Babcock & Wilcox

Power Generation Group

P.O. Box 1260, Lynchburg, Va. 24505
Telephone: (804) 384-5111

September 14, 1979

George T. Frampton, Jr., Esq.
U.S. Nuclear Regulatory Commission
TMI Special Inquiry Group, AR-400
Washington, D.C. 20555

Dear Mr. Frampton:

Enclosed are the documents listed below, which are in response to your letter of August 6, 1979 to G. L. Edgar, Esq:

1. A copy of the official field record of the reactimeter setup on March 28, 1979, and a tabulation of changes that were made during the two months following the TMI-2 incident. (Responsive to Para.1)

2. Core maps of the TMI-2 reactor showing placement of control rods, burnable poison rods, power shaping rods, active and inactive instrumentation tubes, sources and source tubes, traveling in-core probes, etc., that could serve as "heat sinks" during heatup of the core when it is partially uncovered; copies of in-core temperature maps as functions of time from March 28, 1979 to April 1, 1979, that were presented to members of the NRC/SIG staff on July 26, 1979 at Lynchburg. (Responsive to Para. 2 and 3)

cc to: Pickel-Hayes
GTF 9/17/79

Additional materials will follow which are responsive to Paragraph 4.

Very truly yours,

J. G. Mullin
Contracts-Legal
Nuclear Power Generation Division

JGM:nnc
Enclosures
cc:
G. L. Edgar

7911060 228

REACTIMETER TAPE NUMBER: _____ LOGGING REACTIMETER S.C [illegible]

TEST NUMBER ON ABOVE TAPE: PP Test 09 DELOGGING REACTIMETER _____ DATE 3/28/79

SP 800/21 CONTROLLING PROCEDURE/PES

Mux Channel	Patchboard Number		Logged Variable	Pre-Amp Gain	Logged Variable Range	Sign-off Initial
1	14	-0125 +0125	NI FLUX (NI-5) ~~(NI-3)~~	1	0-125% (0/10V)	
2	28	+0520 +0620	RC LP A T OUT	1	520F - 620F (-/+10V)	
3	29	+0520 +0620	RC LP B T OUT	1	520F - 620F (-/+10V)	
4	31	+0050 +0650	RC LP A T IN HR	1	50F - 650F (-/+10V)	
5	34	+0050 +0650	RC LP B T IN HR	1	50F - 650F (-/+10V)	
6	45	+0000 +0090	RC LP A FLOW (Temp. Comp.)	1	0 - 90 MPPH (-/+10V)	
7	22	-0400 +0000	RC PZR PZR LVL (Temp. Comp.)	1	0 - 400 in (+/-10V)	
8	96	+0000 +0100	MAKE UP TK LVL	1	0 - 100 in (-/+10V)	
9	19		PZR SPRAY VLV POS	1	CLOSED - CC	
10	65	-0250 +0250	DRAIN TANK PRESS	1	0 - 250 PSIG (0/+10V)	
11	~~(28)~~ 27	+0700 +2500	RC PRESS NR "B" LP	1	1700 - 2500 PSIG (0/+10V)	
12	1		REACTOR TRIP	1	TRIP - CC	
13	47	+0000 +0090	RC LP B FLOW (TEMP. COMP.)	1	0-90 MPH (-/+10V)	
14	57	-0500 +0000	FDW TEMP.	1	0-500°F (+/- 10V)	
15	110	-0305 +1203	TURBINE HDR PRESS A	1	600 - 1200 PSIG (+2/+10V)	
16	49	+0000 +0100	OTSG A OP LVL. (Temp. Comp.)	1	0 - 100% (-/+10V)	
17	50	+0000 +0250	OTSG A SU LVL	1	0 - 250 in (-/+10V)	
18	62	+0000 +0065	LP A FDW FLOW	1	0 - 6.5 MPPH (-/+10V)	
19	63	+0000 +0065	LP B FDW FLOW	1	0- 6.5 MPPH (-/+10V)	
20	85	3.86	TURBINE TRIP	1	TRIP - CC	
21	112	-1533 +1223	OTSG A STM. PRESS.	1	0-1200 PSI (+2/+10V)	
22	113	-1796 +1197	OTSG B STM. PRESS	1	0-1200 PSI (+2/+10V)	
23	51	+0000 +0100	OTSG B OP LVL (Temp. Comp.)	1	0-100% (-/+10V)	
24	52	+0000 +0250	OTSG B SU LVL	1	0-250 in. (-/+10V)	

