS	MS-578	
32	100' E.N. 100' E.N. WELLS	MS-578	
33	100' E.N. 100' E.N. WELLS	MS-578	
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82	100' E.N. 100' E.N. WELLS	MS-578	
83	100' E.N. 100' E.N. WELLS	MS-578	
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85	100' E.N. 100' E.N. WELLS	MS-578	
86	100' E.N. 100' E.N. WELLS	MS-578	
87	100' E.N. 100' E.N. WELLS	MS-578	
88	100' E.N. 100' E.N. WELLS	MS-578	
89	100' E.N. 100' E.N. WELLS	MS-578	
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92	100' E.N. 100' E.N. WELLS	MS-578	
93	100' E.N. 100' E.N. WELLS	MS-578	
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95	100' E.N. 100' E.N. WELLS	MS-578	
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97	100' E.N. 100' E.N. WELLS	MS-578	
98	100' E.N. 100' E.N. WELLS	MS-578	
99	100' E.N. 100' E.N. WELLS	MS-578	
100	100' E.N. 100' E.N. WELLS	MS-578	

REVISION RECORD				
NO	DATE	BY	REVISION	REMARKS
1	7/24/64	NEL LLO	REVISED BY NPS DESIGNS: CORRECTED ISO CNT. NO. WAS 2045. (ACP ARRG DTG 2-5235 REV.0)	NO ACTION REQD
2	7/27/64	NEL	CHGO ORIENTATION OF FTA-201 PER A.B.R. REQUEST	-
3	7/27/64	DO	1050 APPROVAL STAND REV 1 DWA. 2-5225	4. H. 203 U.S.C.
4	7/27/64	JG	ADDED NOTE NOTE R/CN VALVES ACP ARRG DTG. 2-5235 REV 2	4. H. 203 U.S.C.
5	7/27/64	JG	CFN WAS AFW. ADD CORRECTION FWD TO GENRCH C47 FWD 52.2. ITEMS G TWD TO D.N. FIELD NOTE. PC 524 INOTE 2. PER ACP ARRG DTG. 2-5235 REV 3	4. H. 203 U.S.C.
6	7/27/64	DO	ADDED NOTE NOTE R/CN VALVES ACP ARRG DTG. 2-5235 REV 4	4. H. 203 U.S.C.

INSPECT! B, F, H, D

UNCONTROLLED  
DOCUMENT

10783:

FIELD PROCEDURE AS FOLLOWS.

1. 2-1-1 FORM -

2. 2-1-1 INDEX -

3. USE SPARE AIDS OF GRINNELL

4. NO 16A COMPLIED ON ALL

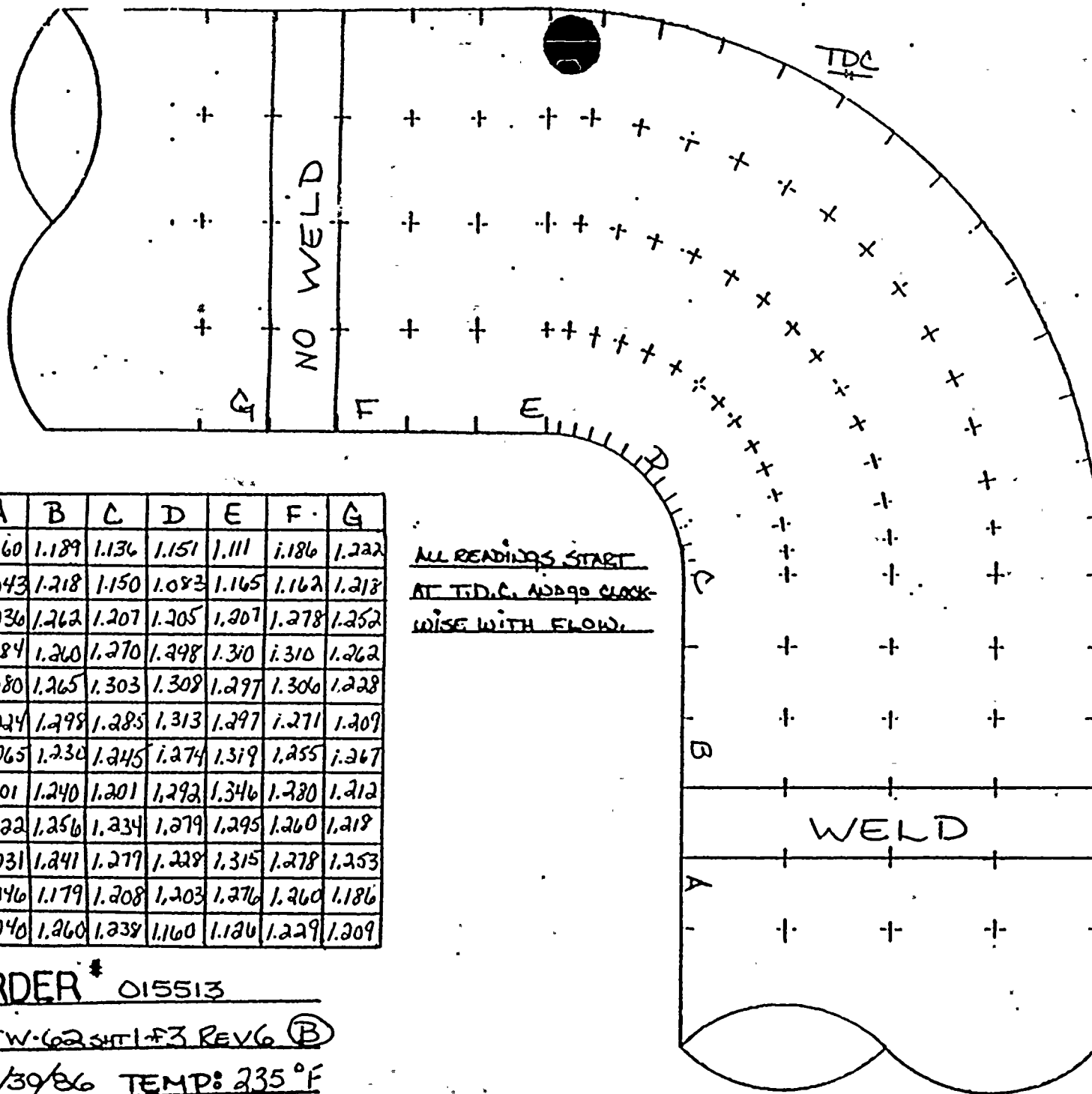
THIRTEEN CONDO.

[illegible]

FOUR/ZONE No. <u>272</u> REQUIRED COMPLETION DATE <u>12-80</u> FABRICATED BY <u>ECO</u>	FLOW DIAGRAM <u>SEE ECO</u> D.S. <u>ECO</u> WEIDPRODUCTION <u>SEE NOTE 1</u>
NPS DESIGNS INC. NEW YORK, N.Y.	10510 & 8 (CHARGE) AND DONAHUE & MCKINNON (ELECTRIC CO) DONAHUE & MCKINNON (ELECTRIC CO)
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.P. ARROT. DWGS.	Zone <u>254</u> Item # <u>7754 &amp; 2120</u> (11/10) 7411 Date <u>11/10</u> Job No. <u>2-5295</u>



← FLOW



D.C.

	A	B	C	D	E	F	G
0°	1.060	1.189	1.136	1.151	1.111	1.186	1.222
30°	1.043	1.218	1.150	1.083	1.165	1.162	1.218
60°	1.036	1.262	1.207	1.205	1.207	1.278	1.252
90°	1.084	1.260	1.270	1.298	1.310	1.310	1.262
120°	1.080	1.265	1.303	1.309	1.297	1.306	1.228
150°	1.024	1.298	1.285	1.313	1.297	1.271	1.209
180°	1.065	1.230	1.245	1.274	1.319	1.255	1.267
210°	1.001	1.240	1.201	1.292	1.346	1.230	1.212
240°	1.022	1.256	1.234	1.279	1.295	1.260	1.218
270°	1.031	1.241	1.277	1.228	1.315	1.278	1.253
300°	1.046	1.179	1.208	1.203	1.276	1.260	1.186
330°	1.040	1.260	1.238	1.160	1.126	1.229	1.209

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

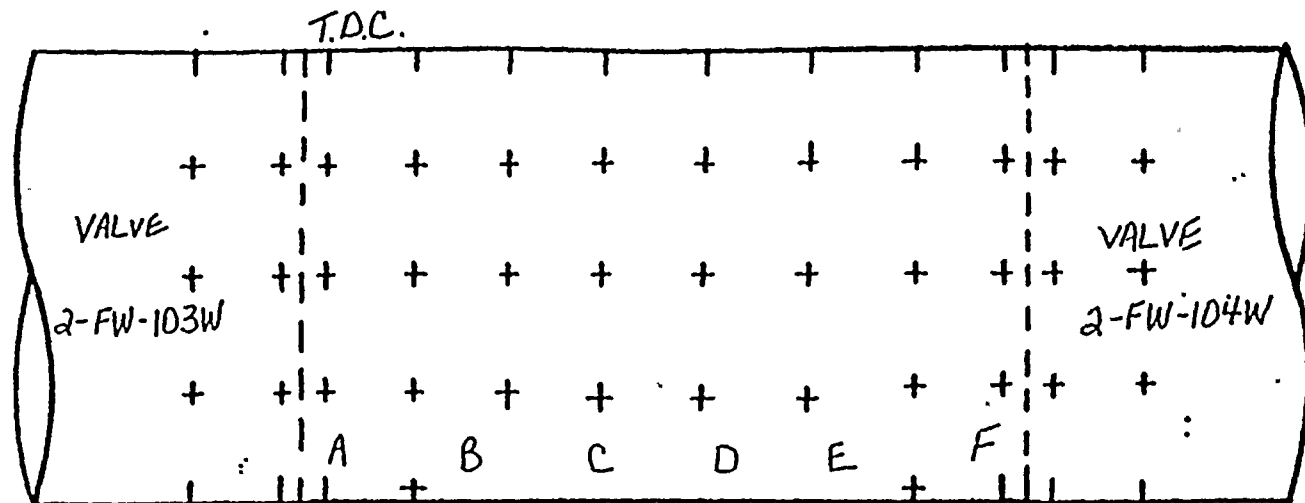
JOB ORDER # 015513

ISO# 2-FW-623HT-F3 REV6 (B)

DATE: 12/30/86 TEMP: 235°F



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

T.D.C.  
 T.D.C.

	A	B	C	D	E	F	G
0°	1.129	1.102	1.118	1.129	1.130	1.138	—
30°	1.100	1.104	1.134	1.112	1.138	1.127	—
60°	1.079	1.081	1.082	1.087	1.097	1.093	—
90°	1.108	1.103	1.098	1.108	1.107	1.104	—
120°	1.120	1.152	1.158	1.120	1.163	1.111	—
150°	1.089	1.141	1.160	1.114	1.123	1.121	—
180°	1.090	1.106	1.117	1.102	1.110	1.113	—
210°	1.119	1.113	1.128	1.127	1.148	1.124	—
240°	1.108	1.157	1.130	1.159	1.117	1.129	—
270°	1.104	1.100	1.093	1.108	1.094	1.128	—
300°	1.094	1.083	1.100	1.101	1.107	1.109	—
330°	1.166	1.119	1.134	1.124	1.128	1.131	—

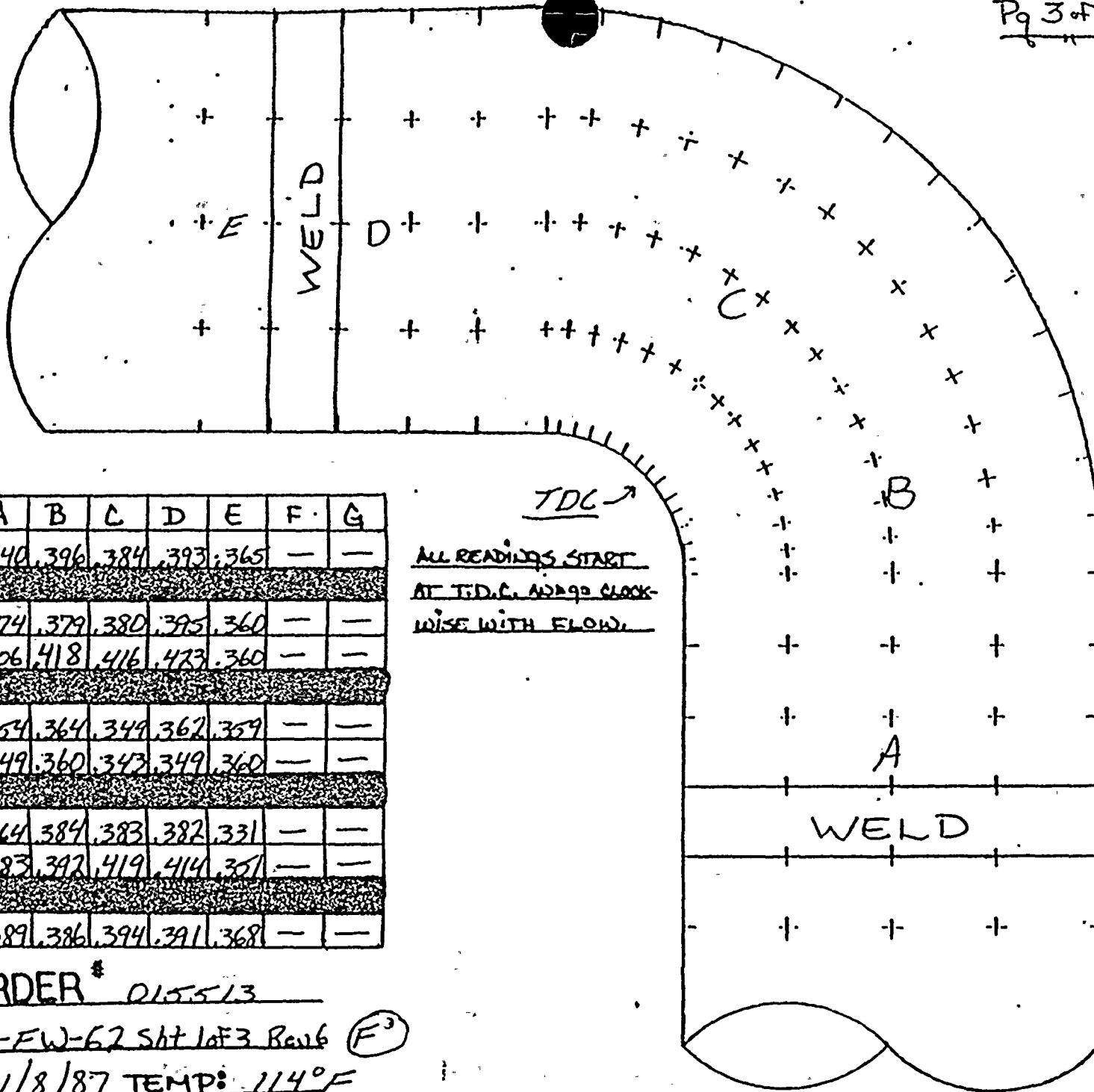
JOB ORDER # 015513

ISO # 2-FW-62 SHT 1 F3 REV 6 (D)

DATE 1/5/87 TEMP: 255°F



← FLOW



TDC

	A	B	C	D	E	F	G
0°	340	396	384	393	365	—	—
45°	374	379	380	395	360	—	—
90°	406	418	416	423	360	—	—
135°	354	364	349	362	359	—	—
180°	349	360	343	349	360	—	—
225°	364	384	383	382	331	—	—
270°	383	392	419	414	361	—	—
315°	389	386	394	391	368	—	—

TDC →

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

JOB ORDER # 015513

ISO # 2-FW-62 SHt 1 of 3 Rev 6 (F<sup>3</sup>)

DATE: 1/8/87 TEMP: 114°F



# EROSION EVALUAT. WORKSHEET

Unit No. 2

Years in service 9

UT Reading Taken on: 1-5-86,

AEPSI Installed Mat'l Class CARBON STEEL SCH. 80

Plant

(I.D.)

Component:

Original

Original

Req'd

Lowest

Percent

## COMMENTS

D 20" 90° ELL 1.031" .902-1.16 .756 1.004 .090 STILL WITHIN MANUFACTURERS TOLERANCE

I    20" 90° FLL    1.031"    .902 - .116    .756    1.002    0%    "    "    "    "

H'	20"180° ELL	1.031	.902-1.16	.756	.950	09%	"	"	"	"
----	-------------	-------	-----------	------	------	-----	---	---	---	---

H <sup>2</sup>	20" 180° E	1.031	0.02 = 1.11	756	0.24	0.9	//	//	//	/
----------------	------------	-------	-------------	-----	------	-----	----	----	----	---

T 850-11-758 1/2 11-11-5

1. RESUBMITTED NO CHANGE -----

\_\_\_\_\_

[illegible]

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12

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\_\_\_\_\_

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[illegible]

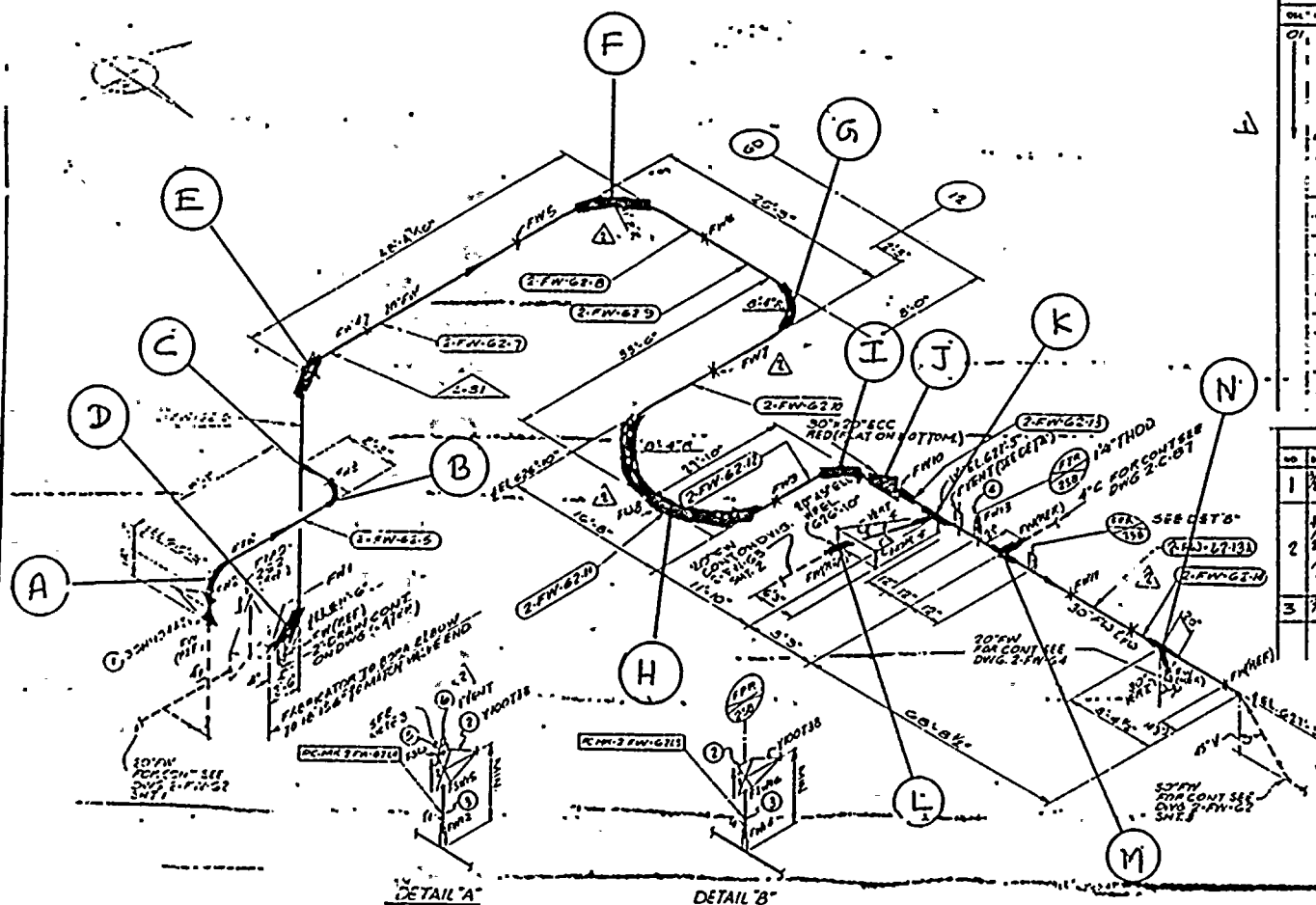
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[illegible][illegible]

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QC. J.O.# 05513  
CONST. J.O.# 015511  
" J.O.# 015512

[illegible]

REVISION RECORD			
NO.	DATE	BY	DESCRIPTION
1	2/11/76	LD	REVISED BEND RADIUS, AS NOTED (PER AEP REQUEST)
2	1/15/76	DO	ADDED: APPROXIMATE STAMP, ITEMS 516 TO 518, METAL, NOT 2 & 516 PC, 2.FW-2.13A. CORRECTED BEND RADIUS & RELOCATED TUS TO EPIPHYS. DIST. REV. 1 DW, 1.5.225
3	2/11/76	LD	REVISIONS, DESIGNS: ALL 21 APPROVED ALL REVISIONS STAMPS STAMP & A COPY DWG 3.52K 3

INSPECT: JH, D *at 11:27*

**UNCONTROLLED  
DOCUMENT**

1 FOR PIPE 2" SMALLER USE  
1 1/2" A 104 GR 8 5/16" CS SCH 40  
FOR 3" PIPE USE 3" OD 1 1/2" N  
1 1/2" GR 8 TO 1 1/2" WELD DON  
1 1/2" GR 8 5/16" CS  
2 WELD JOINTS AS FOLLOWS.  
CS 2 1/2" LINGER  
CS 2 1/2" COVER  
CS 2 1/2" HILL  
3 USE CURVE RT-5 A COMPOUND ON ALL  
THREADED CONNECTIONS.

FOUR ZONE No. 255 FLOW DIAGRAM 7-2-83  
REQUIRED COMPLETION DATE 05/83  
FABRICATED BY 72HFCO WELD PROCEDURE SEE 807E

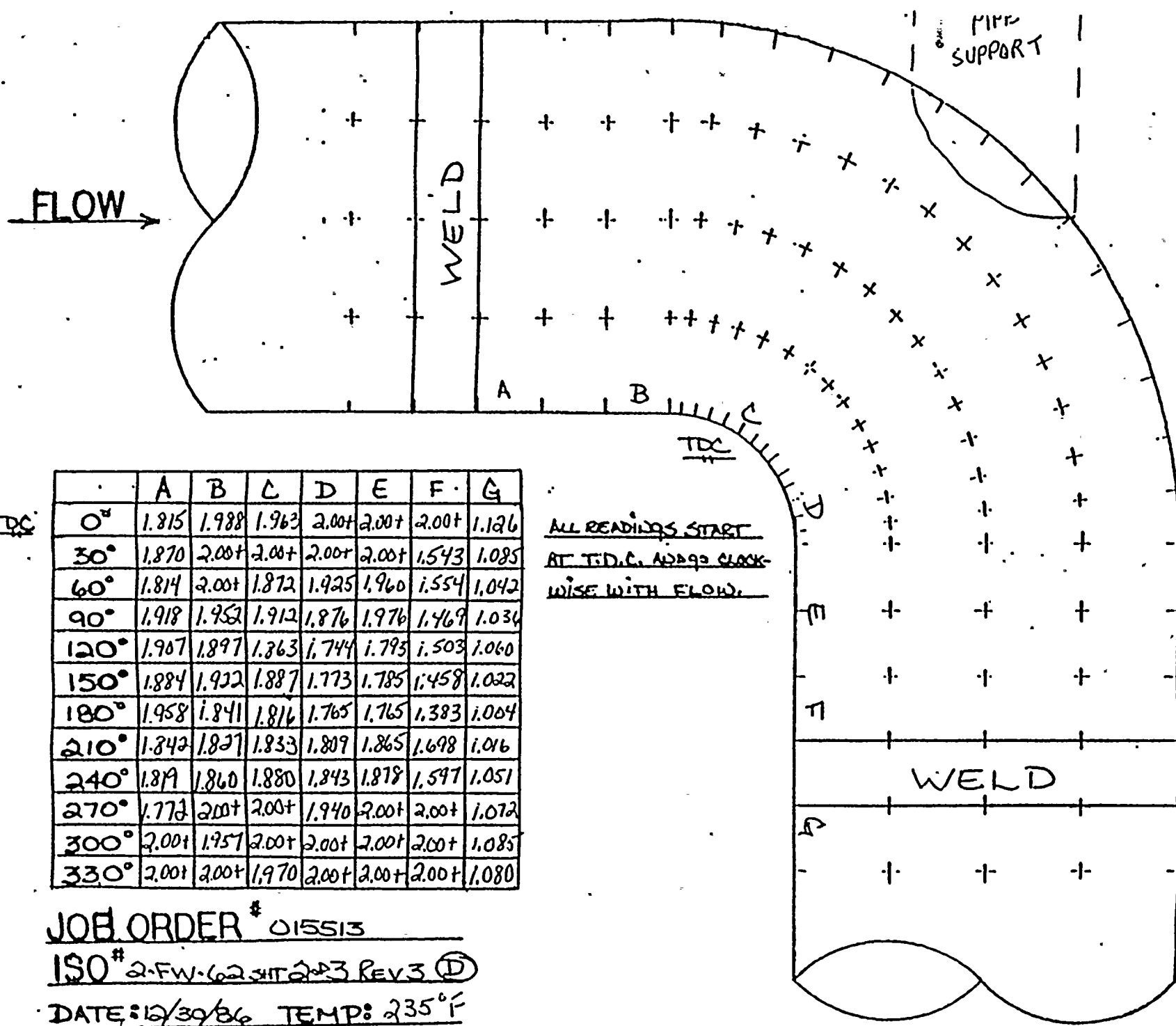
NPS DESIGNS INC.  
NEW YORK, N.Y.

INVEST & COMPANY, INC.  
RODRIGUE & MICHIGAN HIGHWAY, CO  
DOWNEY & COOR MARLBOROUGH, MA

FABRICATOR NOTE:  
FABRICATION MUST  
CONFORM TO LATEST  
A.E.P. ARRGT. DWGS.

DATE 12/1/83 FILE 117 THURS ELEC  
CWO 12/1/83 DWG NO. 1  
REVISED  
CWO 2-2295 2-FW-62





	A	B	C	D	E	F	G
0°	1.815	1.988	1.963	2.00+	2.00+	2.00+	1.126
30°	1.870	2.00+	2.00+	2.00+	2.00+	1.543	1.085
60°	1.814	2.00+	1.872	1.925	1.960	1.554	1.042
90°	1.918	1.952	1.912	1.876	1.976	1.469	1.036
120°	1.907	1.897	1.863	1.744	1.795	1.503	1.060
150°	1.884	1.922	1.887	1.773	1.785	1.458	1.022
180°	1.958	1.841	1.816	1.765	1.765	1.383	1.004
210°	1.842	1.827	1.833	1.809	1.865	1.698	1.016
240°	1.879	1.860	1.880	1.843	1.878	1.597	1.051
270°	1.772	2.00+	2.00+	1.940	2.00+	2.00+	1.072
300°	2.00+	1.957	2.00+	2.00+	2.00+	2.00+	1.085
330°	2.00+	2.00+	1.970	2.00+	2.00+	2.00+	1.080

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

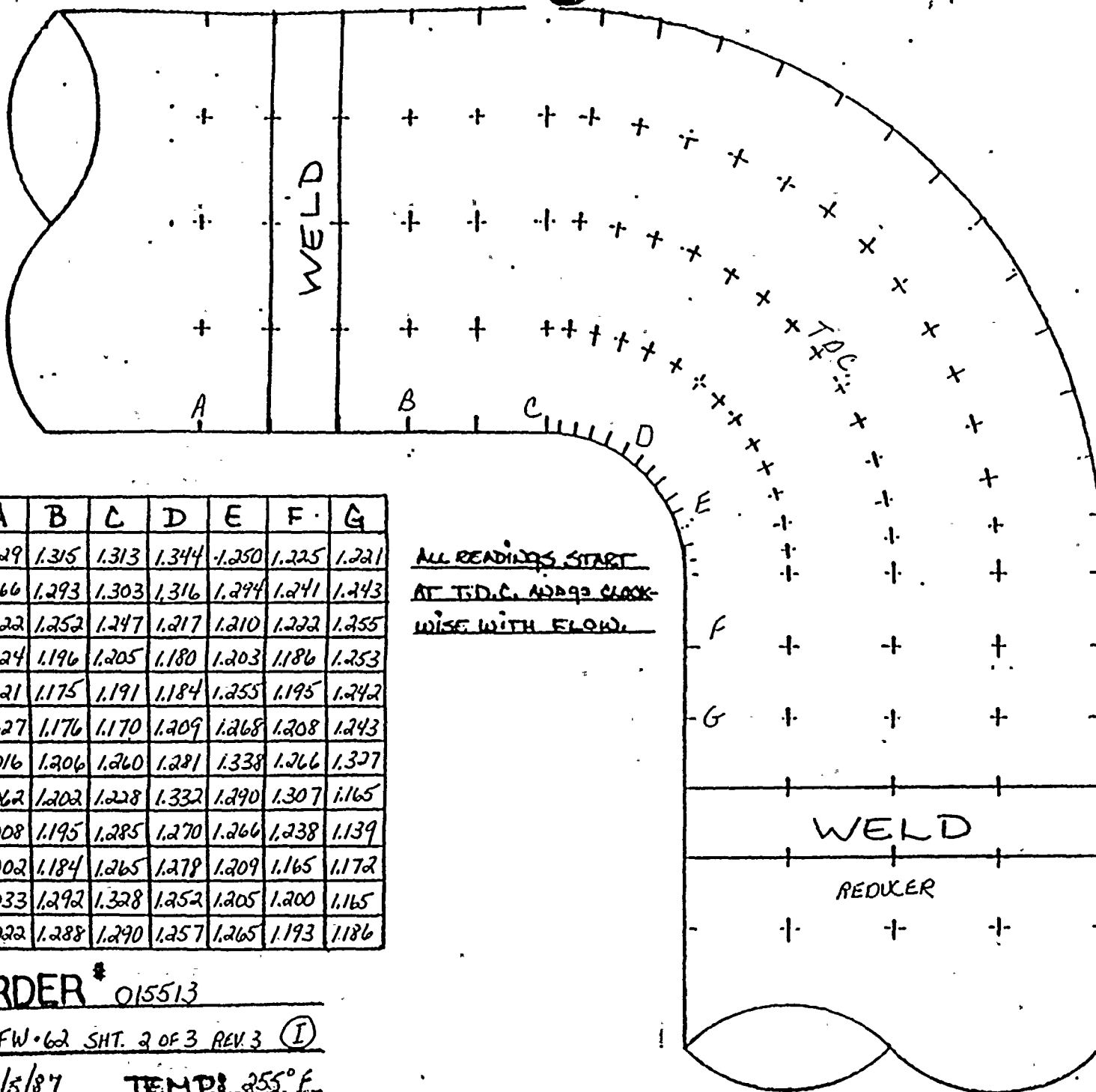
JOB ORDER # 015513

ISO# 2-FW-62-31T-2-3 REV 3 (D)

DATE: 12/30/86 TEMP: 235°F



FLOW →



	A	B	C	D	E	F	G
0°	1.029	1.315	1.313	1.344	1.250	1.225	1.221
30°	1.066	1.293	1.303	1.316	1.294	1.241	1.243
60°	1.022	1.252	1.247	1.217	1.210	1.222	1.255
90°	1.024	1.196	1.205	1.180	1.203	1.186	1.253
120°	1.021	1.175	1.191	1.184	1.255	1.195	1.242
150°	1.027	1.176	1.170	1.209	1.268	1.208	1.243
180°	1.016	1.206	1.260	1.281	1.338	1.266	1.327
210°	1.062	1.202	1.228	1.332	1.290	1.307	1.165
240°	1.008	1.195	1.285	1.270	1.266	1.238	1.139
270°	1.002	1.184	1.265	1.279	1.209	1.165	1.172
300°	1.033	1.292	1.328	1.252	1.205	1.200	1.165
330°	1.022	1.288	1.290	1.257	1.265	1.193	1.186

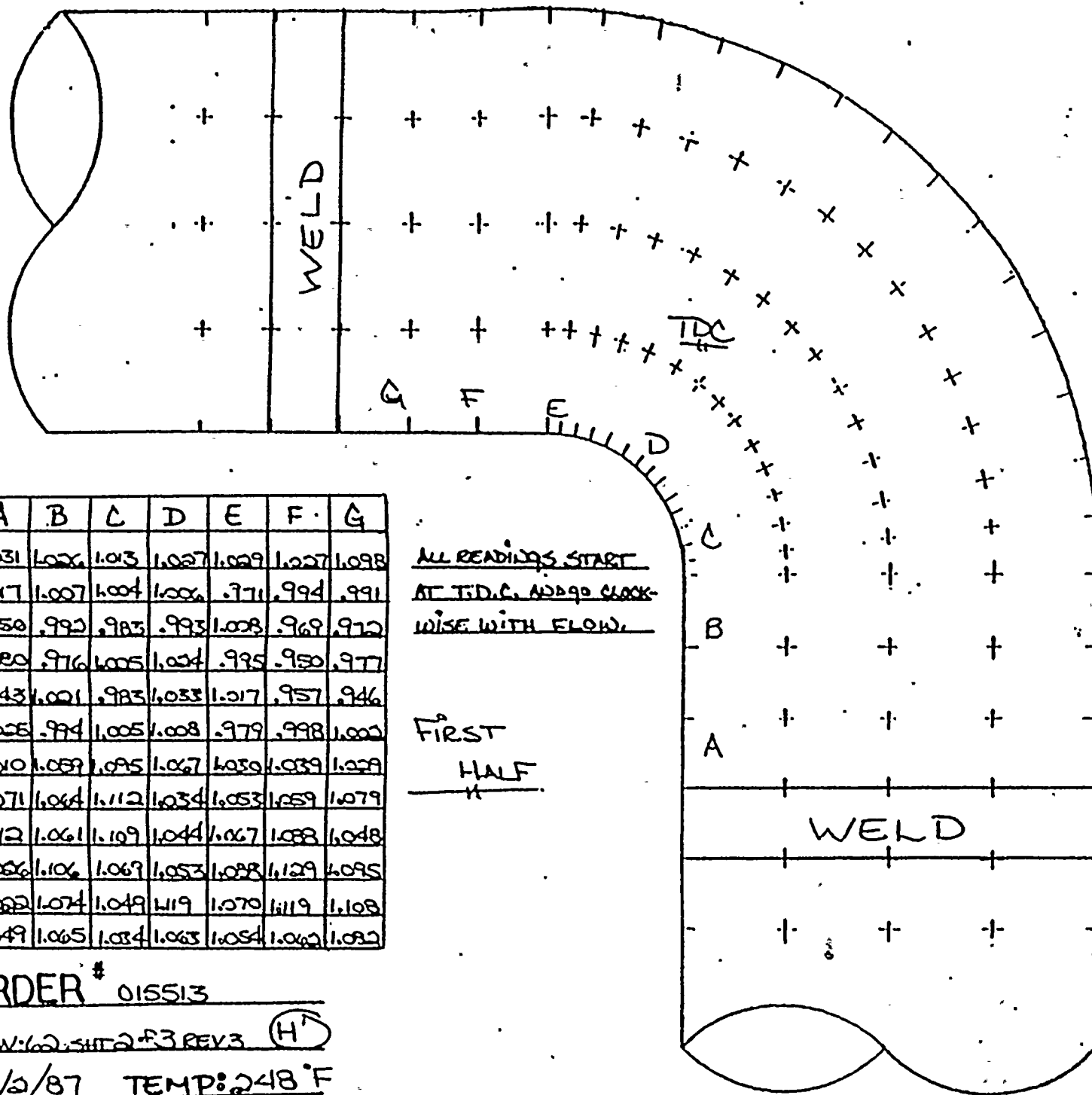
JOB ORDER # 015513

ISO# 2-FW-62 SHT. 2 OF 3 REV. 3 (I)

DATE: 1/5/87 TEMP: 255°F



← FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	1.031	1.026	1.013	1.027	1.029	1.027	1.098
30°	1.017	1.007	1.004	1.006	.971	.994	.991
60°	1.050	.992	.983	.993	1.008	.969	.972
90°	1.020	.976	1.005	1.024	.995	.950	.977
120°	1.043	1.001	.983	1.033	1.017	.957	.946
150°	1.025	.994	1.005	1.008	.979	.998	1.000
180°	1.010	1.059	1.095	1.067	1.030	1.039	1.029
210°	1.071	1.064	1.112	1.034	1.053	1.059	1.079
240°	1.012	1.061	1.109	1.044	1.067	1.088	1.048
270°	1.056	1.106	1.069	1.053	1.088	1.129	1.095
300°	1.052	1.074	1.049	1.119	1.070	1.119	1.108
330°	1.049	1.065	1.034	1.063	1.054	1.062	1.092

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

FIRST  
HALF  
H

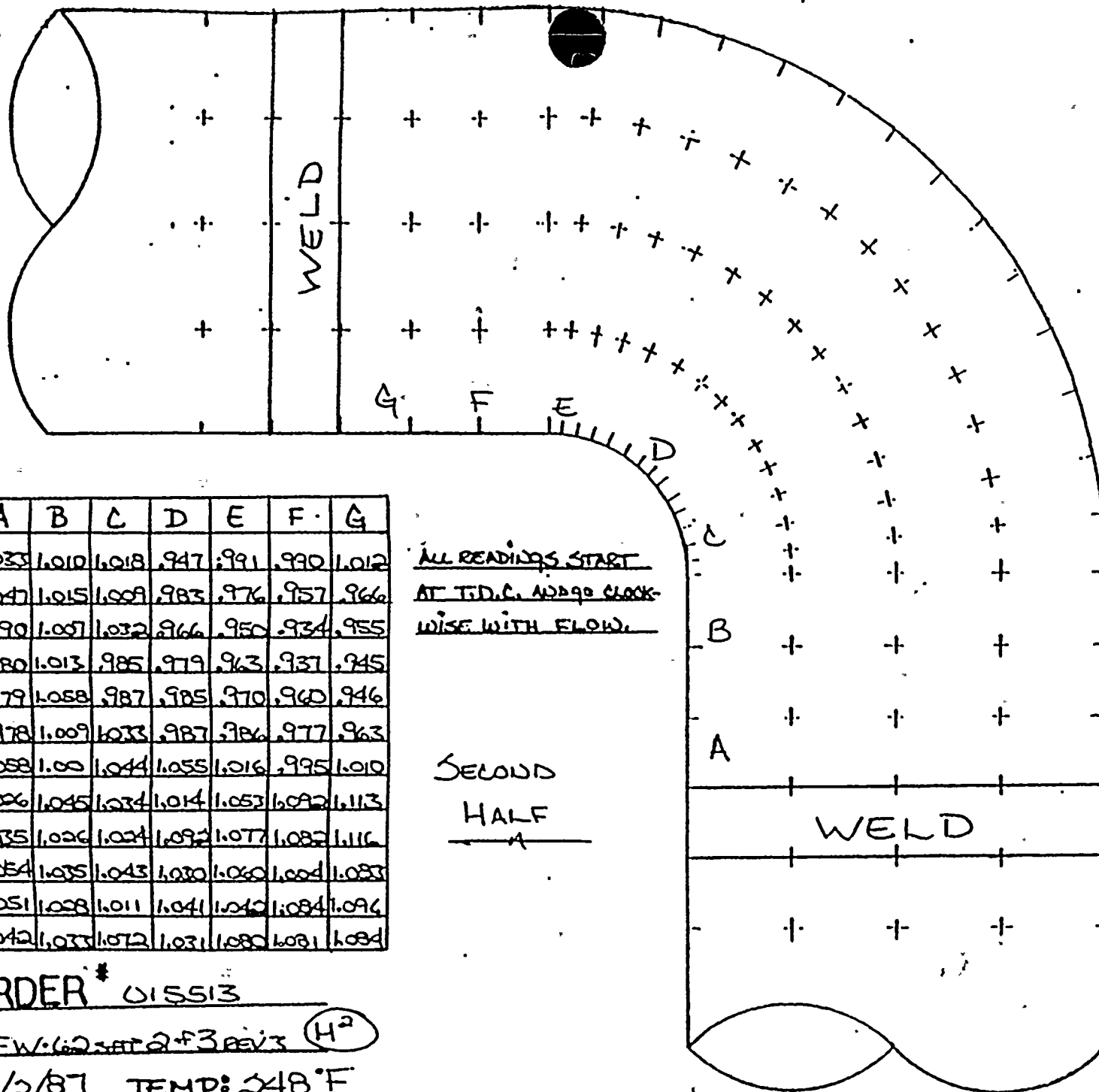
JOB ORDER # 015513

ISO # 2-FW:62-SHT 2-F3 REV 3 (H)

DATE: 1/2/87 TEMP: 248°F



← FLOW



	A	B	C	D	E	F	G
0°	1.033	1.010	1.018	.947	.991	.990	1.012
30°	1.047	1.015	1.009	.983	.976	.957	.966
60°	.990	1.007	1.032	.966	.950	.934	.955
90°	.980	1.013	.985	.979	.963	.937	.945
120°	.979	1.058	.987	.985	.970	.960	.946
150°	.978	1.009	1.033	.987	.986	.977	.963
180°	1.058	1.00	1.044	1.055	1.016	.995	1.010
210°	1.006	1.045	1.034	1.014	1.053	1.092	1.113
240°	1.035	1.026	1.024	1.092	1.077	1.082	1.116
270°	1.054	1.035	1.043	1.030	1.060	1.084	1.083
300°	1.051	1.028	1.011	1.041	1.040	1.084	1.094
330°	1.042	1.033	1.072	1.031	1.080	1.081	1.084

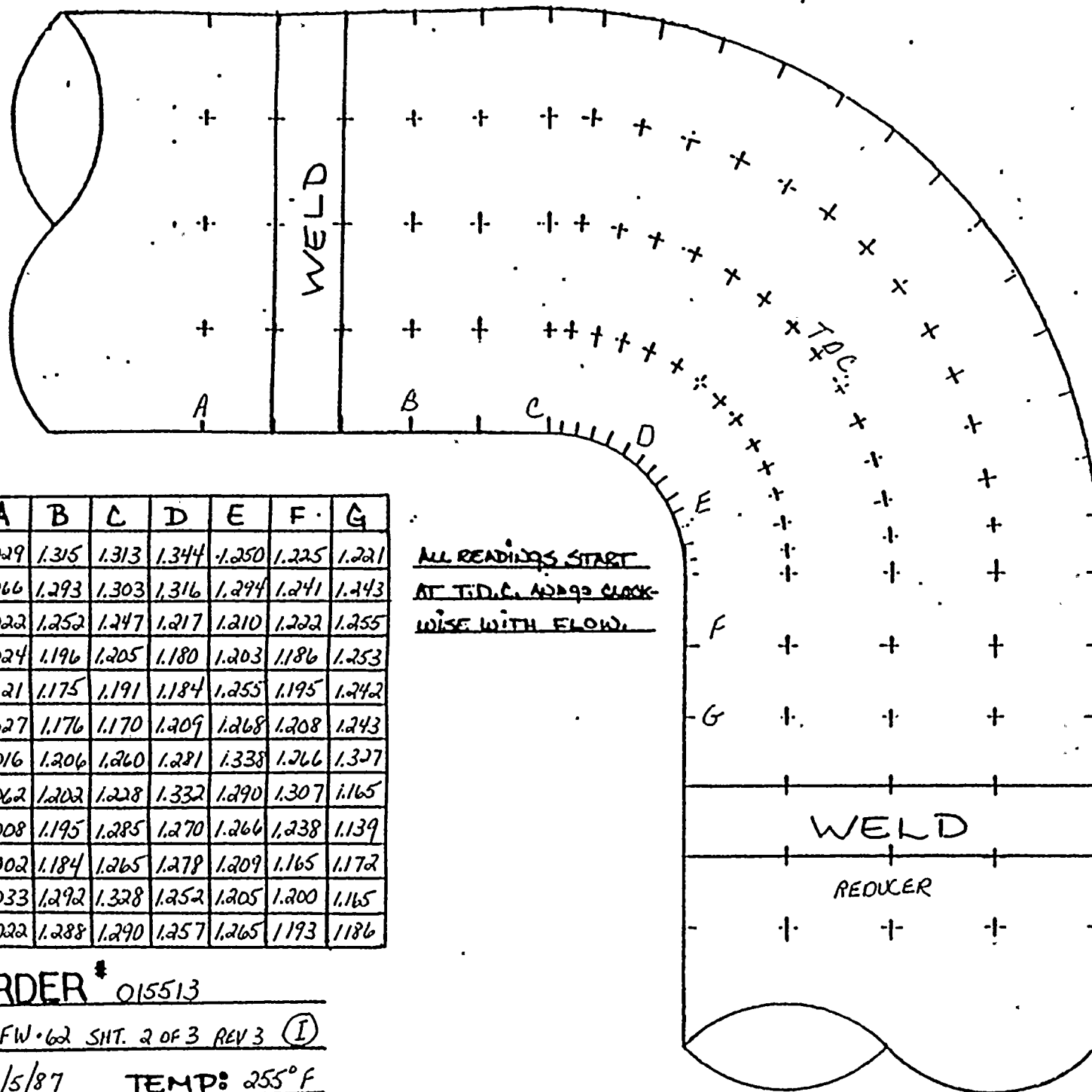
ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

SECOND  
HALF

JOB ORDER # 015513  
ISO # 2-FW-662-AT 2-F3 REV 3 (H<sup>2</sup>)  
DATE: 1/2/87 TEMP: 248°F



FLOW →



	A	B	C	D	E	F	G
0°	1.029	1.315	1.313	1.344	1.250	1.225	1.221
30°	1.066	1.293	1.303	1.316	1.294	1.241	1.243
60°	1.022	1.252	1.247	1.217	1.210	1.222	1.255
90°	1.024	1.196	1.205	1.180	1.203	1.186	1.253
120°	1.021	1.175	1.191	1.184	1.255	1.195	1.242
150°	1.027	1.176	1.170	1.209	1.268	1.208	1.243
180°	1.016	1.206	1.260	1.281	1.338	1.266	1.327
210°	1.062	1.202	1.228	1.332	1.290	1.307	1.165
240°	1.008	1.195	1.285	1.270	1.266	1.238	1.139
270°	1.002	1.184	1.265	1.278	1.209	1.165	1.172
300°	1.033	1.292	1.328	1.252	1.205	1.200	1.165
330°	1.022	1.288	1.290	1.257	1.265	1.193	1.186

ALL READINGS START  
AT T.D.C. 12:00 O'CLOCK  
WISE WITH FLOW.

JOE ORDER # 015513

ISO # 2-FW-62 SHT. 2 OF 3 REV 3 (I)

DATE: 1/5/87 TEMP: 255°F



D. C. COOK N. PLANT  
EROSION EVALUATION WORKSHEET

NEPSC Engineer: A.J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. 2

Evaluation Date: JANUARY 13, 1987

SER No. 23-85 (Water) X

Years in service 9

UT Reading Transmitted on: 1-6-87 & 1-9-87

UT Reading Taken on: 12-30-86

Isometric Dwg. NO. 2-FW-62 REV.2 Sh. 3 of 3

AEPSC Installed Mat'l Class CARBON STEEL SCH-80

Plant

(I.D.)

Comp.

Component

### Description

Original

Wall Thk.

Original

Thk. Range

Req'd

Tmin

Lowest

## Reading

Percent

Eroded

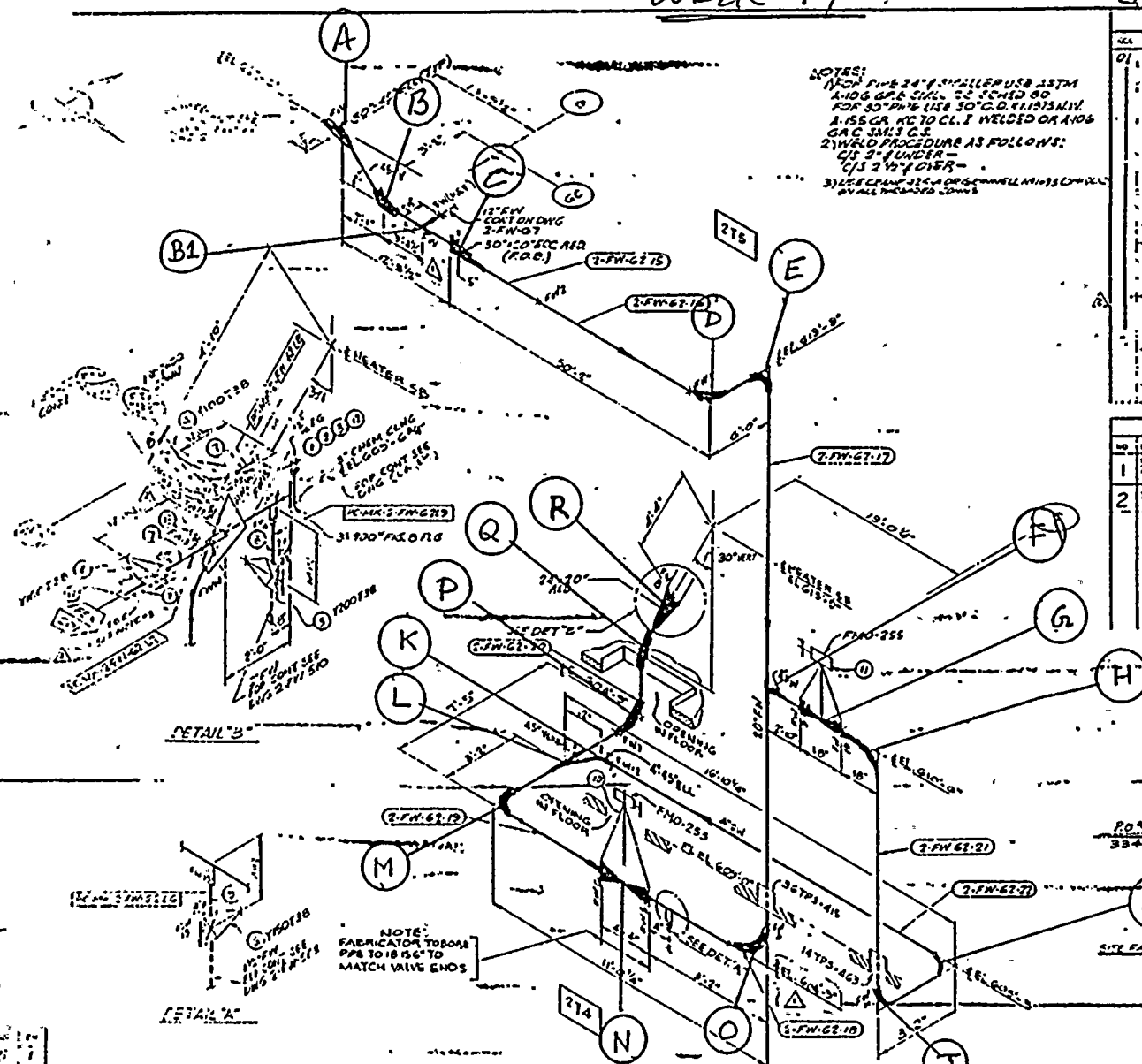
### COMMENTS

[illegible]



WEEK # 14

QC. I.O.# 015513  
CONST. I.O.# 015511  
JO # 015512



NOTES:  
1) FOR PIPE 24\"/>

NO.	REV.	DATE	BY	DESCRIPTION	ISO SHI NO	150
01	1	2	3	24" 3" 24"		

REVISION RECORD					
NO.	DATE	BY	DESCRIPTION	REVISION	REMARKS
1	3/1/76	LB	ADDED APPROVAL STAMP, DIM 2-1/2" x 4-1/2" (PER AMP REQUEST)	2nd ACTION	2800
2	2/1/76	LB	REVISION TO DIMENSIONS AND MATERIALS TO BE USED IN CONSTRUCTION OF THE STRUCTURE	1st ACTION	2800

INSPECT: N, G, H, E, C

UNCONTROLLED DOCUMENT

2-FW-62  
SHI 3 OF 3

DRAWING APPROVED FOR

CONSTRUCTION	PRE OPER TESTING
BY GC DATE 3/11/76 BY PR DATE 3/11/76	

FOURTONES NO. 274, 275  
REQUIRED COMPLETION DATE  
FABRICATED BY TUBISCO

NPS DESIGNS INC.  
NEW YORK, N.Y.

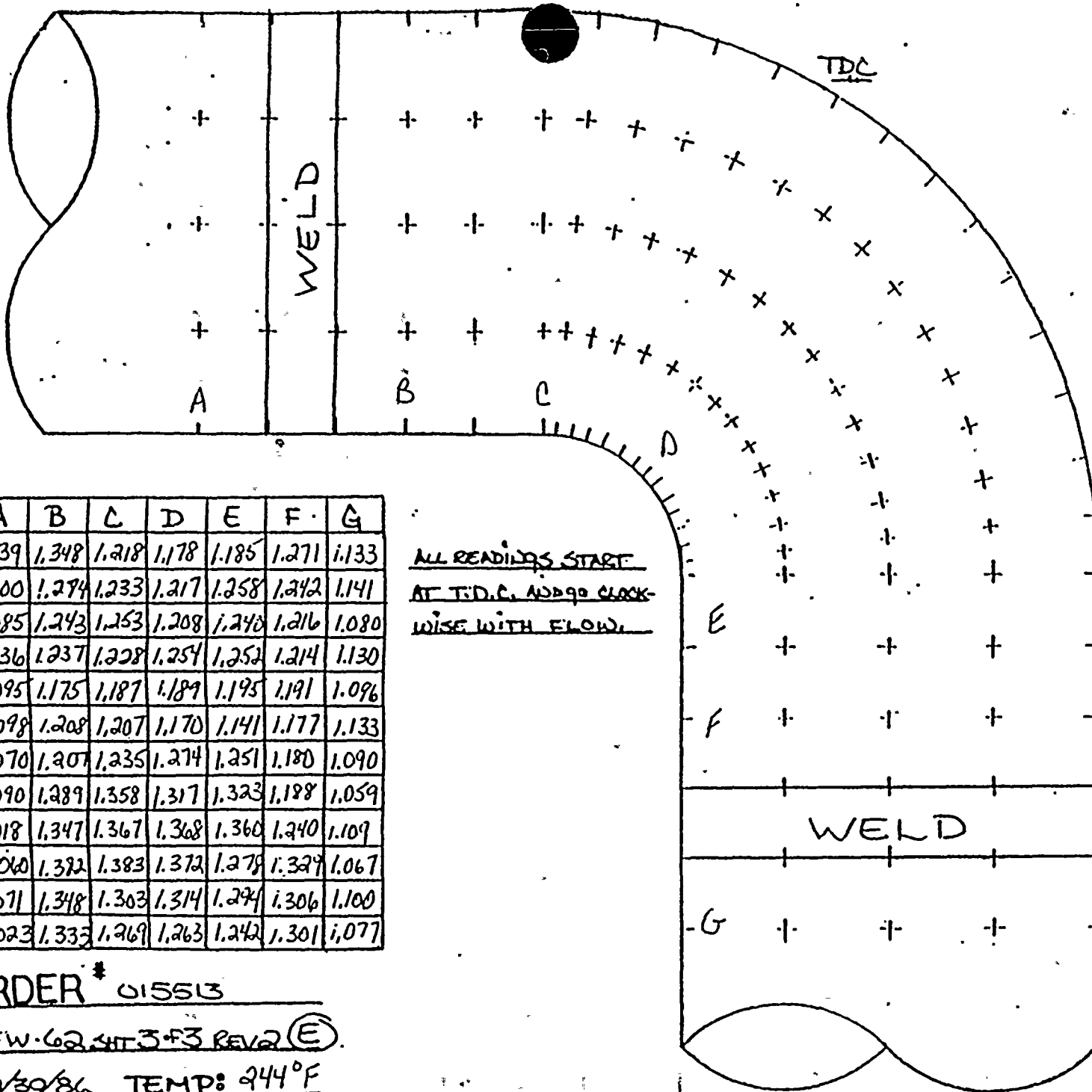
FABRICATOR NOTE:  
FABRICATION MUST  
CONFORM TO LATEST  
A.E.P. ARRG. DWGS.

SECTION SPEC	DESCRIPTION	REMARKS
2-FW-62-10	PIPE	
2-FW-62-11	FLANGES	
2-FW-62-12	TESTING	
2-FW-62-13	ADDITIONAL	

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12



FLOW →



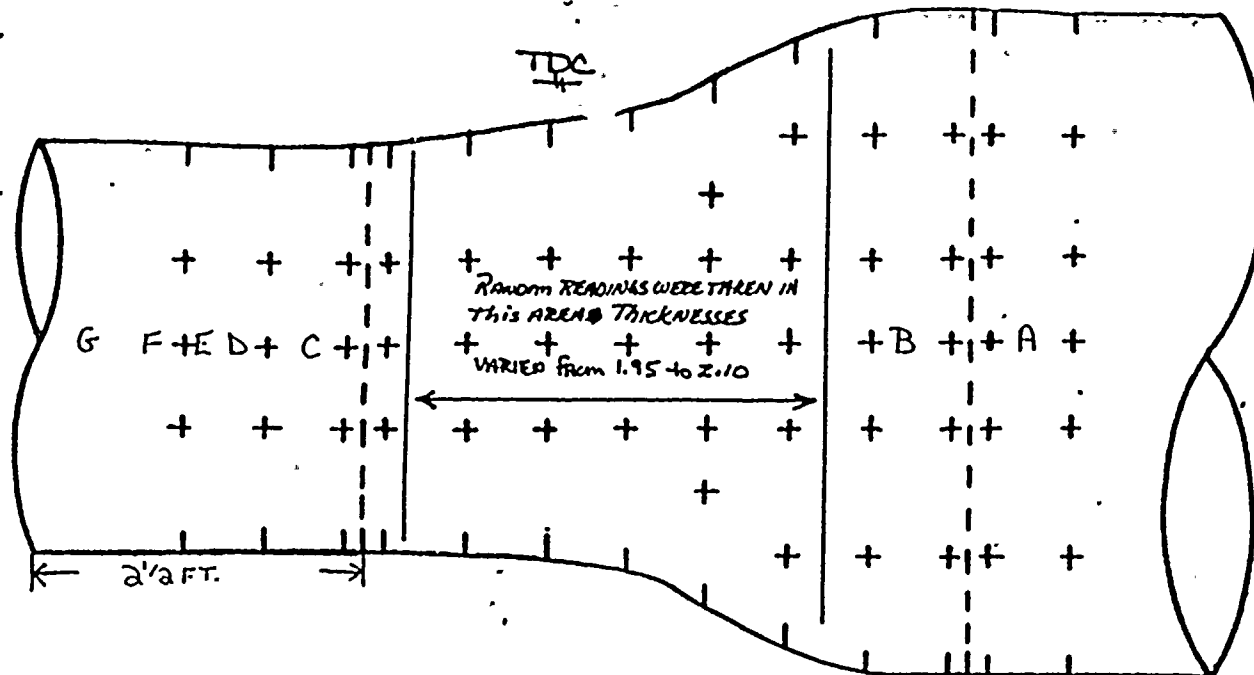
	A	B	C	D	E	F	G
0°	1.039	1.348	1.218	1.178	1.185	1.271	1.133
30°	1.100	1.274	1.233	1.217	1.258	1.242	1.141
60°	1.085	1.243	1.253	1.208	1.240	1.216	1.080
90°	1.036	1.237	1.228	1.254	1.252	1.214	1.130
120°	1.095	1.175	1.187	1.189	1.195	1.191	1.096
150°	1.098	1.208	1.207	1.170	1.141	1.177	1.133
180°	1.070	1.207	1.235	1.274	1.251	1.180	1.090
210°	1.090	1.289	1.358	1.317	1.323	1.188	1.059
240°	1.018	1.347	1.367	1.368	1.360	1.240	1.109
270°	1.060	1.372	1.383	1.372	1.278	1.327	1.067
300°	1.071	1.348	1.303	1.314	1.274	1.306	1.100
330°	1.023	1.333	1.269	1.263	1.242	1.301	1.077

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

JOB ORDER # 015513  
ISO # 2-FW-62-SHT 3-F3 REV 2 (E)  
DATE: 12/30/86 TEMP: 244°F



FLOW



TDC

	A	B	C	D	E	F	G
0°	1.279	1.190	1.105	1.076	1.092	1.058	1.063
30°	1.344	1.209	1.014	1.008	.989	.975	.910
60°	1.353	1.221	.995	1.002	1.031	1.013	1.033
90°	1.401	1.311	1.009	.977	.971	.997	.981
120°	1.380	1.320	.983	1.003	1.007	.979	1.027
150°	1.383	1.310	.973	.976	1.001	1.028	1.015
180°	1.404	1.329	1.008	1.003	1.021	1.048	1.043
210°	1.008	1.301	1.118	1.016	1.040	1.081	1.110
240°	1.508	1.305	1.200	1.113	1.093	1.103	1.113
270°	1.401	1.360	1.077	1.090	1.095	1.102	1.131
300°	1.412	1.316	1.099	1.198	1.187	1.176	1.191
330°	1.295	1.190	1.121	1.179	1.172	1.193	1.151

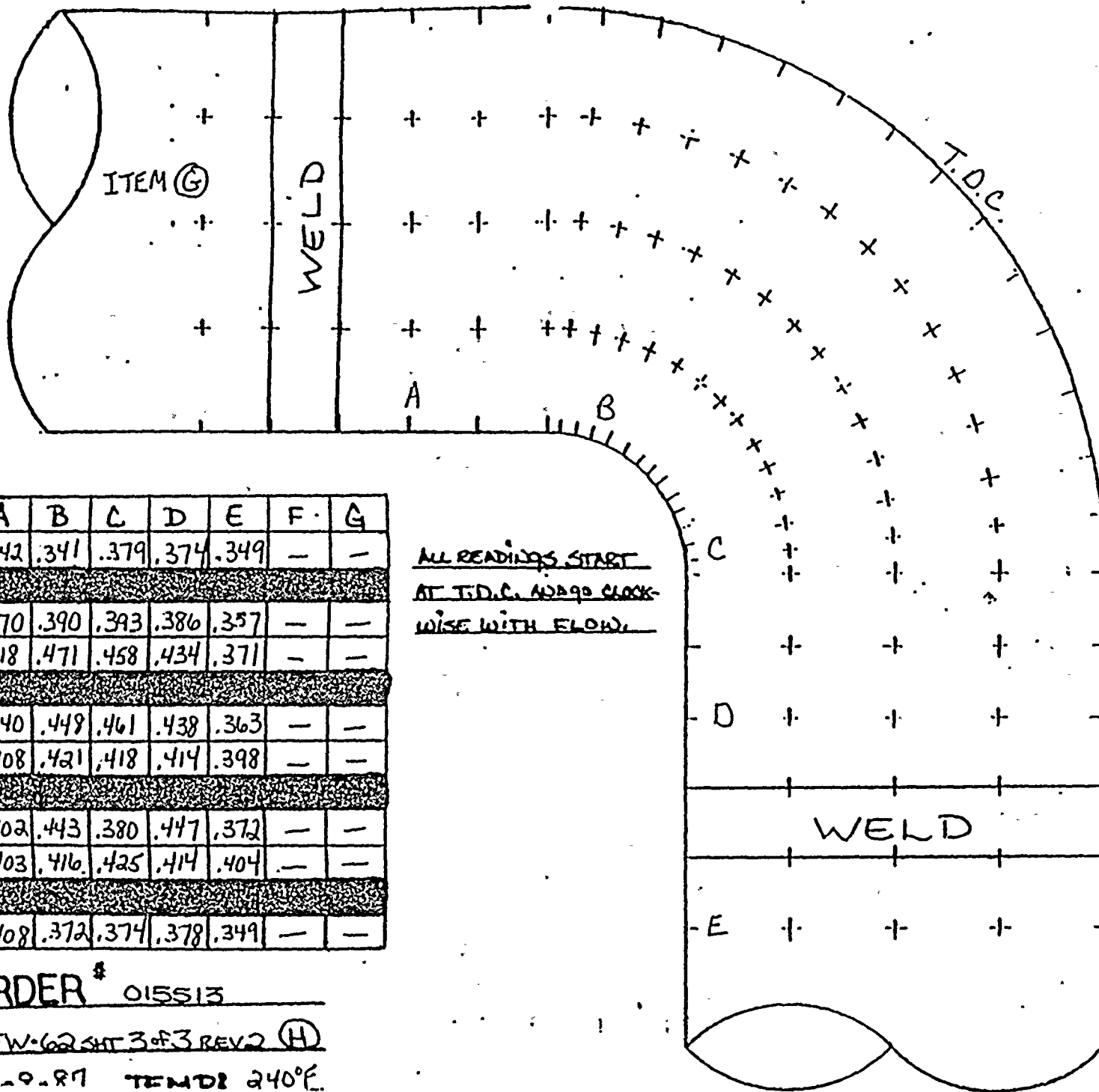
JOB ORDER 015513

ISO 2-FW-62 SH 3-53 REV 1

DATE: 1/8/87 TEMP: 255°F



FLOW →



T.D.C.

	A	B	C	D	E	F	G
0°	.342	.341	.379	.374	.349	—	—
45°	.370	.390	.393	.386	.357	—	—
90°	.418	.471	.458	.434	.371	—	—
135°	.440	.449	.461	.438	.363	—	—
180°	.408	.421	.418	.414	.398	—	—
225°	.402	.443	.380	.447	.372	—	—
270°	.403	.416	.425	.414	.404	—	—
315°	.408	.372	.374	.378	.349	—	—

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

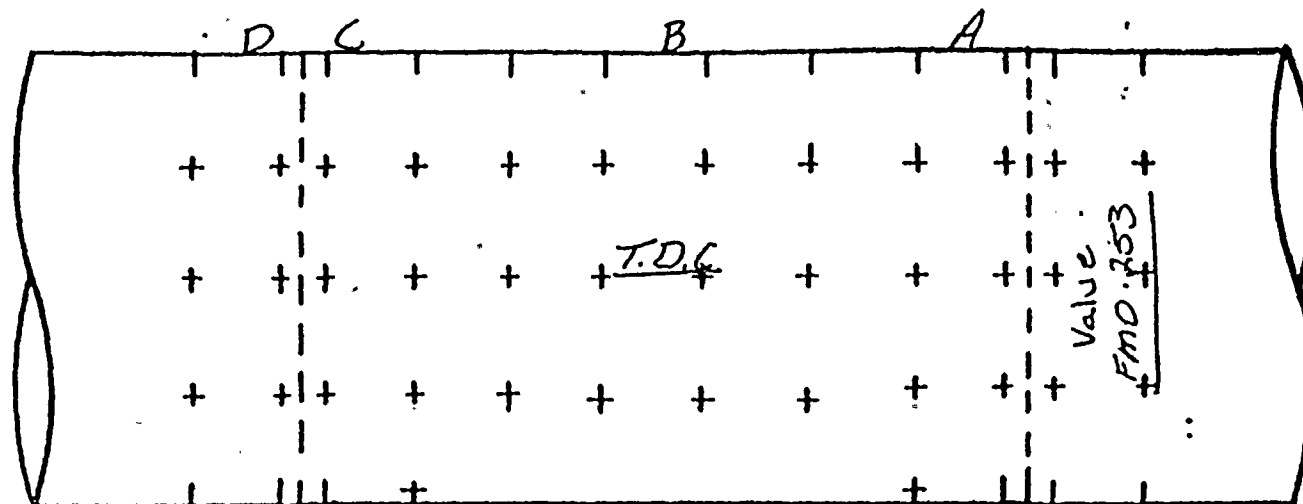
JOE ORDER # 015513

ISO # 2-FW-62-SHT 3 of 3 REV 2 (H)

DATE 1-9-87 TEMP 240°F



← FLOW



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

T.D.C.

	A	B	C	D	E	F	G
0°	1.080	1.082	1.092	1.310	—	—	—
30°	1.087	1.032	1.035	1.264	—	—	—
60°	1.080	1.030	1.031	1.162	—	—	—
90°	1.063	1.021	1.034	1.120	—	—	—
120°	1.017	1.020	1.030	1.131	—	—	—
150°	1.067	1.025	1.021	1.198	—	—	—
180°	1.062	1.092	1.030	1.238	—	—	—
210°	1.078	1.071	1.075	1.235	—	—	—
240°	1.067	1.086	1.082	1.258	—	—	—
270°	1.083	1.090	1.079	1.277	—	—	—
300°	1.081	1.091	1.073	1.294	—	—	—
330°	1.042	1.038	1.062	1.292	—	—	—

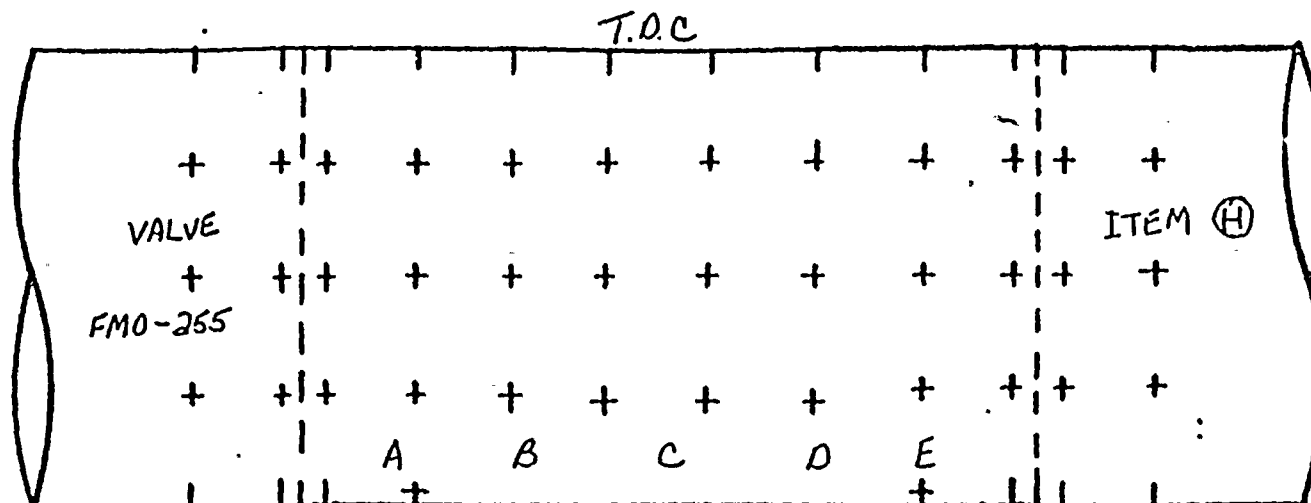
JOB ORDER # 015513

ISO # 2-FW-62 Sh + 30 F3 Rev 2 (N)

DATE 1-7-87 TFMP: 244°F



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

T.D.C

	A	B	C	D	E	F	G
0°	.365	.355	.356	.366	.375	—	—
45°	.356	.343	.333	.336	.341	—	—
90°	.346	.341	.344	.347	.346	—	—
135°	.346	.340	.362	.362	.361	—	—
180°	.333	.351	.364	.364	.370	—	—
225°	.324	.352	.367	.375	.356	—	—
270°	.349	.364	.358	.367	.351	—	—
315°	.389	.380	.363	.371	.354	—	—

JOB ORDER # 015513

ISO # 2-FW-62 SH-3-F3 REV 2 (G)

DATE: 1-8-87 TEMP: 240°F



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPSC Engineer: A.J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. 2

Evaluation Date: JANUARY 13, 1987

SER No. 23-85 (Water) X

Years in service 9

UT Reading Transmitted on: 1-6-87

UT Reading Taken on: 12-31-86

Isometric Dwg. NO. 2-FW-63, REV. 3, Sh. 1 of 2

AEPSI Installed Mat'l Class CARBON STEEL SCH. 80

Plant

(I.D.)

Component

Original

Original

Req'd

Lowest

Percent

## COMMENTS

Comp.

### Description

Wall Thk.

Thk. Range

Tmin

## Reading

Eroded

B

20° ELL 90°

1.031

902-116

.756.

L.002

09.

STILL WITHIN MANUFACTURERS TOLERANCE

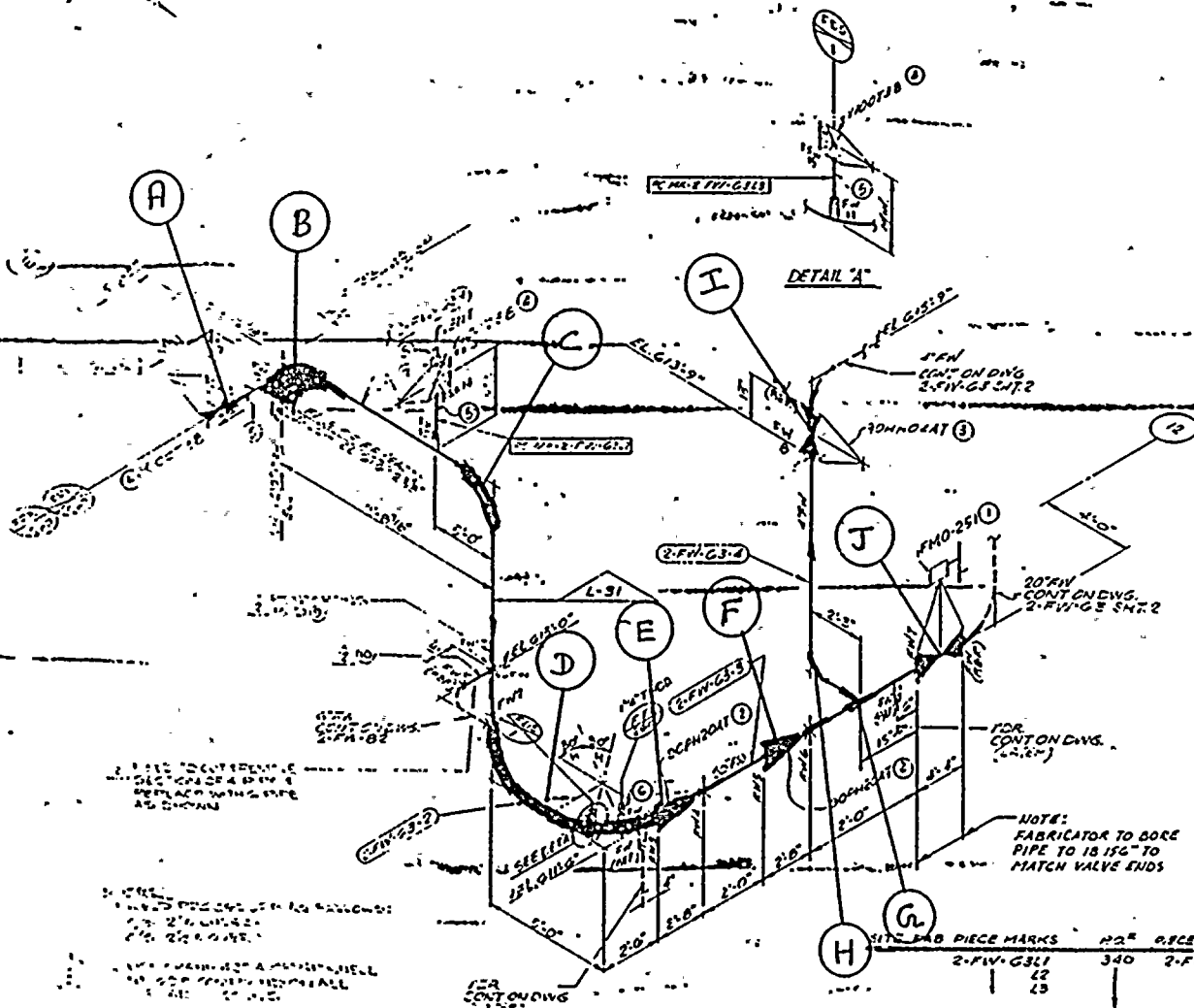


WEEK # 14

QC. J.O.# 015513  
CONST. J.O.# 015511  
" J.O.# 015512

MATERIAL DESCRIPTION	
01	1 20" 900# PIPE 12' LONG
2	2 20" 900# PIPE 12' LONG
3	1 20" 900# PIPE 12' LONG
4	1 20" 900# PIPE 12' LONG
5	1 20" 900# PIPE 12' LONG
6	1 20" 900# PIPE 12' LONG
7	1 20" 900# PIPE 12' LONG
8	1 20" 900# PIPE 12' LONG
9	1 20" 900# PIPE 12' LONG
10	1 20" 900# PIPE 12' LONG

REVISION RECORD	
NO.	DATE
1	10/1/63
2	10/1/63
3	10/1/63



INSPECT: B, J, and 13 REEL

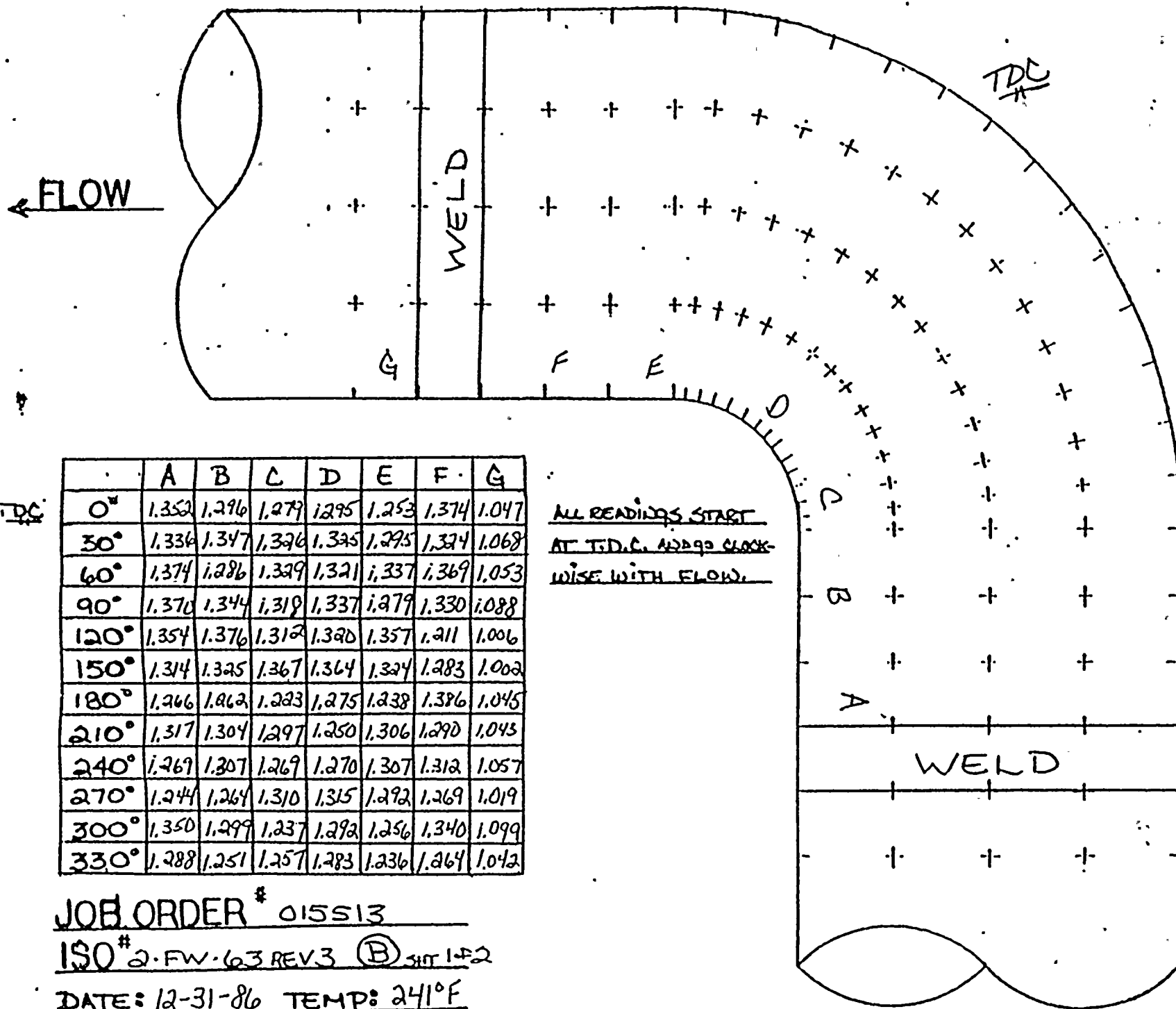
UNCONTROLLED DOCUMENT

2-FW-63  
SHT-1 OF 2

DRAWING APPROVED FOR	
CONSTRUCTION	DESIGNED TESTING

NPS DESIGNS INC. NEW YORK, N.Y.	
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRG. DWGS.	
2-FW-63 SHT-1 OF 2	





	A	B	C	D	E	F	G
0°	1.352	1.296	1.279	1.295	1.253	1.374	1.047
30°	1.336	1.347	1.326	1.325	1.295	1.324	1.068
60°	1.374	1.286	1.329	1.321	1.337	1.369	1.053
90°	1.370	1.344	1.319	1.337	1.279	1.330	1.088
120°	1.354	1.376	1.312	1.320	1.357	1.211	1.006
150°	1.314	1.325	1.367	1.364	1.324	1.283	1.002
180°	1.266	1.262	1.223	1.275	1.238	1.386	1.045
210°	1.317	1.304	1.297	1.250	1.306	1.290	1.043
240°	1.267	1.307	1.267	1.270	1.307	1.312	1.057
270°	1.244	1.264	1.310	1.315	1.292	1.269	1.019
300°	1.350	1.299	1.237	1.292	1.256	1.340	1.099
330°	1.288	1.251	1.257	1.283	1.236	1.264	1.042

ALL READINGS START  
AT T.D.C. 12:00 CLOCK  
WISE WITH FLOW.

JOB ORDER # 015513

ISO# 2-FW-63 REV.3 (B) SHIT 1-2

DATE: 12-31-86 TEMP: 241°F



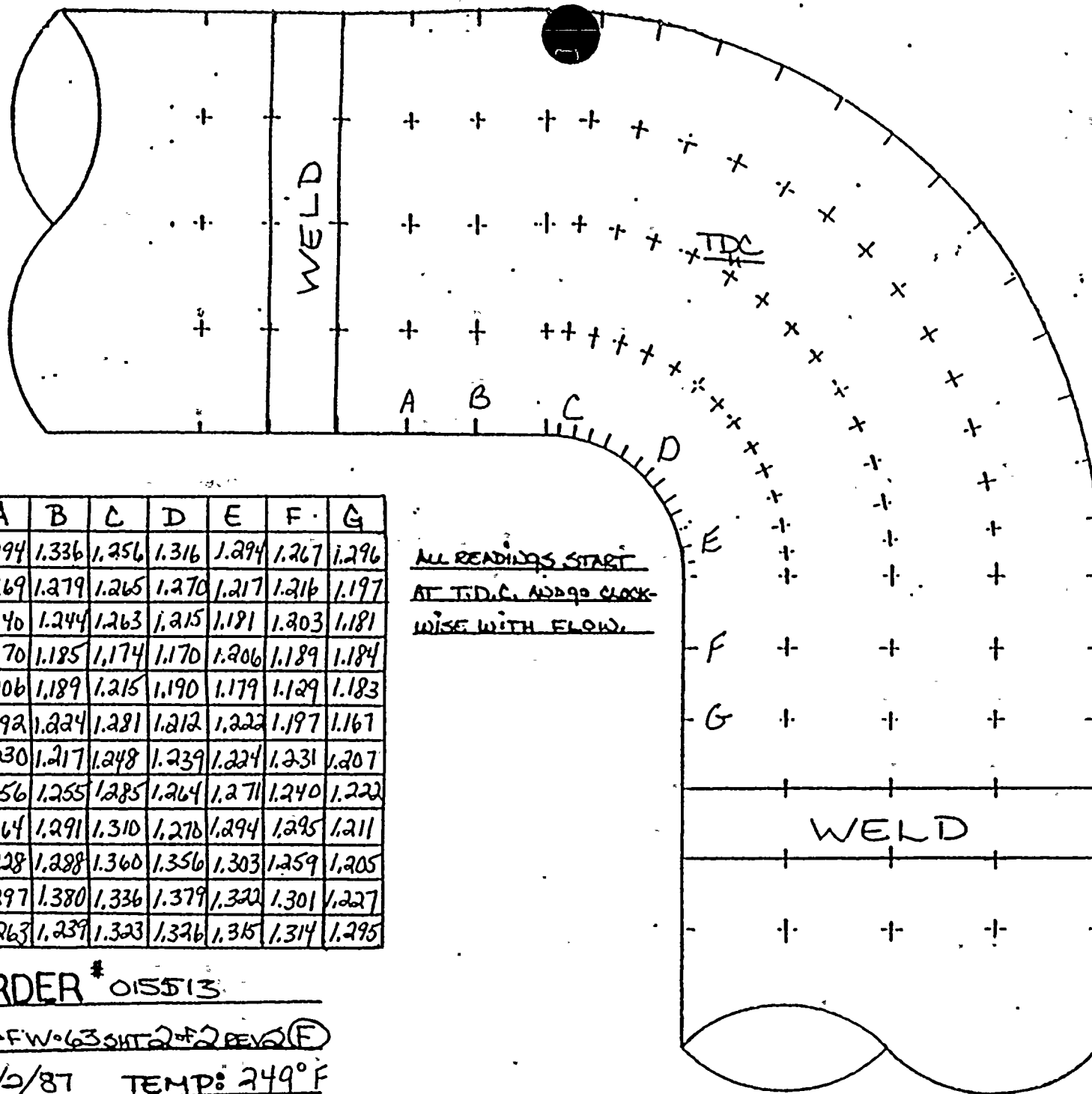








FLOW →



TDC

	A	B	C	D	E	F	G
0°	1.294	1.336	1.256	1.316	1.294	1.267	1.296
30°	1.269	1.279	1.265	1.270	1.217	1.216	1.197
60°	1.240	1.244	1.263	1.215	1.191	1.203	1.181
90°	1.170	1.185	1.174	1.170	1.206	1.189	1.184
120°	1.206	1.189	1.215	1.190	1.179	1.129	1.183
150°	1.192	1.224	1.281	1.212	1.222	1.197	1.167
180°	1.230	1.217	1.248	1.239	1.224	1.231	1.207
210°	1.256	1.255	1.285	1.264	1.271	1.240	1.222
240°	1.264	1.291	1.310	1.270	1.294	1.295	1.211
270°	1.228	1.288	1.360	1.356	1.303	1.259	1.205
300°	1.297	1.380	1.336	1.379	1.322	1.301	1.227
330°	1.263	1.237	1.323	1.326	1.315	1.314	1.295

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

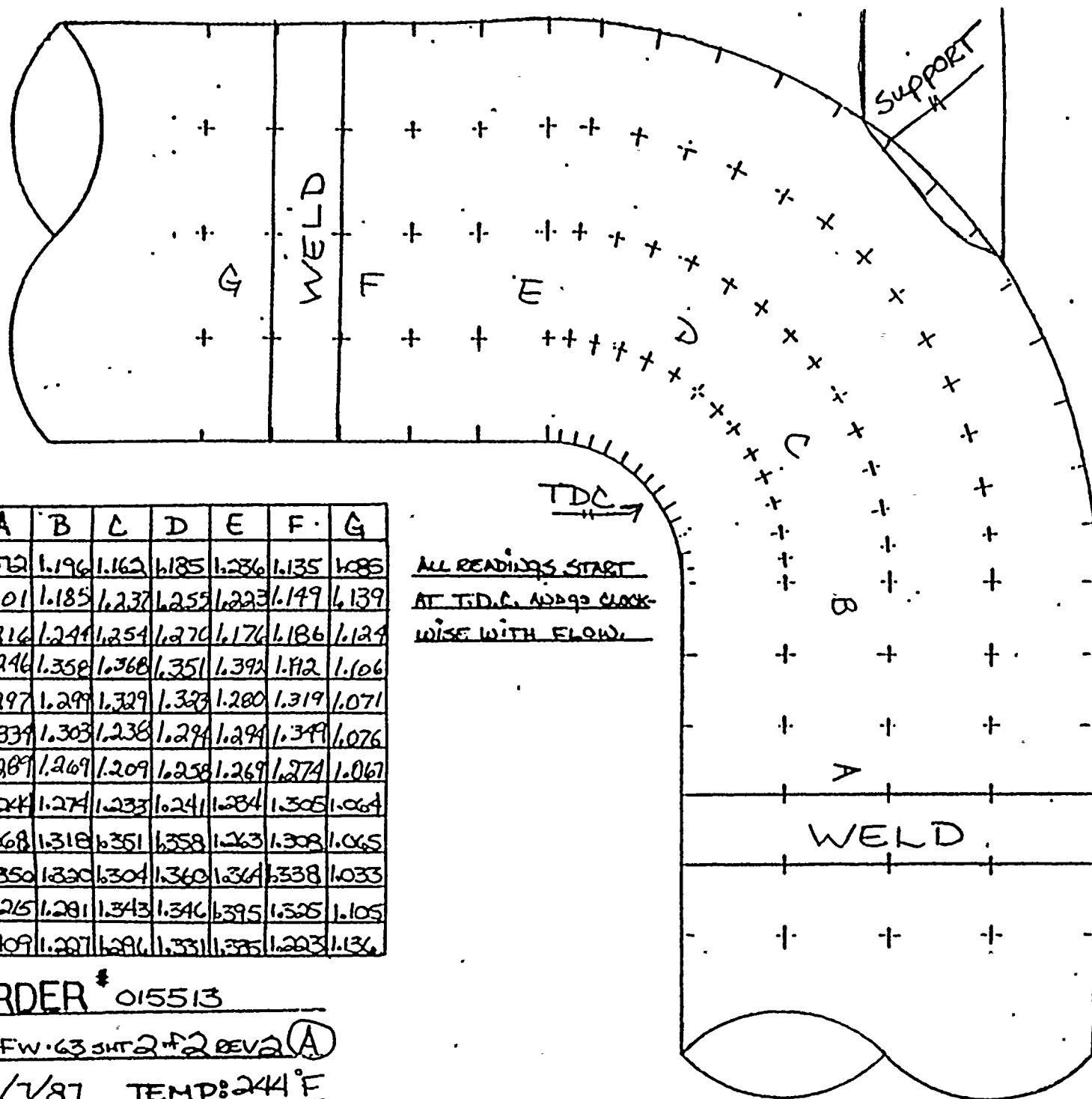
JOB ORDER # 015513

ISO # 2-FW-63 SHT 2 of 2 REV 2 (F)

DATE: 1/2/87 TEMP: 249°F



FLOW



TDC

	A	B	C	D	E	F	G
0°	1.072	1.196	1.162	1.185	1.286	1.135	1.085
30°	1.101	1.185	1.237	1.255	1.223	1.149	1.139
60°	1.216	1.241	1.254	1.270	1.176	1.186	1.124
90°	1.246	1.358	1.368	1.351	1.392	1.112	1.106
120°	1.297	1.299	1.329	1.323	1.280	1.319	1.071
150°	1.334	1.303	1.238	1.294	1.294	1.349	1.076
180°	1.289	1.269	1.209	1.258	1.269	1.274	1.067
210°	1.244	1.274	1.233	1.241	1.284	1.305	1.064
240°	1.268	1.318	1.351	1.358	1.263	1.308	1.065
270°	1.350	1.320	1.304	1.360	1.364	1.338	1.033
300°	1.265	1.281	1.343	1.346	1.395	1.325	1.105
330°	1.109	1.207	1.296	1.331	1.375	1.203	1.136

TDC →  
ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

JOB ORDER # 015513  
ISO# 2-FW-63 JMT 2#2 REV 2 (A)  
DATE: 1/7/87 TEMP: 244°F



## PLANT

Unit No. 2

SER No. 23-85 (Water) X

Years in service 9

UT Reading Taken on: 12-31-81

AEPSIC Installed Mat'l Class CARBON STEEL, SCH. 80

(I.D.)

(I.D.)

Сопы.

Component

### Description

Original

Wall Thk.

Original

Tnk. Range

Reçin'd

Min

Lowest

## Reading

Percent

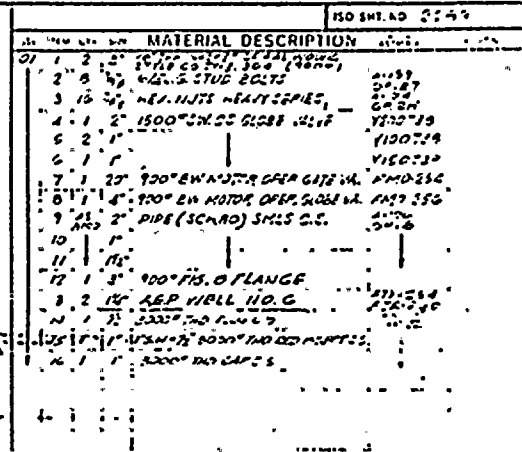
Eroded

## COMMENTS

[illegible]



Q.C. J.O. # 015313  
CONST. J.O. # 015511  
" J.O. # 015512



REVISION RECORD			
NO	DATE	DESCRIPTION	REMARKS
1	5/1/78	CORRECTED FIREARM NO AEP ARREST DNO 25255-2 425255-1	NO ACTION - 5252
2	5/1/78	16" DIM WAS 2" O" PER AEP COMMENT PUT REV. 3 DMS 25255	NO ACTION REC'D
3	5/1/78	10000 APPROVAL STAND Rev 2 DMS 25255	NO ACTION - 5252
4	5/1/78	REVISIONS TO STAND: 1. 10000 APPROVAL STAND 2. 10000 APPROVAL STAND 3. 10000 APPROVAL STAND	NO ACTION - 5252

INSPECT: B, K, and <sup>12/12/36</sup>

UNCONTROLLED  
DOCUMENT

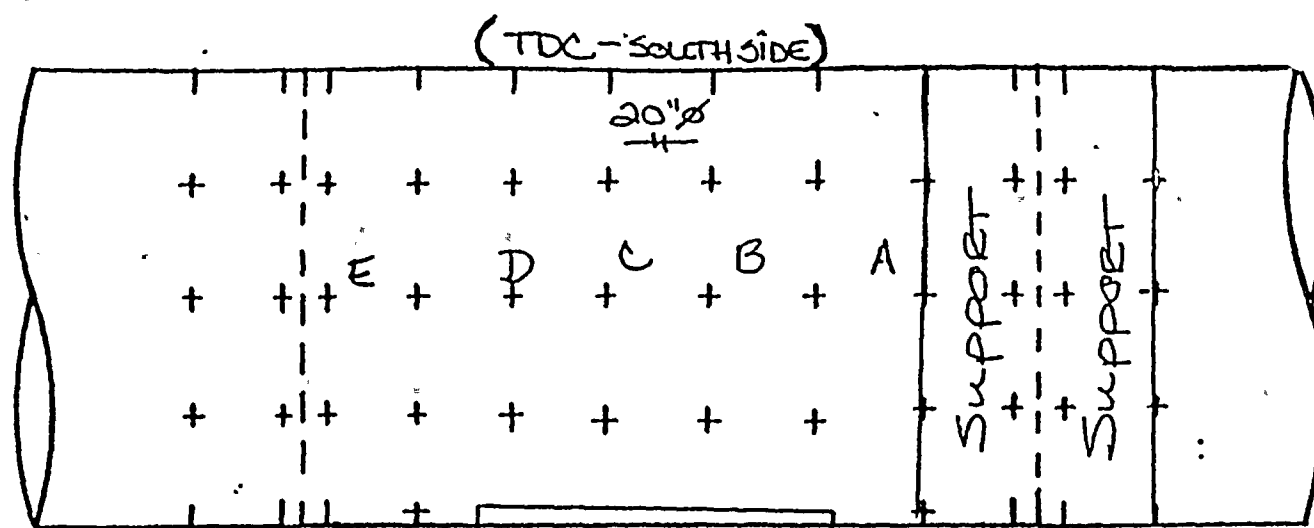
DRAWING APPROVED FOR  
CONSTRUCTION BY: [Signature] FOR: [Signature]  
BY: MRL. DATE: [Signature] BY: [Signature] DATE: [Signature]  
AMERICAN ELECTRIC POWER SERVICE CO.

SECTION NAME <b>CCCPH000000</b>		a-10 <input type="checkbox"/> <b>CCCPH000000</b> a-11 <input type="checkbox"/> <b>CCCPH000000</b> a-12 <input type="checkbox"/> <b>CCCPH000000</b> a-13 <input type="checkbox"/> <b>CCCPH000000</b> a-14 <input type="checkbox"/> <b>CCCPH000000</b> a-15 <input type="checkbox"/> <b>CCCPH000000</b> a-16 <input type="checkbox"/> <b>CCCPH000000</b> a-17 <input type="checkbox"/> <b>CCCPH000000</b> a-18 <input type="checkbox"/> <b>CCCPH000000</b> a-19 <input type="checkbox"/> <b>CCCPH000000</b> a-20 <input type="checkbox"/> <b>CCCPH000000</b> a-21 <input type="checkbox"/> <b>CCCPH000000</b> a-22 <input type="checkbox"/> <b>CCCPH000000</b> a-23 <input type="checkbox"/> <b>CCCPH000000</b> a-24 <input type="checkbox"/> <b>CCCPH000000</b> a-25 <input type="checkbox"/> <b>CCCPH000000</b> a-26 <input type="checkbox"/> <b>CCCPH000000</b> a-27 <input type="checkbox"/> <b>CCCPH000000</b> a-28 <input type="checkbox"/> <b>CCCPH000000</b> a-29 <input type="checkbox"/> 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FOUR ZONE NO. <u>214, 215</u>	FLOOR DIAGRAM <u>11-21-62</u>
REQUIRED COMPLETION DATE <u>...</u>	<u>Q54</u>
FABRICATED BY <u>1-2-62</u>	WELD PAINTED <u>1-2-62</u>
NPS DESIGNS INC. NEW YORK, N.Y.	19751 S COMPANY INC. BOLLANA & MACHIGAN EILEEN CO RONALD C GOOD CONSTRUCTION PLANT
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRG. DWGS.	DATE <u>1-2-62</u> BY <u>1-2-62</u> FILE <u>140</u> DATE <u>2-1-62</u> BY <u>...</u> REVISION <u>...</u> REF DWG <u>...</u>



← FLOW



SEE PAGE 2 OF 2  
4" Ø

ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	1.074	1.073	1.069	1.069	1.079	—	—
30°	1.061	1.136	1.059	1.125	1.105	—	—
60°	1.025	1.033	1.038	1.050	1.060	—	—
90°	1.021	1.043	1.034	1.040	1.035	—	—
120°	1.031	1.065	1.072	1.023	1.050	—	—
150°	1.027	1.026	—	1.024	1.040	—	—
180°	1.044	—	—	—	1.015	—	—
210°	1.072	1.079	—	1.042	1.035	—	—
240°	1.075	1.054	1.088	1.064	1.068	—	—
270°	1.081	1.100	1.101	1.086	1.089	—	—
300°	1.093	1.089	1.103	1.097	1.082	—	—
330°	1.080	1.109	1.085	1.091	1.100	—	—

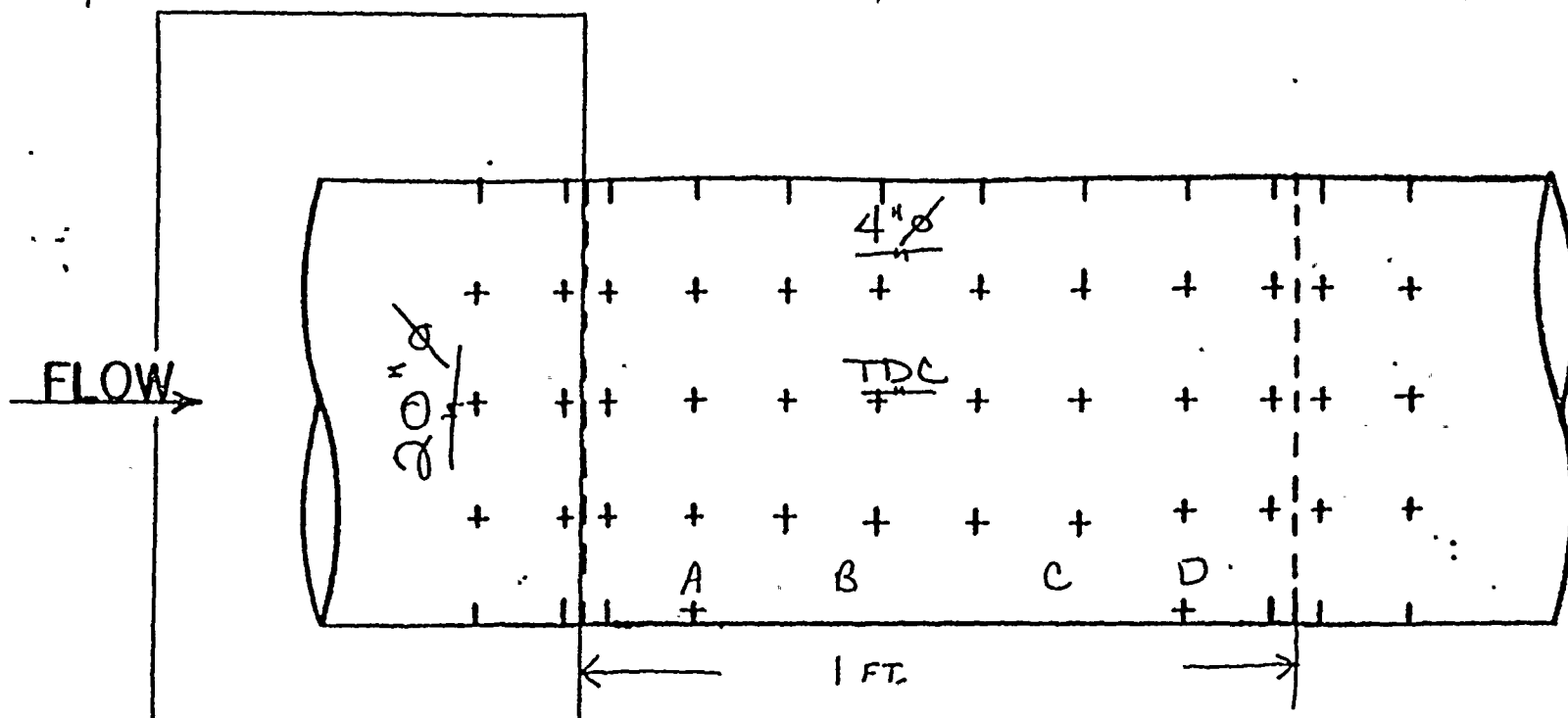
JOB ORDER # 015513

ISO # 2-FW-64 REV 4 (B)

DATE: 1/5/87 TEMP: 242°F



19-2 or 2



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC →

	A	B	C	D	E	F	G
0°	.409	.384	.368	.362	—	—	—
45°	.341	.398	.367	.363	—	—	—
90°	.375	.360	.341	.355	—	—	—
135°	.345	.353	.356	.357	—	—	—
180°	.344	.349	.354	.354	—	—	—
225°	.335	.347	.358	.361	—	—	—
270°	.337	.341	.358	.365	—	—	—
315°	.370	.375	.368	.368	—	—	—

JOB ORDER # 015513

ISO # 2-FW-64 REV 4 (B<sup>2</sup>)

DATE 1/8/87 TEMP: 242°F





ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

DATE: 12/31/86 TEMP: 250°F



## EROSION EVALUATION WORKSHEET

Unit No. 2

Years in service 9

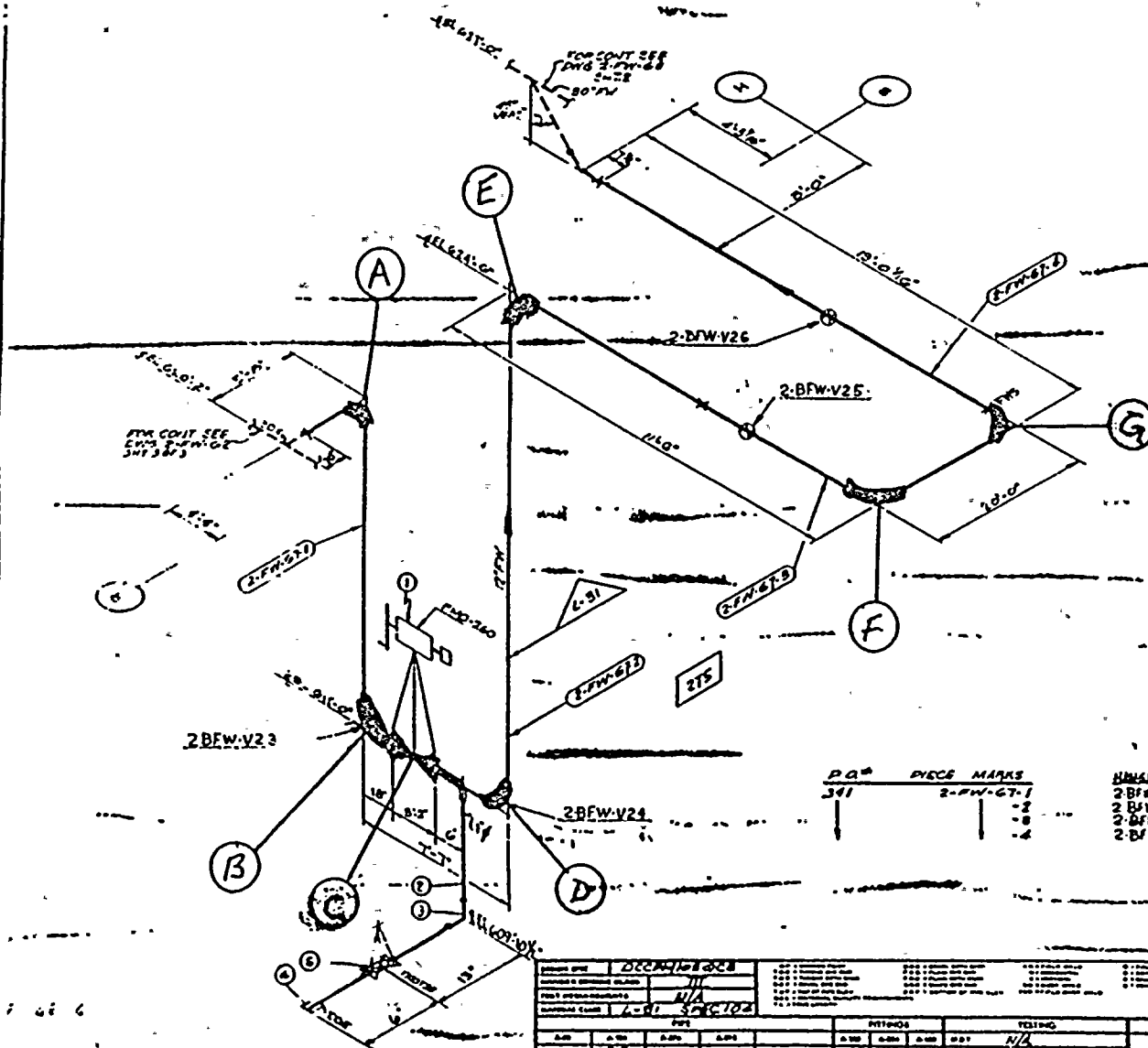
UT Reading Taken on: 12-31-84

AEPS C Installed Mat'l Class *CARBON STEEL SCH. 80*

[illegible]



Q.C. J.O. # 015513  
CONST. J.O. # 015512  
" J.O. # 015511

[illegible]

REVISION RECORD			
NO	DATE	DESCRIPTION	BY
1	3/1/68	ADDED APPROVAL STAMP HIS 2 DWIG 2-5295	ALD
2	3/1/68	REMOVED APPROVAL STAMP	ALD
3	3/1/68	REMOVED APPROVAL STAMP	ALD
4	3/1/68	REMOVED APPROVAL STAMP	ALD

INSPECT:

UNCONTROLLED  
DOCUMENT

C, D, G and 18 Dec 76

INDICATES LOCATION OF PIPE  
SUPPORT AND SYMBOL DETAIL  
NUMBER

SUPPORT MARK SYMBOLS  
SYMBOLS FOR EXACT LOCATION SEE PAGE  
SYMBOLS FOR EXACT LOCATION SEE PAGE

PAGE	PIECE	MARKS	NUMBER MARK
341	2-BW-67-1	-2	2-BW-V2;
		-8	2-BW-V29
		-4	2-BW-V25
			2-BW-V26

[illegible]

2-FW-67

FOURZOM No 578  
REQUIRED COMPLETION DATE

**MP3 DESIGNS INC**  
**NEW YORK, N.Y.**

FABRICATOR NOTE:  
FABRICATION MUST  
CONFORM TO LATEST  
A.E.P. ARRGT. DWGB

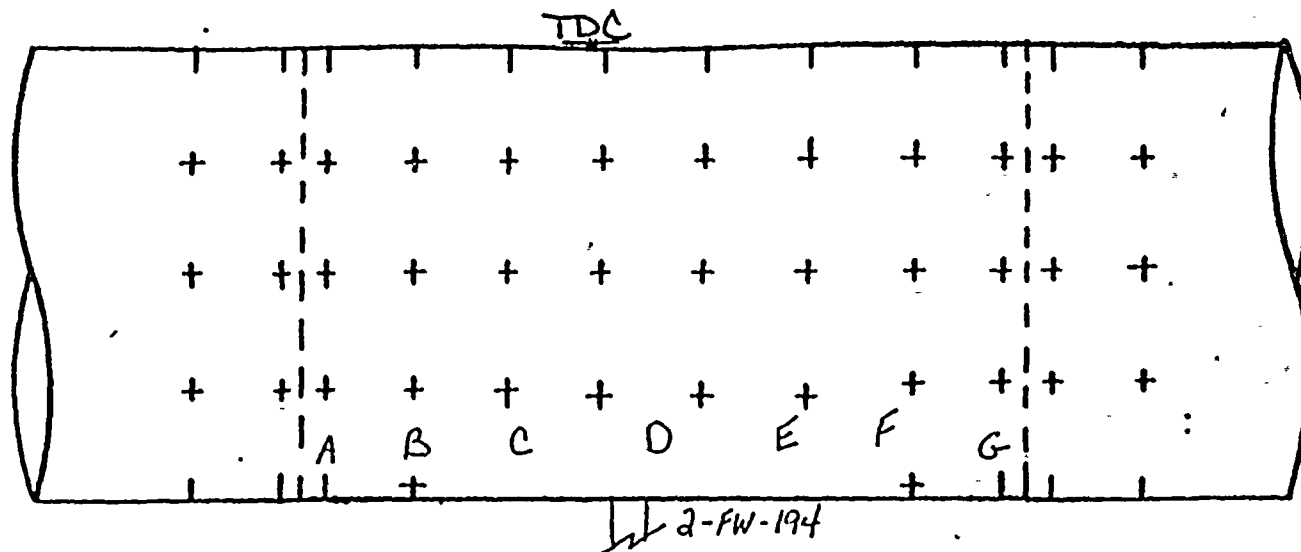
FROM MALDEN 2.15 PM

LOOM & COMPANY, INC.  
BOSTON & NEW HAVEN, CONNECTICUT  
BOSTON & NEW HAVEN, CONNECTICUT

Page 144	Page 145	TURKISH SIDE	
Page 146	Page 147	Page 148	Page 149
Page 150	Page 151	Page 152	Page 153
Page 154	Page 155	Page 156	Page 157
Page 158	Page 159	Page 160	Page 161
Page 162	Page 163	Page 164	Page 165
Page 166	Page 167	Page 168	Page 169
Page 170	Page 171	Page 172	Page 173
Page 174	Page 175	Page 176	Page 177
Page 178	Page 179	Page 180	Page 181
Page 182	Page 183	Page 184	Page 185
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Page 450	Page 451	Page 452	Page 453
Page 454	Page 455	Page 456	Page 457
Page 458	Page 459	Page 460	Page 461
Page 462	Page 4		



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	.785	.745	.720	.798	.742	.724	.770
45°	.800	.814	.798	.772	.802	.746	.751
90°	.769	.760	.754	.757	.748	.745	.743
135°	.828	.732	.737	.765	.738	.729	.735
180°	.770	.701	.693	.701	.698	.710	.708
225°	.726	.766	.750	.701	.706	.717	.729
270°	.708	.703	.712	.745	.735	.721	.726
315°	.708	.712	.740	.731	.730	.729	.769

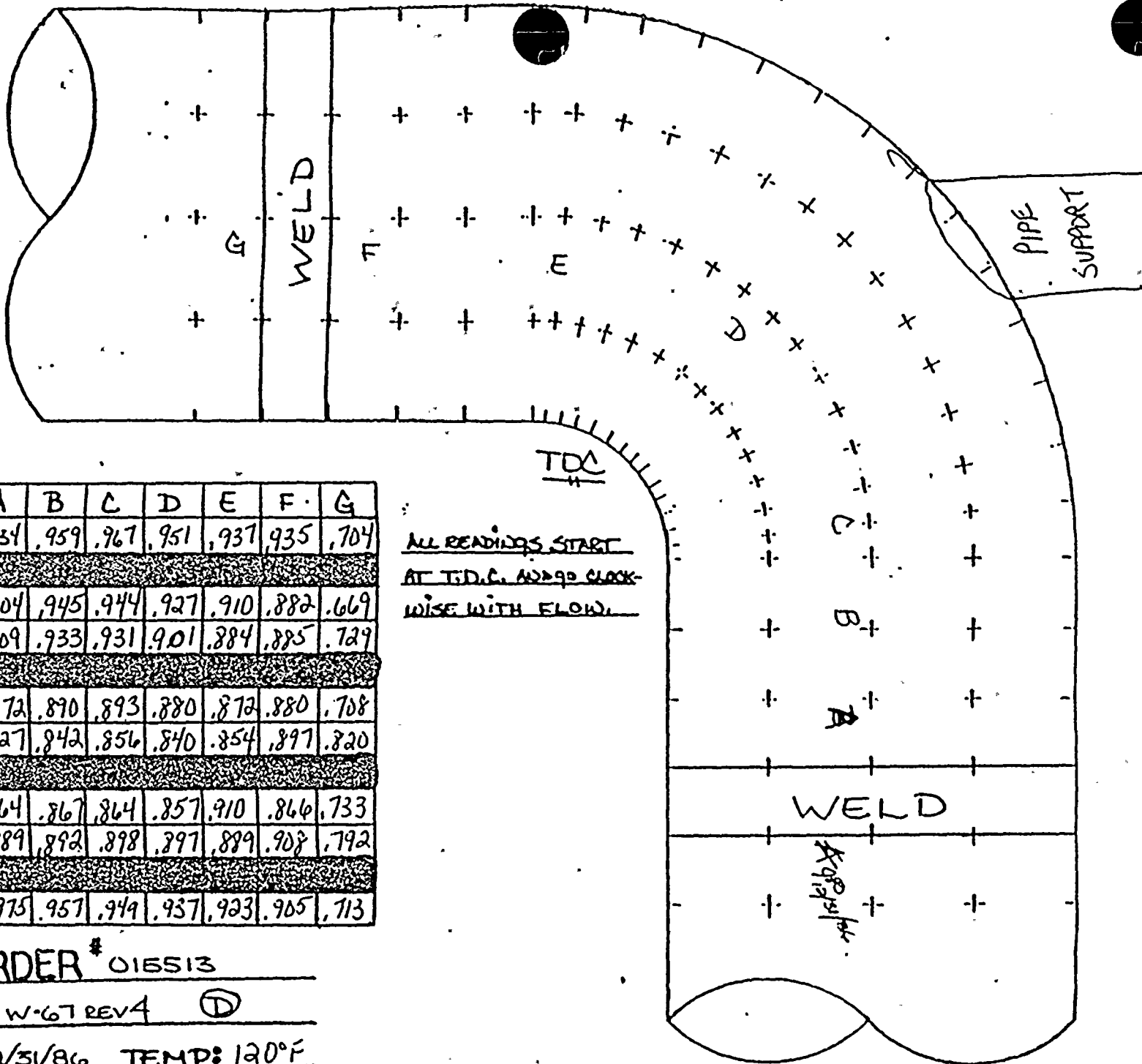
JOB ORDER # 015513

ISO # 2-FW-67 REV 4 (C)

DATE 12/31/86 TEMP: 120°F



← FLOW



TDC

	A	B	C	D	E	F	G
0°	.934	.959	.967	.951	.937	.935	.704
45°	.904	.945	.944	.927	.910	.882	.669
90°	.909	.933	.931	.901	.884	.885	.729
135°	.872	.890	.893	.880	.872	.880	.708
180°	.927	.842	.856	.840	.854	.897	.820
225°	.864	.867	.864	.857	.910	.866	.733
270°	.889	.892	.898	.897	.899	.908	.792
315°	.975	.957	.949	.937	.923	.905	.713

TDC

ALL READINGS START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.

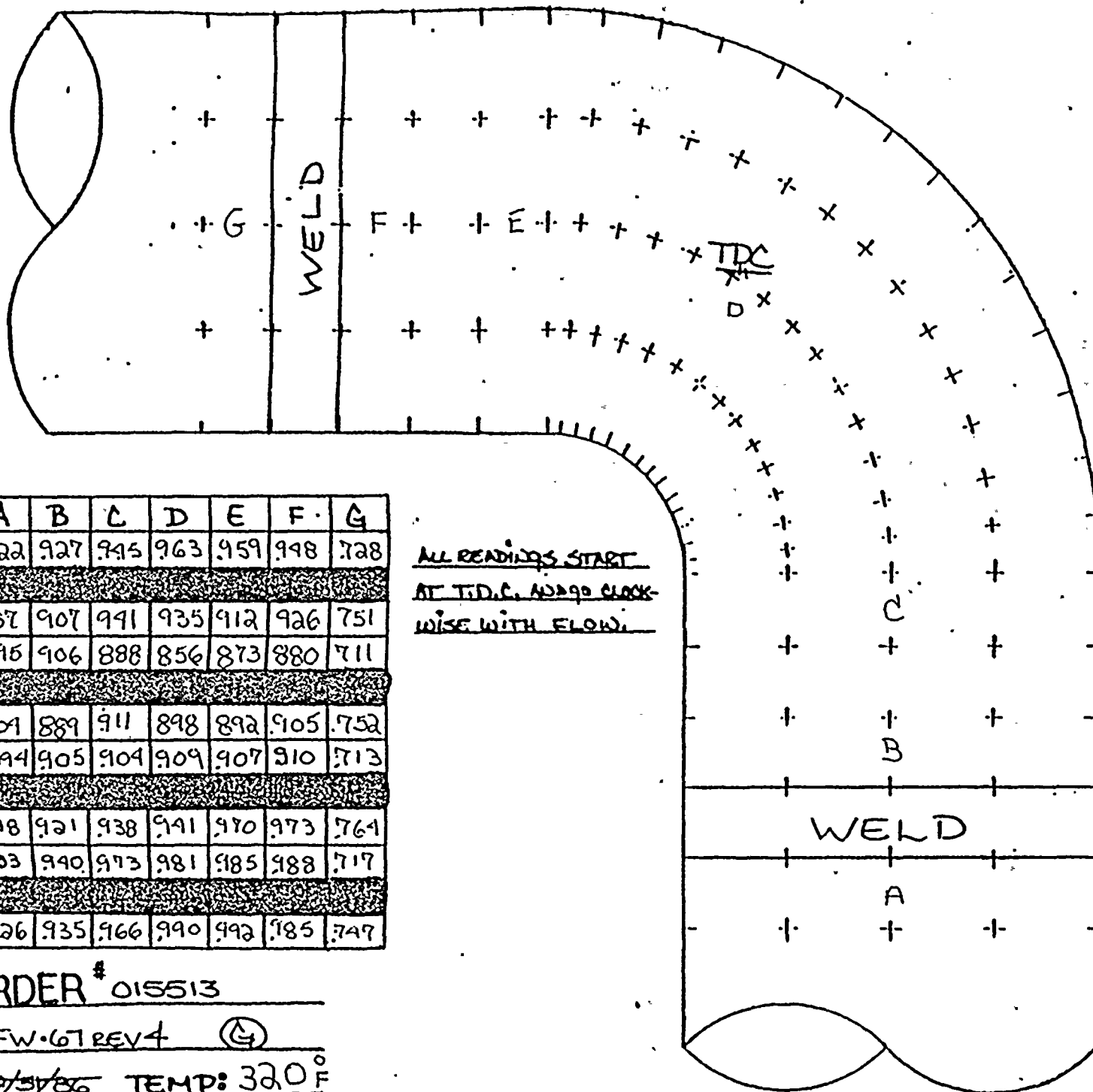
JOE ORDER # 015513

ISO # 2-FW-67 REV4 (D)

DATE: 12/31/86 TEMP: 120°F



← FLOW



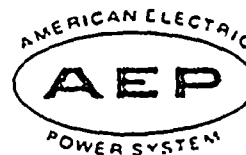
	A	B	C	D	E	F	G
0°	922	927	945	963	959	948	728
45°	907	907	941	935	912	926	751
90°	896	906	888	856	873	880	711
135°	901	889	911	898	892	905	752
180°	894	905	904	909	907	910	713
225°	918	921	938	941	970	973	764
270°	933	940	973	981	985	988	717
315°	926	935	966	990	992	985	747

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

JOE ORDER # 015513  
ISO # 2-FW-67 REV 4 (4)  
DATE: 12/3/86 TEMP: 320°F  
1/8/87



AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: JANUARY 13, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 1  
 Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. ~~J. A. Kobyra~~ *AK 1/13/87*  
 2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on JANUARY 12, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation				
<u>1-FW-1 REV. 4</u>							
<u>Sh. 1 of 2</u>	<u>CS</u>	<u>A</u>	<u>ACCEPTABLE, NO FURTHER ACTION REQUIRED</u>				
<u>1-FW-2, REV. 7</u>			<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>Sh. 1 of 2</u>	<u>CS</u>	<u>J</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>1-C-2, REV. 7</u>	<u>CS</u>	<u>I</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>1-C-56, REV. 4</u>	<u>CS</u>	<u>G</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
	<u>CS</u>	<u>H</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>

A. J. Lewandowski  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 4.6.3.15.2.5.2

Sheet No. 1 OF 1



と

Unit No. /

Years in service //

UT Reading Taken on: 1-9-87

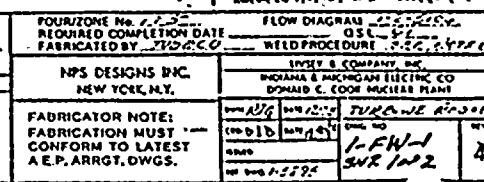
AEPSIC Installed Mat'l Class CS SCH.80

## COMMENTS

[illegible]



QC - J.O.# 0049



⑤ INDICATES LOCATION OF PIPE  
SUPPORT AND SUPPORT DETAIL  
NUMBER

1-FW-1  
SHT-10A-2

DRAWING APPROVED FOR

MRL 741 D.C. 4

FOUR/ZONE No. 7 FLOW DIAGRAM  
REQUIRED COMPLETION DATE QSL  
FABRICATED BY WELD PROCEDURE

NPS DESIGNS INC. NEW YORK, N.Y.	INVEST & COMPANY, INC. INDIANA & MICHIGAN ELECTRIC CO DONALD C. COOK NUCLEAR PLANT
------------------------------------	--

FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRG. DWGS.	DATE	BY	TURN IN
	DATE	BY	DATE
	DATE	BY	DATE

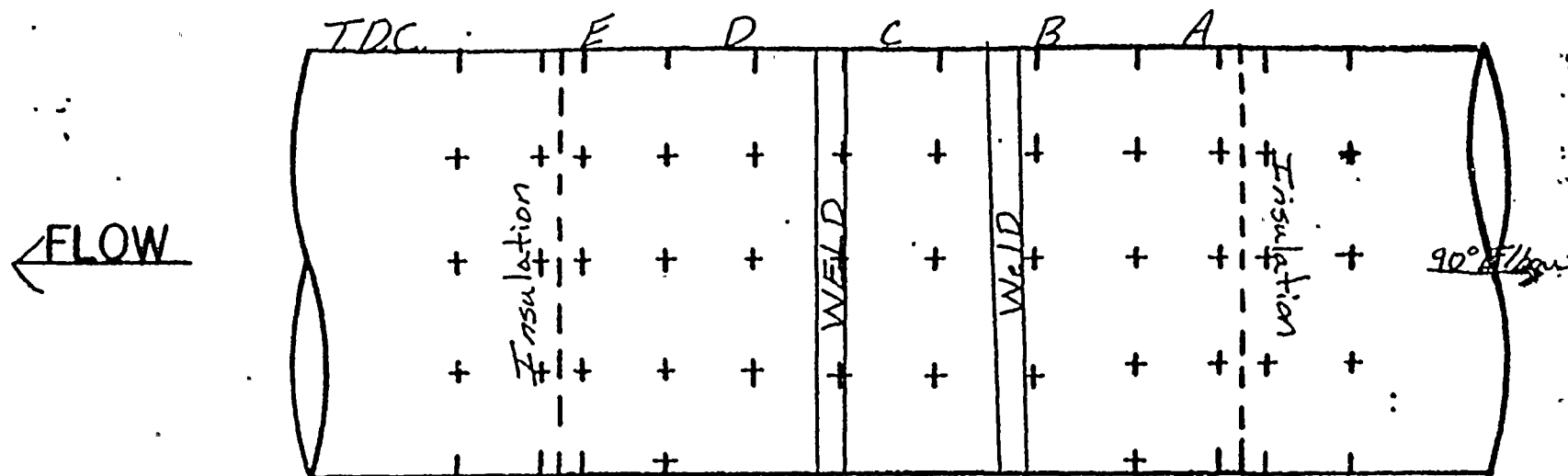
DATE	TIME	LOCATION	REMARKS
10/10/68	12:00	TURNER RD	1-FW-1
10/10/68	12:00	TURNER RD	2-FW-2

8.5'

11<sup>th</sup>

17"





ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	1104	1125	1116	1045	1120	—	—
30°	1079	1041	1061	1045	1090	—	—
60°	1108	1080	1064	1069	1098	—	—
90°	1058	1061	1071	1097	1095	—	—
120°	1078	1065	1080	1092	1087	—	—
150°	1085	1073	1088	1105	1083	—	—
180°	1114	1134	1116	1122	1119	—	—
210°	1097	1111	1119	1145	1108	—	—
240°	1081	1127	1123	1122	1120	—	—
270°	1105	1148	1149	1122	1120	—	—
300°	1101	1138	1123	1113	1109	—	—
330°	1111	1121	1115	1115	1108	—	—

JOB ORDER # 004954

IS 1-FW-1.5kt 10F2 Rev 4 (A<sup>2</sup>)

DATE - 10 07 1960



D. C. COOK NUMBER PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. 1

Evaluation Date: JANUARY 13, 1987

SER.No. 23-85 (Water) X

Years in service 19

UT Reading Transmitted on: 1-12-1987

UT Reading Taken on: 1-10-87

Isometric Dwg. NO. 1-FW-2, REV. 7 Sh. 1 of 2 AEPSC Installed Mat'l Class CARBON STEEL, SCH. 80

Plant

(I.D.)

Camp.

Component

### Description

Original

Wall Thk.

Original

Thk. Range

Req'd

Trên

Lowest

## Reading

Percent

Eroded

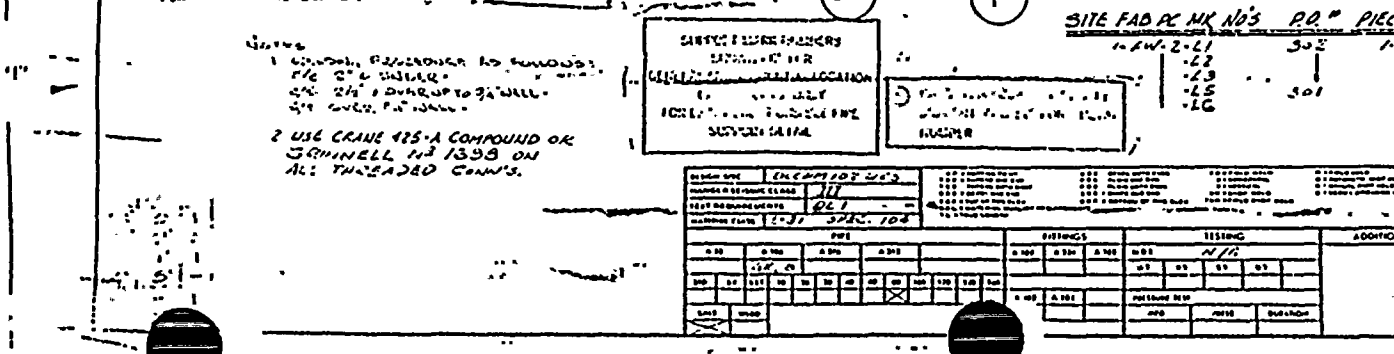
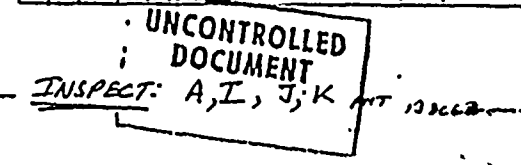
## COMMENTS

J	4" 90° ELL	.337	.295	.379	.170	.370	0%	STILL WITHIN MANUFACTURERS TOLERANCE
I	20" STRAIGHT $\phi$	1.031	.902	1.160	.756	1.010	0%	" " " "

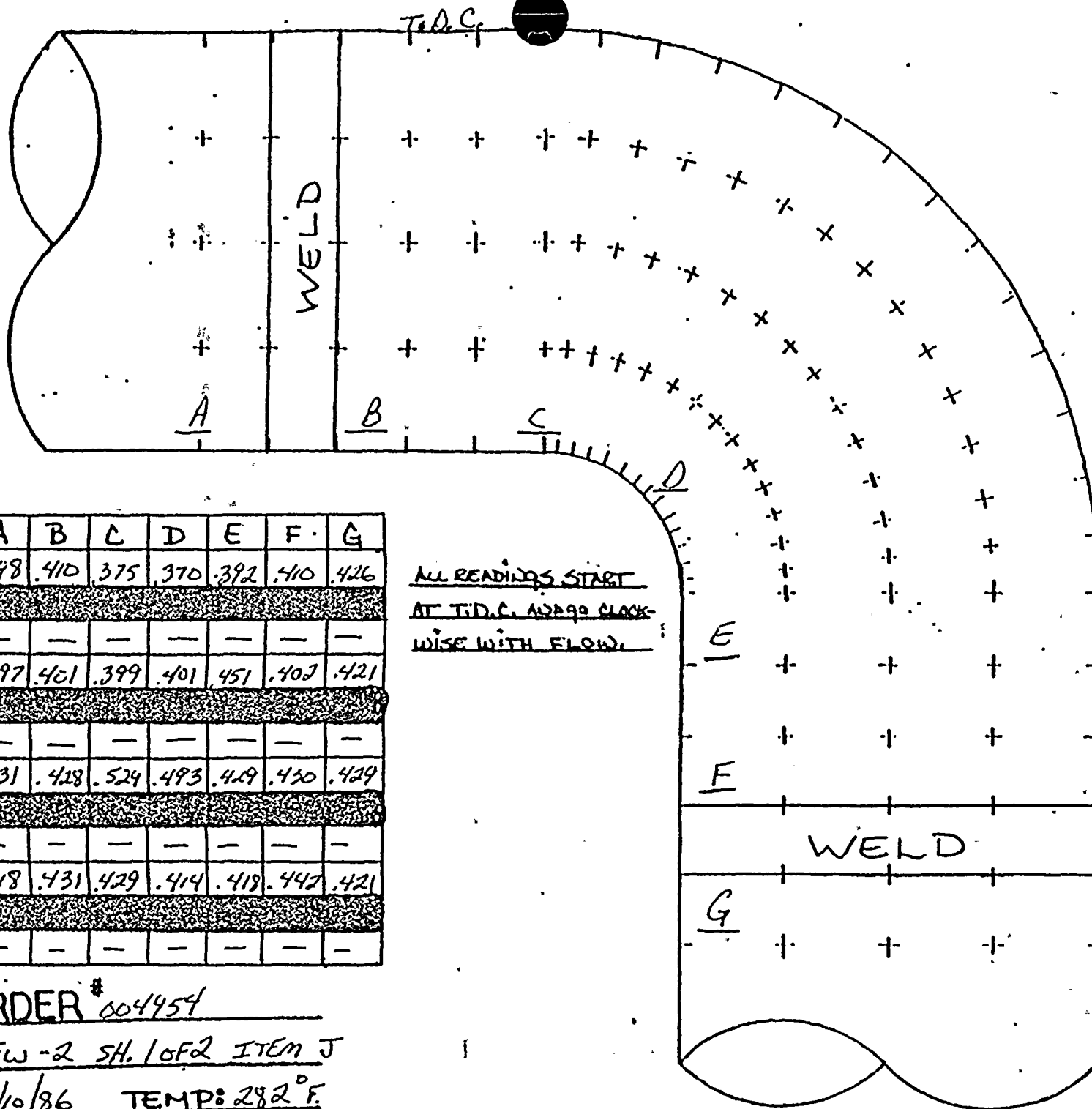
[illegible]



J.O.# 004953

[illegible]



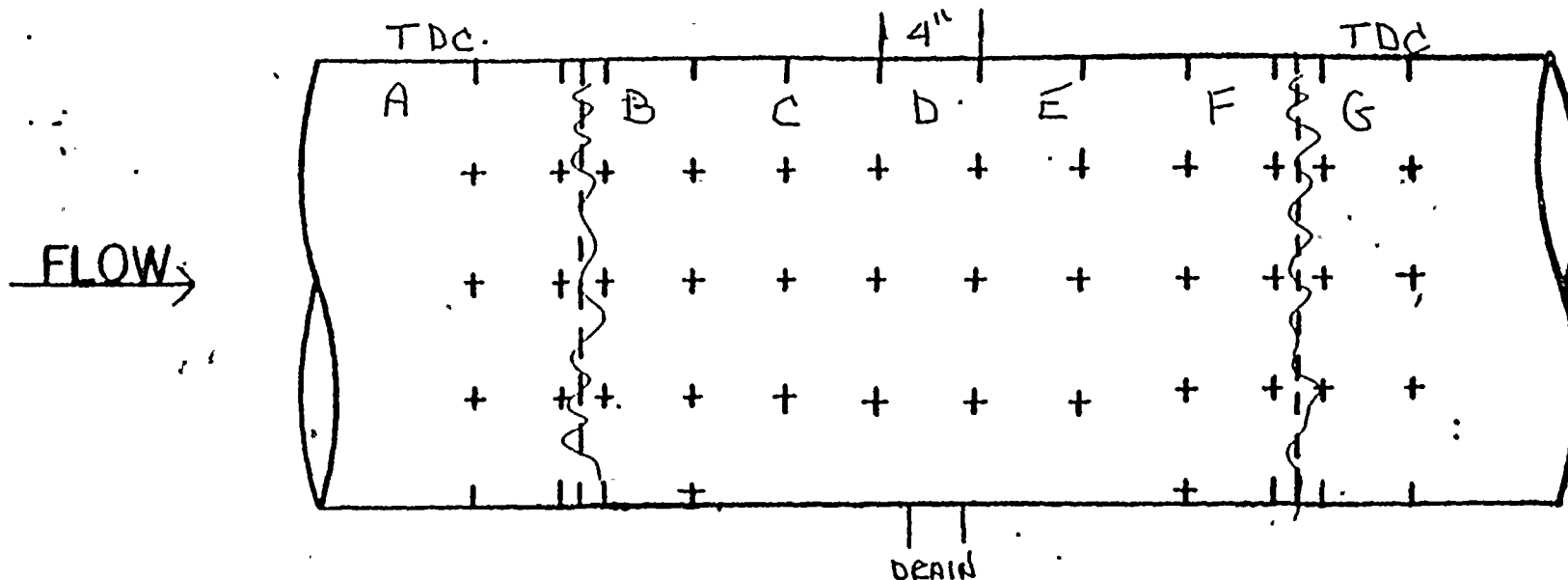


	A	B	C	D	E	F	G
0°	.398	.410	.375	.370	.392	.410	.426
45°	—	—	—	—	—	—	—
90°	.397	.401	.399	.401	.451	.402	.421
135°	—	—	—	—	—	—	—
180°	.431	.428	.524	.493	.429	.420	.429
225°	—	—	—	—	—	—	—
270°	.418	.431	.429	.414	.418	.442	.421
315°	—	—	—	—	—	—	—

ALL READINGS START  
AT T.I.D.C. 12290 CLOCK-  
WISE WITH FLOW.

JOE ORDER # 004454  
ISO# 1-FW-2 SH. 1 OF 2 ITEM J  
DATE: 1/10/86 TEMP: 28.2° F.





ALL READINGS START AT  
TDC AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	1.032	1.035	1.039	1.033	1.023	1.042	1.013
30°	1.020	1.031	1.034	1.061	1.013	1.024	1.071
60°	1.091	1.028	1.040	1.024	1.028	1.029	1.041
90°	1.089	1.073	1.070	1.059	1.085	1.049	1.098
120°	1.096	1.049	1.036	1.048	1.035	1.046	1.041
150°	1.029	1.081	1.090	1.092	1.085	1.100	1.044
180°	1.022	1.015	1.010	1.016	1.028	1.024	1.118
210°	1.027	1.061	1.042	1.020	1.110	1.082	1.069
240°	1.026	1.086	1.085	1.047	1.052	1.100	1.083
270°	1.025	1.027	1.028	1.036	1.084	1.047	1.043
300°	1.036	1.102	1.032	1.029	1.033	1.031	1.032
330°	1.040	1.045	1.046	1.032	1.016	1.024	1.026

JOB ORDER # 004954

ISC-1-FW-2 SHT. 1 OF 2 (I)

DATE: 1/10/97 TEMP: 282°F



# EROSION EVALUAT. WORKSHEET

Unit No. /

Years in service //

UT Reading Taken on: 1-9-87

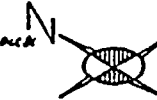
AEPSIC Installed Mat'l Class CARBON STEEL SCH. 40 X-HVY

## COMMENTS

C 24 90° ELL .500 .438 .563 .342 .436 0% STILL WITHIN MANUFACTURERS TOLERANCE



INSPECT: C, M, P, M



### SITE FIND PLACE MARKS

P.O. # PIECE MARKS

1.0.21

113 1-C-2-1  
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Notes

1) Use CRANE 225-A COMPOUND ON ALL THREE COATS:

SUPPORT MARK NUMBERS  
SHOWN ARE FOR  
GENERAL AND SEQUENTIAL LOCATION  
OF SUPPORTS ONLY  
FOR EXACT LOCATIONS SEE PIPE  
SUPPORTS LIST

⊗ INDICATES LOCATION OF PIPE  
SUPPORT AND SUPPORT DETAIL  
NUMBER

[illegible]

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN MICHIGAN  
UNIT NO. 1

A-53		A-100		A-329		A-313				SHE 5		DATE: 8/22/64							
STD		SY		311		50		30		40		00 80 100 120 140 160							
C		PROB		AREA		RSD		QUAN		JOB		OWNS CODE							
A		522.0		740.0		15.0		10.0		10.0		10.0							
A		17.4		15.7				005050											
DESCRIPTION												REF		COMPL.		S.S.		M	
CONDENSATE																			
PLANT		V-2		BLAST		THER		BACK		SUCK		V-2							
SIL BELLY		INTOMO		-		RT.													
WT.		MT		-		PT.		/		OY									
DTC		0.5		all		off		1.5220		-		M. 1111							

T

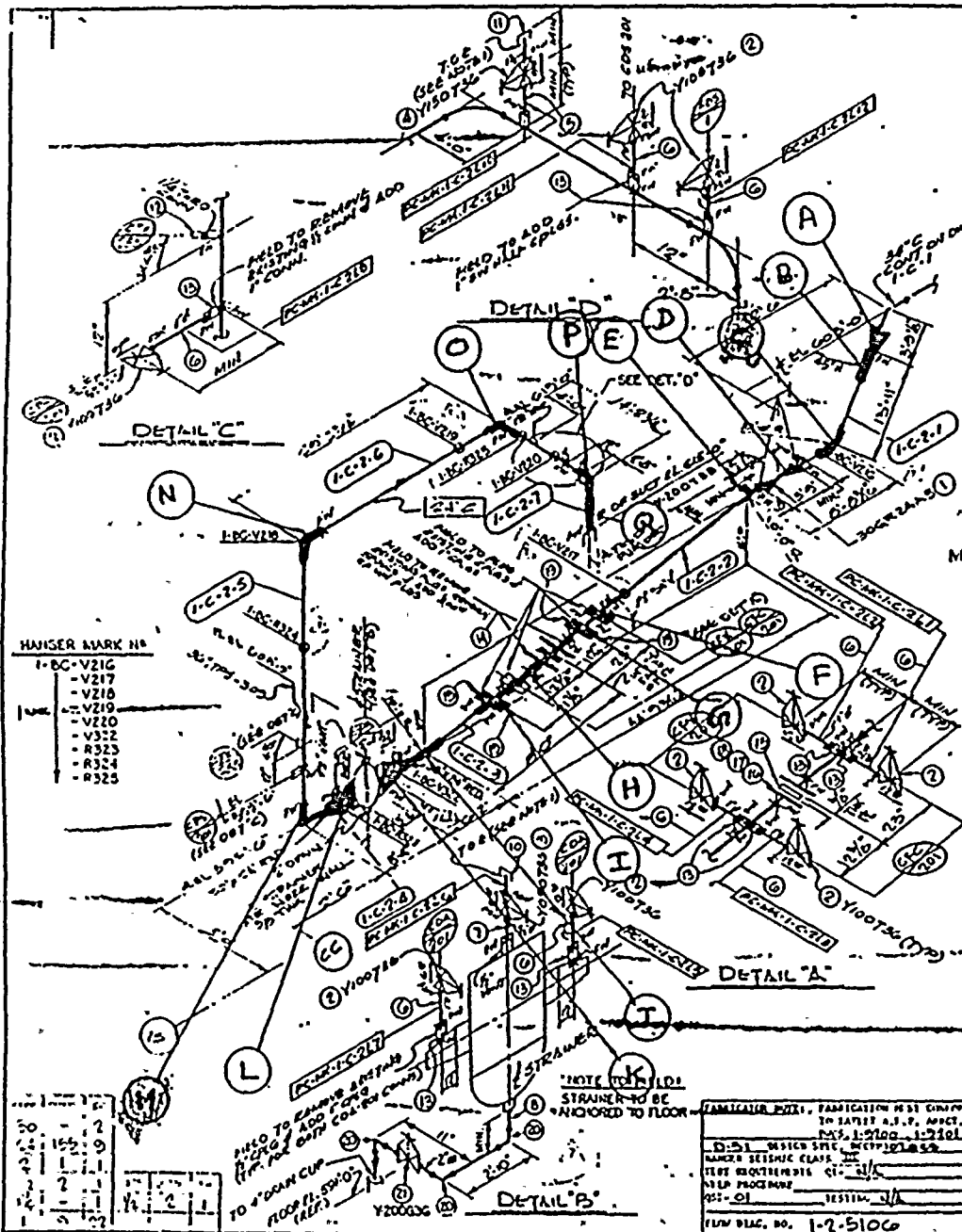
TUBECO

123 VARICK AVENUE  
 BROOKLYN, N. Y. 11211

**MATERIAL REQUIRED FOR  
FIELD REWORK**

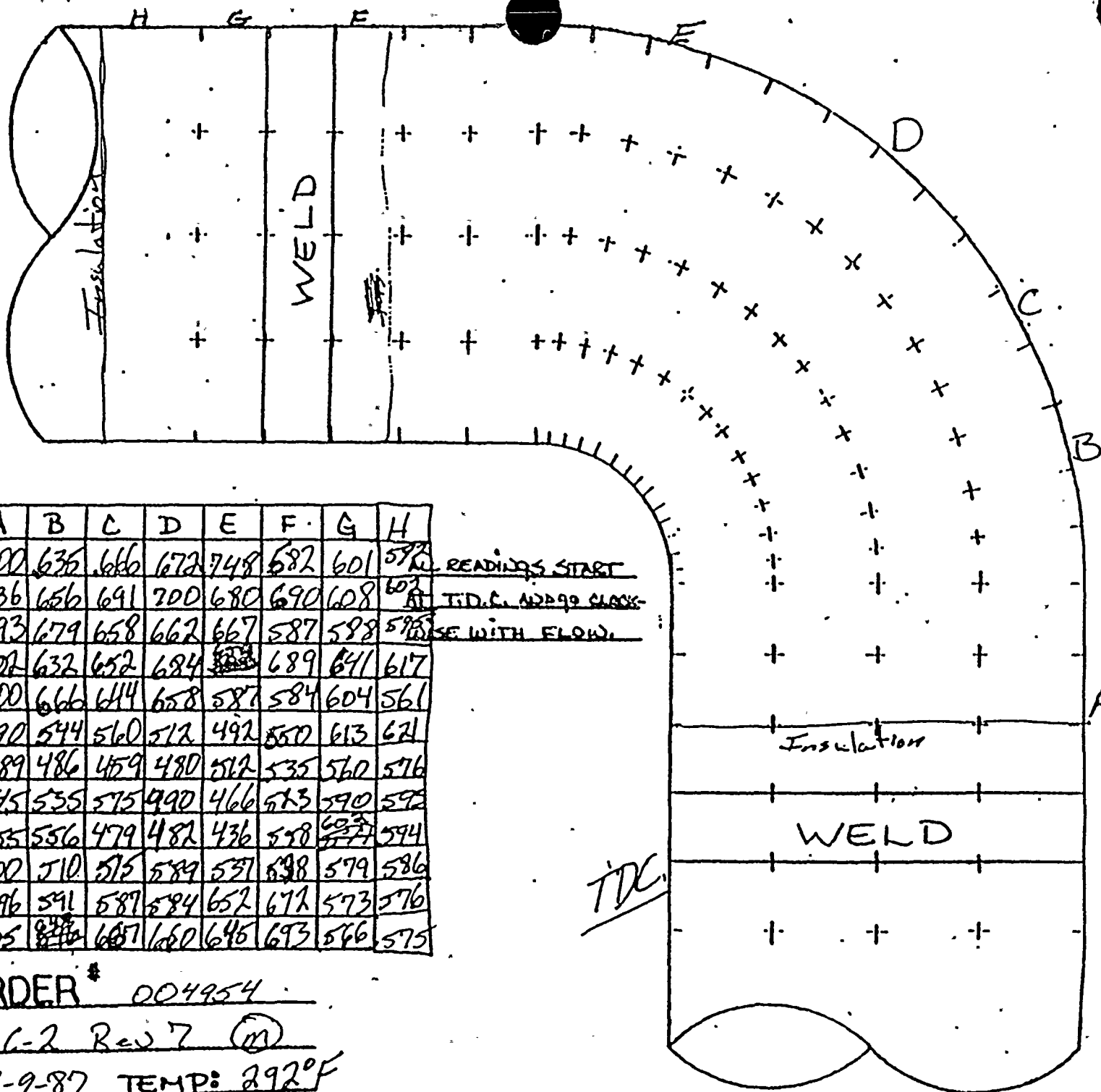
UNCONTROLLED  
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DWG NO 1-C-2 REV 7





← FLOW



TDC

	A	B	C	D	E	F	G	H
0°	700	636	666	672	748	682	601	572
30°	736	656	691	700	680	690	608	602
60°	693	679	658	662	667	587	588	575
90°	702	632	652	684	689	641	617	
120°	600	666	644	658	587	584	604	561
150°	490	544	560	512	492	550	613	621
180°	589	486	459	480	512	535	560	576
210°	545	535	575	490	466	513	590	592
240°	455	556	479	482	436	538	577	594
270°	600	510	515	589	531	638	579	586
300°	596	591	587	584	652	672	573	576
330°	605	578	607	660	645	693	546	575

READINGS START  
AT T.D.C. APPROX. CLOCK-  
WISE WITH FLOW.

TDC

JOB ORDER # 004954  
ISO # 1-6-2 Rev 7 (M)  
DATE: 1-9-87 TEMP: 292°F







WEEK #15

CUT J.O. # 004952

J.O. # 004953

Q.L. J.O. #

54

# LEVEL 1 FAB. & MAT'L

SITE FAB. P.C. NIK. NA

I.C. 50-11  
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100-1

INSPECT!

B, K, H, E

FIELD NOTE:  
STRAINER TO BE  
ANCHORED TO FLOOR

DETAIL 'C'

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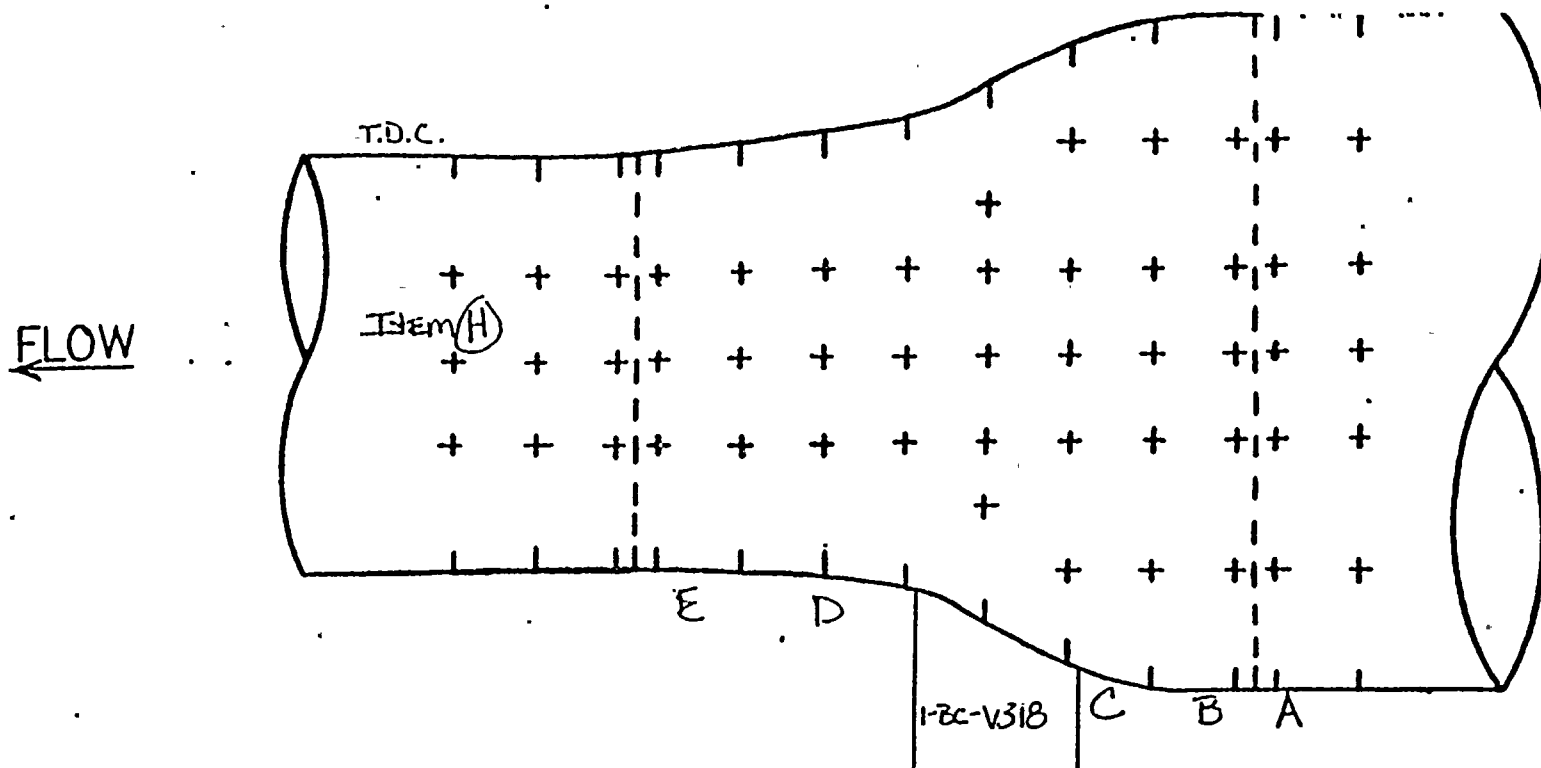
276

277

278

279





ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH  
FLOW.

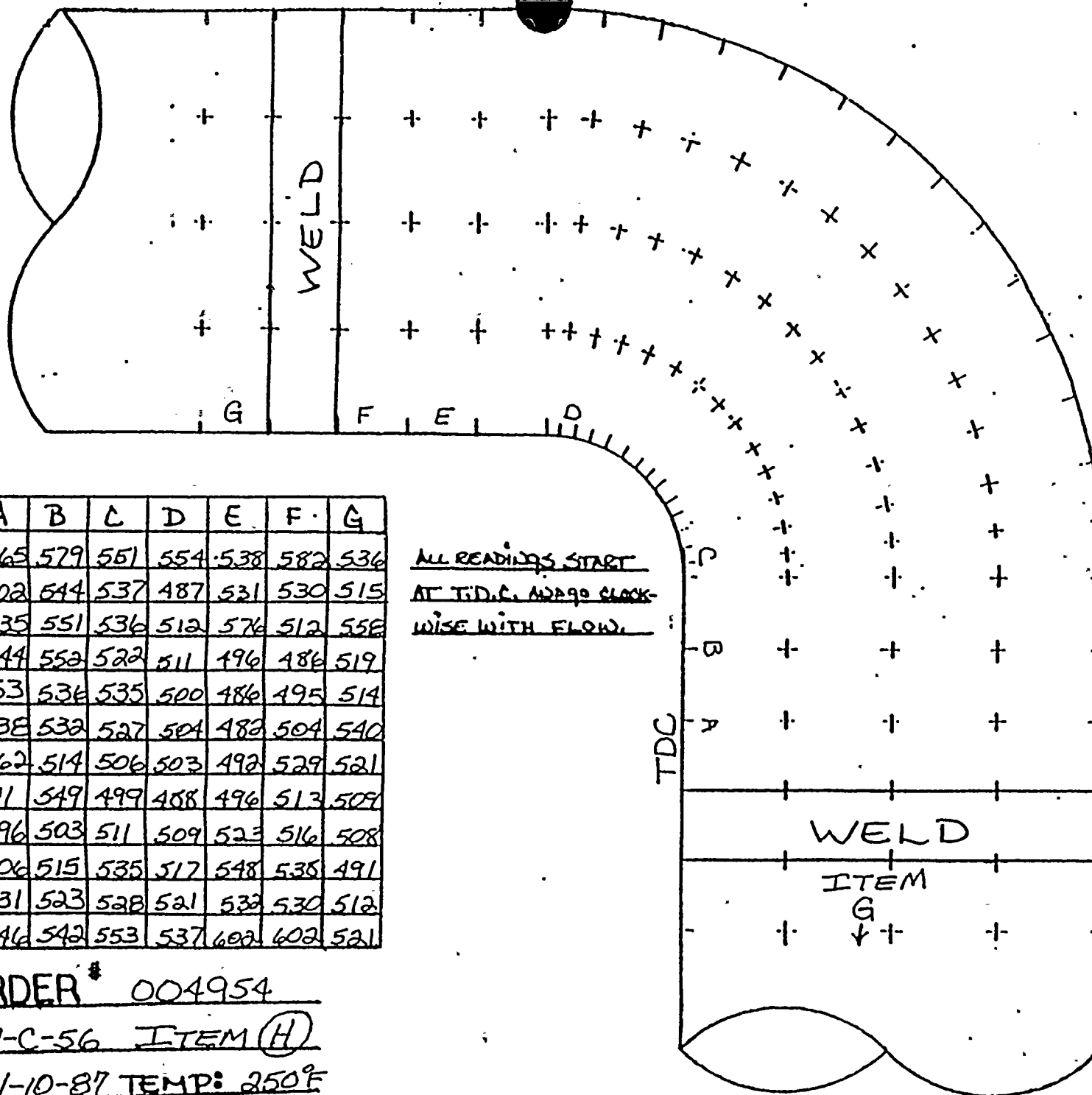
TDC

	A	B	C	D	E	F	G
0°	.937	.557	.570	.598	.568	—	—
30°	1.047	.591	.591	.631	.590	—	—
60°	.845	.579	.556	.620	.603	—	—
90°	.943	.552	.551	.598	.598	—	—
120°	1.003	.560	.549	.671	.600	—	—
150°	1.059	.573	.564	.604	.583	—	—
180°	.953	.602	.504	.608	.548	—	—
210°	.820	.548	.566	.570	.546	—	—
240°	.823	.535	.534	.616	.532	—	—
270°	.837	.604	.554	.646	.509	—	—
300°	.960	.502	.524	.616	.535	—	—
330°	.866	.529	.549	.622	.545	—	—

JOB ORDER# 004954  
1-C-56 ITEM (G)



← FLOW



TDC

	A	B	C	D	E	F	G
0°	565	579	561	554	538	582	536
30°	602	644	537	487	531	530	515
60°	535	551	536	512	576	512	558
90°	544	552	522	511	496	486	519
120°	553	536	535	500	486	495	514
150°	538	532	527	504	482	504	540
180°	562	514	506	503	492	529	521
210°	511	549	499	488	496	513	509
240°	496	503	511	509	523	516	508
270°	506	515	535	517	548	538	491
300°	531	523	528	521	532	530	512
330°	546	542	553	537	602	602	521

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

TDC

JOB ORDER # 004954  
ISO# 1-C-56 ITEM (H)  
DATE: 1-10-87 TEMP: 250°F



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1



## 1

Unit No. 2

Years in service 9

UT Reading Taken on: 1-9-87

AEPSIC Installed Mat'l Class CS, X-HVY

Plant

(I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
A	24" <sup>45°</sup> <del>90°</del> ELL	.500	.438 ~ .563	<del>.375</del> .312	.490	0%	STILL WITHIN MANUFACTURERS TOLERANCE

This image shows a full page of primary-ruled notebook paper. It features ten horizontal rows, each defined by two parallel dashed lines. Vertical solid lines are positioned at approximately one-fifth and four-fifths of the page width from the left edge, creating narrow margins on both sides. The paper is otherwise blank, with no handwriting or other markings.



WEEK # 14

QC - J.O. # 015513  
CONST - J.O. # 015511

J.O. # 015512

ISO SHE NO 7372

MATERIAL DESCRIPTION		QUANTITY	REMARKS
1	24" 300# 40 THK R, D. 13577	1	CFE-201
2	24" 300# 40 THK R, D. 13577	1	CFE-201
3	24" 300# 40 THK R, D. 13577	1	CFE-201
4	24" 300# 40 THK R, D. 13577	1	CFE-201
5	24" 300# 40 THK R, D. 13577	1	CFE-201
6	24" 300# 40 THK R, D. 13577	1	CFE-201
7	24" 300# 40 THK R, D. 13577	1	CFE-201
8	24" 300# 40 THK R, D. 13577	1	CFE-201
9	24" 300# 40 THK R, D. 13577	1	CFE-201
10	24" 300# 40 THK R, D. 13577	1	CFE-201
11	24" 300# 40 THK R, D. 13577	1	CFE-201
12	24" 300# 40 THK R, D. 13577	1	CFE-201
13	24" 300# 40 THK R, D. 13577	1	CFE-201
14	24" 300# 40 THK R, D. 13577	1	CFE-201
15	24" 300# 40 THK R, D. 13577	1	CFE-201

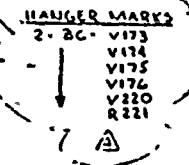
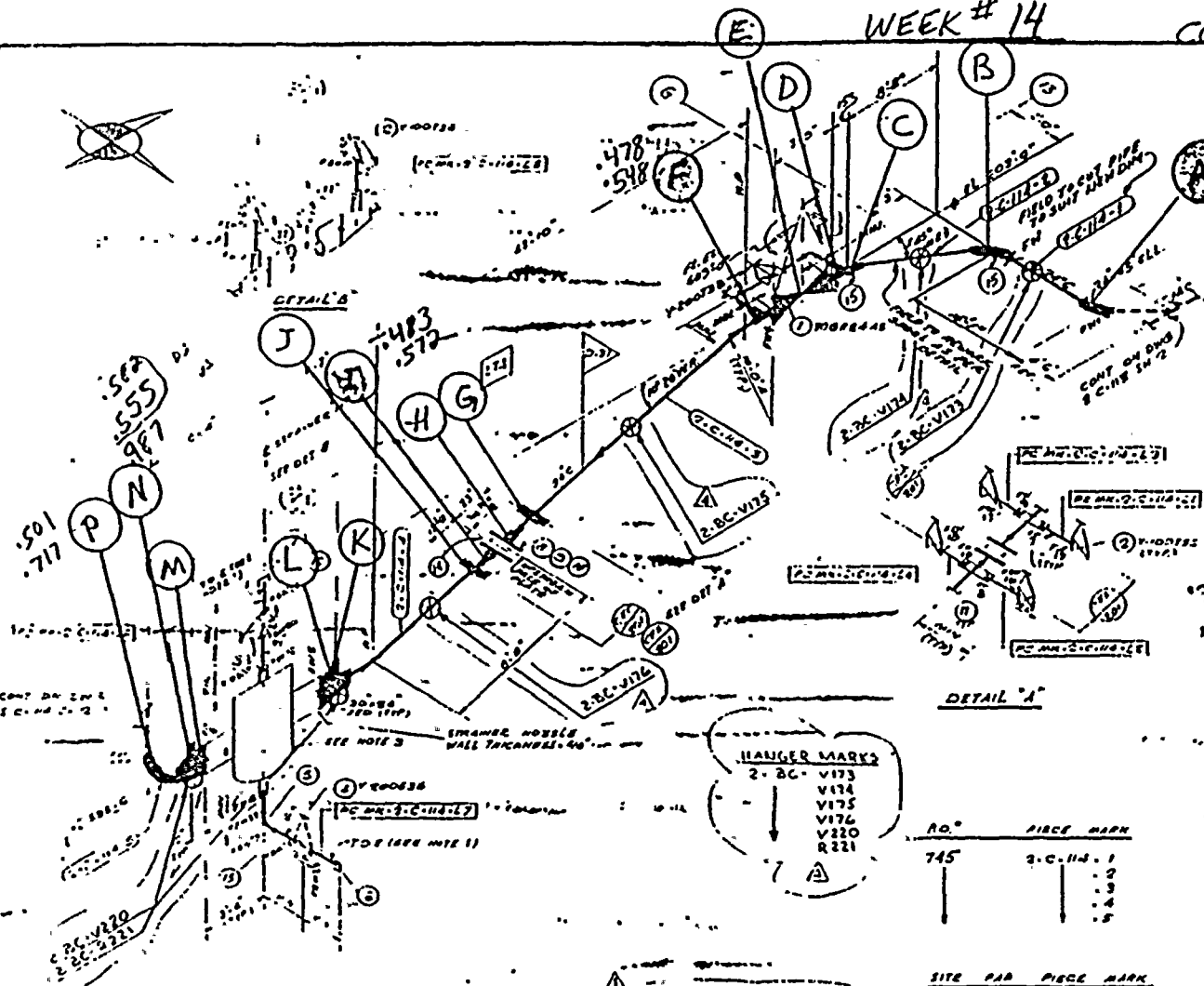
REVISION RECORD		DESCRIPTION	REMARKS
1	10-10-70	10-10-70 HAS 9-43; ADDED ITEM 14 TO B/L.	REVISION 10-10-70
2	10-10-70	PER AEP ARRGY 2-5203-2	REVISION 10-10-70
3	10-10-70	PER AEP ARRGY 2-5203-2	REVISION 10-10-70
4	10-10-70	PER AEP ARRGY 2-5203-2	REVISION 10-10-70

INSPECT:

F, I, J, M, N, P ANT 1356286

UNCONTROLLED DOCUMENT

2-C-114  
SHEET 1 OF 2



NO.	PIECE MARK
745	2-C-114-1
	2
	3
	4
	5

SITE	PAR	PIECE MARK
		2-C-114-1
		2
		3
		4
		5
		6
		7
		8

1. USE CRANE SET A COMPOUND ON ALL TRAD CONNECTIONS

2. FIELD PROCEDURE AS FOLLOWS:  
a. 8" INCH  
b. 8" INCH  
c. STRAINER TO BE ADJUSTED TO FRONT OF FIELD.

⑤ INDICATES LOCATION OF PIPE SUPPORT AND SUPPORT DETAIL NUMBER

SUPPORT MARK NUMBERS  
STANDARD FOR  
GENERAL AND SPECIAL LOCATION  
OF SUPPORTS ONLY  
FOR EXACT LOCATION SEE THE  
SUPPORT DATA.

INSULATION		
ITEM	QTY	REMARKS
1	1	24\"/>

MATERIALS		METHODS		TESTING		ADDITIONAL	
ITEM	QTY	ITEM	QTY	ITEM	QTY	ITEM	QTY
1	1	1	1	1	1	1	1
2	1	2	1	2	1	2	1
3	1	3	1	3	1	3	1
4	1	4	1	4	1	4	1
5	1	5	1	5	1	5	1
6	1	6	1	6	1	6	1
7	1	7	1	7	1	7	1
8	1	8	1	8	1	8	1
9	1	9	1	9	1	9	1
10	1	10	1	10	1	10	1
11	1	11	1	11	1	11	1
12	1	12	1	12	1	12	1
13	1	13	1	13	1	13	1
14	1	14	1	14	1	14	1
15	1	15	1	15	1	15	1
16	1	16	1	16	1	16	1
17	1	17	1	17	1	17	1
18	1	18	1	18	1	18	1
19	1	19	1	19	1	19	1
20	1	20	1	20	1	20	1

FOUR/ONE No. 272 REQUIRED COMPLETION DATE: 10-10-70 FABRICATED BY: FUSECO	FLOW DIAGRAM: 051 FIELD PROCEDURE: 117 5012
NPS DESIGNS INC. NEW YORK, N.Y.	INDIANA & MICHIGAN ELECTRIC CO BONARD C. COOL NUCLEAR PLANT
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRGY DWGS.	2-C-114 SHEET 1 OF 2



FLOW →

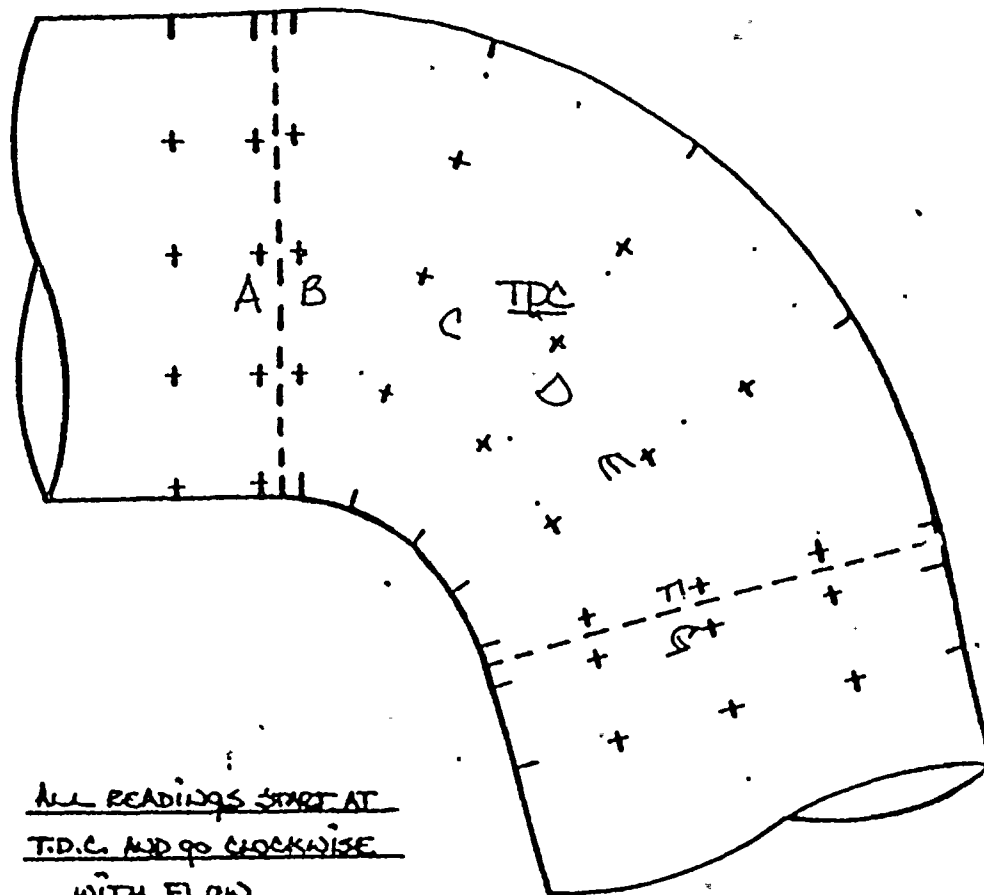
TDC

	A	B	C	D	E	F	G
0°	.510	.612	.633	.598	.604	.610	.500
30°	.496	.594	.591	.598	.601	.608	.503
60°	.496	.564	.581	.593	.503	.593	.509
90°	.507	.515	.548	.552	.552	.545	.497
120°	.503	.612	.600	.582	.658	.599	.511
150°	.506	.605	.623	.622	.641	.633	.588
180°	.504	.602	.681	.674	.623	.621	.507
210°	.498	.600	.552	.548	.555	.606	.571
240°	.499	.538	.583	.584	.540	.532	.505
270°	.568	.511	.520	.538	.552	.526	.494
300°	.502	.570	.591	.598	.623	.604	.510
330°	.490	.581	.630	.601	.641	.634	.501

JOB ORDER\*\* 015513

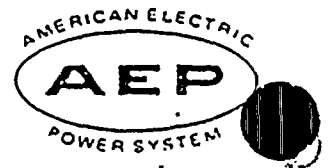
ISO\*\* 2.0-114 SHT 1 F2 REV 4 (A)

DATE: 1/9/87 TEMP: 252°F





AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: JANUARY 13, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 2  
 \_\_\_\_\_ Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. ~~J. A. Kobyra~~ AK 1/13/87  
 2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on JANUARY 5, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
2-C-112, 2	CS	E	ACCEPTABLE, NO NEED FOR FURTHER INSPECTION
2-C-112, 2		L	
2-C-113, Sh. 1 of 3		E	
2-C-113, Sh. 1 of 3		G	
2-C-113, Sh. 1 of 3		N	
2-C-113, Sh. 2 of 3		A	
2-C-113, Sh. 2 of 3	BRANCH MAIN	C	
2-C-113, Sh. 2 of 3		D	
2-C-113, Sh. 2 of 3	BRANCH MAIN	E	
2-C-113, Sh. 2 of 3	BRANCH MAIN	K	

A. J. Lewandowski  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 4.6.3 15.2.5.2

Sheet: 1 of 2



D. C. Cook Nuclear Plant, Unit No. 2  
 Steam Piping; Erosion Program, SER No. 88-84  
☒ Water Piping Erosion Program, SER No. 23-85  
 Engineering evaluation of Wall Thickness Measurements  
 Date: JANUARY 13 1987  
 Sheet No. 2 of 2

[illegible]



# EROSION EVALUATION WORKSHEET

Unit No. 2

Years in service 9

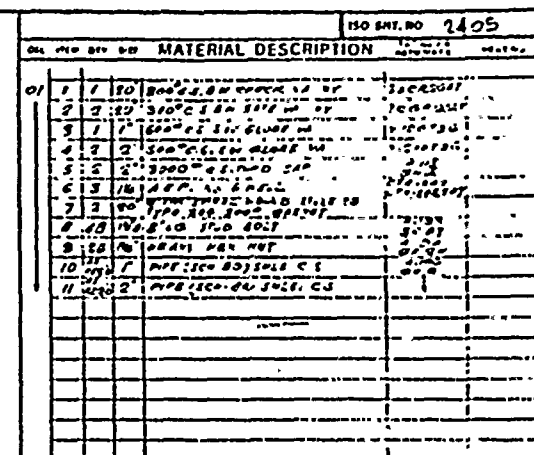
UT Reading Taken on: 12-22-86

AEPSO Installed Mat'l Class CARBON STEEL X-HVY

[illegible]



WEEK #14:



REVISION RECORD				
NO	DATE	BY	DESCRIPTION	REMARKS
1	11/1/54	JD	Y-FOOTSC WAS YIDOTSL A.E.P. ARRG'T. DWG 2-5200-6	NO ACTION REQ'D
2	11/1/54	JD	ELEV. 555'-10" WAS 555'-7 1/2".	NO ACTION REQ'D

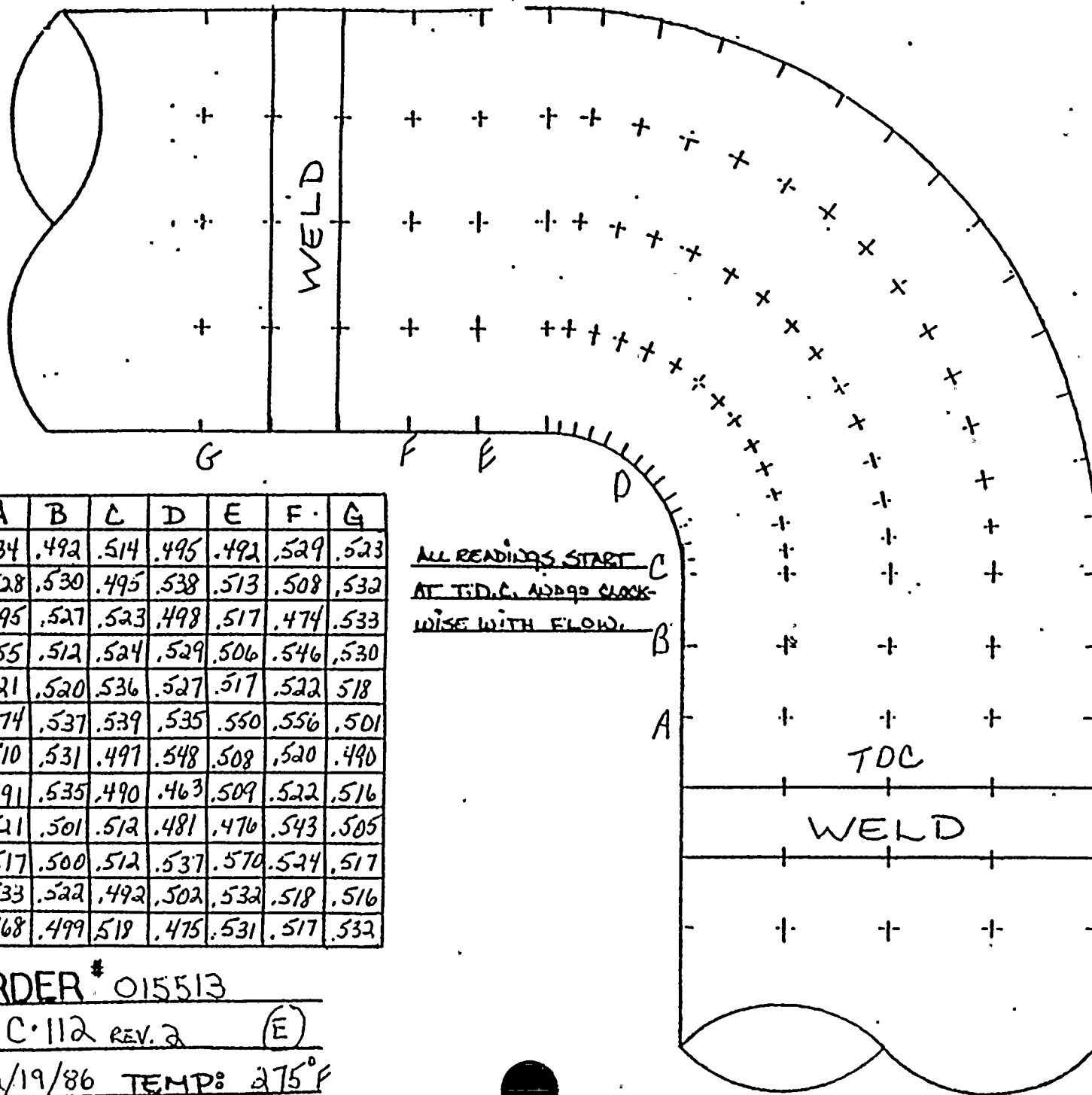
INSPECT: E, L Mr 13JAC86

**UNCONTROLLED  
DOCUMENT**

DRAWING NO. <b>DCCPM 106 E.C.S.</b> PROJECT NO. <b>106</b> PROJECT DESCRIPTION <b>106</b> PROJECT LOCATION <b>106</b> PROJECT CLIENT <b>D. J. 106 106</b>		FLOW DIAGRAM <b>106</b> FLOW RATE <b>106</b> FLOW DIRECTION <b>106</b> FLOW TYPE <b>106</b> FLOW UNIT <b>106</b>	
FLOW RATE <b>106</b> FLOW DIRECTION <b>106</b> FLOW TYPE <b>106</b> FLOW UNIT <b>106</b>		FLOW RATE <b>106</b> FLOW DIRECTION <b>106</b> FLOW TYPE <b>106</b> FLOW UNIT <b>106</b>	



← FLOW



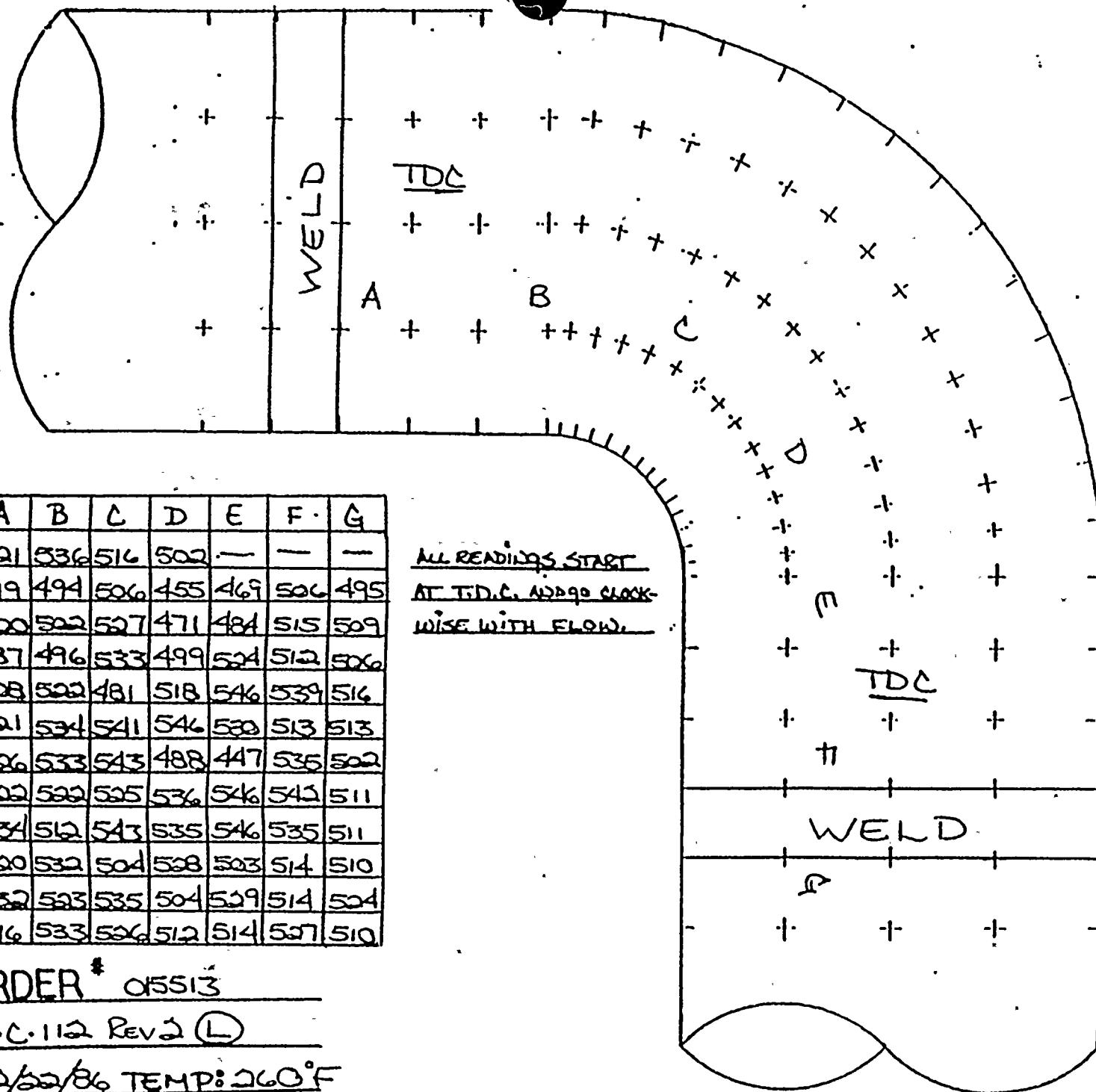
ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

	A	B	C	D	E	F	G
0°	.534	.492	.514	.495	.492	.529	.523
30°	.528	.530	.495	.538	.513	.508	.532
60°	.495	.527	.523	.498	.517	.474	.533
90°	.555	.512	.524	.529	.506	.546	.530
120°	.521	.520	.536	.527	.517	.522	.518
150°	.574	.537	.539	.535	.550	.556	.501
180°	.510	.531	.497	.548	.508	.520	.490
210°	.491	.535	.490	.463	.509	.522	.516
240°	.521	.501	.512	.481	.476	.543	.505
270°	.517	.500	.512	.537	.570	.524	.517
300°	.533	.522	.492	.502	.532	.518	.516
330°	.468	.499	.519	.475	.531	.517	.532

JOB ORDER # 015513  
ISO # 2.C.112 REV. 2 (E)  
DATE: 12/19/86 TEMP: 275°F



FLOW →



TDC

	A	B	C	D	E	F	G
0°	521	536	516	502	—	—	—
30°	519	494	506	455	469	506	495
60°	500	522	527	471	484	515	509
90°	487	496	533	499	524	512	506
120°	508	522	481	518	546	539	516
150°	521	534	541	546	533	513	513
180°	526	533	543	488	447	535	502
210°	522	522	525	536	546	542	511
240°	534	512	543	535	546	535	511
270°	520	532	504	528	523	514	510
300°	532	533	535	504	529	514	524
330°	516	533	526	512	514	527	510

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

TDC

WELD

JOB ORDER # 05513

ISO# 2.C.112 Rev 2 (L)

DATE: 12/22/86 TEMP: 260°F



# EROSION EVALUATION WORKSHEET

AEPSIC Installed Mat'l Class CARBON STEEL, X-HVY

<u>E</u>	20" STRAIGHT $\phi$	.500"	.438	.563	<del>.205</del> .329	.493	.096	STILL WITHIN MANUFACTURERS TOLERANCE
<u>G</u>	20" 90° ELL	.500"	.438	.563	<del>.205</del> .329	.458	.096	" " " "
<u>N</u>	20" STRAIGHT $\phi$	.500"	.438	.563	<del>.205</del> .329	.474	.096	" " " "



WEEK #14

W.C. - J.O. 015513  
CONST - J.O. # 015511  
J.O. # 015512

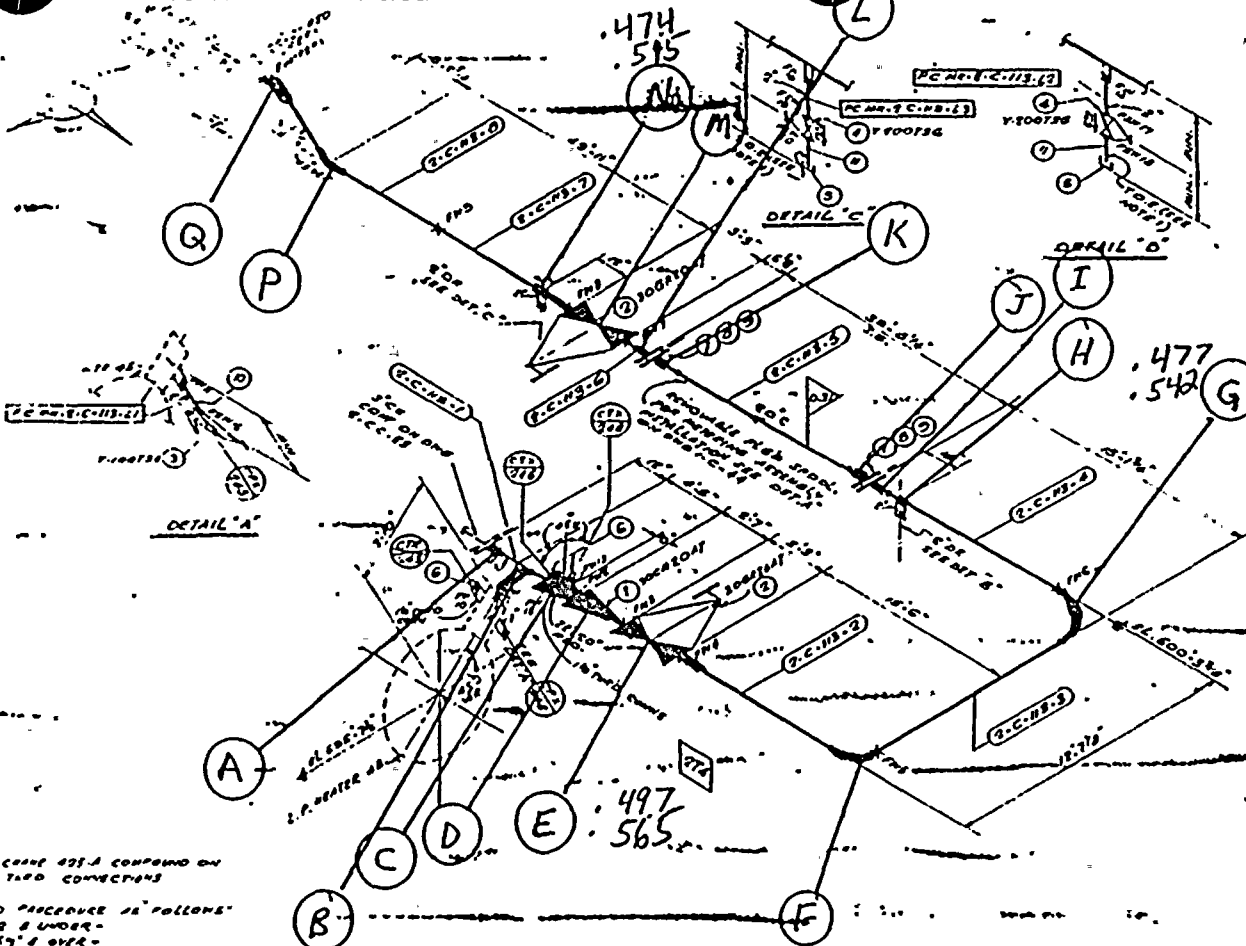
150 SHIP NO 7362

MATERIAL DESCRIPTION		QTY	UNIT
1	1" 300" C.S. BNC-25 W. 1/2"	1	PC
2	1" 300" C.S. BNC-25 W. 1/2"	1	PC
3	1" 300" C.S. BNC-25 W. 1/2"	1	PC
4	1" 300" C.S. BNC-25 W. 1/2"	1	PC
5	1" 300" C.S. BNC-25 W. 1/2"	1	PC
6	1" 300" C.S. BNC-25 W. 1/2"	1	PC
7	1" 300" C.S. BNC-25 W. 1/2"	1	PC
8	1" 300" C.S. BNC-25 W. 1/2"	1	PC
9	1" 300" C.S. BNC-25 W. 1/2"	1	PC
10	1" 300" C.S. BNC-25 W. 1/2"	1	PC
11	1" 300" C.S. BNC-25 W. 1/2"	1	PC

REVISION RECORD	
NO.	DATE

INSPECT: E, G, N  
150 SHIP NO 7362UNCONTROLLED  
DOCUMENT

DESIGN DATE: 05/01/68 DESIGNED BY: J.O. # 015511 CHECKED BY: J.O. # 015512 APPROVED BY: J.O. # 015513		FOUR/ONE NO. 113 REQUIRED COMPLETION DATE: 12/31/68 FABRICATED BY: J.O. # 015511		FLOW DIAGRAM: 113-01 WELD PROCEDURE: 113-01	
NPS DESIGNS INC. NEW YORK, N.Y.		LINDY & COMPANY, INC. INDIANAPOLIS, IND.		DONALD C. COOK NUCLEAR PLANT	
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRG. DWGS.		THERMONE GLOBE 2-C-113 SH. 1078		150 SHIP NO 7362	



P.O. #

PIECE MARK  
2-C-113-1  
2  
3  
4  
5  
6  
7  
8

SITE FAB. PIECE MARK

2-C-113-1  
18  
13

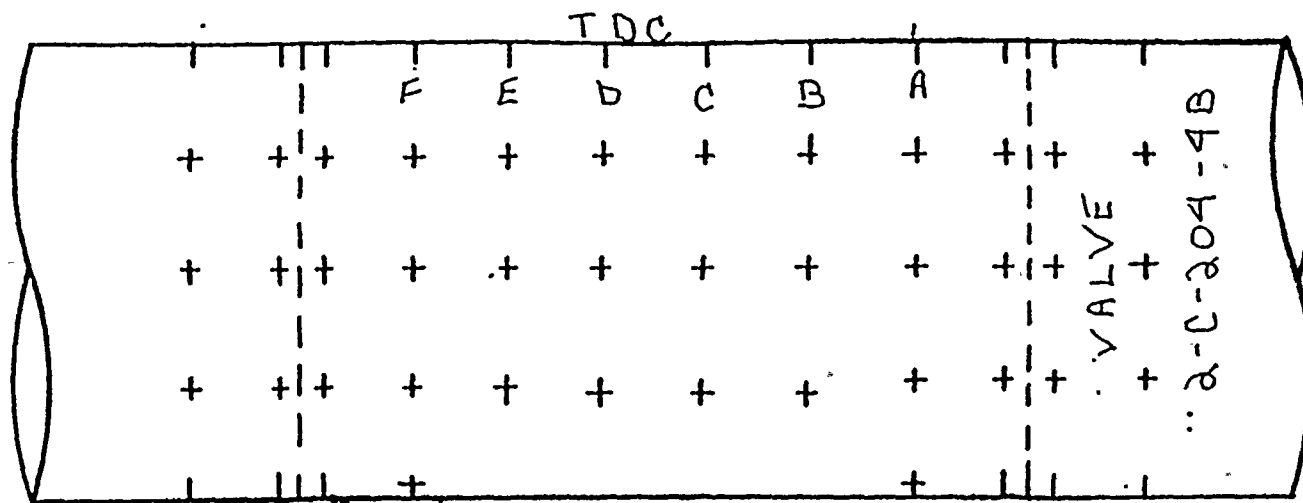
NOTES

1. SEE CHINE 113-A CONFORM ON ALL TAP CONNECTIONS

2. WELD PRECEDENCE AS FOLLOWS:  
 a. 1 UNDER  
 b. 2 OVER



← FLOW



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	499	517	512	518	514	522	—
30°	502	521	511	520	507	513	—
60°	497	510	518	507	499	509	—
90°	499	508	508	514	518	513	—
120°	505	503	514	506	519	518	—
150°	529	521	522	529	522	530	—
180°	565	520	519	528	521	528	—
210°	535	534	547	542	537	543	—
240°	534	523	534	531	533	528	—
270°	493	533	524	520	523	540	—
300°	519	522	534	533	544	545	—
330°	498	520	525	531	516	523	—

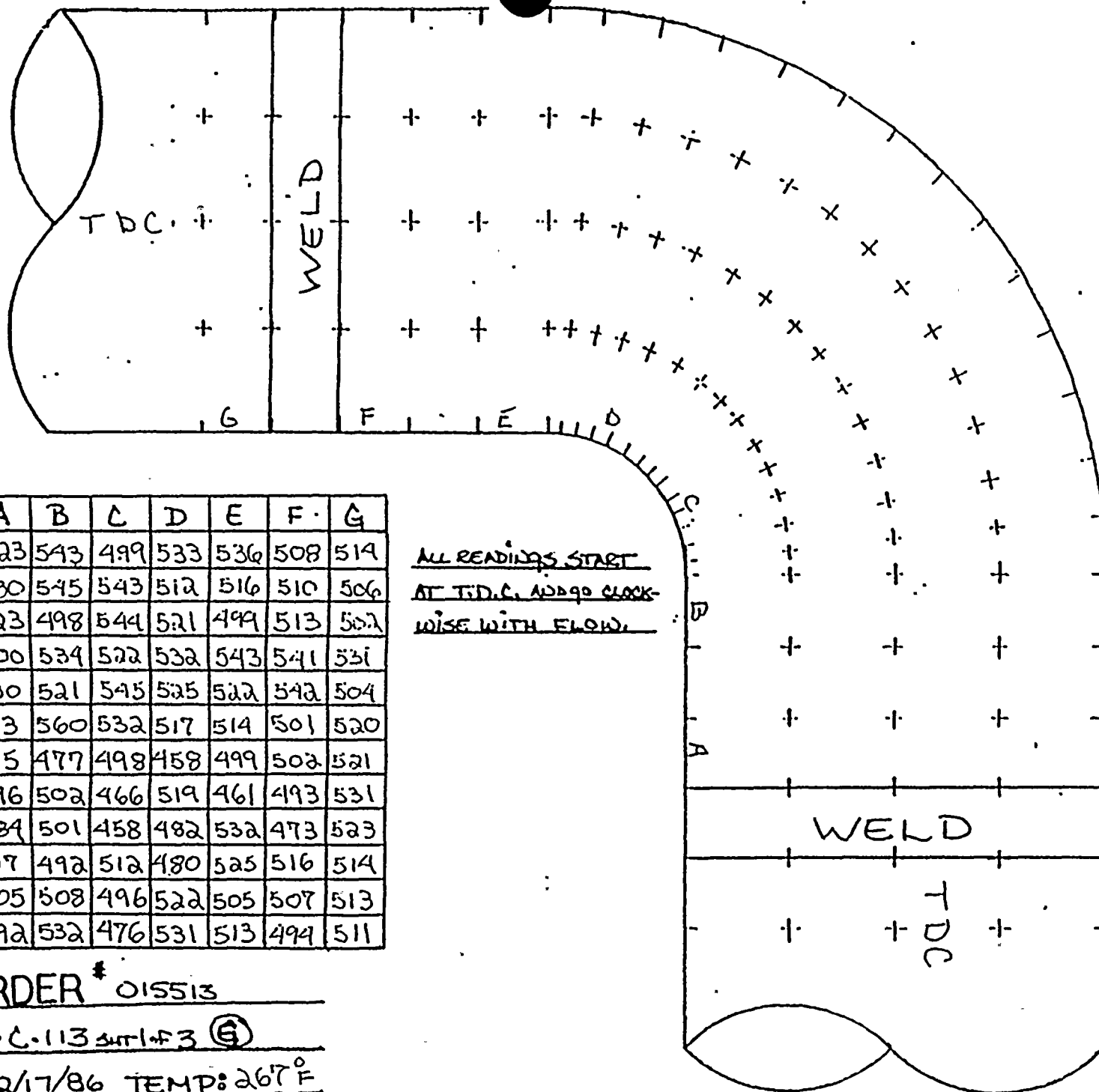
JOB ORDER # 015513

ISO 2-C-113 SHR 143 (E)

DATE: 12/17/82 TFMP: 267°F



← FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	523	543	499	533	536	508	519
30°	530	545	543	512	516	510	506
60°	523	498	544	521	499	513	502
90°	500	534	522	532	543	541	531
120°	530	521	545	525	522	542	504
150°	513	560	532	517	514	501	520
180°	515	477	498	458	499	502	521
210°	496	502	466	519	461	493	531
240°	484	501	458	482	532	473	523
270°	517	492	512	480	525	516	514
300°	505	508	496	522	505	507	513
330°	492	532	476	531	513	494	511

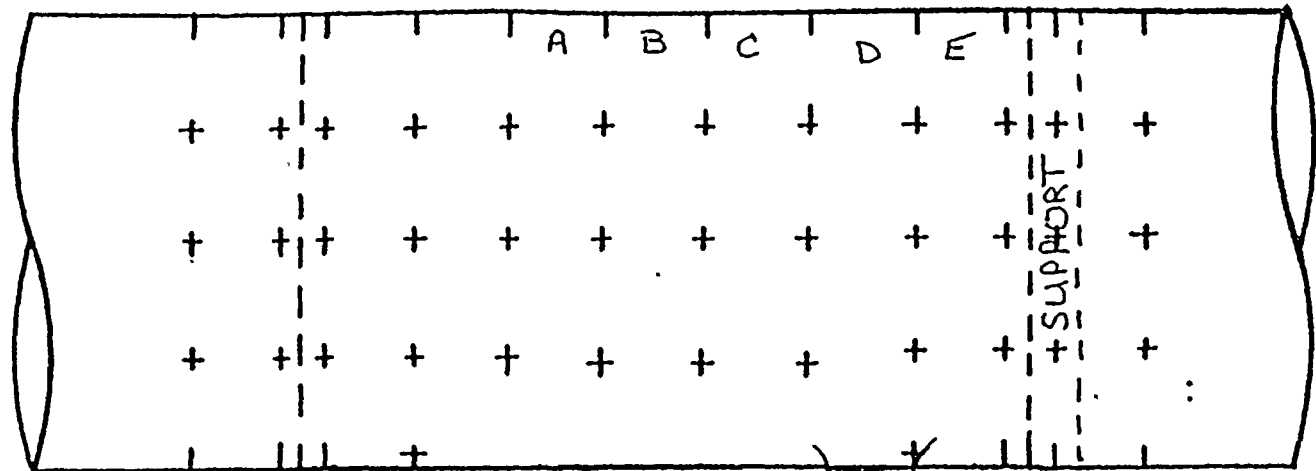
ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

JOB ORDER # 015513  
ISO# 2.C.113 3411 F3 (G)  
DATE: 12/17/86 TEMP: 267°F



T.D.C.

← FLOW



2-C-499-4B  
DRAIN LINE

ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	498	496	497	496	492	-	-
30°	496	497	494	497	501	-	-
60°	501	498	511	510	512	-	-
90°	502	496	507	513	516	-	-
120°	500	497	521	510	513	-	-
150°	500	490	497	523	506	-	-
180°	490	497	500	-	-	-	-
210°	515	502	491	483	488	-	-
240°	474	477	479	478	482	-	-
270°	488	481	474	479	477	-	-
300°	498	489	485	486	479	-	-
330°	488	482	491	488	490	-	-

JOB ORDER # 015513

IS 2-C-113 SH-1 #3 (N)

DATE: 12/1/01 TEMP: 267°F

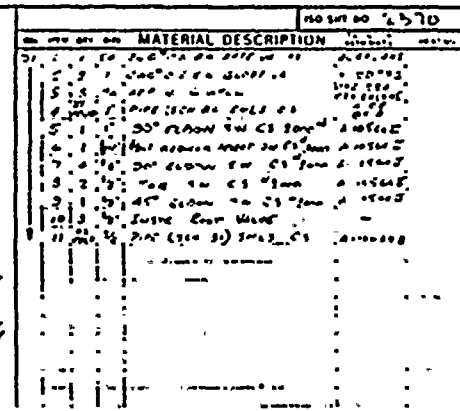


# EROSION EVALUATION WORKSHEET

(I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
A	26"x20" REDUCER	.500"	.438-.563	.367 <del>.367</del>	.488	0%	STILL WITHIN MANUFACTURERS TOLERANCE
C	26" PIPE	.500"	.438-.563	.367 <del>.367</del>	.526	0%	" " " "
D	34"x26" REDUCER	.625"	.547-.703	.480 <del>.480</del>	.618	0%	" " " "
E	34" PIPE	.625"	.547-.703	.480 <del>.480</del>	.687	0%	" " " "
E-BRANCH	18" PIPE	.500"	.438-.563	.296 <del>.296</del>	.504	0%	" " " "
K	34" PIPE	.625"	.547-.703	.480 <del>.480</del>	.690	0%	" " " "
K-BRANCH	24" PIPE	.500"	.438-.563	.395 <del>.395</del>	.494	0%	" " " "
L	34"x34" REDUCER	.625"	.547-.703	.480 <del>.480</del>	.652	0%	" " " "
G-BRANCH	20" PIPE	.500"	.438-.563	.329 <del>.329</del>	.504	0%	" " " "



WEEK #14

[illegible]

INSPECT :

$A, C, D, E, K, L$

**UNCONTROLLED  
DOCUMENT**

2-C-113

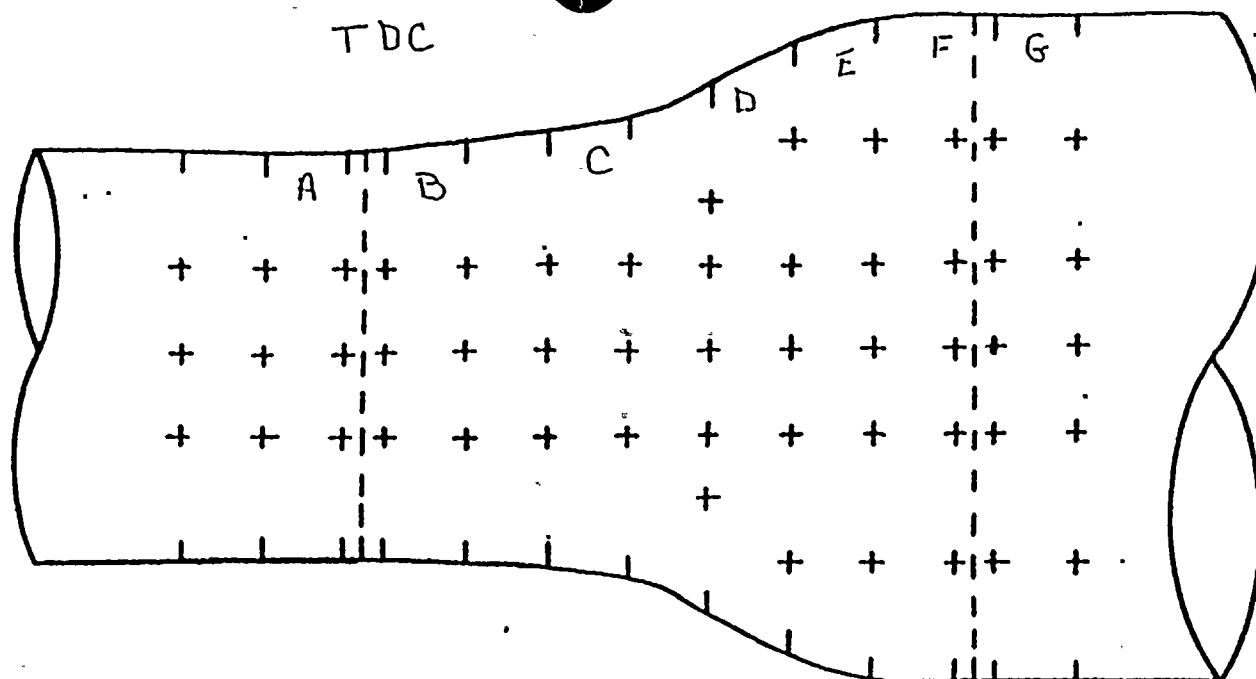
SH 2 OF 3

2-C-113  
 SH 2 OF 3  
 10/2/73

NAME: [Blank] ADDRESS: [Blank] CITY: [Blank] STATE: [Blank] ZIP: [Blank]	1. PROJECT NO.: [Blank] 2. PROJECT NAME: [Blank] 3. PROJECT LOCATION: [Blank] 4. PROJECT DESCRIPTION: [Blank]	5. PROJECT START DATE: [Blank] 6. PROJECT END DATE: [Blank] 7. PROJECT STATUS: [Blank]	8. PROJECT BUDGET: [Blank] 9. PROJECT COST: [Blank] 10. PROJECT PROFIT: [Blank]	11. PROJECT RISK: [Blank] 12. PROJECT IMPACT: [Blank] 13. PROJECT BENEFIT: [Blank]	14. PROJECT CHALLENGE: [Blank] 15. PROJECT OPPORTUNITY: [Blank] 16. PROJECT CONCLUSION: [Blank]
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FLOW →



ALL READINGS START AT  
T.D.C AND 60 CLOCKWISE  
WITH FLOW

TDC

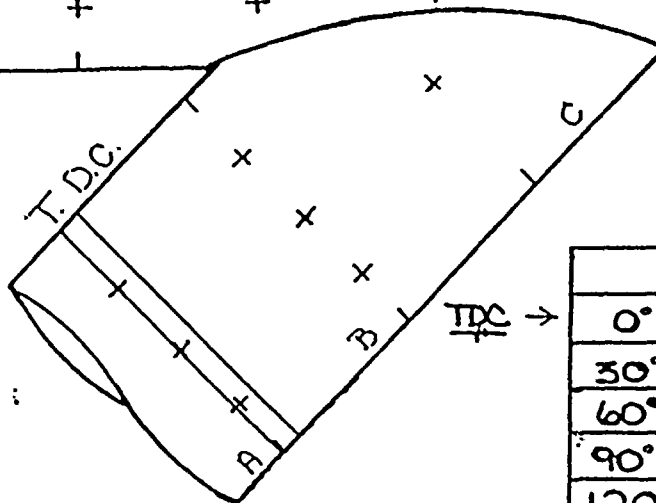
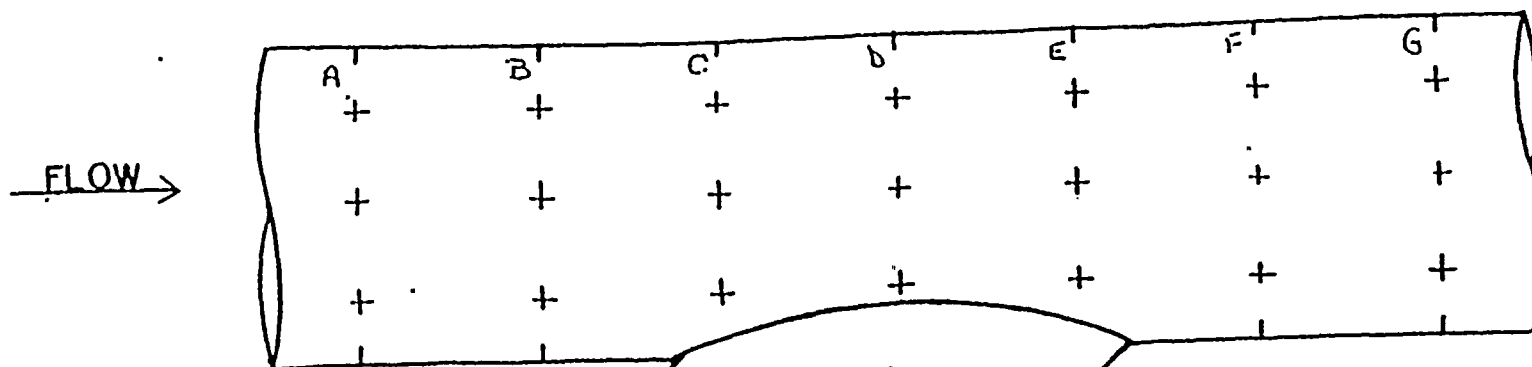
	A	B	C	D	E	F	G
0°	542	543	807	808	748	624	549
30°	530	540	817	814	793	602	534
60°	517	532	804	820	800	742	601
90°	521	535	833	823	760	673	534
120°	493	545	841	837	765	638	535
150°	508	543	839	860	763	760	543
180°	535	539	820	918	712	687	567
210°	443	536	838	779	739	678	530
240°	488	550	844	776	768	637	560
270°	495	538	860	815	772	628	580
300°	540	543	859	766	709	633	546
330°	514	589	836	790	725	580	567

JOB ORDER\* 015513

ISO\* 2.C.113 SHT. 2 OF 3 (A)



T.D.C.



BRANCH  
CONNECTION

	A	B	C
0°	—	—	—
30°	582	585	577
60°	568	561	557
90°	553	530	591
120°	528	532	583
150°	537	549	592
180°	547	515	573
210°	526	509	563
240°	532	526	594
270°	515	529	592
300°	509	532	583
330°	560	520	571

ALL READING START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.

	A	B	C	D	E	F	G
0°	535	528	527	539	535	540	546
30°	540	536	510	545	534	553	541
60°	558	610	558	547	554	534	541
90°	547	548	544	545	551	540	549
120°	529	537	—	—	535	515	552
150°	522	—	—	—	—	521	541
180°	529	—	—	—	—	543	535
210°	531	—	—	—	—	546	543
240°	532	526	—	—	530	522	524
270°	540	531	532	524	525	521	518
300°	545	538	542	538	548	540	520
330°	583	536	538	536	530	552	518

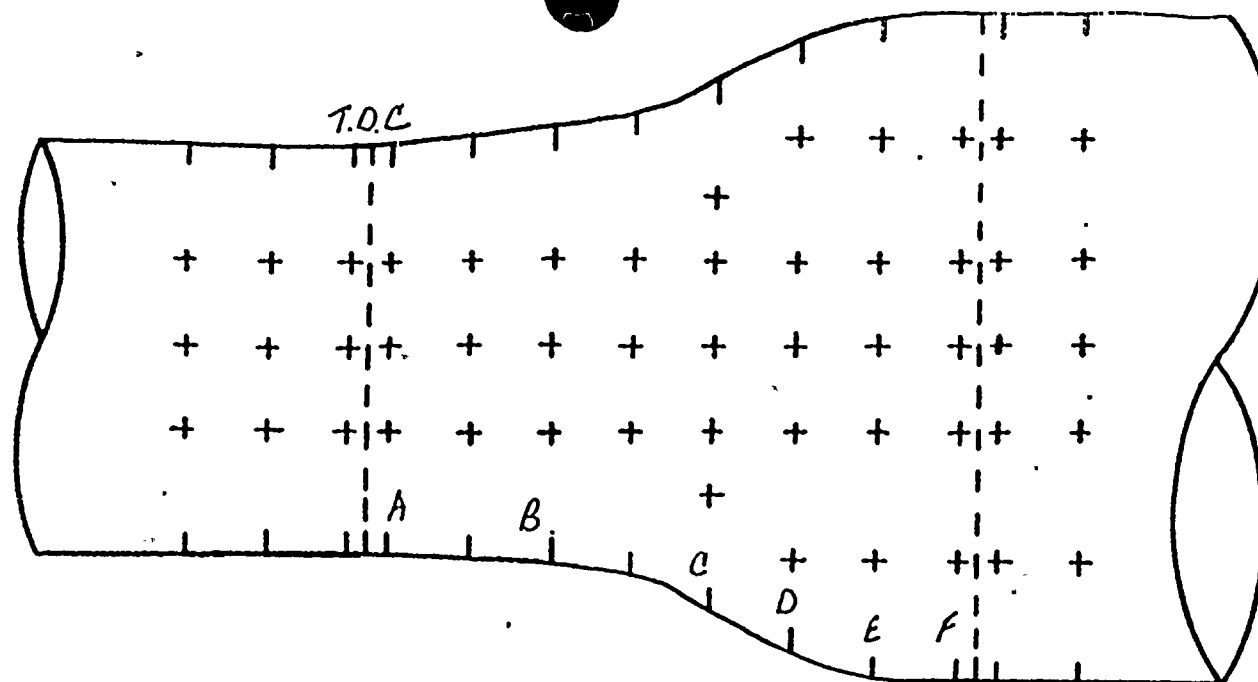
JOB ORDER# C15513

ISO# 2-C-113 SHT. 2 of 3 (C)

DATE: 12/18/86 TEMP: 265°F



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	.635	.651	.913	.919	.882	.808	—
30°	.641	.718	.904	.889	.840	.772	—
60°	.650	.739	.943	.874	.786	.782	—
90°	.652	.680	.970	.880	.807	.745	—
120°	.649	.689	.980	.869	.838	.855	—
150°	.645	.660	.965	.880	.840	.850	—
180°	.650	.650	.960	.916	.870	.864	—
210°	.671	.647	.983	.868	.854	.817	—
240°	.618	.696	.989	.926	.906	.896	—
270°	.623	.650	.981	.932	.853	.820	—
300°	.653	.753	.936	.946	.943	.817	—
330°	.662	.663	.940	.930	.902	.901	—

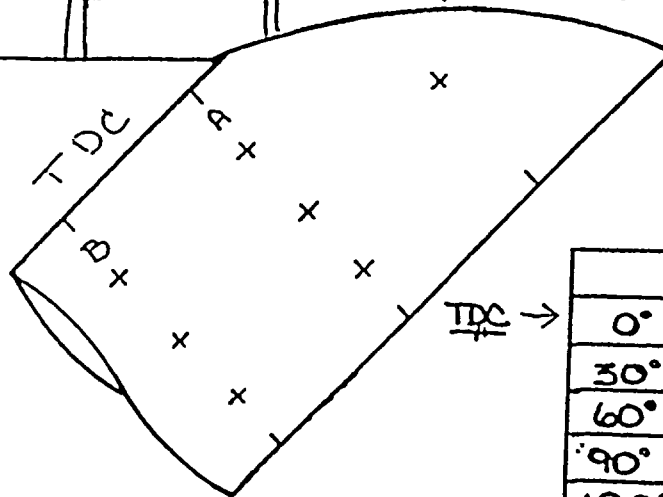
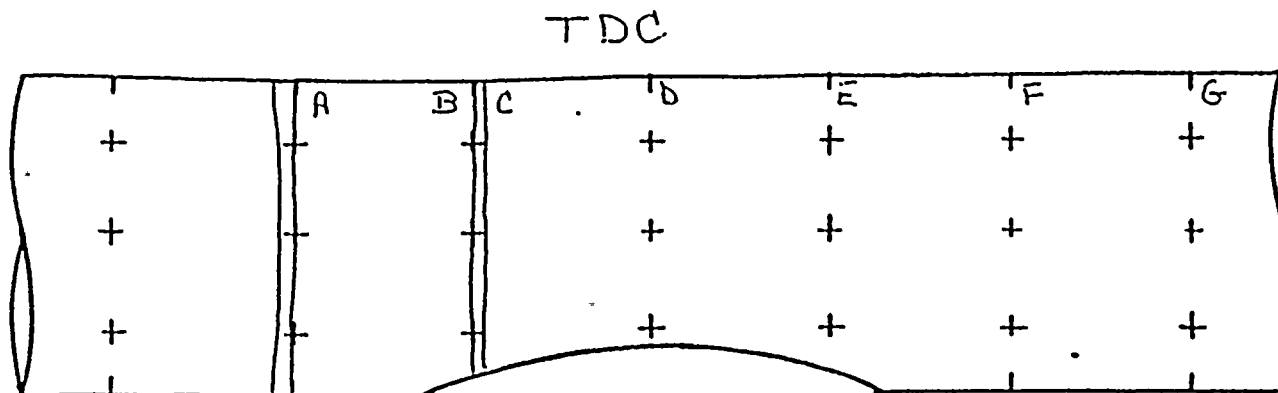
JOB ORDER\* 015513

ISO\* 2-C-113 SHT. 2 OF 3 (D)

DATE\* 12/19/86 TEMP. 227°E



FLOW →



BRANCH  
COLLECTION

	A	B	C
0°	—	—	—
30°	545	542	—
60°	534	513	—
90°	518	519	—
120°	514	504	—
150°	524	513	—
180°	—	—	—
210°	—	—	—
240°	—	—	—
270°	609	525	—
300°	528	515	—
330°	532	527	—

ALL READING START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

	A	B	C	D	E	F	G
0°	687	733	688	699	705	707	709
30°	688	695	705	706	710	713	720
60°	714	702	693	715	708	714	712
90°	706	703	700	703	712	710	713
120°	708	711	702	715	715	718	723
150°	712	696	—	—	—	—	713
180°	713	—	—	—	—	—	—
210°	725	—	—	—	—	—	—
240°	—	—	—	—	—	—	—
270°	—	—	—	—	—	—	—
300°	—	—	—	—	—	—	—
330°	702	692	704	705	721	711	708

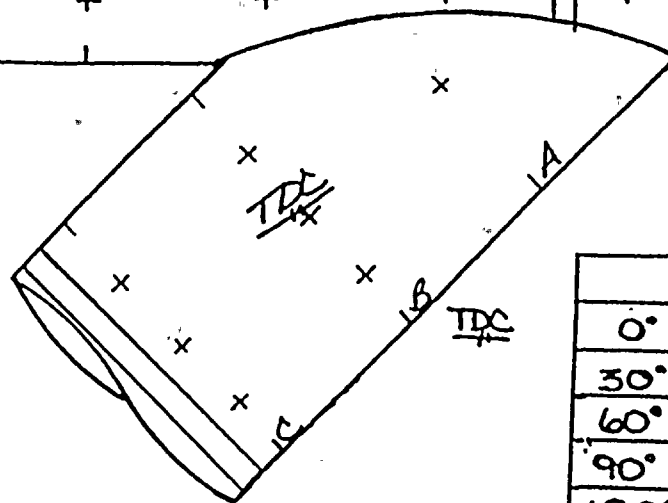
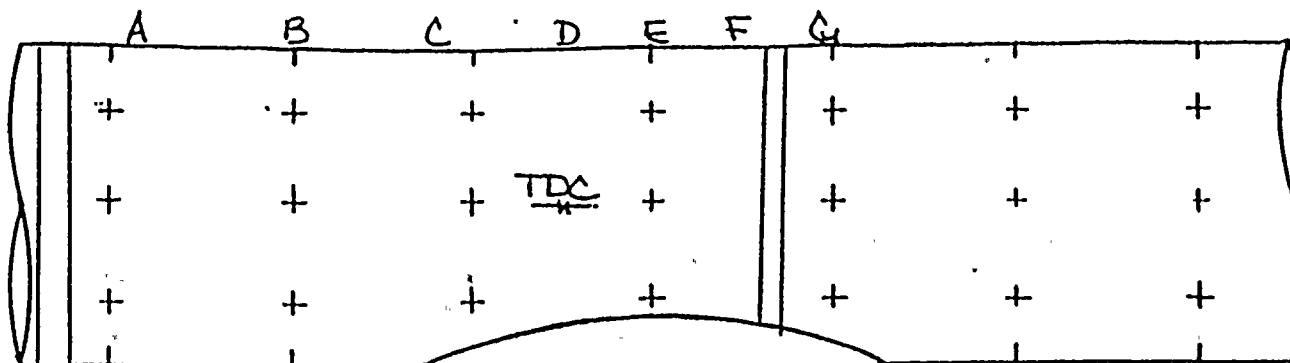
JOB ORDER # 015513

ISO# 2.C.113 SHT. 2 OF 3 (E)

DATE: 12/19/86 TEMP: 267°F



← FLOW



ALL READING START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.

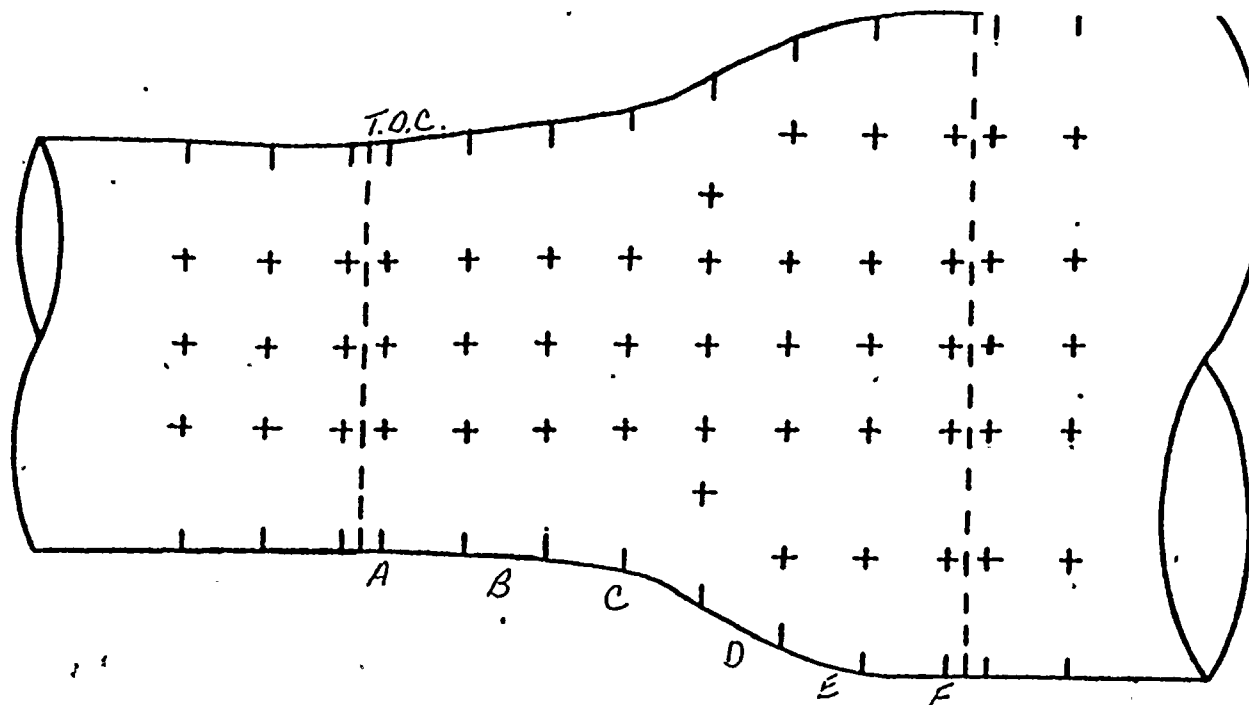
BRANCH CONVECTION			
	A	B	C
0°	530	505	494
30°	—	—	—
60°	—	—	—
90°	—	—	—
120°	532	560	540
150°	524	534	547
180°	523	525	532
210°	528	525	544
240°	529	530	535
270°	527	528	532
300°	499	498	498
330°	507	500	497

	A	B	C	D	E	F	G
0°	697	698	697	693	694	706	—
30°	702	700	700	701	693	—	—
60°	708	706	704	704	—	—	—
90°	711	707	706	691	—	—	—
120°	696	693	724	722	724	720	710
150°	726	723	714	715	725	713	695
180°	728	724	713	717	724	714	690
210°	714	725	713	714	705	706	692
240°	711	726	706	720	705	707	704
270°	706	707	709	707	705	710	702
300°	711	706	710	705	706	706	700
330°	707	712	706	705	708	704	701

JOB ORDER # 015513  
ISO # 2-C-113 SHT 2 OF 3 (R)  
DATE: 12/23/86 TEMP: 250°F



FLOW  
←



TDC

	A	B	C	D	E	F	G
0°	—	—	—	—	—	—	—
30°	.673	.668	1.020	.929	.903	.834	—
60°	.672	.663	1.042	.964	.898	.802	—
90°	.712	.653	.997	.986	.896	.696	—
120°	.723	.672	.990	.937	.904	.898	—
150°	.654	.652	1.001	.950	.903	.890	—
180°	.702	.666	1.003	.972	.920	.739	—
210°	.675	.668	1.008	.939	.860	.798	—
240°	.680	.654	1.009	.960	.842	.743	—
270°	.673	.661	1.004	.941	.862	.760	—
300°	.668	.667	1.030	.978	.899	.860	—
330°	.663	.662	1.044	.989	.920	.885	—

JOB ORDER\* 015513

18 2.C.113 SHT. 2 OF 3 (L)

DATE: 12/23/86

TEMP: 250°F



D. C. COOK N~~UMBER~~ PLANT

SER No. 88-84 (Steam)

Unit No. 2

SER No. 23-85 (Water) X

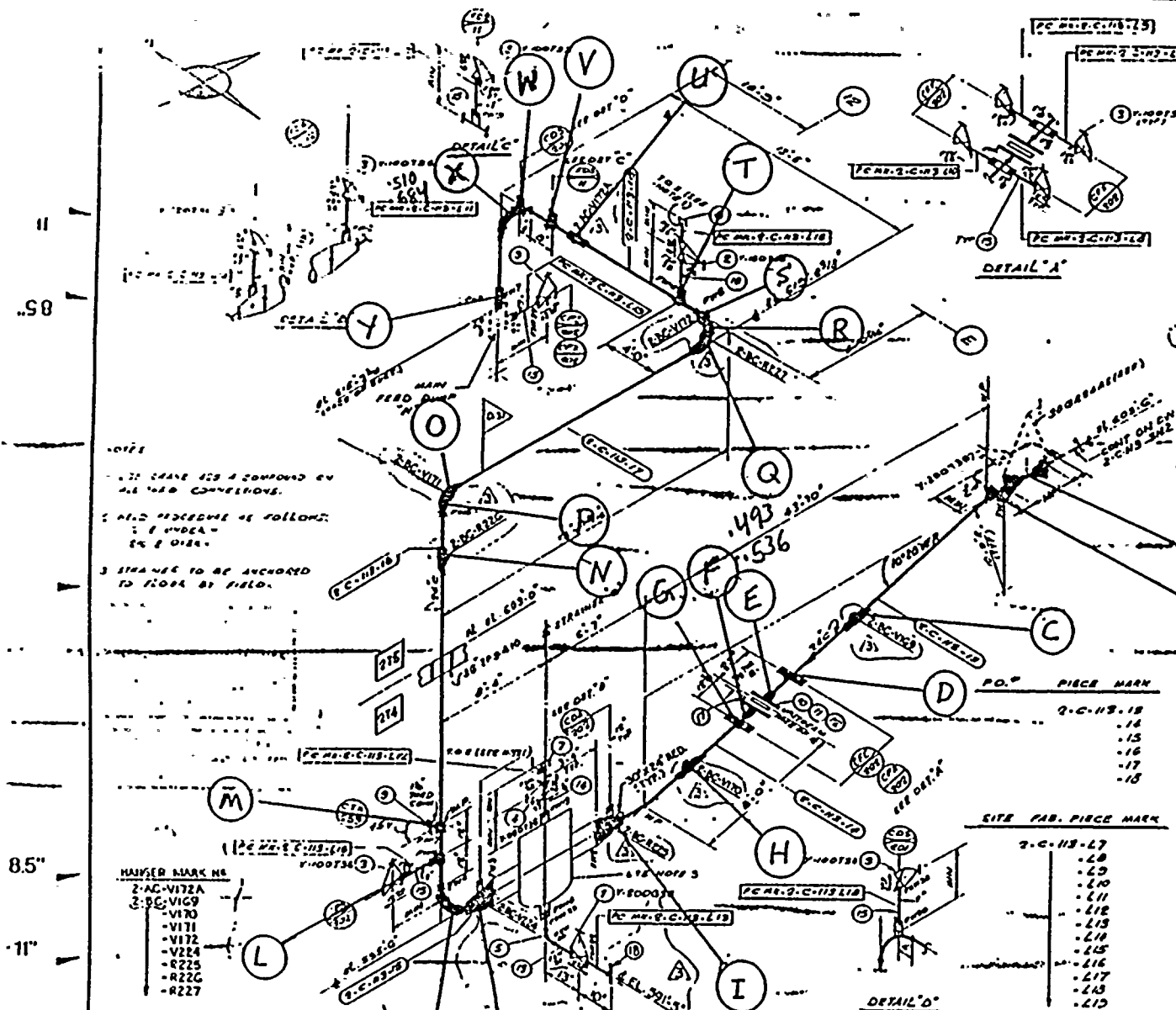
Years in service 9

UT Reading Taken on: 12-22-86

AEPSIC Installed Mat'l Class CARBON STEEL X-HVY

[illegible]





J.O. #		MATERIAL DESCRIPTION		QTY	QTY
QTY	QTY	QTY	QTY	QTY	QTY
1	1	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
2	1	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
3	1	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
4	1	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
5	1	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
6	1	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
7	1	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
8	1	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
9	1	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
10	2	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
11	2	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
12	2	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
13	2	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
14	2	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
15	2	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
16	2	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
17	2	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		
18	2	3500 C.S. SW 3/4" x 1/2"	3500 C.S.		

[illegible]

INSPECT:

~~F, R, X~~ AND 139C86

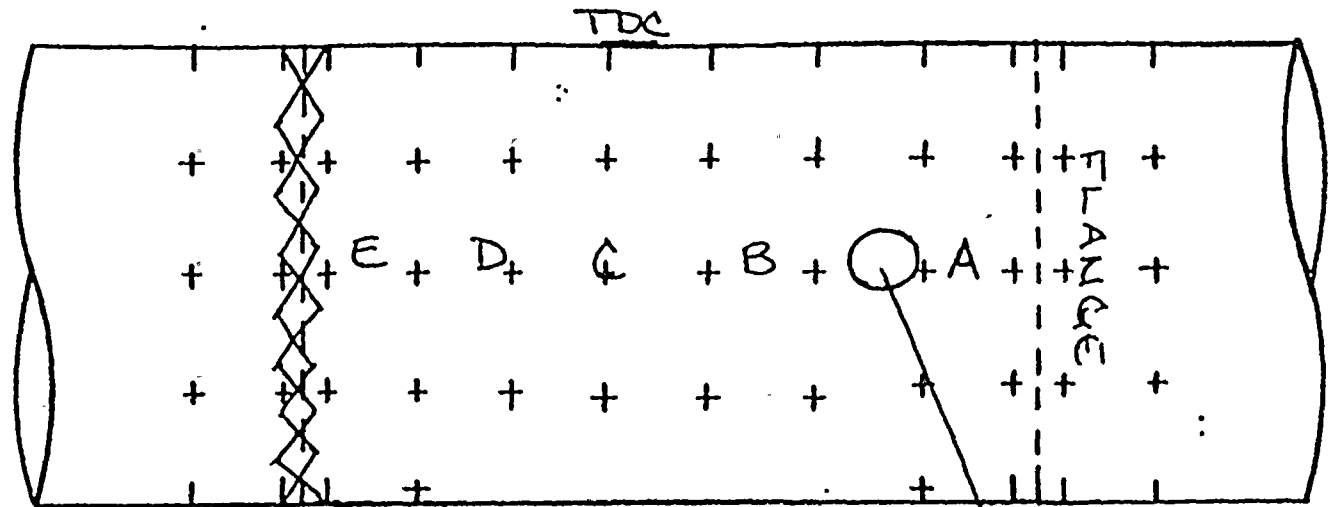
UNCONTROLLED  
DOCUMENT

2-C-113  
~~JMT 3043~~

[illegible]



← FLOW



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	536	530	533	532	532	—	—
30°	534	543	548	542	543	—	—
60°	530	531	534	532	533	—	—
90°	516	—	500	504	533	—	—
120°	528	515	534	508	520	—	—
150°	517	515	532	509	526	—	—
180°	493	505	512	518	513	—	—
210°	506	517	520	516	530	—	—
240°	512	521	525	518	522	—	—
270°	511	506	506	502	520	—	—
300°	515	523	531	526	523	—	—
330°	536	529	540	539	536	—	—

2-CFX-200-V2

2-CFC-200-V2

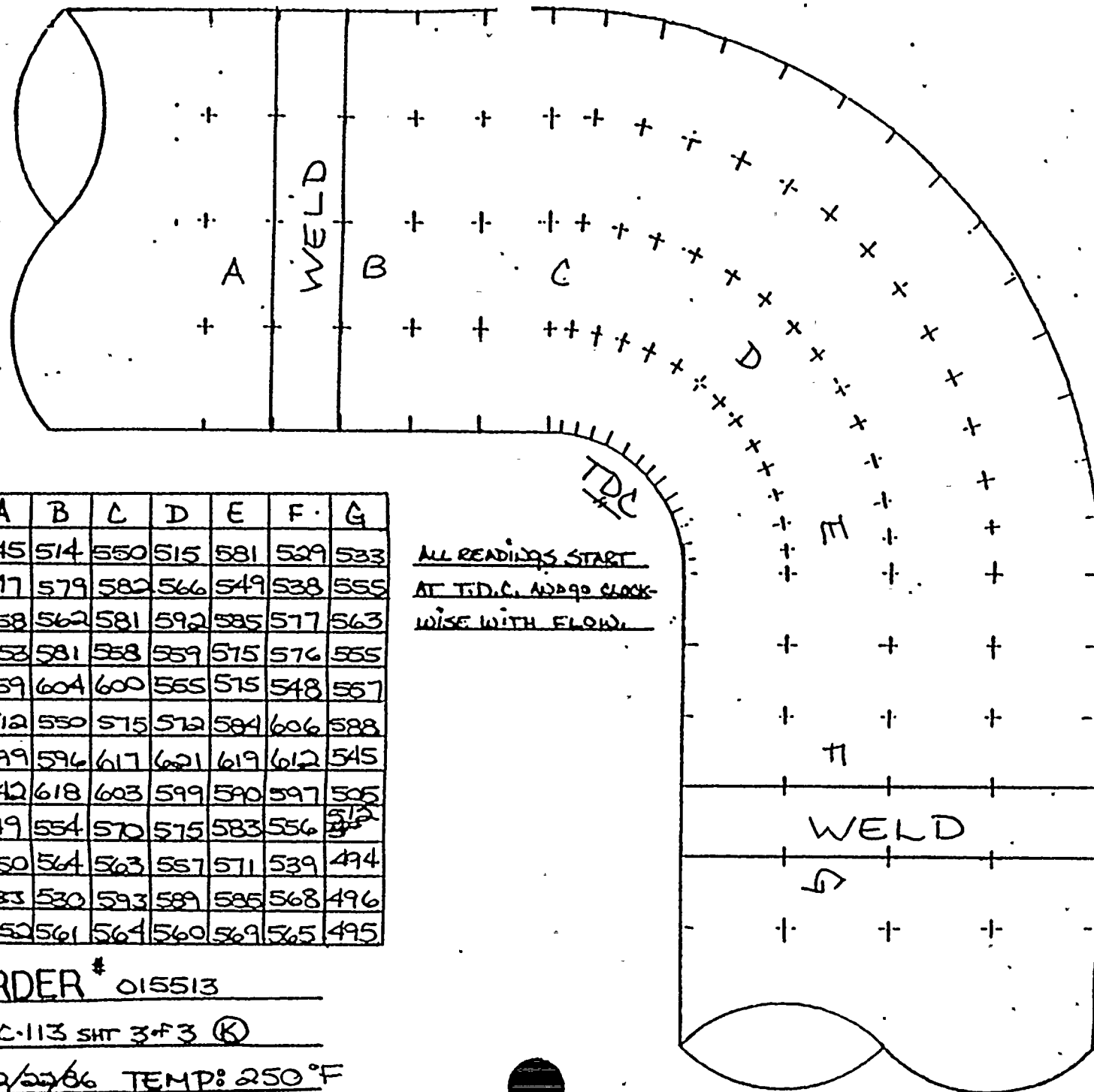
JOB ORDER # 015513

ISO # 2-C-113 SH 3 F 3 (F)

DATE: 12/6/86 TEMP: 241°F



FLOW →



T.D.C.

	A	B	C	D	E	F	G
0°	545	514	550	515	581	529	533
30°	577	579	582	566	549	538	555
60°	558	562	581	592	585	577	563
90°	553	581	558	559	575	576	555
120°	559	604	600	565	575	548	557
150°	512	550	575	572	584	606	588
180°	499	596	617	621	619	612	545
210°	542	618	603	599	590	597	505
240°	549	554	570	575	583	556	512
270°	550	564	563	557	571	539	494
300°	533	530	593	589	585	568	496
330°	552	561	564	560	569	565	495

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

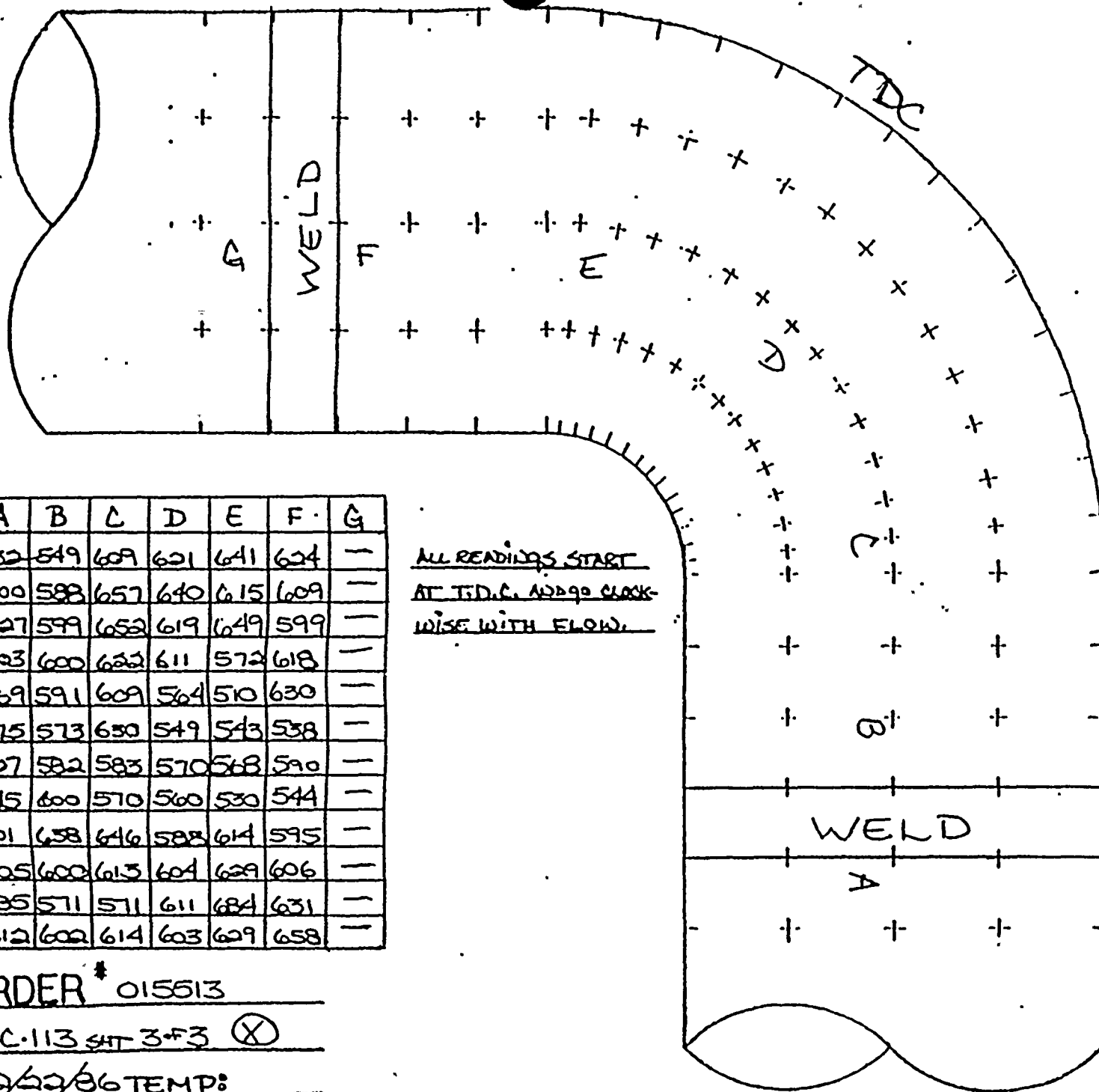
JOB ORDER # 015513

ISO # 2-C-113 SHR 3" 3 (K)

D: 12/27/86 TEMP: 250°F



← FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	532	549	609	621	641	624	—
30°	600	588	657	640	615	609	—
60°	527	599	652	619	649	599	—
90°	603	600	622	611	572	618	—
120°	569	591	609	564	510	630	—
150°	575	573	630	549	543	538	—
180°	507	582	583	570	568	590	—
210°	545	600	570	560	530	544	—
240°	601	638	646	588	614	595	—
270°	605	600	613	604	629	606	—
300°	585	571	571	611	684	631	—
330°	612	602	614	603	629	658	—

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

2.C.25TW

JOB ORDER # 015513  
ISO # 2.C.113 SH 3-F3 (X)  
DATE: 12/22/86 TEMP:



# EROSION EVALUATION WORKSHEET

Unit No. 2

Years in service 9

UT Reading Taken on: 12-24-86

AEPSIC Installed Mat'l Class CARBON STEEL, X-HVY

## COMMENTS

F	24" PIPE	.500	.438-.563	.395 <del>.395</del>	.460	0%	STILL WITHIN MANUFACTURERS TOLERANCE
I	24" PIPE	.500	.438-.563	.395 <del>.395</del>	.483	0%	" " " "
	34"x24"	.500	.438-.563	.395 <del>.395</del>	.543	0%	" " " "
N	STN NOZZLE	.625	.547-.703	.480 <del>.480</del>	.601	0%	" " " "
P	24" 90° ELL	.500	.438-.563	.395 <del>.395</del>	.473	0%	" " " "



WEEK # 14

CONST - JO. # 015511  
T.O. # 015512

ISO SHE NO. 1372

MATERIAL DESCRIPTION		QUANTITY	REMARKS
1	2" 3000 PSI 2" DIA. 10' L	233.5 LBS	
2	1" 1600 PSI 2" DIA. 10' L	116.75 LBS	
3	1" 3000 PSI 2" DIA. 10' L	116.75 LBS	
4	1" 2" 3000 PSI 2" DIA. 10' L	116.75 LBS	
5	1" 3000 PSI 2" DIA. 10' L	116.75 LBS	
6	1" 3000 PSI 2" DIA. 10' L	116.75 LBS	
7	1" 3000 PSI 2" DIA. 10' L	116.75 LBS	
8	1" 3000 PSI 2" DIA. 10' L	116.75 LBS	
9	1" 3000 PSI 2" DIA. 10' L	116.75 LBS	
10	1" 3000 PSI 2" DIA. 10' L	116.75 LBS	
11	1" 3000 PSI 2" DIA. 10' L	116.75 LBS	
12	1" 3000 PSI 2" DIA. 10' L	116.75 LBS	
13	1" 3000 PSI 2" DIA. 10' L	116.75 LBS	
14	1" 3000 PSI 2" DIA. 10' L	116.75 LBS	
15	1" 3000 PSI 2" DIA. 10' L	116.75 LBS	

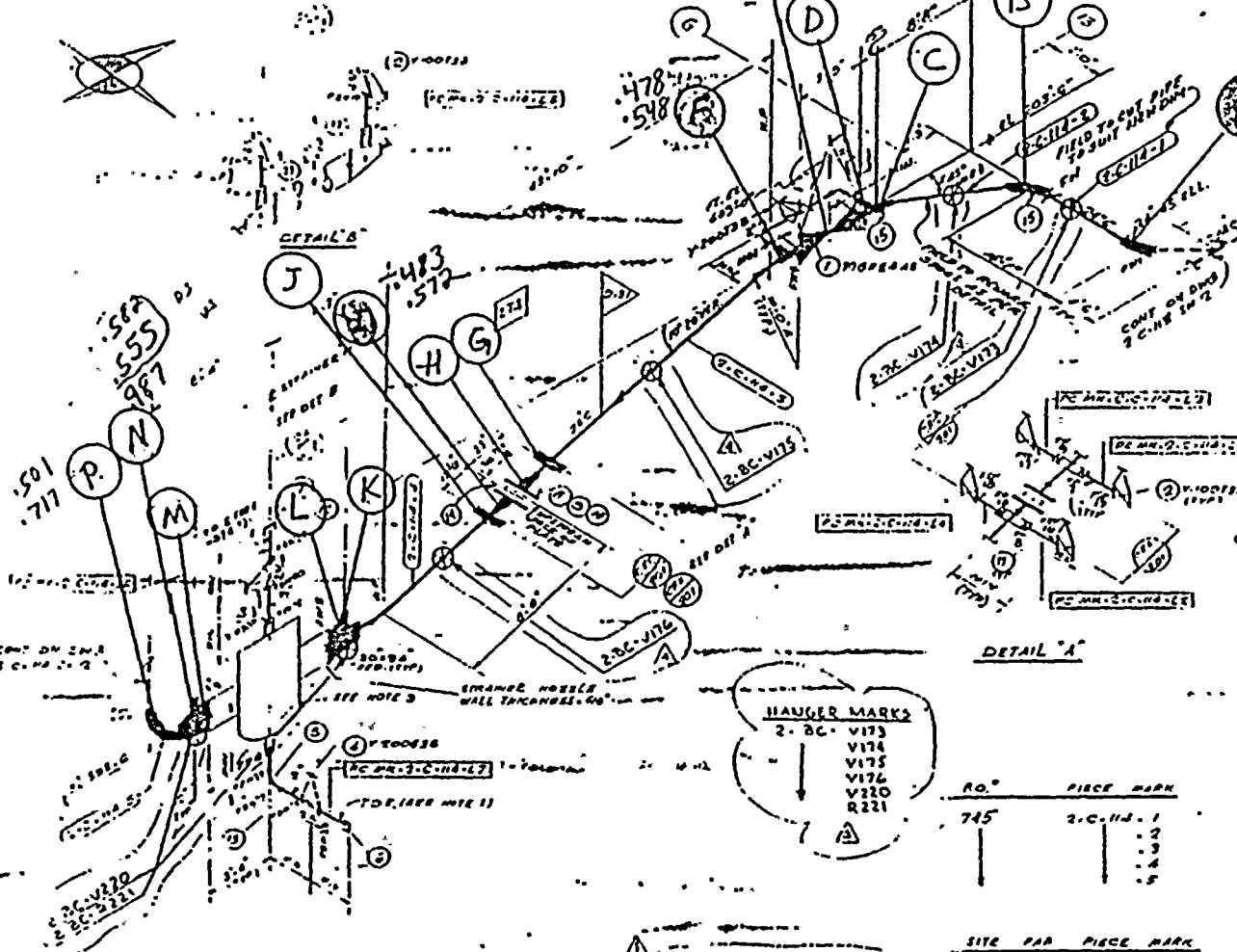
REVISION RECORD		DESCRIPTION	APPROVED
1	1	10-20 HAS 9-43: ADDED ITEM 14 TO B/M. PER AEP ARRG'T. 2-5205-2	REDO
2	2	ADDED 1" 3000 PSI 2" DIA. 10' L. PER AEP ARRG'T. 2-5205-2	REDO
3	3	PER AEP ARRG'T. ADDED 1" 3000 PSI 2" DIA. 10' L. PER AEP ARRG'T. 2-5205-2	REDO
4	4	PER AEP ARRG'T. ADDED 1" 3000 PSI 2" DIA. 10' L. PER AEP ARRG'T. 2-5205-2	REDO

INSPECT:

F, I, J, M, N, P NOT 132426

UNCONTROLLED DOCUMENT

2.C-114  
SHT 1 OF 2



HANGER MARKS  
2.C-114-1  
V173  
V174  
V176  
V210  
R221

NO.	PIECE MARK
745	2.C-114-1
	2
	3
	4
	5

SITE	PIECE MARK
2.C-114-1	1
	2
	3
	4
	5
	6
	7
	8

1. USE CRANE SET A COMPOUND ON ALL TIE-ROD CONNECTIONS

2. FIELD PROCEDURE AS FOLLOWS:  
a. 8" INCHES  
b. 8" INCHES  
c. STRAINING TO BE ANCHORED TO FLOOR OF FIELD.

INDICATES LOCATION OF PIPE SUPPORT AND SUPPORT DETAIL HANGER

SUPPORT MARK NUMBERS  
GENERAL AND SPECIFIC LOCATION  
OF SUPPORTS, CHECK  
FOR EXACT LOCATION PER  
SUPPORT DETAIL.

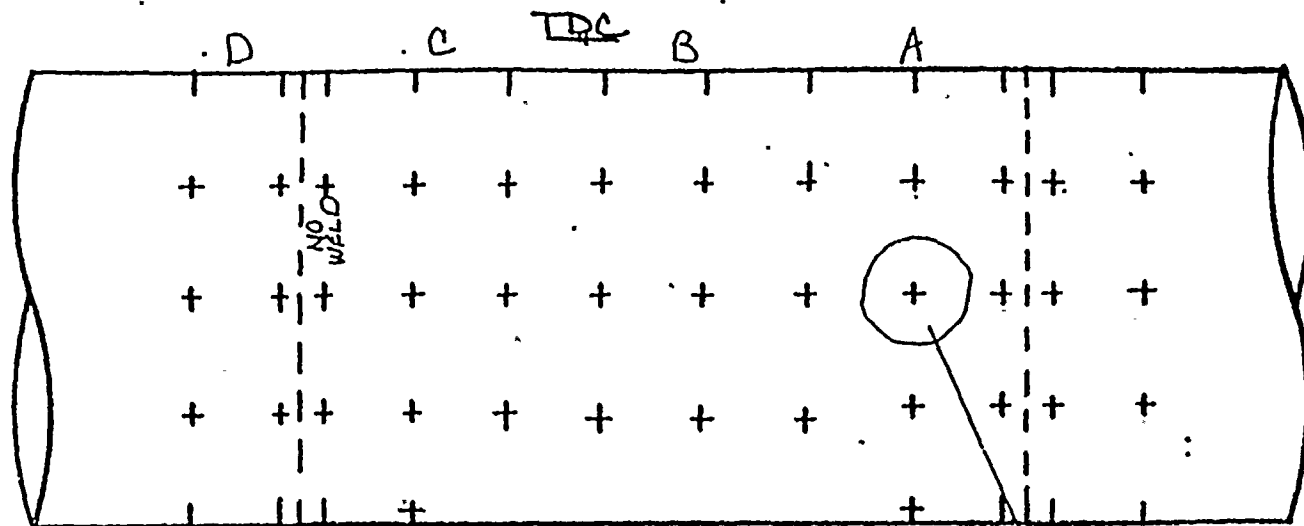
INSULATION		
CHECK REQUIREMENTS		
DATE	TIME	REMARKS

DEFINITIONS		TESTING		ADDITIONAL	
NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION
1		1		1	
2		2		2	
3		3		3	
4		4		4	
5		5		5	
6		6		6	
7		7		7	
8		8		8	
9		9		9	
10		10		10	

FOUR/ZONE NO. 224	REQUIRED COMPLETION DATE	FLOW DIAGRAM
FABRICATED BY: ECECO		
NPS DESIGNS INC. NEW YORK, N.Y.		PERMANENT & MECHANICAL ENGINEERING CO. DONALD E. COOK, MANAGER
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRG'T. DWGS.		2.C-114 SHT 1 OF 2



← FLOW



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	.511	.472	.475	.480	—	—	—
30°	.460	.465	.465	.471	—	—	—
60°	.478	.474	.476	.481	—	—	—
90°	—	.490	.491	.505	—	—	—
120°	.520	.495	.496	.508	—	—	—
150°	.532	.537	.540	.533	—	—	—
180°	.525	.545	.539	.534	—	—	—
210°	.533	.549	.548	.540	—	—	—
240°	.538	.543	.542	.536	—	—	—
270°	.520	.535	.524	.524	—	—	—
300°	.502	.508	.508	.508	—	—	—
330°	.491	.490	.478	.477	—	—	—

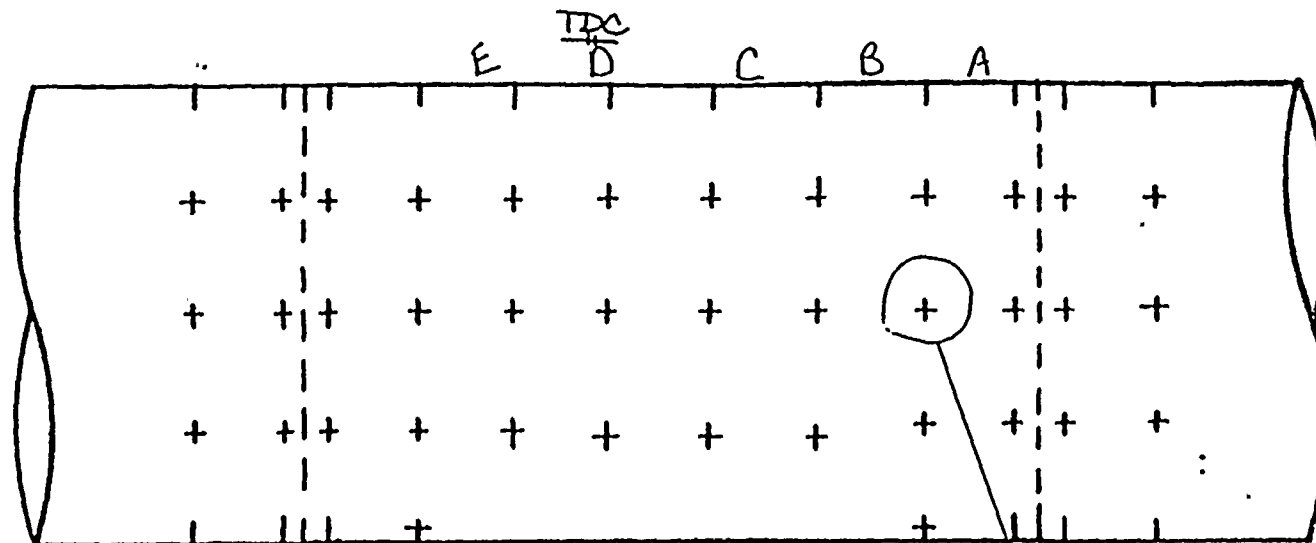
2-C-336E

JOB ORDER # 015513

IS 2-C-114 SHT 1 OF 2 REV 4 (E)



← FLOW



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

T.D.C.

	A	B	C	D	E	F	G
0°	.483	.489	.498	.509	.530	—	—
30°	.527	.532	.497	.521	.524	—	—
60°	.533	.529	.528	.528	.520	—	—
90°	.526	—	.547	.546	.535	—	—
120°	.550	.538	.537	.535	.534	—	—
150°	.542	.572	.551	.556	.548	—	—
180°	.549	.555	.550	.552	.547	—	—
210°	.531	.537	.548	.535	.548	—	—
240°	.525	.527	.540	.530	.539	—	—
270°	.518	—	.526	.518	.526	—	—
300°	.512	.510	.522	.521	.526	—	—
330°	.512	.509	.519	.510	.520	—	—

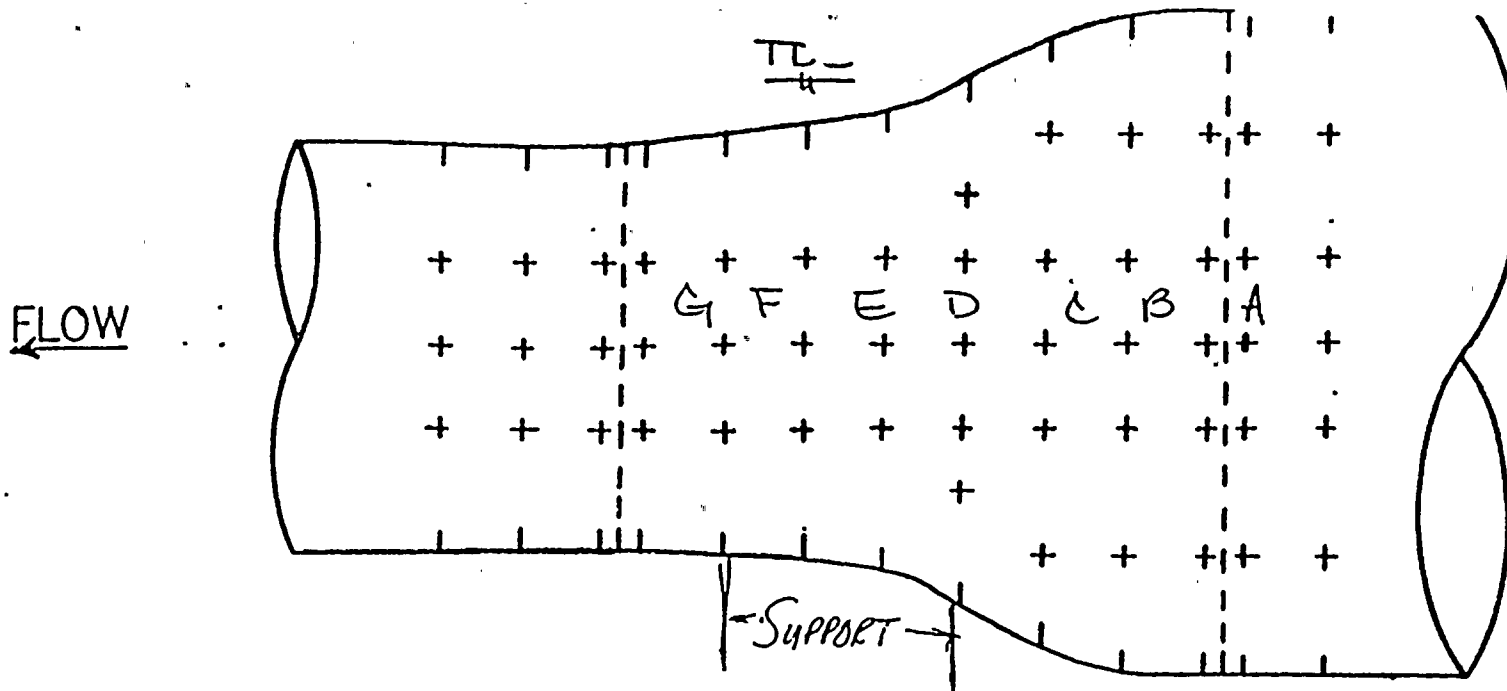
2-CFX-201-V2  
 or 2-CFC-201-V2

JOB ORDER # 015513

ISO # 2-C-114 SH. 1 OF 2 REV 4 ITEM I

DATE: 1-24-86 TEMP: 26.0°F





TDC

	A	B	C	D	E	F	G
0°	704	646	654	681	715	543	555
30°	915	692	756	792	728	580	568
60°	987	757	704	726	765	566	568
90°	946	732	714	742	749	564	556
120°	783	696	714	803	760	560	555
150°	903	642	715	773	836	584	624
180°	910	661	741	—	—	635	582
210°	935	601	712	790	742	574	575
240°	974	610	653	712	750	564	571
270°	962	674	682	711	732	555	564
300°	928	695	725	736	771	560	562
330°	903	660	715	703	733	555	560

ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

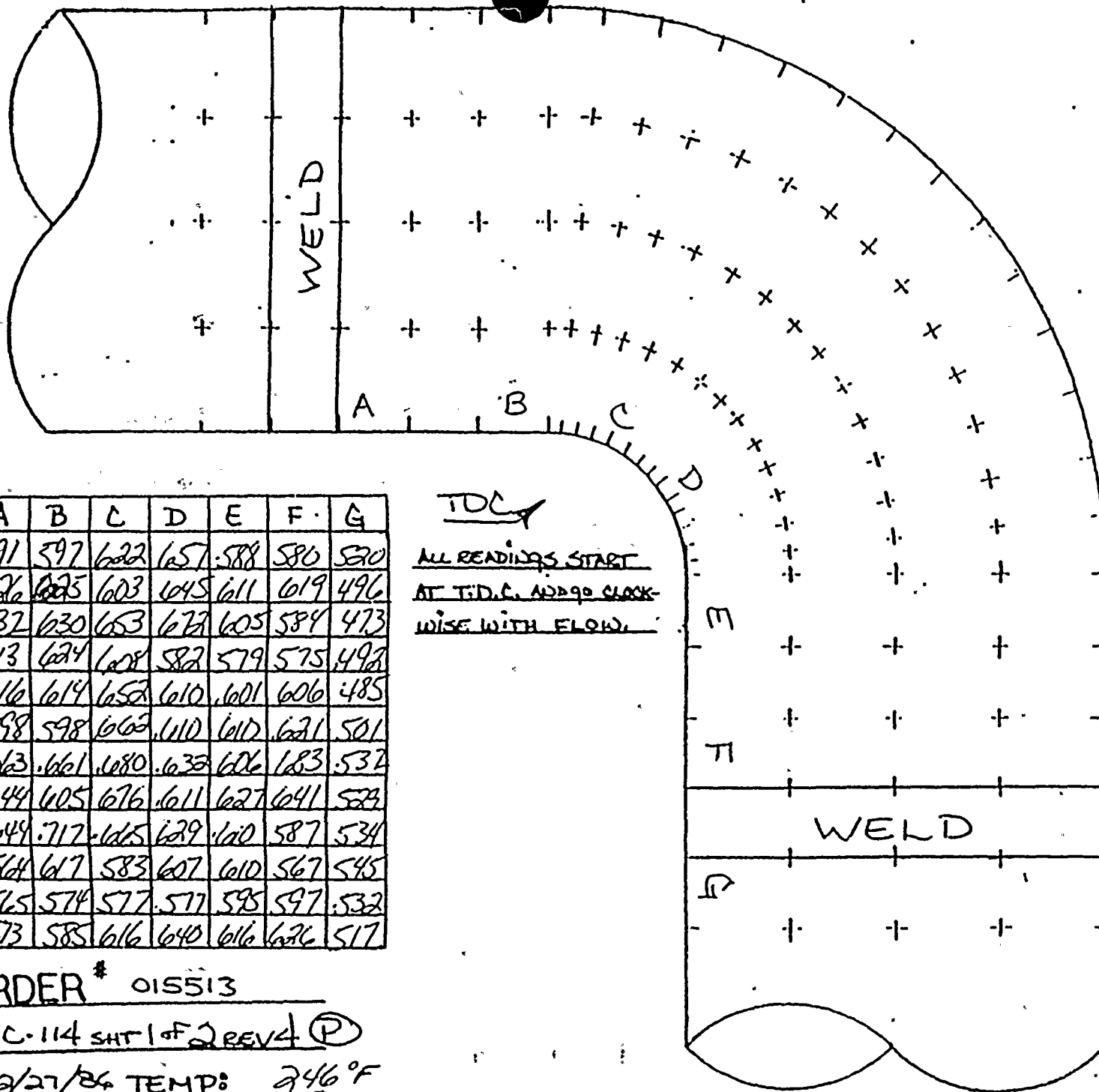
JOB ORDER\* 015513

1-2-C-114 SHT 1 OF 2 REV 4 (N)

DATE: 12/27/86 TEMP: 246°F



FLOW →



TDC

	A	B	C	D	E	F	G
0°	591	597	622	657	588	580	590
30°	626	625	603	645	611	619	496
60°	632	630	653	672	605	584	473
90°	613	624	608	582	579	575	492
120°	616	614	652	610	601	606	485
150°	598	598	665	610	610	621	501
180°	623	661	680	633	606	683	532
210°	644	605	676	611	627	641	522
240°	644	717	665	629	610	587	534
270°	564	617	583	607	610	567	545
300°	565	574	577	577	598	597	532
330°	573	585	616	640	616	626	517

TDC

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.

WELD

JOB ORDER # 015513

ISO # 2.C.114 SH1 of 2 REV 4 (P)

DATE: 12/27/86 TEMP: 246°F



## 1

Unit No. 2

Years in service 9

UT Reading Taken on: 12-29-86

AEPSC Installed Mat'l Class CARBON STEEL, X-HVY

## COMMENTS

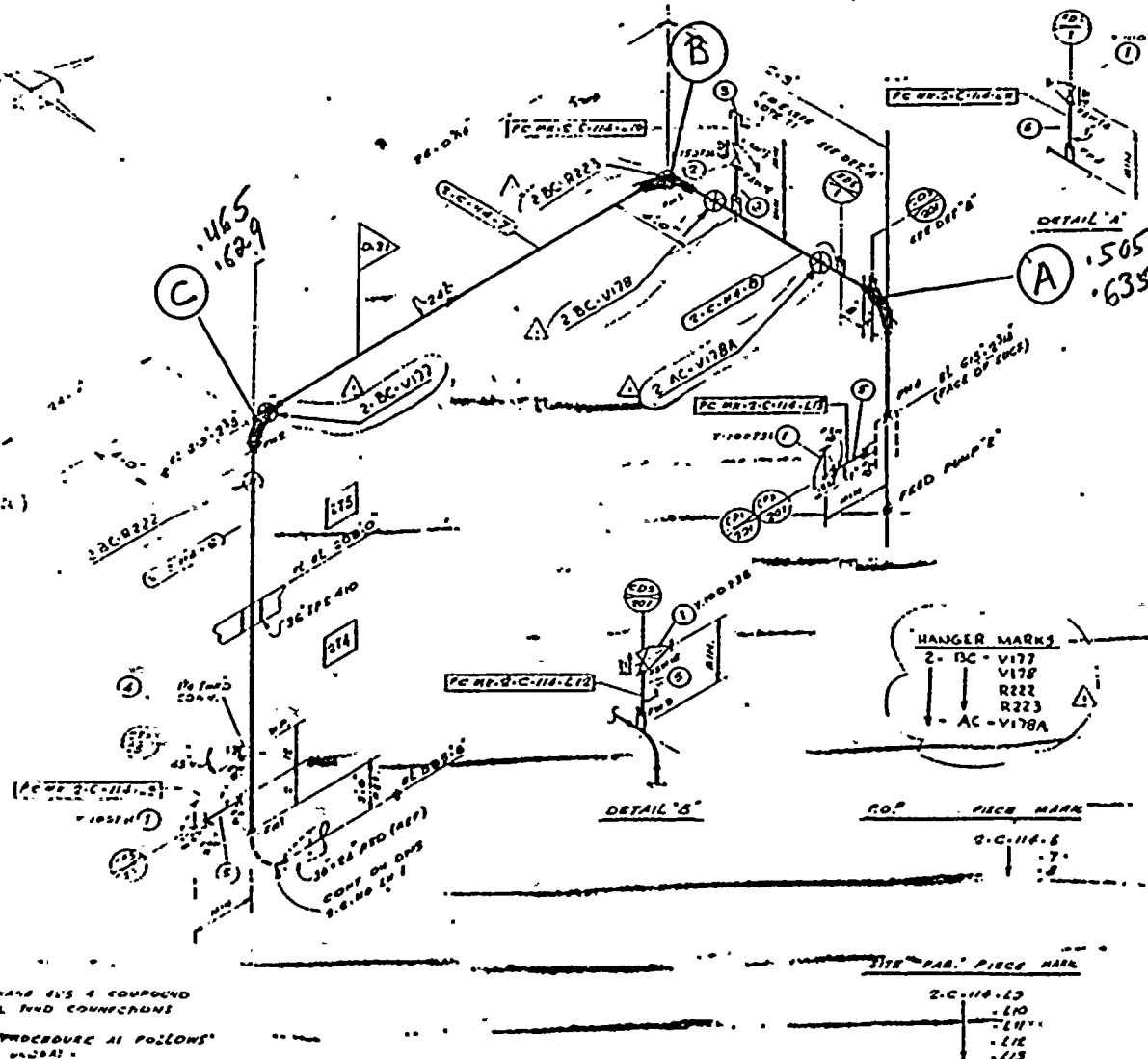
## COMMENTS

\_\_\_\_\_



QC - J.O. # 015515  
CQNST - J.O. # 015511  
J.O. # 015512

ISO 341 00 2272



QTY	UNIT	MATERIAL DESCRIPTION	PRICE	TOTAL
51	1	500° C S IN 1.000 IN	1.25	62.50
2	1	500° C S IN 1.000 IN	1.25	2.50
3	1	300° C S IN 1.000 IN	1.25	3.75
4	1	300° C S IN 1.000 IN	1.25	3.75
5	1	300° C S IN 1.000 IN	1.25	3.75
6	1	300° C S IN 1.000 IN	1.25	3.75
7	1	300° C S IN 1.000 IN	1.25	3.75
8	1	300° C S IN 1.000 IN	1.25	3.75
9	1	300° C S IN 1.000 IN	1.25	3.75
10	1	300° C S IN 1.000 IN	1.25	3.75
11	1	300° C S IN 1.000 IN	1.25	3.75
12	1	300° C S IN 1.000 IN	1.25	3.75
13	1	300° C S IN 1.000 IN	1.25	3.75
14	1	300° C S IN 1.000 IN	1.25	3.75
15	1	300° C S IN 1.000 IN	1.25	3.75
16	1	300° C S IN 1.000 IN	1.25	3.75
17	1	300° C S IN 1.000 IN	1.25	3.75
18	1	300° C S IN 1.000 IN	1.25	3.75
19	1	300° C S IN 1.000 IN	1.25	3.75
20	1	300° C S IN 1.000 IN	1.25	3.75
21	1	300° C S IN 1.000 IN	1.25	3.75
22	1	300° C S IN 1.000 IN	1.25	3.75
23	1	300° C S IN 1.000 IN	1.25	3.75
24	1	300° C S IN 1.000 IN	1.25	3.75
25	1	300° C S IN 1.000 IN	1.25	3.75
26	1	300° C S IN 1.000 IN	1.25	3.75
27	1	300° C S IN 1.000 IN	1.25	3.75
28	1	300° C S IN 1.000 IN	1.25	3.75
29	1	300° C S IN 1.000 IN	1.25	3.75
30	1	300° C S IN 1.000 IN	1.25	3.75
31	1	300° C S IN 1.000 IN	1.25	3.75
32	1	300° C S IN 1.000 IN	1.25	3.75
33	1	300° C S IN 1.000 IN	1.25	3.75
34	1	300° C S IN 1.000 IN	1.25	3.75
35	1	300° C S IN 1.000 IN	1.25	3.75
36	1	300° C S IN 1.000 IN	1.25	3.75
37	1	300° C S IN 1.000 IN	1.25	3.75
38	1	300° C S IN 1.000 IN	1.25	3.75
39	1	300° C S IN 1.000 IN	1.25	3.75
40	1	300° C S IN 1.000 IN	1.25	3.75
41	1	300° C S IN 1.000 IN	1.25	3.75
42	1	300° C S IN 1.000 IN	1.25	3.75
43	1	300° C S IN 1.000 IN	1.25	3.75
44	1	300° C S IN 1.000 IN	1.25	3.75
45	1	300° C S IN 1.000 IN	1.25	3.75
46	1	300° C S IN 1.000 IN	1.25	3.75
47	1	300° C S IN 1.000 IN	1.25	3.75
48	1	300° C S IN 1.000 IN	1.25	3.75
49	1	300° C S IN 1.000 IN	1.25	3.75
50	1	300° C S IN 1.000 IN	1.25	3.75
51	1	300° C S IN 1.000 IN	1.25	3.75
52	1	300° C S IN 1.000 IN	1.25	3.75
53	1	300° C S IN 1.000 IN	1.25	3.75
54	1	300° C S IN 1.000 IN	1.25	3.75
55	1	300° C S IN 1.000 IN	1.25	3.75
56	1	300° C S IN 1.000 IN	1.25	3.75
57	1	300° C S IN 1.000 IN	1.25	3.75
58	1	300° C S IN 1.000 IN	1.25	3.75
59	1	300° C S IN 1.000 IN	1.25	3.75
60	1	300° C S IN 1.000 IN	1.25	3.75
61	1	300° C S IN 1.000 IN	1.25	3.75
62	1	300° C S IN 1.000 IN	1.25	3.75
63	1	300° C S IN 1.000 IN	1.25	3.75
64	1	300° C S IN 1.000 IN	1.25	3.75
65	1	300° C S IN 1.000 IN	1.25	3.75
66	1	300° C S IN 1.000 IN	1.25	3.75
67	1	300° C S IN 1.000 IN	1.25	3.75
68	1	300° C S IN 1.000 IN	1.25	3.75
69	1	300° C S IN 1.000 IN	1.25	3.75
70	1	300° C S IN 1.000 IN	1.25	3.75
71	1	300° C S IN 1.000 IN	1.25	3.75
72	1	300° C S IN 1.000 IN	1.25	3.75
73	1	300° C S IN 1.000 IN	1.25	3.75
74	1	300° C S IN 1.000 IN	1.25	3.75
75	1	300° C S IN 1.000 IN	1.25	3.75
76	1	300° C S IN 1.000 IN	1.25	3.75
77	1	300° C S IN 1.000 IN	1.25	3.75
78	1	300° C S IN 1.000 IN	1.25	3.75
79	1	300° C S IN 1.000 IN	1.25	3.75
80	1	300° C S IN 1.000 IN	1.25	3.75
81	1	300° C S IN 1.000 IN	1.25	3.75
82	1	300° C S IN 1.000 IN	1.25	3.75
83	1	300° C S IN 1.000 IN	1.25	3.75
84	1	300° C S IN 1.000 IN	1.25	3.75
85	1	300° C S IN 1.000 IN	1.25	3.75
86	1	300° C S IN 1.000 IN	1.25	3.75
87	1	300° C S IN 1.000 IN	1.25	3.75
88	1	300° C S IN 1.000 IN	1.25	3.75
89	1	300° C S IN 1.000 IN	1.25	3.75
90	1	300° C S IN 1.000 IN	1.25	3.75
91	1	300° C S IN 1.000 IN	1.25	3.75
92	1	300° C S IN 1.000 IN	1.25	3.75
93	1	300° C S IN 1.000 IN	1.25	3.75
94	1	300° C S IN 1.000 IN	1.25	3.75
95	1	300° C S IN 1.000 IN	1.25	3.75
96	1	300° C S IN 1.000 IN	1.25	3.75
97	1	300° C S IN 1.000 IN	1.25	3.75
98	1	300° C S IN 1.000 IN	1.25	3.75
99	1	300° C S IN 1.000 IN	1.25	3.75
100	1	300° C S IN 1.000 IN	1.25	3.75

REVISION RECORD			
NO.	DATE	DESCRIPTION	REMARKS
1	7/7/71	PER ADMINISTRATIVE CHANGE ADDED SUPPORT-WARM N° 90 SUPERTECO MANAGER ISO. 2-BC-114 SMT.2	APPROVED BY: [Signature] READ

INSPECT:

C, A ANT 11 82486

UNCONTROLLED  
DOCUMENT

**NOTE:**

I USE CRAB AS A COMPOUND  
ON ALL TAND CONNECTIONS

~~STANDARD PROCEDURE IS FOLLOWS~~

(1) P UNDO =  
W L & GIBB -

PRESENT MARKING IS  
 IN THE AREA  
 GENERAL AND SUFFICIENT TO LOCATE.  
 IS SUFFICIENT TO  
 FOR EXACT LOCATIONS SEE PAGE  
 SUPPORT UNIT

1. - 2. 7. 1951 (1951) 1951 1951  
1951 1951 1951 1951  
1951 1951

[illegible]





DC

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

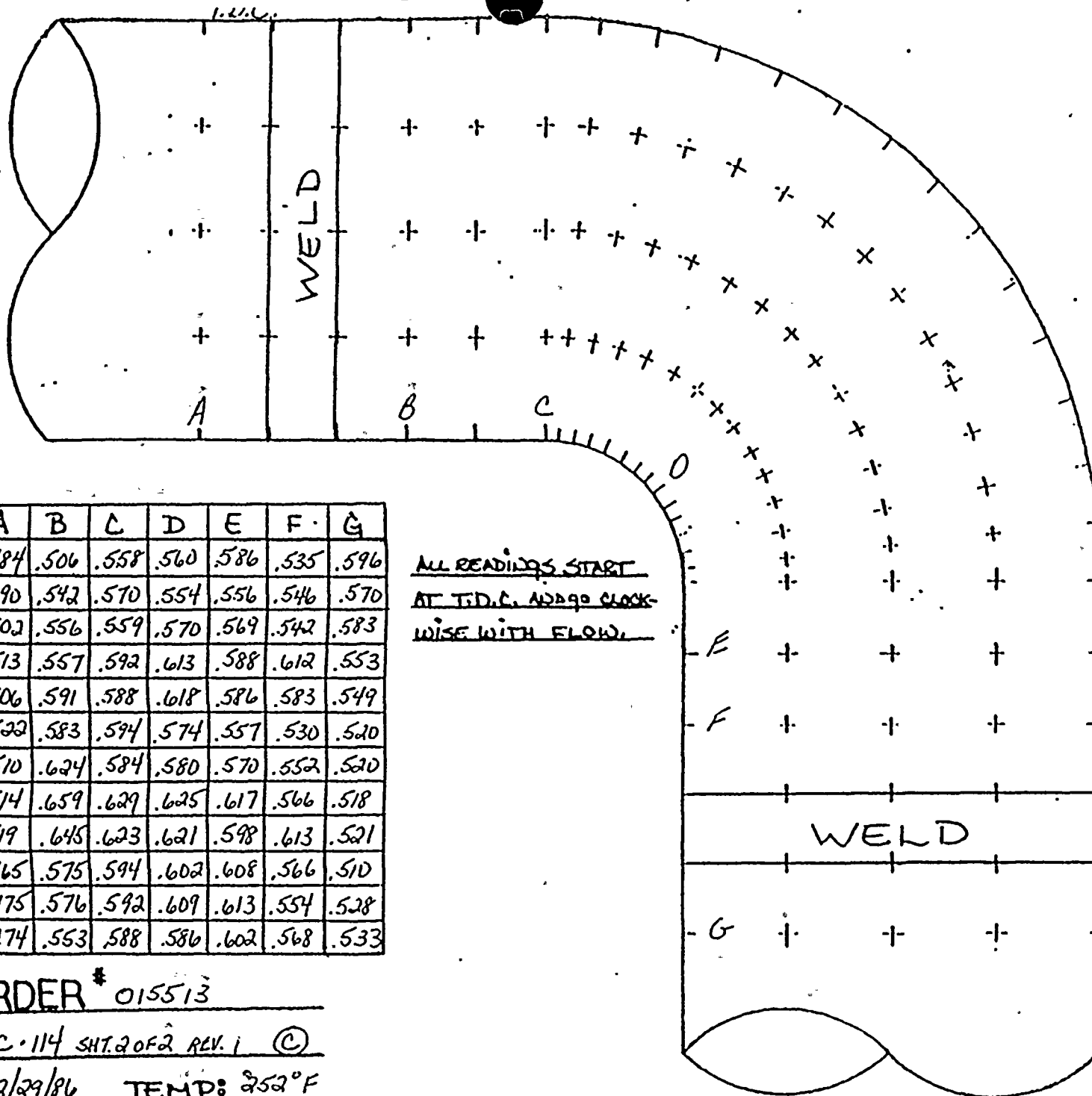
JOB ORDER # 015513

ISO# 2.C.114 rev1 2.2 (A)

DATE: 12/29/86 TEMP: 252°F



FLOW →



T.D.C.

	A	B	C	D	E	F	G
0°	.484	.506	.558	.560	.586	.535	.596
30°	.490	.542	.570	.554	.556	.546	.570
60°	.502	.556	.559	.570	.569	.542	.583
90°	.513	.557	.592	.613	.588	.612	.553
120°	.506	.591	.588	.618	.586	.583	.549
150°	.522	.583	.594	.574	.557	.530	.520
180°	.510	.624	.584	.580	.570	.552	.520
210°	.514	.659	.629	.625	.617	.566	.518
240°	.519	.645	.623	.621	.598	.613	.521
270°	.465	.575	.594	.602	.608	.566	.510
300°	.475	.576	.592	.609	.613	.554	.528
330°	.474	.553	.588	.586	.602	.568	.533

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

JOB ORDER # 015513

ISO# 2-C-114 SH. 2 OF 2 REV. 1 (C)

DATE: 12/29/86 TEMP: 252°F



HEATER DRAINS AND  
VENTS SYSTEMS



## AMERICAN ELECTRIC POWER SERVICE CORPORATION

DATE: SEPTEMBER 16, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 1  
 Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. J. A. Zebayra *HK 9/16/87*  
 2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on AUGUST 19, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
<u>LHPD-11, REV 3</u>	<u>CS</u>	<u>A</u>	<u>ACCEPTABLE, NO FURTHER INSPECTIONS REQUIRED</u>
<u>-----</u>	<u>CS</u>	<u>D</u>	<u>-----</u>
<u>-----</u>	<u>CS</u>	<u>E</u>	<u>-----</u>
<u>LHPD-9, REV 4</u>	<u>CS</u>	<u>B</u>	<u>-----</u>
<u>-----</u>	<u>CS</u>	<u>F</u>	<u>-----</u>
<u>-----</u>	<u>CS</u>	<u>F</u>	<u>-----</u>
<u>-----</u>	<u>CS</u>	<u>P</u>	<u>-----</u>
<u>-----</u>	<u>CS</u>	<u>Q</u>	<u>-----</u>
<u>-----</u>	<u>CS</u>	<u>R</u>	<u>-----</u>
<u>-----</u>	<u>CS</u>	<u>U</u>	<u>-----</u>

Anthony J. Lewandowski  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
~~C. A. Eriksen~~ J. F. Kurgan  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 4.6.3.15.2.6.2

Sheet No. 1 of 3



D. C. Cook Nuclear Plant, Unit No. 1  
 Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering evaluation of Wall Thickness Measurements  
 Date: SEPTEMBER 16, 1987  
 Sheet No. 2 of 3

Isometric Drawing No.	Piping Material	Comp. I.D.	AEFSC Recommendation
LHPD-9, REV 4	CS	X	ACCEPTABLE, NO FURTHER INSPECTIONS REQUIRED
↓	CS	Y	↓
LHPD-12, REV 2	CS	A	↓
↓	CS	H	REPLACE WITHIN 2 YEARS
↓	CS	I	ACCEPTABLE, RE-INSPECT IN 8 YEARS
LHPD-10, REV 4	CS	A	ACCEPTABLE, NO FURTHER INSPECTION REQUIRED
↓	CS	B	↓
↓	CS	H	↓
↓	CS	J	↓
↓	CS	K	↓
LHPD-14, REV 1	CS	A	↓
↓	CS	B	ACCEPTABLE, RE-INSPECT IN 21 YEARS
↓	CS	C	ACCEPTABLE, RE-INSPECT IN 8 YEARS
↓	CS	D	ACCEPTABLE, NO FURTHER INSPECTION REQUIRED
↓	CS	E	↓
LHPD-15, REV 1	CS	A	↓
↓	CS	B	ACCEPTABLE, RE-INSPECT IN 25 YEARS
↓	CS	C	ACCEPTABLE, NO FURTHER INSPECTIONS REQUIRED
↓	CS	D	↓
↓	CS	E	↓
LHPD-16, REV 1	CS	A	↓
↓	CS	B	↓



Sheet No. 3 of 3

[illegible]



## EROSION EVALUATION WORKSHEET

[illegible]



CONST: 95838, 95839

**INSPECT:**



**FAB**

1. WFO-74  
-75  
-76  
-77

INFORMATION REPORTS CENTER  
CONTROLLED  
DOCUMENT  
JAN 13 1976  
WORKING COPY  
VOLUME #

3	1-1-77	ENC	AS PER FIELD "AS-BUILT" ROTATED (SEE SECT. OF ITEM # 2)		
2	2-2-75	ENC 1-1-77	REVISED BY AEP DURING DESIGN LINE AND HAND-PLACED, PAVING 12-18 AND 12-18-19, 12-18-20, 12-18-21 AND 12-18-22, 12-18-23, 12-18-24 AND 12-18-25, 12-18-26, 12-18-27 AND 12-18-28, 12-18-29, 12-18-30 AND 12-18-31, 12-18-32, 12-18-33 AND 12-18-34, 12-18-35, 12-18-36 AND 12-18-37, 12-18-38, 12-18-39 AND 12-18-40, 12-18-41, 12-18-42 AND 12-18-43, 12-18-44, 12-18-45 AND 12-18-46, 12-18-47, 12-18-48 AND 12-18-49, 12-18-50, 12-18-51 AND 12-18-52, 12-18-53, 12-18-54 AND 12-18-55, 12-18-56, 12-18-57 AND 12-18-58, 12-18-59, 12-18-60 AND 12-18-61, 12-18-62, 12-18-63 AND 12-18-64, 12-18-65, 12-18-66 AND 12-18-67, 12-18-68, 12-18-69 AND 12-18-70, 12-18-71, 12-18-72 AND 12-18-73, 12-18-74, 12-18-75 AND 12-18-76, 12-18-77, 12-18-78 AND 12-18-79, 12-18-80, 12-18-81 AND 12-18-82, 12-18-83, 12-18-84 AND 12-18-85, 12-18-86, 12-18-87 AND 12-18-88, 12-18-89, 12-18-90 AND 12-18-91, 12-18-92, 12-18-93 AND 12-18-94, 12-18-95, 12-18-96 AND 12-18-97, 12-18-98, 12-18-99 AND 12-19-00, 12-19-01, 12-19-02 AND 12-19-03, 12-19-04, 12-19-05 AND 12-19-06, 12-19-07, 12-19-08 AND 12-19-09, 12-19-10, 12-19-11 AND 12-19-12, 12-19-13, 12-19-14 AND 12-19-15, 12-19-16, 12-19-17 AND 12-19-18, 12-19-19, 12-19-20 AND 12-19-21, 12-19-22, 12-19-23 AND 12-19-24, 12-19-25, 12-19-26 AND 12-19-27, 12-19-28, 12-19-29 AND 12-19-30, 12-19-31, 12-19-32 AND 12-19-33, 12-19-34, 12-19-35 AND 12-19-36, 12-19-37, 12-19-38 AND 12-19-39, 12-19-40, 12-19-41 AND 12-19-42, 12-19-43, 12-19-44 AND 12-19-45, 12-19-46, 12-19-47 AND 12-19-48, 12-19-49, 12-19-50 AND 12-19-51, 12-19-52, 12-19-53 AND 12-19-54, 12-19-55, 12-19-56 AND 12-19-57, 12-19-58, 12-19-59 AND 12-19-60, 12-19-61, 12-19-62 AND 12-19-63, 12-19-64, 12-19-65 AND 12-19-66, 12-19-67, 12-19-68 AND 12-19-69, 12-19-70, 12-19-71 AND 12-19-72, 12-19-73, 12-19-74 AND 12-19-75, 12-19-76, 12-19-77 AND 12-19-78, 12-19-79, 12-19-80 AND 12-19-81, 12-19-82, 12-19-83 AND 12-19-84, 12-19-85, 12-19-86 AND 12-19-87, 12-19-88, 12-19-89 AND 12-19-90, 12-19-91, 12-19-92 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## UNIT NO.1

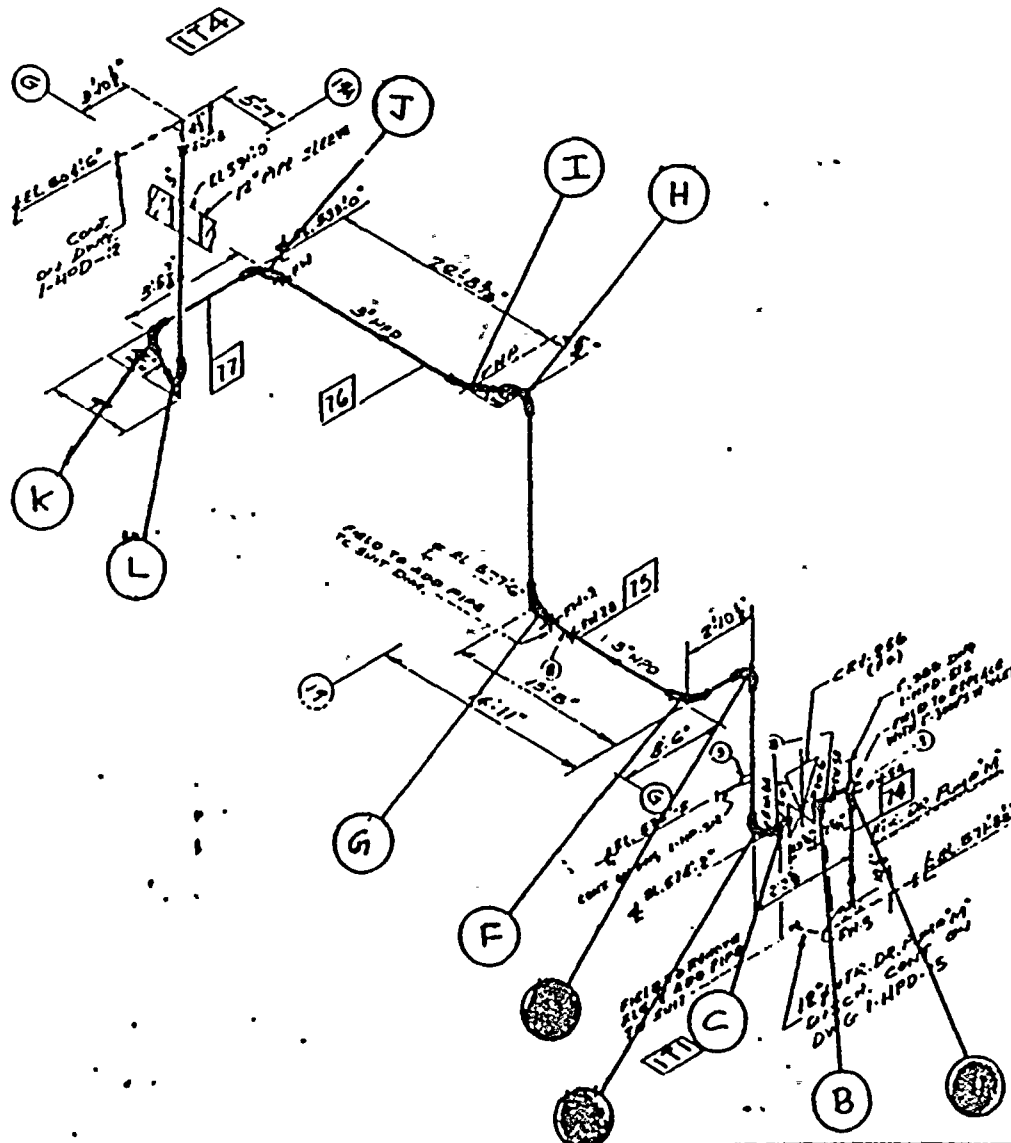
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POW	BT	ELI	NO	NO	NO	NO
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1	1012	1010	1011	1010	1010	1010
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						HPD-1 REV. 3

DESCRIPTION	MT	COMP	SS	W
HEATER DRAINS AND VENTS				

120 BELLEVILLE ST. N.Y. 10019  
 TUBECO  
 111 JAMES STREET

1-HPD-11.

DWG NO 110911251

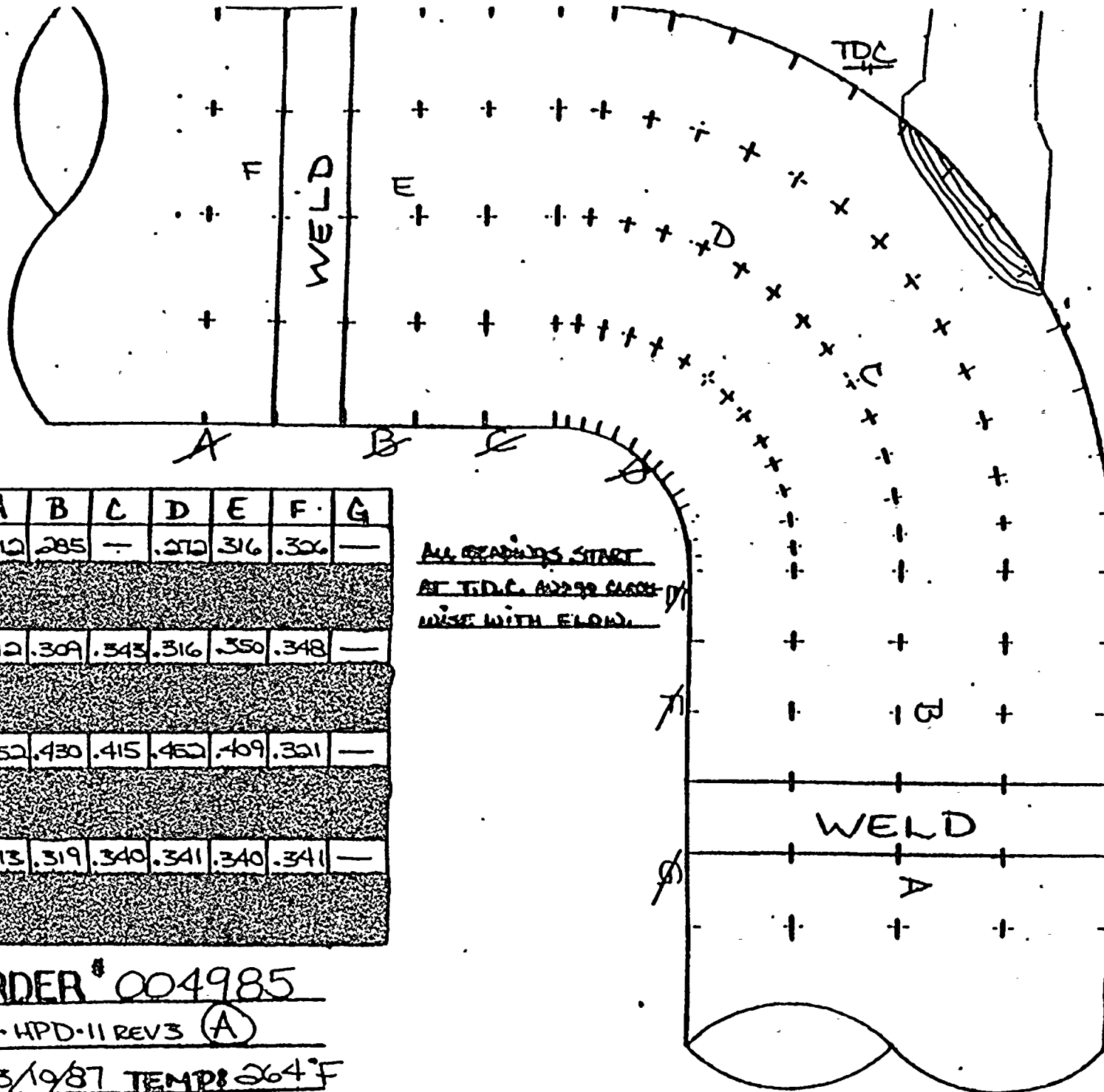


PRICE NO'S PREPARED BY I-HPD

**FAMICAT** **POST**: FAMILICATION POST COMING  
TO LATEST A.S.P. BRANCH  
**DATE**: 1-27-68  
**J.B.** **BASIC SPEC.** **WARM** **10-30-68**  
**MARCH** **METRIC CLASS** **BE**  
**NET** **ALTIMENTS** **CL.** **N/A**  
**ATO** **10-30-68**  
**REL.** **Q1** **TESTING** **N/A**



← FLOW



	A	B	C	D	E	F	G
0°	.312	.285	—	.272	.316	.322	—
90°	.312	.309	.343	.316	.350	.348	—
180°	.352	.430	.415	.452	.409	.321	—
270°	.313	.319	.340	.341	.340	.341	—

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

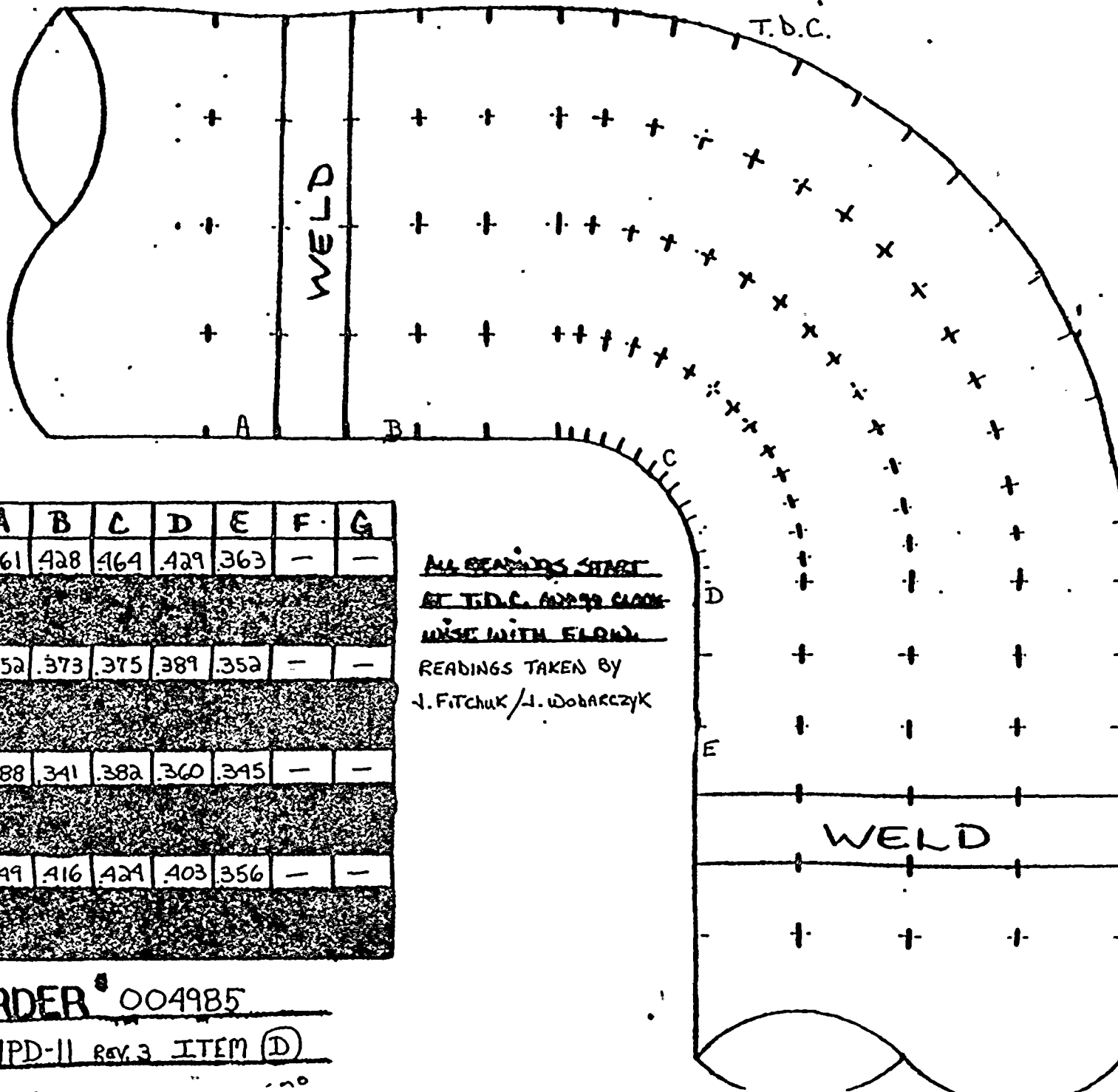
JOB ORDER # 004985

ISO# 1-HPD-11 REV 3 (A)

DATE: 3/19/87 TEMP: 264°F



FLOW →



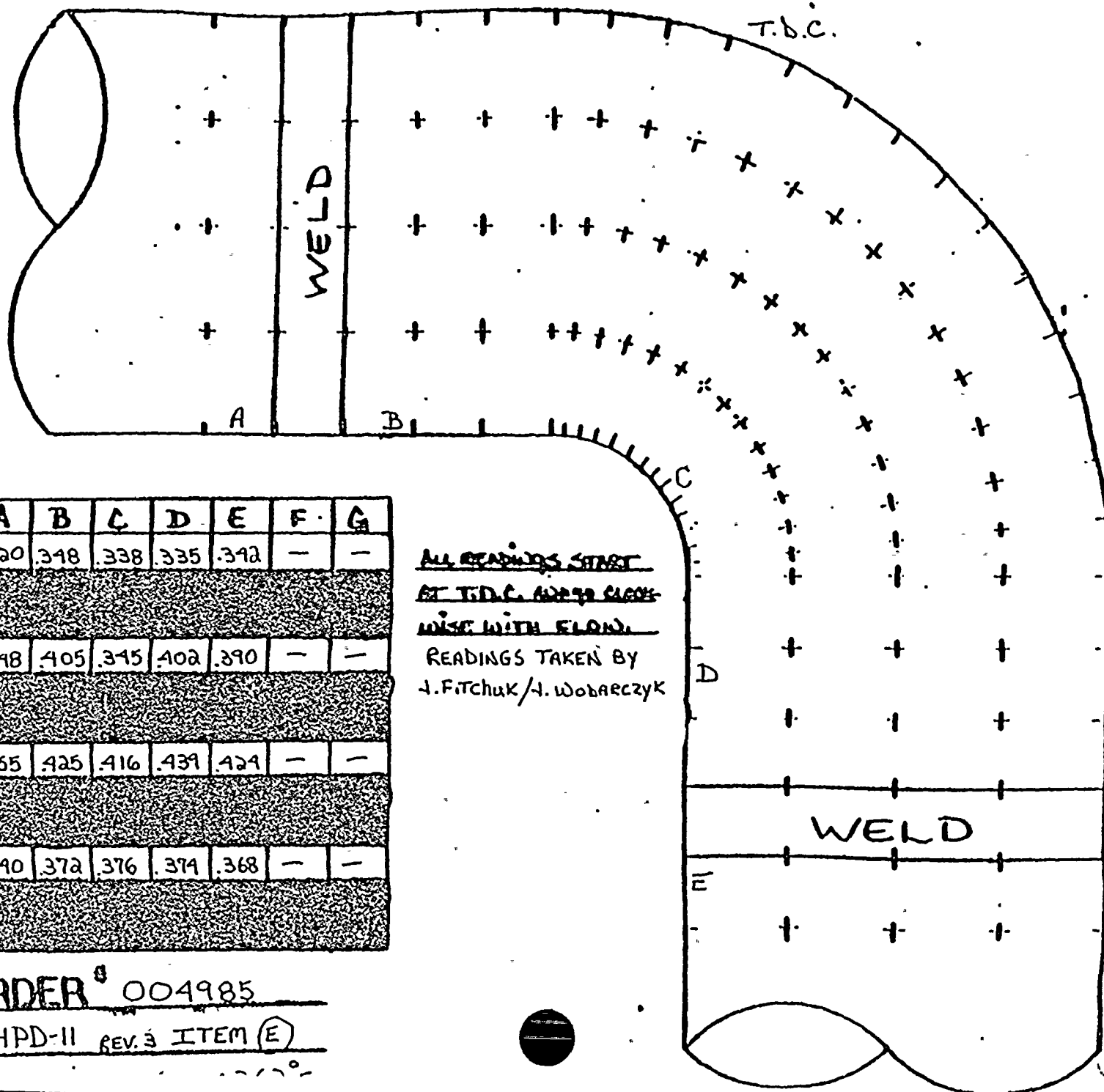
	A	B	C	D	E	F	G
0°	.361	.428	.464	.429	.363	—	—
90°	.352	.373	.375	.389	.352	—	—
180°	.388	.341	.382	.360	.345	—	—
270°	.349	.416	.424	.403	.356	—	—

ALL READINGS START  
AT T.D.C. AND 90 DEGREE  
INCREASING WITH FLOW.  
READINGS TAKEN BY  
J. FITCHUK / J. WODARCZYK

JOE ORDER # 004985  
ISO # 1-HPD-11 REV. 3 ITEM (D)



FLOW →



	A	B	C	D	E	F	G
0°	.320	.348	.338	.335	.342	—	—
90°	.348	.405	.345	.402	.390	—	—
180°	.355	.425	.416	.439	.424	—	—
270°	.340	.372	.376	.374	.368	—	—

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.  
READINGS TAKEN BY  
J. FITCHUK/J. WOBARCZYK

JOE ORDER # 004985

ISC-HPD-11 REV. 3 ITEM (E)



# EMISSION EVALUATION WORKSHEET

Unit No. 1

Years in service 11

UT Reading Taken on: 2-18, 2-25 &  
4-10-87

AEPSC Installed Mat'l Class ASTM A-106 GR B

Plant

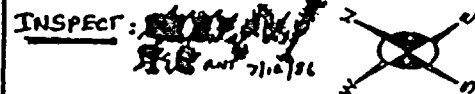
COMMENTS

	3" 90° ELL	.300	.263-.338	.135	.334	0	STILL WITHIN MANUFACTURERS TOLERANCE
B	3" 90° ELL	.300	.263-.338	.135	.338	0	" " " "
E	3" 90° ELL	.300	.263-.338	.135	.301	0	" " " "
F	3" 90° ELL	.300	.263-.338	.135	.301	0	" " " "
P	3" 90° ELL	.300	.263-.338	.135	.317	0	" " " "
Q	3" 90° ELL	.300	.263-.338	.135	.294	0	" " " "
R	3" 90° ELL	.300	.263-.338	.135	.281	0	" " " "
U	3" 90° ELL	.300	.263-.338	.135	.294	0	" " " "
X	3" 90° ELL	.300	.263-.338	.135	.288	0	" " " "
Y	3" 90° ELL	.300	.263-.338	.135			" " " "



WEEK-13 2.0.4  
CONST: 95838, 95839  
QC: 95837

ISOMETRIC SHEET NO. 544



<u>PO</u>	<u>PIECE MARK</u>	<u>FAB</u>
	1. NPD-38	SHAW
	.59	
	.00	
	.01	
	.02	
	.03	
	.04	
	.05	
	.06	

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1	8-77	ARC	AS PER FIELD 'AS-BUILT' CONTENTS / REMOVAL OF ITEM #8		
2	7-75	CB	LOANED BY APT. BUILDING FIRM, A LAW FIRM, 1200 N. 12TH ST. S.E. MILWAUKEE, WISCONSIN 53204. NO. 10-10-75 FOR ANNUAL SURV. 11-2212 / 0-0125	FIELD VISUAL CHECK	
3	4-81	CMB	REMOVED BY MPO. DITCHING (PER APT BUILDING DEPT. 11-10-80) BY 12000' OF ROAD. TRANSFER FIRM, INC. 11-10-80. NO. 10-10-80. 11-10-80. 11-10-80. 11-10-80. 11-10-80. 11-10-80. 11-10-80. 11-10-80. 11-10-80. 11-10-80. 11-10-80.	FIELD VISUAL CHECK	
4	5-77		ADDED VALVE 2" DIAMETER 10' FROM PUMP		
REV	DATE	CODE	DESCRIPTION	PO	DWG

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN MICHIGAN  
UNIT NO. 1

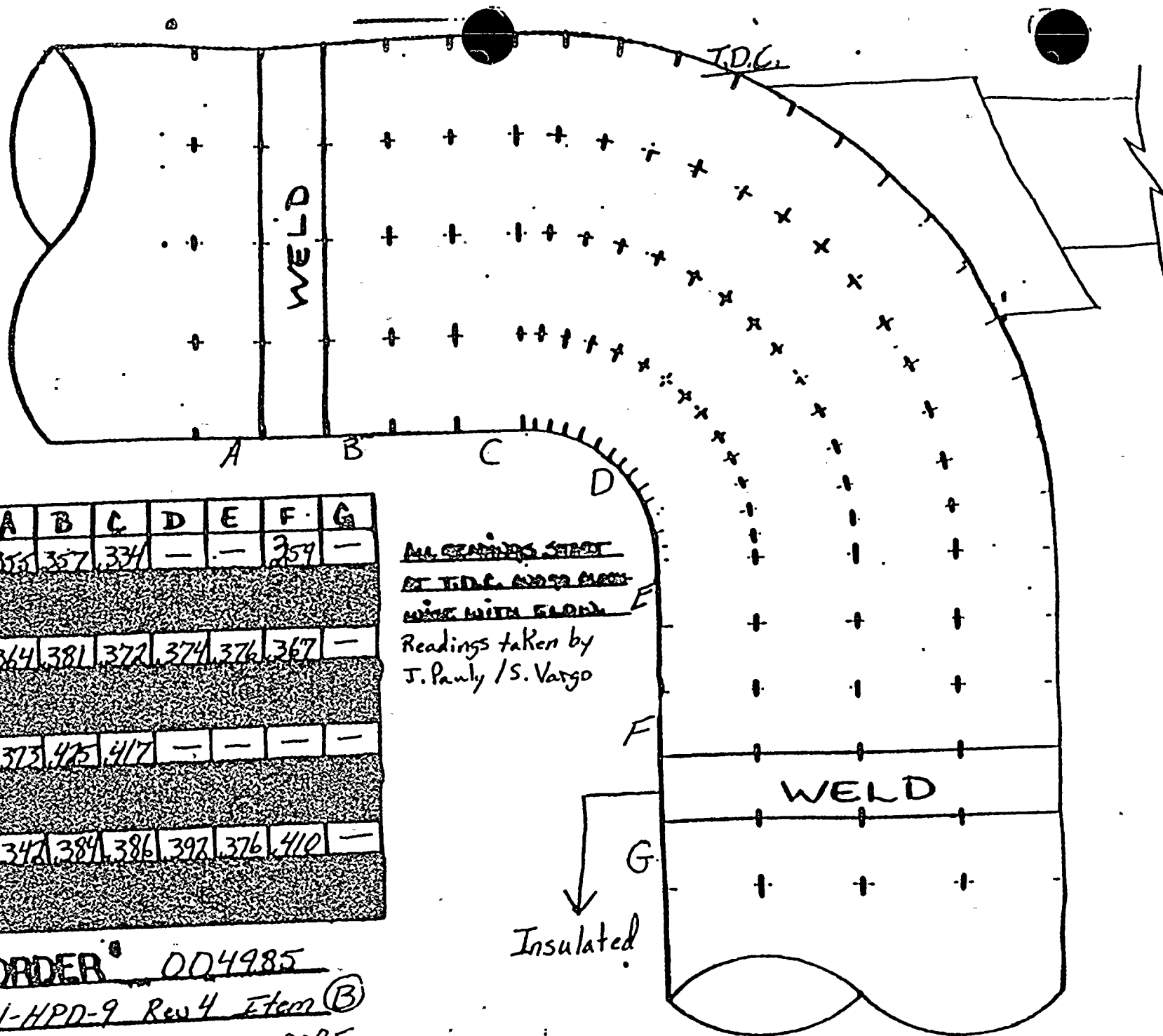
[illegible]

### MATERIAL REQUIRED FOR FIELD REWORK

DWG NO  
1-HP1 V. 4



FLOW →



	A	B	C	D	E	F	G
0°	356	357	334	—	—	359	—
90°	364	381	372	374	376	367	—
180°	373	425	417	—	—	—	—
270°	342	384	386	392	376	410	—

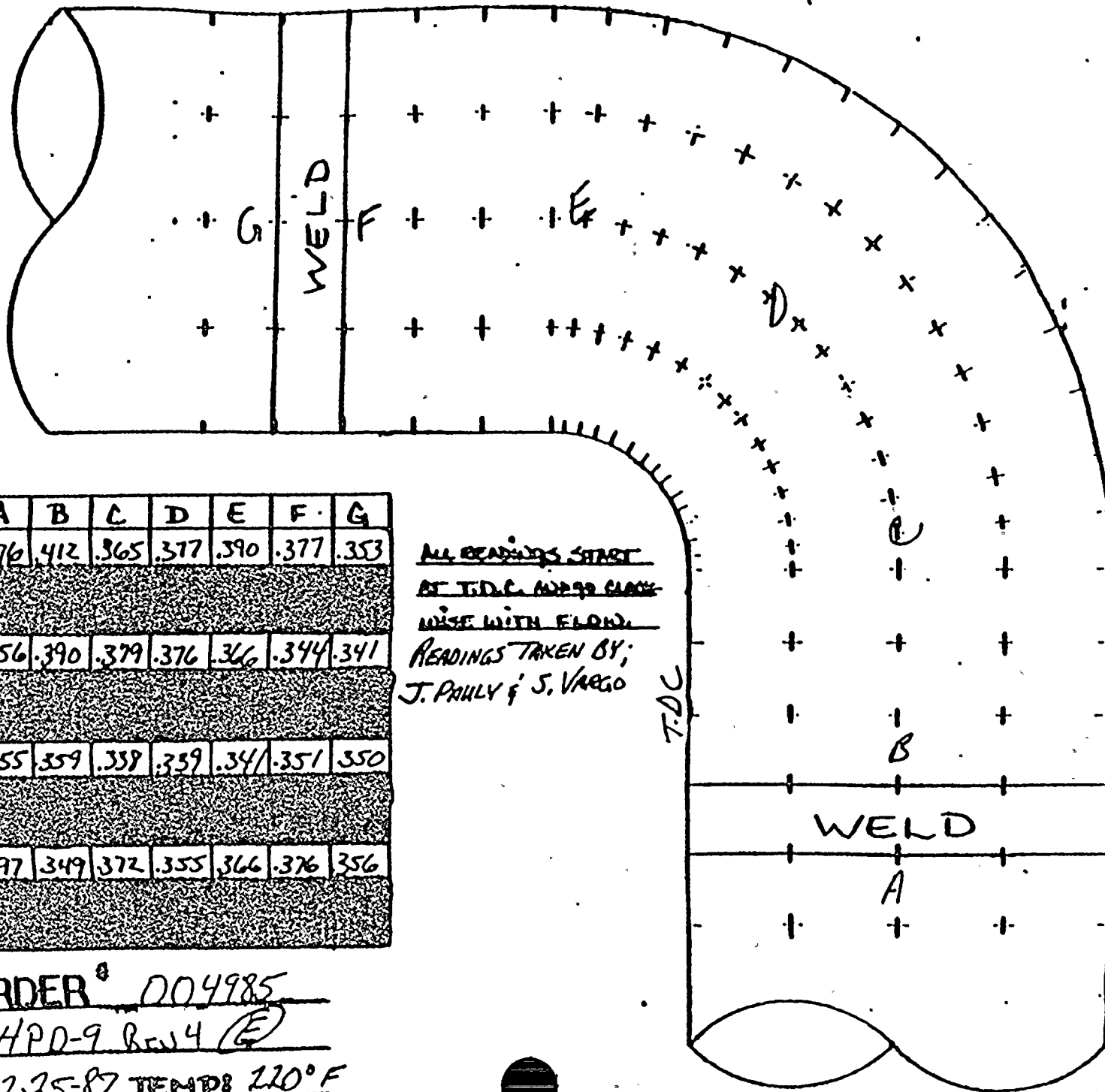
ALL READINGS TAKEN  
AT T.D.C. AND 90° FROM  
WIRE WITH FLAME  
Readings taken by  
J. Pauly / S. Vargo

JOEL ORDER # 004985  
ISO # 1-HPD-9 Rev 4 Item (B)  
DATE: 2/25/87 TEMP: 300°F

Insulated



← FLOW



FIG

	A	B	C	D	E	F	G
0°	.376	.412	.365	.377	.390	.377	.353
90°	.356	.390	.379	.376	.366	.344	.341
180°	.355	.359	.339	.339	.341	.351	.350
270°	.397	.349	.372	.355	.366	.376	.356

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.  
READINGS TAKEN BY;  
J. PAULY & S. VARGO

T.D.C.

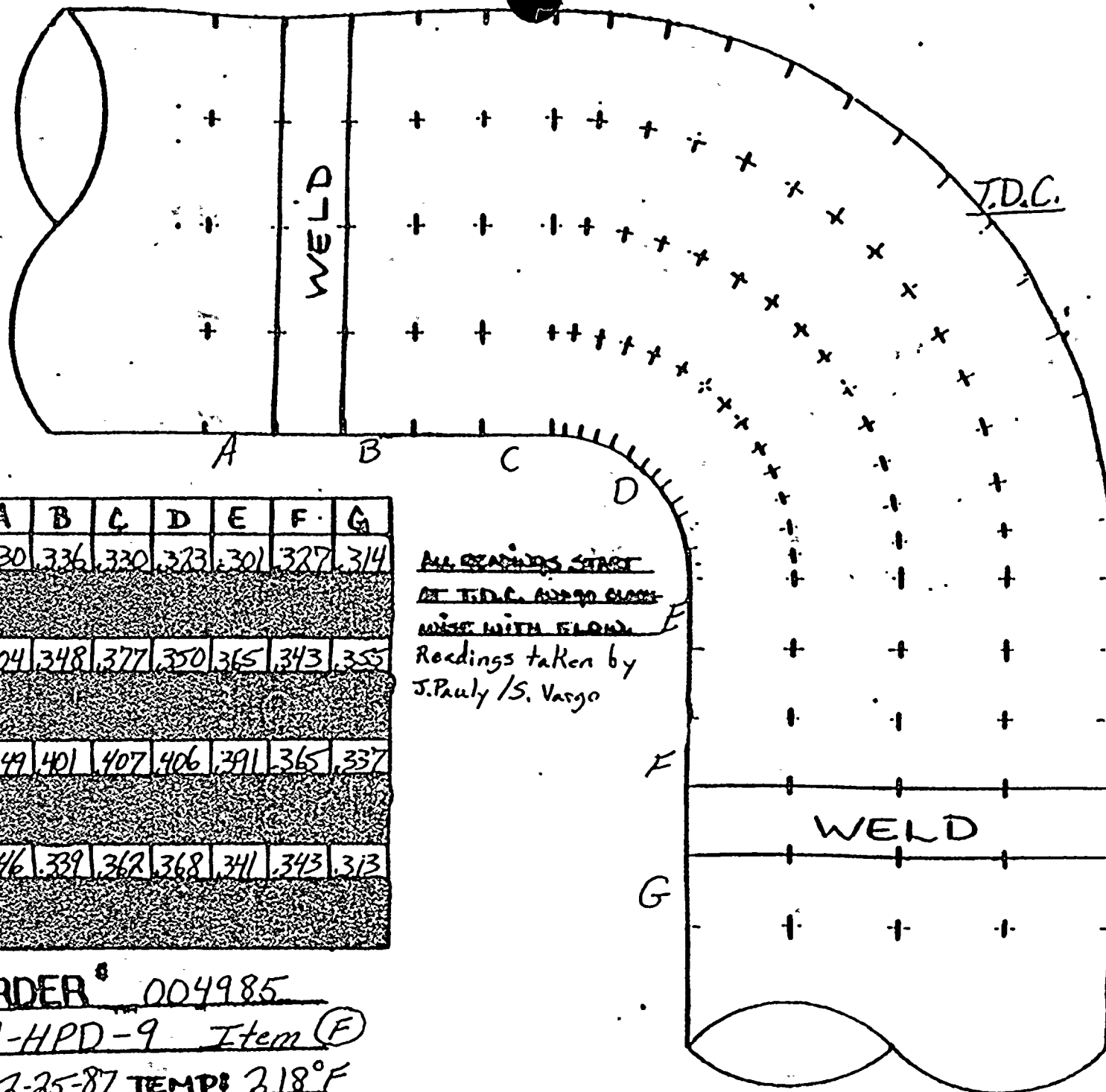
JOE ORDER # 004985

ISO # 1-HPD-9 Rev 4 (E)

DATE: 2-25-87 TEMP: 220° F



FLOW →

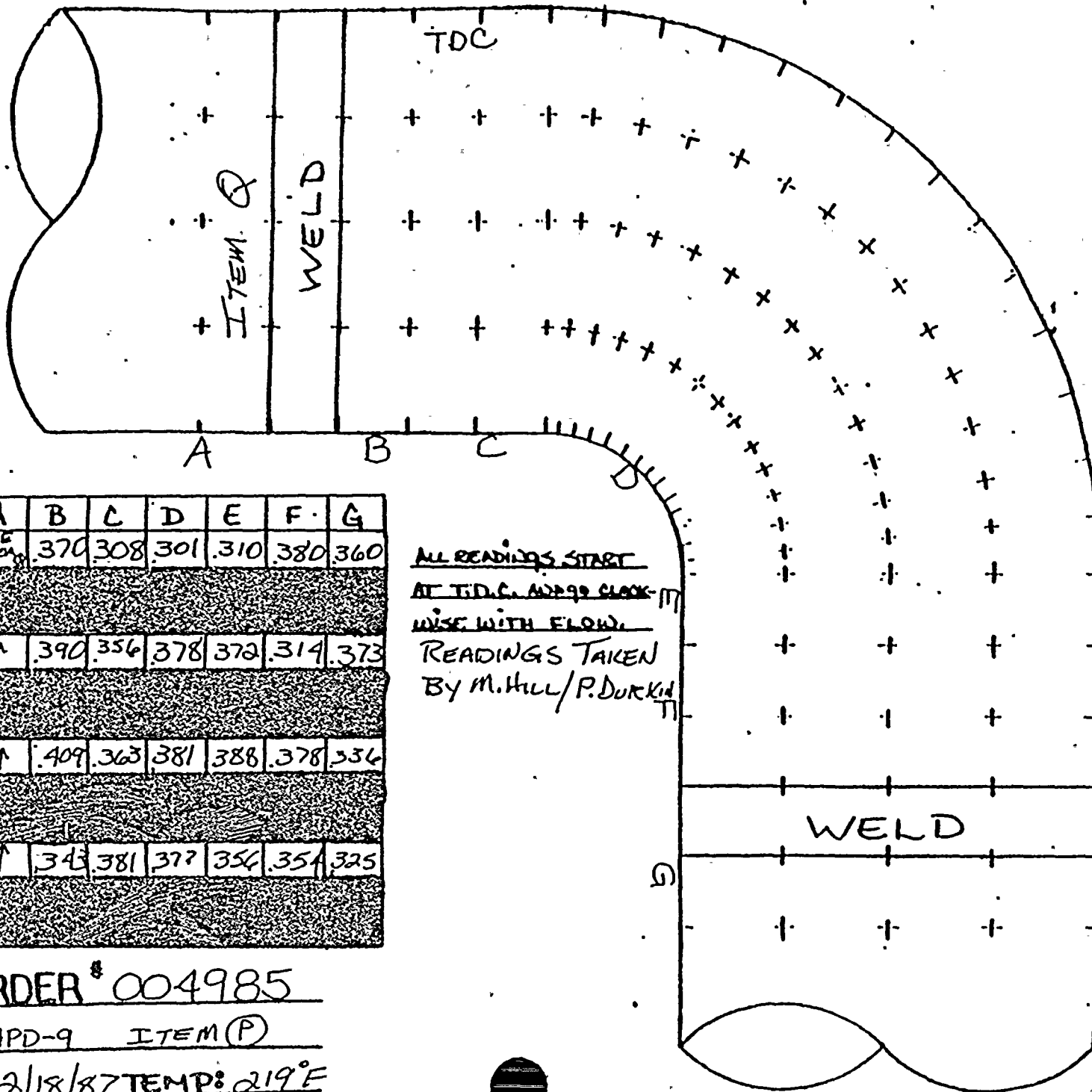


DOC

JOE ORDER # 004985  
 ISO # 1-HPD-9 Item (F)  
 DATE: 2-25-87 TEMP: 218°F



← FLOW

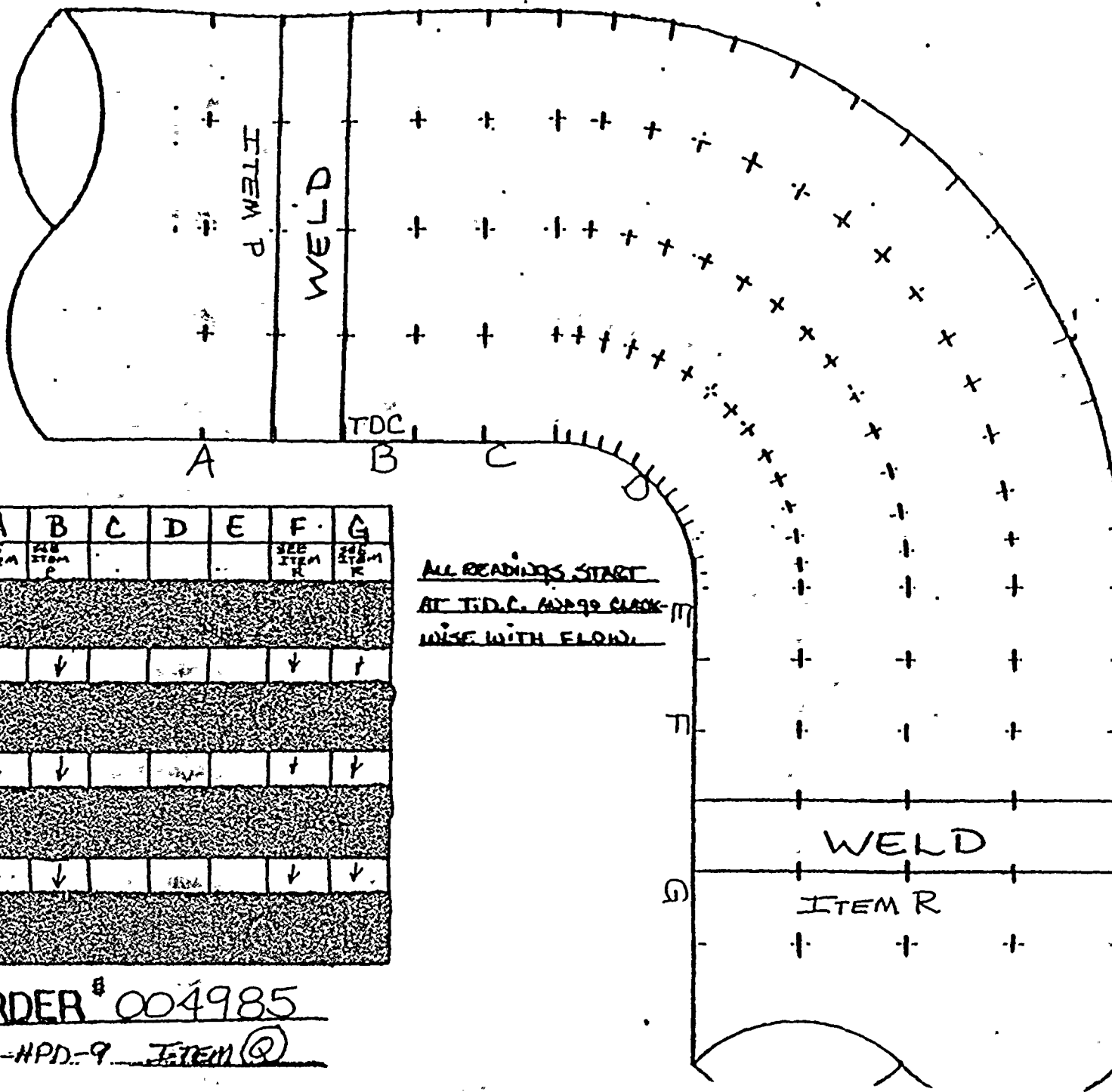


ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.  
READINGS TAKEN  
BY M. HILL / P. DURKID

JOE ORDER # 004985  
ISO # 1-HPD-9 ITEM (P)  
DATE: 2/18/87 TEMP: 219°F



FLOW →



TDC

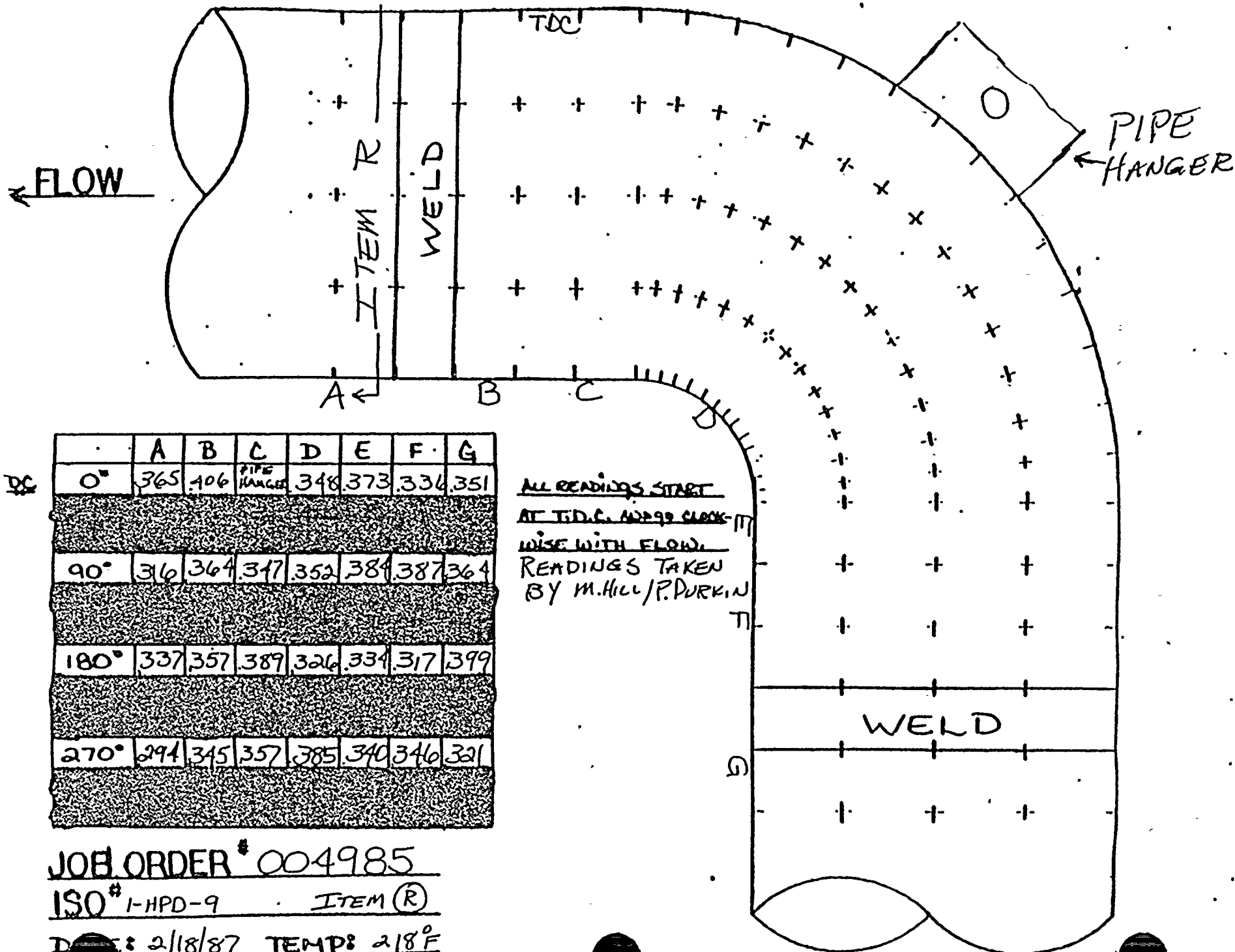
	A	B	C	D	E	F	G
0°	SEE ITEM P	SEE ITEM P				SEE ITEM R	SEE ITEM R
90°	↓	↓				↓	↓
180°	↓	↓				↓	↓
270°	↓	↓				↓	↓

ALL READINGS START  
AT T.D.C. AND GO CLOCK  
WISE WITH FLOW.

JOE ORDER # 004985

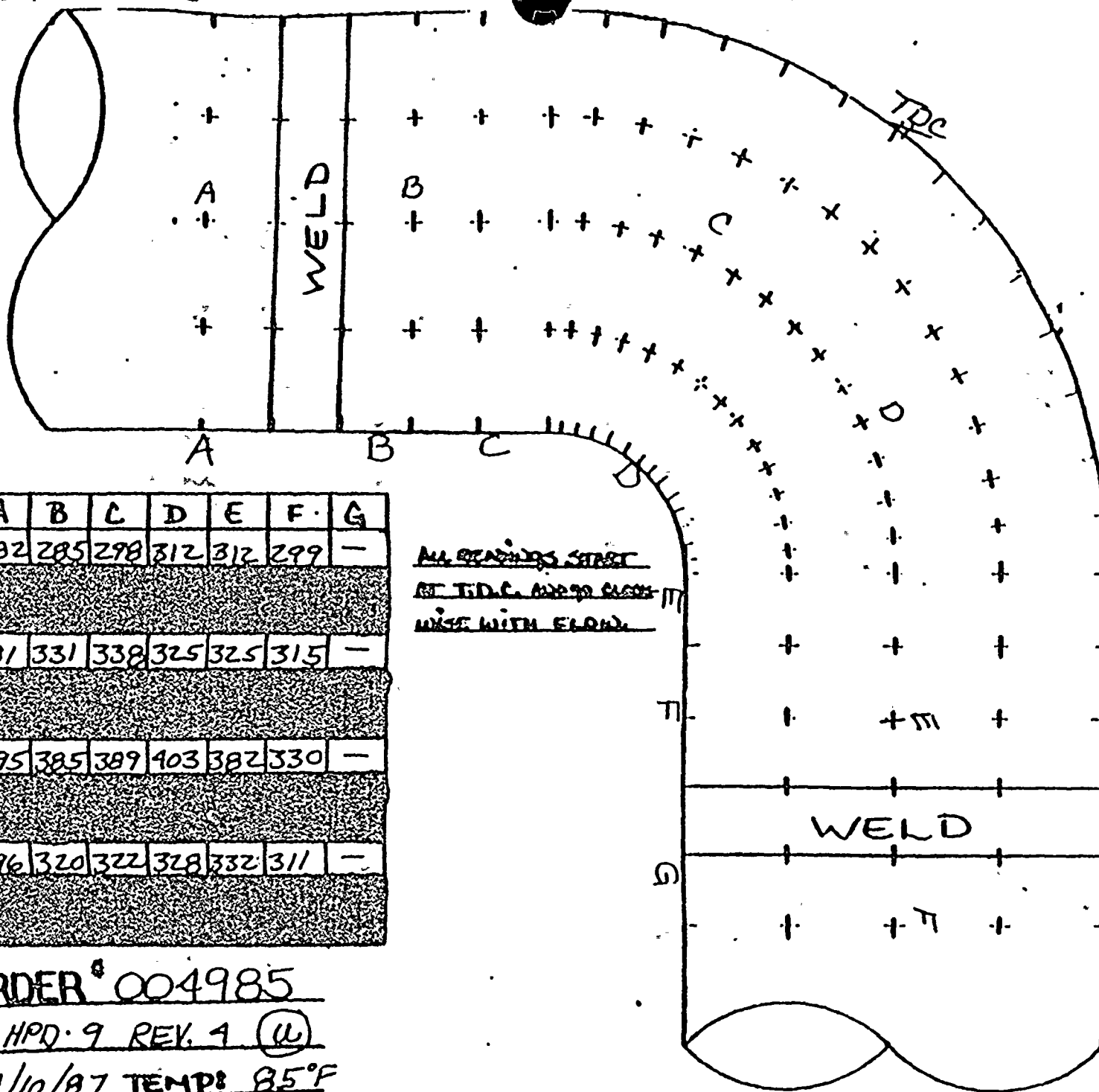
190# 1-HPD-9 ITEM @







FLOW →



700

	A	B	C	D	E	F	G
0°	282	285	298	312	312	299	—
90°	281	331	338	325	325	315	—
180°	295	385	389	403	382	330	—
270°	296	320	322	328	332	311	—

ALL READINGS START  
AT T.D.C. AND 90 DEG.  
CIRCUMFERENCE WITH FLOW.

JOE ORDER# 004985

ISO# 1-HPD-9 REV. 4 (U)

DATE: 4/10/87 TEMP: 85°F



FLOW →

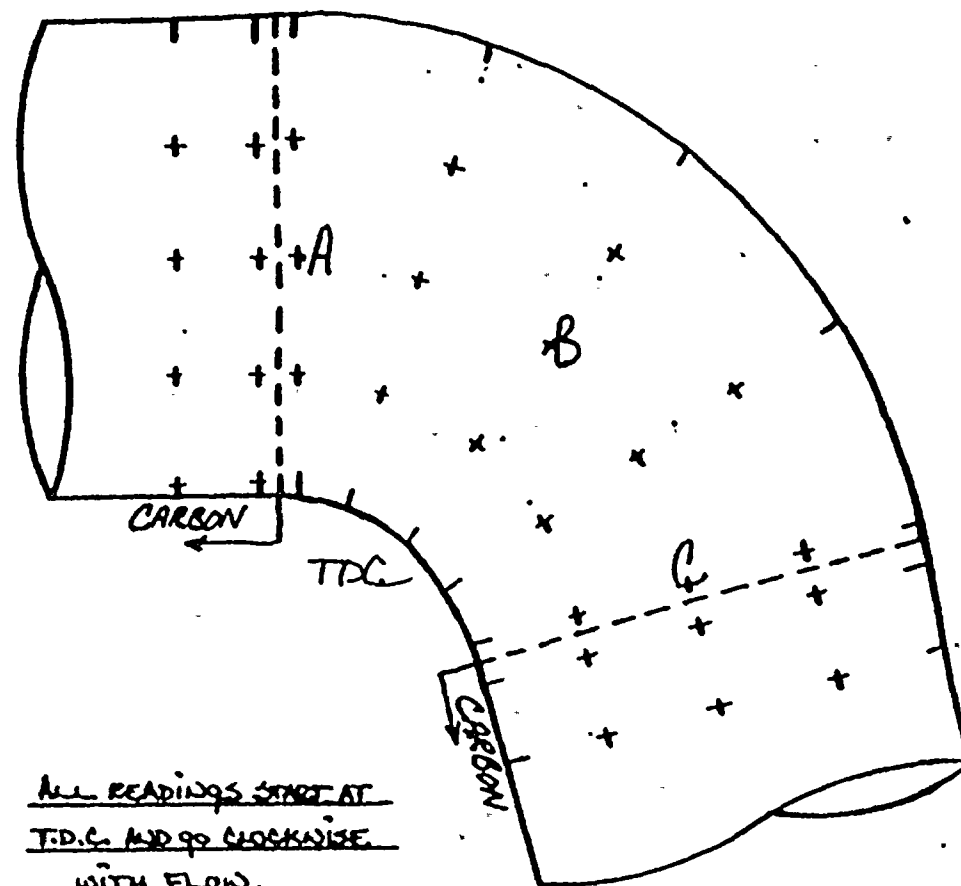
TDC

	A	B	C	D	E	F	G
0°	.338	.336	.337	—	—	—	—
30°							
60°							
90°	.384	.394	.384	—	—	—	—
120°							
150°							
180°	.318	.312	.311	—	—	—	—
210°							
240°							
270°	.322	.296	.294	—	—	—	—
300°							
330°							

JOB ORDER\*\* 004985

ISO\*\* 1-NPD-9 REV. 4 (X)

DATE: 2/25/87 TEMP: 145°F

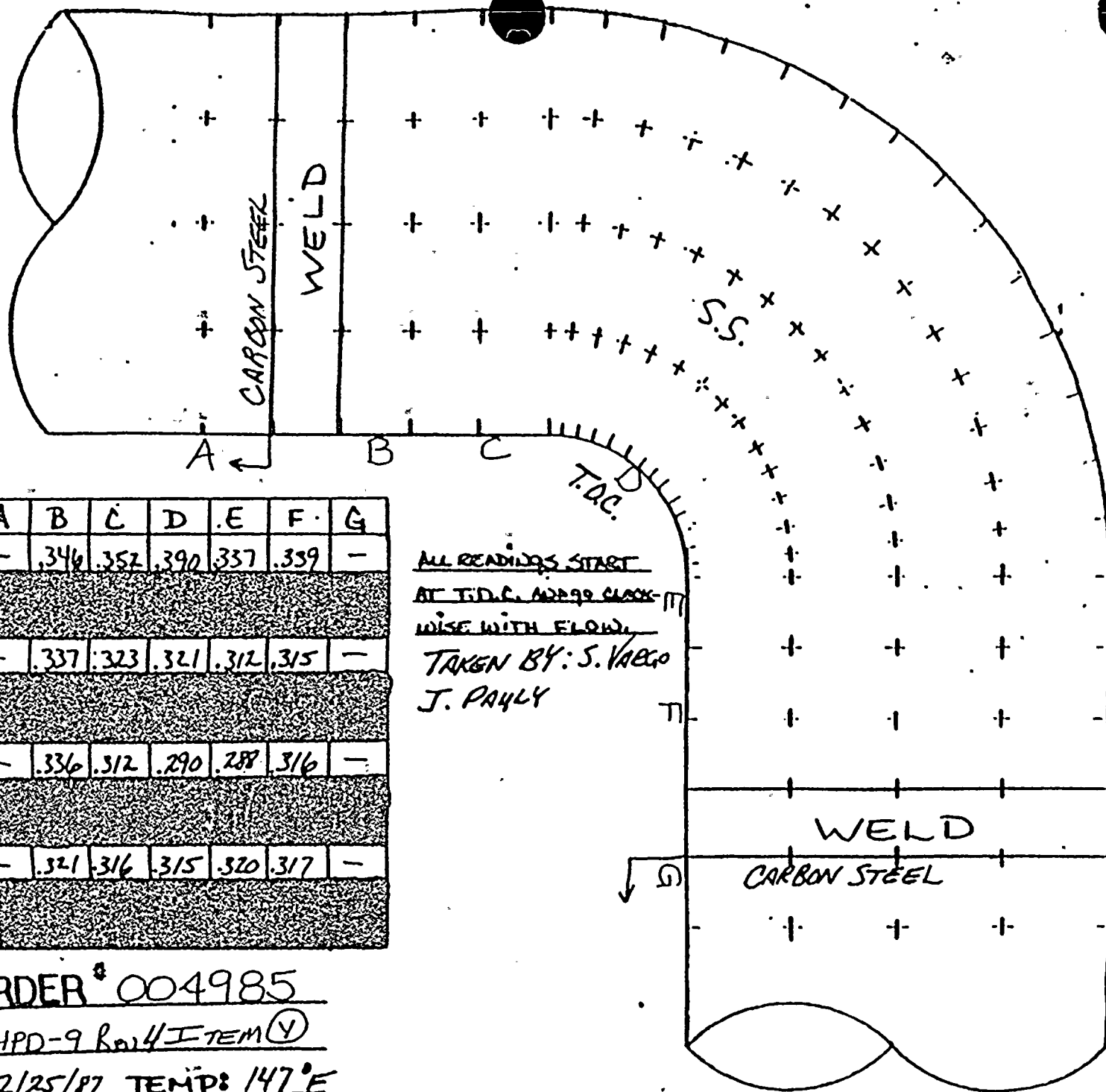


ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

READINGS TAKEN BY:  
J. PAULY & S. VARGO



FLOW →



DC

	A	B	C	D	E	F	G
0°	-	.346	.352	.390	.337	.339	-
90°	-	.337	.323	.321	.312	.315	-
180°	-	.336	.312	.290	.288	.316	-
270°	-	.321	.316	.315	.320	.317	-

ALL READINGS START  
AT T.D.C. AND 90 CLOCK-  
WISE WITH FLOW.  
TAKEN BY: S. VARGO  
J. PAULY

JOB ORDER # 004985

ISO # 1-HPD-9 Rev 4 ITEM (Y)

DATE: 2/25/87 TEMP: 147°F



## EROSION EVALUATION WORKSHEET

Unit No. /

Years in service 11

UT Reading Taken on: 2-18 4-15-87

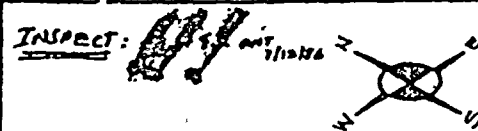
AEPSIC Installed Mat'l Class J-31: ASTM A-106 GR.B

## COMMENTS

A	3"-90° FLL	.300	.263-.338	.135	.346	0	STILL WITHIN MANUFACTURERS TOLERANCE
H	3"-90° FLL	.300	.263-.338	.135	.170	35.4	REPLACE AS SOON AS POSSIBLE WITHIN 2 YRS.
I	3"-90° FLL	.300	.263-.338	.135	.213	19.0	RE-INSPECT IN 8 YEARS



CONST 95838, 95839

ISOMETRIC SHEET NO. 647

<u>SITE</u>	<u>FAB</u>	<u>P.C.</u>	<u>MK'NO.</u>	<u>R.D.</u>	<u>PIECE MARK</u> <u>I. HPS-78</u>	<u>FAB</u> <u>SNOW</u>
					- 79	
					- 80	
					- 81	
					- 82	
					- 83	

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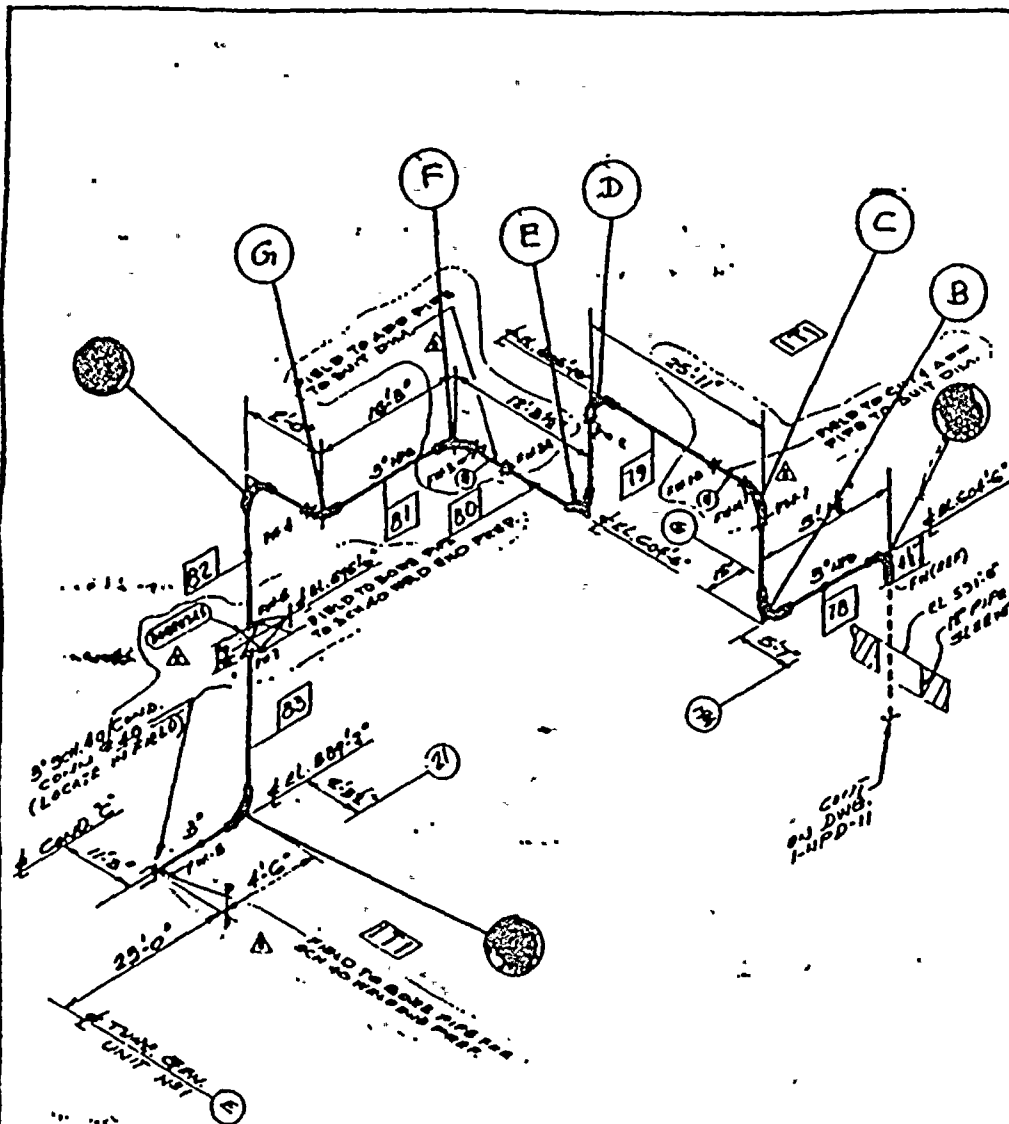
INDIANA & MICHIGAN ELECTRIC COMPANY,  
DONALD C. COOK NUCLEAR PLANT  
BRIARCLIFF MICHIGAN  
UNIT NO. 1

A-100		A-200		A-300		A-400		A-500		A-600		A-700		A-800		A-900		A-1000		A-1100		A-1200		A-1300		A-1400		A-1500		A-1600		A-1700		A-1800		A-1900		A-2000		A-2100		A-2200		A-2300		A-2400		A-2500		A-2600		A-2700		A-2800		A-2900		A-3000		A-3100		A-3200		A-3300		A-3400		A-3500		A-3600		A-3700		A-3800		A-3900		A-4000		A-4100		A-4200		A-4300		A-4400		A-4500		A-4600		A-4700		A-4800		A-4900		A-5000		A-5100		A-5200		A-5300		A-5400		A-5500		A-5600		A-5700		A-5800		A-5900		A-6000		A-6100		A-6200		A-6300		A-6400		A-6500		A-6600		A-6700		A-6800		A-6900		A-7000		A-7100		A-7200		A-7300		A-7400		A-7500		A-7600		A-7700		A-7800		A-7900		A-8000		A-8100		A-8200		A-8300		A-8400		A-8500		A-8600		A-8700		A-8800		A-8900		A-9000		A-9100		A-9200		A-9300		A-9400		A-9500		A-9600		A-9700		A-9800		A-9900		A-10000		A-10100		A-10200		A-10300		A-10400		A-10500		A-10600		A-10700		A-10800		A-10900		A-11000		A-11100		A-11200		A-11300		A-11400		A-11500		A-11600		A-11700		A-11800		A-11900		A-12000		A-12100		A-12200		A-12300		A-12400		A-12500		A-12600		A-12700		A-12800		A-12900		A-13000		A-13100		A-13200		A-13300		A-13400		A-13500		A-13600		A-13700		A-13800		A-13900		A-14000		A-14100		A-14200		A-14300		A-14400		A-14500		A-14600		A-14700		A-14800		A-14900		A-15000		A-15100		A-15200		A-15300		A-15400		A-15500		A-15600		A-15700		A-15800		A-15900		A-16000		A-16100		A-16200		A-16300		A-16400		A-16500		A-16600		A-16700		A-16800		A-16900		A-17000		A-17100		A-17200		A-17300		A-17400		A-17500		A-17600		A-17700		A-17800		A-17900		A-18000		A-18100		A-18200		A-18300		A-18400		A-18500		A-18600		A-18700		A-18800		A-18900		A-19000		A-19100		A-19200		A-19300		A-19400		A-19500		A-19600		A-19700		A-19800		A-19900		A-20000		A-20100		A-20200		A-20300		A-20400		A-20500		A-20600		A-20700		A-20800		A-20900		A-21000		A-21100		A-21200		A-21300		A-21400		A-21500		A-21600		A-21700		A-21800		A-21900		A-22000		A-22100		A-22200		A-22300		A-22400		A-22500		A-22600		A-22700		A-22800		A-22900		A-23000		A-23100		A-23200		A-23300		A-23400		A-23500		A-23600		A-23700		A-23800		A-23900		A-24000		A-24100		A-24200		A-24300		A-24400		A-24500		A-24600		A-24700		A-24800		A-24900		A-25000		A-25100		A-25200		A-25300		A-25400		A-25500		A-25600		A-25700		A-25800		A-25900		A-26000		A-26100		A-26200		A-26300		A-26400		A-26500		A-26600		A-26700		A-26800		A-26900		A-27000		A-27100		A-27200		A-27300		A-27400		A-27500		A-27600		A-27700		A-27800		A-27900		A-28000		A-28100		A-28200		A-28300		A-28400		A-28500		A-28600		A-28700		A-28800		A-28900		A-29000		A-29100		A-29200		A-29300		A-29400		A-29500		A-29600		A-29700		A-29800		A-29900		A-30000		A-30100		A-30200		A-30300		A-30400		A-30500		A-30600		A-30700		A-30800		A-30900		A-31000		A-31100		A-31200		A-31300		A-31400		A-31500		A-31600		A-31700		A-31800		A-31900		A-32000		A-32100		A-32200		A-32300		A-32400		A-32500		A-32600		A-32700		A-32800		A-32900		A-33000		A-33100		A-33200		A-33300		A-33400		A-33500		A-33600		A-33700		A-33800		A-33900		A-34000		A-34100		A-34200		A-34300		A-34400		A-34500		A-34600		A-34700		A-34800		A-34900		A-35000		A-35100		A-35200		A-35300		A-35400		A-35500		A-35600		A-35700		A-35800		A-35900		A-36000		A-36100		A-36200		A-36300		A-36400		A-36500		A-36600		A-36700		A-36800		A-36900		A-37000		A-37100		A-37200		A-37300		A-37400		A-37500		A-37600		A-37700		A-37800		A-37900		A-38000		A-38100		A-38200		A-38300		A-38400		A-38500		A-38600		A-38700		A-38800		A-38900		A-39000		A-39100		A-39200		A-39300		A-39400		A-39500		A-39600		A-39700		A-39800		A-39900		A-40000		A-40100		A-40200		A-40300		A-40400		A-40500		A-40600		A-40700		A-40800		A-40900		A-41000		A-41100		A-41200		A-41300		A-41400		A-41500		A-41600		A-41700		A-41800		A-41900		A-42000		A-42100		A-42200		A-42300		A-42400		A-42500		A-42600		A-42700		A-42800		A-42900		A-43000		A-43100		A-43200		A-43300		A-43400		A-43500		A-43600		A-43700		A-43800		A-43900		A-44000		A-44100		A-44200		A-44300		A-44400		A-44500		A-44600		A-44700		A-44800		A-44900		A-45000		A-45100		A-45200		A-45300		A-45400		A-45500		A-45600		A-45700		A-45800		A-45900		A-46000		A-46100		A-46200		A-46300		A-46400		A-46500		A-46600		A-46700		A-46800		A-46900		A-47000		A-47100		A-47200		A-47300		A-47400		A-47500		A-47600		A-47700		A-47800		A-47900		A-48000		A-48100		A-48200		A-48300		A-48400		A-48500		A-48600		A-48700		A-48800		A-48900		A-49000		A-49100		A-49200		A-49300		A-49400		A-49500		A-49600		A-49700		A-49800		A-49900		A-50000		A-50100		A-50200		A-50300		A-50400		A-50500		A-50600		A-50700		A-50800		A-50900		A-51000		A-51100		A-51200		A-51300		A-51400		A-51500		A-51600		A-51700		A-51800		A-51900		A-52000		A-52100		A-52200		A-52300		A-52400		A-52500		A-52600		A-52700		A-52800		A-52900		A-53000		A-53100		A-53200		A-53300		A-53400		A-53500		A-53600		A-53700		A-53800		A-53900		A-54000		A-54100		A-54200		A-54300		A-54400		A-54500		A-54600		A-54700		A-54800		A-54900		A-55000		A-55100		A-55200		A-55300		A-55400		A-55500		A-55600		A-55700		A-55800		A-55900		A-56000		A-56100		A-56200		A-56300		A-56400		A-56500		A-56600		A-56700		A-568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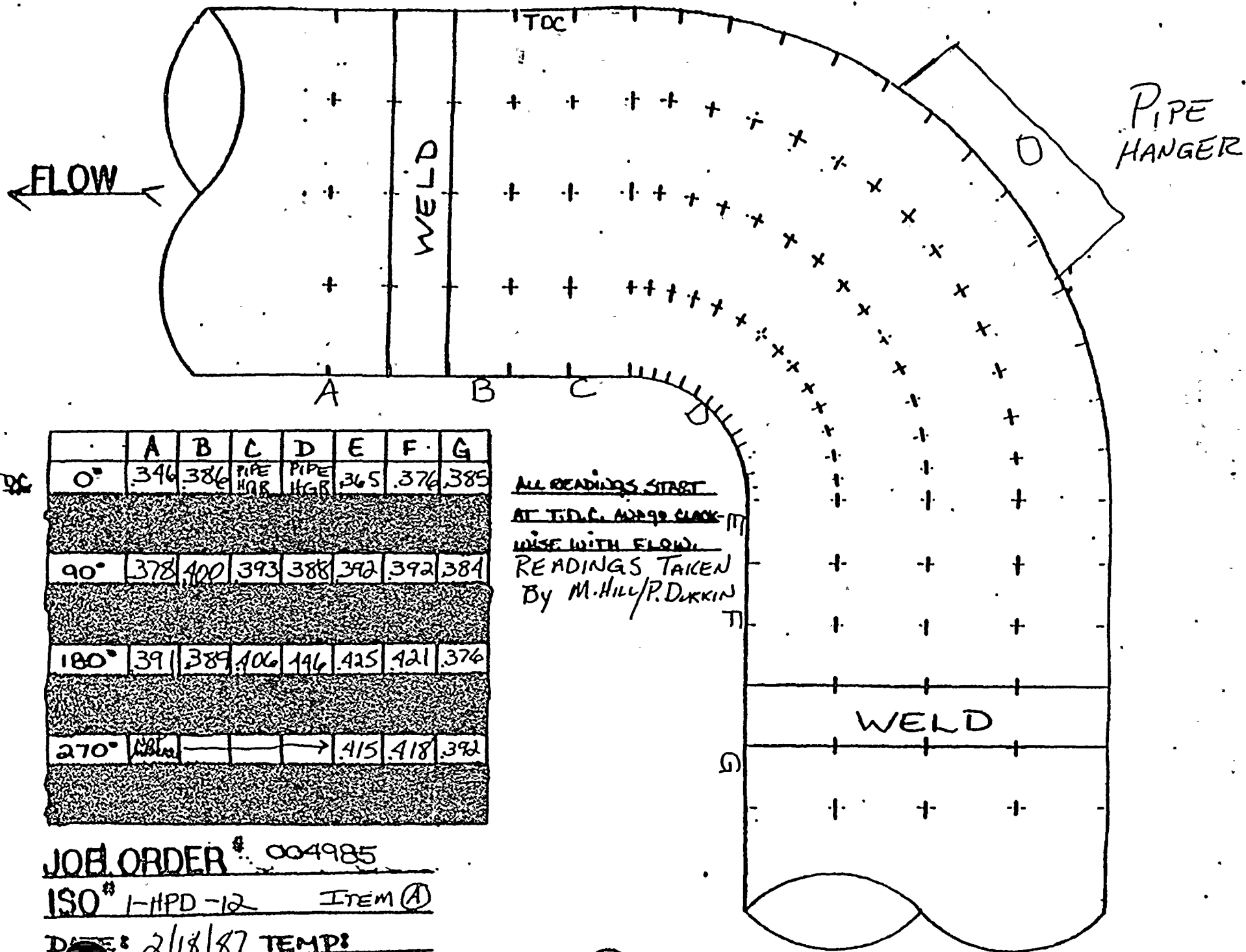


Price No's Printed By I-HPD

FABRICATION DATE: FABRICATION POST COMPLETED  
 TO LATEST A.S.P. REPORT.  
 FROM 1-11-68 TO 1-12-68  
 1-31 DESIGN DATE, DUCT 1-12-68  
 MANAGED DESIGN CLASS III  
 TEST EQUIPMENTED ON N/A  
 TEST COMMENTS  
 MFL 01 TESTING N/A  
 PLS. BLANK NO. 1-5109, 1-5109A

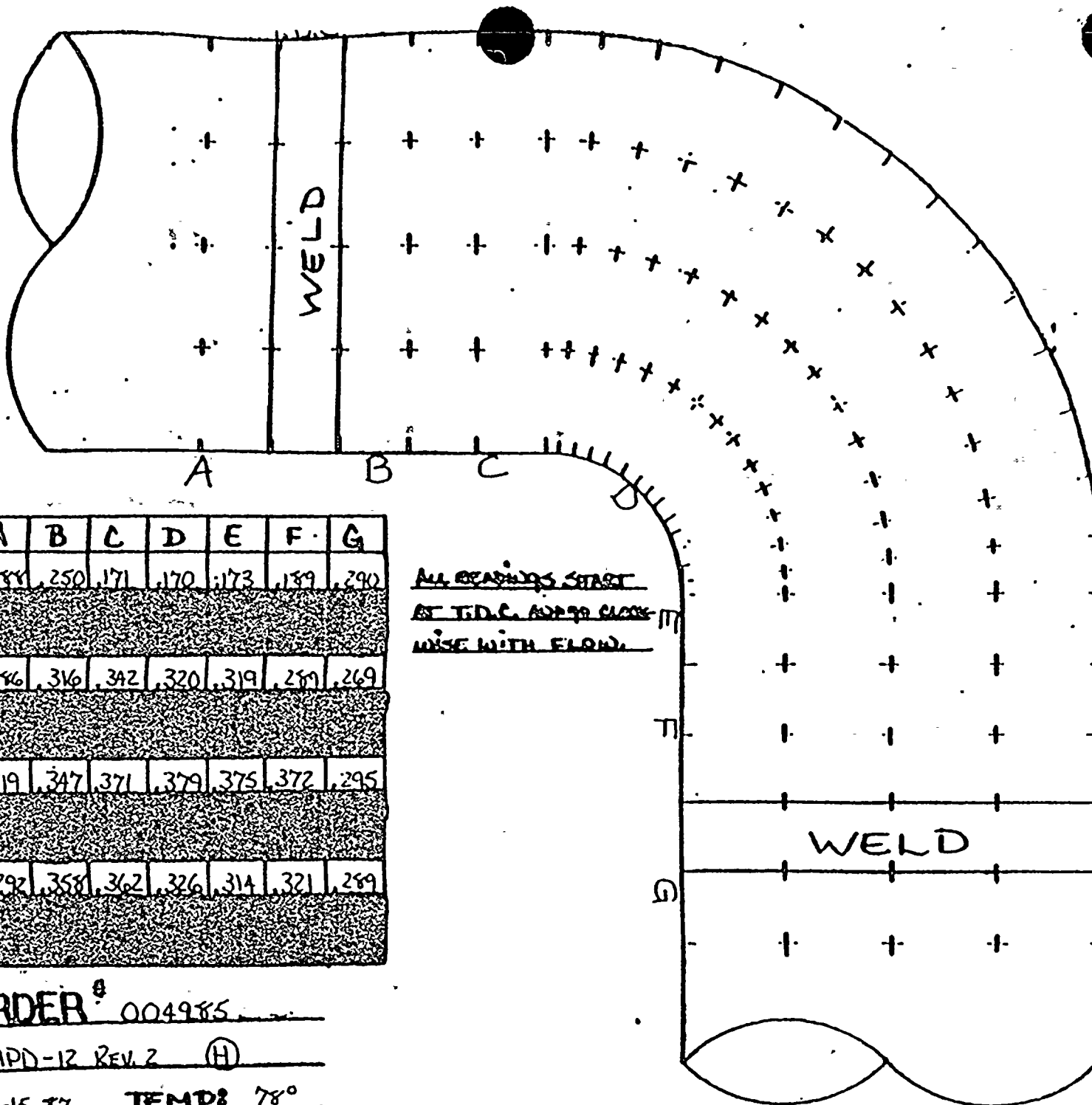
**T** **TUBECO** INC.  
119 VARKE AVENUE  
BROOKLYN 96 N.Y.







FLOW  
3"



TDC

	A	B	C	D	E	F	G
0°	288	250	171	170	173	189	290
90°	286	316	342	320	319	289	269
180°	319	347	371	379	375	372	295
270°	292	358	362	326	314	321	289

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

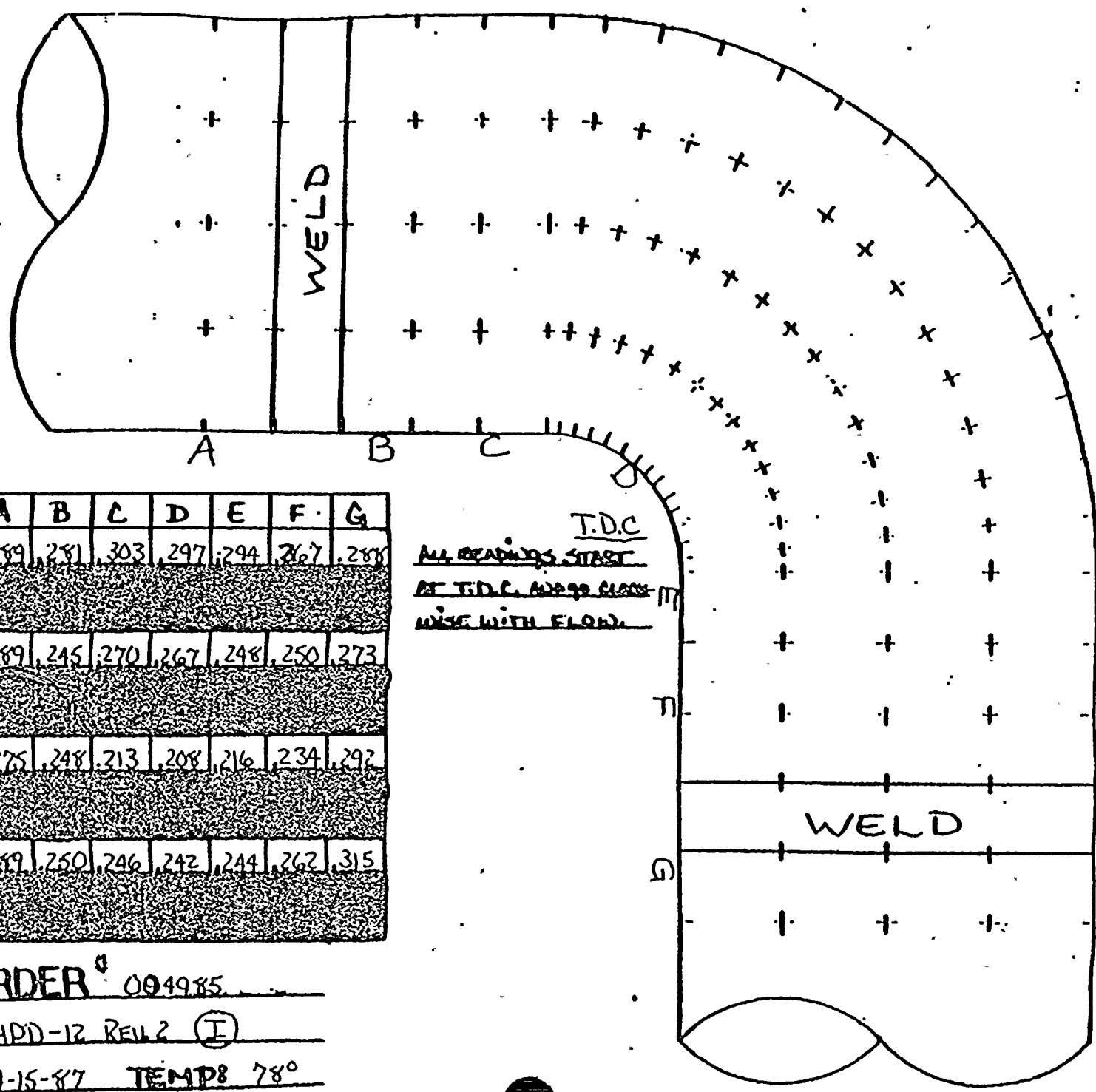
JOB ORDER # 004985

ISO # 1-HPD-12 REV. 2 (H)

DATE: 4-15-87 TEMP: 78°



FLOW  
3"



mc

	A	B	C	D	E	F	G
0°	289	281	303	297	294	267	288
90°	289	245	270	267	248	250	273
180°	275	248	213	208	216	234	292
270°	289	250	246	242	244	262	315

T.D.C  
ALL READINGS START  
AT T.D.C. AND GO CIRCUM-  
FERENTIAL WITH FLOW.

JOE ORDER # 004985  
ISO # 1-HPD-12 REL 2 (I)  
DATE: 4-15-87 TEMP: 78°



D. C. COOK N. R. PLANT  
EROSION EVALUATION WORKSHEET

SER No. 88-84 (Steam)

Unit No. 1

SER No. 23-85 (Water) X

Years in service //

UT Reading Taken on: 2-18 3-10-87

AEPSC Installed Mat'l Class A-31 : ASTM A-106 GR.B

[illegible]



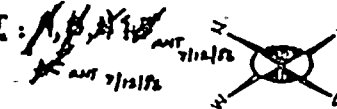
WEEK #13

CONET: S.O.M 95838, 95839

DC: 95837

ISOMETRIC SHEET NO. C045

INSPECT: *[Signature]*



P.O.	PIECE MARK	FAB.
	I-HPD-61	SHW
	-65	
	-67	
	-70	
	-71	
	-72	
	-73	

INFORMATION RECORDS CENTER  
CONTROLLED  
DOCUMENT  
JAN 13 1986  
VOLUME #  
**WORKING COPY**

REV.	DATE	CODE	DESCRIPTION	FIELD ACTION
4	1-13-77	AWC	AS PER FIELD "AS-BUILT" REVISED (AND REVISED) BY FIELD	FIELD ACTION REQUIRED
3	1-13-77	LD	REMOVED BY PERMITS (AND REVISED) BY FIELD	FIELD ACTION REQUIRED
1	1-13-77	AWC	ADDED VALVE (AND REVISED) BY FIELD	FIELD ACTION REQUIRED
0	1-13-77	AWC	ADDED VALVE (AND REVISED) BY FIELD	FIELD ACTION REQUIRED

INDIANA & MICHIGAN ELECTRIC COMPANY  
**DONALD C. COOK NUCLEAR PLANT**  
BRIDGMAN MICHIGAN  
UNIT NO. 1

REV.	DATE	CODE	DESCRIPTION	FIELD ACTION
4	1-13-77	AWC	AS PER FIELD "AS-BUILT" REVISED (AND REVISED) BY FIELD	FIELD ACTION REQUIRED
3	1-13-77	LD	REMOVED BY PERMITS (AND REVISED) BY FIELD	FIELD ACTION REQUIRED
1	1-13-77	AWC	ADDED VALVE (AND REVISED) BY FIELD	FIELD ACTION REQUIRED
0	1-13-77	AWC	ADDED VALVE (AND REVISED) BY FIELD	FIELD ACTION REQUIRED

FABRICATOR: *[Signature]*  
TO LATEST A.S.P. AMST.  
DESIGN: *[Signature]*  
TEST REQUIREMENTS: *[Signature]*  
FIELD FORCE: *[Signature]*  
PLAN DING. NO. 1-5109

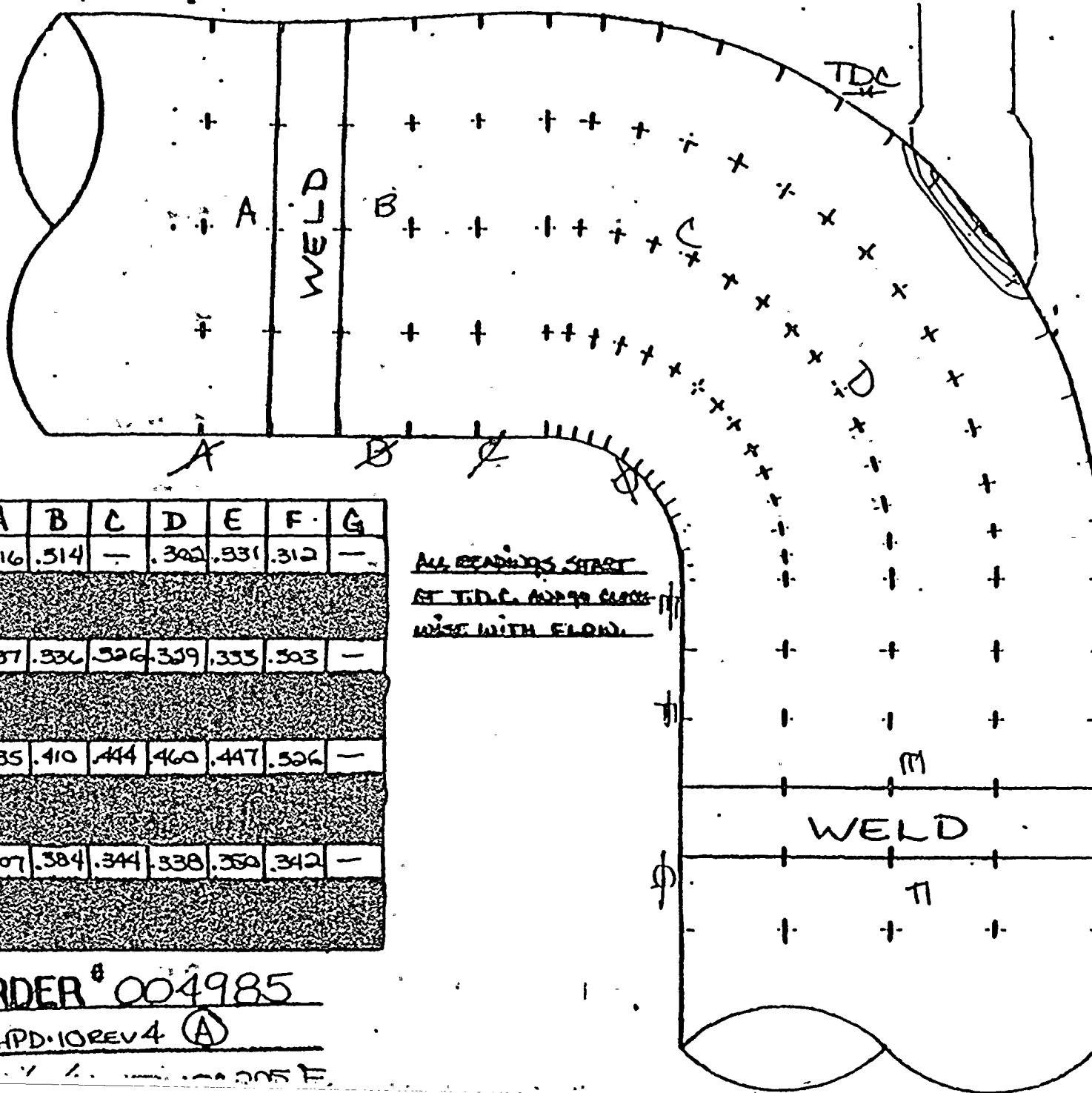
PIECE NO'S PREFIXED BY I-HPD

MATERIAL REQUIRED FOR FIELD NETWORK

DWG NO. I-HPD V. 4



FLOW →



	A	B	C	D	E	F	G
0°	.316	.514	—	.302	.931	.312	—
90°	.337	.536	.326	.359	.353	.503	—
180°	.535	.410	.444	.460	.447	.526	—
270°	.507	.384	.344	.338	.350	.342	—

ALL READINGS START  
AT T.D.C. AND 90° CROSS-  
WISE WITH FLOW.

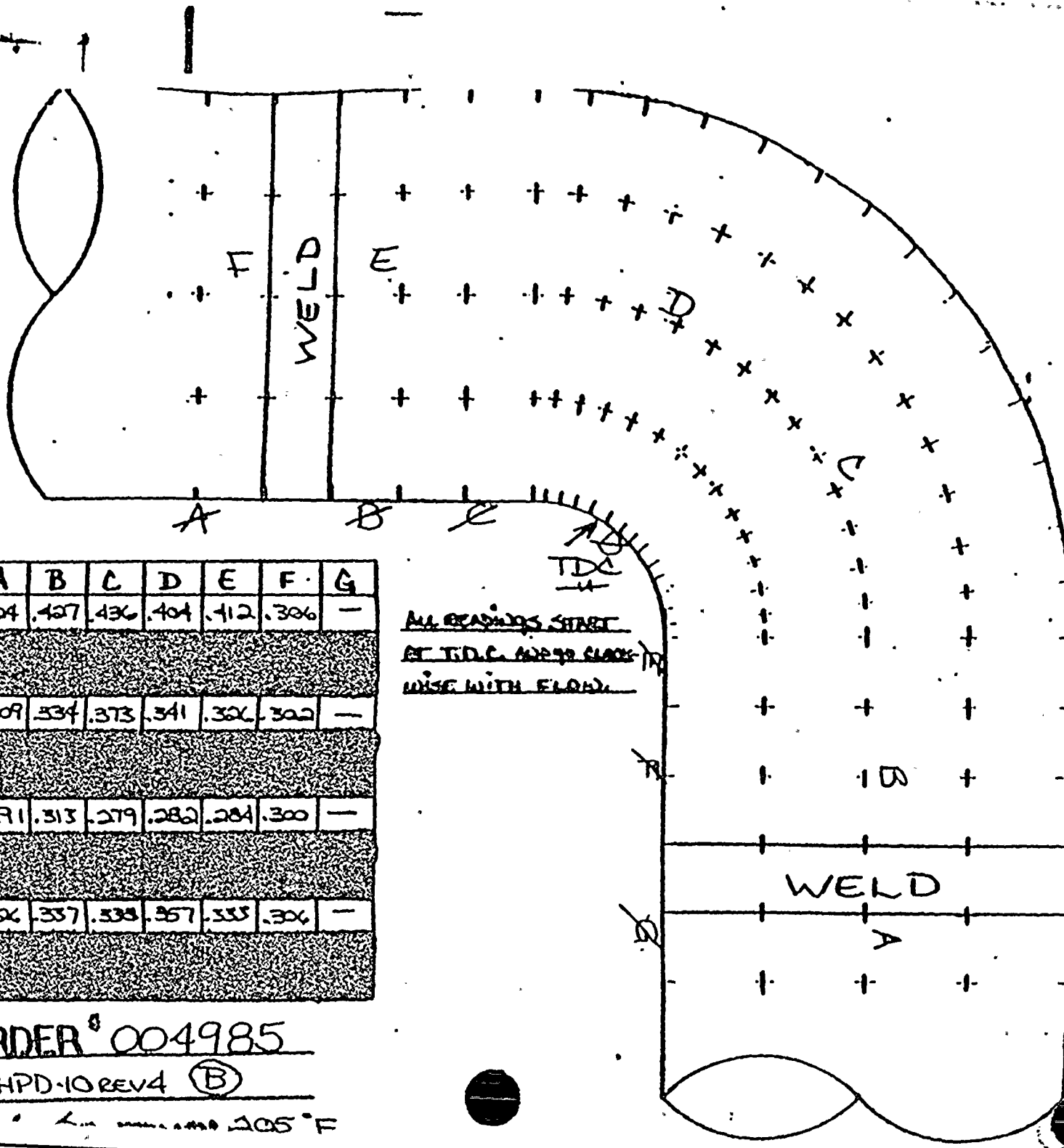
JOE ORDER # 004985

ISO # 1-HPD-10REV 4 (A)

... 205 F.



← FLOW



172

	A	B	C	D	E	F	G
0°	.324	.427	.436	.404	.412	.326	—
90°	.309	.334	.373	.341	.326	.322	—
180°	.291	.313	.279	.282	.284	.300	—
270°	.326	.337	.338	.357	.333	.326	—

ALL READINGS START

AT T.D.C. AND 90 DEGREE

WISE WITH FLOW.

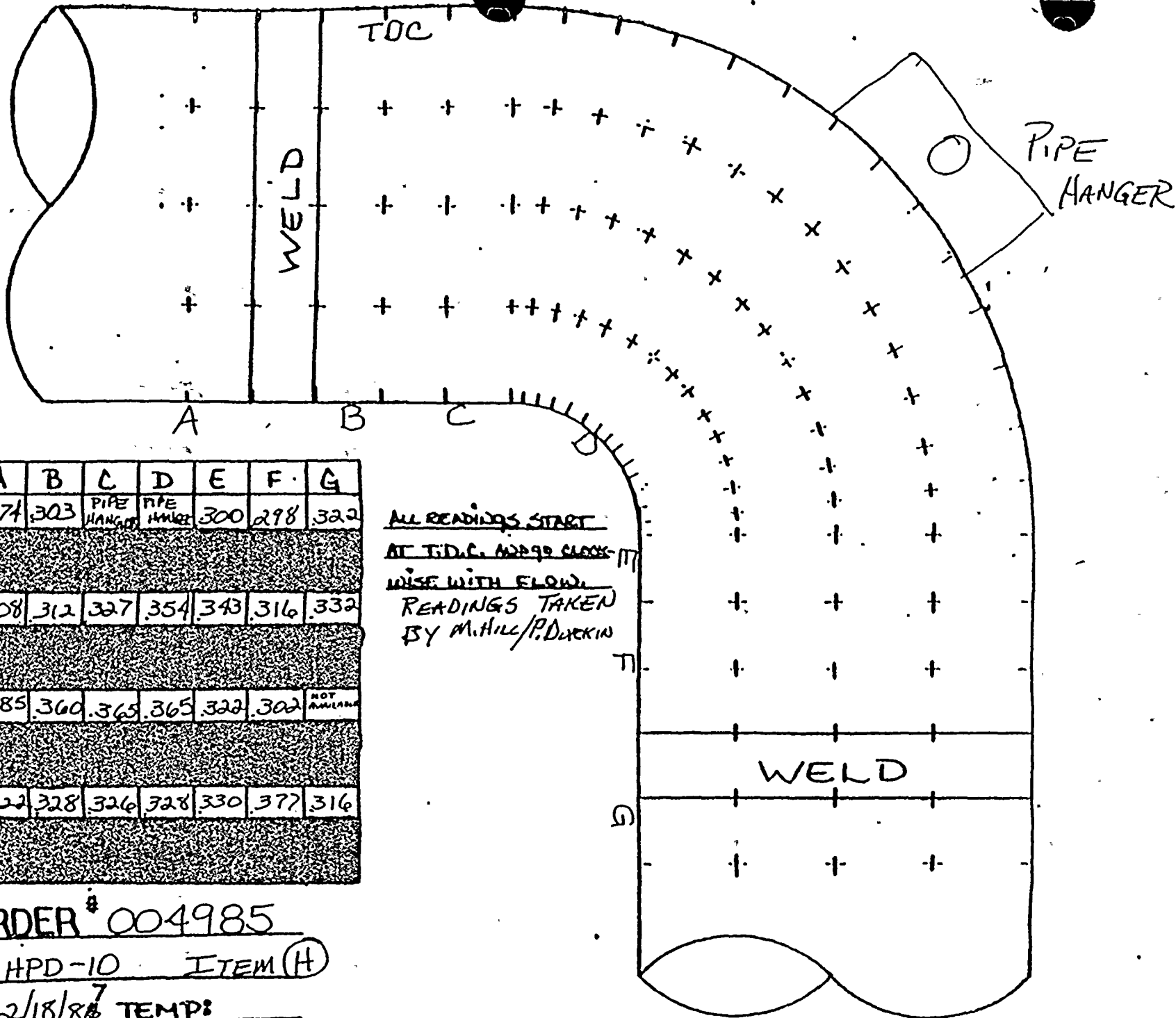
JOE ORDER # 004985

# 1-HPD-10 REV4 (B)

... 2 in ... 105°F



← FLOW



DC

	A	B	C	D	E	F	G
0°	374	303	PIPE HANGER	PIPE HANGER	300	298	322
90°	308	312	327	354	343	316	332
180°	385	360	365	365	322	302	NOT AVAILABLE
270°	322	328	326	328	330	377	316

ALL READINGS START

AT TIDAL WATER CLOCK

WISE WITH FLOW

READINGS TAKEN  
BY M. HILL/P. DUKKIN

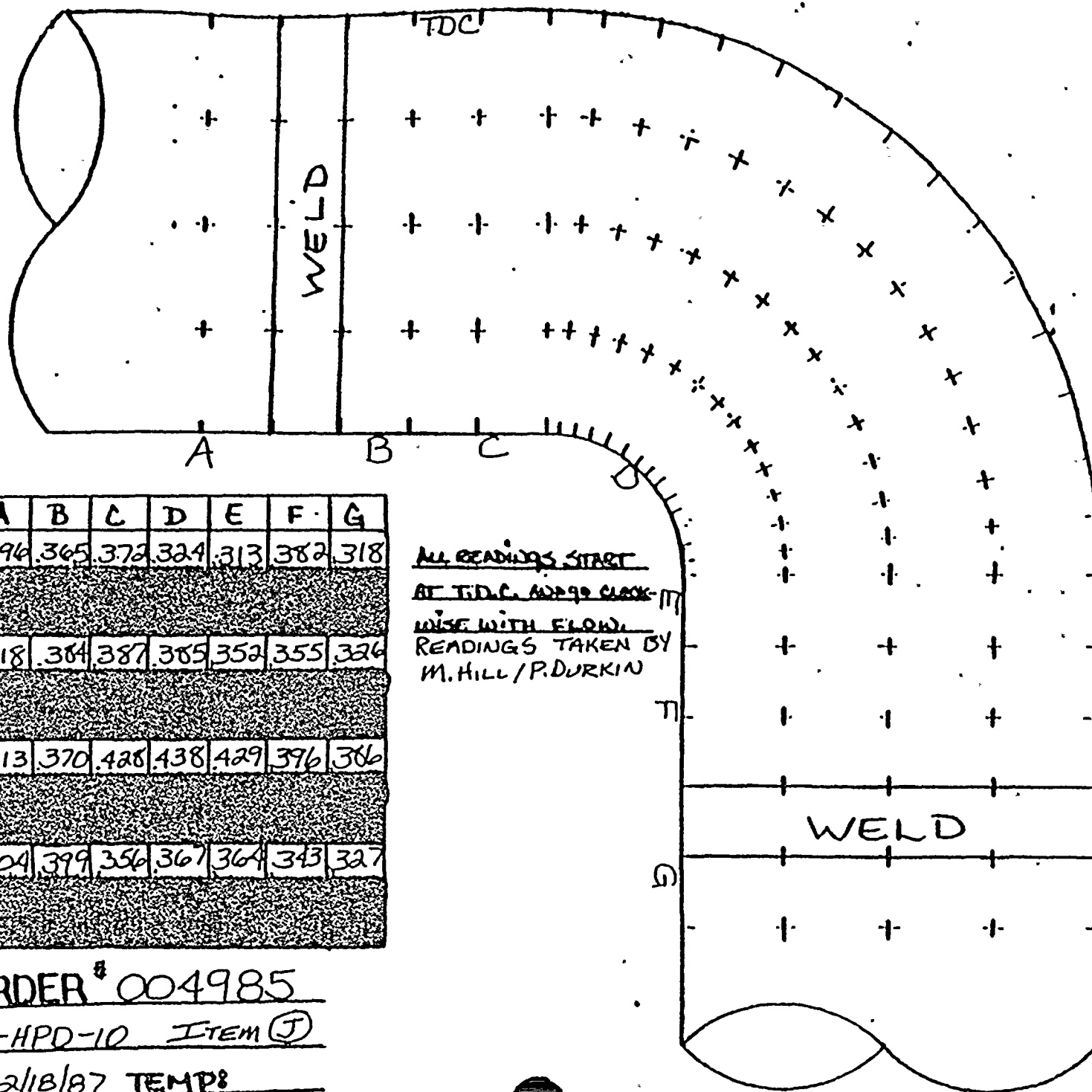
JOE ORDER # 004985

ISO # 1-HPD-10 ITEM (H)

DATE: 2/18/87 TEMP:



FLOW →



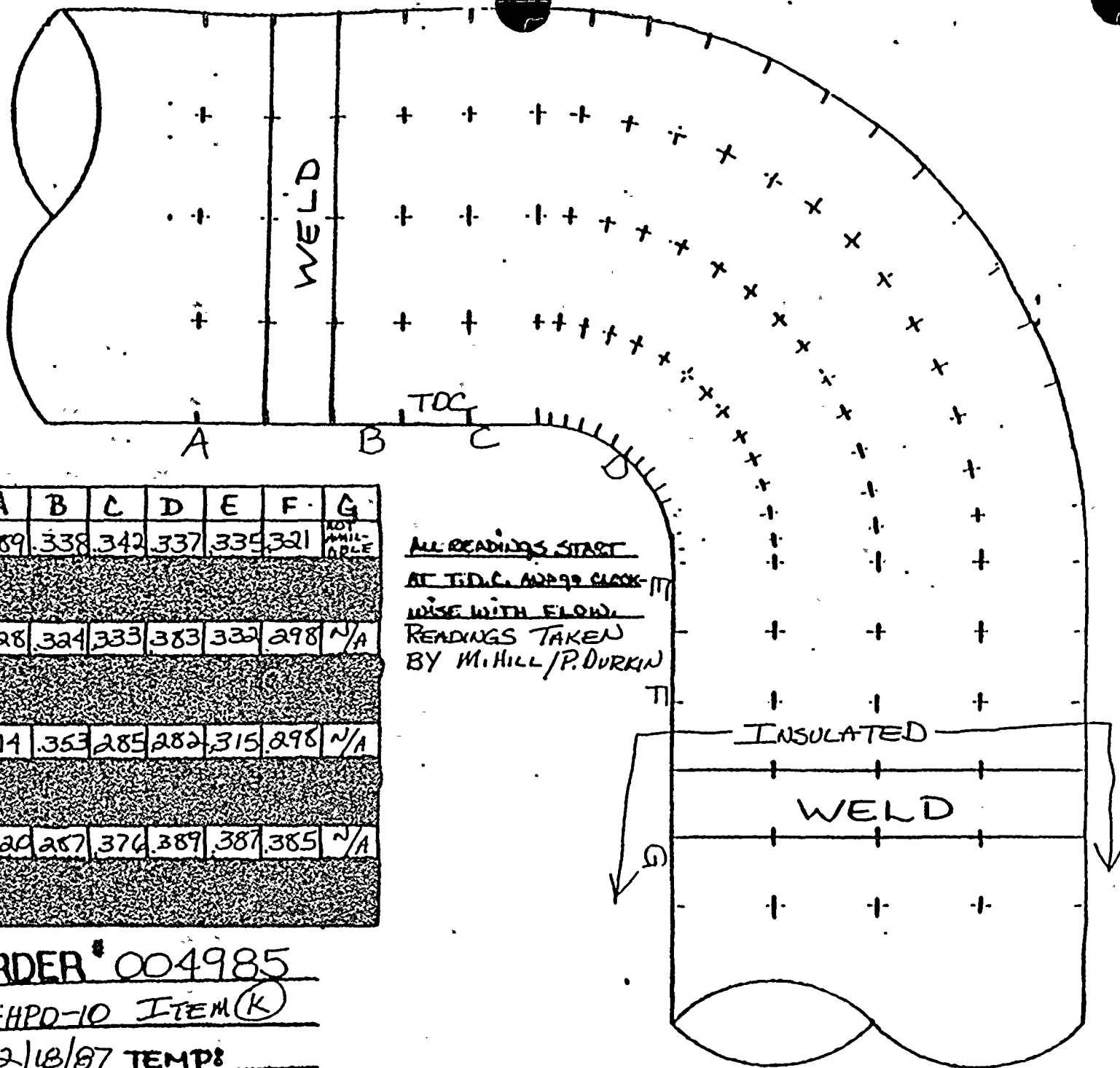
JOE ORDER # 004985

ISO # 1-HPD-10 ITEM (J)

DATE: 2/18/87 TEMP:



← FLOW



	A	B	C	D	E	F	G
0°	389	338	342	337	335	321	NOT AVAILABLE
90°	328	324	333	383	332	298	N/A
180°	314	353	285	282	315	298	N/A
270°	320	287	374	389	387	385	N/A

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.  
READINGS TAKEN  
BY M. HILL / P. DURKIN

JOE ORDER # 004985  
ISO # 1-HPD-10 ITEM (K)  
DATE: 2/18/87 TEMP:

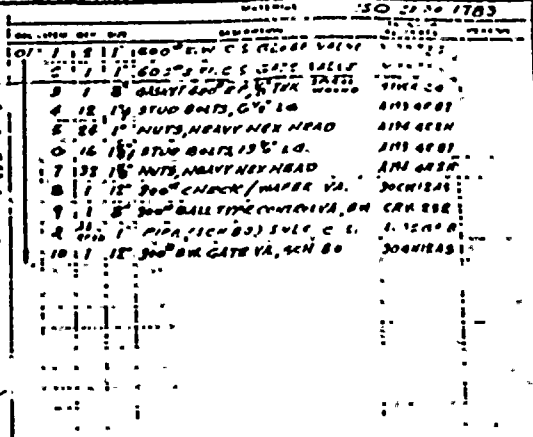






WALLING 150 220 1703

ENCLOSURE



RECEIVED BY  
CONTROL  
DOCUMENT  
JAN 13 1978  
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VOLUME II

SITE	PAR	PIECE	MARK	R.D. <sup>o</sup>	PIECE	MARK	
1	INPD	16	11		1	APD	10
			12				91
			13				92
							93

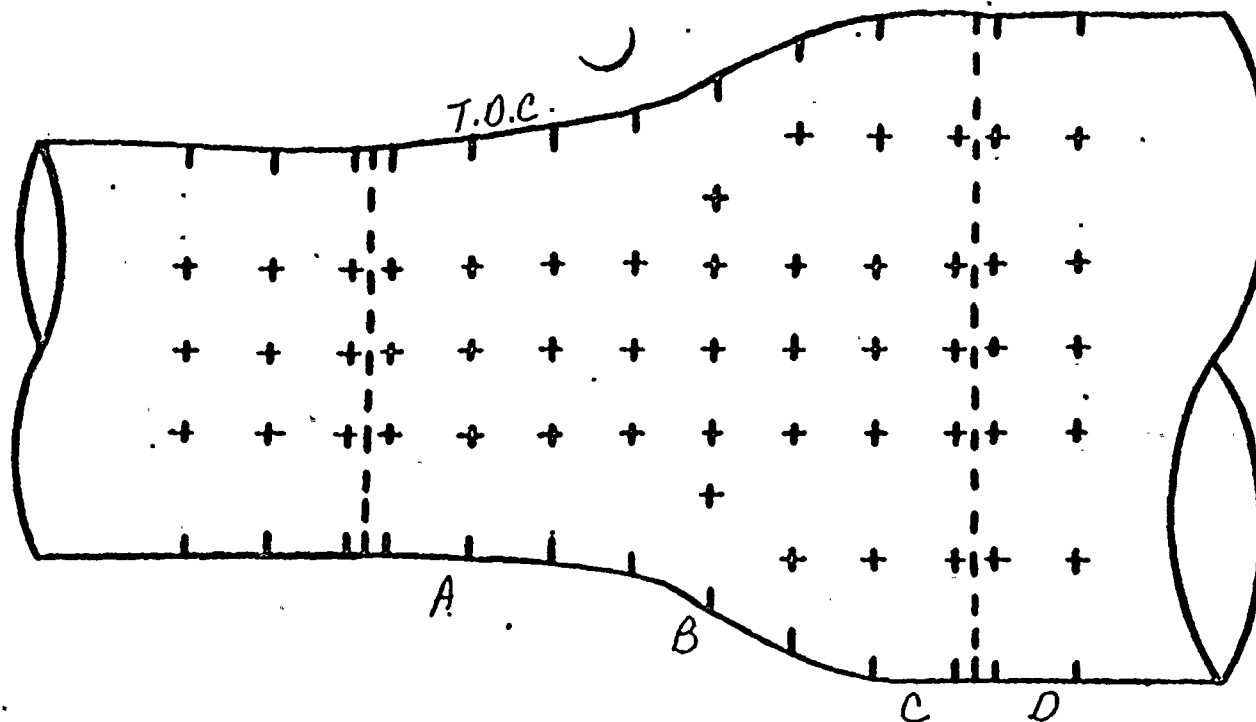
[illegible]

756  
45  
17

ACEE MW PREPARED BY I.M.D.



FLOW →



All readings start at TDC

and go clockwise with

flow.

READINGS TAKEN BY  
J. FITCHUK / J. WODARCZYK

004985

1. HPD-14 REV (A)

4/16/87

135 F

TDC

	A	B	C	D	E	F	G
0°	.694	.893	.755	.812	—	—	—
45°	.679	.783	.756	.845	—	—	—
90°	.676	.963	.824	.795	—	—	—
135°	.659	1.006	.787	.829	—	—	—
180°	.645	1.015	.816	.781	—	—	—
225°	.648	.988	.848	.776	—	—	—
270°	.686	.930	.790	.712	—	—	—



FLOW

CUR 258

WELD

T.D.C.