NOTE: CC - CONTACT CLOSED

Duplicate Page

I-13
II-25

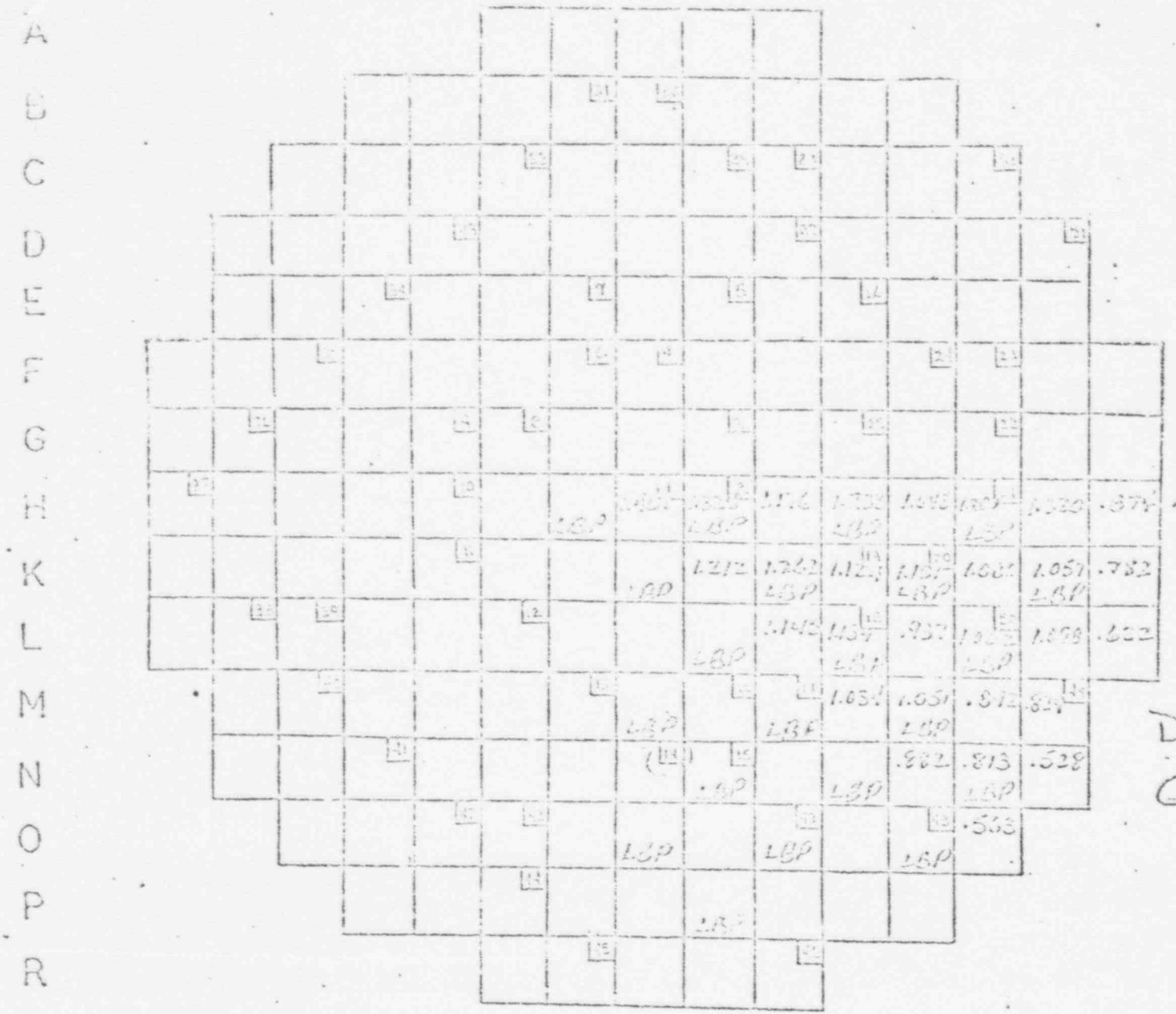
TMI UNIT II
SP 800/21
Enclosure 6
Page 1 of 1