C

B

A

WELD

DC

	A	B	C	D	E	F	G
0°	1.136	1.216	1.215	1.310	1.400	.772	.510
45°	1.064	1.062	1.085	1.147	1.199	.751	.515
90°	1.073	1.080	1.041	1.038	1.099	.735	.517
135°	1.049	1.160	1.164	1.190	1.131	.716	.501
180°	1.152	1.302	1.346	1.427	1.444	.779	.499
225°	1.174	1.307	1.402	1.478	1.499	.782	.504
270°	1.154	1.302	1.472	1.256	1.566	.739	.510
315°	1.208	1.308	1.378	1.408	1.513	.812	.511

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.  
READINGS TAKEN BY:  
S. VARGO & A. HOLCOM

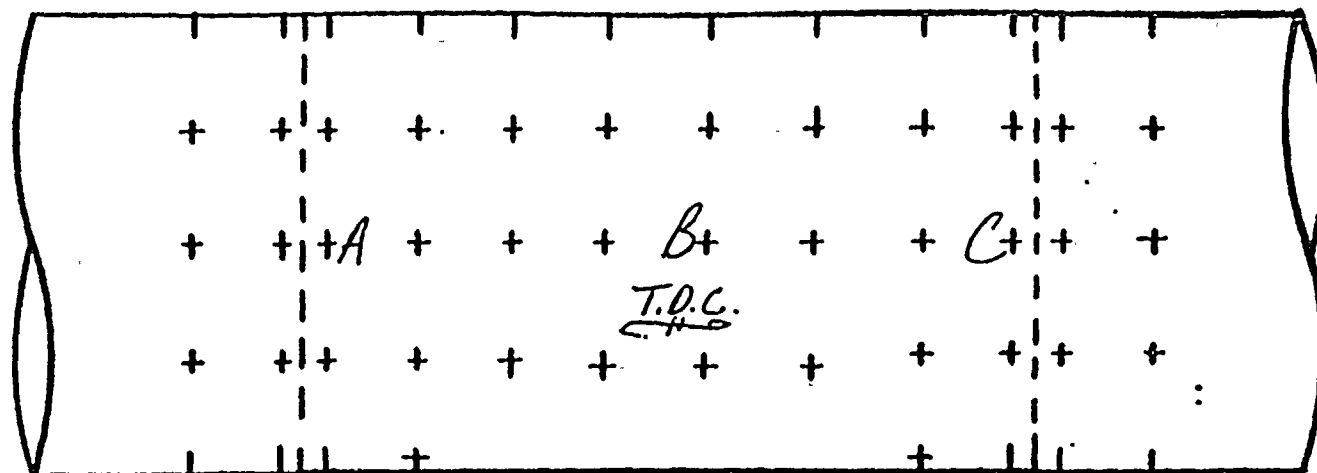
JOB ORDER # 004985

ISO# 1-HPD-14 REV. 1 (B)

DATE: 4/7/87 TEMP: 115°F



FLOW →



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

READINGS TAKEN BY:  
 S. VARGAS & A. HOLIDAY

TDC

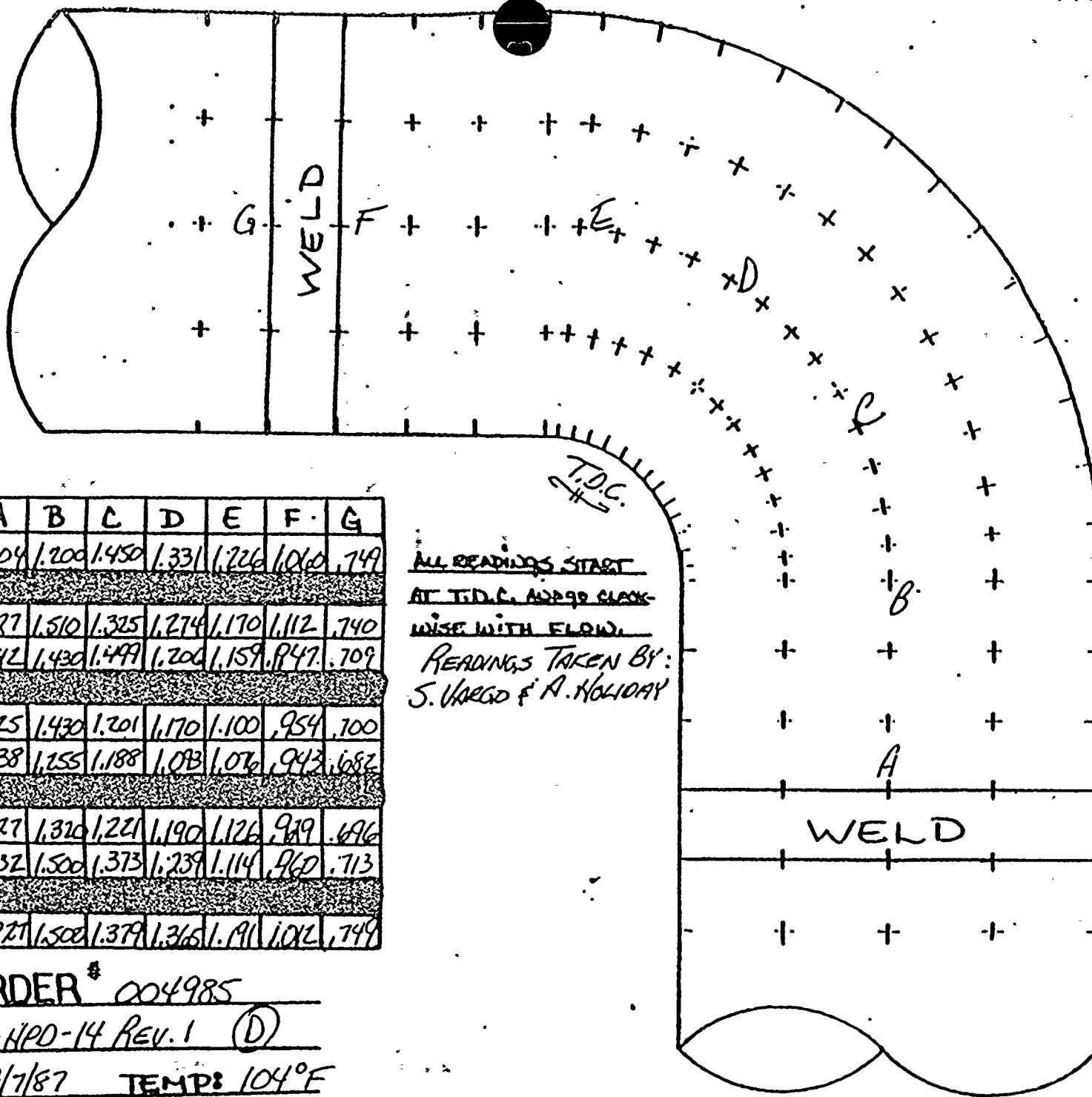
	A	B	C	D	E	F	G
0°	.528	.531	.547				
45°	.523	.538	.542				
90°	.519	.488	.513				
135°	.519	.537	.507				
180°	.538	.517	.513				
225°	.567	.566	.573				
270°	.547	.531	.531				
315°	.521	.533	.525				

JOB ORDER # 004985

1. HPD-14 REV. 1 (C)

DATE: 11/7/87 TEMP: 110°F





	A	B	C	D	E	F	G
0°	.704	1.200	1.450	1.331	1.226	1.060	.749
45°	.727	1.510	1.325	1.274	1.170	1.112	.740
90°	.742	1.430	1.449	1.200	1.159	1.047	.709
135°	.725	1.430	1.201	1.170	1.100	.954	.700
180°	.738	1.255	1.188	1.083	1.076	.943	.682
225°	.727	1.310	1.221	1.190	1.126	.929	.696
270°	.732	1.500	1.373	1.239	1.114	.960	.713
315°	.727	1.500	1.379	1.366	1.191	1.022	.749

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

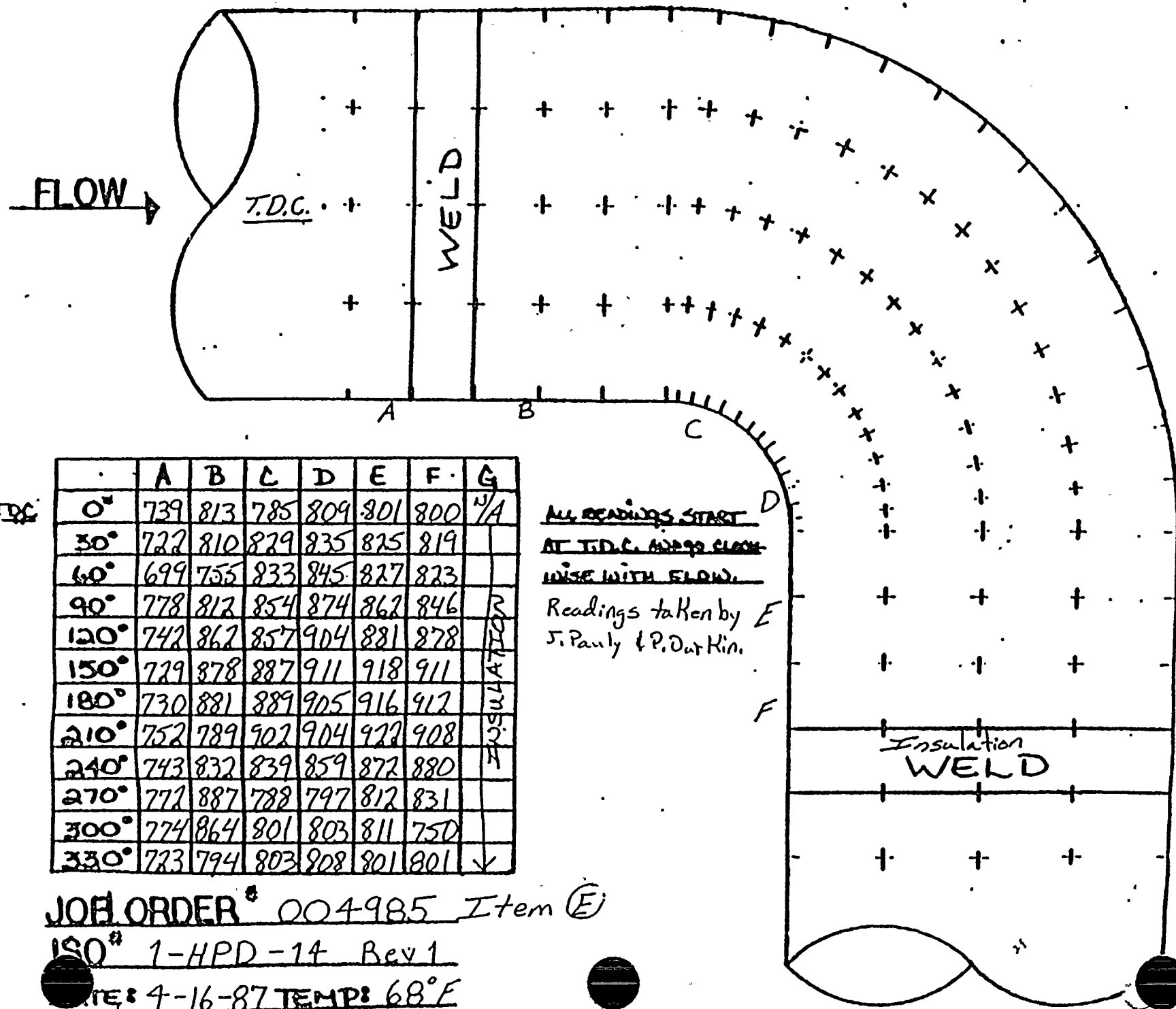
READINGS TAKEN BY:  
S. VARGO & A. HOLIDAY

JOE ORDER # 004985

ISO<sup>®</sup> 1-NPD-14 REV. 1 (D)

DATE: 4/7/87 TEMP: 104°F







# EROSION EVALUATION SHEET

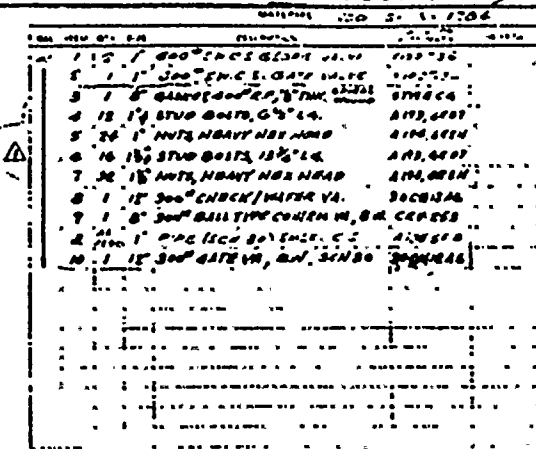
AEPSO Installed Mat'l Class J-31: ASTM A-96 GR. B

[illegible]



CONST: 10#95838, 9583

ANT 7/12/76



SECTION 802 (a)(1)			
NO.	DATE	BY	DESCRIPTION
1	1/1/70	100	100.00

INFORMATION REPORT  
CONTROL  
DOCUMENT  
JAN 15 1966  
**WORKING COPY**  
VOLUME #—

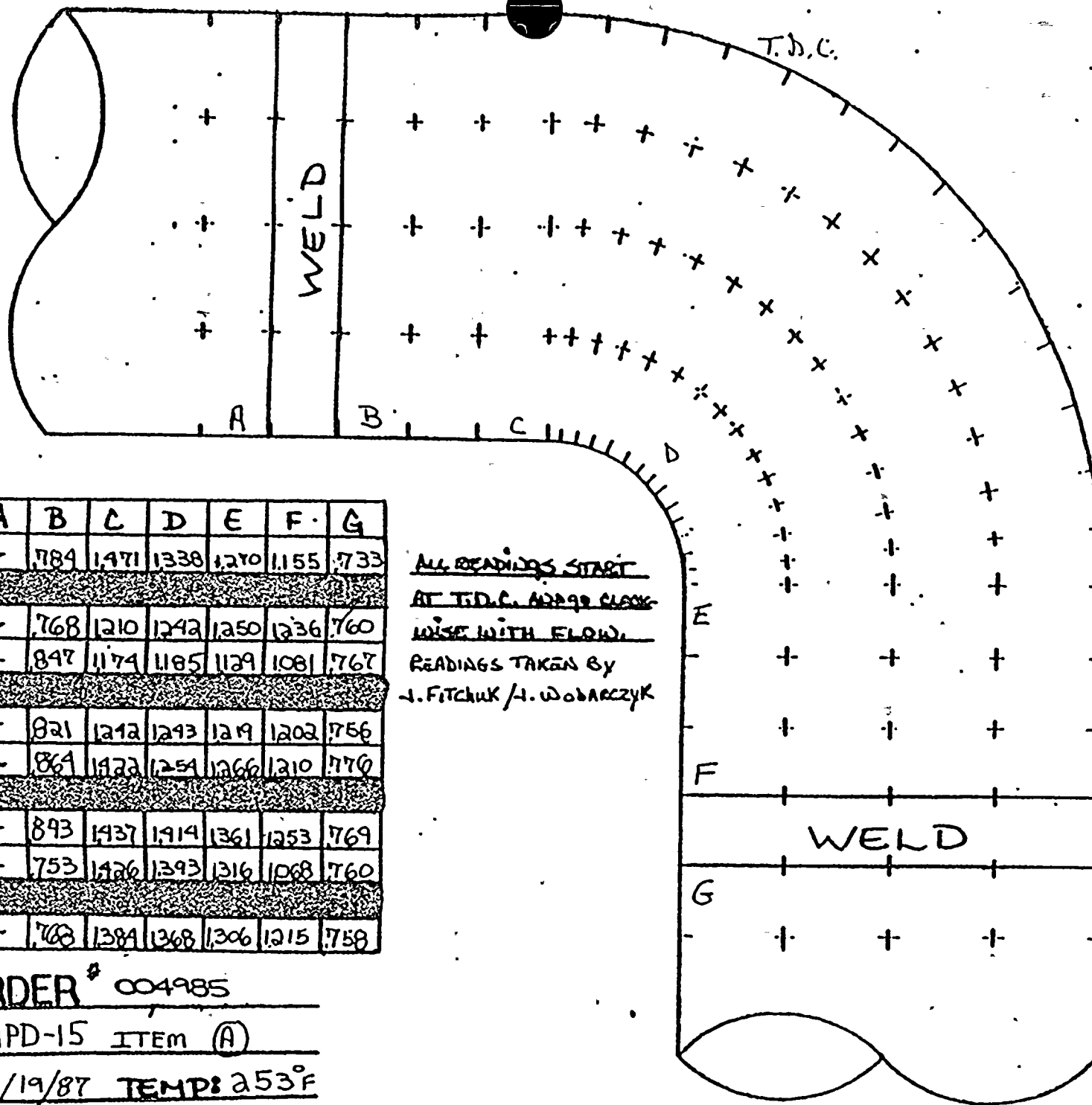
LABOR COST CONTROL		LABOR COST CONTROL	
PIPE SIZE	PIPE SIZE	PIPE SIZE	PIPE SIZE
SCHEDULE	SCHEDULE	SCHEDULE	SCHEDULE
TYPE	TYPE	TYPE	TYPE
ISO START DATE	ISO START DATE	ISO START DATE	ISO START DATE
ISO FINISH DATE	ISO FINISH DATE	ISO FINISH DATE	ISO FINISH DATE
WORK OPERATION	WORK OPERATION	WORK OPERATION	WORK OPERATION
MANAGER NAME	MANAGER NAME	MANAGER NAME	MANAGER NAME
NAME	NAME	NAME	NAME
WELD	WELD	WELD	WELD
RATCHET & RAY	RATCHET & RAY	RATCHET & RAY	RATCHET & RAY
STRESS POLYMER	STRESS POLYMER	STRESS POLYMER	STRESS POLYMER
SHOCK WOUND	SHOCK WOUND	SHOCK WOUND	SHOCK WOUND

**FABRICATION DATE:** FABRICATION MUST CORRESPOND TO LATEST A.B.P. ABOVE.  
DATE: 1-8-24

[illegible]



FLOW →



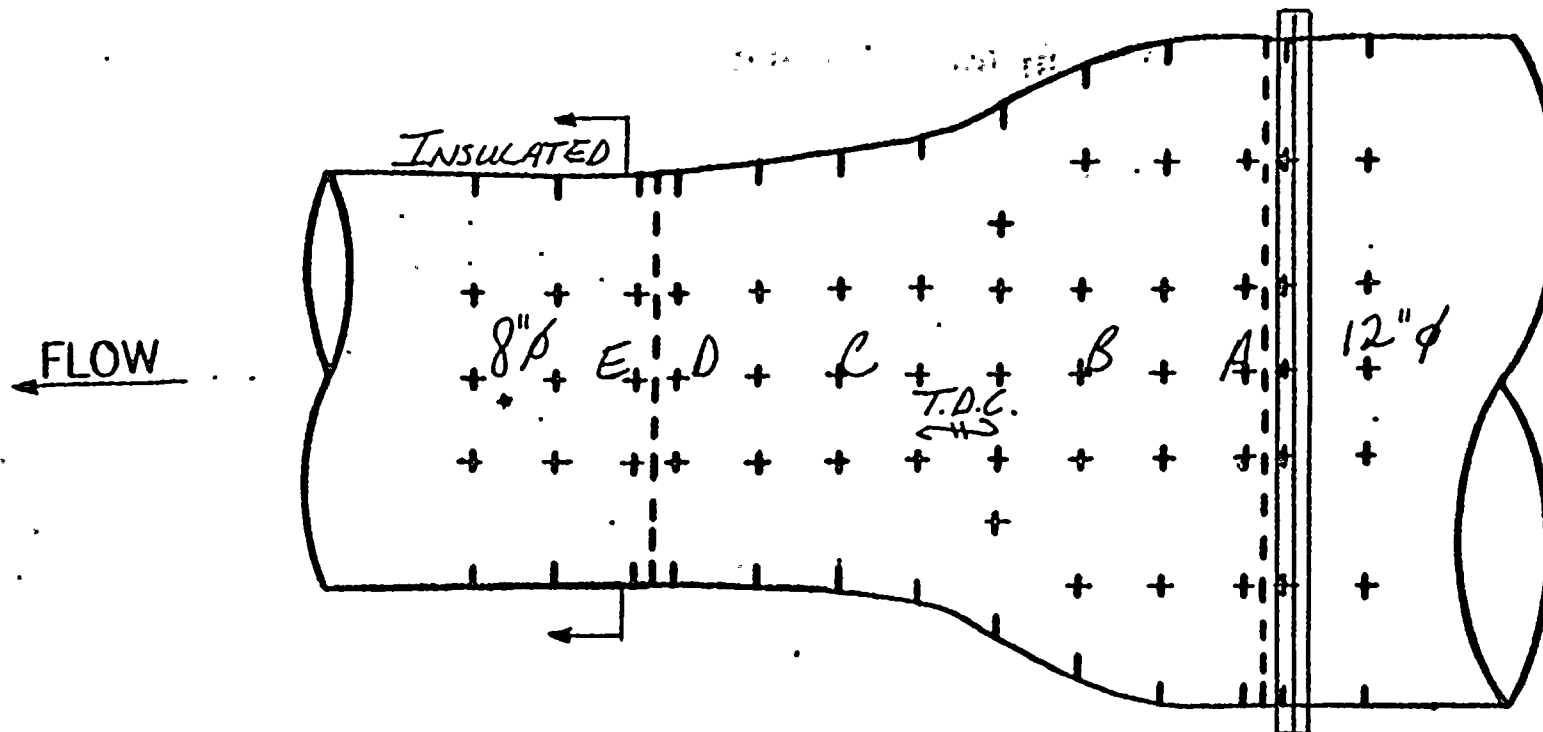
T.D.C.

	A	B	C	D	E	F	G
0°	-	784	1471	1338	1210	1155	733
45°	-	768	1210	1242	1250	1236	760
90°	-	847	1174	1185	1129	1081	767
135°	-	821	1212	1243	1219	1202	756
180°	-	864	1122	1254	1266	1210	770
225°	-	893	1437	1414	1361	1253	769
270°	-	753	1426	1393	1316	1068	760
315°	-	768	1384	1368	1306	1215	758

ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.  
READINGS TAKEN BY  
J. FITCHUK / J. WODARCZYK

JOB ORDER # 004985  
ISO # 1-HPD-15 ITEM (A)  
DATE: 2/19/87 TEMP: 253°F





ALL READINGS START AT TDC

AND GO COUNTERW. WITH

Flow.

READINGS TAKEN BY:  
J. VARGO & A. HOLYOAK

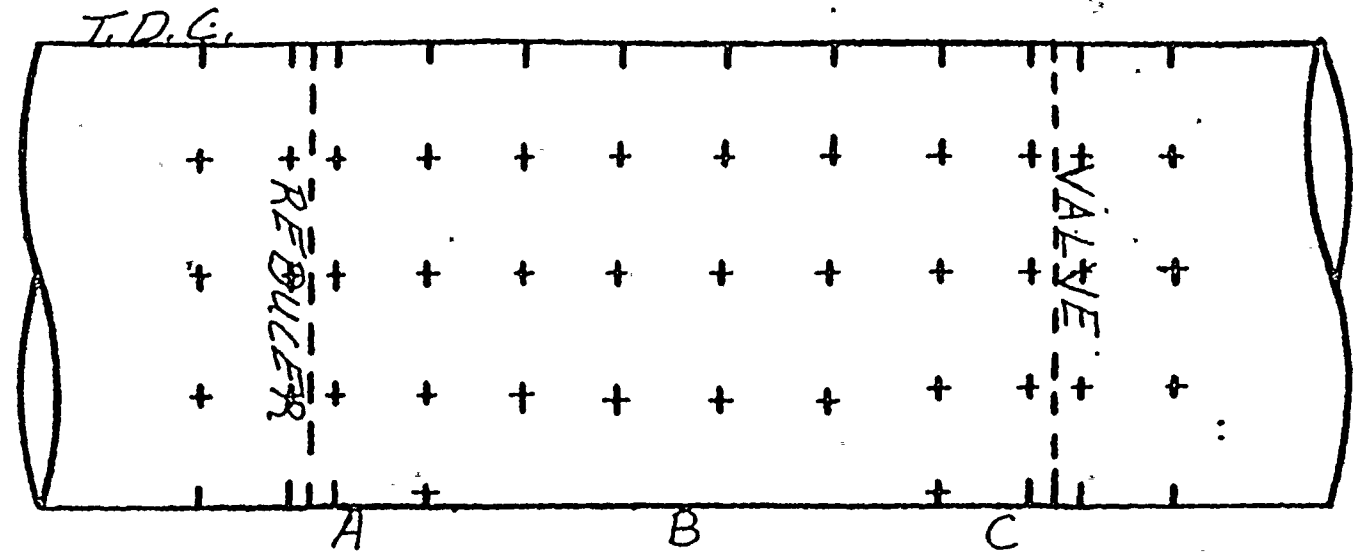
TDC

	A	B	C	D	E	F	G
0°	.754	.859	.925	.655	.577		
45°	.762	.876	.923	.616	.537		
90°	.750	.895	.947	.624	.568		
135°	.738	.880	.936	.609	.612		
180°	.726	.867	.933	.592	.568		
225°	.727	.826	.925	.577	.565		
270°	.712	.820	.911	.575	.531		
315°	.749	.829	.890	.576	.545		

JOB ORDER 004985  
1-HPD-15 REV. 1 (B)



FLOW →



ALL READINGS START AT  
T.D.C. AND 90° CLOCKWISE  
WITH FLOW.

Readings taken by  
 J. Pauly and A. Holiday.

TDC

	A	B	C	D	E	F	G
0°	515	511	512				
45°	541	505	510				
90°	513	514	506				
135°	525	560	531				
180°	529	538	534				
225°	546	525	518				
270°	510	535	507				
315°	543	529	509				

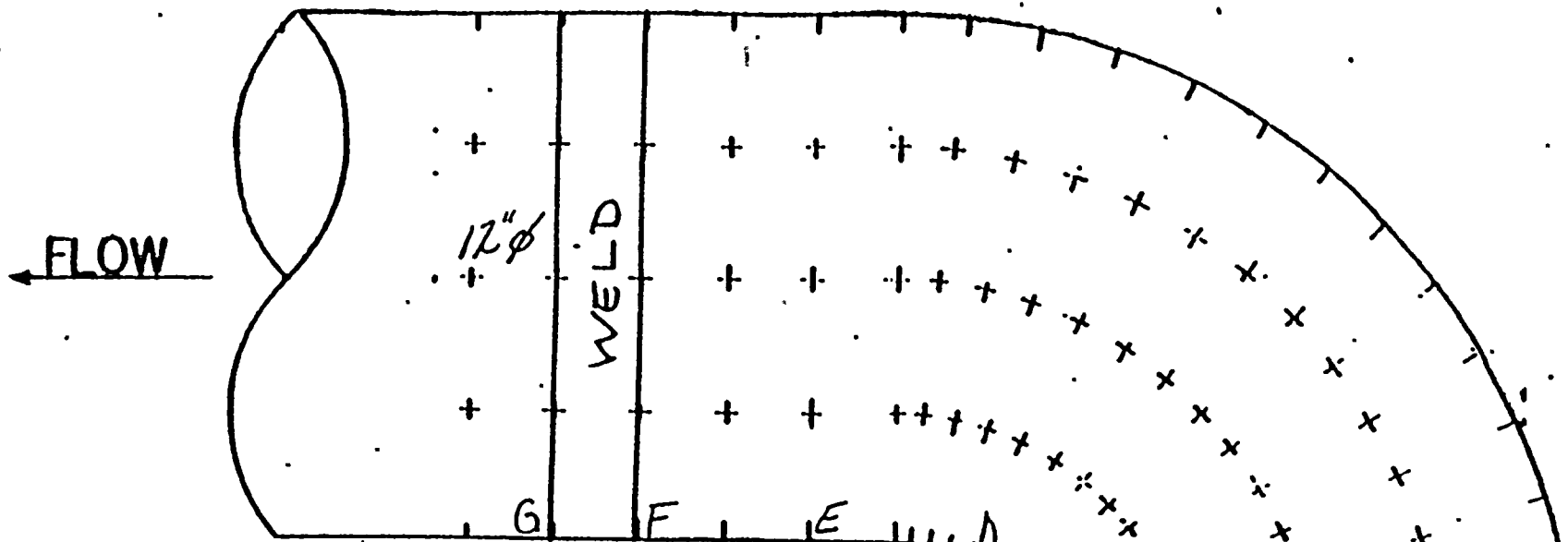
Item ©

JOB ORDER # 004985

ISO # 1-HPD-15 Rev 1

DATE: 4-20-87 TEMP: 78°F

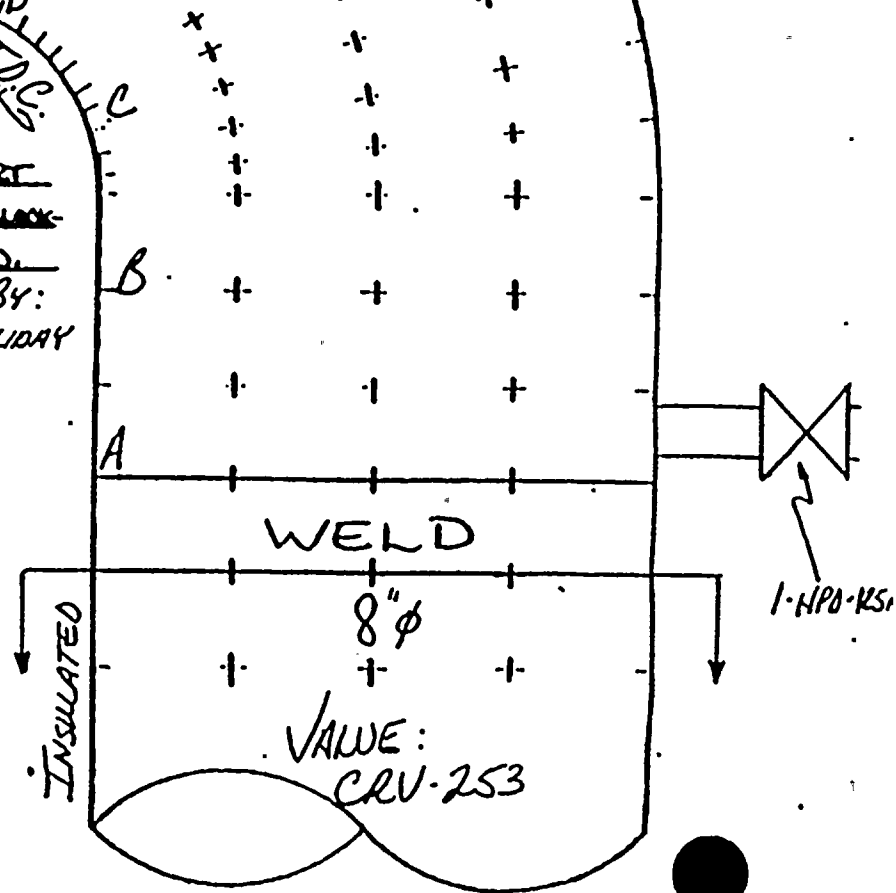




T.D.C.

	A	B	C	D	E	F	G
0°	.736	1.511	1.442	1.329	1.259	1.175	.637
45°	.726	1.525	1.482	1.335	1.187	1.187	.679
90°	.742	1.567	1.504	1.392	1.212	1.212	.665
135°	.696	1.276	1.274	1.225	1.412	1.163	.709
180°	—	1.024	1.198	1.118	1.112	1.094	.716
225°	.661	1.269	1.280	1.219	1.147	1.174	.710
270°	.718	1.647	1.569	1.330	1.196	1.235	.709
315°	.723	1.573	1.524	1.412	1.208	1.280	.678

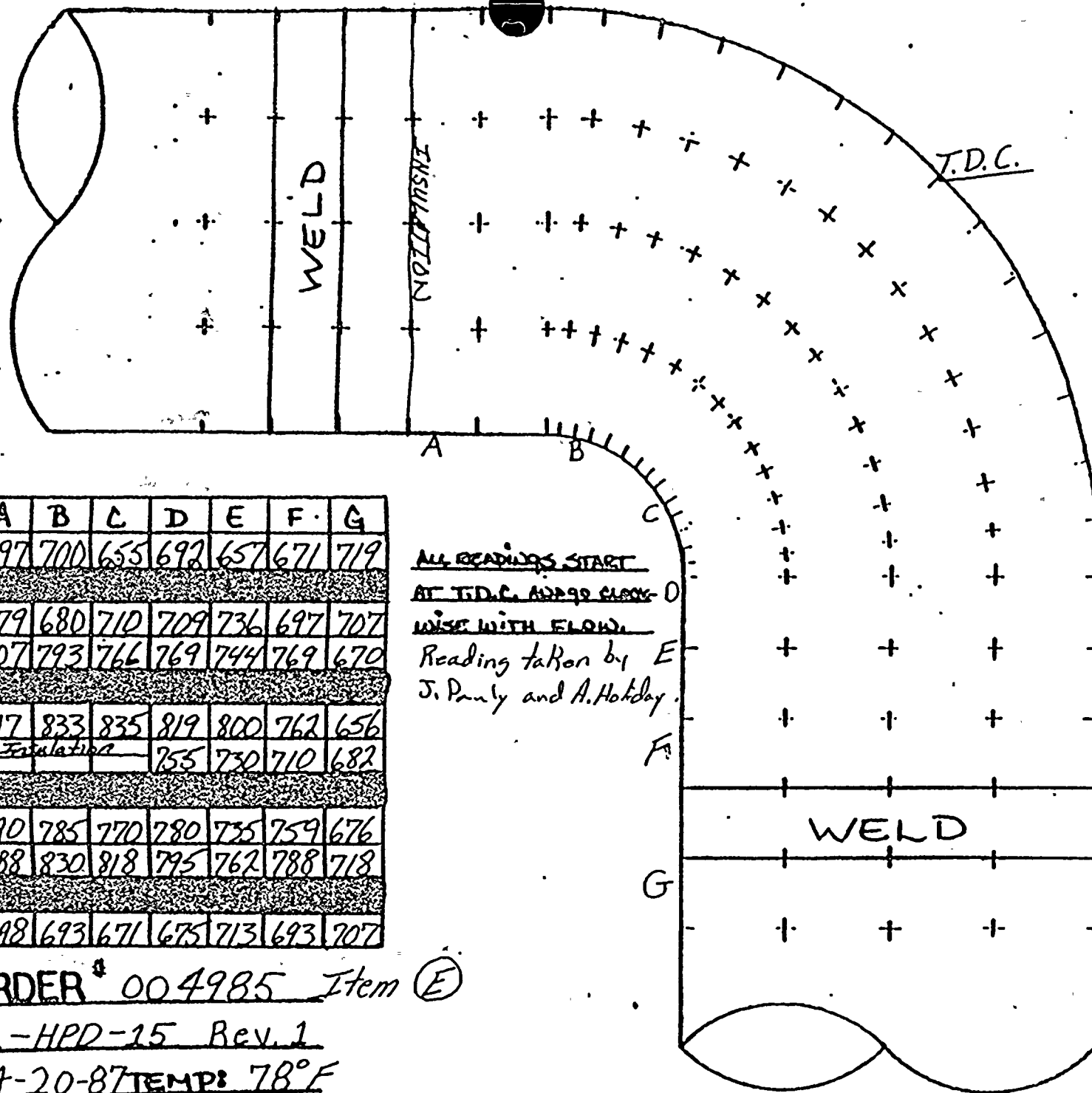
ALL READINGS START  
AT T.D.C. AND 90° CLOCK-  
WISE WITH FLOW.  
READINGS TAKEN BY:  
S. VARGO & A. HOLIDAY



JOE ORDER # 004985  
ISO # 1-HPD-15 REV. 1 (D)  
DATE: 4/14/87 TEMP: 69°F



FLOW →



T.D.C.

	A	B	C	D	E	F	G
0°	697	700	655	692	657	671	719
45°	679	680	710	709	736	697	707
90°	807	793	766	769	744	769	670
135°	817	833	835	819	800	762	656
180°	Insulation			755	730	710	682
225°	790	785	770	780	735	759	676
270°	788	830	818	795	762	788	718
315°	698	693	671	675	713	693	707

ALL READINGS START

AT T.D.C. AND 90° CLOCK

WISE WITH FLOW.

Reading taken by E  
J. Pauly and A. Hotday.

F

G

JOE ORDER # 004985 Item (E)

ISO # 1-HPD-15 Rev. 1

DATE: 4-20-87 TEMP: 78°F



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: A.T. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 1

Evaluation Date: SEPTEMBER 16, 1987

SER No. 23-85 (Water) X

Years in service 11

UT Reading Transmitted on: AUGUST 19, 1987

UT Reading Taken on: 2-19, 4-7-87

Isometric Dwg. NO. 1-HPD-16, REV-1

AEPS Installed Mat'l Class J-31: ASTM A-106, GR-B

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
--------------------------	--------------------------	-----------------------	------------------------	---------------	-------------------	-------------------	----------

A	12x8 RED	.687	.601-.773	.242	.734	0	STILL WITHIN MANUFACTURERS TOLERANCE
---	----------	------	-----------	------	------	---	--------------------------------------

B	12" 90° ELL COL G	1.125	.984-1.266	.328	1.121	0	" " " " "
---	----------------------	-------	------------	------	-------	---	-----------

B	12" 90° ELL	.813	.739-.948	.328	.744	0	" " " " "
---	-------------	------	-----------	------	------	---	-----------

C	12" STRAIGHT	.562	.492-.632	.328	.550	0	" " " " "
---	--------------	------	-----------	------	------	---	-----------

D	12" 90° ELL COL A+C	1.125	.984-1.266	.328	.879	10.7	RE INSPECT IN 20 YEARS
---	------------------------	-------	------------	------	------	------	------------------------

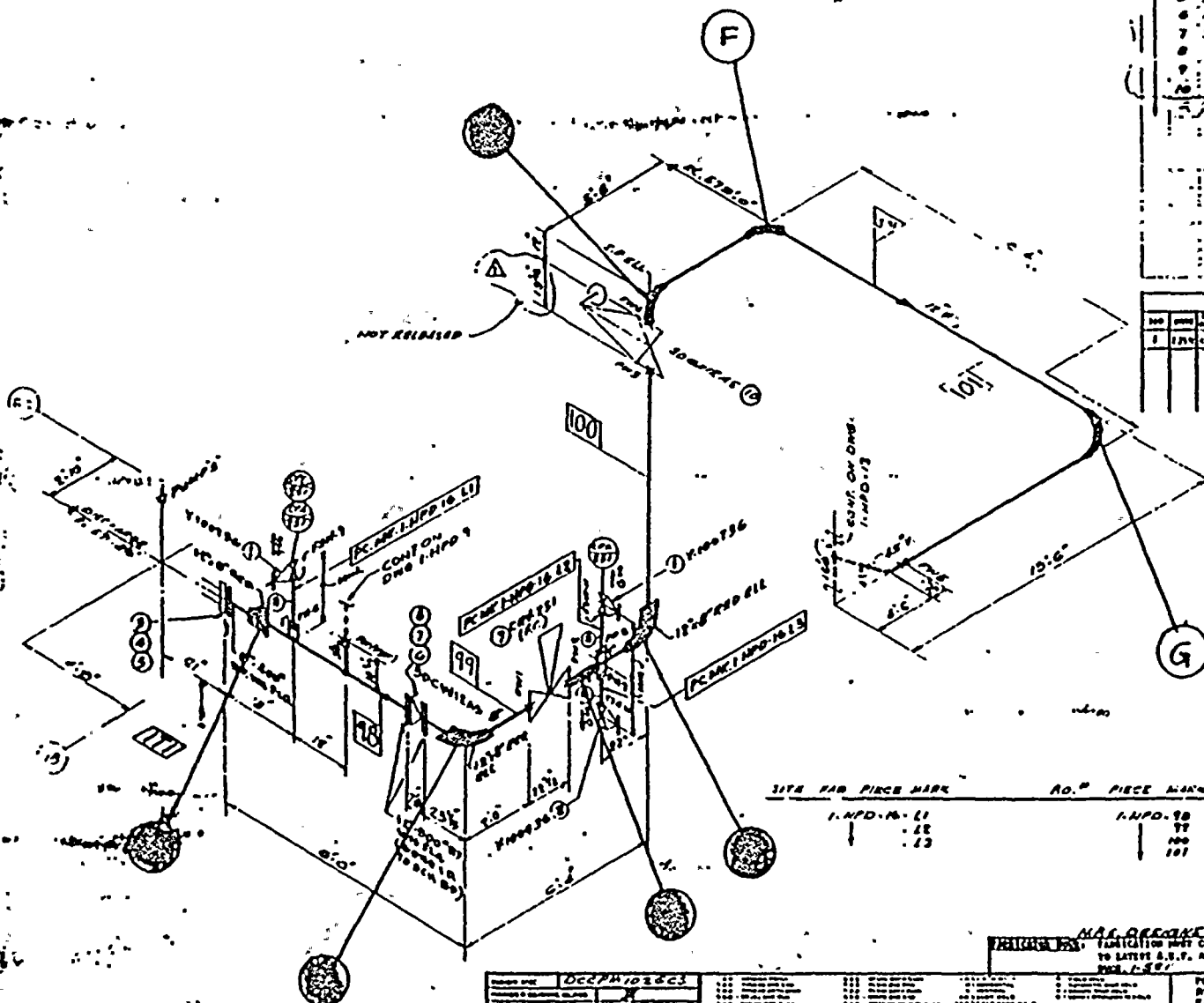
D	12" 90° ELL	.687	.601-.773	.328	.660	0	STILL WITHIN MANUFACTURERS TOLERANCE
---	-------------	------	-----------	------	------	---	--------------------------------------

E	12" 90° ELL	.687	.601-.773	.328	.705	0	" " " " "
---	-------------	------	-----------	------	------	---	-----------



CONST J.O. # 75838, 95839

萬壽無疆



CR	HEAV	GRV	TYPE	DATE	TIME	STN	NO.	TIME
1	Q	1	000	ENCL	1211E	30	35	
2	1	000	ENCL	1211E	1211E	30	35	
3	1	000	ENCL	1211E	1211E	30	35	
4	15	14	STUD	ENCL	1211E	30	35	
5	20	1	STUD	ENCL	1211E	30	35	
6	20	1	STUD	ENCL	1211E	30	35	
7	32	15	STUD	ENCL	1211E	30	35	
8	1	15	300	ENCL	1211E	30	35	
9	1	15	300	ENCL	1211E	30	35	
10	1	15	300	ENCL	1211E	30	35	
11	1	15	300	ENCL	1211E	30	35	
12	1	15	300	ENCL	1211E	30	35	
13	1	15	300	ENCL	1211E	30	35	
14	1	15	300	ENCL	1211E	30	35	
15	1	15	300	ENCL	1211E	30	35	
16	1	15	300	ENCL	1211E	30	35	
17	1	15	300	ENCL	1211E	30	35	
18	1	15	300	ENCL	1211E	30	35	
19	1	15	300	ENCL	1211E	30	35	
20	1	15	300	ENCL	1211E	30	35	
21	1	15	300	ENCL	1211E	30	35	
22	1	15	300	ENCL	1211E	30	35	
23	1	15	300	ENCL	1211E	30	35	
24	1	15	300	ENCL	1211E	30	35	
25	1	15	300	ENCL	1211E	30	35	
26	1	15	300	ENCL	1211E	30	35	
27	1	15	300	ENCL	1211E	30	35	
28	1	15	300	ENCL	1211E	30	35	
29	1	15	300	ENCL	1211E	30	35	
30	1	15	300	ENCL	1211E	30	35	

REVENUE RECORD					
No.	Date	Description			Amount
1	1944	...			...

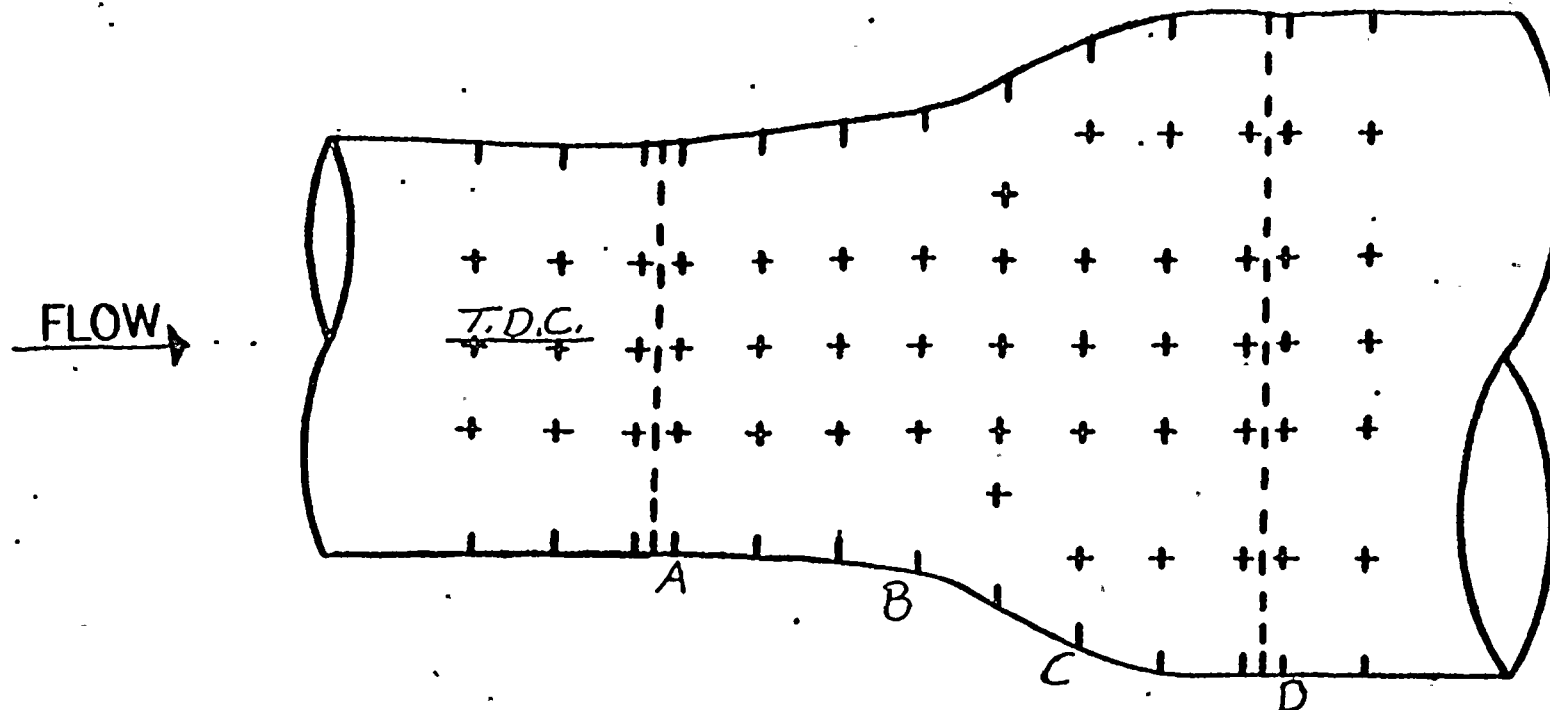
CONFIDENTIAL  
JAN 1 1964  
WORKING COPY

[illegible][illegible]

<b>FOURIGHT No.</b> 111		<b>ITEM DIAGRAM</b> 1-210
<b>REQUIRED COMPLETION DATE</b>		<b>Q3 '77</b>
<b>FABRICATED BY</b> SAHM		<b>WELD PROCEDURE</b>
<b>REVISION RECORD</b>		
NO.	DATE	DESCRIPTION
INSTR & DRAWINGS per DONALD C COOK MILLER PLANT		
DATE	SIGNATURE	TURCINE : GDR.
(1968)	DATE 6/11	BY
MAKER		SAHM-KS

PRICE NOT PREPARED BY I.W.O.





ALL READINGS START AT TDC

TDC

AND GO COUNTER WITH

FLOW.

READINGS TAKEN BY  
S. VARGAS / J. PAULY

	A	B	C	D	E	F	G
0°	840	986	845	783			
45°	852	978	832	775			
90°	853	952	785	770			
135°	867	929	770	817			
180°	932	917	768	734			
225°	844	937	820	748			
270°	835	911	795	781			
315°	911	949	866	744			

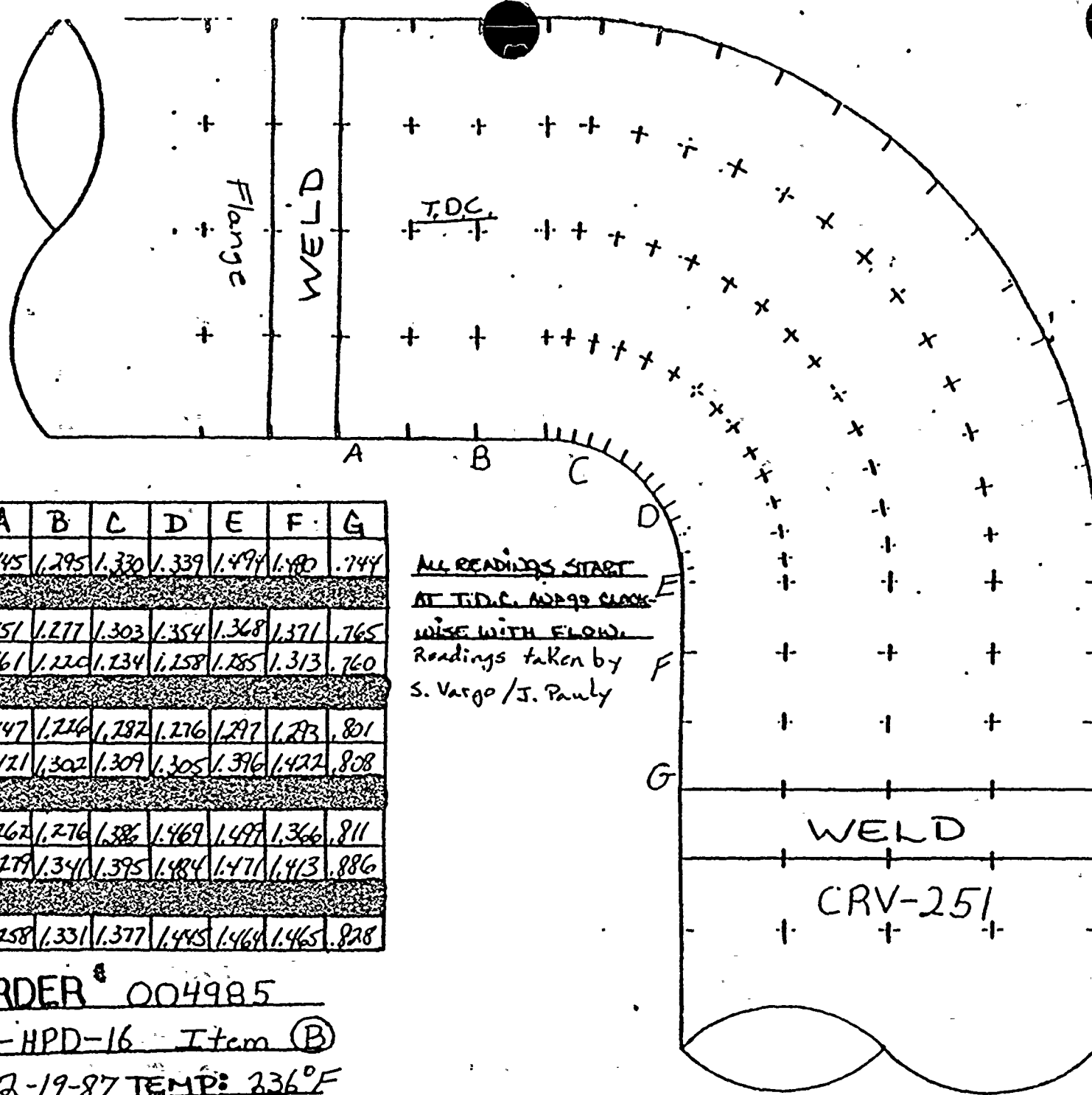
JOB ORDER\* 004985

1-HPD-16 Item (A)

DATE: 11/10/74 TEMP: 126.0°F



FLOW →



TDC

	A	B	C	D	E	F	G
0°	1.145	1.295	1.330	1.339	1.494	1.480	.744
45°	1.151	1.277	1.303	1.354	1.368	1.371	.765
90°	1.161	1.220	1.134	1.258	1.285	1.313	.760
135°	1.147	1.216	1.282	1.276	1.297	1.283	.801
180°	1.121	1.302	1.309	1.305	1.396	1.422	.808
225°	1.262	1.276	1.386	1.469	1.499	1.366	.811
270°	1.279	1.341	1.395	1.484	1.471	1.413	.886
315°	1.258	1.331	1.377	1.445	1.464	1.465	.828

ALL READINGS START

AT T.D.C. AND 90° CLOCK

WISE WITH FLOW.

Readings taken by

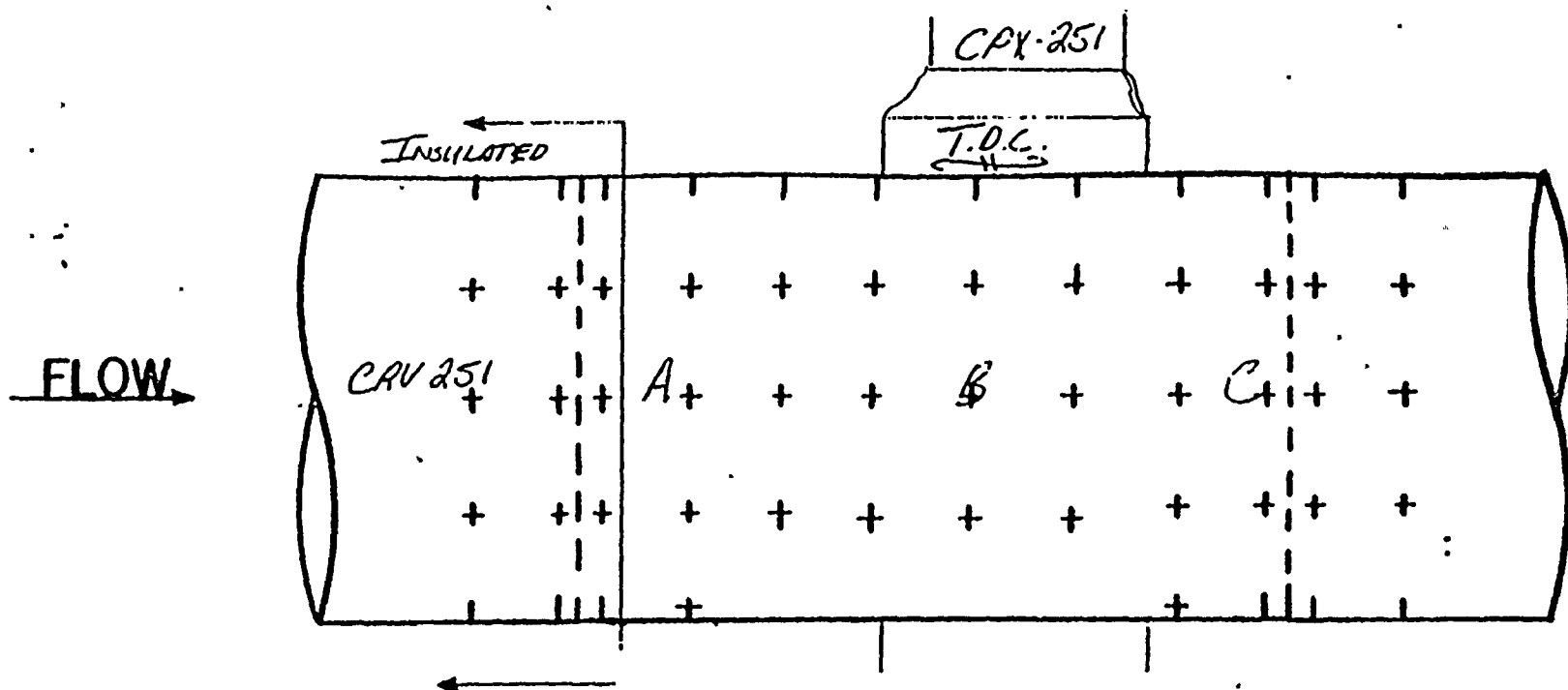
S. Vargo / J. Pauly

JOB ORDER # 004985

ISO # 1-HPD-16 Item (B)

DATE: 2-19-87 TEMP: 236°F





ALL READINGS START AT  
T.D.C. AND 90 CLOCKWISE  
WITH FLOW.

READINGS TAKEN BY:  
 S. VARGAS & A. HOLIOAY

TDC

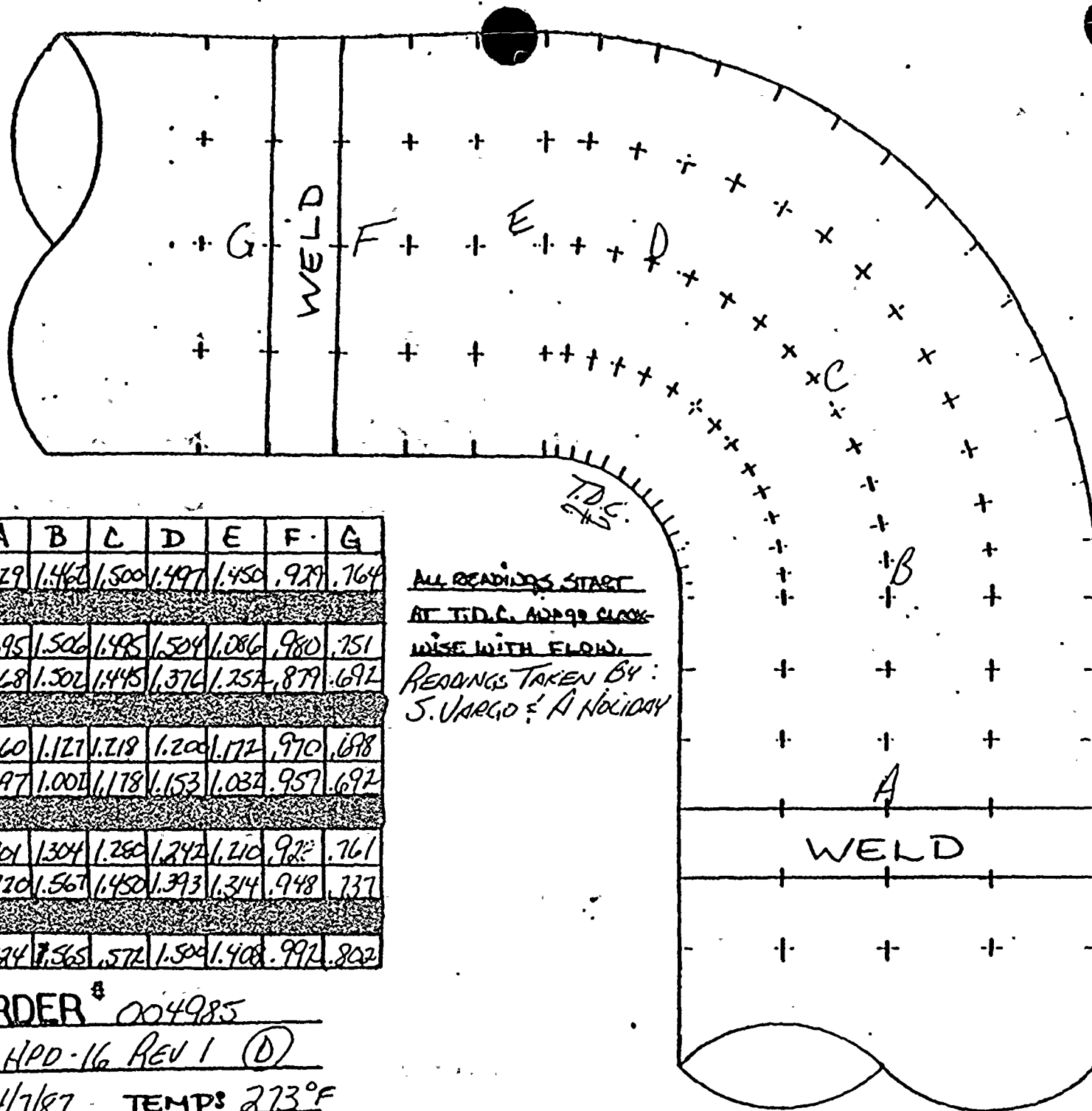
	A	B	C	D	E	F	G
0°	.571	-	.565				
45°	.563	.557	.568				
90°	.572	.553	.550				
135°	.590	.598	.578				
180°	.605	-	.573				
225°	.582	.609	.599				
270°	.576	.563	.564				
315°	.602	.589	.582				

JOB ORDER # 004985

# 1-HPD-16 REV. 1 (C)

DATE: 4/7/87 TEMP: 269°F





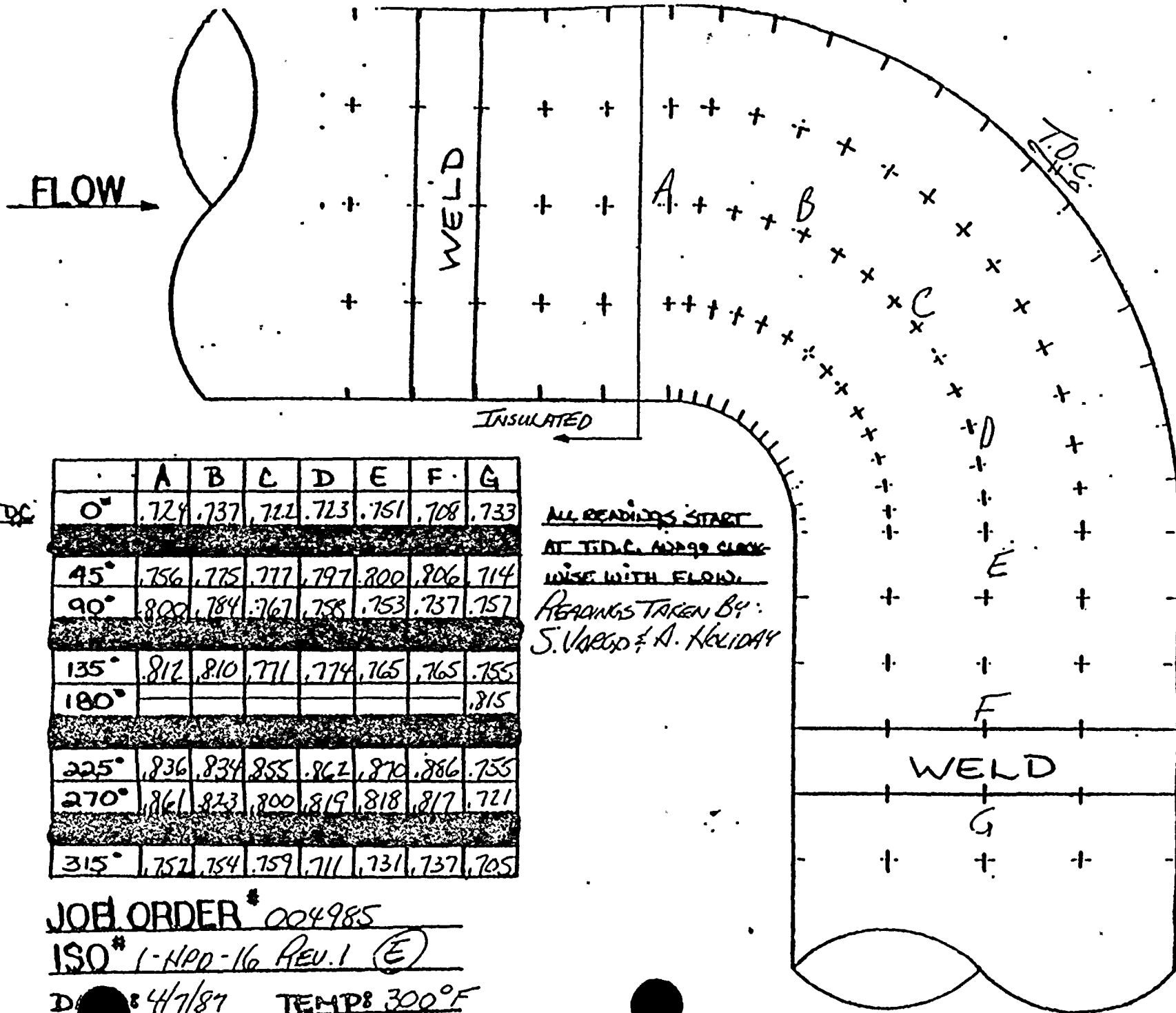
	A	B	C	D	E	F	G
0°	.729	1.462	1.500	1.497	1.450	.929	.764
45°	.695	1.506	1.495	1.504	1.086	.980	.751
90°	.668	1.502	1.445	1.376	1.252	.879	.692
135°	.660	1.121	1.218	1.200	1.172	.970	.698
180°	.697	1.001	1.178	1.153	1.032	.957	.692
225°	.701	1.304	1.280	1.242	1.210	.922	.761
270°	.730	1.567	1.450	1.393	1.314	.948	.737
315°	.724	1.565	.572	1.500	1.408	.992	.802

ALL READINGS START  
AT T.D.C. APPROX 90 CLOCK-  
WISE WITH FLOW.

READINGS TAKEN BY:  
J. VARGO & A. HOLIDAY

JOE ORDER # 004985  
ISO # 1-HPD-16 REV 1 (D)  
DATE: 4/7/87 - TEMP: 273°





JOB ORDER # 004985

ISO # 1-HPD-16 REV. 1 (E)

D: 4/7/87 TEMP: 300°F



## AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: JANUARY 16, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 2  
 \_\_\_\_\_ Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1: J. A. Kobyra *AKC 1/16/87*  
 2: R. Tella

We have reviewed the wall thickness measurements transmitted to us on 10-21-86 AND 11-18-86, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
<u>2-HPD-17</u>			
REV. 6, Sh. 2 of 2	CS	C	ACCEPTABLE, NO FURTHER INSPECTION REQUIRED
↓	CS	D	-----
↓	CS	H	-----
<u>2-HPD-24</u>			
REV. 4	CS	B	-----
↓	CS	D	-----
↓	CS	E	-----
↓	CS	F	-----
↓	CS	H	-----
<u>2-HPD-25</u>			
REV. 3	CS	B'	-----
↓	CS	B <sup>2</sup>	-----

*Anthony J. Lewandowski*  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schopf  
 H. B. Bricker  
 P & V File No. 4.6.3.15.2.6.2

Sheet No. 1 of 2



D. C. Cook Nuclear Plant, Unit No.  
 Steam Piping Erosion Program, SER No. 88-84  
X Water Piping Erosion Program, SER No. 23-85  
 Engineering evaluation of Wall Thickness Measurements  
 Date: JANUARY 16, 1986  
 Sheet No. 2 of 2

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPS Recommendation
<u>2-HPD-25</u>			
<u>REV. 3</u>	<u>CS</u>	<u>C</u>	<u>ACCEPTABLE, NO FURTHER INSPECTION REQUIRED</u>
	<u>CS</u>	<u>D</u>	
	<u>CS</u>	<u>E</u>	
<u>2-HPD-26</u>			
<u>REV. 1, 5/1/82</u>	<u>CS</u>	<u>C</u>	
	<u>CS</u>	<u>G</u>	
	<u>CS</u>	<u>H</u>	
<u>2-HPD-26,</u>			
<u>REV. 0, 5/1/82</u>	<u>CS</u>	<u>B</u>	
	<u>CS</u>	<u>E</u>	
	<u>CS</u>	<u>F</u>	
<u>2-HPD-27</u>			
<u>REV. 2</u>	<u>CS</u>	<u>D</u>	
	<u>CS</u>	<u>I</u>	
	<u>CS</u>	<u>J</u>	
	<u>CS</u>	<u>R</u>	
	<u>CS</u>	<u>Q</u>	
<u>2-HPD-28</u>			
<u>REV. 1</u>	<u>CS</u>	<u>E</u>	
	<u>CS</u>	<u>J</u>	
	<u>CS</u>	<u>N</u>	
	<u>CS</u>	<u>O</u>	
	<u>CS</u>	<u>S</u>	
	<u>CS</u>	<u>T</u>	<u>ELBOW IS STILL WITHIN MINIMUM WALL.</u> <u>HOWEVER, IT SHOULD BE REPLACED WITHIN 10 YEARS</u>



## EROSION EVALUATION WORKSHEET

[illegible]



WEEK # 7,8

QC 7.0 #109124

109124

109124

JAN 3 1980

DETAIL A

NOTE: AFTER METERING TEST IS COMPLETED THE METERING ASSEMBLY WITH ADAPTERS IS TO BE REMOVED & THE 10" SECTION TO BE REINSTALLED AS SHOWN BELOW.

METER RUN ASSEMBLY WITH ADAPTERS

QTY	DESCRIPTION	UNIT
1	1" COOLING WATER VALVE 1/2" NPT	
2	1" PIPE (SCH. 40) 1/2" NPT	
3	1" FLEXIBLE GASKET 1/2" NPT	
4	1/2" LONG STUD BOLTS 1/2" NPT	
5	1/2" HEXAGON NUTS 1/2" NPT	
6	1/2" FLEXIBLE GASKET 1/2" NPT	
7	1/2" LONG STUD BOLTS 1/2" NPT	
8	1/2" HEXAGON NUTS 1/2" NPT	
9	1/2" FLEXIBLE GASKET 1/2" NPT	
10	1/2" LONG STUD BOLTS 1/2" NPT	
11	1/2" HEXAGON NUTS 1/2" NPT	
12	1/2" FLEXIBLE GASKET 1/2" NPT	

NO.	REVISION	DESCRIPTION
1	1	ADDED PARTS
2	2	ADDED PARTS
3	3	ADDED PARTS
4	4	ADDED PARTS
5	5	ADDED PARTS
6	6	ADDED PARTS

INSPECT:

H 22 MAY 81 ANT  
C, D 14 JUL 81 ANT

PIECE MARKS
2-NPD-17-G
7-VND
8-VND
9-VND
10-VND
11
12
13
14
15
16
2-NPD-25-5

SITETAB PIECE MARKS  
2-NPD-17-LG

1. MATERIALS LOCATION OF PIPE SUPPORT AND SUPPORT DETAIL  
2. SURFACE DATA NUMBERS  
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100. SURFACE DATA NUMBERS

NOTE 2-NPD-17  
10F2 CHAMPA

NO.	DESCRIPTION	UNIT
1	1" COOLING WATER VALVE 1/2" NPT	
2	1" PIPE (SCH. 40) 1/2" NPT	
3	1" FLEXIBLE GASKET 1/2" NPT	
4	1/2" LONG STUD BOLTS 1/2" NPT	
5	1/2" HEXAGON NUTS 1/2" NPT	
6	1/2" FLEXIBLE GASKET 1/2" NPT	
7	1/2" LONG STUD BOLTS 1/2" NPT	
8	1/2" HEXAGON NUTS 1/2" NPT	
9	1/2" FLEXIBLE GASKET 1/2" NPT	
10	1/2" LONG STUD BOLTS 1/2" NPT	
11	1/2" HEXAGON NUTS 1/2" NPT	
12	1/2" FLEXIBLE GASKET 1/2" NPT	

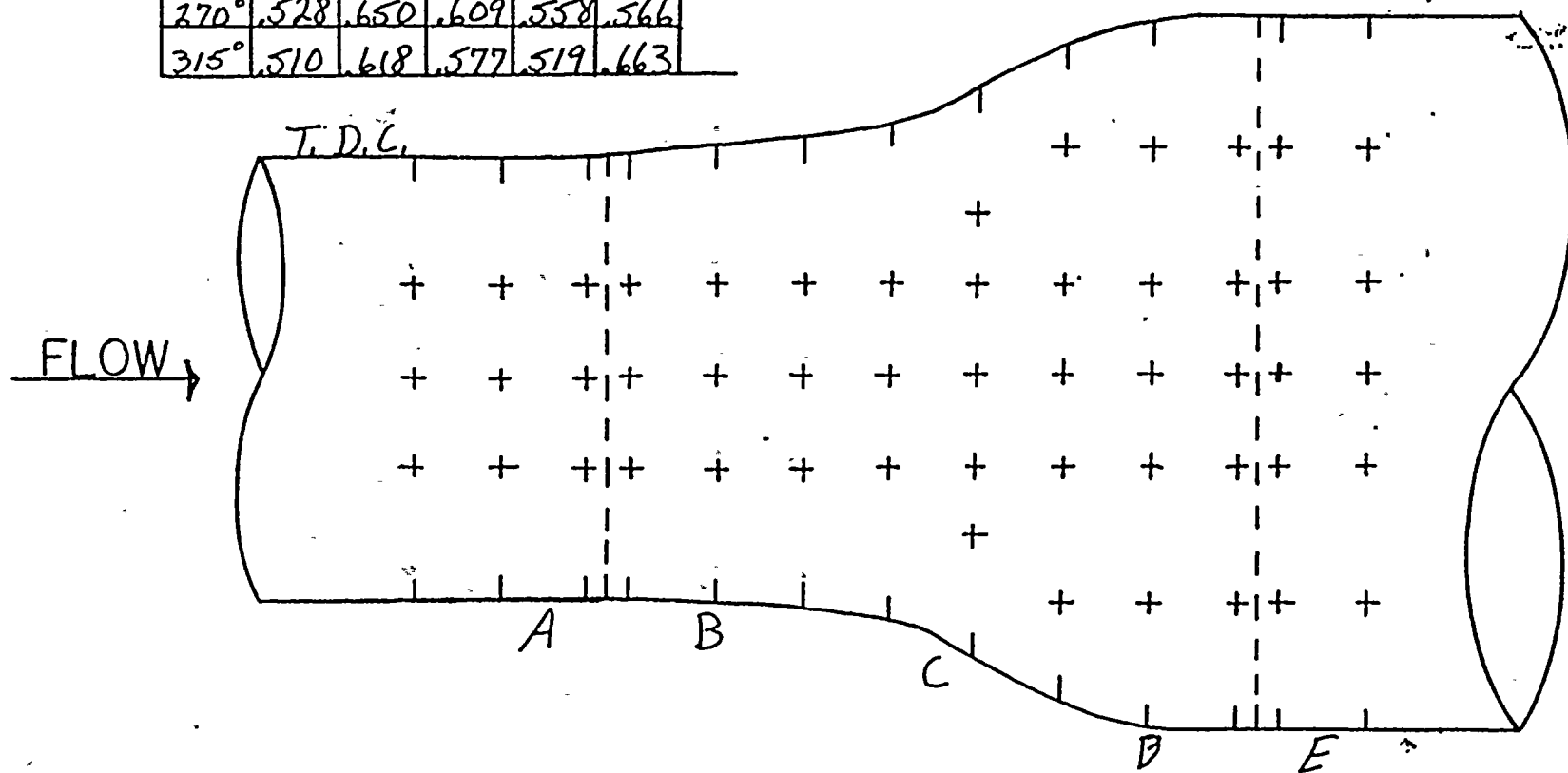
NO.	DESCRIPTION	UNIT
1	1" COOLING WATER VALVE 1/2" NPT	
2	1" PIPE (SCH. 40) 1/2" NPT	
3	1" FLEXIBLE GASKET 1/2" NPT	
4	1/2" LONG STUD BOLTS 1/2" NPT	
5	1/2" HEXAGON NUTS 1/2" NPT	
6	1/2" FLEXIBLE GASKET 1/2" NPT	
7	1/2" LONG STUD BOLTS 1/2" NPT	
8	1/2" HEXAGON NUTS 1/2" NPT	
9	1/2" FLEXIBLE GASKET 1/2" NPT	
10	1/2" LONG STUD BOLTS 1/2" NPT	
11	1/2" HEXAGON NUTS 1/2" NPT	
12	1/2" FLEXIBLE GASKET 1/2" NPT	



T.D.C.

	A	B	C	D	E
0°	.591	.592	.588	.529	.567
45°	.497	.612	.629	.565	.574
90°	.582	.634	.642	.576	.531
135°	.468	.650	.657	.578	.526
180°	.490	.673	.624	.645	.552
225°	.536	.648	.644	.537	.583
270°	.528	.650	.609	.558	.566
315°	.510	.618	.577	.519	.663

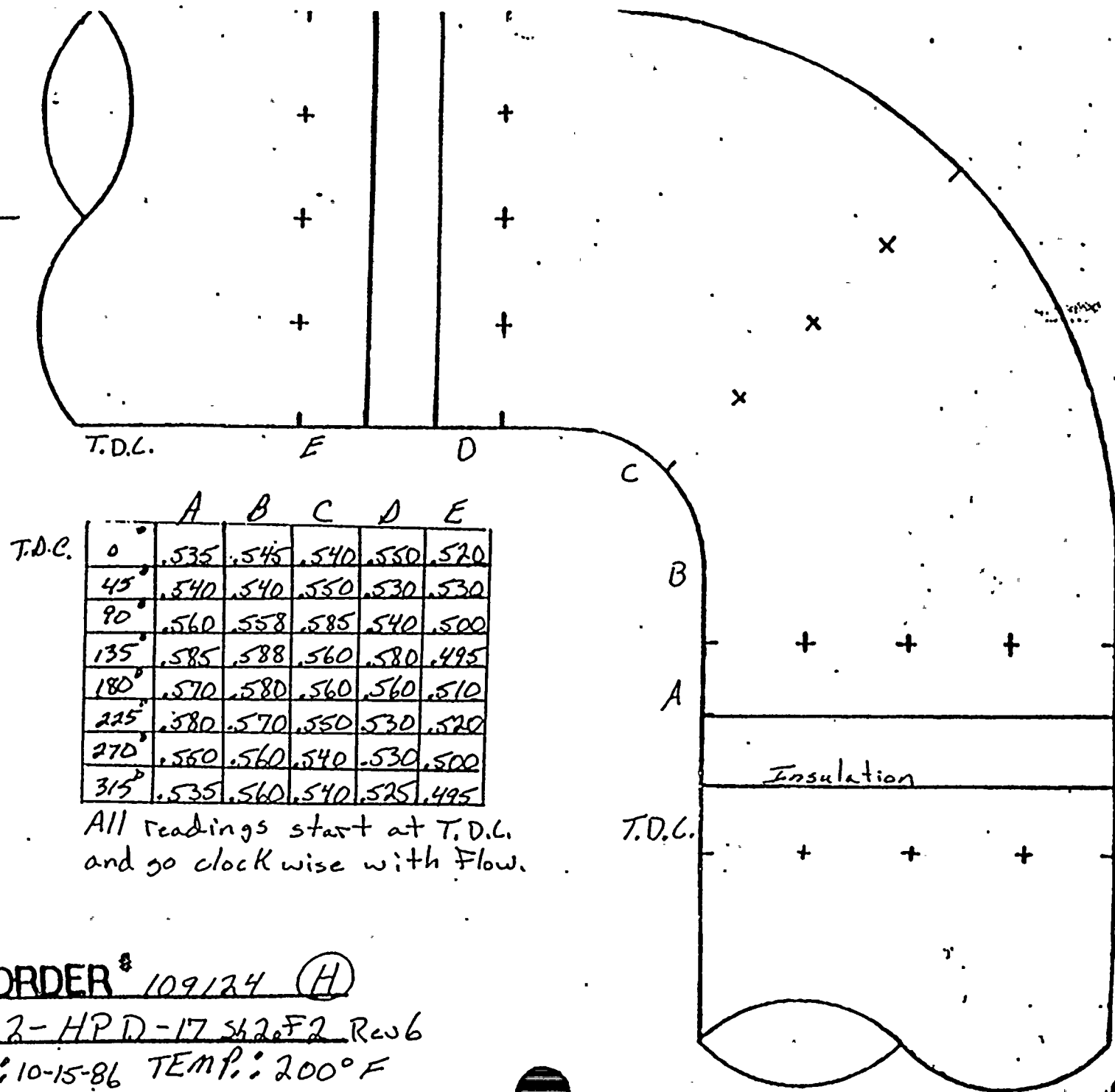
All readings start at T.D.C.  
and go clockwise with Flow.



JOB ORDER# 109124 (D)  
ISO# 2-HPD-17 Rev 6 Sh + 2o F 2  
Date: 10-15-86 Temp: 200° F



FLOW



T.D.C.		A	B	C	D	E
0°		.535	.545	.540	.550	.520
45°		.540	.540	.550	.530	.530
90°		.560	.558	.585	.540	.500
135°		.585	.588	.560	.580	.495
180°		.570	.580	.560	.560	.510
225°		.580	.570	.550	.530	.520
270°		.560	.560	.540	.530	.500
315°		.535	.560	.540	.525	.495

All readings start at T.D.L.  
and go clock wise with Flow.

JOE ORDER # 109124 (H)

ISO # 2-HPD-17 542°F2 Rev 6

DATE: 10-15-86 TEMP.: 200°F



D. C. COOK AR PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 2

Evaluation Date: JANUARY 16, 1987

SER No. 23-85 (Water) X

Years in service 9

UT Reading Transmitted on: 11-18-86

UT Reading Taken on: 10-23-86

Isometric Dwg. No. 2-HPD-24, REV. 4

AEPS Installed Mat'l Class CS: A-106: 14" 90° ELLS SCH 40  
14" X 8" REDUCERS X-STRONG

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
B	14" 90° ELL	.437	.382-.492	.125	.392	0%	STILL WITHIN MANUFACTURERS TOLERANCE
D	14" X 8" REDUCERS	.500	.438-.563	.125	.441	0%	} SEE NOTE
E	14" X 8" REDUCERS	.500	.438-.563	.125	.648	0%	
F	14" X 8" REDUCERS	.500	.438-.563	.125	.470	0%	
H	14" 90° ELL	.437	.382-.492	.125	.431	0%	STILL WITHIN MANUFACTURERS TOLERANCE

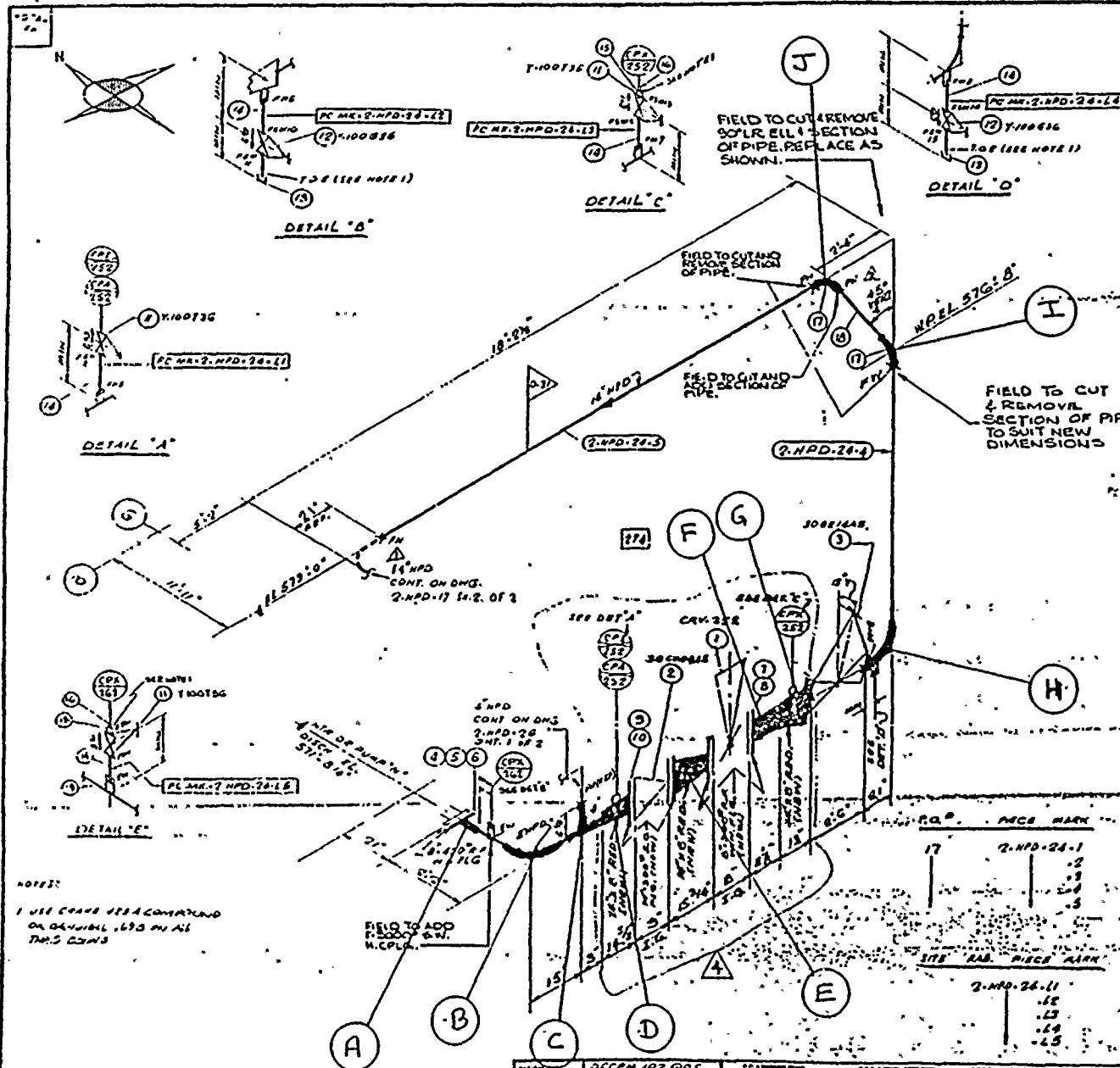
\* NOTE: THE THREE REDUCERS WERE ORIGINALLY SCH. 40. PER REC-  
DC-02-2331 THE REDUCERS WERE REPLACED WITH X-STRONG (X-HVY)  
REDUCERS (DUE TO A RELOCATION OF THE CHECK VALVE AND TURBULENCE  
FROM THE CONTROL VALVES). THE WALL THICKNESSES ARE STILL  
WITHIN MANUFACTURERS TOLERANCE.

○ AN EVEN HIGHER SCH, 80, MAY HAVE BEEN USED



1-18-86

WEEK # 8

 RC 109125  
 CONST J.O.# 109122  
 109123


ISO SHY. NO. 3011				MATERIAL DESCRIPTION		QTY	UNIT
01	1	8'		REGULATING VA			
2	1	18"		300° SWEEP 1/2\"			
3	1	18"		300° SWEEP 1/2\"			
4	1	6'		18\"			
5	12	1/2"		6\"			
6	24	1"		HEAVY HEX NUT			
7	12	1/2"		1/2\"			
8	24	1"		HEAVY HEX NUT			
9	24	1/2"		1/2\"			
10	10	1/2"		HEAVY HEX NUT			
11	3	1"		600° SWEEP 1/2\"			
12	2	1"		600° SWEEP 1/2\"			
13	2	1"		3000° SWEEP 1/2\"			
14	1	1"		PIPE (SCH 40) 1/2\"			
15	2	1/2"		1/2\"			
16	2	1/2"		3000° SWEEP 1/2\"			
17	2	1/2"		1/2\"			
18	1	1/2"		PIPE (SCH 40) 1/2\"			
19	1	1"		3000° SWEEP 1/2\"			

REVISION RECORD				DESCRIPTION	REMARKS
1	1/1	1/1	1/1	2\"	2\"
2	1/1	1/1	1/1	2\"	2\"
3	1/1	1/1	1/1	2\"	2\"
4	1/1	1/1	1/1	2\"	2\"

 INSPECT : B, E & H 22 MAY 86  
 D, F 14 JUL 86 AMT

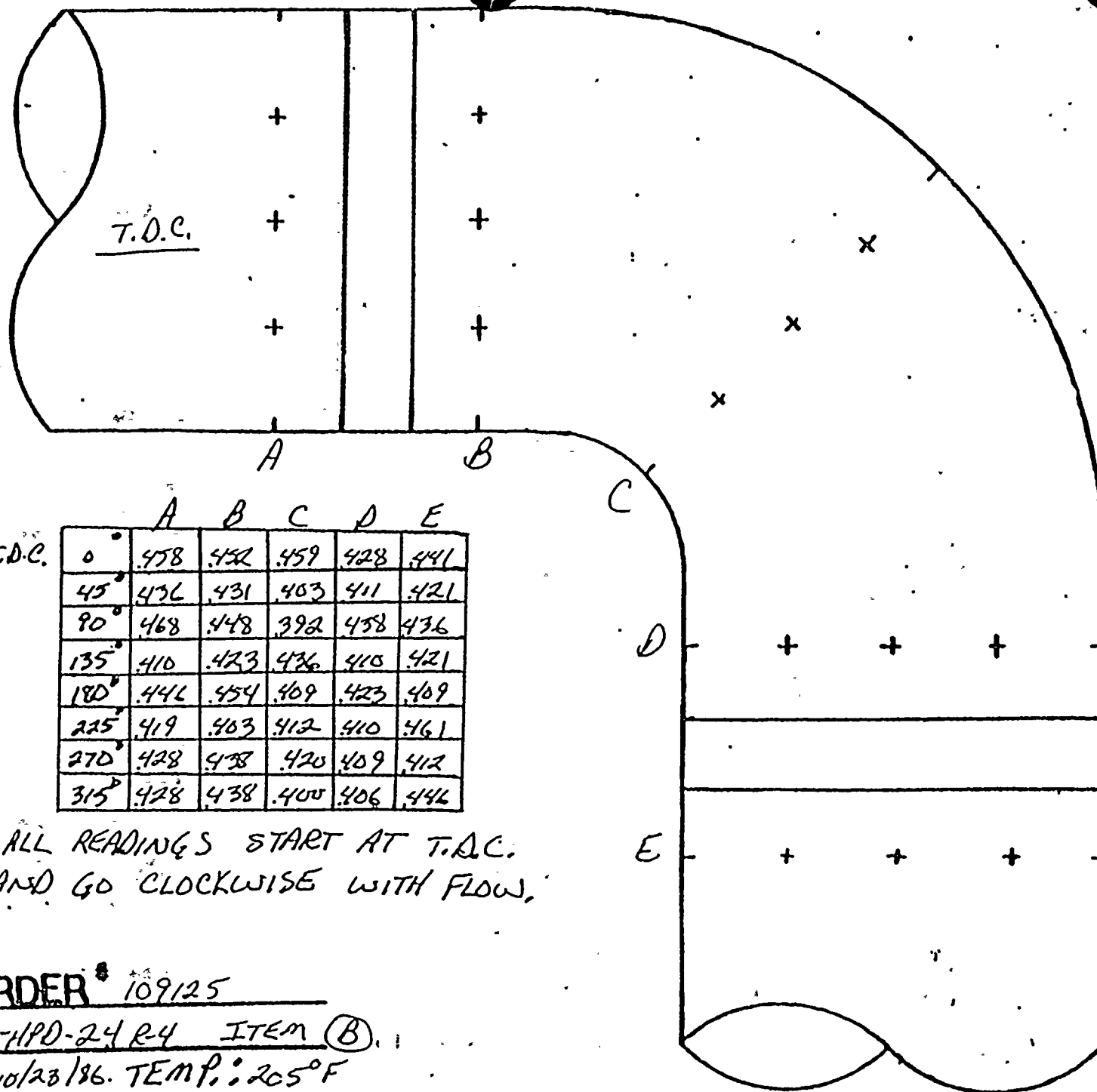
 UNCONTROLLED  
 DOCUMENT

DETAILED SPECIFICATIONS				MATERIALS			
ITEM	QTY	UNIT	DESCRIPTION	ITEM	QTY	UNIT	DESCRIPTION
1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1
17	1	1	1	1	1	1	1
18	1	1	1	1	1	1	1
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23	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1
25	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1
27	1	1	1	1	1	1	1
28	1	1	1	1	1	1	1
29	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1
31	1	1	1	1	1	1	1
32	1	1	1	1	1	1	1
33	1	1	1	1	1	1	1
34	1	1	1	1	1	1	1
35	1	1	1	1	1	1	1
36	1	1	1	1	1	1	1
37	1	1	1	1	1	1	1
38	1	1	1	1	1	1	1
39	1	1	1	1	1	1	1
40	1	1	1	1	1	1	1
41	1	1	1	1	1	1	1
42	1	1	1	1	1	1	1
43	1	1	1	1	1	1	1
44	1	1	1	1	1	1	1
45	1	1	1	1	1	1	1
46	1	1	1	1	1	1	1
47	1	1	1	1	1	1	1
48	1	1	1	1	1	1	1
49	1	1	1	1	1	1	1
50	1	1	1	1	1	1	1
51	1	1	1	1	1	1	1
52	1	1	1	1	1	1	1
53	1	1	1	1	1	1	1
54	1	1	1	1	1	1	1
55	1	1	1	1	1	1	1
56	1	1	1	1	1	1	1
57	1	1	1	1	1	1	1
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98	1	1	1	1	1	1	1
99	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1

FOUR/ZONE No. 278	FLOW DIAGRAM 1-302
REQUIRED COMPLETION DATE	OSL 07
FABRICATED BY TUBEC	WELD PROCEDURE
NPS DESIGNS INC.	INDIANA ELECTRIC CO.
NEW YORK, N.Y.	DONALDSON CLEAR PLANT
FABRICATOR NOTE:	INDIANA ELECTRIC CO.
FABRICATION MUST	INDIANA ELECTRIC CO.
CONFORM TO LATEST	INDIANA ELECTRIC CO.
4-PARTY APPROVAL	INDIANA ELECTRIC CO.



FLOW →



T.D.C.		A	B	C	D	E
0°		458	452	459	428	441
45°		436	431	403	411	421
90°		468	448	392	458	436
135°		410	423	436	410	421
180°		446	454	409	423	409
225°		419	403	412	410	461
270°		428	438	420	409	412
315°		428	438	400	406	446

ALL READINGS START AT T.A.C.  
AND GO CLOCKWISE WITH FLOW.

JOB ORDER # 109125

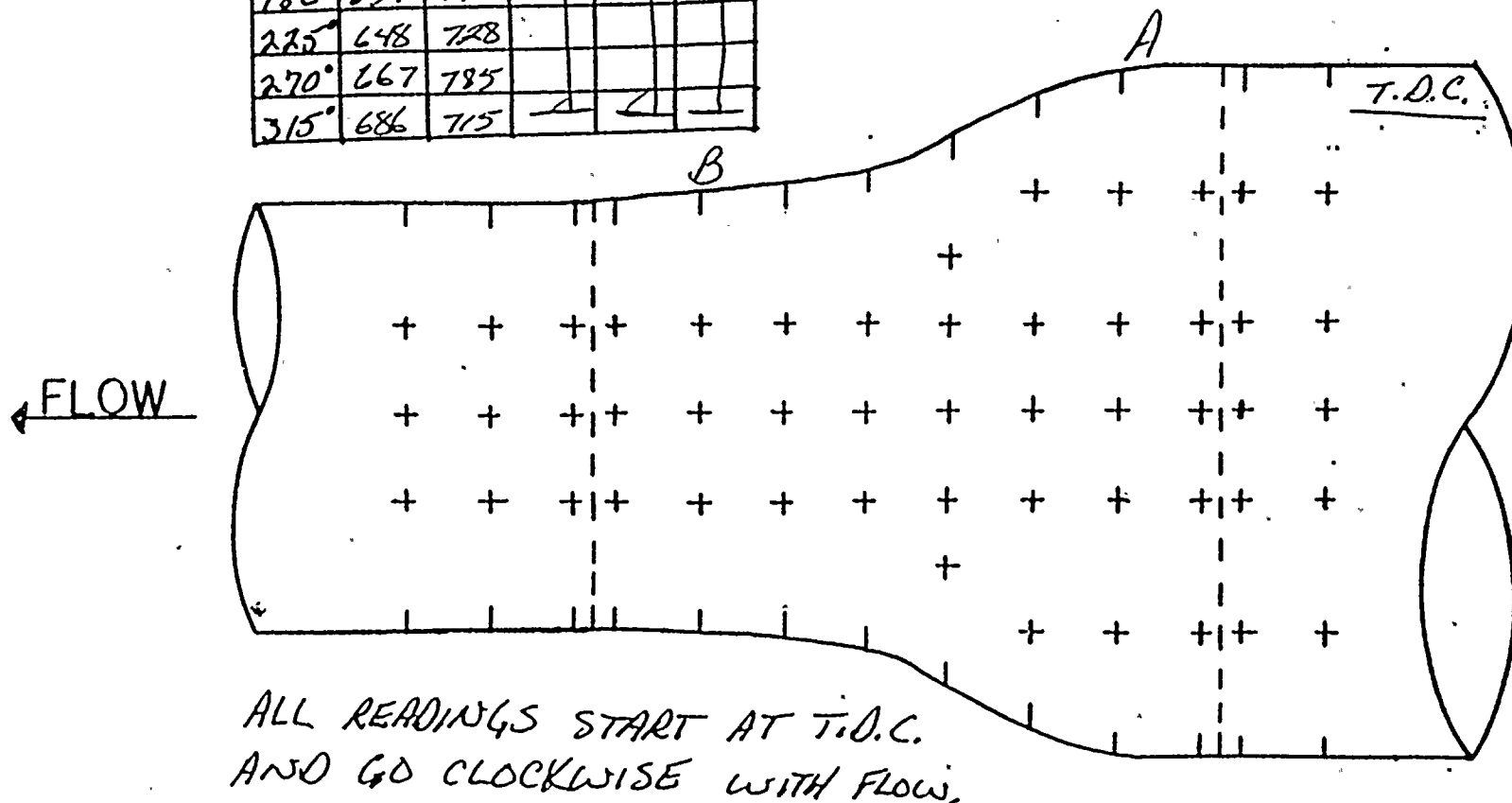
ISO # 2-HPD-24 R4 ITEM (B)

DATE: 10/23/86. TEMP.: 205°F



T.D.C.

	A	B	C	D	E
0°	712	788	N/A	N/A	N/A
45°	706	836			
90°	714	833			
135°	704	779			
180°	659	770			
225°	648	728			
270°	667	785			
315°	686	715			



JOB ORDER# 109125

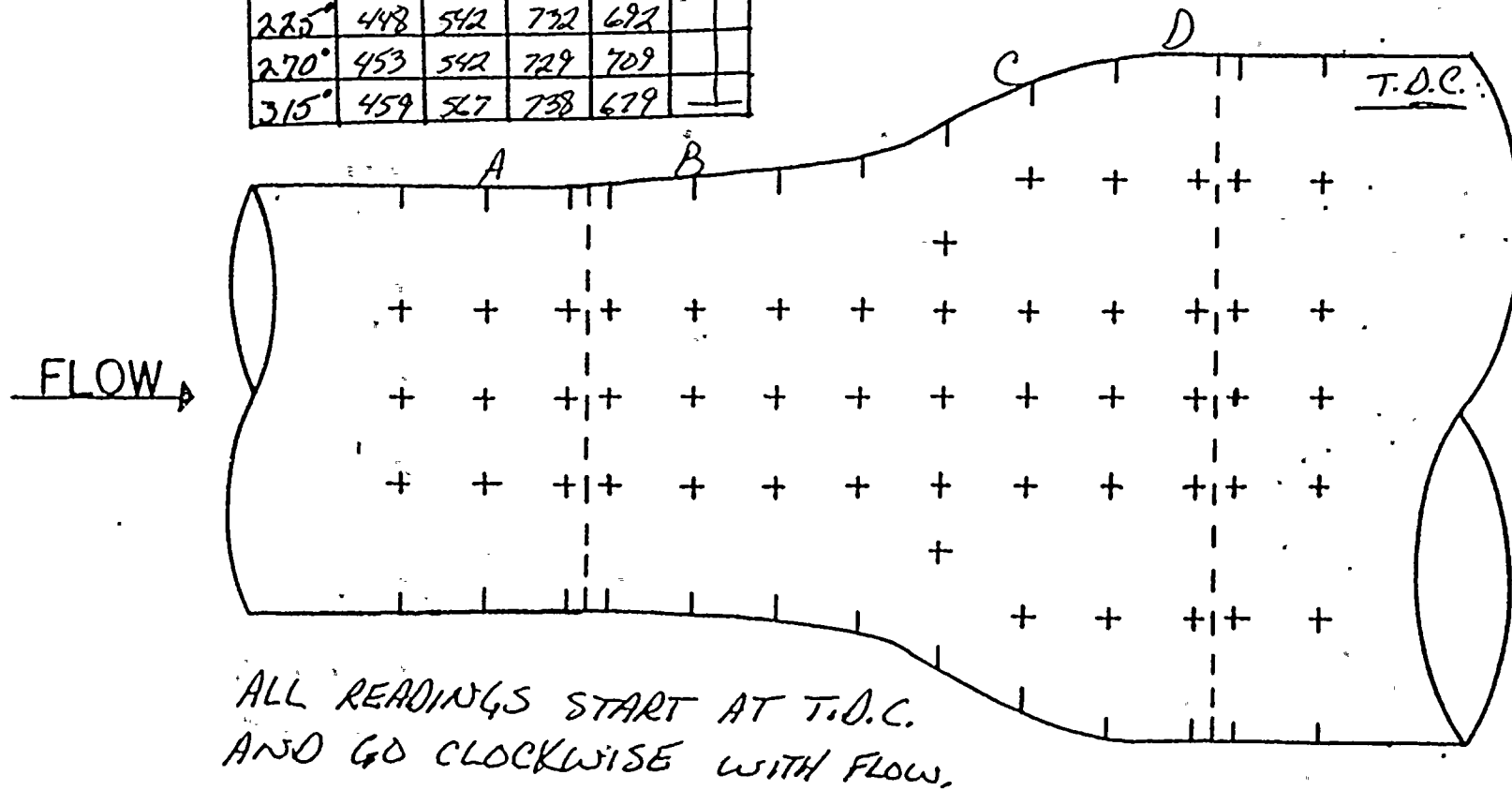
# 2-HPD-24 R4 ITEM (D)

DATE: 10/23/86 TEMP: 205°F



T.D.C.

	A	B	C	D	E
0°	498	520	714	677	N/A
45°	476	591	689	678	
90°	458	516	706	663	
135°	472	591	699	654	
180°	441	553	708	684	
225°	448	542	732	692	
270°	453	542	729	709	
315°	459	527	738	679	



ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

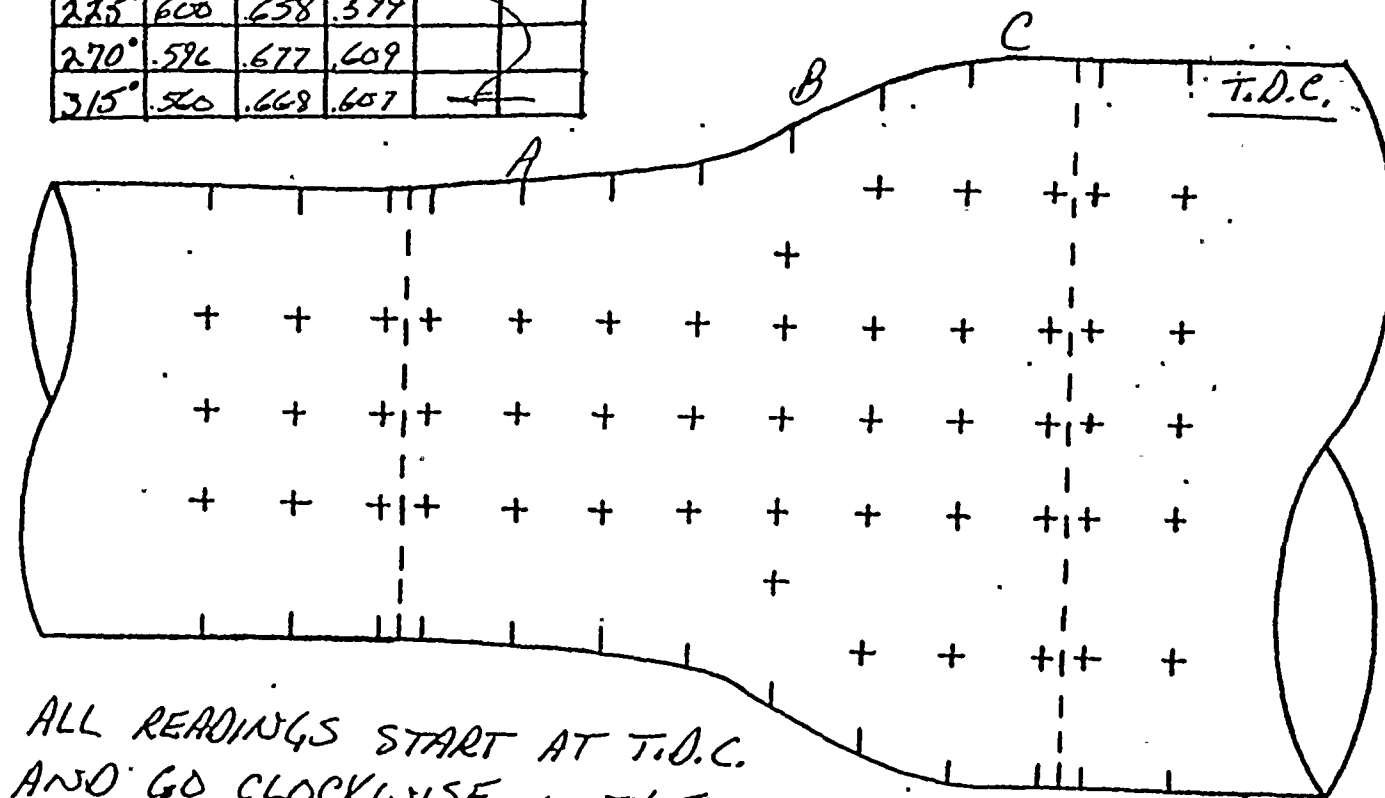
JOB ORDER# 109125  
ISO# 2-HPD-24 R-4 ITEM (E)  
DATE: 10/23/86 TEMP: 205°F



T.D.C.

	A	B	C	D	E
0°	.579	.672	.591	N/A	
45°	.494	.704	.632		A
90°	.478	.749	.626		
135°	.470	.752	.658		
180°	.480	.637	.581		
225°	.600	.658	.599		
270°	.596	.677	.609		
315°	.520	.668	.607		

FLOW →



ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

JOB ORDER# 109125  
ISO# 2-HPD-24 & 4 ITEM (F)  
DATE: 10/23/86 TEMP. 205°F.



← FLOW

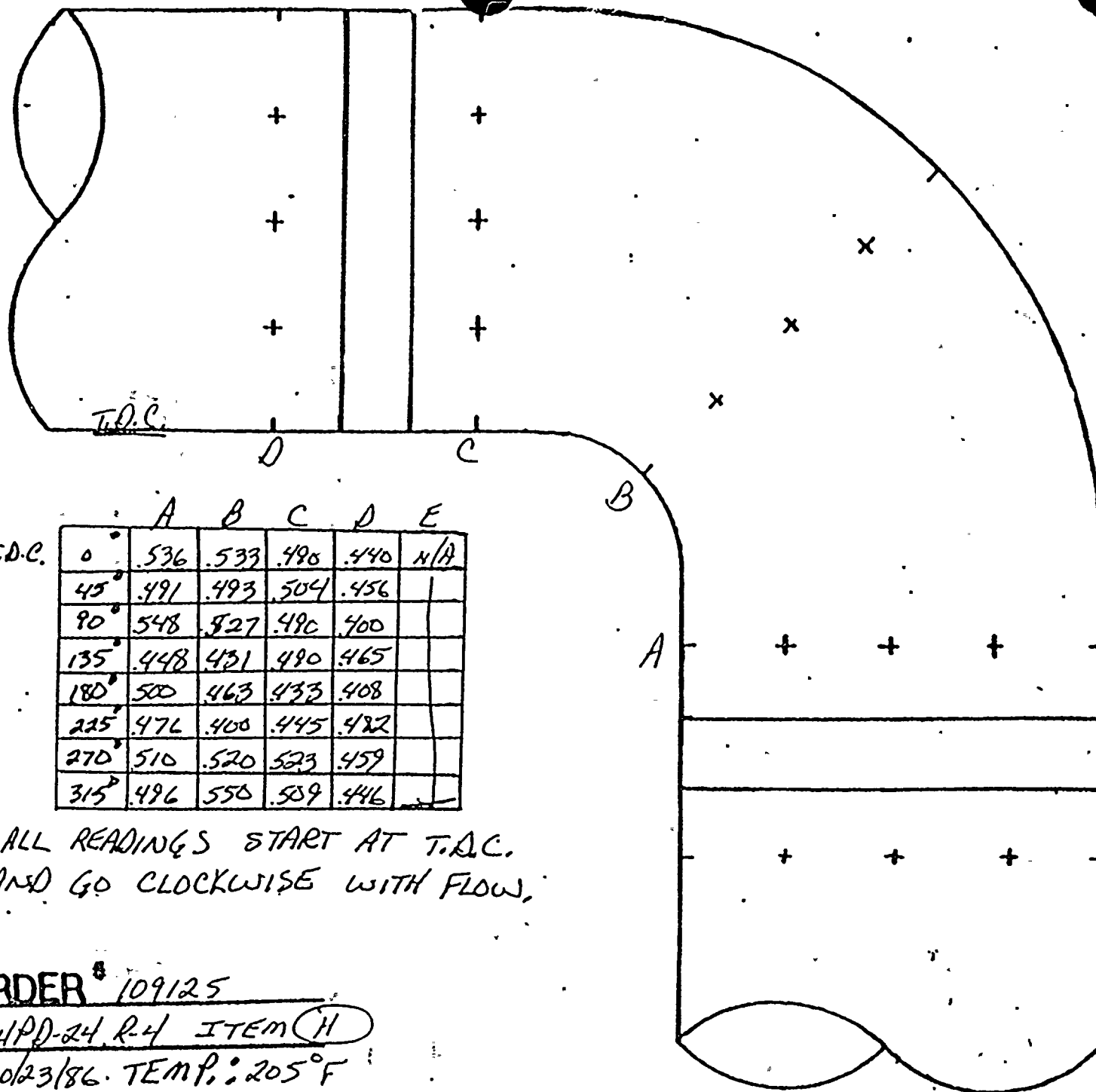
T.D.C.		A	B	C	D	E
0°		.536	.533	.490	.440	N/A
45°		.491	.493	.504	.456	
90°		.548	.527	.490	.400	
135°		.448	.431	.490	.465	
180°		.500	.463	.433	.408	
225°		.476	.400	.445	.422	
270°		.510	.520	.523	.459	
315°		.496	.550	.509	.446	

ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

JOB ORDER # 109125

ISO # 2-HPD-24 R-4 ITEM (H)

DATE: 10/23/86. TEMP.: 205°F





D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: A.J. LEWANDOWSKI

SER No. 88-84 (Steam) \_\_\_\_\_

Unit No. 2

Evaluation Date: JANUARY 16, 1988

SFR No. 23-85 (Water) X

Years in service 9

UT Reading Transmitted on: 10-21-86

UT Reading Taken on: 10-16-86

Isometric Dwg. NO. 2-HPDH-25, REV. 3

AEPS Installed Mat'l Class CS: A-106 GR. B SCH. 40 & SCH. X-HVY

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
B'	8" STRAIGHT P	.322	.282-.362	.125	.366	0%	STILL WITHIN MANUFACTURERS TOLERANCE
* C	14"x8" 90° REDUCING ELL	.500	.438-.563	.125	.523	0%	" " " "
* D	14"x8" REDUCER	.500	.438-.563	.125	.458	0%	" " " "
E	14" 90° ELL	.437	.382-.492	.125	.428	0%	" " " "
* B <sup>2</sup>	14"x8" REDUCER	.500	.438-.563	.125	.553	0%	" " " "

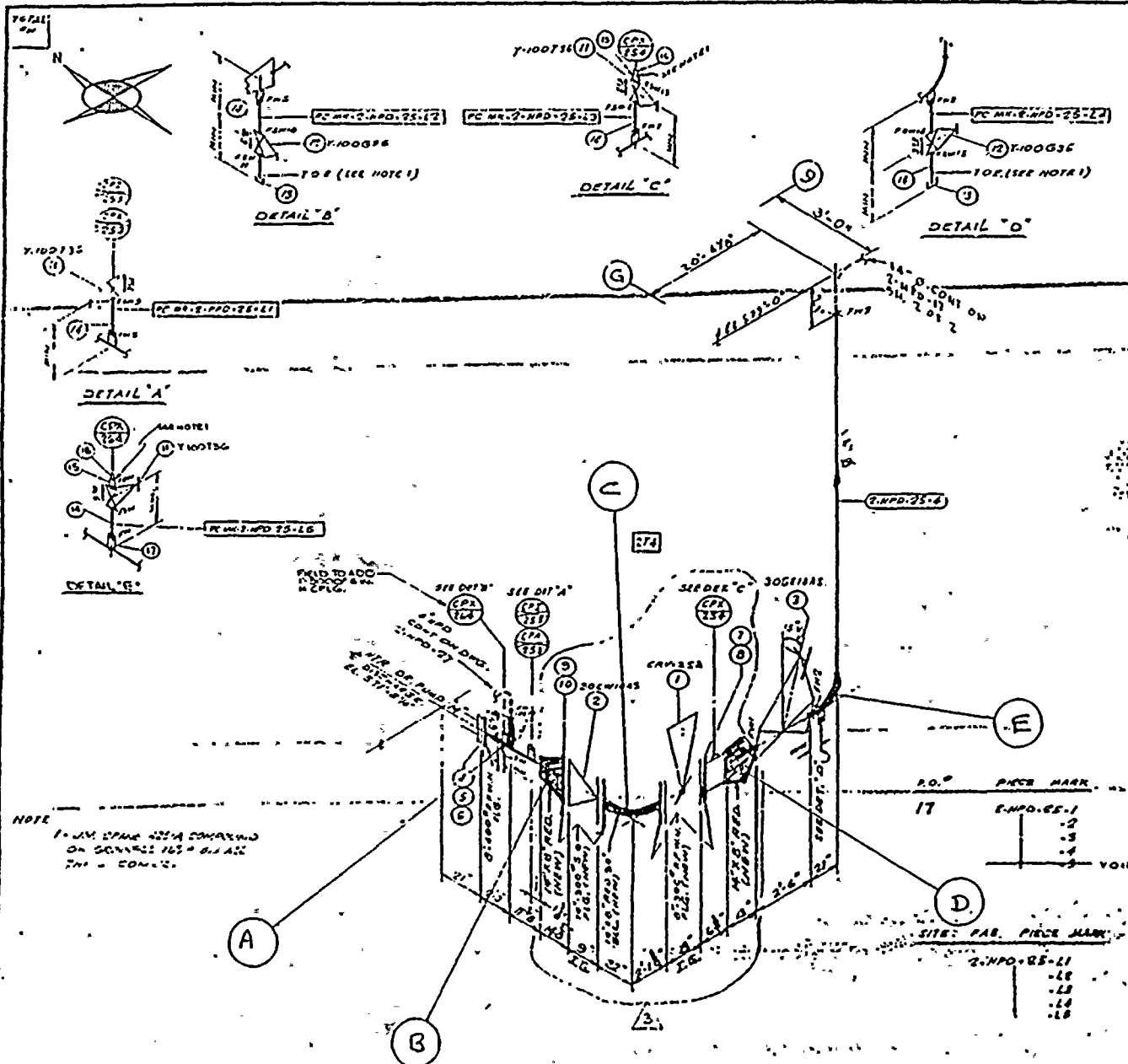
\* NOTE: PLANT ID COMPONENT NUMBERS C, D AND B<sup>2</sup> WERE  
REPLACED WITH X-HVY PIPE PER RFC-DC-02-2331. DUE TO  
RELOCATION OF CHECK VALVE AND TURBULENCE FROM CONTROL VALVE  
THE WALL THICKNESS WAS INCREASED.



10-21-86

QC-J.O.# 109124

CONST. J.O. # 109122, 109123



QSL	ITEM	QTY	UNIT	MATERIAL DESCRIPTION	PRICE PER UNIT TOTAL PRICE	REMARKS
1	1			REGULATING VAL	\$2.50	
2	1	18		300° WATER TYP GREEN VA	\$2.50	
3	1	18		300° AIR C'S GATE VA SCH 40	\$3.67	
4	1	3		4" 1/2" 200# 3" HALF NOUN	\$1.42	
5	12	18		G 1/2 1" 100 BOLT	\$2.50	
6	54	1		HEAVY NER NUT	\$2.50	
7	12	30		1 1/2" 1/2 1" 100 BOLT	\$2.50	
8	84	1		HEAVY NER NUT	\$2.50	
9	20	1/2		1 1/2" 1/2 1" 100 BOLT	\$2.50	
10	12	1		HEAVY NER NUT	\$2.50	
11	3	1		600° SW C'S 3" SCH 40	\$100.00	
12	2	1		600° SW C'S GATE VA	\$1,200.00	
13	2			3000° C'S 1" 1/2 C'S	\$1,200.00	
14	1			PIPE (SCH 30) 1/2" C'S	\$1,200.00	
15	2	1/2		1 1/2" 1/2 1" 100 BOLT	\$1,200.00	
16	2	1		3000° 1/2" 1/2 C'S	\$1,200.00	
17	1	1		3000° SW HALF CCG	\$1,200.00	

REVISION RECORD				
NO	DATE	BY	DESCRIPTION	REMARKS
1	7/25/72	ALC HJR	VOIDED SPOOL 1 - HPD-75-3 PER. AEP ARRG-7 DWG. 2-3210-3	— — SEC. SEC.
2	7/25/72	C G	ADD ITEM 2, HPD-75-3, CFT 2 ITEM NO 17 N CM AND FIELD NOTE, REVISED QTY CFT ITEM NO 3 11 B 12 N CM PER AEP ARRG DWG 2-3210-3	FIELD ACTION REQD —
3	7/25/72	HJR	ASER REC-02-2551, REVISED 10W PRESS. HEATER DRAIN PUMP DISCHARGE PIPING	FIELD ACTION REQD

**CONTROLLED  
DOCUMENT**

INSPECT: C, D & E

B 1430286 ANT

22 MAY 86

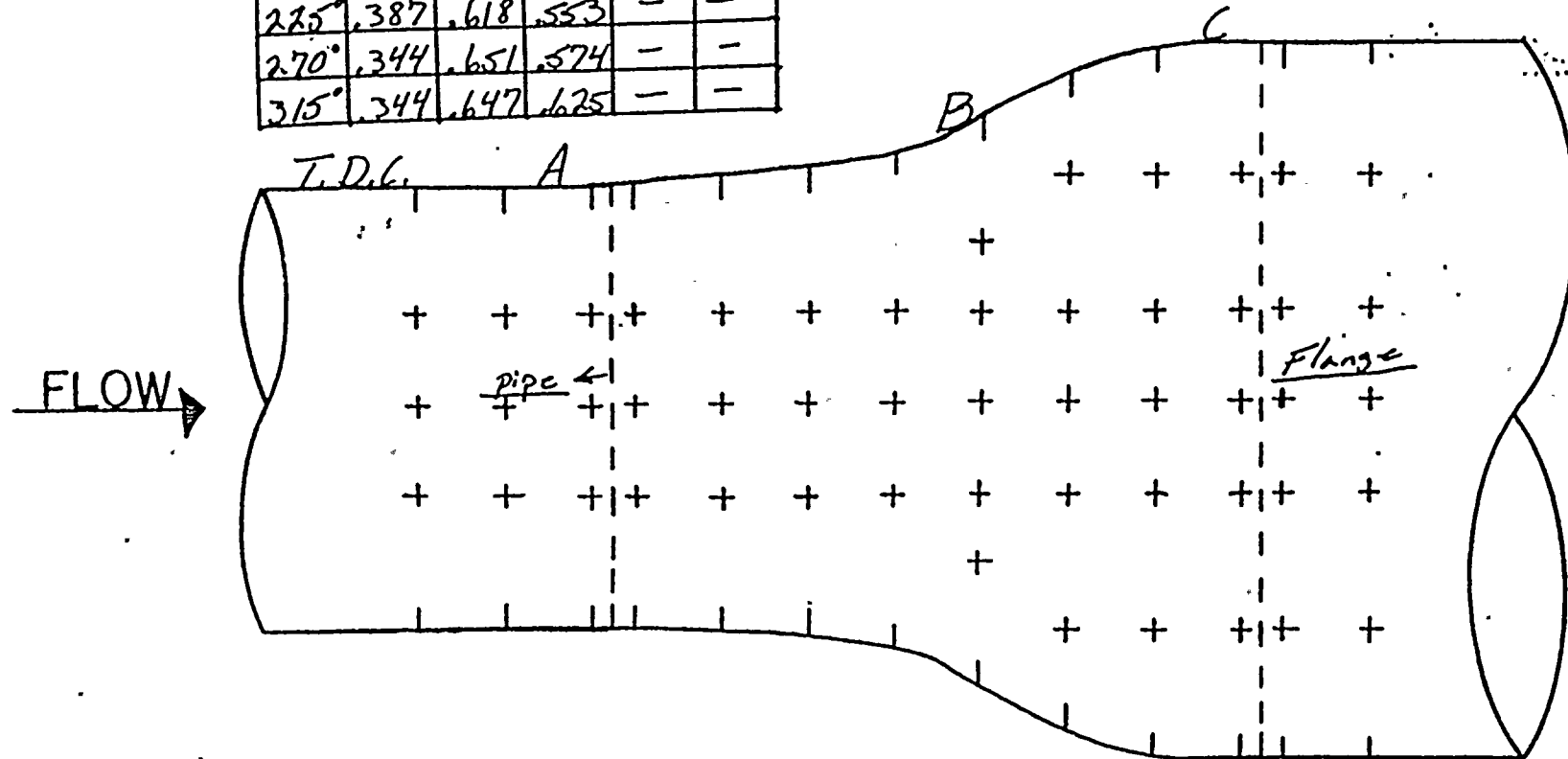
MACHINIC NO. <u>DECPH 102066</u> QUALITY & METHOD CLASS <u>IF</u> TESTS & MEASUREMENTS <u>N/A</u> MATERIALS CLAS. <u>D.31 3120 103</u>		2.01 2.02 2.03 2.04 2.05 2.06 2.07 2.08 2.09 2.10 2.11 2.12 2.13 2.14 2.15 2.16 2.17 2.18 2.19 2.20 2.21 2.22 2.23 2.24 2.25 2.26 2.27 2.28 2.29 2.30 2.31 2.32 2.33 2.34 2.35 2.36 2.37 2.38 2.39 2.40 2.41 2.42 2.43 2.44 2.45 2.46 2.47 2.48 2.49 2.50 2.51 2.52 2.53 2.54 2.55 2.56 2.57 2.58 2.59 2.60 2.61 2.62 2.63 2.64 2.65 2.66 2.67 2.68 2.69 2.70 2.71 2.72 2.73 2.74 2.75 2.76 2.77 2.78 2.79 2.80 2.81 2.82 2.83 2.84 2.85 2.86 2.87 2.88 2.89 2.90 2.91 2.92 2.93 2.94 2.95 2.96 2.97 2.98 2.99 3.00 3.01 3.02 3.03 3.04 3.05 3.06 3.07 3.08 3.09 3.10 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18 3.19 3.20 3.21 3.22 3.23 3.24 3.25 3.26 3.27 3.28 3.29 3.30 3.31 3.32 3.33 3.34 3.35 3.36 3.37 3.38 3.39 3.40 3.41 3.42 3.43 3.44 3.45 3.46 3.47 3.48 3.49 3.50 3.51 3.52 3.53 3.54 3.55 3.56 3.57 3.58 3.59 3.60 3.61 3.62 3.63 3.64 3.65 3.66 3.67 3.68 3.69 3.70 3.71 3.72 3.73 3.74 3.75 3.76 3.77 3.78 3.79 3.80 3.81 3.82 3.83 3.84 3.85 3.86 3.87 3.88 3.89 3.90 3.91 3.92 3.93 3.94 3.95 3.96 3.97 3.98 3.99 4.00 4.01 4.02 4.03 4.04 4.05 4.06 4.07 4.08 4.09 4.10 4.11 4.12 4.13 4.14 4.15 4.16 4.17 4.18 4.19 4.20 4.21 4.22 4.23 4.24 4.25 4.26 4.27 4.28 4.29 4.30 4.31 4.32 4.33 4.34 4.35 4.36 4.37 4.38 4.39 4.40 4.41 4.42 4.43 4.44 4.45 4.46 4.47 4.48 4.49 4.50 4.51 4.52 4.53 4.54 4.55 4.56 4.57 4.58 4.59 4.60 4.61 4.62 4.63 4.64 4.65 4.66 4.67 4.68 4.69 4.70 4.71 4.72 4.73 4.74 4.75 4.76 4.77 4.78 4.79 4.80 4.81 4.82 4.83 4.84 4.85 4.86 4.87 4.88 4.89 4.90 4.91 4.92 4.93 4.94 4.95 4.96 4.97 4.98 4.99 5.00 5.01 5.02 5.03 5.04 5.05 5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 5.15 5.16 5.17 5.18 5.19 5.20 5.21 5.22 5.23 5.24 5.25 5.26 5.27 5.28 5.29 5.30 5.31 5.32 5.33 5.34 5.35 5.36 5.37 5.38 5.39 5.40 5.41 5.42 5.43 5.44 5.45 5.46 5.47 5.48 5.49 5.50 5.51 5.52 5.53 5.54 5.55 5.56 5.57 5.58 5.59 5.60 5.61 5.62 5.63 5.64 5.65 5.66 5.67 5.68 5.69 5.70 5.71 5.72 5.73 5.74 5.75 5.76 5.77 5.78 5.79 5.80 5.81 5.82 5.83 5.84 5.85 5.86 5.87 5.88 5.89 5.90 5.91 5.92 5.93 5.94 5.95 5.96 5.97 5.98 5.99 6.00 6.01 6.02 6.03 6.04 6.05 6.06 6.07 6.08 6.09 6.10 6.11 6.12 6.13 6.14 6.15 6.16 6.17 6.18 6.19 6.20 6.21 6.22 6.23 6.24 6.25 6.26 6.27 6.28 6.29 6.30 6.31 6.32 6.33 6.34 6.35 6.36 6.37 6.38 6.39 6.40 6.41 6.42 6.43 6.44 6.45 6.46 6.47 6.48 6.49 6.50 6.51 6.52 6.53 6.54 6.55 6.56 6.57 6.58 6.59 6.60 6.61 6.62 6.63 6.64 6.65 6.66 6.67 6.68 6.69 6.70 6.71 6.72 6.73 6.74 6.75 6.76 6.77 6.78 6.79 6.80 6.81 6.82 6.83 6.84 6.85 6.86 6.87 6.88 6.89 6.90 6.91 6.92 6.93 6.94 6.95 6.96 6.97 6.98 6.99 7.00 7.01 7.02 7.03 7.04 7.05 7.06 7.07 7.08 7.09 7.10 7.11 7.12 7.13 7.14 7.15 7.16 7.17 7.18 7.19 7.20 7.21 7.22 7.23 7.24 7.25 7.26 7.27 7.28 7.29 7.30 7.31 7.32 7.33 7.34 7.35 7.36 7.37 7.38 7.39 7.40 7.41 7.42 7.43 7.44 7.45 7.46 7.47 7.48 7.49 7.50 7.51 7.52 7.53 7.54 7.55 7.56 7.57 7.58 7.59 7.60 7.61 7.62 7.63 7.64 7.65 7.66 7.67 7.68 7.69 7.70 7.71 7.72 7.73 7.74 7.75 7.76 7.77 7.78 7.79 7.80 7.81 7.82 7.83 7.84 7.85 7.86 7.87 7.88 7.89 7.90 7.91 7.92 7.93 7.94 7.95 7.96 7.97 7.98 7.99 8.00 8.01 8.02 8.03 8.04 8.05 8.06 8.07 8.08 8.09 8.10 8.11 8.12 8.13 8.14 8.15 8.16 8.17 8.18 8.19 8.20 8.21 8.22 8.23 8.24 8.25 8.26 8.27 8.28 8.29 8.30 8.31 8.32 8.33 8.34 8.35 8.36 8.37 8.38 8.39 8.40 8.41 8.42 8.43 8.44 8.45 8.46 8.47 8.48 8.49 8.50 8.51 8.52 8.53 8.54 8.55 8.56 8.57 8.58 8.59 8.60 8.61 8.62 8.63 8.64 8.65 8.66 8.67 8.68 8.69 8.70 8.71 8.72 8.73 8.74 8.75 8.76 8.77 8.78 8.79 8.80 8.81 8.82 8.83 8.84 8.85 8.86 8.87 8.88 8.89 8.90 8.91 8.92 8.93 8.94 8.95 8.96 8.97 8.98 8.99 9.00 9.01 9.02 9.03 9.04 9.05 9.06 9.07 9.08 9.09 9.10 9.11 9.12 9.13 9.14 9.15 9.16 9.17 9.18 9.19 9.20 9.21 9.22 9.23 9.24 9.25 9.26 9.27 9.28 9.29 9.30 9.31 9.32 9.33 9.34 9.35 9.36 9.37 9.38 9.39 9.40 9.41 9.42 9.43 9.44 9.45 9.46 9.47 9.48 9.49 9.50 9.51 9.52 9.53 9.54 9.55 9.56 9.57 9.58 9.59 9.60 9.61 9.62 9.63 9.64 9.65 9.66 9.67 9.68 9.69 9.70 9.71 9.72 9.73 9.74 9.75 9.76 9.77 9.78 9.79 9.80 9.81 9.82 9.83 9.84 9.85 9.86 9.87 9.88 9.89 9.90 9.9	
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B<sup>1</sup> : m B<sup>2</sup>

T.D.C.	A	B	C	D	E
0°	.368	.664	.578	-	-
45°	.366	.664	.566	-	-
90°	.439	.639	.641	-	-
135°	.467	.639	.613	-	-
180°	.379	.633	.567	-	-
225°	.387	.618	.553	-	-
270°	.344	.651	.574	-	-
315°	.344	.647	.625	-	-

ALL readings start at T.D.C.  
and go clockwise with Flow.



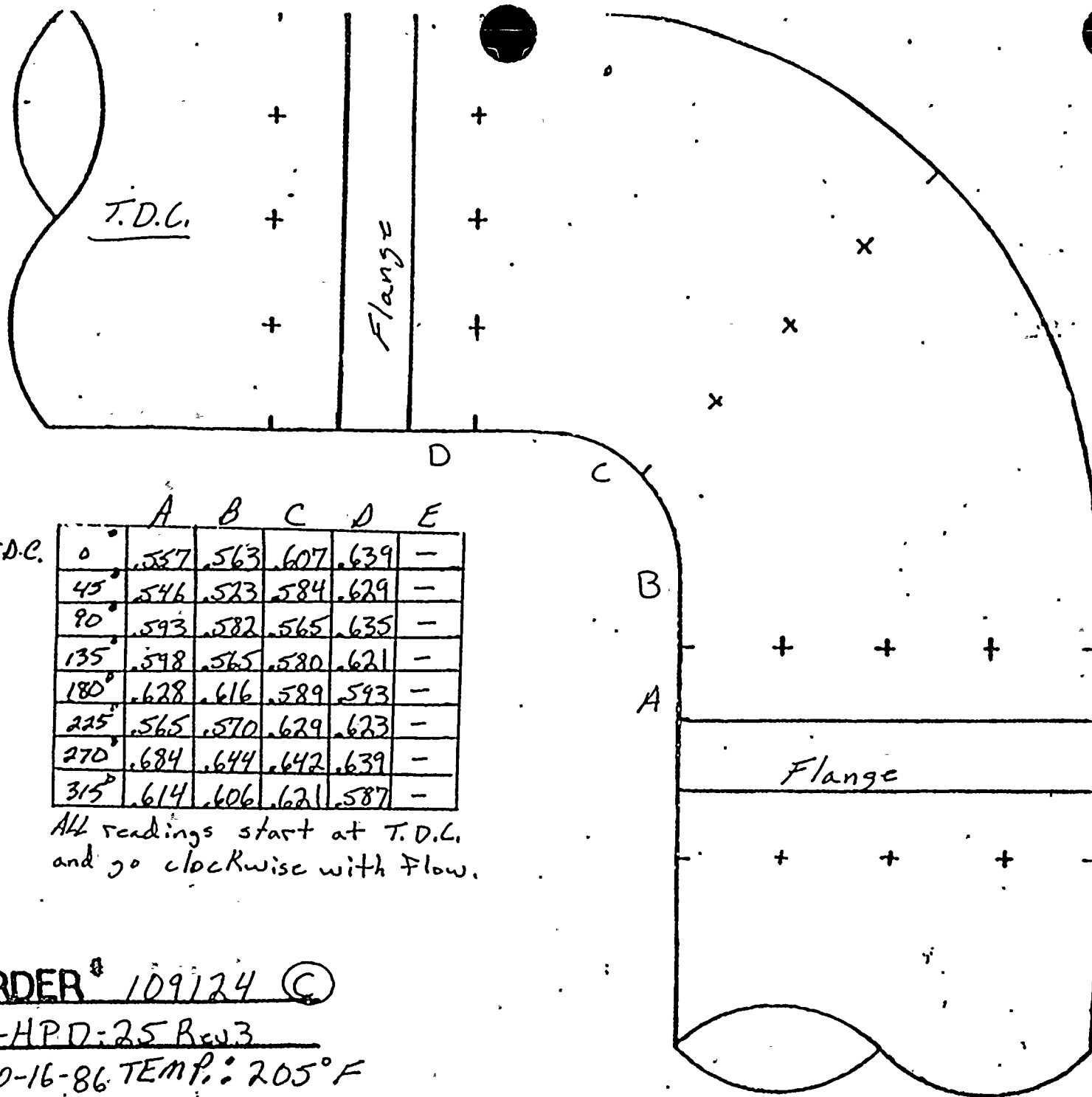
JOB ORDER# 109124 (B)

ISC# 2-HPD-25 Rev 3

Date: 10-16-86 Temp: 200°F



← FLOW



T.D.C.	A	B	C	D	E
0°	.557	.563	.607	.639	-
45°	.546	.523	.584	.629	-
90°	.593	.582	.565	.635	-
135°	.598	.565	.580	.621	-
180°	.628	.616	.589	.593	-
225°	.565	.570	.629	.623	-
270°	.684	.644	.642	.639	-
315°	.614	.606	.621	.587	-

All readings start at T.D.C.  
and go clockwise with Flow.

JOB ORDER # 109124 (C)

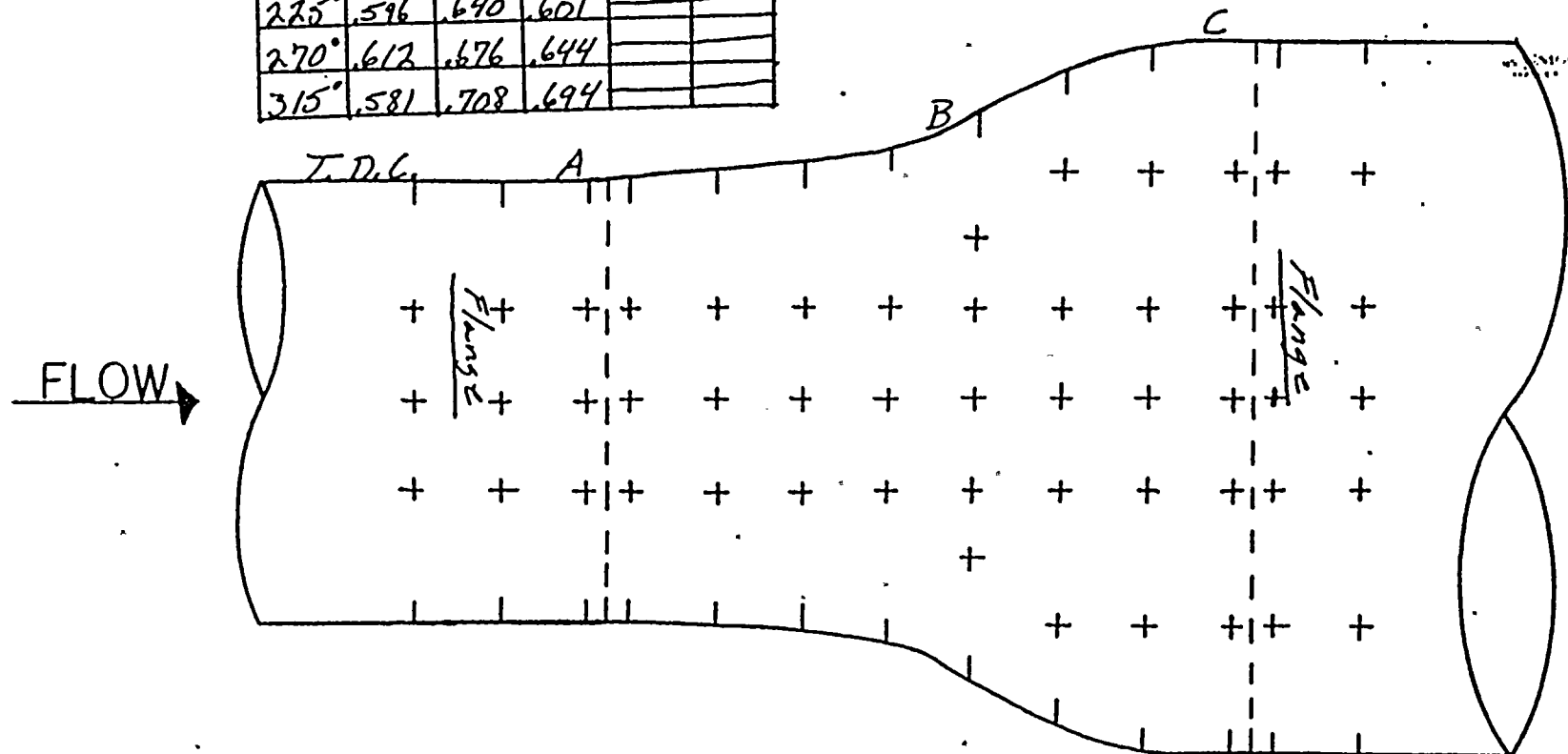
ISO # 2-HPD-25 Rev 3

DATE: 10-16-86 TEMP.: 205°F



	A	B	C	D	E
T.D.C.	0°	.458	.684	.596	
	45°	.569	.717	.625	
	90°	.563	.719	.644	
	135°	.605	.563	.663	
	180°	.545	.623	.581	
	225°	.596	.640	.601	
	270°	.612	.676	.644	
	315°	.581	.708	.694	

All readings start at T.D.C.  
and go clockwise with flow.



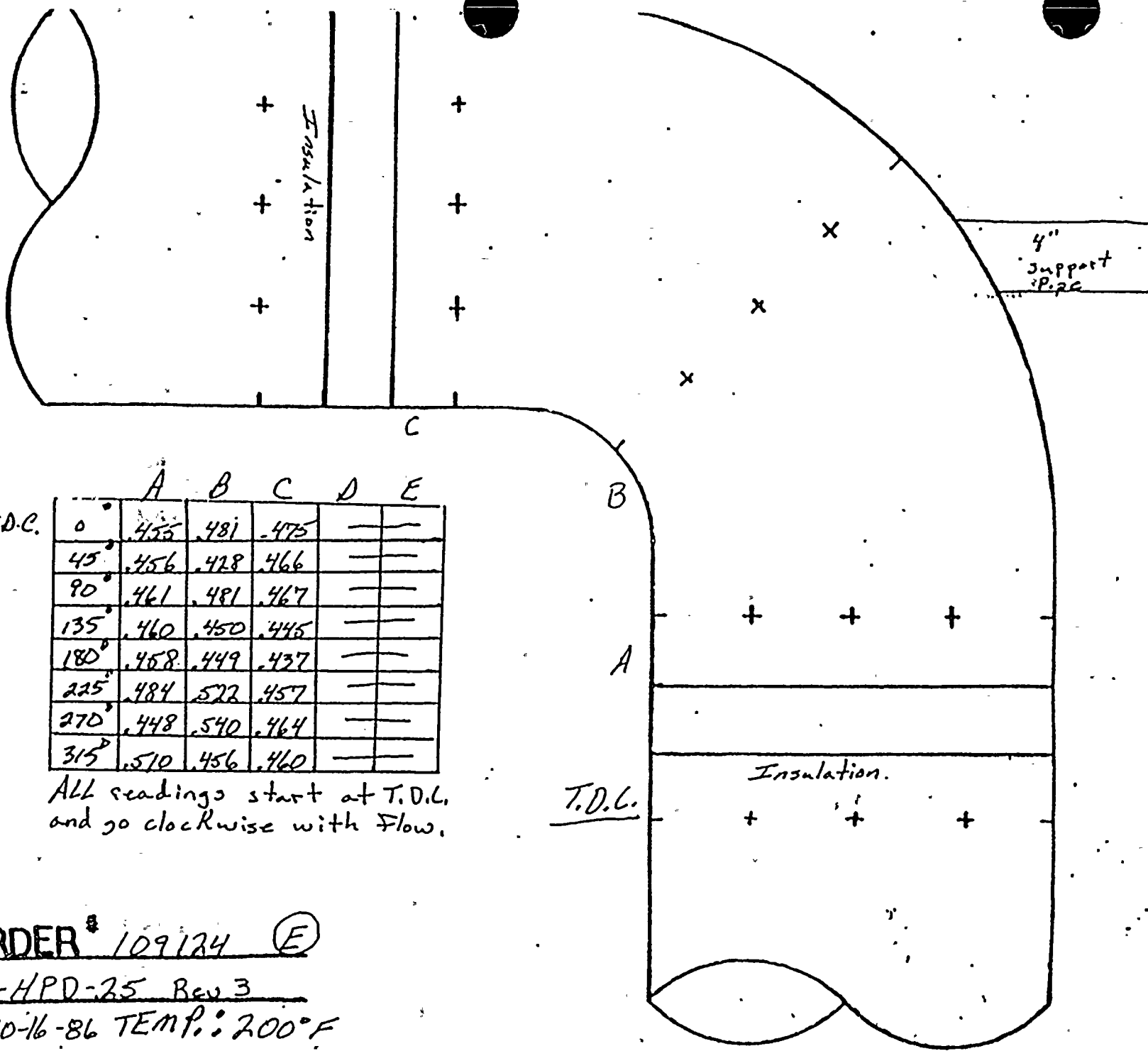
JOB ORDER# 109124 (D)

ISO# 2-HPD-25 Rev 3

Date: 10-16-86 Temp: 200° F



← FLOW



	A	B	C	D	E
T.D.C. 0°	.455	.481	.475	—	—
45°	.456	.428	.466	—	—
90°	.461	.481	.467	—	—
135°	.460	.450	.445	—	—
180°	.458	.449	.437	—	—
225°	.484	.522	.457	—	—
270°	.448	.540	.464	—	—
315°	.510	.456	.460	—	—

ALL readings start at T.D.C.  
and go clockwise with Flow.

T.D.C.

JOB ORDER # 109124 (E)

ISO # 2-HPD-25 Rev 3

DATE: 10-16-86 TEMP.: 200°F



## EROSION EVALUATION WORKSHEET

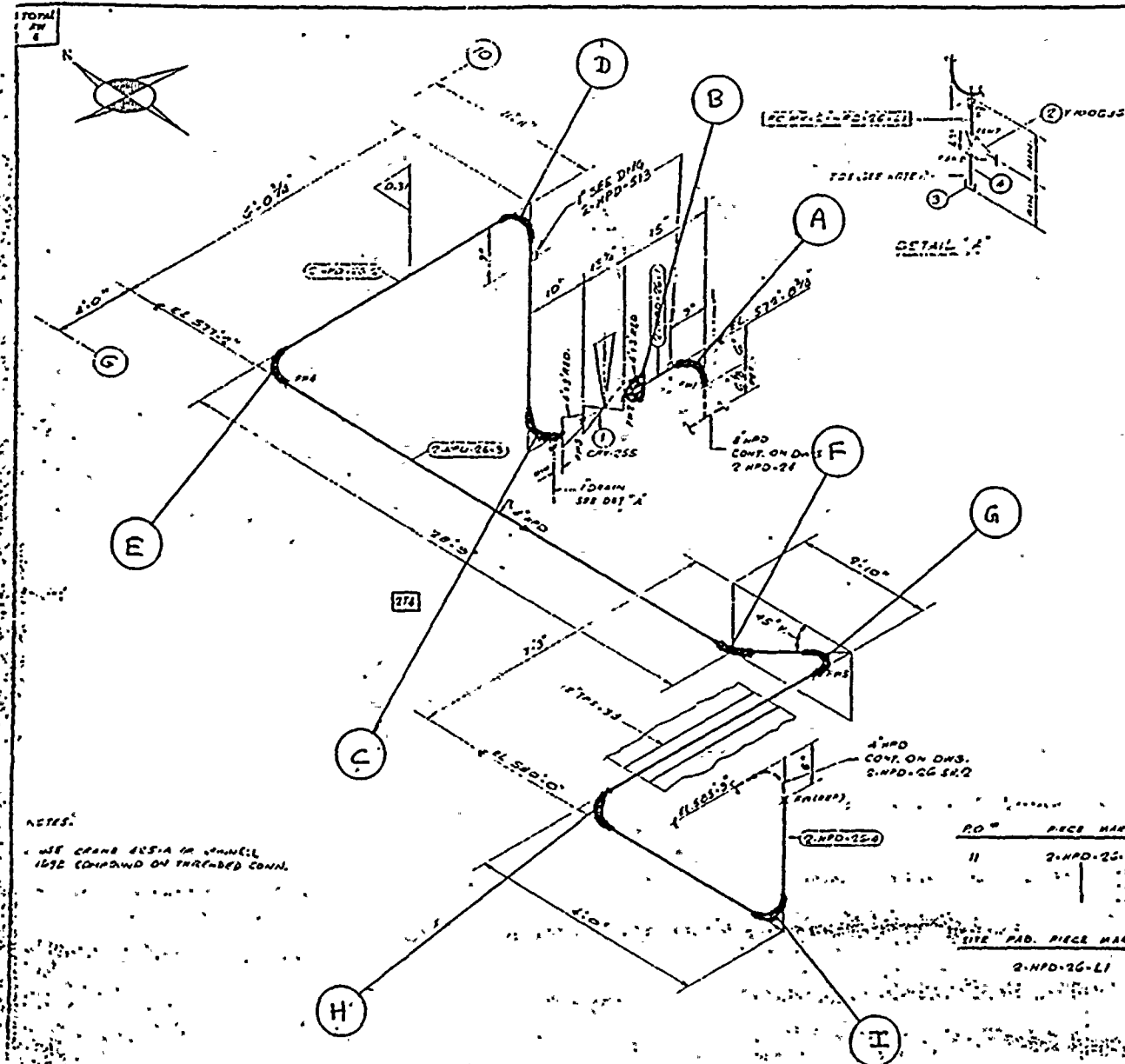
AEPSIC Installed Mat'l Class CS: A-106 GR-B SCH. 40

[illegible]



WEEK # 8  
11-18-86

QC - J.O.# 109, 110  
CONST - J.O.# 109122, 109123



ITEM				MATERIAL DESCRIPTION		QUANTITY	UNIT	PRICE	TOTAL
01	1	3"	REGULATING VALVE	1	CRV-255				
	2	1"	800°C S.S. GATE VALVE	1	11003, 1				
	3	1"	3000°C S.S. FWD CAP	1	11003, 1				
	4	1"	PIPE (SCH 80) S.S. CL	1	11003, 1				
	5	2"	3200°C S.S. S.S. CL	2	11003, 1				

REVISION RECORD		
NO	DATE	DESCRIPTION
1	97	REMOVED BY ACP ADDED ITEM'S TO B/M.F.R. SUMMARY LWS ALPAC ARMYT. Bmg'S. 2-5110 2-5112. LA

INSPECT: "C" { "G" 22 MAY 86  
"H" 14 JUL 86 RST

COPIES OF  
DOCUMENT  
JAN 13 1968

1967-1968

NEWS.

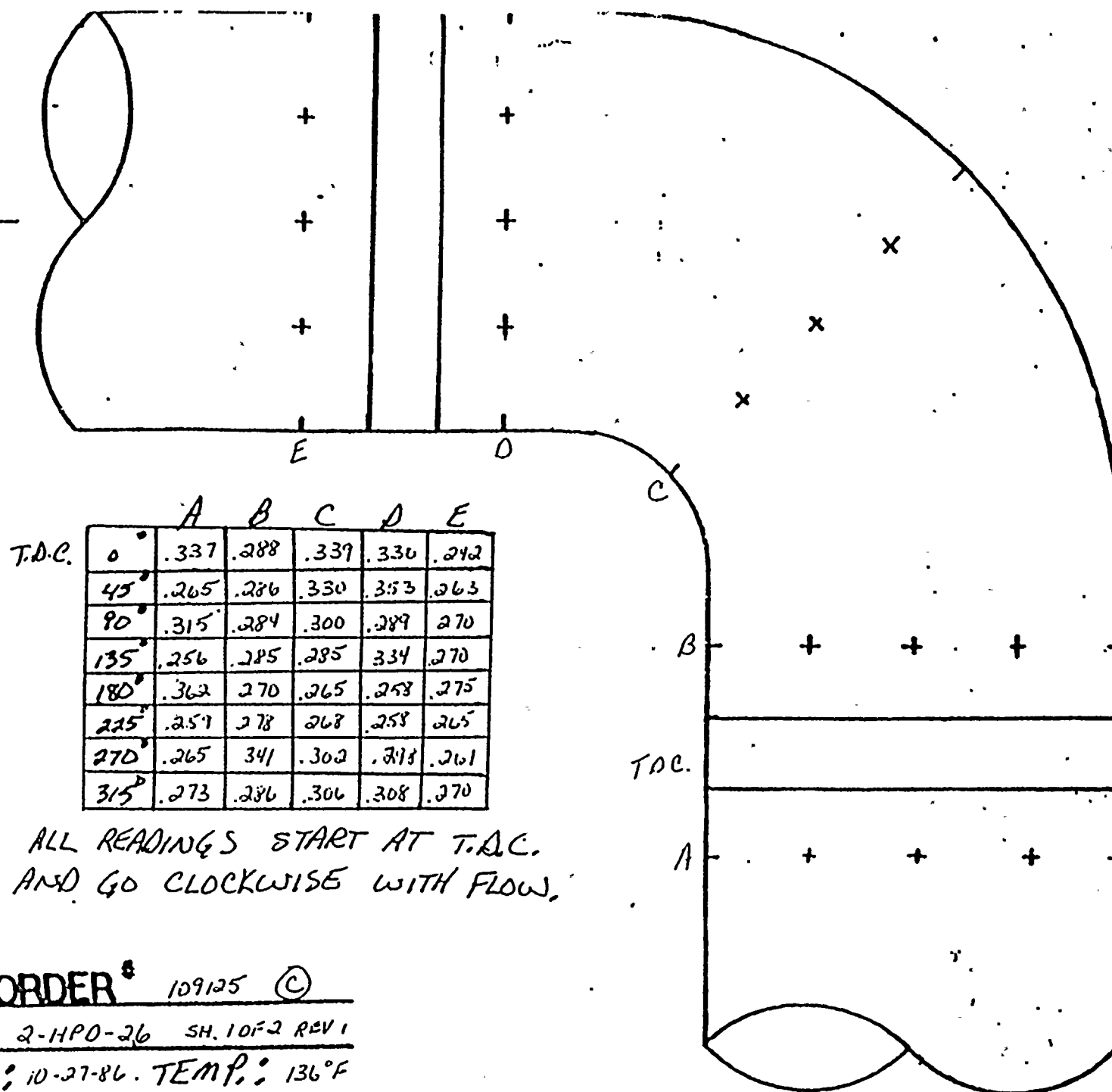
WE CANE 425-A IN JUNE 1972 COMPARED ON THREE-DEP CONN.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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DESIGN NO. <b>DCP-M108-066</b> MATERIAL & SUPPLY CLASS <b>1018</b> 1018 STEEL SHOTS OR STEEL MATERIAL CLASS <b>D-37 JMC 108</b>		A-1 1/2" nominal depth A-2 1/4" nominal depth A-3 1/8" nominal depth A-4 1/16" nominal depth A-5 1/32" nominal depth A-6 1/64" nominal depth A-7 1/128" nominal depth A-8 1/256" nominal depth A-9 1/512" nominal depth A-10 1/1024" nominal depth A-11 1/2048" nominal depth A-12 1/4096" nominal depth A-13 1/8192" nominal depth A-14 1/16384" nominal depth A-15 1/32768" nominal depth A-16 1/65536" nominal depth A-17 1/131072" nominal depth A-18 1/262144" nominal depth A-19 1/524288" nominal depth A-20 1/1048576" nominal depth A-21 1/2097152" nominal depth A-22 1/4194304" nominal depth A-23 1/8388608" nominal depth A-24 1/16777216" nominal depth A-25 1/33554432" nominal depth A-26 1/67108864" nominal depth A-27 1/134217728" nominal depth A-28 1/268435456" nominal depth A-29 1/536870912" nominal depth A-30 1/1073741824" nominal depth A-31 1/2147483648" nominal depth A-32 1/4294967296" nominal depth A-33 1/8589934592" nominal depth A-34 1/17179869184" nominal depth A-35 1/34359738368" nominal depth A-36 1/68719476736" nominal depth A-37 1/137438953472" nominal depth A-38 1/274877907344" nominal depth A-39 1/549755814688" nominal depth A-40 1/1099511629376" nominal depth A-41 1/2199023258752" nominal depth A-42 1/4398046517504" nominal depth A-43 1/8796093035008" nominal depth A-44 1/17592186070016" nominal depth A-45 1/35184372140032" nominal depth A-46 1/70368744280064" nominal depth A-47 1/140737488560128" nominal depth A-48 1/281474977120256" nominal depth A-49 1/562949954240512" nominal depth A-50 1/1125899908481024" nominal depth A-51 1/2251799816962048" nominal depth A-52 1/4503599633924096" nominal depth A-53 1/9007199267848192" nominal depth A-54 1/18014398535696384" nominal depth A-55 1/36028797071392768" nominal depth A-56 1/72057594142785536" nominal depth A-57 1/144115188285571072" nominal depth A-58 1/288230376571142144" nominal depth A-59 1/576460753142284288" nominal depth A-60 1/1152921506284568576" nominal depth A-61 1/2305843012569137152" nominal depth A-62 1/4611686025138274304" nominal depth A-63 1/9223372050276548608" nominal depth A-64 1/18446744100553097216" nominal depth A-65 1/36893488201106194432" nominal depth A-66 1/73786976402212388864" nominal depth A-67 1/14757395280442477728" nominal depth A-68 1/29514790560884955456" nominal depth A-69 1/59029581121769910912" nominal depth A-70 1/118059162243539821824" nominal depth A-71 1/236118324487079643648" nominal depth A-72 1/472236648974159287296" nominal depth A-73 1/944473297948318574592" nominal depth A-74 1/1888946595896637149184" nominal depth A-75 1/3777893191793274298368" nominal depth A-76 1/7555786383586548596736" nominal depth A-77 1/15111572767173097193472" nominal depth A-78 1/30223145534346194386944" nominal depth A-79 1/60446291068692388773888" nominal depth A-80 1/120892582137384777547776" nominal depth A-81 1/241785164274769555095552" nominal depth A-82 1/483570328549539110191104" nominal depth A-83 1/967140657099078220382208" nominal depth A-84 1/1934281314198156440764416" nominal depth A-85 1/3868562628396312881528832" nominal depth A-86 1/7737125256792625763057664" nominal depth A-87 1/15474250513585251526115328" nominal depth A-88 1/30948501027170503052230656" nominal depth A-89 1/61897002054341006104461312" nominal depth A-90 1/123794004108682012208922624" nominal depth A-91 1/247588008217364024417845248" nominal depth A-92 1/495176016434728048835690496" nominal depth A-93 1/990352032869456097671380992" nominal depth A-94 1/1980704065738912195342761984" nominal depth A-95 1/3961408131477824390685523968" nominal depth A-96 1/7922816262955648781371047936" nominal depth A-97 1/15845632525911297562742095872" nominal depth A-98 1/31691265051822595125484191744" nominal depth A-99 1/63382530103645190250968383488" nominal depth A-100 1/126765060207290380501936766976" nominal depth A-101 1/253530120414580761003873533952" nominal depth A-102 1/507060240829161522007747067904" nominal depth A-103 1/1014120481658323044015494135808" nominal depth A-104 1/2028240963316646088030988271616" nominal depth A-105 1/4056481926633292176061976543232" nominal depth A-106 1/8112963853266584352123953086464" nominal depth A-107 1/16225927706533168704247906172928" nominal depth A-108 1/32451855413066337408495812345856" nominal depth A-109 1/64903710826132674816991624691712" nominal depth A-110 1/129807421652265349633983249383424" nominal depth A-111 1/259614843304530699267966498766848" nominal depth A-112 1/519229686609061398535932997533696" nominal depth A-113 1/1038459373218122797071865995067392" nominal depth A-114 1/2076918746436245594143731990134784" nominal depth A-115 1/4153837492872491188287463980269568" nominal depth A-116 1/8307674985744982376574927960539136" nominal depth A-117 1/16615349971489964753149855121078272" nominal depth A-118 1/33230699942979929506299710242156544" nominal depth A-119 1/66461399885959859012599420484313088" nominal depth A-120 1/132922799771919718025198840968626176" nominal depth A-121 1/265845599543839436050397681932522352" nominal depth A-122 1/531691199087678872100	
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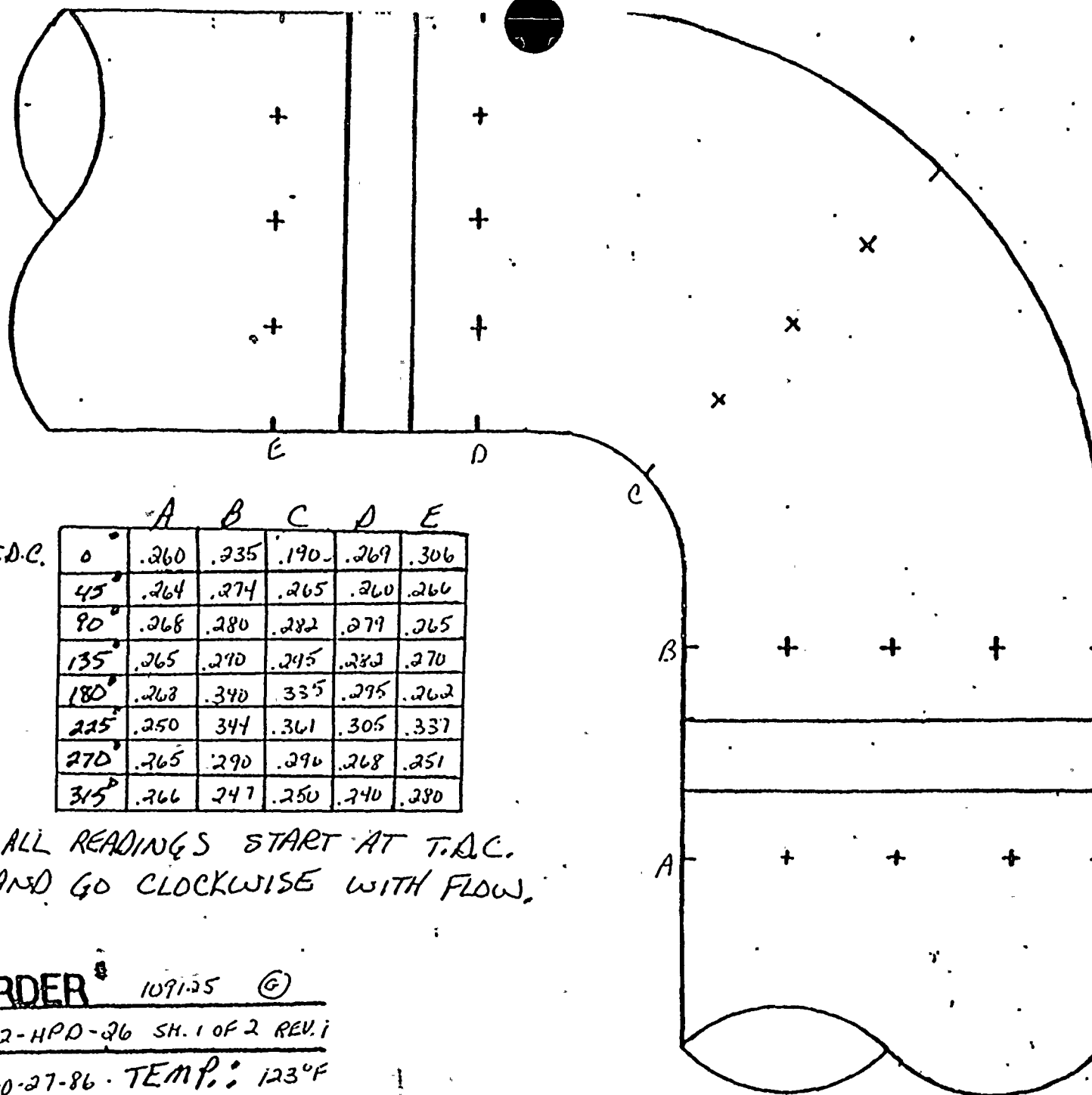
← FLOW



JOE ORDER # 109125 (C)  
ISO # 2-HPD-26 SH. 10F2 REV 1  
DATE: 10-27-86. TEMP.: 136°F



← FLOW



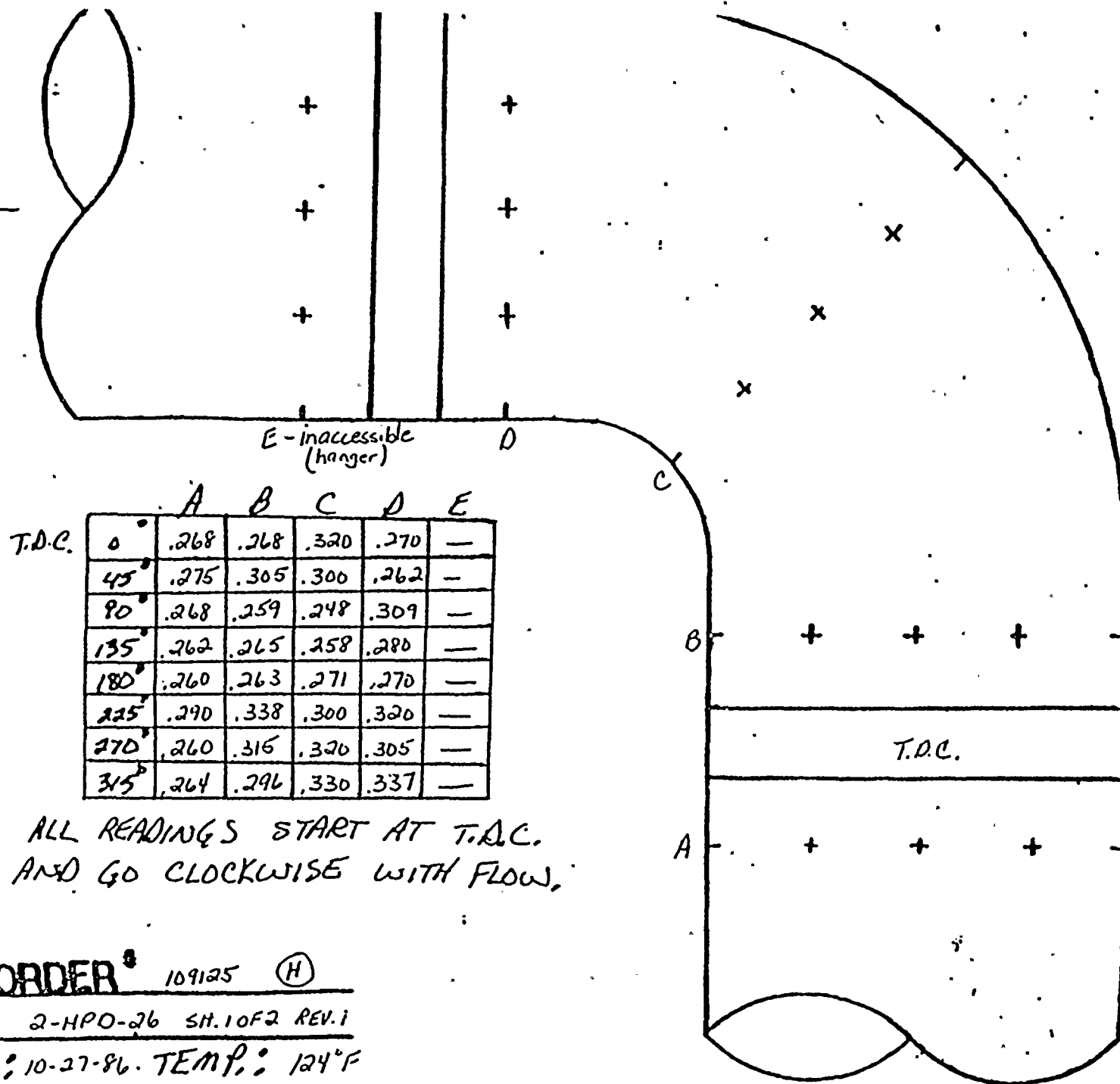
	A	B	C	D	E	
T.D.C.	0°	.260	.235	.190	.269	.306
	45°	.264	.274	.265	.260	.266
	90°	.268	.280	.282	.279	.265
	135°	.265	.290	.295	.282	.270
	180°	.268	.340	.335	.295	.262
	225°	.250	.344	.361	.305	.337
	270°	.265	.290	.296	.268	.251
	315°	.266	.247	.250	.240	.280

ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

JOE ORDER 1071-25 (G)  
ISO 2-HPD-26 SH. 1 OF 2 REV. 1  
DATE: 10-27-86 TEMP.: 123°F



← FLOW



JOE ORDER # 109125 (H)

ISO # 2-MPO-26 SH.10F2 REV.1

DATE: 10-27-86. TEMP.: 124°F



D. C. COOK      PEAR PLANT  
EROSION EVALUATION WORKSHEET

NEPSC Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam)

Unit No. 2

Evaluation Date: JANUARY 16, 1986

SER No. 23-85 (Water) X

Years in service 9

UT Reading Transmitted on: 11-18-86

UT Reading Taken on: 10-27-86

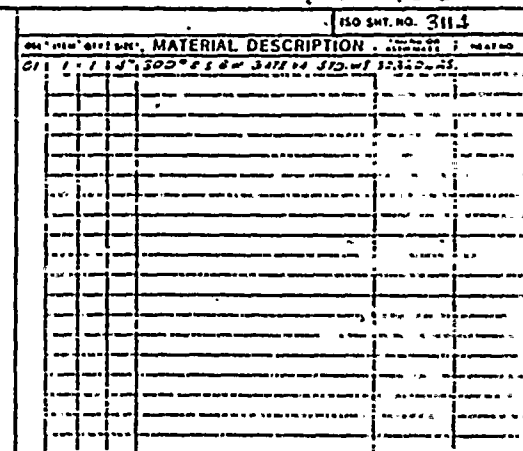
Isometric Dwg. NO. 2-HPD-26 REV 0 Sh. 2 of 2

AEPSIC Installed Mat'l Class *CS: A-106 SCH. 40*

[illegible]



QC - J.O.# 109125  
CONST - J.O.# 109123 } 109122



NO		DATE	DESCRIPTION
			<u>INSPECT:</u> B & E ANT 22 MAY 86 F ANT 14 JUL 86

REC'D. CIVIL RIGHTS DIV.  
U.S. DEPT. OF JUSTICE  
JAN 11 1968  
FBI - NEW YORK  
FBI - NEW YORK

2-HPD-26  
SH 20F2

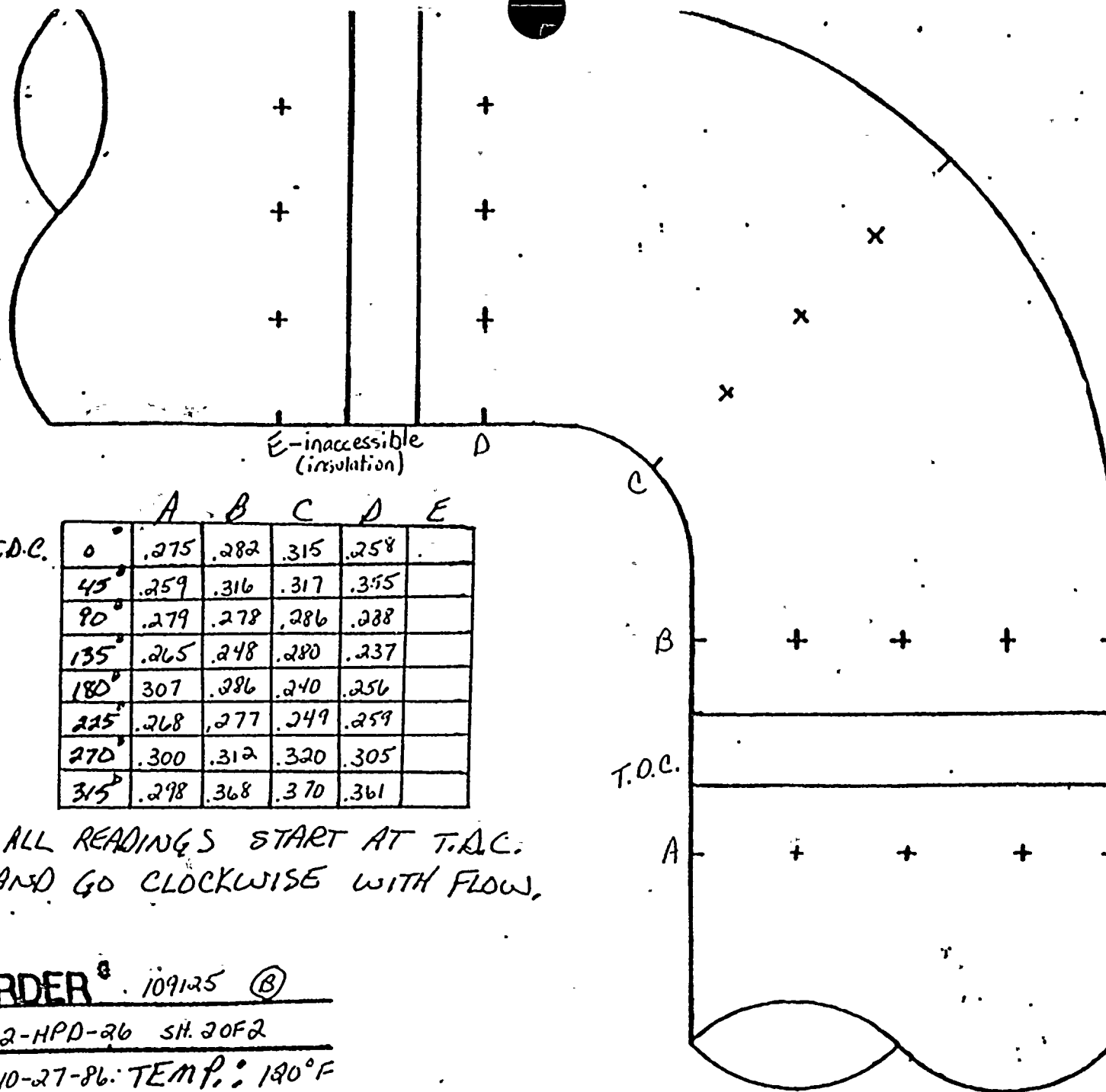
DATE	JAN.	PM
4	63	5

1. <u>DISPATCH UNIT</u> <u>025 PM 102 DES</u> 2. <u>TO</u> <u>025 PM 102 DES</u> 3. <u>FROM</u> <u>025 PM 102 DES</u> 4. <u>REMARKS</u> <u>N/A</u> 5. <u>DATE</u> <u>025 PM 102 DES</u> 6. <u>TIME</u> <u>025 PM 102 DES</u> 7. <u>LOCATION</u> <u>025 PM 102 DES</u> 8. <u>UNIT</u> <u>025 PM 102 DES</u> 9. <u>STATUS</u> <u>025 PM 102 DES</u> 10. <u>REMARKS</u> <u>N/A</u> 11. <u>DATE</u> <u>025 PM 102 DES</u> 12. <u>TIME</u> <u>025 PM 102 DES</u> 13. <u>LOCATION</u> <u>025 PM 102 DES</u> 14. <u>UNIT</u> <u>025 PM 102 DES</u> 15. <u>STATUS</u> <u>025 PM 102 DES</u> 16. <u>REMARKS</u> <u>N/A</u> 17. <u>DATE</u> <u>025 PM 102 DES</u> 18. <u>TIME</u> <u>025 PM 102 DES</u> 19. <u>LOCATION</u> <u>025 PM 102 DES</u> 20. <u>UNIT</u> <u>025 PM 102 DES</u> 21. <u>STATUS</u> <u>025 PM 102 DES</u> 22. <u>REMARKS</u> <u>N/A</u> 23. <u>DATE</u> <u>025 PM 102 DES</u> 24. <u>TIME</u> <u>025 PM 102 DES</u> 25. <u>LOCATION</u> <u>025 PM 102 DES</u> 26. <u>UNIT</u> <u>025 PM 102 DES</u> 27. <u>STATUS</u> <u>025 PM 102 DES</u> 28. <u>REMARKS</u> <u>N/A</u> 29. <u>DATE</u> <u>025 PM 102 DES</u> 30. <u>TIME</u> <u>025 PM 102 DES</u> 31. <u>LOCATION</u> <u>025 PM 102 DES</u> 32. <u>UNIT</u> <u>025 PM 102 DES</u> 33. <u>STATUS</u> <u>025 PM 102 DES</u> 34. <u>REMARKS</u> <u>N/A</u> 35. <u>DATE</u> <u>025 PM 102 DES</u> 36. <u>TIME</u> <u>025 PM 102 DES</u> 37. <u>LOCATION</u> <u>025 PM 102 DES</u> 38. <u>UNIT</u> <u>025 PM 102 DES</u> 39. <u>STATUS</u> <u>025 PM 102 DES</u> 40. <u>REMARKS</u> <u>N/A</u> 41. <u>DATE</u> <u>025 PM 102 DES</u> 42. <u>TIME</u> <u>025 PM 102 DES</u> 43. <u>LOCATION</u> <u>025 PM 102 DES</u> 44. <u>UNIT</u> <u>025 PM 102 DES</u> 45. <u>STATUS</u> <u>025 PM 102 DES</u> 46. <u>REMARKS</u> <u>N/A</u> 47. <u>DATE</u> <u>025 PM 102 DES</u> 48. <u>TIME</u> <u>025 PM 102 DES</u> 49. <u>LOCATION</u> <u>025 PM 102 DES</u> 50. <u>UNIT</u> <u>025 PM 102 DES</u> 51. <u>STATUS</u> <u>025 PM 102 DES</u> 52. <u>REMARKS</u> <u>N/A</u> 53. <u>DATE</u> <u>025 PM 102 DES</u> 54. <u>TIME</u> <u>025 PM 102 DES</u> 55. <u>LOCATION</u> <u>025 PM 102 DES</u> 56. <u>UNIT</u> <u>025 PM 102 DES</u> 57. <u>STATUS</u> <u>025 PM 102 DES</u> 58. <u>REMARKS</u> <u>N/A</u> 59. <u>DATE</u> <u>025 PM 102 DES</u> 60. <u>TIME</u> <u>025 PM 102 DES</u> 61. <u>LOCATION</u> <u>025 PM 102 DES</u> 62. <u>UNIT</u> <u>025 PM 102 DES</u> 63. <u>STATUS</u> <u>025 PM 102 DES</u> 64. <u>REMARKS</u> <u>N/A</u> 65. <u>DATE</u> <u>025 PM 102 DES</u> 66. <u>TIME</u> <u>025 PM 102 DES</u> 67. <u>LOCATION</u> <u>025 PM 102 DES</u> 68. <u>UNIT</u> <u>025 PM 102 DES</u> 69. <u>STATUS</u> <u>025 PM 102 DES</u> 70. <u>REMARKS</u> <u>N/A</u> 71. <u>DATE</u> <u>025 PM 102 DES</u> 72. <u>TIME</u> <u>025 PM 102 DES</u> 73. <u>LOCATION</u> <u>025 PM 102 DES</u> 74. <u>UNIT</u> <u>025 PM 102 DES</u> 75. <u>STATUS</u> <u>025 PM 102 DES</u> 76. <u>REMARKS</u> <u>N/A</u> 77. <u>DATE</u> <u>025 PM 102 DES</u> 78. <u>TIME</u> <u>025 PM 102 DES</u> 79. <u>LOCATION</u> <u>025 PM 102 DES</u> 80. <u>UNIT</u> <u>025 PM 102 DES</u> 81. <u>STATUS</u> <u>025 PM 102 DES</u> 82. <u>REMARKS</u> <u>N/A</u> 83. <u>DATE</u> <u>025 PM 102 DES</u> 84. <u>TIME</u> <u>025 PM 102 DES</u> 85. <u>LOCATION</u> <u>025 PM 102 DES</u> 86. <u>UNIT</u> <u>025 PM 102 DES</u> 87. <u>STATUS</u> <u>025 PM 102 DES</u> 88. <u>REMARKS</u> <u>N/A</u> 89. <u>DATE</u> <u>025 PM 102 DES</u> 90. <u>TIME</u> <u>025 PM 102 DES</u> 91. <u>LOCATION</u> <u>025 PM 102 DES</u> 92. <u>UNIT</u> <u>025 PM 102 DES</u> 93. <u>STATUS</u> <u>025 PM 102 DES</u> 94. <u>REMARKS</u> <u>N/A</u> 95. <u>DATE</u> <u>025 PM 102 DES</u> 96. <u>TIME</u> <u>025 PM 102 DES</u> 97. <u>LOCATION</u> <u>025 PM 102 DES</u> 98. <u>UNIT</u> <u>025 PM 102 DES</u> 99. <u>STATUS</u> <u>025 PM 102 DES</u> 100. <u>REMARKS</u> <u>N/A</u> 101. <u>DATE</u> <u>025 PM 102 DES</u> 102. <u>TIME</u> <u>025 PM 102 DES</u> 103. <u>LOCATION</u> <u>025 PM 102 DES</u> 104. <u>UNIT</u> <u>025 PM 102 DES</u> 105. <u>STATUS</u> <u>025 PM 102 DES</u> 106. <u>REMARKS</u> <u>N/A</u> 107. <u>DATE</u> <u>025 PM 102 DES</u> 108. <u>TIME</u> <u>025 PM 102 DES</u> 109. <u>LOCATION</u> <u>025 PM 102 DES</u> 110. <u>UNIT</u> <u>025 PM 102 DES</u> 111. <u>STATUS</u> <u>025 PM 102 DES</u> 112. <u>REMARKS</u> <u>N/A</u> 113. <u>DATE</u> <u>025 PM 102 DES</u> 114. <u>TIME</u> <u>025 PM 102 DES</u> 115. <u>LOCATION</u> <u>025 PM 102 DES</u> 116. <u>UNIT</u> <u>025 PM 102 DES</u> 117. <u>STATUS</u> <u>025 PM 102 DES</u> 118. <u>REMARKS</u> <u>N/A</u> 119. <u>DATE</u> <u>025 PM 102 DES</u> 120. <u>TIME</u> <u>025 PM 102 DES</u> 121. <u>LOCATION</u> <u>025 PM 102 DES</u> 122. <u>UNIT</u> <u>025 PM 102 DES</u> 123. <u>STATUS</u> <u>025 PM 102 DES</u> 124. <u>REMARKS</u> <u>N/A</u> 125. <u>DATE</u> <u>025 PM 102 DES</u> 126. <u>TIME</u> <u>025 PM 102 DES</u> 127. <u>LOCATION</u> <u>025 PM 102 DES</u> 128. <u>UNIT</u> <u>025 PM 102 DES</u> 129. <u>STATUS</u> <u>025 PM 102 DES</u> 130. <u>REMARKS</u> <u>N/A</u> 131. <u>DATE</u> <u>025 PM 102 DES</u> 132. <u>TIME</u> <u>025 PM 102 DES</u> 133. <u>LOCATION</u> <u>025 PM 102 DES</u> 134. <u>UNIT</u> <u>025 PM 102 DES</u> 135. <u>STATUS</u> <u>025 PM 102 DES</u> 136. <u>REMARKS</u> <u>N/A</u> 137. <u>DATE</u> <u>025 PM 102 DES</u> 138. <u>TIME</u> <u>025 PM 102 DES</u> 139. <u>LOCATION</u> <u>025 PM 102 DES</u> 140. <u>UNIT</u> <u></u>	
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FOUR-TONE NO. <u>212-213</u>	FLOW DIAGRAM NO. <u>212-213</u>
REQUIRED COMPLETION DATE	QSL NO. <u>212</u>
FABRICATED BY: <u>246CO</u>	WELD PROCEDURE
NPS DESIGNS INC. NEW YORK, N.Y.	IMSY & CO.
	PHOENIX & MACH CO DONALD C. CO
FABRICATOR NOTE: FABRICATION MUST CONFORM TO 14 CFR 45	DATE <u>2.2</u> AUTH BY <u>212</u>
	COO <u>212</u> DATE <u>2.2</u> DATE <u>212</u>



← FLOW



	A	B	C	D	E
T.D.C.	0°	.275	.282	.315	.258
	45°	.259	.316	.317	.355
	90°	.279	.278	.286	.288
	135°	.265	.248	.280	.237
	180°	.307	.286	.240	.256
	225°	.268	.277	.249	.259
	270°	.300	.312	.320	.305
	315°	.298	.368	.370	.361

ALL READINGS START AT T.O.C.  
AND GO CLOCKWISE WITH FLOW.

JOB ORDER 109125 (B)  
ISO 2-HPD-26 SH. 20F2  
 DATE: 10-27-86 TEMP.: 190°F

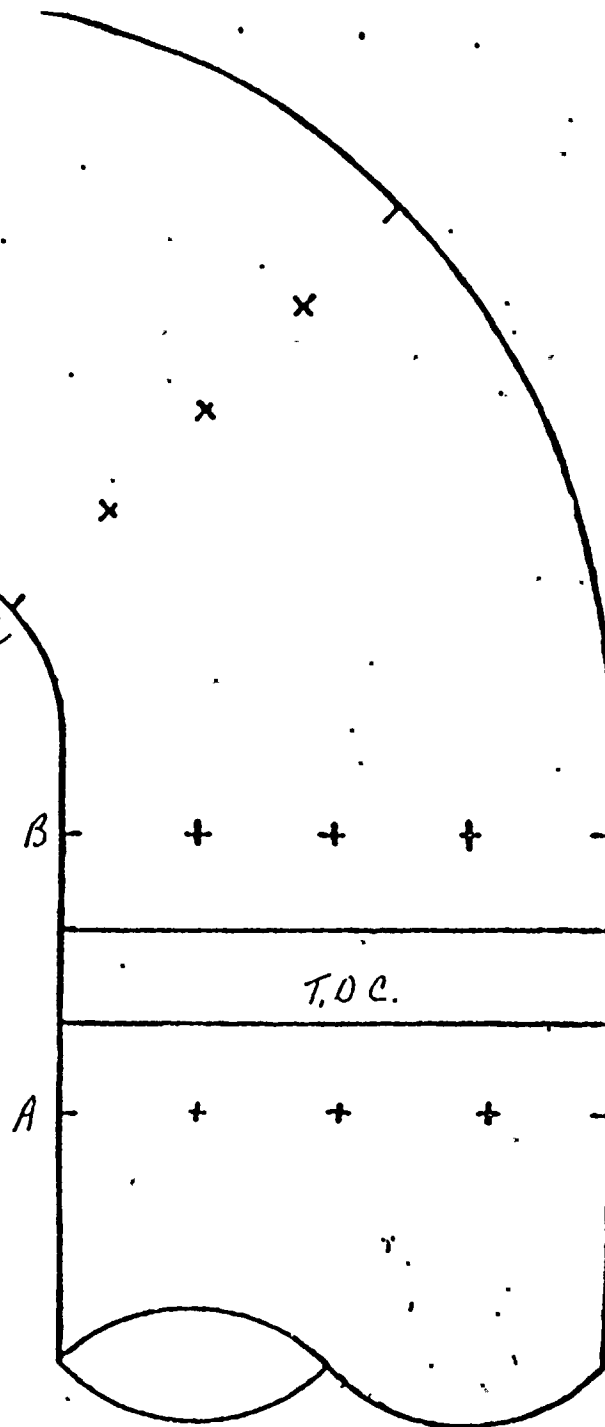


← FLOW

T.D.C.		A	B	C	D	E
0°		.280	.289	.288	.269	.318
45°		.252	.272	.246	.223	.240
90°		.243	.252	.252	.283	.295
135°		.265	.279	.268	.238	.239
180°		.272	.293	.330	.302	.252
225°		.282	.287	.290	.274	.269
270°		.245	.273	.284	.297	.275
315°		.265	.283	.303	.297	.300

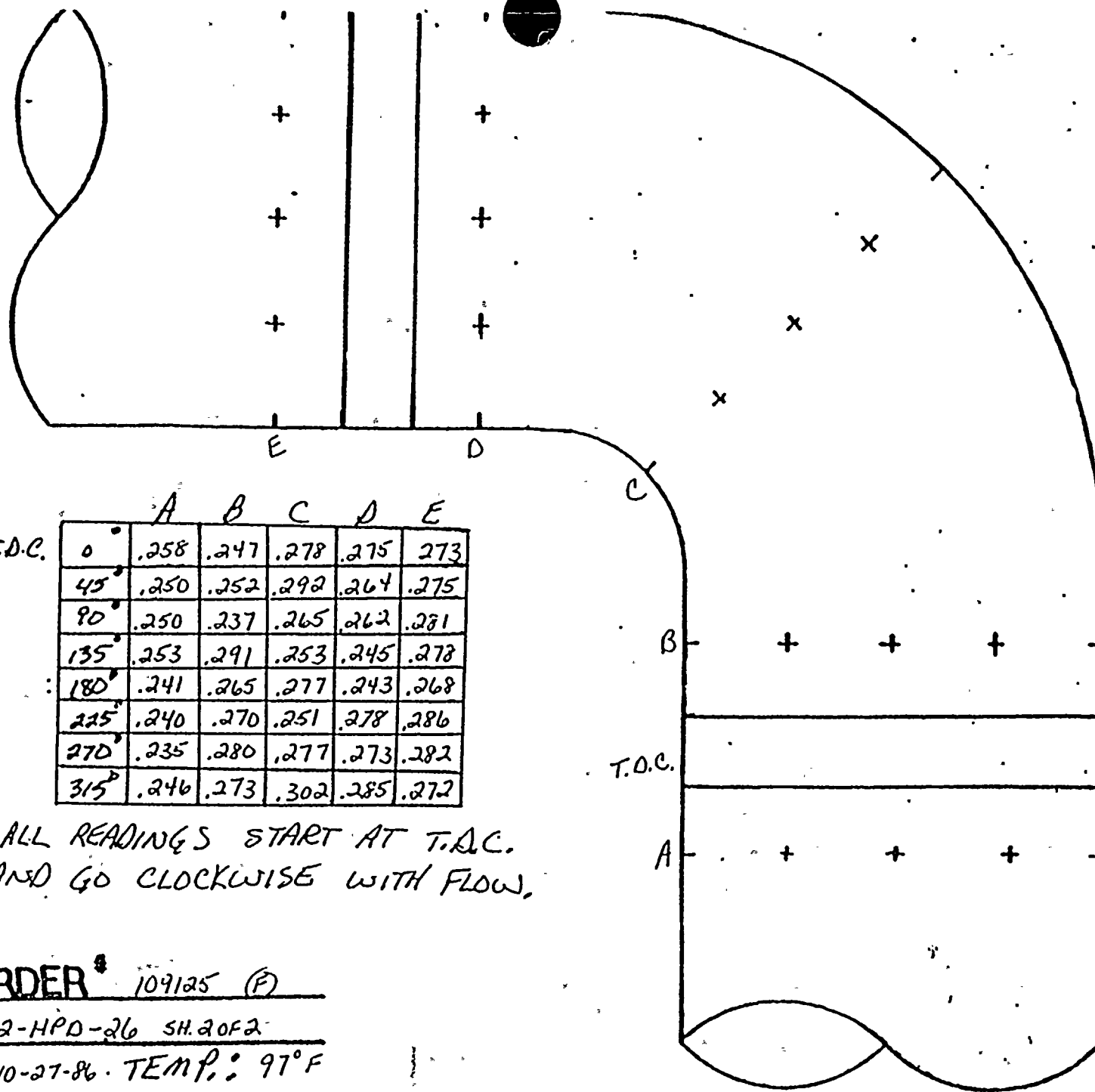
ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

JOE ORDER # 109125 (E)  
ISO # 2-HPD-26. SH. 2 OF 2  
DATE: 10-27-86 TEMP.: 96°F





← FLOW



T.D.C.	A	B	C	D	E
0°	.258	.247	.278	.275	.273
45°	.250	.252	.292	.264	.275
90°	.250	.237	.265	.262	.281
135°	.253	.291	.253	.245	.278
180°	.241	.265	.277	.243	.268
225°	.240	.270	.251	.278	.286
270°	.235	.280	.277	.273	.282
315°	.246	.273	.302	.285	.272

ALL READINGS START AT T.D.C.  
AND GO CLOCKWISE WITH FLOW.

JOE ORDER # 109125 (P)

ISO # 2-HPD-26 SH. 2 OF 2

DATE: 10-27-86 TEMP.: 97°F



## EROSION EVALUATION WORKSHEET

Isometric Dwg. NO. 2-HPD-27, REV. 2

AEPSIC Installed Mat'l Class CS: A-106 GR-B SCH-40

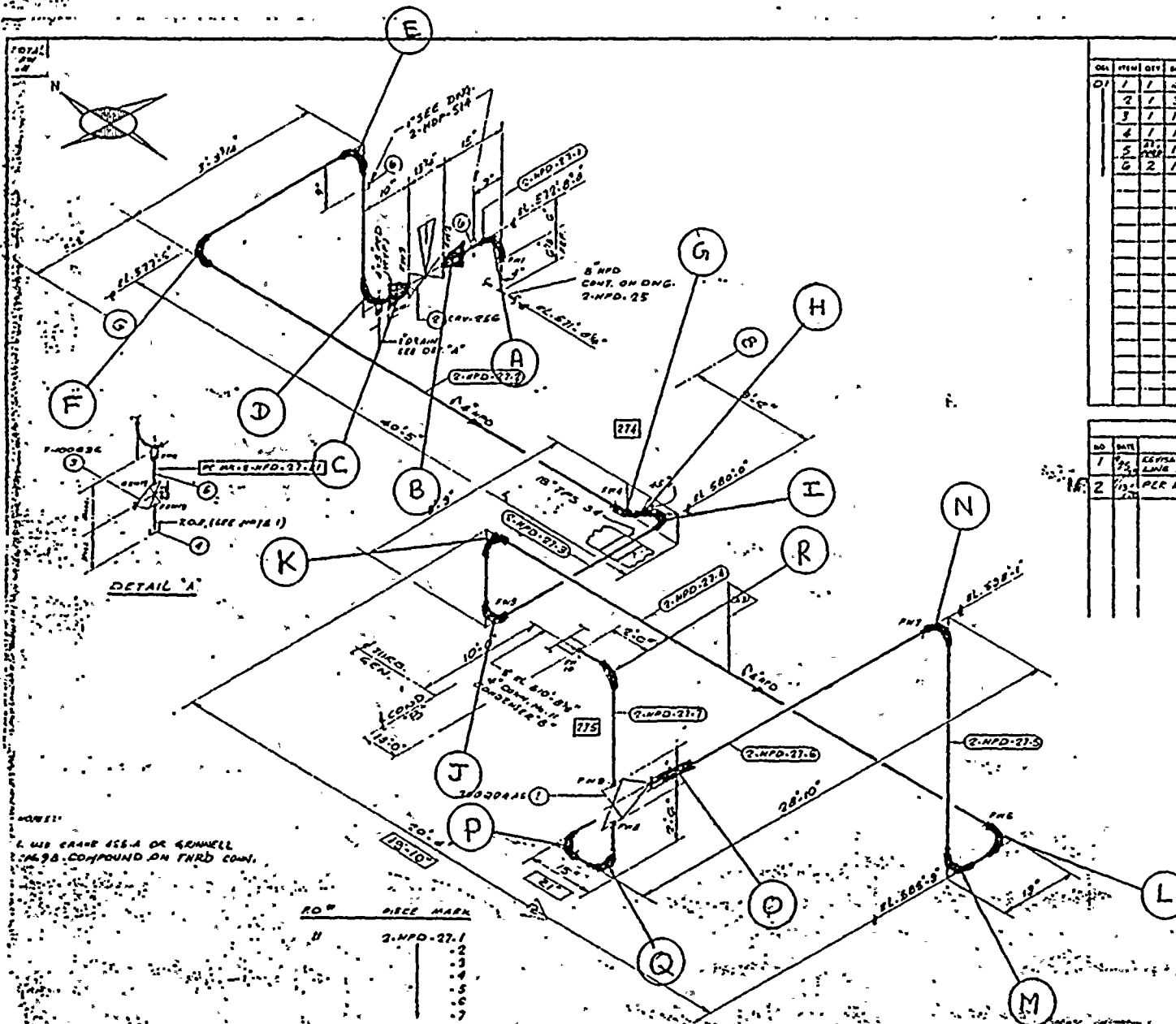
Years in service 9

[illegible]



10-21-86

WEEK# 7



				ISO SWT. NO. 345	
QTY	ITEM	REV	DATE	MATERIAL DESCRIPTION	REMARKS
1	1	2		1000° C F. SW. GATE VALVE STD. WT.	1000000000
2	1	3		REGULATING VALVE (8 IN)	240 150
3	1	1		800° C F. SW. GATE VALVE	1000000000
4	1	1		1000° C F. THERM. COIL	1000000000
5	1	1		PIPE (SCH. 80) 8 IN. S. C. 1	1000000000
6	2	1		3000° C F. SW. GATE VALVE	1000000000

REVISION RECORD			
NO	DATE	DESCRIPTION	FILED
1	5/25/78	REMOVED BY AS.P. ADDED ITEM #6 FORM FORMERLY LINE AS PER ARIST DRQS. 2-21217, 20	FILED KPMH Pgs 20
2	7/13/78	PER RCM-NC-0591 ADDED AS-QUIET DIA.	PER ARIST

INSPECT: D { I

22 MAY 78  
J. R. R.

INSPECT: D { I  
J, R 14 JUL 86

INFORMATION RECORDS CENTER  
CONTROLLED  
DOCUMENT  
JAN 13 1986

VOLUME# 002

2-HPD-27

[illegible]



← FLOW

	A	B	C	D	E	
T.D.C.	0	404	300	359	372	328
	45	413	371	429	326	320
	90	442	368	311	314	260
	135	435	402	300	371	286
	180	422	373	278	354	284
	225	428	371	283	304	293
	270	423	311	339	311	271
	315	452	311	339	309	287

ALL readings start at T.D.C.  
and go clockwise with Flow.

JOB ORDER # 109124 (D)

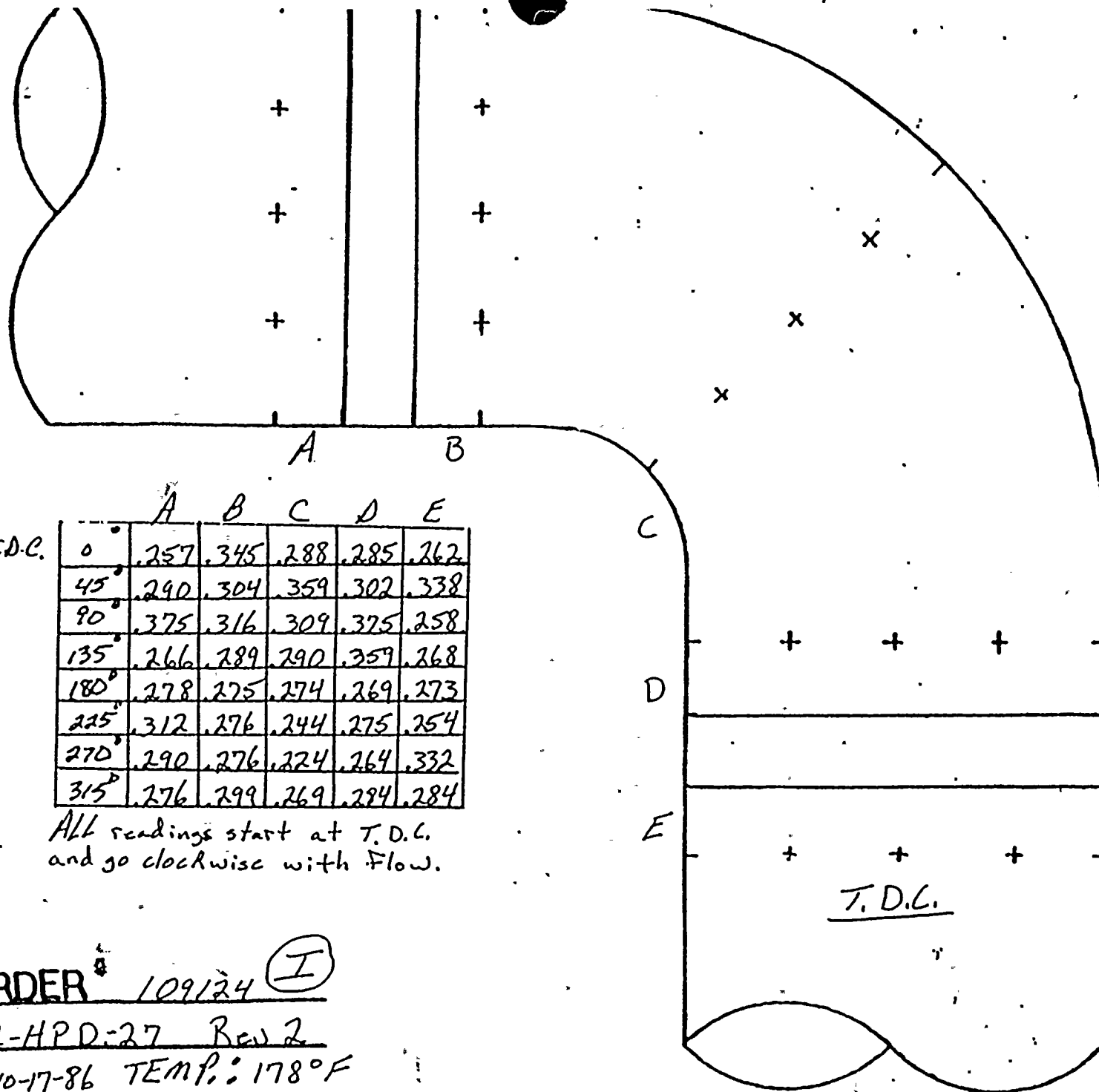
ISO # 2-HPD-27 Rev 2

DATE: 10-17-86 TEMP: 198° F

T.D.C.



FLOW →



T.D.C.	A	B	C	D	E
0°	257	345	288	285	262
45°	290	304	359	302	338
90°	375	316	309	375	258
135°	266	289	290	359	268
180°	278	275	274	269	273
225°	312	276	244	275	254
270°	290	276	224	264	332
315°	276	299	269	284	284

All readings start at T.D.C.  
and go clockwise with Flow.

JOB ORDER # 109124 (I)  
ISO# 2-HPD-27 Rev 2  
DATE: 10-17-86 TEMP.: 178°F



← FLOW

T.D.C.		A	B	C	D	E
0°		275	288	356	288	314
45°		252	322	326	319	270
90°		292	313	388	314	337
135°		318	337	290	360	339
180°		317	325	268	312	273
225°		295	280	277	346	324
270°		265	334	306	285	292
315°		268	295	306	343	320

All readings start at T.D.C.  
and go clockwise with flow.

T.D.C.

JOE ORDER # 109124 (J)

ISO # 2-HPD-27 Rev 2

DATE: 12-16-86 TEMP: 175°F



← FLOW

	A	B	C	D	E
T.D.C. 0°	242	293	274	260	275
45°	293	282	214	254	252
90°	268	234	331	298	272
135°	286	257	336	313	266
180°	226	284	318	360	278
225°	302	296	320	326	299
270°	284	287	302	251	289
315°	298	310	220	257	290

All readings start at T.D.C. and go clockwise with Flow.

JOB ORDER # 109124 (R)

ISO # 2-HPD-27 Rev 2

DATE: 10-17-86 TEMP.: 157° F

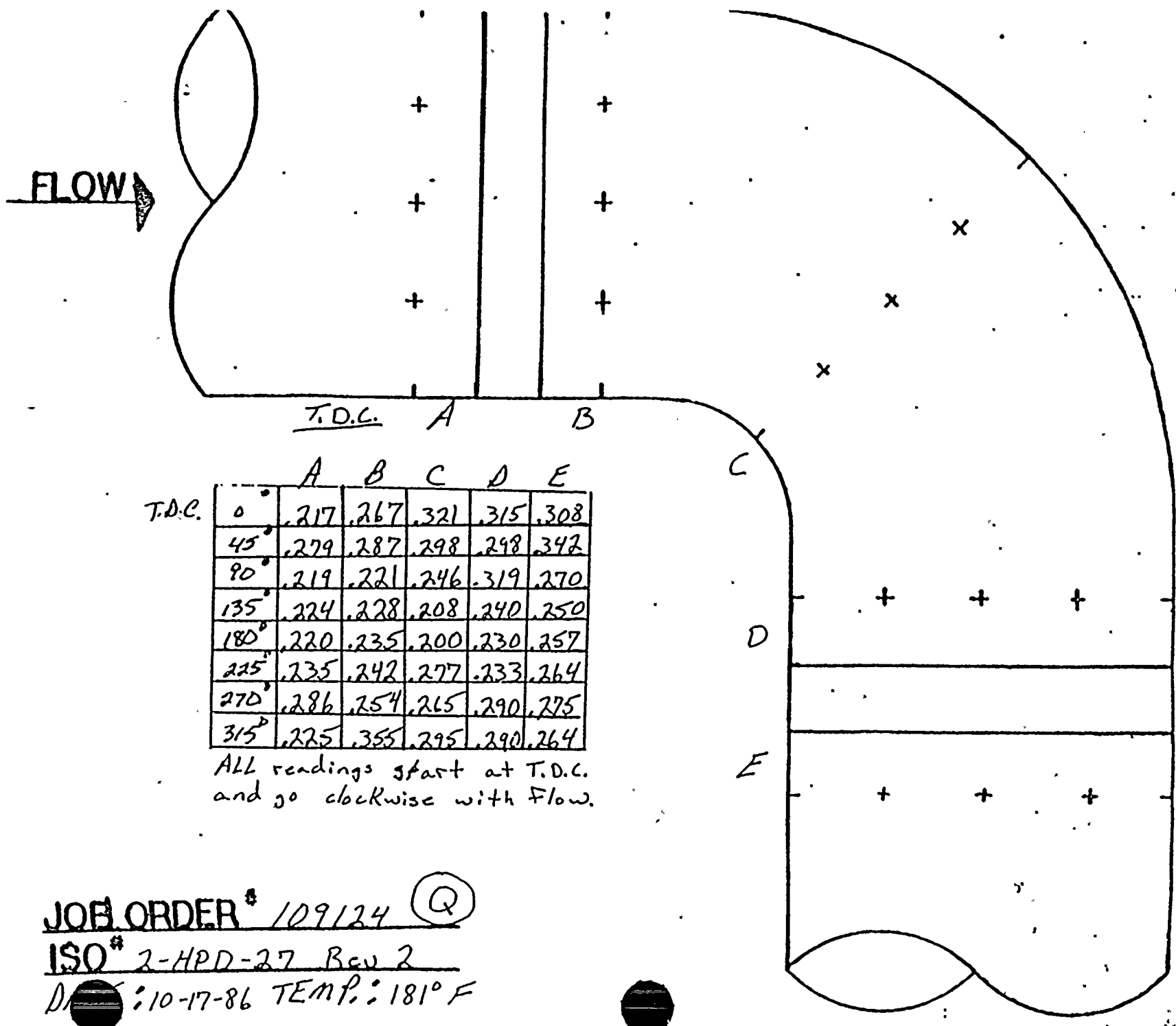
C

B

A

T.D.C.





T.D.C.		A	B	C	D	E
0°		217	267	321	315	308
45°		279	287	298	298	342
90°		219	221	246	319	270
135°		224	228	208	240	250
180°		220	235	200	230	257
225°		235	242	277	233	264
270°		286	254	265	290	275
315°		225	355	295	290	264

ALL readings start at T.D.C.  
and go clockwise with Flow.

**JOB ORDER** # 109124 (Q)

**ISO** # 2-HPD-27 Rev 2

DIA: 10-17-86 TEMP: 181° F



D. C. CLOX SE [REDACTED] PLATE

## EMISSION EVALUATION WORKSHEET

NEPSC Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam)\_\_\_\_\_

Unit No. 2

Evaluation Date: JANUARY 16, 1987

SER No. 23-85 (Water) X

Years in service 9

UT Reading Transmitted on: 10-21-86

UT Reading Taken on: 10-16-86

Isometric Dwg. NO. 2-HPD-28 REV. 1

AEPSC Installed Mat'l Class CS: A-106 GR B SCH-40

Plant

(I.D.)

Comp.

Component

### Description

Original

Wall Thk.

Original

Tnk. Range

Reg 'd

Trin

Lowest

## Reading

Percent

Exceded

COMMENTS

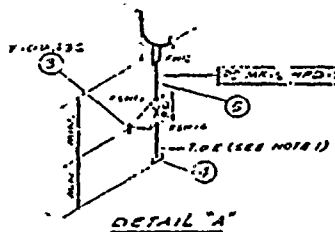
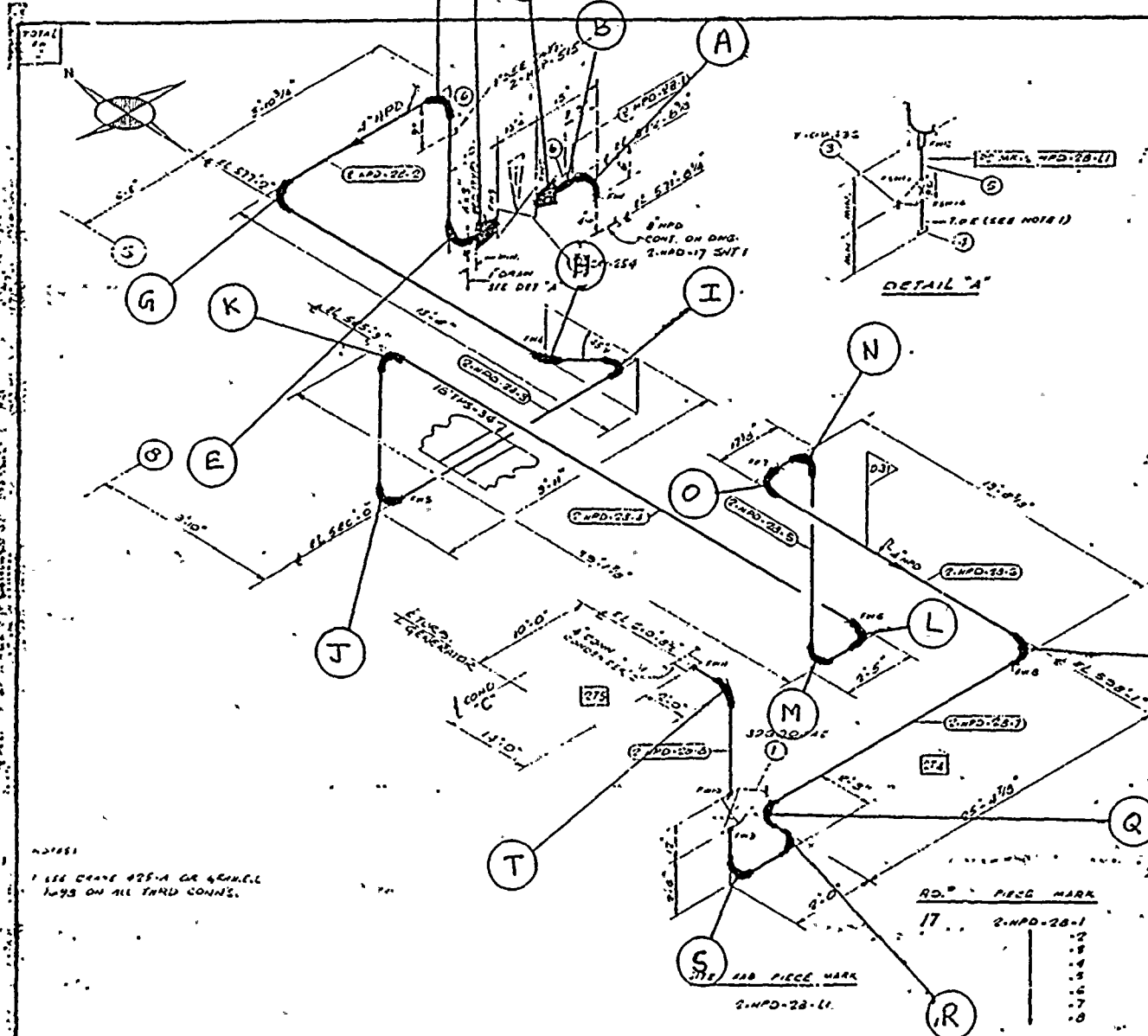
	4"-90°ELL	237	207	267	.049	.269	0%	STILL WITHIN MANUFACTURERS TOLERANCE
E	4"-90°ELL	.237	.207	.267	.049	.269	0%	" " " "
J	4"-90°ELL	.237	.207	.267	.049	.216	0%	" " " "
N	4"-90°ELL	.237	.207	.267	.049	.225	0%	" " " "
O	4"-90°ELL	.237	.207	.267	.049	.226	0%	" " " "
S	4"-90°ELL	.237	.207	.267	.049	.218	0%	" " " "
T	4"-90°ELL	.237	.207	.267	.049	.132	36%	REPLACE WITH SS WITHIN THE NEXT 10 yrs

[illegible]



1 EK # 7 10-21-86

QC - J.O. # 9124  
CONST - J.O. # 109122  
109123



ISO SH. NO. 3116			
QTY	UNIT	MATERIAL DESCRIPTION	REMARKS
1	1	300° CS. 818 IN STD. WT	20300418
2	1	REGULATING VALVE	CRV-254
3	1	300° CS. 818 IN GATE VALVE	1-00335
4	1	3000° CS. STD. C-10	1-108
5	1	PIPE (SEE 30) SMLS 2 S.	1-108
6	2	3000° CS. 3 IN. C-14	1-108

REVISION RECORD			
NO.	DATE	DESCRIPTION	FIELD ACTION
1	10-21-86	REVISED BY AEP. ADD ITEM 6 TO BILL FOR WELDING LMA AS PER ASSET DWG 2-5102-1-SUB. IN	

INSPECT: E & N  
J, T & S

INFORMATION IN THIS CENTER  
CONTROLLED  
DOCUMENT  
JAN 13 1986  
VOL. 1000-1000  
WORKING COPY

2-HPD-28

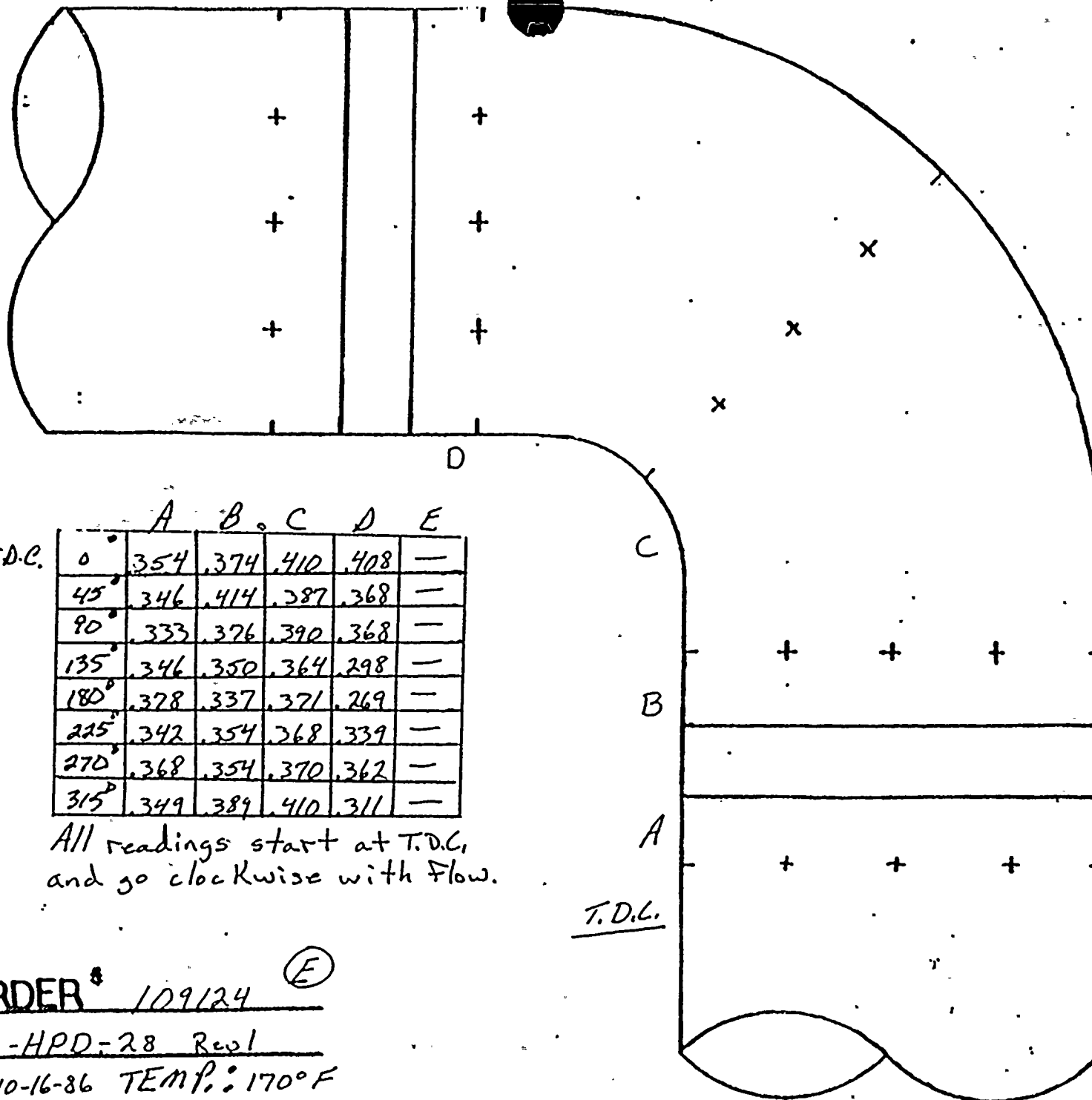
NOTE:  
1. SEE DRAWING 2-5102-1 FOR GENERAL LAYOUT ON ALL THIRD CORNS.

RD.	PIECE MARK
17	2-HPD-28-1
	2-HPD-28-11

DESIGN SHEET		PROJECT NO. 2-5102-1		FOURZONE No. 212-212		FLOW DIAGRAM C-212-212	
DRAWN BY: J. J. J.		CHECKED BY: J. J. J.		REQUIRED COMPLETION DATE: 10-21-86		WELD PROCEDURE: 01	
TESTING: N/A		FABRICATOR: NPS DESIGNS INC.		FABRICATOR NOTE: FABRICATION MUST		INSPECTOR: INDIANA & MARK DONALD C. C.	
MATERIALS:		PIPE:		FITTINGS:		WELDING:	
SIZES: 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 30, 36, 42, 48, 60, 72, 84, 96, 108, 120, 144, 168, 192, 216, 240, 270, 300, 360, 420, 480, 540, 600, 660, 720, 780, 840, 900, 960, 1080, 1200, 1320, 1440, 1560, 1680, 1800, 1920, 2100, 2280, 2460, 2640, 2820, 3000, 3240, 3480, 3720, 3960, 4200, 4440, 4680, 4920, 5160, 5400, 5640, 5880, 6120, 6360, 6600, 6840, 7080, 7320, 7560, 7800, 8040, 8280, 8520, 8760, 9000, 9240, 9480, 9720, 9960, 10200, 10440, 10680, 10920, 11160, 11400, 11640, 11880, 12120, 12360, 12600, 12840, 13080, 13320, 13560, 13800, 14040, 14280, 14520, 14760, 15000, 15240, 15480, 15720, 15960, 16200, 16440, 16680, 16920, 17160, 17400, 17640, 17880, 18120, 18360, 18600, 18840, 19080, 19320, 19560, 19800, 20040, 20280, 20520, 20760, 21000, 21240, 21480, 21720, 21960, 22200, 22440, 22680, 22920, 23160, 23400, 23640, 23880, 24120, 24360, 24600, 24840, 25080, 25320, 25560, 25800, 26040, 26280, 26520, 26760, 27000, 27240, 27480, 27720, 27960, 28200, 28440, 28680, 28920, 29160, 29400, 29640, 29880, 30120, 30360, 30600, 30840, 31080, 31320, 31560, 31800, 32040, 32280, 32520, 32760, 33000, 33240, 33480, 33720, 33960, 34200, 34440, 34680, 34920, 35160, 35400, 35640, 35880, 36120, 36360, 36600, 36840, 37080, 37320, 37560, 37800, 38040, 38280, 38520, 38760, 39000, 39240, 39480, 39720, 40000, 40240, 40480, 40720, 40960, 41200, 41440, 41680, 41920, 42160, 42400, 42640, 42880, 43120, 43360, 43600, 43840, 44080, 44320, 44560, 44800, 45040, 45280, 45520, 45760, 46000, 46240, 46480, 46720, 46960, 47200, 47440, 47680, 47920, 48160, 48400, 48640, 48880, 49120, 49360, 49600, 49840, 50080, 50320, 50560, 50800, 51040, 51280, 51520, 51760, 52000, 52240, 52480, 52720, 52960, 53200, 53440, 53680, 53920, 54160, 54400, 54640, 54880, 55120, 55360, 55600, 55840, 56080, 56320, 56560, 56800, 57040, 57280, 57520, 57760, 58000, 58240, 58480, 58720, 58960, 59200, 59440, 59680, 59920, 60160, 60400, 60640, 60880, 61120, 61360, 61600, 61840, 62080, 62320, 62560, 62800, 63040, 63280, 63520, 63760, 64000, 64240, 64480, 64720, 64960, 65200, 65440, 65680, 65920, 66160, 66400, 66640, 66880, 67120, 67360, 67600, 67840, 68080, 68320, 68560, 68800, 69040, 69280, 69520, 69760, 70000, 70240, 70480, 70720, 70960, 71200, 71440, 71680, 71920, 72160, 72400, 72640, 72880, 73120, 73360, 73600, 73840, 74080, 74320, 74560, 74800, 75040, 75280, 75520, 75760, 76000, 76240, 76480, 76720, 76960, 77200, 77440, 77680, 77920, 78160, 78400, 78640, 78880, 79120, 79360, 79600, 79840, 80080, 80320, 80560, 80800, 81040, 81280, 81520, 81760, 82000, 82240, 82480, 82720, 82960, 83200, 83440, 83680, 83920, 84160, 84400, 84640, 84880, 85120, 85360, 85600, 85840, 86080, 86320, 86560, 86800, 87040, 87280, 87520, 87760, 88000, 88240, 88480, 88720, 88960, 89200, 89440, 89680, 89920, 90160, 90400, 90640, 90880, 91120, 91360, 91600, 91840, 92080, 92320, 92560, 92800, 93040, 93280, 93520, 93760, 94000, 94240, 94480, 94720, 94960, 95200, 95440, 95680, 95920, 96160, 96400, 96640, 96880, 97120, 97360, 97600, 97840, 98080, 98320, 98560, 98800, 99040, 99280, 99520, 99760, 100000.		DATE: 10-21-86		BY: J. J. J.		CHECKED BY: J. J. J.	



← FLOW



	A	B	C	D	E
T.D.C. 0°	354	374	410	408	—
45°	346	414	387	368	—
90°	333	376	390	368	—
135°	346	350	364	298	—
180°	378	337	371	269	—
225°	342	354	368	339	—
270°	368	354	370	362	—
315°	349	389	410	311	—

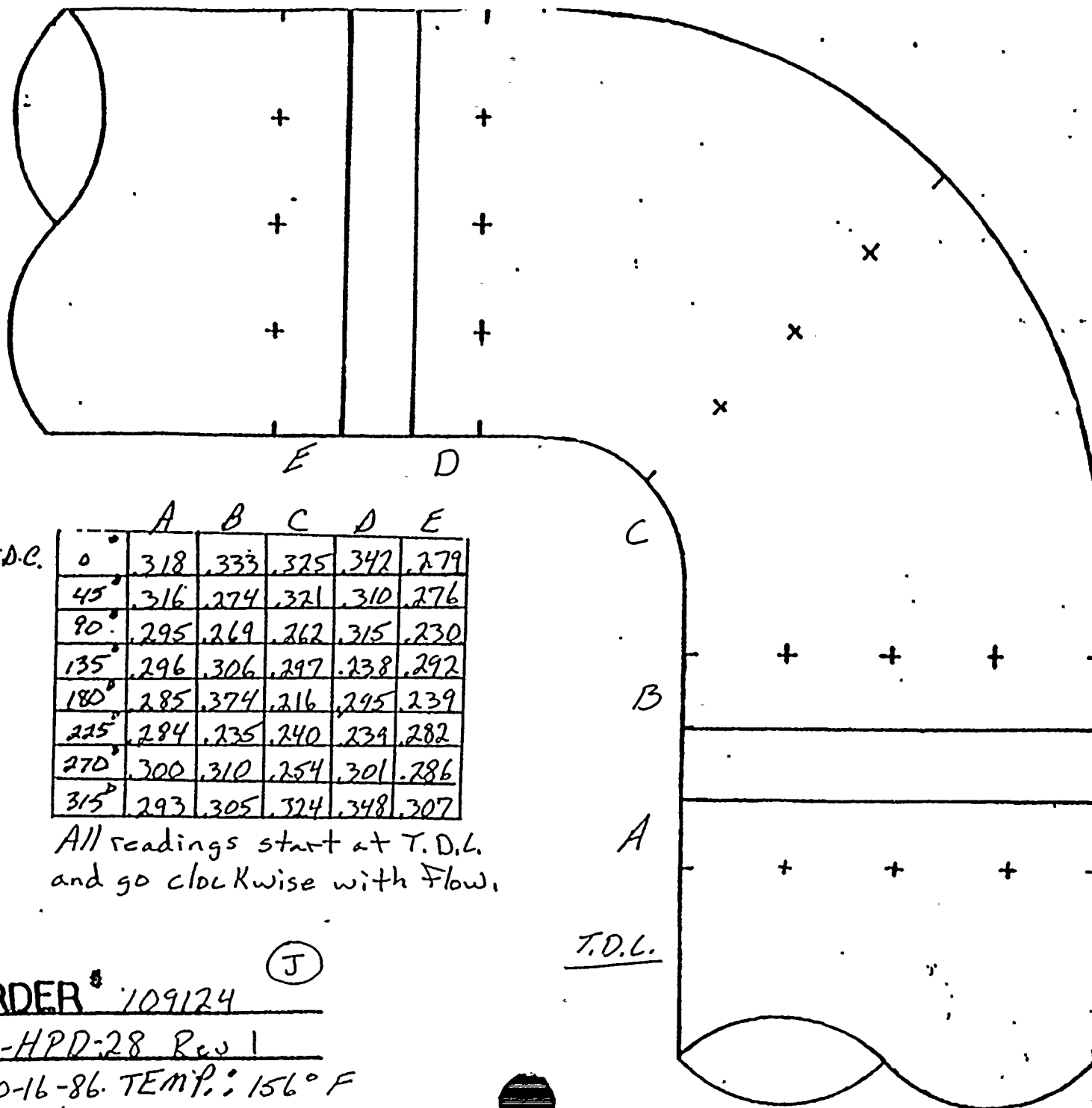
All readings start at T.D.C.  
and go clockwise with Flow.

T.D.C.

JOB ORDER # 109124 (E)  
ISO # 2-HPD-28 Rev 1  
DATE: 10-16-86 TEMP.: 170°F



FLOW



T.D.C.		A	B	C	D	E
0		318	333	325	342	279
45		316	274	321	310	276
90		295	269	262	315	230
135		296	306	297	238	292
180		285	374	216	295	239
225		284	235	240	239	282
270		300	310	254	301	286
315		293	305	324	348	307

All readings start at T.D.L.  
and go clockwise with Flow.

JOE ORDER # 109124

ISO # 2-HPD-28 Rev 1

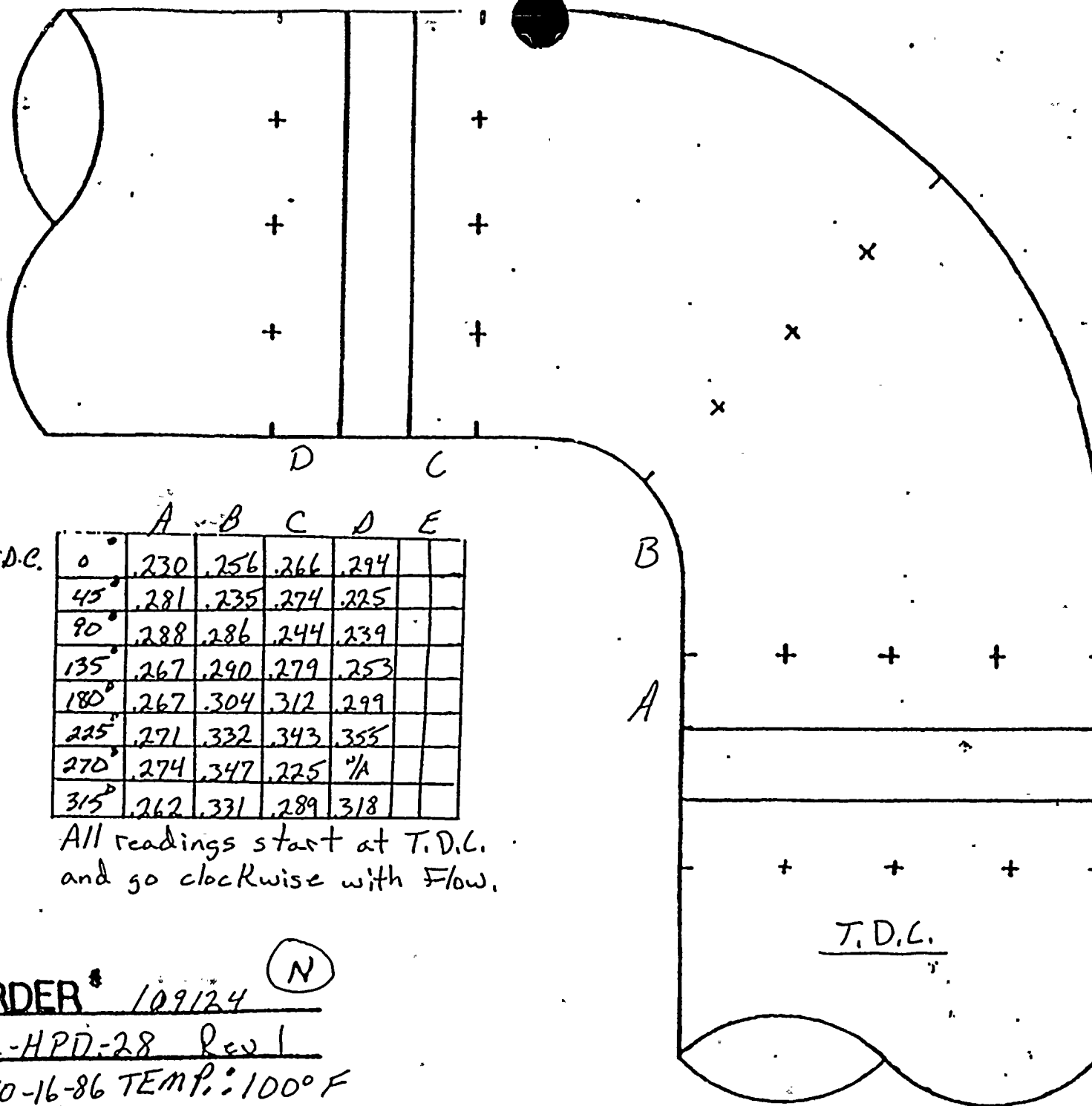
DATE: 10-16-86 TEMP.: 156° F

(J)

T.D.L.



←FLOW



T.D.C.	0°	A	B	C	D	E
0°	.230	.256	.266	.294		
45°	.281	.235	.274	.225		
90°	.288	.286	.244	.239		
135°	.267	.290	.279	.253		
180°	.267	.304	.312	.299		
225°	.271	.332	.343	.355		
270°	.274	.347	.225	1/A		
315°	.262	.331	.289	.318		

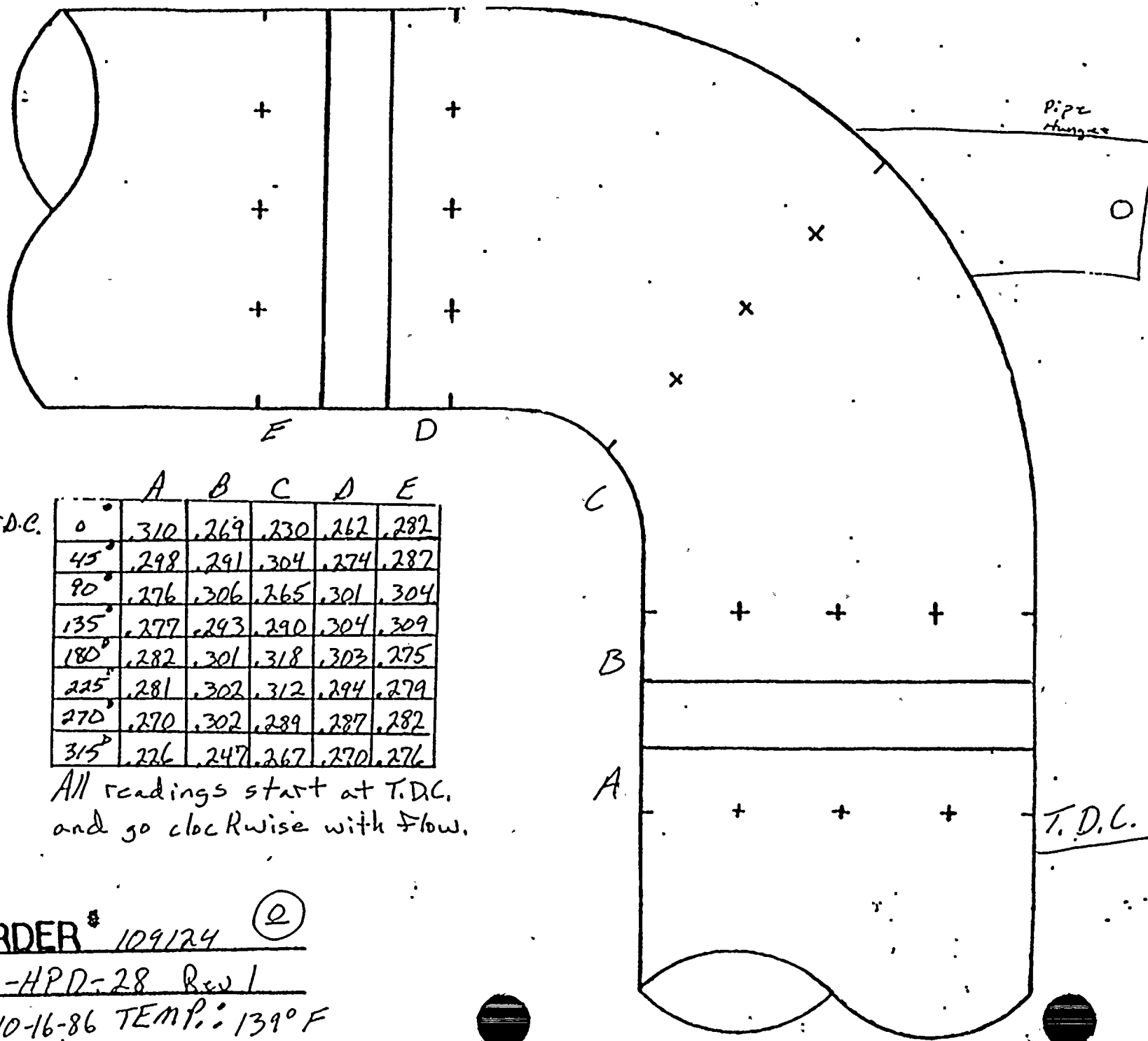
All readings start at T.D.C.  
and go clockwise with Flow.

JOB ORDER # 109124 (N)  
ISO# 2-HPD-28 Rev 1  
DATE: 10-16-86 TEMP: 100°F

T.D.C.

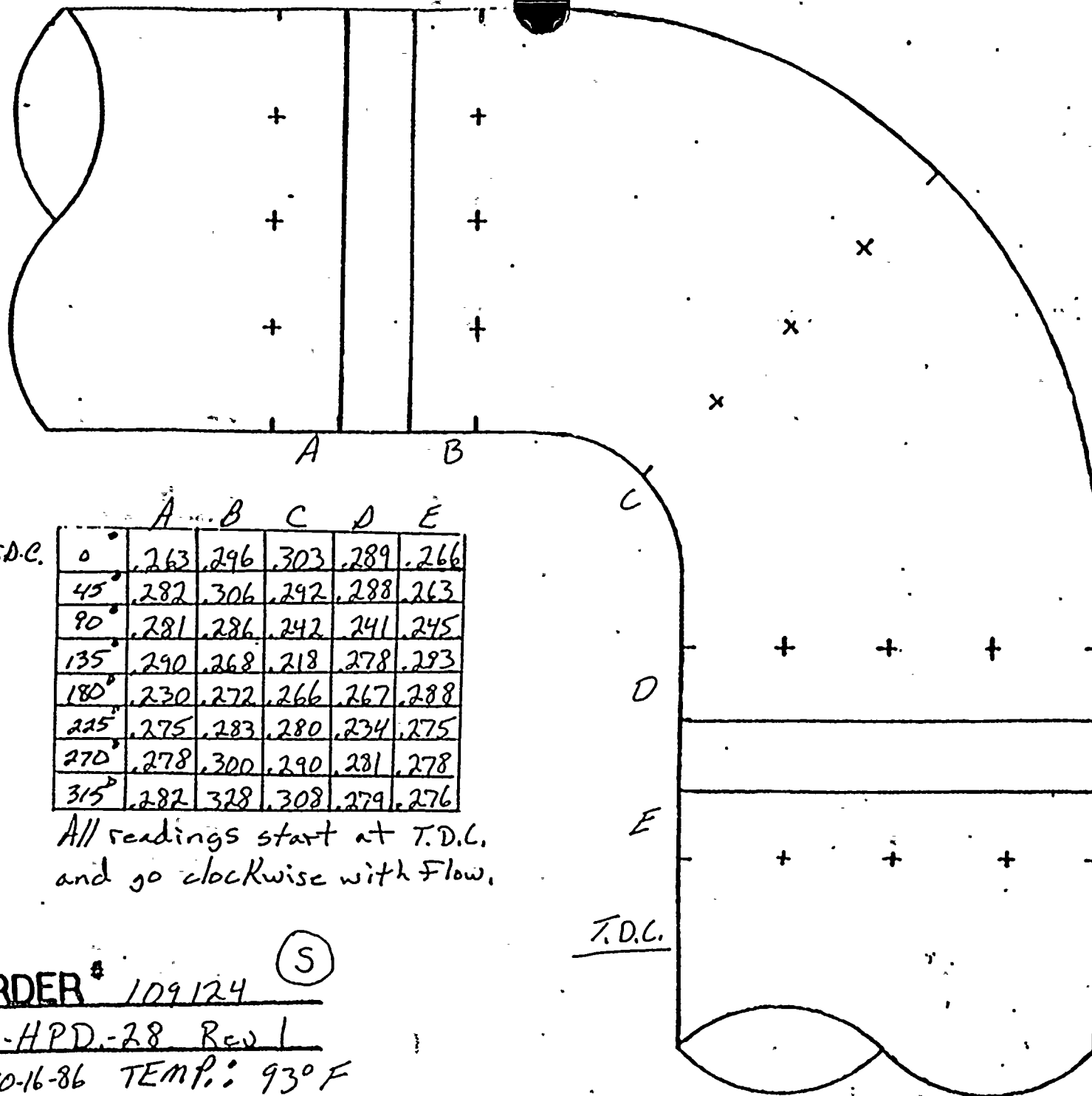


← FLOW



JOB ORDER # 109124 (2)  
 ISO # 2-HPD-28 Rev 1  
 DATE: 10-16-86 TEMP.: 139°F



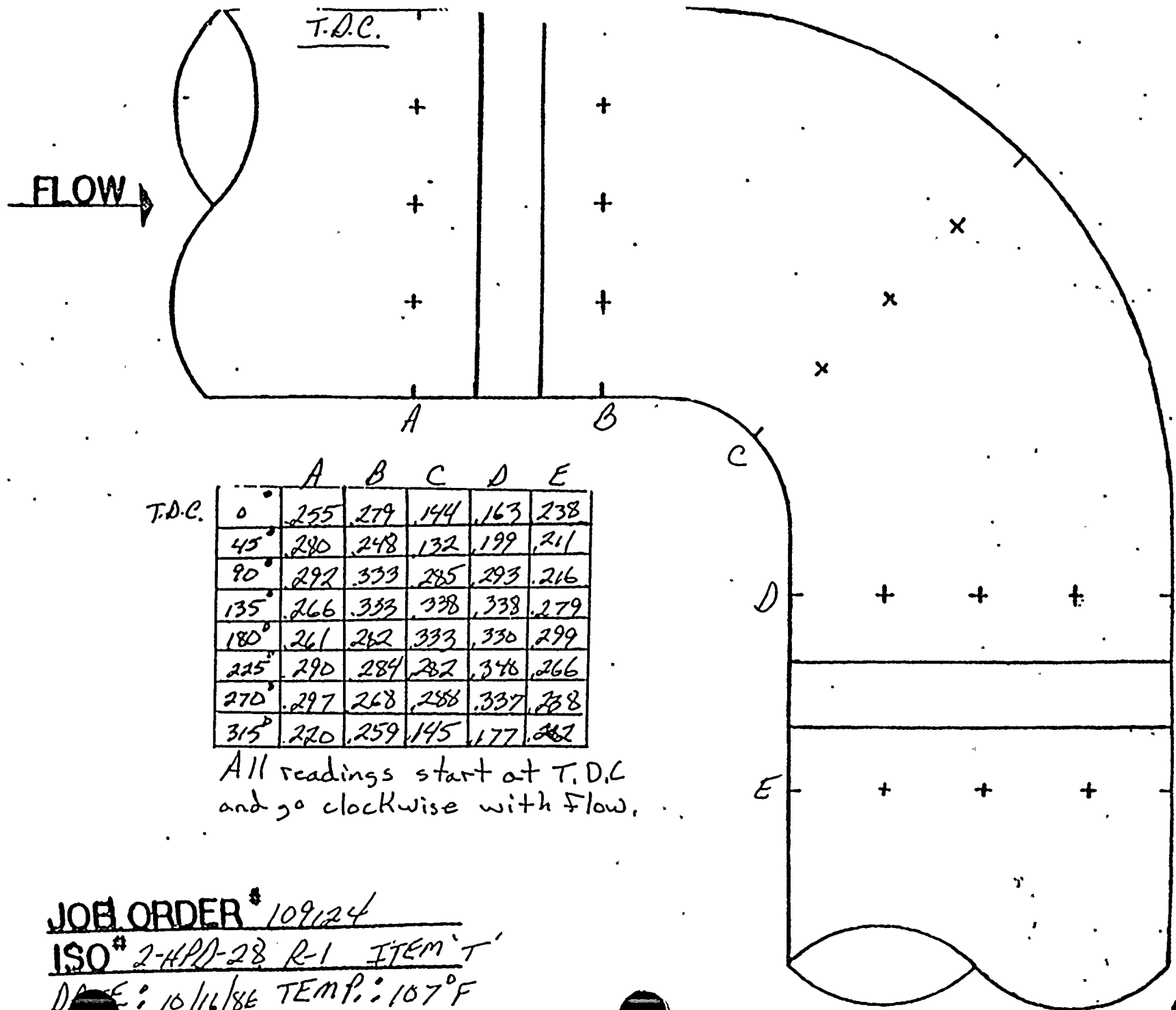


	A	B	C	D	E
0	263	296	303	289	266
45	282	306	292	288	263
90	281	286	242	241	245
135	290	268	218	278	293
180	230	272	266	267	288
225	275	283	280	234	275
270	278	300	290	281	278
315	282	328	308	279	276

All readings start at T.D.C.  
and go clockwise with Flow.

JOE ORDER # 109124 (5)  
ISO # 2-HPD.-28 Rev 1  
DATE: 10-16-86 TEMP.: 93°F







BLEED STEAM  
SYSTEM



## AMERICAN ELECTRIC POWER SERVICE CORPORATION

DATE: SEPTEMBER 16, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 1  
X Steam Piping Erosion Program, SER No. 88-84  
 Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements

FROM: A. J. Lewandowski

TO: 1. J. A. ~~Kopyra~~ *9/14/87*  
 2. R. Tella

We have reviewed the wall thickness measurements transmitted to us on AUGUST 19, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
<u>L-B-9, REV. 2</u>	<u>CS</u>	<u>I</u>	<u>ACCEPTABLE, NO FURTHER INSPECTIONS REQUIRED</u>
---	<u>CS</u>	<u>J</u>	-----
↓	<u>CS</u>	<u>K</u>	-----
<u>L-B-10, REV. 3</u>	<u>CS</u>	<u>I</u>	-----
↓	<u>CS</u>	<u>J</u>	-----
↓	<u>CS</u>	<u>K</u>	-----
<u>L-B-11, REV. 3</u>	<u>CS</u>	<u>I</u>	-----
↓	<u>CS</u>	<u>J</u>	-----
↓	<u>CS</u>	<u>K</u>	-----
<u>L-B-12, REV. 2</u>	<u>CS</u>	<u>I</u>	-----

*Anthony J. Lewandowski*  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
~~C. A. Erikson~~ J. F. Kurgan  
 P. G. Schoepf  
 H. B. Brügger  
 P & V File No. 4.6.3.15.2.1.2

Sheet No. 1 of 3



D. C. Cook Nuclear Plant, Unit No. 1  
X Steam Piping Erosion Program, SER No. 88-84  
 Water Piping Erosion Program, SER No. 23-85  
 Engineering evaluation of Wall Thickness Measurements  
 Date: SEPTEMBER 16, 1987  
 Sheet No. 2 of 2

<u>Isometric Drawing No.</u>	<u>Piping Material</u>	<u>Comp. I.D.</u>	<u>AEPSC Recommendation</u>
I-B-12, REV. 2	CS	J	ACCEPTABLE, NO FURTHER INSPECTIONS REQUIRED
I-B-13, REV. 3	CS	I	
	CS	J	
I-B-14, REV. 2	CS	I	
	CS	J	
I-B-15, REV. 2	CS	T	
	CS	S	ACCEPTABLE, RE-INSPECT IN 17 YEARS
	CS	R	ACCEPTABLE, RE-INSPECT IN 17 YEARS
I-B-16, REV. 3	CS	B	ACCEPTABLE, NO FURTHER INSPECTIONS REQUIRED
	CS	B	
	CS	D	
	CS	E	
	CS	E-F	
	CS	F	ACCEPTABLE, RE-INSPECT IN 19 YEARS
	CS	G	ACCEPTABLE, NO FURTHER INSPECTIONS REQUIRED
	CS	G-H	
	CS	H	ACCEPTABLE, RE-INSPECT IN 24 YEARS
I-B-17, REV. 3	CS	B	ACCEPTABLE, RE-INSPECT IN 26 YEARS
	CS	B	ACCEPTABLE, RE-INSPECT IN 22 YEARS
	CS	E	ACCEPTABLE, NO FURTHER INSPECTIONS REQUIRED
	CS	F	
	CS	G	ACCEPTABLE, RE-INSPECT IN 23 YEARS







# EROSION EVALUATION WORKSHEET

Unit No. 1

Years in service 11

UT Reading Taken on: 4-21-87

AEPSI Installed Mat'l Class V-31, ASTM A-155 GR. KC70 CLASS I

[illegible]

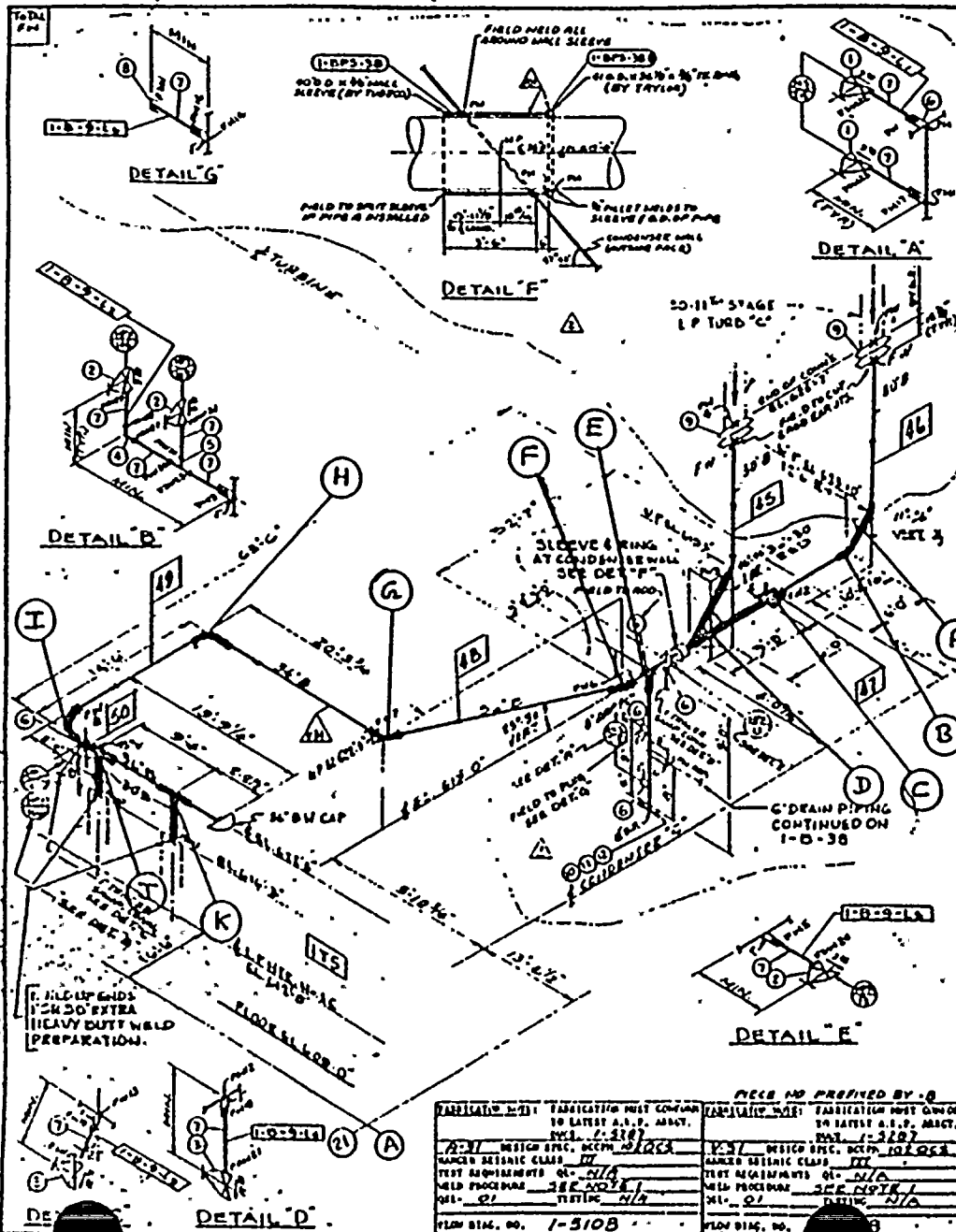


WEEK # 16

CONSTRUCTION: J.O.# 715743

10. 715744

QC: 10. # 715742

ISOMETRIC SHEET NO. 422

INSPECT: (D) 趙志民

DO NOT IMPROVE  
JF 4-2087

P.O.#	PIECE MARKS	FAB.
	1-B-43	3HAW

-46  
-47

-48  
-49

282      1-BPS-50  
1-BPS-38      TUBSCO  
TAYLOR

SITE FAD. PIECE MARKS

NOTE

1. WELDING PROCEDURE TO BE AS FOLLOWS:  
CARBON STEEL 2" & UNDER 5  
C/S 2 1/2" & OVER UP TO 3/4" WALL 1  
C/S OVER 3/4" WALL 2

REV.	DATE	CODE	DESCRIPTION	P.A.	DATE
2	2-11-72	BT	REVISED BY NPS DESIGN PER A.E.P. DWS 1-25-72 REV.1 ADDED ITEMS TO DETS A-B SITE FAB. AC. MRS. 1-B-16, PL MRS 1-DPS-3B, 1-DPS-3B-2B REMOVED ITEMS TO DETS A-B, ELICATED INST. CONN. MRS-215 WITH MRS-216 REMOVED HOLD PL MRS 1-B-15 & 6, CODE STAMP PER A-SI SPEC 6 DELETE MRP PORTENTS OF IDENTIFICATION		FIELD ACTION REQD
		TJD			FAB ACTION REQD
1	2-11-72	BT	REVISED BY NPS DESIGN PER A.E.P. DWS 1-25-72 REV.1 ADDED ITEMS TO DETS A-B SITE FAB. AC. MRS. 1-B-16, PL MRS 1-DPS-3B, 1-DPS-3B-2B REMOVED ITEMS TO DETS A-B, ELICATED INST. CONN. MRS-215 WITH MRS-216 REMOVED HOLD PL MRS 1-B-15 & 6, CODE STAMP PER A-SI SPEC 6 DELETE MRP PORTENTS OF IDENTIFICATION		FIELD ACTION REQD
		TJD			FAB ACTION REQD

**INDIANA & MICHIGAN ELECTRIC COMPANY**

DONALD C. COOK NUCLEAR PLANT.

**BRIDGMAN**

UNIT NO. 1

A-02		A-03		A-04		A-05		A-06		A-07		A-08		A-09		A-10		A-11		A-12		A-13		A-14		A-15		A-16		A-17		A-18		A-19		A-20		A-21		A-22		A-23		A-24		A-25		A-26		A-27		A-28		A-29		A-30		A-31		A-32		A-33		A-34		A-35		A-36		A-37		A-38		A-39		A-40		A-41		A-42		A-43		A-44		A-45		A-46		A-47		A-48		A-49		A-50		A-51		A-52		A-53		A-54		A-55		A-56		A-57		A-58		A-59		A-60		A-61		A-62		A-63		A-64		A-65		A-66		A-67		A-68		A-69		A-70		A-71		A-72		A-73		A-74		A-75		A-76		A-77		A-78		A-79		A-80		A-81		A-82		A-83		A-84		A-85		A-86		A-87		A-88		A-89		A-90		A-91		A-92		A-93		A-94		A-95		A-96		A-97		A-98		A-99		A-100	
A-02		A-03		A-04		A-05		A-06		A-07		A-08		A-09		A-10		A-11		A-12		A-13		A-14		A-15		A-16		A-17		A-18		A-19		A-20		A-21		A-22		A-23		A-24		A-25		A-26		A-27		A-28		A-29		A-30		A-31		A-32		A-33		A-34		A-35		A-36		A-37		A-38		A-39		A-40		A-41		A-42		A-43		A-44		A-45		A-46		A-47		A-48		A-49		A-50		A-51		A-52		A-53		A-54		A-55		A-56		A-57		A-58		A-59		A-60		A-61		A-62		A-63		A-64		A-65		A-66		A-67		A-68		A-69		A-70		A-71		A-72		A-73		A-74		A-75		A-76		A-77		A-78		A-79		A-80		A-81		A-82		A-83		A-84		A-85		A-86		A-87		A-88		A-89		A-90		A-91		A-92		A-93		A-94		A-95		A-96		A-97		A-98		A-99		A-100	
A-02		A-03		A-04		A-05		A-06		A-07		A-08		A-09		A-10		A-11		A-12		A-13		A-14		A-15		A-16		A-17		A-18		A-19		A-20		A-21		A-22		A-23		A-24		A-25		A-26		A-27		A-28		A-29		A-30		A-31		A-32		A-33		A-34		A-35		A-36		A-37		A-38		A-39		A-40		A-41		A-42		A-43		A-44		A-45		A-46		A-47		A-48		A-49		A-50		A-51		A-52		A-53		A-54		A-55		A-56		A-57		A-58		A-59		A-60		A-61		A-62		A-63		A-64		A-65		A-66		A-67		A-68		A-69		A-70		A-71		A-72		A-73		A-74		A-75		A-76		A-77		A-78		A-79		A-80		A-81		A-82		A-83		A-84		A-85		A-86		A-87		A-88		A-89		A-90		A-91		A-92		A-93		A-94		A-95		A-96		A-97		A-98		A-99		A-100	

### MATERIAL REQUIRED FOR FIELD WORK

UNCONTROLLED  
DOCUMENT

DWG NO

REV.2



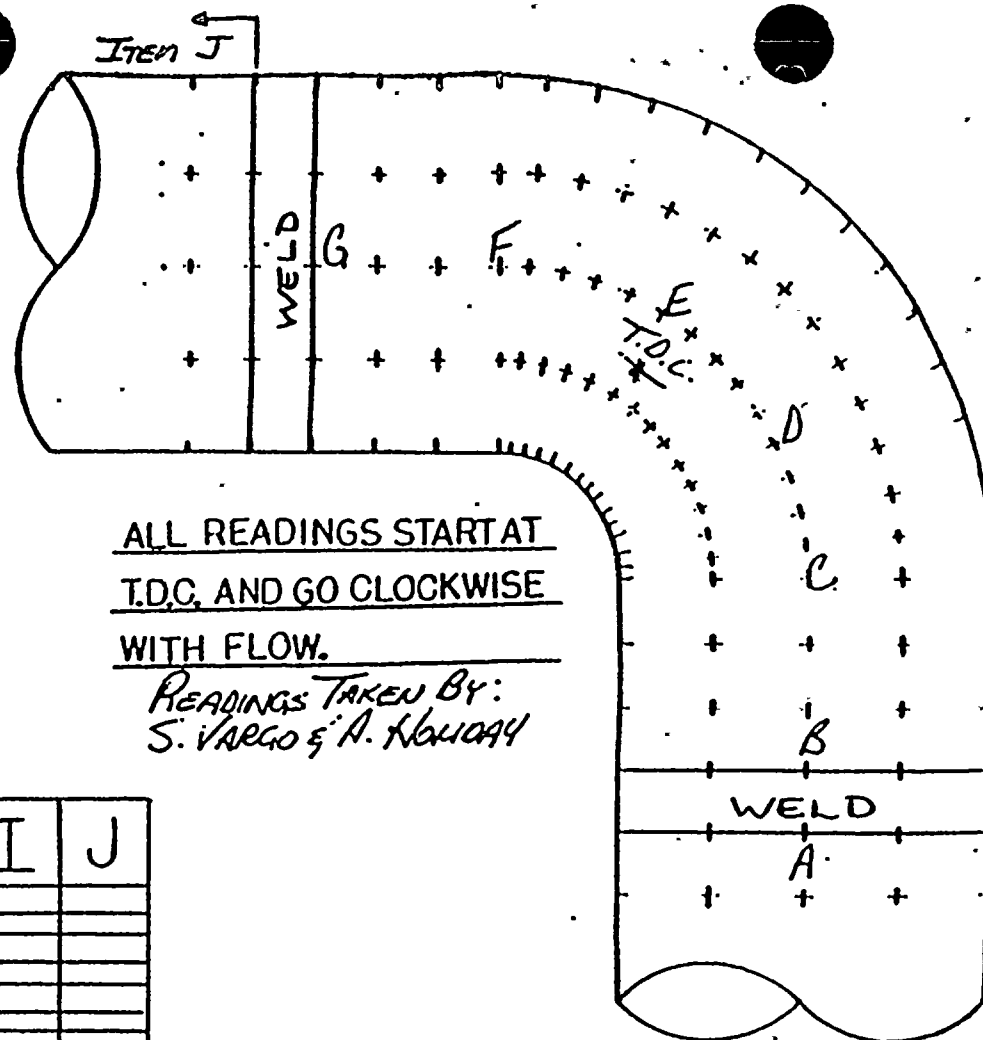
← FLOW

JOB ORDER # 715742

ISO. 1-B-9 REV. 2 (I)

DATE 4/21/87 TEMP. 74°F

PIPE SIZE 36" SCH.



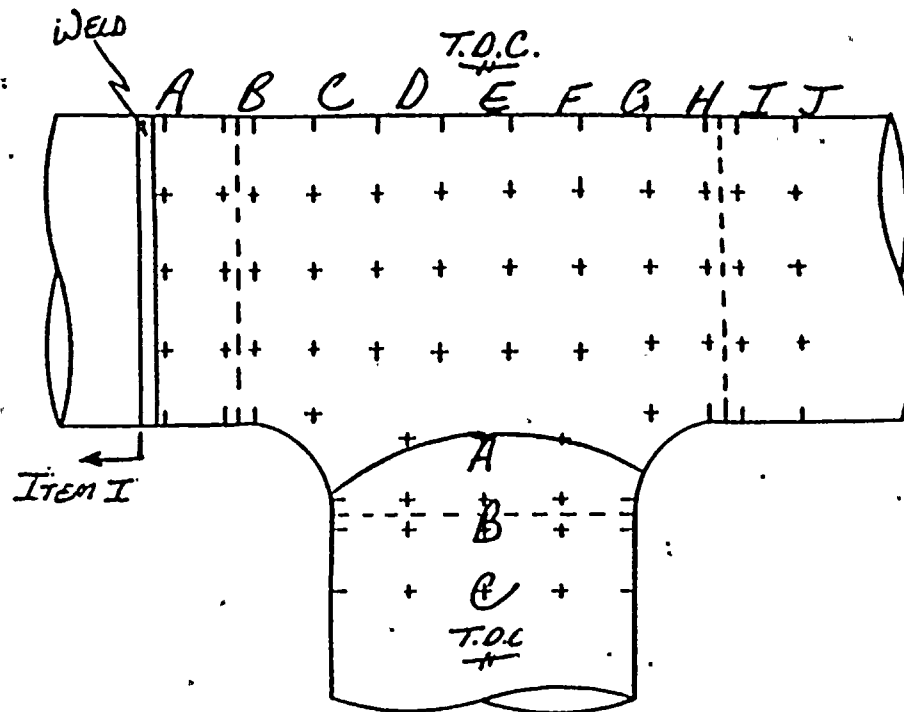
ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

READINGS TAKEN BY:  
S. VARGO & A. KAWAAY

	A	B	C	D	E	F	G	H	I	J
TDC 0°	.403	.468	.500	.476	.478	.475	.466			
30°	.397	.479	.489	.468	.448	.441	.449			
60°	.387	.494	.475	.449	.476	.461	.439			
90°	.383	.490	.470	.470	.447	.462	.440			
120°	.399	.477	.524	.505	.490	.485	.435			
150°	.392	.493	.520	.507	.487	.475	.457			
180°	.392	.491	.528	.514	.493	.470	.496			
210°	.397	.448	.499	.506	.493	.464	.454			
240°	.393	.442	.477	.480	.478	.462	.423			
270°	.400	.420	.458	.462	.459	.457	.438			
300°	.392	.418	.466	.468	.467	.455	.436			
330°	.398	.450	.468	.462	.480	.458	.450			



JOB ORDER # 715742  
 ISO. 1. B. 9 REV. 2 (J)  
 DATE 4/21/87 TEMP. 74°F  
 PIPE SIZE 3/6" SCH.



TDC		A	B	C	D	E	F	G	H	I	J
0°		.441	.438	.438	.421	.438	.435	.432	.433	.432	.435
30°		.441	.444	.442	.441	.441	.441	.438	.435	.441	.439
60°		.438	.429	.436	.430	.468	.438	.435	.434	.437	.439
90°		.407	.442	.435	.432	.445	.439	.435	.425	.432	.437
120°		.428	.440	.421	.438	.435	.432	.432	.434	.430	.433
150°		.435	.425	.434	—	—	—	.429	.426	.430	.418
180°		.425	.428	.427	—	—	—	.433	.427	.425	.426
210°		.421	.430	.434	—	—	—	.432	.427	.428	.428
240°		.422	.438	.434	.433	.433	.433	.430	.432	.431	.430
270°		.436	.439	.437	.437	.438	.436	.432	.433	.435	.436
300°		.436	.448	.440	.437	.441	.445	.437	.439	.438	.440
330°		.445	.442	.436	.440	.437	.443	.436	.432	.434	

FLOW

ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

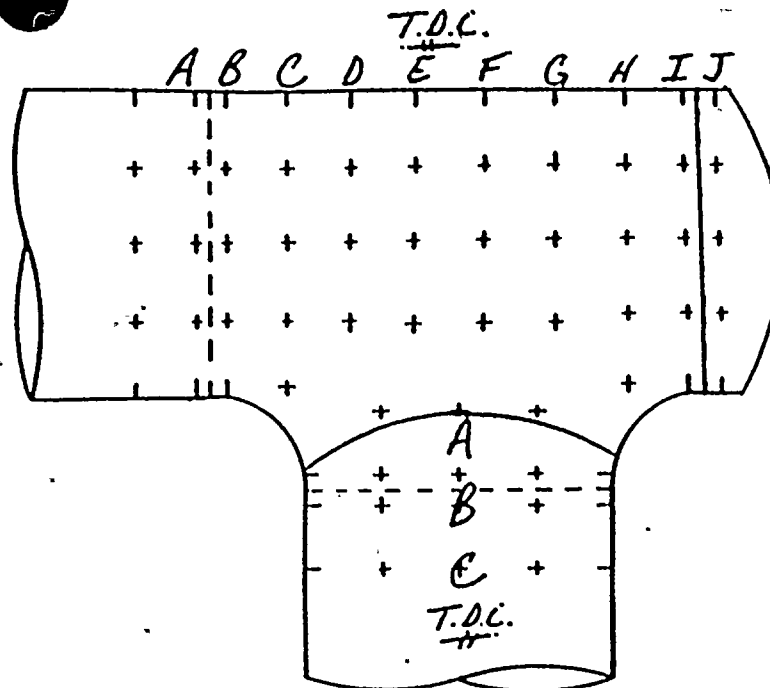
READINGS TAKEN BY:  
 S. VARGO & A. HOLIAR

	A	B	C
0°	.517	.516	.516
30°	.514	.519	.514
60°	.523	.511	.508
90°	.511	.512	.518
120°	.515	.517	.518
150°	.502	.521	.495
180°	.520	.523	.499
210°	.517	.515	.496
240°	.517	.495	.486
270°	.507	.501	.493
300°	.480	.475	.483
330°	.480	.480	.520



JOB ORDER\* 715742  
 ISO. 1-B-9 REV. 2 (K)  
 DATE 4/21/87 TEMP. 74°F  
 PIPE SIZE 36" SCH.

FLOW →



T.D.C.	0°	A	B	C	D	E	F	G	H	I	J
0°	.433	.430	.434	.436	.434	.436	.438	.436	.436	.413	
30°	.433	.424	.432	.429	.430	.428	.431	.435	.427	.434	
60°	.432	.432	.436	.434	.430	.432	.435	.433	.430	.431	
90°	.420	.417	.418	.419	.431	.433	.431	.435	.431	.424	
120°	.435	.426	.432	.433	.419	.438	.430	.423	.435	.419	
150°	.430	.430	.431	—	—	—	.434	.432	.434	.422	
180°	.426	.427	—	—	—	—	.421	.434	.438		
210°	.432	.430	.397	—	—	—	.406	.431	.410	.421	
240°	.438	.434	.430	.414	.415	.423	.434	.430	.415	.430	
270°	.433	.431	.416	.429	.419	.430	.430	.424	.422	.422	
300°	.440	.437	.433	.426	.413	.435	.422	.430	.432	.436	
330°	.440	.435	.433	.432	.431	.430	.434	.435	.432	.436	

↓ FLOW

ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

READINGS TAKEN BY:  
 S. VARGO & A. HODDY

	A	B	C
0°	.519	.510	.501
30°	.524	.519	.515
60°	.511	.518	.519
90°	.518	.517	.520
120°	.516	.514	.514
150°	.515	.523	.518
180°	.515	.517	.513
210°	.518	.518	.505
240°	.508	.510	.513
270°	.512	.519	.514
300°	.497	.503	.481
330°	.510	.512	.510



## EROSION EVALUATION WORKSHEET

Unit No. 1

Years in service //

UT Reading Taken on: 5-7-87  
5-11-87

AEPSI Installed Mat'l Class V-31, ASTM A-155 GR. K670 CLASS I

## COMMENTS

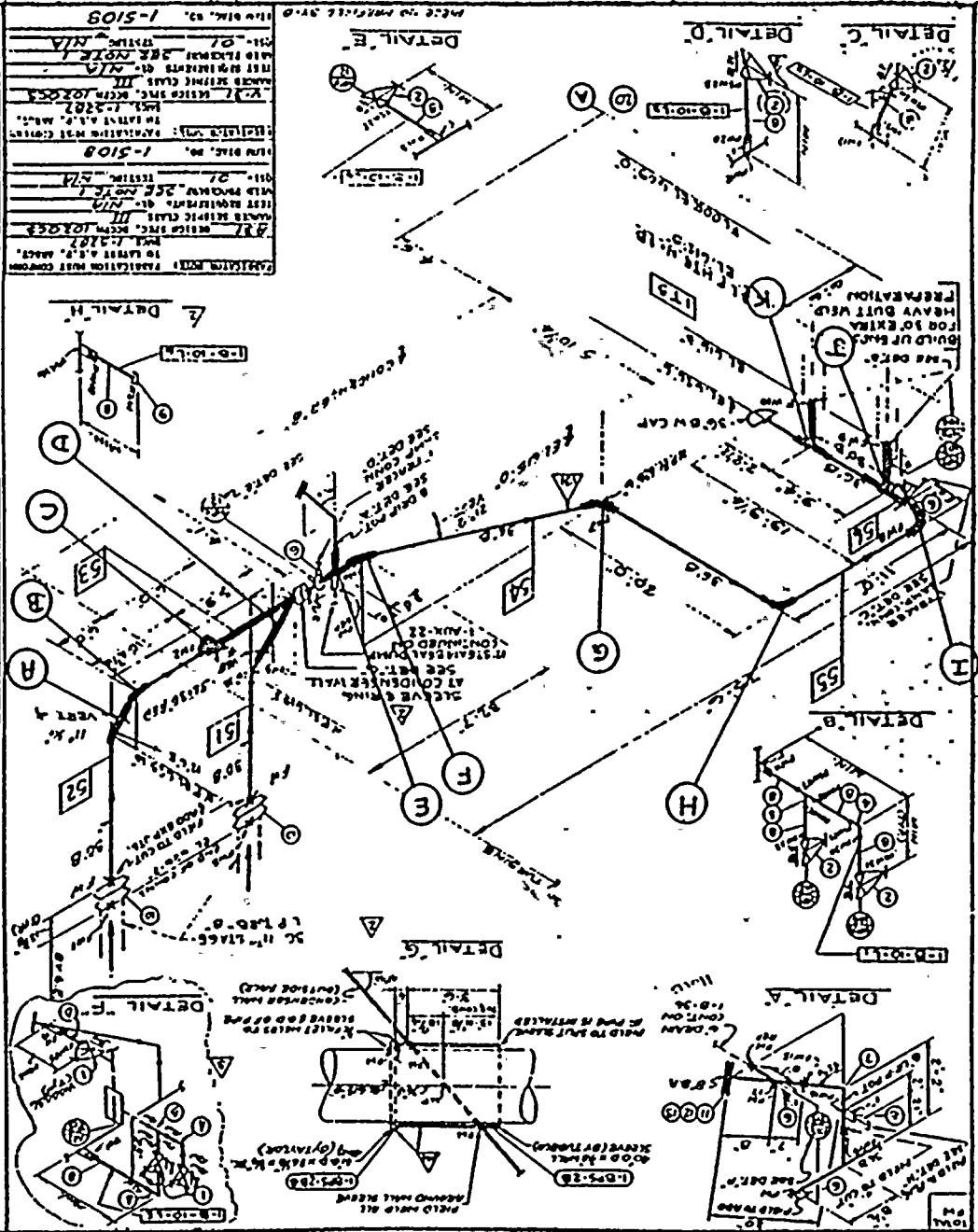
## COMMENTS


I	36" 90° ELL	.375	.328-.422	.165	.423	0	STILL WITHIN MANUFACTURERS TOLERANCE
I	COLUMN A						
I	36" 90° ELL	.375	.328-.422	.165	.370	0	" " " "
J	MAIN HEADER						
J	36x36x30	.375	.328-.422	.165	.404	0	" " " "
J	BRANCH						
J	36x36x30	.375	.328-.422	.148	.526	0	" " " "
K	MAIN HEADER						
K	36x36x30	.375	.328-.422	.165	.401	0	" " " "
K	BRANCH						
K	36x36x30	.375	.328-.422	.148	.531	0	" " " "



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Q. C. 715742



INSPECT:  4000  
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UNCLASSIFIED  
CONTROLLED

1-B-10 REV.3



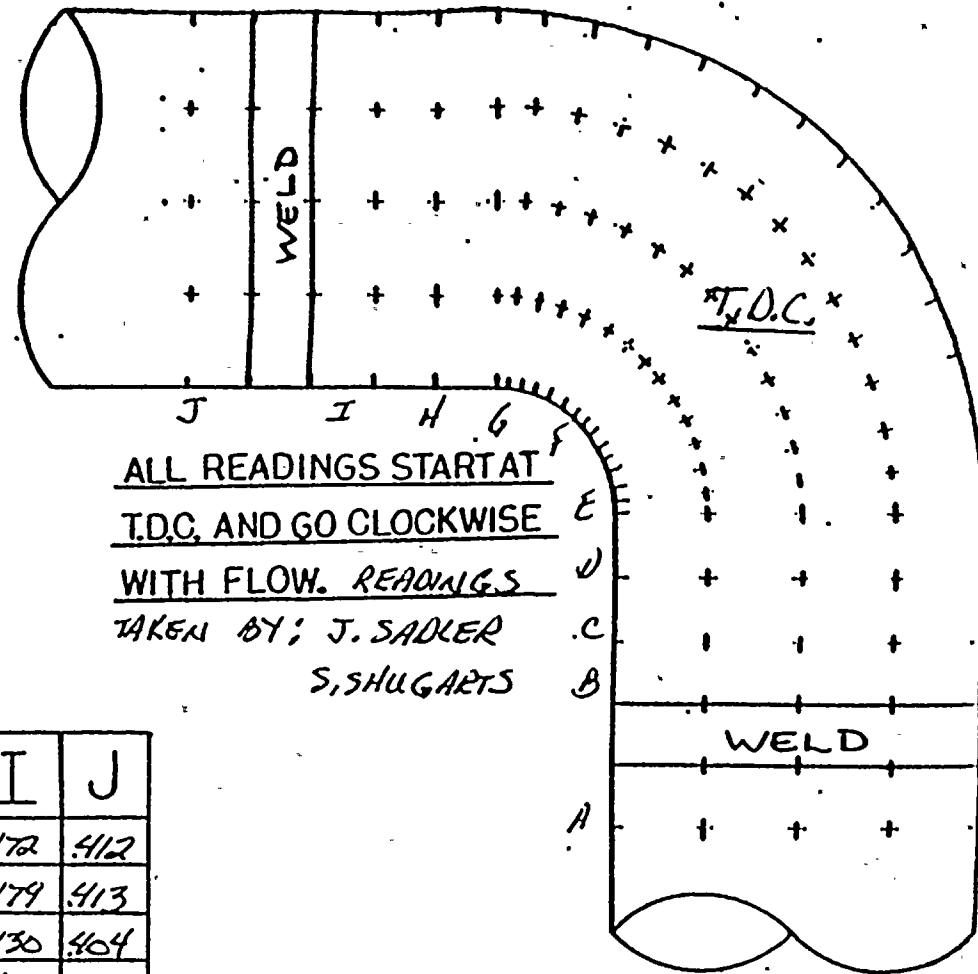
← FLOW

JOB ORDER # 715742

ISO. 1-B-10 REV. 3 (I)

DATE 5/11/87 TEMP. 163°F

PIPE SIZE 36" SCH.



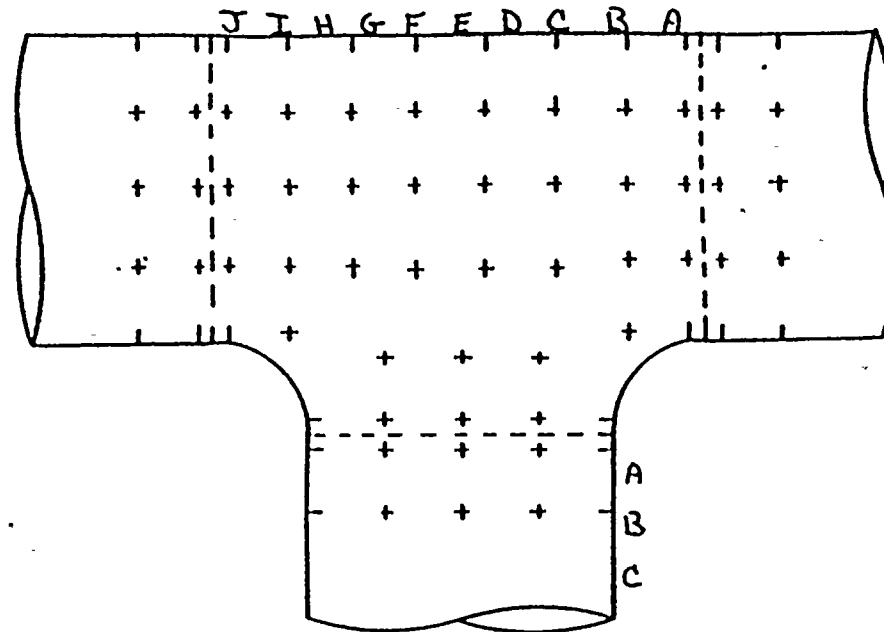
ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW. READINGS  
TAKEN BY: J. SADLER  
S. SHUGARTS

	A	B	C	D	E	F	G	H	I	J
TDC 0°	376	508	515	525	515	497	498	482	472	412
30°	446	474	486	460	479	484	489	467	479	413
60°	452	451	451	458	473	467	447	440	430	404
90°	410	475	478	464	468	444	440	435	423	407
120°	446	495	447	468	483	506	470	474	478	419
150°	468	512	502	505	495	490	501	509	450	420
180°	—	522	537	537	507	504	550	498	577	411
210°	446	524	495	487	493	497	511	472	518	412
240°	446	493	493	481	486	474	464	456	446	408
270°	453	483	481	477	480	474	452	423	438	409
300°	447	488	483	495	501	497	480	476	477	415
330°	414	484	488	497	488	507	483	488	488	412



JOB ORDER# 715742  
 ISO. 1-B-10 REV. 3 ITEM J  
 DATE 5-7-87 TEMP. 164°F  
 PIPE SIZE 36" SCH.

← FLOW



TDC		A	B	C	D	E	F	G	H	I	J
0°		.408	.419	.405	.408	.434	.407	.433	.411	.404	.417
30°		—	—	—	—	—	—	—	—	—	—
60°		.436	.451	.415	—	—	—	—	—	—	—
90°		.404	.402	.405	.410	.410	.415	.414	.410	.433	.461
120°		.433	.412	.410	.413	.409	.412	.425	.433	.422	.404
150°		.415	.426	.408	—	—	.417	.431	.404	.412	.407
180°		.434	.418	.417	—	—	.428	.416	.417	.413	.418
210°		.406	.428	.414	—	—	.411	.415	.414	.414	.430
240°		.409	.410	.439	.407	.454	.436	.420	.413	.414	.417
270°		.404	.412	.411	.413	.419	.422	.412	.410	.408	.409
300°		.407	.403	.407	.406	.409	.410	.408	.411	.409	.404
330°		.402	.411	.410	.417	.410	.412	.402	.412	.412	.411

↓ FLOW

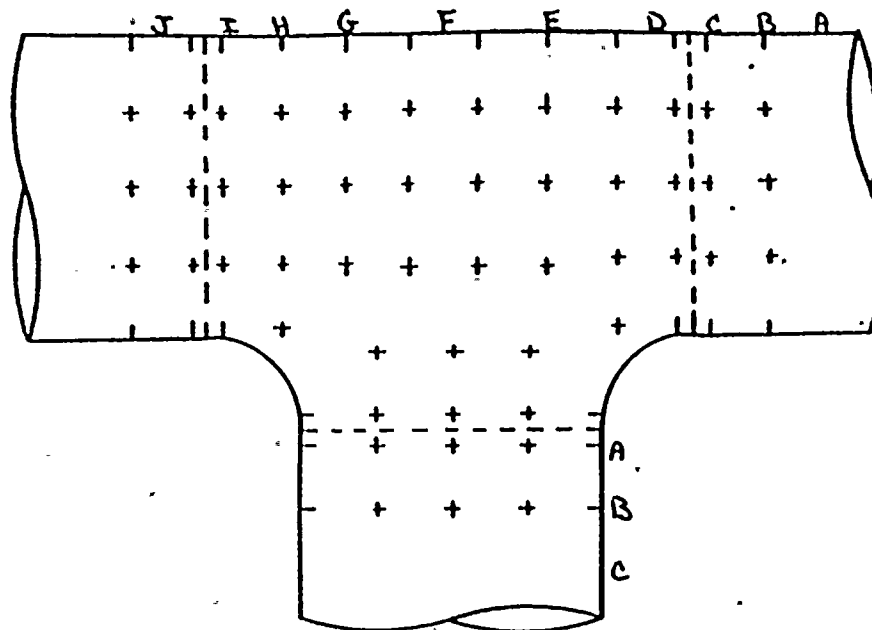
	A	B	C
0°	.536	.526	.563
30°	.536	.541	.547
60°	.549	.543	.582
90°	.539	.543	.545
120°	.575	.550	.552
150°	.565	.552	.576
180°	.543	.569	.577
210°	.577	.544	.548
240°	.549	.553	.550
270°	.542	.560	.543
300°	.544	.563	.572
330°	.541	.549	.550

ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

READINGS TAKEN BY- P. DUKKIN  
 S.H. SHUKARTS



← FLOW



JOB ORDER\*\* 715742  
 ISO. 1-B-10 REV 3 ITEM K  
 DATE 5-7-87 TEMP. 164°F  
 PIPE SIZE 36" SCH.

TDC

	A	B	C	D	E	F	G	H	I	J
0°	.425	.422	.413	.417	.411	.432	.437	.433	.437	.438
30°	-	-	-	-	-	-	-	-	-	-
60°	-	-	-	-	-	-	-	.440	.431	.453
90°	.426	.405	.428	.441	.425	.426	.400	.426	.401	.440
120°	.413	.401	.427	.423	.408	.408	.409	.409	.415	.438
150°	.413	.415	.415	.409	-	-	-	.440	.444	.486
180°	.451	.416	.413	.438	-	-	-	.420	.411	.447
210°	.443	.419	.434	.435	-	-	-	.434	.420	.473
240°	.415	.422	.434	.410	.423	.416	.445	.449	.410	.479
270°	.409	.419	.435	.430	.406	.416	.409	.413	.416	.504
300°	.415	.438	.438	.412	.409	.441	.414	.415	.444	.449
330°	.422	.417	.417	.409	.410	.419	.418	.410	.430	.440

↓ FLOW

	A	B	C
0°	.559	.564	.585
30°	.531	.546	.559
60°	.582	.581	.559
90°	.567	.568	.598
120°	.566	.570	.557
150°	.575	.577	.551
180°	.535	.548	.548
210°	.546	.569	.549
240°	.578	.583	.548
270°	.544	.538	.584
300°	.581	.579	.556
330°	.581	.534	.536

ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

READINGS TAKEN BY - P. DURKIN  
 S.H. SHUGARTS



D. C. COOK NUMBER PLANT

# EROSION EVALUATION WORKSHEET

NEPSC Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam) X

Unit No. 1

Evaluation Date: SEPTEMBER 13, 1987

SER No. 23-85 (Water)

Years in service 11

UT Reading Transmitted on: AUGUST 19, 1987

UT Reading Taken on: 4-28-87  
4-29-87

Isometric Dwg. NO. 1-B-11 REV. 3

AEPSI Installed Mat'l Class V-31, ASTM A-155 GR. KC70 CLASS I

Plant

(I.D.)

Comp.

Component

### Description

Original

Wall Thk.

Original

Thk. Range

Req'd

Trin

Lowest

## Reading

Percent

Eroded

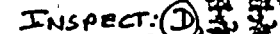
## COMMENTS

[illegible]



OC J.O.# 715742

ISOMETRIC SHEET NO. 12



DO NOT INSPECT  
540027

12 FEB 1977

R.O. <sup>W</sup>	PIECE MARKS	FAB.
	1-B-57	SWAN

282  1-OPS-10 TUBCO  
1-OPS-10-6 TAYLOR

SITE FAB. PIECE MARKS  
1-B-11-L<sub>1</sub>

**NOTE**

NOTE  
1. WELDING PROCEDURE TO BE AS FOLLOWS:  
CARBON STEEL 2" & UNDER =  
5/8 3/4" & OVER UP TO 7/8" WALL =  
C/S OVER 7/8" WALL =

REV	DATE	CODE	DESCRIPTION	P.D.	OWN
5	2-11-72	MTJ	REVISD BY NPS DESIGN FOR A.S.P. DWG. 1-5287 REVIS ADDED ITEM 3 SITE, DETS 9, 10, SITE PAC. PC. NCS 1-B-11-L6, PC. NCS 1-B-11- 1-SPE-10-B (RELOCATED HOLD, DET 1) QTY 5 WAS 4, RELOCATED NETWORK. NCS-311 WAS NCS-210, REWAS HOLD ON PC. NCS 1-B-8T 650. CODE STRAP FOR A-3110K, RELOC HOLD PROGRESSIVE DESIGNATION 4 ADDED HOLD ON A-3110K CONN.	NO ACTION REQD	
		DT	REVISD BY NPS DESIGN FOR A.S.P. DWG. 1-5287 REVIS ADDED ITEM 3 SITE, DETS 9, 10, SITE PAC. PC. NCS 1-B-11-L6, PC. NCS 1-B-11- 1-SPE-10-B (RELOCATED HOLD, DET 1) QTY 5 WAS 4, RELOCATED NETWORK. NCS-311 WAS NCS-210, REWAS HOLD ON PC. NCS 1-B-8T 650. CODE STRAP FOR A-3110K, RELOC HOLD PROGRESSIVE DESIGNATION 4 ADDED HOLD ON A-3110K CONN.	FIELD ACTION REQD	
	2-14-72	TJB	REVISD BY NPS DESIGN FOR A.S.P. DWG. 1-5287 REVIS ADDED ITEM 3 SITE, DETS 9, 10, SITE PAC. PC. NCS 1-B-11-L6, PC. NCS 1-B-11- 1-SPE-10-B (RELOCATED HOLD, DET 1) QTY 5 WAS 4, RELOCATED NETWORK. NCS-311 WAS NCS-210, REWAS HOLD ON PC. NCS 1-B-8T 650. CODE STRAP FOR A-3110K, RELOC HOLD PROGRESSIVE DESIGNATION 4 ADDED HOLD ON A-3110K CONN.	FIELD ACTION REQD	
		DT	REVISD BY NPS DESIGN FOR A.S.P. DWG. 1-5287 REVIS ADDED ITEM 3 SITE, DETS 9, 10, SITE PAC. PC. NCS 1-B-11-L6, PC. NCS 1-B-11- 1-SPE-10-B (RELOCATED HOLD, DET 1) QTY 5 WAS 4, RELOCATED NETWORK. NCS-311 WAS NCS-210, REWAS HOLD ON PC. NCS 1-B-8T 650. CODE STRAP FOR A-3110K, RELOC HOLD PROGRESSIVE DESIGNATION 4 ADDED HOLD ON A-3110K CONN.	FIELD ACTION REQD	
1	2-23-72	TJB	REVISD BY NPS DESIGN FOR A.S.P. DWG. 1-5287 REVIS ADDED ITEM 3 SITE, DETS 9, 10, SITE PAC. PC. NCS 1-B-11-L6, PC. NCS 1-B-11- 1-SPE-10-B (RELOCATED HOLD, DET 1) QTY 5 WAS 4, RELOCATED NETWORK. NCS-311 WAS NCS-210, REWAS HOLD ON PC. NCS 1-B-8T 650. CODE STRAP FOR A-3110K, RELOC HOLD PROGRESSIVE DESIGNATION 4 ADDED HOLD ON A-3110K CONN.	FIELD ACTION REQD	

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIEGMAN MICHIGAN

UNIT NO. 1

[illegible]

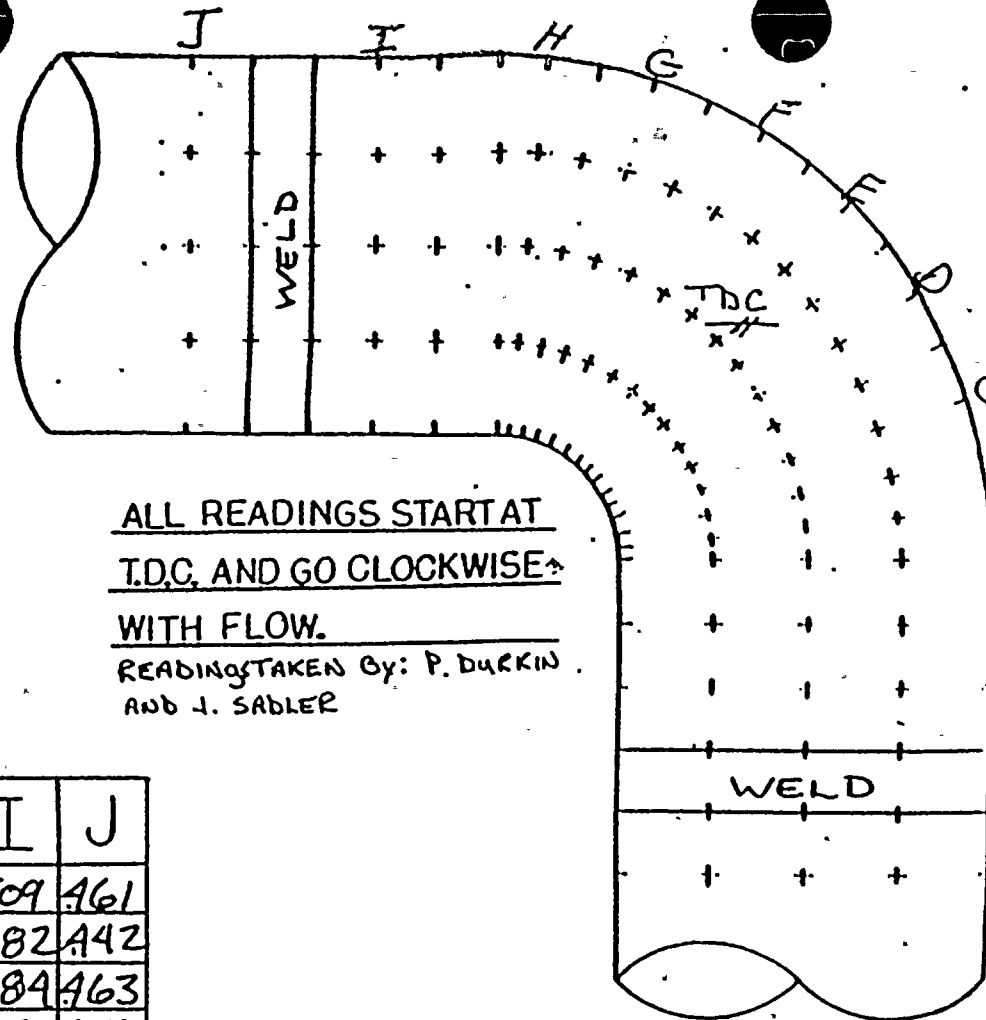
**MATERIAL REQUIRED FOR  
FIELD WORK**

UNCONTROLLED  
DOCUMENT

DWG NO 1-B-11 REV. 3



← FLOW



JOB ORDER# 715742

ISO. 1-B-11 REV. 3 (I)

DATE 4-28-87 TEMP. 144°F

PIPE SIZE 36" SCH.

ALL READINGS START AT

T.D.C. AND GO CLOCKWISE

WITH FLOW.

READINGS TAKEN BY: P. DUKIN  
AND J. SABLER

	A	B	C	D	E	F	G	H	I	J
TDC 0°	398	528	540	528	502	499	486	512	509	461
30°	395	489	510	529	500	492	514	485	482	442
60°	420	499	538	521	503	471	503	482	484	463
90°	423	492	460	506	503	510	522	489	450	459
120°	417	487	425	500	478	469	509	462	456	423
150°	408	482	482	493	489	478	487	490	494	465
180°	405	479	480	525	530	482	476	510	498	461
210°	392	487	481	475	482	466	460	470	454	430
240°	394	499	485	457	453	467	442	452	450	450
270°	374	511	465	485	482	474	446	455	451	464
300°	384	509	509	490	465	482	462	471	468	469
330°	400	519	533	512	488	495	482	485	479	456



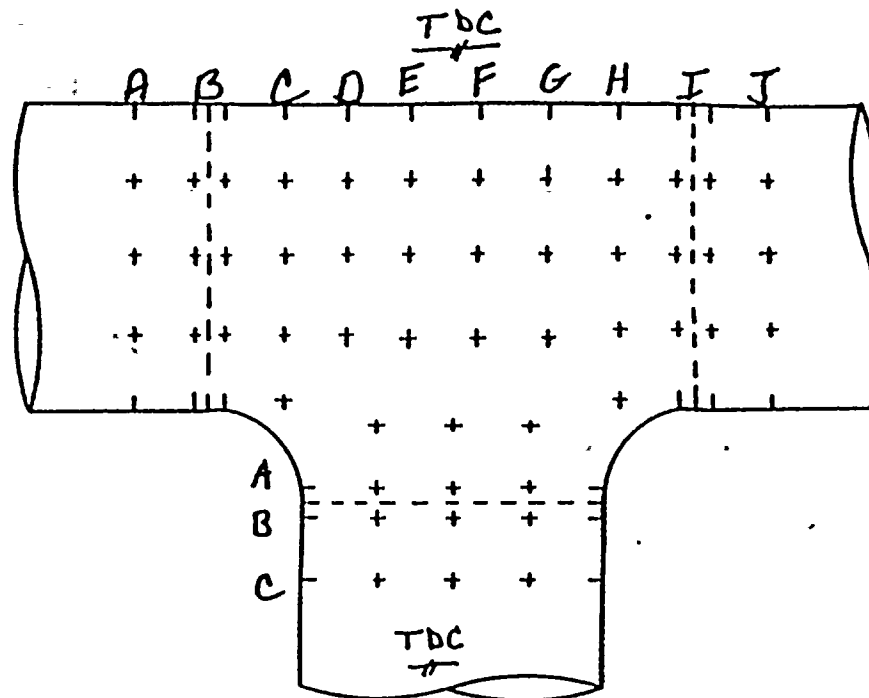
JOB ORDER\* 715742

ISO. 1-B-11 REV. 3 (✓)

DATE 4-28-87 TEMP. 146°F

PIPE SIZE 36" 30 SCH.

J  
FLOW →



TDC		A	B	C	D	E	F	G	H	I	J
0°		416	418	425	420	423	426	430	430	428	434
30°		430	431	457	428	460	433	429	431	432	437
60°		415	430	425	446	438	435	436	436	433	437
90°		428	407	435	458	437	439	437	438	435	436
120°		430	430	430	433	NA	428	433	434	433	437
150°		420	425	430	NA	NA	NA	NA	437	439	439
180°		426	446	425	NA	NA	NA	NA	436	432	439
210°		432	436	430	NA	NA	NA	NA	433	428	437
240°		428	425	433	NA	NA	NA	NA	431	434	435
270°		422	429	430	432	429	428	430	428	427	427
300°		436	420	436	440	442	430	435	430	426	432
330°		434	426	421	430	435	431	435	437	436	434

FLOW ↓  
TDC

	A	B	C
0°	520	525	528
30°	524	527	523
60°	522	520	525
90°	521	525	526
120°	521	525	523
150°	527	528	530
180°	528	532	523
210°	523	524	518
240°	525	527	529
270°	540	543	538
300°	530	530	529
330°	532	526	529

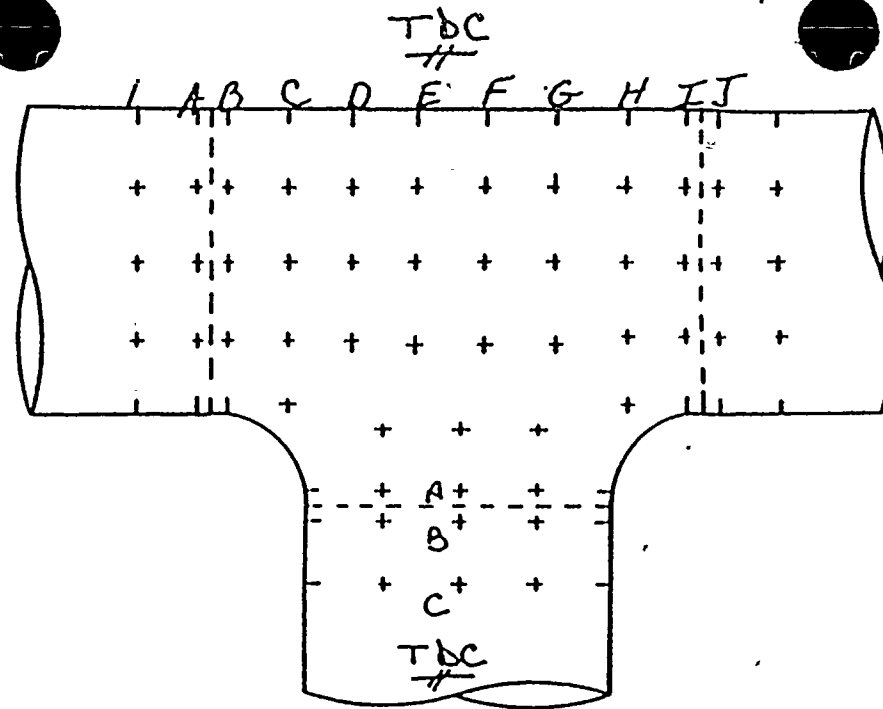
ALL READINGS START  
AT T.D.C. AND GO  
CLOCKWISE WITH  
FLOW.

READINGS TAKEN By: T. DUKIN  
AND T. SABLEK



JOB ORDER\* 715742  
 ISO. 1-B-11 REV. 3 (K)  
 DATE 4-29-87 TEMP. 147°F  
 PIPE SIZE 36" SCH.

K.  
 FLOW. →



TDC		A	B	C	D	E	F	G	H	I	J
	0°	479	439	462	448	473	477	469	466	463	480
	30°	432	418	459	461	426	434	437	453	467	484
	60°	472	434	436	430	496	432	460	460	470	452
	90°	445	437	438	491	447	445	465	464	468	441
	120°	418	429	435	435	461	455	474	473	478	484
	150°	421	440	442	-	-	-	-	450	427	478
	180°	448	423	496	-	-	-	-	426	456	474
	210°	400	444	456	-	-	-	-	456	456	468
	240°	436	447	459	458	458	395	458	454	435	481
	270°	451	413	440	448	449	499	423	427	452	431
	300°	423	420	455	453	450	463	450	458	453	456
	330°	454	451	455	461	499	455	449	453	452	459

FLOW ↓

	A	B	C
0°	528	558	557
30°	539	556	530
60°	560	555	551
90°	560	557	559
120°	568	537	560
150°	528	554	555
180°	542	551	565
210°	581	568	563
240°	569	561	566
270°	563	560	563
300°	531	563	562
330°	556	537	559

ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

READINGS TAKEN By: J. DUCKIN  
 AND J. SADLER



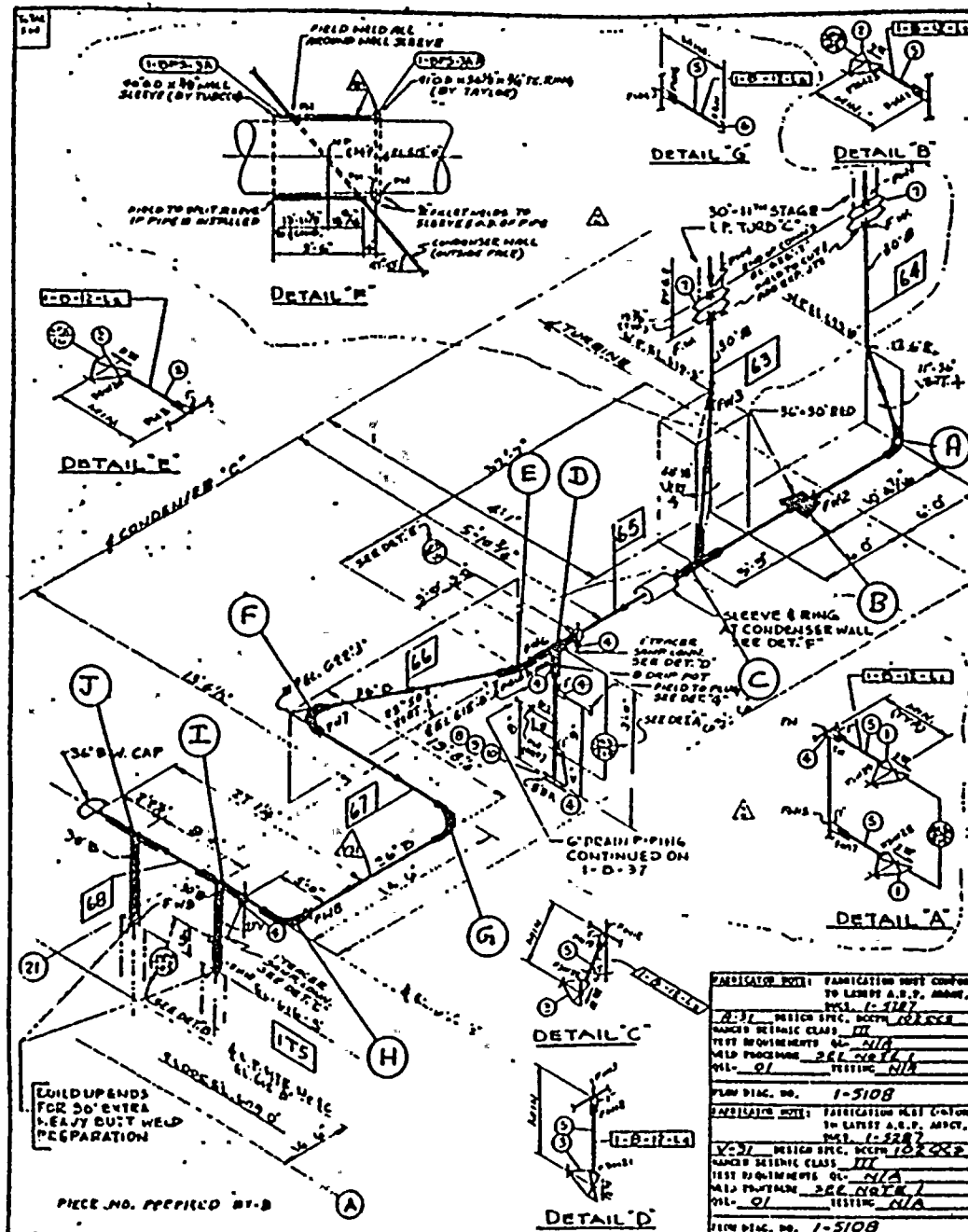
# EROSION EVALUATION WORKSHEET

I	36x36x30	:375	:328	:422	:165	:446	-0	STILL WITHIN MANUFACTURERS TOLERANCE
I	BRANCH							" " " "
I	36x36x30	:375	:328	:422	:148	:487	-0	" " " "
I	MAIN HEADER							" " " "
J	36x36x30	:375	:328	:422	:165	:421	-0	" " " "
J	BRANCH							" " " "
J	36x36x30	:375	:328	:422	:148	:519	-0	" " " "



QC J. 015742


J.O.# 715744



INSPECT: (C) 王

DO NOT IMPRINT  
(b) (7)(C)

P.O. # PRICE MARKS FAB.  
1-B-68 SHAW

202        1-SPS-3A    TURSCO  
1-OPS-3A-A    TAYLOR

SITE CAR. PIECE MARKS  
1-B-12-L

**NOTE**

1. WELDING PROCEDURE TO BE AS FOLLOWS:

CARBON STEEL 2" & UNDER	=
C/S $5/8$ " & OVER UP TO $3/4$ " WALL	=
C/S OVER $3/4$ " WALL	=

A

2	24-72	BT	REVISED BY NPS DESIGN PER A.S.P. DWG. 1-5827 REV.1 ADDED ITEMS ①②③, DETS ①②, ③ SITE PLAN, PL. ME. 1-B-12-14, R. ME. 1-BPS-34, 1-BPS-3A, A REMOVED HOLD, ITEM ④ STYSB, REMOVED INST. CONN. ME. 3-M NPS ME. 3IS, REMOVED HOLD ON PLANS 1-B-63 & 44 CODE STAMP FOR A-3 SPEC (DATED NPD PRELIMINARY DEDICATION)	FIELD ACTION REQD	FAB ACTION REQD
1	0-29-71	BT	REVISED BY NPS DESIGN PER A.S.P. DWG. 1-5827 REV.1 ADDED ITEMS ①②③, DETS ① A TO B, SITE PLAN, PL. ME. 1- B-12-14, T. FAS, ME. 1-B-12-14, 44 CODE STAMP. HOLD PLANS 1-B-63 & 64.	FIELD ACTION REQD	
REV	DATE	CODE	DESCRIPTION	P.A.	DWG.

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN MICHIGAN

UNIT NO. 1

[illegible]

### MATERIAL REQUIRED FOR FIELD WORK

UNCONTROLLED  
DOCUMENT

DATE

1-B-12 REV.2



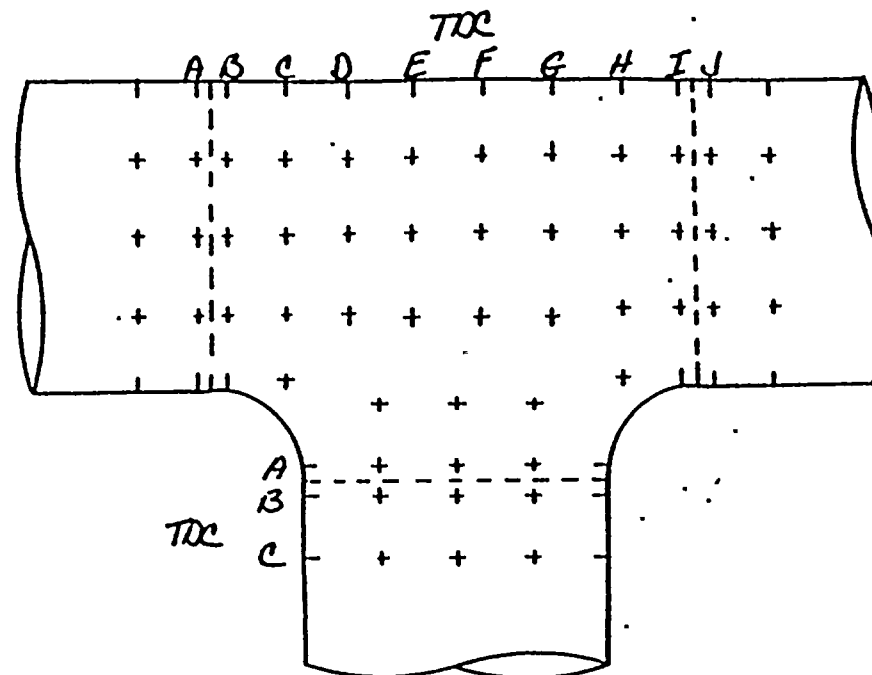
JOB ORDER\* 715742

ISO. 1-D-12 REV. 2 (I)

DATE 4-24-87 TEMP. 124°F.

PIPE  
SIZE 36" SCH.

FLOW



TDC		A	B	C	D	E	F	G	H	I	J
	0°	482	489	496	494	491	491	493	467	498	470
	30°	477	478	480	481	487	486	490	490	487	488
	60°	477	485	481	482	484	486	487	484	488	496
	90°	496	478	477	484	480	482	482	481	479	467
	120°	475	478	477	470	470	477	478	479	471	478
	150°	489	481	482	470	NA	NA	NA	472	478	478
	180°	485	487	485	485	NA	NA	NA	487	483	474
	210°	484	466	482	475	NA	NA	NA	NA	483	499
	240°	477	480	477	482	484	490	490	496	480	478
	270°	480	488	486	484	486	487	492	489	484	488
	300°	483	485	482	481	489	489	491	490	487	473
	330°	485	487	491	485	488	491	499	488	483	473

FLOW

	A	B	C
0°	542	522	538
30°	535	530	542
60°	577	593	569
90°	502	568	573
120°	487	504	574
150°	571	544	528
180°	577	547	577
210°	575	577	577
240°	545	576	579
270°	578	580	581
300°	554	565	563
330°	554	576	552

ALL READINGS START  
AT T.D.C. AND GO  
CLOCKWISE WITH  
FLOW.

READINGS TAKEN By: D. DUCKIN  
AND J. SADLER



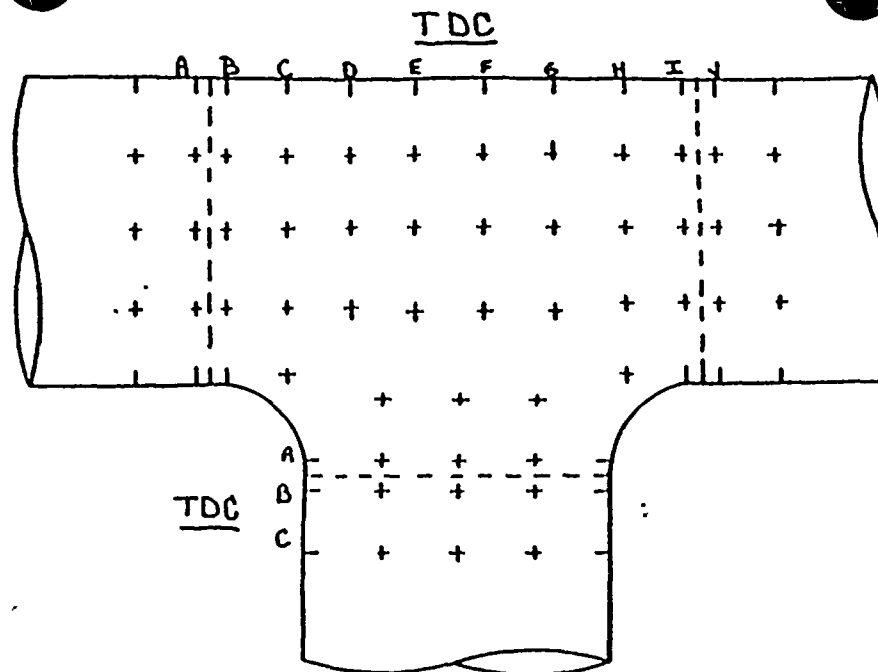
JOB ORDER# 715742

ISO. 1-B-12 REV. 2

DATE 4-24-87 TEMP. 124°F

PIPE SIZE 30" SCH.

FLOW



TDC		A	B	C	D	E	F	G	H	I	J
0°	470	443	470	464	473	473	482	476	462	470	
30°	473	446	468	465	470	470	481	492	471	463	
60°	447	450	464	460	473	472	481	474	466	460	
90°	444	466	463	461	466	471	480	493	489	482	
120°	462	461	465	456	458	463	473	476	470	475	
150°	462	454	458	—	—	460	466	480	485	484	
180°	459	443	472	—	—	431	475	477	481	483	
210°	478	475	480	—	—	478	481	480	483	486	
240°	490	461	480	441	436	440	475	483	474	474	
270°	487	494	483	482	487	465	485	492	481	483	
300°	483	452	483	482	486	460	473	482	493	491	
330°	488	455	482	485	494	497	464	480	494	484	

FLOW

TDC

	A	B	C
0°	.574	.572	.545
30°	.533	.531	.546
60°	.536	.515	.523
90°	.577	.576	.579
120°	.577	.578	.583
150°	.576	.577	.523
180°	.591	.575	.581
210°	.572	.576	.583
240°	.578	.583	.579
270°	.575	.572	.564
300°	.540	.538	.540
330°	.519	.527	.584

ALL READINGS START  
AT T.D.C. AND GO  
CLOCKWISE WITH  
FLOW.

READINGS TAKEN BY: P. DUKIN  
AND J. SADLER







WEEK # 16

CONST: J.O.# 715743

QC: 10-115742

J.O. # 715744

ISOMETRIC SHEET NO. 497

INSPECT: ② 生理

DO NOT WRITE IN  
OFF 4-20-67

P.O.#	PIECE MARKS	FAR.
	1-B-69	SHAW


**202**                      -74  
1- BPS-2A  
1- BPS-2A-A

SITE FAB. PIECE MARKS  
1-B-13-L,

**NOTE**

1. WELDING PROCEDURE TO BE AS FOLLOWS:

CARBON STEEL 2" & UNDER	=	
C/S 2 1/2" & OVER UP TO 3/4" WALL	=	
C/S OVER 3/4" WALL	=	



3	1-2-73	JPT	<p>ARRIVED BY AIR DESIG:          1-2-73 10:00 AM. 1-2-73 10:00 AM.          1-2-73 10:00 AM. 1-2-73 10:00 AM.          1-2-73 10:00 AM. 1-2-73 10:00 AM.</p>	<p>1-2-73 10:00 AM.          1-2-73 10:00 AM.</p>	
2	2-16-72	BT	<p>REVISED BY NPS DESIGN          PER A.B.P. DWG. 1-5527 REQ'D          ADDED ITEM TO ①, DATS 4 SH.          SITE FAB. P.C. MKS. 1-B-10-L, 1-B-10-R,          1-B-10-A, 1-B-10-B, 1-B-10-C,          QTY'S WAS 4, RELOCATED ITEM ①, COMM.          NLS - 212 WAS NLS - 213, REMOVED          HOLD ON PL. MKS. 1-B - 69 F 70,          CODE STAMP FOR A-B SPEC. DATED          WELD REPAIRS OBSERVATION</p>	<p>FIELD          ACTION          REQ'D</p> <p>FAB.          ACTION          REQ'D</p>	
1	10-29-72	BT	<p>REVISED BY NPS DESIGN          PER A.B.P. DWG. 1-5527 REQ'D          ADDED ITEMS ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩, ⑪, ⑫, ⑬, ⑭, ⑮, ⑯, ⑰, ⑱, ⑲, ⑳, ㉑, ㉒, ㉓, ㉔, ㉕, ㉖, ㉗, ㉘, ㉙, ㉚, ㉛, ㉜, ㉝, ㉞, ㉟, ㊱, ㊲, ㊳, ㊴, ㊵, ㊶, ㊷, ㊸, ㊹, ㊺, ㊻, ㊼, ㊽, ㊾, ㊿, 1-B-10-L, 1-B-10-R, 1-B-10-A, 1-B-10-B, 1-B-10-C, QTY'S WAS 4, RELOCATED ITEM ①, COMM. NLS - 212 WAS NLS - 213, REMOVED HOLD ON PL. MKS. 1-B - 69 F 70, CODE STAMP FOR A-B SPEC. DATED WELD REPAIRS OBSERVATION</p>	<p>FIELD          ACTION          REQ'D</p>	
REV.	DATE	CODE	DESCRIPTION	P.O.	DWG.

INDIANA & MICHIGAN ELECTRIC COMPANY

**DONALD C. COOK NUCLEAR PLANT**

**BRIDGMAN**

## UNIT NO. 1

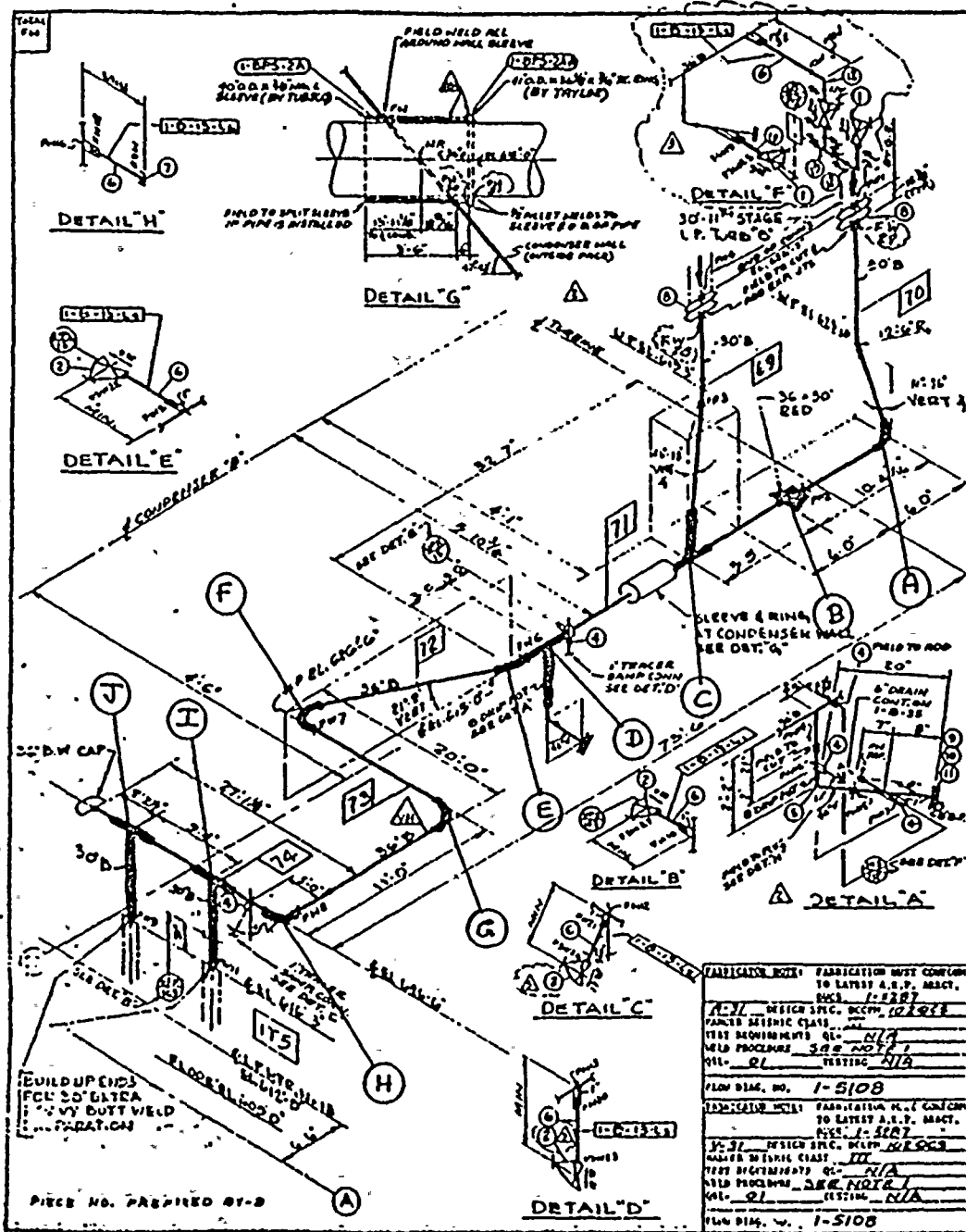
A-13		A-100		A-130		A-212		A-18		SHEETS		PAGE 07 OF 12, OF 12													
<div style="display: flex; justify-content: space-between;"> <span>NOV 27 1977</span> <span>10 30 30 30 30 30 30 30 30 30 30 30</span> </div>												<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>		<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>		<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>		<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>		<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>		<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>		<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>	
<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>												<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>		<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>		<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>		<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>		<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>		<div style="display: flex; justify-content: space-between;"> <span>0000</span> <span>0000</span> </div>			
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**MATERIAL REQUIRED FOR  
FIELD REWORK -**

..ROLLED  
..MENT

**DWG NO**

1-B-13-REV.3





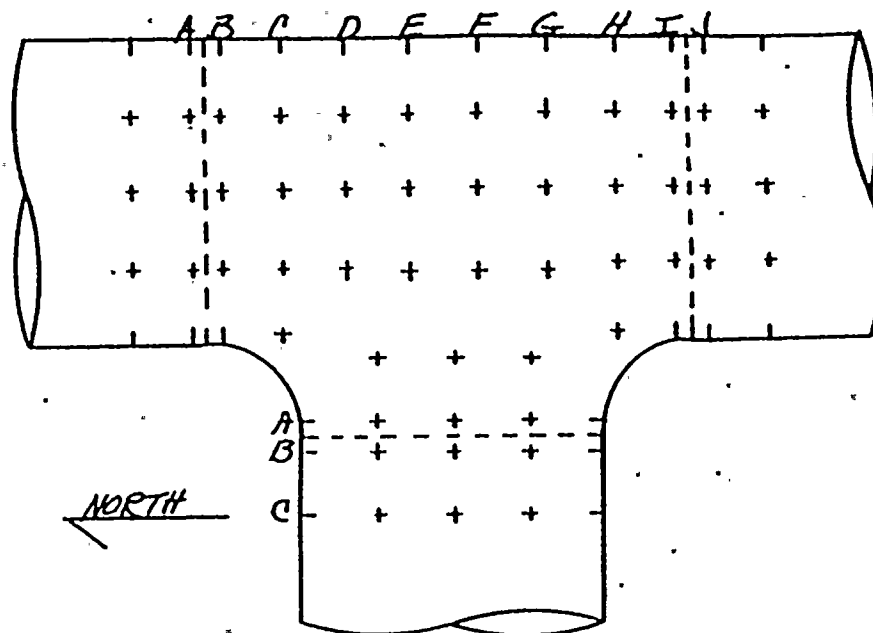
JOB ORDER# 715742

ISO. 1-B-13 REV. 3 (I)

DATE 5-6-87 TEMP. 172°F

PIPE  
SIZE 36"/30" SCH.

READINGS TAKEN BY: P. DUKIN / J. SAWLER



NORTH

FLOW

	A	B	C	D	E	F	G	H	I	J
TDC 0°	449	492	469	466	-	-	-	-	-	-
30°	476	471	473	470	470	472	466	467	499	471
60°	481	484	466	425	464	464	465	469	466	465
90°	487	467	446	438	435	462	468	466	465	464
120°	493	466	460	464	453	442	458	470	467	479
150°	497	442	-	-	-	-	467	471	461	472
180°	493	458	-	-	-	-	459	469	462	465
210°	456	444	473	-	-	466	495	470	466	443
240°	507	469	470	-	-	466	456	465	467	439
270°	470	469	468	470	429	475	496	462	465	467
300°	498	471	487	443	430	474	442	433	437	488
330°	459	470	469	472	443	465	457	459	450	

ALL READINGS START  
AT T.D.C. AND GO  
CLOCKWISE WITH  
FLOW. TDC IS NORTH  
ON VERTICAL PIPE.

	A	B	C
0°	574	567	581
30°	558	570	548
60°	570	572	573
90°	565	574	567
120°	570	576	573
150°	584	567	575
180°	563	566	560
210°	567	569	566
240°	575	574	570
270°	566	570	560
300°	576	573	569
330°	568	571	



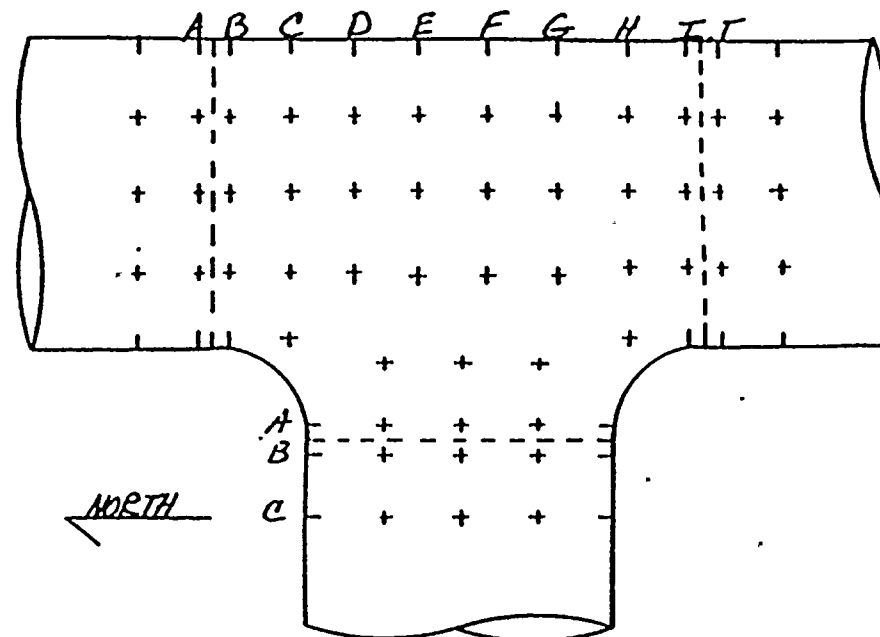
JOB ORDER # 715742

ISO. 1-B-13-REV. 3 (J)

DATE 5-6-87 TEMP. 180°F

PIPE  
SIZE 36"/30" SCH.

READINGS TAKEN By: P. DURKIN/J. SAOLER



TDC		A	B	C	D	E	F	G	H	I	J
0°	—	471	471	438	438	438	470	419	456	476	
30°		445	439	439	445	482	466	474	431	484	472
60°		441	437	433	418	439	441	417	461	438	444
90°		432	433	406	437	410	437	438	442	477	461
120°		431	431	439	435	416	413	440	442	462	461
150°		425	426	432	412	—	—	410	410	427	462
180°		402	400	431	421	—	—	431	402	421	428
210°		434	435	437	435	—	—	434	431	428	423
240°		425	441	442	438	434	460	431	438	435	429
270°		444	439	439	437	436	465	437	442	441	434
300°		449	445	444	445	452	425	443	440	446	437
330°		—	—	—	—	—	—	—	—	—	—

FLOW ↓

ALL READINGS START  
AT T.D.C. AND GO  
CLOCKWISE WITH  
FLOW. T.D.C. IS NORTH  
ON VERTICAL PIPE

	A	B	C
0°	548	525	514
30°	518	512	509
60°	505	502	517
90°	542	558	559
120°	542	548	559
150°	543	543	544
180°	538	546	538
210°	554	545	540
240°	540	539	540
270°	526	543	542
300°	521	541	548
330°	505	519	526



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

SER No. 88-84 (Steam) X

Unit No. 1

SER No. 23-85 (Water)

Years in service 11

UT Reading Taken on: 4-30-87

UT Reading Taken on: 4-30-87

AEPSI Installed Mat'l Class V-31, ASTM A-155 GR. KC70 CLASS I

AEPSI Installed Mat'l Class V-31, ASTM A-155 GR. K670 CLASS I

(I.D.)

Component	Description
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Original  
Thk. Range

Req'd  
Tmin

Lowest  
Reading

Percent Eroded

## COMMENTS

ITEM	DESCRIPTION	QTY	UNIT PRICE	TOTAL PRICE	TAX	NET TOTAL	REMARKS
I	36X36X30 BRANCH	375	328.422	165	423	0	STILL WITHIN MANUFACTURERS TOLERANCE
I	36X36X30 MAIN MEMBER	375	328.422	148	468	0	" " " "
J	36X36X30 BRANCH	375	328.422	165	405	0	" " " "
J	36X36X30	375	328.422	148	493	0	" " " "



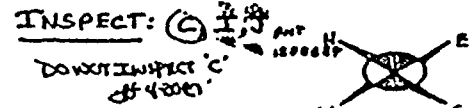
WEEK #16

CONST: 3.0.# 715743

J.O.# 715244

OC : J.O #715742

ISOMETRIC SHEET NO. 99B



20. PIECE MARKS FAB:  
1-B-75 SHAW  
-76  
-77  
-78  
-79  
-80  
282 1-BPS-1A TUBERO  
1-BPS-1A TAYLOR  
SITE FAB PIECE MARKS

NOTE 1. WELDING PROCEDURE TO BE AS FOLLOWS:  
CARBON STEEL 2" UNDER  
C/S 3/8" OVER UP TO 1/4" WALL  
C/S OVER 1/4" WALL

REV.	DATE	CODE	DESCRIPTION	PQ.	OWN
2	2-17-72	BT	<p>REVISED BY NPS DESIGN PER A.B.R. DWS. 1-5287 REV.3 ADDED ITEMS D.B. DETS "6", SITE FAB. FC. MK. 1-B-19-L, R. MK. 1-B-18-1A, 1-B-19-1A-1A REMOVED HOLD, ITEM# 875 IN NS, ELICATED INST. (CONN. M.S. 20 M.S. M.S. 21, REMOVED HOLD ON A. NOTE B-75 IN CODE STAMP FOR A. 1-5166 (M.S. 1A) FIELD REQUEST DESIGNATION</p>	FIELD ACTION REQD	
1	4-29-73	MT	<p>REVISED BY NPS DESIGN PER A.B.P. DWS. 1-5287 REV.1 ADDED ITEMS (313131) "A" TO "B" SITE FAB. FC. MKS 1-B-18-L, 1-B-L, R. MK. 1-B-18-1A 1 CODE STAMP. HOLD FC. MKS 1-B-75 76</p>	FIELD ACTION REQD	

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN MICHIGAN  
UNIT NO. 1

[illegible]

**MATERIAL REQUIRED FOR  
FIELD REWORK**

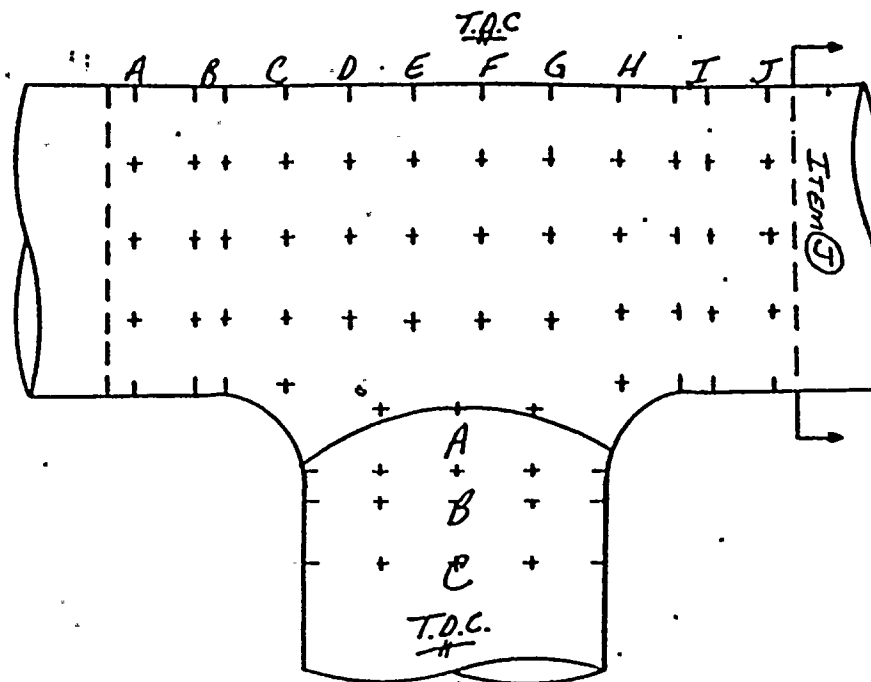
UNCONTROLLED  
DOCUMENT

DWG NO 1 D 14 05112



JOB ORDER# 715742  
 ISO. 1-B-14 REV. 2 ITEM(I)  
 DATE 4/30/87 TEMP. 157°F  
 PIPE SIZE 3/6" SCH.

FLOW →



TDC		A	B	C	D	E	F	G	H	I	J
0°		.434	.440	.438	.441	.441	.433	.426	.432	.428	.432
30°		.439	.441	.431	.428	.427	.426	.428	.423	.428	.426
60°		.431	.423	.432	.420	.430	.427	.423	.424	.425	.428
90°		.436	.435	.429	.436	.427	.432	.426	.433	.429	.423
120°		.439	.429	.430	.426	.448	.431	.428	.436	.426	.430
150°		.434	.432	.438	—	—	.438	.432	.435	.435	.439
180°		.444	.438	.442	—	—	.437	.435	.433	.432	.434
210°		.448	.441	.451	—	—	.437	.442	.437	.433	.438
240°		.450	.444	.452	.443	.434	.433	.436	.433	.431	.435
270°		.435	.433	.447	.449	.434	.435	.433	.437	.436	.427
300°		.445	.447	.447	.445	.431	.432	.432	.422	.428	.428
330°		.439	.446	.445	.445	.432	.435	.430	.442	.433	

↓ FLOW

ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

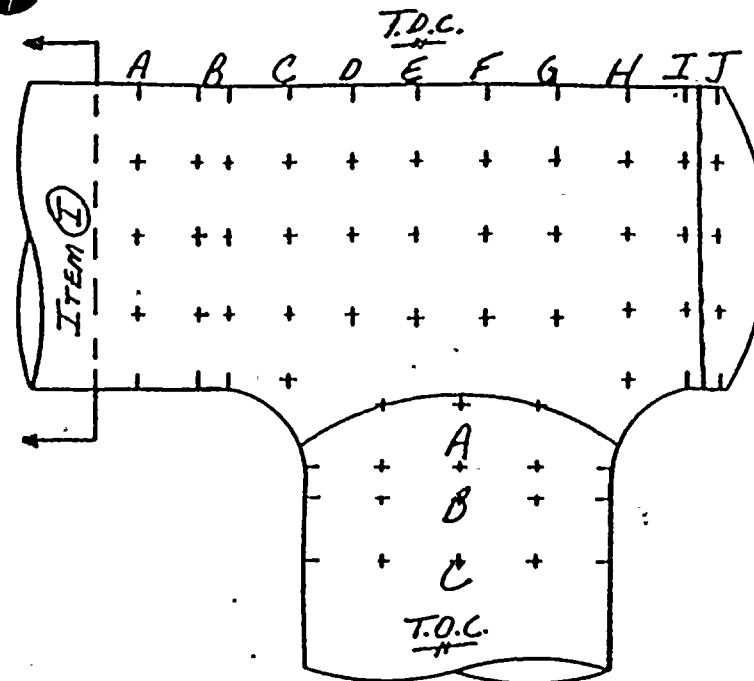
READINGS TAKEN BY:  
 S. VARGO & J. POLLEY

	A	B	C
0°	.521	.531	.515
30°	.527	.532	.521
60°	.532	.525	.527
90°	.535	.536	.533
120°	.533	.538	.537
150°	.538	.534	.535
180°	.537	.532	.534
210°	.468	.520	.519
240°	.500	.513	.517
270°	.514	.496	.503
300°	.525	.499	.496
330°	.528	.513	



JOB ORDER# 715742  
 ISO. 1-B-14 REV. 2 ITEM ①  
 DATE 4/30/87 TEMP. 150°F  
 PIPE SIZE 36" SCH.

FLOW →



T.D.C.	0°	A	B	C	D	E	F	G	H	I	J
30°	.425	.433	.432	.421	.429	.433	.431	.430	.435	.452	
60°	.428	.429	.426	.424	.430	.427	.426	.427	.430	.457	
90°	.431	.435	.427	.433	.435	.441	.433	.430	.427	.453	
120°	.428	.436	.434	.433	.432	.435	.455	.432	.429	.461	
150°	.430	.443	.437	.432	.430	.425	.443	.434	.433	.427	
180°	.433	.444	.445	.432	.425	—	.408	.435	.431	.443	
210°	.437	.436	.435	.447	—	—	—	.428	.461	.440	
240°	.445	.439	.437	.434	—	—	—	.440	.444	.435	
270°	.439	.432	.433	.436	.443	.437	.443	.440	.444	.443	
300°	.434	.437	.441	.431	.445	.440	.440	.432	.448	.452	
330°	.430	.433	.442	.434	.436	.436	.446	.431	.433	.460	
	.438	.430	.433	.441	.433	.434	.435	.430	.433	.452	

FLOW ↓

	A	B	C
0°	.521	.545	.560
30°	.517	.543	.536
60°	.525	.535	.533
90°	.536	.528	.536
120°	.515	.539	.535
150°	.525	.537	.527
180°	.532	.546	.534
210°	.543	.543	.528
240°	.497	.493	.544
270°	.543	.550	.520
300°	.502	.524	.537
330°	.515	.547	.537

ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

READINGS TAKEN BY:  
 S. VARGO & A. HOLLAND



## EROSION EVALUATION WORKSHEET

Unit No. 1

Years in service //

UT Reading Taken on: 6-2-87  
8-13-87

AEPSI Installed Mat'l Class V-31, ASTM A-155 GR. KC70 CLASS I

[illegible]



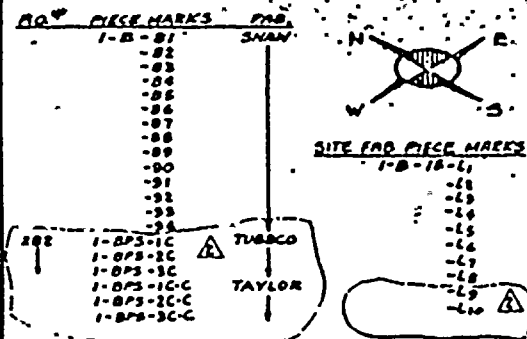
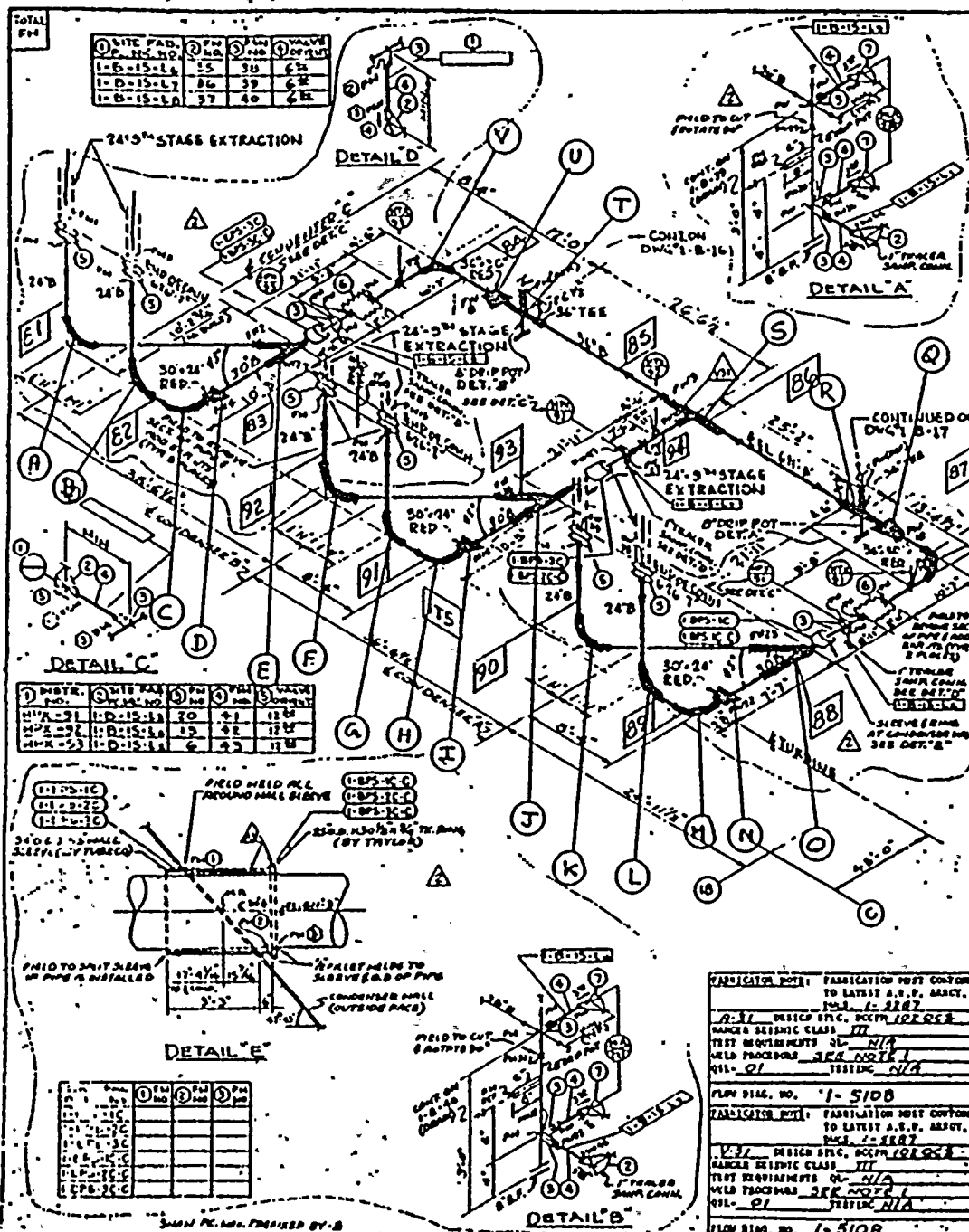
WEEK # 16

CONST: J.D. 715743

D.C. 715742

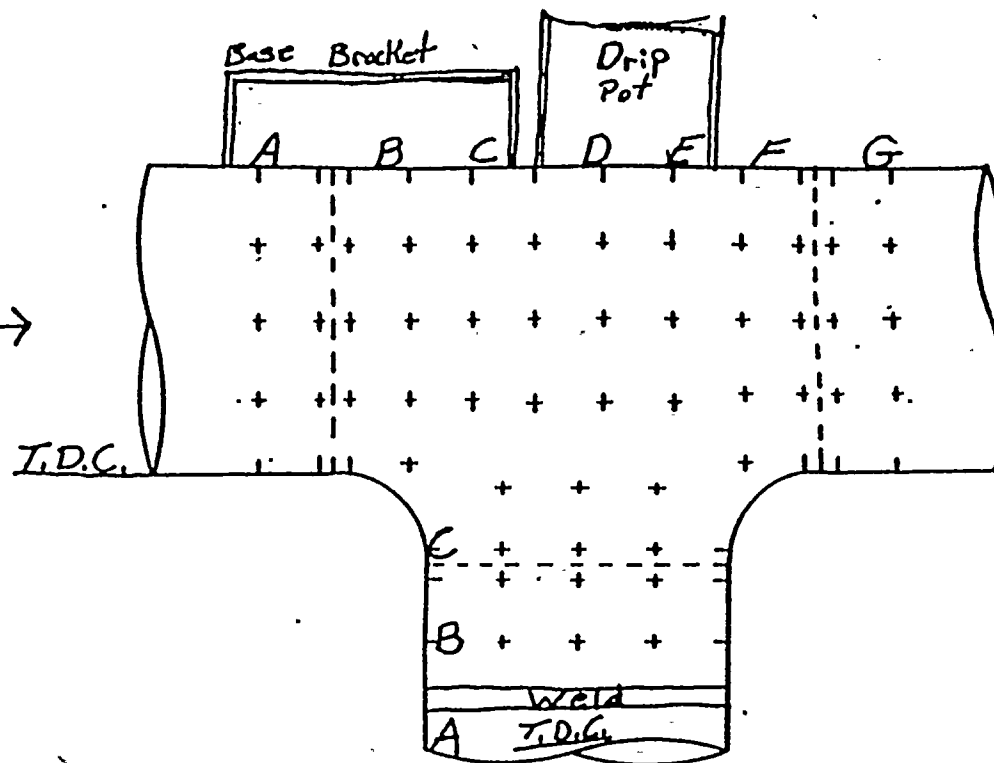
J.D. 715744

ISOMETRIC SHEET NO. 522





JOB ORDER\* 715742  
 ISO. 1-B-15 Rev. 2 (I)  
 DATE 6-2-87 TEMP. 190°F  
 PIPE  
 SIZE 36" SCH. 4A



TDC		A	B	C	D	E	F	G	H	I	J
0°	1.086	1.074	—	—	—	1.173	1.143				
30°	1.095	1.074	—	—	—	1.070	1.058				
60°	1.146	1.098	1.070	—	1.071	1.058	1.123				
90°	1.014	1.023	1.063	1.018	1.025	1.028	1.014				
120°	.995	.955	1.035	1.000	.995	1.024	1.001				
150°	1.010	.956	.964	1.058	1.005	.999	1.003				
180°	—	—	—	—	.995	1.002	1.007				
210°	.970	.961	.984	.956	1.017	1.006	1.012				
240°	.980	.964	.992	.977	1.011	1.038	.999				
270°	.963	.954	.995	.995	.993	.997	.993				
300°	.964	1.058	—	—	—	1.106	1.098				
330°	.941	1.049	—	—	—	1.026	1.072				

FLOW ↓

TDC

	A	B	C
0°	429	729	895
30°	403	680	977
60°	392	721	883
90°	423	834	782
120°	423	856	721
150°	421	821	926
180°	415	759	889
210°	419	750	751
240°	421	684	843
270°	426	789	850
300°	41	1	900
330°	4	26	975

RT

day.

ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

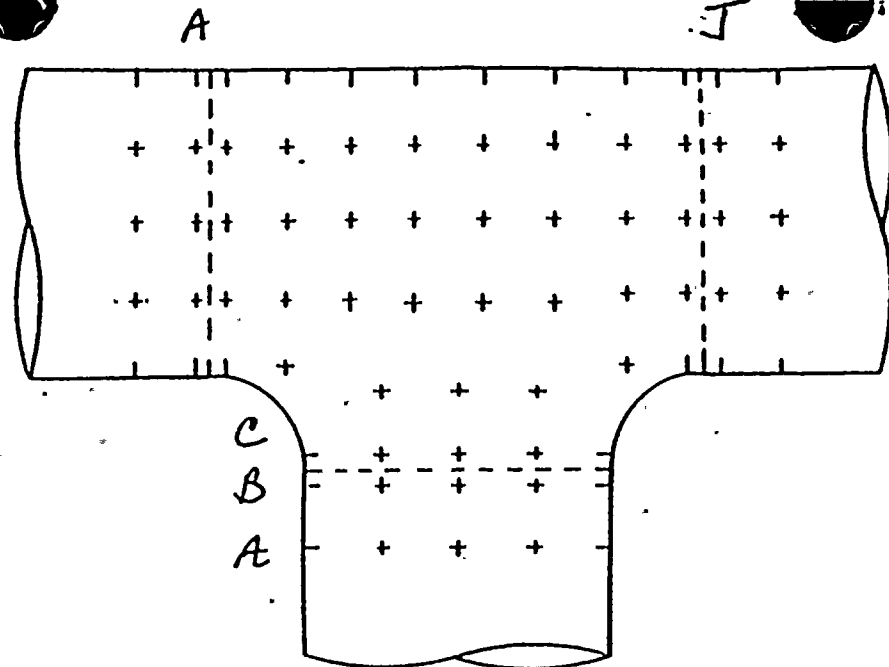
Readings taken by  
 J. Pauly and A. Holiday.



JOB ORDER\* 715742  
 ISO. 1-B-15 REV 2 (S)  
 DATE 8-13-87 TEMP.  
 PIPE  
 SIZE 36" SCH.

TEE "S"

	A	B	C	D	E	F	G	H	I	J
TDC 0°	.410	.395	.390	.370	.410	.415	.365	.395	.400	.425
45°	.420	.365	.375	.385	.380	.375	.370	.405	.405	.400
90°	.380	.335	.340	.350	.350	.340	.345	.370	.410	.405
135°	.395	.305	.345	.340	.345	.345	.415	.395	.345	.405
180°	.415	.375	.395	.340	.355	.335	.340	.340	.385	.365
225°	.405	.420	.400	.335	N/A	.395	.415	.410	.395	.405
270°	.365	.345	.340	N/A	N/A	N/A	N/A	.420	.365	.385
315°	.410	.375	.385	N/A	N/A	N/A	.395	.400	.385	.345



FLOW ↑

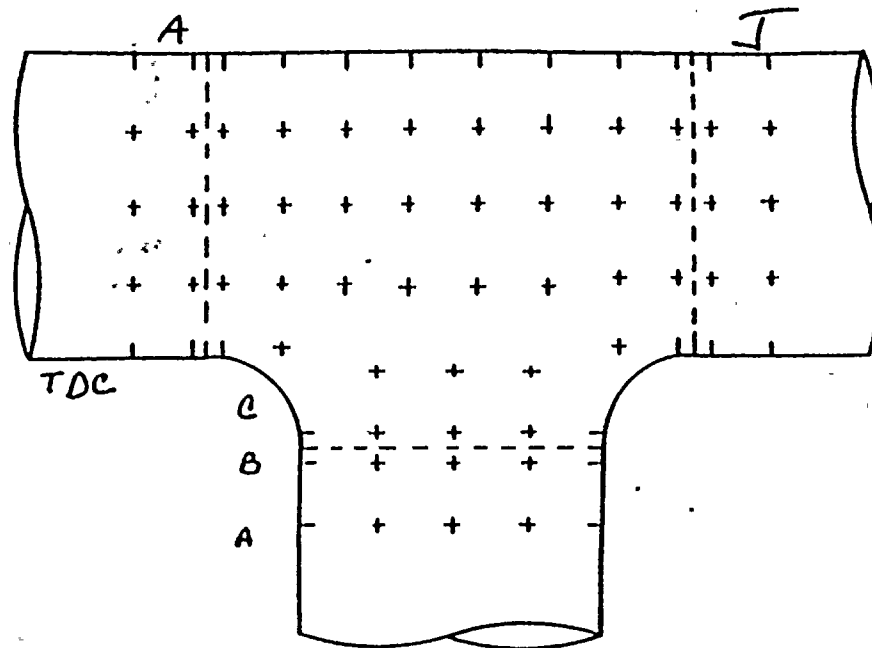
*1-KTCL*  
 8-14-87

ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

	A	B	C
TDC 0°	.365	.375	.370
45°	.380	.395	.380
90°	.345	.380	N/A
135°	.370	.375	N/A
180°	.365	.300	.320
225°	.370	.385	N/A
270°	.365	.370	N/A
315°	.355	.380	.365



← FLOW



JOB ORDER\* 715742  
 ISO. 1-B-15 REV 2 (R)  
 DATE 8-13-87 TEMP.  
 PIPE  
 SIZE 36" SCH.

TEE "R"

TDC		A	B	C	D	E	F	G	H	I	J
	0°	.425	.790	N/A	N/A	N/A	N/A	N/A	1.140	.905	.510
	45°	.420	1.020	1.015	N/A	N/A	N/A	N/A	1.450	.910	.510
	90°	.420	.995	.980	.985	.980	.970	.975	.975	.945	.500
	135°	.400	.990	1.010	1.000	1.000	1.015	1.000	.990	1.015	.510
	180°	.405	1.100	1.080	1.100	1.010	1.015	1.010	1.010	.995	.500
	225°	.400	.990	.990	.995	.996	.955	.950	.960	.965	.505
	270°	.415	1.095	1.090	1.085	1.075	.975	.970	.965	.965	.505
	315°	.405	1.060	1.050	N/A	N/A	N/A	N/A	1.055		.500

↓ FLOW

*LK TELL*  
 8-14-87

ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

TDC		A	B	C
	0°	.375	.750	.910
	45°	.390	.710	.915
	90°	.390	.905	N/A
	135°	.340	.760	.950
	180°	.400	.755	.880
	225°	.390	.710	.935
	270°	.380	.910	N/A
	315°	.370	.755	.940



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam) X

Unit No. 1

Evaluation Date: SEPTEMBER 16, 1987

SER No. 23-85 (Water)

Years in service 11

UT Reading Transmitted on: AUGUST 19, 1987

UT Reading Taken on: 5-18, 5-19, 5-20, 5-21, 5-26, 5-27 AND 6-1-1987

Isometric Dwg. NO. 1-B-16, REV. 3

AEPS Installed Mat'l Class V-31, ASTM A-155 GR. KCTO CLASS I

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
A	36"-90° FL	.375	.328-.422	.165	.378	0	STILL WITHIN MANUFACTURERS TOLERANCE
B	36"-90° FL	.375	.328-.422	.165	.370	0	" " " "
D	36X36X36 MAIN HEADER	.500	.438-.563	.165	.490	0	" " " "
D	36X36X36 BRANCH	.500	.438-.563	.165	.517	0	" " " "
F	36X36X20 MAIN HEADER	.500	.438-.563	.165	.483	0	" " " "
F	36X36X20 BRANCH	.375	.328-.422	.119	.338	0	" " " "
E-F	36" STRAIGHT MAIN HEADER	.500	.438-.563	.165	.518	0	" " " "
F	36X36X20 BRANCH	.500	.438-.563	.165	.514	0	" " " "
F	36X36X20 MAIN HEADER	.375	.328-.422	.119	.296	9.8	RE-INSPECT 19 YEARS
G	36X36X20 BRANCH	.500	.438-.563	.165	.521	0	STILL WITHIN MANUFACTURERS TOLERANCE
G	36X36X20	.375	.328-.422	.119	.328	0	" " " "
G-H	36" STRAIGHT MAIN HEADER	.500	.438-.563	.165	.504	0	" " " "
H	36X36X20 BRANCH	.500	.438-.563	.165	.500	0	" " " "
H	36X36X20	.375	.328-.422	.119	.307	6.4	RE-INSPECT 23 YEARS
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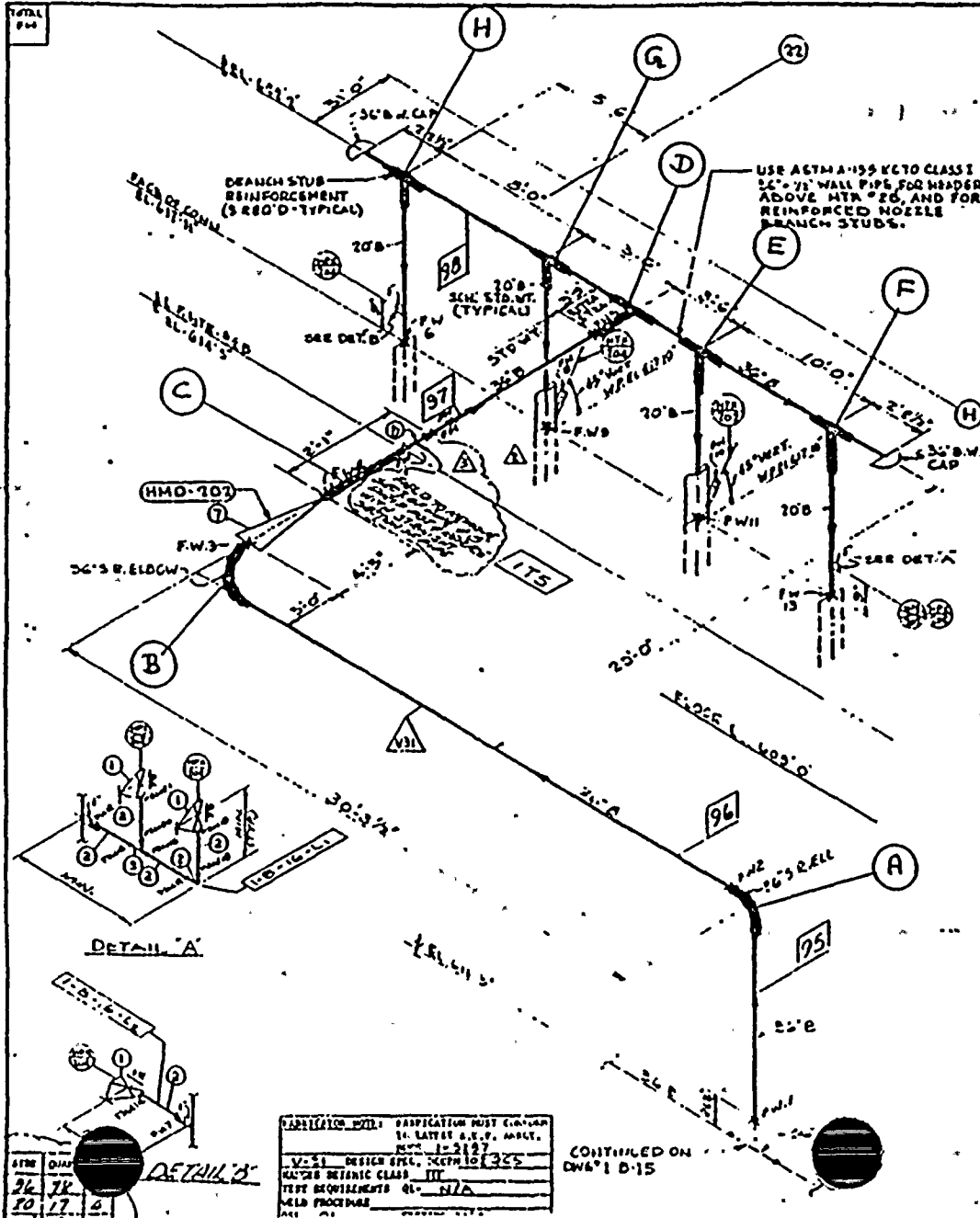


WEEK # 16

CONST: J.O.# 715743  
J.O.# 715744

QC : 3.0.4  
715742

ISOMETRIC SHEET NO. 523



P.O.      PIECE MARKS      FAB.

1-B-95                      SHAW

-96  
 -97  
 -98  
 -97A

SITE FAB. PIECE MARKS

1-B-16-L<sub>1</sub>  
-L<sub>2</sub>

INSPECT: A, B, E, F, G

[illegible]

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN MICHIGAN  
UNIT NO. 1

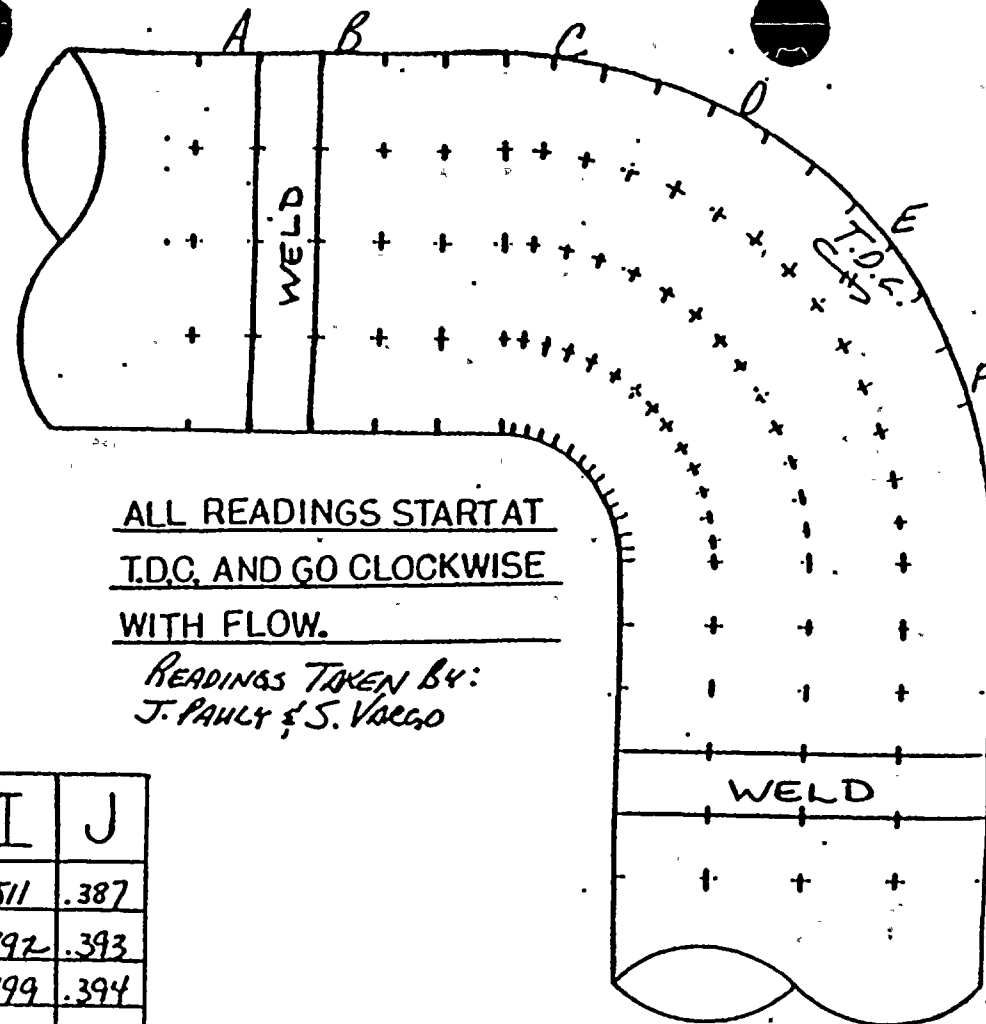
A-32		A-32A		A-32B		A-32C		A-32D		A-32E		A-32F		A-32G		A-32H		A-32I		A-32J		A-32K		A-32L		A-32M		A-32N		A-32O		A-32P		A-32Q		A-32R		A-32S		A-32T		A-32U		A-32V		A-32W		A-32X		A-32Y		A-32Z		A-32AA		A-32AB		A-32AC		A-32AD		A-32AE		A-32AF		A-32AG		A-32AH		A-32AI		A-32AJ		A-32AK		A-32AL		A-32AM		A-32AN		A-32AO		A-32AP		A-32AQ		A-32AR		A-32AS		A-32AT		A-32AU		A-32AV		A-32AW		A-32AX		A-32AY		A-32AZ		A-32BA		A-32BB		A-32BC		A-32BD		A-32BE		A-32BF		A-32BG		A-32BH		A-32BI		A-32BJ		A-32BK		A-32BL		A-32BM		A-32BN		A-32BO		A-32BP		A-32BQ		A-32BR		A-32BS		A-32BT		A-32BU		A-32BV		A-32BW		A-32BX		A-32BY		A-32BZ		A-32CA		A-32CB		A-32CC		A-32CD		A-32CE		A-32CF		A-32CG		A-32CH		A-32CI		A-32CJ		A-32CK		A-32CL		A-32CM		A-32CN		A-32CO		A-32CP		A-32CQ		A-32CR		A-32CS		A-32CT		A-32CU		A-32CV		A-32CW		A-32CX		A-32CY		A-32CZ		A-32DA		A-32DB		A-32DC		A-32DD		A-32DE		A-32DF		A-32DG		A-32DH		A-32DI		A-32DJ		A-32DK		A-32DL		A-32DM		A-32DN		A-32DO		A-32DP		A-32DQ		A-32DR		A-32DS		A-32DT		A-32DU		A-32DV		A-32DW		A-32DX		A-32DY		A-32DZ		A-32EA		A-32EB		A-32EC		A-32ED		A-32EE		A-32EF		A-32EG		A-32EH		A-32EI		A-32EJ		A-32EK		A-32EL		A-32EM		A-32EN		A-32EO		A-32EP		A-32EQ		A-32ER		A-32ES		A-32ET		A-32EU		A-32EV		A-32EW		A-32EX		A-32EY		A-32EZ		A-32FA		A-32FB		A-32FC		A-32FD		A-32FE		A-32FF		A-32FG		A-32FH		A-32FI		A-32FJ		A-32FK		A-32FL		A-32FM		A-32FN		A-32FO		A-32FP		A-32FQ		A-32FR		A-32FS		A-32FT		A-32FU		A-32FV		A-32FW		A-32FX		A-32FY		A-32FZ		A-32GA		A-32GB		A-32GC		A-32GD		A-32GE		A-32GF		A-32GG		A-32GH		A-32GI		A-32GJ		A-32GK		A-32GL		A-32GM		A-32GN		A-32GO		A-32GP		A-32GQ		A-32GR		A-32GS		A-32GT		A-32GU		A-32GV		A-32GW		A-32GX		A-32GY		A-32GZ		A-32HA		A-32HB		A-32HC		A-32HD		A-32HE		A-32HF		A-32HG		A-32HH		A-32HI		A-32HJ		A-32HK		A-32HL		A-32HM		A-32HN		A-32HO		A-32HP		A-32HQ		A-32HR		A-32HS		A-32HT		A-32HU		A-32HV		A-32HW		A-32HX		A-32HY		A-32HZ		A-32IA		A-32IB		A-32IC		A-32ID		A-32IE		A-32IF		A-32IG		A-32IH		A-32II		A-32IJ		A-32IK		A-32IL		A-32IM		A-32IN		A-32IO		A-32IP		A-32IQ		A-32IR		A-32IS		A-32IT		A-32IU		A-32IV		A-32IW		A-32IX		A-32IY		A-32IZ		A-32JA		A-32JB		A-32JC		A-32JD		A-32JE		A-32JF		A-32JG		A-32JH		A-32JI		A-32JJ		A-32JK		A-32JL		A-32JM		A-32JN		A-32JO		A-32JP		A-32JQ		A-32JR		A-32JS		A-32JT		A-32JU		A-32JV		A-32JW		A-32JX		A-32JY		A-32JZ		A-32KA		A-32KB		A-32KC		A-32KD		A-32KE		A-32KF		A-32KG		A-32KH		A-32KI		A-32KJ		A-32KK		A-32KL		A-32KM		A-32KN		A-32KO		A-32KP		A-32KQ		A-32KR		A-32KS		A-32KT		A-32KU		A-32KV		A-32KW		A-32KX		A-32KY		A-32KZ		A-32LA		A-32LB		A-32LC		A-32LD		A-32LE		A-32LF		A-32LG		A-32LH		A-32LI		A-32LJ		A-32LK		A-32LL		A-32LM		A-32LN		A-32LO		A-32LP		A-32LQ		A-32LR		A-32LS		A-32LT		A-32LU		A-32LV		A-32LW		A-32LX		A-32LY		A-32LZ		A-32MA		A-32MB		A-32MC		A-32MD		A-32ME		A-32MF		A-32MG		A-32MH		A-32MI		A-32MJ		A-32MK		A-32ML		A-32MM		A-32MN		A-32MO		A-32MP		A-32MQ		A-32MR		A-32MS		A-32MT		A-32MU		A-32MV		A-32MW		A-32MX		A-32MY		A-32MZ		A-32NA		A-32NB		A-32NC		A-32ND		A-32NE		A-32NF		A-32NG		A-32NH		A-32NI		A-32NJ		A-32NK		A-32NL		A-32NM		A-32NN		A-32NO		A-32NP		A-32NQ		A-32NR		A-32NS		A-32NT		A-32NU		A-32NV		A-32NW		A-32NX		A-32NY		A-32NZ		A-32OA		A-32OB		A-32OC		A-32OD		A-32OE		A-32OF		A-32OG		A-32OH		A-32OI		A-32OJ		A-32OK		A-32OL		A-32OM		A-32ON		A-32OO		A-32OP		A-32OQ		A-32OR		A-32OS		A-32OT		A-32OU		A-32OV		A-32OW		A-32OX		A-32OY		A-32OZ		A-32PA		A-32PB		A-32PC		A-32PD		A-32PE		A-32PF		A-32PG		A-32PH		A-32PI		A-32PJ		A-32PK		A-32PL		A-32PM		A-32PN		A-32PO		A-32PP		A-32PQ		A-32PR		A-32PS		A-32PT		A-32PU		A-32PV		A-32PW		A-32PX		A-32PY		A-32PZ		A-32QA		A-32QB		A-32QC		A-32QD		A-32QE		A-32QF		A-32QG		A-32QH		A-32QI		A-32QJ		A-32QK		A-32QL		A-32QM		A-32QN		A-32QO		A-32QP		A-32QQ		A-32QR		A-32QS		A-32QT		A-32QU		A-32QV		A-32QW		A-32QX		A-32QY		A-32QZ		A-32RA		A-32RB		A-32RC		A-32RD		A-32RE		A-32RF		A-32RG		A-32RH		A-32RI		A-32RJ		A-32RK		A-32RL		A-32RM		A-32RN		A-32RO		A-32RP		A-32RQ		A-32RR		A-32RS		A-32RT		A-32RU		A-32RV		A-32RW		A-32RX		A-32RY		A-32RZ		A-32SA		A-32SB		A-32SC		A-32SD		A-32SE		A-32SF		A-32SG		A-32SH		A-32SI		A-32SJ		A-32SK		A-32SL		A-32SM		A-32SN		A-32SO		A-32SP		A-32SQ		A-32SR		A-32SS		A-32ST		A-32SU		A-32SV		A-32SW		A-32SX		A-32SY		A-32SZ		A-32TA		A-32TB		A-32TC		A-32TD		A-32TE		A-32TF		A-32TG		A-32TH		A-32TI		A-32TJ		A-32TK		A-32TL		A-32TM		A-32TN		A-32TO		A-32TP		A-32TQ		A-32TR		A-32TS		A-32TT		A-32TU		A-32TV		A-32TW		A-32TX		A-32TY		A-32TZ		A-32UA		A-32UB		A-32UC		A-32UD		A-32UE		A-32UF		A-32UG		A-32UH		A-32UI		A-32UJ		A-32UK		A-32UL		A-32UM		A-32UN		A-32UO		A-32UP		A-32UQ		A-32UR		A-32US		A-32UT		A-32UU		A-32UV		A-32UW		A-32UX		A-32UY		A-32UZ		A-32VA		A-32VB		A-32VC		A-32VD		A-32VE		A-32VF		A-32VG		A-32VH		A-32VI		A-32VJ		A-32VK		A-32VL		A-32VM		A-32VN		A-32VO		A-32VP		A-32VQ		A-32VR		A-32VS		A-32VT		A-32VU		A-32VV		A-32VW		A-32VX		A-32VY		A-32VZ		A-32WA		A-32WB		A-32WC		A-32WD		A-32WE		A-32WF		A-32WG		A-32WH		A-32WI		A-32WJ		A-32WK		A-32WL		A-32WM		A-32WN		A-32WO		A-32WP		A-32WQ		A-32WR		A-32WS		A-32WT		A-32WU		A-32WV		A-32WW		A-32WX		A-32WY		A-32WZ		A-32XA		A-32XB		A-32XC		A-32XD		A-32XE		A-32XF		A-32XG		A-32XH		A-32XI		A-32XJ		A-32XK		A-32XL		A-32XM		A-32XN		A-32XO		A-32XP		A-32XQ		A-32XR		A-32XS		A-32XT		A-32XU		A-32XV		A-32XW		A-32XX		A-32XY		A-32XZ		A-32YA		A-32YB		A-32YC		A-32YD		A-32YE		A-32YF		A-32YG		A-32YH		A-32YI		A-32YJ		A-32YK		A-32YL		A-32YM		A-32YN		A-32YO		A-32YP		A-32YQ		A-32YR		A-32YS		A-32YT		A-32YU		A-32YV		A-32YW		A-32YX		A-32YY		A-32YZ		A-32ZA		A-32ZB		A-32ZC		A-32ZD		A-32ZE		A-32ZF		A-32ZG		A-32ZH		A-32ZI		A-32ZJ		A-32ZK		A-32ZL		A-32ZM		A-32ZN		A-32ZO		A-32ZP		A-32ZQ		A-32ZR		A-32ZS		A-32ZT		A-32ZU		A-32ZV		A-32ZW		A-32ZX		A-32ZY		A-32ZZ	
A-32		A-32A		A-32B		A-32C		A-32D		A-32E		A-32F		A-32G		A-32H		A-32I		A-32J		A-32K		A-32L		A-32M		A-32N		A-32O		A-32P		A-32Q		A-32R		A-32S		A-32T		A-32U		A-32V		A-32W		A-32X		A-32Y		A-32Z		A-32AA		A-32AB		A-32AC		A-32AD		A-32AE		A-32AF		A-32AG		A-32AH		A-32AI		A-32AJ		A-32AK		A-32AL		A-32AM		A-32AN		A-32AO		A-32AP		A-32AQ		A-32AR		A-32AS		A-32AT		A-32AU		A-32AV		A-32AW		A-32AX		A-32AY		A-32AZ		A-32BA		A-32BB		A-32BC		A-32BD		A-32BE		A-32BF		A-32BG		A-32BH		A-32BI		A-32BJ		A-32BK		A-32BL		A-32BM		A-32BN		A-32BO		A-32BP		A-32BQ		A-32BR		A-32BS		A-32BT		A-32BU		A-32BV		A-32BW		A-32BX		A-32BY		A-32BZ		A-32CA		A-32CB		A-32CC		A-32CD		A-32CE		A-32CF		A-32CG		A-32CH		A-32CI		A-32CJ		A-32CK		A-32CL		A-32CM		A-32CN		A-32CO		A-32CP		A-32CQ		A-32CR		A-32CS		A-32CT		A-32CU		A-32CV		A-32CW		A-32CX		A-32CY		A-32CZ		A-32DA		A-32DB		A-32DC		A-32DD		A-32DE		A-32DF		A-32DG		A-32DH		A-32DI		A-32DJ		A-32DK		A-32DL		A-32DM		A-32DN		A-32DO		A-32DP		A-32DQ		A-32DR		A-32DS		A-32DT		A-32DU		A-32DV		A-32DW		A-32DX		A-32DY		A-32DZ		A-32EA		A-32EB		A-32EC		A-32ED		A-32EE		A-32EF		A-32EG		A-32EH		A-32EI		A-32EJ		A-32EK		A-32EL		A-32EM		A-32EN		A-32EO		A-32EP		A-32EQ		A-32ER		A-32ES		A-32ET		A-32EU		A-32EV		A-32EW		A-32EX		A-32EY		A-32EZ		A-32FA		A-32FB		A-32FC		A-32FD		A-32FE		A-32FF		A-32FG		A-32FH		A-32FI		A-32FJ		A-32FK		A-32FL		A-32FM		A-32FN		A-32FO		A-32FP		A-32FQ		A-32FR		A-32FS		A-32FT		A-32FU		A-32FV		A-32FW		A-32FX		A-32FY		A-32FZ		A-32GA		A-32GB		A-32GC		A-32GD		A-32GE		A-32GF		A-32GG		A-32GH		A-32GI		A-32GJ		A-32GK		A-32GL		A-32GM		A-32GN		A-32GO		A-32GP		A-32GQ		A-32GR		A-32GS		A-32GT		A-32GU		A-32GV		A-32GW		A-32GX		A-32GY		A-32GZ		A-32HA		A-32HB		A-32HC		A-32HD		A-32HE		A-32HF		A-32HG		A-32HH		A-32HI		A-32HJ		A-32HK		A-32HL		A-32HM		A-32HN		A-32HO		A-32HP		A-32HQ		A-32HR		A-32HS		A-32HT		A-32HU		A-32HV		A-32HW		A-32HX		A-32HY		A-32HZ		A-32IA		A-32IB		A-32IC		A-32ID																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

~~MATERIAL REQUIRED FOR~~  
~~FIELD WORK~~  
**UNCONTROLLED**  
**DOCUMENT**

34 16



FLOW →



JOB ORDER # 715742 ITEM (A)

ISO. 1-B-16 REV. 3

DATE 6/1/87 TEMP. 210 °F

PIPE SIZE 36" SCH.

ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

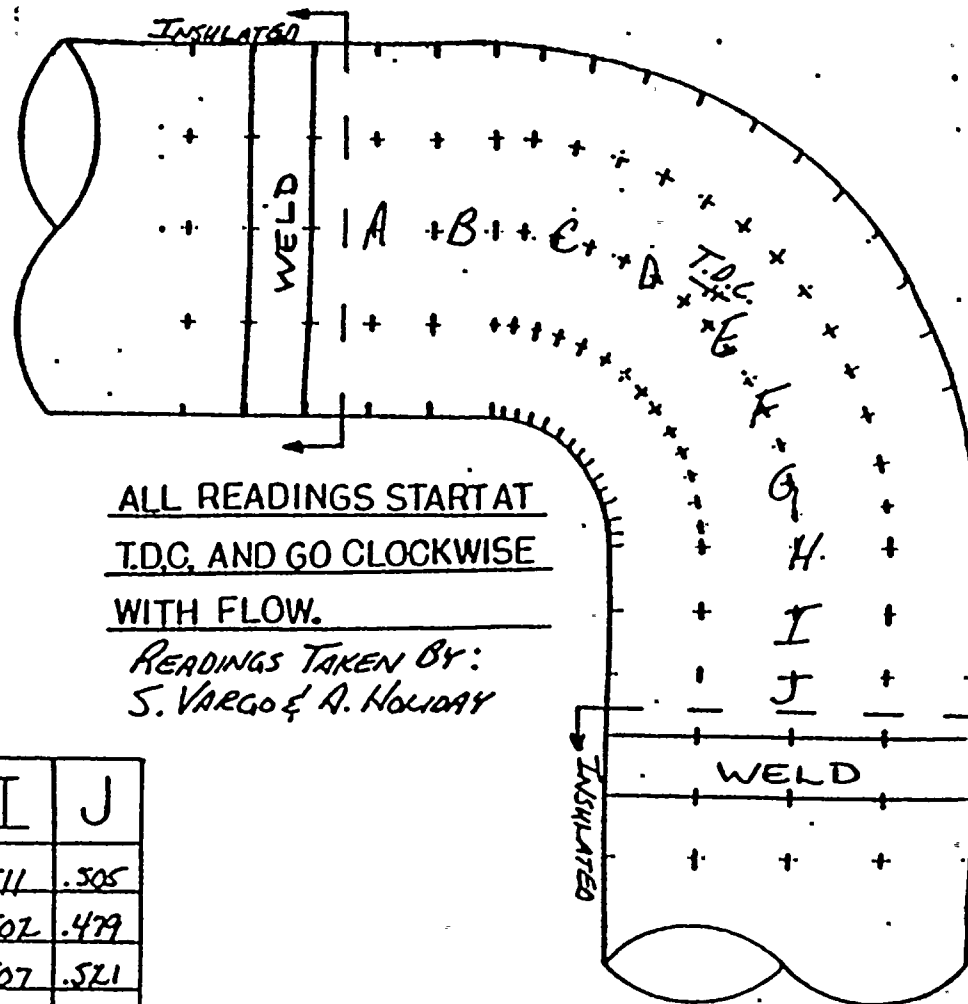
READINGS TAKEN BY:  
J. PAULY & S. VARGO

	A	B	C	D	E	F	G	H	I	J
TDC 0°	.429	.493	.517	.503	.517	.455	.500	.475	.511	.387
30°	.410	.511	.526	.532	.474	.508	.453	.520	.492	.393
60°	.400	.533	.513	.531	.529	.528	.476	.499	.499	.394
90°	.378	.493	.535	.544	.555	.549	.559	.560	.542	.389
120°	.393	.503	.538	.514	.556	.522	.541	.550	.501	.391
150°	.388	.406	.473	.525	.540	.533	.530	.510	.483	.391
180°	.380	.446	.471	.459	.492	.492	.484	.461	.459	.391
210°	.439	.472	.491	.472	.472	.464	.448	.448	.372	.394
240°	.416	.453	.481	.468	.473	.466	.450	.433	.412	.396
270°	.400	.438	.469	.460	.446	.449	.452	.462	.414	.381
300°	.392	.442	.445	.452	.460	.448	.429	.460	.466	.389
330°	.381	.471	.460	.462	.461	.477	.451	.486	.487	.393



FLOW →

JOB ORDER # 715742 ITEM (B)  
 ISO. 1-B-16 REV. 3  
 DATE 5/27/87 TEMP. 213°F  
 PIPE SIZE 3/4" SCH.



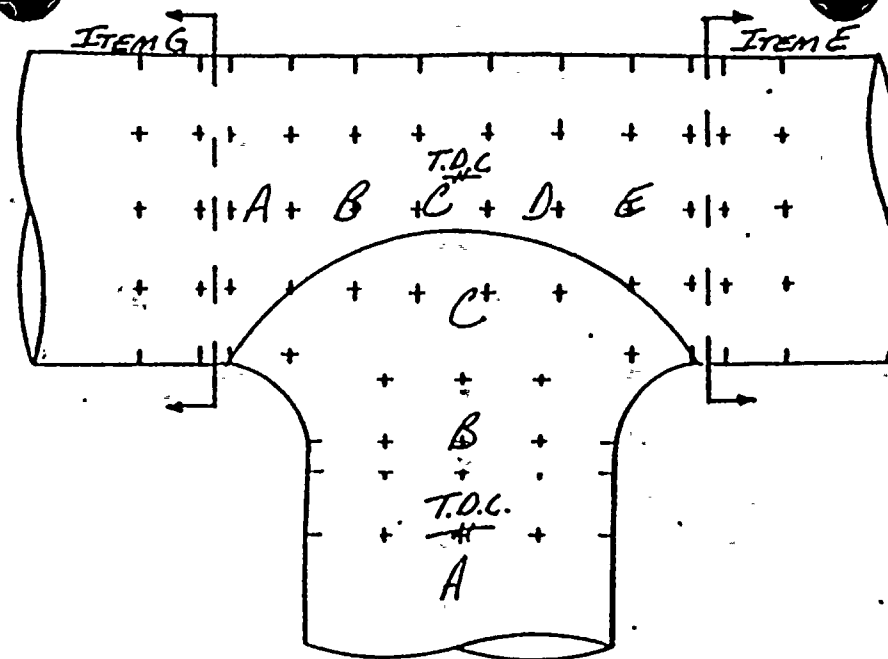
ALL READINGS START AT  
 T.D.C. AND GO CLOCKWISE  
 WITH FLOW.

READINGS TAKEN BY:  
 S. VARGO & A. HOLIDAY

	A	B	C	D	E	F	G	H	I	J
TDC 0°	.506	.523	.497	.561	.527	.523	.509	.506	.511	.505
30°	.497	.488	.501	.495	.517	.495	.530	.524	.502	.479
60°	.446	.475	.485	.502	.510	.499	.530	.525	.507	.521
90°	.419	.462	.494	.496	.512	.516	.514	.509	.521	.503
120°	.375	.427	.430	.471	.524	.514	.417	.519	.525	.508
150°	.370	.387	.400	.422	.501	.469	.513	.520	.531	.536
180°	.476	.462	.494	.445	.508	.482	.502	.506	.506	.517
210°	.485	.500	.492	.508	.460	.461	.509	.502	.496	.511
240°	.496	.494	.471	.452	.468	.500	.454	.478	.491	.480
270°	.501	.492	.483	.464	.487	.465	.437	.449	.439	.479
300°	.499	.482	.484	.446	.442	.443	.444	.450	.465	.509
330°	.499	.522	.542	.501	.487	.480	.481	.489	.492	.510



FLOW →



JOB ORDER\* 715742 ITEM(D)  
 ISO. 1-B-16 REV. 3  
 DATE 5/26/87 TEMP. 193°F  
 PIPE SIZE 36" SCH.

DC		A	B	C	D	E	F	G	H	I	J
0°	.535	.540	.533	.531	.530						
30°	.544	.535	.533	.541	.532						
60°	.535	.534	.532	.533	.529						
90°	.535	.540	.535	.521	.514						
120°	.519	.529	.543	.513	.516						
150°	.524	.534	.535	.533	.521						
180°	.534	.533	.524	.525	.525						
210°	.532				.530						
240°											
270°											
300°	.533				.527						
330°	.542			.541	.529						

↑  
FLOW

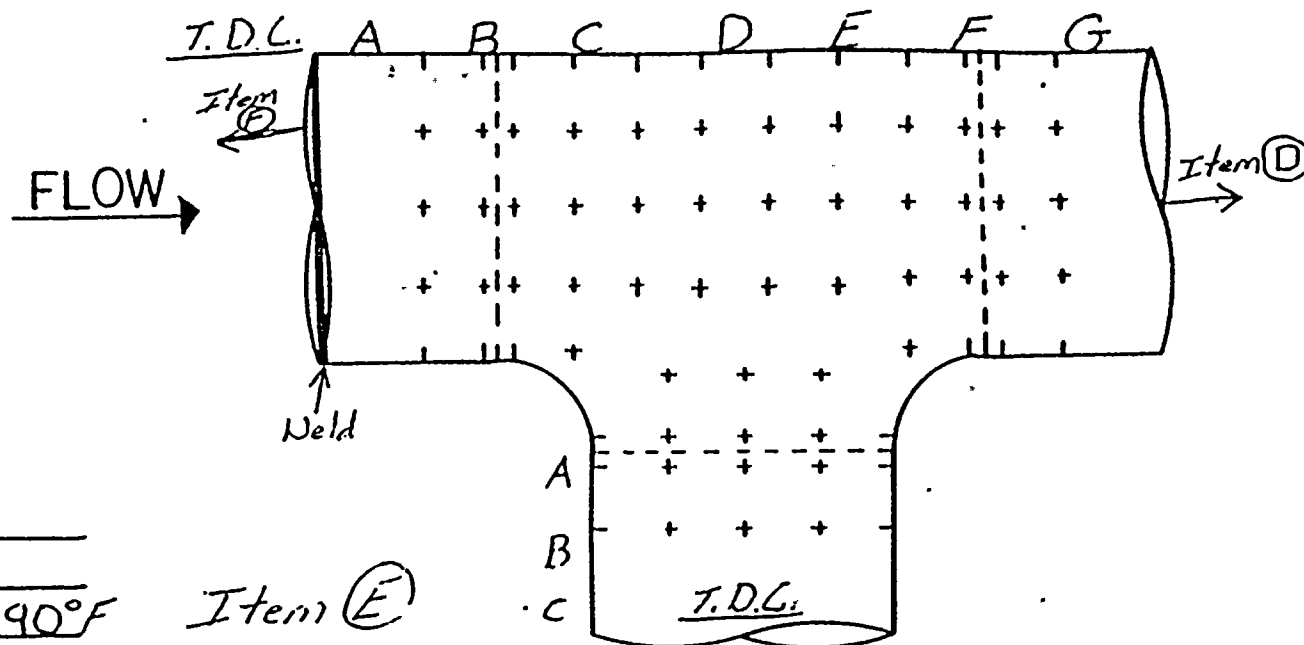
ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

READINGS TAKEN BY:  
 S. VAREJO & A. HOLIDAY

	A	B	C
0°	.532	.533	.528
30°	.535	.540	.536
60°	.533	.535	.521
90°	.530	.534	.534
120°	.527	.537	.521
150°	.529	.535	.527
180°	.526	.515	.552
210°	.530	.536	.537
240°	.535	.532	.521
270°	.555	.539	.512
300°	.541	.545	.517
330°	.530	.539	.546



JOB ORDER # 715742  
 ISO. 1-B-16 Rev. 3  
 DATE 5-20-87 TEMP. 190°F  
 PIPE SIZE 36" SCH. —



TDC		A	B	C	D	E	F	G	H	I	J
0°	535	534	534	535	483	531	526				
30°	541	535	538	537	532	536	531				
60°	542	532	532	541	532	534	530				
90°	529	531	534	534	541	545	546				
120°	534	534	536	534	534	515	536				
150°	538	536	541	536	541	530	531				
180°	531	525	531	—	—	523	536				
210°	548	534	539	—	—	535	521				
240°	540	547	531	540	545	525	532				
270°	540	545	536	541	536	536	511				
300°	536	531	535	532	534	527	528				
330°	538	533	537	537	532	532	531				

FLOW ↓

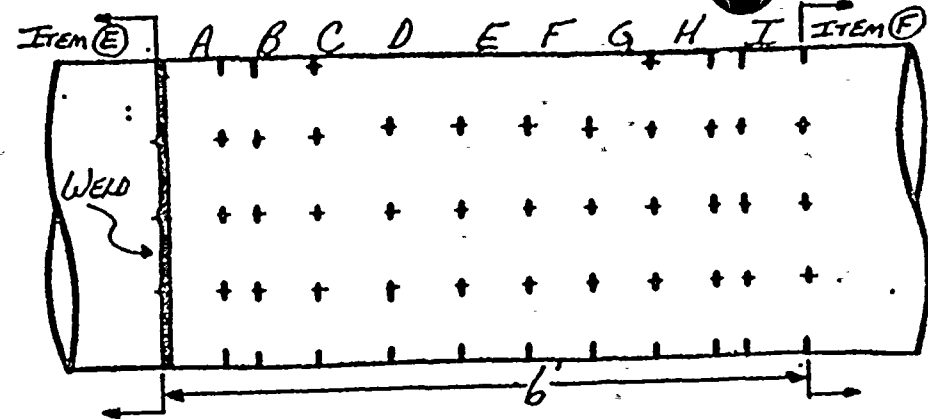
ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

Readings taken by  
 S. Pa. & A. Holiday.

	A	B	C
0°	387	346	369
30°	342	347	361
60°	357	370	373
90°	372	380	378
120°	350	385	378
150°	341	373	361
180°	338	341	371
210°	361	363	362
240°	343	369	369
270°	347	346	361
300°	349	356	357
330°	371	377	373



FLOW →



JOB ORDER# 715742

ISO 1-B-16 REV. 3-6 FT. SEC. BETWEEN E & F

DATE 5/19/87 TEMP. 194°F

PIPE SIZE 3/8" SCH.

ALL READINGS START AT

I.D.C. AND GO CLOCKWISE

WITH FLOW.

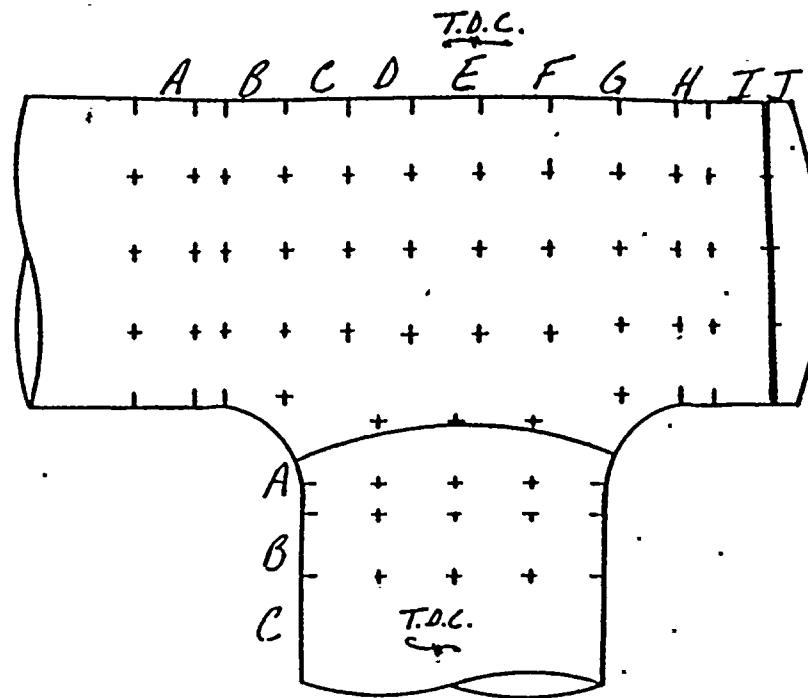
READINGS TAKEN BY:  
J. PAULY & S. VARGO

	A	B	C	D	E	F	G	H	I	J
TDC 0°	.531	.529	.532	.527	.531	.530	.526	.526	.528	—
30°	.539	.531	.528	.531	.528	.527	.529	.530	.532	—
60°	.531	.534	.530	.534	.529	.529	.531	.526	.533	—
90°	.529	.528	.528	.531	.530	.530	.529	.530	.535	—
120°	.532	.540	.530	.528	.526	.525	.526	.531	.531	—
150°	.532	.535	.532	.527	.528	.532	.534	.540	.533	—
180°	.529	.531	.529	.534	.531	.528	.532	.543	.540	—
210°	.534	.536	.546	.548	.545	.532	.531	.524	.535	—
240°	.532	.534	.536	.549	.530	.533	.524	.532	.539	—
270°	.525	.524	.529	.521	.523	.525	.520	.520	.527	—
300°	.520	.530	.532	.523	.534	.524	.527	.531	.538	—
330°	.534	.533	.537	.528	.529	.524	.527	.525	.533	—



JOB ORDER# 715742 ITEM(F)  
 ISO. 1-B-16 REV.3  
 DATE 5/18/87 TEMP. 194°F  
 PIPE SIZE 36" SCH.

FLOW →



	A	B	C	D	E	F	G	H	I	J
0°	.528	.526	.531	.533	.533	.530	.530	.536	.543	.544
30°	.527	.521	.527	.530	.531	.527	.531	.554	.544	.548
60°	.528	.529	.523	.525	.524	.531	.533	.549	.548	.543
90°	.528	.534	.532	.532	.535	.525	.535	.550	.542	.534
120°	.524	.534	.531	.527	.535	.534	.532	.539	.532	.539
150°	.527	.534	.538	—	—	—	.540	.533	.567	.537
180°	.534	.550	—	—	—	—	—	.542	.548	.535
210°	.522	.521	.550	—	—	—	.537	.533	.540	.533
240°	.515	.524	.531	.526	.519	.518	.517	.537	.548	.536
270°	.525	.529	.542	.530	.528	.514	.523	.541	.546	.550
300°	.526	.532	.546	.529	.531	.527	.524	.530	.538	.540
330°	.525	.535	.525	.526	.530	.524	.525	.527	.541	—

↓ FLOW

	A	B	C
0°	.506	.304	.350
30°	.305	.341	.322
60°	.322	.347	.343
90°	.358	.350	.349
120°	.348	.357	.355
150°	.351	.348	.372
180°	.327	.356	.350
210°	.341	.366	.346
240°	.342	.380	.374
270°	.343	.374	.320
300°	.310	.382	.362
330°	.29	.39	.325

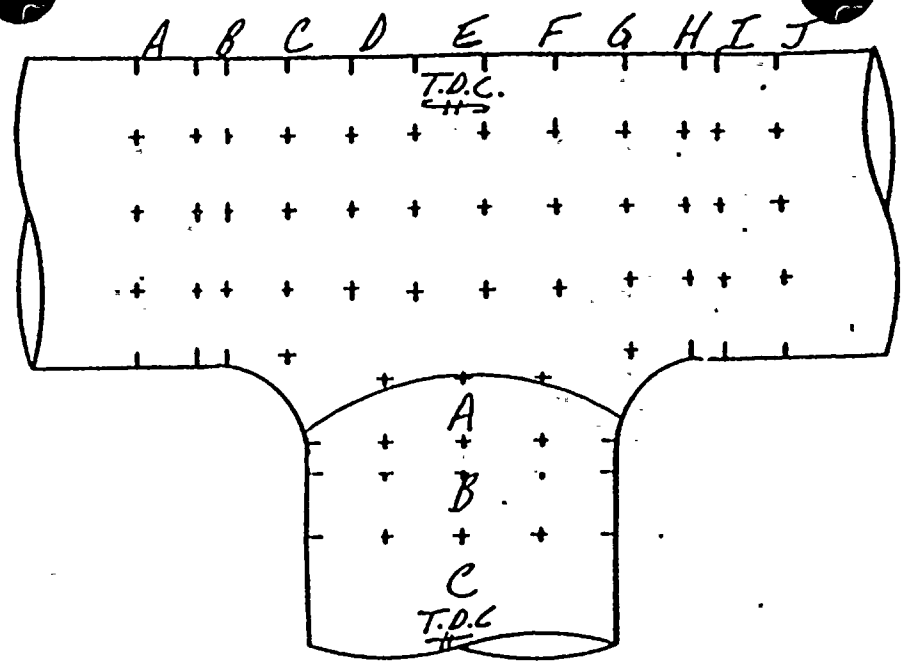
ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

READINGS TAKEN BY:  
 S. VARGO & J. PAULLY



JOB ORDER\* 715742 ITEM (6)  
 ISO. 1-B-16 REV. 3  
 DATE 5/21/87 TEMP. 202°F  
 PIPE SIZE 3/8" SCH.

FLOW →



	A	B	C	D	E	F	G	H	I	J
0°	.532	.536	.537	.537	.539	.539	.542	.541	.540	.540
30°	.534	.537	.544	.535	.539	.542	.542	.540	.542	.539
60°	.532	.534	.537	.539	.538	.539	.542	.546	.540	.544
90°	.535	.541	.541	.551	.547	.551	.543	.547	.547	.545
120°	.536	.540	.545	.544	.544	.546	.542	.545	.549	.549
150°	.536	.536	.537	—	—	—	.547	.540	.529	.540
180°	.527	.544	—	—	—	—	—	.537	.539	.537
210°	.533	.533	.533	—	—	—	.539	.539	.526	.538
240°	.535	.538	.540	.541	.540	.539	.542	.545	.542	.535
270°	.532	.533	.527	.535	.535	.538	.538	.549	.540	.538
300°	.534	.532	.533	.531	.547	.542	.540	.554	.558	.538
330°	.536	.537	.540	.541	.543	.540	.548	.544	.545	.547

↓ FLOW

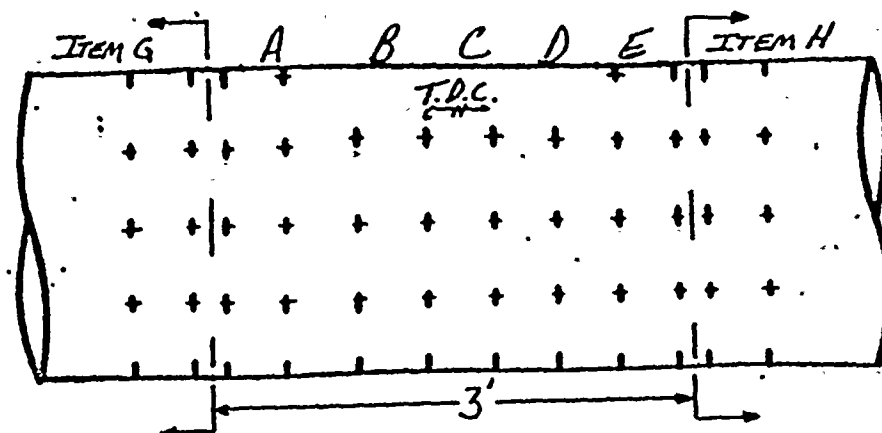
	A	B	C
0°	.375	.372	.352
30°	.375	.363	.357
60°	.350	.375	.357
90°	.367	.378	.364
120°	.368	.375	.370
150°	.350	.371	.389
180°	.341	.364	.363
210°	.353	.354	.345
240°	.332	.371	.365
270°	.358	.330	.366
300°	.378	.370	.360
330°	.346	.343	.348

ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

READINGS TAKEN BY:  
 S. VARGO & A. HOLIDAY



FLOW →



JOB ORDER# 715742

ISO. 1-B-16 REV. 3 - 3 FT. SECTION BETWEEN G & H

DATE 5/21/87 TEMP. 202°F

PIPE SIZE 36" SCH.

ALL READINGS START AT

T.D.C. AND GO CLOCKWISE

WITH FLOW.

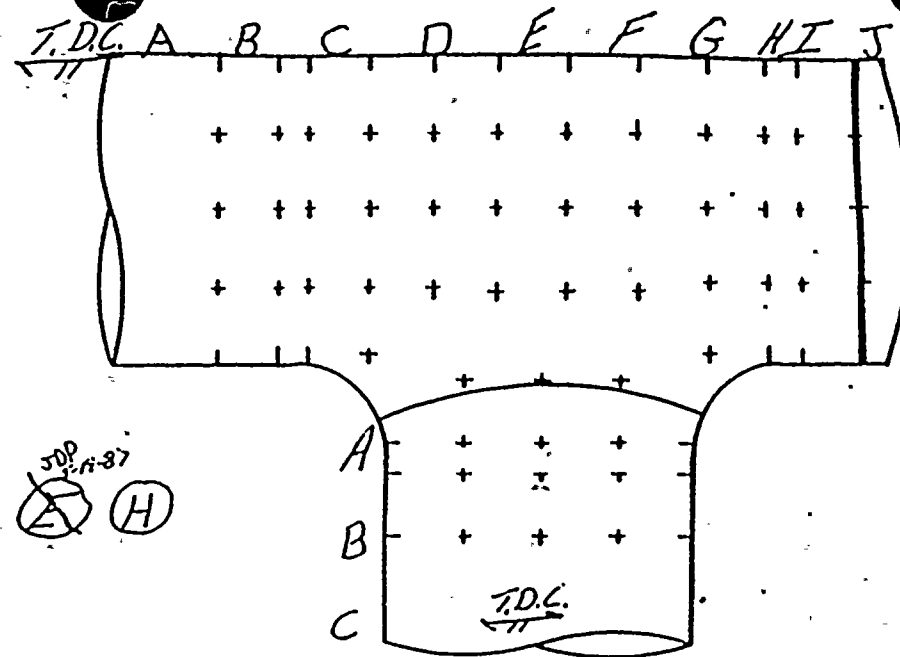
READINGS TAKEN BY:  
S. VARGO & A. HOLIDAY

	A	B	C	D	E	F	G	H	I	J
0°	.523	.526	.536	.533	.534	---	---	---	---	---
30°	.537	.540	.536	.540	.534	---	---	---	---	---
60°	.543	.546	.536	.541	.533	---	---	---	---	---
90°	.550	.544	.543	.539	.539	---	---	---	---	---
120°	.542	.540	.542	.538	.544	---	---	---	---	---
150°	.537	.524	.537	.542	.540	---	---	---	---	---
180°	.533	.504	.526	.521	.540	---	---	---	---	---
210°	.546	.537	.535	.538	.533	---	---	---	---	---
240°	.541	.531	.538	.535	.531	---	---	---	---	---
270°	.533	.541	.539	.538	.538	---	---	---	---	---
300°	.543	.538	.535	.533	.526	---	---	---	---	---
330°	.541	.540	.536	.532	.534	---	---	---	---	---



JOB ORDER# 715742 Item <sup>500</sup> ~~A~~ (H)  
 ISO. 1-B-16 Rev 3  
 DATE 5-19-87 TEMP. 195°F  
 PIPE SIZE 36" SCH. -

FLOW →



TDC		A	B	C	D	E	F	G	H	I	J
0°	533	534	529	529	530	537	534	521	525	522	
30°	539	533	534	530	523	525	521	528	525	534	
60°	532	533	528	530	537	521	518	520	521	531	
90°	537	528	524	529	530	528	522	525	522	534	
120°	538	535	532	523	521	520	526	527	526	533	
150°	536	530	515				526	526	525	531	
180°	536	532	537				529	521	523	486	
210°	530	537	537				524	520	526	514	
240°	530	541	536	532	527	511	521	521	523	525	
270°	540	532	535	536	532	521	513	524	514	536	
300°	535	532	529	544	534	532	532	527	528	540	
330°	542	531	554	532	531	530	520	532	540	529	

FLOW ↓

	A	B	C
0°	336	328	344
30°	344	342	345
60°	350	359	367
90°	362	363	375
120°	357	363	340
150°	349	351	351
180°	364	364	369
210°	344	375	370
240°	358	370	371
270°	338	353	331
300°	339	342	349
330°	327	348	372

ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW. Readings taken  
 by J. Pauly & S. Vargo.