E-22

Changes in TMI-2 Reactimeter Patch Tapes

	Date
Thot LPA NR Deleted	3/31/79
Thot LPB NR Deleted	3/31/79
RC Press. NR "B" LP Replaced by RCS LPB Press. WR	3/31/79
NI Flux (NI-5) Power Range Replaced by NI-3 Intermediate Range	3/31/79
NI-1 Source Range Added	4/8/79
PZR LVL (Temp. Comp.) Added	4/8/79
PZR LVL (Uncomp.) Added	4/8/79
PZR Spray Valve Pos. Replaced by Tcold LPA WR	4/8/79
Drain Tank Press. Replaced by RCS LPA Press. WR	4/8/79
Reactor Trip Deleted	4/8/79
FDW Temp. Deleted	4/8/79
Turbine HDR Press. (A) Deleted	4/8/79
Turbine Trip Deleted	4/8/79
SU FW Flow LPB Added	4/8/79
PZR LVL (Temp. Comp.) Replaced by Thot LPA (RC4A-TT1)	5/24/79
PZR LVL (Uncomp.) Replaced by Thot LPB (RC4B-TT1)	5/24/79
RCS Flow LPA (Temp. Comp.) Replaced by Tcold LPA (RC5A-TT4)	5/27/79
RCS Flow LPB (Temp. Comp.) Replaced by Tcold LPB (RC5B-TT4)	5/27/79

177 CORE AND INSTRUMENT LAYOUT



CALCULATION DATA/TRANSMITTAL SHEET

DOCUMENT IDENTIFIER

CALC. 32 - _____ - _____

TRANS. 86 - 0139 - 02

TYPE: ___RESEARCH & DEVELOPMENT ___SAFETY ANALYSIS REPORT X FUNC. SERV. INPUT ___DESIGN ACMT. ___DESIGN VERIF. ___OTHER

TITLE TMI-2 CYCLE 1 FCLP WITHOUT ORA'S

PREPARED BY N. Harlow N.C. Harlow REVIEWED BY M.R. Brashear

TITLE Assoc. Engineer DATE 6/2/78 TITLE Project Engineer DATE 6/2/78

PURPOSE: To revise the Core Loading Plan for TMI-2 Cycle 1 after removal of ORA's.

SUMMARY OF RESULTS (INCLUDE DOC. ID'S OF PREVIOUS TRANSMITTALS & SOURCE CALCULATIONAL PACKAGES FOR THIS TRANSMITTAL)

REFERENCES:
1) N.C. Harlow to Distribution, "Revised Initial Core Loading Plan for TMI-2", 86-0139-01, 660-021A/12E11.32/NA-78-38, July 13, 1977.
2) C.P. Jones to E.H. Cann, "Modified ORA ID Numbers", 6/2/78.
3) C.L. Gray to L.C. Rogers, "Burnable Poison and Mod. Orifice Rod Assy. Retainer", T3.16.3/NSS-6, June 1, 1978.

The attached Core Loading Plan for TMI-2 Cycle 1 is for use after removal of the original ORA's. It is identical to the plan presented in Reference 1 with the exception of the ORA's, their modified replacements and Retainers. All Retainers are identified in Reference 2, as well as the modified ORA's to be used in Core locations B-12 and P-4, where the Primary Neutron Sources are located. At these two locations the following loading procedures should be followed: Load Orifice Assembly (Modified ORA) into dummy F.A., withdraw O.A. with mast and insert into FA. Perform the Lock Test of the Orifice Assembly engagement in the fuel assembly. Verify by records that one of the Orifice Assembly rods is correctly positioned in the Primary Neutron Source guide tube. Thereafter follow the procedure outlined in Reference 3 for installing the retainer. Retainer #L006 only may be used as a substitute for L004 or L005.