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: A. J. LEWANDOWSKI

SER No. 88-84 (Steam) X

Unit No. 1

Evaluation Date: SEPTEMBER 16, 1987

SER No. 23-85 (Water)

Years in service 11

UT Reading Transmitted on: AUGUST 19, 1987

UT Reading Taken on: 6-12, 6-28, 6-30 AND 8-13-87

Isometric Dwg. NO. 1-B-17 REV. 3

AEPS Installed Mat'l Class V-31, ASTM A-155 GR. K670 CLASS I

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
A	36" 90° FLL COLUMN J	.500	.438-.563	.165	.390	11.0	RE-INSPECT IN 26 YEARS
A	36" 90° FLL	.375	.328-.422	.165	.355	0	STILL WITHIN MANUFACTURERS TOLERANCE
B	36" 90° FLL	.500	.438-.563	.165	.365	16.7	RE INSPECT IN 22 YEARS
E	36X36X36 MAIN HEADER	.500	.438-.563	.165	.490	0	STILL WITHIN MANUFACTURERS TOLERANCE
E	36X36X36 BRANCH	.500	.438-.563	.165	.490	0	" " " "
F	36X36X20 MAIN HEADER	.500	.438-.563	.165	.491	0	" " " "
F	36X36X20 BRANCH	.375	.328-.422	.119	.346	0	" " " "
G	36X36X20 MAIN HEADER	.528	.438-.563	.165	.528	0	" " " "
G	36X36X20 BRANCH	.375	.328-.422	.119	.304	7.3	RE-INSPECT IN 23 YEARS
H	36X36X20 MAIN HEADER	.500	.438-.563	.165	.474	0	STILL WITHIN MANUFACTURERS TOLERANCE
H	36X36X20 BRANCH	.375	.328-.422	.119	.315	4.0	RE-INSPECT IN 28 YEARS
I	36X36X20 MAIN HEADER	.500	.438-.563	.165	.511	0	STILL WITHIN MANUFACTURERS TOLERANCE
I	36X36X20 BRANCH	.375	.328-.422	.119	.236	28.0	RE-INSPECT IN 7 YEARS



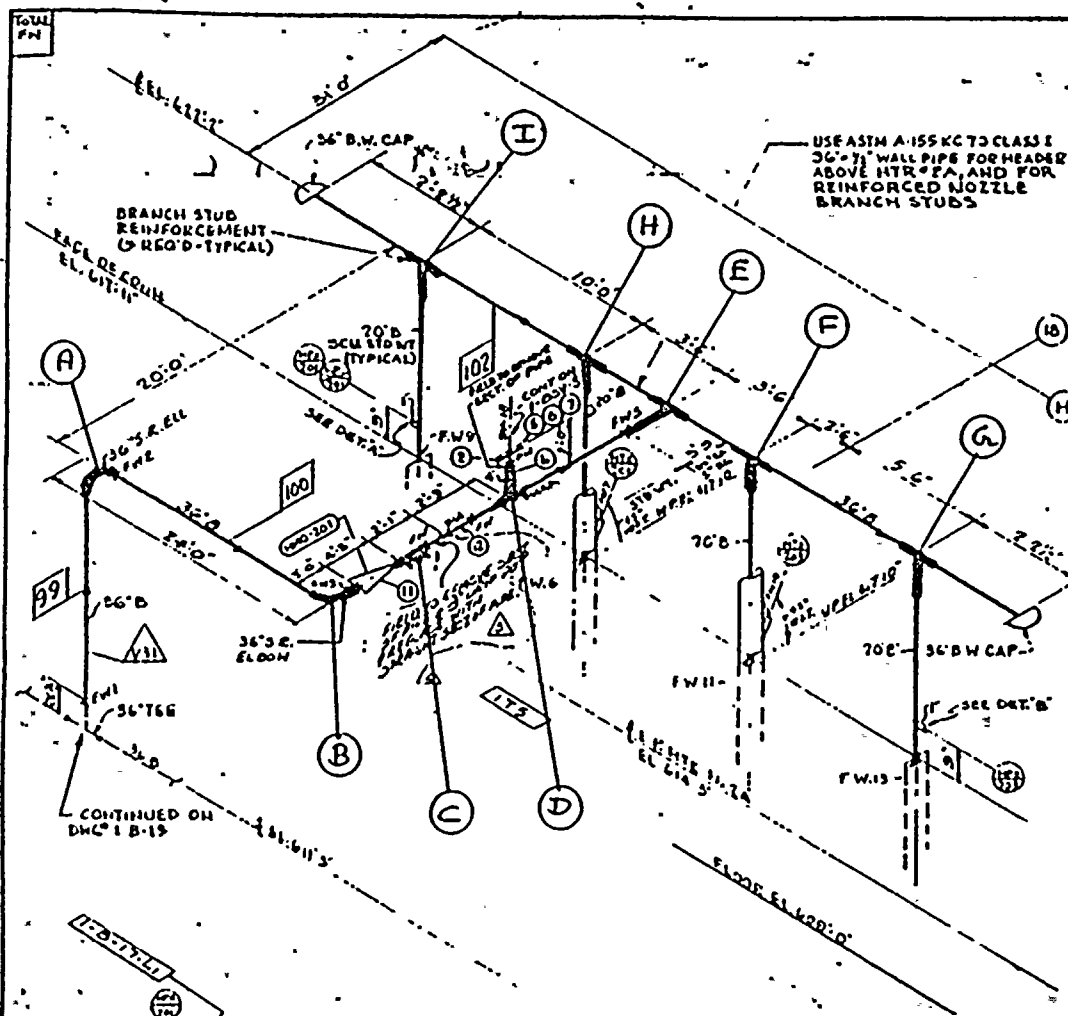
WEEK #16

CONST: J.O. # 715743

QC # 715742

J.O. # 715744

ISOMETRIC SHEET NO. 524



P.O.F. PIECE MARKS FAD.  
 1-B-99 SHAW  
 -100  
 -101  
 -102  
 -101A TAYLOR  
 -100

SITE FAD. PIECE MARKS  
 1-B-17-L<sub>1</sub>  
 -L<sub>2</sub>

INSPECT: A, B, E, G, H, I

REV	DATE	CODE	DESCRIPTION	P.O.	DWG.
3	12-19-71	TJB	REVISED BY NPS DESIGN ADDED ITEM 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" HAS 36" 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" CONT. DIM. 1-B-17-L <sub>1</sub> HAS 1-B-17-L <sub>1</sub>		
2	12-17-71	TJB	REVISED BY NPS DESIGN PER A.E.P. DWG. 1-5287 REV. 3 ADDED ITEMS 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" HAS 36" 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" CONT. DIM. 1-B-17-L <sub>1</sub> HAS 1-B-17-L <sub>1</sub>		
1	9-23-71	TJB	REVISED BY NPS DESIGN PER A.E.P. DWG. 1-5287 REV. 1 ADDED ITEMS 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" HAS 36" 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" CONT. DIM. 1-B-17-L <sub>1</sub> HAS 1-B-17-L <sub>1</sub>		

INDIANA & MICHIGAN ELECTRIC COMPANY  
**DONALD C. COOK NUCLEAR PLANT**  
 BRIDGMAN MICHIGAN  
 UNIT NO. 1

REV	DATE	CODE	DESCRIPTION	P.O.	DWG.
1	12-17-71	TJB	REVISED BY NPS DESIGN ADDED ITEM 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" HAS 36" 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" CONT. DIM. 1-B-17-L <sub>1</sub> HAS 1-B-17-L <sub>1</sub>		
2	12-17-71	TJB	REVISED BY NPS DESIGN PER A.E.P. DWG. 1-5287 REV. 3 ADDED ITEMS 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" HAS 36" 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" CONT. DIM. 1-B-17-L <sub>1</sub> HAS 1-B-17-L <sub>1</sub>		
3	12-19-71	TJB	REVISED BY NPS DESIGN ADDED ITEM 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" HAS 36" 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" CONT. DIM. 1-B-17-L <sub>1</sub> HAS 1-B-17-L <sub>1</sub>		

REV	DATE	CODE	DESCRIPTION	P.O.	DWG.
1	12-17-71	TJB	REVISED BY NPS DESIGN ADDED ITEM 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" HAS 36" 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" CONT. DIM. 1-B-17-L <sub>1</sub> HAS 1-B-17-L <sub>1</sub>		
2	12-17-71	TJB	REVISED BY NPS DESIGN PER A.E.P. DWG. 1-5287 REV. 3 ADDED ITEMS 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" HAS 36" 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" CONT. DIM. 1-B-17-L <sub>1</sub> HAS 1-B-17-L <sub>1</sub>		
3	12-19-71	TJB	REVISED BY NPS DESIGN ADDED ITEM 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" HAS 36" 1-B-17-L <sub>1</sub> (BY TAYLOR) DIM. 2'-0" CONT. DIM. 1-B-17-L <sub>1</sub> HAS 1-B-17-L <sub>1</sub>		

MATERIAL REQUIRED FOR  
FIELD REWORK

**UNCONTROLLED  
DOCUMENT**

DWG NO 1-B-17-001/0

DETAIL A

DETAIL B

INDICATION: FABRICATION MUST CONFORM TO LATEST A.E.P. ASSET.  
 FILE: 1-2287  
 NAME: MICHIGAN ELECTRIC COMPANY  
 NAME: BRIDGMAN CLASS: III  
 TEST REQUIREMENTS: N/A  
 WELD PROCEDURE: Q1  
 TESTING: N/A

BLEED STEAM PIPING

TUBECO



← FLOW

JOB ORDER # 715742

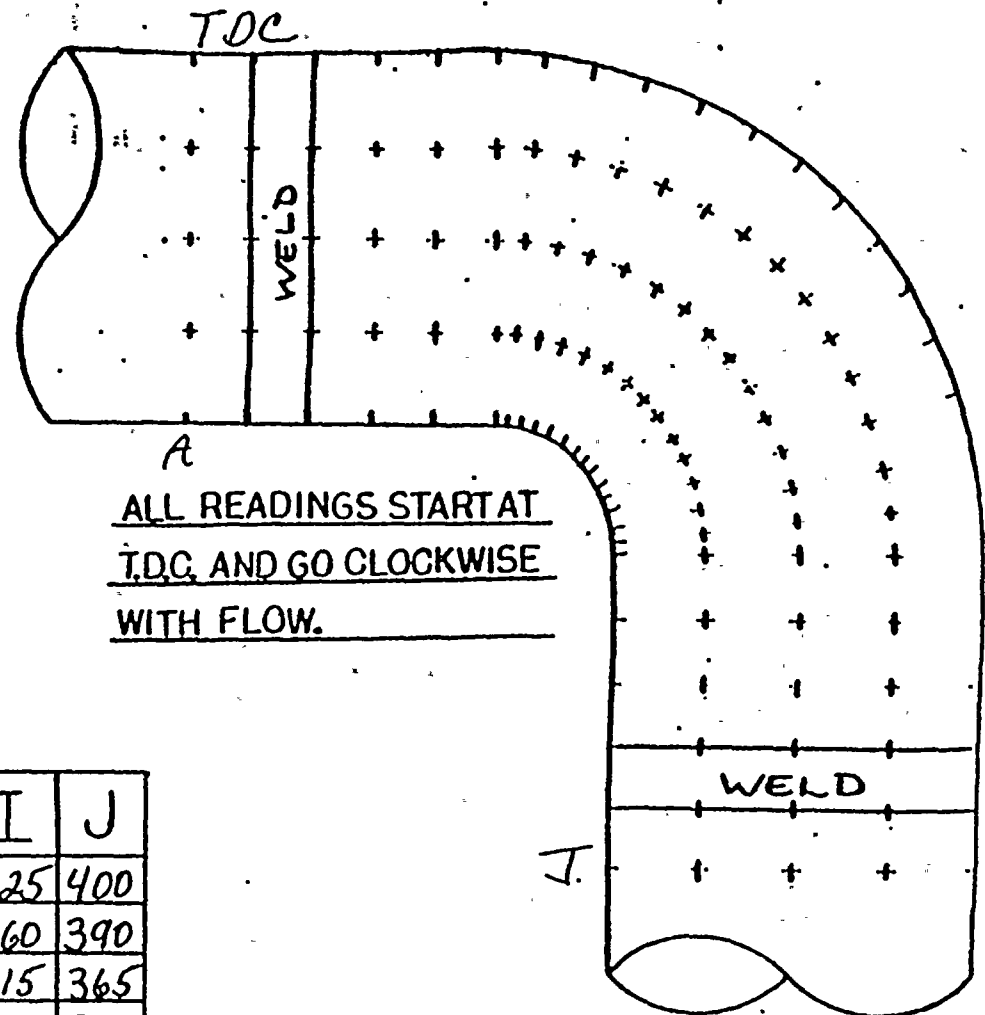
ISO. 1-B-17 REV. 3 (A)

DATE 8-13-87 TEMP.

PIPE SIZE 36" SCH.

ELBOW A

	A	B	C	D	E	F	G	H	I	J	
TDC	0°	435	455	445	475	465	420	390	480	425	400
	30°	420	420	470	455	445	445	405	490	360	390
	60°	425	420	475	460	435	480	475	475	415	365
	90°	420	435	445	475	505	500	485	505	450	390
	120°	415	445	475	505	485	495	495	490	460	360
	150°	415	465	475	480	475	445	495	510	460	375
	180°	415	470	485	485	485	480	485	485	470	380
	210°	410	450	455	485	480	485	485	475	435	355
	240°	420	440	445	485	480	475	485	490	450	365
	270°	425	485	495	490	480	480	395	455	445	390
	300°	440	480	475	470	425	430	480	465	455	380
	330°	435	440	465	465	480	470	480	485	435	405



1-KTLL

8-14-87



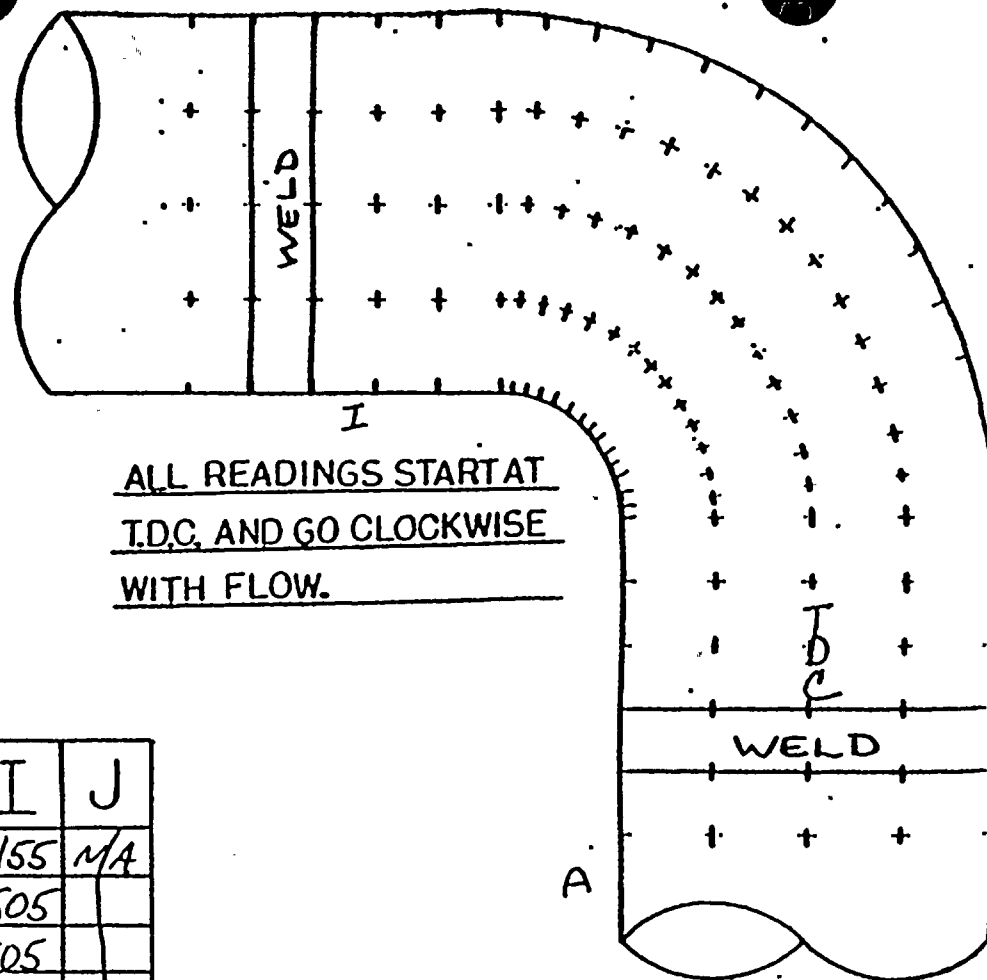
← FLOW

JOB ORDER# 715742

ISO. 1-B-17 REV. 3 (B)

DATE 8-13-87 TEMP.

PIPE SIZE 36" SCH.



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

ELBOW B

	A	B	C	D	E	F	G	H	I	J
TDC 0°	430	415	490	496	496	505	480	460	455	MA
30°	410	405	480	465	465	470	445	435	505	
60°	420	415	475	490	475	430	485	455	505	
90°	420	410	455	475	430	450	455	465	495	
120°	415	425	445	440	415	465	490	490	500	
150°	415	410	445	475	485	435	510	515	500	
180°	415	380	365	375	420	435	430	515	525	
210°	380	365	400	445	405	415	395	475	475	
240°	415	400	505	490	505	515	460	445	480	
270°	415	425	510	505	485	520	495	495	490	
300°	445	420	455	490	495	490	490	485	455	
330°	420	435	445	505	515	490	480	465	450	↓

J-K Roll 8-14-87



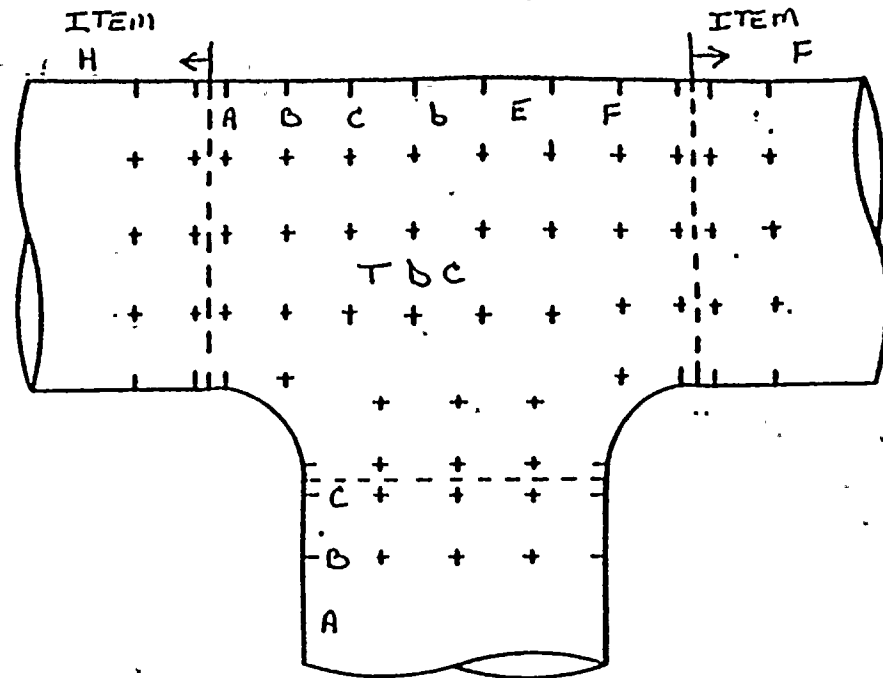
JOB ORDER\* 715742

ISO. 1-B-17 REV. 3 (E)

DATE 6/30/87 TEMP.

PIPE  
SIZE 36" SCH.

FLOW



TDC	0°	A	B	C	D	E	F	G	H	I	J
30°		.529	.490	.524	.526	.525	.532	-	-	-	-
60°		.498	.533	-	-	.548	.532	-	-	-	-
90°		.538	-	-	-	.511	.503	-	-	-	-
120°		.538	-	-	-	.540	.525	-	-	-	-
150°		.535	-	-	-	.529	.538	-	-	-	-
180°		.527	.533	-	-	.522	.539	-	-	-	-
210°		.535	.532	.528	.527	.528	.523	-	-	-	-
240°		.532	.535	.509	.512	.501	.497	-	-	-	-
270°		.492	.501	.503	.500	.496	.540	-	-	-	-
300°		.503	.507	.501	.528	.528	.505	-	-	-	-
330°		.505	.520	.522	.521	.521	.526	-	-	-	-
360°		.492	.521	.528	.528	.532	.527	-	-	-	-

FLOW

TDC	0°	A	B	C
30°		.525	.529	.540
60°		.526	.550	.519
90°		.532	.532	.489
120°		.524	.534	.537
150°		.501	.542	.505
180°		.550	.531	.514
210°		.533	.534	.550
240°		.531	.530	.514
270°		.530	.529	.521
300°		.550	.490	.490
330°		.531	.523	.534
360°		.531	.535	.540

ALL READINGS START  
AT T.D.C. AND GO  
CLOCKWISE WITH  
FLOW.

READINGS TAKEN BY J. PAULY  
AND A. HOLLEY.



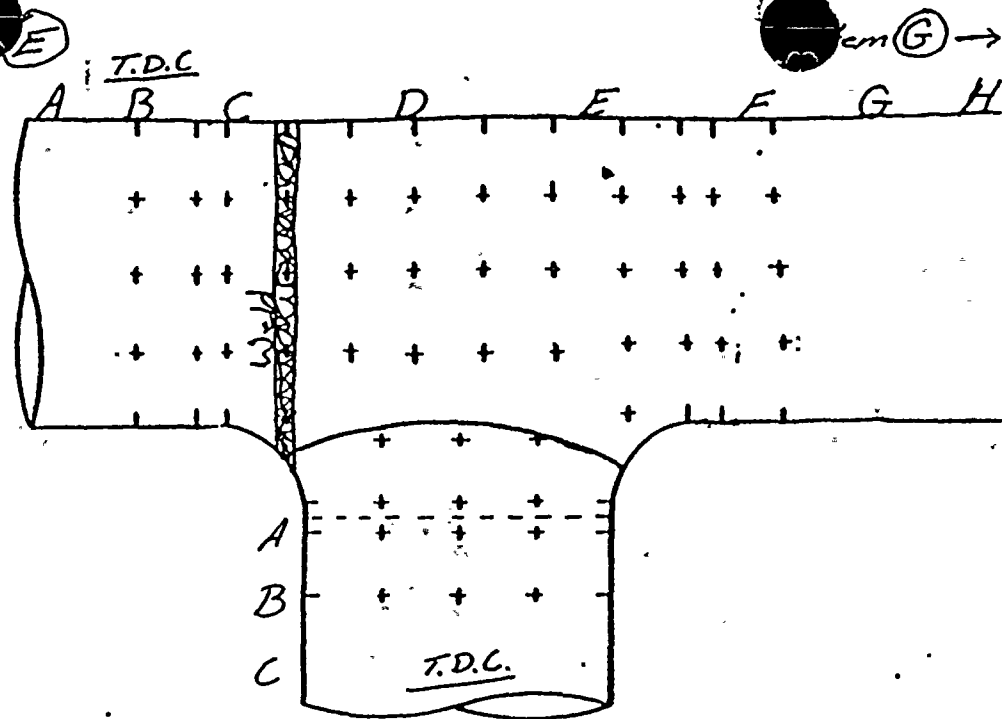
JOB ORDER\* 715742

ISO. 1-B-17 Rev. 3 Item (F)

DATE 6-28-87 TEMP. 90°F

PIPE  
SIZE 36" SCH.

FLOW →



TDC		A	B	C	D	E	F	G	H	I	J
0°	514	533	528	525	527	523	526	525			
30°	537	536	541	528	528	518	524	560			
60°	514	535	535	526	530	533	531	528			
90°	522	517	536	530	529	530	500	539			
120°	534	544	539	532	533	536	534	539			
150°	537	—	—	526	530	532	531	532			
180°	491	—	—	523	523	530	531	535			
210°	534	534	540	528	528	527	530	531			
240°	505	534	536	530	528	534	532	530			
270°	532	528	530	528	524	528	526	529			
300°	535	533	539	533	521	529	532	530			
330°	530	514	533	525	528	533	528	529			

FLOW ↓

TDC

	A	B	C
0°	367	411	382
30°	371	371	367
60°	362	379	373
90°	373	356	373
120°	363	372	375
150°	360	352	386
180°	346	373	383
210°	361	361	379
240°	358	367	373
270°	365	363	373
300°	367	375	361
330°	350	367	366

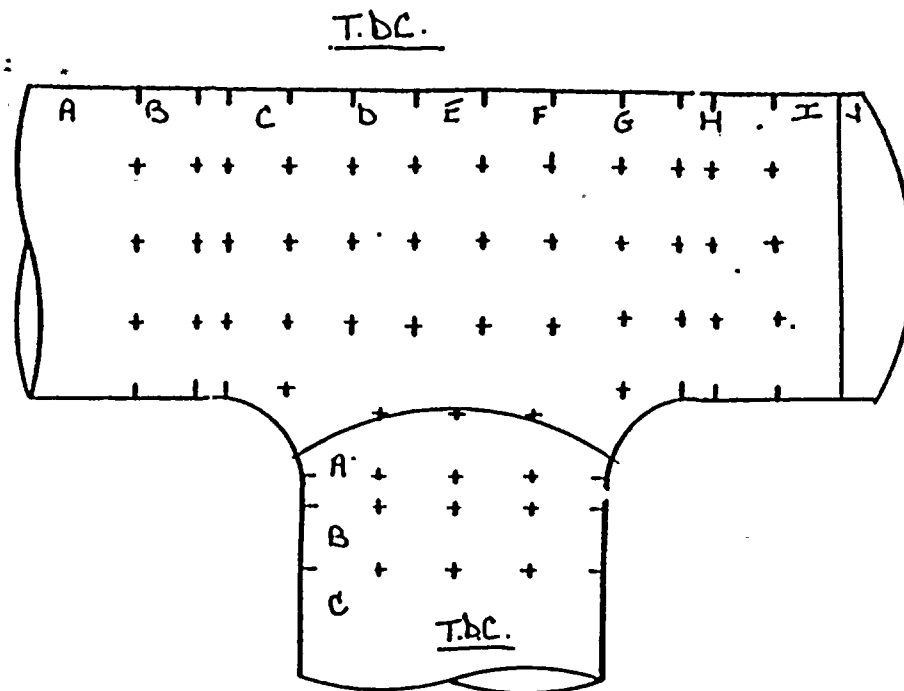
ALL READINGS START  
AT T.D.C. AND GO  
CLOCKWISE WITH  
FLOW.

Readings taken by  
J. Pauly and A. Holiday.



JOB ORDER\* 715742  
 ISO. 1 B.17 REV. 3 (G)  
 DATE 6/12/87 TEMP. 18°F  
 PIPE SIZE 36" SCH.

FLOW →



TDC		A	B	C	D	E	F	G	H	I	J
0°		530	532	532	544	549	531	528	529	530	538
30°		532	536	534	538	535	535	546	533	548	546
60°		531	546	538	530	531	540	531	530	535	541
90°		534	517	542	540	541	543	530	529	533	543
120°		539	543	539	538	543	544	546	550	541	536
150°		535	546	541	547	-	-	-	548	547	523
180°		542	539	536	533	-	-	-	538	539	541
210°		535	536	534	532	-	-	-	544	534	546
240°		535	541	542	538	542	543	537	541	531	542
270°		538	543	542	540	543	544	538	540	534	543
300°		536	540	540	542	546	543	537	535	533	543
330°		541	535	546	541	538	534	534	541	531	546

↓ FLOW

TDC		A	B	C
0°		348	324	304
30°		328	324	305
60°		346	326	316
90°		369	349	324
120°		366	331	320
150°		356	350	337
180°		349	351	341
210°		365	361	363
240°		366	333	365
270°		354	349	368
300°		342	361	361
330°		364	367	

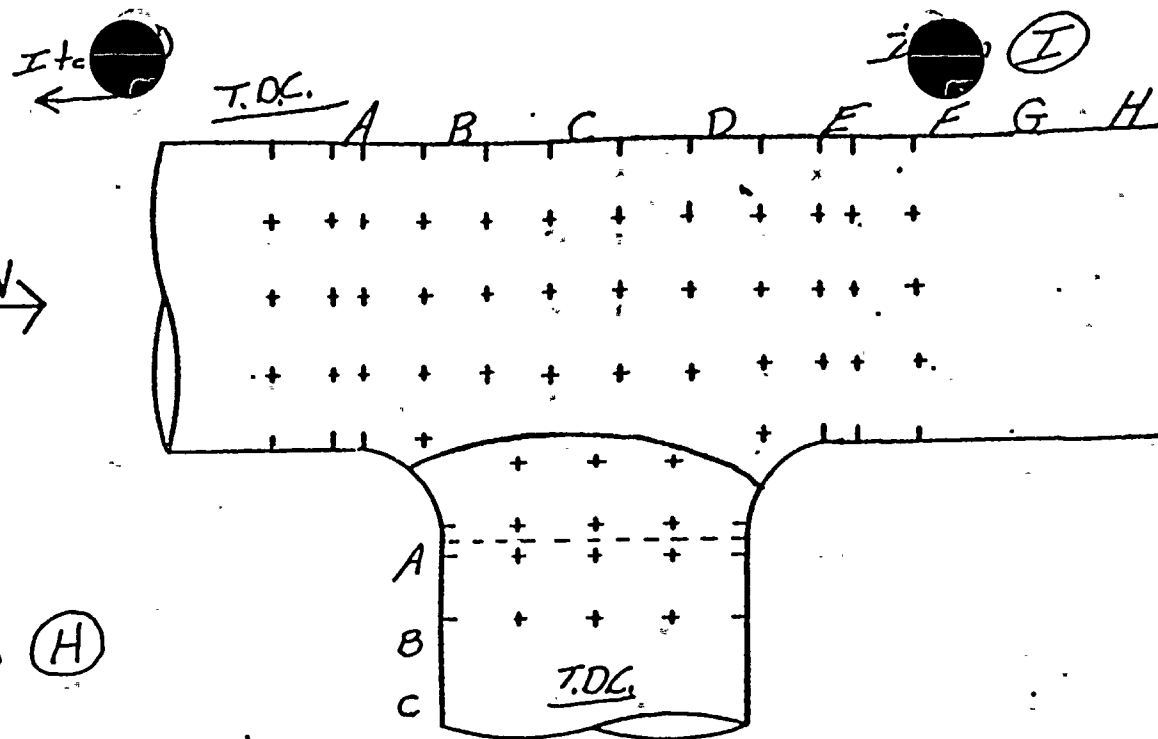
ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

READINGS TAKEN BY:  
 J. WOBARCZYK & J. PAULY



JOB ORDER\* 715742  
 ISO. 1-B-17 Box 3 Item (H)  
 DATE 6-28-87 TEMP. 90°F  
 PIPE SIZE 36" SCH.

FLOW →



TDC		A	B	C	D	E	F	G	H	I	J
0°	567	577	542	540	540	538	538	540			
30°	556	541	565	546	548	539	540	539			
60°	540	540	544	544	552	546	540	542			
90°	521	541	541	541	538	538	540	536			
120°	544	540	540	550	543	548	544	545			
150°	474	—	—	541	540	537	538	543			
180°	524	—	—	538	534	536	535	533			
210°	540	—	—	547	542	542	542	539			
240°	517	542	544	546	547	530	545	545			
270°	520	561	546	551	548	542	535	544			
300°	514	549	547	547	550	545	549	546			
330°	540	542	542	545	530	540	545	545			

FLOW ↓

TDC

	A	B	C
0°	368	358	372
30°	370	336	368
60°	378	324	323
90°	366	363	333
120°	368	343	343
150°	362	361	369
180°	331	351	378
210°	315	348	371
240°	348	350	382
270°	373	386	380
300°	373	380	380
330°	368	350	364

ALL READINGS START  
 AT T.D.C. AND GO  
 CLOCKWISE WITH  
 FLOW.

Readings taken by  
 J. Pauly & A. Holiday.



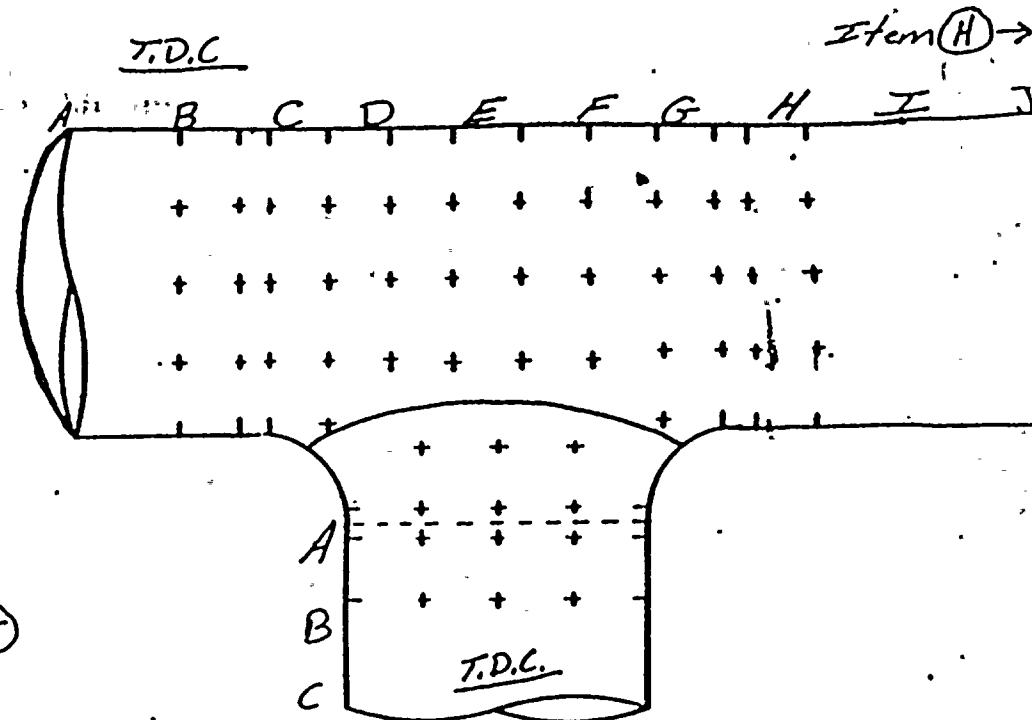
JOB ORDER\* 715742

ISO. 1-B-17 Rev. 3 Item (I)

DATE 6-28-87 TEMP. 90°F

PIPE  
SIZE 36" SCH.

FLOW



TDC		A	B	C	D	E	F	G	H	I	J
0°	542	533	528	532	536	535	534	531	540	537	
30°	534	530	533	527	532	530	533	530	529	532	
60°	533	522	520	530	532	533	530	530	533	541	
90°	539	531	525	531	530	530	529	529	530	533	
120°	508	533	531	533	530	534	525	533	535	536	
150°	535	531	530	—	533	537	540	530	534	533	
180°	532	567	530	—	534	533	533	533	533	535	
210°	520	532	517	—	531	528	538	534	534	538	
240°	524	534	537	534	534	536	537	537	534	538	
270°	535	538	528	520	537	522	535	540	537	540	
300°	537	533	542	519	536	536	520	514	536	540	
330°	532	539	528	536	533	538	536	515	537	537	

FLOW

TDC

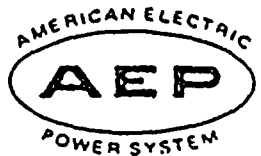
	A	B	C
0°	324	315	319
30°	343	360	330
60°	348	360	331
90°	356	385	328
120°	319	338	302
150°	312	319	350
180°	307	341	345
210°	236	319	344
240°	296	326	352
270°	319	320	349
300°	335	339	342
330°	335	346	

ALL READINGS START  
AT T.D.C. AND GO  
CLOCKWISE WITH  
FLOW.

Readings taken by  
J. Pauly & A. Holiday.



AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: MAY 19, 1987

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 1  
X Steam Piping Erosion Program, SER No. 88-84  
   Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation of Wall Thickness Measurements  
 NOTE: 16-INCH BLEED STM TO HEATERS 5A & 5B

FROM: A. J. Lewandowski

TO: 1. J. A. Kobyra  
 2. R. Tella

*AK 5/26/87*

We have reviewed the wall thickness measurements transmitted to us on MAY 1, 1987, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
LB-22, REV. 3	SS	A STRAIGHT	PREVIOUSLY REPLACED WITH SS
---	CS	B 90° ELL	ACCEPTABLE, NO FURTHER EXAMINATION REQ'D
---	SS	B	PREVIOUSLY REPLACED WITH SS
---	CS	C	ACCEPTABLE, RE EXAMINE IN 14 YEARS
---	---	D MAIN HEADER	ACCEPTABLE, RE EXAMINE IN 17 YEARS
---	---	E BRANCH	ACCEPTABLE, NO FURTHER EXAMINATION REQ'D
---	---	E STRAIGHT	ACCEPTABLE, NO FURTHER EXAMINATION REQ'D
---	---	E	ACCEPTABLE, RE EXAMINE IN 20 YEARS
---	---	H	ACCEPTABLE, NO FURTHER EXAMINATION REQ'D
---	---	I	ACCEPTABLE, NO FURTHER EXAMINATION REQ'D

*Anthony J. Lewandowski*  
 Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr. - Bridgman  
 C. A. Erikson  
 P. G. Schoepf  
 H. B. Brugger  
 P & V File No. 4.6.3.15.2.1.2



D. C. Cook Nuclear Plant, Unit No. 1  
 X Steam Piping Erosion Program, SER No. 88-84  
 Water Piping Erosion Program, SER No. 23-85  
 Engineering evaluation of Wall Thickness Measurements  
 Date: MAY 19 1987  
 Sheet No. 2 of 3

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
---	CS	J	ACCEPTABLE, NO FURTHER EXAMINATION REQ'D
---	---	K	ACCEPTABLE, RE EXAMINE IN 23 YEARS
---	---	L	ACCEPTABLE, NO FURTHER EXAMINATION REQ'D
---	---	M	ACCEPTABLE, RE EXAMINE IN 7 YEARS
---	---	N	ACCEPTABLE, RE EXAMINE IN 14 YEARS
1-B-23, REV. 5	---	90° ELL B	ACCEPTABLE, RE EXAMINE IN 11 YEARS
---	---	STRAIGHT B	ACCEPTABLE, NO FURTHER EXAMINATION REQ'D
---	---	90° ELL C	ACCEPTABLE, RE EXAMINE IN 12 YEARS
---	---	STRAIGHT C	ACCEPTABLE, RE EXAMINE IN 23 YEARS
---	---	E	ACCEPTABLE, RE EXAMINE IN 29 YEARS *
---	---	F	ACCEPTABLE, RE EXAMINE IN 28 YEARS *
---	---	G	ACCEPTABLE, RE EXAMINE IN 26 YEARS
1-B-24, REV. 5	SS	A 90° ELL	PREVIOUSLY REPLACED WITH SS
---	SS	B STRAIGHT	PREVIOUSLY REPLACED WITH SS
---	CS	B 90° ELL	ACCEPTABLE, NO FURTHER EXAMINATION REQ'D
---	SS	C STRAIGHT	PREVIOUSLY REPLACED WITH SS
---	CS	C	ACCEPTABLE, NO FURTHER EXAMINATION REQ'D
---	---	D	ACCEPTABLE, RE EXAMINE IN 13 YEARS
---	---	E	ACCEPTABLE, RE EXAMINE IN 12 YEARS
---	---	F	ACCEPTABLE, NO FURTHER EXAMINATION REQ'D
---	---	I 90° ELL	ACCEPTABLE, RE EXAMINE IN 26 YEARS
---	---	J	ACCEPTABLE, RE EXAMINE IN 9 YEARS



D. C. Cook Nuclear Plant, Unit No. 1  
X Steam Piping Erosion Program, SER No. 88-84  
   Water Piping Erosion Program, SER No. 23-85  
 Engineering evaluation of Wall Thickness Measurements  
 Date: MAY 19 1987  
 Sheet No. 2 of 3

[illegible]

\* DENOTES COMPONENTS WHICH ARE TO BE RE-EXAMINED IF THE RELINQUISHING OF THE PLANT IS PURSUED.



PLANT

D. C. COOK    LEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: ANTHONY J. LEWANDOWSKI

SER No. 88-84 (Steam) X

Unit No. 1

Evaluation Date: MAY 18, 1987

SER No. 23-85 (Water)

Years in service 11

UT Reading Transmitted on: MAY 1, 1987

UT Reading Taken on: 46,474-9  
4139416

Isometric Dwg. NO. 1-B-22, REV. 3

AEPS Installed Mat'l Class CS ASTM A106 GR.B, X-MYY & SCH.40

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Rec'd Thk.	Lowest Reading	Percent Eroded	COMMENTS
A	16" 90° ELL	---	---	---	---	---	REPLACED CS ELL WITH A SS ELL
B	16" STRAIGHT P	.500	.438-.562	.222 <del>.159</del>	.456	0%	STILL WITHIN MANUFACTURERS REQ'D TOLERANCE
B	16" 90° ELL	---	---	---	---	---	REPLACED CS ELL WITH A SS ELL
C	16" 90° ELL	.500	.438-.562	.222 <del>.159</del>	.364	17%	RE EXAM <sup>14</sup> YEARS
D	16" 90° ELL MAIN HEADER	.500	.438-.562	.222 <del>.159</del>	.376	14%	RE EXAM 18 YEARS
E	16" TEE BRANCH	1.031	.902-1.160	.222 <del>.159</del>	.972	0%	STILL WITHIN MANUFACTURERS REQ'D TOLERANCE
E	16" TEE	.500	.438-.562	.222 <del>.159</del>	.439	0%	" " " "
E	16" STRAIGHT P	.500	.438-.562	.222 <del>.159</del>	.395	10%	RE EXAM 20 YEARS
H	16" 90° ELL	.500	.438-.562	.222 <del>.159</del>	.515	0%	STILL WITHIN MANUFACTURERS REQ'D TOLERANCE
I	8" STRAIGHT P	.322	.282-.362	.149 <del>.086</del>	.315	0%	" " " "
J	16" STRAIGHT P	.500	.438-.562	.222 <del>.159</del>	.516	0%	" " " "
K	16" 90° ELL	.500	.438-.562	.222 <del>.159</del>	.400	9%	RE EXAM 23 YEARS
L	8" STRAIGHT P	.322	.282-.362	.149 <del>.086</del>	.305	0%	STILL WITHIN MANUFACTURERS REQ'D TOLERANCE
M	16" 90° ELL	.500	.438-.562	.222 <del>.159</del>	.301	31%	RE EXAM 70 YEARS
N	16" 90° ELL	.500	.438-.562	.222 <del>.159</del>	.360	18%	RE EXAM 14 YEARS



WEEK #12

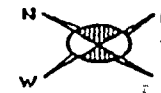
CONST: J.O.# 008527

QC: J.O.# 04984

J.O.# 715740

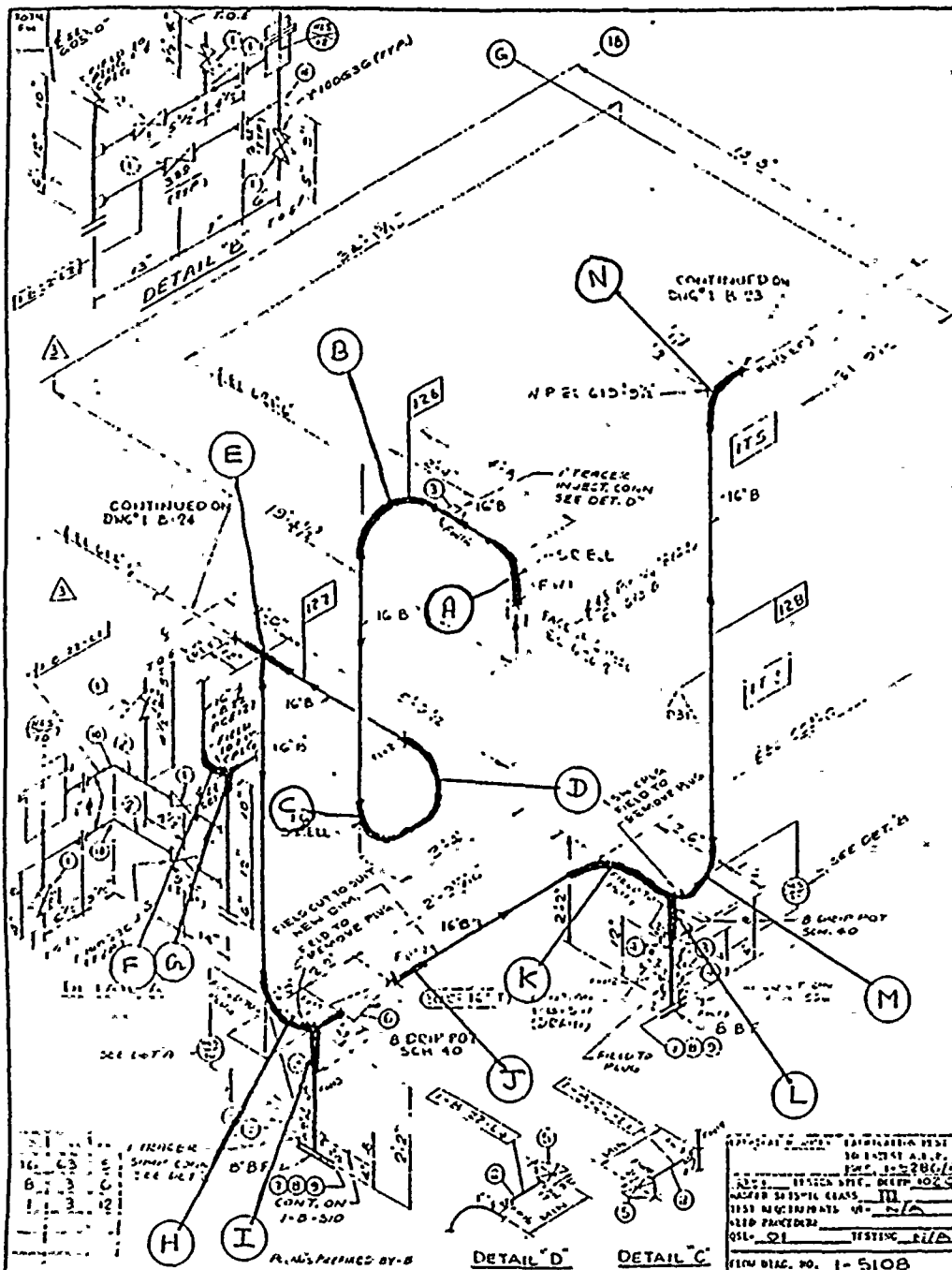
ISOMETRIC SHEET NO. 522

INSPECT: A, B, C, D  
E, H, I  
J, K, L, M  
N



P.O.#      PIECE MARKS      FAB.  
1-B-126  
-127  
-128  
SHAW

SITE FAB. PIECE MARKS  
1-B-24-L1  
-L2  
-L3  
-L4



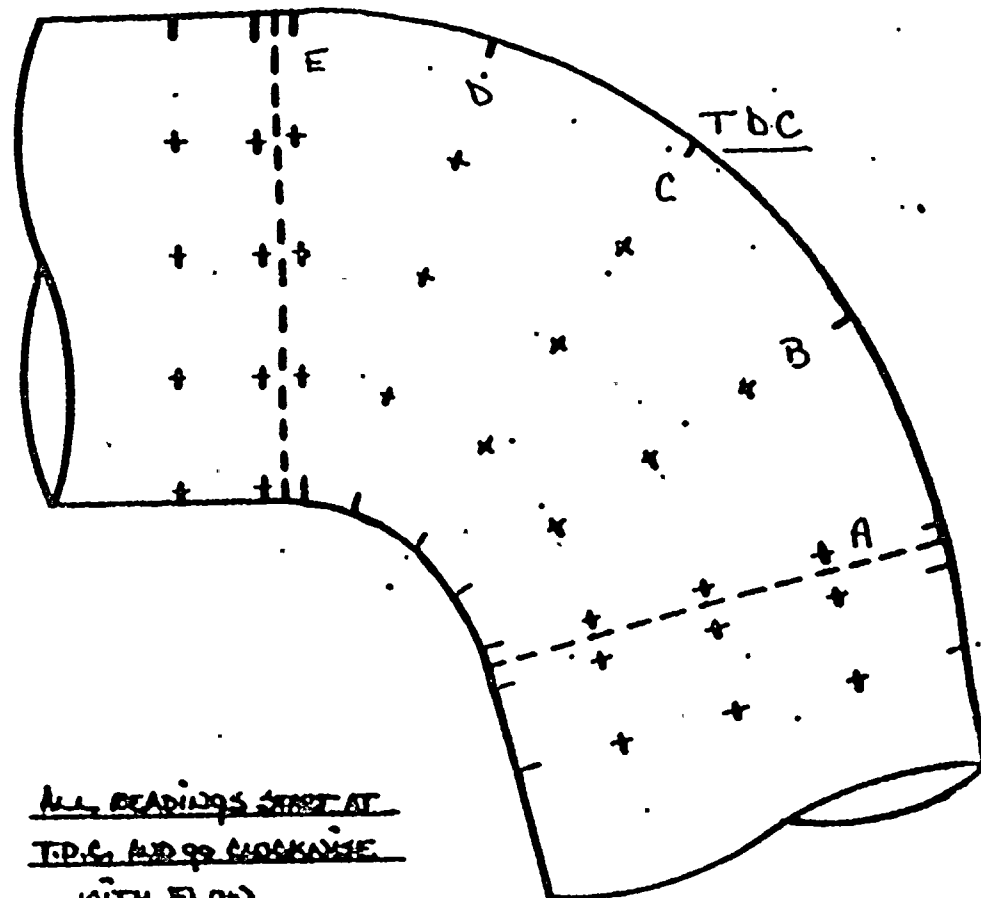
REV	DATE	CODE	DESCRIPTION	P.O.	DWG.
3			REVISED PER A.E.P. DESIGN. PER A.E.P. DWG. 1-5108 FOR REV. 3. ADDED ITEMS 126, 127, 128. DELETED ITEM 125. VIOON34 REPLACED BY ITEM 126. VIOON34.		
2	3-1-72	BT	REVISED BY NPS DESIGN PER A.E.P. DWG. 1-5108 FOR REV. 3. ADDED ITEMS 126, 127, 128. DELETED ITEM 125. VIOON34 REPLACED BY ITEM 126. VIOON34.		
1	9-27-71	BT	REVISED BY NPS DESIGN PER A.E.P. DWG. 1-5108 FOR REV. 3. ADDED ITEMS 126, 127, 128. DELETED ITEM 125. VIOON34 REPLACED BY ITEM 126. VIOON34.		

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN      UNIT NO.1      MICHIGAN

A-53		A-104		A-323		A-312		THWLS		CWN BY J. K. ON			
CRD										CWN BY S. A. ON			
STD	BY	221	30	30	60	60	100	120	200	260	WED		
EXCEP										CWN BY S. A. ON			
C	PPH	AREA	ISO	JUAN		JOB		DING		CODE	APPS	D	ON
C	PPH	221	30	30	60	60	100	120	200	260	WED		
3										005050		DRAWING NO.	
1										E-22			



← FLOW



ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW.

16" (sch. X. Hvy)

\* STAINLESS STEEL

	A	B	C	D	E	F	G
0°	.518	.518	.528	.510	.509	-	-
30°	.509	.516	.520	.508	.519	-	-
60°	.508	.504	.505	.502	.503	-	-
90°	.515	.514	.516	.514	.510	-	-
120°	.522	.532	.533	.531	.512	-	-
150°	.531	.544	.535	.537	.518	-	-
180°	.470	.496	.499	.528	.519	-	-
210°	.531	.525	.531	.526	.522	-	-
240°	.533	.533	.539	.532	.506	-	-
270°	.522	.534	.530	.527	.515	-	-
300°	.513	.506	.499	.507	.516	-	-
330°	.515	.510	.498	.510	.507	-	-

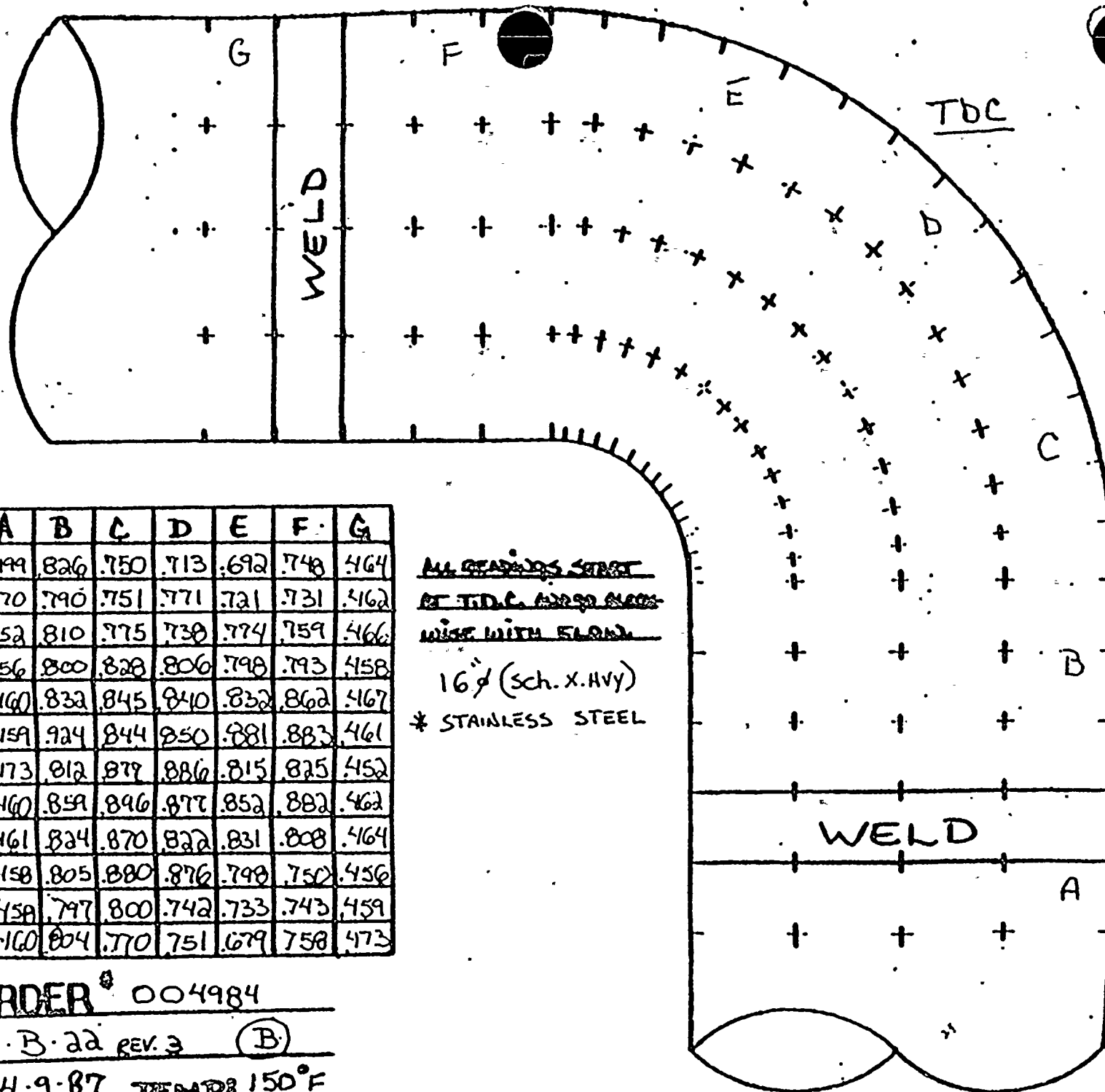
JOB ORDER\*\* 004984

ISO\*\* 1-B-22 REV. 3 (A)

DATE 4-9-87 TEMP: 150°F



← FLOW



TDC

	A	B	C	D	E	F	G
0°	.499	.826	.750	.713	.692	.748	.464
30°	.470	.790	.751	.771	.721	.731	.462
60°	.452	.810	.775	.738	.774	.759	.466
90°	.456	.800	.828	.806	.798	.793	.458
120°	.460	.832	.845	.840	.832	.862	.467
150°	.459	.924	.844	.850	.881	.883	.461
180°	.473	.812	.879	.886	.815	.825	.452
210°	.460	.859	.896	.877	.852	.882	.462
240°	.461	.824	.870	.822	.831	.808	.464
270°	.458	.805	.880	.876	.798	.750	.456
300°	.458	.797	.800	.742	.733	.743	.459
330°	.460	.804	.770	.751	.679	.758	.473

ALL READINGS START  
AT T.D.C. AND GO DOWN  
WITH FLOW

16" (sch. X.Hvy)  
\* STAINLESS STEEL

JOB ORDER # 004984  
ISO# 1-B-22 REV. 3 (B)  
DATE: 4-9-87 TEMP: 150°F



← FLOW

WELD

G F E D C B A

T.O.C.

T.O.C.

	A	B	C	D	E	F	G
0°	.547	.530	.517	.500	.498	.535	.514
30°	.511	.507	.496	.486	.475	.472	.467
60°	.479	.488	.490	.481	.473	.476	.472
90°	.470	.477	.491	.493	.447	.422	.407
120°	.475	.461	.492	.454	.379	.371	.384
150°	.462	.416	.418	.476	.405	.389	.390
180°	.474	.412	.426	.454	.417	.418	.424
210°	.475	.400	.394	.420	.424	.402	.384
240°	.477	.418	.405	.396	.371	.372	.364
270°	.492	.520	.514	.485	.501	.566	.460
300°	.524	.520	.506	.500	.493	.488	.465
330°	.532	.531	.536	.498	.494	.480	.493

ALL READINGS START

AT T.O.C. AND 90 DEGREE

WISE WITH FLOW.

READINGS TAKEN BY:

S. VARGO & A. HOLIDAY

16" (sch. x. Hvy)

B

A

WELD

STAINLESS STEEL

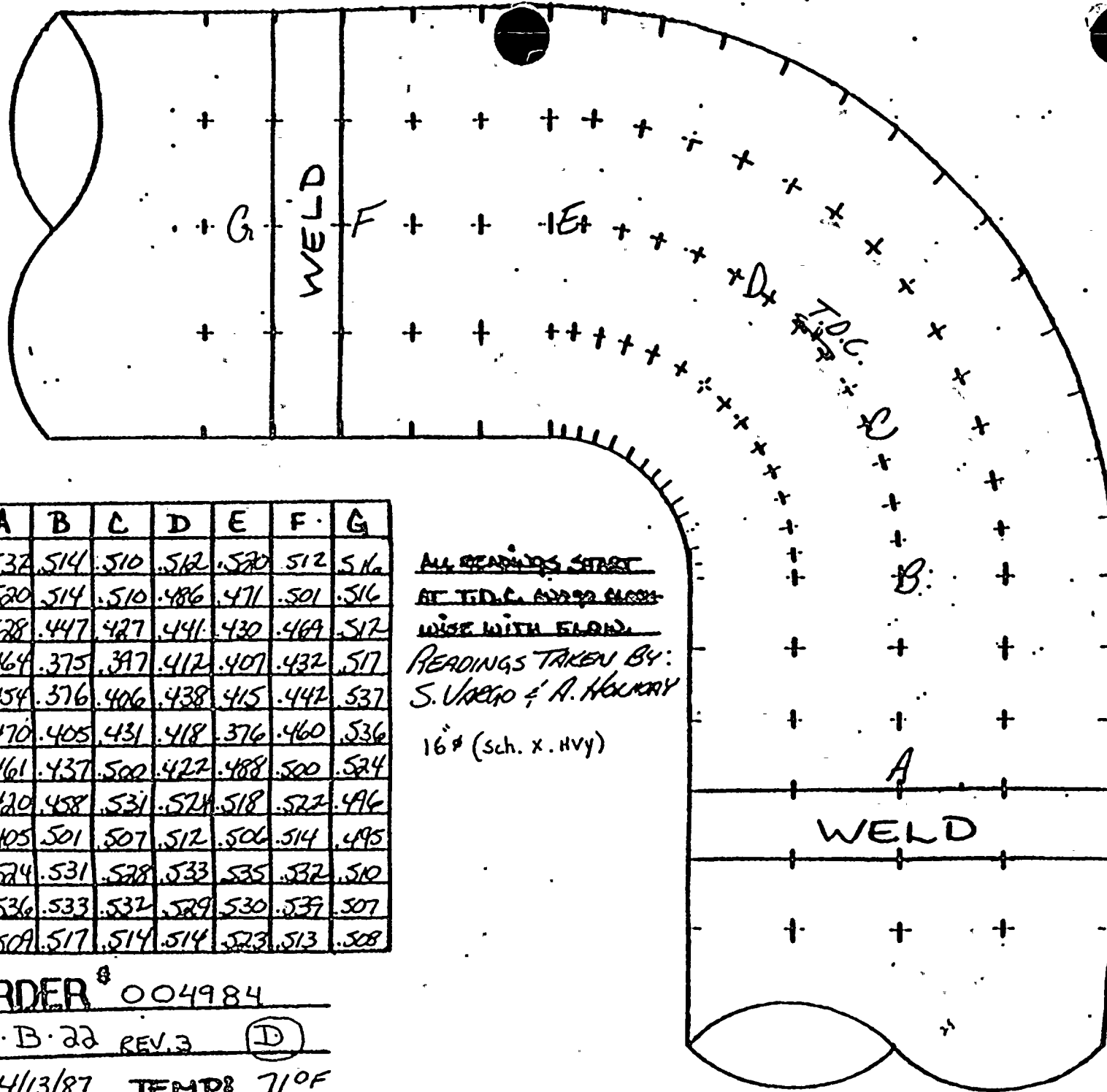
JOE ORDER # 004984

ISO # 1-B-22 REV. 3 (C)

DATE: 4/13/87 TEMP: 72° F



FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	.532	.514	.510	.512	.520	.512	.516
30°	.520	.514	.510	.486	.471	.501	.516
60°	.528	.447	.427	.441	.430	.469	.512
90°	.464	.375	.397	.412	.407	.432	.517
120°	.454	.376	.406	.438	.415	.442	.537
150°	.470	.405	.431	.418	.376	.460	.536
180°	.461	.437	.500	.422	.488	.500	.524
210°	.420	.458	.531	.524	.518	.522	.496
240°	.405	.501	.507	.512	.506	.514	.495
270°	.524	.531	.528	.533	.535	.532	.510
300°	.536	.533	.532	.529	.530	.539	.507
330°	.509	.517	.514	.514	.523	.513	.508

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

READINGS TAKEN BY:  
S. VAEGO & A. HOLWAY

16" (Sch. X. Hvy)

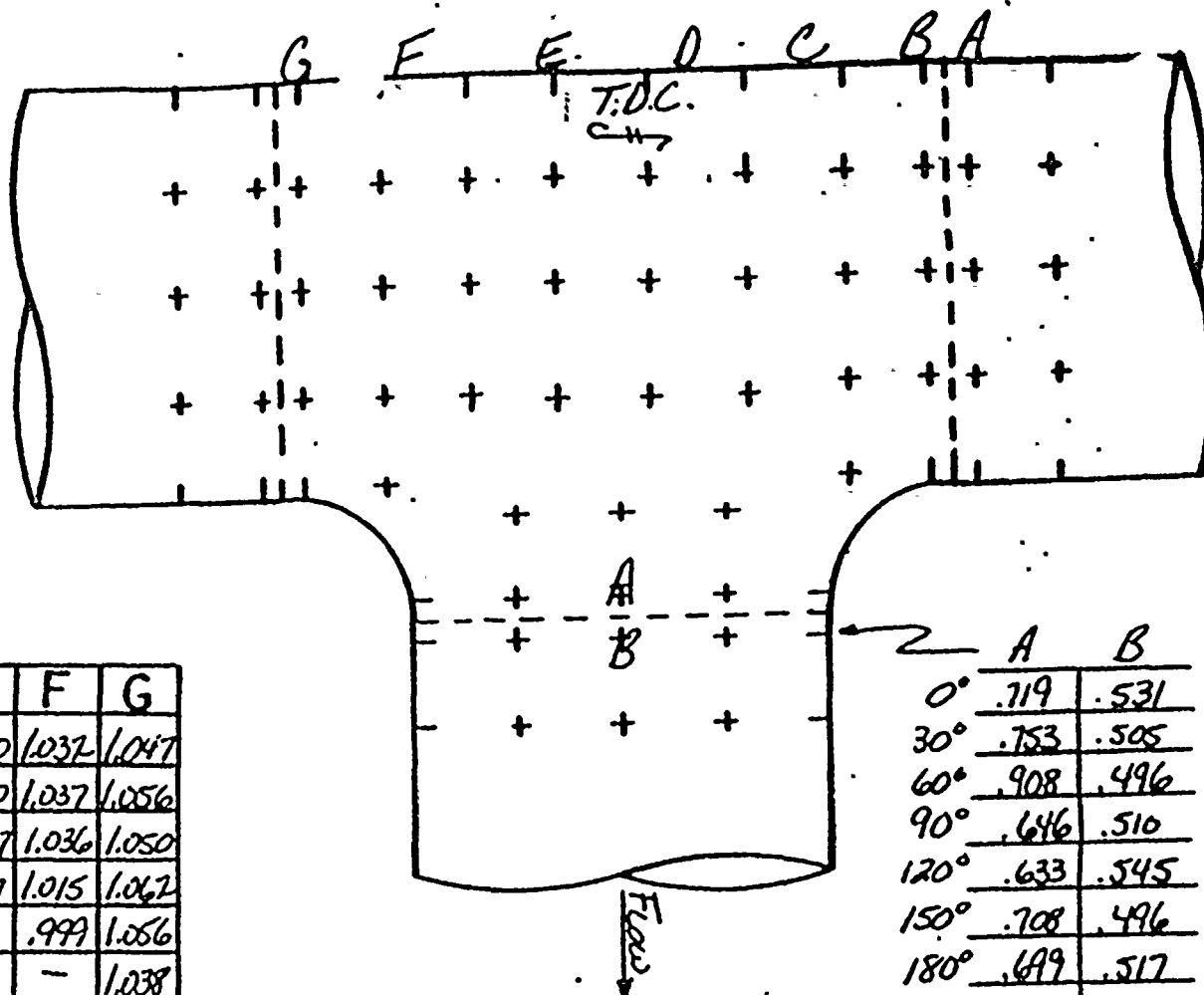
JOE ORDER # 004984

ISO # 1-B-22 REV. 3 (D)

DATE: 4/13/87 TEMP: 71°F



← FLOW



	A	B	C	D	E	F	G
0°	.401	1.066	1.044	1.025	1.040	1.037	1.047
30°	.420	1.081	1.049	1.013	1.020	1.037	1.056
60°	.417	1.078	1.040	1.041	1.047	1.036	1.050
90°	.440	1.100	1.024	1.006	1.007	1.015	1.062
120°	.493	1.120	1.036	—	—	.999	1.056
150°	.421	1.098	—	—	—	—	1.038
180°	.426	1.130	—	—	—	—	.971
210°	.403	1.093	—	—	—	—	.987
240°	.395	1.097	1.061	—	—	1.010	1.062
270°	.408	1.024	1.021	1.034	1.044	1.016	1.017
300°	.415	1.016	.996	.992	.991	.994	1.010
330°	.409	1.020	1.005	1.009	1.015	1.016	1.034

	A	B
0°	.719	.531
30°	.753	.505
60°	.908	.496
90°	.646	.510
120°	.633	.545
150°	.708	.496
180°	.699	.517
210°	.575	.477
240°	.470	.439
270°	.590	.537
300°	.674	.570
330°	.757	.536

ALL READINGS START AT  
T.D.C. AND 90° CLOCKWISE  
WITH FLOW.

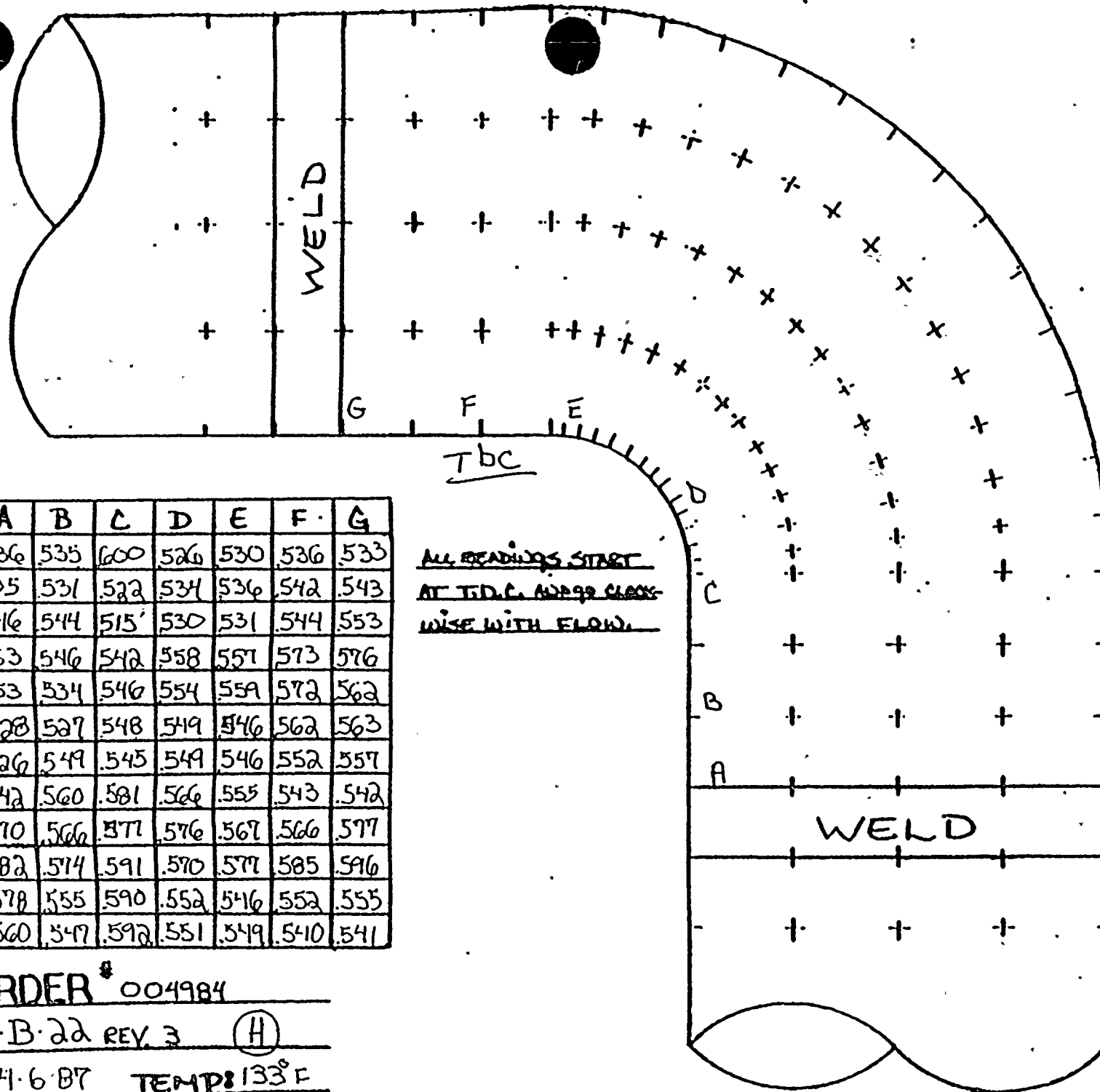
READINGS TAKEN BY:  
S. VARGO & A. HOLIDAY

16" (sch. x Hvy)

JOB ORDER# 004984  
ISO\*\* 1-B-22 REV.3 (E)  
DATE 4/13/87 TEMP: 70°F



← FLOW



	A	B	C	D	E	F	G
0°	536	535	600	526	530	536	533
30°	605	531	522	534	536	542	543
60°	546	544	515	530	531	544	553
90°	563	546	542	558	557	573	576
120°	553	534	546	554	559	572	562
150°	528	527	548	549	546	562	563
180°	526	549	545	549	546	552	557
210°	542	560	581	566	555	543	542
240°	570	566	577	576	567	566	577
270°	582	574	591	570	577	585	596
300°	578	555	590	552	546	552	555
330°	560	547	592	551	549	540	541

ALL READINGS START  
AT T.D.C. AND 90 DEGREE  
WISE WITH FLOW.

JOE ORDER # 004984

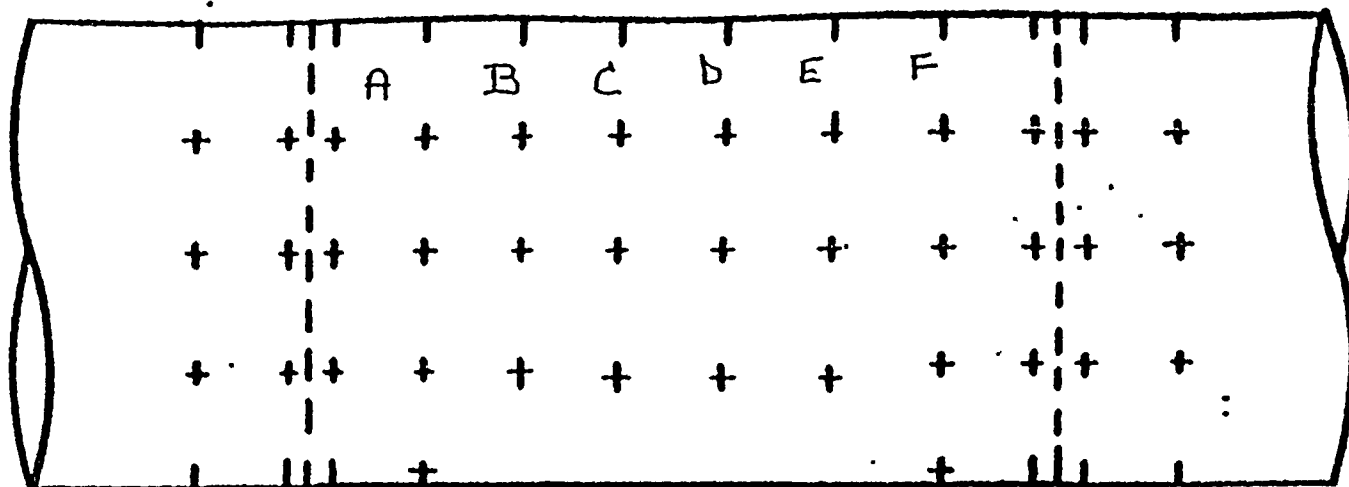
ISO # 1-B-22 REV. 3 (H)

DATE: 4-6-87 TEMP: 133°F



T.D.C

FLOW →



ALL READINGS START AT  
T.D.C. AND 90 DEGREE  
WITH FLOW.

T.D.C

	A	B	C	D	E	F	G
0°	335	337	340	345	337	—	—
45°	338	375	337	379	376	389	—
90°	320	340	362	351	340	338	—
135°	325	328	367	352	358	326	—
180°	321	323	378	328	327	348	—
225°	328	326	352	315	323	328	—
270°	368	338	336	342	354	340	—
315°	370	350	373	360	377	361	—

JOB ORDER # 004984

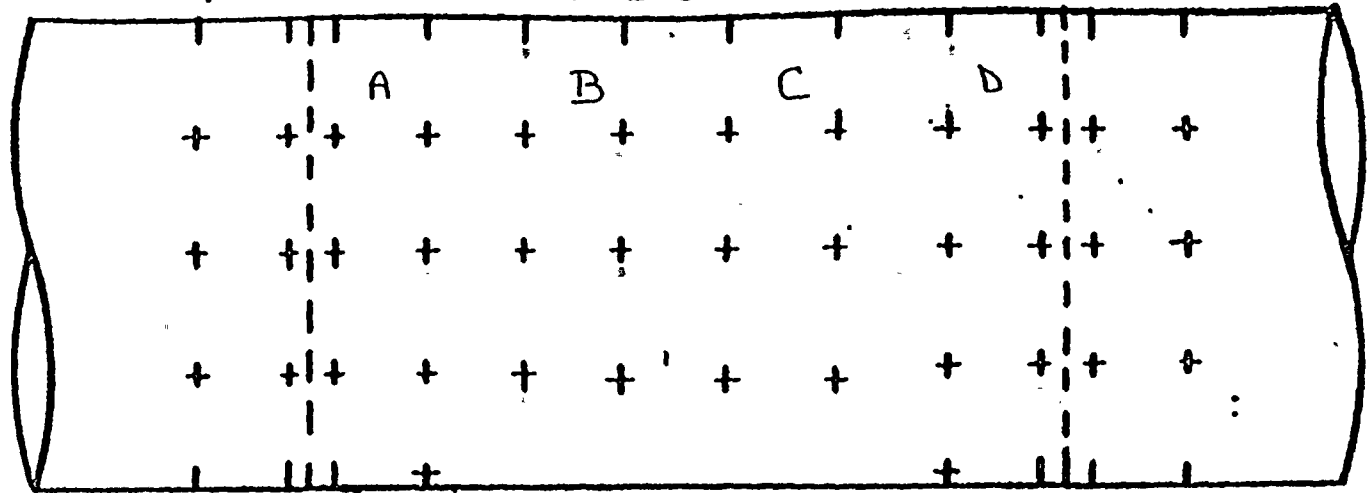
ISO # 1.B.22 REV. 3 (I)

DATE: 4.7.87 TEMP: 302°F



TDC

FLOW →



ALL READINGS START AT  
T.D.C. AND 90 CLOCKWISE  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	.532	.516	.536	.508	-	-	-
30°	.564	.525	.540	.531	-	-	-
60°	.548	.537	.541	.536	-	-	-
90°	.536	.535	.542	.546	-	-	-
120°	.538	.538	.541	.543	-	-	-
150°	.531	.546	.545	.553	-	-	-
180°	.536	.540	.538	.543	-	-	-
210°	.561	.573	.570	.551	-	-	-
240°	.574	.571	.563	.568	-	-	-
270°	.569	.574	.548	.556	-	-	-
300°	.575	.571	.563	.562	-	-	-
330°	.551	.539	.567	.560	-	-	-

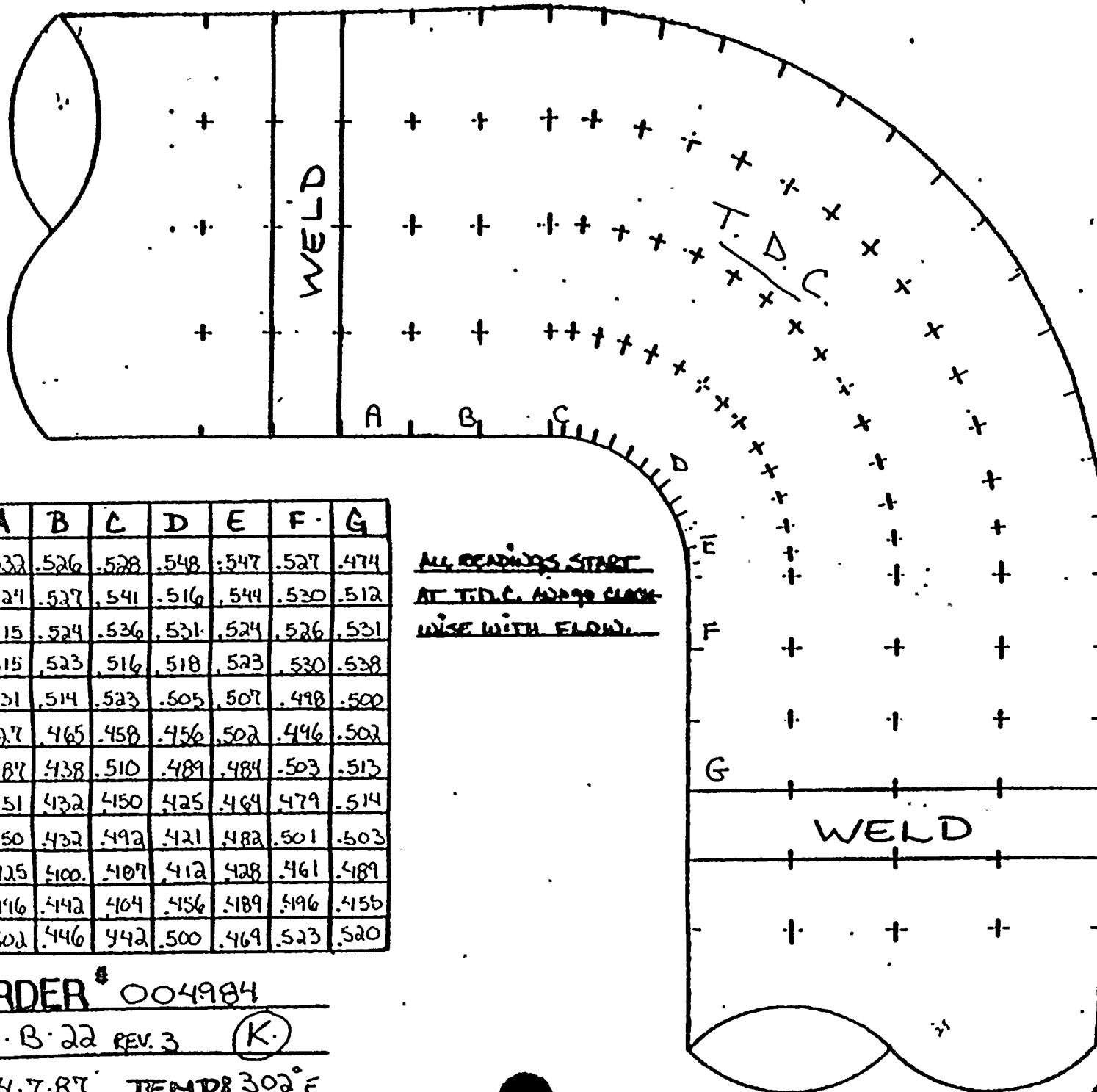
JOB ORDER # 004984

ISO # 1-B-22 REV. 3 (1)

DATE: 4-7-87 TEMP: 302°F



FLOW →



T.D.C.

	A	B	C	D	E	F	G
0°	.532	.526	.528	.548	.547	.527	.474
30°	.524	.527	.541	.516	.544	.530	.512
60°	.515	.524	.536	.531	.524	.526	.531
90°	.515	.523	.516	.518	.523	.530	.538
120°	.531	.514	.523	.505	.507	.498	.500
150°	.527	.465	.458	.456	.502	.496	.502
180°	.5187	.438	.510	.489	.484	.503	.513
210°	.451	.432	.450	.425	.464	.479	.514
240°	.450	.432	.492	.421	.482	.501	.503
270°	.425	.500	.407	.412	.428	.461	.489
300°	.416	.442	.404	.456	.489	.496	.455
330°	.502	.446	.442	.500	.469	.523	.520

ALL READINGS START  
AT T.D.C. AND GO CLOCK  
WISE WITH FLOW.

WELD

JOE ORDER # 004984

ISO # 1-B-22 REV. 3 (K)

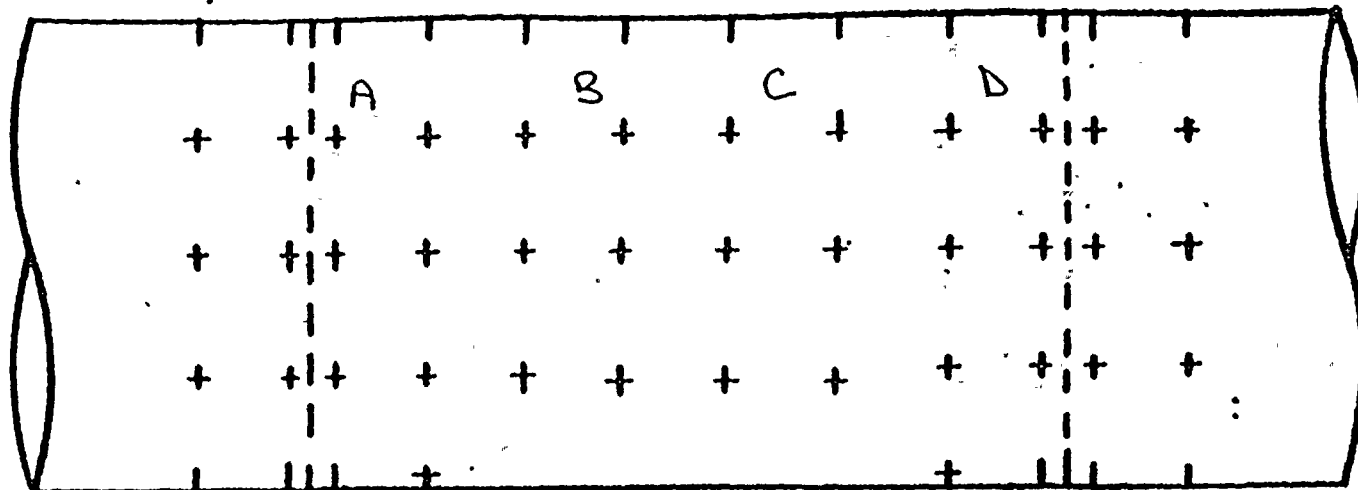
D: 4.7.87 TEMP 302°F



ELBOW

TDC

FLOW →



ALL READINGS START AT  
T.D.C. AND 90 DEGREES  
WITH FLOW.

TDC

	A	B	C	D	E	F	G
0°	341	321	312	318	-	-	-
45°	340	335	347	345	-	-	-
90°	329	321	326	328	-	-	-
135°	325	334	341	337	-	-	-
180°	333	313	326	334	-	-	-
225°	316	310	305	322	-	-	-
270°	326	330	329	333	-	-	-
315°	326	315	317	319	-	-	-

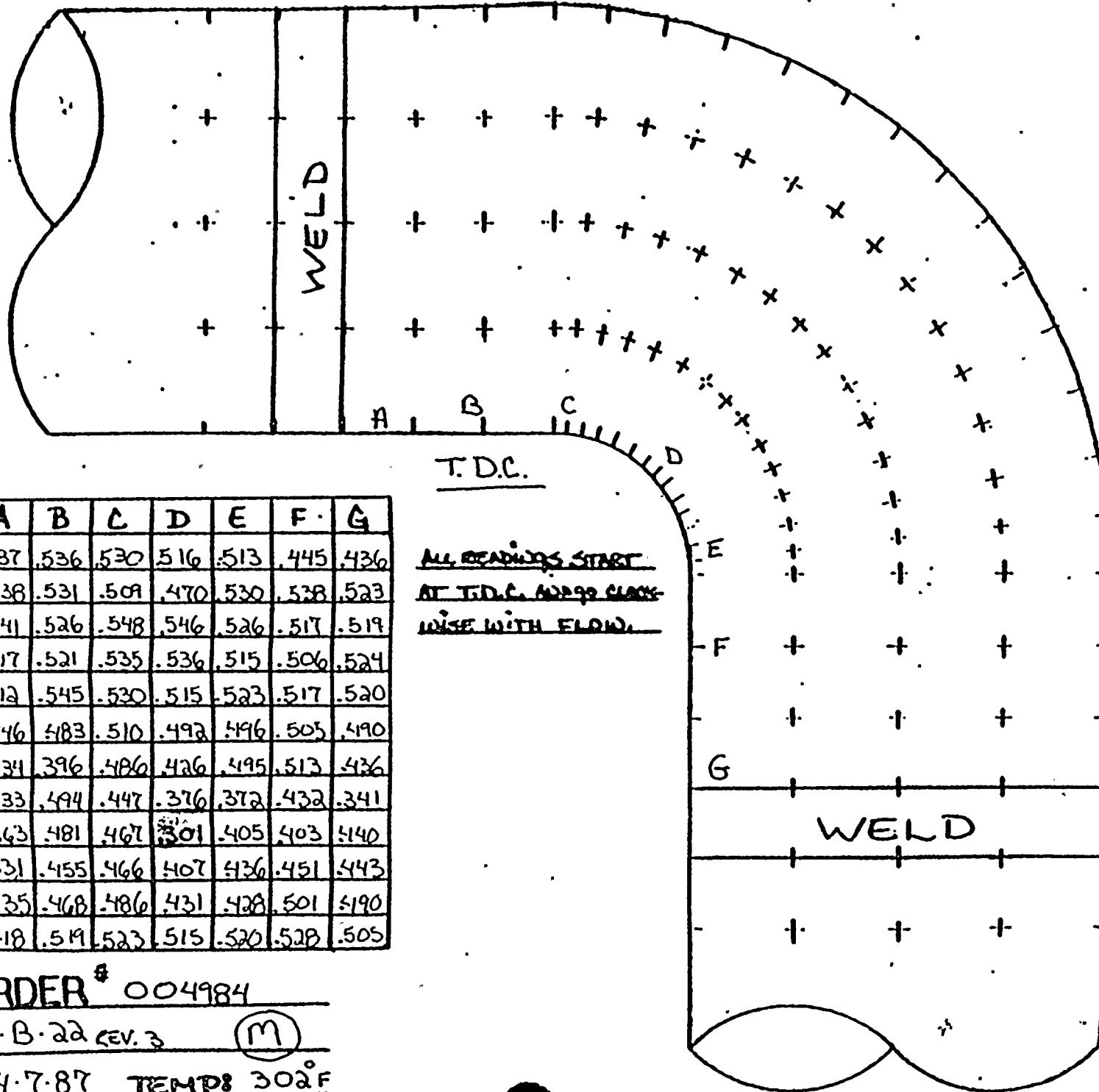
JOB ORDER # 004984

ISO # 1-B-22 REV. 3 (L)

DATE: 4-7-87 TEMP: 302°F



FLOW →



T.D.C.

	A	B	C	D	E	F	G
0°	.537	.536	.530	.516	.513	.445	.436
30°	.538	.531	.509	.470	.530	.538	.523
60°	.541	.526	.548	.546	.526	.517	.519
90°	.517	.521	.535	.536	.515	.506	.524
120°	.512	.545	.530	.515	.523	.517	.520
150°	.516	.5183	.510	.492	.5196	.505	.5190
180°	.434	.396	.486	.426	.495	.513	.436
210°	.433	.494	.447	.376	.372	.432	.341
240°	.363	.481	.467	.301	.405	.403	.5140
270°	.331	.455	.466	.407	.436	.451	.543
300°	.435	.468	.486	.431	.428	.501	.5190
330°	.518	.519	.523	.515	.520	.528	.505

T.D.C.

ALL READINGS START  
AT T.D.C. AND 90 DEGREE  
WISE WITH FLOW.

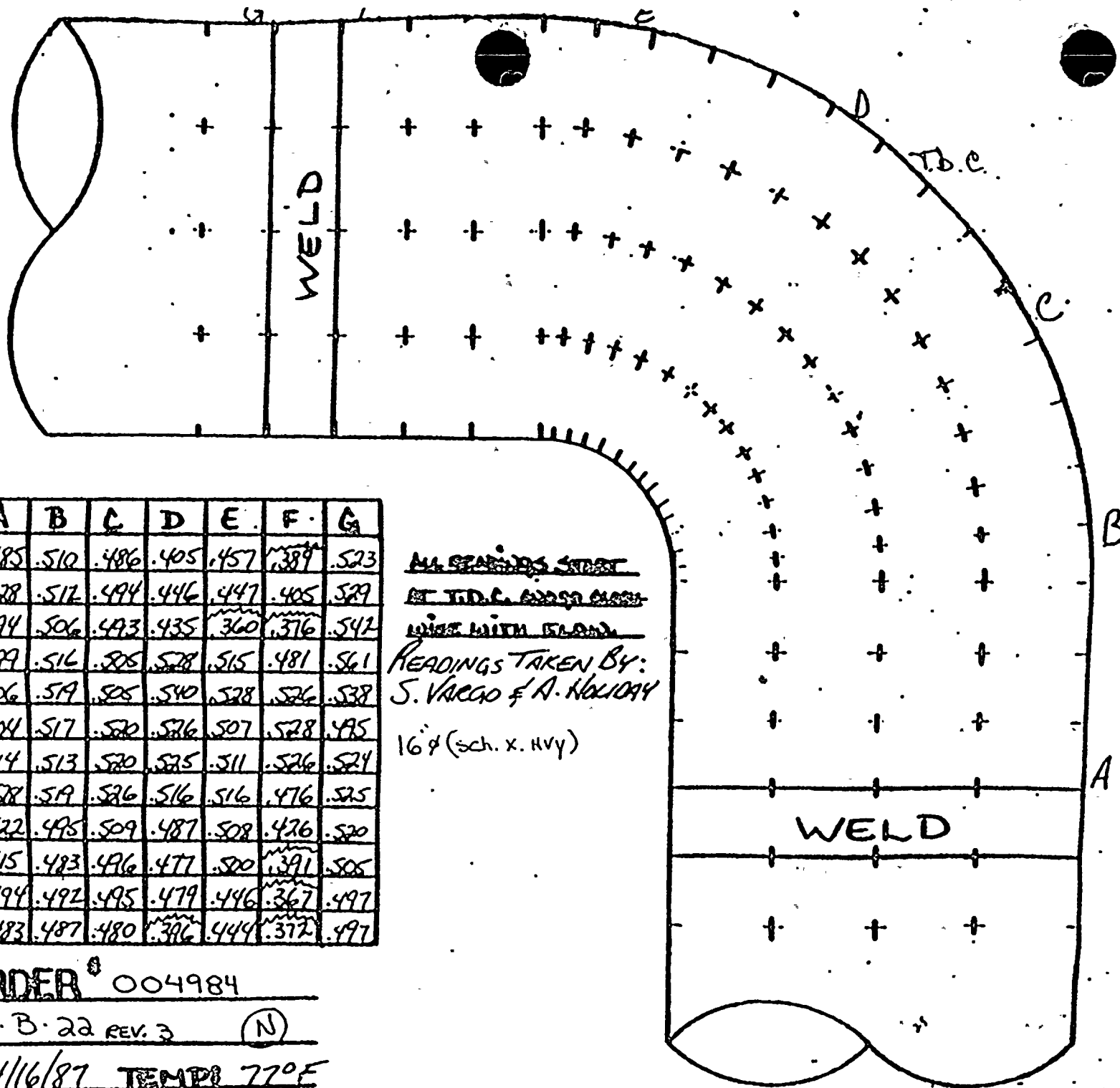
JOB ORDER # 004984

ISO # 1-B-22 REV. 3 (M)

DATE: 4-7-87 TEMP: 302°F



← FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	.485	.510	.486	.405	.457	.389	.523
30°	.528	.512	.494	.446	.447	.405	.529
60°	.494	.506	.493	.435	.360	.376	.542
90°	.499	.516	.505	.528	.515	.481	.561
120°	.506	.519	.505	.510	.528	.526	.538
150°	.504	.517	.520	.526	.507	.528	.495
180°	.514	.513	.520	.525	.511	.526	.524
210°	.528	.519	.526	.516	.516	.476	.525
240°	.522	.495	.509	.487	.508	.426	.520
270°	.515	.483	.496	.477	.500	.391	.505
300°	.494	.492	.495	.479	.446	.367	.497
330°	.483	.487	.480	.396	.444	.372	.497

ALL READINGS TAKEN  
AT T.D.C. AND 30°  
WITH FLOW

READINGS TAKEN BY:  
S. VARGO & A. HOLLIDAY

16" (sch. x. Hvy)

JOB ORDER # 004984

190° 1. B. 22 REV. 3 (N)

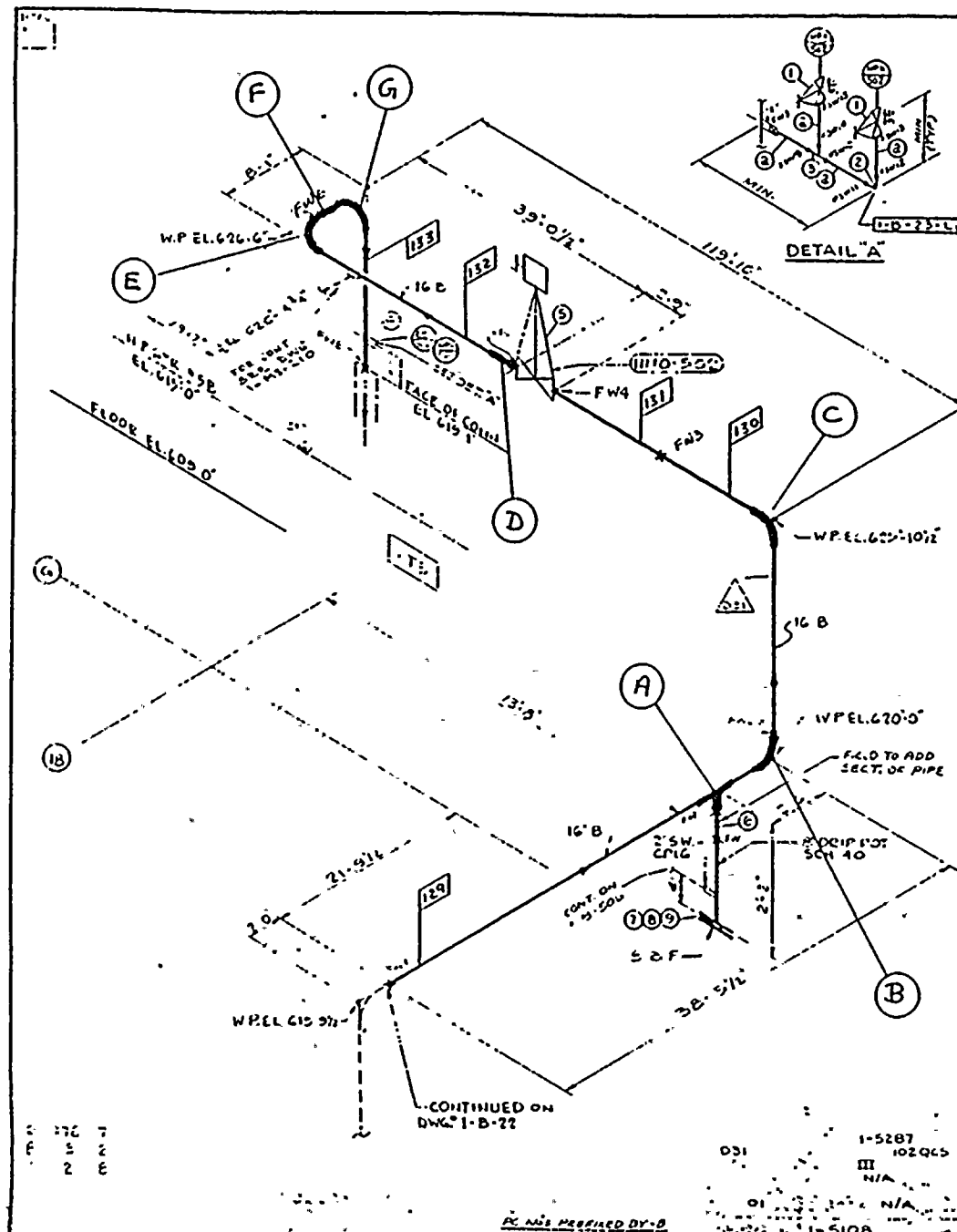
DATE: 4/16/87 TEMP: 77°F





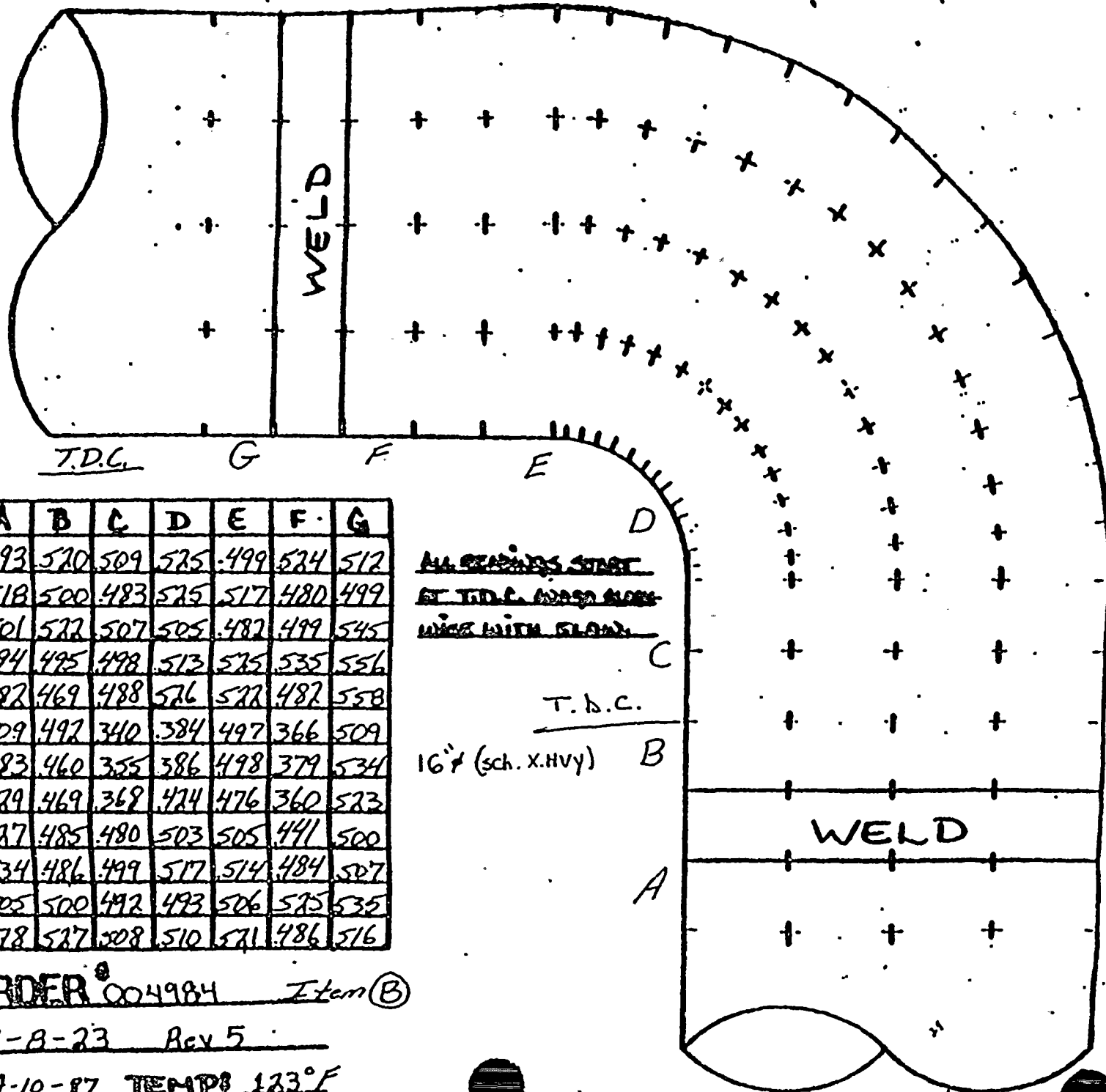


1-B-23 REV.5





← FLOW



ALL READINGS START  
AT T.D.C. AND GO  
DOWN WITH FLOW

T.D.C.

16" (sch. X.HVY)

	A	B	C	D	E	F	G
0°	493	520	509	525	499	524	512
30°	518	500	483	525	517	480	499
60°	501	522	507	505	482	499	545
90°	494	495	498	513	525	535	556
120°	482	469	488	526	522	482	558
150°	509	492	340	384	497	366	509
180°	483	460	355	386	498	379	534
210°	529	469	368	424	476	360	523
240°	527	485	480	503	505	441	500
270°	534	486	499	517	514	484	507
300°	505	500	492	493	506	525	535
330°	518	527	508	510	521	486	516

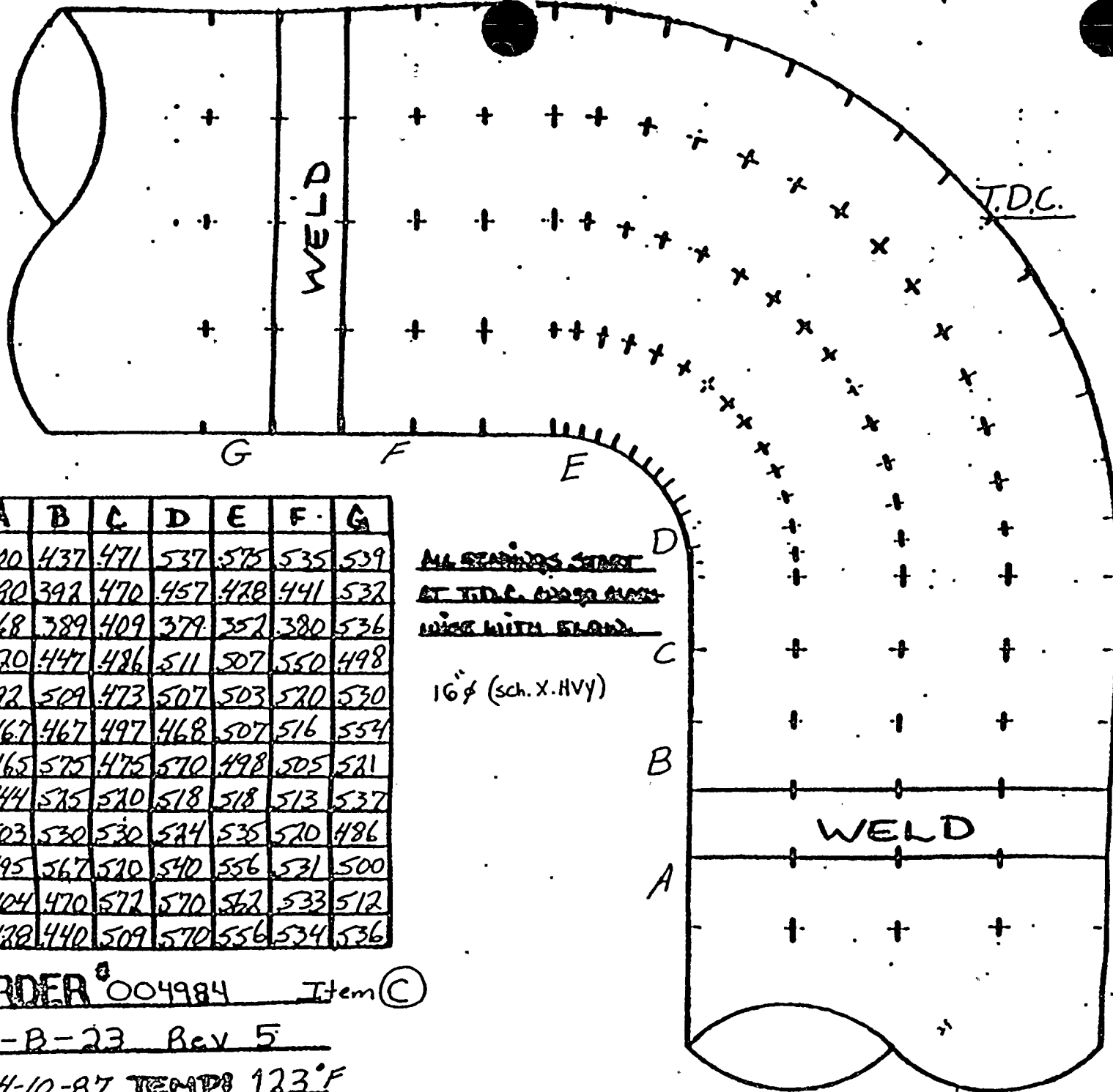
JOB ORDER 004984 Item (B)

190° 1-8-23 Rev 5

DATE: 4-10-87 TEMP: 123°F



← FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	400	437	471	537	575	535	539
30°	480	392	470	457	428	441	532
60°	468	389	409	379	352	380	536
90°	520	447	486	511	507	550	498
120°	492	509	473	507	503	520	530
150°	467	467	497	468	507	516	554
180°	465	575	475	570	498	505	521
210°	444	575	520	518	518	513	537
240°	503	530	530	524	535	520	486
270°	495	567	520	540	556	531	500
300°	404	470	572	570	562	533	512
330°	422	440	509	570	556	534	536

ALL STAINLESS STEEL  
AT T.D.C. 60000 P.S.I.  
WELD WITH FLOW

16" (sch. X.HVY)

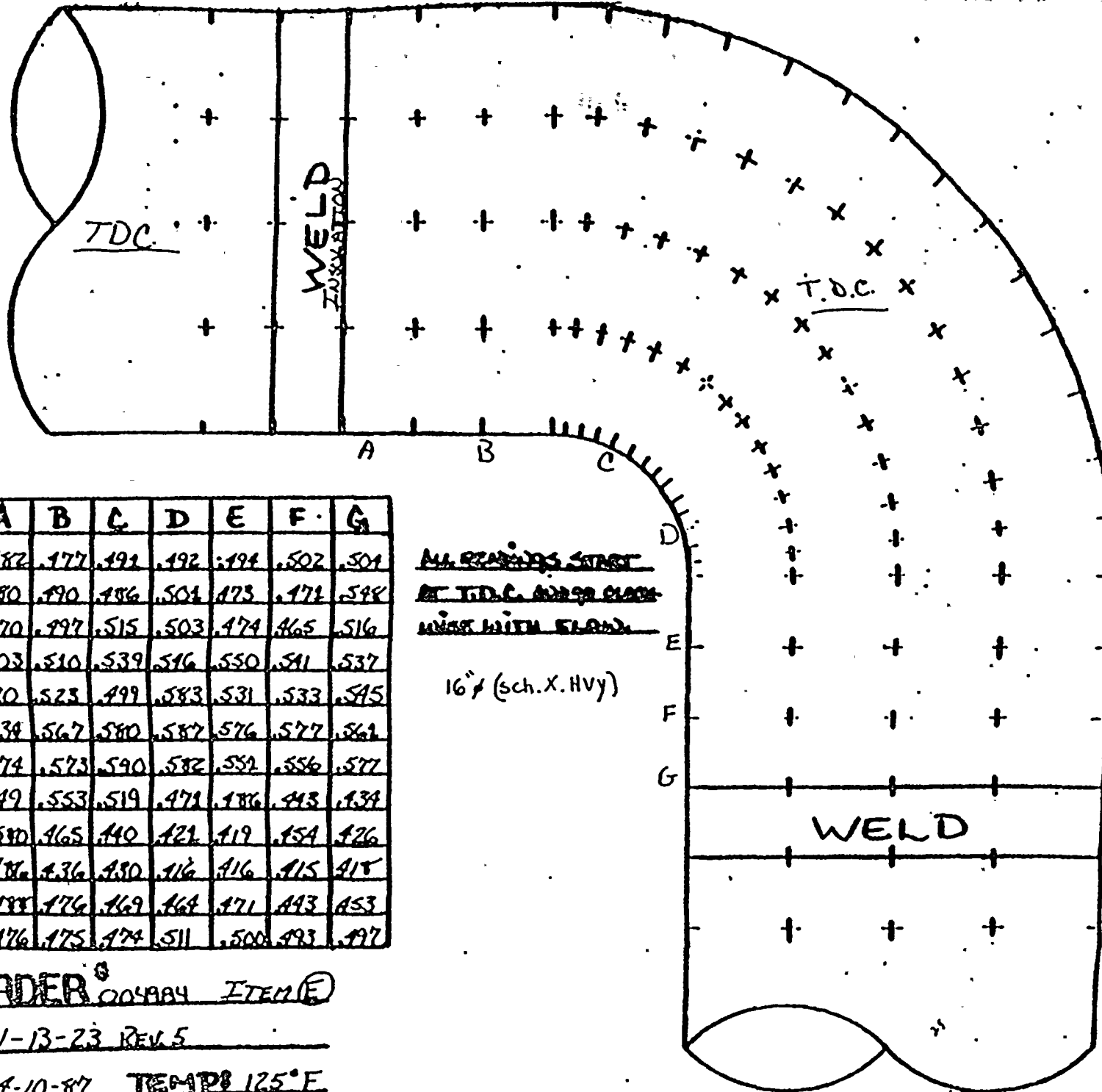
JOE ORDER # 004984 Item C

ISO # 1-B-23 Rev 5

DATE: 4-10-87 TEMP: 123°F



FLOW →



TDC

	A	B	C	D	E	F	G
0°	.182	.177	.191	.192	.194	.502	.501
30°	.180	.190	.186	.501	.173	.171	.544
60°	.170	.197	.515	.503	.474	.465	.516
90°	.503	.510	.539	.516	.550	.541	.537
120°	.520	.523	.499	.583	.531	.533	.515
150°	.534	.567	.580	.587	.576	.577	.561
180°	.574	.573	.590	.582	.552	.556	.577
210°	.549	.553	.519	.471	.186	.413	.134
240°	.580	.465	.440	.421	.419	.154	.426
270°	.411	.436	.430	.416	.416	.415	.415
300°	.488	.476	.469	.464	.471	.443	.453
330°	.476	.475	.474	.511	.500	.493	.497

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

16" (sch. X. Hvy)

WELD

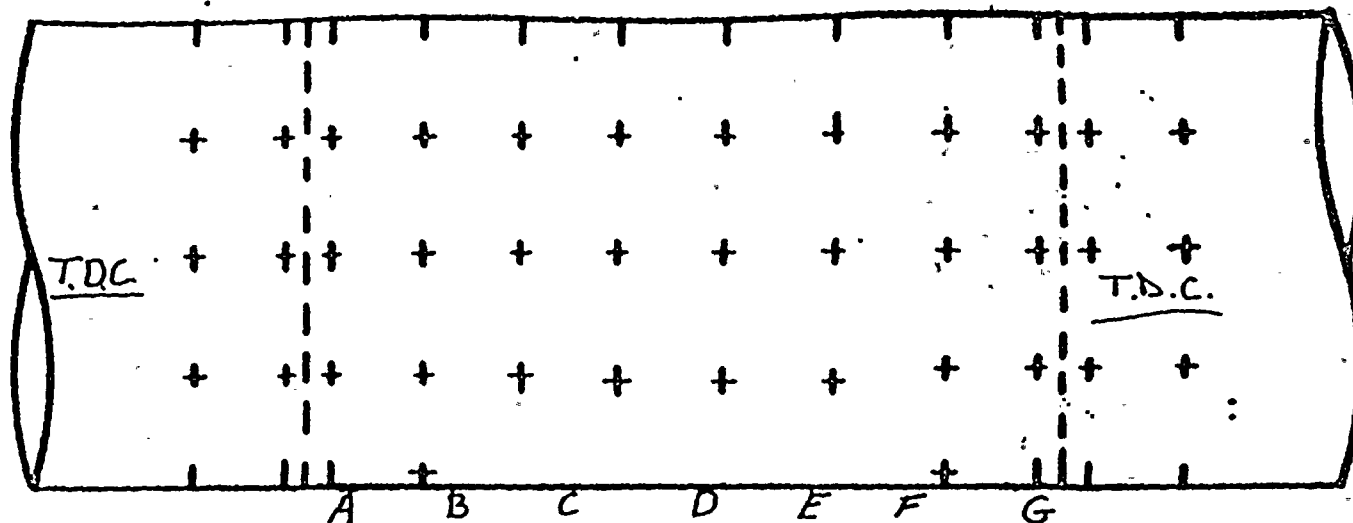
JOE ORDER 004984 ITEM (E)

ISO 1-13-23 REV. 5

DATE: 4-10-87 TEMP: 125°F



FLOW →



ALL READINGS START AT  
T.D.C. AND GO AROUND  
WITH FLOW.

16" (sch. X. HVY)

T.D.C.

	A	B	C	D	E	F	G
0°	542	532	542	531	510	508	
30°	551	520	514	512	526	448	
60°	478	503	505	482	483	460	
90°	528	480	500	492	537	486	
120°	529	512	515	520	503	490	
150°	513	500	547	512	450	471	
180°	482	482	490	445	503	527	
210°	491	413	522	529	540	460	
240°	454	418	520	520	505	437	
270°	494	505	551	549	559	472	
300°	565	577	565	550	522	538	
330°	560	565	551	555	535	489	

Item (F)

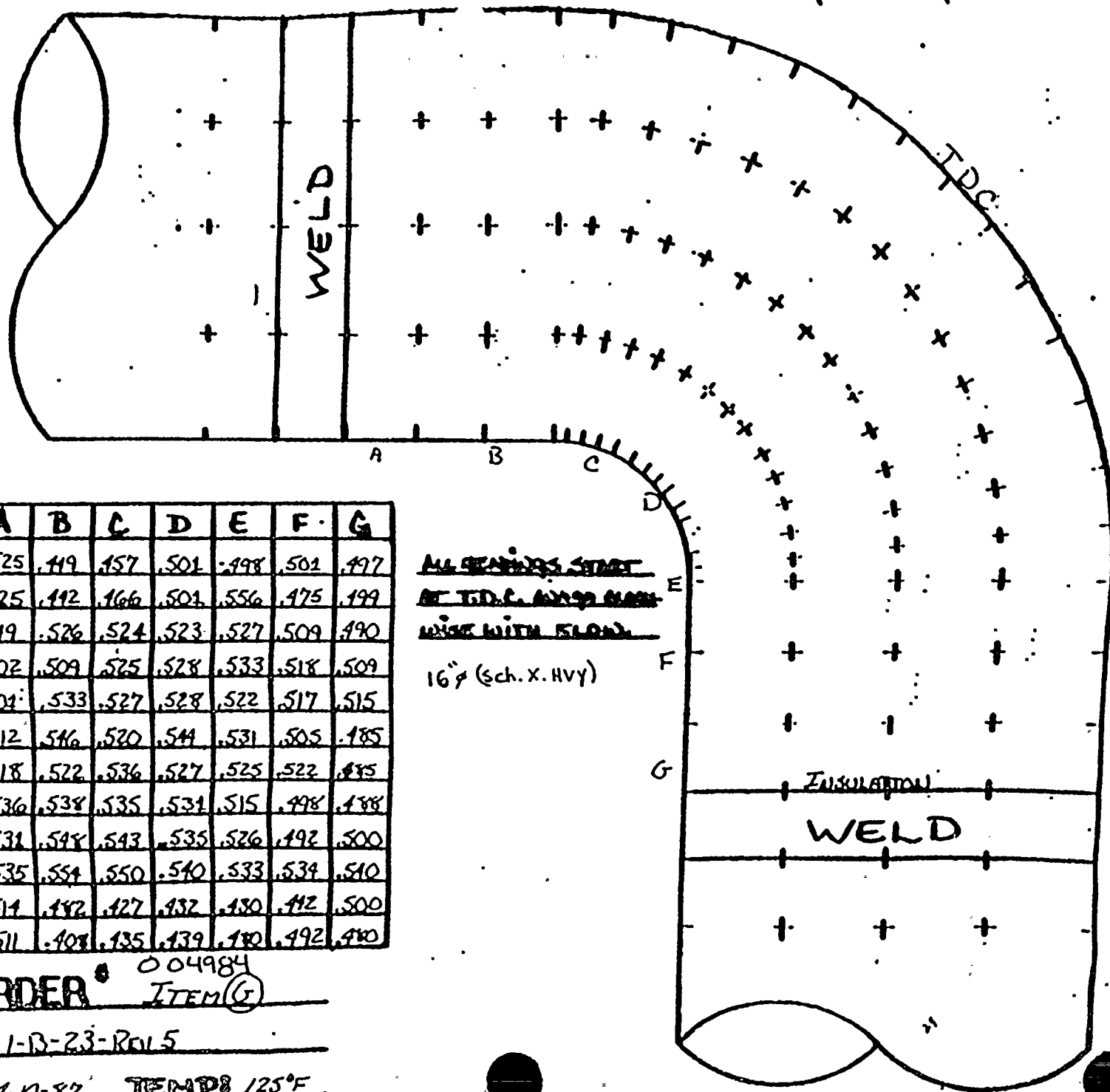
JOB ORDER # 004984

ISO # 1-B-23 Rev 5

DATE: 4-10-87 TEMP: 125°F



FLOW →



	A	B	C	D	E	F	G
0°	.525	.419	.157	.501	.498	.501	.497
30°	.525	.412	.166	.501	.556	.475	.199
60°	.519	.526	.524	.523	.527	.509	.490
90°	.502	.509	.525	.528	.533	.518	.509
120°	.501	.533	.527	.528	.522	.517	.515
150°	.512	.546	.520	.544	.531	.505	.485
180°	.518	.522	.536	.527	.525	.522	.485
210°	.536	.538	.535	.531	.515	.498	.488
240°	.531	.548	.543	.535	.526	.492	.500
270°	.535	.554	.550	.540	.533	.534	.510
300°	.514	.482	.427	.432	.430	.412	.500
330°	.511	.408	.135	.439	.440	.492	.480

ALL SEAMERS START  
AT T.D.C. AND GO DOWN  
WISE WITH FLOW.

16" (Sch. X. Hvy)

INSULATION

WELD

JOE LORDER 004984  
ITEM (5)

130° 1-B-23-ROL5

4-10-87 TEMP 125°F



D. C. COOK PLANT  
EROSION EVALUATION WORKSHEET

AEPS Engineer: ANTHONY J. LEWANDOWSKI SER No. 88-84 (Steam) X

Unit No. 1

Evaluation Date: MAY 18, 1987

SER No. 23-85 (Water)

Years in service 11

UT Reading Transmitted on: MAY 1, 1987

UT Reading Taken on: 46, 47, 48  
44, 46

Isometric Dwg. NO. 1-B-24 REV. 5

AEPS Installed Mat'l Class CS: ASTM A106 GR. B SCH. 40

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Thk.	Lowest Reading	Percent Eroded	COMMENTS
A	16" 90° ELL	---	---	---	---	---	REPLACED CS ELL WITH SS ELL
B	16" 90° ELL	---	---	---	---	---	" " " "
B	16" STRAIGHT	.500	.438-.562	.222 159	.456	0%	STILL WITHIN MANUFACTURERS REQ'D TOLERANCE
C	16" 90° ELL	---	---	---	---	---	REPLACED CS ELL WITH SS ELL
C	16" STRAIGHT MAIN HEADER	.500	.438-.562	.222 159	.454	0%	STILL WITHIN MANUFACTURERS REQ'D TOLERANCE
D	16" TEE	1.031	.902-1.16	.222 159	.664	26%	RE EXAM <sup>13</sup> YEARS
E	16" 90° ELL	.500	.438-.562	.222 159	.348	20%	RE EXAM <sup>12</sup> YEARS
F	16" 90° ELL	.500	.438-.562	.222 159	.459	0%	STILL WITHIN MANUFACTURERS REQ'D TOLERANCE
I	8" STRAIGHT	.322	.282-.362	.222 159	.258	9%	RE EXAM <sup>26</sup> YEARS
J	16" 90° ELL	.500	.438-.562	.222 159	.328	25%	RE EXAM <sup>9</sup> YEARS
J	16" STRAIGHT	.500	.438-.562	.222 159	.301	31%	RE EXAM <sup>7</sup> YEARS
K	16" 90° ELL	.500	.438-.562	.222 159	.390	11%	RE EXAM <sup>25</sup> YEARS
K	16" STRAIGHT	.500	.438-.562	.222 159	.488	0%	STILL WITHIN MANUFACTURERS REQ'D TOLERANCE
L	16" 90° ELL	.500	.438-.562	.222 159	.356	19%	RE EXAM <sup>13</sup> YEARS
L	16" STRAIGHT	.500	.438-.562	.222 159	.418	5%	RE EXAM <sup>30</sup> YEARS



## EROSION EVALUATION WORKSHEET

NEPSC Engineer: ANTHONY J. LEWANDOWSKI SER No. 88-84 (Steam) X

Unit No. 1

Evaluation Date: MAY 18, 1987

SER No. 23-85 (Water)

Years in service 11

UT Reading Transmitted on: MAY 1, 1987

UT Reading Taken on: 4-16-87

Isometric Dwg. NO. 1-B-24 REV. 5

NEPSC Installed Mat'l Class CS:ASTM A106 GR B XHVY

Plant (I.D.)	Component	Original	Original	Req'd	Lowest	Percent	COMMENTS
Comp.	Description	Wall Thk.	Thk. Range	Thick	Reading	Eroded	

M 16" 90° EIL .500 .438-.562 .~~1.25~~ .256 42% RE ~~FRAM~~ <sup>1.000</sup> NEXT OUTAGE

**QUESTION**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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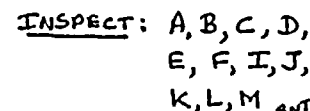
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P.O.#	PIECE MARKS	FAB.
	1-B-134	SHAW
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SITE FAB. PIECE MARKS

1-B-24-L1  
-L2  
-L3  
-L4

5		NAL BT	REVISED PER A.F.A. DESIGN- RELOCATED PER 1-23-73. RELOCATED ITEM 1-20-1112 RELOCATED AT BUILT	NO ACTION REQD.
4	12-1-71	JPJ	REVISED BY NPS DESIGN- REMOVED, SAME AS 2-11-1112 DETAILS 400, ITEM 1-1112 RELOCATED PER 1-23-73. RELOCATED PER 1-23-73. RELOCATED PER 1-23-73	NO ACTION REQD.
3	3-2-72	BT TJD	REVISED BY NPS DESIGN PER REP DWS 1-1526, 1-1527 REK 3 ADDED ITEMS 1-1526, 1-1527 RELOCATED NST. CONN'S HL5-11113, ITEM 1-1527 2 WAS 1, DELETED ITEM 1-1526 REPLACED BY ITEM 1-1527	FIELD ACTION REQD.
2	9-23-71	BT TJD	REVISED BY NPS DESIGN PER A.F.A. DWS 1-1526, 1-1527 REK 1. ADDED ITEMS 1-1526, 1-1527 DET'S A, B, C, D SITE FAB. PC. NPS 1-1-24-1, 1-1-24-2, 1-1-24-3, 1-1-24-4 1 CODE STAMP, RELOCATED DWP POT CONN'S FROM PC. NPS 1-1-24-1-1526 1-1-24-1, 1-1-24-2, 1-1-24-3, 1-1-24-4 1-1-24-5, 1-1-24-6, 1-1-24-7, 1-1-24-8 1-1-24-9, 1-1-24-10, 1-1-24-11, 1-1-24-12 1-1-24-13, 1-1-24-14, 1-1-24-15, 1-1-24-16 1-1-24-17, 1-1-24-18, 1-1-24-19, 1-1-24-20 1-1-24-21, 1-1-24-22, 1-1-24-23, 1-1-24-24 1-1-24-25, 1-1-24-26, 1-1-24-27, 1-1-24-28 1-1-24-29, 1-1-24-30, 1-1-24-31, 1-1-24-32 1-1-24-33, 1-1-24-34, 1-1-24-35, 1-1-24-36 1-1-24-37, 1-1-24-38, 1-1-24-39, 1-1-24-40 1-1-24-41, 1-1-24-42, 1-1-24-43, 1-1-24-44 1-1-24-45, 1-1-24-46, 1-1-24-47, 1-1-24-48 1-1-24-49, 1-1-24-50, 1-1-24-51, 1-1-24-52 1-1-24-53, 1-1-24-54, 1-1-24-55, 1-1-24-56 1-1-24-57, 1-1-24-58, 1-1-24-59, 1-1-24-60 1-1-24-61, 1-1-24-62, 1-1-24-63, 1-1-24-64 1-1-24-65, 1-1-24-66, 1-1-24-67, 1-1-24-68 1-1-24-69, 1-1-24-70, 1-1-24-71, 1-1-24-72 1-1-24-73, 1-1-24-74, 1-1-24-75, 1-1-24-76 1-1-24-77, 1-1-24-78, 1-1-24-79, 1-1-24-80 1-1-24-81, 1-1-24-82, 1-1-24-83, 1-1-24-84 1-1-24-85, 1-1-24-86, 1-1-24-87, 1-1-24-88 1-1-24-89, 1-1-24-90, 1-1-24-91, 1-1-24-92 1-1-24-93, 1-1-24-94, 1-1-24-95, 1-1-24-96 1-1-24-97, 1-1-24-98, 1-1-24-99, 1-1-24-100 1-1-24-101, 1-1-24-102, 1-1-24-103, 1-1-24-104 1-1-24-105, 1-1-24-106, 1-1-24-107, 1-1-24-108 1-1-24-109, 1-1-24-110, 1-1-24-111, 1-1-24-112 1-1-24-113, 1-1-24-114, 1-1-24-115, 1-1-24-116 1-1-24-117, 1-1-24-118, 1-1-24-119, 1-1-24-120 1-1-24-121, 1-1-24-122, 1-1-24-123, 1-1-24-124 1-1-24-125, 1-1-24-126, 1-1-24-127, 1-1-24-128 1-1-24-129, 1-1-24-130, 1-1-24-131, 1-1-24-132 1-1-24-133, 1-1-24-134, 1-1-24-135, 1-1-24-136 1-1-24-137, 1-1-24-138, 1-1-24-139, 1-1-24-140 1-1-24-141, 1-1-24-142, 1-1-24-143, 1-1-24-144 1-1-24-145, 1-1-24-146, 1-1-24-147, 1-1-24-148 1-1-24-149, 1-1-24-150, 1-1-24-151, 1-1-24-152 1-1-24-153, 1-1-24-154, 1-1-24-155, 1-1-24-156 1-1-24-157, 1-1-24-158, 1-1-24-159, 1-1-24-160 1-1-24-161, 1-1-24-162, 1-1-24-163, 1-1-24-164 1-1-24-165, 1-1-24-166, 1-1-24-167, 1-1-24-168 1-1-24-169, 1-1-24-170, 1-1-24-171, 1-1-24-172 1-1-24-173, 1-1-24-174, 1-1-24-175, 1-1-24-176 1-1-24-177, 1-1-24-178, 1-1-24-179, 1-1-24-180 1-1-24-181, 1-1-24-182, 1-1-24-183, 1-1-24-184 1-1-24-185, 1-1-24-186, 1-1-24-187, 1-1-24-188 1-1-24-189, 1-1-24-190, 1-1-24-191, 1-1-24-192 1-1-24-193, 1-1-24-194, 1-1-24-195, 1-1-24-196 1-1-24-197, 1-1-24-198, 1-1-24-199, 1-1-24-200 1-1-24-201, 1-1-24-202, 1-1-24-203, 1-1-24-204 1-1-24-205, 1-1-24-206, 1-1-24-207, 1-1-24-208 1-1-24-209, 1-1-24-210, 1-1-24-211, 1-1-24-212 1-1-24-213, 1-1-24-214, 1-1-24-215, 1-1-24-216 1-1-24-217, 1-1-24-218, 1-1-24-219, 1-1-24-220 1-1-24-221, 1-1-24-222, 1-1-24-223, 1-1-24-224 1-1-24-225, 1-1-24-226, 1-1-24-227, 1-1-24-228 1-1-24-229, 1-1-24-230, 1-1-24-231, 1-1-24-232 1-1-24-233, 1-1-24-234, 1-1-24-235, 1-1-24-236 1-1-24-237, 1-1-24-238, 1-1-24-239, 1-1-24-240 1-1-24-241, 1-1-24-242, 1-1-24-243, 1-1-24-244 1-1-24-245, 1-1-24-246, 1-1-24-247, 1-1-24-248 1-1-24-249, 1-1-24-250, 1-1-24-251, 1-1-24-252 1-1-24-253, 1-1-24-254, 1-1-24-255, 1-1-24-256 1-1-24-257, 1-1-24-258, 1-1-24-259, 1-1-24-260 1-1-24-261, 1-1-24-262, 1-1-24-263, 1-1-24-264 1-1-24-265, 1-1-24-266, 1-1-24-267, 1-1-24-268 1-1-24-269, 1-1-24-270, 1-1-24-271, 1-1-24-272 1-1-24-273, 1-1-24-274, 1-1-24-275, 1-1-24-276 1-1-24-277, 1-1-24-278, 1-1-24-279, 1-1-24-280 1-1-24-281, 1-1-24-282, 1-1-24-283, 1-1-24-284 1-1-24-285, 1-1-24-286, 1-1-24-287, 1-1-24-288 1-1-24-289, 1-1-24-290, 1-1-24-291, 1-1-24-292 1-1-24-293, 1-1-24-294, 1-1-24-295, 1-1-24-296 1-1-24-297, 1-1-24-298, 1-1-24-299, 1-1-24-300 1-1-24-301,	FIELD ACTION REQD.
1	4-15-71	TJD	REVISED PER CONN'S DWS 1-1-24-1-1526 ADDED 1-1-24-1, 1-1-24-2, 1-1-24-3, 1-1-24-4 1 CODE STAMP, RELOCATED DWP POT CONN'S FROM PC. NPS 1-1-24-1-1526 1-1-24-1, 1-1-24-2, 1-1-24-3, 1-1-24-4 1-1-24-5, 1-1-24-6, 1-1-24-7, 1-1-24-8 1-1-24-9, 1-1-24-10, 1-1-24-11, 1-1-24-12 1-1-24-13, 1-1-24-14, 1-1-24-15, 1-1-24-16 1-1-24-17, 1-1-24-18, 1-1-24-19, 1-1-24-20 1-1-24-21, 1-1-24-22, 1-1-24-23, 1-1-24-24 1-1-24-25, 1-1-24-26, 1-1-24-27, 1-1-24-28 1-1-24-29, 1-1-24-30, 1-1-24-31, 1-1-24-32 1-1-24-33, 1-1-24-34, 1-1-24-35, 1-1-24-36 1-1-24-37, 1-1-24-38, 1-1-24-39, 1-1-24-40 1-1-24-41, 1-1-24-42, 1-1-24-43, 1-1-24-44 1-1-24-45, 1-1-24-46, 1-1-24-47, 1-1-24-48 1-1-24-49, 1-1-24-50, 1-1-24-51, 1-1-24-52 1-1-24-53, 1-1-24-54, 1-1-24-55, 1-1-24-56 1-1-24-57, 1-1-24-58, 1-1-24-59, 1-1-24-60 1-1-24-61, 1-1-24-62, 1-1-24-63, 1-1-24-64 1-1-24-65, 1-1-24-66, 1-1-24-67, 1-1-24-68 1-1-24-69, 1-1-24-70, 1-1-24-71, 1-1-24-72 1-1-24-73, 1-1-24-74, 1-1-24-75, 1-1-24-76 1-1-24-77, 1-1-24-78, 1-1-24-79, 1-1-24-80 1-1-24-81, 1-1-24-82, 1-1-24-83, 1-1-24-84 1-1-24-85, 1-1-24-86, 1-1-24-87, 1-1-24-88 1-1-24-89, 1-1-24-90, 1-1-24-91, 1-1-24-92 1-1-24-93, 1-1-24-94, 1-1-24-95, 1-1-24-96 1-1-24-97, 1-1-24-98, 1-1-24-99, 1-1-24-100 1-1-24-101, 1-1-24-102, 1-1-24-103, 1-1-24-104 1-1-24-105, 1-1-24-106, 1-1-24-107, 1-1-24-108 1-1-24-109, 1-1-24-110, 1-1-24-111, 1-1-24-112 1-1-24-113, 1-1-24-114, 1-1-24-115, 1-1-24-116 1-1-24-117, 1-1-24-118, 1-1-24-119, 1-1-24-120 1-1-24-121, 1-1-24-122, 1-1-24-123, 1-1-24-124 1-1-24-125, 1-1-24-126, 1-1-24-127, 1-1-24-128 1-1-24-129, 1-1-24-130, 1-1-24-131, 1-1-24-132 1-1-24-133, 1-1-24-134, 1-1-24-135, 1-1-24-136 1-1-24-137, 1-1-24-138, 1-1-24-139, 1-1-24-140 1-1-24-141, 1-1-24-142, 1-1-24-143, 1-1-24-144 1-1-24-145, 1-1-24-146, 1-1-24-147, 1-1-24-148 1-1-24-149, 1-1-24-150, 1-1-24-151, 1-1-24-152 1-1-24-153, 1-1-24-154, 1-1-24-155, 1-1-24-156 1-1-24-157, 1-1-24-158, 1-1-24-159, 1-1-24-160 1-1-24-161, 1-1-24-162, 1-1-24-163, 1-1-24-164 1-1-24-165, 1-1-24-166, 1-1-24-167, 1-1-24-168 1-1-24-169, 1-1-24-170, 1-1-24-171, 1-1-24-172 1-1-24-173, 1-1-24-174, 1-1-24-175, 1-1-24-176 1-1-24-177, 1-1-24-178, 1-1-24-179, 1-1-24-180 1-1-24-181, 1-1-24-182, 1-1-24-183, 1-1-24-184 1-1-24-185, 1-1-24-186, 1-1-24-187, 1-1-24-188 1-1-24-189, 1-1-24-190, 1-1-24-191, 1-1-24-192 1-1-24-193, 1-1-24-194, 1-1-24-195, 1-1-24-196 1-1-24-197, 1-1-24-198, 1-1-24-199, 1-1-24-200 1-1-24-201, 1-1-24-202, 1-1-24-203, 1-1-24-204 1-1-24-205, 1-1-24-206, 1-1-24-207, 1-1-24-208 1-1-24-209, 1-1-24-210, 1-1-24-211, 1-1-24-212 1-1-24-213, 1-1-24-214, 1-1-24-215, 1-1-24-216 1-1-24-217, 1-1-24-218, 1-1-24-219, 1-1-24-220 1-1-24-221, 1-1-24-222, 1-1-24-223, 1-1-24-224 1-1-24-225, 1-1-24-226, 1-1-24-227, 1-1-24-228 1-1-24-229, 1-1-24-230, 1-1-24-231, 1-1-24-232 1-1-24-233, 1-1-24-234, 1-1-24-235, 1-1-24-236 1-1-24-237, 1-1-24-238, 1-1-24-239, 1-1-24-240 1-1-24-241, 1-1-24-242, 1-1-24-243, 1-1-24-244 1-1-24-245, 1-1-24-246, 1-1-24-247, 1-1-24-248 1-1-24-249, 1-1-24-250, 1-1-24-251, 1-1-24-252 1-1-24-253, 1-1-24-254, 1-1-24-255, 1-1-24-256 1-1-24-257, 1-1-24-258, 1-1-24-259, 1-1-24-260 1-1-24-261, 1-1-24-262, 1-1-24-263, 1-1-24-264 1-1-24-265, 1-1-24-266, 1-1-24-267, 1-1-24-268 1-1-24-269, 1-1-24-270, 1-1-24-271, 1-1-24-272 1-1-24-273, 1-1-24-274, 1-1-24-275, 1-1-24-276 1-1-24-277, 1-1-24-278, 1-1-24-279, 1-1-24-280 1-1-24-281, 1-1-24-282, 1-1-24-283, 1-1-24-284 1-1-24-285, 1-1-24-286, 1-1-24-287, 1-1-24-288 1-1-24-289, 1-1-24-290, 1-1-24-291, 1-1-24-292 1-1-24-293, 1-1-24-294, 1-1-24-295, 1-1-24-296 1-1-24-297, 1-1-24-298, 1-1-24-299, 1-1-24-300 1-1-24-301,	REVISED BY FIELD
REV	DATE	CODE	DESCRIPTION	P.Q. DWS

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGHAM MICHIGAN  
UNIT NO.1

A-33		A-106		A-332		A-312		CUMS		CON BY ALL ON	
CAR										QED BY ALL ON	
STD	ST	121	19	20	24	50	90	100	150	160	180
C		PRIOR	AREA	GO	QUAK	JOB	DING	CODE	APPS ON		
1		0000	0000	0000	0000	0000	0000	0000	DRAWING NO.		
		1-5-73		5		005050		1-B-74			
DESCRIPTION										REV	
BLEED STEAM PIPING										COMPL	
PAGE										LA	
BACER										W	
TYPE										BY	
UT										BY	
P7										TAN/A7	
TUBECO										TUBECO	
TUBECO										TUBECO	

~~3 MATERIAL REQUIRED FOR~~  
~~4 FIELD REPAIRS~~

**UNCONTROLLED  
DOCUMENT**

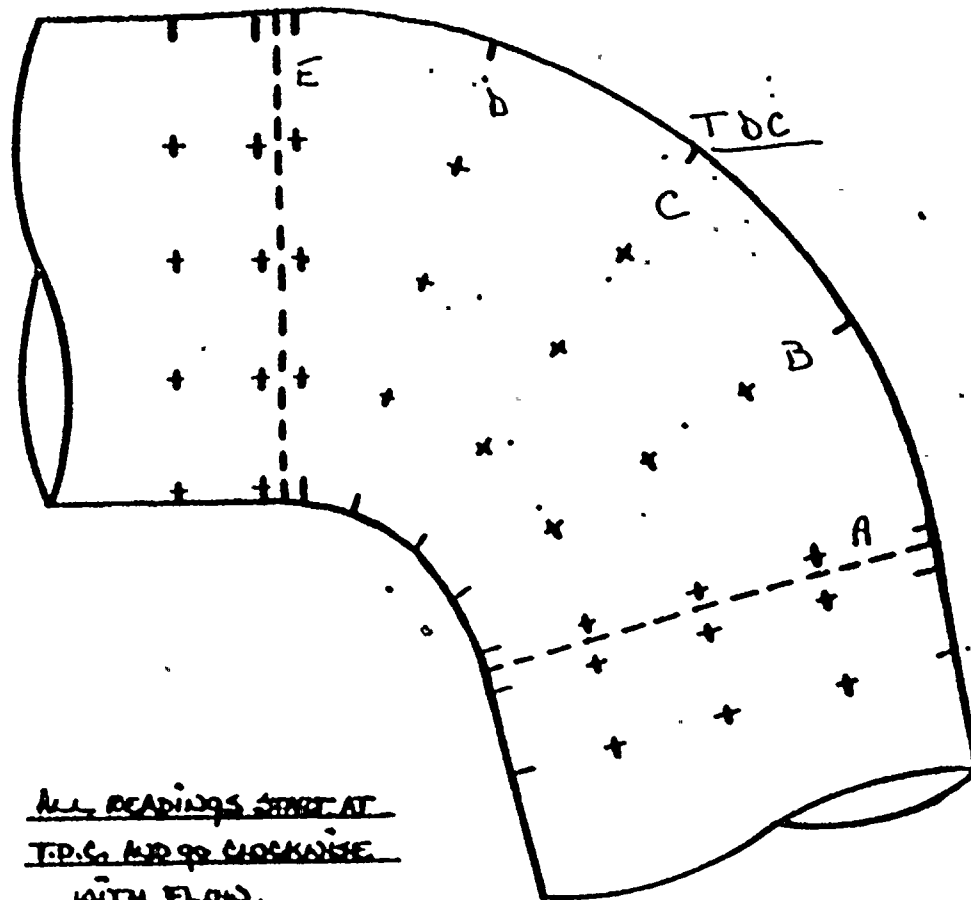
DWG NO 1-B-24 REV.5



← FLOW

TDC

	A	B	C	D	E	F	G
0°	.515	.518	.523	.524	.521	—	—
30°	.527	.515	.518	.517	.516	—	—
60°	.524	.512	.515	.532	.518	—	—
90°	.524	.522	.518	.513	.512	—	—
120°	.560	.546	.543	.542	.516	—	—
150°	.543	.552	.549	.548	.537	—	—
180°	.582	.577	.589	.502	.505	—	—
210°	.541	.547	.543	.546	.534	—	—
240°	.528	.549	.544	.551	.532	—	—
270°	.516	.526	.528	.519	.522	—	—
300°	.516	.507	.511	.513	.510	—	—
330°	.515	.508	.510	.513	.511	—	—



ALL READINGS START AT  
T.P.C. AND GO CLOCKWISE  
WITH FLOW.

16" (sch. X. HVY)

✱ STAINLESS STEEL

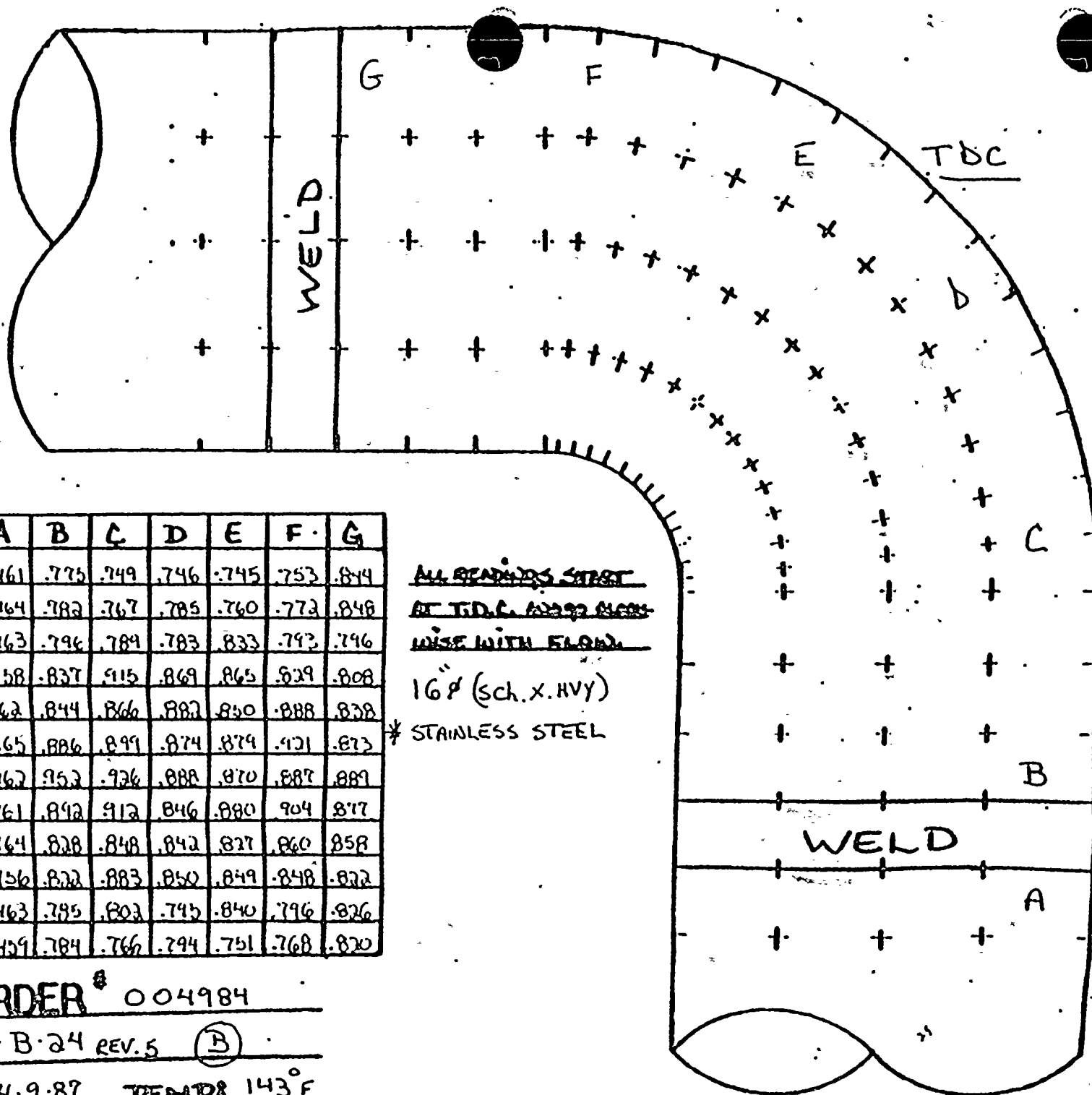
JOB ORDER\*\* 004984

ISO\*\* 1-B-24 REV. 5 (A)

DATE: 4-9-87 TEMP: 143°F



← FLOW



TDC

	A	B	C	D	E	F	G
0°	.461	.725	.749	.746	.745	.753	.814
30°	.464	.782	.767	.785	.760	.773	.848
60°	.463	.796	.784	.783	.833	.792	.796
90°	.758	.837	.915	.869	.865	.829	.808
120°	.762	.844	.866	.882	.850	.888	.838
150°	.465	.886	.899	.874	.879	.921	.873
180°	.462	.952	.926	.888	.870	.887	.889
210°	.461	.892	.912	.846	.880	.904	.877
240°	.464	.828	.848	.842	.827	.860	.858
270°	.456	.822	.883	.850	.849	.848	.822
300°	.463	.785	.803	.745	.840	.796	.826
330°	.459	.784	.766	.794	.751	.768	.820

ALL READINGS START  
AT T.D.C. AND GO  
WISE WITH FLOW

16" (Sch. X. Hvy)

\* STAINLESS STEEL

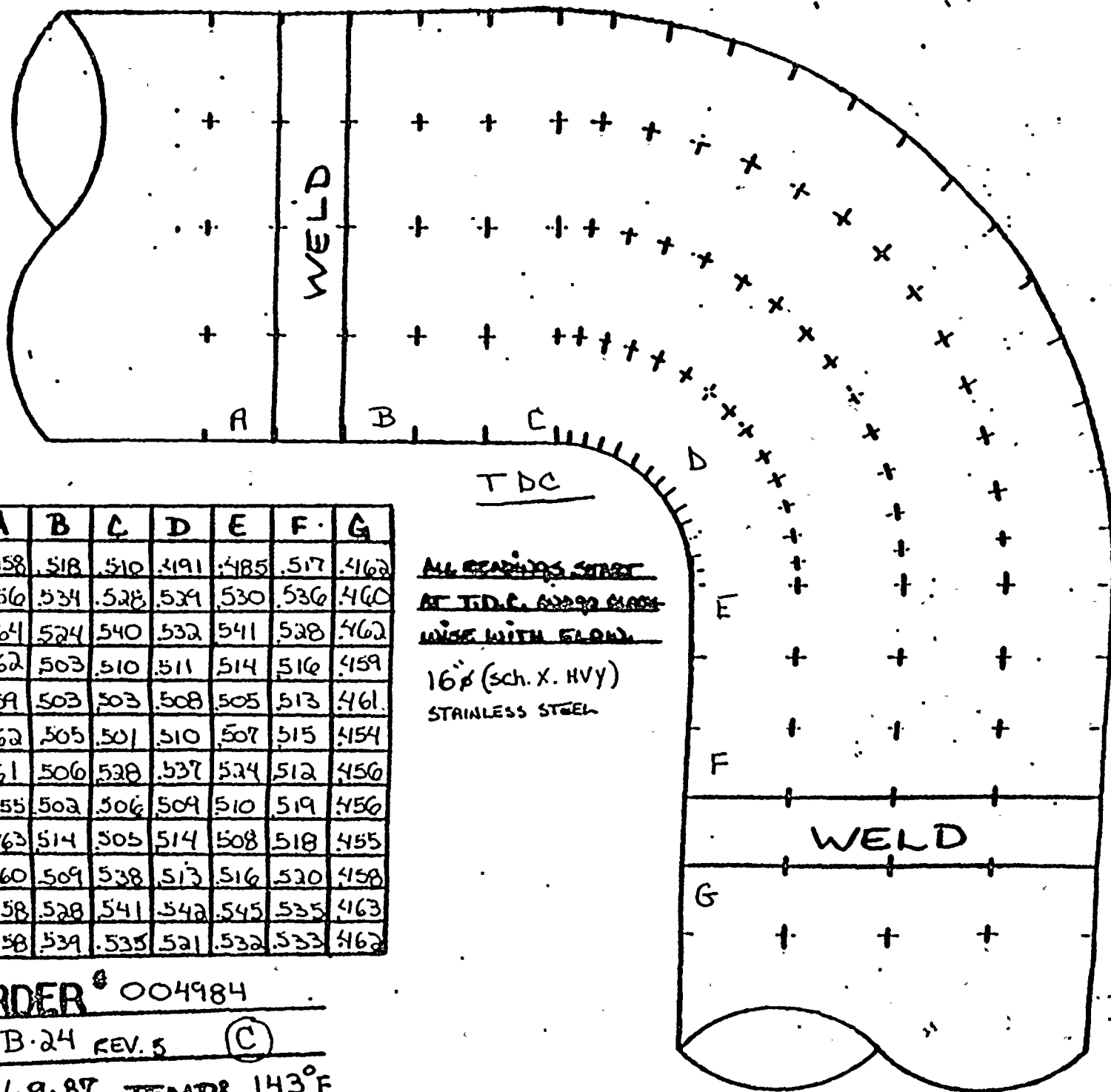
JOE ORDER # 004984

ISO # 1-B-24 REV. 5 (B)

DATE 4-9-87 TEMP 143°F



FLOW →



TDC

	A	B	C	D	E	F	G
0°	5158	518	510	5191	5185	517	5162
30°	5156	534	528	539	530	536	5160
60°	5164	524	540	532	541	528	5162
90°	5162	503	510	511	514	516	5159
120°	5159	503	503	508	505	513	5161
150°	5162	505	501	510	507	515	5154
180°	5161	506	538	537	534	512	5156
210°	5155	502	506	509	510	519	5156
240°	5163	514	505	514	508	518	5155
270°	5160	509	538	513	516	520	5158
300°	5158	528	541	542	545	535	5163
330°	5158	539	535	521	532	533	5162

TDC

ALL READINGS START  
AT T.D.C. AND 90 DEGREE  
WIDE WITH FLOW.

16" (sch. X. HVY)  
STAINLESS STEEL

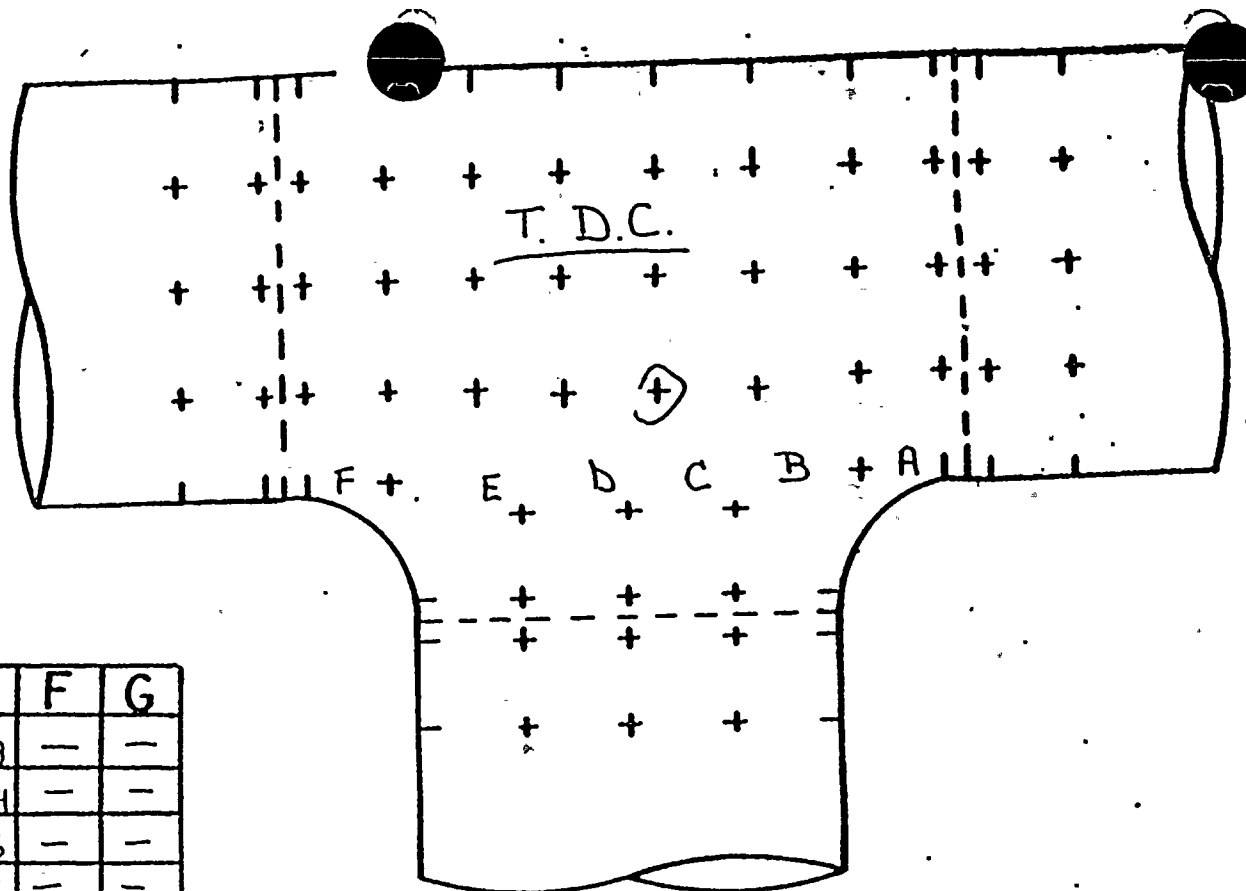
JOE ORDER # 004984

ISO # 1-B-24 REV. 5 (C)

DATE 4.9.87 TEMP 143°F



← FLOW



TDC

	A	B	C	D	E	F	G
0°	1023	1018	1023	1086	1108	—	—
30°	1004	963	986	897	944	—	—
60°	1037	977	963	940	946	—	—
90°	1047	1038	944	927	916	—	—
120°	1035	1037	980	938	885	—	—
150°	1044	1089	989	949	888	—	—
180°	1120	1122	1088	1082	1201	—	—
210°	1154	1133	984	1017	977	—	—
240°	1191	755	700	664	1045	—	—
270°	1168	788	665	718	—	—	—
300°	1113	1137	773	780	727	—	—
330°	1093	1127	1067	1126	1149	—	—

ALL READINGS START AT  
T.D.C. AND GO CLOCKWISE  
WITH FLOW

JOB ORDER# 004904

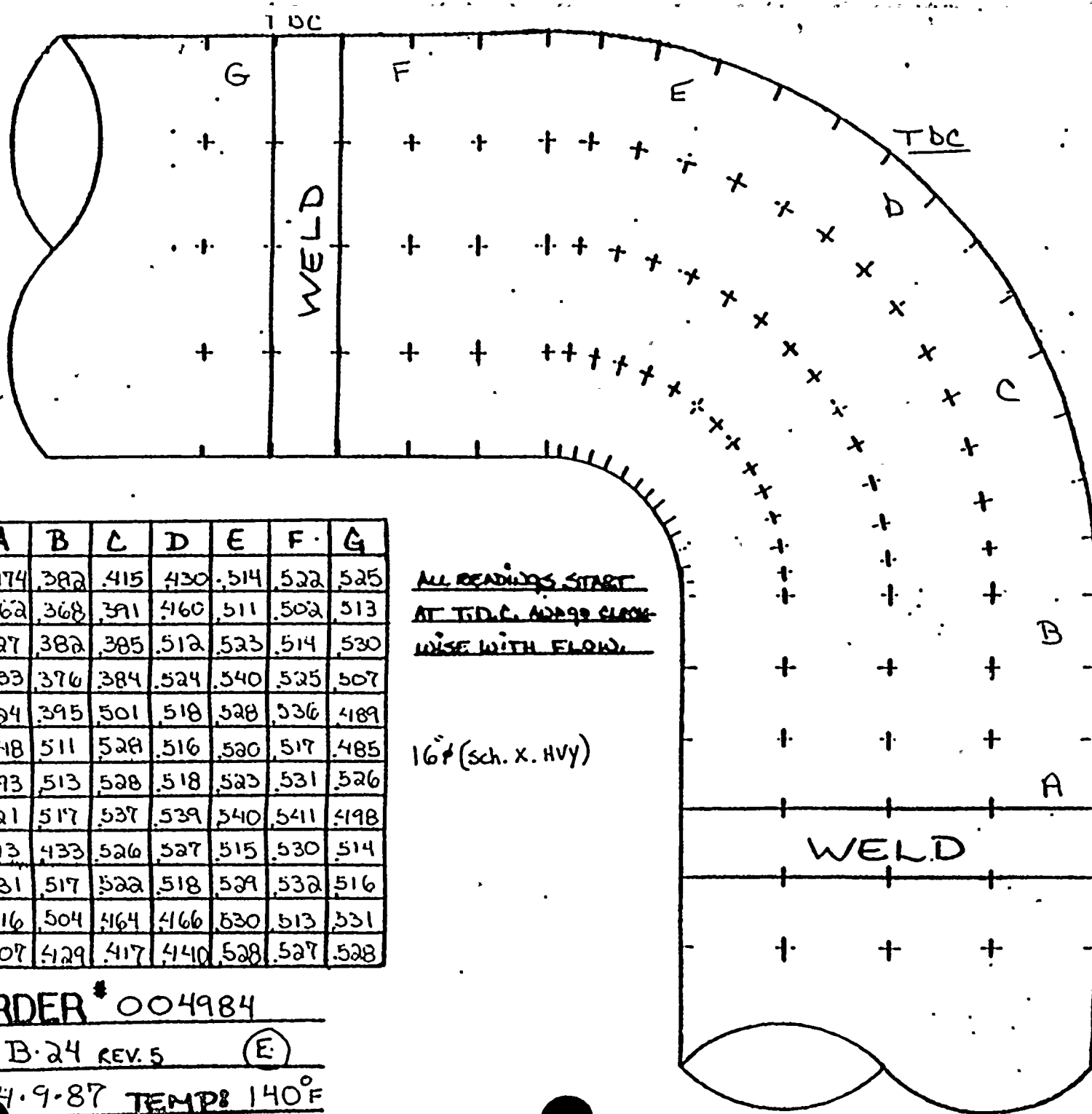
ISO\*\* 1-B-24 REV.5 (D)

DATE: 4-9-87 TEMP: 142°F

16" (Sch. X. Hvy)



← FLOW



	A	B	C	D	E	F	G
0°	.4174	.382	.415	.430	.514	.522	.525
30°	.362	.368	.391	.460	.511	.502	.513
60°	.427	.382	.385	.512	.523	.514	.530
90°	.433	.376	.384	.524	.540	.525	.507
120°	.424	.395	.501	.518	.528	.536	.489
150°	.348	.511	.528	.516	.520	.517	.485
180°	.493	.513	.528	.518	.523	.531	.526
210°	.521	.517	.537	.539	.540	.541	.498
240°	.513	.433	.526	.527	.515	.530	.514
270°	.531	.517	.522	.518	.529	.532	.516
300°	.516	.504	.464	.466	.530	.513	.531
330°	.507	.429	.417	.440	.528	.527	.528

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

16" (Sch. X. Hvy)

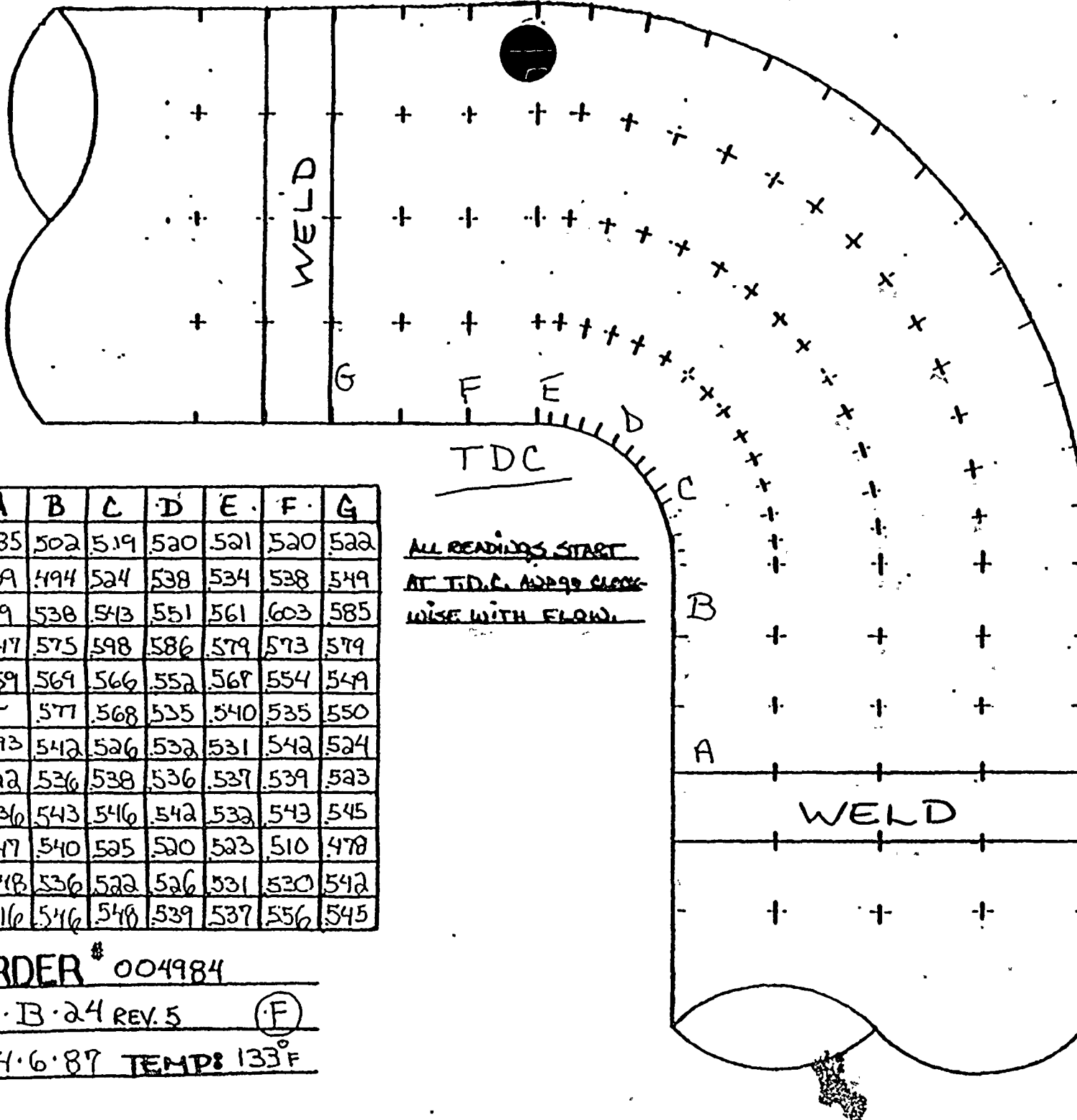
JOB ORDER # 004984

ISO# 1-B-24 REV. 5 (E)

DATE 4-9-87 TEMP 140°F



← FLOW



TDC

	A	B	C	D	E	F	G
0°	485	502	519	520	521	520	522
30°	509	494	524	538	534	538	549
60°	519	538	543	551	561	603	585
90°	547	575	598	586	579	573	579
120°	459	569	566	552	567	554	549
150°	—	577	568	535	540	535	550
180°	493	542	526	532	531	542	524
210°	522	536	538	536	537	539	523
240°	536	543	546	542	532	543	545
270°	547	540	525	520	523	510	478
300°	548	536	522	526	531	530	542
330°	516	546	548	539	537	556	545

TDC

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

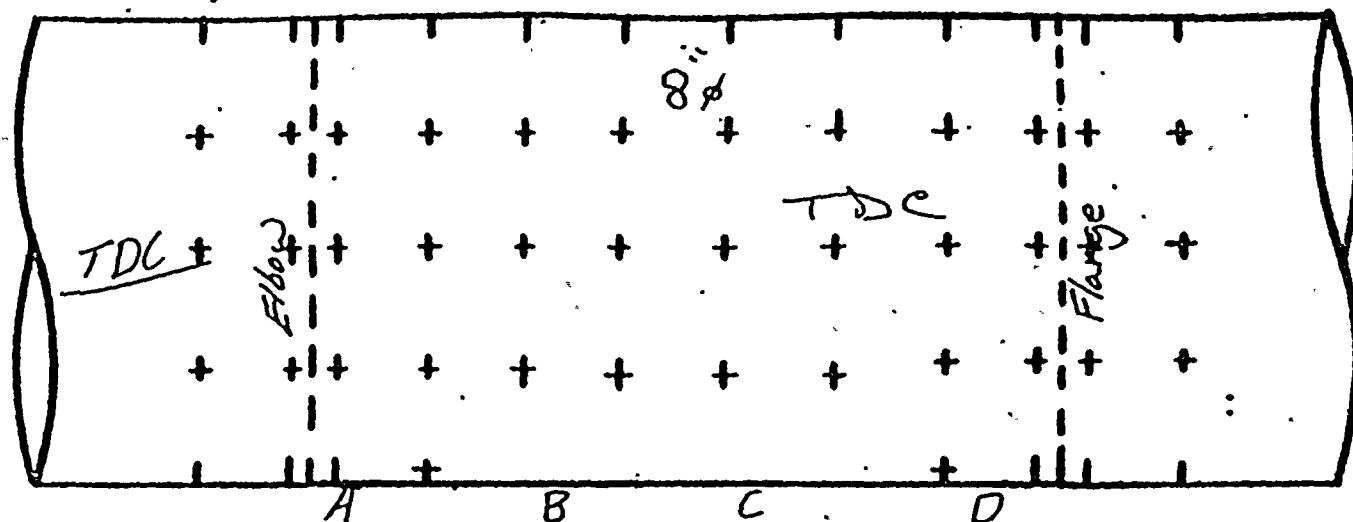
JOE ORDER # 004984

ISO # 1-B-24 REV. 5 (F)

DATE: 4-6-87 TEMP: 133°F



FLOW →



ALL READINGS START AT  
TDC. AND GO CLOCKWISE  
WITH FLOW.

8" (sch. X. Hvy)

TDC

	A	B	C	D	E	F	G
0°	319	336	326	329			
45°	318	307	306	313			
90°	311	317	329	330			
135°	258	308	307	323			
180°	296	315	322	354			
225°	310	329	339	314			
270°	355	366	333	331			
315°	317	316	302	310			

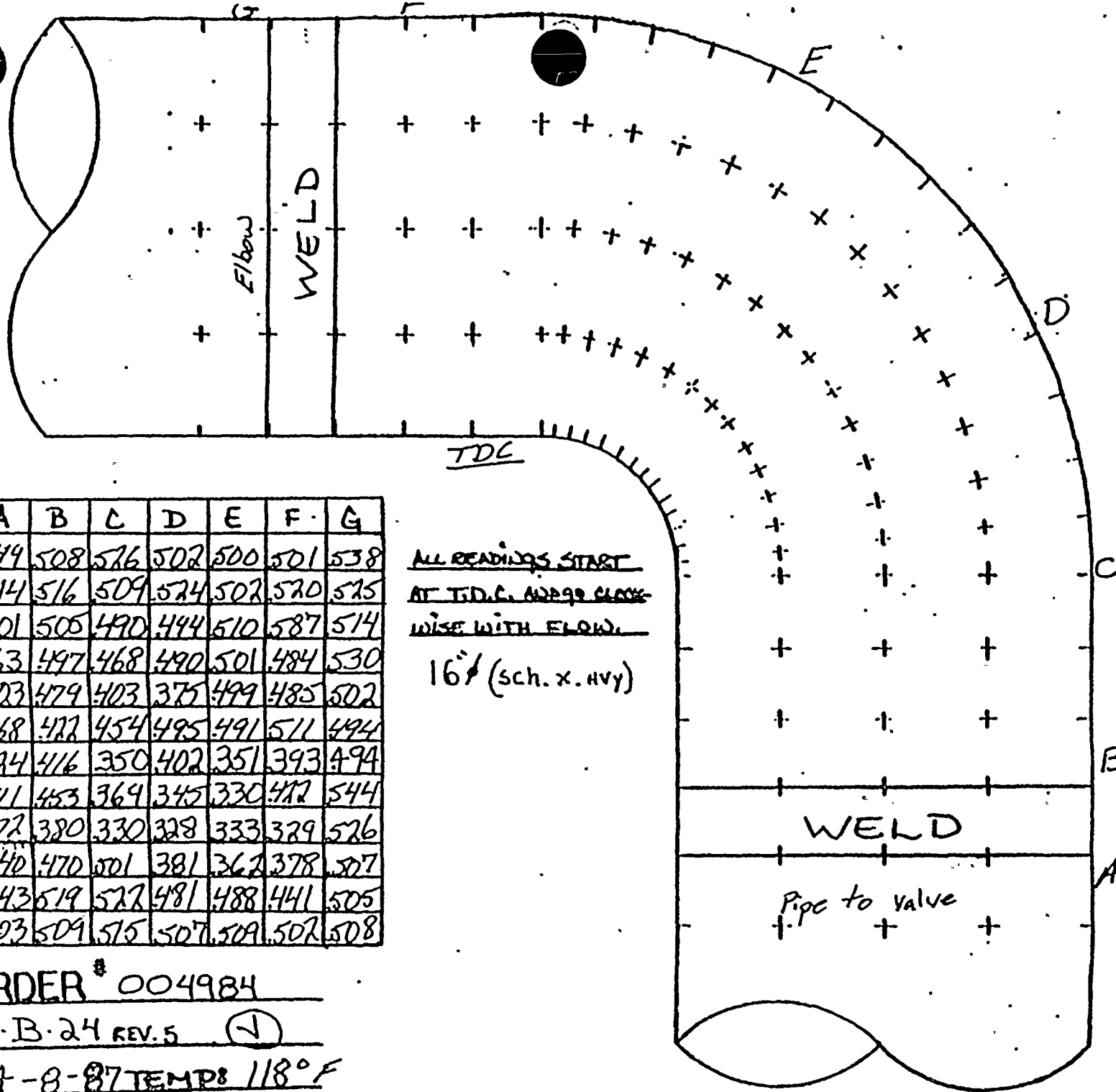
JOB ORDER # 004984

ISO # 1-B-24 REV. 5 (I)

DATE 4-7-87 TEMP: 118°F



← FLOW



TDC

	A	B	C	D	E	F	G
0°	344	508	526	502	500	501	538
30°	314	516	509	524	502	520	525
60°	301	505	490	444	510	587	514
90°	363	497	468	490	501	484	530
120°	403	479	403	375	499	485	502
150°	468	472	454	495	491	511	494
180°	524	416	350	402	351	393	494
210°	511	453	364	345	330	412	544
240°	472	380	330	328	333	329	526
270°	440	470	501	381	362	378	507
300°	443	519	522	481	488	441	505
330°	403	509	515	507	509	502	508

ALL READINGS START  
AT T.D.C. AND GO CLO-  
WISE WITH FLOW.

16" (sch. x. hvy)

WELD

Pipe to valve

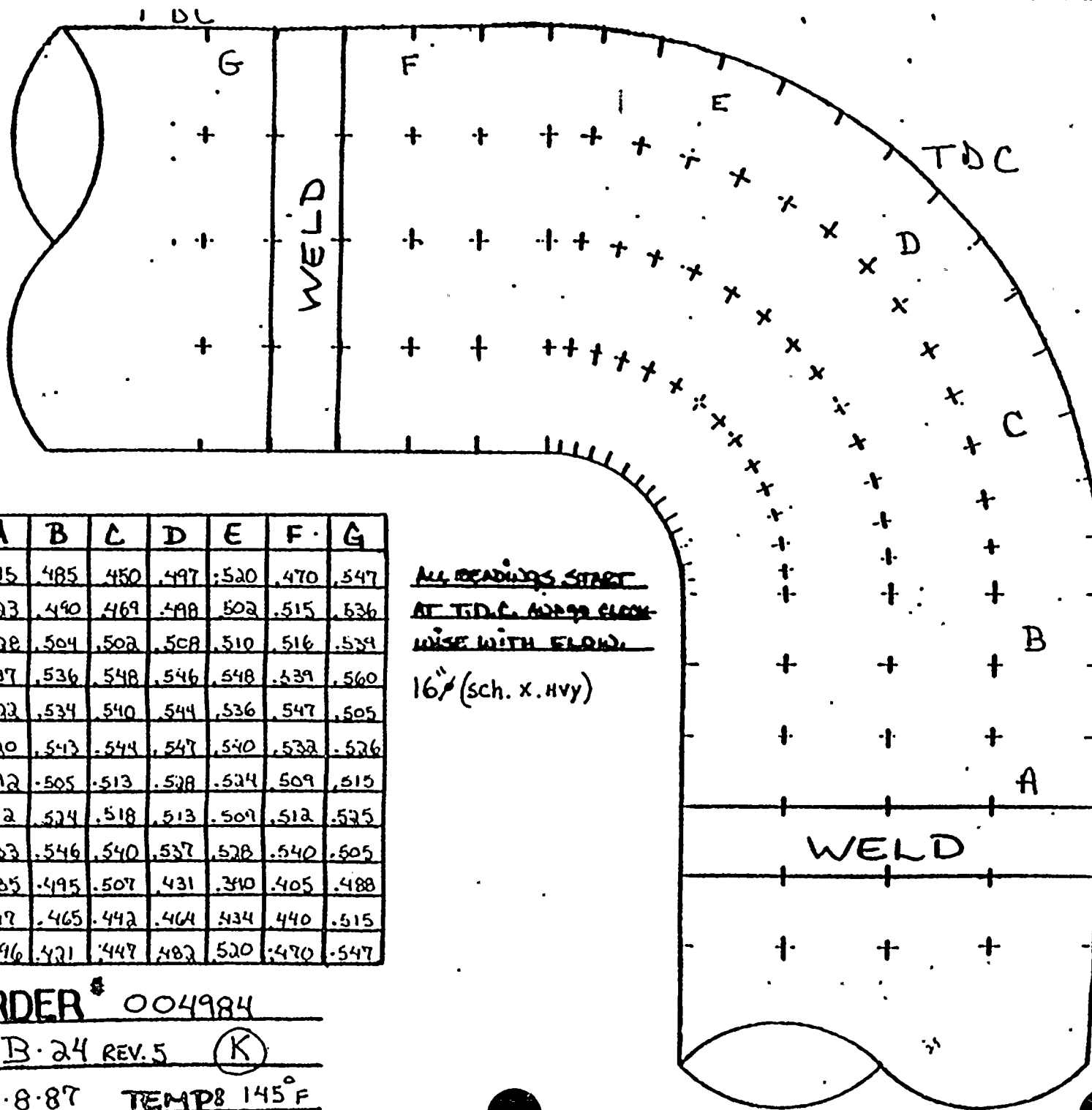
JOB ORDER # 004984

ISO# 1-B-24 REV. 5 (✓)

DATE: 4-8-87 TEMP: 118°F



← FLOW



TDC

	A	B	C	D	E	F	G
0°	.515	.485	.450	.497	.520	.470	.547
30°	.523	.490	.469	.498	.502	.515	.536
60°	.528	.504	.502	.508	.510	.516	.534
90°	.537	.536	.548	.546	.548	.539	.560
120°	.522	.534	.540	.544	.536	.547	.505
150°	.520	.543	.544	.547	.540	.532	.526
180°	.512	.505	.513	.528	.524	.509	.515
210°	.512	.524	.518	.513	.509	.512	.525
240°	.523	.546	.540	.537	.528	.540	.505
270°	.535	.495	.507	.431	.340	.405	.488
300°	.517	.465	.442	.464	.434	.440	.515
330°	.496	.421	.447	.482	.520	.470	.547

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

16" (sch. x. Hvy)

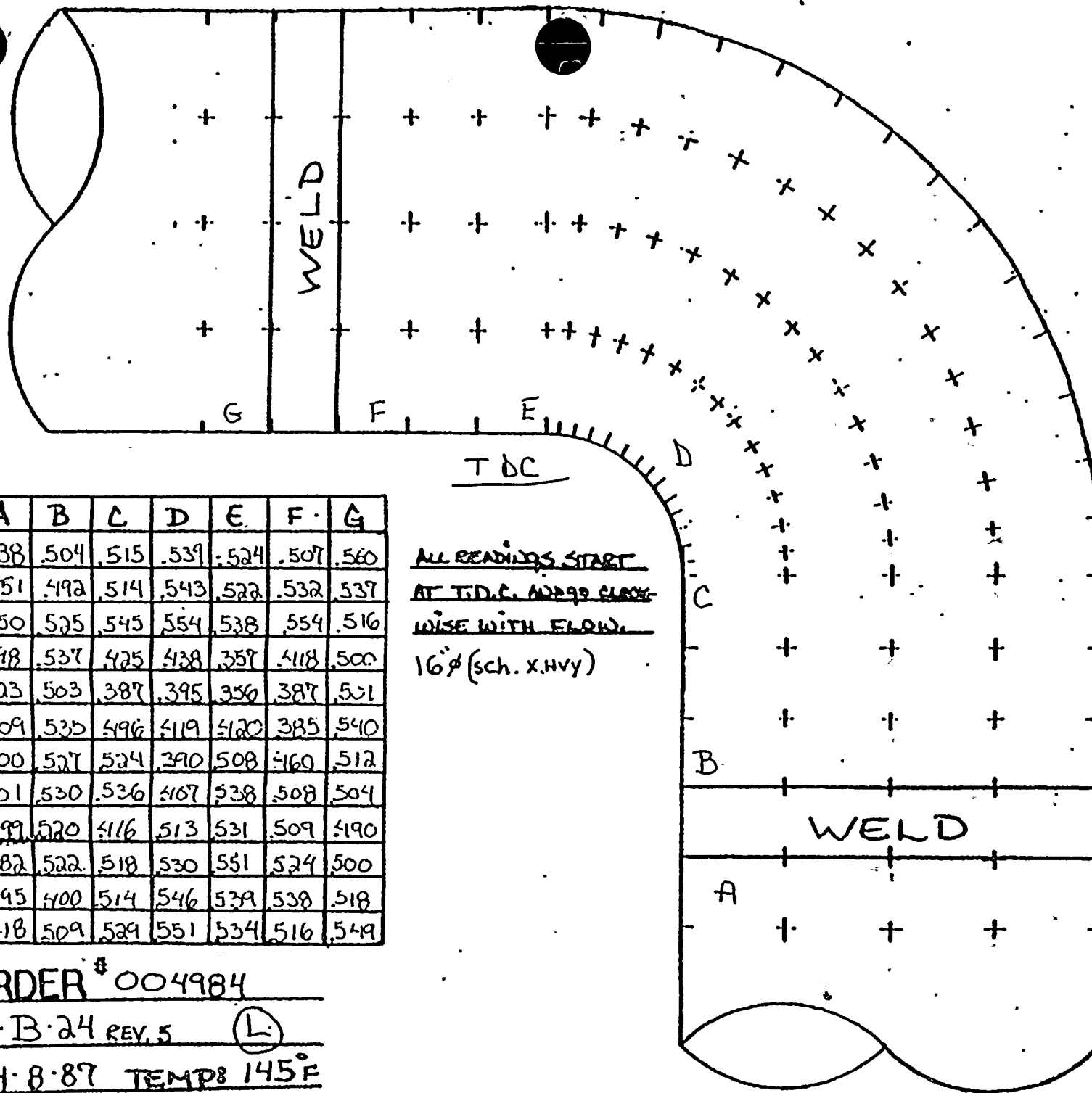
JOE ORDER # 004984

ISO # 1-B-24 REV. 5 (K)

D 4-8-87 TEMP 145°F



← FLOW



DC

	A	B	C	D	E	F	G
0°	538	504	515	539	524	507	560
30°	551	492	514	543	522	532	537
60°	550	525	545	554	538	554	516
90°	548	537	525	538	537	518	500
120°	523	503	387	395	356	387	501
150°	509	535	596	519	520	385	540
180°	500	527	524	390	508	560	512
210°	501	530	536	567	538	508	504
240°	5199	520	516	513	531	509	5190
270°	582	522	518	530	551	524	500
300°	5145	500	514	546	539	538	518
330°	518	509	529	551	534	516	549

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.  
 16" (sch. X.Hvy)

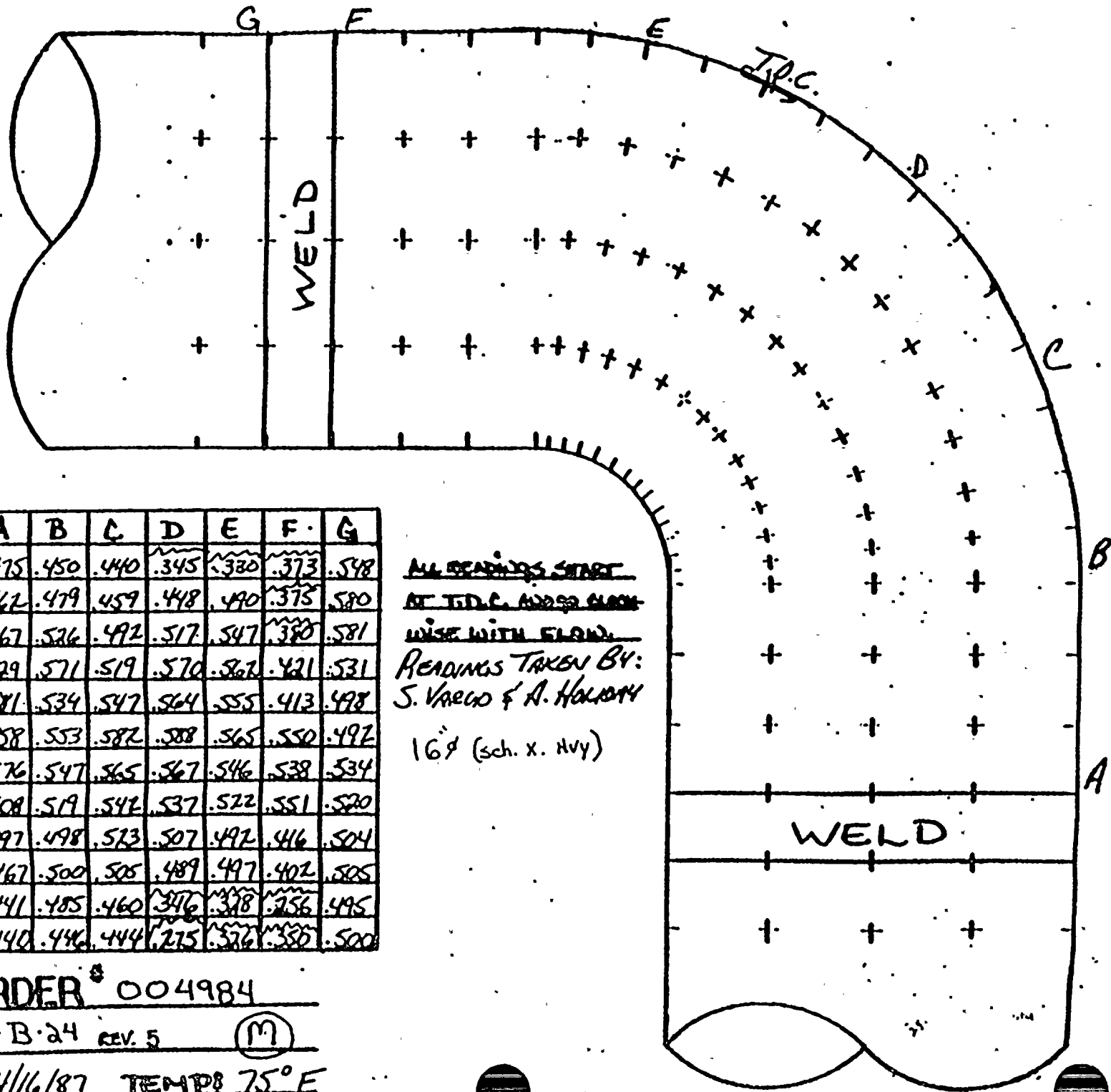
JOB ORDER # 004984

ISO # 1-B-24 REV. 5 (L)

DATE: 4-8-87 TEMP: 145°F



← FLOW



TDC

	A	B	C	D	E	F	G
0°	.475	.450	.440	.345	.330	.373	.548
30°	.462	.479	.459	.448	.490	.375	.580
60°	.567	.526	.492	.517	.547	.380	.581
90°	.529	.571	.519	.570	.362	.421	.531
120°	.581	.534	.547	.564	.555	.413	.498
150°	.558	.553	.582	.588	.565	.550	.492
180°	.576	.547	.565	.567	.546	.538	.534
210°	.508	.519	.542	.537	.522	.551	.520
240°	.497	.498	.523	.507	.492	.446	.504
270°	.467	.500	.505	.489	.497	.402	.505
300°	.441	.485	.460	.346	.338	.356	.495
330°	.440	.446	.444	.275	.326	.350	.500

ALL READINGS START  
AT T.D.C. AND GO CLOCK-  
WISE WITH FLOW.

READINGS TAKEN BY:  
S. VARGO & A. HOLCOMB

16" (sch. x. Hvy)

JOB ORDER # 004984

ISO # 1-B-24 REV. 5 (M)

D 4/16/87 TEMP: 75° F



PLANT

SER No. 88-84 (Steam) X

Unit No. 1

SER No. 23-85 (Water)

Years in service 11

UT Reading Taken on: 4-11 & 4-13-87

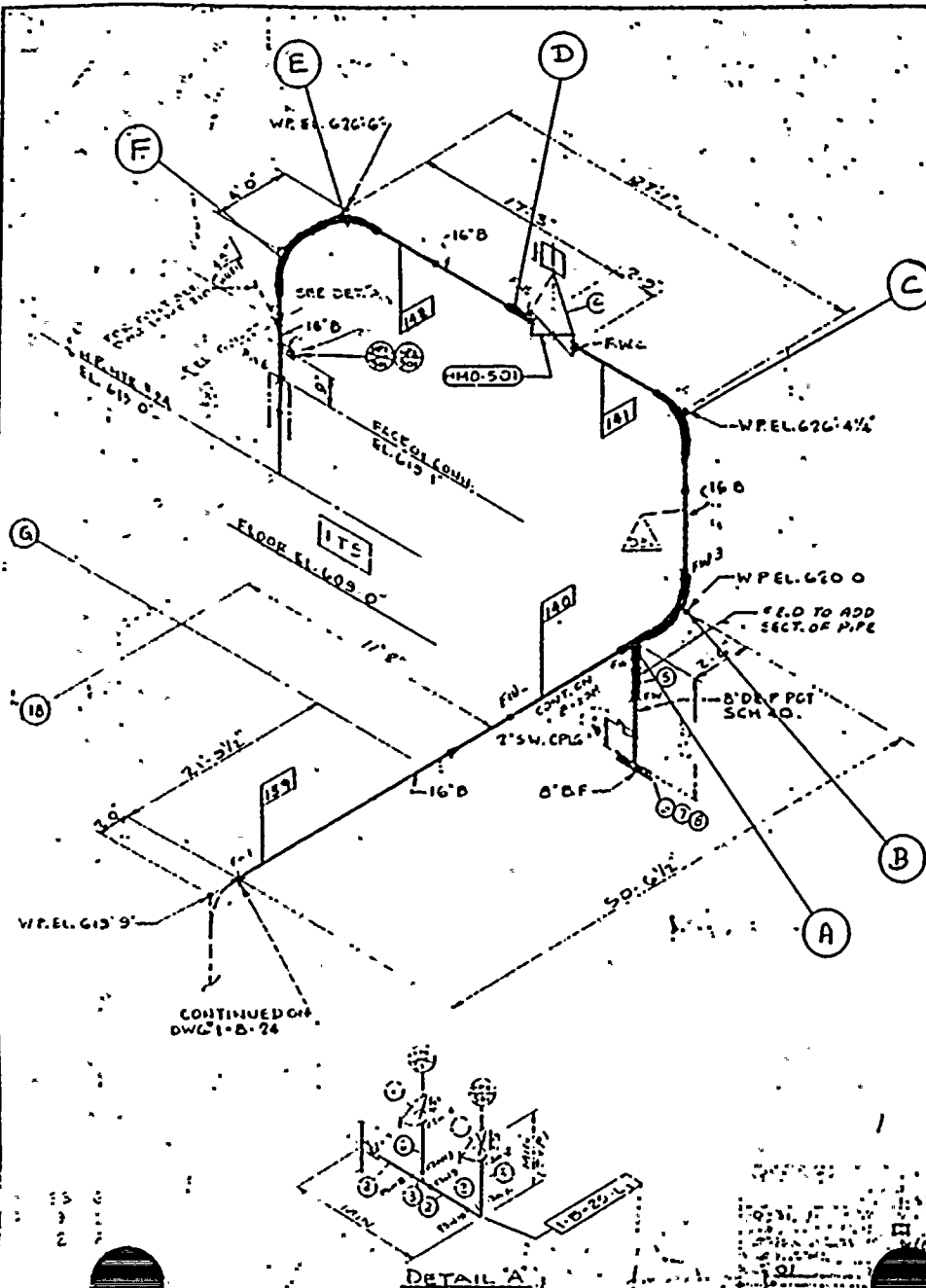
AEPSIC Installed Mat'l Class CS:ASTM A406 GRB SCH. X HVY

[illegible]

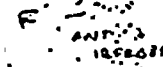


J.O.# 715740

ISOMETRIC SHEET NO. 602



INSPECT: B; C, E:



P.O.#	PIECE MARKS	FAB.
	1-B-139	SHAW

SUB. FILE MARKS  
1-B-25-L

3	1-1-72	SD	ALPS RPT. 2-1-72 ADDED 1-1-72	FIELD
2	3-1-72	BT	REVISED BY APS DESIGN PER AER DWS #3287 2613 ADDED ITEMS 3-2-72 2-2- 1-72 15	FIELD
1	9-1-71	BT	REVISED BY APS DESIGN PER AER DWS #3287 2613 ADDED ITEMS 1-2-72 2-2- 1-72 15	FIELD
REV.	DATE	CODE	DESCRIPTION	P.O. - DWS

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN MICHIGAN  
UNIT NO. 1

[illegible]

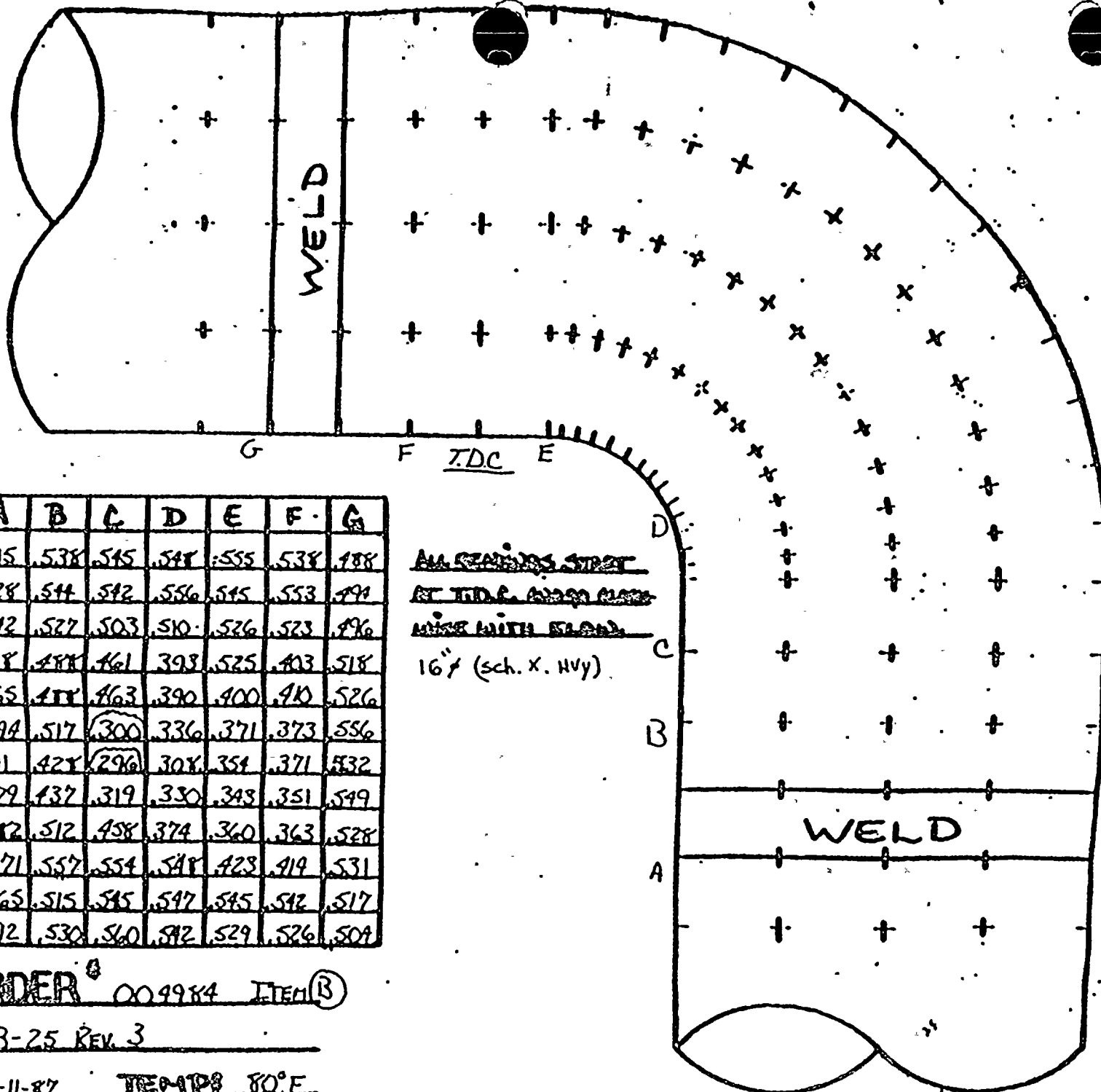
### MATERIAL REQUIRED FOR FIELD REWORK

**UNCONTROLLED  
DOCUMENT**

DWG NO: 25 REV.3



← FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	515	538	545	548	555	538	488
30°	528	544	542	556	545	553	499
60°	542	527	503	510	526	523	496
90°	518	488	461	393	525	403	518
120°	465	477	463	390	400	410	526
150°	494	517	300	336	371	373	556
180°	511	427	296	308	354	371	532
210°	479	437	319	330	348	351	549
240°	472	512	458	374	360	363	528
270°	471	557	554	548	428	414	531
300°	465	515	545	547	545	542	517
330°	512	530	560	542	529	526	504

~~ALL SEAMLESS STEEL~~  
~~AT T.D.C. AND 90°~~  
~~WELD WITH FLANG~~  
 16" (sch. X. Hvy)

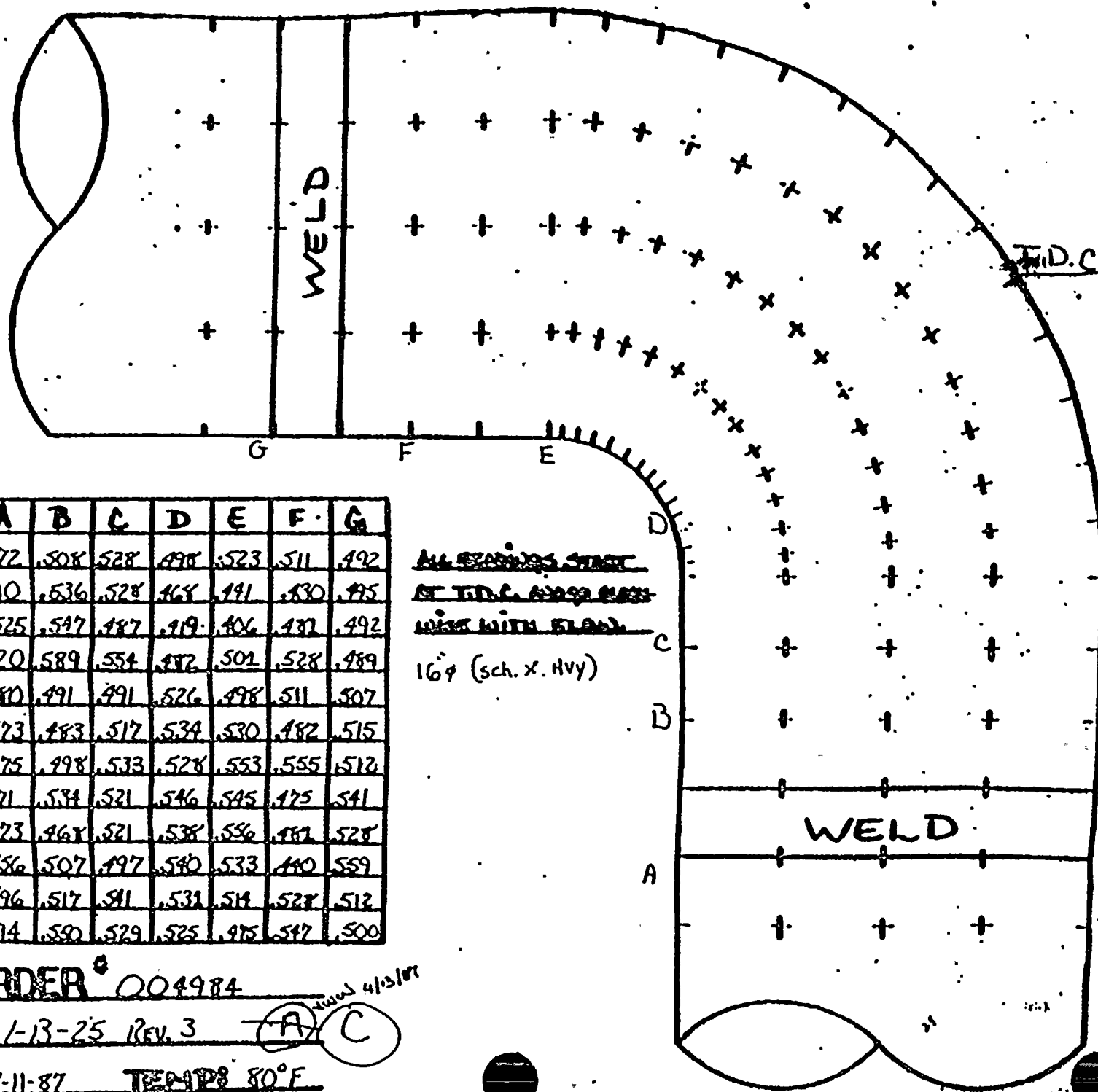
JOB ORDER 009984 ITEM (B)

190° 1-B-25 REV. 3

DATE: 1-11-87 TEMP: 80°F



← FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	172	508	528	498	523	511	492
30°	510	536	528	468	491	430	495
60°	525	547	487	419	406	482	492
90°	520	589	554	482	501	528	489
120°	480	491	491	526	498	511	507
150°	473	483	517	534	530	482	515
180°	475	498	533	528	553	555	512
210°	471	534	521	546	545	475	541
240°	473	468	521	538	556	482	528
270°	456	507	497	540	533	440	559
300°	496	517	581	531	514	528	512
330°	514	550	529	525	475	547	500

ALL READINGS START  
AT T.D.C. AND GO  
DOWN WITH FLOW.

16" (sch. X. Hvy)

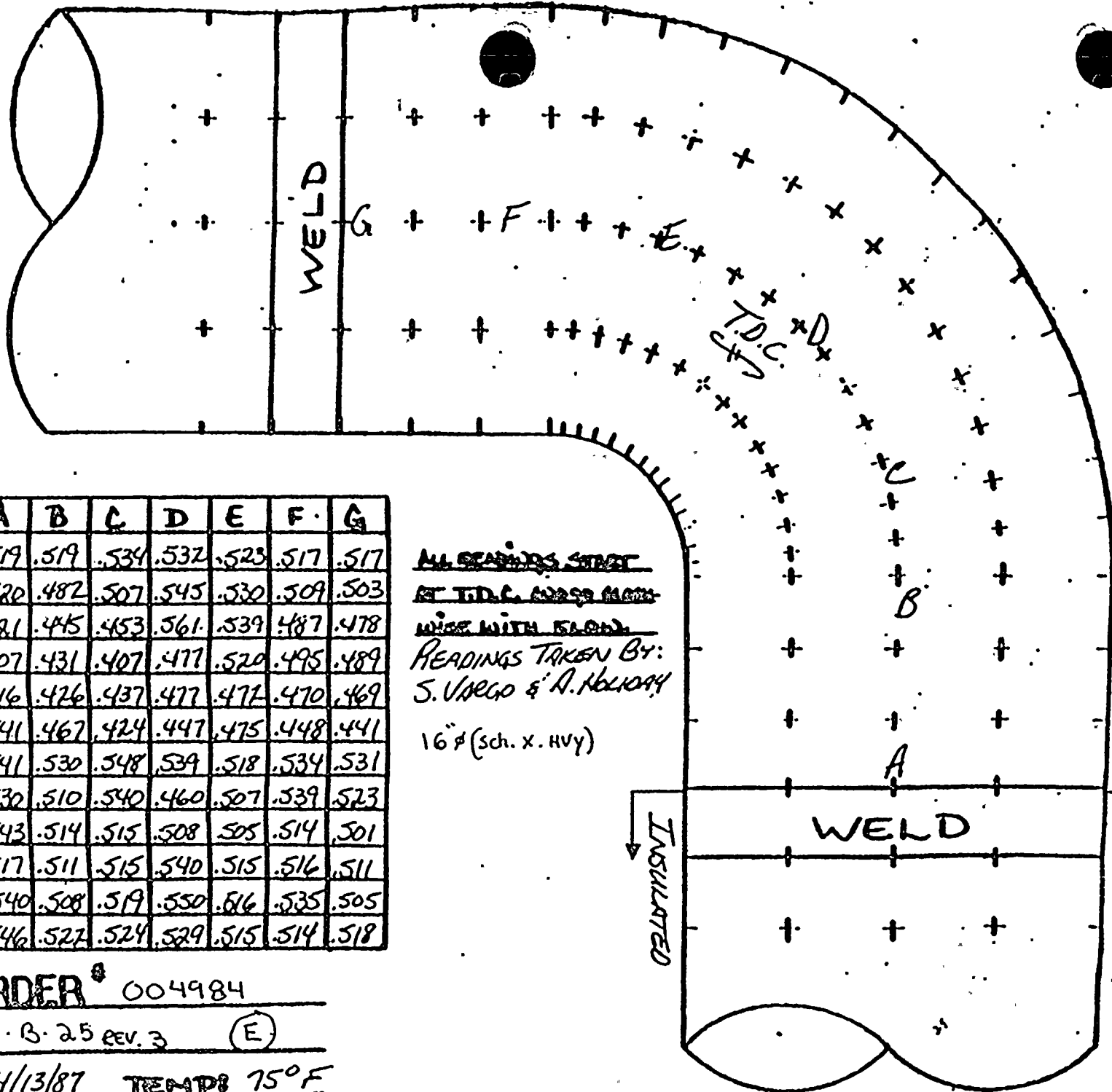
JOE ORDER 004984

180° 1-13-25 REV. 3

DATE 9-11-87 TEMP 80°F



← FLOW



T.D.C.

	A	B	C	D	E	F	G
0°	.519	.519	.534	.532	.523	.517	.517
30°	.520	.482	.507	.545	.530	.509	.503
60°	.521	.445	.453	.561	.539	.487	.478
90°	.507	.431	.407	.477	.520	.495	.489
120°	.516	.426	.437	.477	.472	.470	.469
150°	.541	.467	.424	.447	.475	.448	.441
180°	.541	.530	.548	.539	.518	.534	.531
210°	.530	.510	.540	.460	.507	.539	.523
240°	.543	.514	.515	.508	.505	.514	.501
270°	.517	.511	.515	.540	.515	.516	.511
300°	.540	.508	.519	.550	.516	.535	.505
330°	.546	.522	.524	.529	.515	.514	.518

ALL READINGS START

AT T.D.C. AND 90°

WIDE WITH FLARE

READINGS TAKEN BY:

S. VARGO & A. HOLLOMAN

16" (sch. x. Hvy)

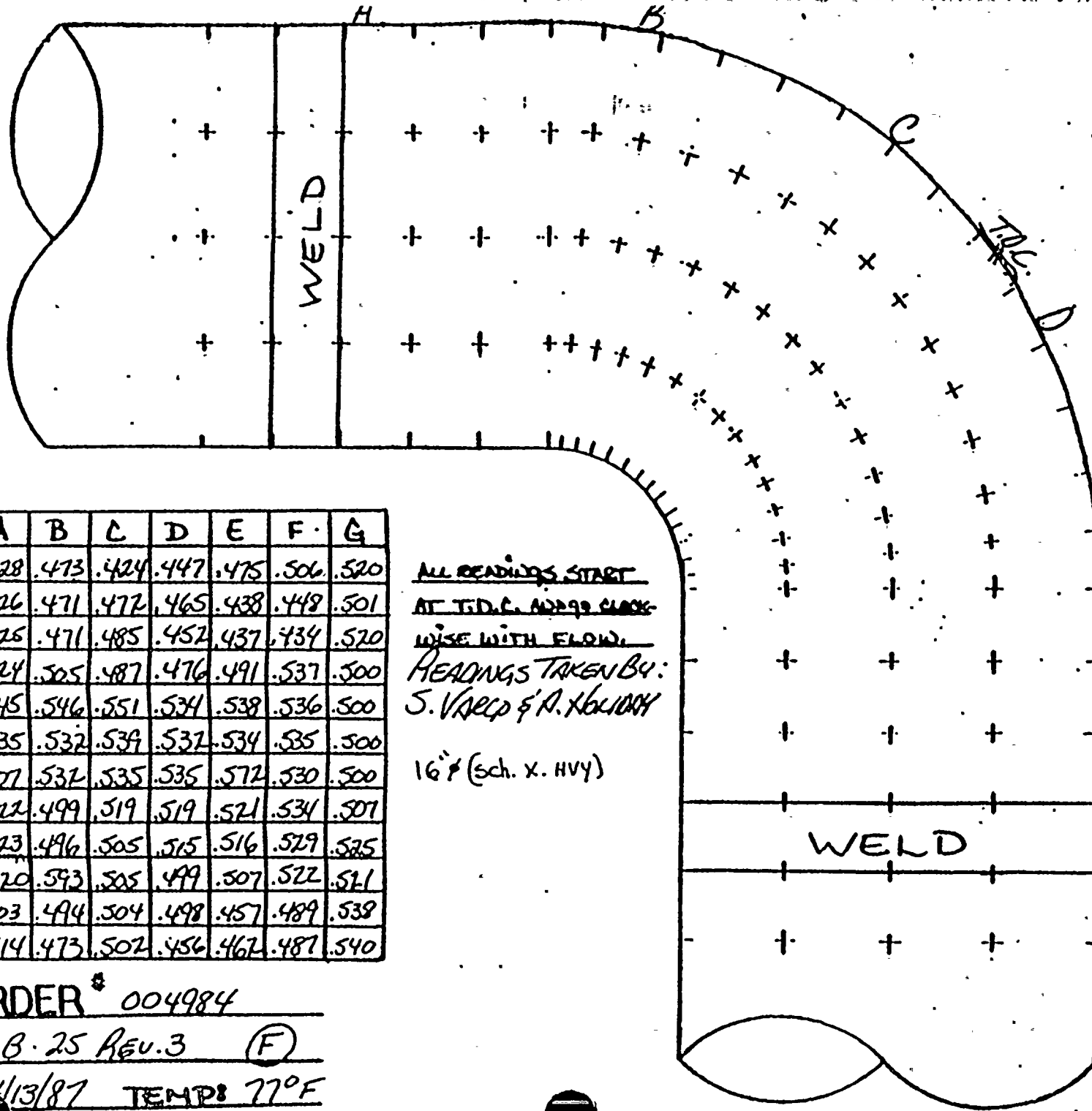
JOE ORDER # 004984

ISO # 1-B-25 REV. 3 (E)

DATE: 4/13/87 TEMP: 75°F



FLOW →



	A	B	C	D	E	F	G
0°	.528	.473	.424	.447	.475	.506	.520
30°	.526	.471	.472	.465	.438	.448	.501
60°	.525	.471	.485	.452	.437	.434	.520
90°	.524	.505	.487	.476	.491	.537	.500
120°	.545	.546	.551	.534	.538	.536	.500
150°	.535	.532	.539	.532	.534	.535	.500
180°	.507	.532	.535	.535	.572	.530	.500
210°	.522	.499	.519	.519	.521	.531	.507
240°	.523	.496	.505	.515	.516	.529	.525
270°	.520	.593	.505	.499	.507	.522	.511
300°	.503	.494	.504	.498	.457	.489	.538
330°	.514	.473	.502	.456	.462	.487	.540

ALL READINGS START  
AT T.D.C. APPROX. CLOCK-  
WISE WITH FLOW.

READINGS TAKEN BY:  
S. VAREL & R. K. LLOYD

16" (sch. X. HVY)

JOB ORDER # 004984

ISO # 1-B-25 REV. 3 (F)

DATE: 4/13/87 TEMP: 77°F

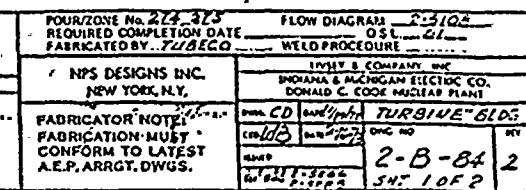


cc: S. H. Steinhart  
W. G. Smith, Jr.,-Bridgman  
J. A. Kobyra







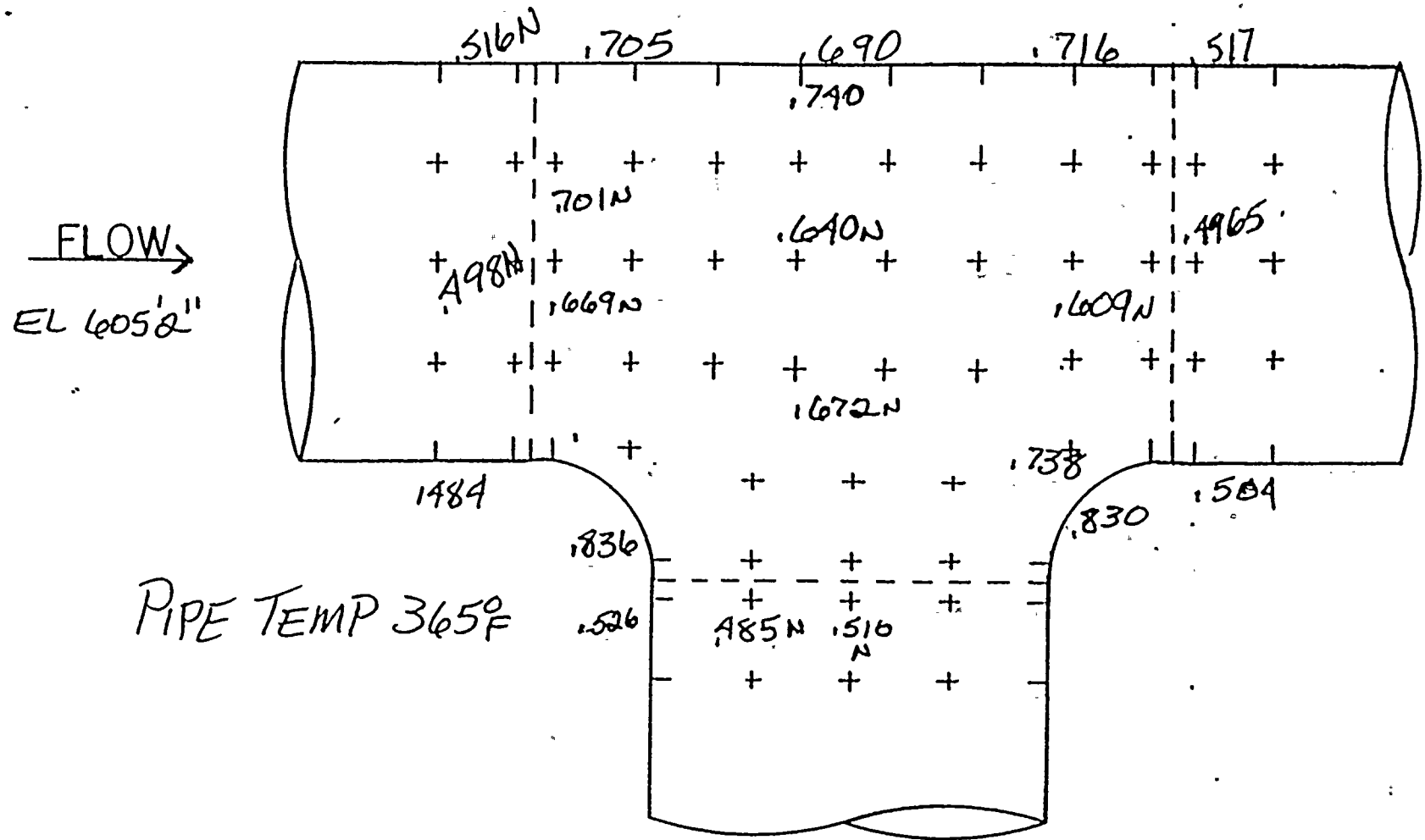


CONST / D.C.







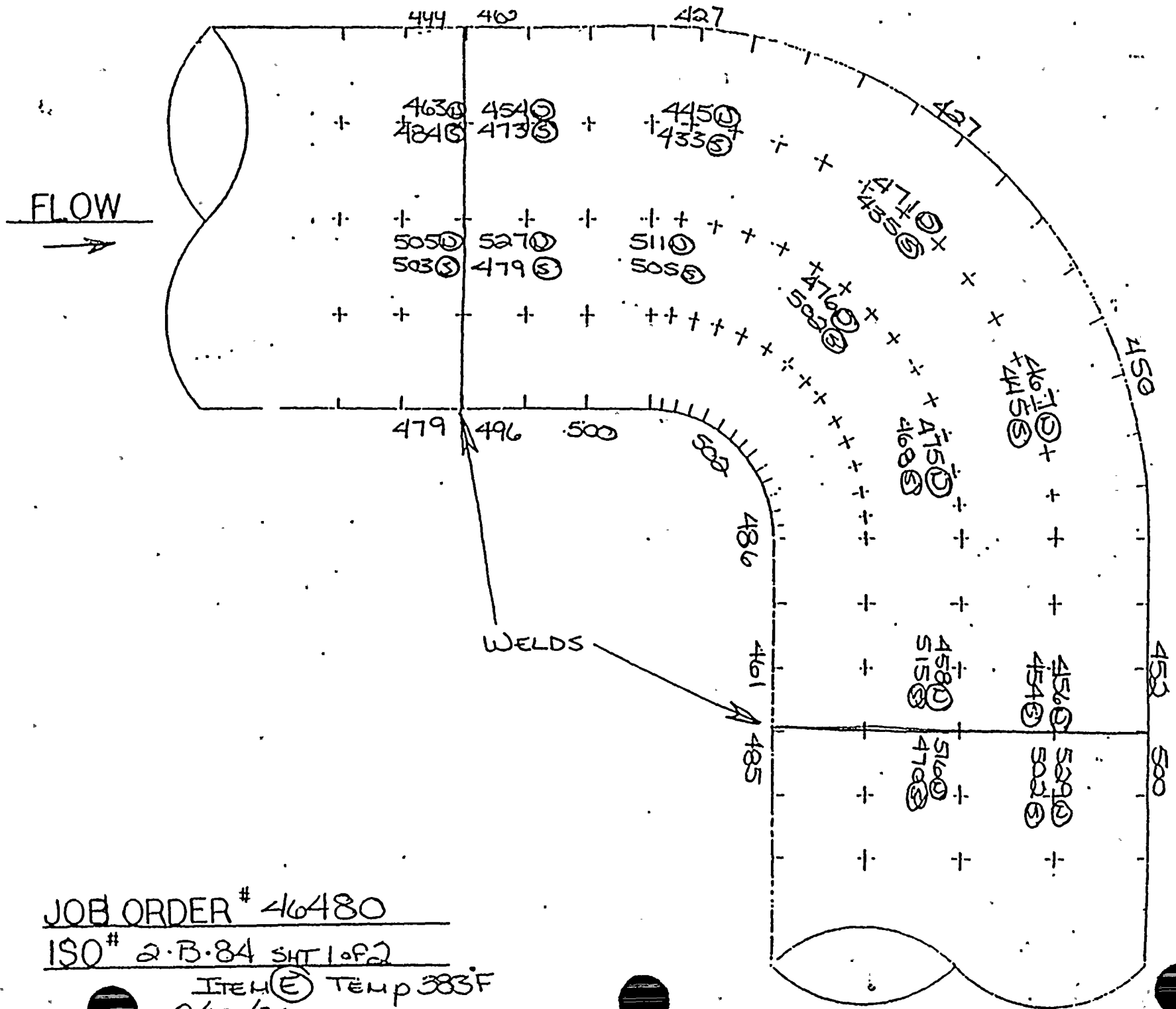


JOB ORDER # 46480 ITEM "B"

ISO # 2-B-84 SAT 1 of 2 2/12/86

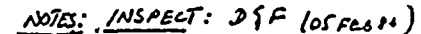
SOUTH 16" LINE







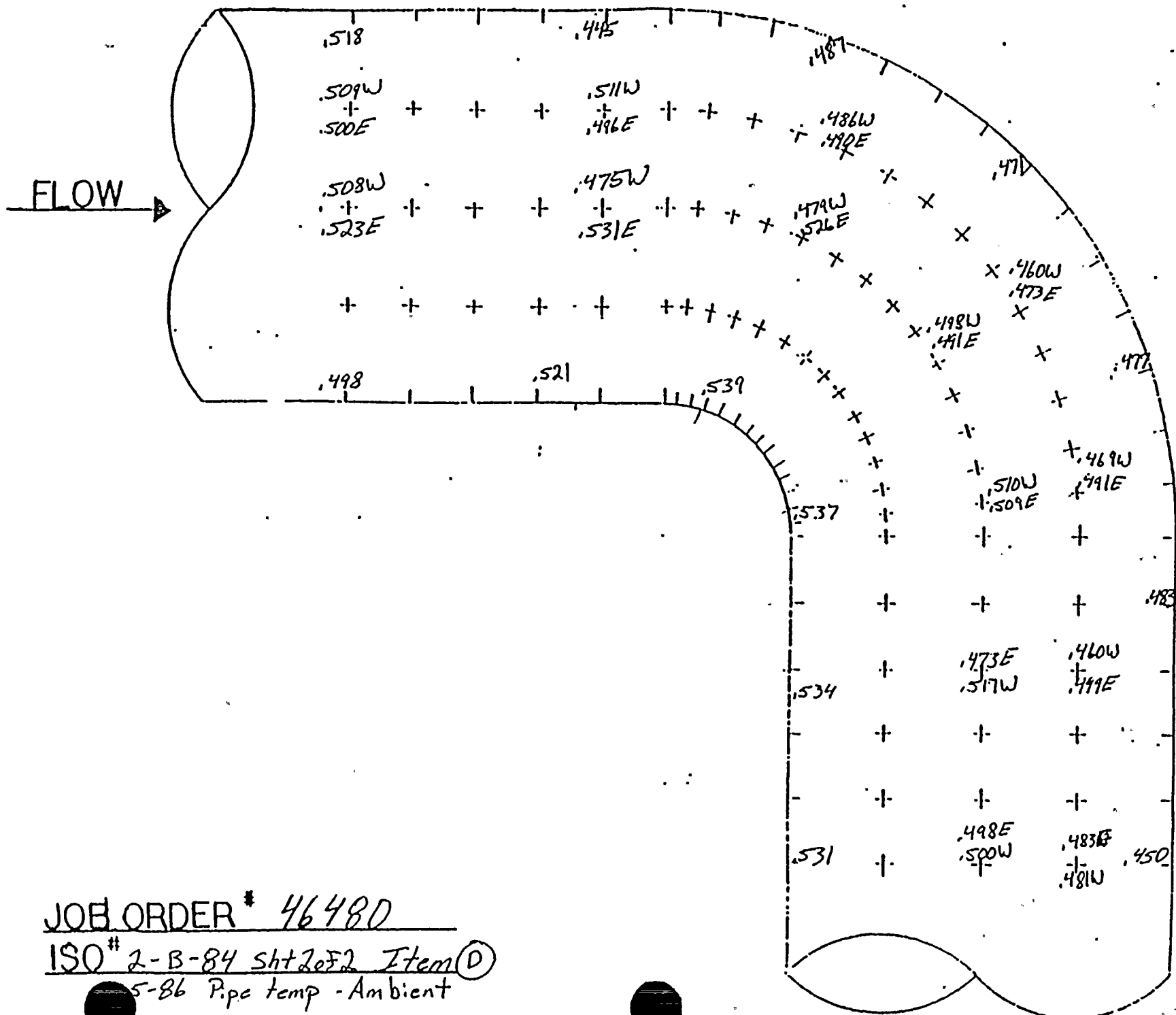
NEEK



NPS DESIGNS INC. NEW YORK, N.Y.	APPLIED & COMPANY INC. INDIANA & MICHIGAN ELECTRIC CO. DONALD C. COOK NUCLEAR PLANT																				
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRG. DWGS.	<table border="1"> <tr> <td>DATE</td> <td>DATE</td> <td>DATE</td> <td>DATE</td> <td>DATE</td> </tr> <tr> <td>CO</td> <td>LD</td> <td>DATE</td> <td>DATE</td> <td>DATE</td> </tr> <tr> <td>NAME</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SA</td> <td>NO</td> <td>DATE</td> <td>DATE</td> <td>DATE</td> </tr> </table> <div style="text-align: right;">             2-B-84              SNT. 20F2           </div>	DATE	DATE	DATE	DATE	DATE	CO	LD	DATE	DATE	DATE	NAME					SA	NO	DATE	DATE	DATE
DATE	DATE	DATE	DATE	DATE																	
CO	LD	DATE	DATE	DATE																	
NAME																					
SA	NO	DATE	DATE	DATE																	

cons/2c





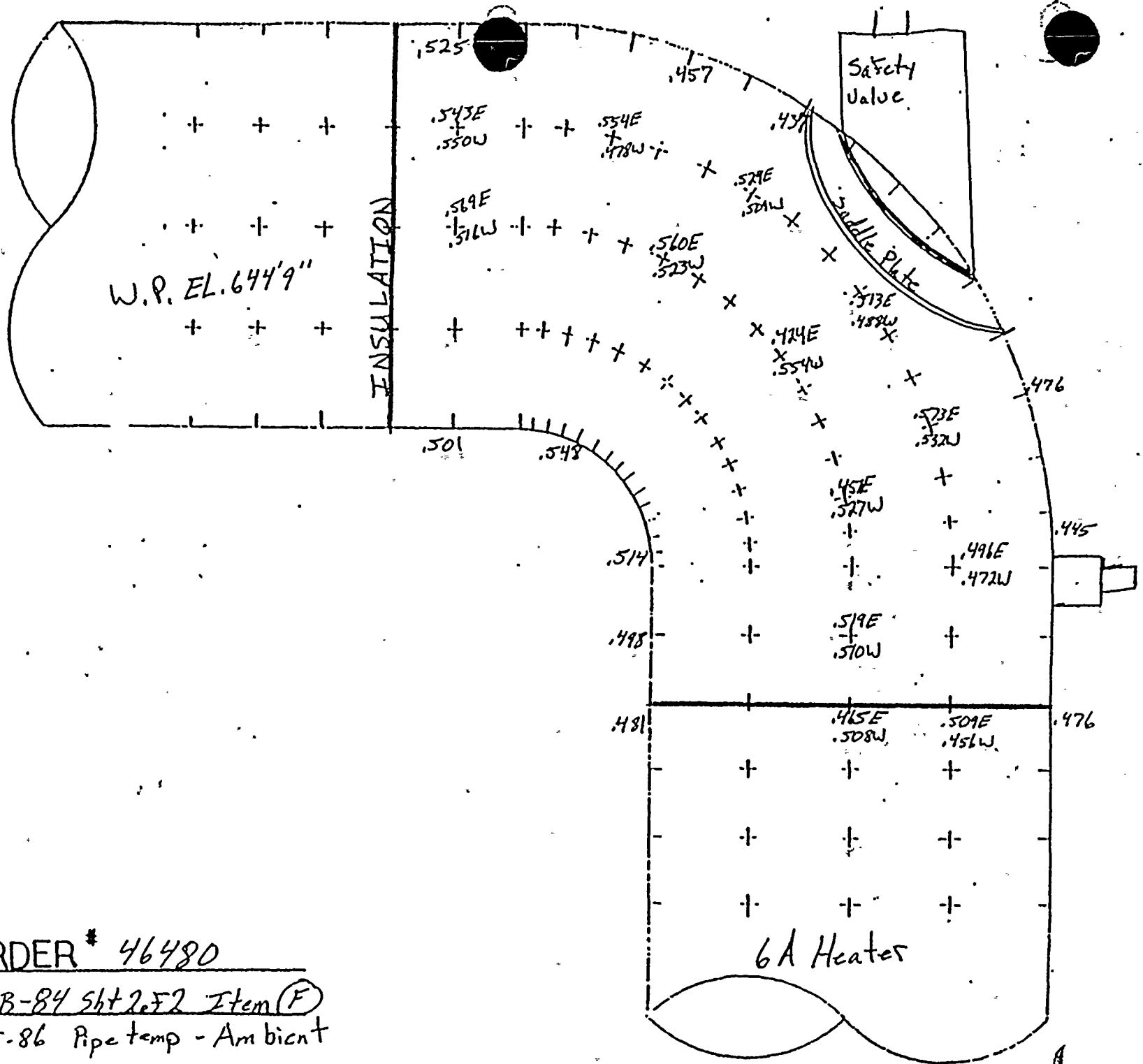
JOB ORDER # 46480

ISO# 2-B-84 Sht 2 of 2 Item ①

5-86 Pipe temp - Ambient



FLOW



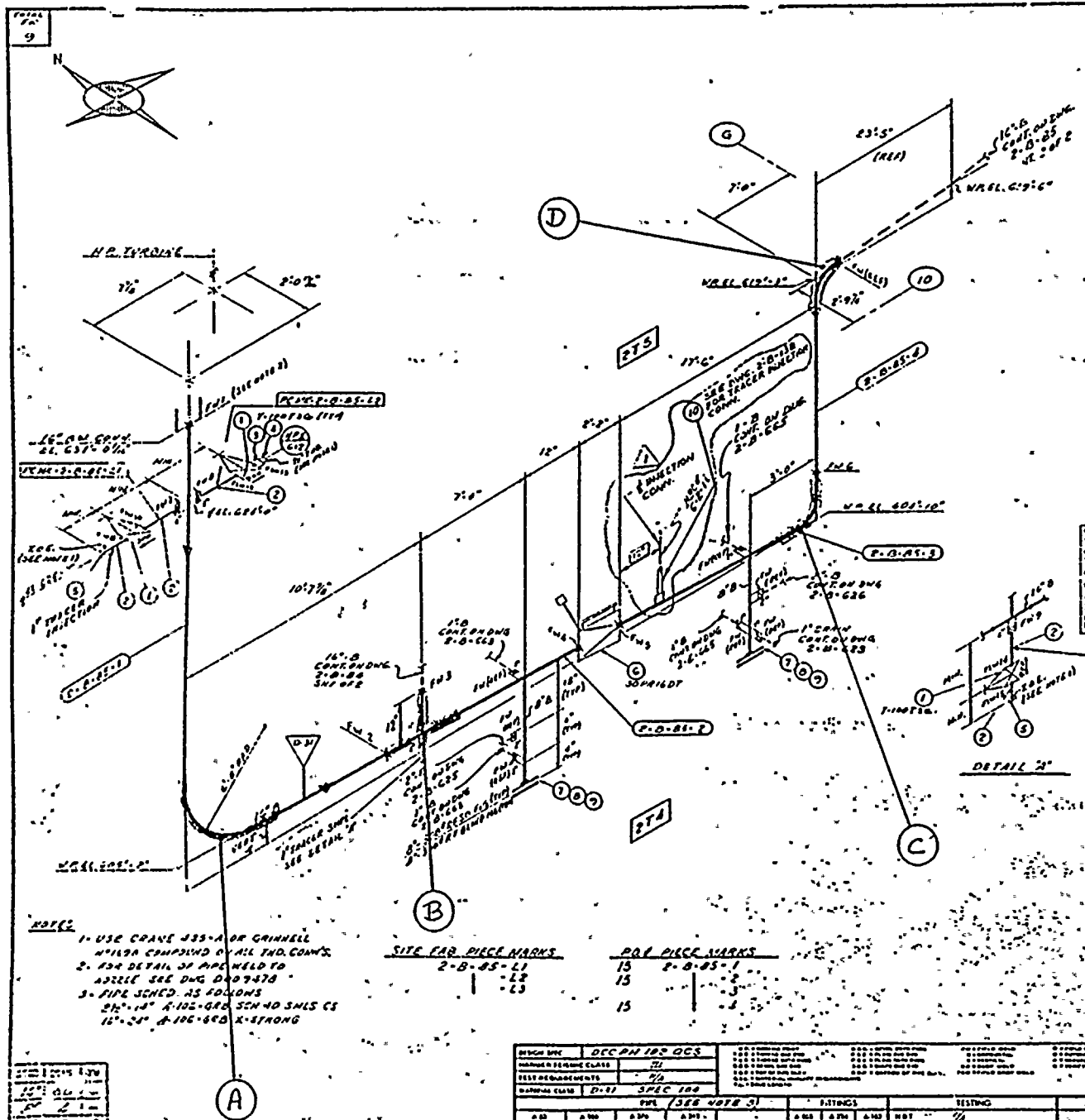
JOB ORDER # 46480

ISO# 2-B-84 Sht 2 of 2 Item (F)

3-5-86 Pipe temp - Ambient



CONST - J.O. 110154  
J.O. 110198



QTY	ITEM	QTY	SIZE	DESCRIPTION	UNIT	QTY	PRICE	TOTAL
1	3	1"	600° SW GLOBE VA	CS	11/12/72			
2	1	1"	SCH 80 PIPE SMLS	CS	11/12/72			
3	1	1 1/2"	3000° 1/2" 1 1/2" THD REG INLET	CS	11/12/72			
4	1	1 1/2"	3000° THD. PLUG	CS	11/12/72			
5	2	1"	3000° THD. CAP	CS	11/12/72			
6	1	16"	POSITIVE CLOSING CHECK VALVE	30PR16X				
7	2	6"	JOINT TIGHTENING LAMP	1/2" 1/2"				
8	10	1 1/2"	HEAVY HEX. NUTS	CS	11/12/72			
9	24	1/2"	1/2" 1/2" LG. STUD BOLTS	CS	11/12/72			
10	1	1 1/2"	INJECTION CONN. (BSC ENG)	CS	11/12/72			
			TX-S: 31162					

REVISION RECORD			
NO.	DATE	DESCRIPTION	REMARKS
1	11/1/58	MS. FOR RDN - MS. 0032 ADDED ITEM - 10 & 15 BUILT DIM.	REVISION REQUIRED.

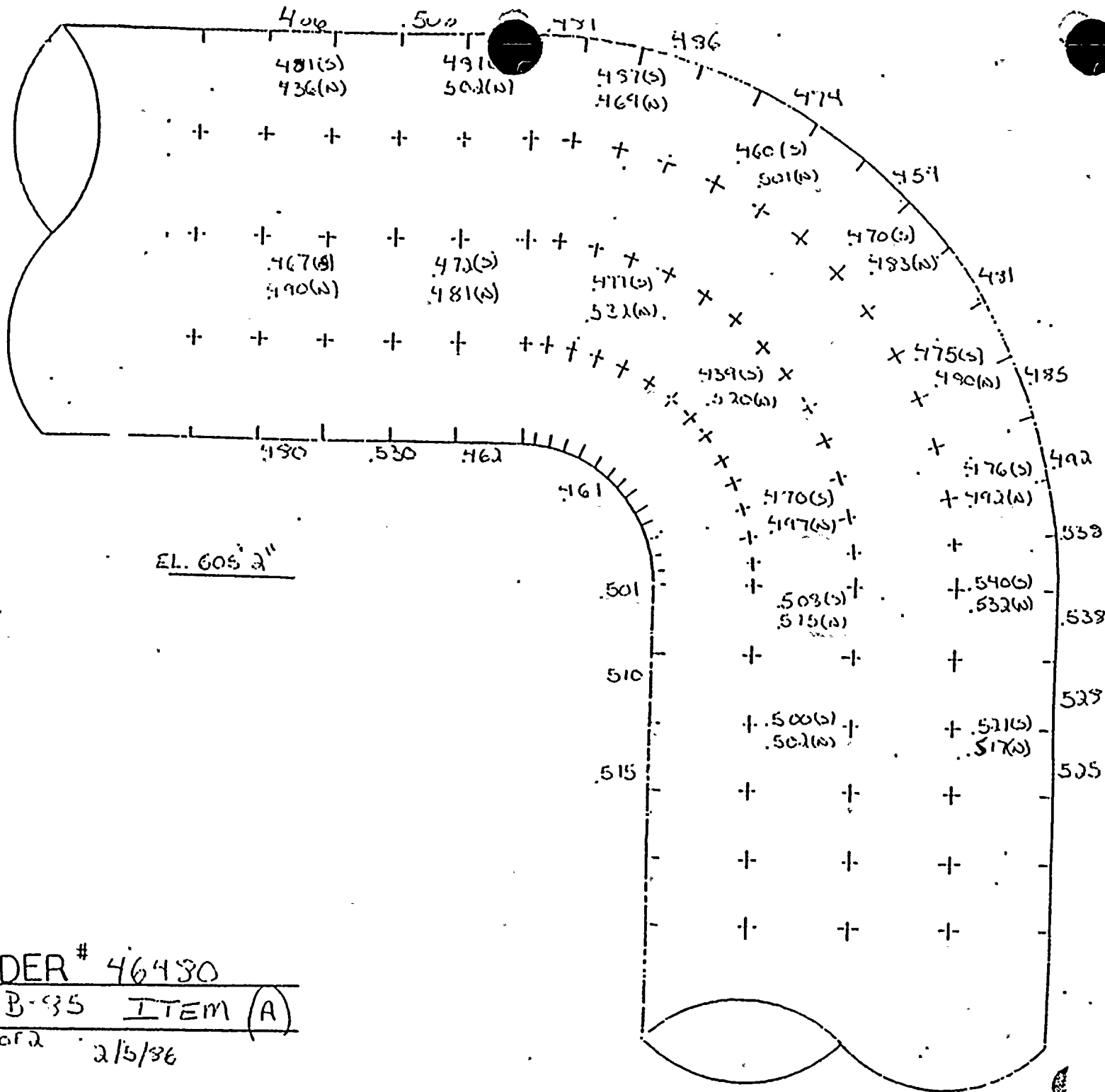
RECEIVED  
COMMUNICATIONS  
DIVISION  
JAN 7 1967  
10:14 AM '67

NOTES: INSPECT A, B & C  
(DSC)

[illegible]



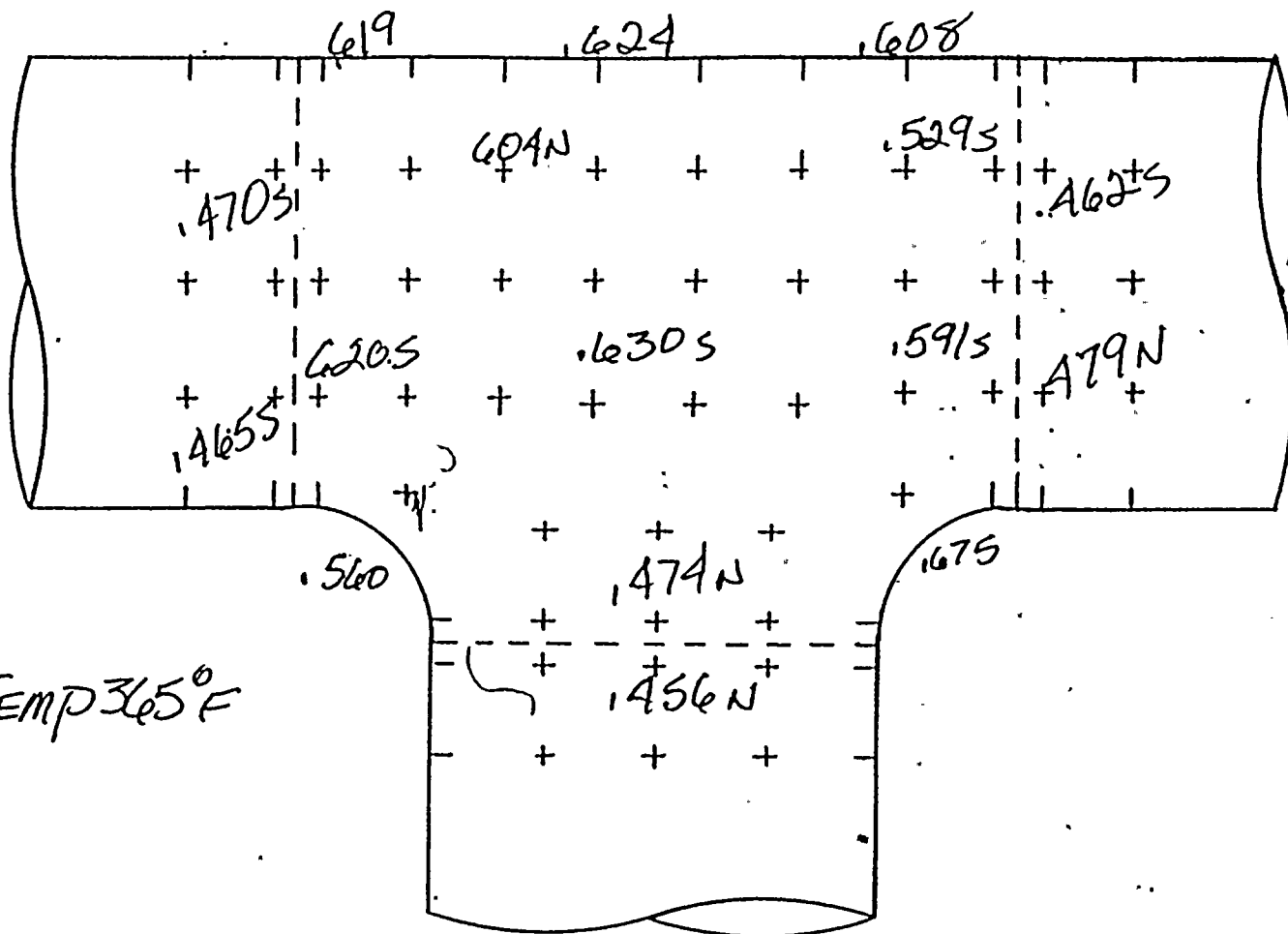
← FLOW



JOB ORDER # 46430  
 ISO # 2-B-35 ITEM (A)  
 SH. T. 1 of 2 2/5/36



FLOW →  
EL 605'2"



PIPE TEMP 365°F

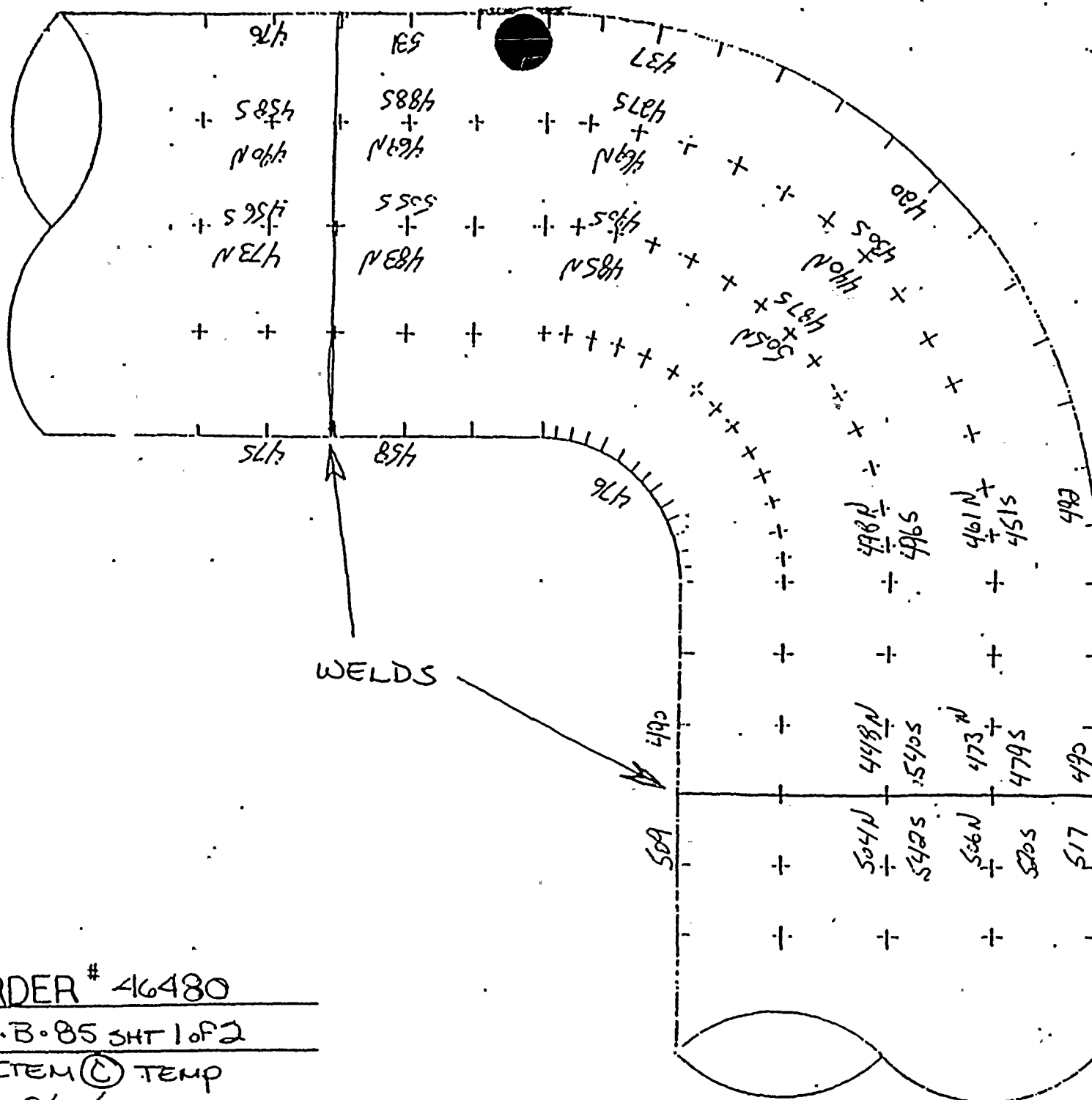
JOB ORDER # 16480 ITEM "B"

ISO # 2-B-85 SRT 1682 2/12/86

ORTH 16" LINE



FLOW  
→



JOB ORDER # 46480

ISO # 2.B.85 SHT 1 of 2

ITEM (C) TEMP  
2/19/86

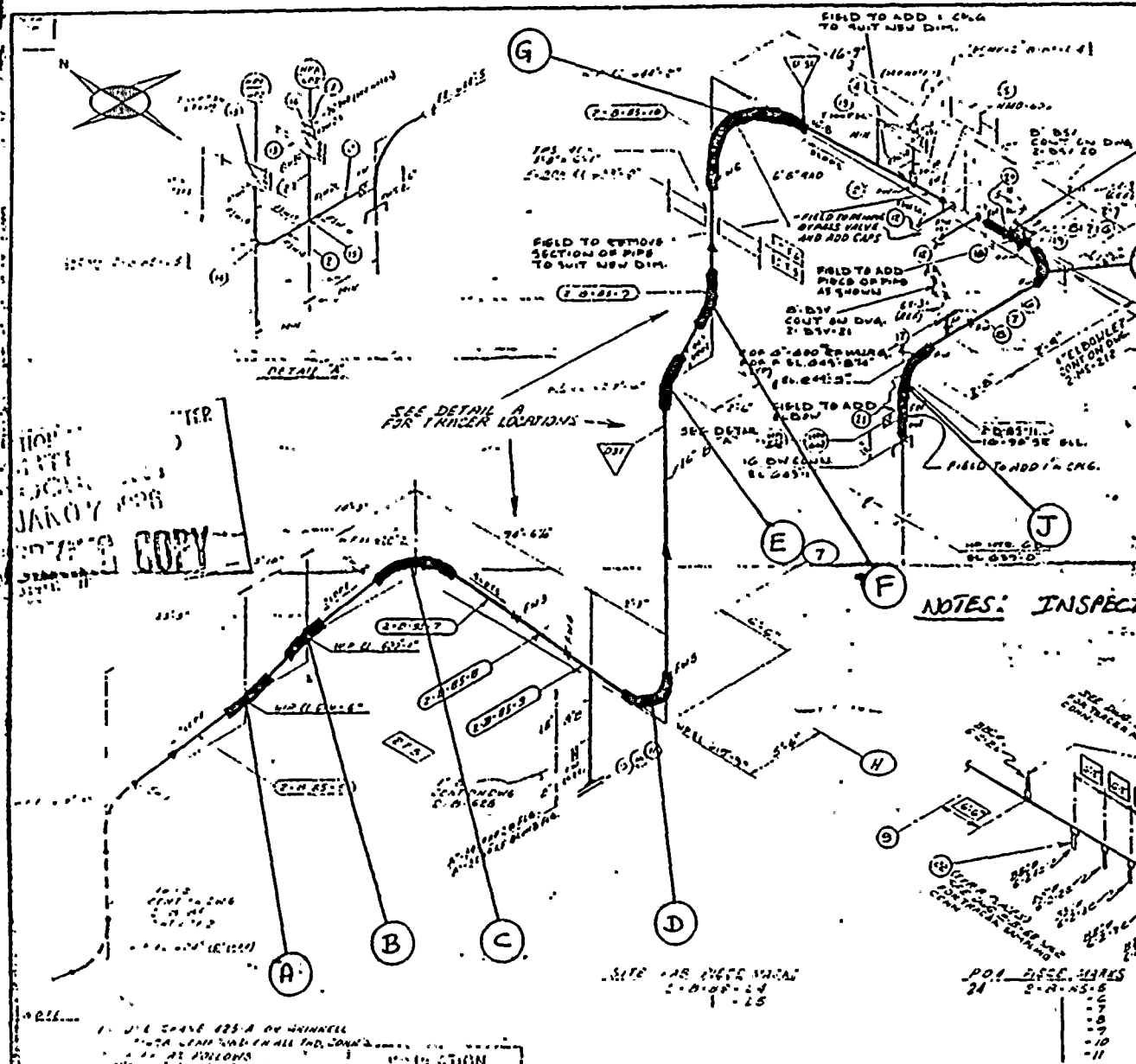


COST: 1.0. 110157

QC - 1.0 46480

1.0. 110197

WEEK 5

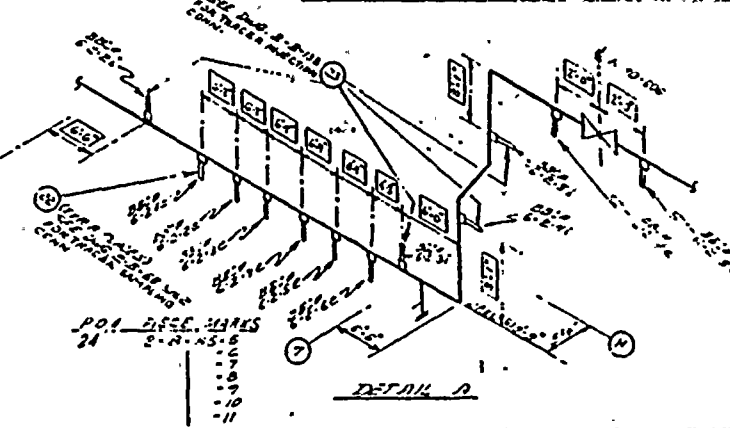


QTY		MATERIAL DESCRIPTION		ISO SHI NO	1.0. 110197
1	1	3000' END PLUG	CS	1.0. 110197	
2	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
3	1	3000' END PLUG	CS	1.0. 110197	
4	1	1/2" SCH 40 PIPE 24" L	CS	1.0. 110197	
5	1	1" MOTOR OPER SHAFT	4402-076		
6	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
7	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
8	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
9	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
10	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
11	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
12	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
13	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
14	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
15	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
16	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
17	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
18	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
19	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
20	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
21	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	
22	1	1" SCH 40 PIPE 24" L	CS	1.0. 110197	

REVISION RECORD		DESCRIPTION	REMARKS
NO	DATE	DESCRIPTION	REMARKS
1	1/1/77	REVISED D.M. UP 2.0. 05.10.11.	FIELD
2	1/1/77	REVISED D.M. UP 2.0. 05.10.11.	FIELD
3	1/1/77	REVISED D.M. UP 2.0. 05.10.11.	FIELD
4	1/1/77	REVISED D.M. UP 2.0. 05.10.11.	FIELD

MATERIAL DESCRIPTION, CONTD.	
QTY	DESCRIPTION
1	3000' END PLUG CS

NOTES: INSPECT D & J 05 FEB 77



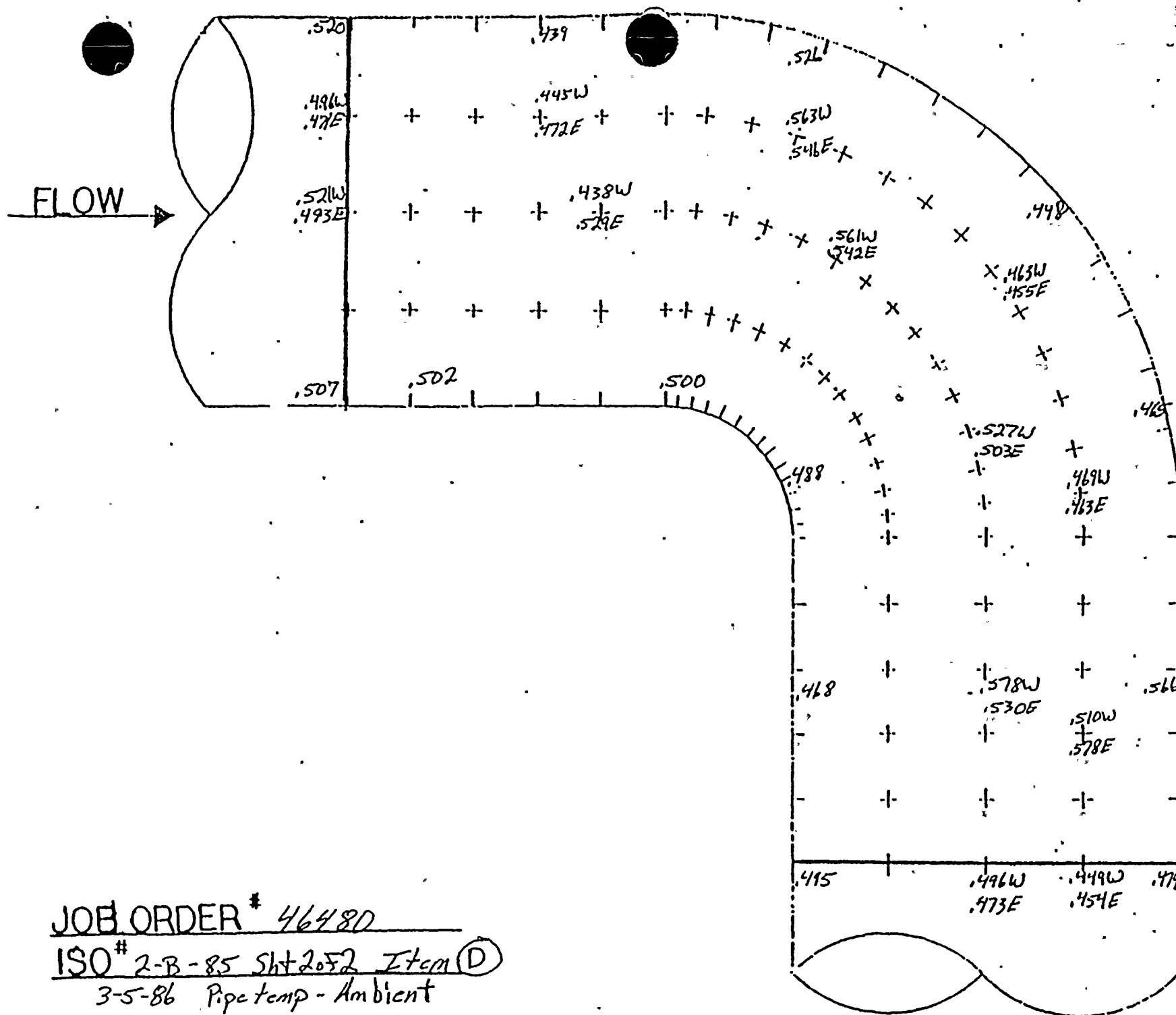
1. USE 24\"/>

MATERIAL SPECIFICATION		TESTING	
QTY	DESCRIPTION	QTY	DESCRIPTION
1	3000' END PLUG CS	1	3000' END PLUG CS

FOURZONE No. 1.0. 110197	REQUIRED COMPLETION DATE 1.0. 110197
FABRICATED BY NPS DESIGNS INC.	WELD PROCEDURE
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRGY. DW'GS.	

2-B-85



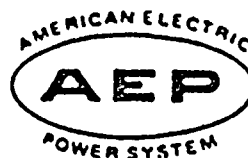








AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: 2-26-86

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 2  
X Steam Piping Erosion Program, SER No. 88-84  
 Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation at Wall Thickness Measurements

FROM: J.D. HOFFMAN

TO: 1. ~~M. Murocco~~ *N/M 2/27/86*  
 2. R. Tella - Bridgman

We have reviewed the wall thickness measurements transmitted to us on 2-20-86, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
2-B-82 SHEET 1 OF 2	20" 5D BEND	A	NO ACTION REQ'D NOW; INSPECT IN 6 YEARS
"	20" TEE	B	" NO INSPECTION REQ'D
"	20" LR 90	C	" INSPECT IN 10 YEARS
"	20" LR 90	D	" NO INSPECTION REQ'D
"	20" LR 90	E	" INSPECT IN 6 YEARS
"	20" LR 90	F	" INSPECT IN 10 YEARS
2-B-82 SHEET 2 OF 2	20" SR 90	B	" INSPECT IN 6 YEARS
"	24" 20" REEL	C	" INSPECT IN 10 YEARS
2-B-83 SHEET 1 OF 2	20" 5D BEND	A	" INSPECT IN 6 YEARS
"	20" TEE	B	" NO INSPECTION REQ'D
"	20" LR 90	C	" INSPECT IN 10 YEARS
2-B-83 SHEET 2 OF 2	24" SR 45	E	" INSPECT IN 10 YEARS
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*J.D. Hoffman*

Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr., -Bridgman



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

AEPSC Engineer: J. V. HOFFMAN

SER No. 88-84 (Steam) X

Unit No. 2

Evaluation Date: 2-25-86

SER No. 23-85 (Water) \_\_\_\_\_

Years in service 7½

UT Reading Transmitted on: 2-20-86

UT Reading Taken on: 2-5-86

BLEND STEAM TO HEATER 5A  
Isometric Dwg. NO. 2-B-82 10FL REV 2  
20FL REV 3

AEPSC Installed Mat'l Class D-31 20" XS

Plant (I.D.) Comp.	Component Description	Original Wall Thk.	Original Thk. Range	Req'd Tmin	Lowest Reading	Percent Eroded	COMMENTS
	<u>SHEET 10FL</u>						
<u>A</u>	<u>SD BLEND</u>	<u>0.500</u>	<u>0.438-0.562</u>	<u>0.228"</u>	<u>0.394"</u>	<u>21.2%</u>	<u>INSPECT IN 6 YEARS</u>
<u>B</u>	<u>TEE</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>0.466"</u>	<u>6.8%</u>	<u>NO ACTION REQUIRED</u>
<u>C</u>	<u>LR 90° EL</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>0.432"</u>	<u>13.6%</u>	<u>INSPECT IN 10 YEARS*</u>
<u>D</u>	<u>LR 90° EL</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>0.478"</u>	<u>4.4%</u>	<u>NO ACTION REQUIRED</u>
<u>E</u>	<u>LR 90° EL</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>0.327"</u>	<u>34.6%</u>	<u>INSPECT IN 4 YEARS</u>
<u>F</u>	<u>LR 90° EL</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>0.443"</u>	<u>11.4%</u>	<u>INSPECT IN 10 YEARS</u>
	<u>SHEET 20FL</u>						
<u>B</u>	<u>SR 90° EL</u>	<u>0.500</u>	<u>0.438-0.562</u>	<u>0.228"</u>	<u>0.383"</u>	<u>23.4%</u>	<u>INSPECT IN 6 YEARS</u>
<u>C</u>	<u>24x20° KQ EL</u>	<u>"</u>	<u>"</u>	<u>0.261"</u> <u>0.228"</u>	<u>2.422"</u>	<u>15.6%</u>	<u>INSPECT IN 10 YEARS</u>

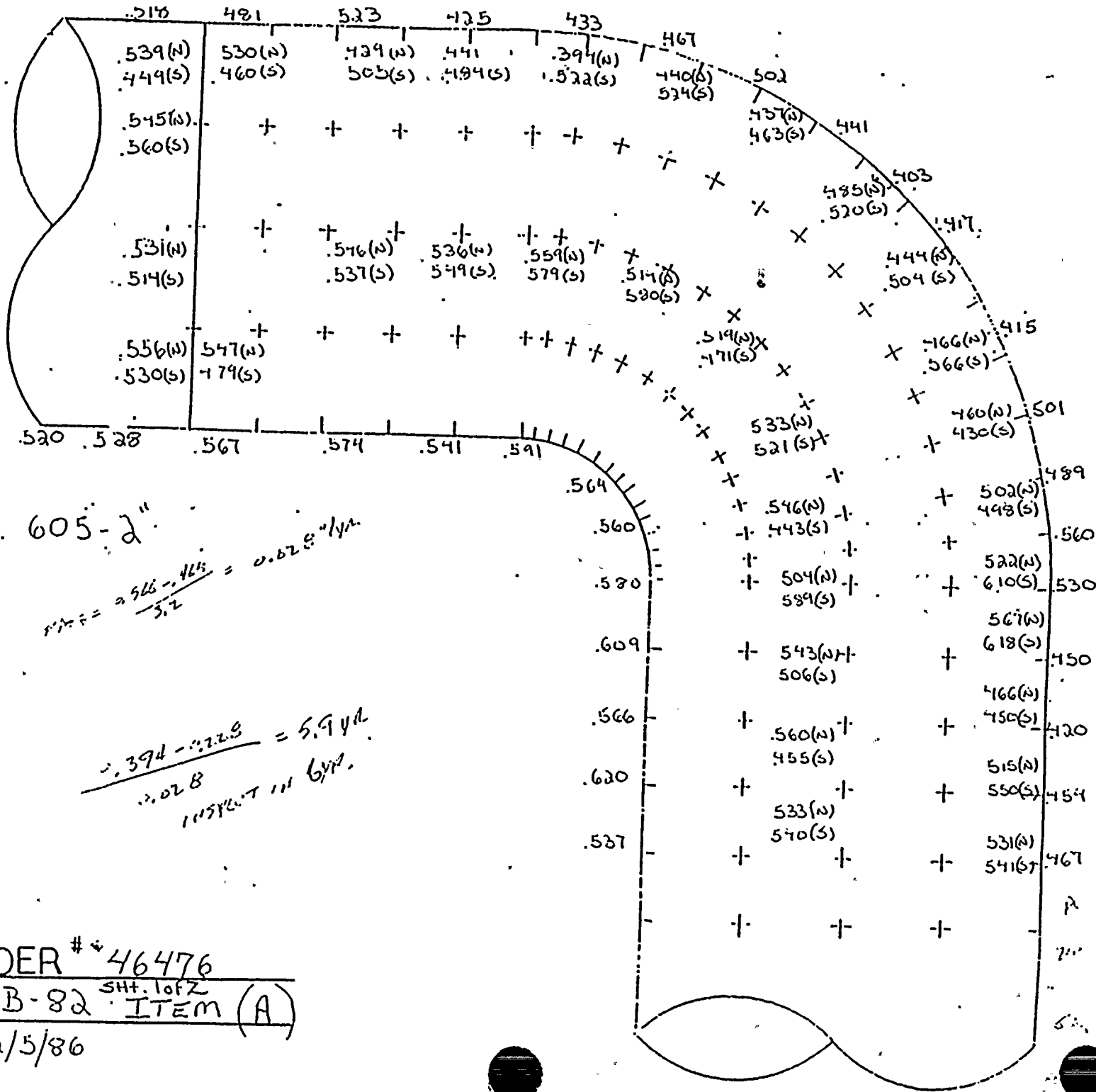
\* NOTE: 10 YEARS IS AN ARBITRARY MAXIMUM TIME BETWEEN INSPECTIONS UNLESS  
EROSION RATE IS SO LOW THAT FITTING SHOULD LAST LIFE OF PLANT.







← FLOW



W P. EL. 605-2"

$$S = \frac{566 - 465}{3.2} = 0.028' / 1'.$$

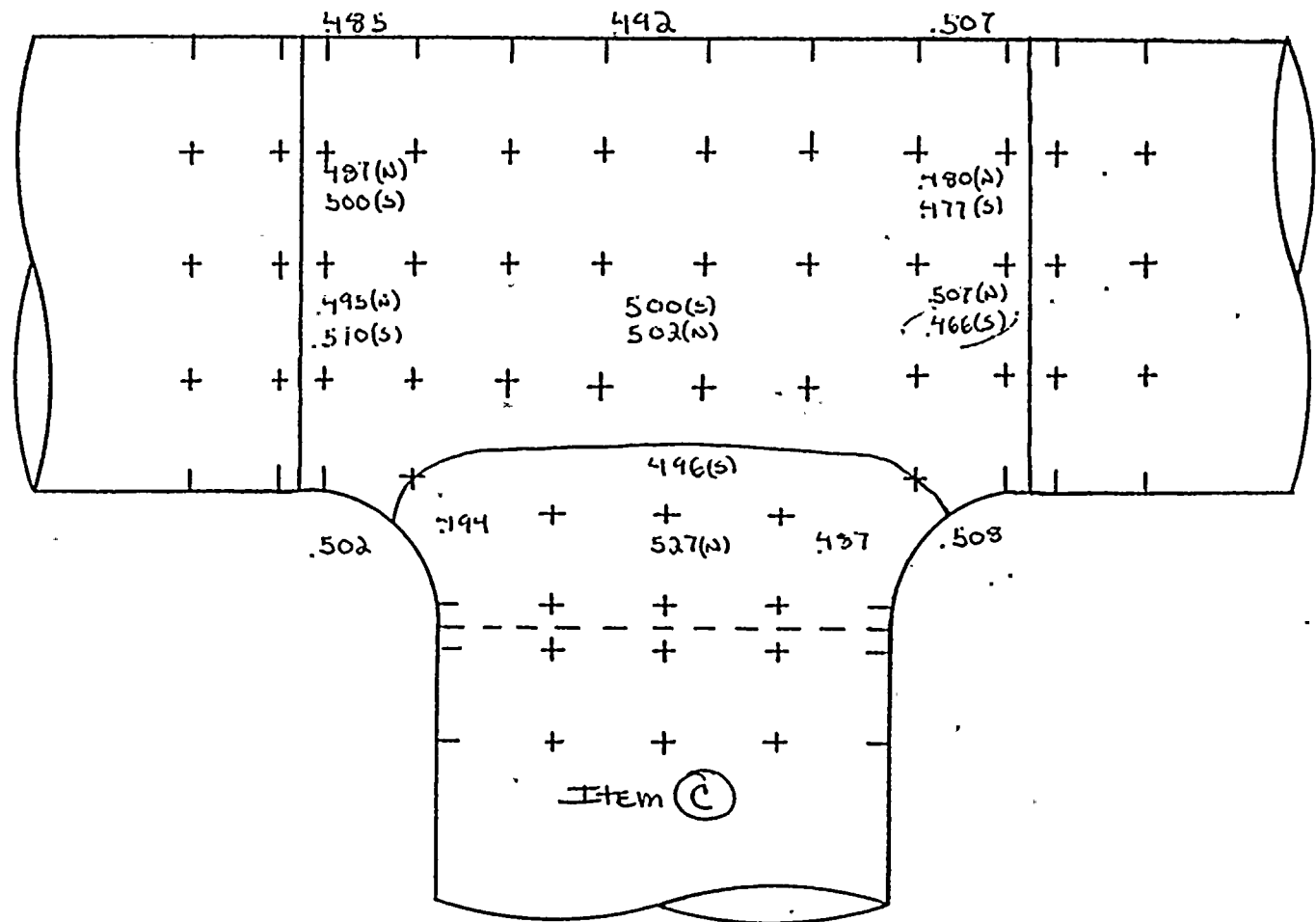
$$\frac{5394 - 5728}{0.028} = 5.94' / 1'.$$

JOB ORDER # 46476  
ISO# 2-B-82  
ITEM (A)

2/5/86



← FLOW  
W.P. EL. 605'-2"



JOB ORDER # 46476  
ISO # 2-B-82 <sup>SH. 1 of 2</sup> ITEM (B)

2/5/86



[illegible]

2/5/86



FLOW

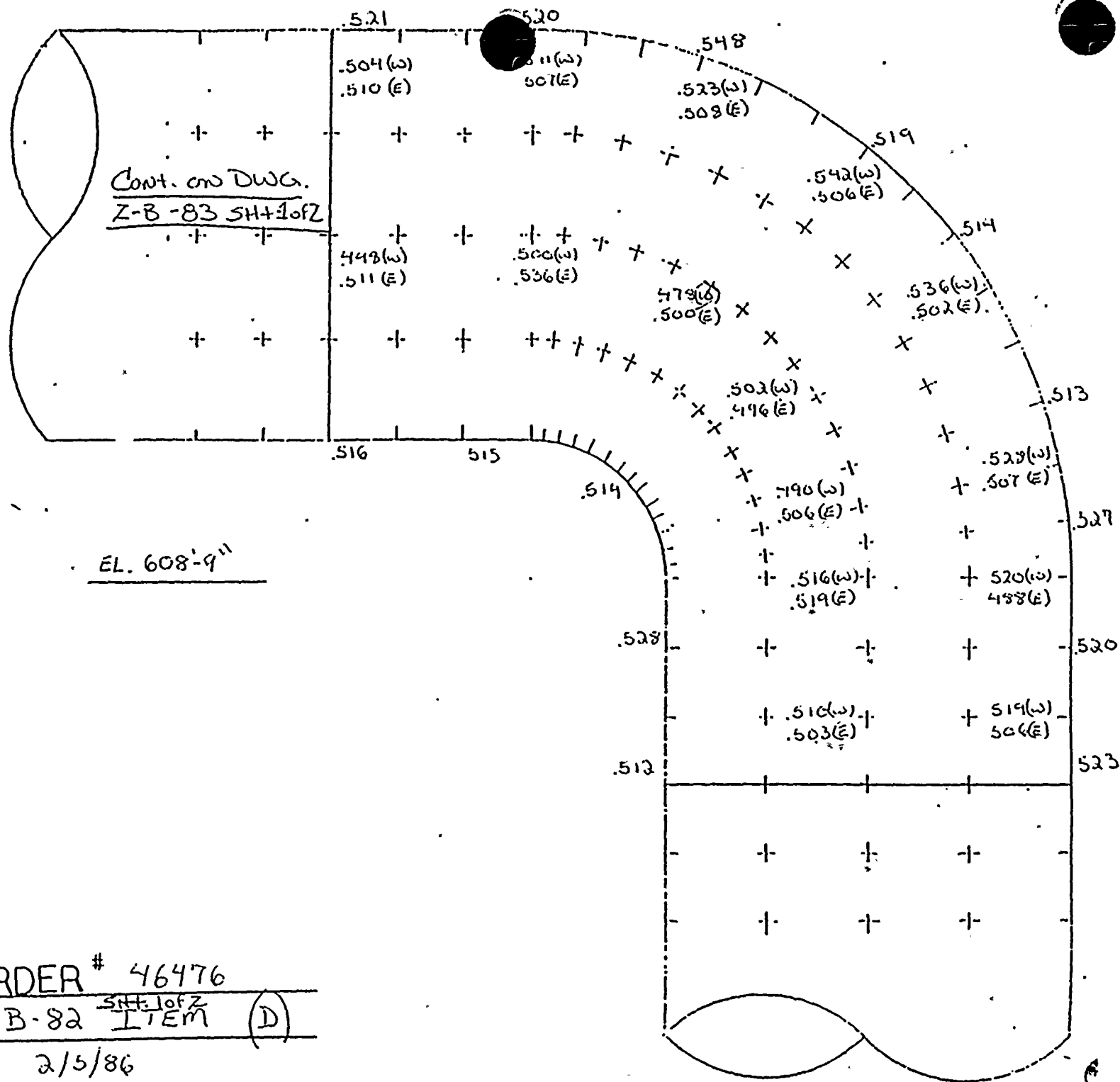
Cont. on DWG.  
Z-B-83 SH+1 of 2

EL. 608'-9"

JOB ORDER # 46476

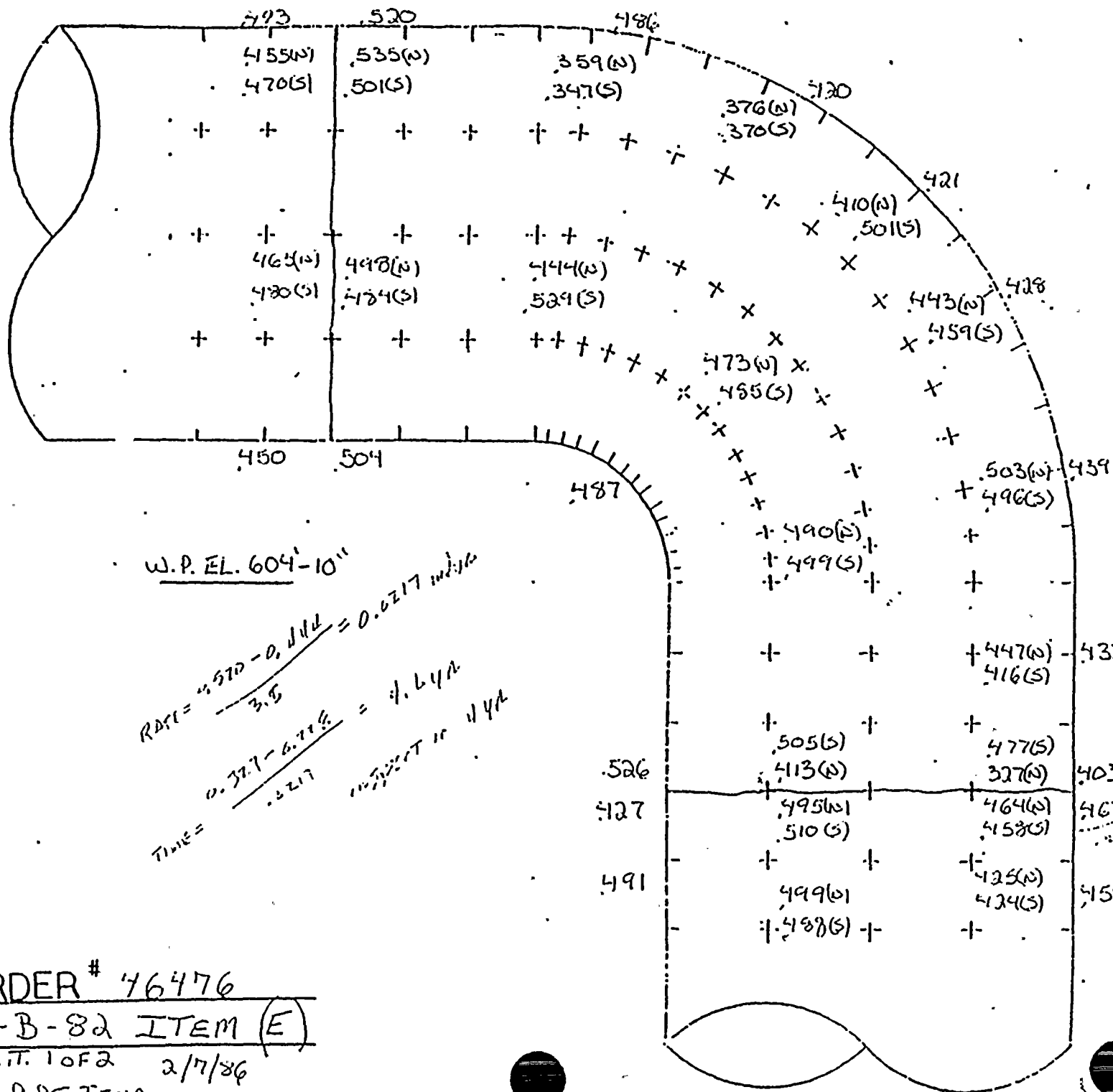
ISO # 2-B-82 <sup>SH+1 of 2</sup> ITEM (D)

2/5/86





FLOW →



JOB ORDER # 76476  
 ISO # 2-B-82 ITEM (E)  
 SHIT. 1 OF 2 2/7/86  
 PIPE TEMP.  
 76.9°C



← FLOW

← T

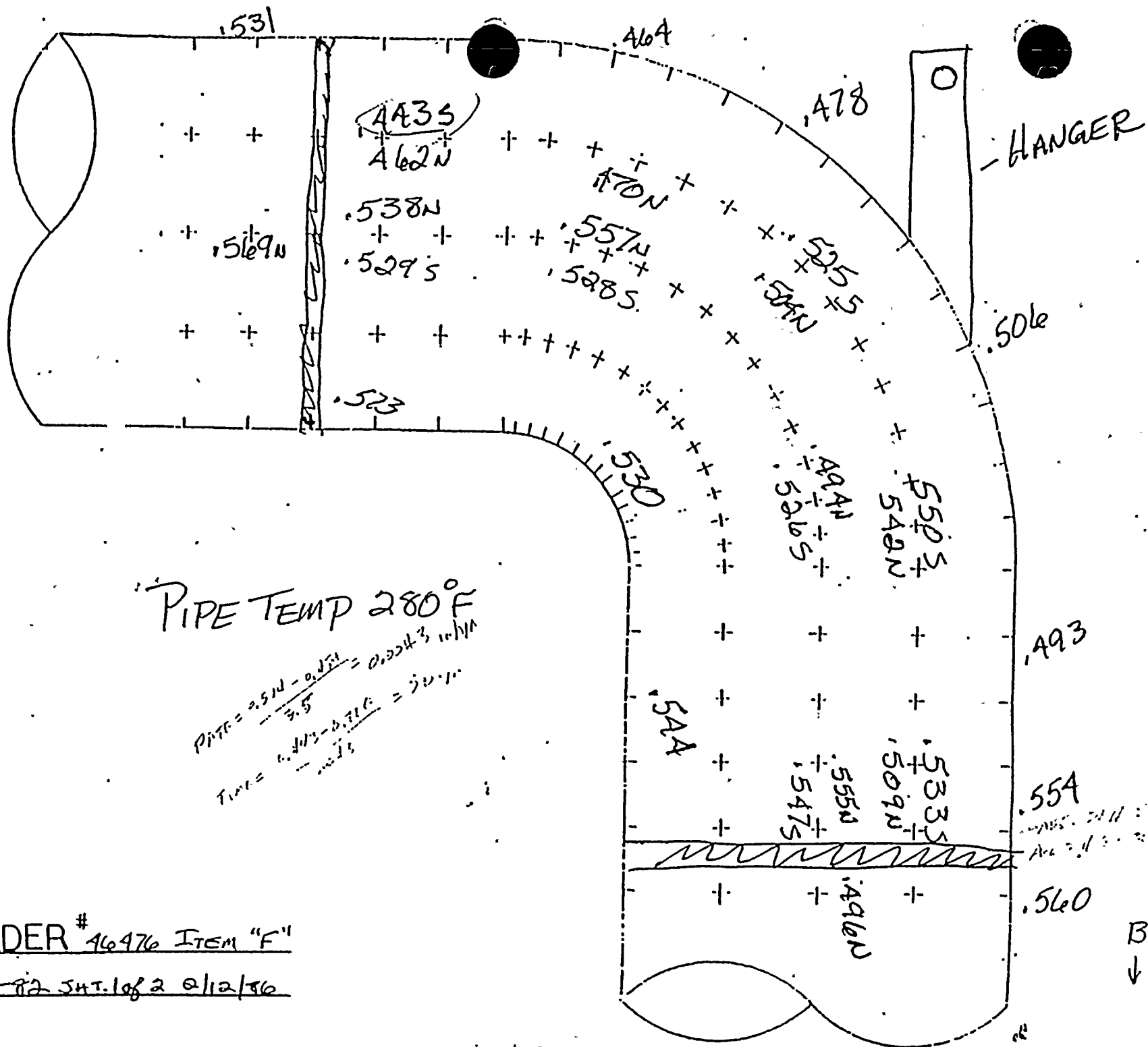
HANGER

PIPE TEMP 280°F

$$PATE = \frac{0.510 - 0.451}{3.5} = 0.01714$$

$$TIME = \frac{0.413 - 0.716}{-0.303} = 1.033$$

JOB ORDER # 46476 ITEM "F"  
 ISO # 2-B-82 JHT. log 2 2/12/86



B ↓

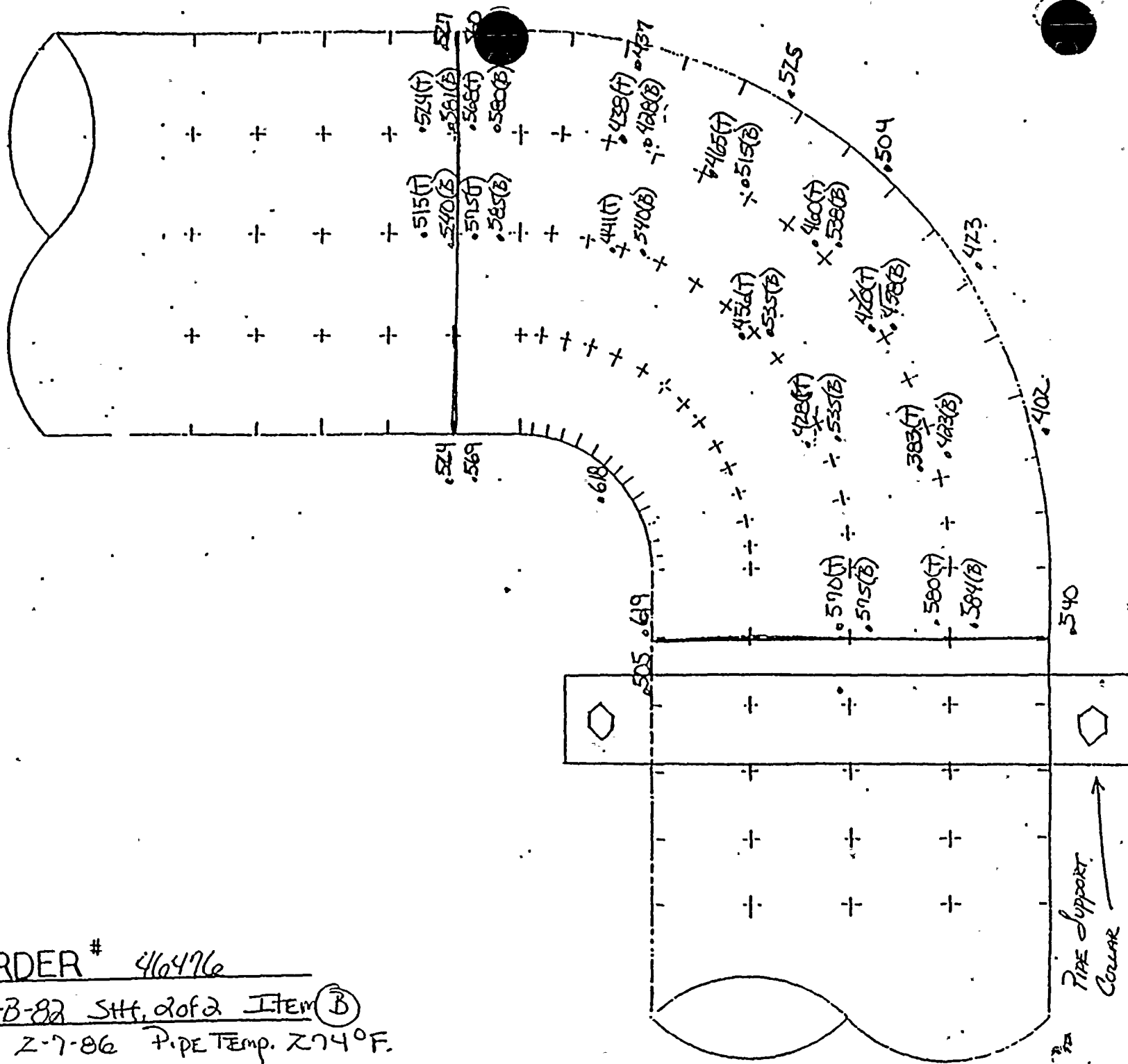




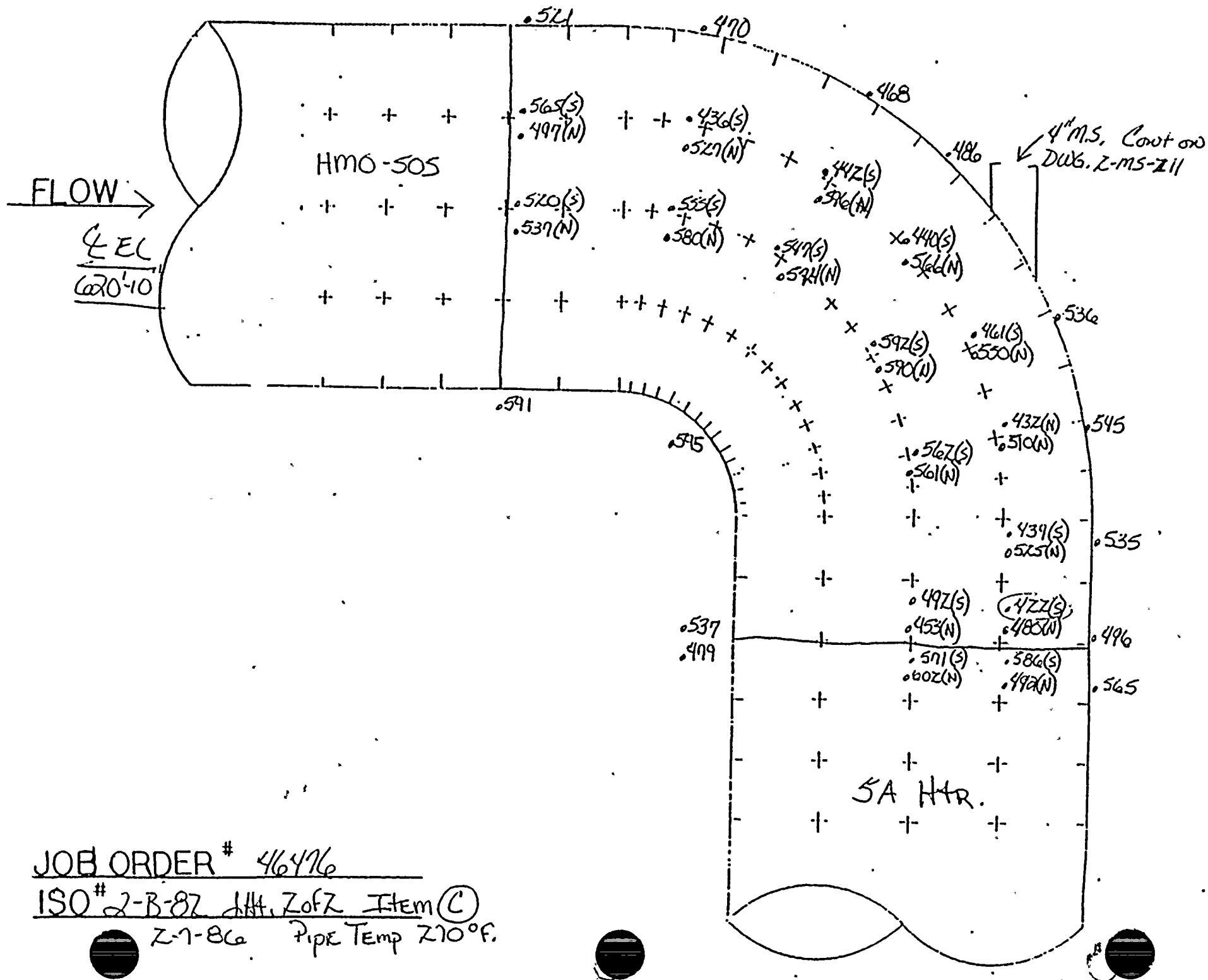


← FLOW  
W.P. EL.  
620'-10"

JOB ORDER # 46476  
ISO # 2-B-82 SHt. 2 of 2 ITEM (B)  
2-7-86 Pipe Temp. 274°F.







JOB ORDER # 46476

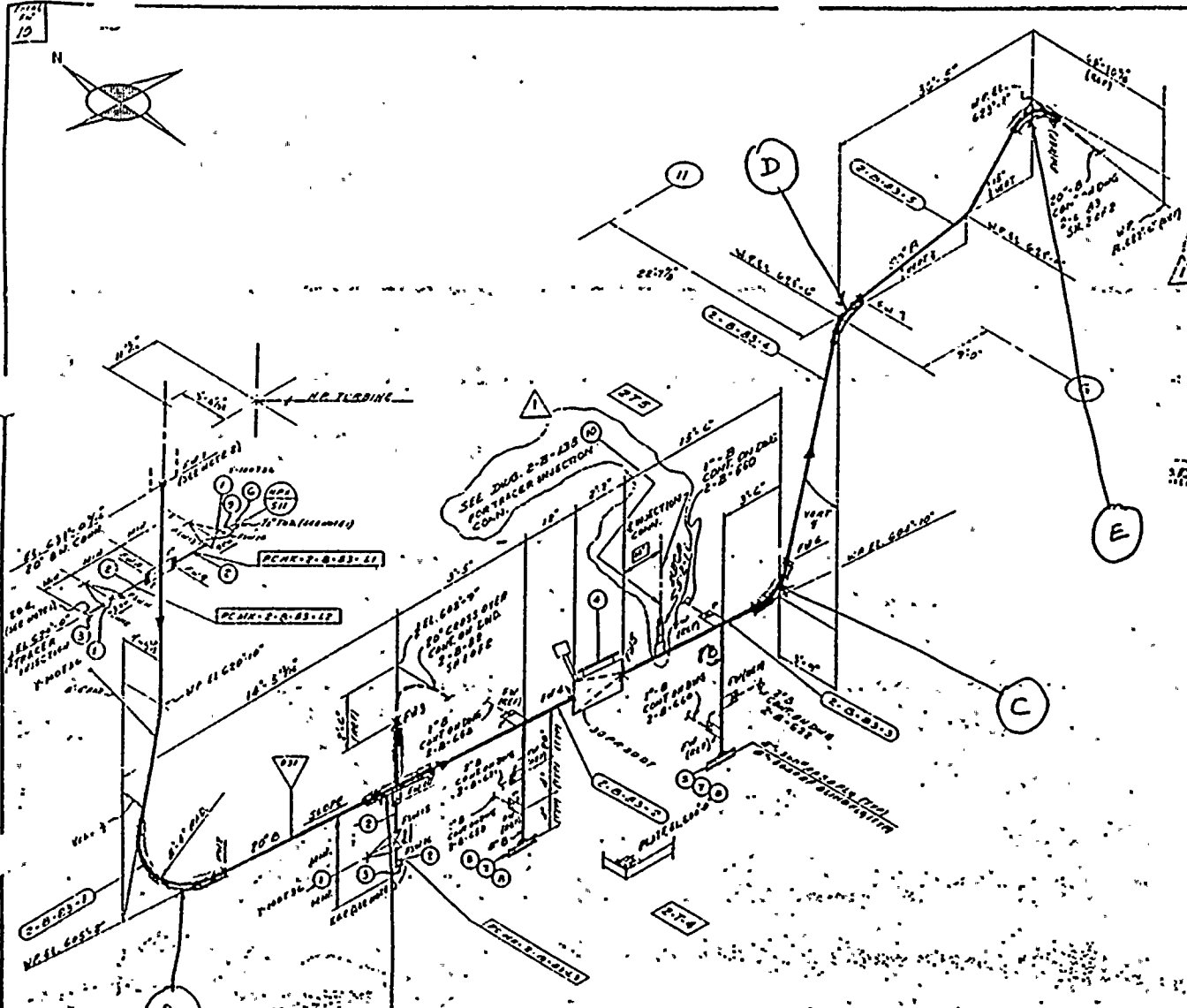
ISO # 2-B-82 H.H. Z of Z Item (C)

Z-7-86 Pipe Temp 270°F.









MATERIAL DESCRIPTION			
01	1	3	1" 3000# GLOBE VA CS
02	1	1	1" SCH 80 PIPE SHLS CS
03	1	1	3000# TND. CAP CS
04	1	1	1" POSITIVE CLOSING CHECK VA
05	1	1	1" 1/2" 3000# TND. PLUG CS
06	1	1	1" 1/2" 3000# TND. PLUG CS
07	1	1	1" 1/2" 3000# TND. PLUG CS
08	1	1	1" 1/2" 3000# TND. PLUG CS
09	1	1	1" 1/2" 3000# TND. PLUG CS
10	1	1	1" 1/2" 3000# TND. PLUG CS

REVISION RECORD			
NO	DATE	DESCRIPTION	REMARKS
1	1/1/68	AS PER RDM-110-032E ADDED ITEM #10 & (25 BUILT) QTY.	AS PER RDM-110-032E

NOTES: Inspected A, B & C  
25 FEB 68

INFORMATION CONTAINED  
HEREIN IS UNCLASSIFIED  
DATE 10/7/88 BY 1043  
VOLUME 1

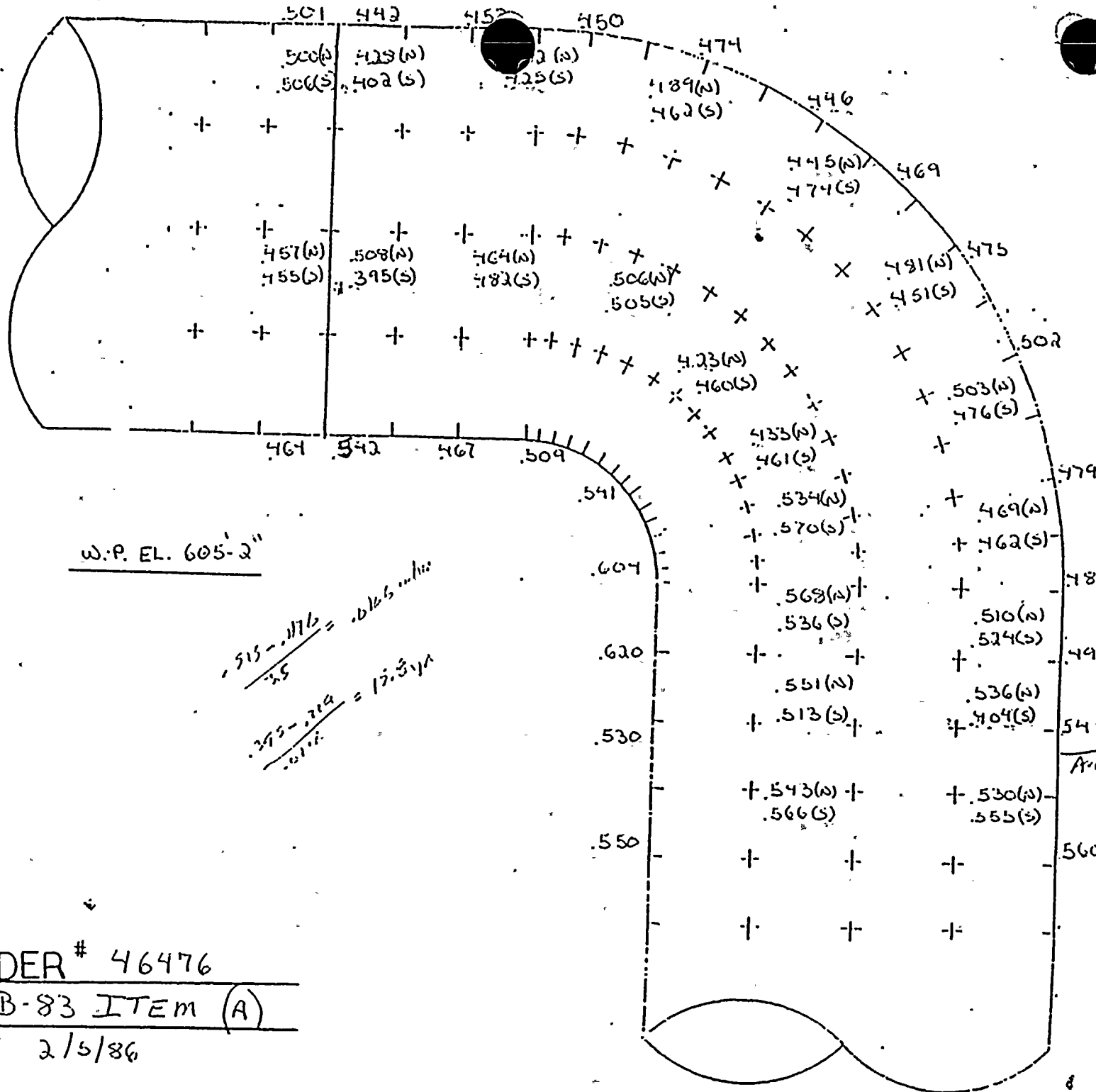
NOTE: 1- USE CRANE AREA OR GRINWELL  
2- 11000 COMPRESSOR IN ALL TND. CONN.  
3- FOR DETAIL OF PIPE WELD TO HUBBLE  
SEE DWG. 0000478  
4- PIPE SCHED AS FOLLOWS  
R11-16" A-106 GR B SCH 40 3MS CS  
16" 20" A-106 GR B X-STRONG

SITE PIERCE MARK  
2-0-83-11  
15-0-83-11  
15-0-83-11  
15-0-83-11

SECTION SPEC				DCPH 103 RES				1. 1/2" x			
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← FLOW



JOB ORDER # 46476

ISO # 2-B-83 ITEM (A)

SK. T. FORA

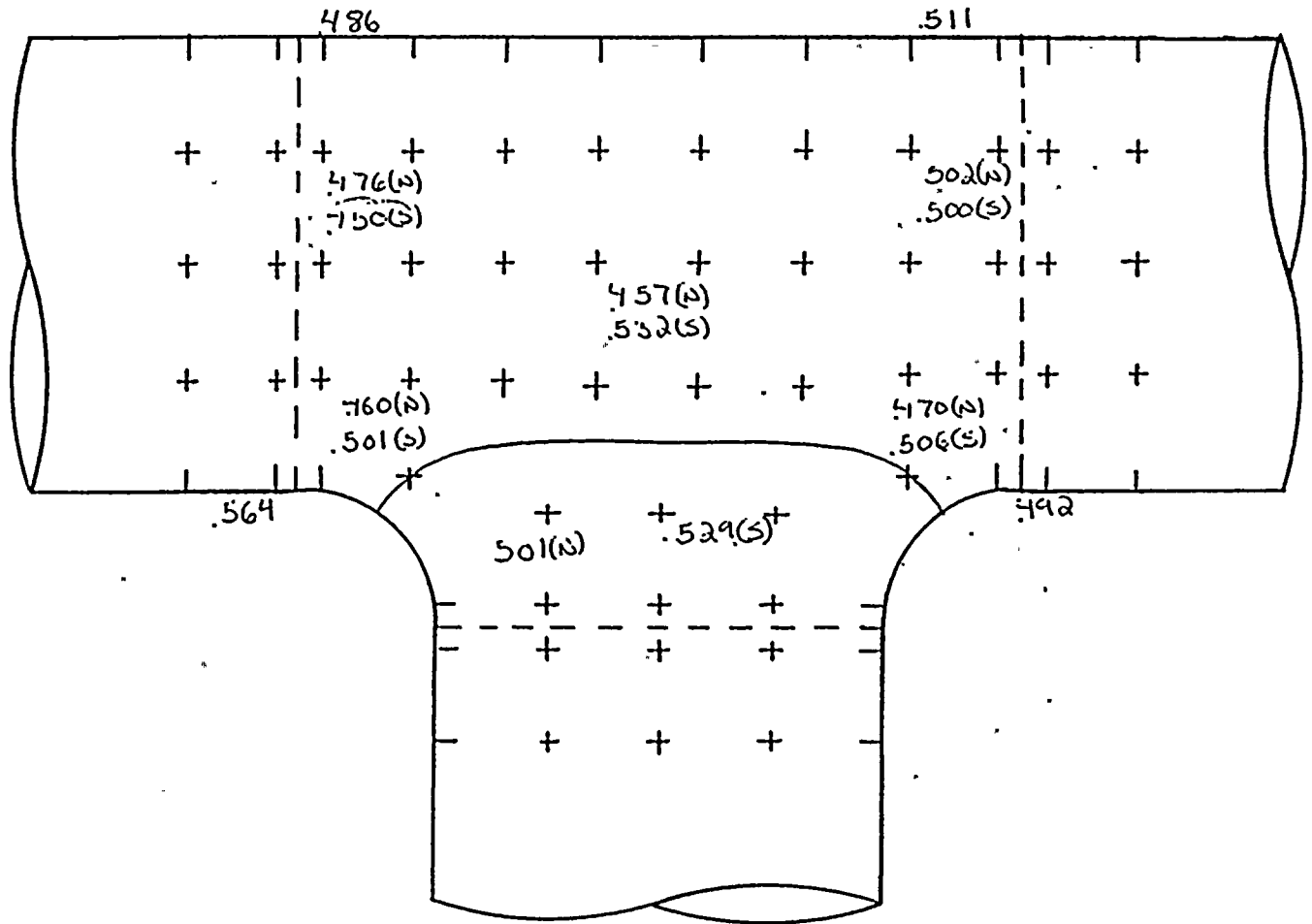
2/5/86

2 1/2" / yr



← FLOW

EL. 608'-9"



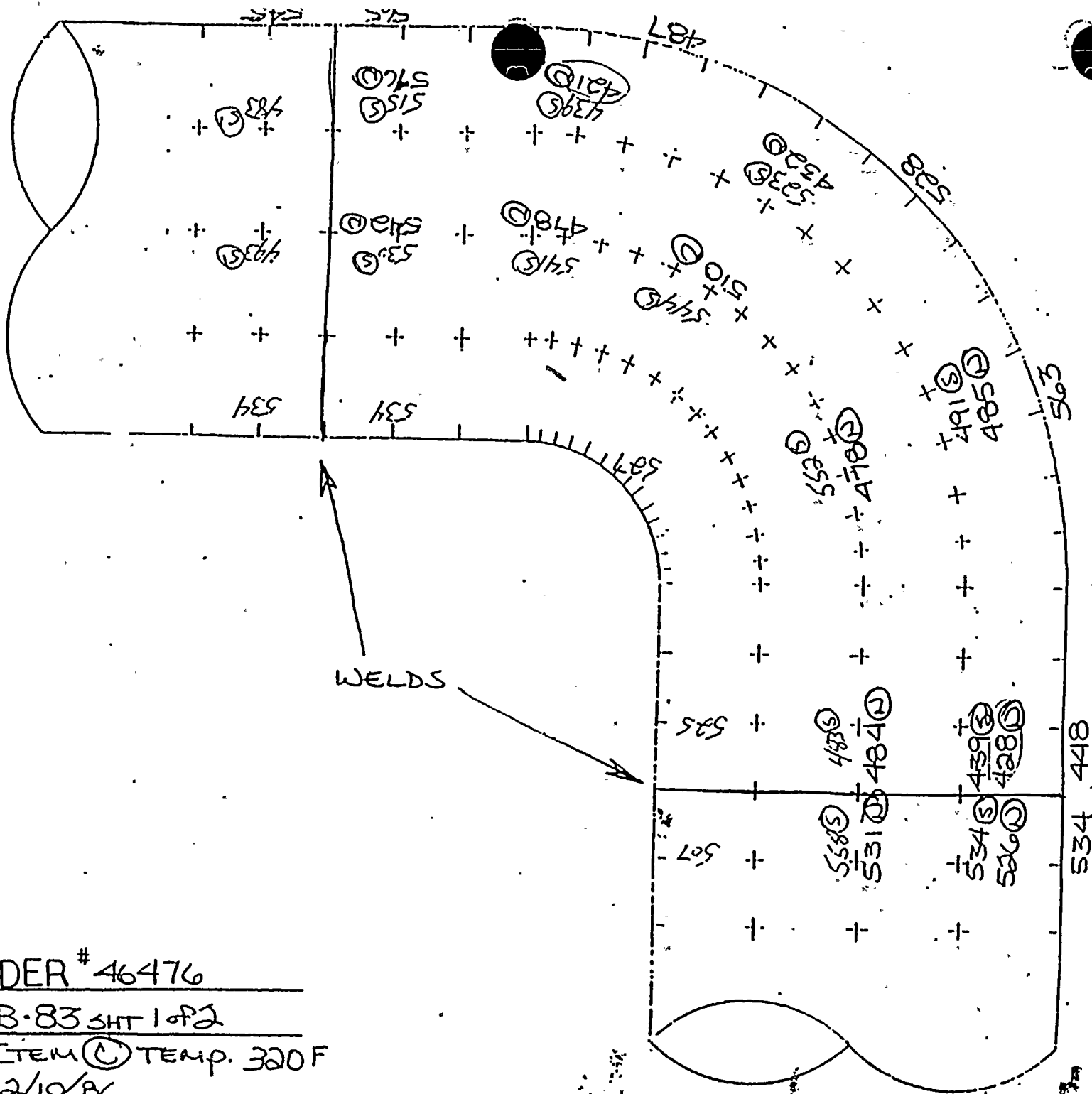
JOB ORDER # 46476

ISO # 2-B-83 ITEM (B)

Shirley 2/5/86

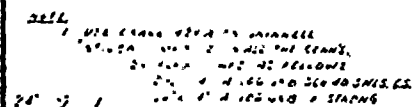


FLOW  
→



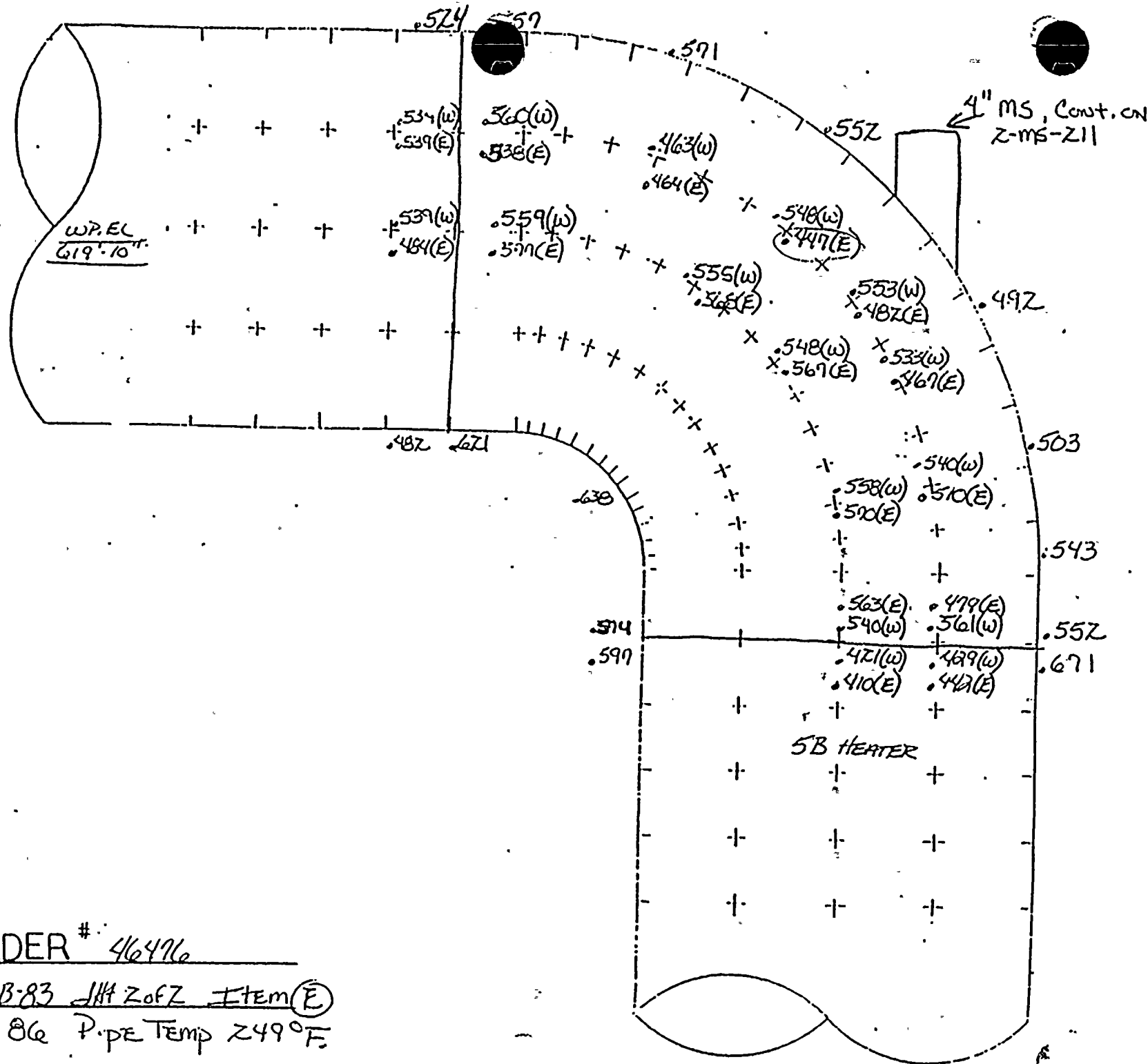
JOB ORDER # 46476  
ISO # 2-B-83 SHT 1 of 2  
ITEM ① TEMP. 320 F  
2/19/86



[illegible]



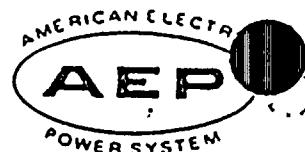
FLOW →



JOB ORDER # 46476  
 ISO# Z-B-83 JH Z of Z Item (E)  
 Z-2-86 P. PE Temp 249°F



AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: 2-4-86

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 2  
X Steam Piping Erosion Program, SER No. 88-84  
 Water Piping Erosion Program, SER No. 23-85  
 Engineering Evaluation at Wall Thickness Measurements

FROM:

TO: 1. M. Marrecco *MM 2/4/86*  
 2. R. Tella - Bridgman

We have reviewed the wall thickness measurements transmitted to us on 1-28-86, for the below listed piping material and recommend the following:

Isometric Drawing No.	Piping Material	Comp. I.D.	AEPSC Recommendation
2-B-106 Rev. 6	18" PIPE	A	NO ACTION REQ'D NOW; INSPECT IN 6 YRS
"	18" 45° EL	B	NO ACTION REQ'D NOW; INSPECT IN 6 YEARS
"	18" 90° REL	C	REPLACE WITHIN 3 YEARS
"	20" 18" REL	D	NO ACTION REQ'D NOW; INSPECT IN 10 YEARS
"	18" 90° LONG TANGENT EL	DOWNSTREAM OF HMD-405	REPLACE NOW (RECOMMENDED IN MEMO DATED 5/14/84 FROM K. JANTIS TO R.L. DUDMAN)
2-B-107 Rev. 7	18" PIPE	A	NO ACTION REQ'D NOW; INSPECT IN 8 YEARS
"	18" 90° REL	B	NO ACTION REQ'D NOW; INSPECT IN 8 YEARS
"	18" 90° REL	C	REPLACE WITHIN 3 YEARS
"	20" 58 90° EL	D	REPAIR AS SHOWN ON ATTACHED SKETCH

*G. H. Hoffman*

Piping & Valves Section

cc: S. H. Steinhart  
 W. G. Smith, Jr., -Bridgman  
 J. A. Kobyra



D. C. COOK N<sup>o</sup> 100 PLANT

# EROSION EVALUATION WORKSHEET

SER No. 88-84 (Steam) X

Unit No. 2

SER No. 23-85 (Water)

Years in service 8

UT Reading Taken on: 1-18-86 TU  
1-22-86

UT Reading Taken on: 1-18-86 TU  
1-22-86

AEPSC Installed Mat'l Class V-31 STD. WGT A-234 WPB

AEPSC Installed Mat'l Class V-31 STD. WGT A-234 WPB

NOTE: UT DATA INDICATE MATERIAL INSTALLED WAS  
MOST LIKELY SCH. 40

[illegible]

\*BASED ON MINIMUM ORIGINAL WALK TRACKINGS



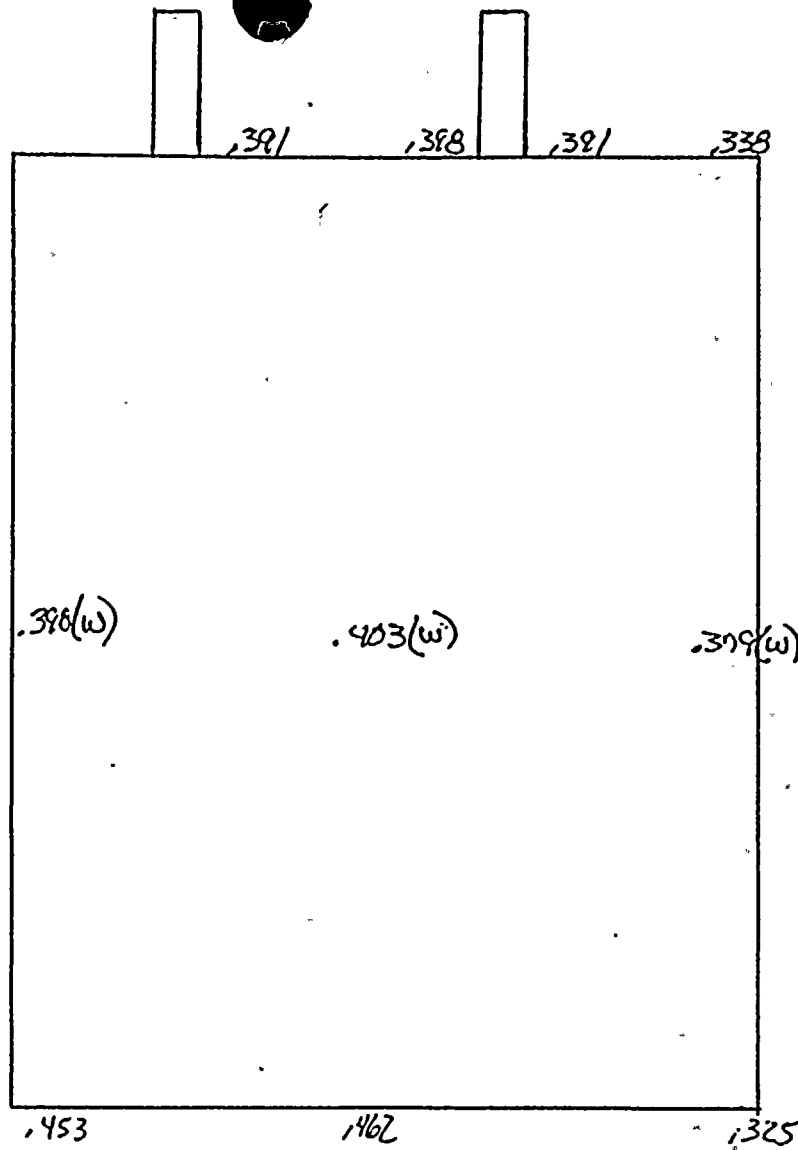




W.P. EL. 612'-0"

← FLOW  
← H110-405

Pipe Temp. 282°F

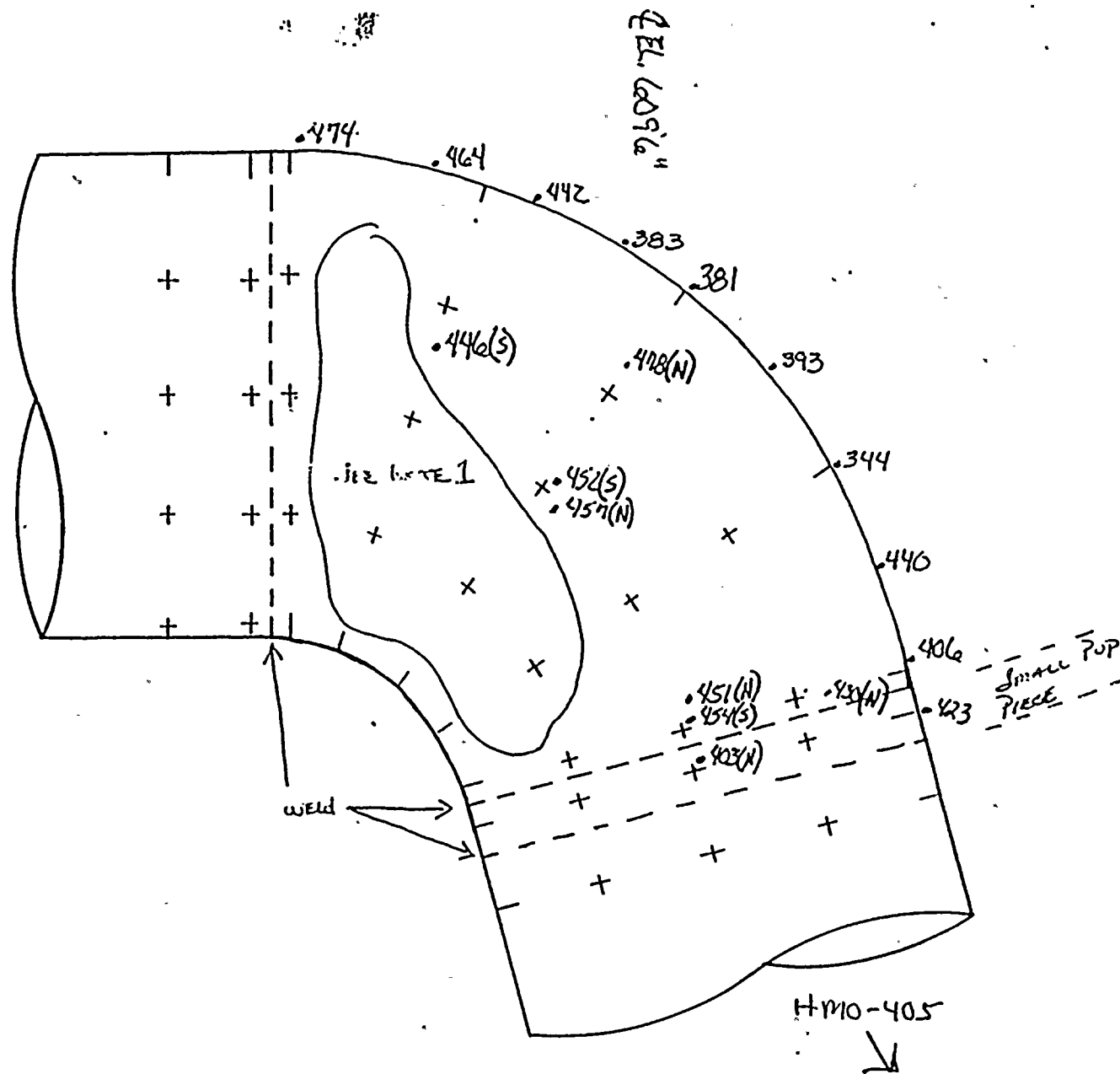


JOB ORDER 46424  
ISO 2-B-100 ITEM (A)  
1-18-86

1-18-86



← FLOW



Pipe Temp 282°F

1. Floor penetration and sleeve design precluded any measurements in this area with high temperature transducer.

JOB ORDER # 46424

ISO# 2-B-106 Item ② 45° cut from EL

1-10-66

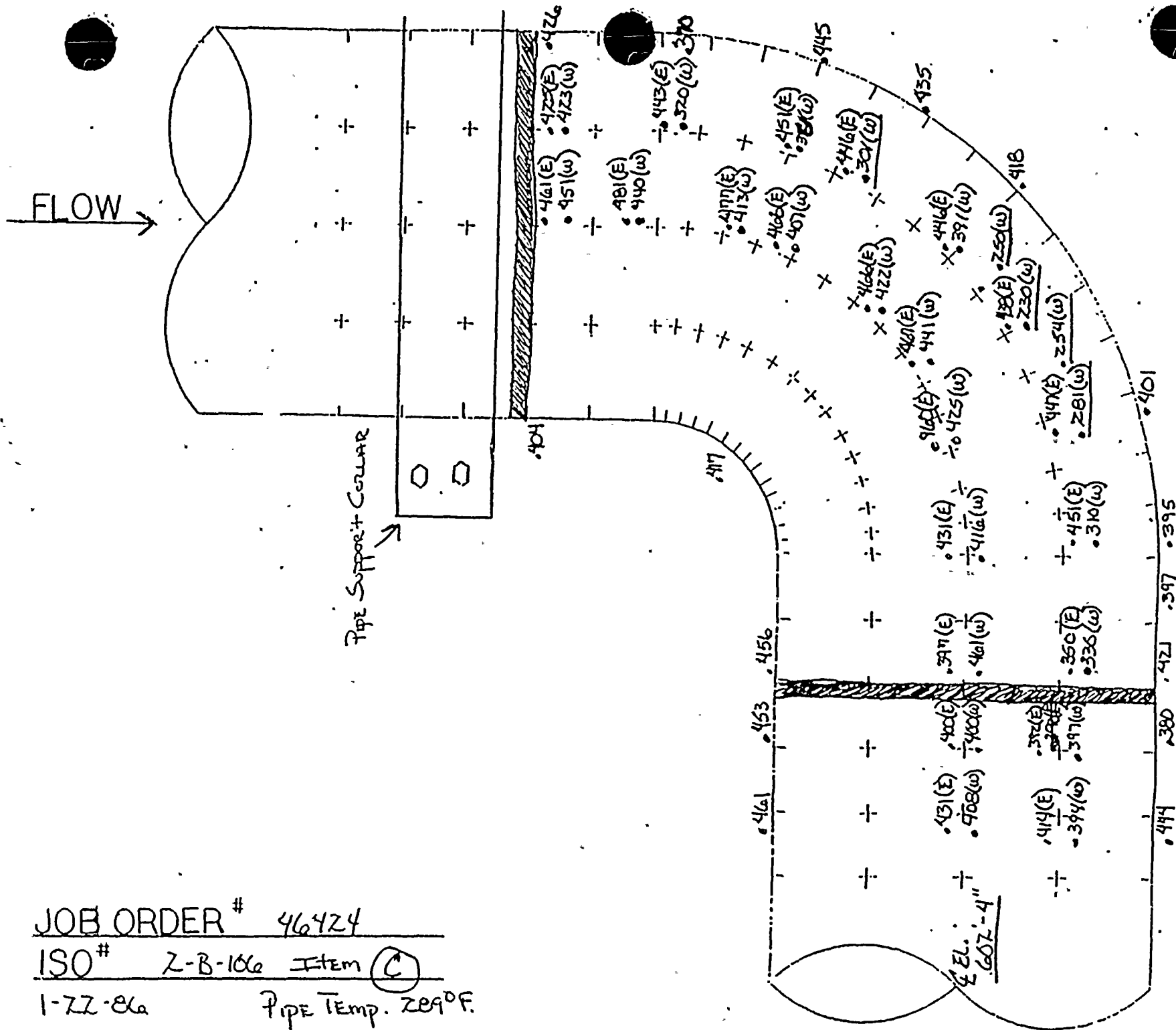


JOB ORDER # 46424

ISO# Z-B-106 Item (C)

1-72-86

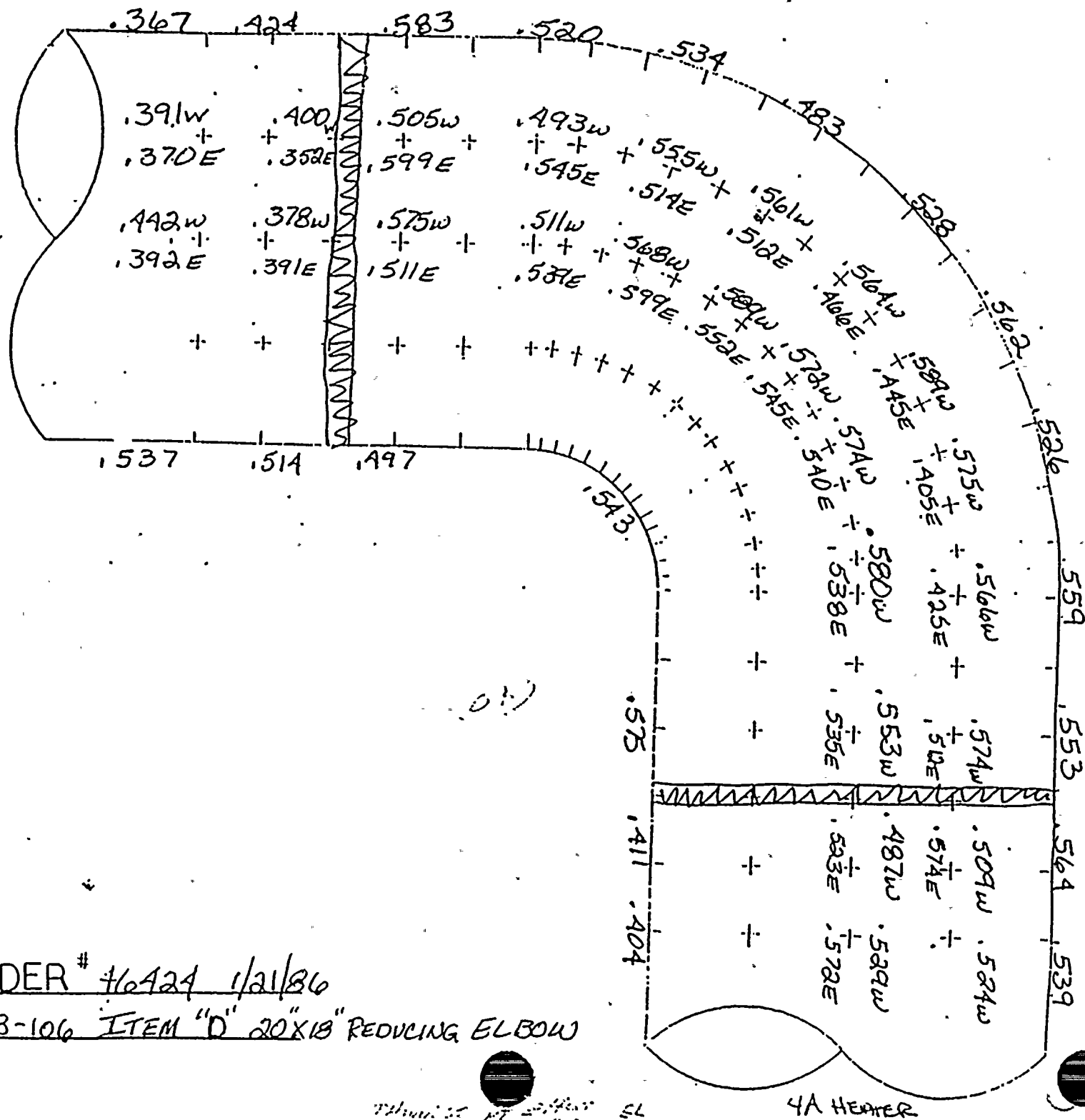
PIPE TEMP. 209°F.





EL. 602'-4"

FLOW →



JOB ORDER # 46424 1/21/86

ISO# a-B-106 ITEM "D" 20"X18" REDUCING ELBOW



\* REPLACED WITH  
STAINLESS STEEL

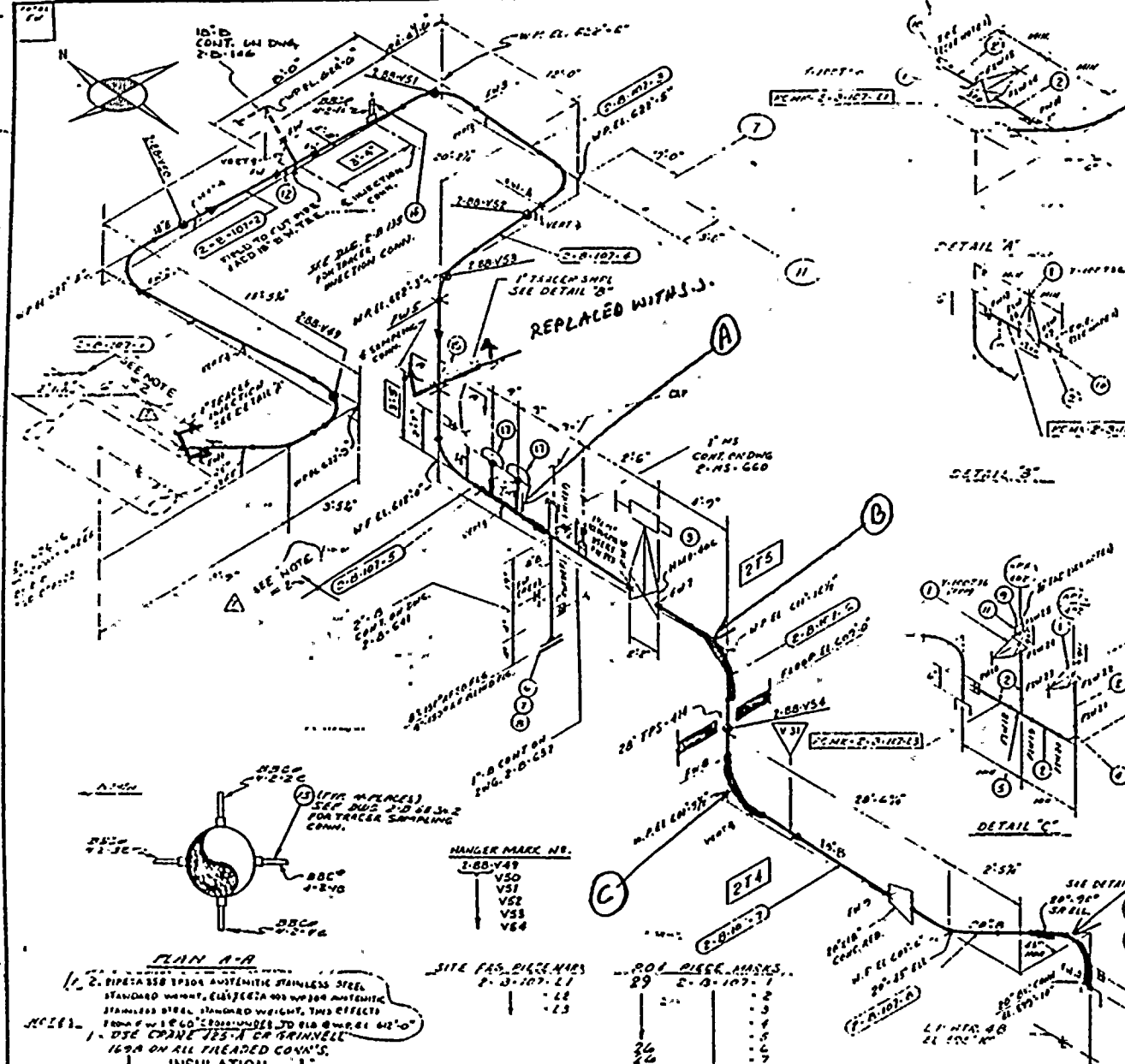
ISO SH. NO. 1053

QTY	ITEM	UNIT	MATERIAL DESCRIPTION	REVISION	DATE
1	1	1"	CODE "W" GLOME "H" CS	1-100736	
1	2	1"	SCHEIDT PIPE 5/8" S.S.	1-100736	
1	3	1"	1/2" NUTS 5/8" S.S.	1-100736	
1	4	1"	3000" SW 50" ELL CS	1-100736	
1	5	1"	3000" SW TEE CS	1-100736	
1	6	1"	150" CONE ASD. G. 1/2" TEE	1-100736	
1	7	1"	1 3/4" LG. NUT END NUT 1/2" TEE	1-100736	
1	8	1"	HEAVY HEX. NUT CLP TEE	1-100736	
1	9	1"	3000" TND. CAP CS	1-100736	
1	10	1"	3000" TND. CAP CS	1-100736	
1	11	1"	150" TND. CAP RED INSULATED	1-100736	
1	12	1"	1/2" TEE 1/4" WT. BW. SS	1-100736	
1	13	1"	3000" CAP	1-100736	
1	14	1"	REDUCER	1-100736	
1	15	1"	SAMPLING CONN. (BOC DWG. TX-5 31161)	1-100736	
1	16	1"	INJECTION CONN. (SBC DWG. TX-5 31162)	1-100736	
1	17	2"	1/4" 40 B/W C.S. PIPE CAP	1-100736	

REVISION RECORD

NO	DATE	DESCRIPTION	NO ACTION REQ'D
1	1/1/54	REVISED BY BRANCH CONNECTIONS & ADDED 2" O.D. DIAL TO SURT FABRICATION AEP ASSET DWG. 2-5226-1 (V3)	NO ACTION REQ'D
2	2/1/54	ADDED INSULATION STAMP 2" O.D. DIAL. A.E.P. DWG. NO. 2-5226-5 (V3)	NO ACTION REQ'D
3	3/1/54	AS PER REVISED DWG. 2-5226-5 (V3) ADDED 2" O.D. DIAL TO SURT FABRICATION AEP ASSET DWG. 2-5226-1 (V3)	NO ACTION REQ'D
4	4/1/54	AS PER REVISED DWG. 2-5226-5 (V3) ADDED 2" O.D. DIAL TO SURT FABRICATION AEP ASSET DWG. 2-5226-1 (V3)	NO ACTION REQ'D
5	5/1/54	AS PER REVISED DWG. 2-5226-5 (V3) ADDED 2" O.D. DIAL TO SURT FABRICATION AEP ASSET DWG. 2-5226-1 (V3)	NO ACTION REQ'D
6	6/1/54	AS PER REVISED DWG. 2-5226-5 (V3) ADDED 2" O.D. DIAL TO SURT FABRICATION AEP ASSET DWG. 2-5226-1 (V3)	NO ACTION REQ'D
7	7/1/54	AS PER REVISED DWG. 2-5226-5 (V3) ADDED 2" O.D. DIAL TO SURT FABRICATION AEP ASSET DWG. 2-5226-1 (V3)	NO ACTION REQ'D

INFORMATION RECORD CENTER  
CONT. (1-5)  
DOCUMENT  
JAN 17 1956  
VOLUME 11



PLAN A-A

1. 2" PIPE ASSE 100% AUTENTIC STAINLESS STEEL  
STANDARD WEIGHT, 100% AUTENTIC STAINLESS STEEL  
STANDARD WEIGHT, THIS EFFECTS  
FROM 100% AUTENTIC STAINLESS STEEL TO 100% AUTENTIC  
1. DSC CAPRE 125-A OR GRINNELL  
169A ON ALL THREADED CONNS.

INSULATION

SIZE	QTY	REMARKS
2"	1	
1 1/2"	12	
1"	2	
1"	3	

SPEC. REQUIREMENTS		TEST REQUIREMENTS		FITTINGS		TESTING		ADDITIONAL	
1. Material: 304 SS		2. Thickness: 1/2"		3. Size: 1/2"		4. Type: 1/2"		5. Quantity: 100	
2. Finish: Polished		3. Heat Treatment: Annealed		4. Marking: 1/2"		5. Inspection: 100%		6. Storage: 100%	
3. Dimensions: 1/2" x 1/2" x 1/2"		4. Tolerances: ±0.005"		5. Surface Finish: 1/2"		6. Material: 304 SS		7. Quantity: 100	
4. Weight: 100 lbs		5. Marking: 1/2"		6. Inspection: 100%		7. Storage: 100%		8. Quantity: 100	
5. Dimensions: 1/2" x 1/2" x 1/2"		6. Tolerances: ±0.005"		7. Surface Finish: 1/2"		8. Material: 304 SS		9. Quantity: 100	
6. Weight: 100 lbs		7. Marking: 1/2"		8. Inspection: 100%		9. Storage: 100%		10. Quantity: 100	
7. Dimensions: 1/2" x 1/2" x 1/2"		8. Tolerances: ±0.005"		9. Surface Finish: 1/2"		10. Material: 304 SS		11. Quantity: 100	
8. Weight: 100 lbs		9. Marking: 1/2"		10. Inspection: 100%		11. Storage: 100%		12. Quantity: 100	
9. Dimensions: 1/2" x 1/2" x 1/2"		10. Tolerances: ±0.005"		11. Surface Finish: 1/2"		12. Material: 304 SS		13. Quantity: 100	
10. Weight: 100 lbs		11. Marking: 1/2"		12. Inspection: 100%		13. Storage: 100%		14. Quantity: 100	
11. Dimensions: 1/2" x 1/2" x 1/2"		12. Tolerances: ±0.005"		13. Surface Finish: 1/2"		14. Material: 304 SS		15. Quantity: 100	
12. Weight: 100 lbs		13. Marking: 1/2"		14. Inspection: 100%		15. Storage: 100%		16. Quantity: 100	
13. Dimensions: 1/2" x 1/2" x 1/2"		14. Tolerances: ±0.005"		15. Surface Finish: 1/2"		16. Material: 304 SS		17. Quantity: 100	
14. Weight: 100 lbs		15. Marking: 1/2"		16. Inspection: 100%		17. Storage: 100%		18. Quantity: 100	
15. Dimensions: 1/2" x 1/2" x 1/2"		16. Tolerances: ±0.005"		17. Surface Finish: 1/2"		18. Material: 304 SS		19. Quantity: 100	
16. Weight: 100 lbs		17. Marking: 1/2"		18. Inspection: 100%		19. Storage: 100%		20. Quantity: 100	
17. Dimensions: 1/2" x 1/2" x 1/2"		18. Tolerances: ±0.005"		19. Surface Finish: 1/2"		20. Material: 304 SS		21. Quantity: 100	
18. Weight: 100 lbs		19. Marking: 1/2"		20. Inspection: 100%		21. Storage: 100%		22. Quantity: 100	
19. Dimensions: 1/2" x 1/2" x 1/2"		20. Tolerances: ±0.005"		21. Surface Finish: 1/2"		22. Material: 304 SS		23. Quantity: 100	
20. Weight: 100 lbs		21. Marking: 1/2"		22. Inspection: 100%		23. Storage: 100%		24. Quantity: 100	
21. Dimensions: 1/2" x 1/2" x 1/2"		22. Tolerances: ±0.005"		23. Surface Finish: 1/2"		24. Material: 304 SS		25. Quantity: 100	
22. Weight: 100 lbs		23. Marking: 1/2"		24. Inspection: 100%		25. Storage: 100%		26. Quantity: 100	
23. Dimensions: 1/2" x 1/2" x 1/2"		24. Tolerances: ±0.005"		25. Surface Finish: 1/2"		26. Material: 304 SS		27. Quantity: 100	
24. Weight: 100 lbs		25. Marking: 1/2"		26. Inspection: 100%		27. Storage: 100%		28. Quantity: 100	
25. Dimensions: 1/2" x 1/2" x 1/2"		26. Tolerances: ±0.005"		27. Surface Finish: 1/2"		28. Material: 304 SS		29. Quantity: 100	
26. Weight: 100 lbs		27. Marking: 1/2"		28. Inspection: 100%		29. Storage: 100%		30. Quantity: 100	
27. Dimensions: 1/2" x 1/2" x 1/2"		28. Tolerances: ±0.005"		29. Surface Finish: 1/2"		30. Material: 304 SS		31. Quantity: 100	
28. Weight: 100 lbs		29. Marking: 1/2"		30. Inspection: 100%		31. Storage: 100%		32. Quantity: 100	
29. Dimensions: 1/2" x 1/2" x 1/2"		30. Tolerances: ±0.005"		31. Surface Finish: 1/2"		32. Material: 304 SS		33. Quantity: 100	
30. Weight: 100 lbs		31. Marking: 1/2"		32. Inspection: 100%		33. Storage: 100%		34. Quantity: 100	
31. Dimensions: 1/2" x 1/2" x 1/2"		32. Tolerances: ±0.005"		33. Surface Finish: 1/2"		34. Material: 304 SS		35. Quantity: 100	
32. Weight: 100 lbs		33. Marking: 1/2"		34. Inspection: 100%		35. Storage: 100%		36. Quantity: 100	
33. Dimensions: 1/2" x 1/2" x 1/2"		34. Tolerances: ±0.005"		35. Surface Finish: 1/2"		36. Material: 304 SS		37. Quantity: 100	
34. Weight: 100 lbs		35. Marking: 1/2"		36. Inspection: 100%		37. Storage: 100%		38. Quantity: 100	
35. Dimensions: 1/2" x 1/2" x 1/2"		36. Tolerances: ±0.005"		37. Surface Finish: 1/2"		38. Material: 304 SS		39. Quantity: 100	
36. Weight: 100 lbs		37. Marking: 1/2"		38. Inspection: 100%		39. Storage: 100%		40. Quantity: 100	
37. Dimensions: 1/2" x 1/2" x 1/2"		38. Tolerances: ±0.005"		39. Surface Finish: 1/2"		40. Material: 304 SS		41. Quantity: 100	
38. Weight: 100 lbs		39. Marking: 1/2"		40. Inspection: 100%		41. Storage: 100%		42. Quantity: 100	
39. Dimensions: 1/2" x 1/2" x 1/2"		40. Tolerances: ±0.005"		41. Surface Finish: 1/2"		42. Material: 304 SS		43. Quantity: 100	
40. Weight: 100 lbs		41. Marking: 1/2"		42. Inspection: 100%		43. Storage: 100%		44. Quantity: 100	
41. Dimensions: 1/2" x 1/2" x 1/2"		42. Tolerances: ±0.005"		43. Surface Finish: 1/2"		44. Material: 304 SS		45. Quantity: 100	
42. Weight: 100 lbs		43. Marking: 1/2"		44. Inspection: 100%		45. Storage: 100%		46. Quantity: 100	
43. Dimensions: 1/2" x 1/2" x 1/2"		44. Tolerances: ±0.005"		45. Surface Finish: 1/2"		46. Material: 304 SS		47. Quantity: 100	
44. Weight: 100 lbs		45. Marking: 1/2"		46. Inspection: 100%		47. Storage: 100%		48. Quantity: 100	
45. Dimensions: 1/2" x 1/2" x 1/2"		46. Tolerances: ±0.005"		47. Surface Finish: 1/2"		48. Material: 304 SS		49. Quantity: 100	
46. Weight: 100 lbs		47. Marking: 1/2"		48. Inspection: 100%		49. Storage: 100%		50. Quantity: 100	
47. Dimensions: 1/2" x 1/2" x 1/2"		48. Tolerances: ±0.005"		49. Surface Finish: 1/2"		50. Material: 304 SS		51. Quantity: 100	
48. Weight: 100 lbs		49. Marking: 1/2"		50. Inspection: 100%		51. Storage: 100%		52. Quantity: 100	
49. Dimensions: 1/2" x 1/2" x 1/2"		50. Tolerances: ±0.005"		51. Surface Finish: 1/2"		52. Material: 304 SS		53. Quantity: 100	
50. Weight: 100 lbs		51. Marking: 1/2"		52. Inspection: 100%		53. Storage: 100%		54. Quantity: 100	
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52. Weight: 100 lbs		53. Marking: 1/2"		54. Inspection: 100%		55. Storage: 100%		56. Quantity: 100	
53. Dimensions: 1/2" x 1/2" x 1/2"		54. Tolerances: ±0.005"		55. Surface Finish: 1/2"		56. Material: 304 SS		57. Quantity: 100	
54. Weight: 100 lbs		55. Marking: 1/2"		56. Inspection: 100%		57. Storage: 100%		58. Quantity: 100	
55. Dimensions: 1/2" x 1/2" x 1/2"		56. Tolerances: ±0.005"		57. Surface Finish: 1/2"		58. Material: 304 SS		59. Quantity: 100	
56. Weight: 100 lbs		57. Marking: 1/2"		58. Inspection: 100%		59. Storage: 100%		60. Quantity: 100	
57. Dimensions: 1/2" x 1/2" x 1/2"		58. Tolerances: ±0.005"		59. Surface Finish: 1/2"		60. Material: 304 SS		61. Quantity: 100	
58. Weight: 100 lbs		59. Marking: 1/2"		60. Inspection: 100%		61. Storage: 100%		62. Quantity: 100	
59. Dimensions: 1/2" x 1/2" x 1/2"		60. Tolerances: ±0.005"		61. Surface Finish: 1/2"		62. Material: 304 SS		63. Quantity: 100	
60. Weight: 100 lbs		61. Marking: 1/2"		62. Inspection: 100%		63. Storage: 100%		64. Quantity: 100	
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62. Weight: 100 lbs		63. Marking: 1/2"		64. Inspection: 100%		65. Storage: 100%		66. Quantity: 100	
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64. Weight: 100 lbs		65. Marking: 1/2"		66. Inspection: 100%		67. Storage: 100%		68. Quantity: 100	
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66. Weight: 100 lbs		67. Marking: 1/2"		68. Inspection: 100%		69. Storage: 100%		70. Quantity: 100	
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77. Dimensions: 1/2" x 1/2" x 1/2"		78. Tolerances: ±0.005"		79. Surface Finish: 1/2"		80. Material: 304 SS		81. Quantity: 100	
78. Weight: 100 lbs		79. Marking: 1/2"		80. Inspection: 100%		81. Storage: 100%		82. Quantity: 100	
79. Dimensions: 1/2" x 1/2" x 1/2"		80. Tolerances: ±0.005"		81. Surface Finish: 1/2"		82. Material: 304 SS		83. Quantity: 100	
80. Weight: 100 lbs		81. Marking: 1/2"		82. Inspection: 100%		83. Storage: 100%		84. Quantity: 100	
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82. Weight: 100 lbs		83. Marking: 1/2"		84. Inspection: 100%		85. Storage: 100%		86. Quantity: 100	
83. Dimensions: 1/2" x 1/2" x 1/2"		84. Tolerances: ±0.005"		85. Surface Finish: 1/2"		86. Material: 304 SS		87. Quantity: 100	
84. Weight: 100 lbs		85. Marking: 1/2"		86. Inspection: 100%		87. Storage: 100%		88. Quantity: 100	
85. Dimensions: 1/2" x 1/2" x 1/2"		86. Tolerances: ±0.005"		87. Surface Finish: 1/2"		88. Material: 304 SS		89. Quantity: 100	
86. Weight: 100 lbs		87. Marking: 1/2"		88. Inspection: 100%		89. Storage: 100%		90. Quantity: 100	
87. Dimensions: 1/2" x 1/2" x 1/2"		88. Tolerances: ±0.005"		89. Surface Finish: 1/2"		90. Material: 304 SS		91. Quantity: 100	
88. Weight: 100 lbs		89. Marking: 1/2"		90. Inspection: 100%		91. Storage: 100%		92. Quantity: 100	
89. Dimensions: 1/2" x 1/2" x 1/2"		90. Tolerances: ±0.005"		91. Surface Finish: 1/2"		92. Material: 304 SS		93. Quantity: 100	
90. Weight: 100 lbs		91. Marking: 1/2"		92. Inspection: 100%		93. Storage: 100%		94. Quantity: 100	
91. Dimensions: 1/2" x 1/2" x 1/2"		92. Tolerances: ±0.005"		93. Surface Finish: 1/2"		94. Material: 304 SS		95. Quantity: 100	
92. Weight: 100 lbs		93. Marking: 1/2"		94. Inspection: 100%		95. Storage: 100%		96. Quantity: 100	
93. Dimensions: 1/2" x 1/2" x 1/2"		94. Tolerances: ±0.005"		95. Surface Finish: 1/2"		96. Material: 304 SS		97. Quantity: 100	
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96. Weight: 100 lbs		97. Marking: 1/2"		98. Inspection: 100%		99. Storage: 100%		100. Quantity: 100	
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98. Weight: 100 lbs		99. Marking: 1/2"		100. Inspection: 100%		101. Storage: 100%		102. Quantity: 100	
99. Dimensions: 1/2" x 1/2" x 1/2"		100. Tolerances: ±0.005"		101. Surface Finish: 1/2"		102. Material: 304 SS		103. Quantity: 100	
100. Weight: 100 lbs		101. Marking: 1/2"		102. Inspection: 100%		103. Storage: 100%		104. Quantity: 100	
101. Dimensions: 1/2" x 1/2" x 1/2"		102. Tolerances: ±0.005"		103. Surface Finish: 1/2"		104. Material: 304 SS		105. Quantity: 100	
102. Weight: 100 lbs		103. Marking: 1/2"		104. Inspection: 100%		105. Storage: 100%		106. Quantity: 100	
103. Dimensions: 1/2" x 1/2" x 1/2"		104. Tolerances: ±0.005"		105. Surface Finish: 1/2"		106. Material: 304 SS		107. Quantity: 100	
104. Weight: 100 lbs		105. Marking: 1/2"		106. Inspection: 100%		107. Storage: 100%		108. Quantity: 100	
105. Dimensions: 1/2" x 1/2" x 1/2"		106. Tolerances: ±0.005"		107. Surface Finish: 1/2"		108. Material: 304 SS		109. Quantity: 100	
106. Weight: 100 lbs		107. Marking: 1/2"		108. Inspection: 100%		109. Storage: 100%		110. Quantity: 100	
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108. Weight: 100 lbs		109. Marking: 1/2"		110. Inspection: 100%		111. Storage: 100%		112. Quantity: 100	
109. Dimensions: 1/2" x 1/2" x 1/2"		110. Tolerances: ±0.005"		111. Surface Finish: 1/2"		112. Material: 304 SS		113. Quantity: 100	
110. Weight: 100 lbs		111. Marking: 1/2"		112. Inspection: 100%		113. Storage: 100%		114. Quantity: 100	
111. Dimensions: 1/2" x 1/2" x 1/2"		112. Tolerances: ±0.005"		113. Surface Finish: 1/2"		114. Material: 304 SS		115. Quantity: 100	
112. Weight: 100 lbs		113. Marking: 1/2"		114. Inspection: 100%		115. Storage: 100%		116. Quantity: 100	
113. Dimensions: 1/2" x 1/2" x 1/2"		114. Tolerances: ±0.005"		115. Surface Finish: 1/2"		116. Material: 304 SS		117. Quantity: 100	
114. Weight: 100 lbs		115. Marking: 1/2"		116. Inspection: 100%		117. Storage: 100%		118. Quantity: 100	
115. Dimensions: 1/2" x 1/2" x 1/2"		116. Tolerances: ±0.005"		117. Surface Finish: 1/2"		118. Material: 304 SS		119. Quantity: 100	
116. Weight: 100 lbs		117. Marking: 1/2"		118. Inspection: 100%		119. Storage: 100%		120. Quantity: 100	
117. Dimensions: 1/2" x 1/2" x 1/2"		118. Tolerances: ±0.005"		119. Surface Finish: 1/2"		120. Material: 304 SS		121. Quantity: 100	
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119. Dimensions: 1/2" x 1/2" x 1/2"		120. Tolerances: ±0.005"		121. Surface Finish: 1/2"		122. Material: 304 SS		123. Quantity: 100	
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121. Dimensions: 1/2" x 1/2" x 1/2"		122. Tolerances: ±0.005"		123. Surface Finish: 1/2"		124. Material: 304 SS		125. Quantity: 100	
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124. Weight: 100 lbs		125. Marking: 1/2"		126. Inspection: 100%		12			

NPS DESIGNS INC.		FLOW DIAGRAM	
NEW YORK, N.Y.	REQUIRED COMPLETION DATE	OSL	WELD PROCEDURE
FABRICATOR NOTE:	FABRICATED BY	INVEST & COMPANY INC.	INVEST & COMPANY INC.
FABRICATION MUST CONFORM TO LATEST A.E.P. ARRGT. DWGS.		INVEST & COMPANY INC.	INVEST & COMPANY INC.
		INVEST & COMPANY INC.	INVEST & COMPANY INC.



D. C. COOK NUCLEAR PLANT  
EROSION EVALUATION WORKSHEET

SER No. 88-84 (Steam) X

Unit No. 2

SER No. 23-85 (Water)

Years in service 8

UT Reading Taken on: 1-18-86 rv

UT Reading Taken on: 1-18-86 rv


AEPSC Installed Mat'l Class 11-31 STD. WGT. 1234 WPD

AEPSC Installed Mat'l Class 11-31 STD. WGT. 1234 WPD

NOTES OF DATA INDICATE MATERIAL INSTALLED WAS MOST LIKELY SCH. 40

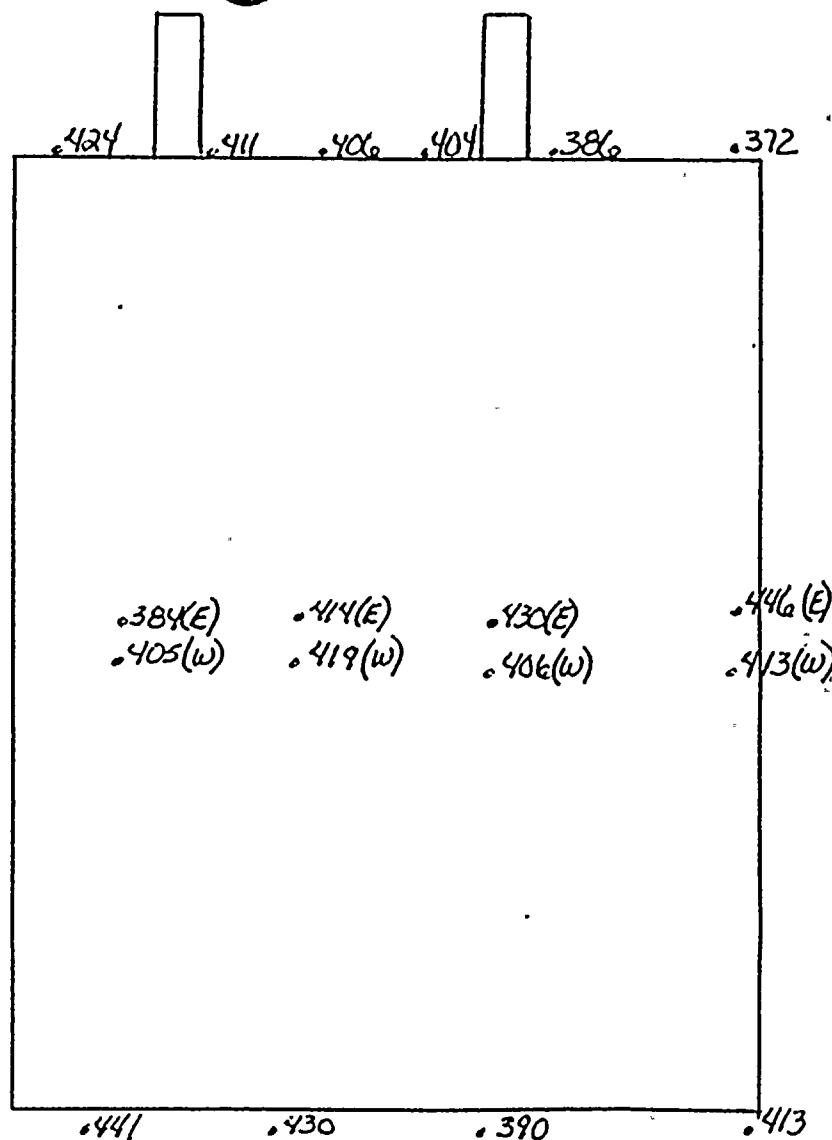
## COMMENTS

[illegible]

\*  OF MINIMUM ORIGINAL WALL THICKNESS



← FLOW  
 EL. 611' 10 1/2"  
 HMS - 406  
 ←  
 PIPE Temp 283°F



JOB ORDER 46424  
 ISO 2-B-107 Item A  
 1-18-86



DER # 46424

2-B-107 Item (B)

986

HMO-400

Pipe Temp 282°F

JOB ORDER # 46424  
ISO# 2-B-107 Item (B)  
1-18-86

Hmo-40e ↓

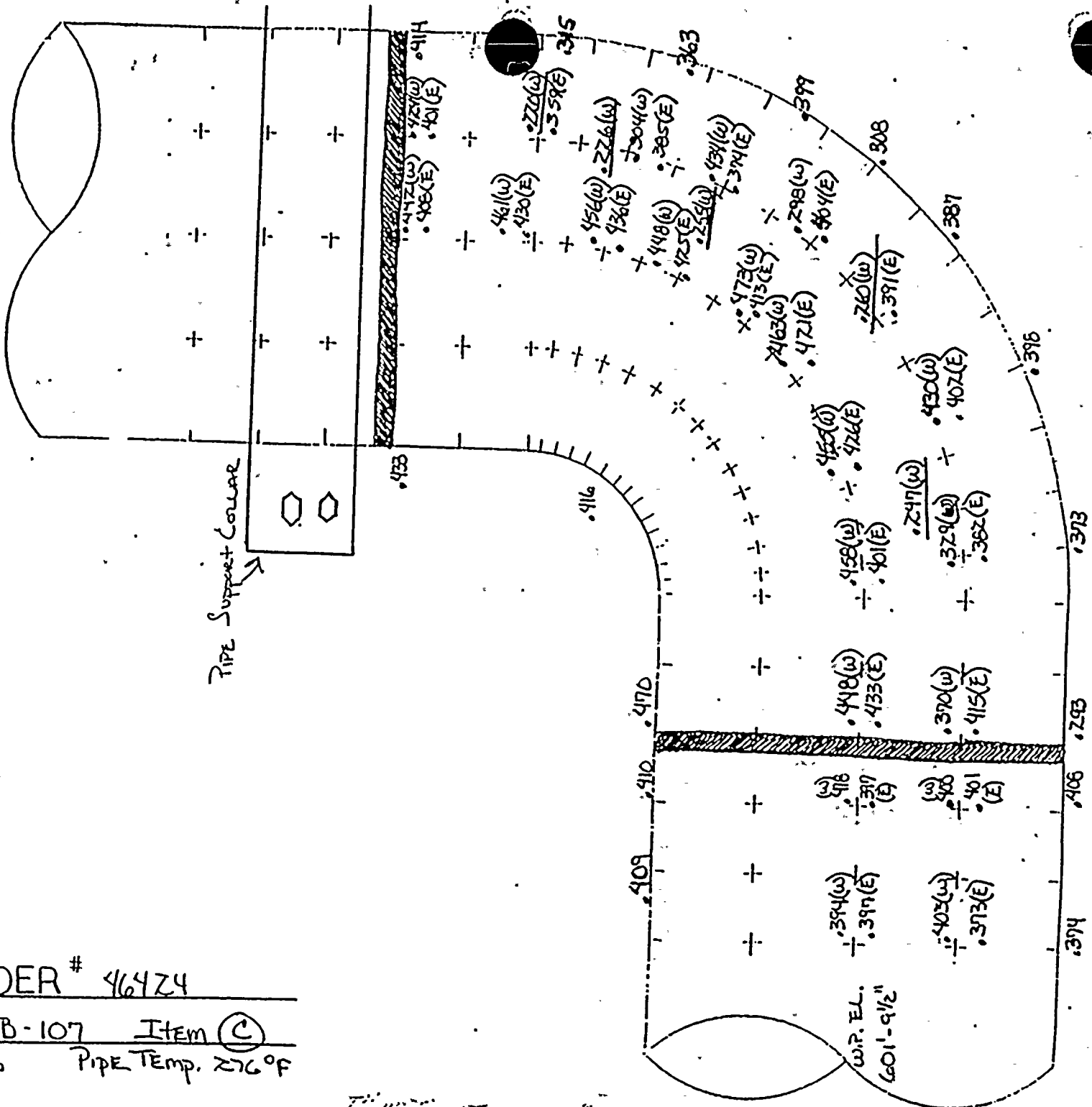
711.1.1. 10/10/1939



JOB ORDER # 46424  
 ISO# Z-B-107 ITEM (C)  
 1-24-86 PIPE TEMP. 276°F

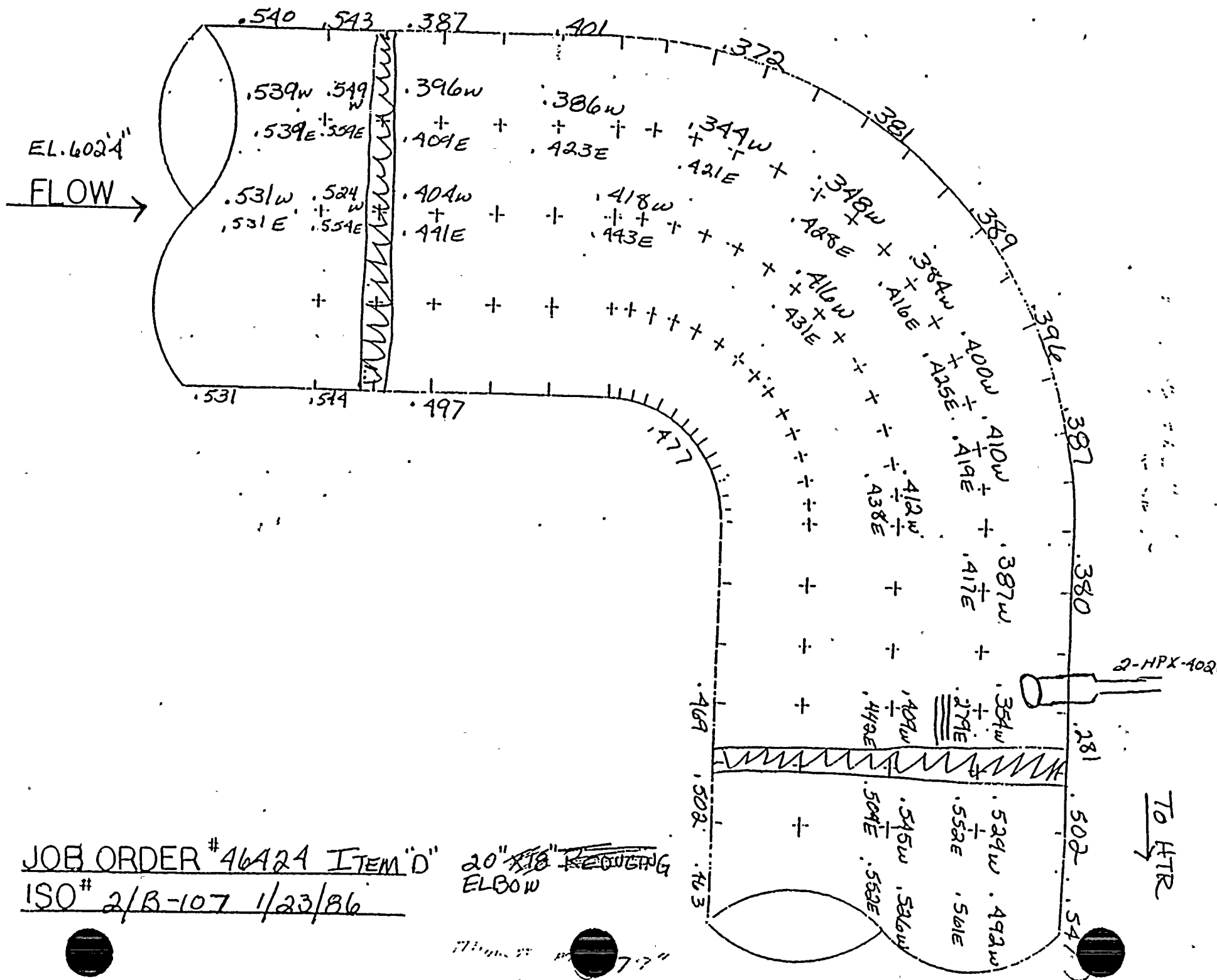
FLOW →

PIPE SUPPORT CORNER



7-11-86 P.T. = 0.071"





JOB ORDER # 46424 ITEM "D"  
 ISO# 2/B-107 1/23/86



*in 11/15/84 / File # 1.4.1*

AMERICAN ELECTRIC POWER SERVICE CORPORATION



DATE: May 14, 1984

SUBJECT: D. C. Cook Nuclear Plant, Unit No. 2  
U.T. Wall Thickness Readings of the 18-Inch Bleed steam Lines to  
Heaters 4A and 4B

FROM: K. J. Santos - Mechanical Engineering Division

TO: R. L. Dudding/F. Pisarsky - Bridgman

We have reviewed the ultrasonic test reports which were done under job order 14978 for the 18-inch diameter bleed steam (line 2-B-106) piping to Heater 4A, and the 18-inch diameter bleed steam (line 2-B-107) to Heater 4B. The U.T. readings for the line to Heater 4A and 4B have been listed in Attachment No. 1 and Attachment No. 2, respectively.

The existing 18-inch diameter piping and fittings are AEP Class V-31, where Specification No. DCC PM 104 QCS, Revision 8 specifies carbon steel, standard weight (.2375-inch wall thickness). The U.T. readings presented in Attachment No.'s 1 and 2 indicate that 18-inch diameter carbon steel piping and fittings at a Schedule 40 (.562-inch wall thickness) was actually installed.

The calculated required minimum wall thickness for this subject carbon steel piping (with a 1/16-inch corrosion allowance) is .125-inch.

The U.T. readings for elbows "A", "B" and "C" as marked up on isometric drawing 2-B-106 in Attachment No. 1 indicate that there is no severe erosion. However, U.T. readings for elbow "D" (first elbow downstream of valve HMO-405) shows signs of significant erosion or pitting in an 8-inch x 9-inch area. According to the U.T. survey of elbow "D", readings ranging from .200-inch thru .300-inch were found with one low reading of .180-inch. Although the readings for elbow "D" are still above the required minimum wall thickness, the erosion is significant to justify replacement of this elbow. Isometric 2-B-106, Revision 4 shows the elbow to be cut from an 18-inch diameter, long tangent elbow. It will be difficult to procure a long tangent elbow; therefore, we recommend that a 304 stainless, long radius, 90 degree, standard weight elbow be bought, where a stainless pup piece be made up in the field to make the long tangent. Additional material information for the replacement elbow is in Specification No. DCC PM 104 QCS, Revision 8, Class V-31, Note 1.



D. C. Cook Nuclear Plant, Unit No. 2  
U.T. Wall Thickness Readings of the 18-Inch Bleed Steam Lines to  
Heaters 4A and 4B  
May 14, 1984  
Page 2

We have reviewed the U.T. readings for line 2-B-107 and  
conclude that elbows on line 2-B-107 surveyed in Attachment No. 2  
do not have to be replaced.

K. J. Santos  
Piping and Valves Section

KJS:jkd

Attachments

cc: W. G. Smith, Jr. - Bridgman  
M. P. Alexich  
S. H. Steinhart  
R. I. Pawliger  
J. A. Kobyra  
N. C. Pruitt/File No. 1.4.1



ORIGINAL WALL = 4,362													
FOUR/ZONE NO. 2-1-4-1-3	FLOWY DIAGRAM = 2-1-4-1-3												
REQUIRED COMPLETION DATE	WELD PROCEDURE												
FABRICATED BY: HSC CO.	INVS = E & COMPANY, INC.												
NPS DESIGN INC.	INDIANA & AMERICAN ELECTRIC CO.												
NEW YORK, N.Y.	DONALD C. COOK NUCLEAR PLANT												
FABRICATOR NOTE: FABRICATION MUST CONFORM TO LATEST A.E.P. ARRGRT. DWGS.	<table> <tr> <td>CHG C/L</td> <td>DATE 7-1-73</td> <td>7-1-4-1-1-3</td> <td>BY</td> </tr> <tr> <td>CHG LDB</td> <td>DATE 7-1-73</td> <td></td> <td></td> </tr> <tr> <td>REASON</td> <td colspan="3">2-B-106</td> </tr> </table>	CHG C/L	DATE 7-1-73	7-1-4-1-1-3	BY	CHG LDB	DATE 7-1-73			REASON	2-B-106		
CHG C/L	DATE 7-1-73	7-1-4-1-1-3	BY										
CHG LDB	DATE 7-1-73												
REASON	2-B-106												

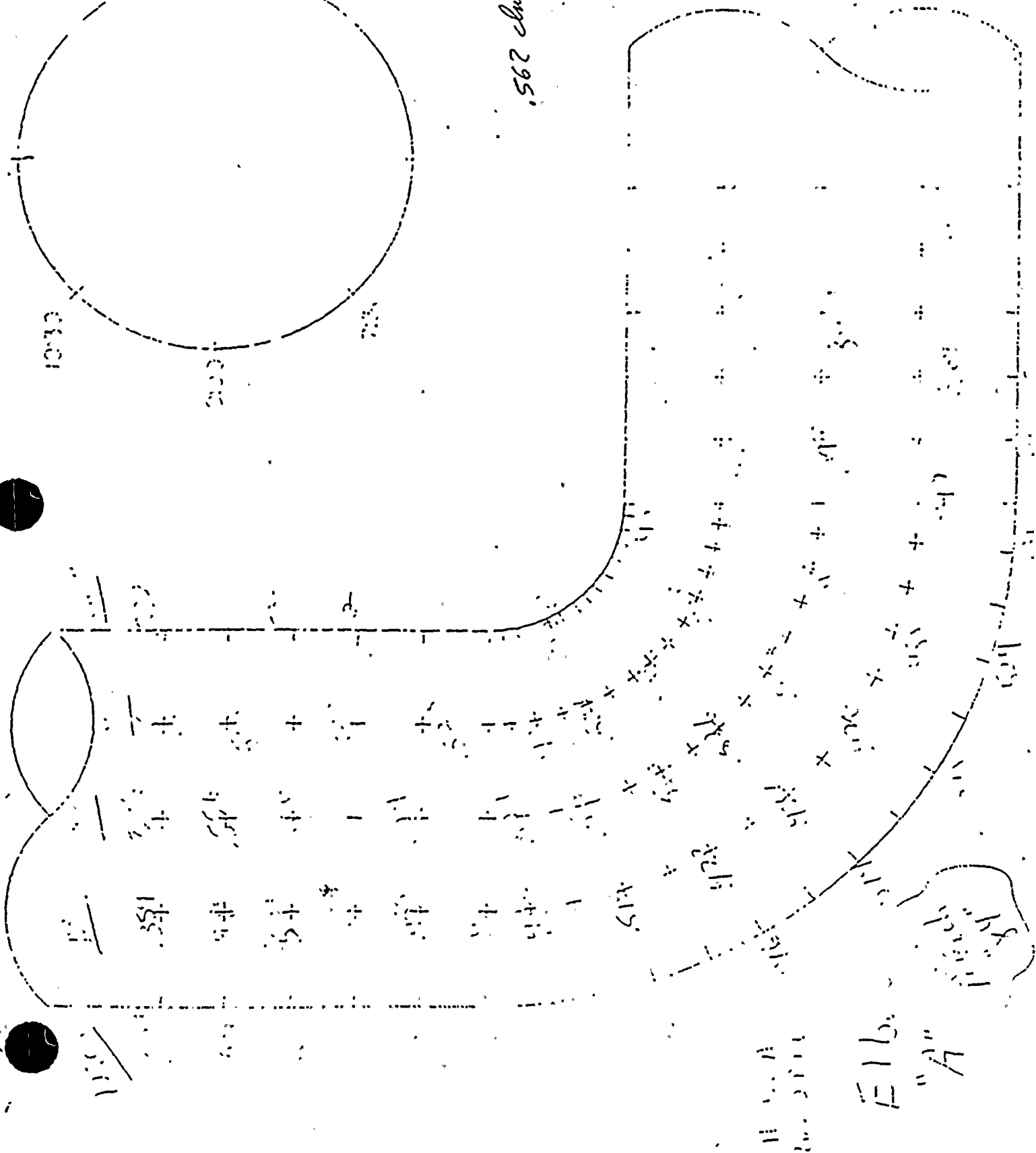
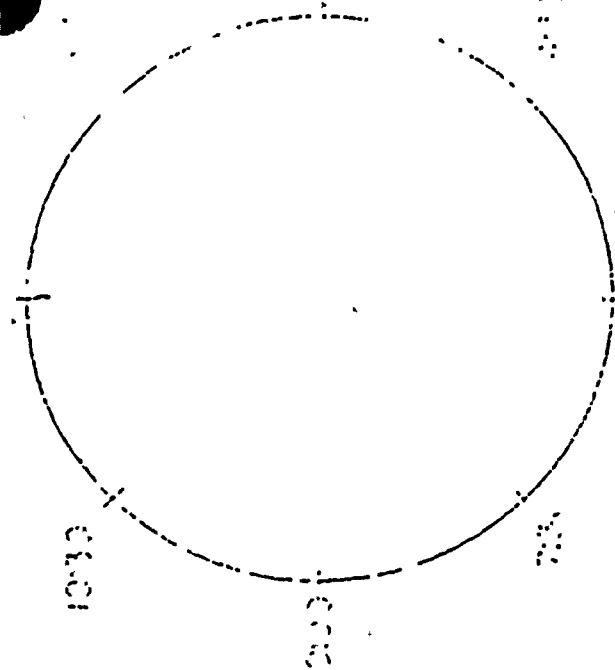




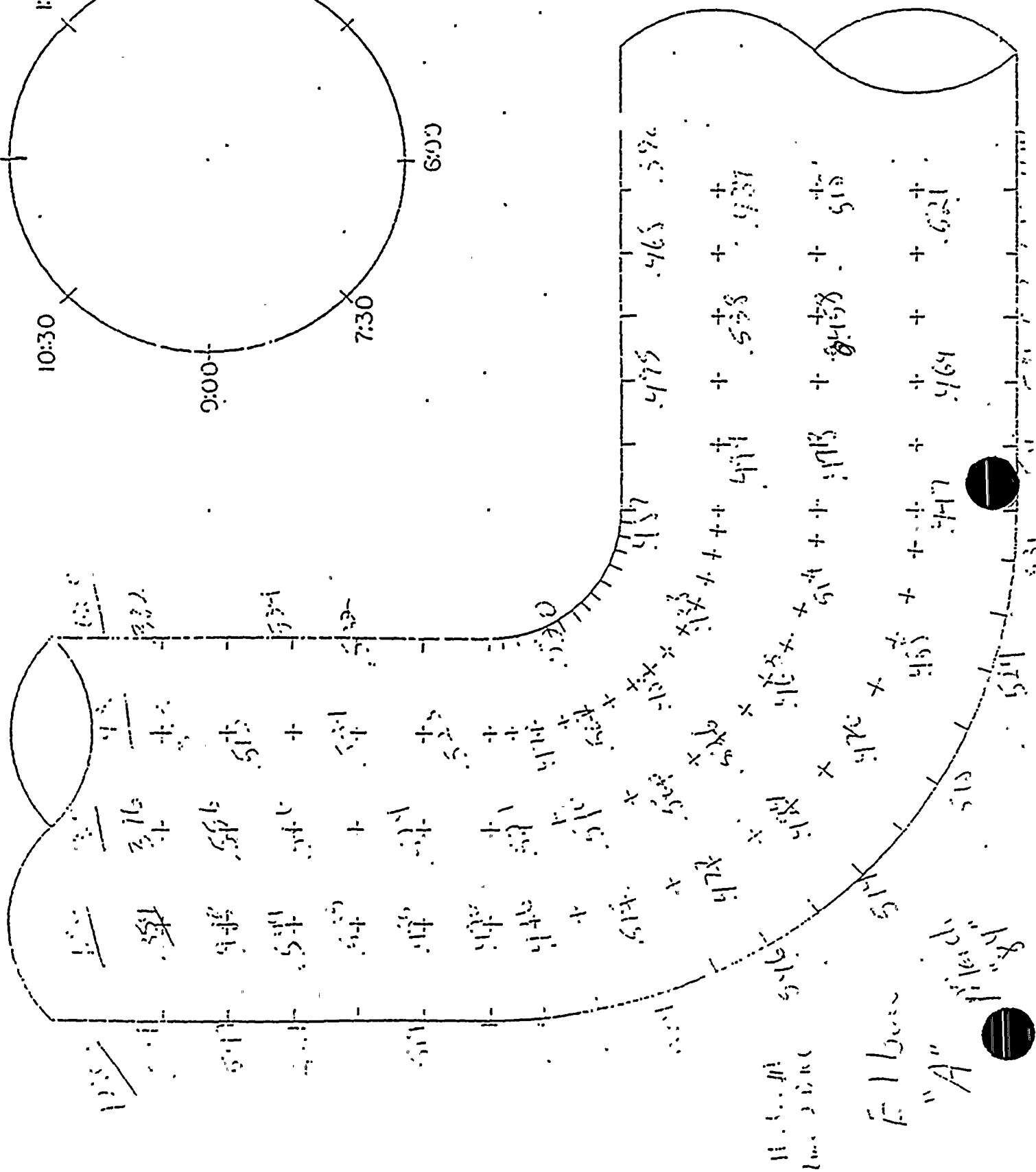
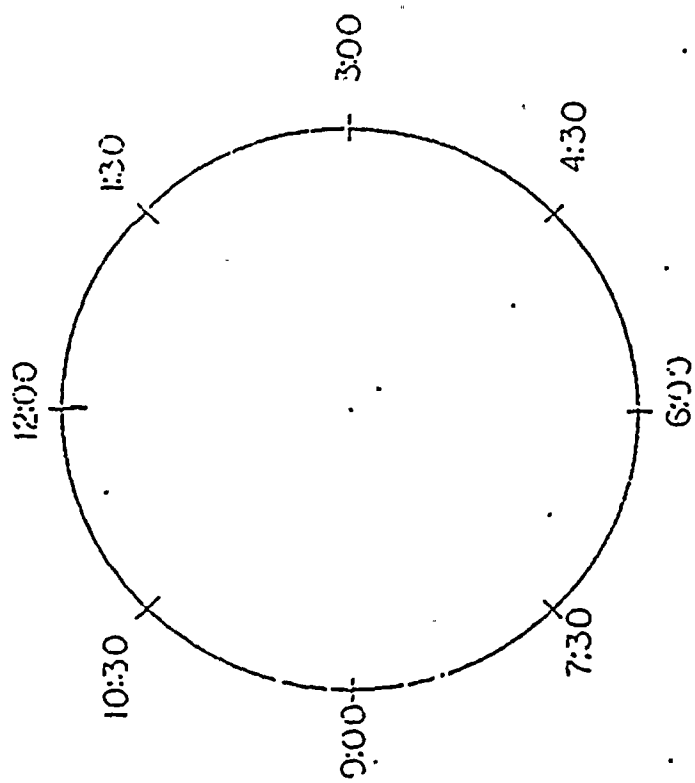


ATTACHMENT NO. 1  
SHT. 2 OF 10

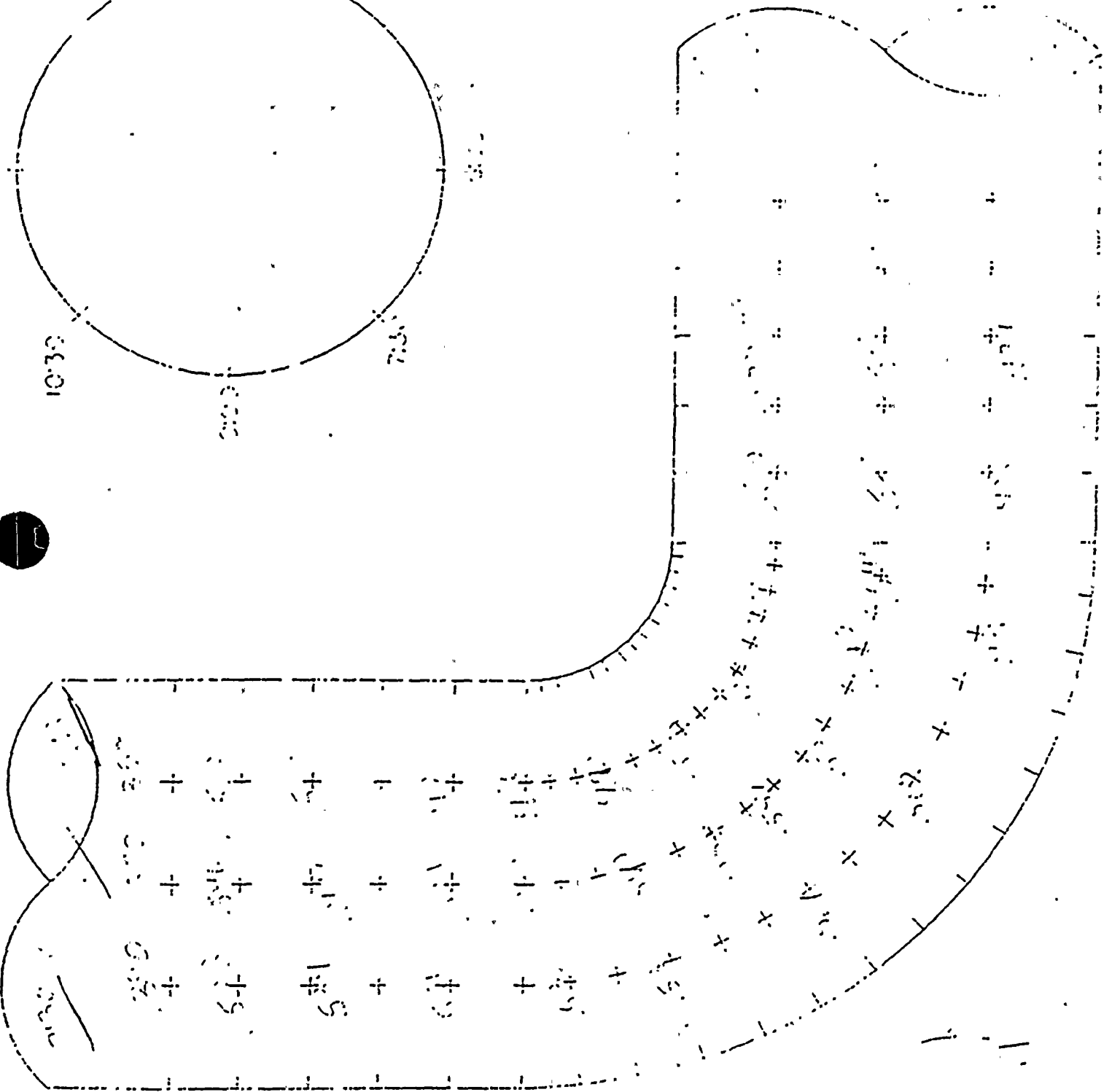
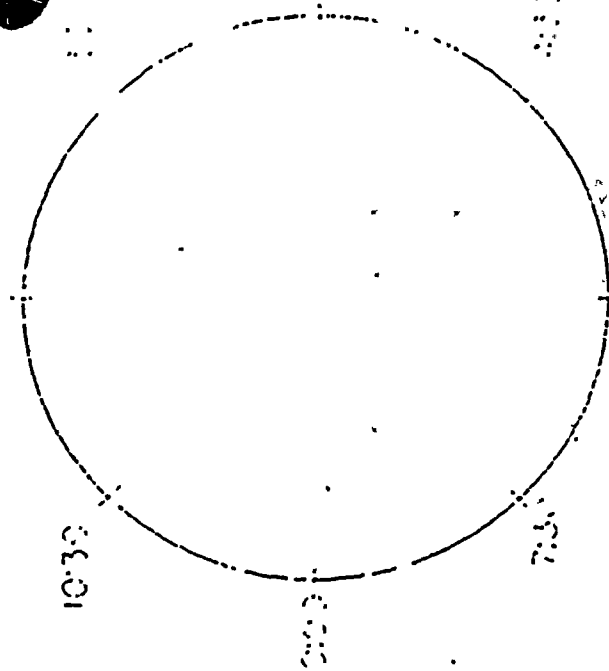
295.562 chortalled







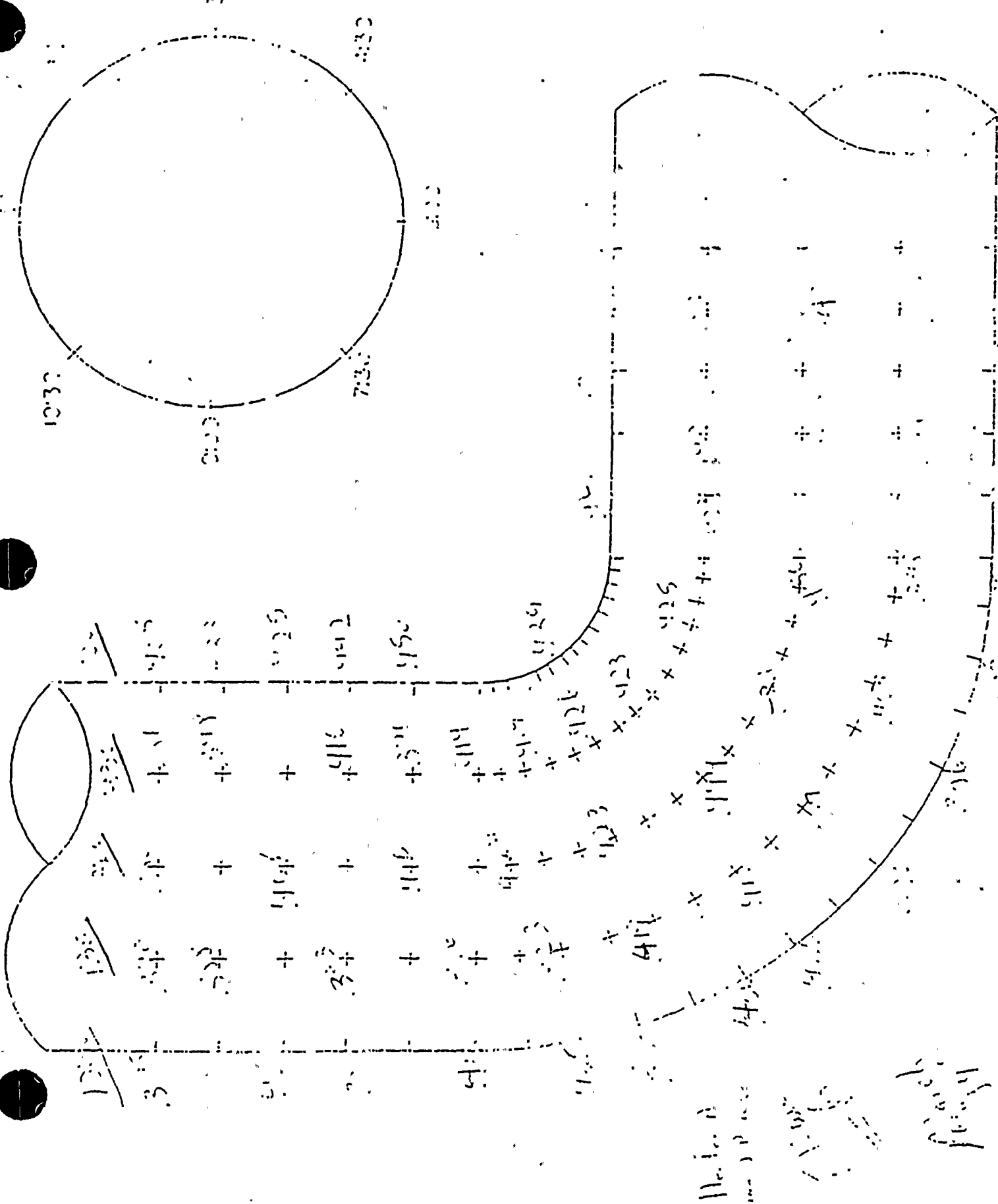








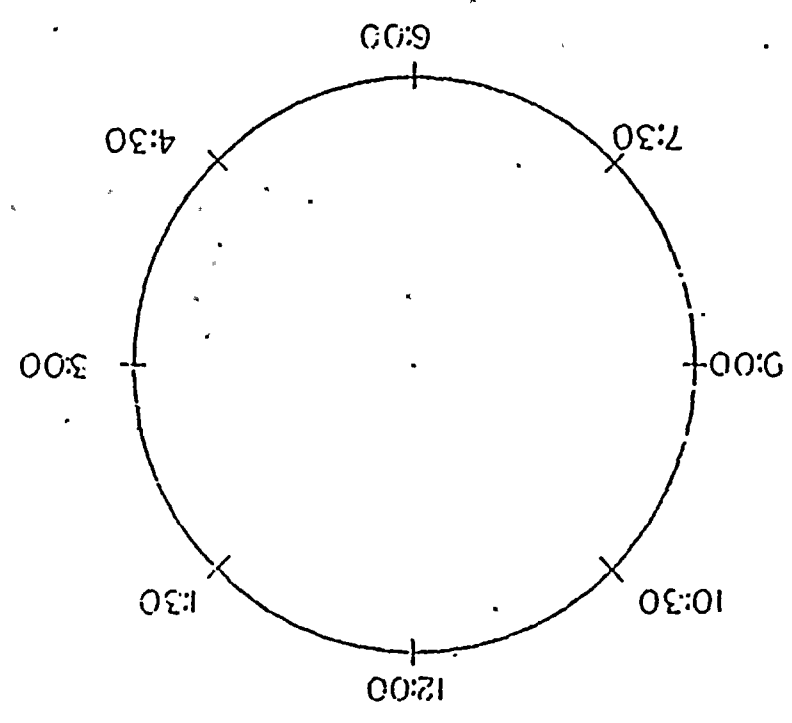
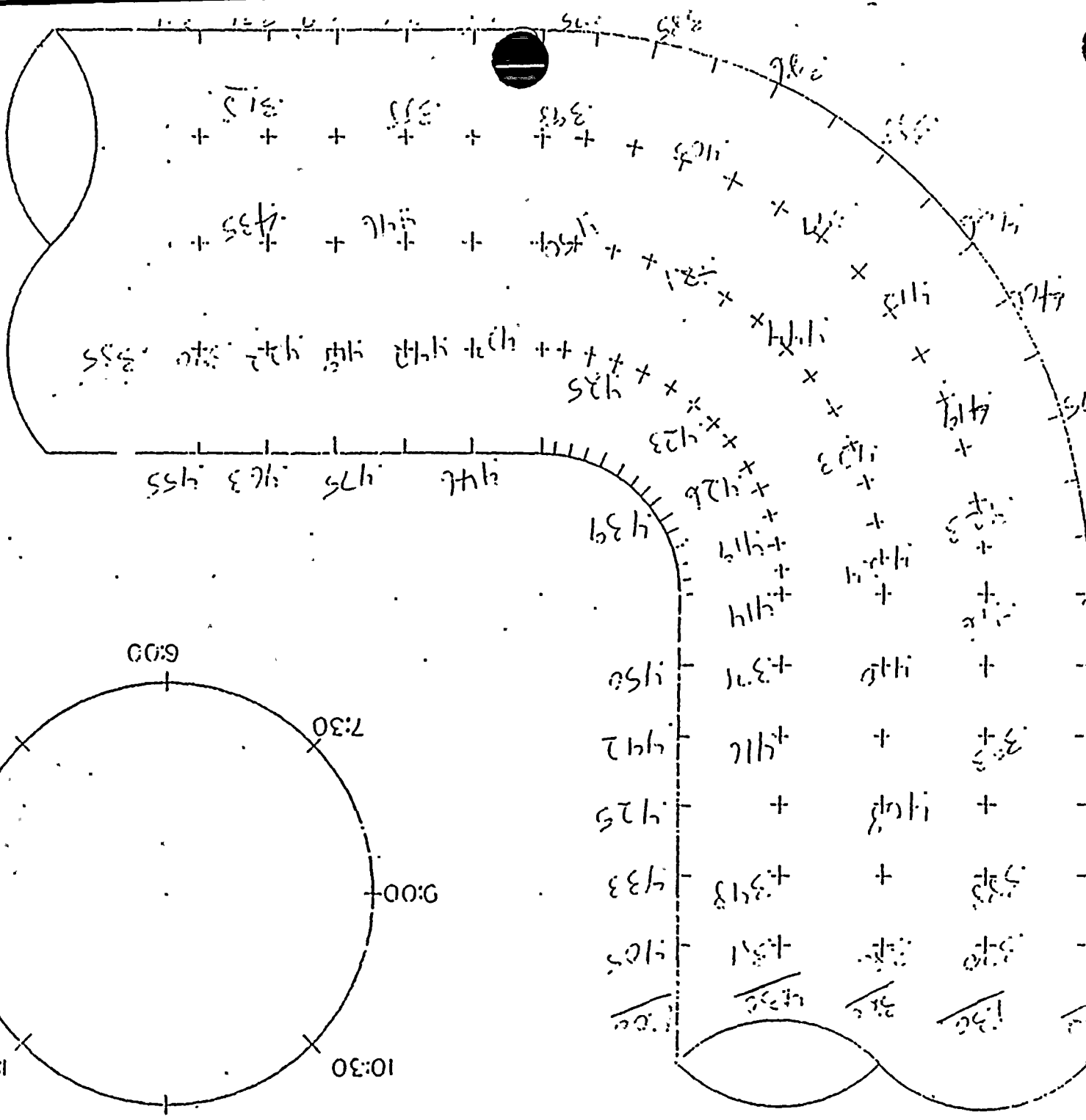




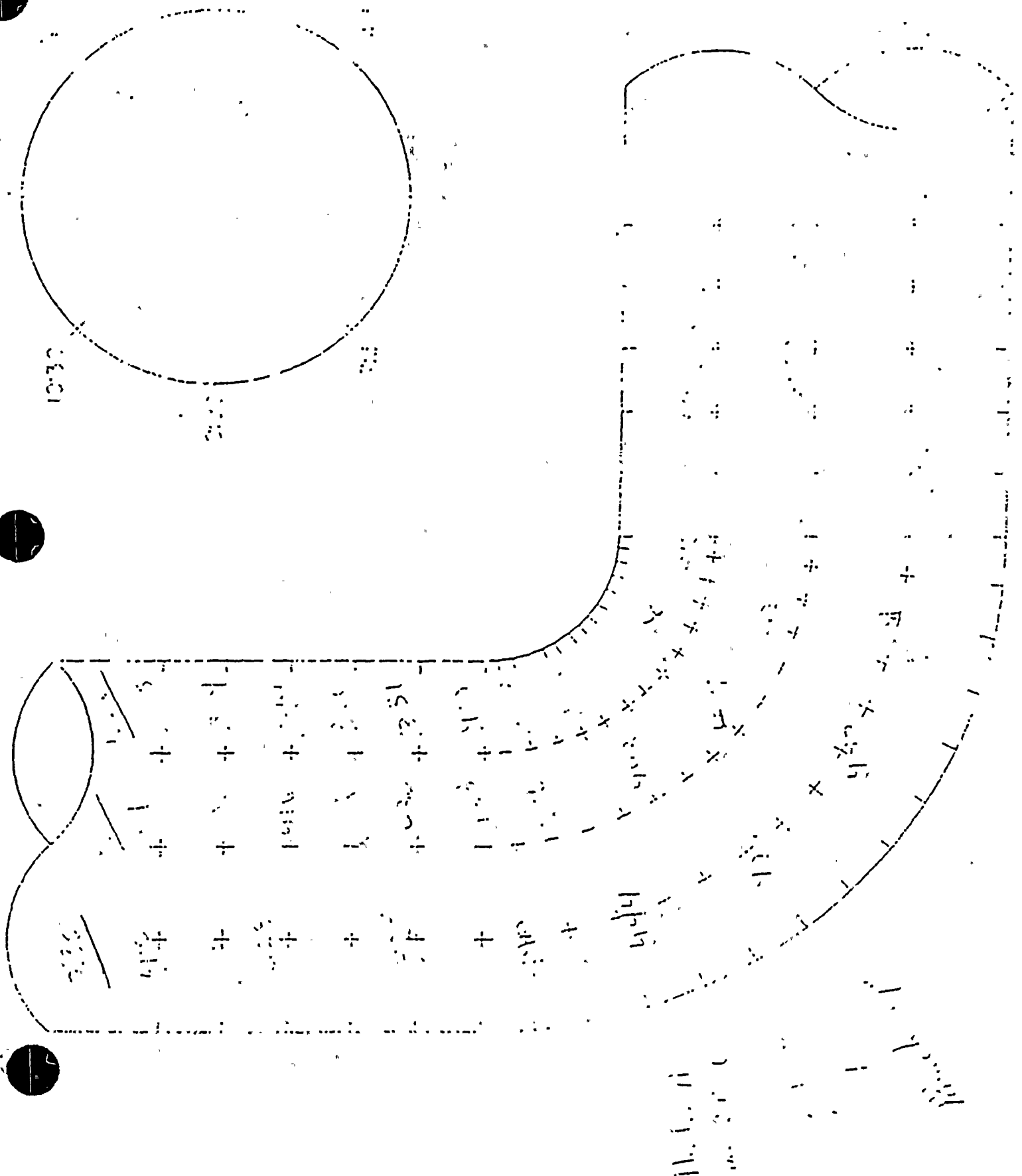


11.1.11

11.1.11





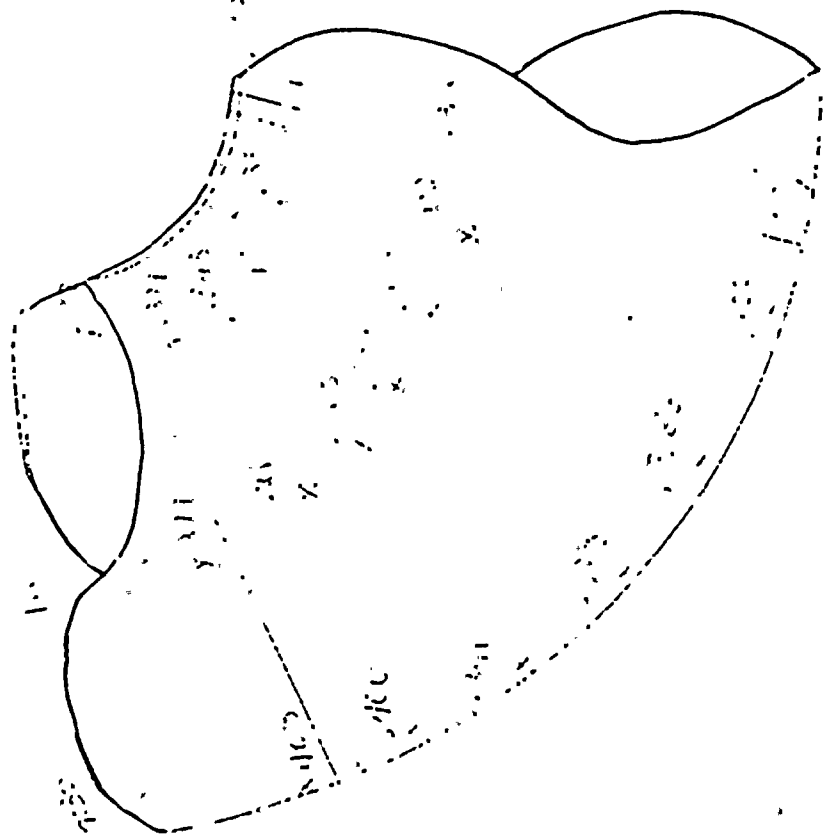






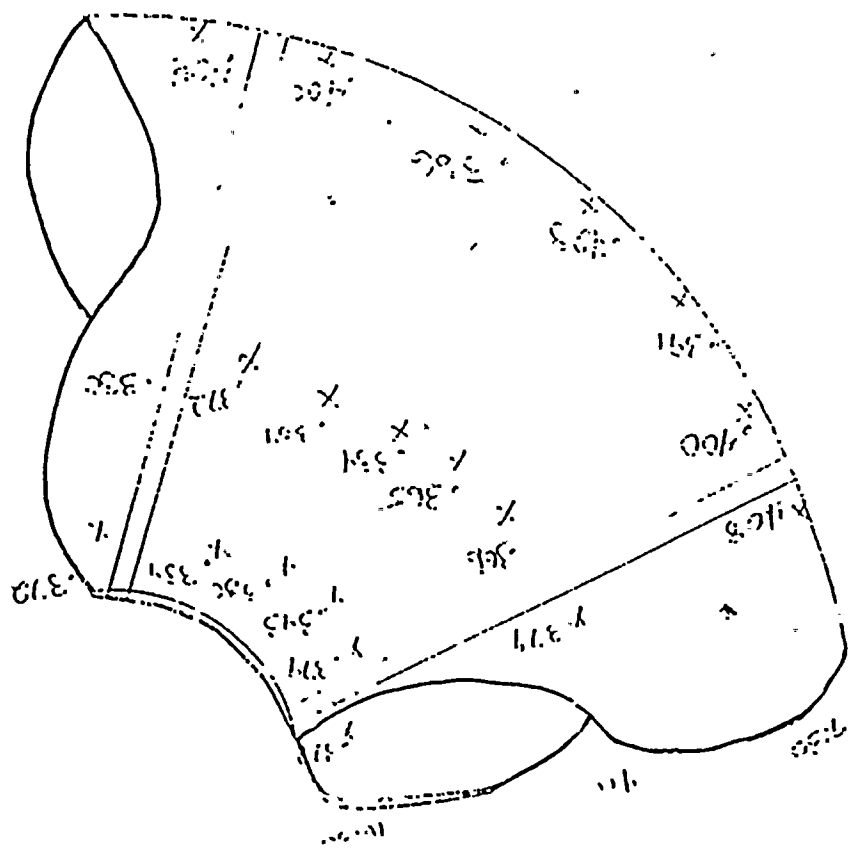


Attachment 1  
Sht. 6 of 10

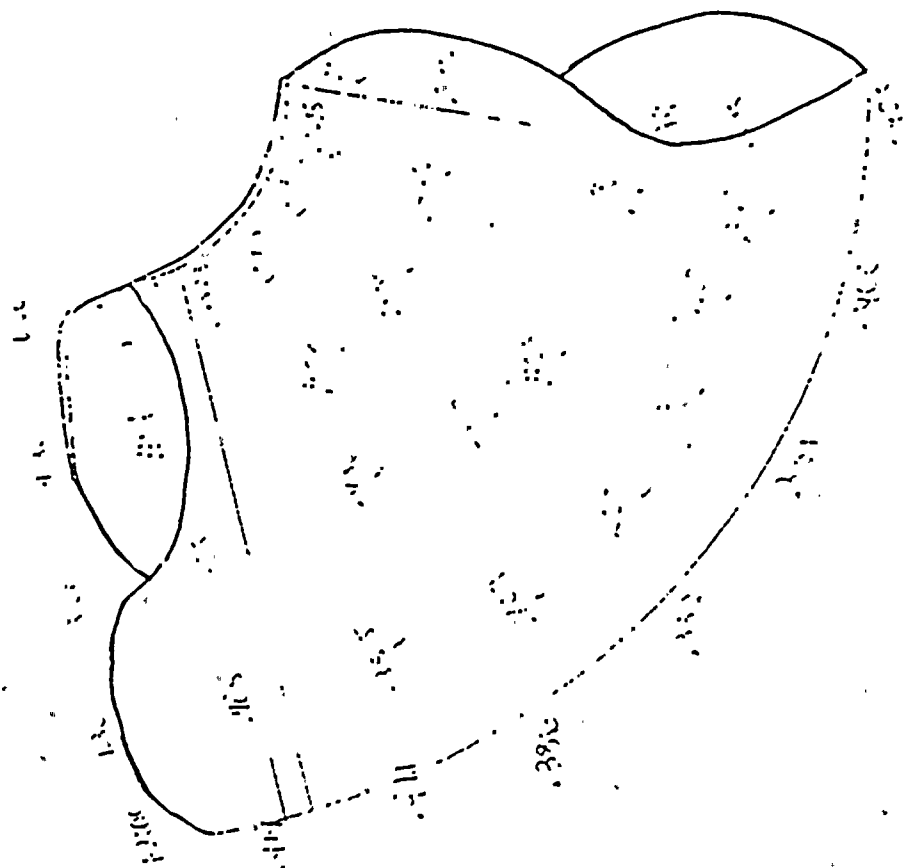




Heath 4A Line 2-B-156  
 E1B60 C  
 March 51





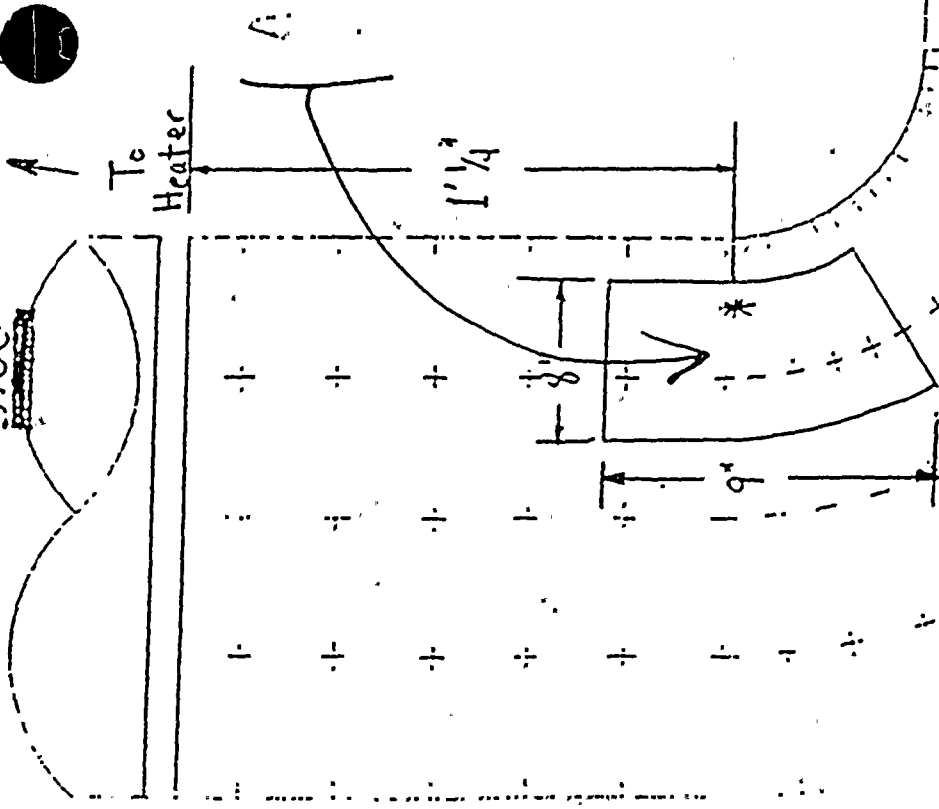








3:00



March 54



3:00

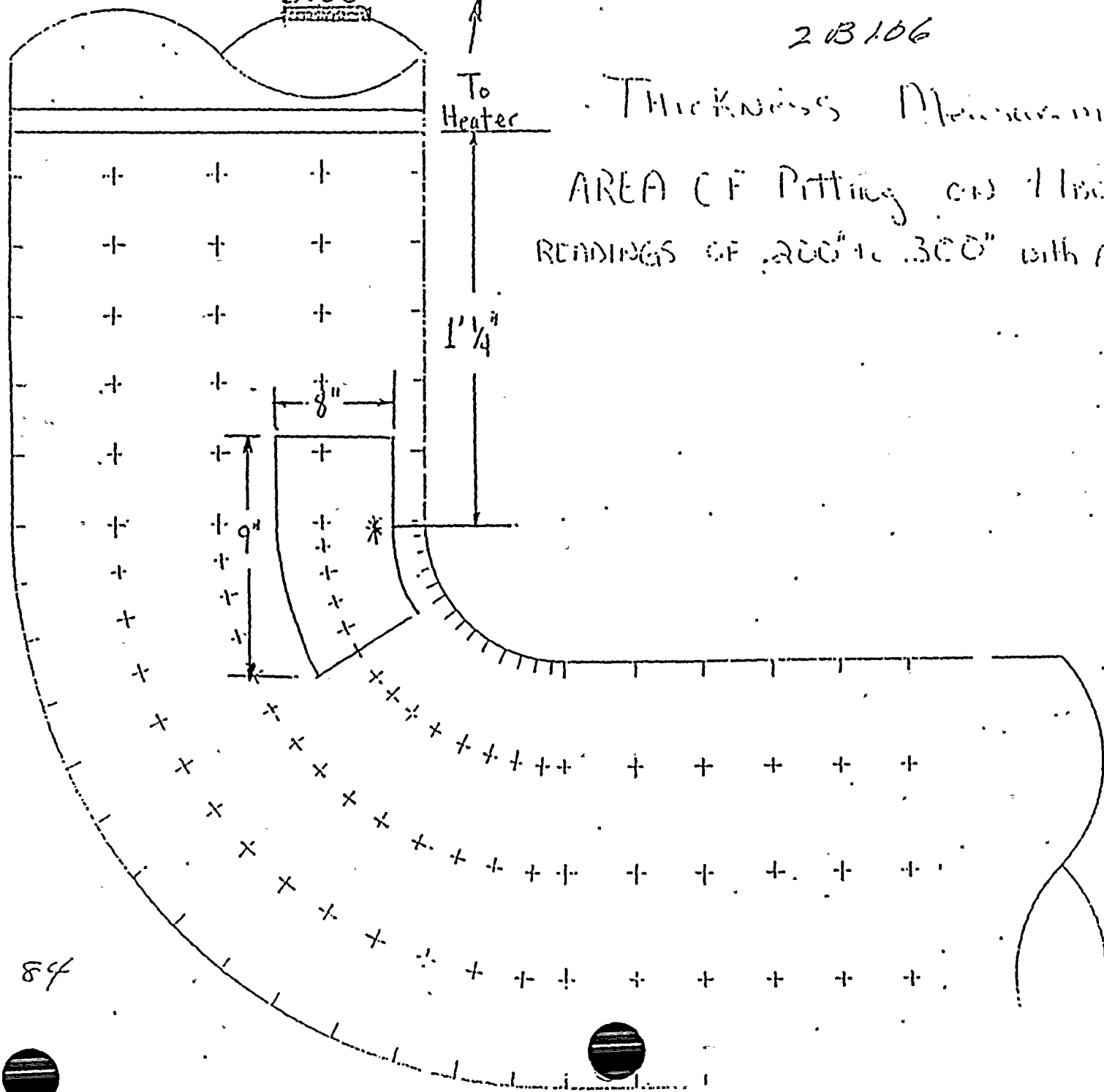
2 B 106

To  
Heater

Thickness Measurement:

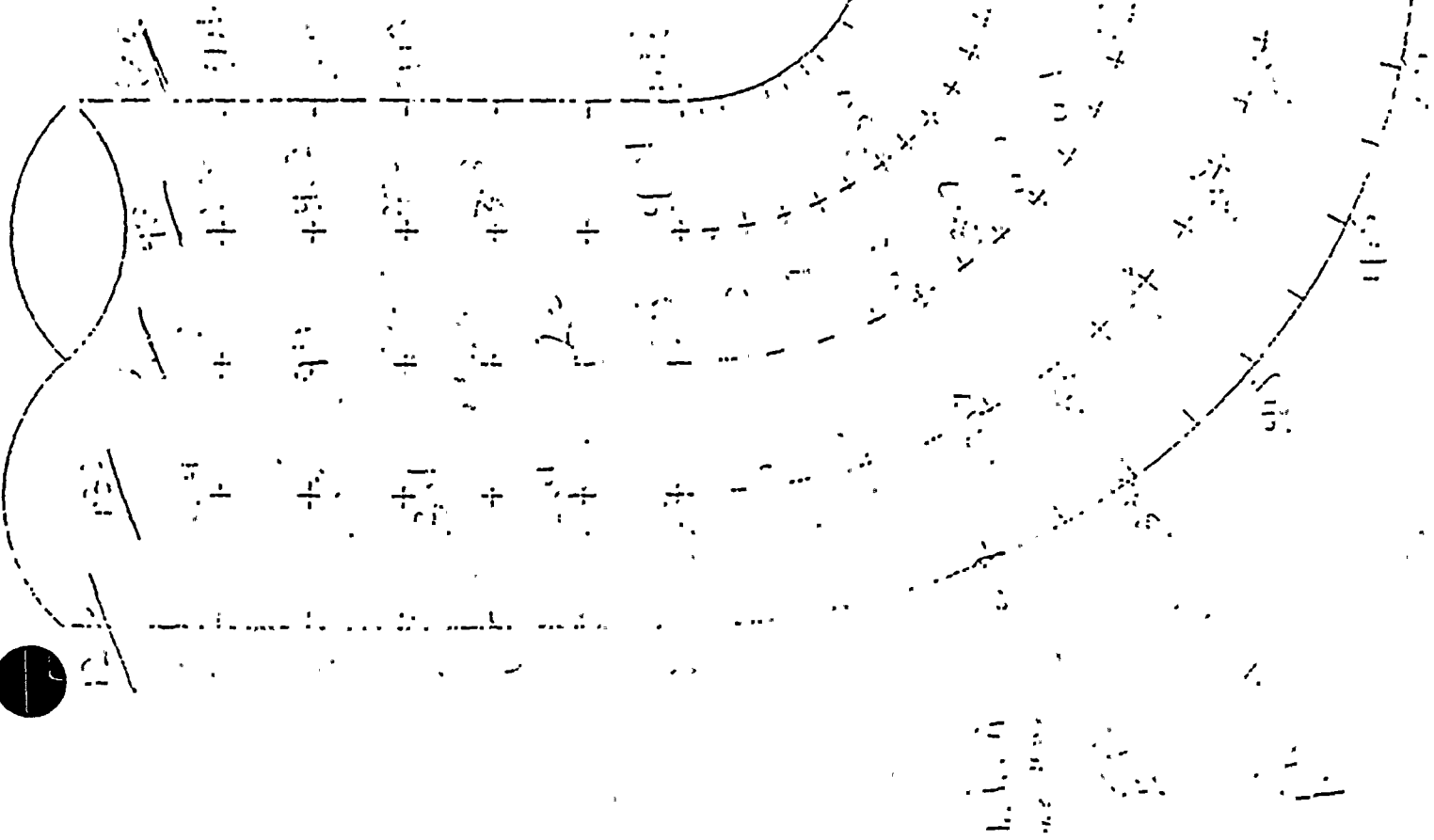
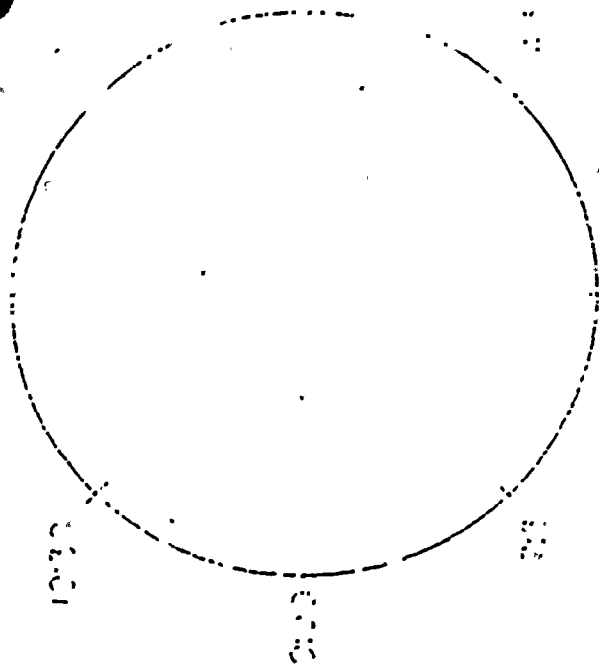
AREA OF Pitting on 1 lb. "13"

READINGS OF 200" to 300" with a Load 180"



March 84







12:00

1:30

3:00

4:30

6:00

415

394

416

492

411

415

397

394

402

411

398

351

352

396

410

415

+

409

393

354

200

+

421

390

4218

404

418

392

+

302

+

415

397

337

+

317

359

421

439

21A

1600

1600 D

each "84"

409

394

+

397

+

322

+

339

+

413

+

415

+

413

398

394

+

397

+

385

+

373

+

392

+

426

+

404

+

355

418

318

+

398

+

417

+

413

+

360

+

401

+

405

+

359

4105

360

+

401

+

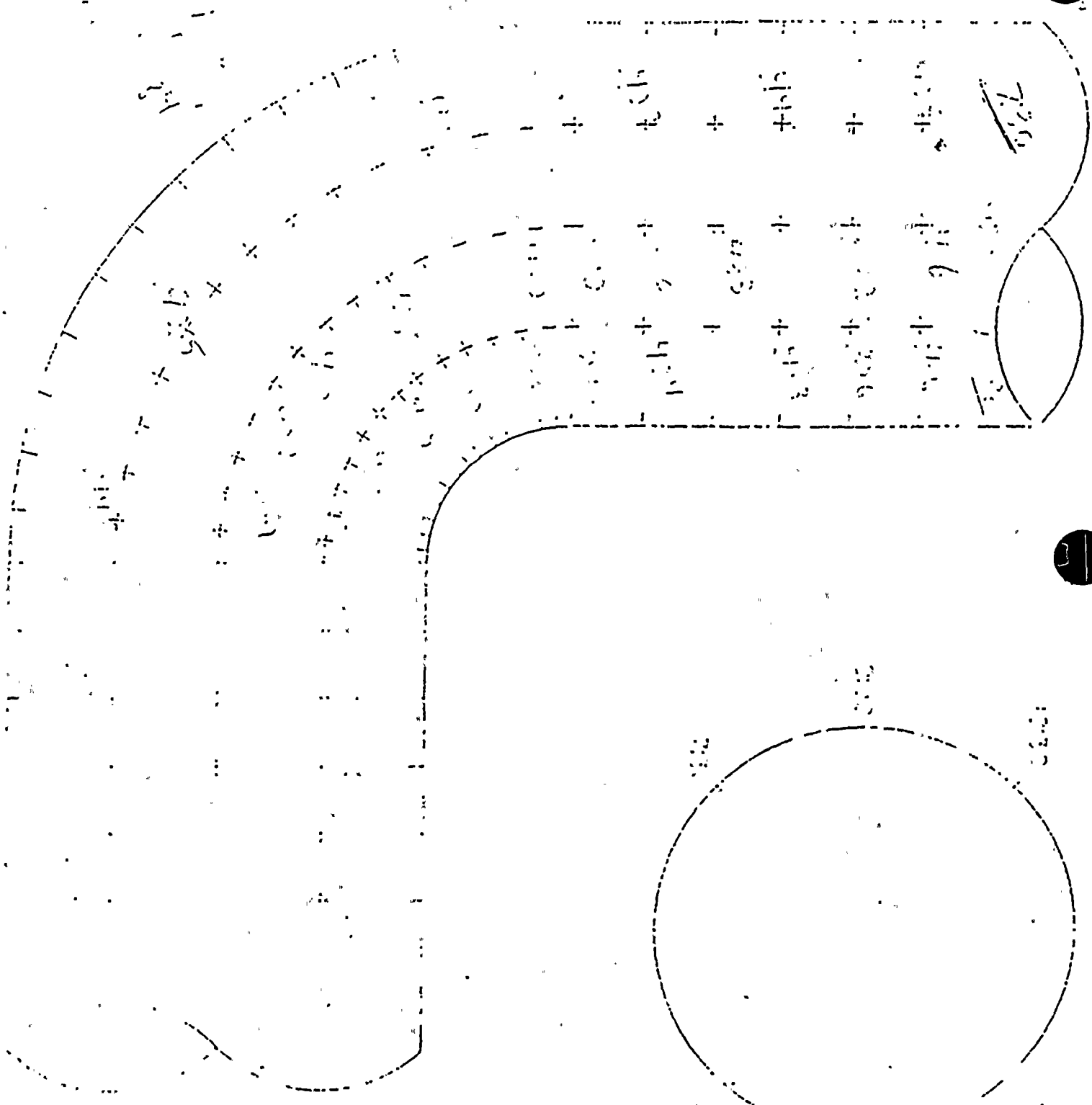
405

+

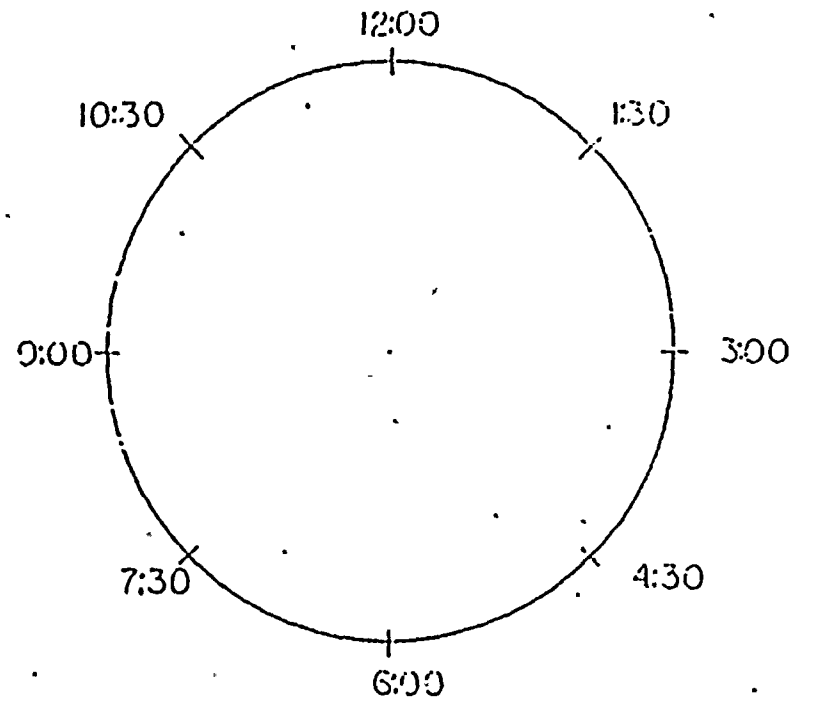
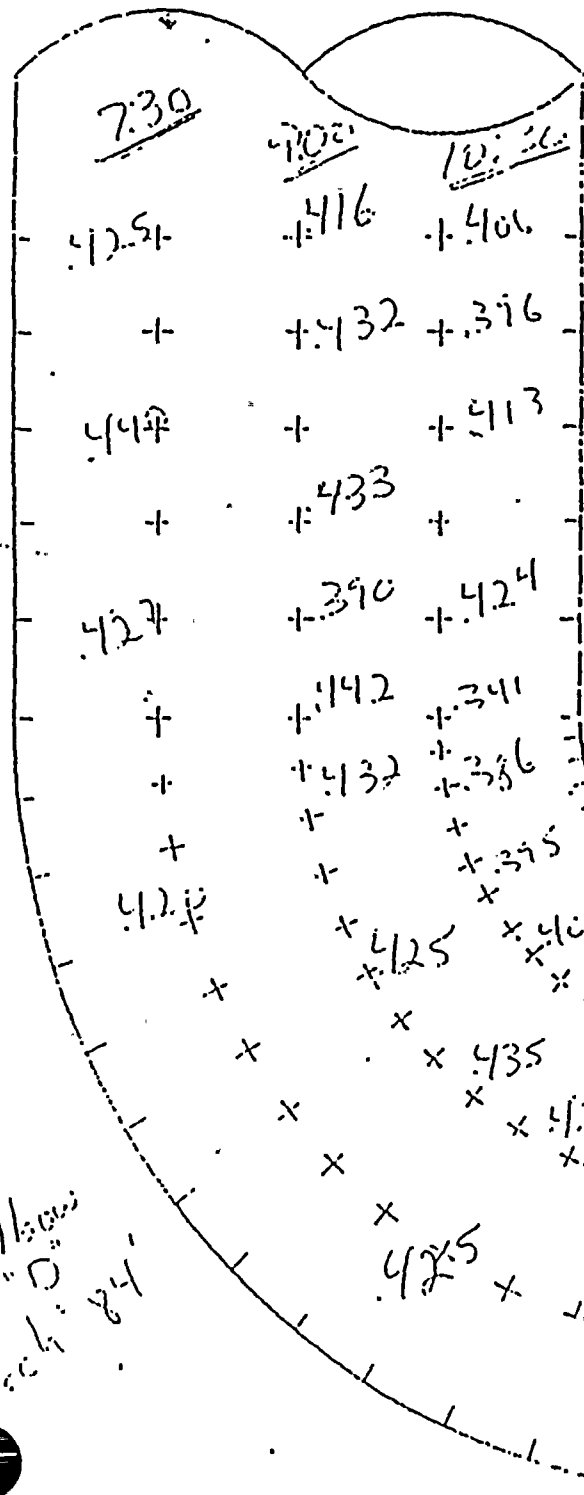
359



Block 11  
me 3/2/00







Hester A  
Mar 2-8-106

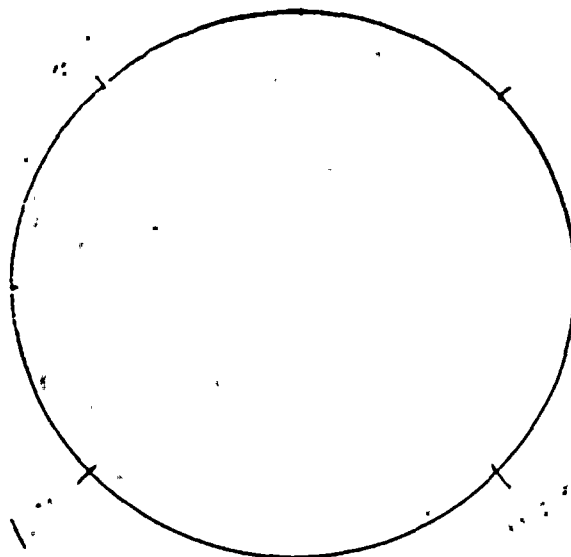
Ellen  
March 24



1. P. to top of pipe  
 on 100' to 100' P.L.  
 7" and 4" P.L.C.

Bottom of Pipe 1.00'  
 Top of Pipe 3.00'

4" Spacing.