The release of this memo by document control indicates that the necessary signoffs (DAR's) have been obtained per B&W procedures. The Source Calculational File is 32-7019-01.

DISTRIBUTION

SEE DRN

TMI-II INITIAL CORE LOADING PLAN
REVISION 2

FUEL TRANSFER CANAL →

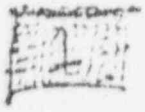
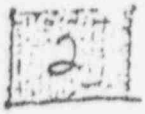
X

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A						TP	TY	UC	TC	TW					
B				UT	UX	UG C139	RL B153 L007	UB C124	RF B158 L008	UA C132	U1	U4 03AT & L004 P			
C			TS	T7 B164 L009	PW C163	SN B174 L010	Q8 C179	SY B177 L011	QB C172	SC B173 L012	PY C156	T8 B163 L013	TF		
D		TR	TA B168 L014	PV C155	T5 B197 L015	Q4 A024	SW B160 L016	RC C144	S1 B183 L017	Q2 A017	T4 B200 L018	PT C152	T8 B169 L019	TD	
E		U2	QS C162	PN B198 L020	QN C131	RX B195 L021	QG C171	SZ B187 L022	QJ C164	TO B204 L023	R8 C128	PP B206 L024	PZ C157	U5	
F	TN	UR C138	RW B171 L025	Q5 A023	RN B202 L026	R6 C151	RS B146 L027	QZ C140	S4 B155 L028	QK C148	S7 B201 L029	QQ A018	RH B182 L030	UQ C133	TG
G	TM	SQ B147 L031	QV C178	SO B185 L032	R2 C170	RQ B145 L033	QX C183	RP B149 L034	QE C180	SM B139 L035	QH C165	SS B176 L036	QA C173	RK B157 L037	UB
H	UU	UF C127	S2 B186 L038	RD C147	T1 B189 L039	QY C143	SH B143 L040	RR C123	SJ B142 L041	QF C141	T2 B188 L042	RA C145	SX B184 L043	UE C125	UY
K	UW	RM B152 L044	Q7 C177	RU B161 L045	R4 C169	T3 B141 L046	QD C182	RT B144 L047	QM C181	SL B154 L048	QC C166	SB B179 L049	Q9 C174	RJ B151 L050	UV
L	TQ	UK C137	RG B162 L051	QP A022	SR B192 L052	QL C150	SK B156 L053	RO C142	S3 B150 L054	QW C149	RV B199 L055	Q3 A019	SA B165 L056	UL C134	TJ
M		UO	QR C161	PM B193 L057	Q6 C130	S8 B194 L058	R3 C168	S6 B159 L059	R1 C167	RY B191 L060	R9 C129	T6 B205 L061	QT C158	TU	
N		TZ	U9 B175 L062	PU C154	SG B203 L063	Q1 A021	SV B180 L064	RB C146	RZ B181 L065	QU A020	PQ B196 L066	PS C153	UH B190 L067	TE	
O			U8	UJ B166 L068	QO C160	S9 B167 L069	R7 C176	ST B172 L070	R5 C175	SU B178 L071	PX C159	T9 B170 L072	TT		
P			L005	TV & 03AU P	U6	UP C136	RE B148 L073	UM C126	SP B140 L074	UN C135	U7	TX			
R						TH	TL	UD	U3	TK					

Z

Fuel Assembly ID (PS-RD:Batch 1; RE-T6 & PM-PQ:Batch 2; T7-UY:Batch 3)
Control Component ID (CXXX - CRA; AXXX - APSRA; BXXX - BPRA; OXXX-MOD.ORA;
Sources (P - Primary) LOXX -RETAINER)

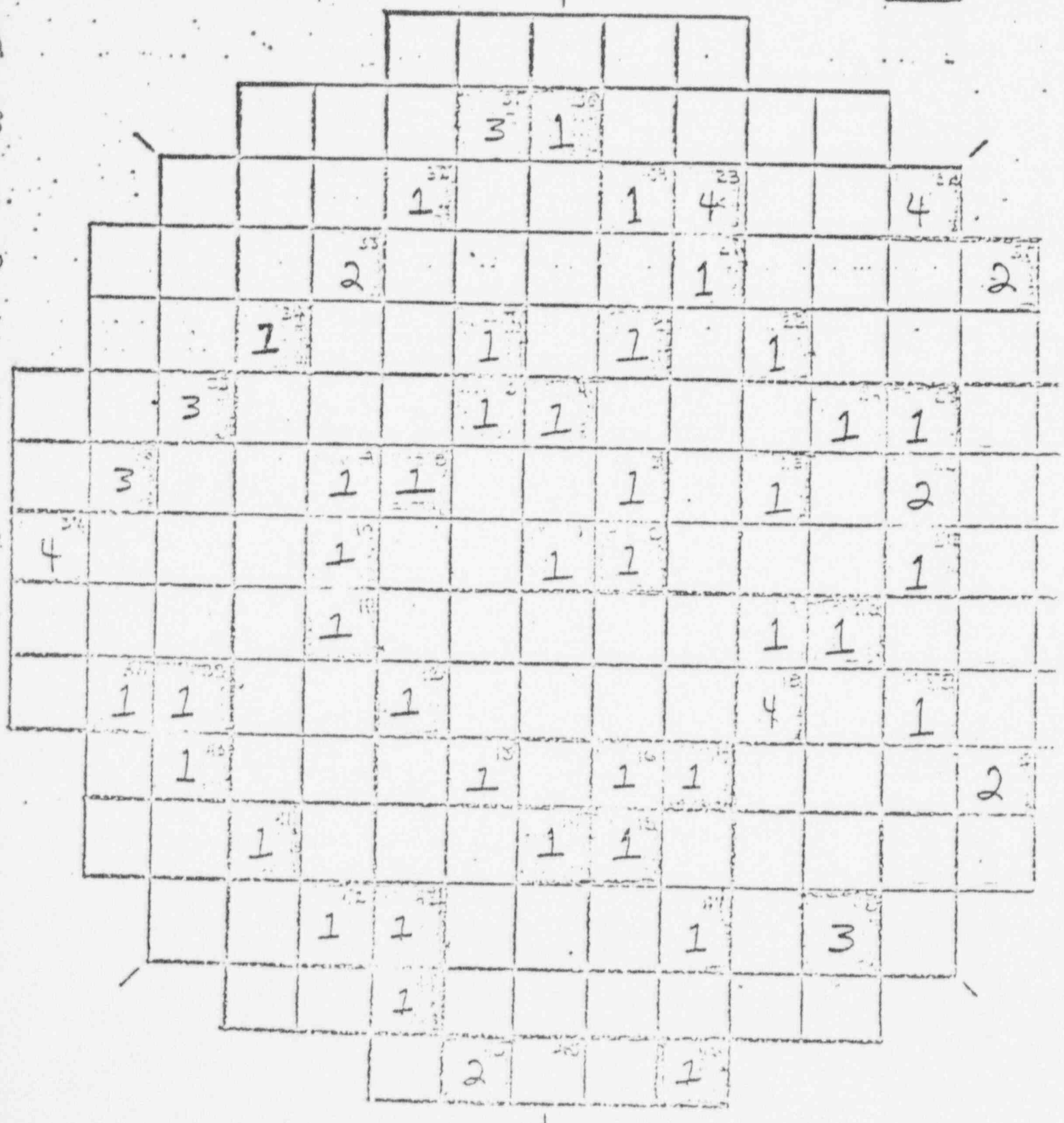
NOTE: NJ00 precedes all fuel assembly ID's.