Pressure of last readings on elev. 1.0'  
 suggested that this line may not be  
 at diameter of elev. 1

	1	2	3 12"	4	5	6 24"	7	8	9 36"
12:00	.354	.360	.356	.356	.349	.348	.347	.354	.360
1:30	.359	.374	.364	.372	.373	.365	.360	.369	.378
3:00	.367	.375	.376	.382	.387	.383	.375	.371	.383
4:30	.382	.377	.380	.388	.386	.387	.380	.372	.362
6:00 (Top of Pipe)	.381	.390	.367	.372	.380	.382	.380	.379	.378
7:30	.358	.365	.357	.354	.358	.360	.367	.359	.368
9:00	.359	.358	.356	.350	.346	.368	.368	.358	.361
10:30	.358	.364	.355	.371	.350	.344	.351	.358	.363

Comment. Readings look O.K.

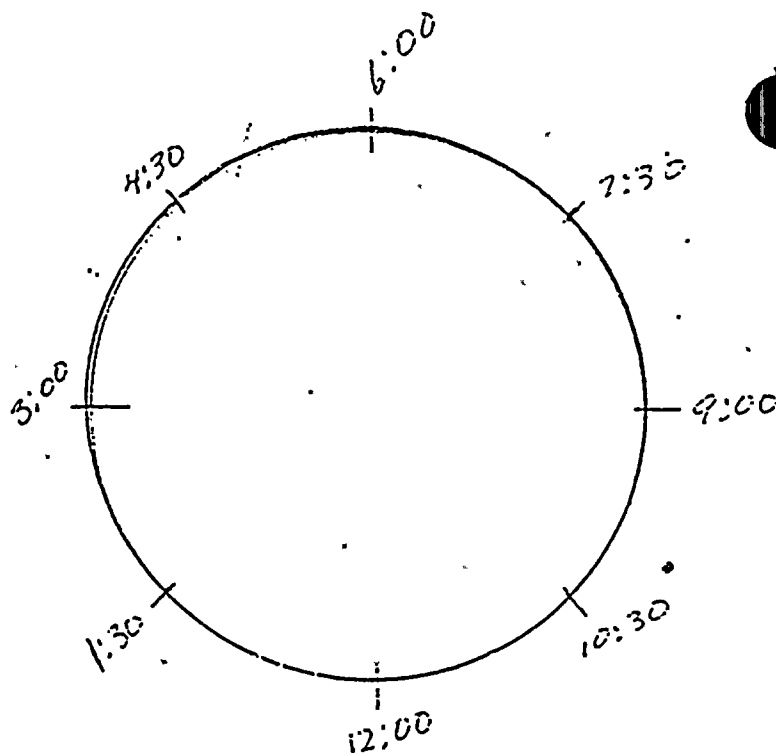
1.00' to 1.00'



3 Ft. Section of Pipe  
on 2BD106 between Ell  
"D" and 45° Ell C.

Bottom of Pipe @ 12:00  
Top of pipe @ 6:00.

4" Spacing.



	1	2	3 12"	4	5	6 24"	7	8	9 36"
12:00	.354	.360	.356	.356	.349	.348	.347	.354	.360
1:30	.359	.374	.364	.372	.373	.365	.360	.369	.378
3:00	.367	.375	.376	.382	.387	.383	.375	.371	.383
4:30	.382	.377	.380	.388	.386	.387	.380	.372	.362
6:00 (Top of Pipe)	.381	.390	.367	.372	.380	.382	.380	.379	.378
7:30	.358	.365	.357	.354	.358	.360	.367	.359	.368
9:00	.359	.358	.356	.350	.346	.368	.368	.358	.361
10:30	.358	.364	.355	.371	.350	<u>.344</u>	.351	.358	.363











10:30

9:00

7:30

6:00

← 45° FITTING

LP HEATER 4B LINE 2-B-107  
ELBOW "A"

NOTE: THIS SIDE OF ELBOW FACES THE CONDENSER.

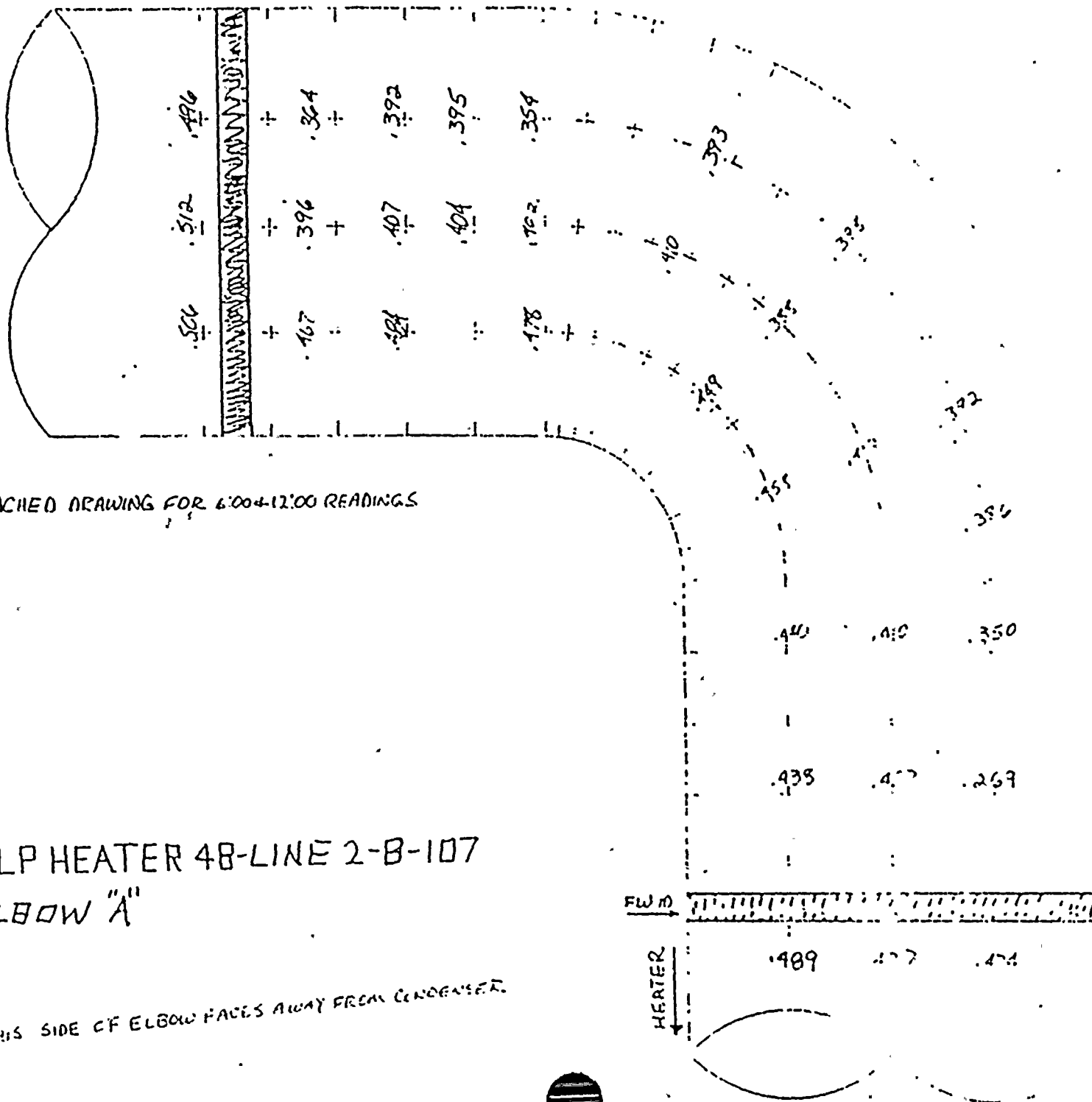
FLUID →

HEATER  
→

SOCKET  
WELD  
FOR  
HIX  
402

Attachment 2  
Sht. 2 of 9



6:00

SEE ATTACHED DRAWING FOR 6:00-12:00 READINGS

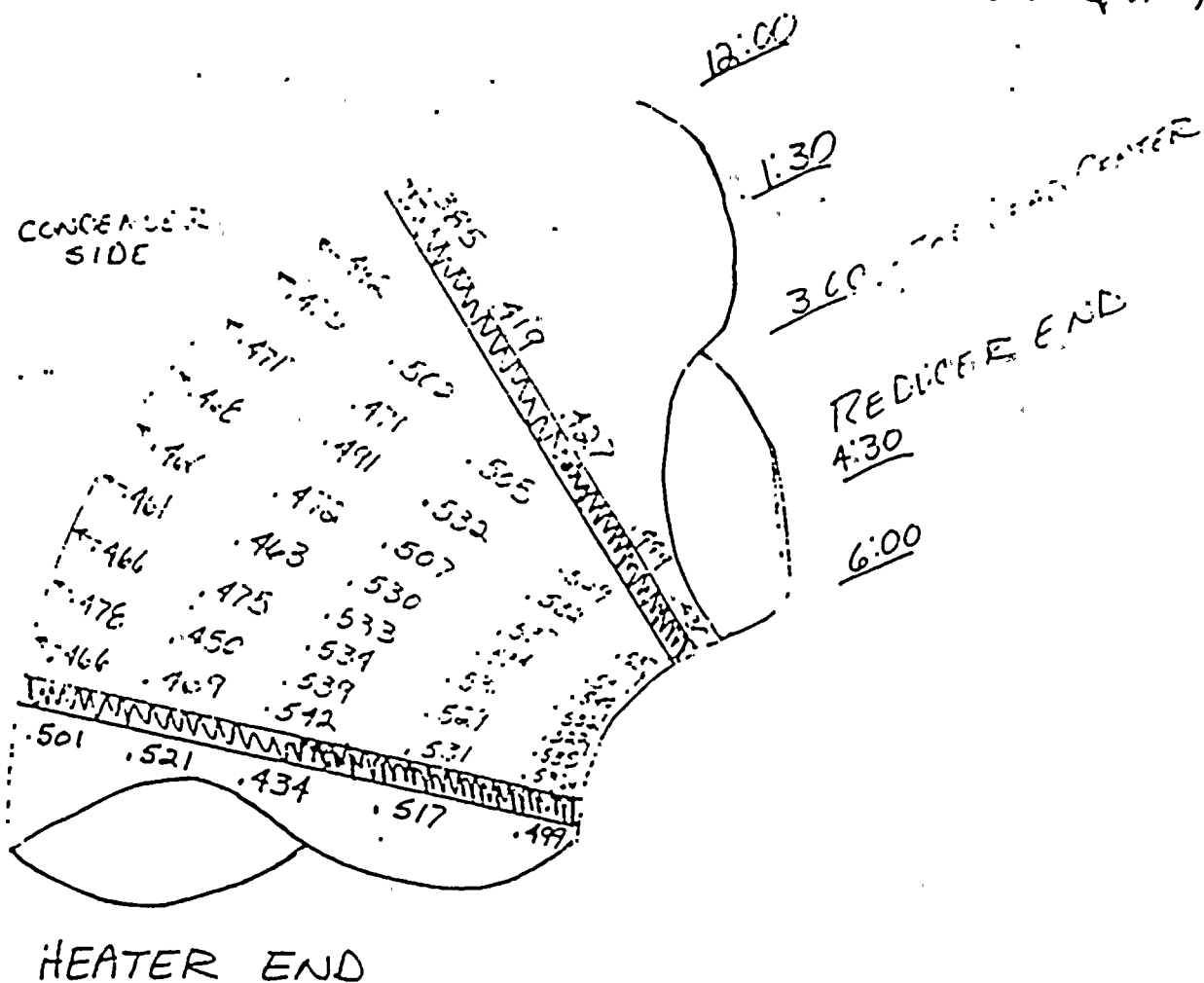
UULP HEATER 48-LINE 2-B-107  
ELBOW "A"

NOTE: THIS SIDE OF ELBOW FACES AWAY FROM CONDENSET.

Attachment 2  
Sht. 3 of 9



Attachment 2  
 SH. 4 OF 9.



U II LP HEATER AB-LINE 2-B-107  
 45° FITTING "B"





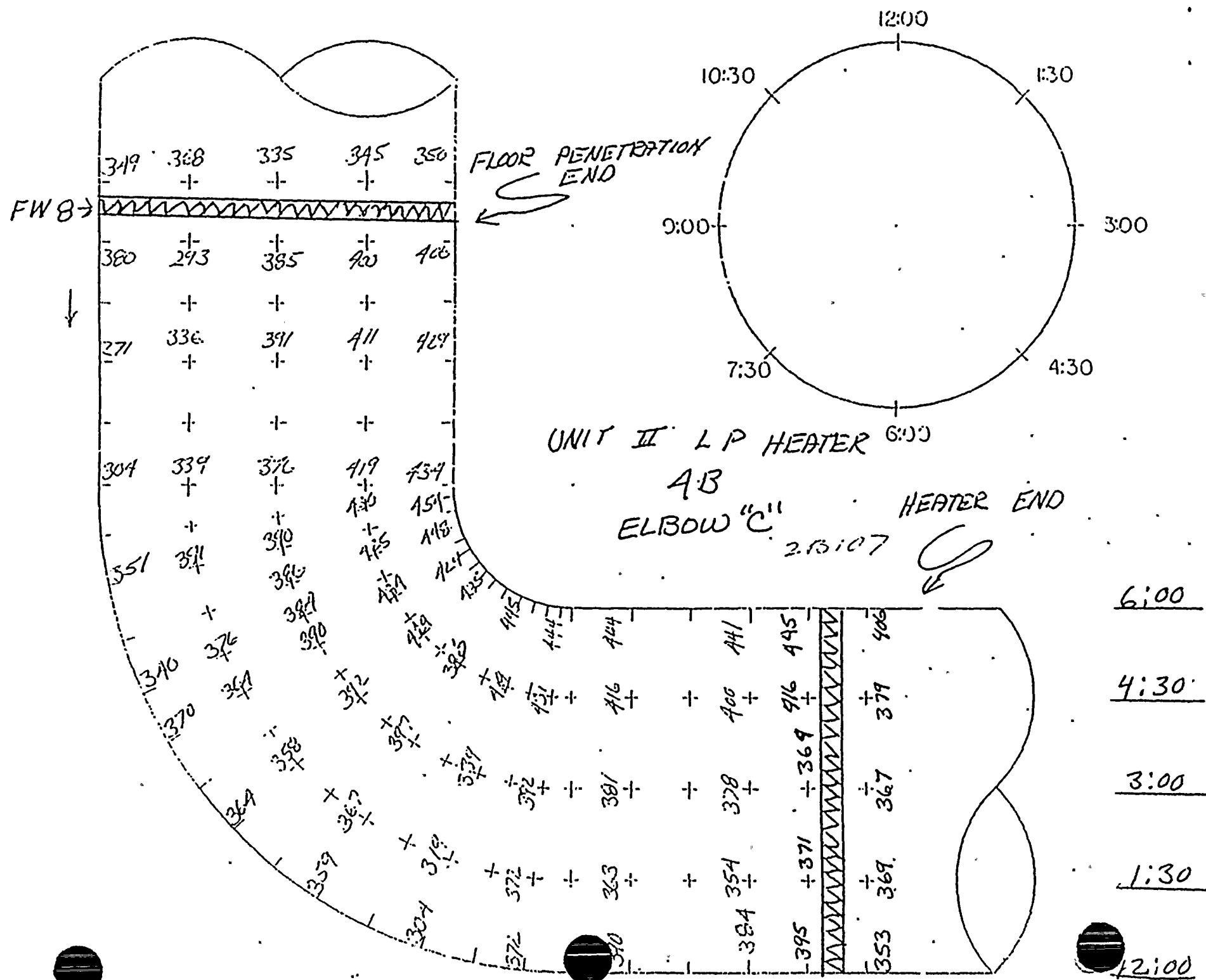
SEE ATTACHED DRAWING  
FOR 6:00+12:00 READINGS

UILLP HEATER 4B LINE 2-B-107  
45° FITTING "B"











FLOOR PENETRATION END

UNIT II LP HEATER AB

ELBOW "C"

FW 8 →

347  
|  
345  
|  
385  
|

378  
|  
401  
|  
421  
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350  
|  
436  
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430  
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252  
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42  
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433  
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HEATER END

6:55

7:30

9:00

10:30

12:00

Attachment 2

SH. 7 OF 9

311 314 350

412 438 505

415 438 438

415 438 438

415 438 438

415 438 438

415 438 438

415 438 438

415 438 438

415 438 438

415 438 438

415 438 438

415 438 438

415 438 438

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415 438 438

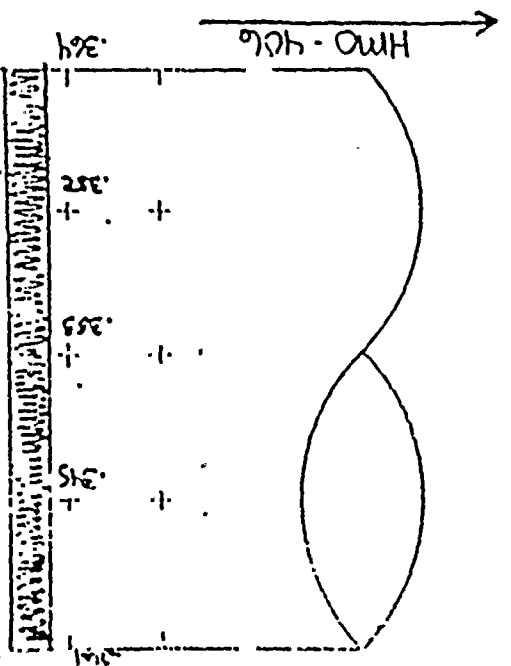
415 438 438

415 438 438

415 438 438

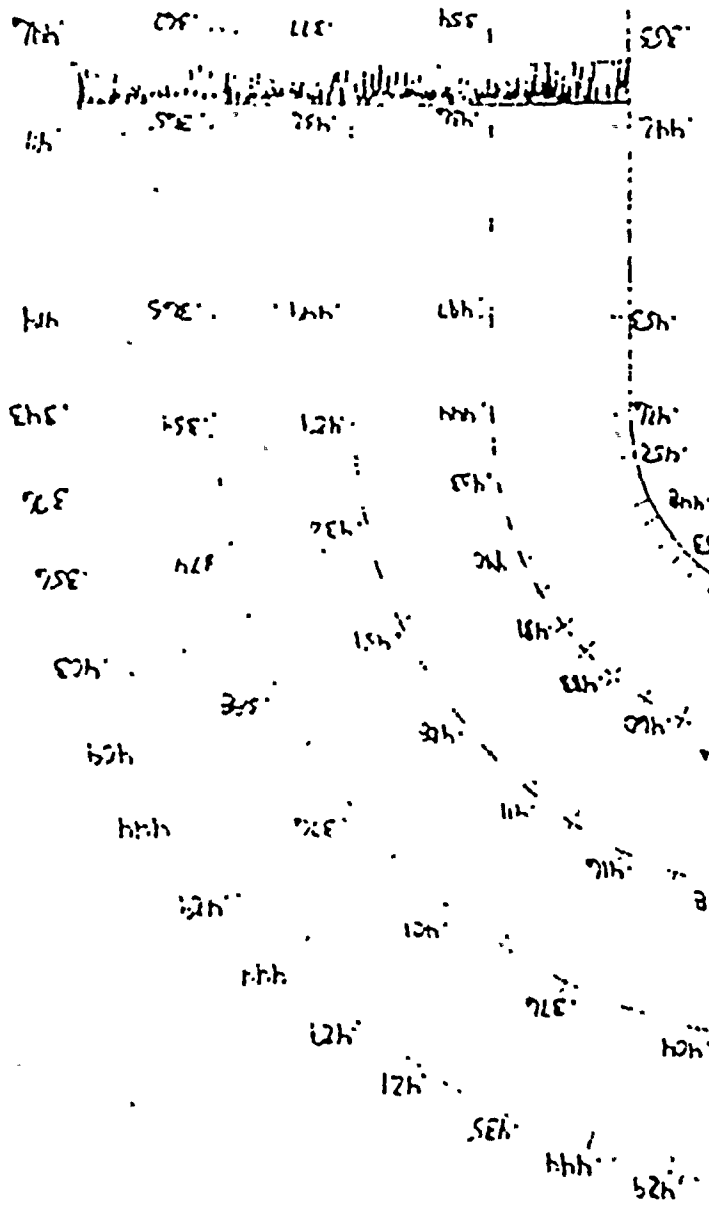


6:00  
7:30  
9:00  
10:30



L.R. HEMER 4B  
2:3107  
Elbow D

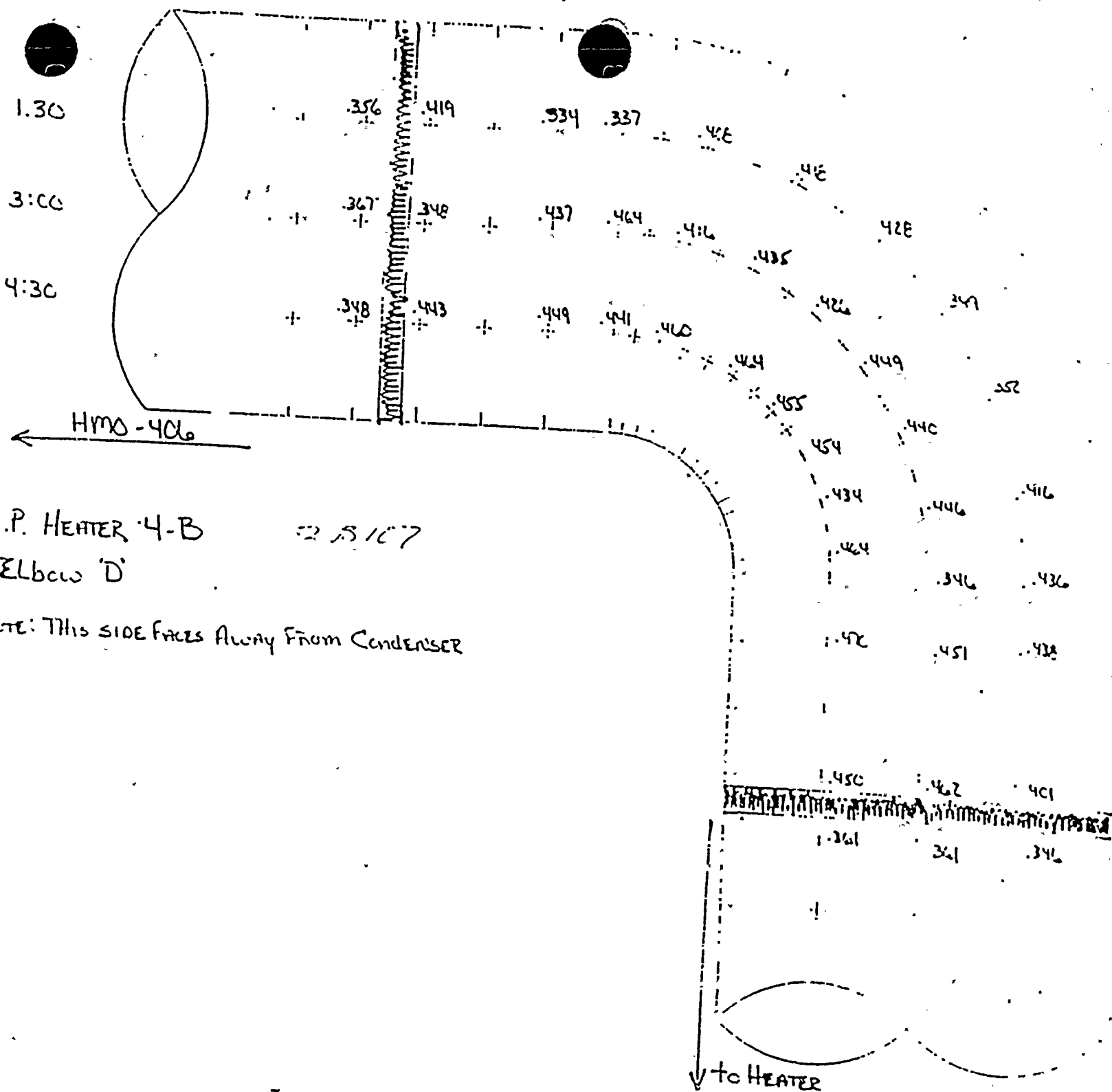
NOTE: THIS SIDE OF ELBOW FEELS CONDENSED



Attachment W. 2  
SH. 8 OF 9

EL. 609





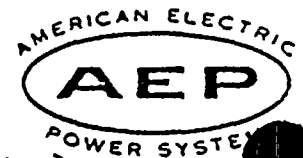
L.P. HEATER 4-B  
 ELbow 'D'

NOTE: THIS SIDE FACES AWAY FROM CONDENSER

Attachment 2  
 Sit. 9 of 9  
 EL. 669'



*Handwritten signature*  
AMERICAN ELECTRIC POWER SERVICE CORPORATION



*File  
Extraction  
Piping Erosion  
4.6.3.13.2.2*

DATE: March 16, 1983  
SUBJECT: D. C. Cook Plant Units 1 & 2  
INPO-SOER #82-11  
Erosion of Extraction Steam Piping

FROM: T. W. Baker

TO: 1. S. H. Steinhart 4. M. P. Alexich  
2. T. J. Seery 5. T. J. Seery  
3. S. Milioti

The subject INPO-SOER describes the degradation of the Turbine Extraction Piping due to steam erosion. Prior to receipt of the subject INPO-SOER our response to IE Information Notice No. 82-22 (dated 10/26/82) discussed the failures in the Turbine Extraction Piping and the steps we intended to take to identify and resolve this problem at the D. C. Cook Nuclear Plant.

Unit #2

During the last Unit #2 refueling outage (December '82 thru January '83) ultrasonic or internal visual inspections were made of all the extraction stages from the turbine and the high pressure turbine exhaust to the reheater. The ultrasonic readings were made on the bleed steam lines to the #5 and #6 heaters. The readings indicate that there is no erosion problem in these extraction lines. (very slight if any). The bleed steam lines to the #1, #2 and #3 heaters were inspected by crawling thru and performing visual examinations. There is no erosion problem in these extraction lines.

The high pressure turbine exhaust was inspected internally and has a very serious erosion problem at the changes in direction. The bleed steam to the #4 heaters emanates from the H.P.T.E. and it also has a bad erosion problem at changes in direction. The pipe specifications have been revised to allow the use of stainless steel elbows and tees and pipe so that eroded areas may be replaced with suitable material. Several elbows and tees in the extraction lines to the #4 heaters were replaced with S.S. fittings during this last outage.



The changes in direction in the 58" H.P.T.E. pipes were repaired by laying on stainless steel weld metal in areas that had eroded. This is interim "fix", and studies are being made to determine the best and most economical way to handle the erosion in the H.P.T.E. on Unit #2.

#### Unit #1

We have not yet completed our inspection of the Unit #1 extraction piping. This will be completed during the re-fueling outage in July. However, we feel that erosion is not a problem in Unit #1 based on the ultrasonic readings made to date on the high pressure extractions and the drier steam associated with the Unit #1 turbine. Attached is a table showing the pressure, temperature, steam quality and average velocities of the Unit #1 and Unit #2 extraction pipes.

The U.T. readings taken on Unit #2 extractions to the #5 and #6 heaters show that erosion is almost nil. The quality of the Unit #1 steam is slightly better than Unit #2 and the velocities are comparable. We do not believe we will find an erosion problem in Unit #1 on these lines.

The Unit #1 H.P.T.E. and extraction to #4 heaters has a very slight superheat and therefore we do not expect to find erosion in these lines on Unit #1.

The extraction pipes to the #3 carries steam with a quality of 0.9975. We do not expect to find erosion here either.

The extraction steam to the #2 heaters on Unit #1 has a slightly lower quality than the steam to the #2 heaters on Unit #2 (0.9473 versus 0.9763). However this is compensated for by a much lower Unit #1 velocity (116 ft/sec. in Unit #1 versus 184 ft/sec.s in Unit #2). Since a visual inspection of the Unit #2 piping did not indicate an erosion problem in Unit #2, we do not expect to find erosion in Unit #1.

The extraction steam to the #1 heaters in Unit #1 has the lowest quality steam of all the extractions. However the pipes are sized to provide a very low velocity (97 ft/sec.). If we are to find an erosion problem in Unit #1 this is where it would be.



In view of the wall thickness surveys that have already been made, and our review of steam qualities and velocities, we believe that the erosion problem is under control and is of no immediate concern - except for the Unit #2 H.P.T.E. is eroding badly at the changes in direction, this condition is presently under control through the lay-on of stainless steel weld metal on eroded areas. As stated previously we are studying various ways of eliminating this erosion problem on a permanent basis.

We agree with the recommendations of SOER 82-11 and have taken items 1 thru 4 inclusive into account in our evaluation of the erosion problem at the Cook Plant.

The only serious erosion problem we have at Cook is in the H.P.T.E. and extraction to the #4 heaters and is related to the poor quality steam - not to malfunctioning traps. However it would be well to heed the recommendation of item #5 and review operating procedures to ensure that traps are routinely inspected.

Attached for your reference is a copy of SOER #82-11 and a table of extraction steam velocities, temperatures qualities and pressures.

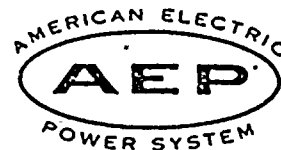
*A. W. Baker*  
A. W. Baker

TWB:dn

cc: S. H. Steinhart/R. F. Hering  
M. Marrocco/T. Durando/P & V File #24.2



INDIANA & MICHIGAN ELECTRIC COMPANY



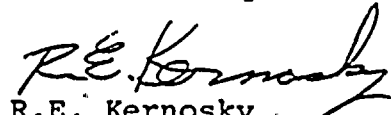
DATE: August 31, 1982

SUBJECT: Ultrasonic Measurement of Steam Piping

FROM: R.E. Kernosky

TO: M.J. Freidman

The attached reports are for the Bleed Steam Piping on Unit 1 that were requested by Mr. Santos.

  
R.E. Kernosky  
Senior QC Technician

/jas

attachments

cc: W.G. Smith, Jr./B.A. Svensson (w/o attachments)  
E.L. Townley (w/o attachments)  
J.F. Stietzel (w/o attachments)  
E.A. Morse (w/o attachments).  
File

INTRA-SYSTEM

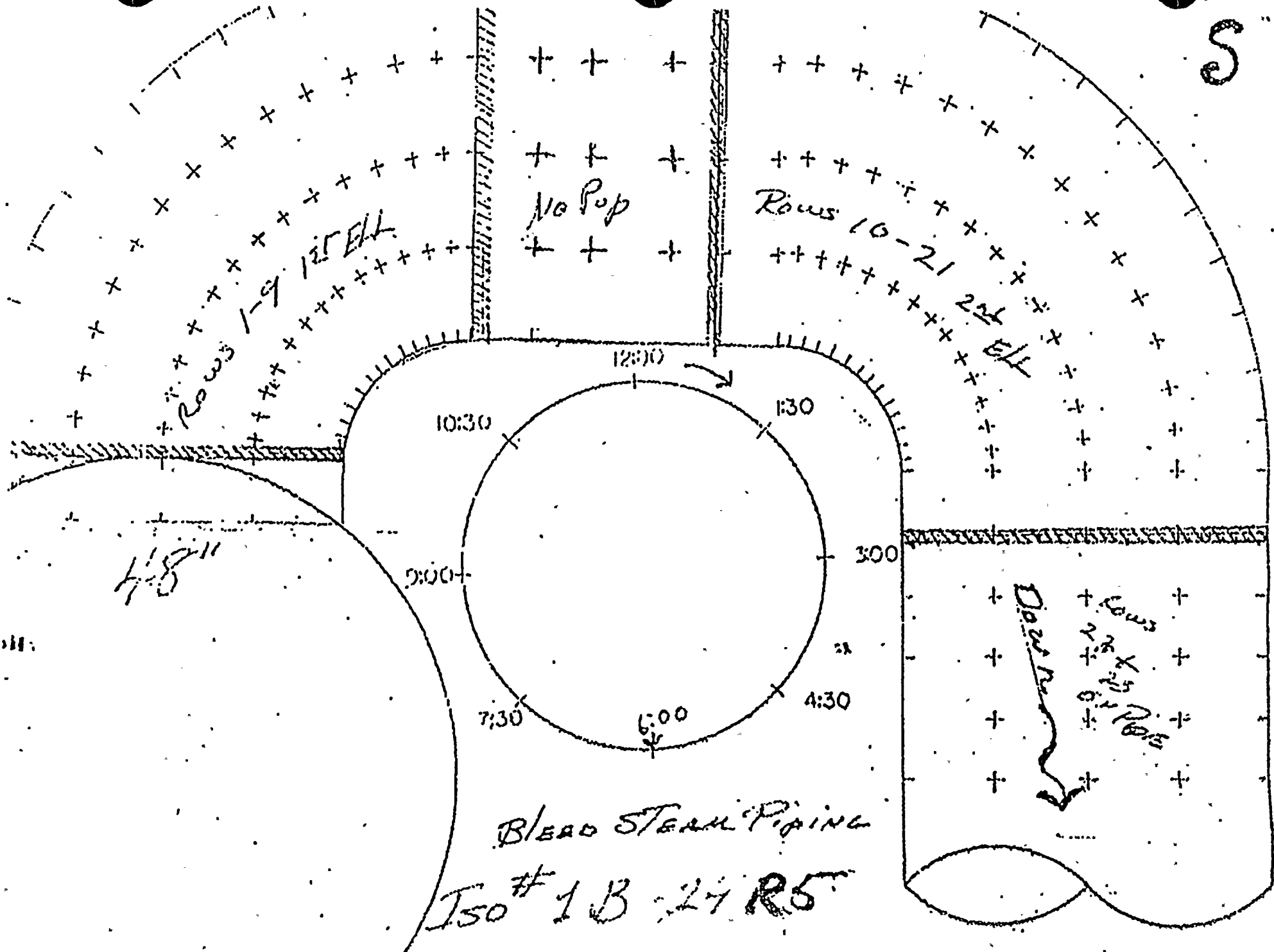


# BLEED STEAM PIPING

<u>DR</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.356	.383	.381	.384	.456	.506	.275	.367
2	.322	.329	.362	.412	.457	.521	.327	.340
3	.308	.304	.354	.390	.404	.492	.366	.350
4	.318	.305	.354	.415	.443	.443	.423	.416
5	.358	.345	.383	.416	.434	.459	.370	.417
6	.415	.372	.429	.365	.438	.459	.379	.478
7	.422	.385	.425	.375	.414	.495	.374	.468
8	.406	.373	.406	.405	.454	.451	.478	.470
9	.386	.408	.407	.393	.453	.458	.482	.401
0	.415	.372	.385	.384	.447	.544	.538	.410
1	.444	.426	.417	.454	.508	.526	.565	.460
2	.435	.477	.430	.457	.477	.549	.570	.568
3	.435	.425	.404	.442	.503	.556	.556	.547
4	.409	.438	.395	.453	.550	.569	.567	.540
	.406	.401	.395	.480	.554	.540	.571	.54
	.432	.396	.394	.476	.540	.564	.525	.445
	.423	.400	.402	.430	.550	.567	.523	.480
4	.466	.393	.384	.431	.551	.567	.555	.480
9	.445	.398	.422	.484	.551	.566	.534	.491
0	.471	.391	.429	.462	.553	.560	.552	.494
1	.429	.398	.406	.497	.555	.563	.559	.490
2	.332	.347	.429	.569	.550	.547	.515	.420
3	.358	.375	.452	.571	.552	.530	.527	.420



5





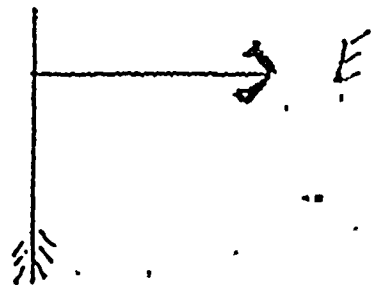
BLEED STEAM PIPING - 6A

<u>ON</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.708	.690	.688	.599	.582	.607	.645	.679
2	.794	.781	.761	.716	.675	*	*	*
3	.751	.750	.746	.732	.717	*	*	*
4	.788	.767	.757	.787	.790	*	*	*
5	.813	.795	.803	.714	.728	*	*	*
6	.719	.712	.700	.605	.609	.665	.719	.705
7	.530	.521	.523	.521	.508	.508	.465	.505
8	.528	.521	.522	.511	.528	.515	.518	.522
9	.601	.662	.687	.685	.606	.491	.544	.623
0	.515	.475	.480	.532	.541	.537	.551	.504

Inaccessible

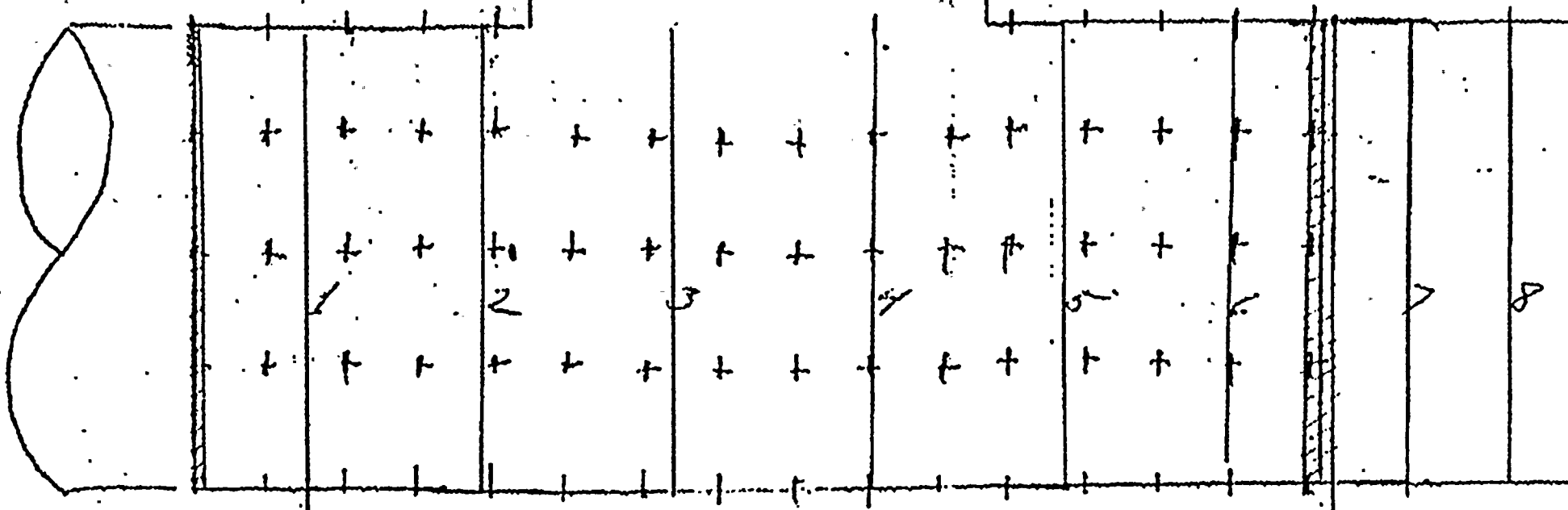


Blind Street  
E R



10

+ + +  
+ + 9 +



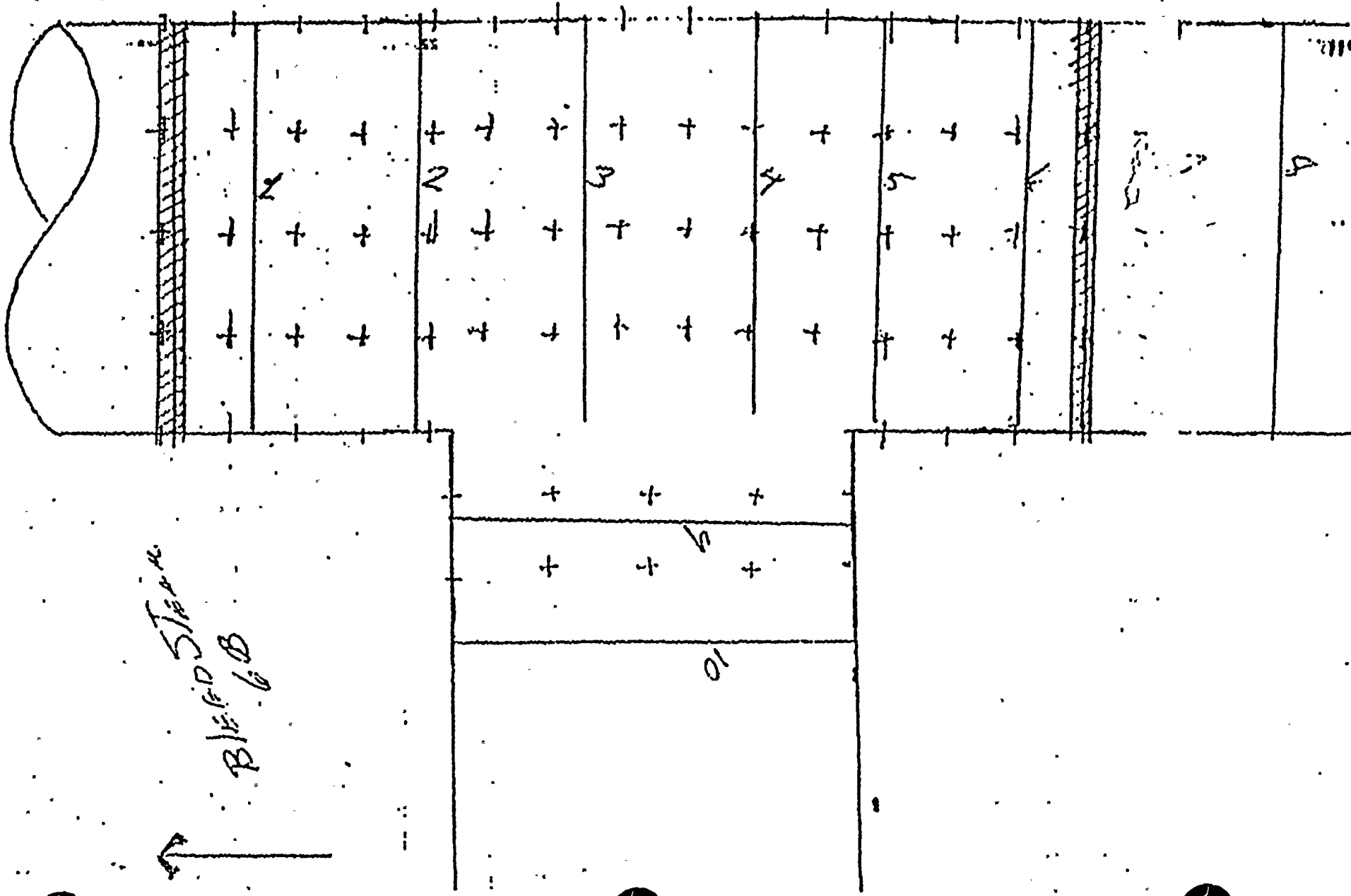


# BLEED STEAM PIPING - 6B

<u>OW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.628	.624	.625	.618	.632	.611	.599	.638
2	.695	.716	.723	.704	.682	*	*	*
3	.741	.743	.750	.755	.740	*	*	*
4	.836	.820	.814	.832	.828	*	*	*
5	.778	.761	.769	.773	.779	*	*	*
6	.684	.681	.680	.660	.658	.610	.588	.616
7	.528	.512	.480	.455	.478	.496	.489	.526
8	.549	.553	.522	.501	.504	.511	.512	.530
9	.559	.607	.673	.577	.653	.628	.588	.570
0	.507	.474	.479	.492	.528	.521	.520	.515

Inaccessible





Bldg 5  
6B





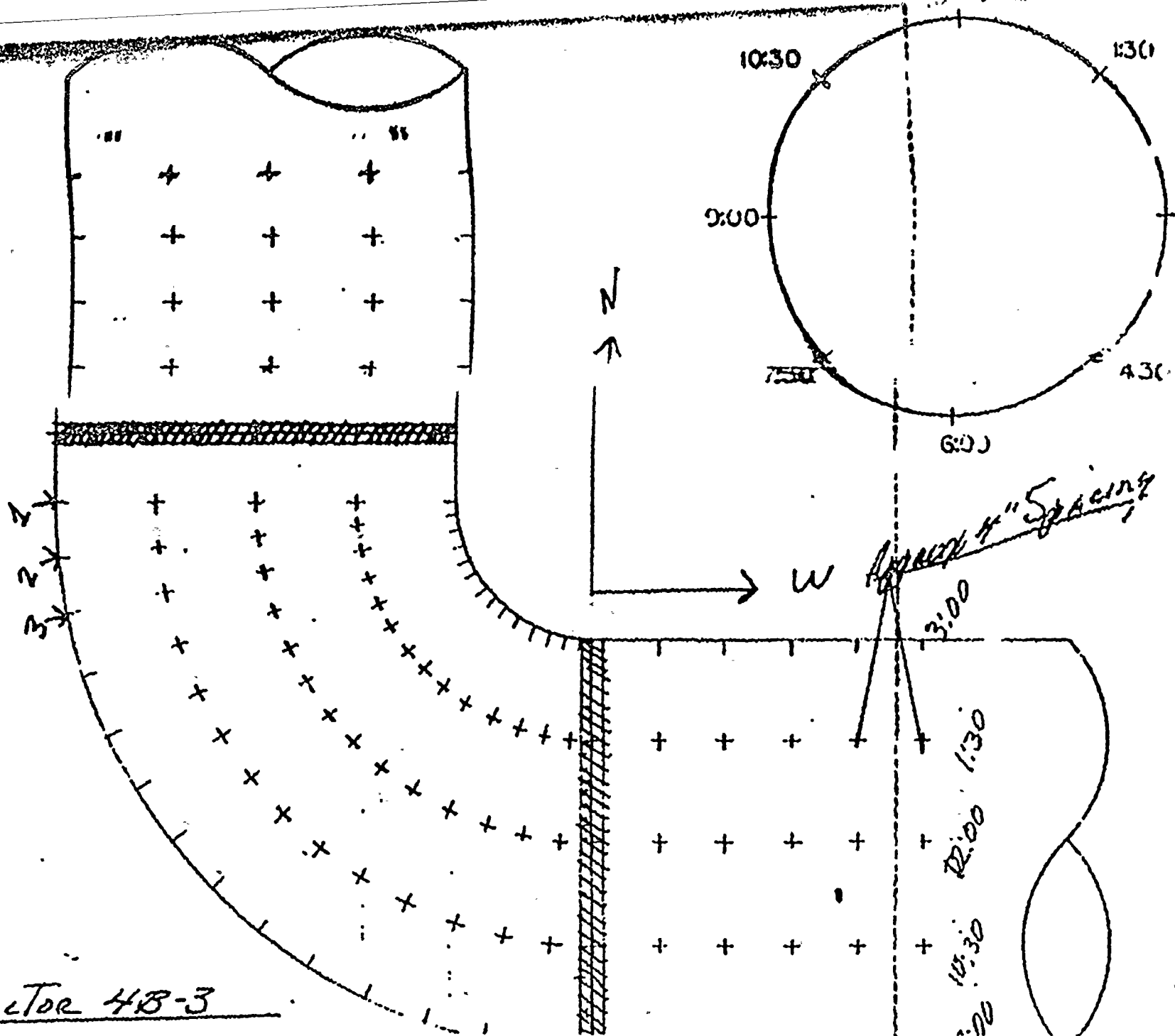
STEAM EXTRACTION LINES

4B-3

	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1.	.456	.457	.462	.453	.381	.447	.460	.444
2.	.458	.446	.438	.460	.446	.457	.478	.448
3.	.451	.450	.445	.444	.444	.472	.490	.458
4.	.460	.457	.472	.465	.440	.479	.481	.463
5.	.456	.450	.445	.443	.452	.488	.510	.459
6.	.470	.449	.444	.459	.464	.512	.535	.476
7.	.476	.445	.338	.450	.457	.510	.517	.456
8.	.484	.456	.442	.443	.450	.512	.534	.484
9.	.474	.441	.435	.438	.449	.507	.523	.495
10.	.482	.420	.410	.429	.448	.500	.537	.471
11.	.472	.446	.399	.436	.490	.499	.503	.472
12.	.420	.408	.376	.404	.388	.416	.431	.426

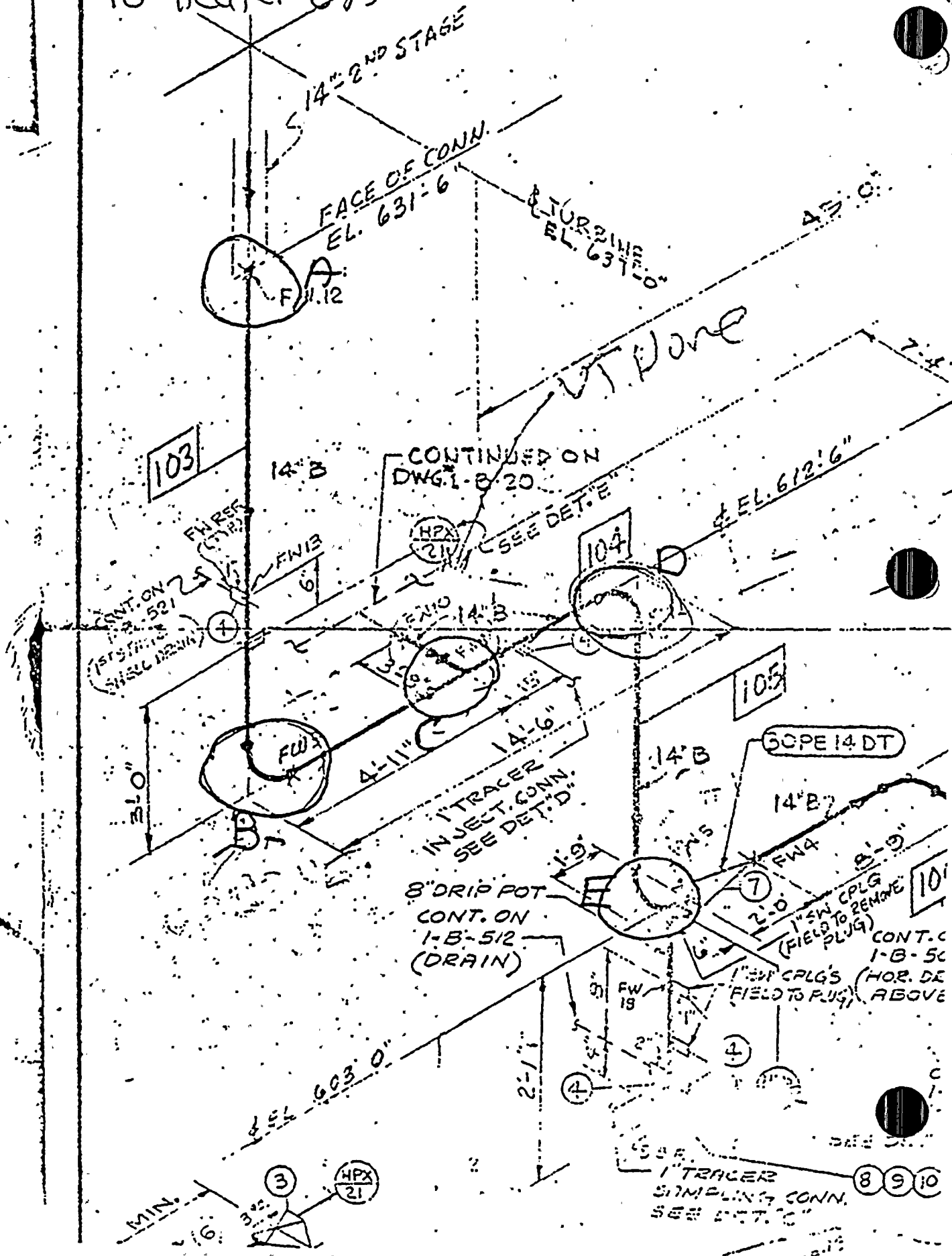


Extractor 4B-3





1-B-18 Rev 5  
To Heater 6A

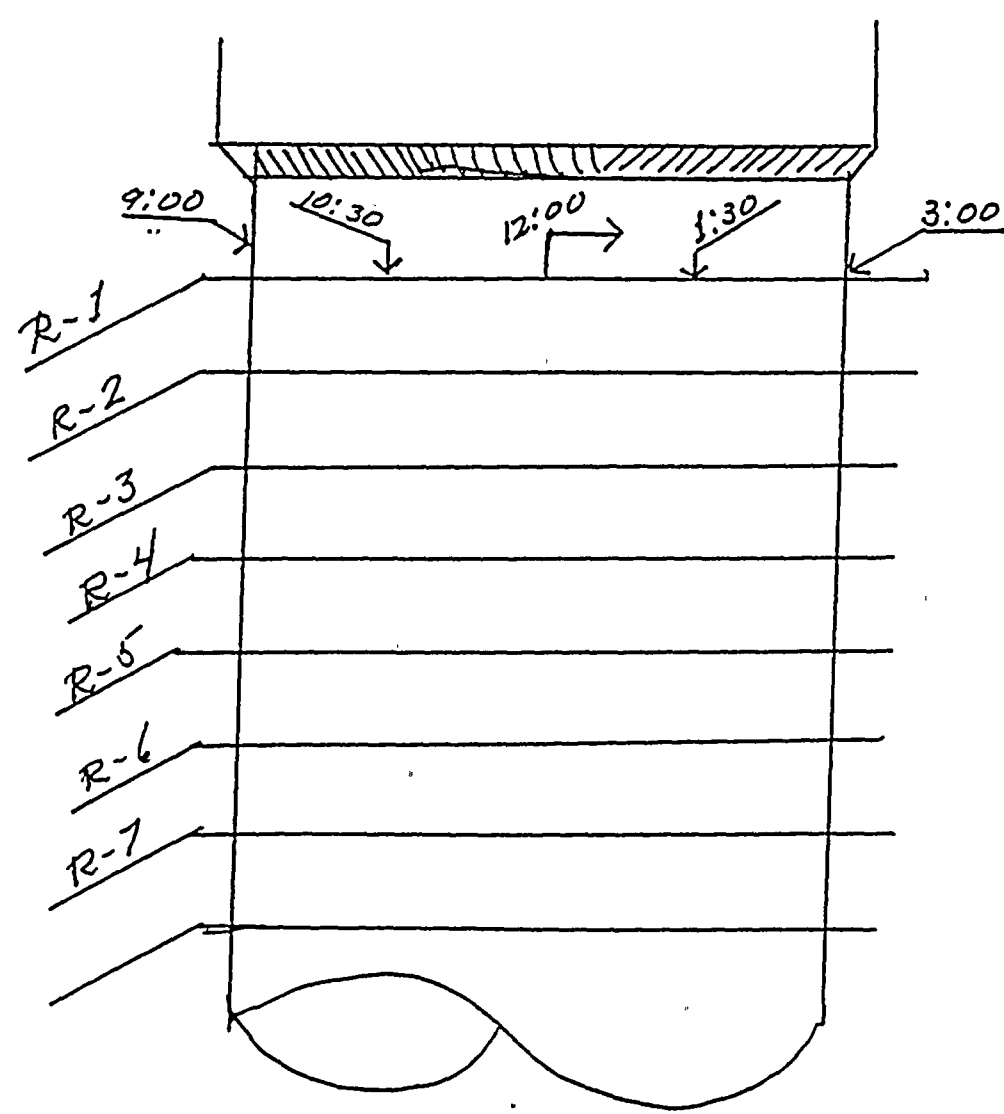




→ N

1 B 18-A

H.P. Turbine ↑



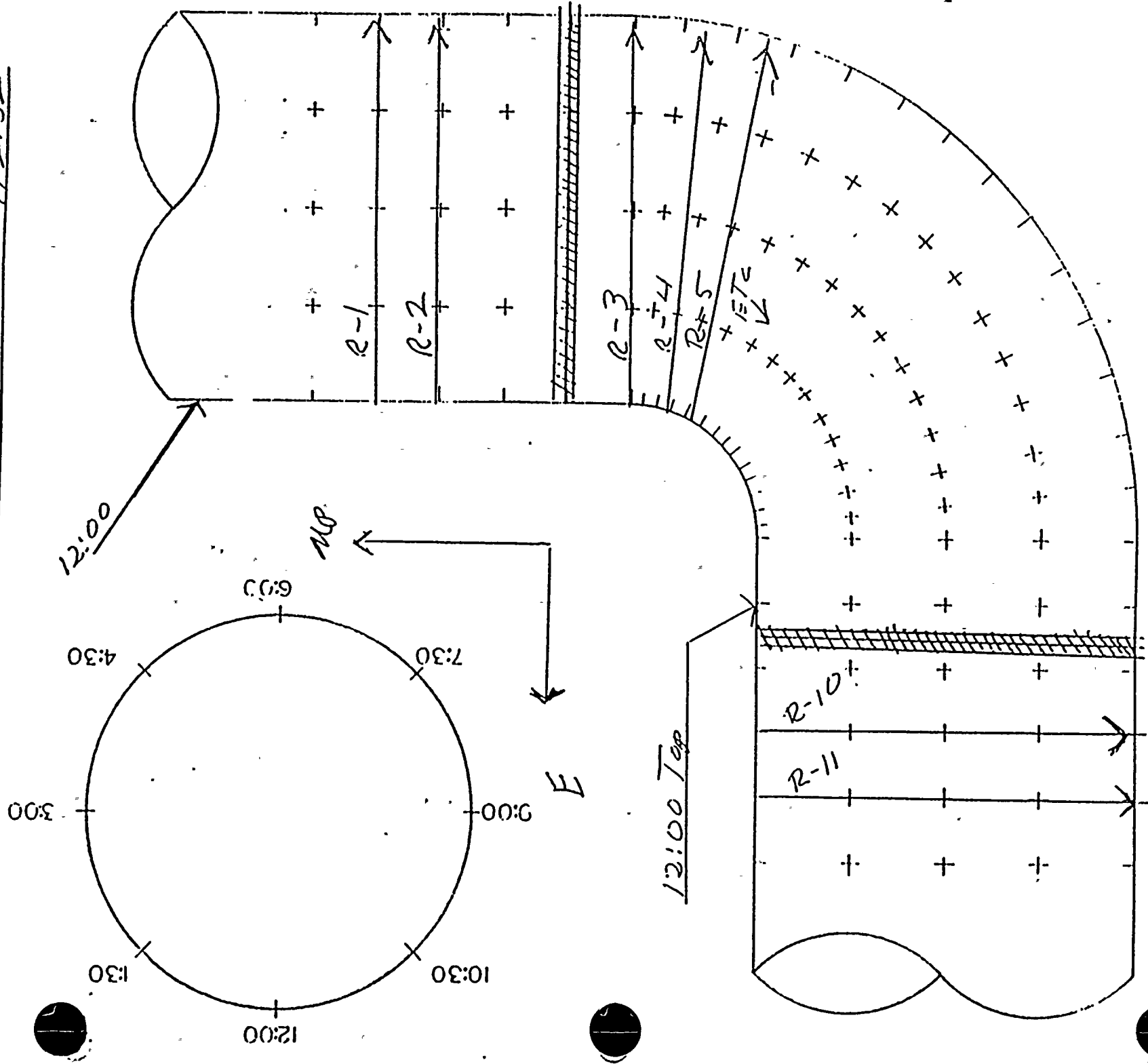


1B-18A

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.414	<u>.399</u>	.450	.417	.450	.487	.457	.480
2	.444	.438	.495	.465	.487	.483	.565	.476
3	.466	.469	.523	.501	.556	.543	.495	.474
4	.459	.420	.495	.522	.515	.548	.557	.503
5	.510	.480	.503	.510	.517	.547	.549	.536
6	.514	.503	.557	.529	.519	.545	.534	.533
7	.562	.515	.522	.516	.551	.552	.541	.540



LB-18-B 9/2/82





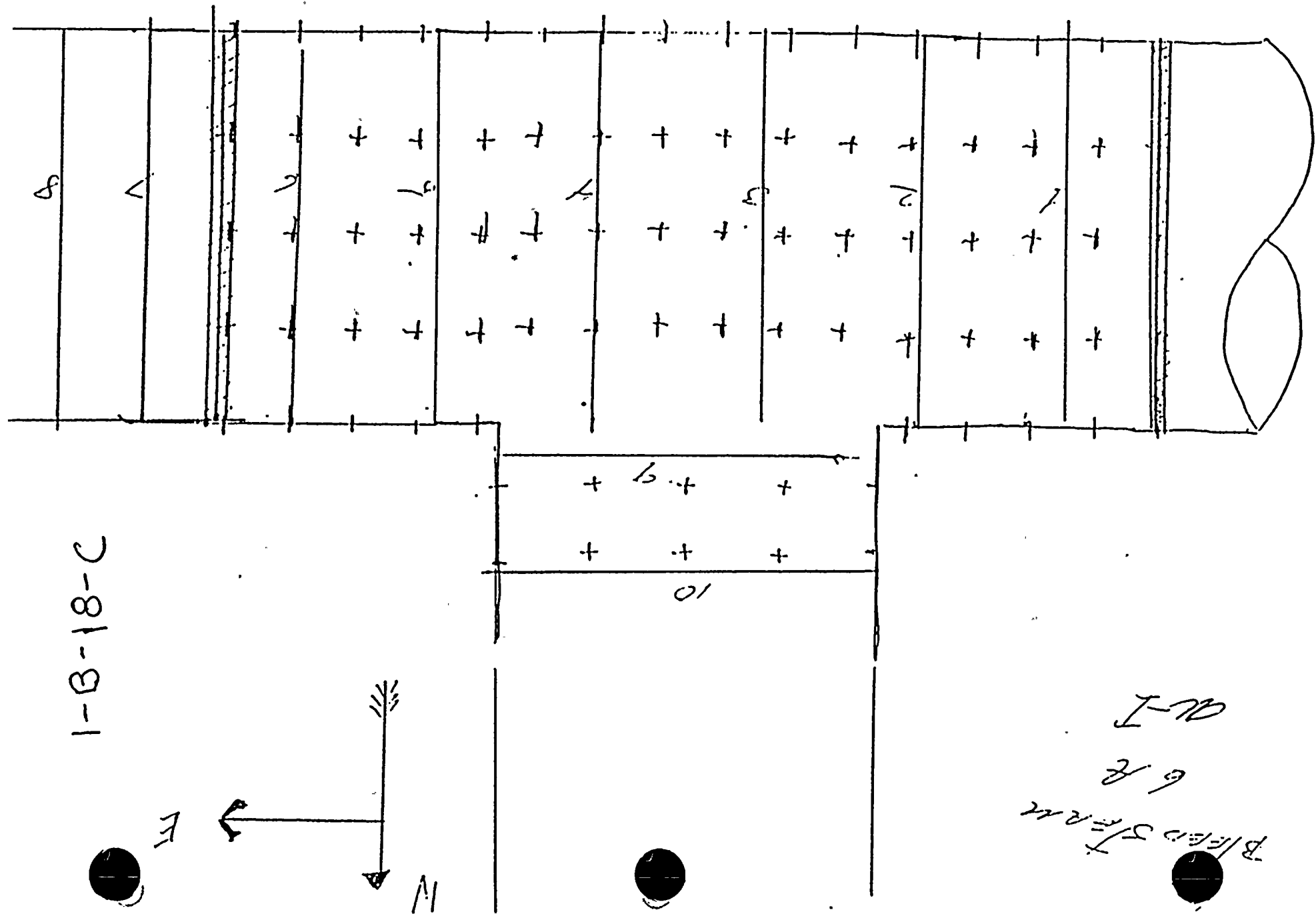
1B-18B

9/2/82

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1.	.514	.536	.516	.509	.492	.494	.492	.497
2	.501	.489	.515	.500	.504	.495	.500	.511
3	.568	.561	.472	.456	.418	.413	.455	.519
4	.566	.556	.450	.440	.411	.429	.457	.564
5	.579	.541	.425	.385	.413	.415	.484	.555
6	.567	.562	.428	.400	.408	.414	.458	.495
7	.535	.553	.485	.431	.430	.422	.442	.458
8	.446	.541	.436	.431	.433	.429	.440	.427
9	.555	.517	.439	.418	.440	.434	.504	.514
10,	.547	.564	.529	.538	.516	.512	.519	.542
11	.541	.547	.527	<u>.514</u>	.518	.539	.518	.528



Blind Stair  
6 ft  
all-I



1-B-18-C



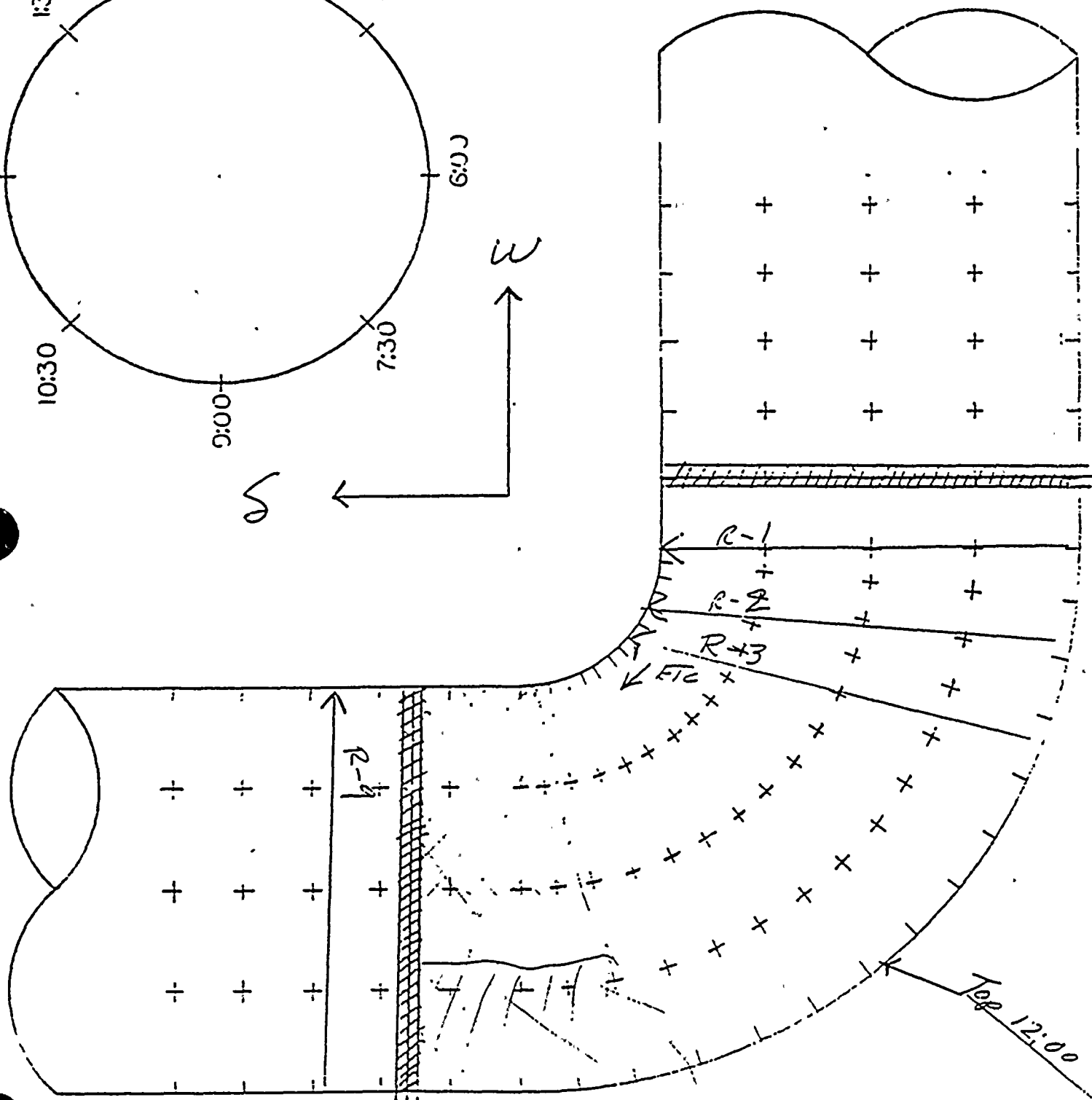
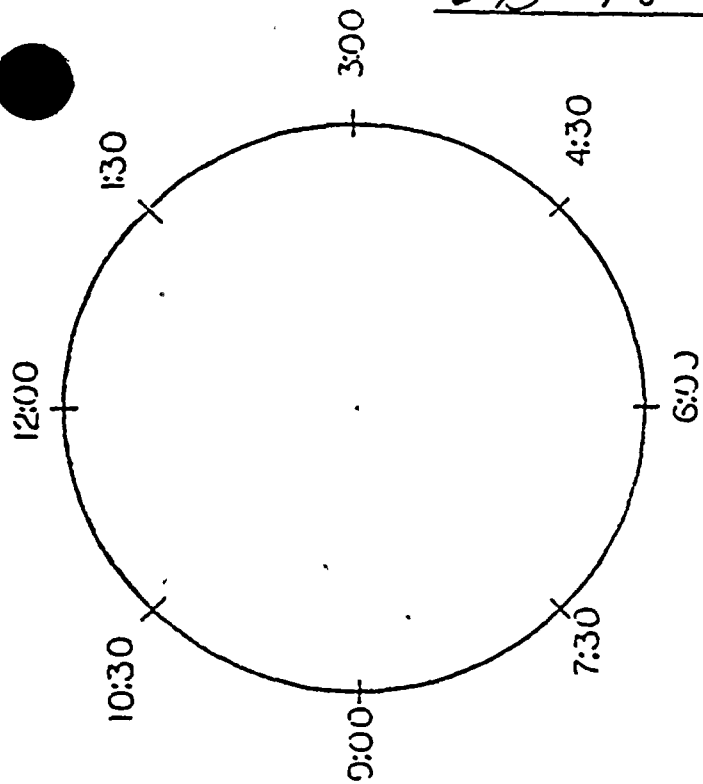
BLEED STEAM PIPING - 6A

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.708	.690	.688	.599	.582	.607	.645	.679
2	.794	.781	.761	.716	.675	*	*	*
3	.751	.750	.746	.732	.717	*	*	*
4	.788	.767	.757	.787	.790	*	*	*
5	.813	.795	.803	.714	.728	*	*	*
6	.719	.712	.700	.605	.609	.665	.719	.705
7	.530	.521	.523	.521	.508	.508	.465	.505
8	.528	.521	.522	.511	.528	.515	.518	.522
9	.601	.662	.687	.685	.606	.491	.544	.623
10	.515	.475	.480	.532	.541	.537	.551	.504

\* Inaccessible



1B-18-D





1B-18D

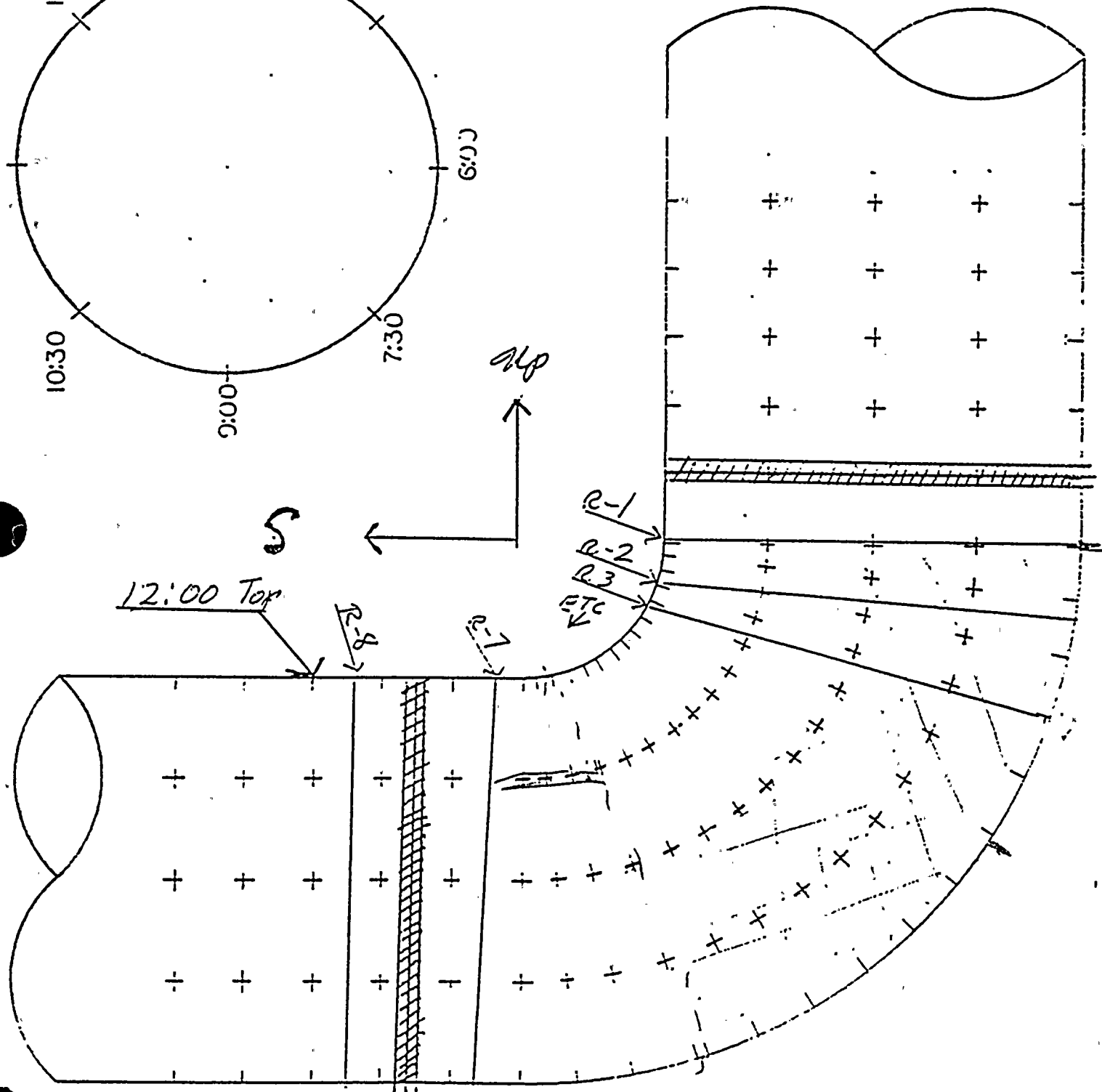
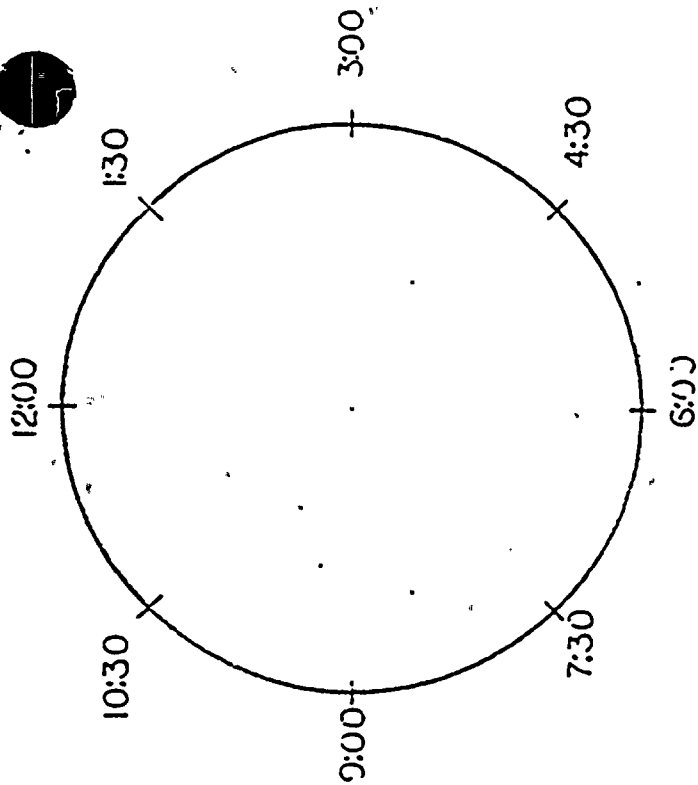
9/2/82

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.508	.474	.510	.500	.535	.555	.489	.479
2	.467	.420	.508	.504	.539	.542	.472	.423
3	.465	.423	.507	.519	.552	.569	.483	.414
4	.452	.425	.457	.510	.574	.540	.438	.401
5	.453	.463	.477	.528	.560	.557	.550	.384
6	.460	.427	.482	.520	.565	.546	.420	.415 6" Square
7	.505	.425	.560	.513	.563	.567	.376	.436 .369 lowest in area
8	.484	.442	.456	.516	.560	.530	.377	.447 .375 lowest in area
9	.477	.400	.501	.507	.563	.561	.406	.440



1B-18-E

9/2/82





1B-18E

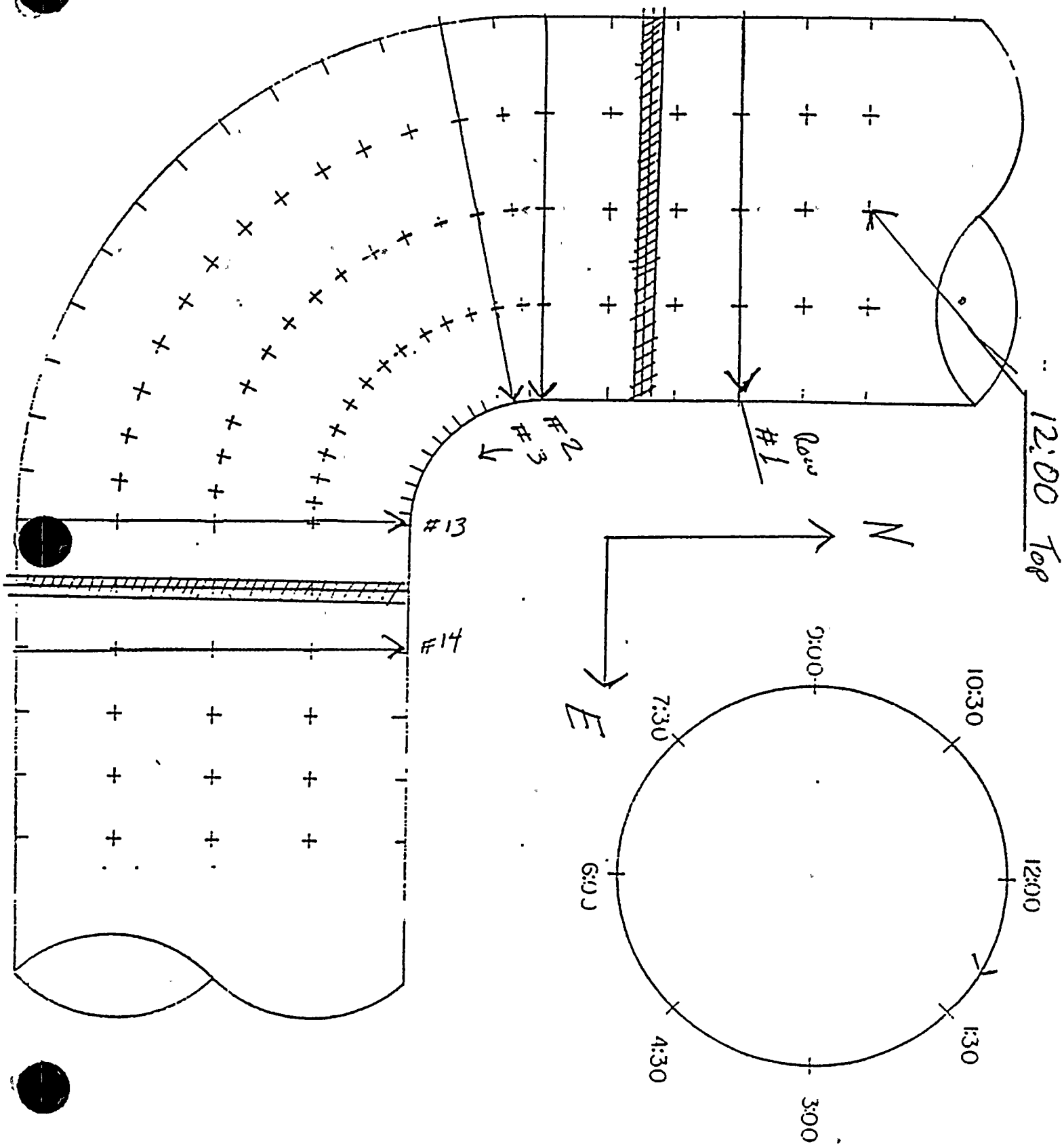
9/2/82

<u>Row</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.573	.461	.376	.356	.399	.522	.488	.511
2	.555	.564	.532	.331	.340	.490	.486	.557
3	.565	.526	.405	.379	.364	.482	.490	.513
4	.550	.540	.411	.366	.353	.487	.495	.535
5	.547	.565	.506	.370	.360	.404	.488	.405
6	.560	.550	.490	.375	.371	.548	.518	.482
7	.548	.499	.476	.498	.464	.386	.496	.480
8	.568	.521	.548	.561	.528	.559	.545	.540



1B-18-F

9/2/82





1B-18F

9/2/82

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.497	<u>.483</u>	.484	.588	.494	.530	.519	.558
2	.500	.550	.551	.548	.511	.477	.485	.490
3	.490	.553	.542	.526	.492	.483	.478	.483
4	.496	.526	.568	.524	.493	.474	.483	.484
5	.581	.523	.535	.520	.490	<u>.467</u>	.480	.499
6	.502	.531	.535	.543	.490	.472	<u>.463</u>	.484
7	.497	.532	.544	.528	.493	.463	.468	.496
8	.497	.521	.544	.552	.498	.481	.464	.478
9	.482	.535	.560	.488	.517	.523	.480	.480
10	.494	.525	.551	.529	.504	.498	.502	.497
11	.507	.526	.541	.515	.488	.487	.496	.565
12	.508	.531	.549	.516	.489	.477	.477	.497
13	.503	.512	.546	.507	.508	.442	.441	.496
14	.541	.520	.525	.551	.510	.534	.531	.533



1-B-20 Rev 4  
To Heater 6B

1-B-20 STAGES  
To Heater 6B

TO FACE OF CONN.  
EL. 631.6"

CONT. ON  
1-B-522  
(ST. 522)  
(SHALL DRAIN)  
SEE DET. E  
1" TRAP  
INJECTION  
SEE DET. D

45.0"

21.9 3/4"

EL. 612.6"

S.R. ELL.

114

FW12

15"

14" B

3'8"

FW9

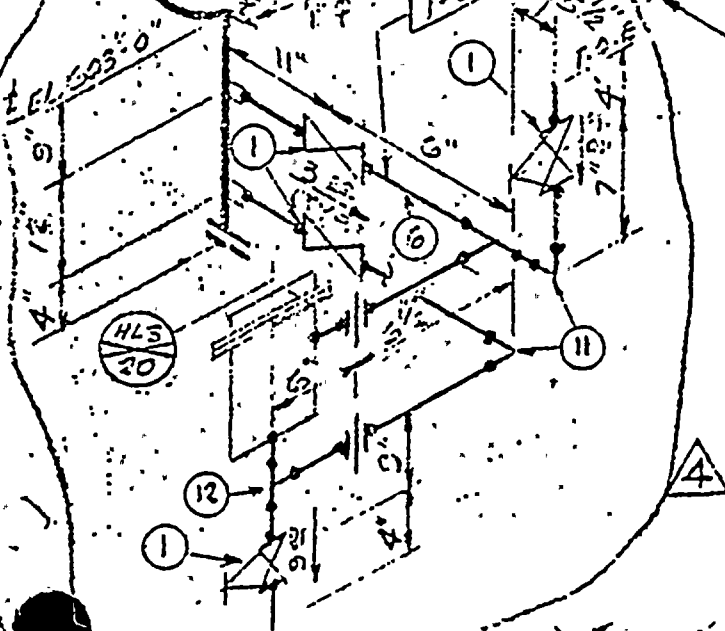
FW (REF.)

7'-0"

CONTINUED ON  
NG: 1-B-18

115

14" 20. PC ELL  
1-B-20-12  
FIELD TO PLUG  
1" SW CPLG.



DETAIL "E"

4

MIN

6

7

8

9

10

11

12

7'-6"

14" B

FW8

116

8" DRIP POT  
CONT. ON  
1-B-511  
(DRAIN)  
1" SW CPLG.  
(FIELD TO REMOVE PLUG)  
1" TRAP  
1" SW CONN.  
SEE DET. C

4

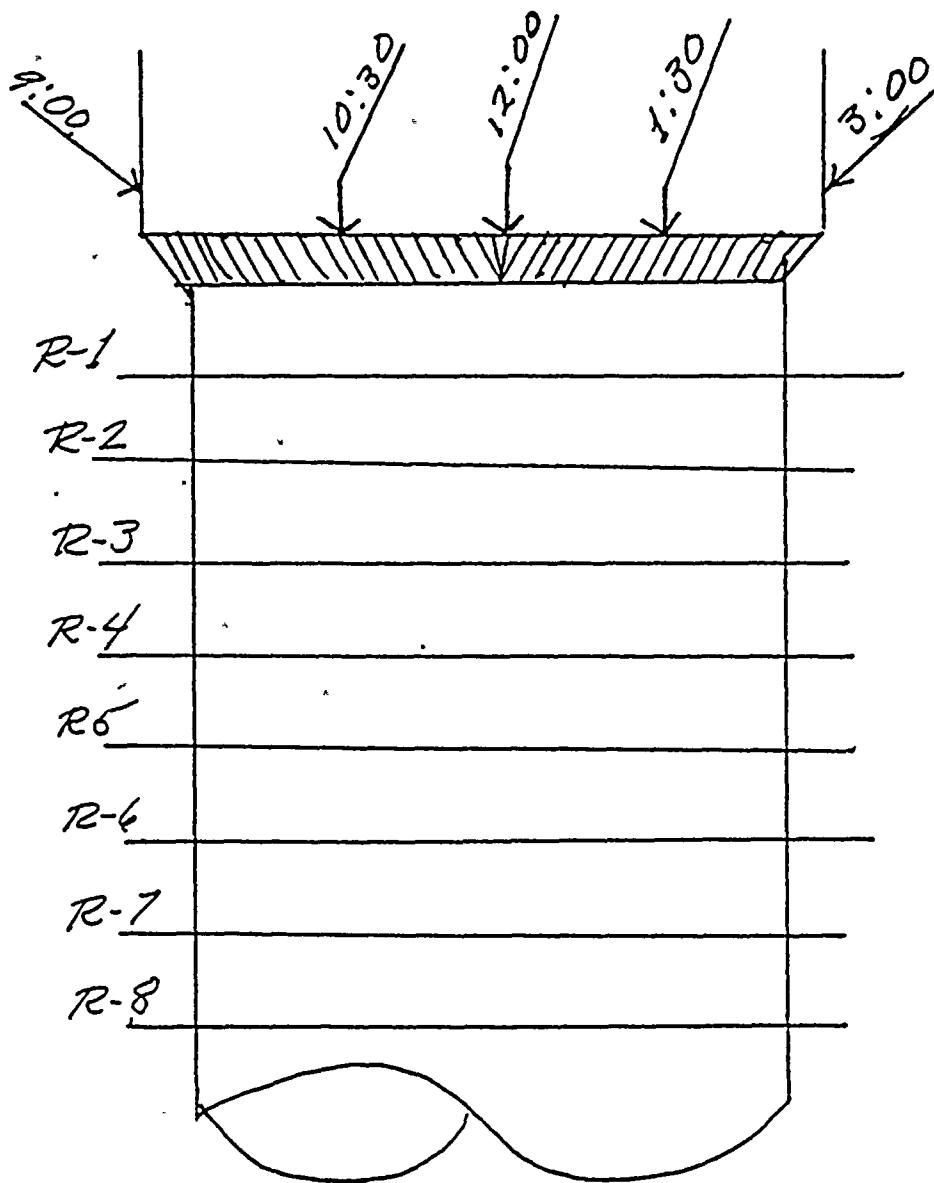
W. TO 6



5

1 B-20 A

H.P. Turbine



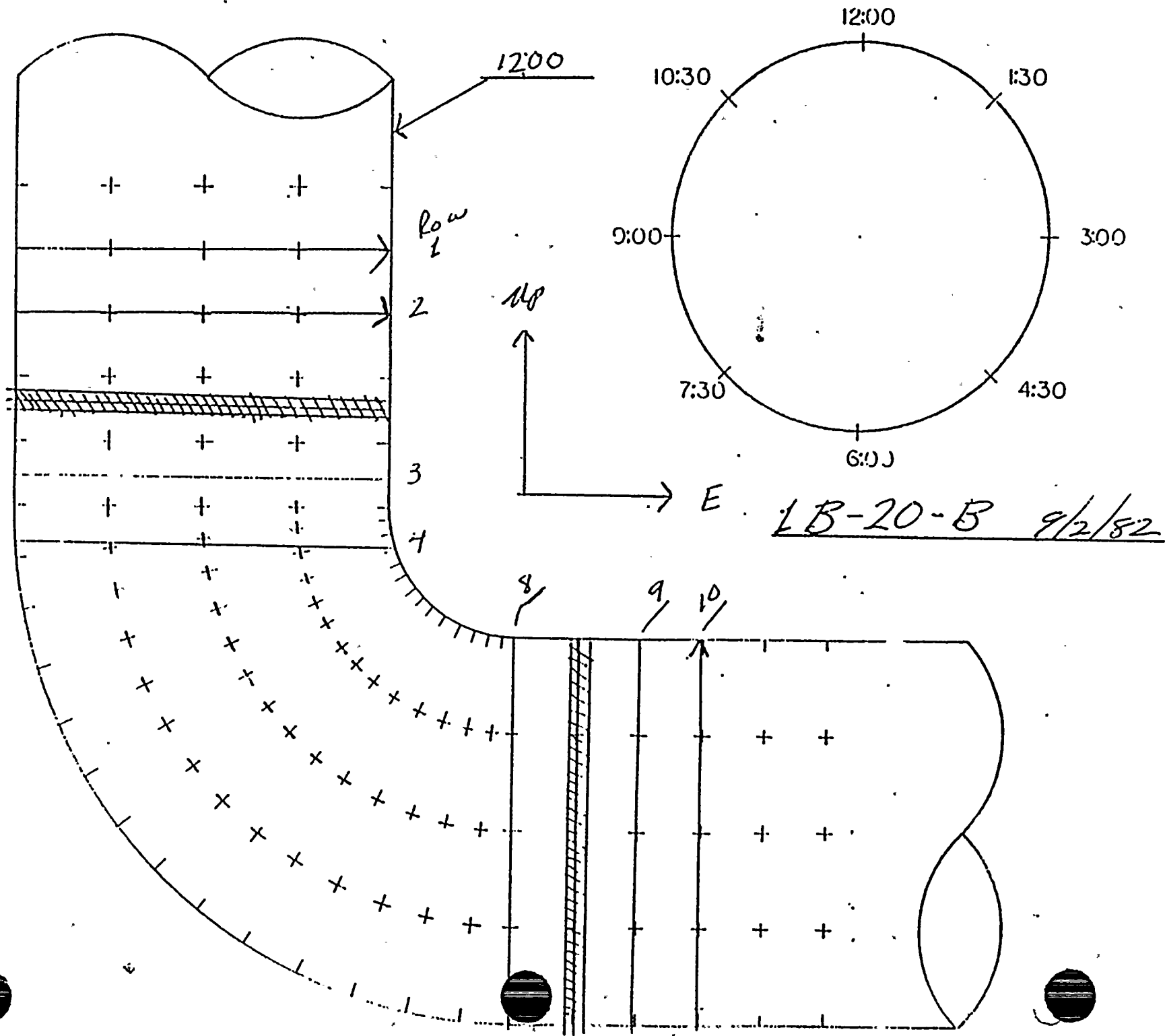


SEP 12 1982

1B-20A

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.411	.444	.511	.575	.568	.552	.444	.398
2	.413	.441	.505	.521	.535	.554	.477	.404
3	.434	.441	.522	.545	.547	.556	.463	.401
4	.437	.450	.511	.544	.546	.551	.551	.434
5	.440	.465	.525	.544	.551	.556	.512	.443
6	.493	.490	.540	.580	.563	.551	.545	.506
7	.514	.500	.550	.561	.556	.539	.553	.534
8	.545	.508	.555	.560	.541	.554	.552	.525







1B-20B

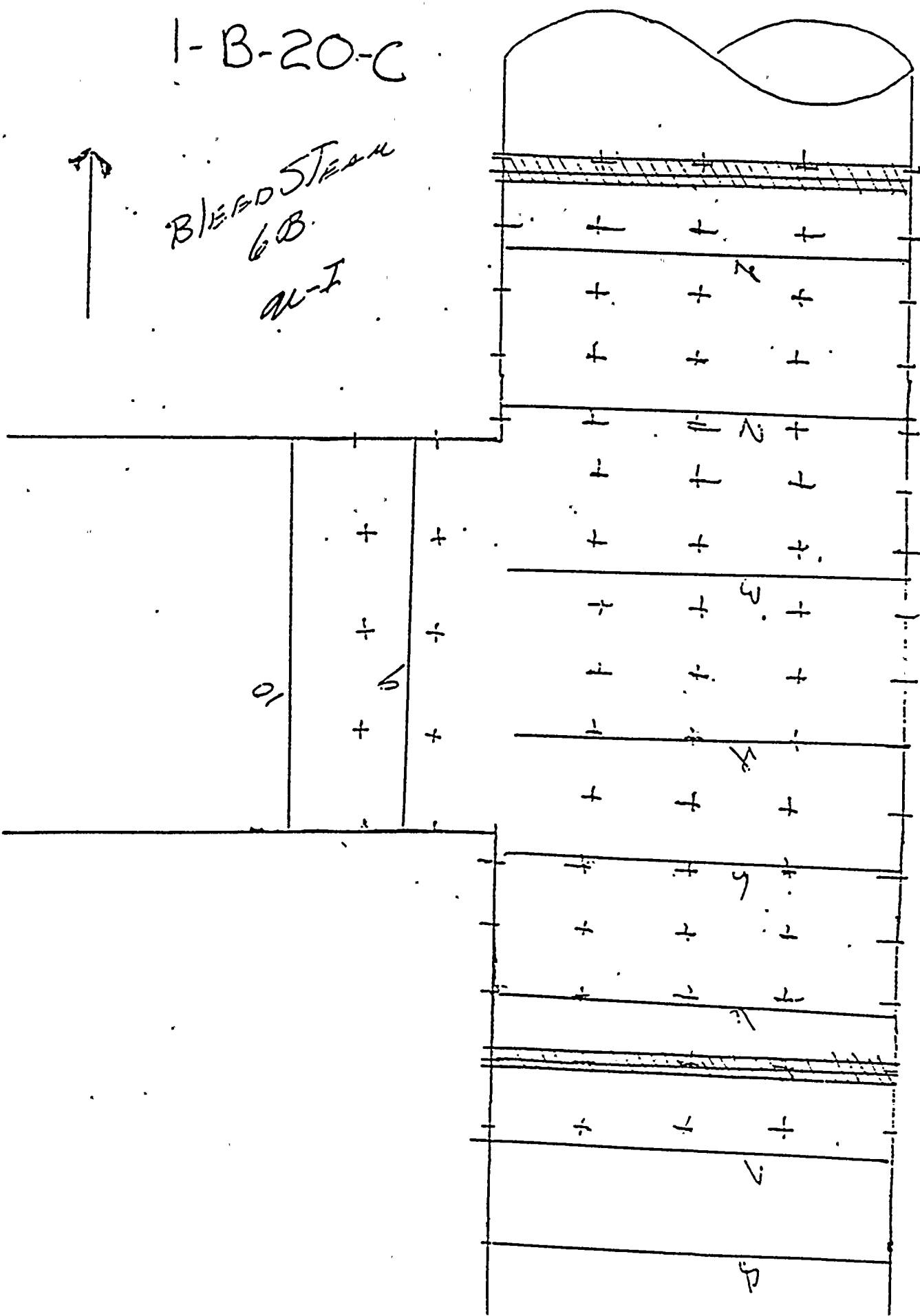
9/2/82

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.539	.504	.508	.535	.492	.509	.510	.540
2	.528	.497	.501	.509	.504	.508	.512	.498
3	.550	.523	.493	.457	.461	.410	.435	.482
4	.542	.514	.521	.432	.423	.400	.419	.500
5	.548	.526	.524	.431	.417	.500	.450	.429
6	.545	.503	.502	.420	.418	.412	.459	.545
7	.538	.510	.499	.431	.418	.417	.518	.529
8	.537	.543	.481	.436	.428	.419	.492	.549
9	.529	.519	.508	.439	.440	.430	.585	.503
10	.559	.503	.477	.439	.436	.425	.463	.483
11	.532	.524	.513	.529	.468	.531	.536	.535
12	.541	.536	.522	.529	.541	.517	.527	.560



1-B-20-C

BLEED STEAM  
6B.  
N-I





BLEED STEAM PIPING - 63

1-B-20C

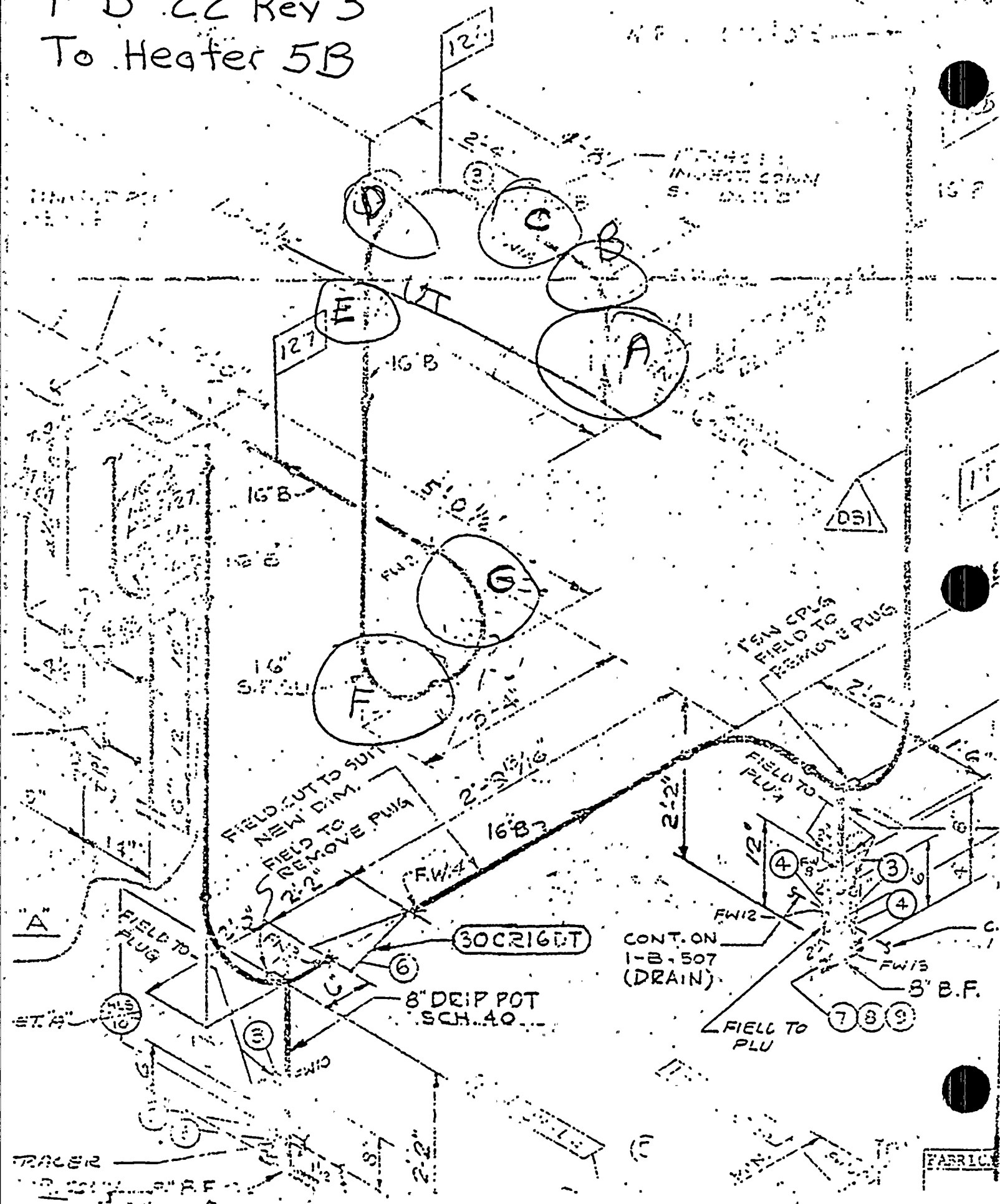
<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.628	.624	.625	.618	.632	.611	.599	.638
2	.695	.716	.723	.704	.682	*	*	*
3	.741	.743	.750	.755	.740	*	*	*
4	.836	.820	.814	.832	.828	*	*	*
5	.778	.761	.769	.773	.779	*	*	*
6	.684	.681	.680	.660	.658	.610	.588	.616
7	.528	.512	.480	<u>.455</u>	.478	.496	.489	.526
8	.549	.553	.522	.502	.504	.511	.512	.530
9	.559	.607	.673	.677	.653	.628	.588	.570
10	.507	.474	.479	.492	.528	.521	.520	.515

\* Inaccessible

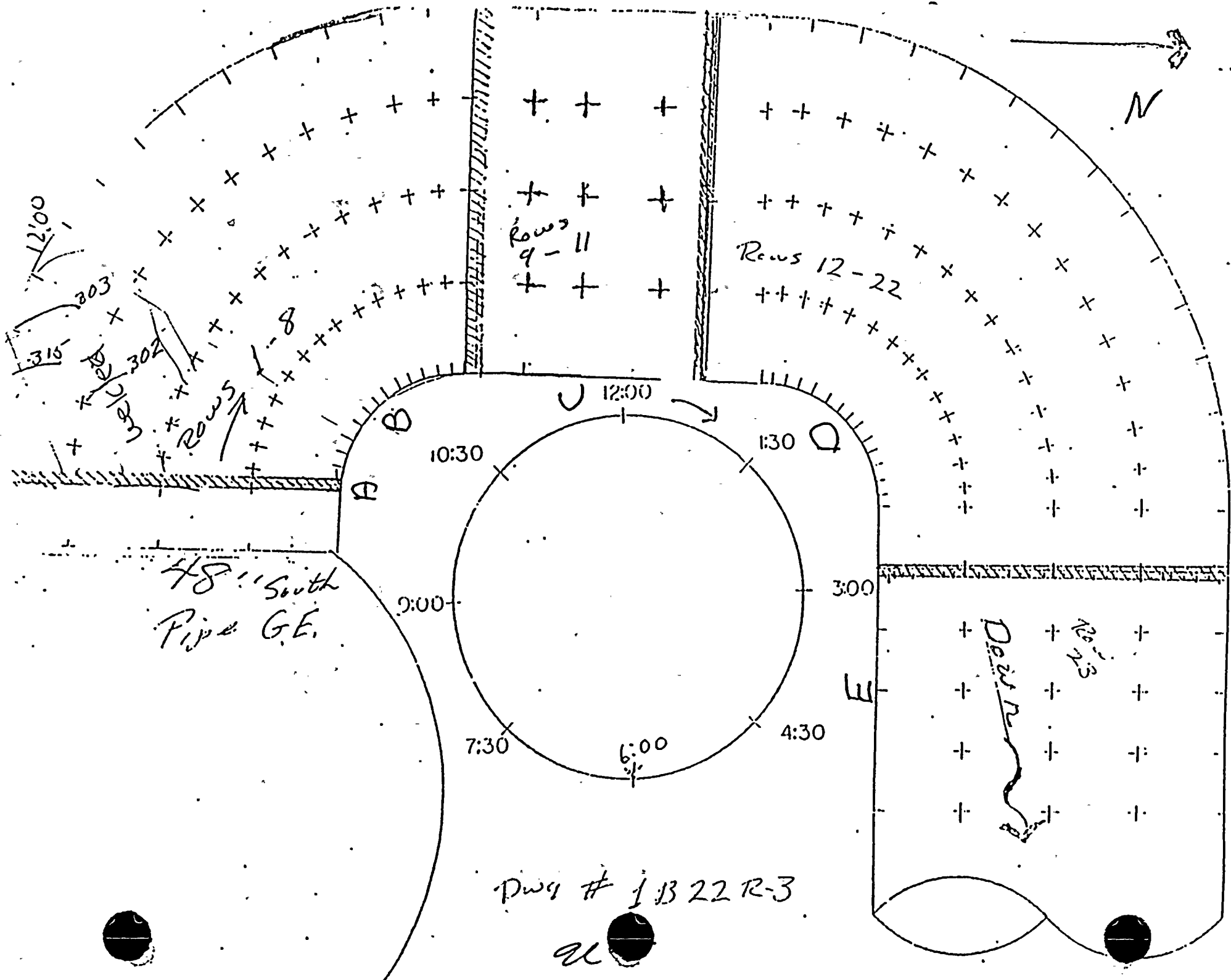


APR 1968

— 10443 :  
MORSEY COLONY  
S. 20115







Dwg # 1 B 22 R-3

22



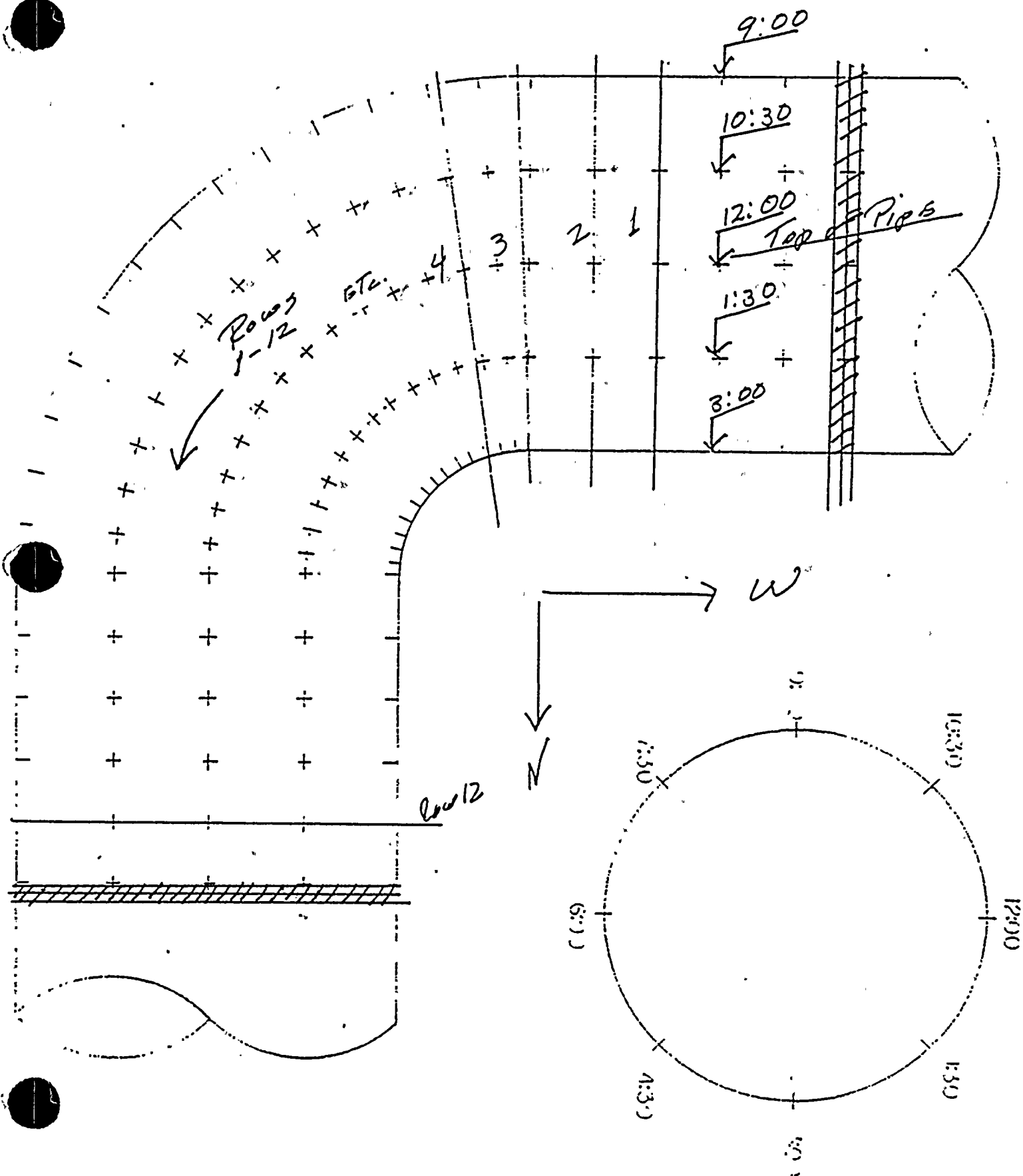
BLEED STEAM PIPING

1B-22  
to plates #5B

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.395	.379	.314	.384	.488	.417	.416	.386
2	.315	.302	.340	.479	.483	.427	.361	.345
3	.303	.291	.367	.489	.490	.418	.390	.342
4	.329	.346	.373	.461	.493	.423	.371	.353
5	.315	.355	.387	.494	.500	.424	.385	.404
6	.330	.370	.395	.518	.510	.433	.410	.384
7	.409	.385	.335	.524	.511	.434	.402	.419
8	.409	.432	.479	.552	.507	.396	.358	.382
9	.452	.480	.422	.554	.520	.367	.375	.379
10	.387	.482	.518	.447	.428	.388	.359	.379
11	.390	.529	.478	.467	.445	.407	.393	.410
12	.396	.484	.548	.450	.411	.448	.438	.445
13	.513	.518	.529	.472	.432	.398	.407	.484
	.539	.541	.529	.477	.488	.430	.413	.484
15	.545	.538	.522	.459	.505	.438	.413	.511
16	.528	.522	.519	.458	.510	.440	.431	.491
17	.545	.541	.500	.494	.502	.439	.406	.478
18	.544	.514	.487	.472	.504	.440	.423	.465
19	.511	.531	.462	.525	.506	.439	.431	.449
20	.455	.470	.462	.527	.493	.437	.410	.427
21	.453	.495	.481	.531	.491	.445	.393	.422
22	.481	.492	.482	.513	.483	.476	.439	.422
23	.443	.474	.463	.535	.458	.449	.431	.368



1B22F





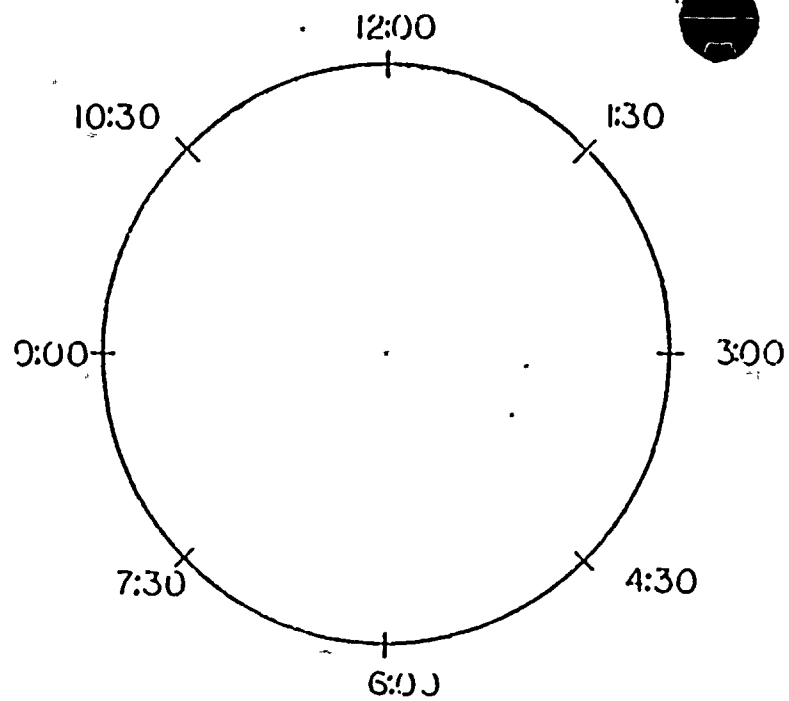
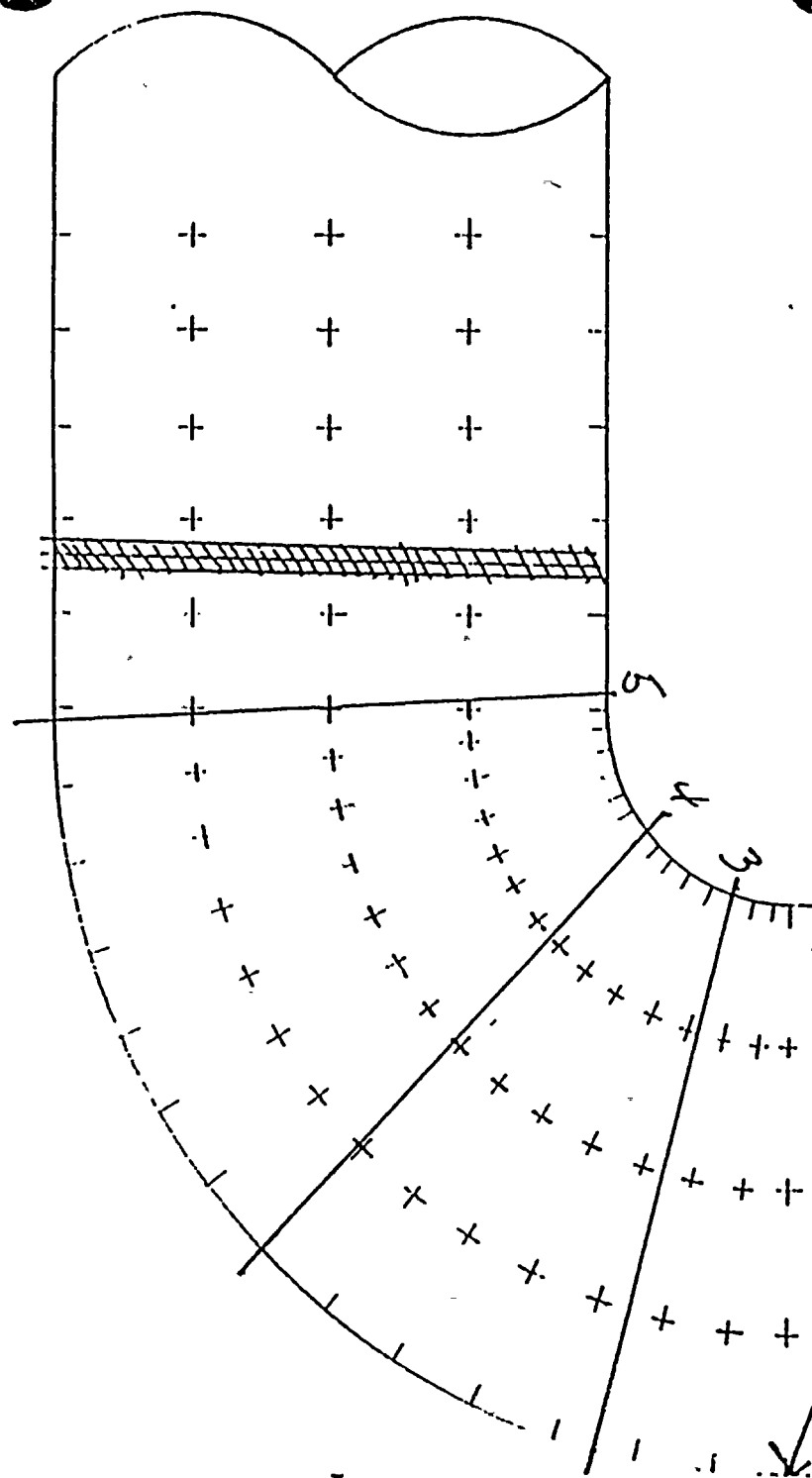
1B-22F

9/7/82

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.554	.526	.573	.461	.456	.487	.479	.553
2	.534	.543	.560	.473	.476	.449	.419	.526
3	.480	.522	.549	.526	.482	.456	.428	.520
4	.486	.552	.542	.526	.507	.484	.451	.500
5	.546	.553	.569	.523	.538	.478	.439	.484
6	.520	.543	.566	.524	.510	.476	.470	.486
7	.518	.552	.561	.533	.473	.484	.453	.489
8	.523	.529	.565	.537	.439	.489	.481	.490
9	.520	.530	.558	.533	.456	.467	.450	.496
10	.526	.519	.540	.529	.535	.459	.462	.512
11	.517	.543	.556	.536	.547	.472	.456	.507
12	.500	.539	.538	.521	.529	.560	.510	.543



1B22G



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1B22G



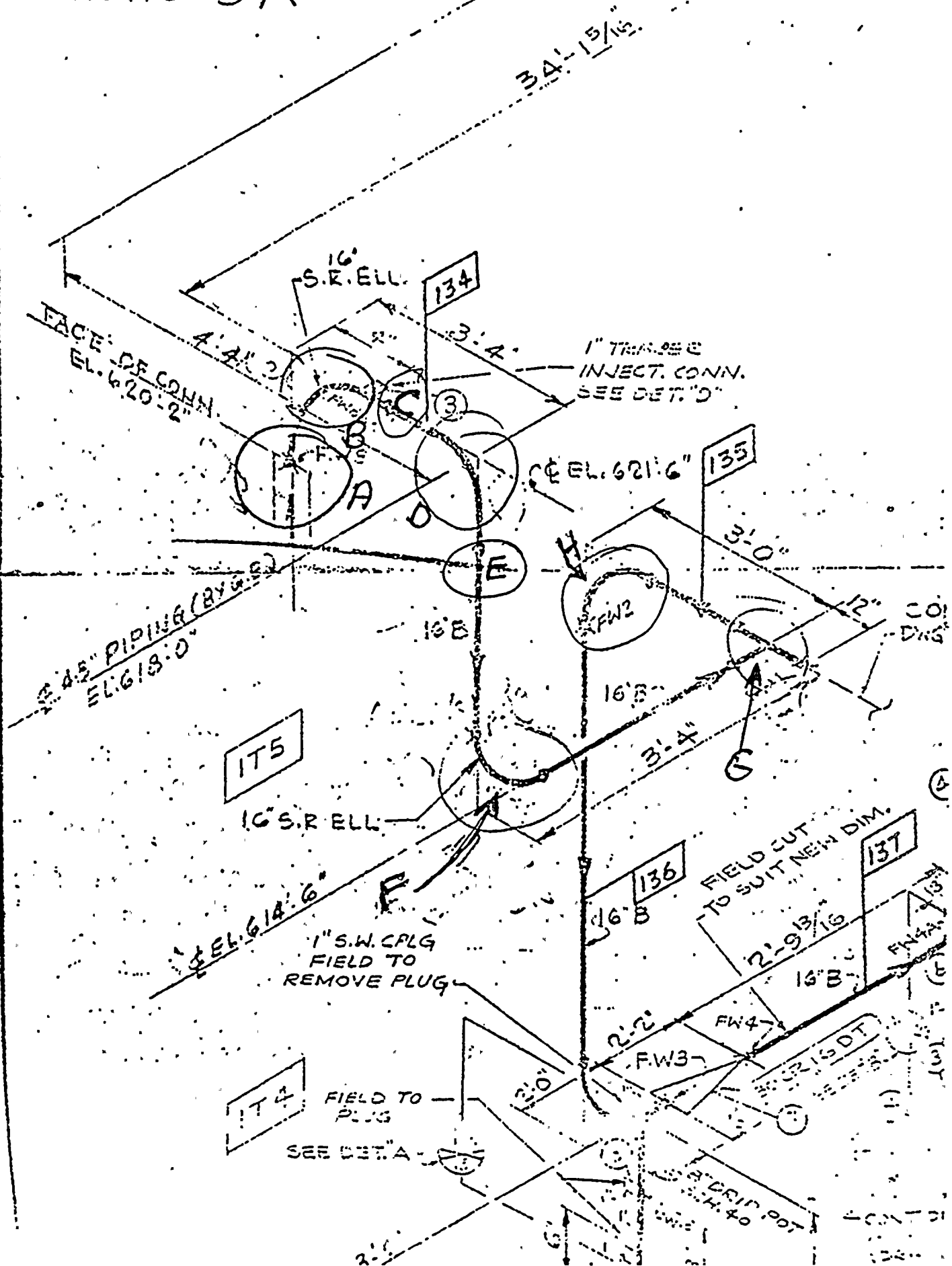
1B-22G

9/7/82

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.481	.483	.519	.519	.555	.514	.508	.539
2	.512	.472	.437	.477	.492	.496	.488	.513
3	.543	.528	.472	.443	.436	.479	.501	.508
4	.526	.492	.493	.507	.513	.478	.489	.498
5	.493	.510	.452	.478	.445	.436	.502	.490

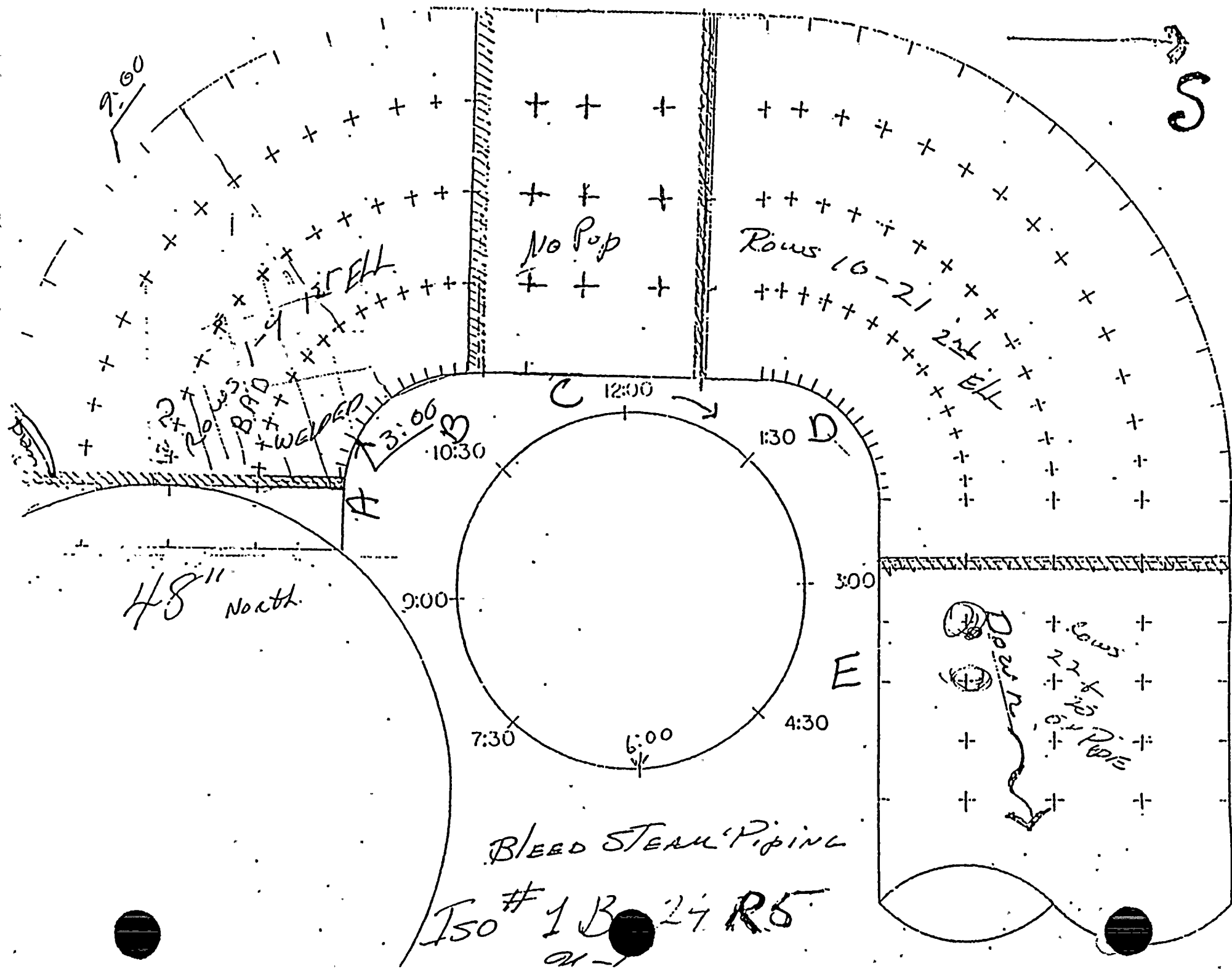


To Heater 5A





S



No Pop

Rows 10-21  
224 ELL

48" North

BLEED STEAM PIPING

ISO #1 B-24 R5

224 R5  
POLE  
Cows



10-24

BLEED STEAM PIPING

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.356	.383	.381	.384	.456	.506	.275	.367
2	.322	.328	.362	.412	.457	.521	.327	.340
3	.308	.304	.354	.390	.404	.492	.366	.350
4	.318	.305	.354	.415	.443	.442	.423	.416
5	.358	.345	.383	.416	.434	.459	.370	.417
6	.415	.372	.429	.365	.438	.459	.379	.478
7	.422	.385	.425	.375	.414	.495	.374	.468
8	.406	.373	.406	.405	.454	.451	.473	.470
9	.386	.408	.407	.393	.453	.458	.482	.401
10	.415	.372	.385	.384	.447	.544	.538	.410
11	.444	.426	.417	.454	.508	.526	.565	.460
12	.435	.477	.430	.457	.477	.549	.570	.568
13	.435	.425	.404	.442	.503	.556	.556	.547
14	.409	.438	.395	.453	.550	.569	.567	.540
	.406	.401	.395	.480	.554	.540	.571	.547
	.432	.396	.394	.476	.540	.564	.525	.445
17	.423	.400	.402	.430	.550	.567	.523	.480
18	.466	.393	.384	.431	.551	.567	.555	.480
19	.445	.398	.422	.484	.551	.566	.534	.491
20	.471	.391	.429	.462	.553	.560	.552	.494
21	.429	.398	.406	.497	.555	.563	.559	.490
22	.332	.347	.429	.569	.550	.547	.515	.430
23	.358	.375	.452	.571	.552	.530	.527	.420





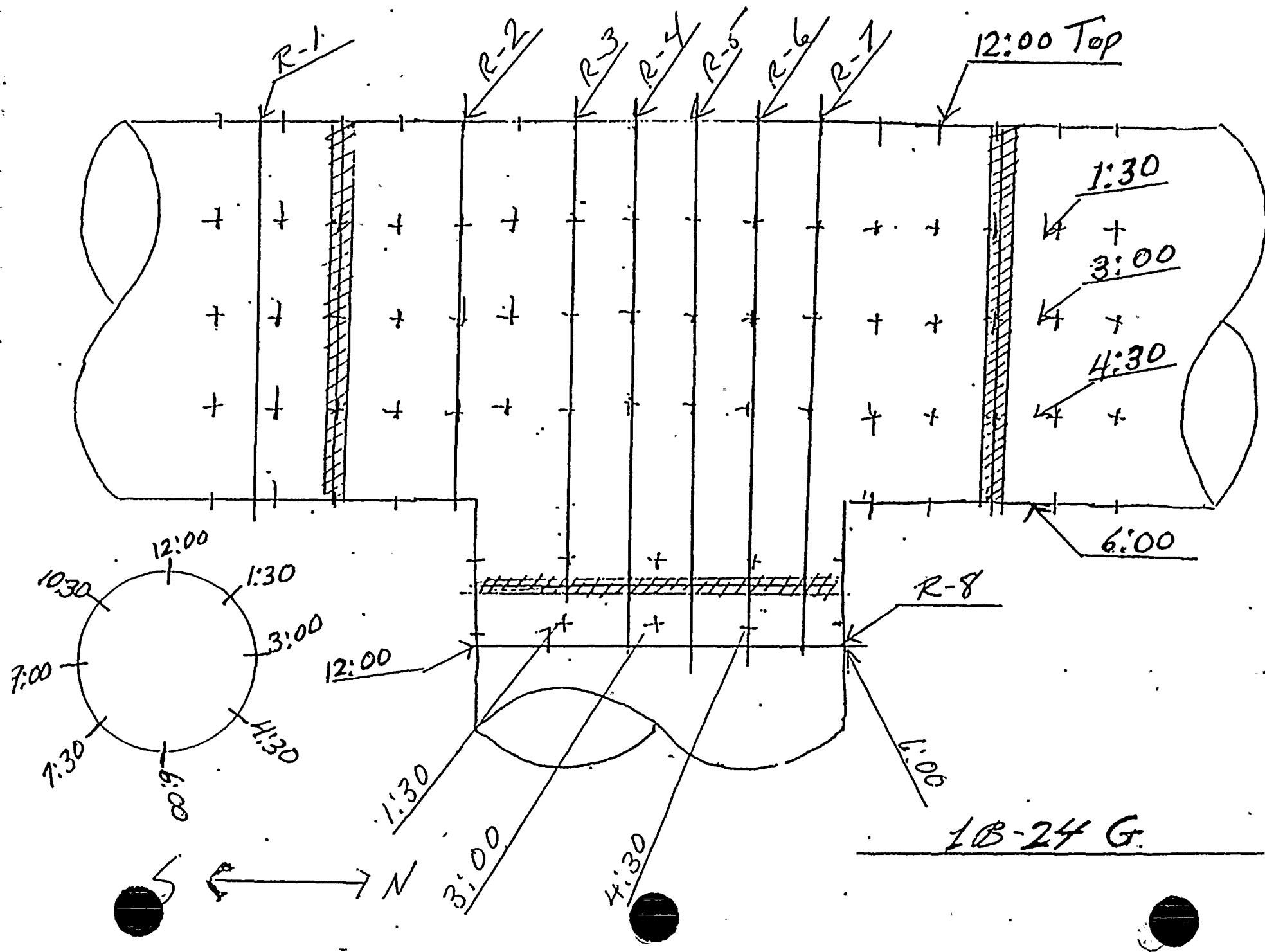


1B-24F

9/7/82

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>12:30</u>
1	.444	.499	.476	.512	.510	.423	.499	.457
2	.435	.509	.514	.519	.503	.415	.444	.455
3	.458	.491	.519	.527	.483	.520	.451	.458
4	.444	.498	.502	.533	.519	.483	.453	.455
5	.457	.493	.539	.551	.518	.526	.451	.485
6	.480	.460	.512	.540	.539	.548	.547	.511
7	.478	.477	.543	.524	.524	.554	.518	.523
8	.476	.488	.540	.522	.522	.543	.559	.523
9	.485	.501	.514	.543	.492	.545	.561	.512
10	.518	.506	.518	.527	.530	.547	.556	.507
11	.520	.518	.515	.520	.535	.523	.560	.539
12	.517	.543	.546	.542	.506	.535	.528	.502
13	.519	.520	.050	.498	.499	.509	.500	.537





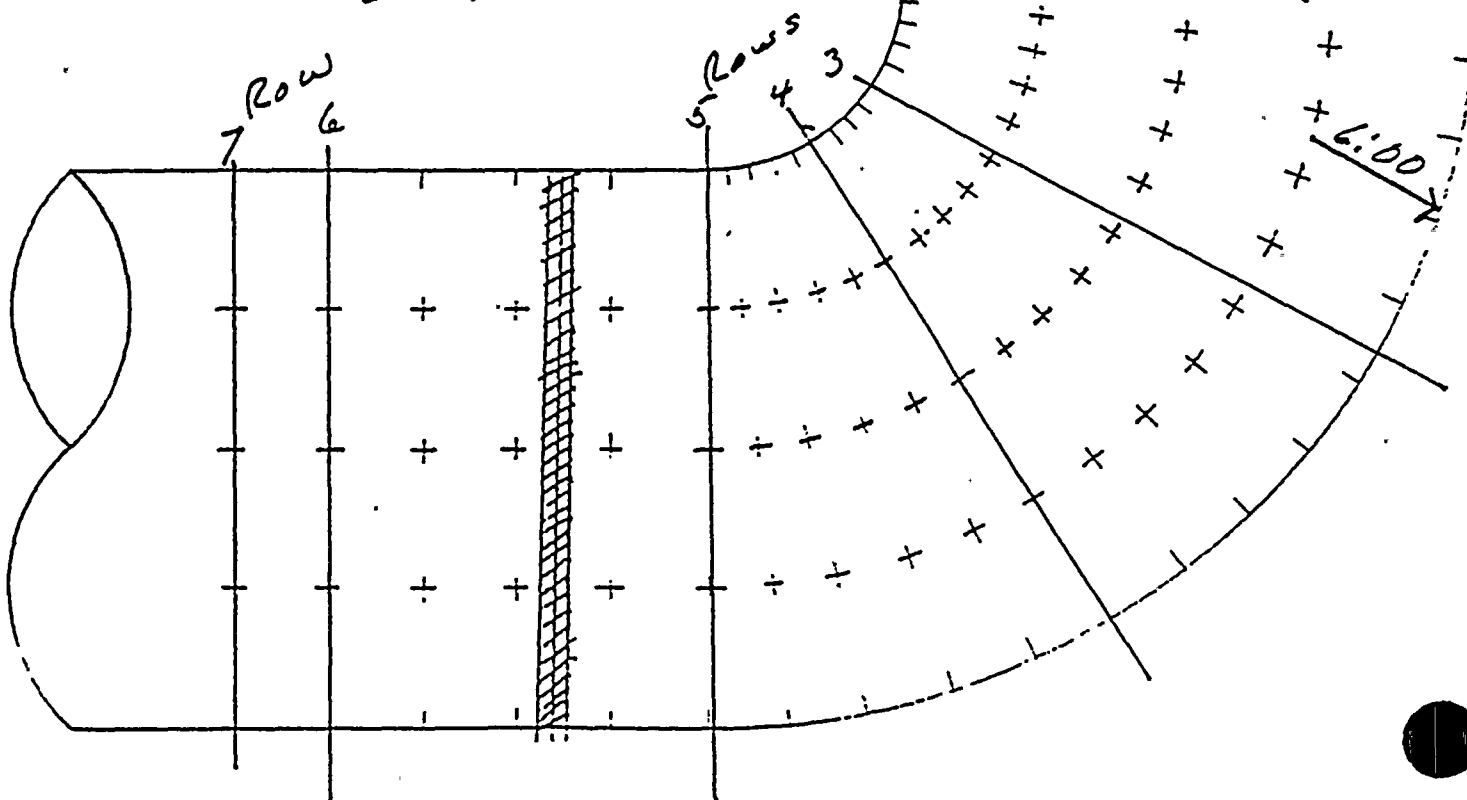
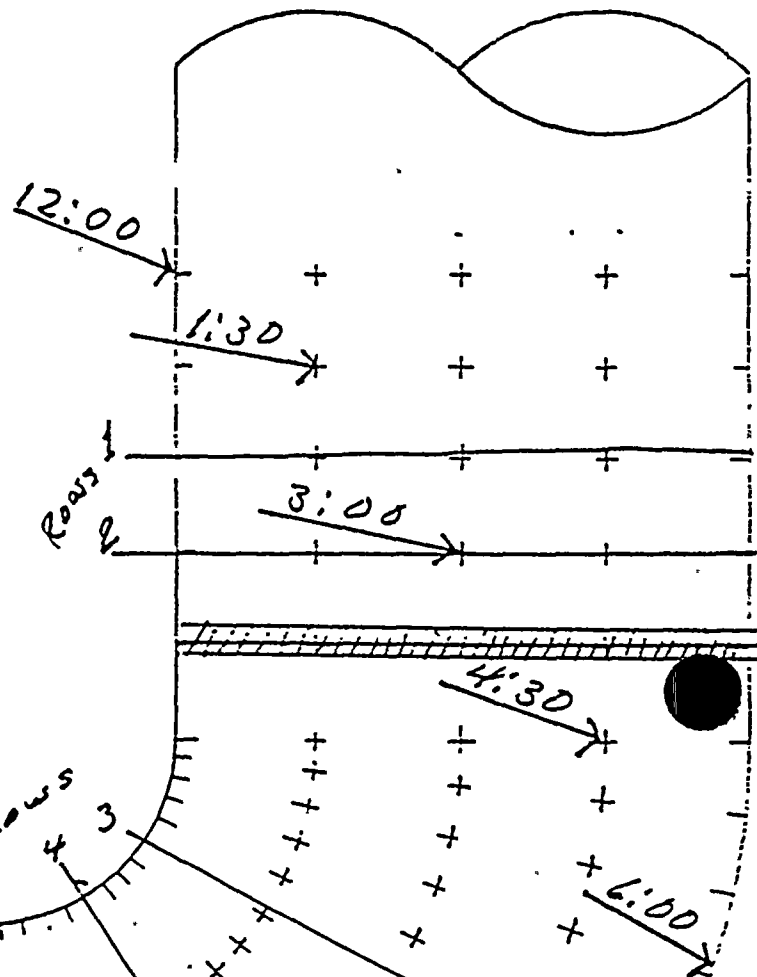
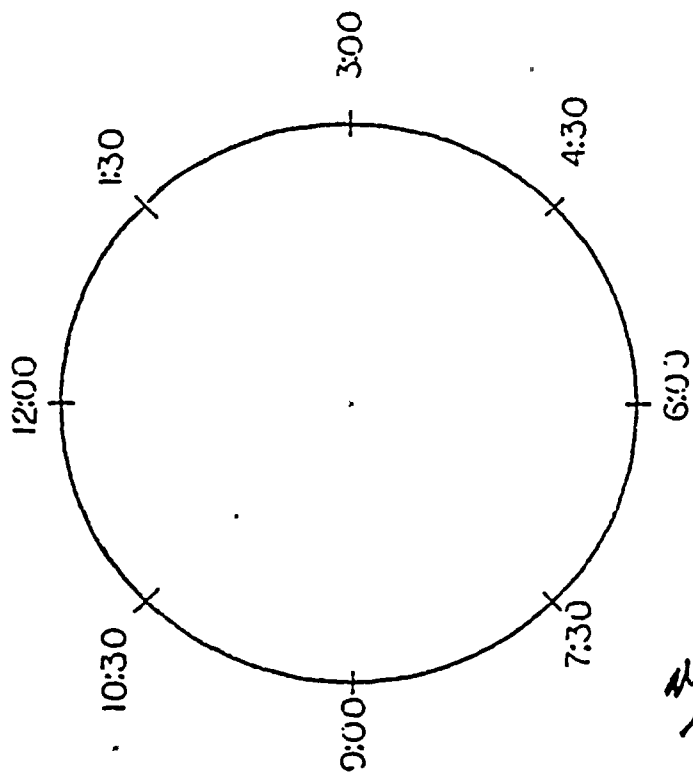


1B-24G

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.484	.486	.486	.516	.491	.429	.524	.506
2	1.071	1.088	1.116	1.189		1.111	1.055	1.047
3	1.054	1.069	1.116	1.135	INACCESSIBLE	1.085	1.049	1.042
4	1.067	1.065	1.066	1.067		1.059	1.036	1.039
5	1.070	1.068	1.072	1.063		1.029	1.038	1.043
6	1.079	1.065	1.078	1.065		1.068	1.066	1.049
7	1.095	1.066	1.111	1.074		1.130	1.049	1.082
8	.529	.540	.531	.473	.561	.544	.529	.457



1B-24 H





1B-24H

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.487	.503	.504	.548	.544	.490	.452	.408
2	.438	.439	.470	.489	.557	.524	.462	.450
3	.556	.532	.513	.462	.469	.492	.483	.544
4	.562	.537	.494	.520	.495	.531	.463	.559
5	.559	.505	.484	.424	.419	.425	.431	.519
6	.503	.535	.475	.460	.505	.402	.530	.535
7	.542	.509	.453	.425	.512	.417	.436	.505

5A





SITE FAB. PIECE MARKS  
1-B-24-L1  
-L2  
-L3  
-L4

**INFORMATION  
COPY ONLY**

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRYOGMAN

A-100		A-200		A-300						<div>1000</div> <div>2000</div> <div>3000</div> <div>4000</div> <div>5000</div> <div>6000</div> <div>7000</div> <div>8000</div> <div>9000</div> <div>10000</div>	
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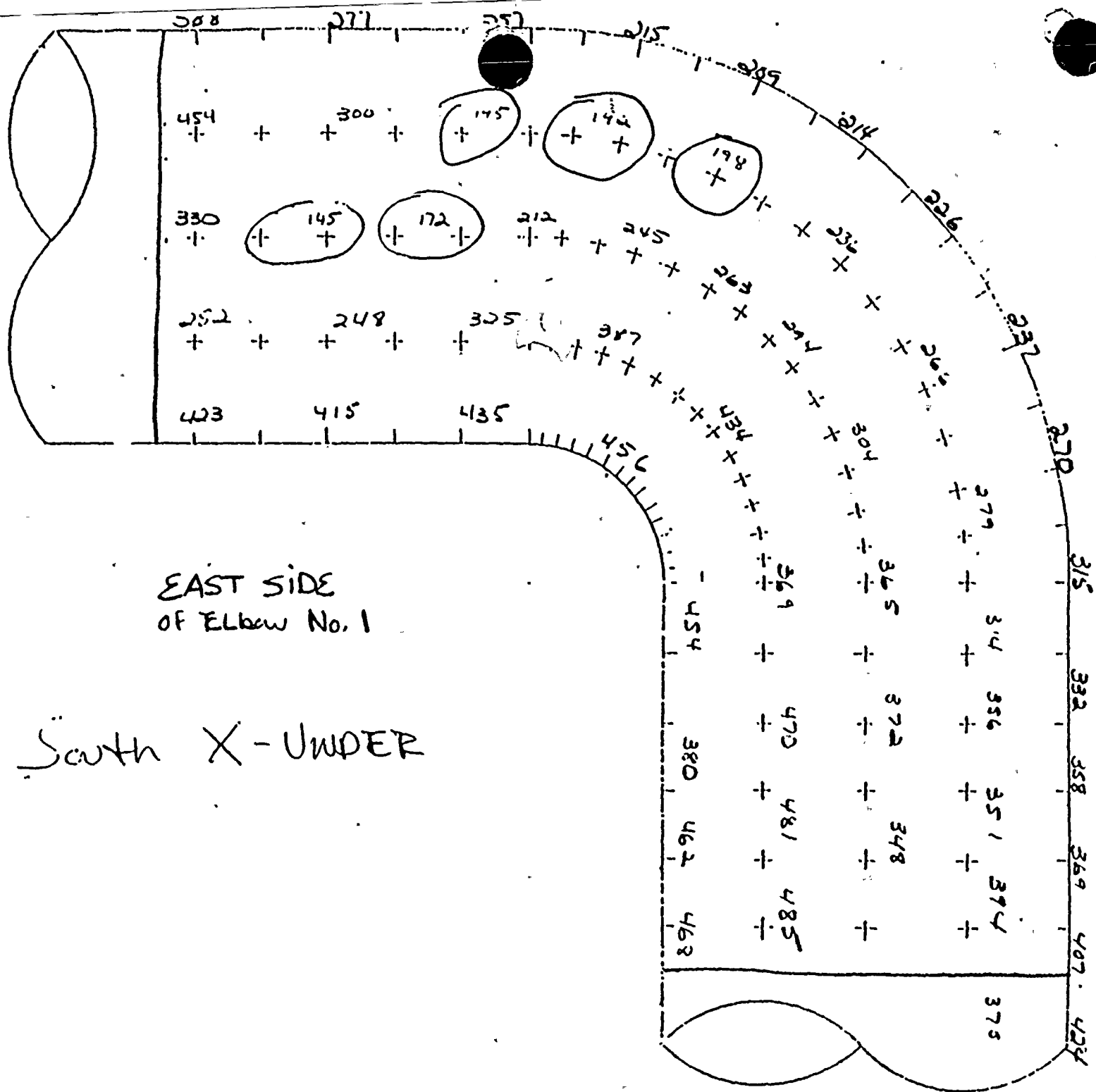
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**MATERIAL REQUIRED FOR  
FIELD REWORK**

FD-302 (Rev. 3-22-64)



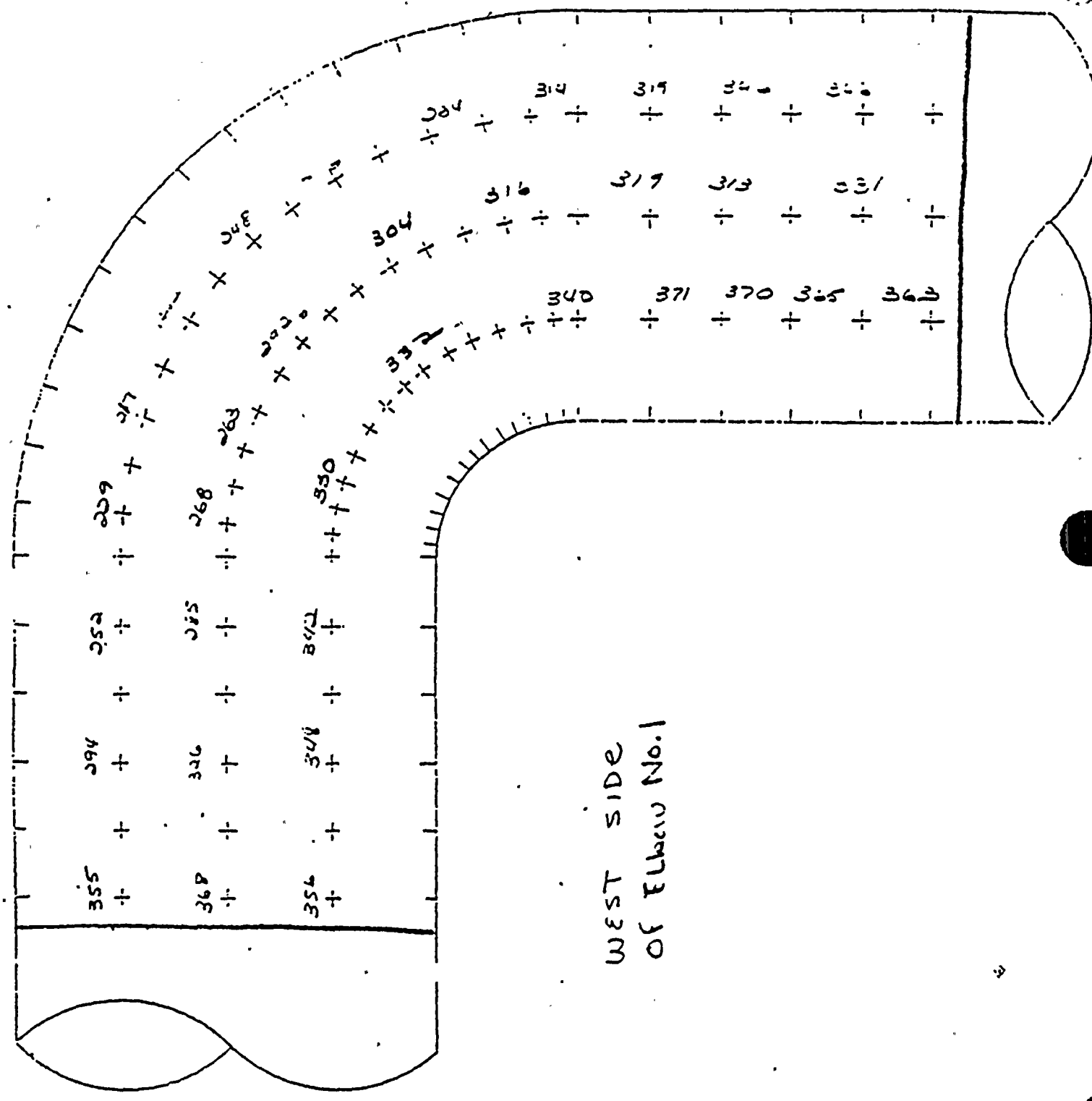
48"  
SIDE



50-100  
100-200



11' 10"   
 South



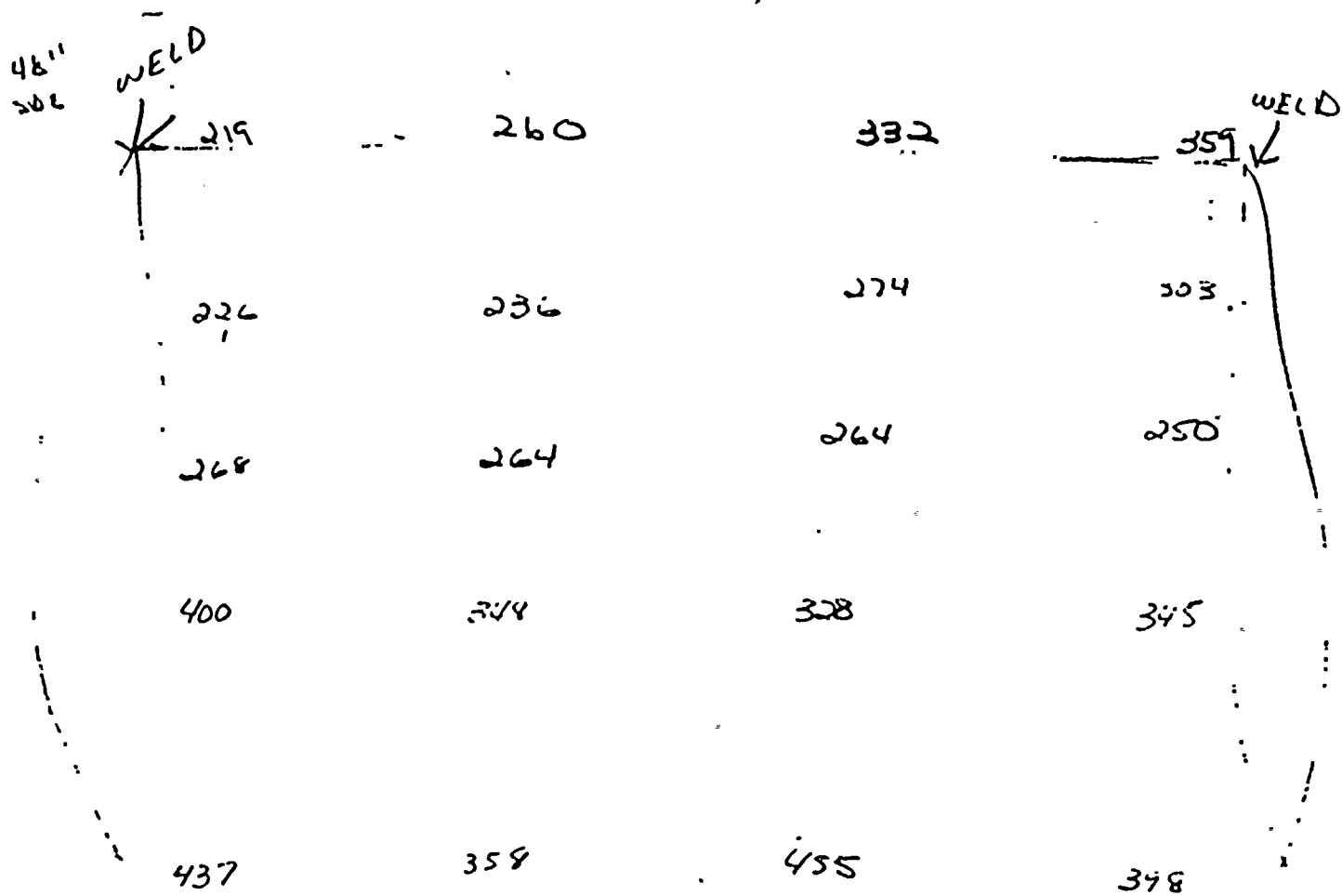
WEST SIDE  
 OF ELBOW No. 1

11' 10"



J.O. 9

WEST SIDE  
of PUP: PIECE



South



J.C. 9 7...

EAST SIDE PUP AC

418" WFLD  
SIDE

238

273

414

483

473

520

490

529

477

472

418

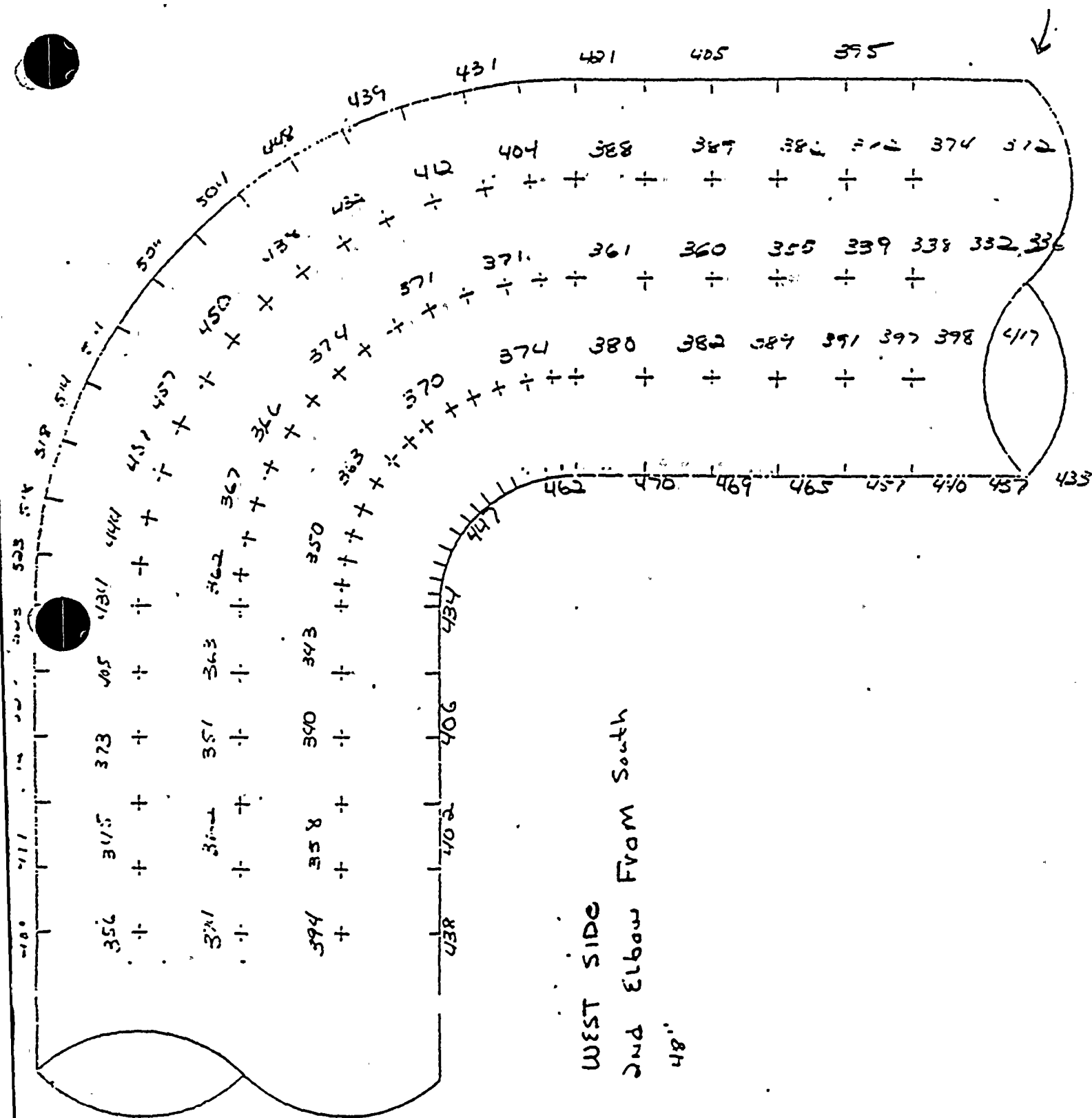
418

WFLD  
↓

SOUTH



GOING  
DOWN







9000

EAST SIDE  
2nd Elbow From South  
48"

[illegible]

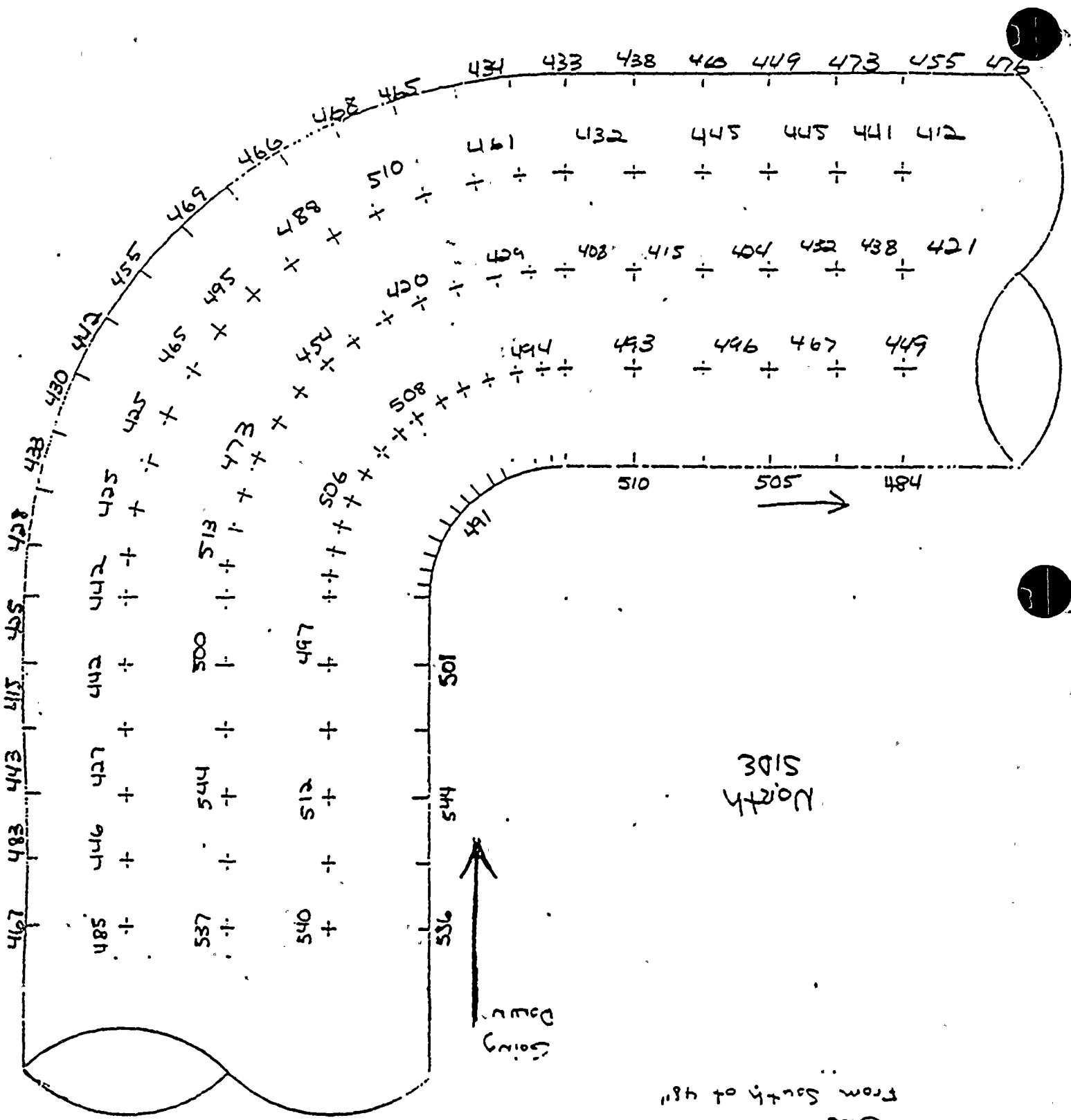


H.C. 96575

3rd Elbow Down  
From South of 481

North  
Side

Going  
Down

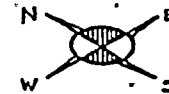








ISOMETRIC SHEET NO. 601



P.O.# PIECE MARKS FAB.  
1-B-134 SHAW  
-135  
-136  
-137  
-138

SITE FAB. PIECE MARKS  
1-B-24-L1  
-L2  
-L3  
-L4

INFORMATION  
COPY ONLY

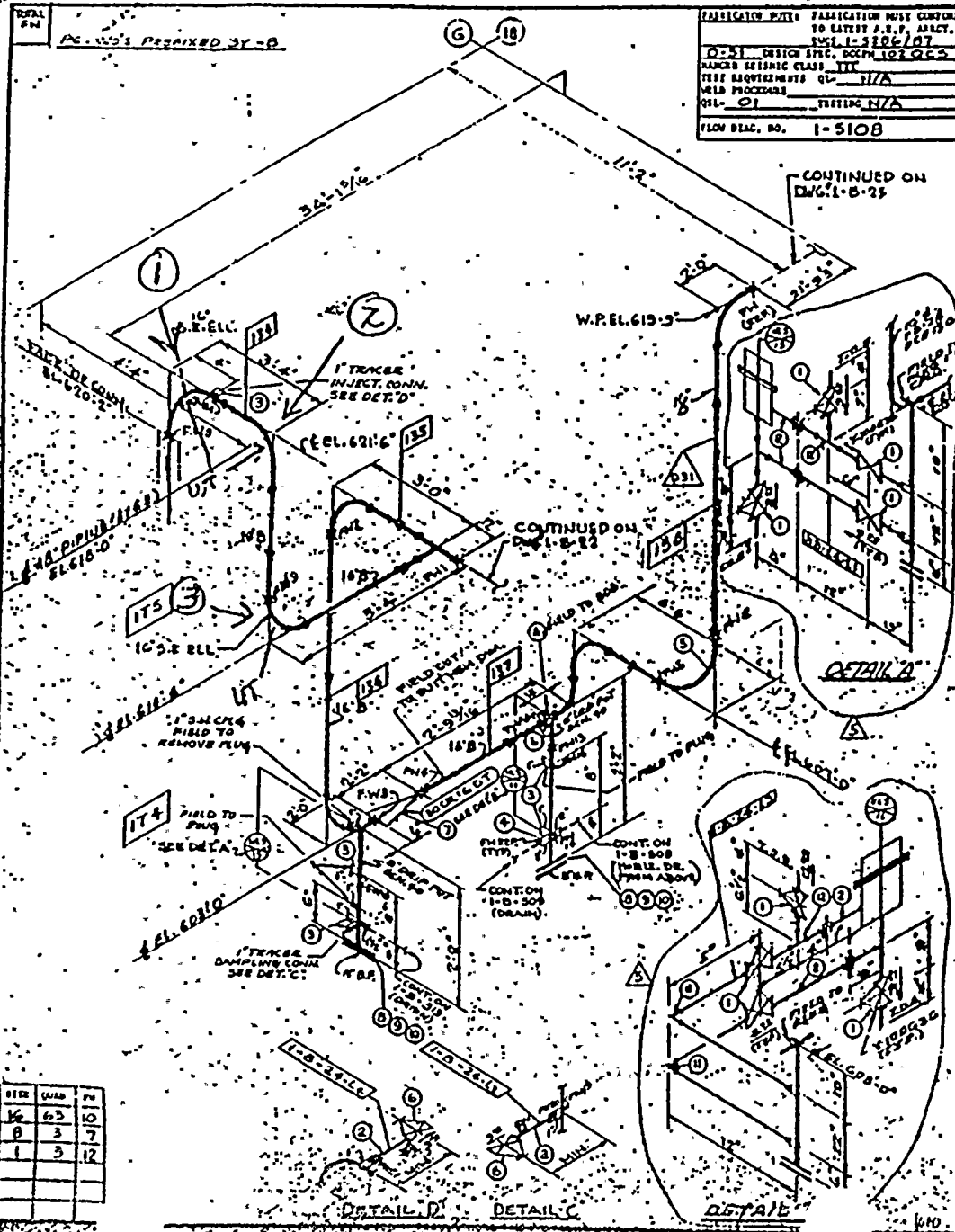
REV.	DATE	CODE	DESCRIPTION	P.D.	DWG.
5	11-17-71	BY TJB	REVISION: NEW 1" TRUCKER INJECT. CONN. SEE DET. D. FIELD ACTION REQ'D		
4	12-7-71	BY TJB	REVISION: NEW 1" TRUCKER INJECT. CONN. SEE DET. D. FIELD ACTION REQ'D		
3	3-2-72	BY TJB	REVISION: NEW 1" TRUCKER INJECT. CONN. SEE DET. D. FIELD ACTION REQ'D		
2	9-2-71	BY TJB	REVISION: NEW 1" TRUCKER INJECT. CONN. SEE DET. D. FIELD ACTION REQ'D		
1	11-17-71	BY TJB	ADDED PN NO'S		

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT  
BRIDGMAN MICHIGAN  
UNIT NO. 1

A-52		A-50		A-50		B-312						C-52		C-52 BY ALL ON	
C-52		C-52		C-52		C-52		C-52		C-52		C-52		C-52 BY ALL ON	
STD	IT	22	18	30	30	30	30	30	30	30	30	30	30	30	30
C	PRIDE	AREA	END	GLAD	END	END	END	END	END	END	END	END	END	END	END
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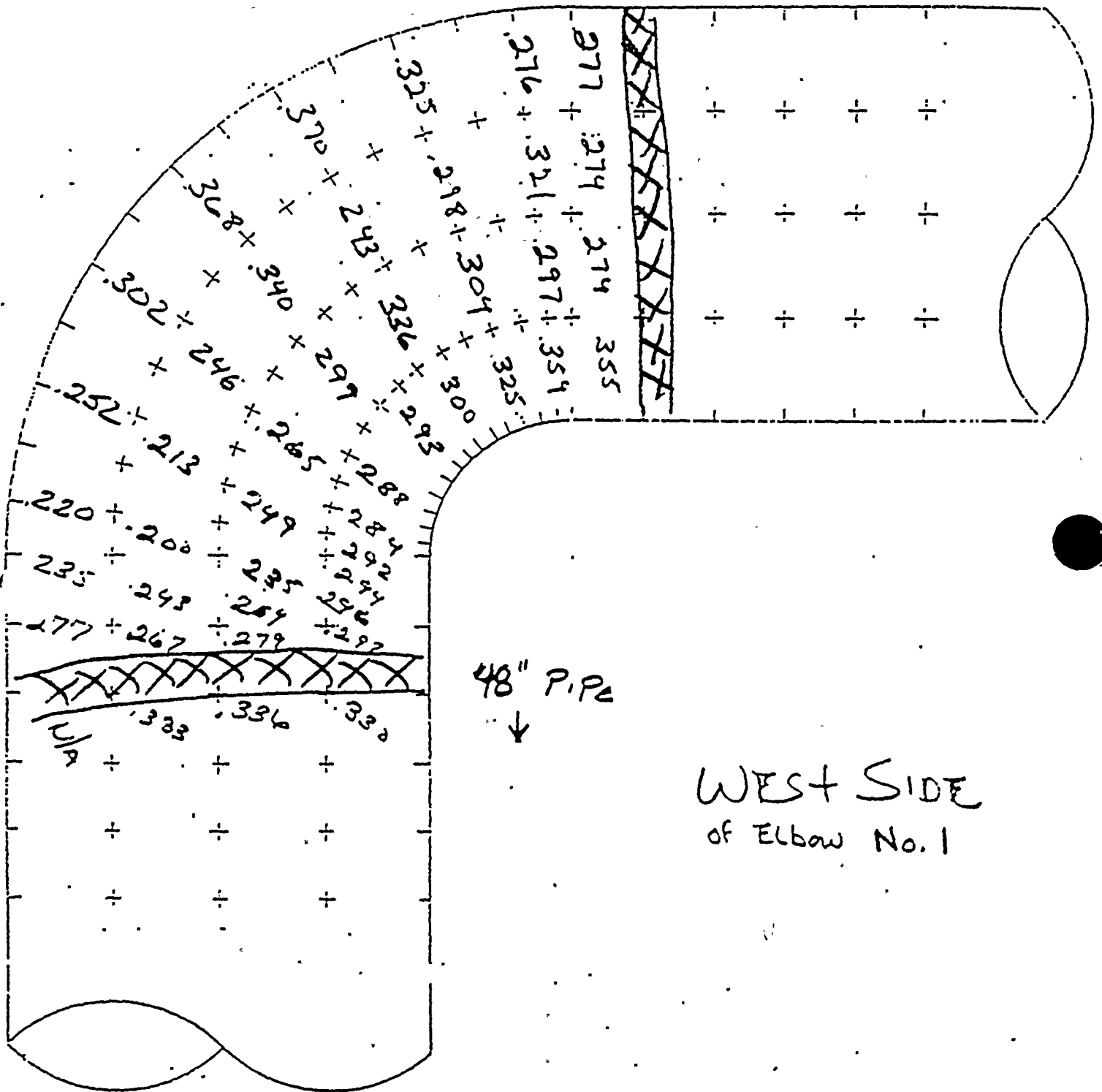
MATERIAL REQUIRED FOR  
FIELD REWORK

B-24 REV.5



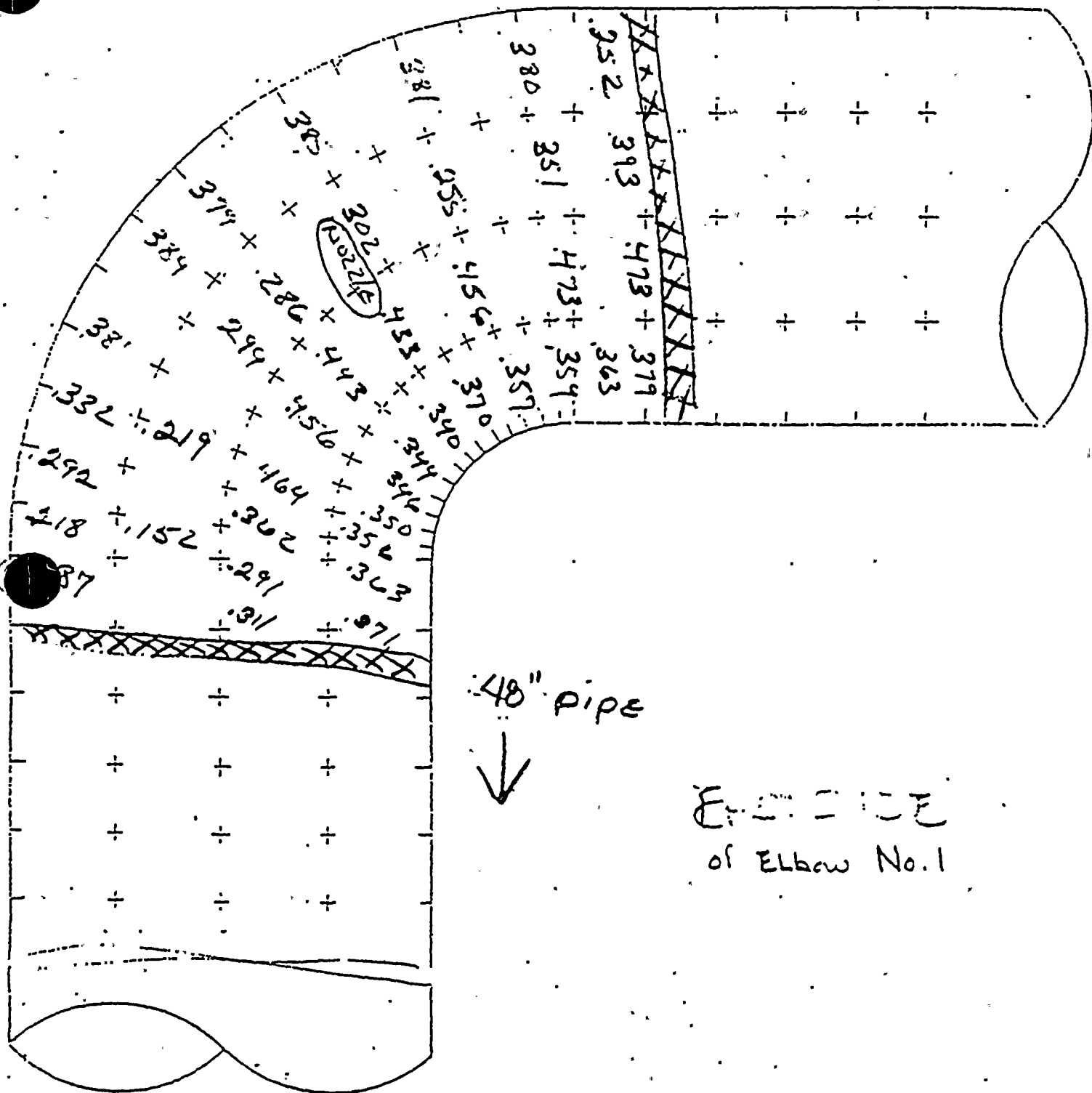
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3/4"	3	7
1"	3	12







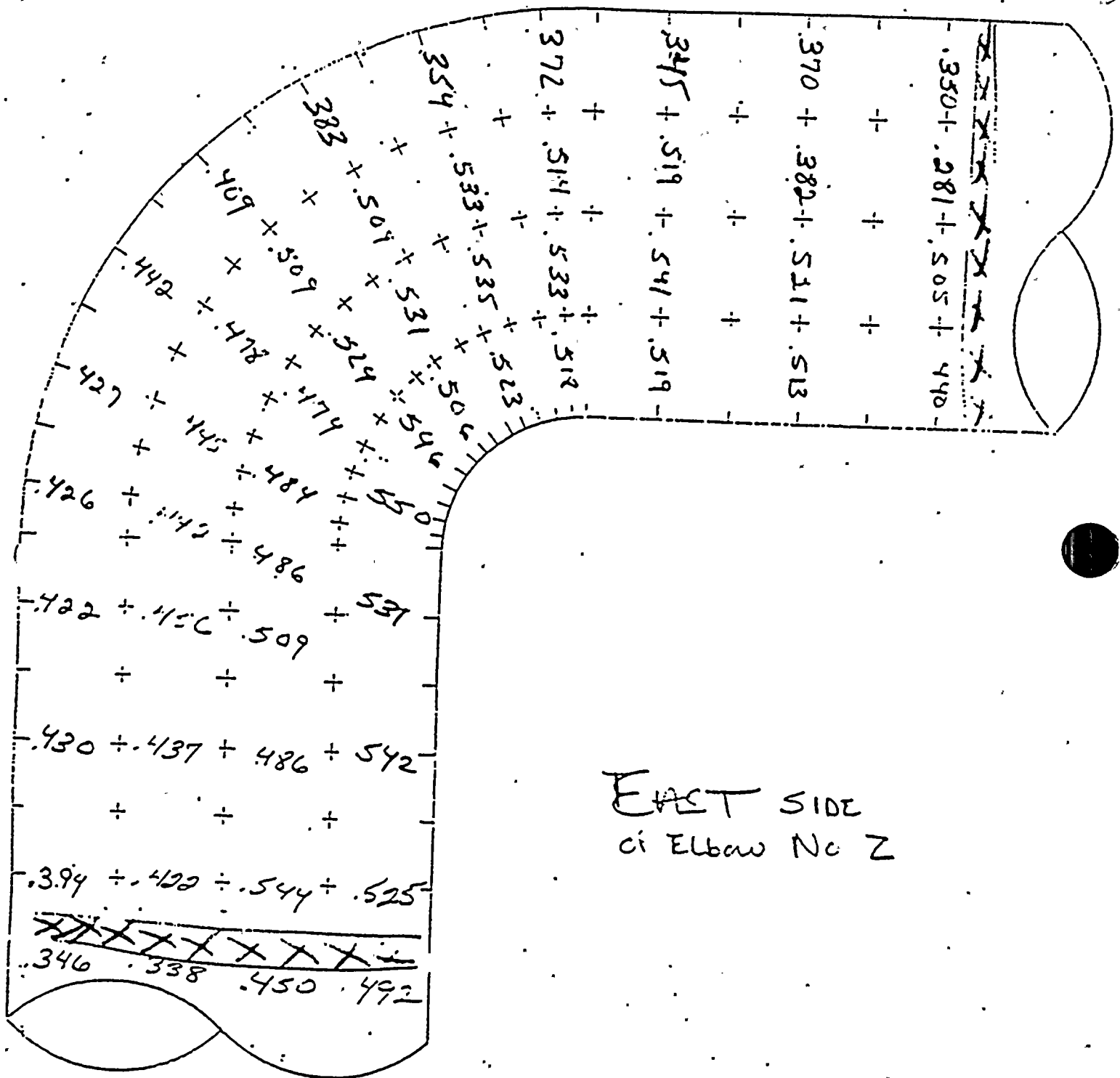
J.O. 96575





JP. 96575

48" →

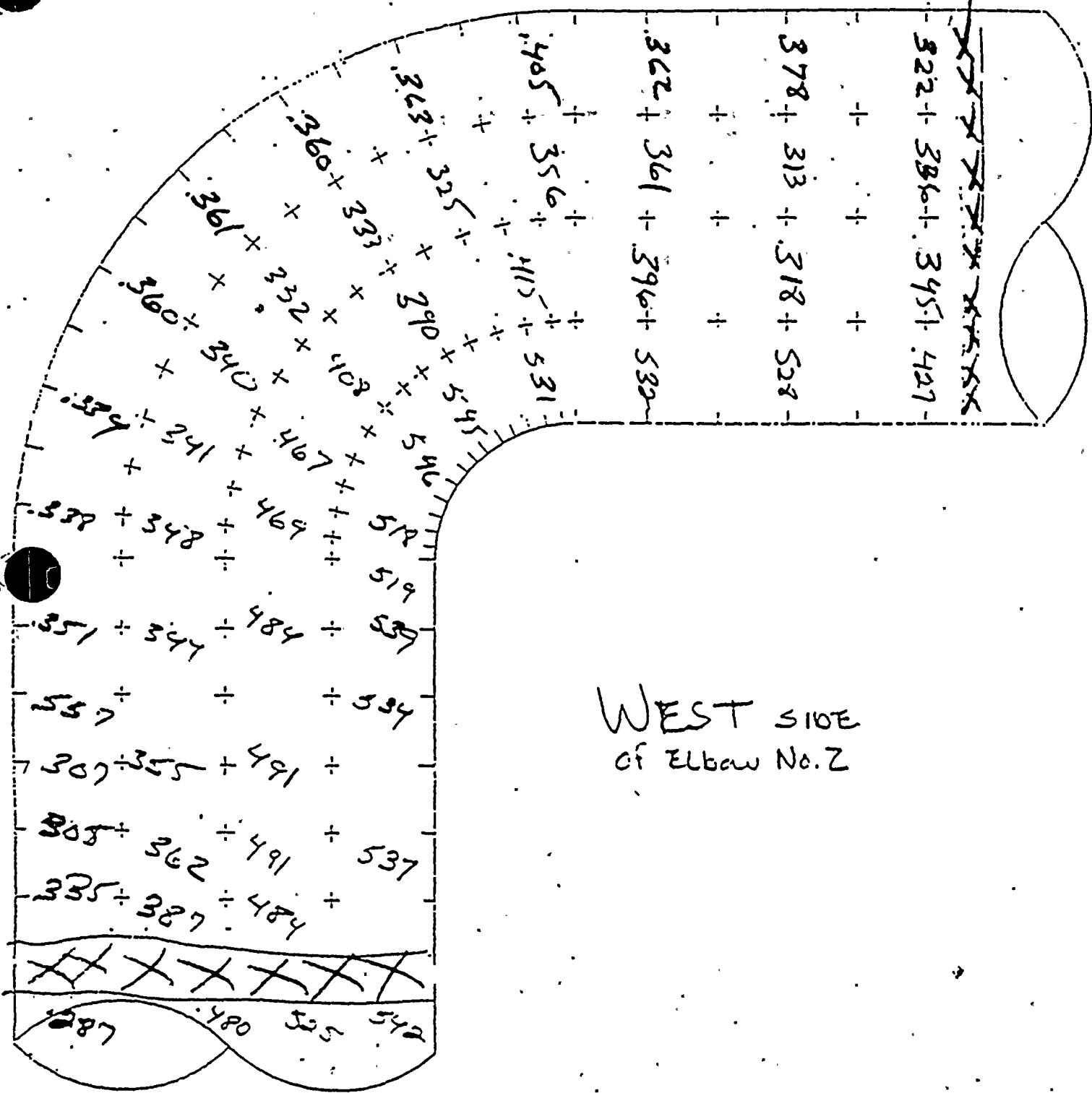


EAST SIDE  
ci Elbow No 2



J.O. 96575

48" →

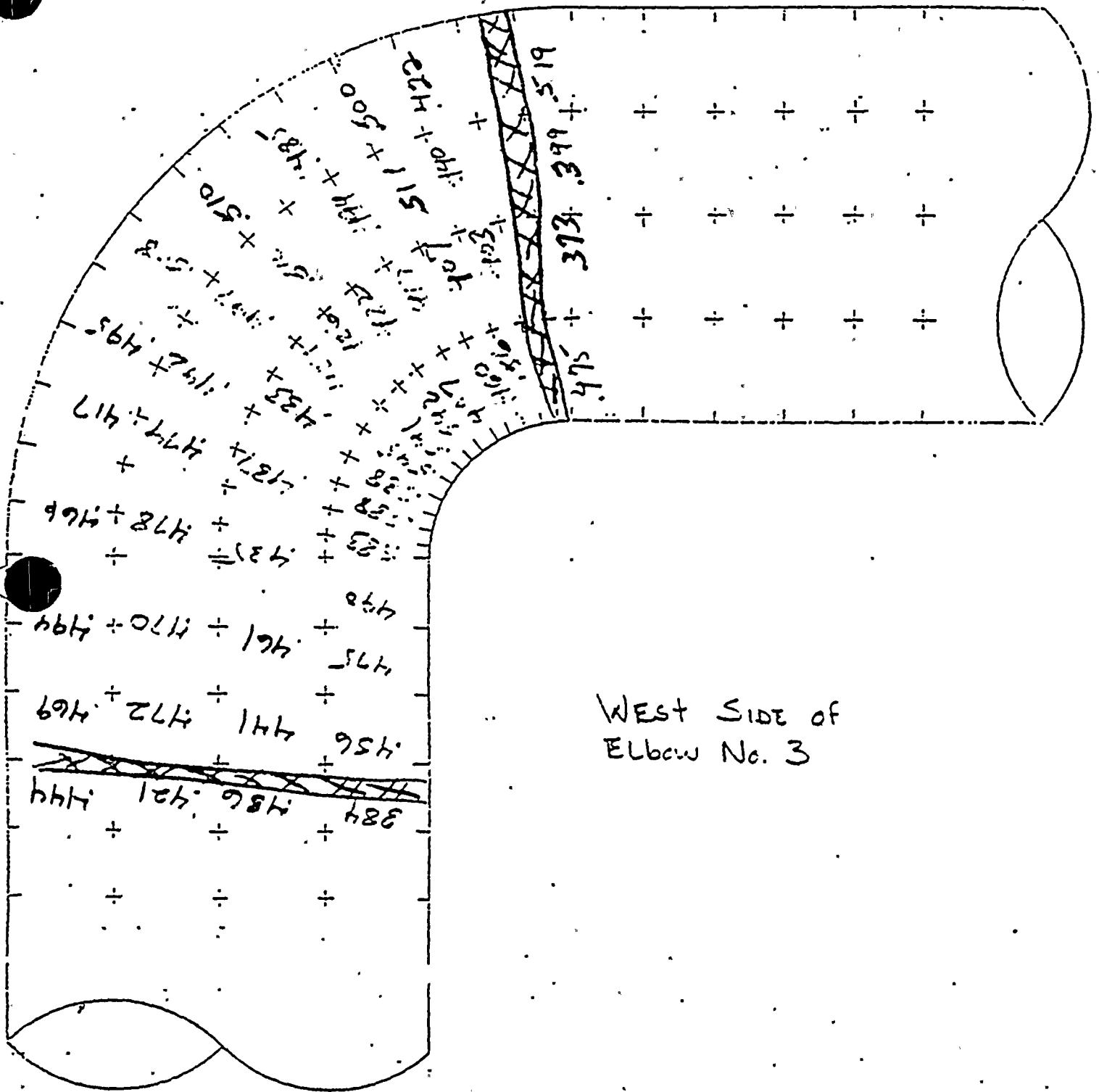






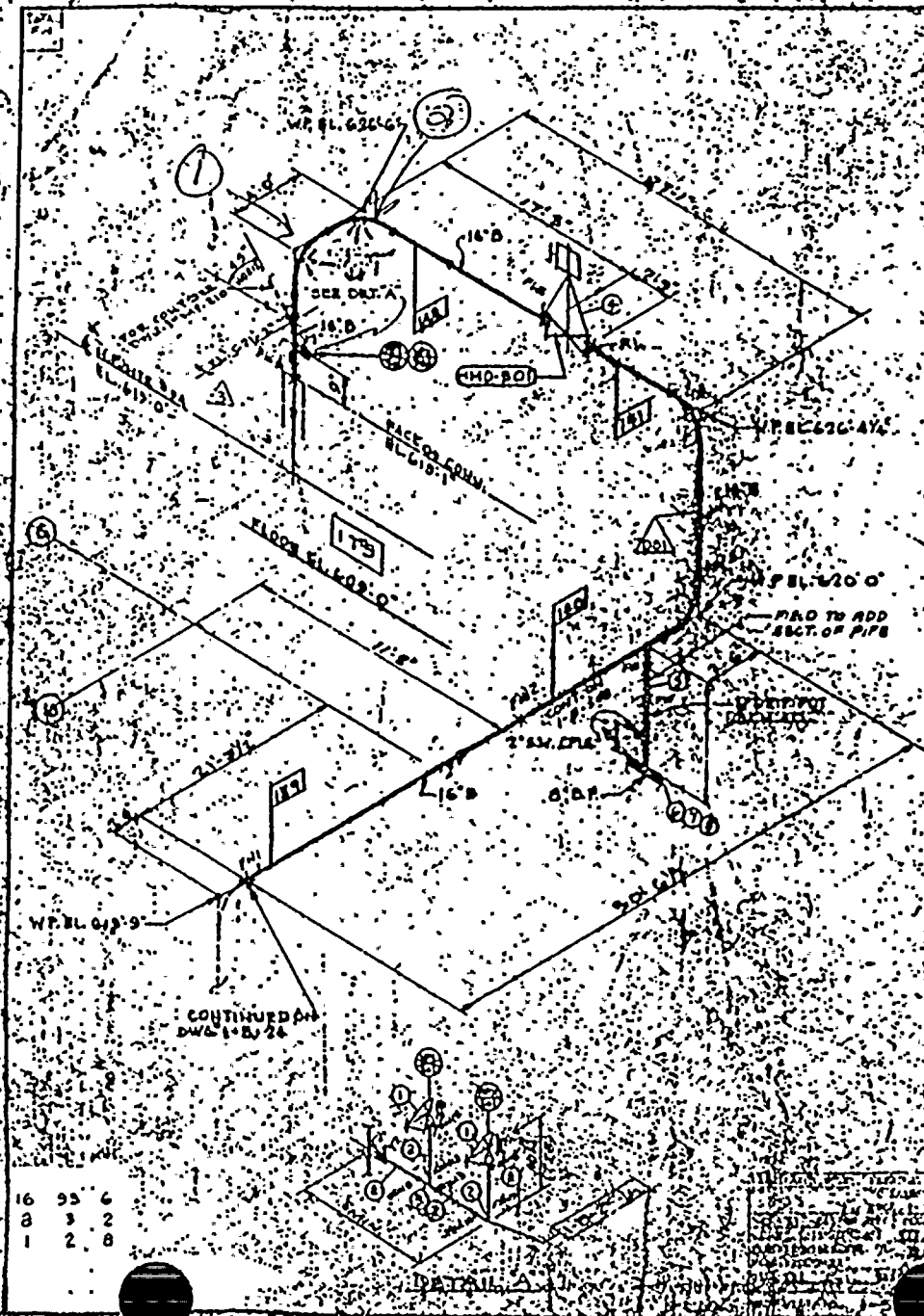


J.O. 96575



WEST SIDE of  
ELbow No. 3





P.O.	PIECE MARKS	FAB.
	1-B-139	SHAW
	-140	
	-141	
	-142	

SITE FAB. PIECE MARKS  
1-B-25-L

INFORMATION  
COPY ONLY

3	✓✓✓	1-8	AS PER RFC 12-2810 ADDED BRANCH 2044	✓✓✓
2	3-1-72	BT TJB	REVISED BY NPS DESIGN FOR A.E.P. DMS 1-2287 REV.2 ADDED ITEMS (1) D, (2) D, 2-8- MSS 12	✓✓✓
1	3-23-71	BT TJB	REVISED BY NPS DESIGN. FOR A.E.P. DMS 1-2287 REV.1 ADDED ITEMS (3) D, (2) D, 1- SITE PG. MK 1-D-ES-L, 1- 1 CODE STAMP	REV. 2 ACTION REQ'D
REV.	DATE	CODE	DESCRIPTION	PO. DMS

INDIANA & MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK, NUCLEAR PLANT  
BRIDGMAN MICHIGAN  
UNIT NO. 1

[illegible]

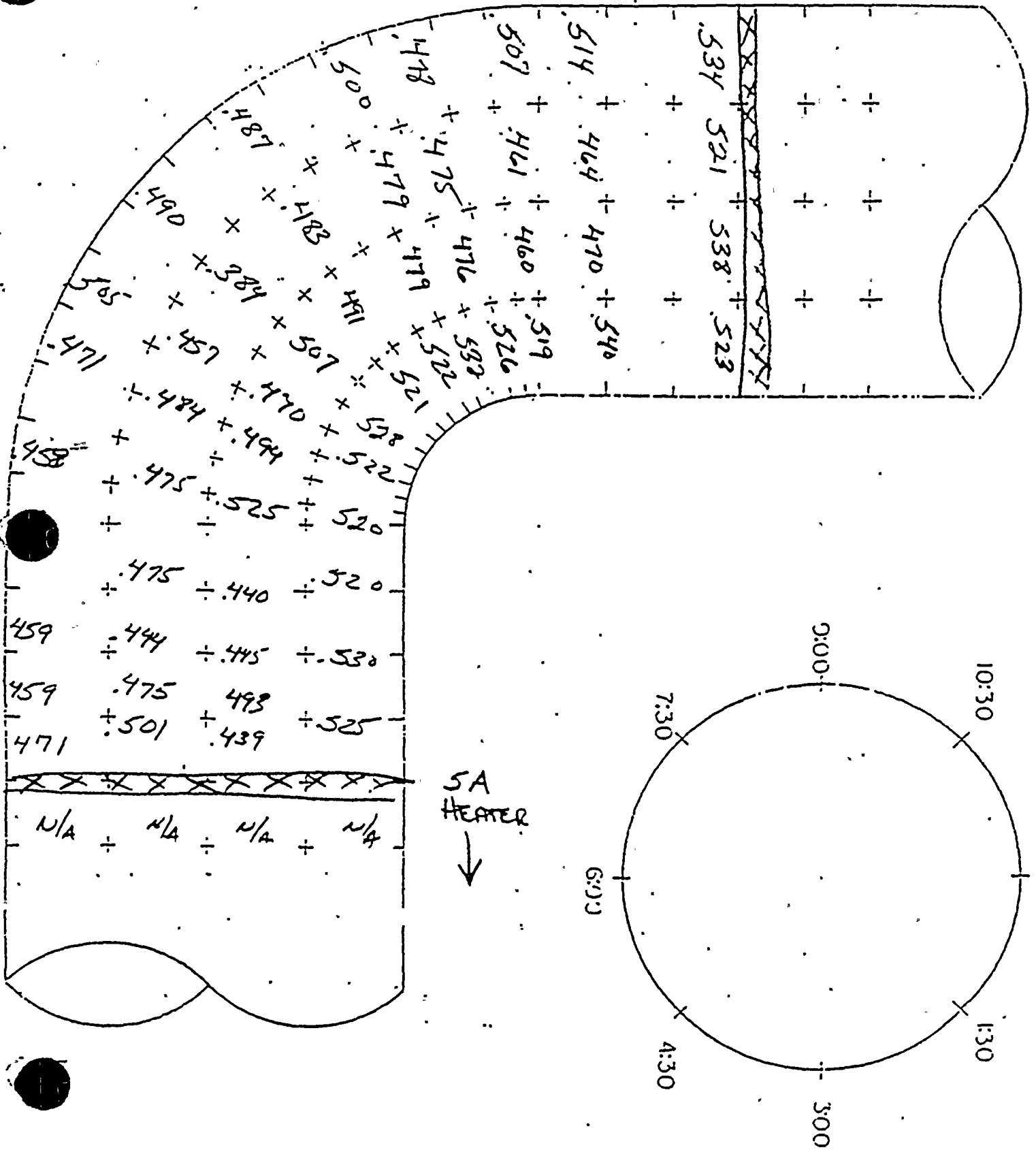
### MATERIAL REQUIRED FOR FIELD REWORK

DWG 140



J.O. 96575

EAST #1



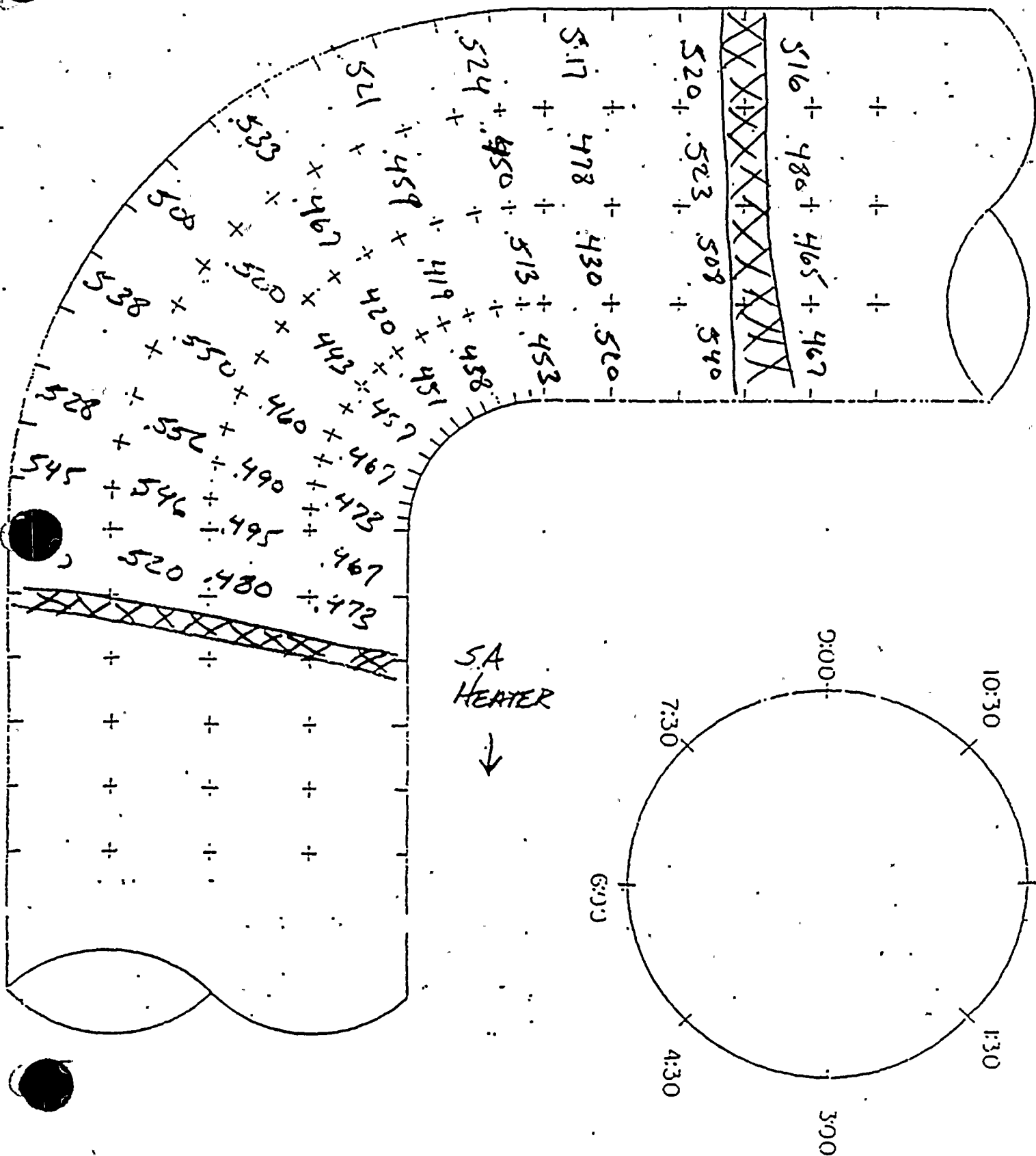






J.O. 96575

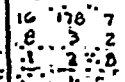
#2 EAST







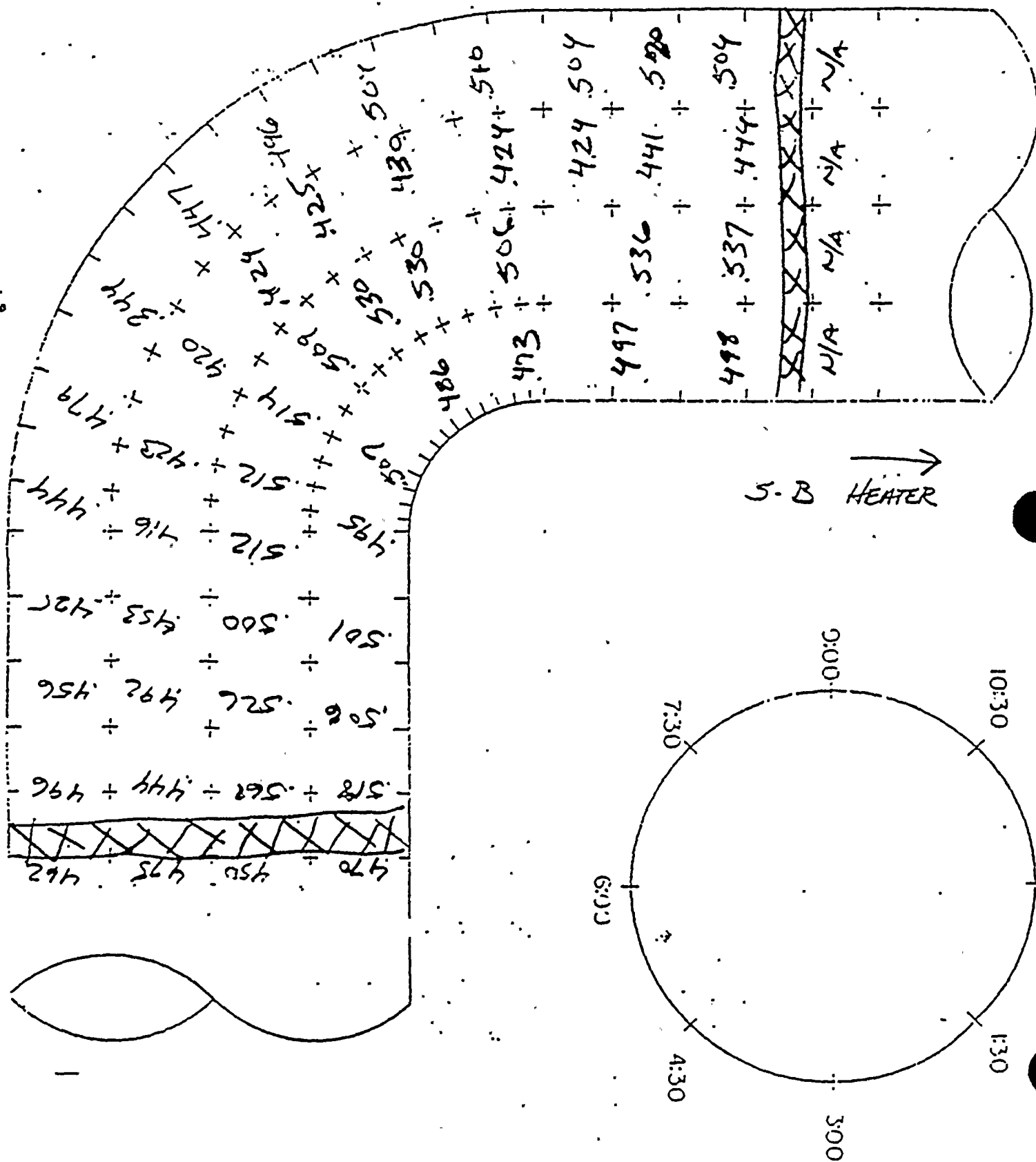




DWG NO 1 F 134.3



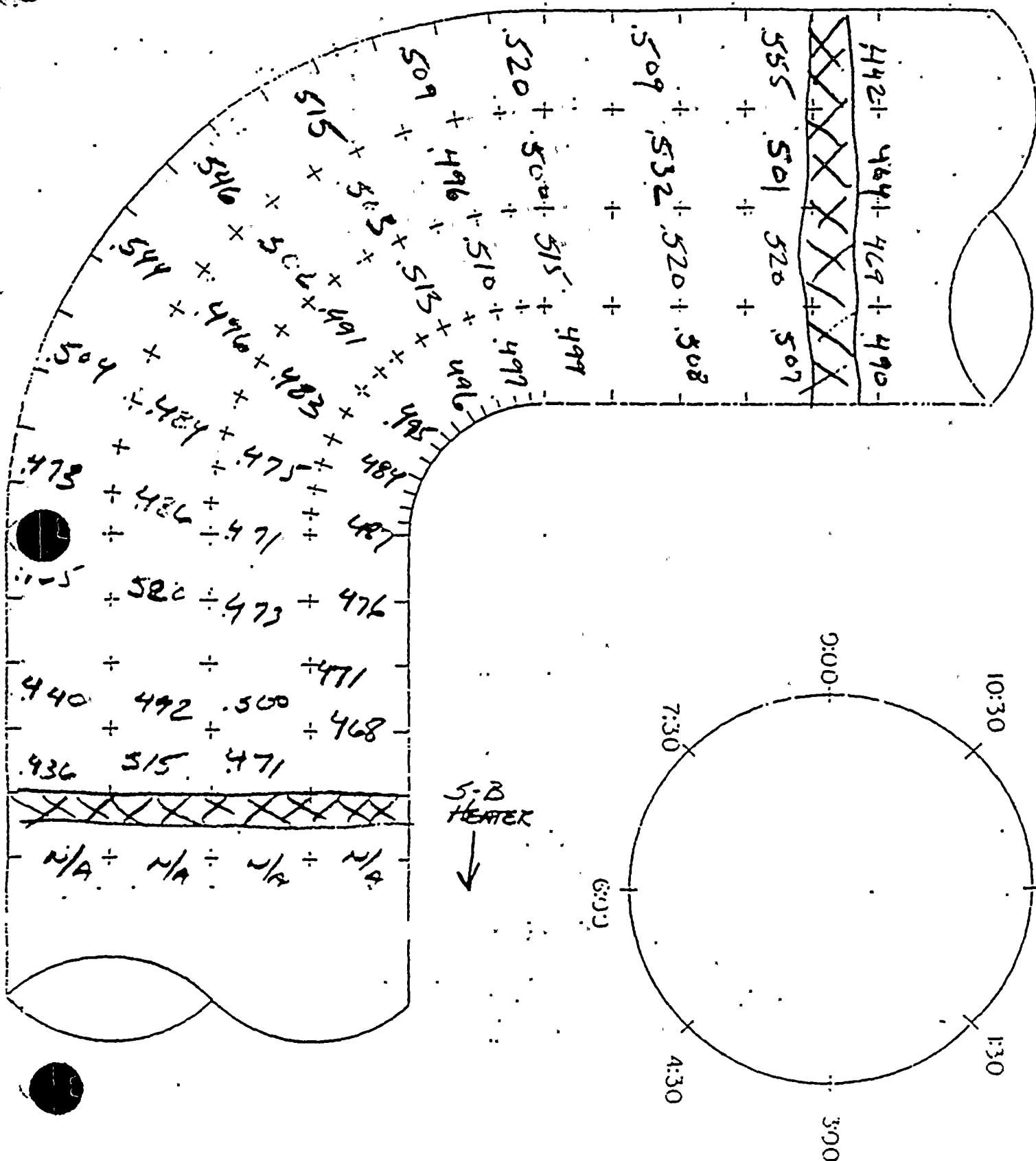
71 EAST.





J.O. 96575

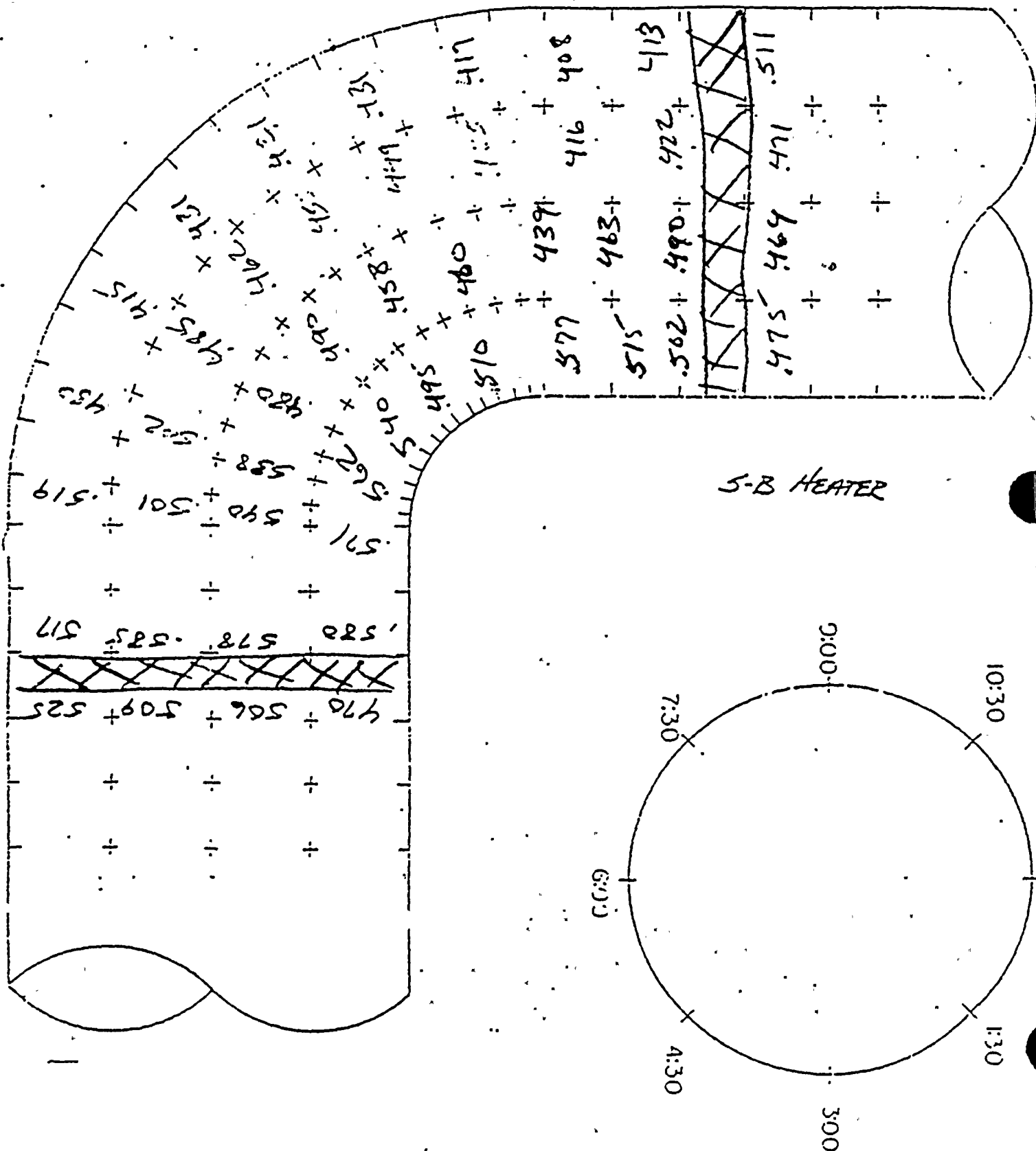
# West





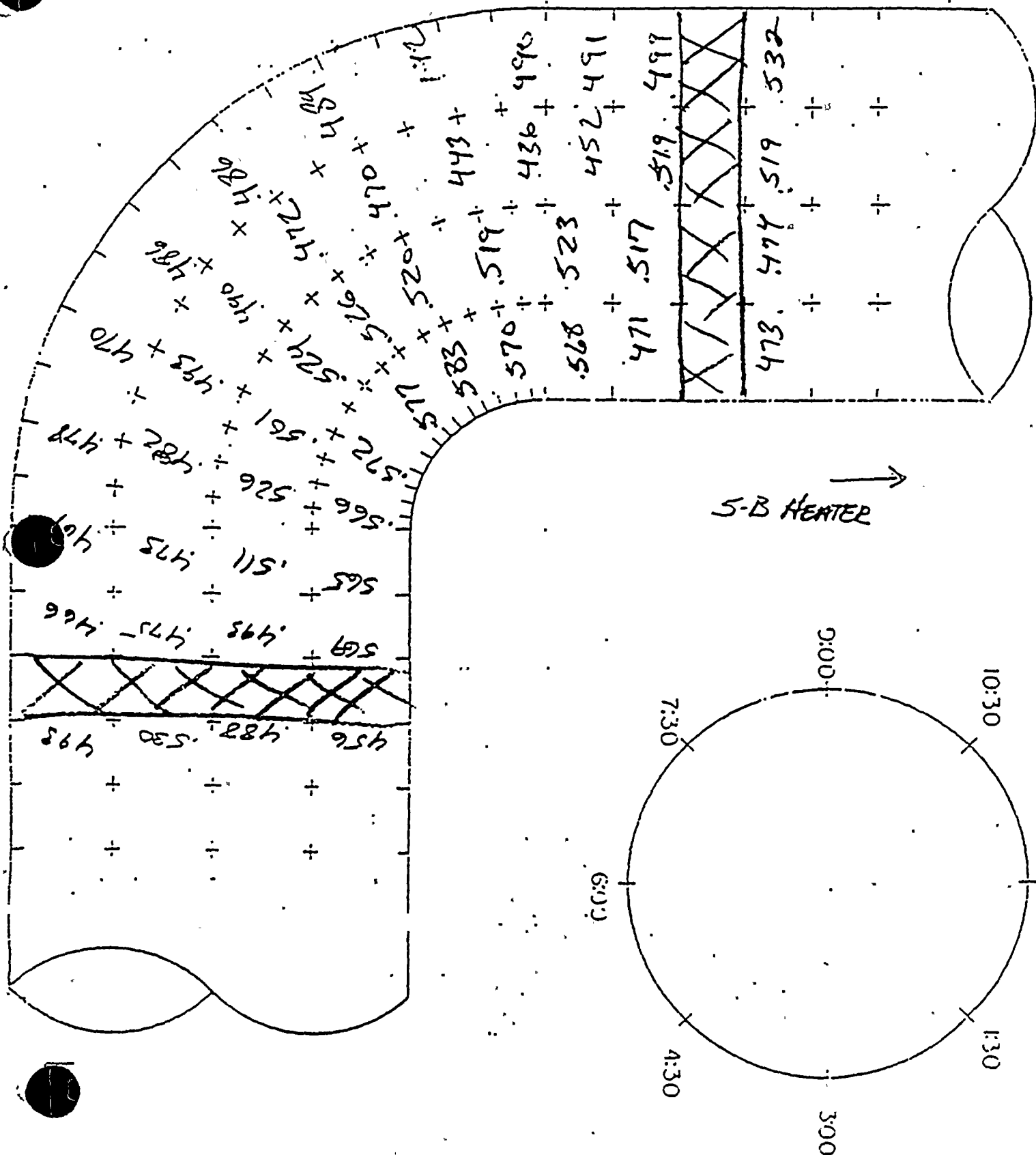
T.O. 96575

#2 EAST



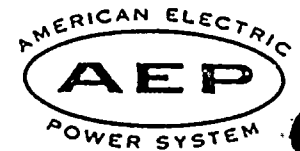


#2 west





INDIANA & MICHIGAN ELECTRIC COMPANY



DATE: August 30, 1982

SUBJECT: Ultrasonic Inspection of Bleed Steam Piping

FROM: R.E. Kernosky

TO: M.J. Freidman

The attached ultrasonic readings are from the first two elbows off of the 48" G.E. Piping as referenced on ISO 1B-24R5.

R.E. Kernosky  
Sr. QC Technician

/jas

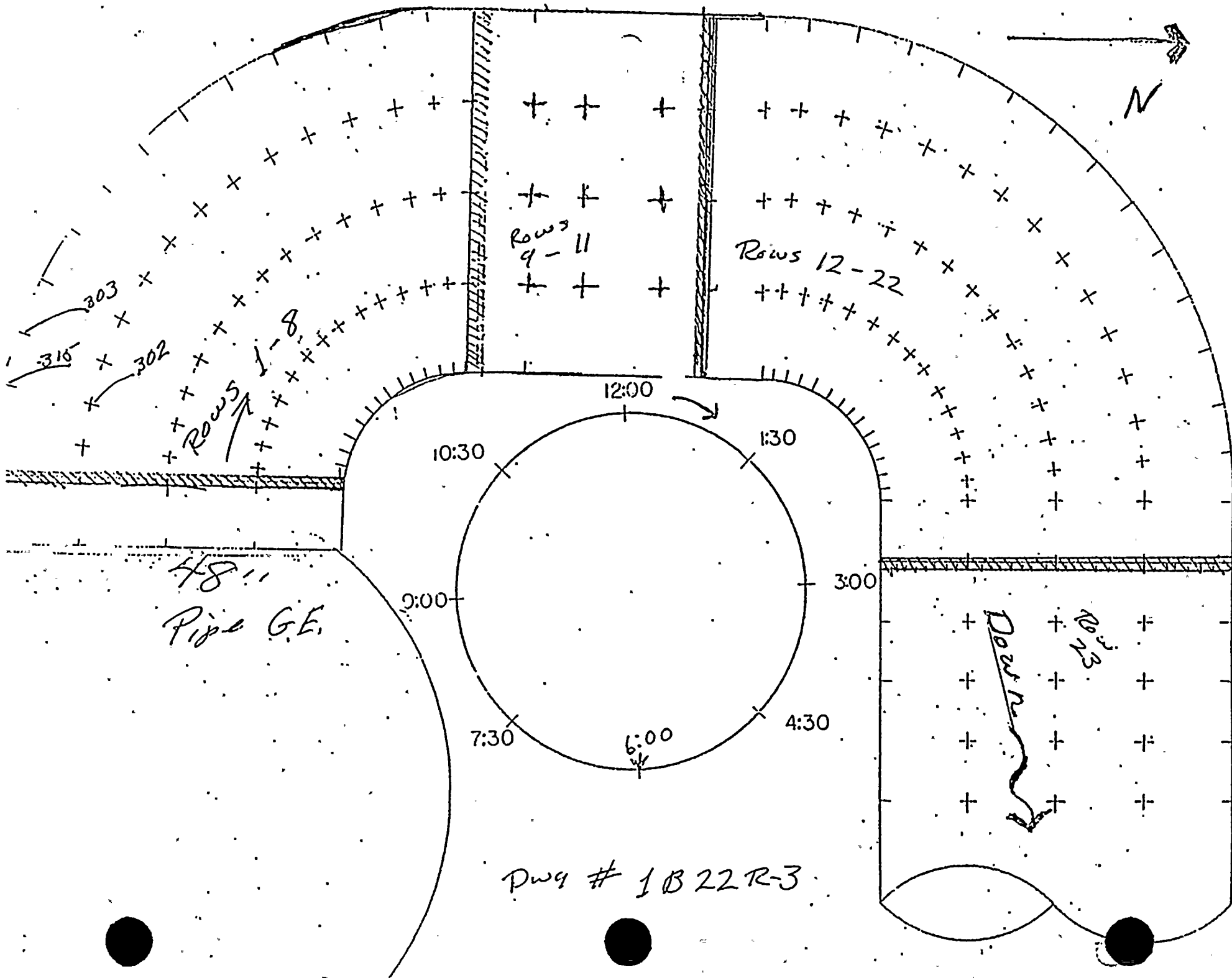
cc: W.G. Smith, Jr./B.A. Svensson (w/o attachments)  
E.L. Townley (w/o attachments)  
J.F. Stietzel (w/o attachments)  
E.A. Morse (w/o attachments)  
File



BLEED STEAM PIPING*Dwg. 1B24R-5*

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.395	.379	.314	.384	.488	.417	.416	.386
2	.315	.302	.340	.479	.483	.427	.361	.345
3	.303	.291	.367	.489	.490	.418	.390	.342
4	.329	.346	.373	.461	.493	.423	.371	.353
5	.315	.355	.387	.494	.500	.424	.385	.404
6	.330	.370	.395	.518	.510	.433	.410	.384
7	.409	.385	.335	.524	.511	.434	.402	.419
8	.409	.432	.479	.552	.507	.396	.358	.382
9	.452	.480	.422	.554	.520	.367	.375	.379
10	.387	.482	.518	.447	.428	.388	.359	.379
11	.390	.529	.478	.467	.445	.407	.393	.410
12	.396	.484	.548	.450	.411	.448	.438	.445
13	.513	.518	.529	.472	.432	.398	.407	.483
14	.539	.541	.529	.477	.488	.430	.413	.484
15	.545	.538	.522	.459	.505	.438	.418	.511
16	.528	.522	.519	.458	.510	.440	.431	.491
17	.545	.541	.500	.494	.502	.439	.406	.478
18	.544	.514	.487	.472	.504	.440	.423	.465
19	.511	.531	.462	.525	.506	.439	.431	.449
20	.455	.470	.462	.527	.493	.437	.410	.427
21	.453	.495	.481	.531	.491	.445	.393	.422
22	.481	.492	.482	.513	.483	.476	.439	.422
23	.443	.474	.463	.535	.458	.449	.431	.368







UNIT 2  
HEATERS 43, 5A & B, 6A & B  
FIRST 90 BEND ONLY  
INDIANA & MICHIGAN ELECTRIC COMPANY



DATE: August 23, 1982

SUBJECT: Steam Extractor Ells Testing

SEP 6 1982

FROM: R.E. Kernosky  
TO: J.F. Stietzel  
E.A. Morse

The following are the steam extractor ells ultrasonically tested during the recent Unit 2 shutdown.

Readings were made at 8 points around the pipe using the clock for reference at approximately 4" intervals. The attempt was made to include as much as possible of the adjacent piping.

  
R.E. Kernosky

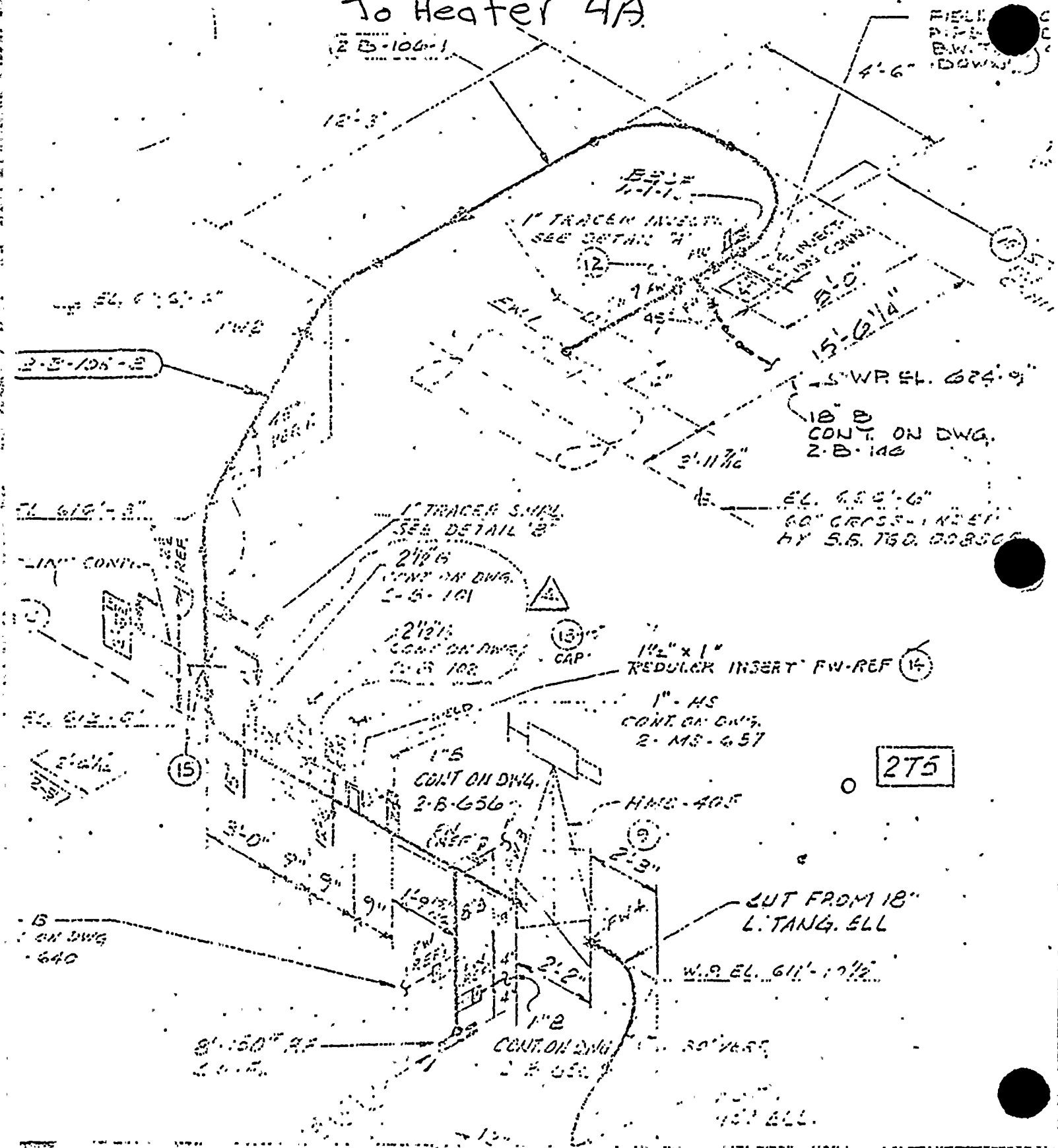
/jas

cc: W.G. Smith, Jr./B.A. Svensson  
E.L. Townley  
File

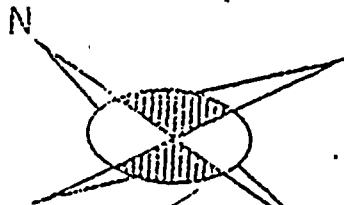


2-B-106  
To Heater 4A

FIELD  
PAGE  
B.V.  
DOWN







2-B-107  
To Heater 4B

18" B  
CONT. ON DWG.  
2-B-146

8'-0"  
CWP EL. 624'-6"

2-B-113

VERT 9-  
FW

2'-4"

INJECTION  
CONN.

2-B-107-2

FIELD TO CUT PIPE  
ADD 18" E.W. TEE

SEE DWG. 2-B-133  
FOR TRIPPER  
INJECTION CONT.

2-B-107-1

VERT 9-  
FW

1" TRIPPER  
INJECTION  
SEE DETAIL A

UT 4B-3

W.F. EL. 622'-5"  
FW 5

SAMPLING  
CONN.

1" PHASE  
SEE DETAIL

2 1/2" - L  
CONT. ON  
2-B-15

2 1/2"  
CONT. ON  
2-B-15

W.F. EL. 622'-5"

3'-5 1/2"

W.F. EL. 612'-6"

SEE DET. A  
VERT 9-  
FW

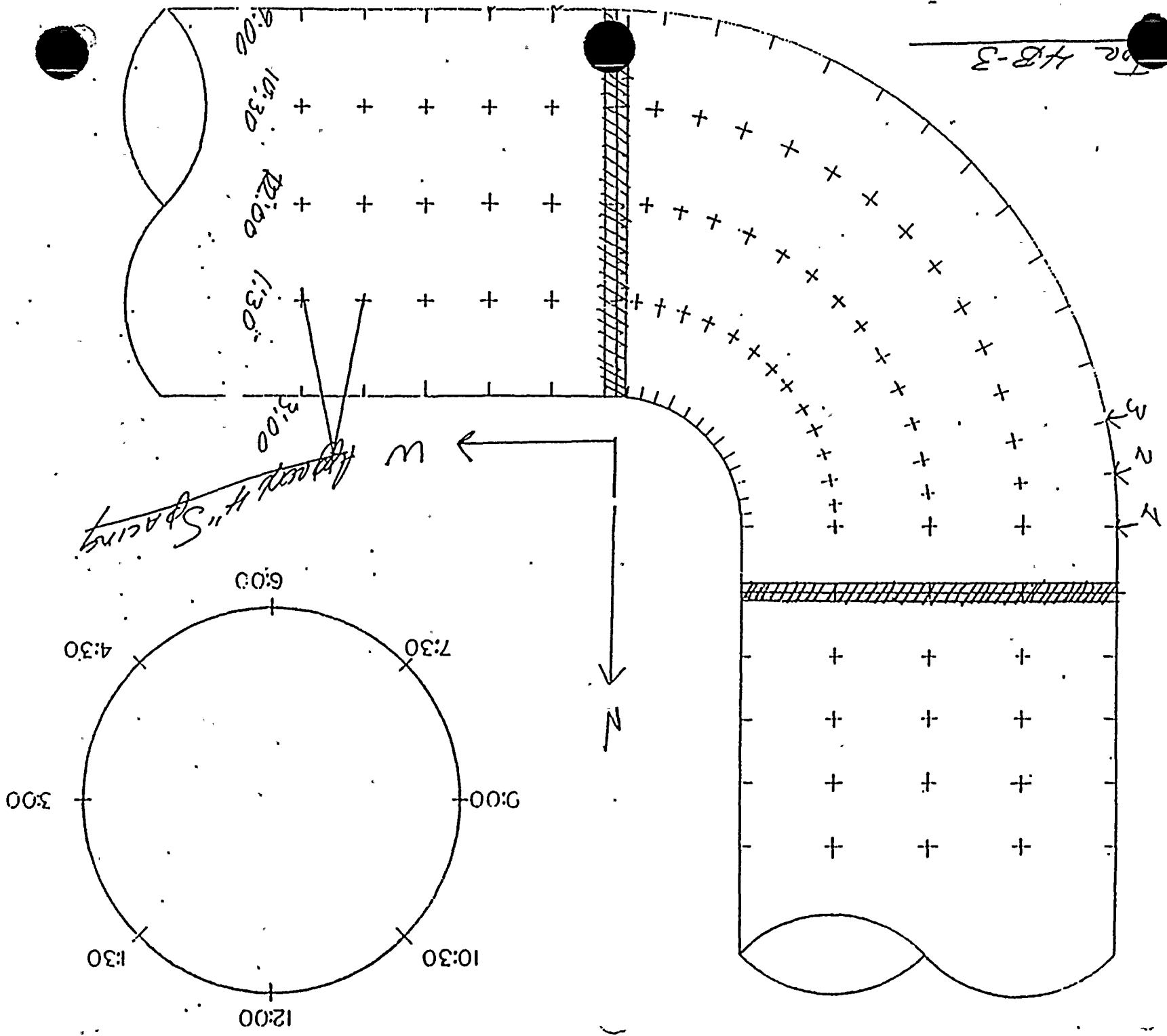
2-B-107-5

2 1/2" B CONT. ON  
DWG. 2-B-103

2" - B  
CONT. ON DWG.  
2-B-641

625'-6"  
CROSS-UNDER  
B.B.  
D. 008505







STEAM EXTRACTION LINES

HB-3

January 52

	<u>12:00</u>	<u>11:30</u>	<u>9:00</u>	<u>7:30</u>	<u>6:00</u>	<u>4:30</u>	<u>3:00</u>	<u>10:30</u>
1.	.456	.457	.462	.453	.381	.447	.460	.444
2.	.458	.446	.438	.460	.446	.457	.478	.448
3.	.451	.450	.445	.444	.444	.472	.490	.458
4.	.460	.457	.472	.465	.440	.479	.481	.463
5.	.456	.450	.445	.443	.452	.488	.510	.459
6.	.470	.449	.444	.459	.464	.512	.535	.476
7.	.476	.445	.338	.450	.457	.510	.517	.456
8.	.484	.456	.442	.443	.450	.512	.534	.484
9.	.474	.441	.435	.438	.449	.507	.523	.495
10.	.482	.420	.410	.429	.448	.500	.537	.471
11.	.472	.446	.399	.436	.490	.499	.503	.472
12.	.420	.408	.376	.404	.388	.416	.431	.426

Minimum wall = 0.122"

P = 100 psi

T = 330° ±

No problem yet.

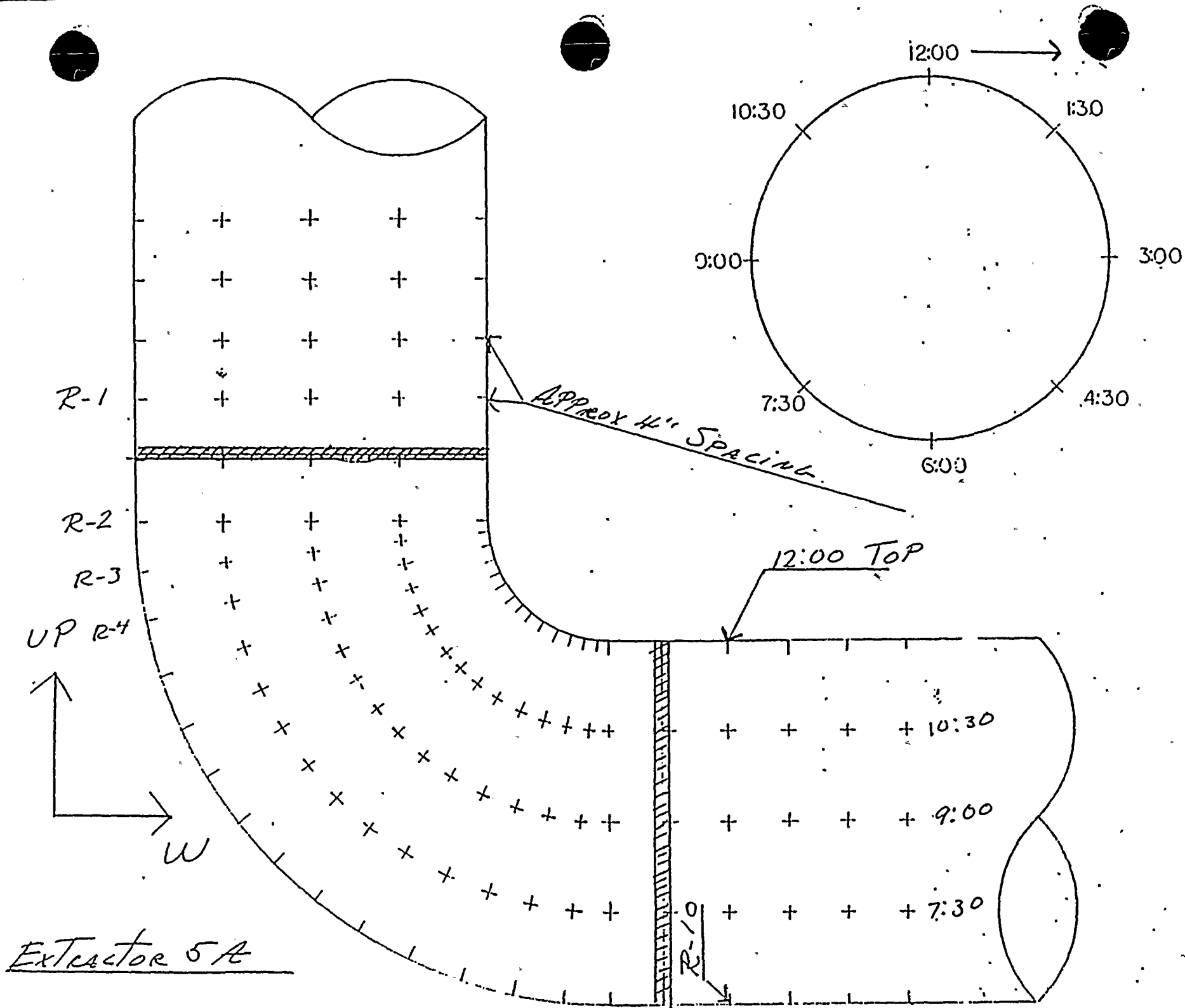
Loss is 0.562" - 0.338" = 0.224"  
in 4 yrs



2-B-82  
To Heater 5A









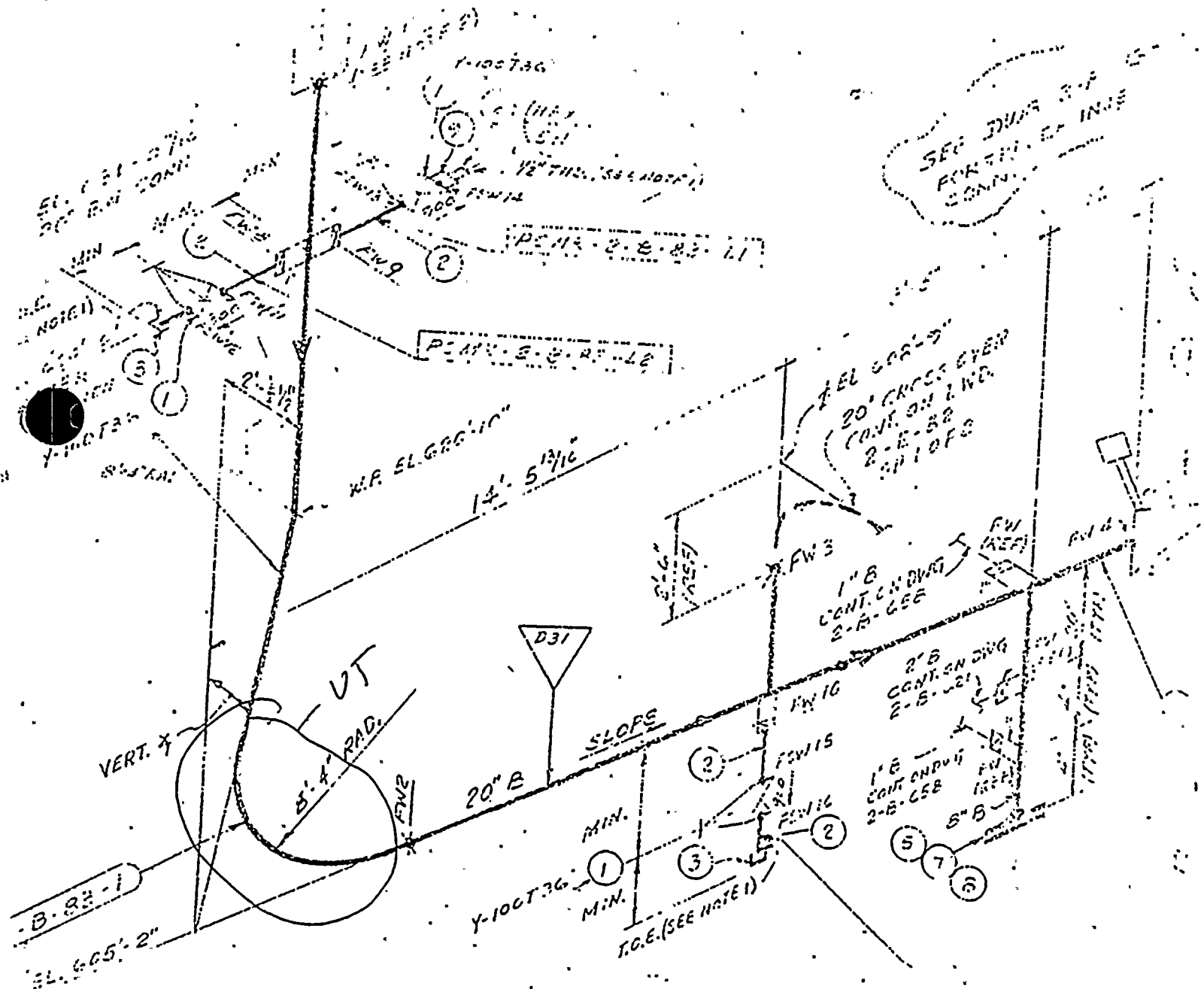
STEAM EXTRACTION LINES 5A

	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1.	.565	.555	.558	.561	.544	.490	.553	.539
2.	.529	.532	.543	.502	.523	.490	.460	.491
3.	.507	.550	.560	.540	.587	.515	.525	.468
4.	.514	.534	.553	.527	.650	.537	.554	.546
5.	.540	.552	.532	.550	.561	.553	.483	.579
6.	.537	.543	.541	.529	.545	.536	.490	.537
7.	.526	.559	.529	.520	.537	.506	.524	.547
8.	.549	.541	.540	.476	.553	.542	.547	.545
9.	.544	.551	.538	.508	.602	.545	.582	.546
10.	.527	.523	.546	.573	.560	.602	.526	.560

AT=566

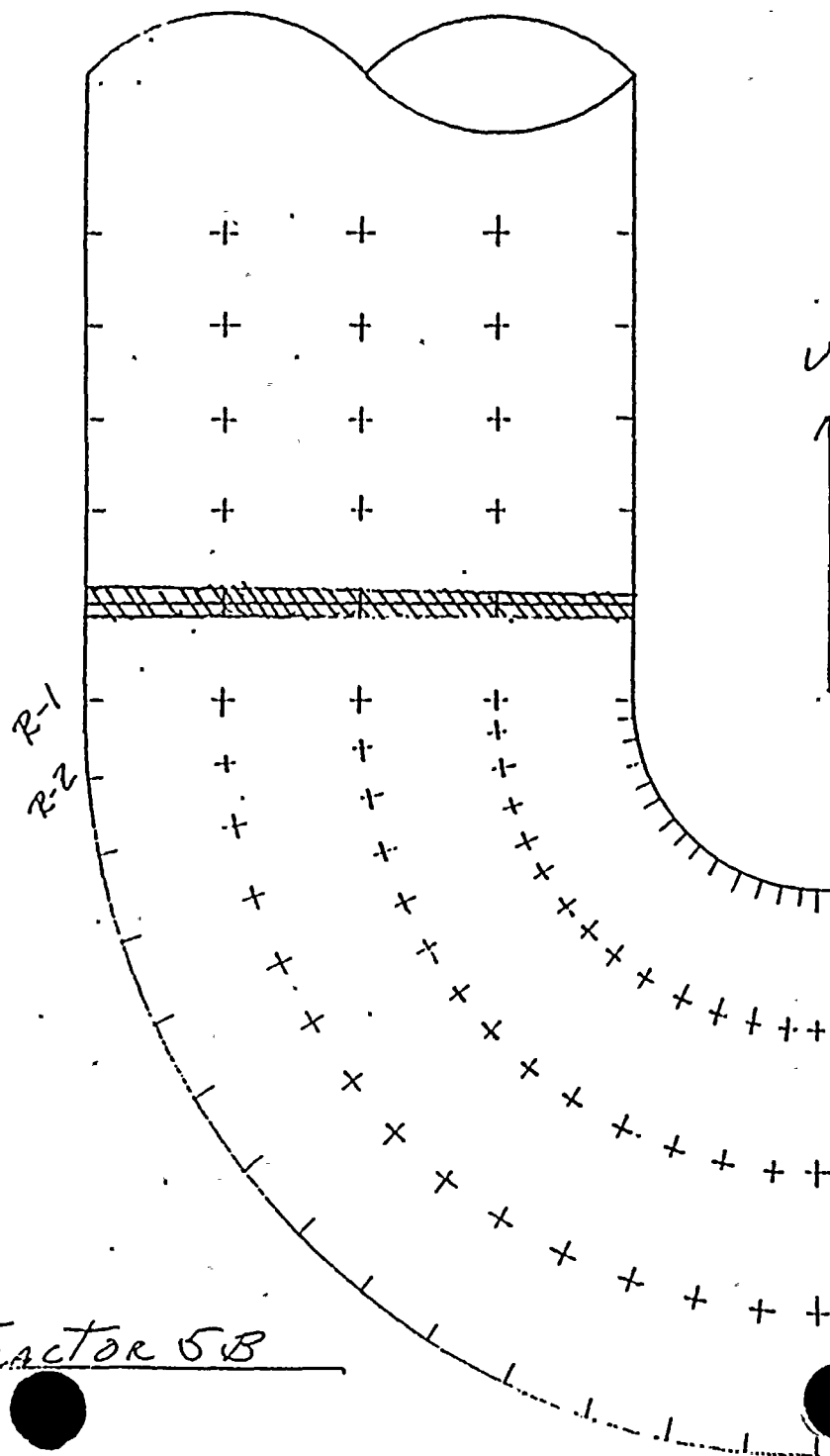


2-B-83  
To Heater 5B

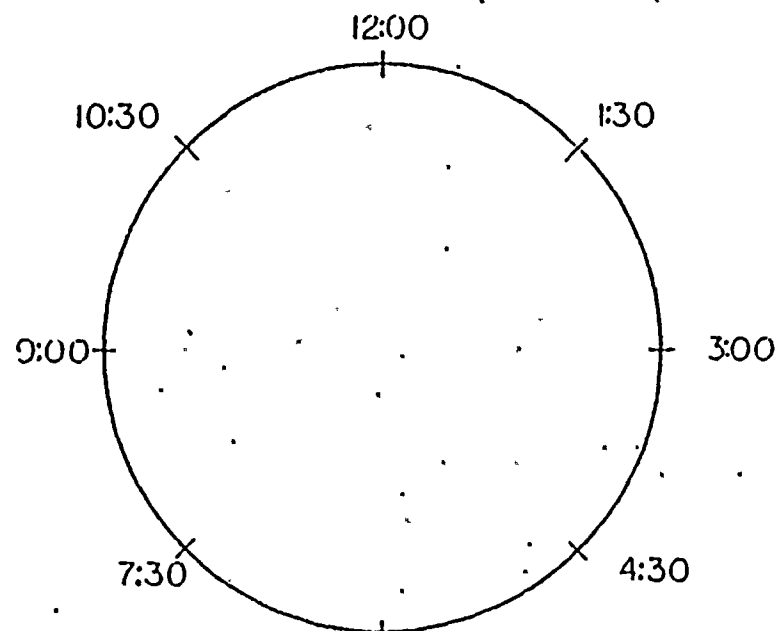
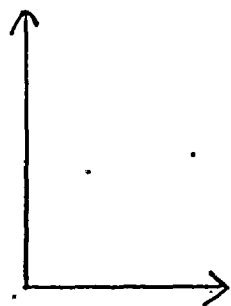




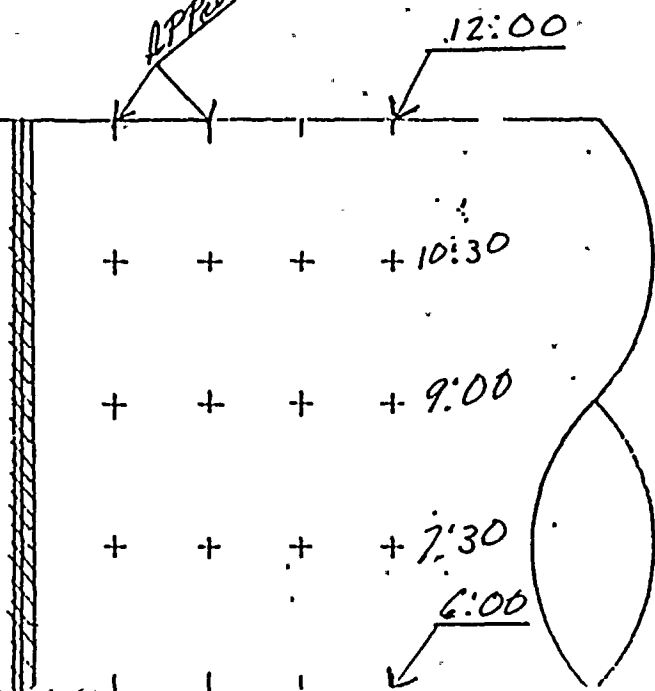
EXTRACTOR 5B



VP



APPROX. 4" SPACING



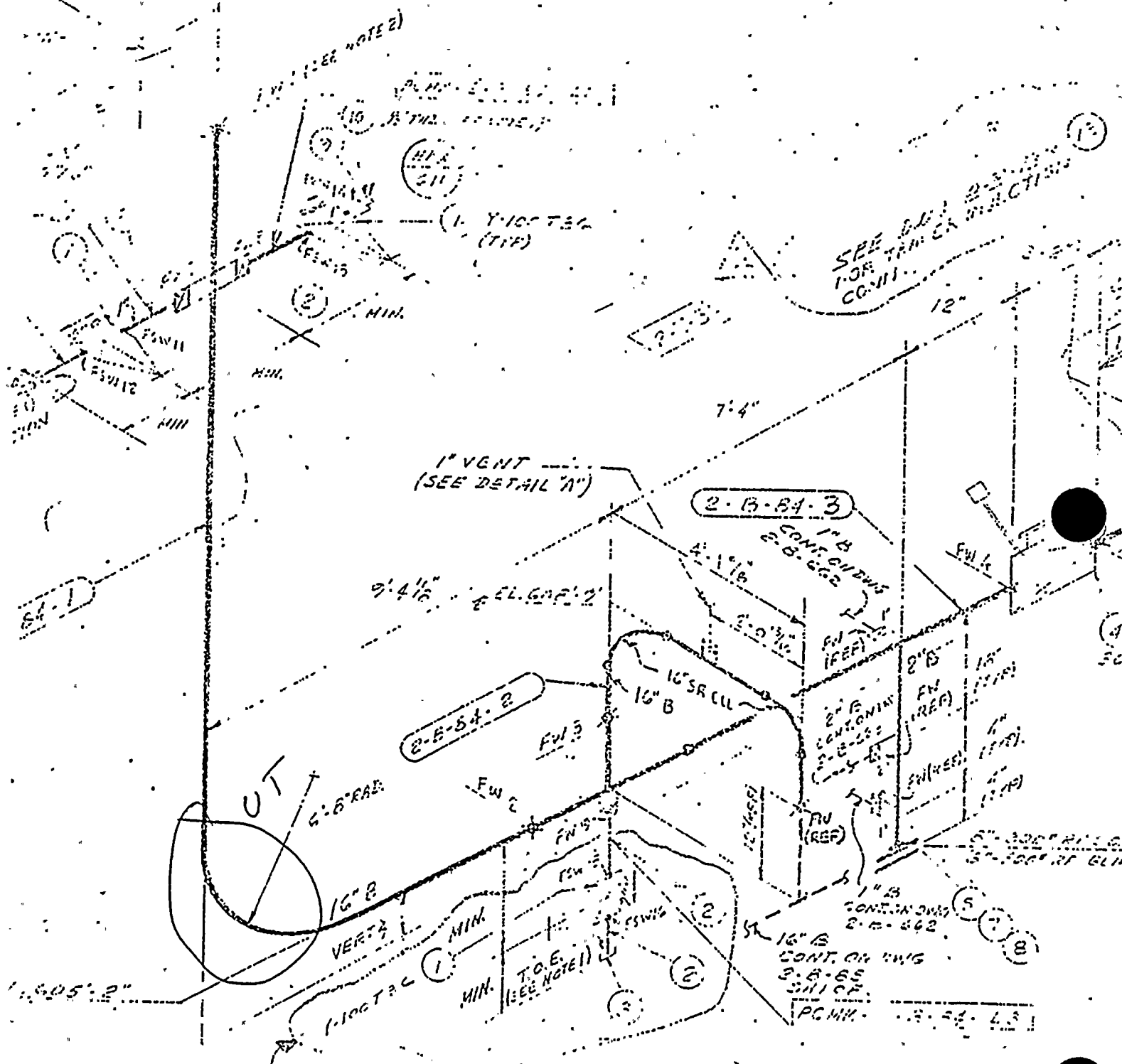


# STEAM EXTRACTION LINES 5B

	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1.	.528	.555	.552	.504	.489	.475	.505	.538
2.	.541	.553	.548	.520	.497	.534	.515	.533
3.	.539	.544	.539	.578	.515	.525	.555	.523
4.	.526	.538	.552	.533	.518	.529	.552	.540
5.	.508	.541	.524	.532	.506	.518	.536	.529
6.	.499	.526	.525	.500	.488	.476	.544	.523
7.	.516	.524	.529	.475	.511	.490	.551	.542
8.	.521	.520	.527	.475	.476	<u>.444</u>	.537	.508
9.	.522	.540	.527	.480	.567	.481	.531	.522
10.	.556	.533	.511	.542	.545	.539	.507	.542
11.	.547	No Access	No Access	No Access	.528	.536	.518	.537
12.	.535	.545	No Access	No Access	Stan- chion	.532	.526	.518



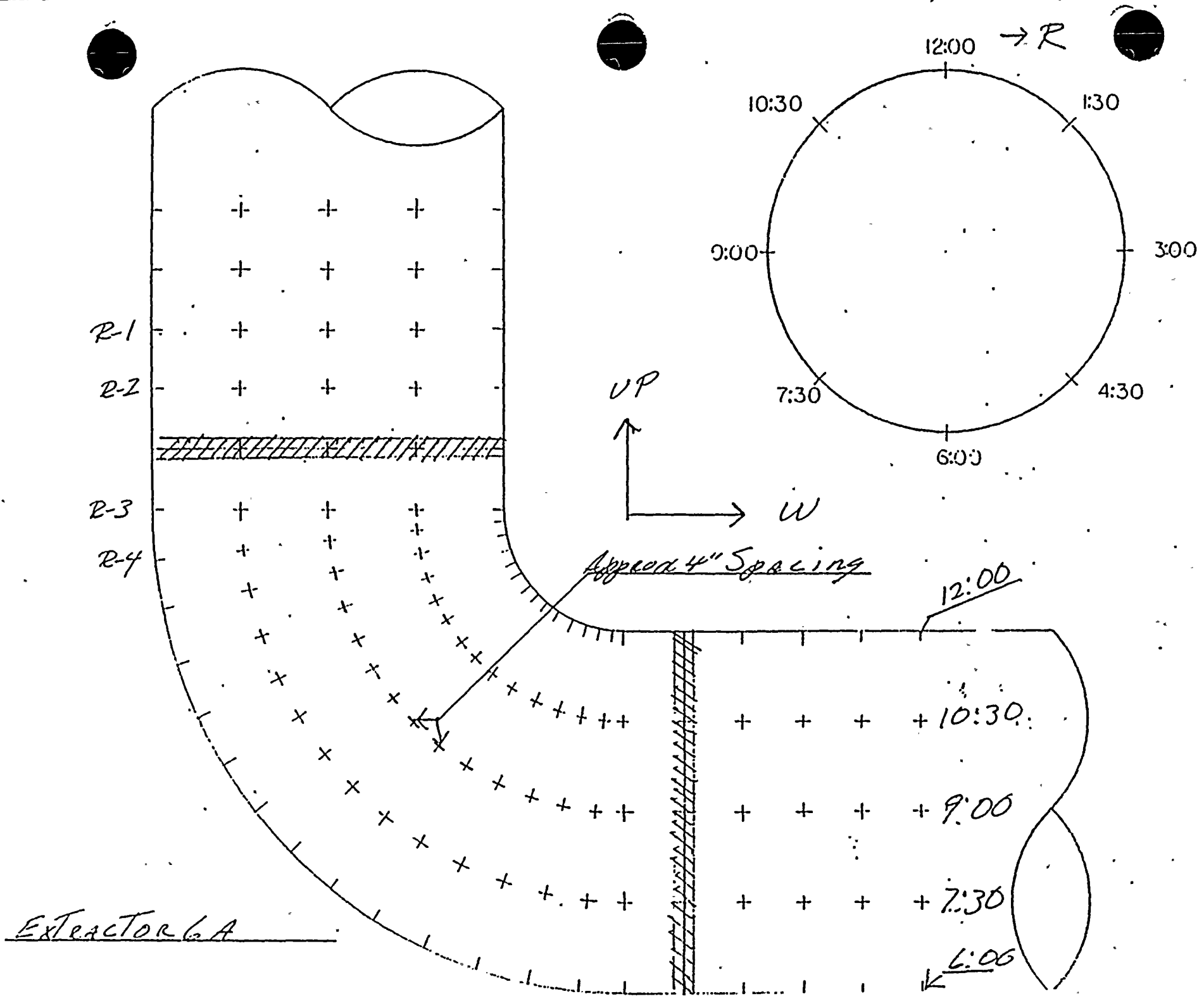
2-B-84 SHT let 2  
To Heater 6A



- 415 CHARGE 415-A OF GROUP 5C  
 11-15-68 11:12 PM 1968 11-15-68

5720 1000 1000 1000 1000





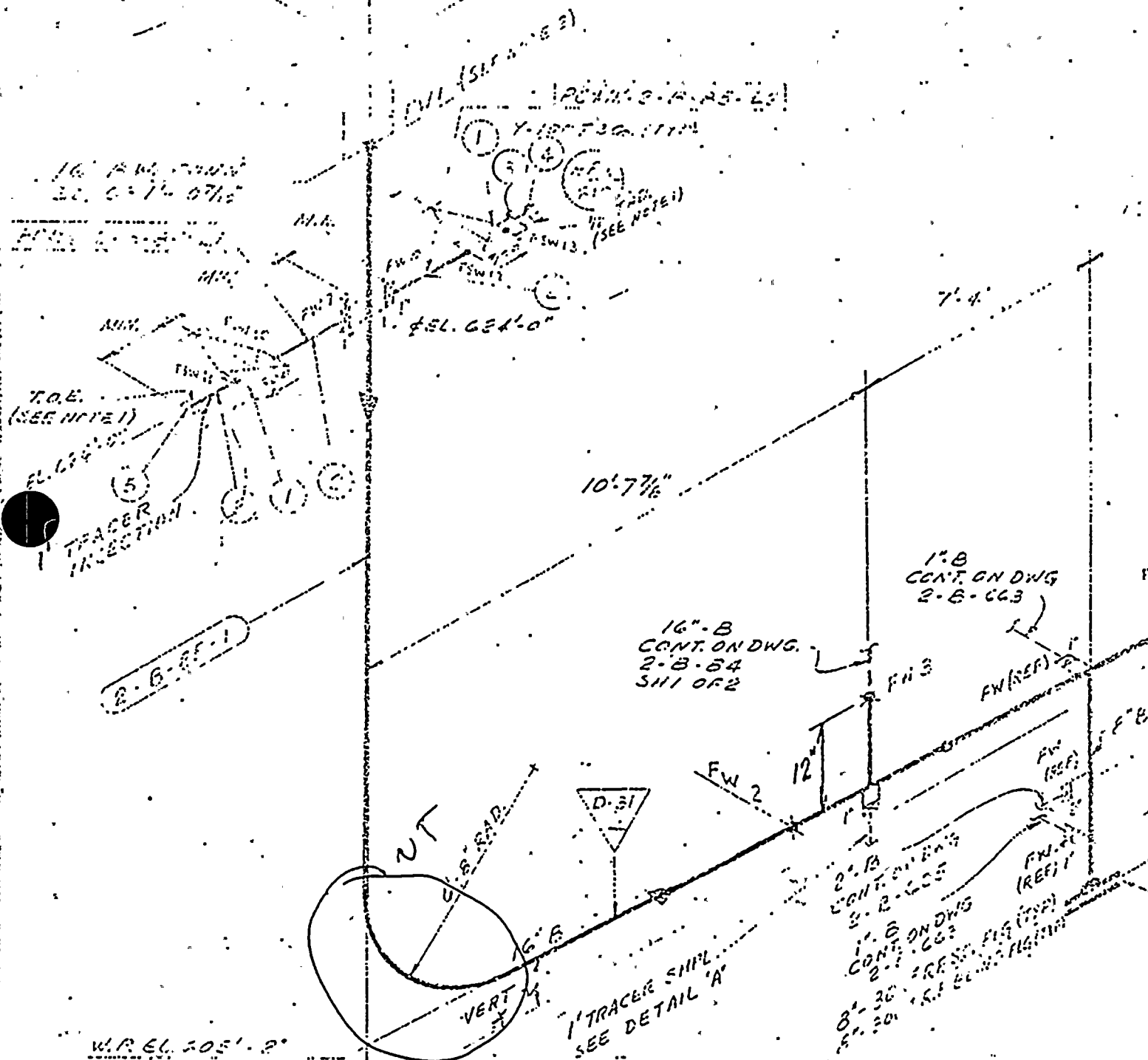


STEAM EXTRACTION LINE 6A

	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1.	.514	.568	.533	.543	.527	.532	.513	.54
2.	.518	.546	.533	.574	.524	.538	.588	.520
3.	.502	.519	.522	.503	.514	.520	.480	.516
4.	.525	.528	.542	.512	.504	.518	.528	.532
5.	.542	.531	.533	.495	.486	.516	.552	.535
6.	.549	.538	.497	.480	<u>.480</u>	.506	.529	.541
7.	.545	.546	.517	.481	.493	.513	.533	.529
8.	.508	.522	.503	.516	.529	.526	.525	.519



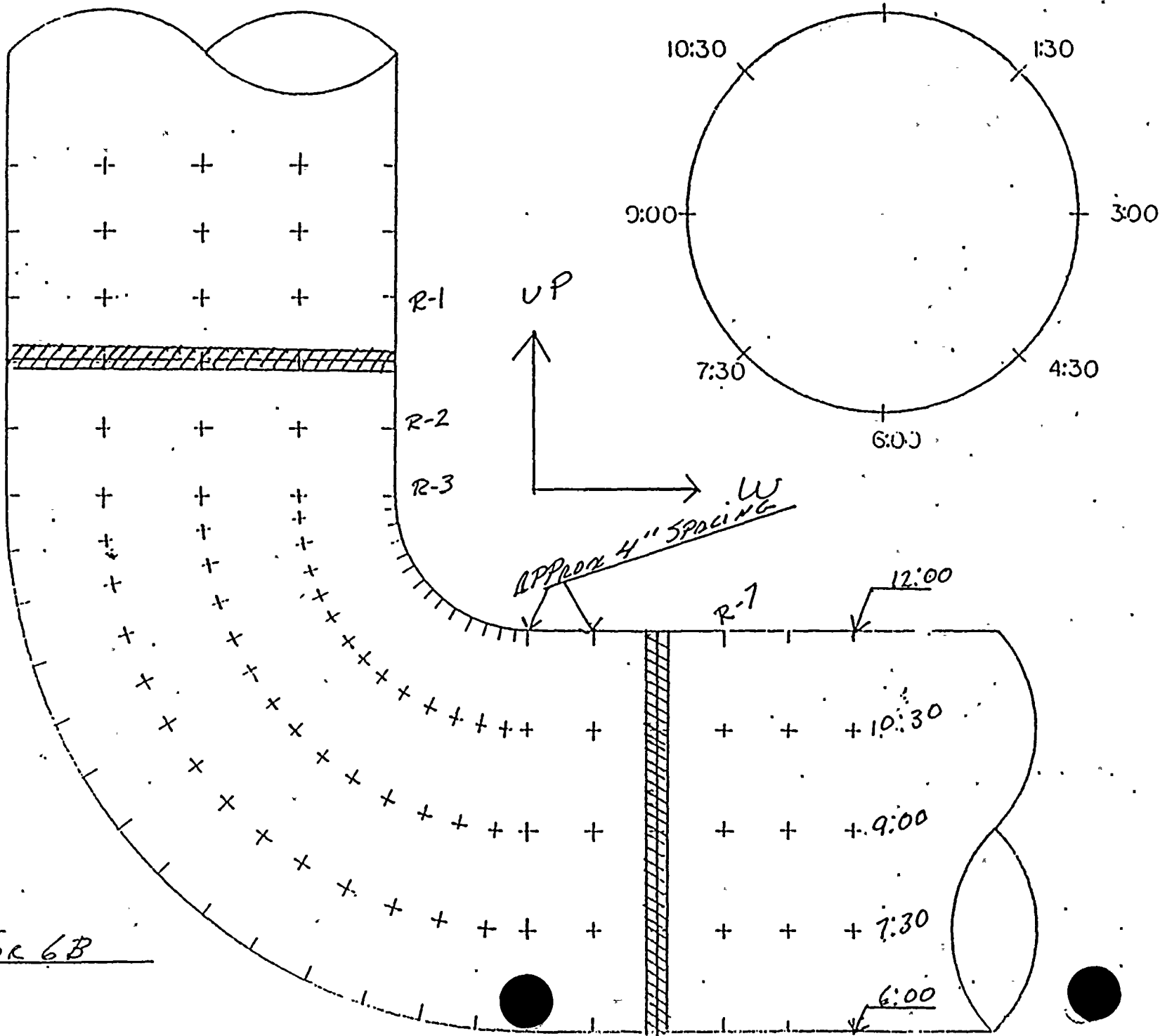
2-B-85  
To Heater 6B



1. "P" HAVE ALL-A OR GREENHILL  
 2. "P" CONFUSED OR ALL THE CONFUSION  
 3. "P" HAVE ALL-A OR GREENHILL

[illegible]







STEAM EXTRACTION LINE 6B

	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1.	.542	.562	.547	.556	.542	.559	.545	.545
2.	.469	.479	.545	.527	.548	.523	.530	.498
3.	.503	.499	.541	.508	.520	.517	.536	.519
4.	.512	.526	.538	.503	.516	.516	.535	.528
5.	.514	.514	.543	.507	.519	.502	.519	.523
6.	.515	.511	.510	.548	.554	.526	.530	.525
7.	.519	.536	.509	.512	.504	.526	.514	.543



INDIANA & MICHIGAN ELECTRIC COMPANY



DATE: December 21, 1982

SUBJECT: Ultrasonic Measurement of Steam  
Extraction Piping Unit 2

FROM: R.E. Kernosky

TO: M. Friedman  
T. Baker

The following are the ultrasonic readings taken during the current refueling outage.

The readings were made at eight points around the pipe, using the clock for reference at approximately 4" spacing. No adjacent piping was checked.

*R.E. Kernosky*  
R.E. Kernosky

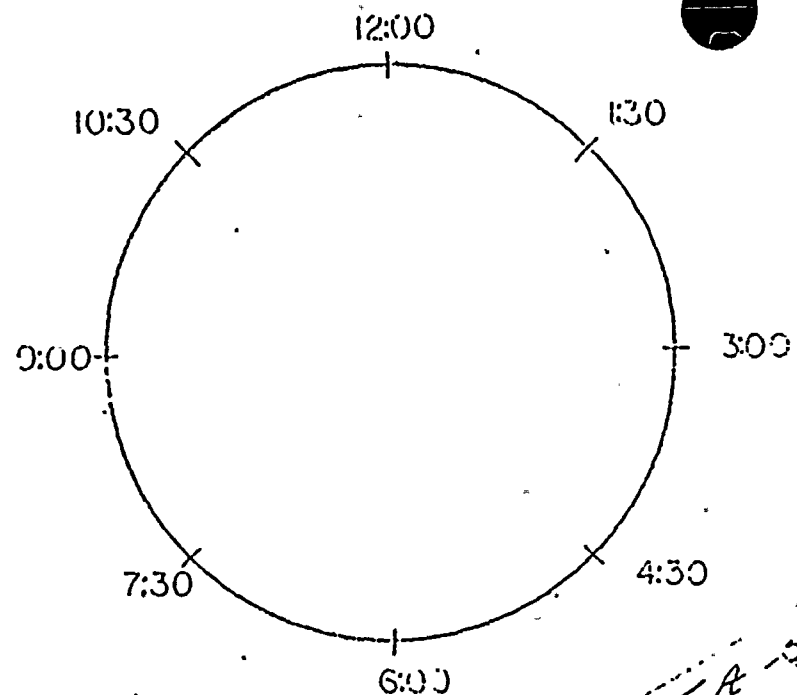
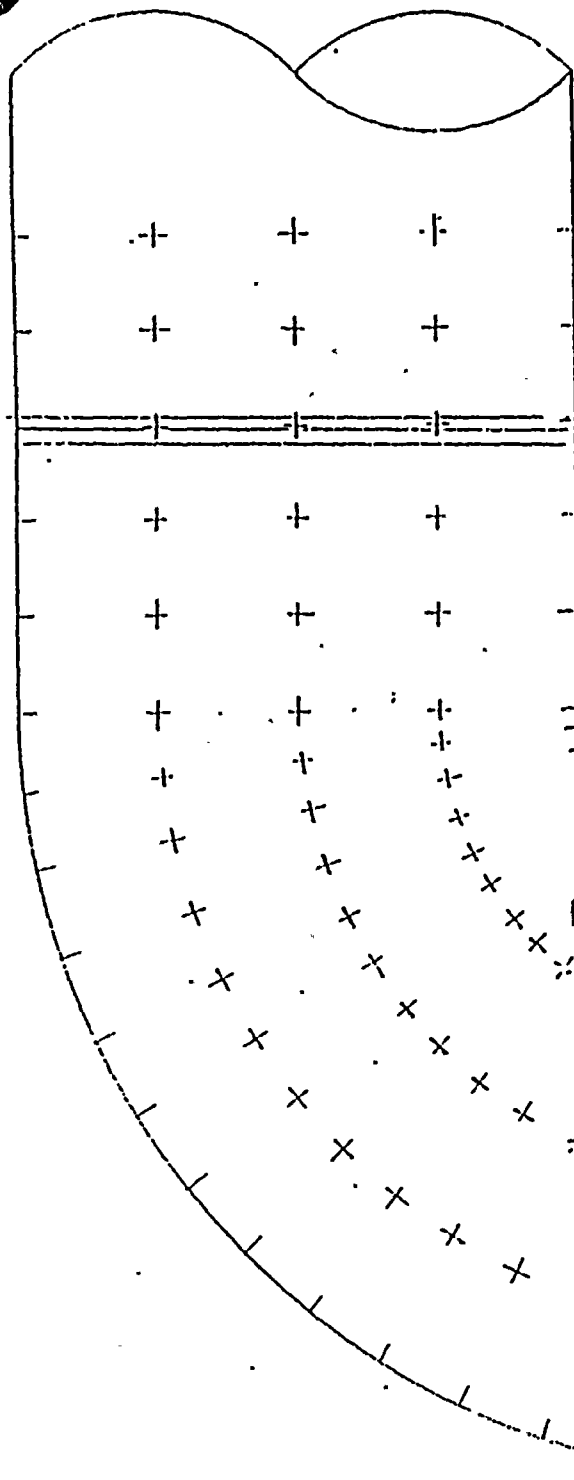
/skf

Attachment

cc: W.G. Smith  
E.L. Townley  
J.F. Stietzel  
E.A. Morse  
File

INTRA-SYSTEM





ETC.  
3  
2 Rows  
1

12:00

1:30

3:00

4:30

6:00

N.T. AREA 5A-5  
12/12/82  
REX

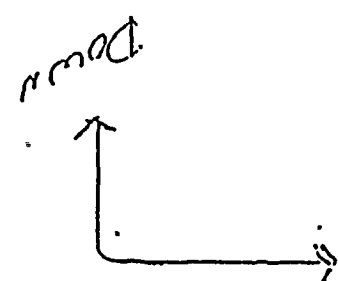
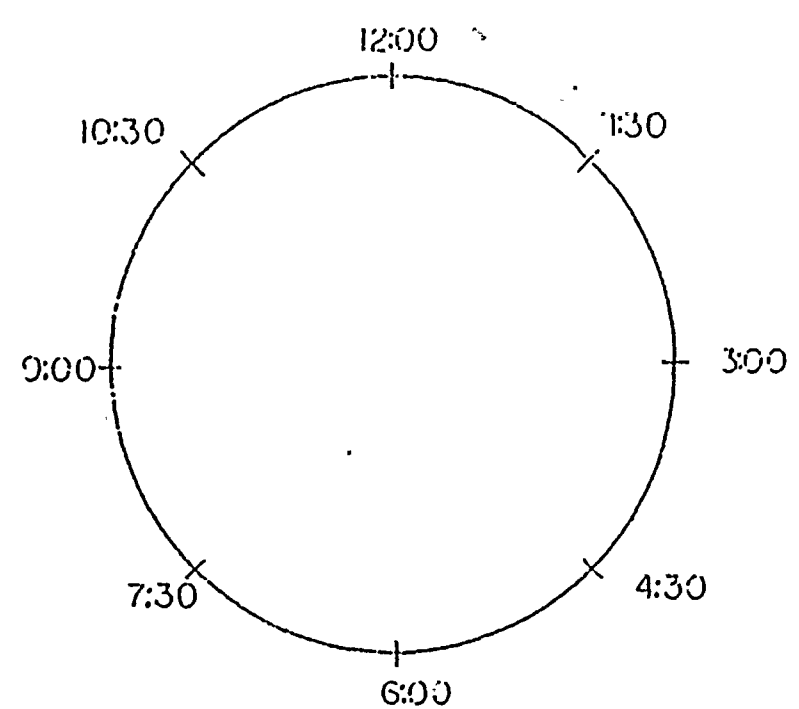
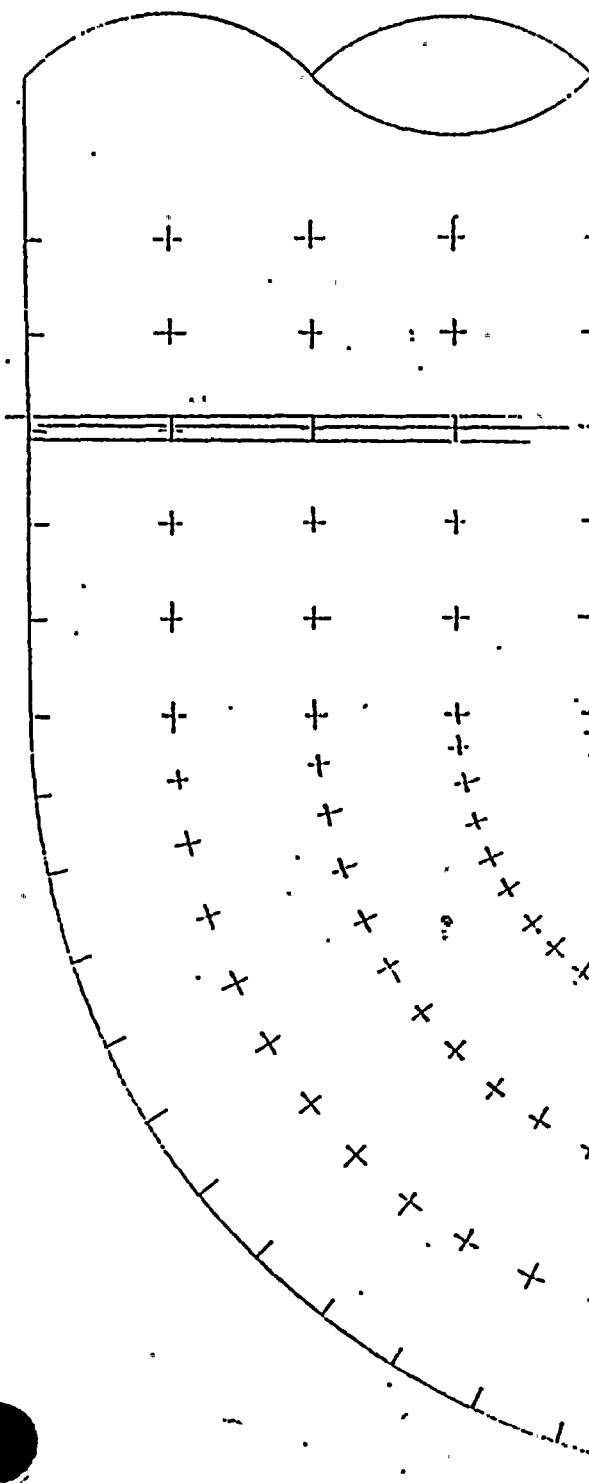


UT AREA 5A-5

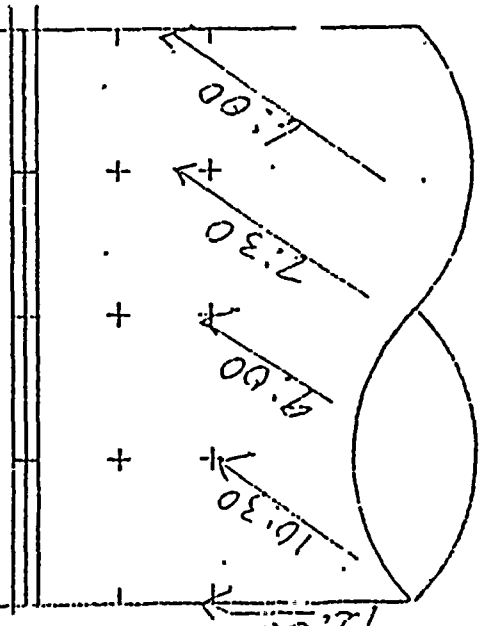
December 21, 1982

ROW	12:00	1:30	3:00	4:30	6:00	7:30	9:00	10:30
1	.492	.511	.528	.506	.460	.446	.512	.510
2	.498	.510	.514	.439	.508	.447	.516	.512
3	.505	.504	.509	.468	.504	.467	.503	.506
4	.483	.512	.519	.460	.483	.458	.507	.520
5	.493	.505	.499	.475	.522	.488	.520	.510
6	.482	.506	.508	.488	.515	.498	.528	.517
7	.480	.491	.498	.477	.503	.506	.525	.491
8	.476	.467	.488	.519	.513	.515	.525	.500
9	.484	.482	.469	.491	.573	.557	.537	.516
10	.482	.485	.468	.457	.586	.534	.527	.521
11	.499	.485	.424	.458	.548	.496	.520	.496





267. LEE A 5A-6  
12/20/82  
PCK



1  
2  
4 ETR  
PWS

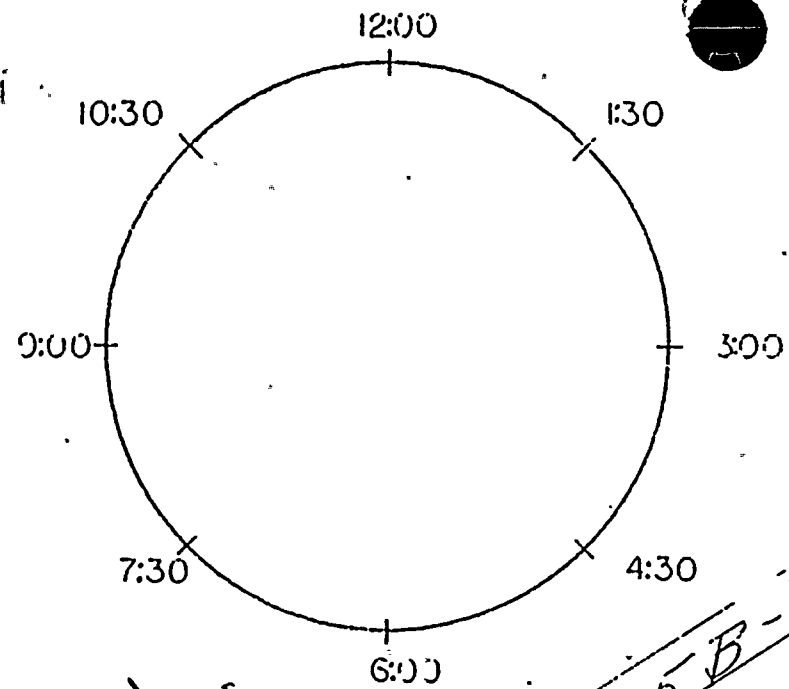
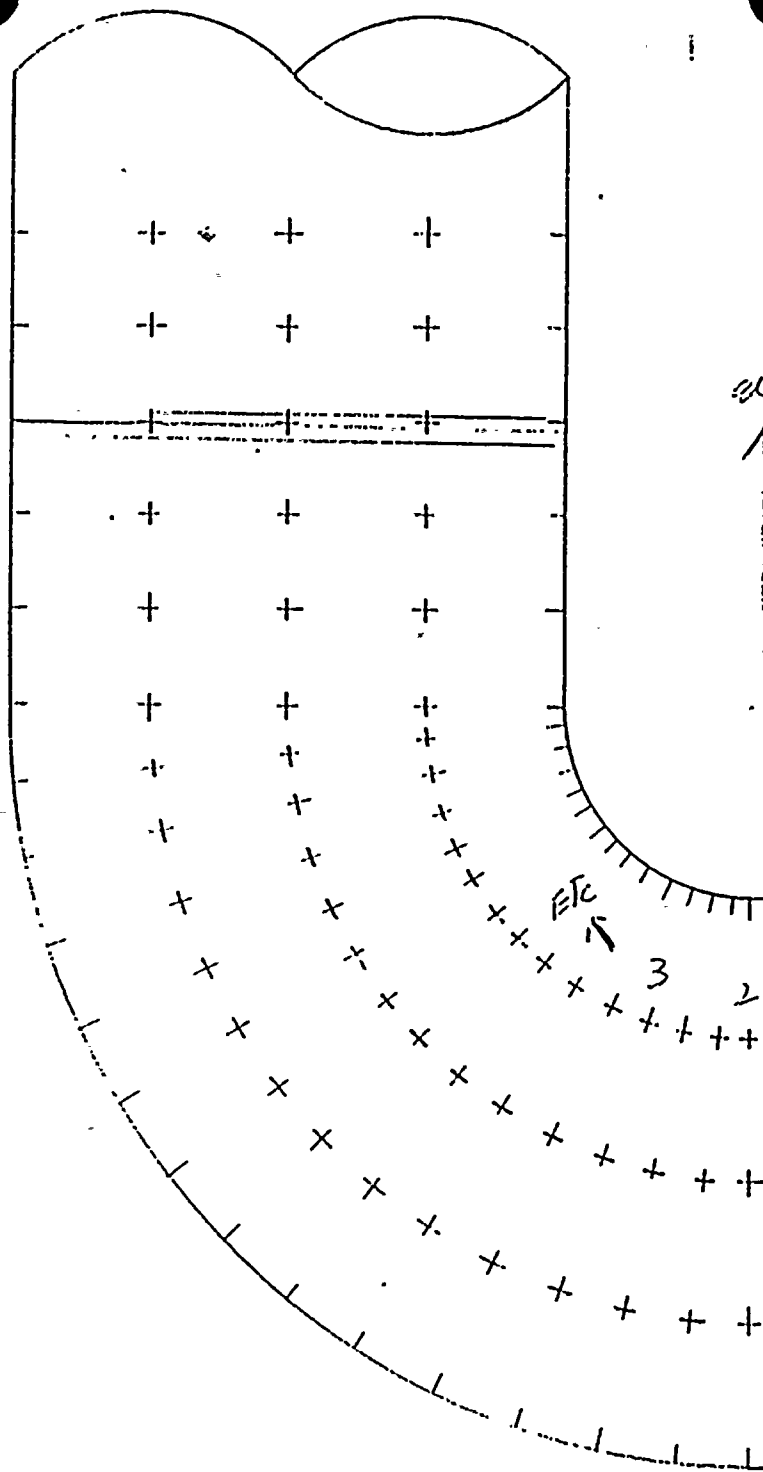


UT AREA 5A-6

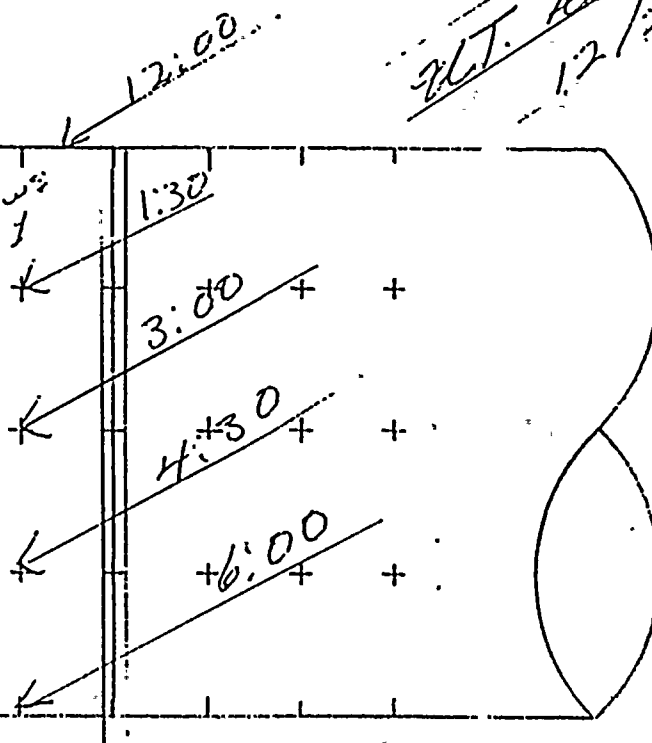
December 20, 1982

ROW	12:00	1:30	3:00	4:30	6:00	7:30	9:00	10:30
1	.519	.417 x	.478	.510	.521	.522	.535	.460
2	.545	.520	.509	.531	.506	.516	.523	.532
3	.535	.519	.515	.541	.523	.534	.536	.525
4	.486	.518	.508	.542	.512	.504	.535	.480
5	.487	.523	.544	.535	.528	.463	.518	.445
6	.502	.516	.547	.528	.533	.491	.475	.545
7	.486	.495	.506	.530	.509	.502	.539	.486
8	.516	.484	.497	.524	.536	.527	.551	.479
9	.522	.501	.507	.544	.522	.516	.531	.480
10	.545	.518	.525	.546	.541	.476	.544	.552





2LT. AREA 5B-3  
12/21/82  
 PER



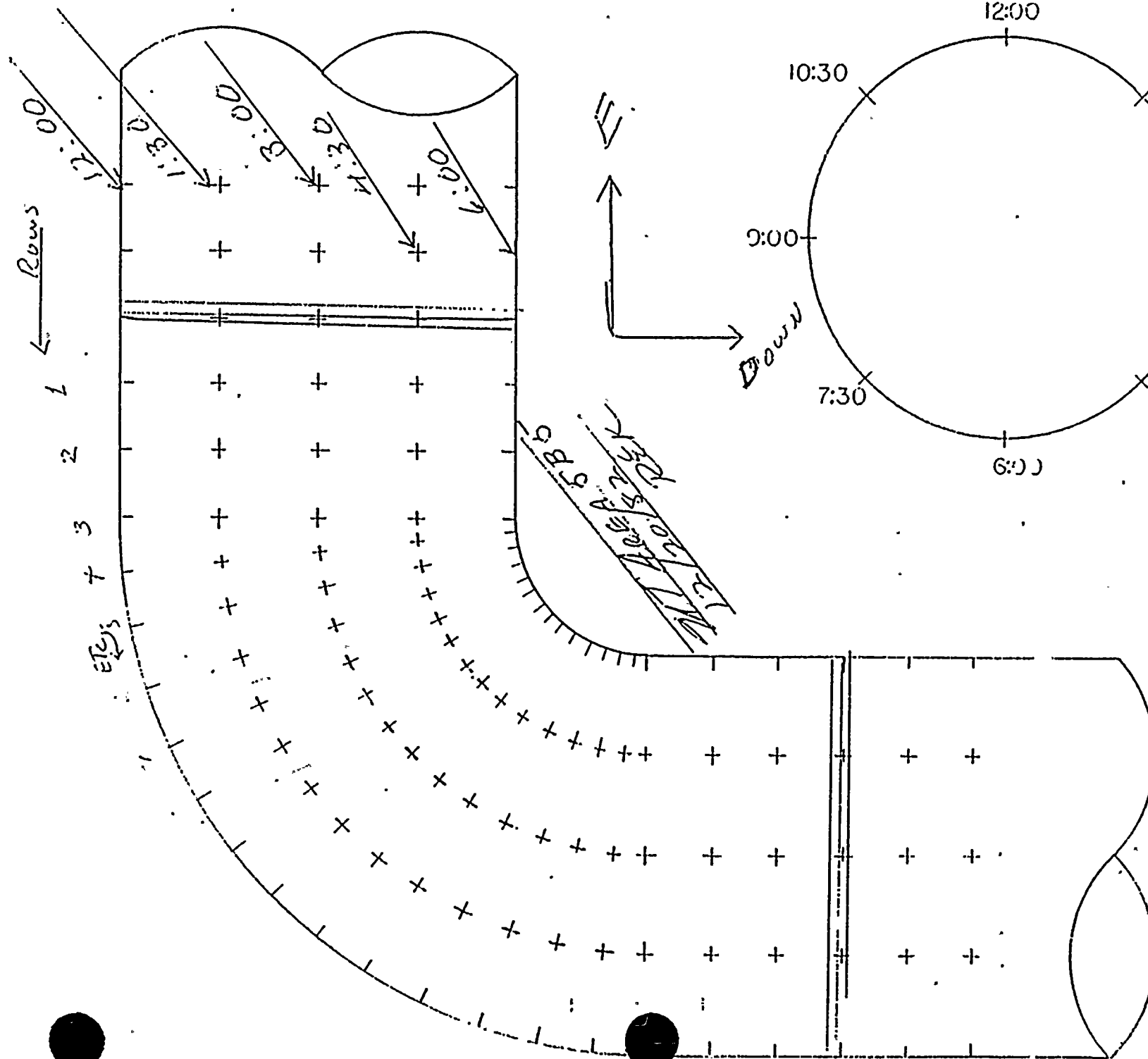


UT AREA 5B-3

December 21, 1982

ROW	12:00	1:30	3:00	4:30	6:00	7:30	9:00	10:30
1	.495	.509	.508	.515	.510	.509	.471	.510
2	.488	.496	.499	.420	.524	<u>.390</u> *	.492	.491
3	.489	.499	.508	.434	.508	.421 *	.499	.502
4	.475	.501	.509	.418	.478	.418 <	.493	.492
5	.491	.506	.485	.434	.460	.435	.488	.509
6	.495	.491	.514	.496	.468	.511	.509	.510
7	.510	.474	.501	.511	.473	.498	.519	.521
8	.525	.498	.488	.465	.453	.496	.528	.518
9	.512	.485	.470	.422	.457	.456	.525	.537





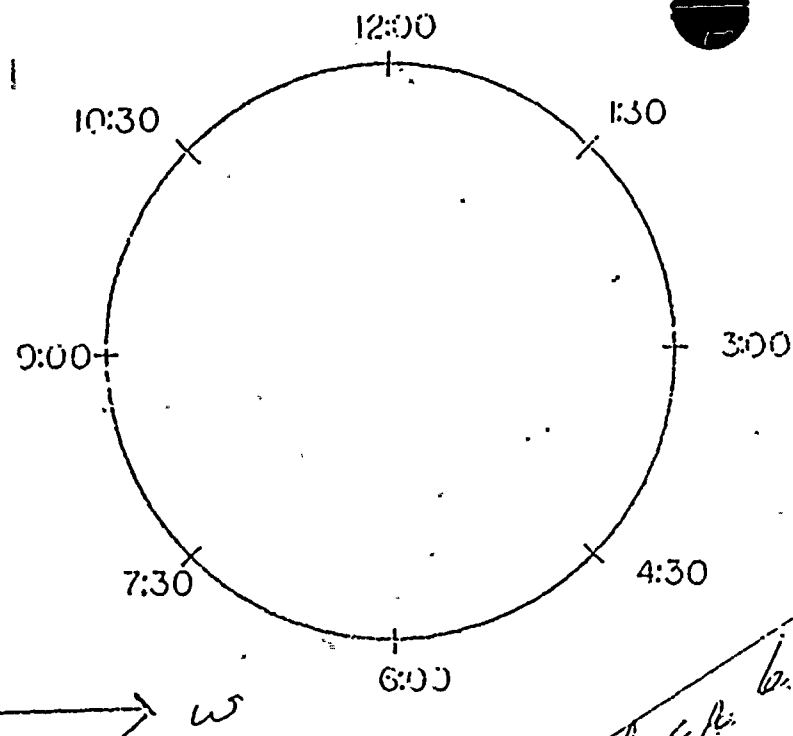
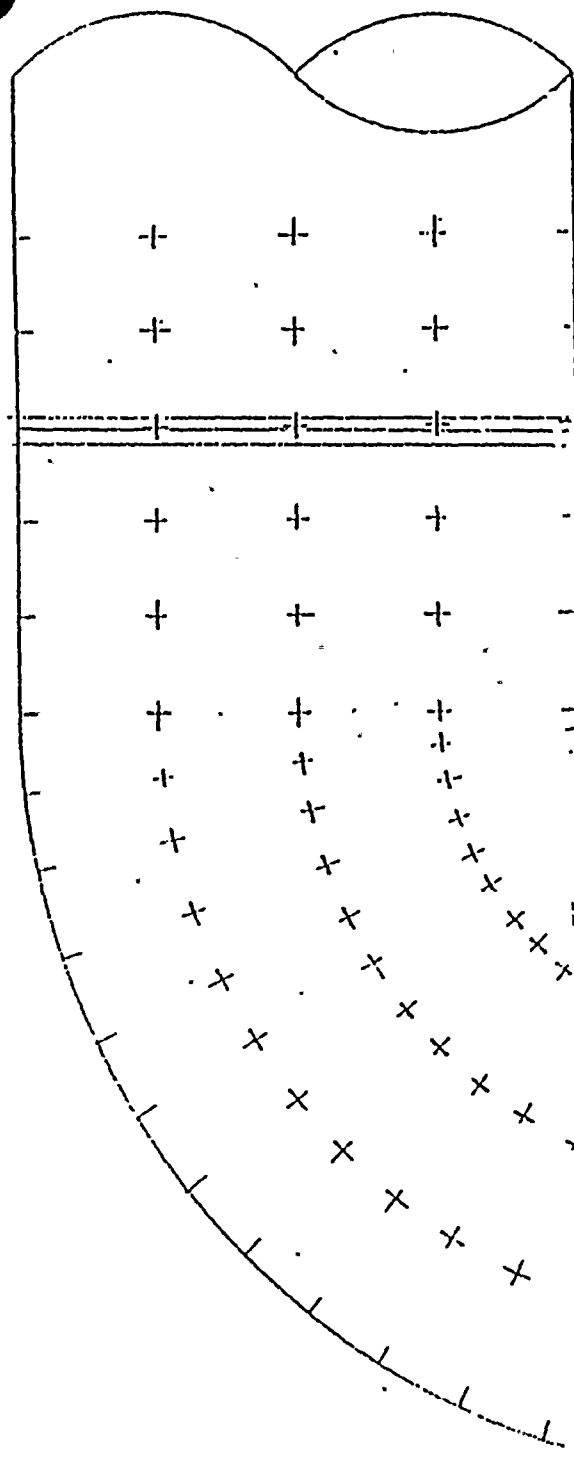


UT AREA 5B-5

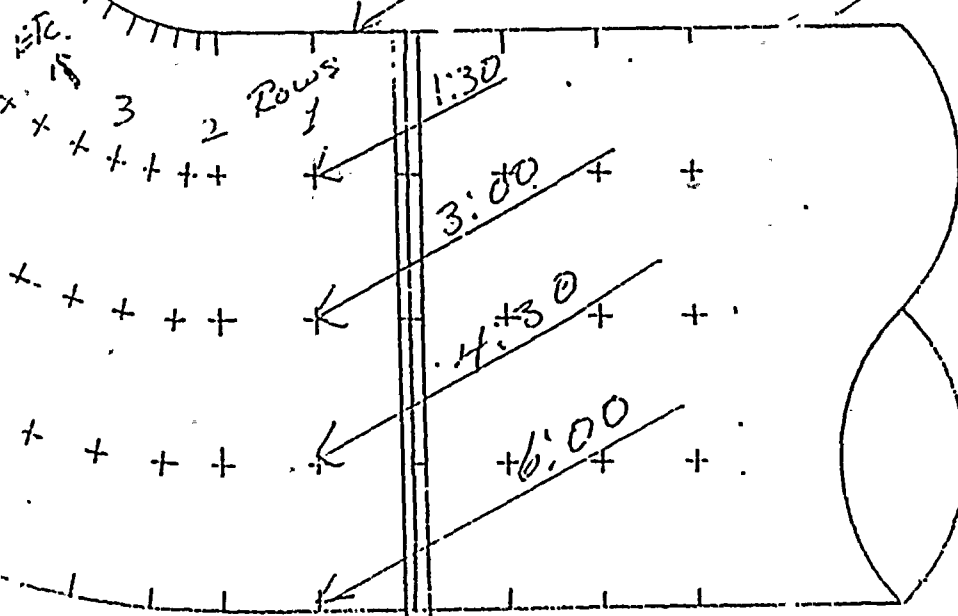
December 20, 1982

ROW	12:00	1:30	3:00	4:30	6:00	7:30	9:00	10:30
1	.541	.547	.471	.540	.518	.510	.509	.519
2	.506	.525	.454	.543	.534	.510	.499	.494
3	.498	.505	.438	.525	.542	.521	.508	.492
4	.472	.443	.466	.526	.520	.503	.512	.450
5	.474	.447	.470	.534	.515	.507	.509	.511
6	.465	.449	.451	.540	.528	.522	.498	<u>.411</u>
7	.456	.442 x	.432 x	.524	.525	.506	.477	.508
8	.450	.445 x	.418 x	.526	.505	.512	.484	.522
9	.463	.509	.425	.517	.516	.498	.518	.520
10	.524	.465	.426	.519	.523	.566	.485	.517
11	.463	.482	.433	.513	.536	.511	.494	.489
12	.525	.504	.491	.510	.509	.526	.516	.527
13	.509	.520	.511	.503	.522	.520	.508	.539
14	.527	.526	.509	.520	.521	.517	.506	.532





G.T. AREA 6 ft - 4  
 12/21/83  
 REX



12:00  
 1:30  
 3:00  
 4:30  
 6:00

Rows

3 2 1

etc.

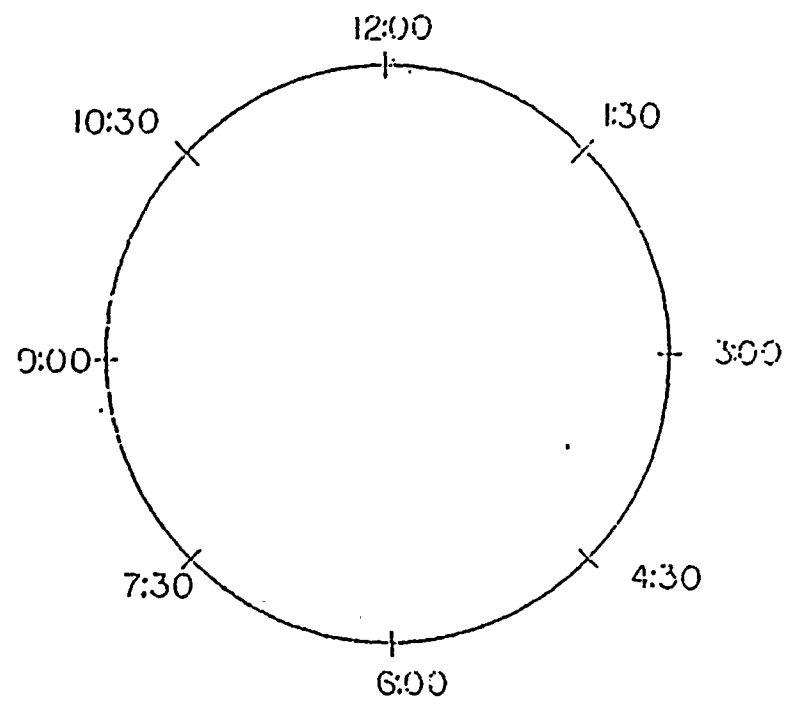
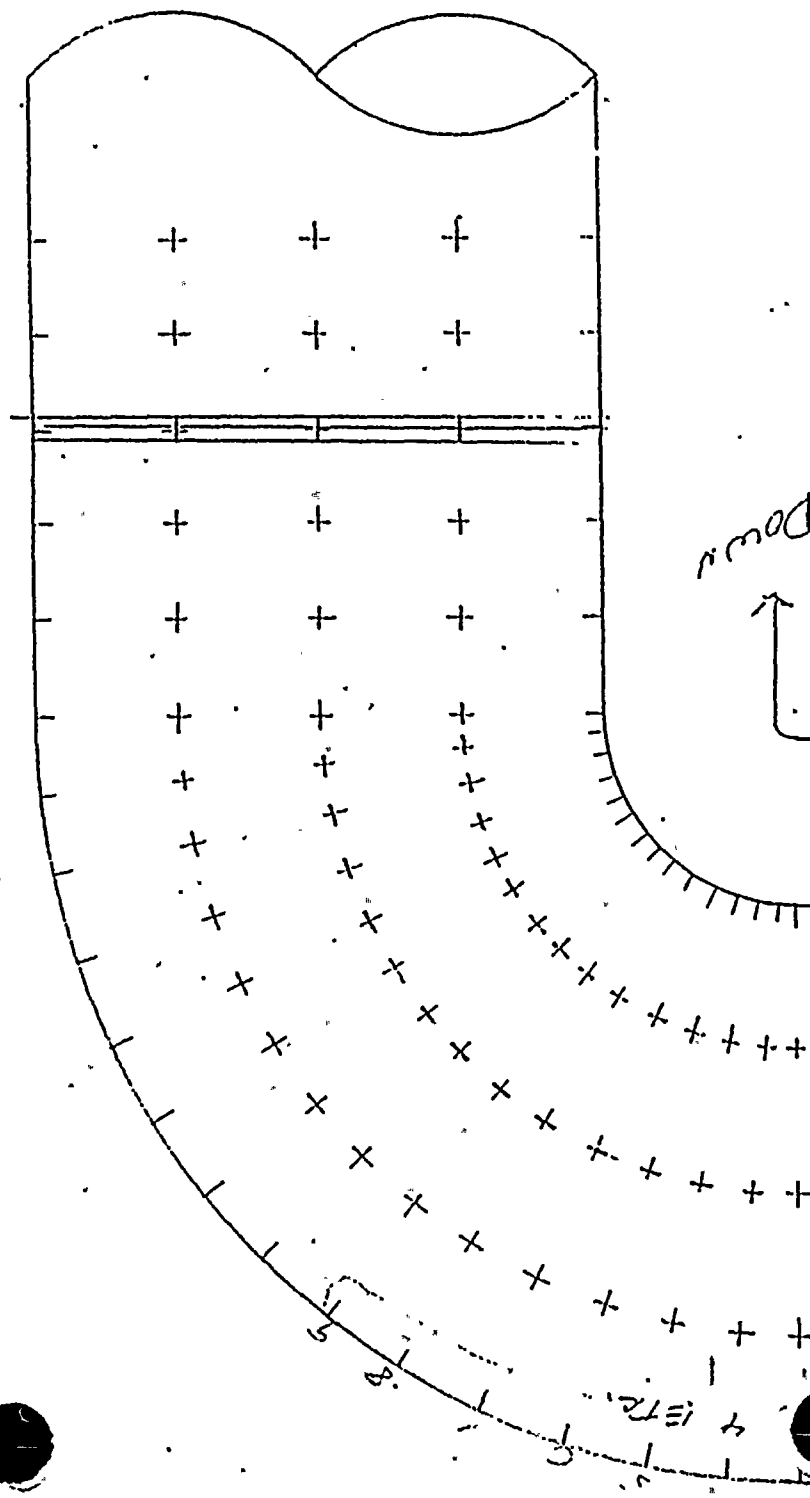


UT AREA 6A-4

December 21, 1982

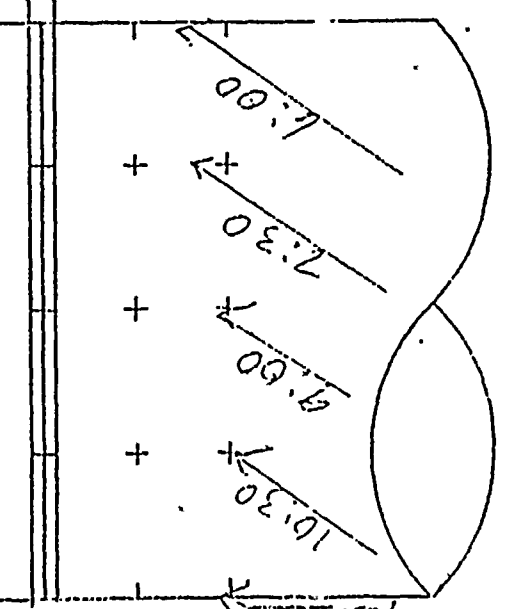
ROW	12:00	1:30	3:00	4:30	6:00	7:30	9:00	10:30
1	.508	.507	.520	.482	.480	.497	.501	.512
2	.512	.505	.519	.469	.468	.467	.511	.519
3	.507	.509	.517	.457	.452	.461	.487	.524
4	.506	.519	.487	.457	<u>.449</u>	.455	.476	.504
5	.496	.509	.487	.465	.460	.462	.479	.509
6	.584	.495	.500	.465	.472	.467	.498	.522
7	.474	.486	.484	.468	.467	.491	.488	.503
8	.459	.472	.468	.470	.484	.482	.488	.472





Down

21T AREA 6 A-5  
12/18/52  
PER



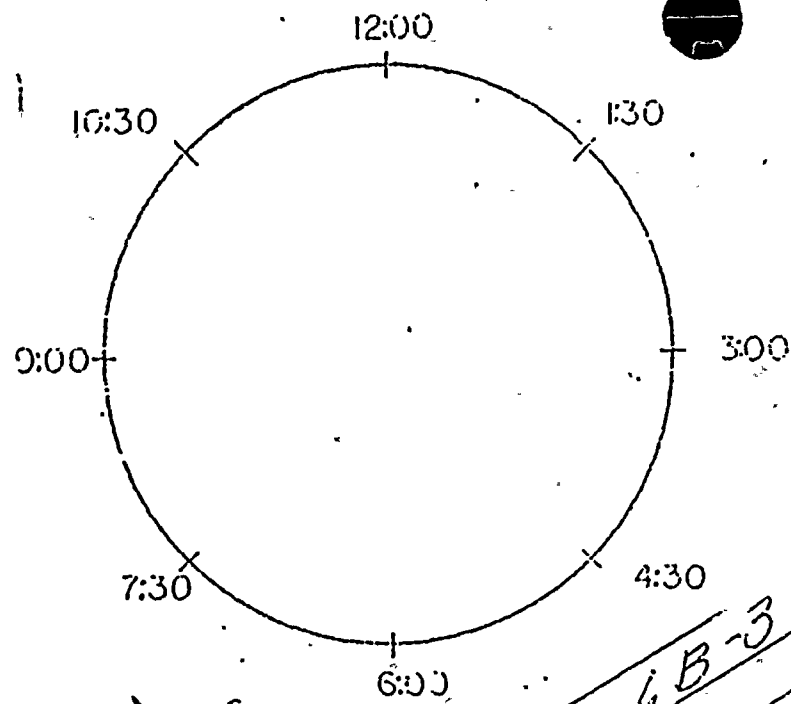
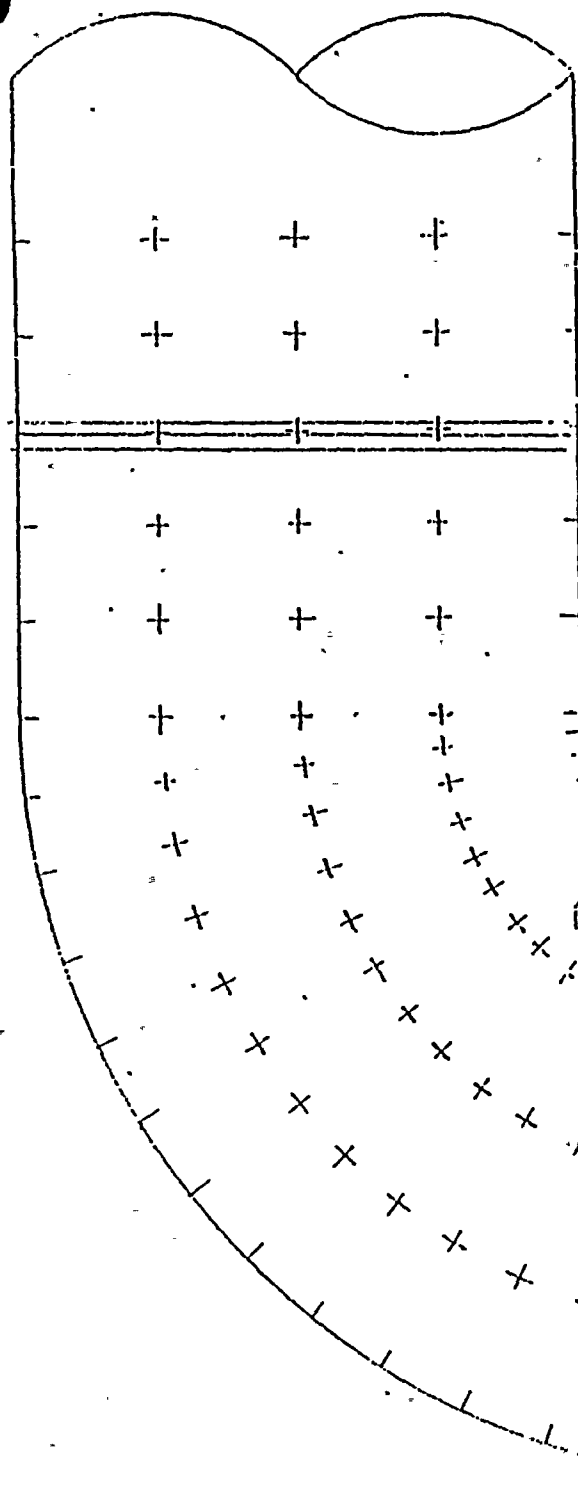


UT AREA 6A-5

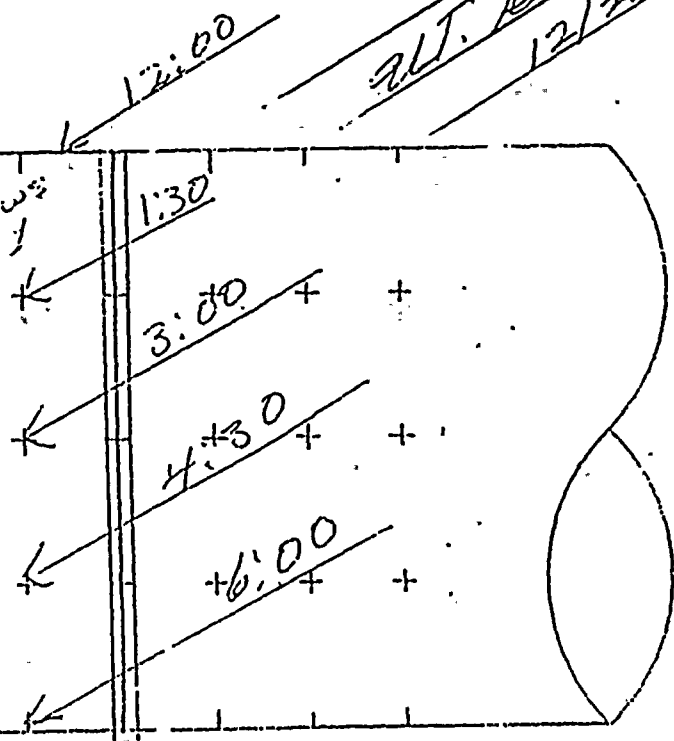
December 18, 1982

ROW	12:00	1:30	3:00	4:30	6:00	7:30	9:00	10:30
1	.494	.536	.539	.605	.664	.557	.516	.454
2	.468	.529	.581	.625	.683	.569	.510	.459
3	.444 x	.503	.588	.625	.678	.579	.549	.476
4	.445 x	.467	.545	.616	.665	.595	.553	.448
5	.431 x	.458	.559	.600	.680	.604	.565	.461
6	.441 x	.477	.535	.614	.679	.605	.577	.447
7	.453	.474	.529	.604	.690	.630	.499	.437
8	----	.460	.535	.609	.672	.659	.557	.444
9	<u>.390</u> x	.449	.542	.614	.661	.635	.553	.448
10	.458	.446	.536	.569	.652	.606	.545	.490
11	.462	.496	.514	.578	.587	.600	.527	.511





ALT. AREA 6B-3  
12/21/82  
PER



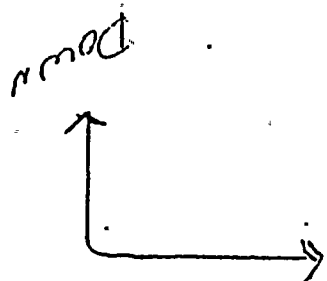
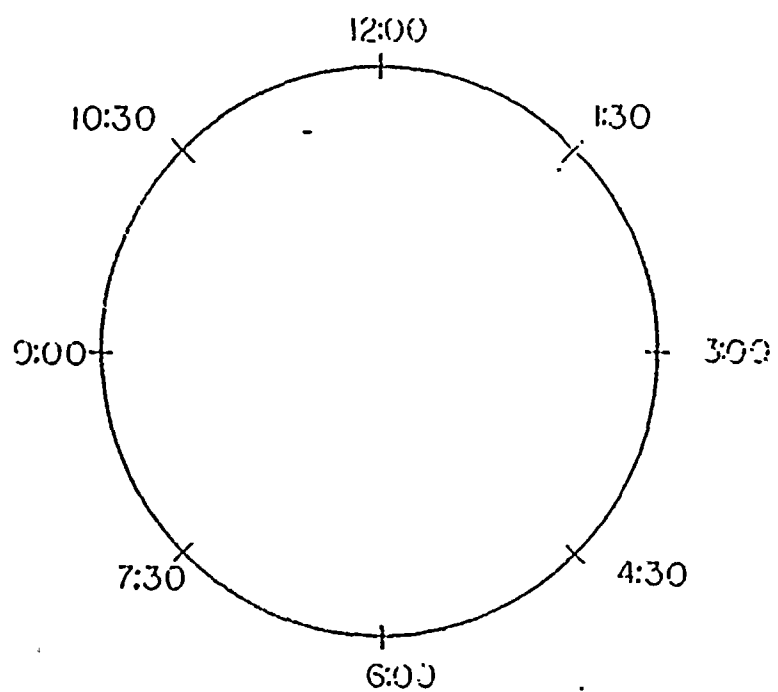
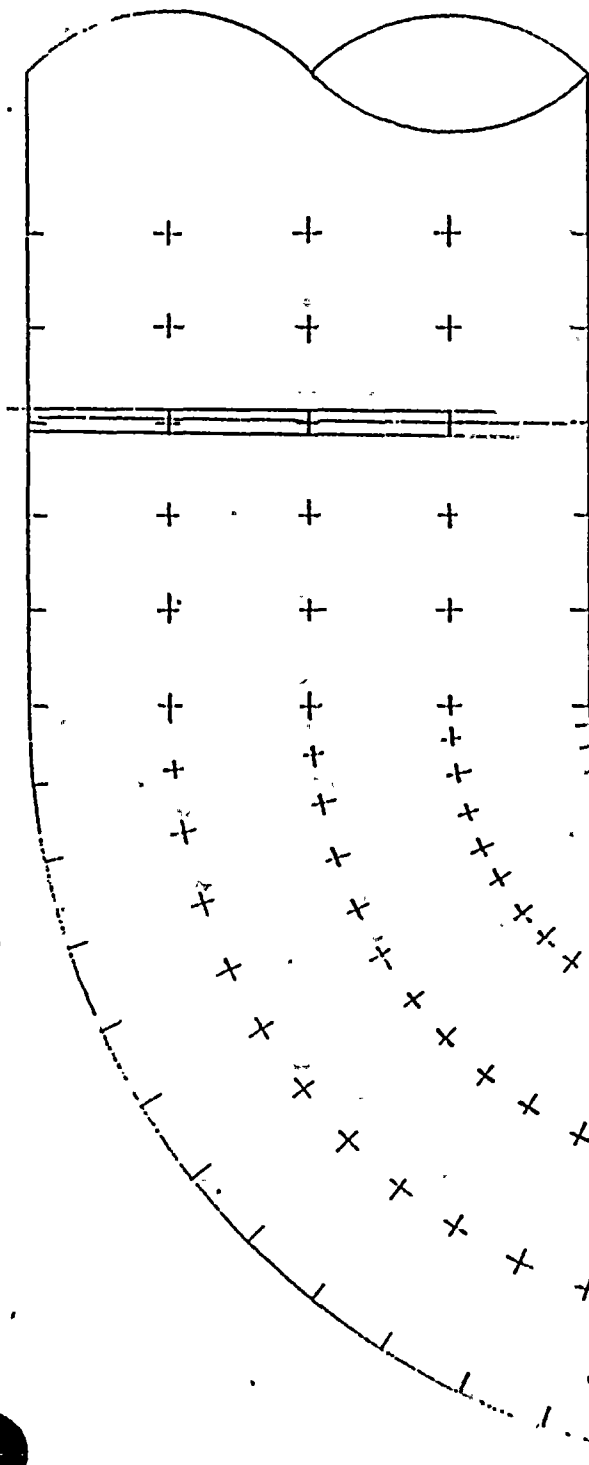


UT AREA 6B-3

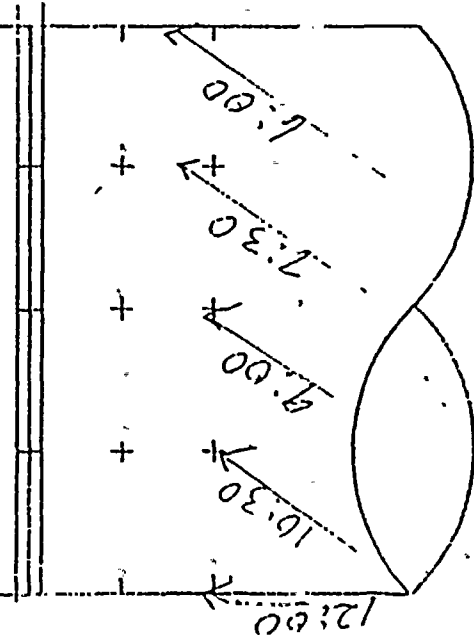
December 21, 1982

ROW	12:00	1:30	3:00	4:30	6:00	7:30	9:00	10:30
1	.464	.479	.493	.548	.559	.531	.555	.465
2	.460	.499	.491	.487	.518	.514	.490	.483
3	.468	.493	.475	.468	.468	.480	.505	.499
4	.483	.499	.471	.483	.461	.472	.515	.489
5	.475	.504	.479	.485	.458	.472	.500	.465
6	.466	.492	.490	.476	.465	.486	.512	.470
7	.457	.480	.497	.489	.494	.507	.514	.469
8	<u>.427</u> X	.443	.499	.500	.515	.519	.512	.456





ALL AREA 6B-4  
12/21/82  
REK



POWERS  
2  
4  
1572



UT AREA 6B-4

December 21, 1982

ROW	12:00	1:30	3:00	4:30	6:00	7:30	9:00	10:30
1	.506	<u>.430</u> x	.436	.492	.537	.525	.429	.492
2	.542	.488	.507	.498	.538	.541	.532	.515
3	.498	.465	.493	.509	.569	.587	.548	.517
4	.535	.445	.492	.531	.606	.586	.544	.492
5	.468	.440	.493	.539	.593	.586	.542	.503
6	.454	.462	.505	.533	.572	.584	.517	.457
7	<u>.430</u> x	.470	.484	.549	.558	.541	.535	.456
8	.467	.539	.486	.555	.533	.515	.553	.505





INDIANA & MICHIGAN ELECTRIC COMPANY

DONALD C. COOK NUCLEAR PLANT  
P.O. Box 324, Bridgman, Michigan 49106  
(616) 465-5501

I have original

Pay File

TELECOPIER COVER LETTER

DATE:

9-10-82

Please deliver the following page(s) to:

Name: Mike Friedman Telephone: X 8881 Room 1026

Verification Number: \_\_\_\_\_

From: J. Stritzel Telephone: \_\_\_\_\_

Total number of pages 15, including cover letter.

We are transmitting on the following speed: 4, 5 minutes.

Please pick-up the telephone receiver:

After the last page.

After each page.

IF YOU DO NOT RECEIVE ALL THE PAGES, OR IF ANY OF THE PAGES ARE NOT READABLE, PLEASE CALL BACK.

Phone: (616) 465-5501 Extension: 1318

The D. C. Cook Plant transmits from a SM Model 60023, Automatic.

Sent by: J. Stritzel

Time: \_\_\_\_\_

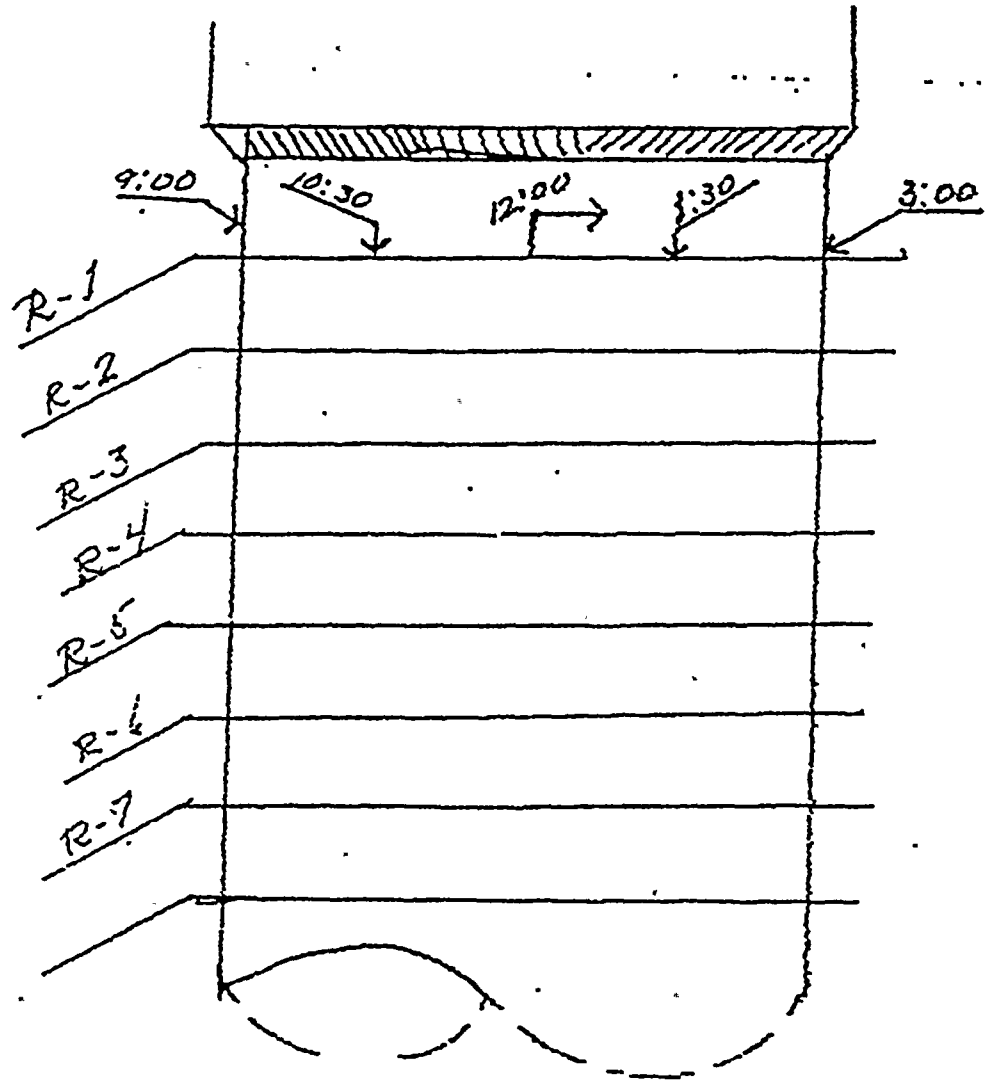
Remarks: \_\_\_\_\_



— N

1 B 18-A

HP Ties

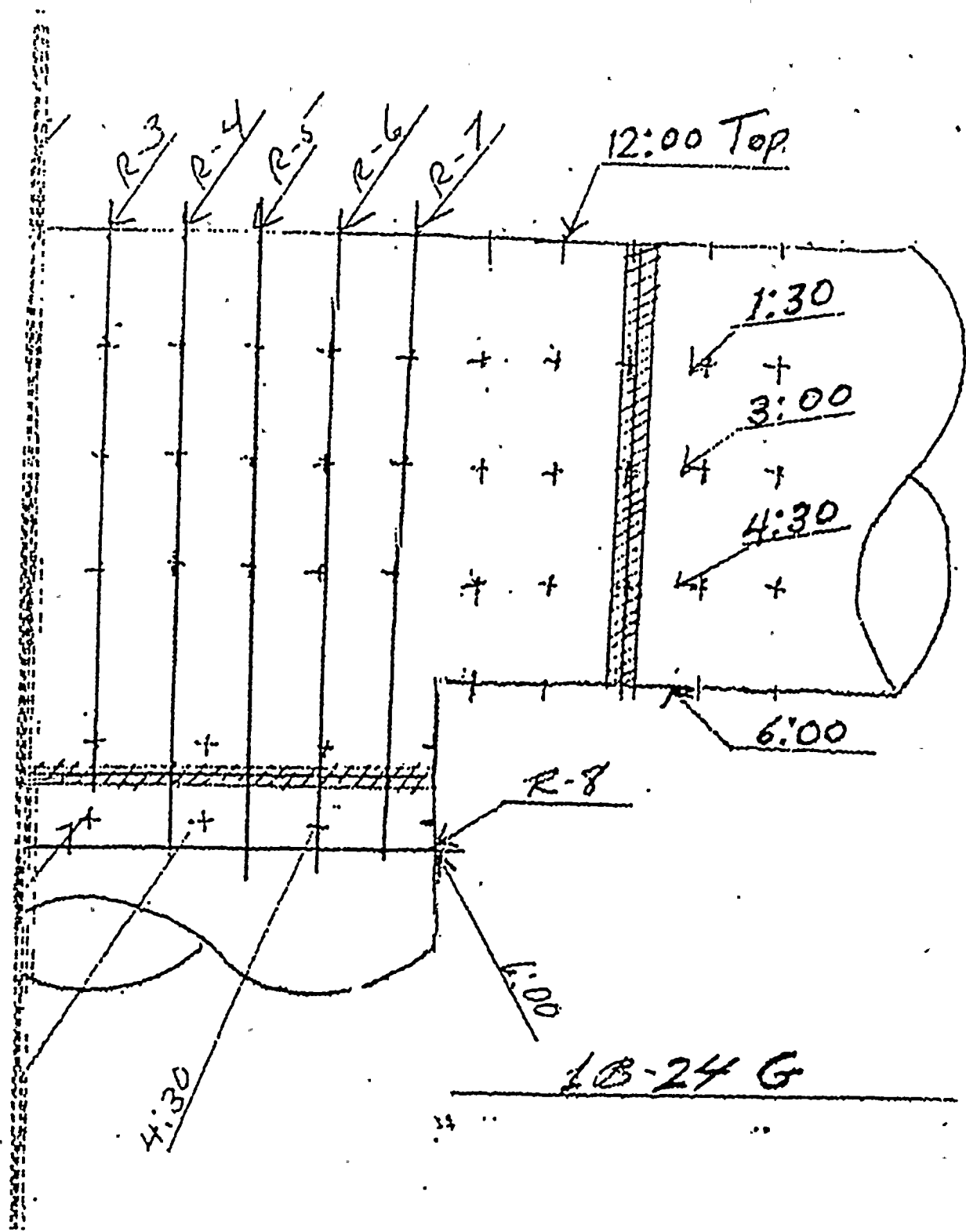




1B-18A

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.414	.399	.450	.417	.450	.487	.457	.480
2	.444	.438	.495	.465	.487	.483	.565	.476
3	.466	.469	.523	.501	.556	.543	.495	.474
4	.459	.420	.495	.522	.515	.548	.557	.503
5	.510	.480	.503	.510	.517	.547	.549	.536
6	.514	.503	.557	.529	.519	.545	.534	.533
7	.562	.515	.522	.516	.551	.552	.541	.540





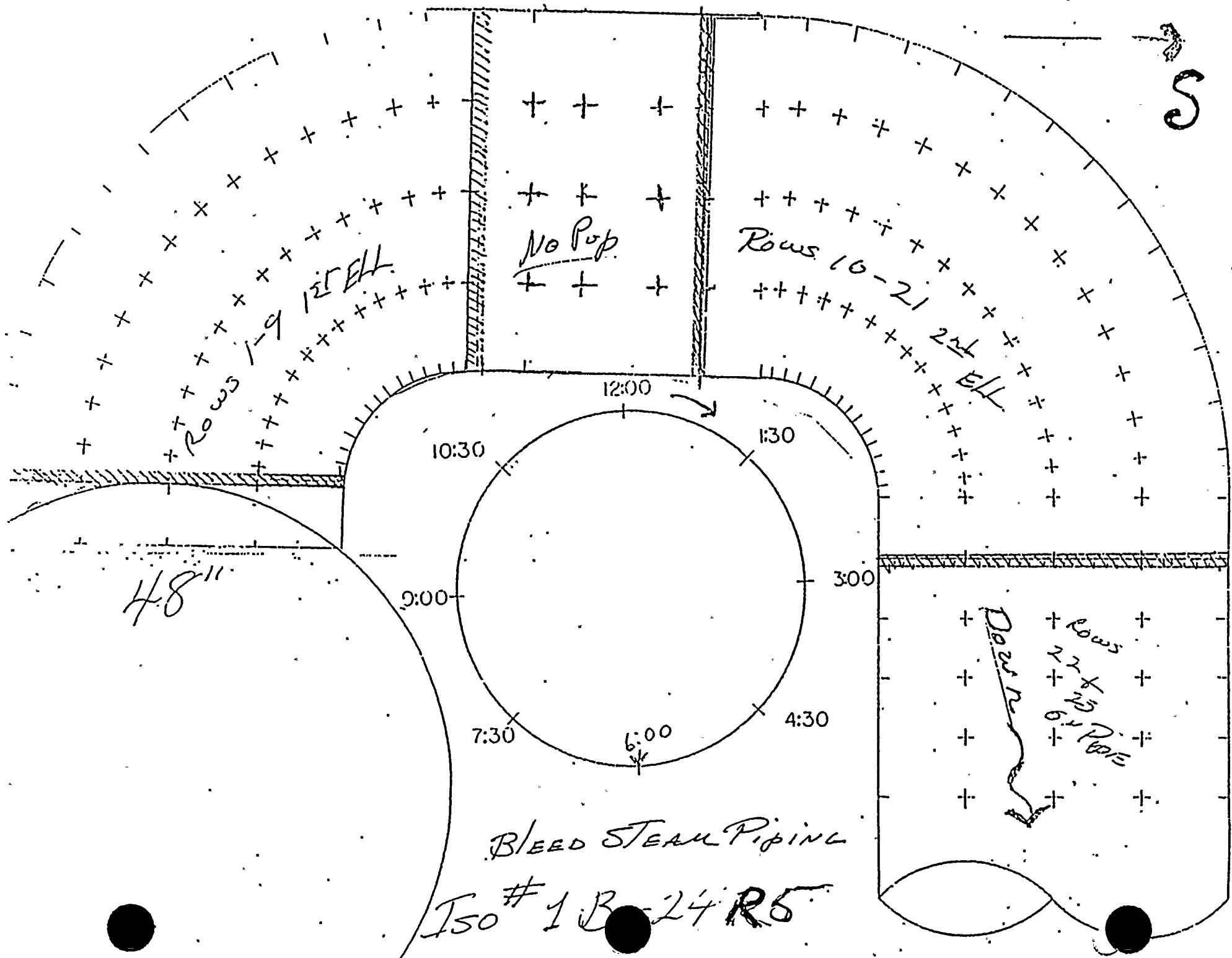


BLEED STEAM PIPING

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.356	.383	.381	.384	.456	.506	.275	.367
2	.322	.328	.362	.412	.457	.521	.327	.340
3	.308	.304	.354	.390	.404	.492	.366	.350
4	.318	.305	.354	.415	.443	.442	.423	.416
5	.358	.345	.383	.416	.434	.459	.370	.417
6	.415	.372	.429	.365	.438	.459	.379	.478
7	.422	.385	.425	.375	.414	.495	.374	.468
8	.406	.373	.406	.405	.454	.451	.478	.470
9	.386	.408	.407	.393	.453	.458	.482	.401
10	.415	.372	.385	.384	.447	.544	.538	.410
11	.444	.426	.417	.454	.508	.526	.565	.460
12	.435	.477	.430	.457	.477	.549	.570	.568
13	.435	.425	.404	.442	.503	.556	.556	.547
14	.409	.438	.395	.453	.550	.569	.567	.540
15	.406	.401	.395	.480	.554	.540	.571	.547
16	.432	.396	.394	.476	.540	.564	.525	.445
17	.423	.400	.402	.430	.550	.567	.523	.480
18	.466	.393	.384	.431	.551	.567	.555	.480
19	.445	.398	.422	.484	.551	.566	.534	.491
20	.471	.391	.429	.462	.553	.560	.552	.494
21	.429	.398	.406	.497	.555	.563	.559	.490
22	.332	.347	.429	.569	.550	.547	.515	.430
23	.358	.375	.452	.571	.552	.530	.527	.420



S



BLEED STEAM PIPING

ISO # 1 B-24 R5



BLEED STEAM PIPING - 6A

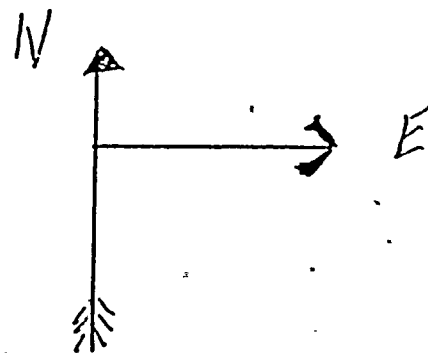
<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.708	.690	.688	.599	.582	.607	.645	.679
2	.794	.781	.761	.716	.675	*	*	*
3	.751	.750	.746	.732	.717	*	*	*
4	.788	.767	.757	.787	.790	*	*	*
5	.813	.795	.803	.714	.728	*	*	*
6	.719	.712	.700	.605	.609	.665	.719	.705
7	.530	.521	.523	.521	.508	.508	.465	.505
8	.528	.521	.522	.511	.528	.515	.518	.522
9	.601	.662	.687	.685	.606	.491	.544	.623
10	.515	.475	.480	.532	.541	.537	.551	.504

\* Inaccessible



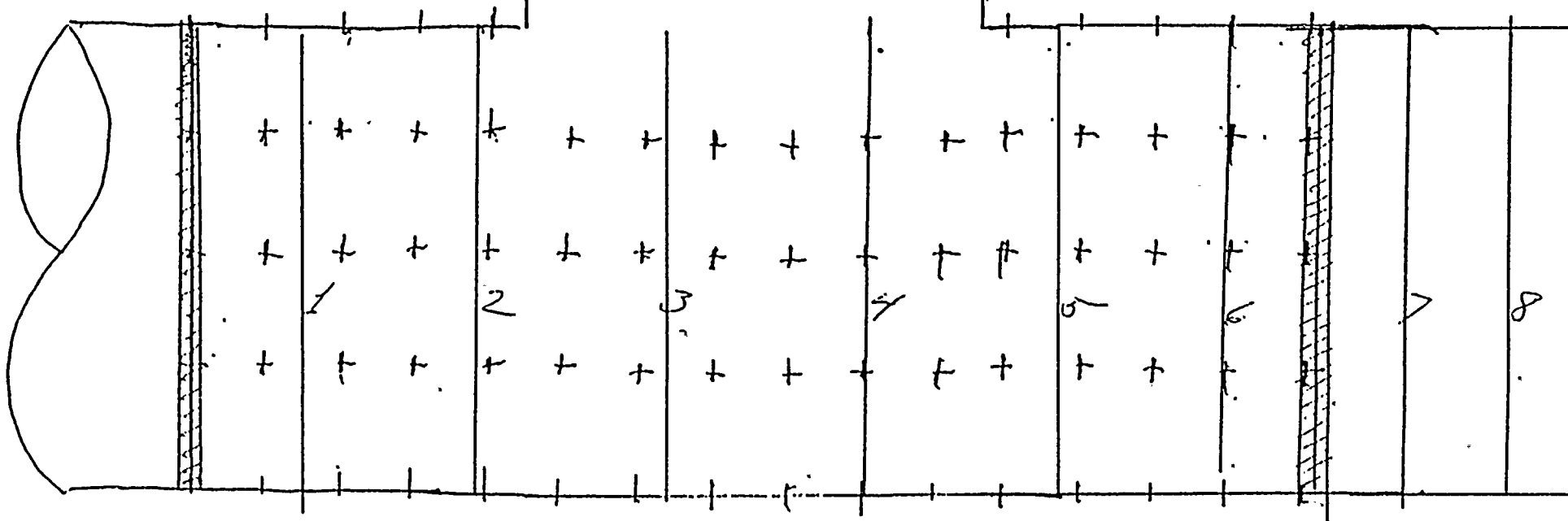
BLEED STEAM

6 A  
61



10

+ + +  
+ + 9 +





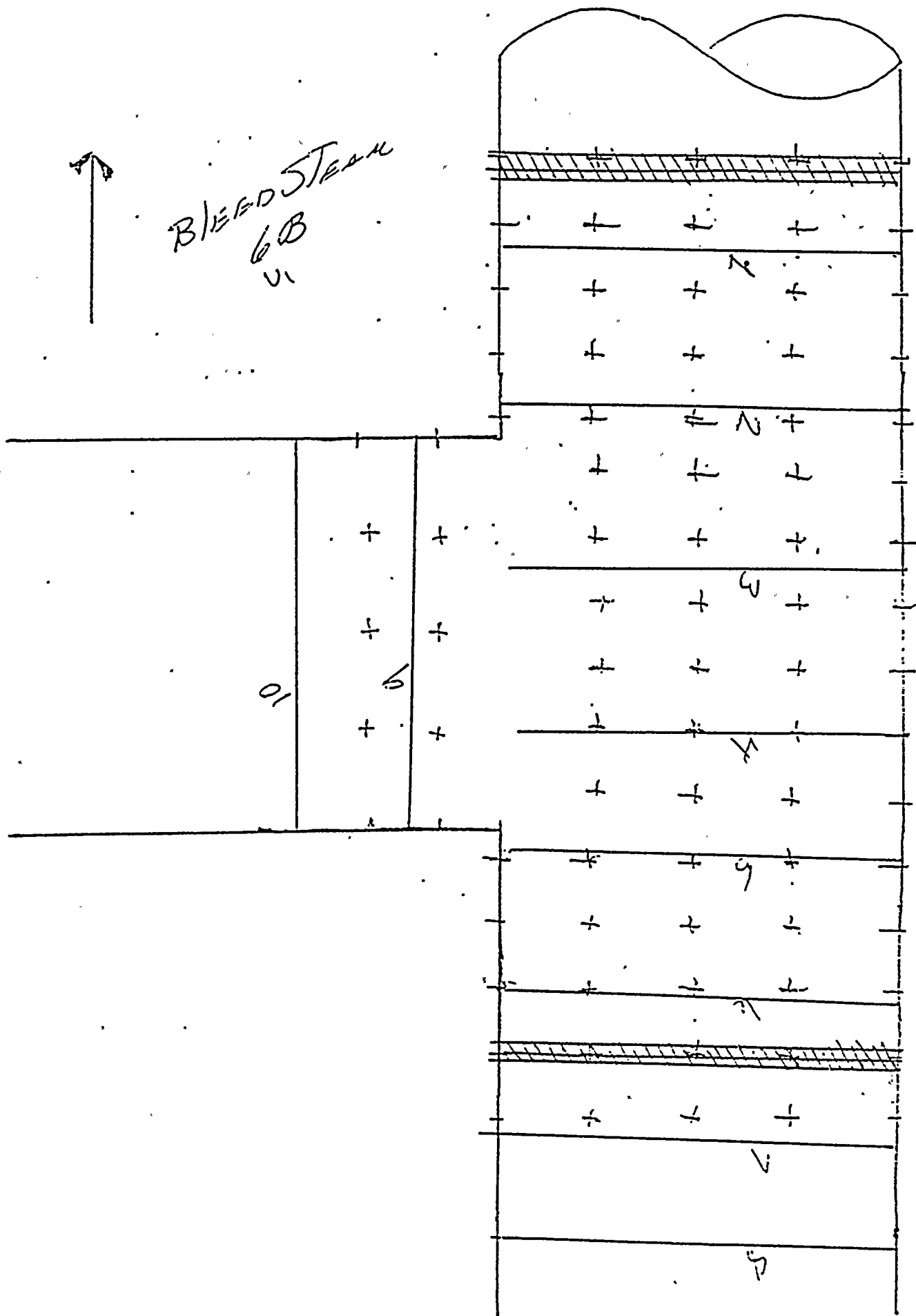
BLEED STEAM PIPING -- 6B

<u>ROW</u>	<u>12:00</u>	<u>1:30</u>	<u>3:00</u>	<u>4:30</u>	<u>6:00</u>	<u>7:30</u>	<u>9:00</u>	<u>10:30</u>
1	.628	.624	.625	.618	.632	.611	.599	.638
2	.695	.716	.723	.704	.682	*	*	*
3	.741	.743	.750	.755	.740	*	*	*
4	.836	.820	.814	.832	.828	*	*	*
5	.778	.761	.769	.773	.779	*	*	*
6	.684	.681	.680	.660	.658	.610	.588	.616
7	.528	.512	.480	.455	.478	.496	.489	.526
8	.549	.553	.522	.502	.504	.511	.512	.530
9	.559	.607	.673	.677	.653	.628	.588	.570
10	.507	.474	.479	.492	.528	.521	.520	.515

\* Inaccessible



BLED STEAK  
6B  
VI









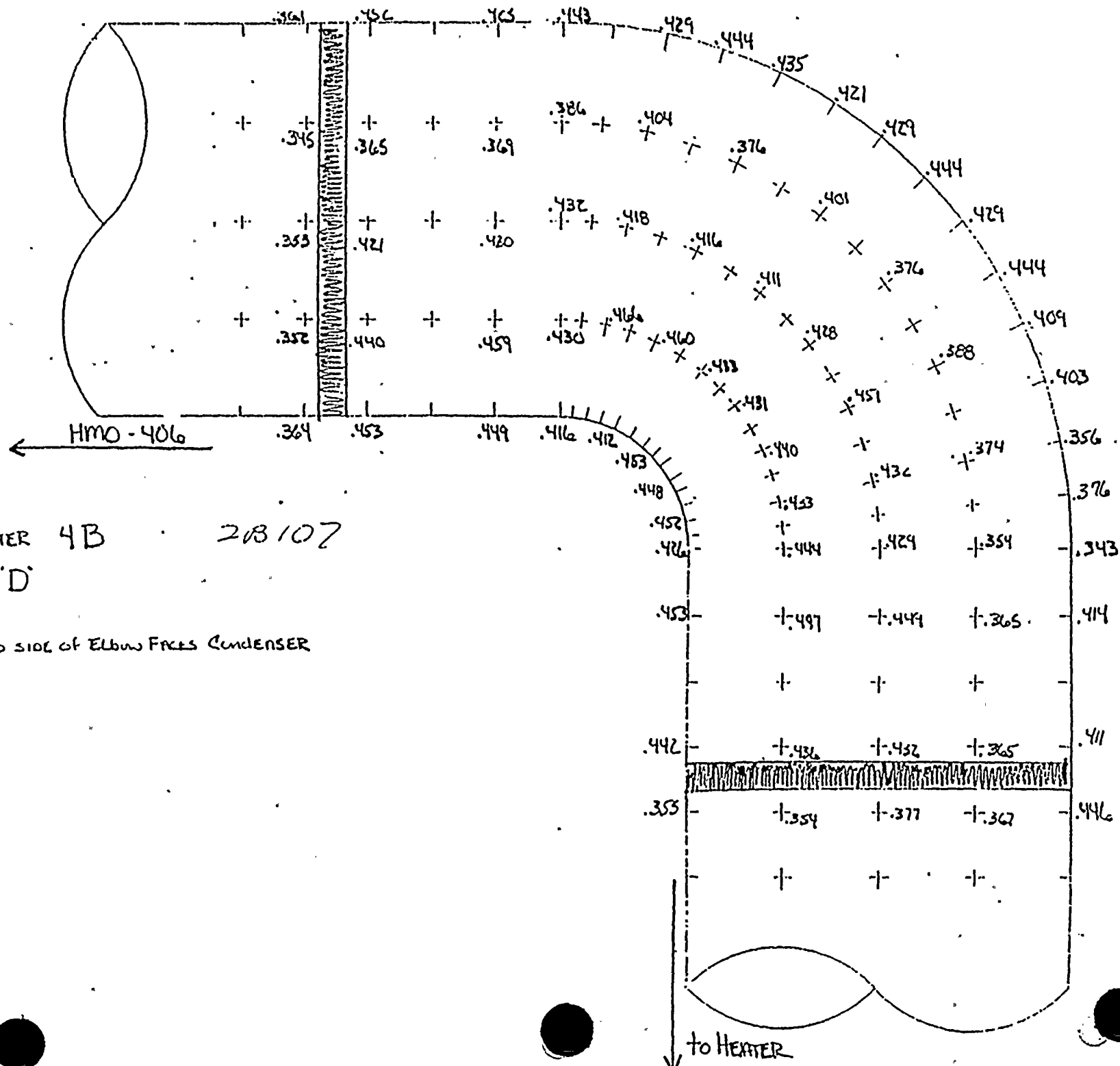
12:00

10:30

9:00

7:30

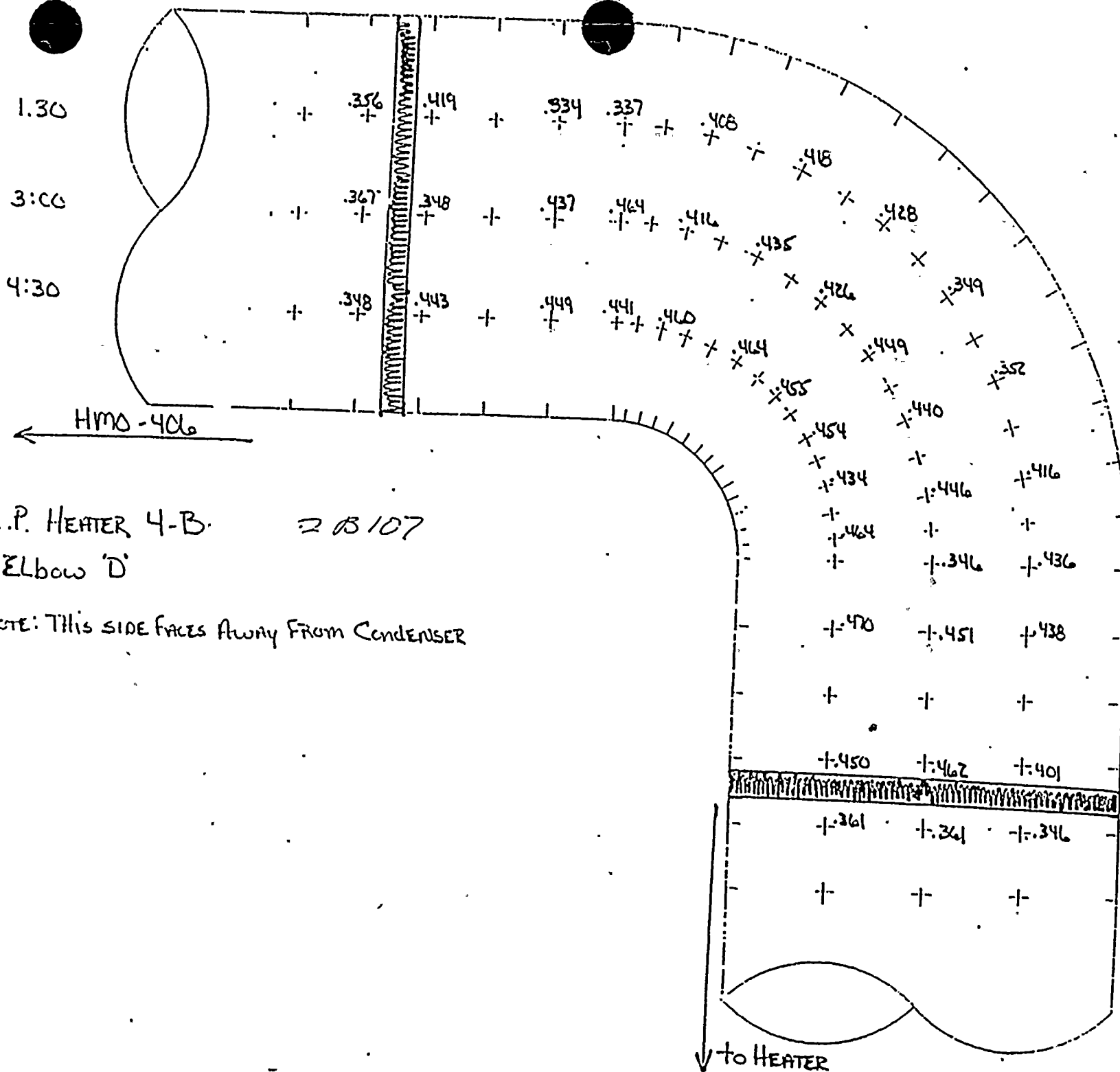
6:00



L.P. HEATER 4B 208107  
ELbow 'D'

NOTE: THIS SIDE OF ELBOW FACES CONDENSER







12.11.12

10:30

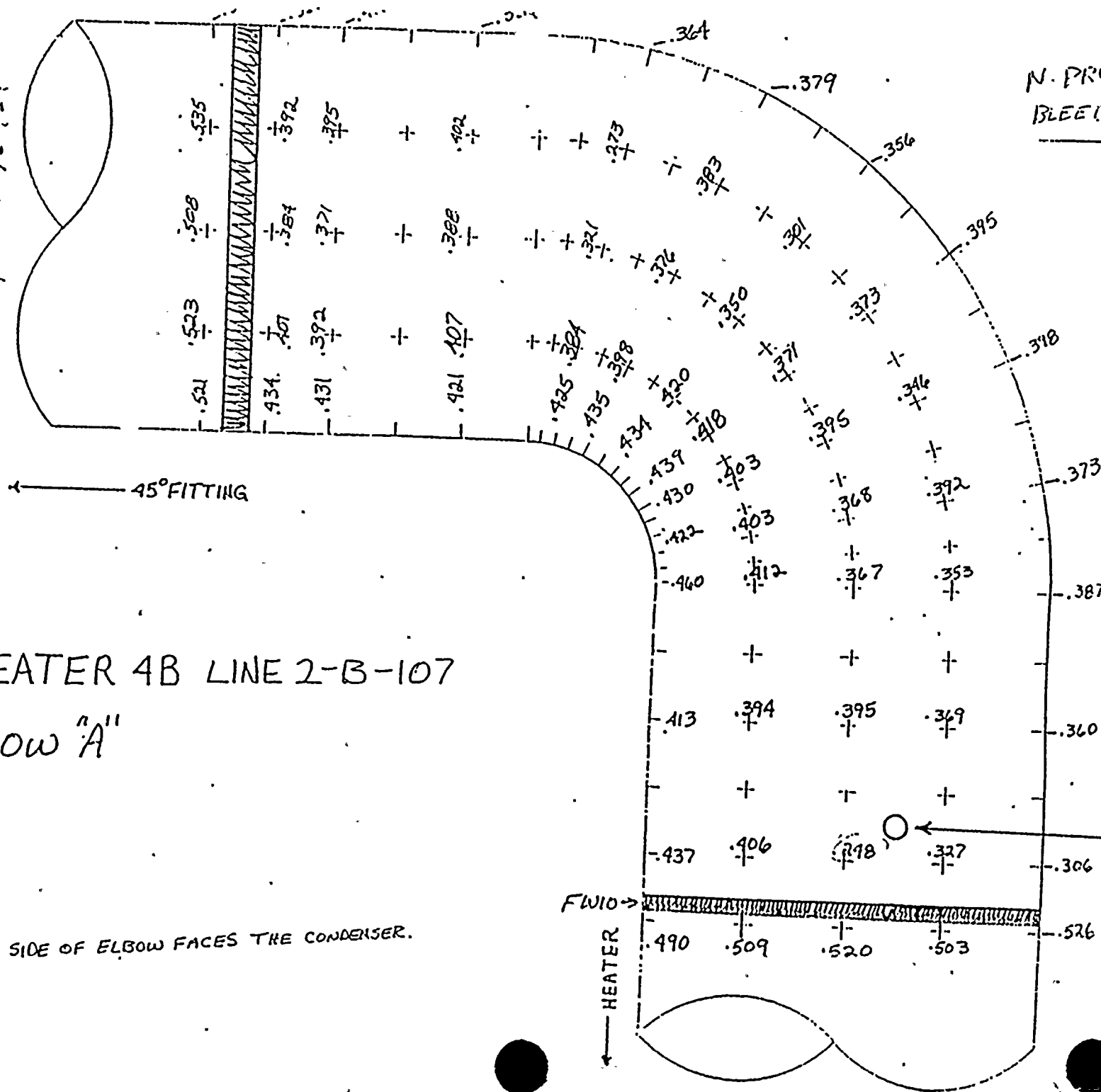
9:00

7:30

6:00

File # 1.4.1

N. PRUITT 14TH  
BLEED STM VTS

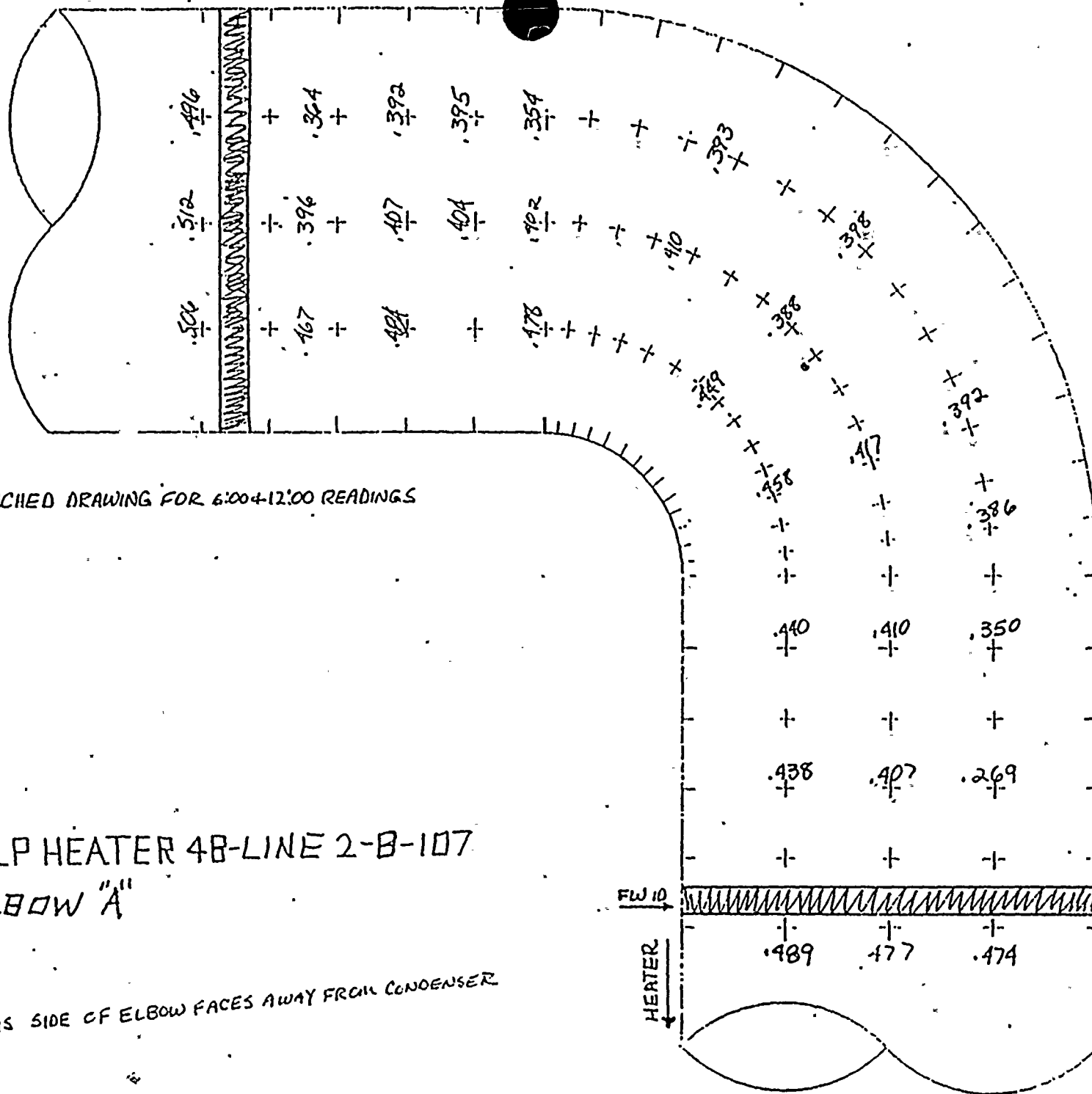


LP HEATER 4B LINE 2-B-107  
ELBOW "A"

NOTE: THIS SIDE OF ELBOW FACES THE CONDENSER.



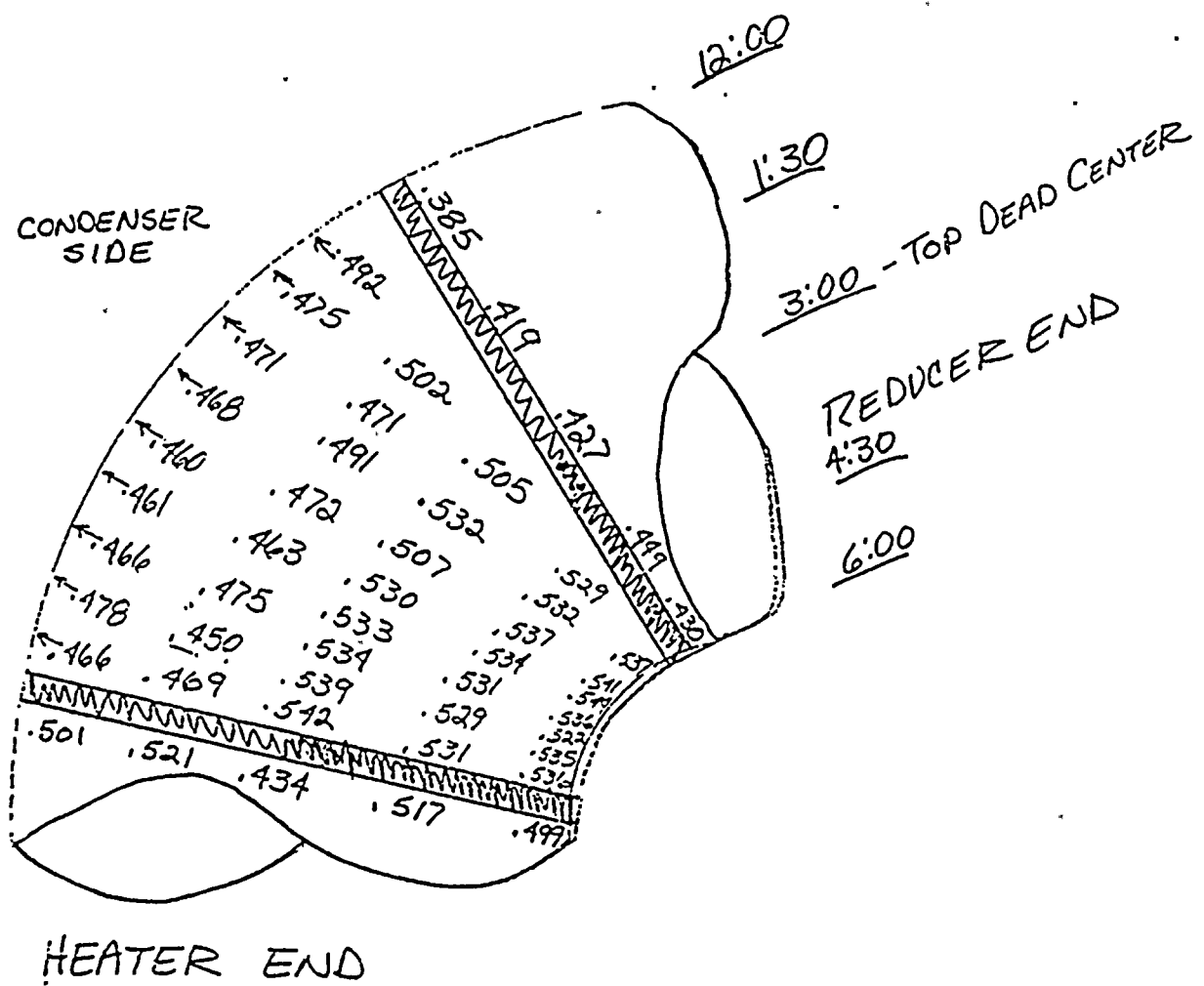
6:00



WILP HEATER 4B-LINE 2-B-107  
ELBOW "A"

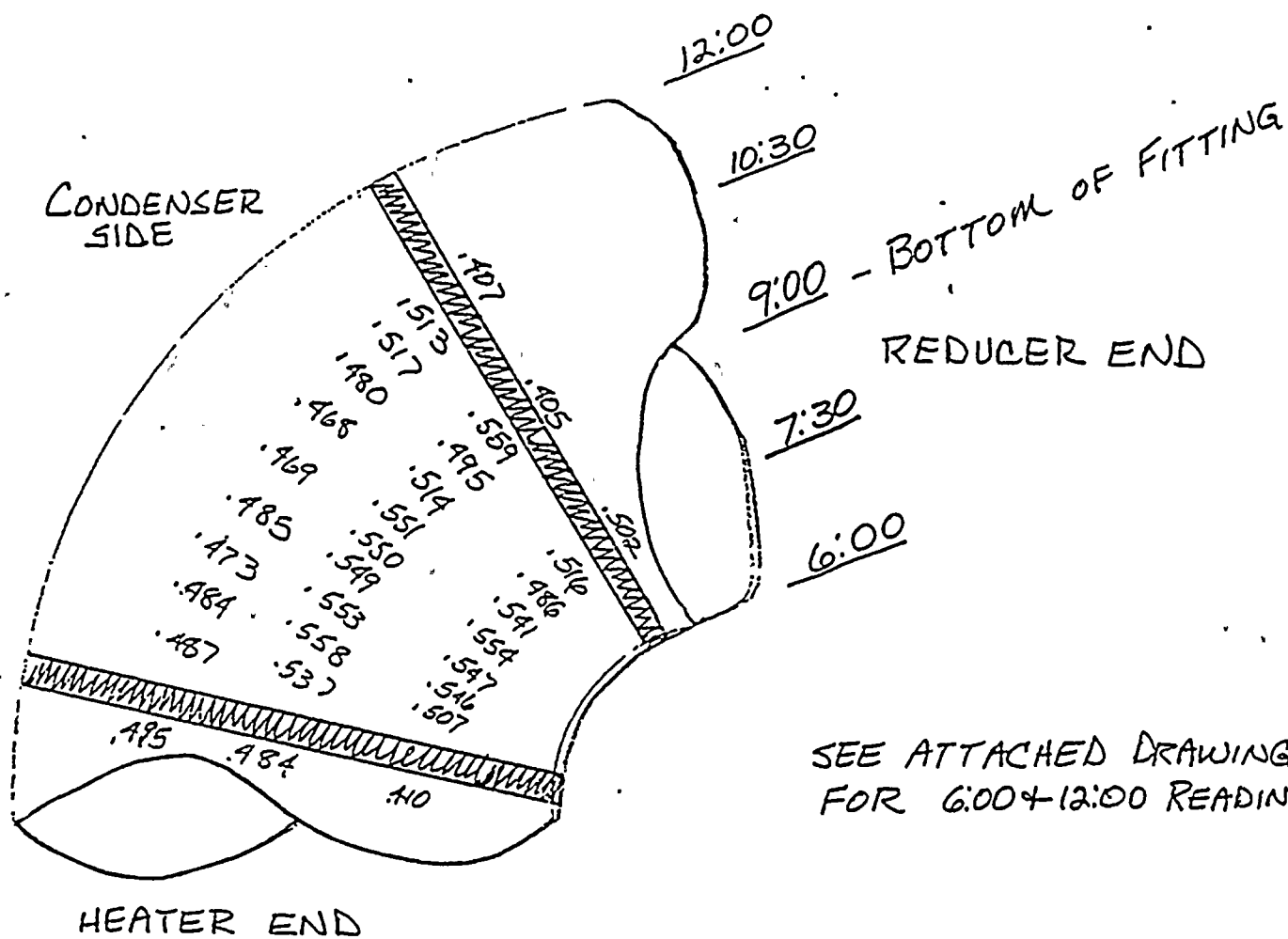
NOTE: THIS SIDE OF ELBOW FACES AWAY FROM CONDENSER





U II LP HEATER 4B-LINE 2-B-107  
45° FITTING "B"



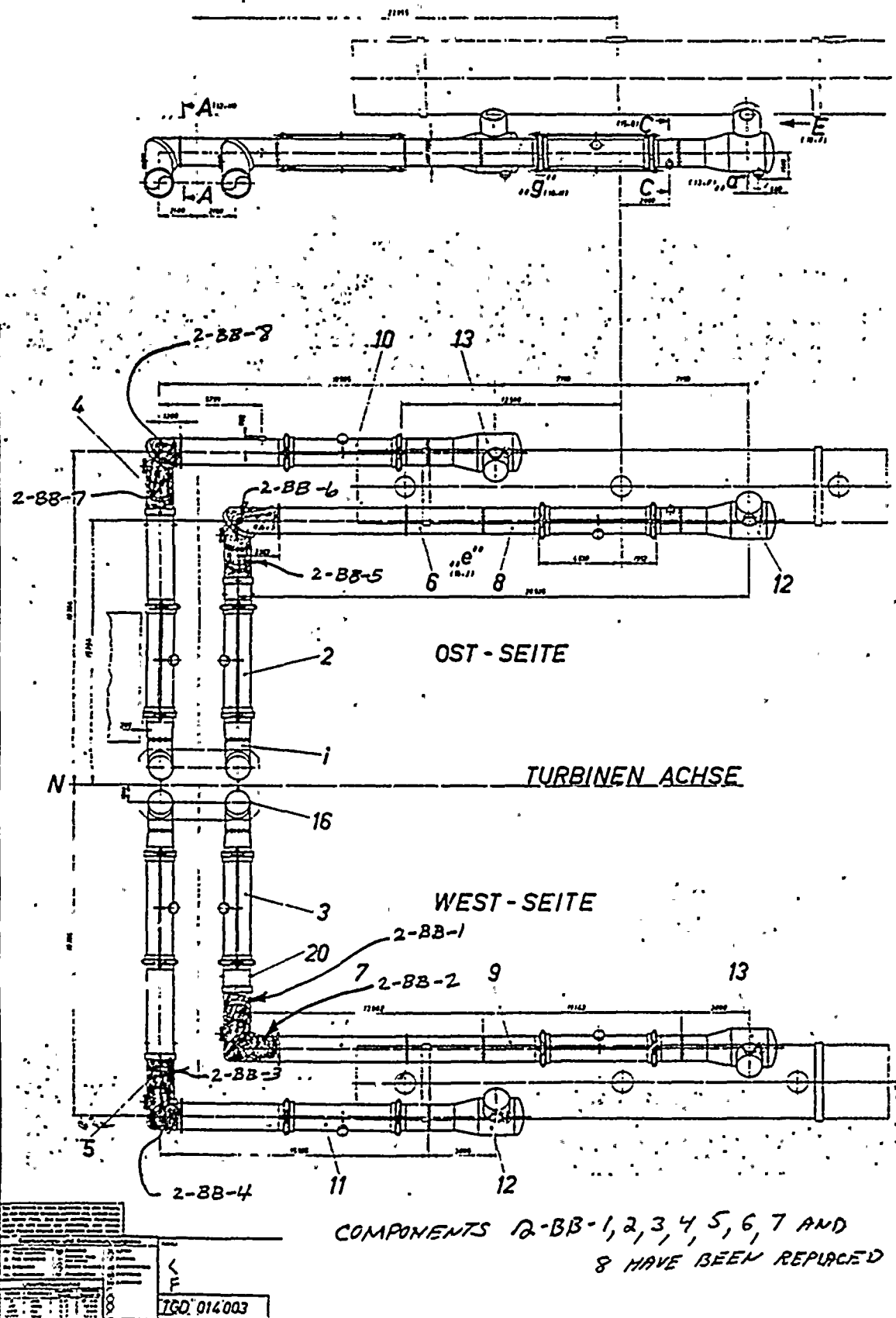


U I I LP HEATER 4B LINE 2-B-107  
45° FITTING "B"



TURBINE CROSS-UNDER  
SYSTEM





TURBINE CROSS-UNDER PIPE, UNIT 2

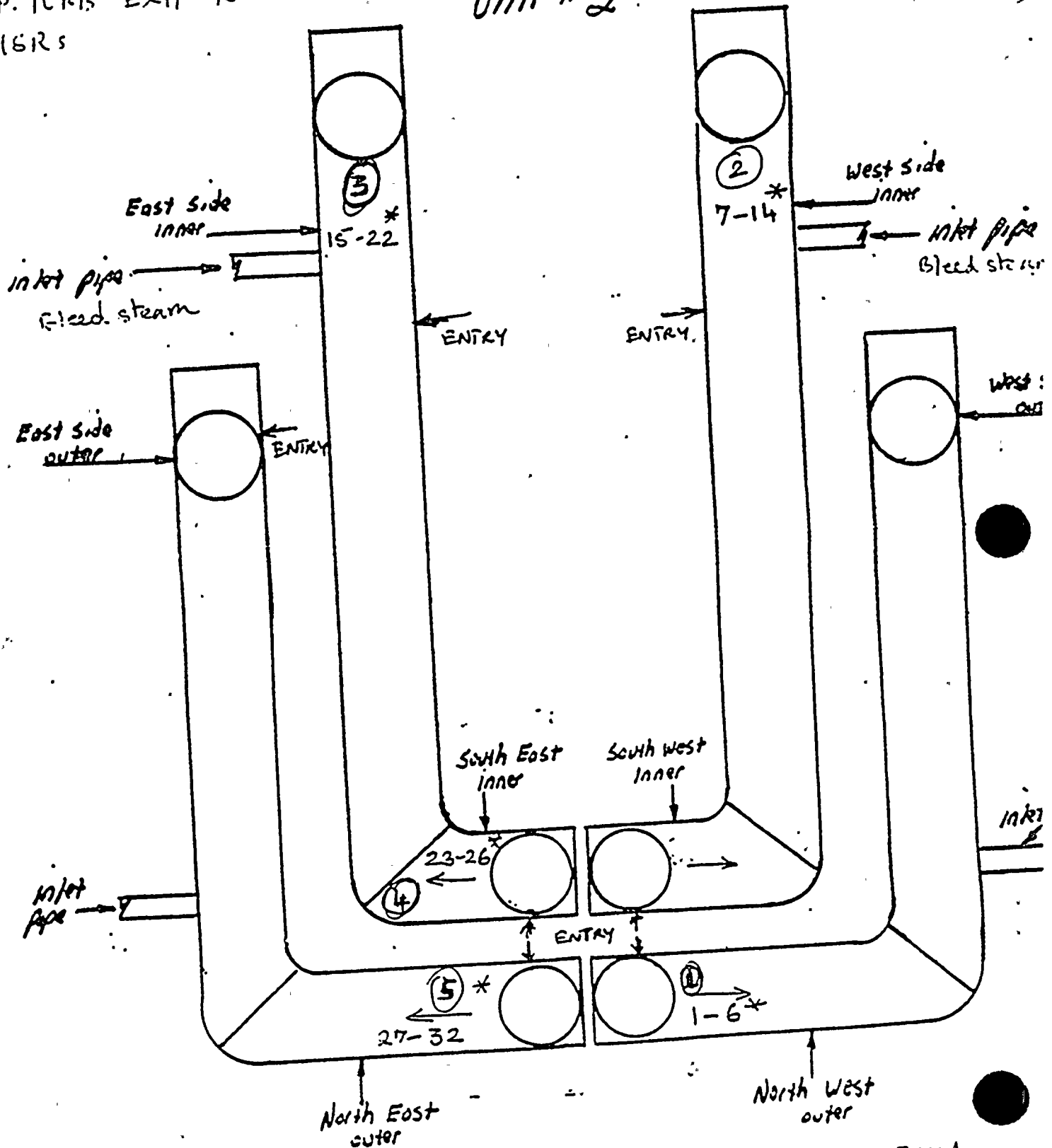


3/10/86

# Thickness Measurement Areas For 60" Cross Under Pipe

H.P. TURB EXH TO  
MGRS

Unit #2



\* PHOTOGRAPH NUMBERS.

CC: RAVI TELLA  
J.D. HOFFMAN  
FILE: GE-EC



## Cross under Pipe

### East Side inner

Average .480

Low .221 located 2 1/2' South of inlet pipe  
@ 5:00 looking North (typ)  
possible lumination - depth .252 located 2'  
South of inlet pipe @ 10:00

### East Side outer

Average .475

Low .357 located 2' South of inlet pipe  
@ 3:00

### South East inner

Average .470

Low .286 located at weld on far west end  
a few intermittent reading in the .300

### North East outer

Average .475

Low .370 located at weld on far west end  
@ 4:00

### South West inner

Average .505

Low .400 located at far East end @ 6:00

### North West outer

Average .480

Low .428 located at far East end @ 6:00

WEST SIDE INNER  
AVERAGE .470

LOW .282 LOCATED AT FAR WEST END @ 5:00  
INLET

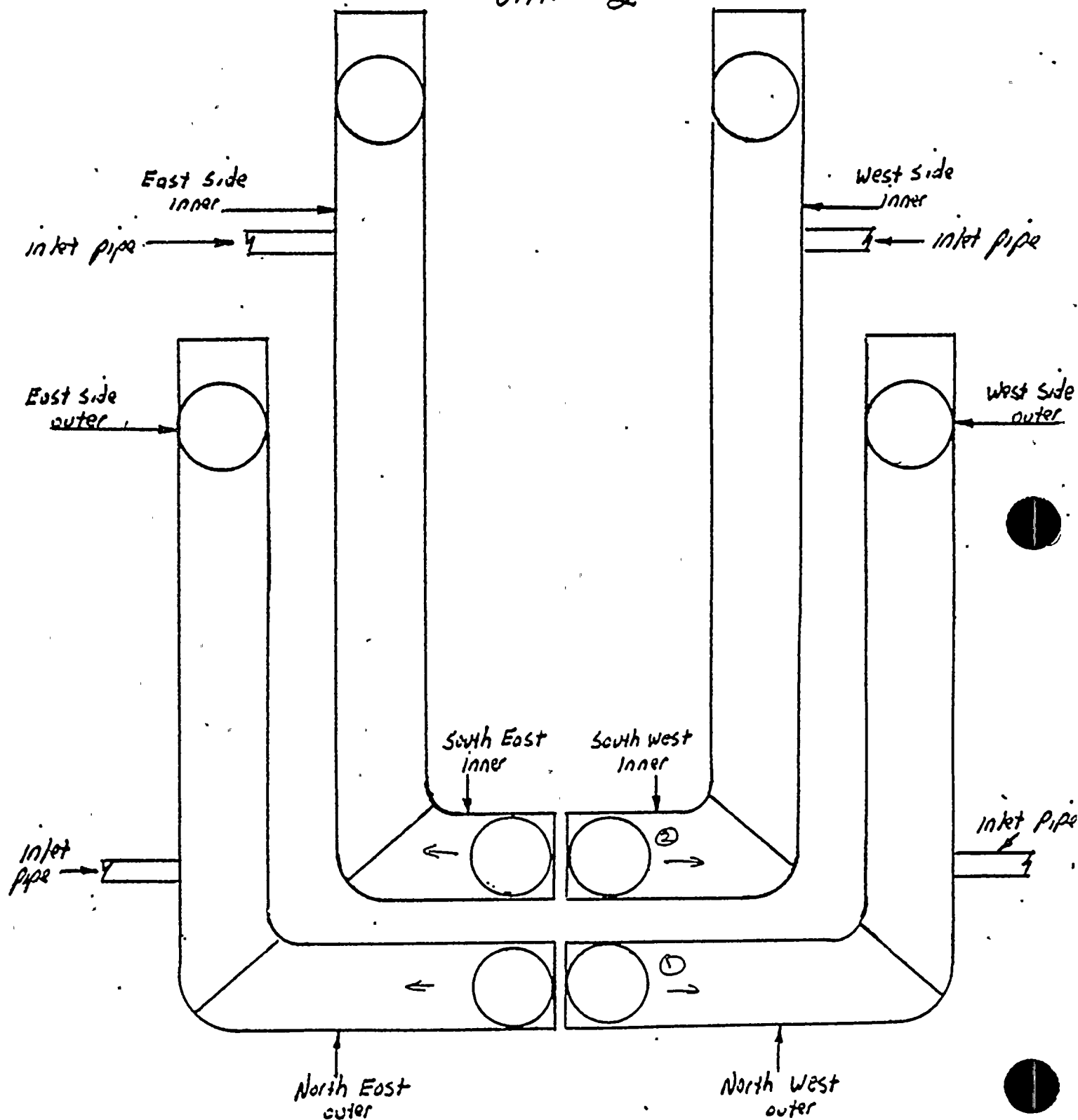
WEST SIDE OUTER  
AVERAGE .470

LOW .291 LOCATED AT FAR SOUTH END @ 12:00  
INLET



# Thickness Measurement Areas For 60" Cross Under Pipe

Unit #2





## Cross under Pipe

### East Side inner

Average .480

Low .221 located 2 1/2' South of inlet pipe  
@ 5:00 looking North (typ)  
possible lamination - depth .752 located 2'  
South of inlet pipe @ 10:00

### East side outer

Average .475

Low .357 located 2' South of inlet pipe  
@ 3:00

### South East inner

Average .470

Low .286 located at weld on far west end  
a few intermittent reading in the .300

### North East outer

Average .475

Low .370 located at weld on far west end  
@ 4:00

### South West inner

Average .505

Low .400 located at far East end @ 6:00

### North West outer

Average .480

Low .428 located at far East end @ 6:00

WEST SIDE INNER  
AVERAGE .470

LOW .282 LOCATED AT FAR WEST END @ 5:00  
INLET

WEST SIDE OUTER  
AVERAGE .470

LOW .291 LOCATED AT FAR SOUTH END @ 12:00  
INLET