	ABOVE 700°F
	650°F - 700°F
	600°F - 650°F
	550°F - 600°F
	500°F - 550°F
	450°F - 500°F
	400°F - 450°F
	350°F - 400°F
	300°F - 350°F
	250°F - 300°F
	200°F - 250°F
	BELOW 200°F

06:55-07:13

SPND STRING NUMBERS AND LOCATIONS – 177 FA CORE

[X] STRING



ENGINEER

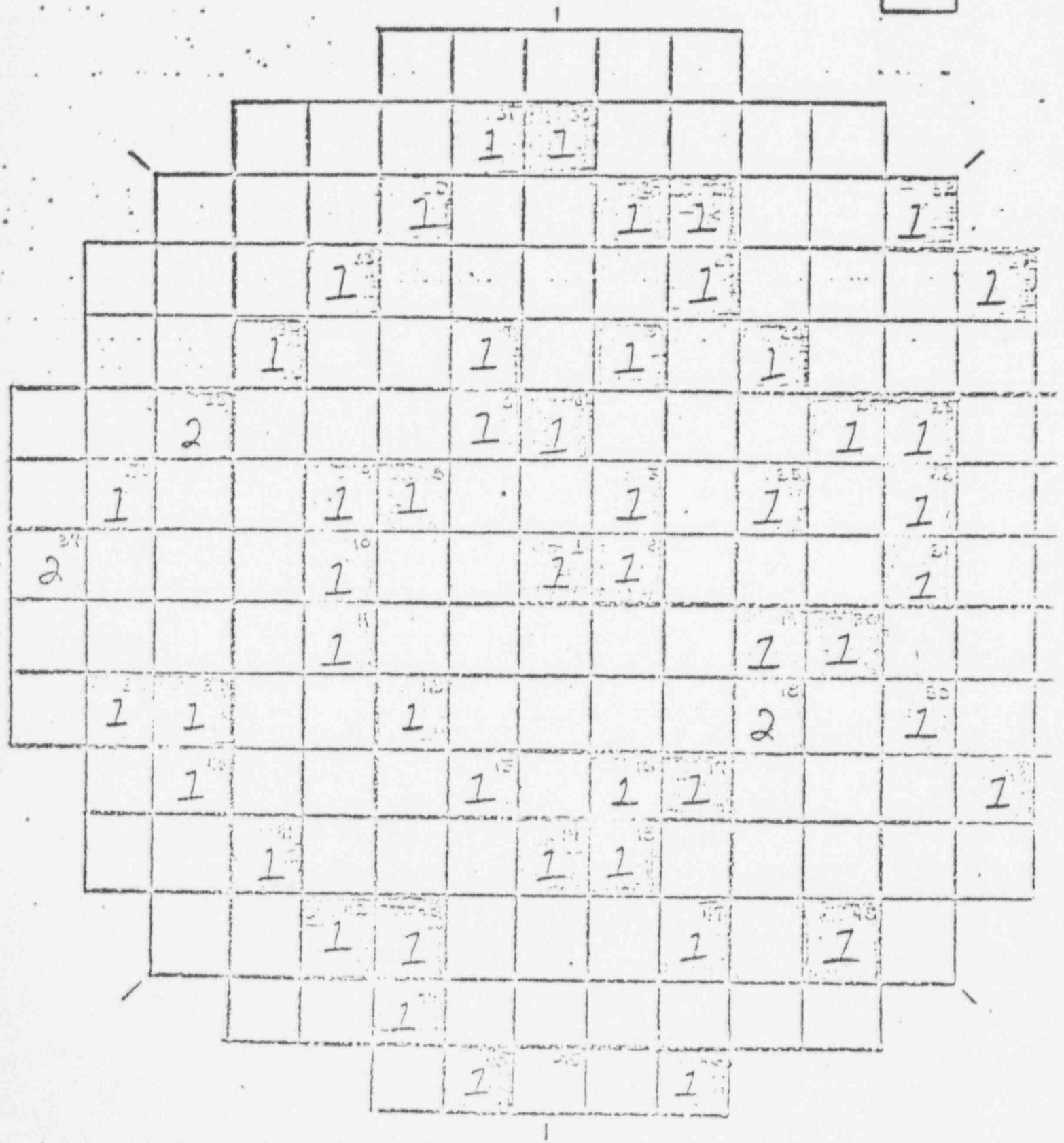
PROJECT

JOB NO.

3-28-77
07:13-07:21

SPND STRING NUMBERS AND LOCATIONS - 177 FA CORE

K STRING



JOB NO

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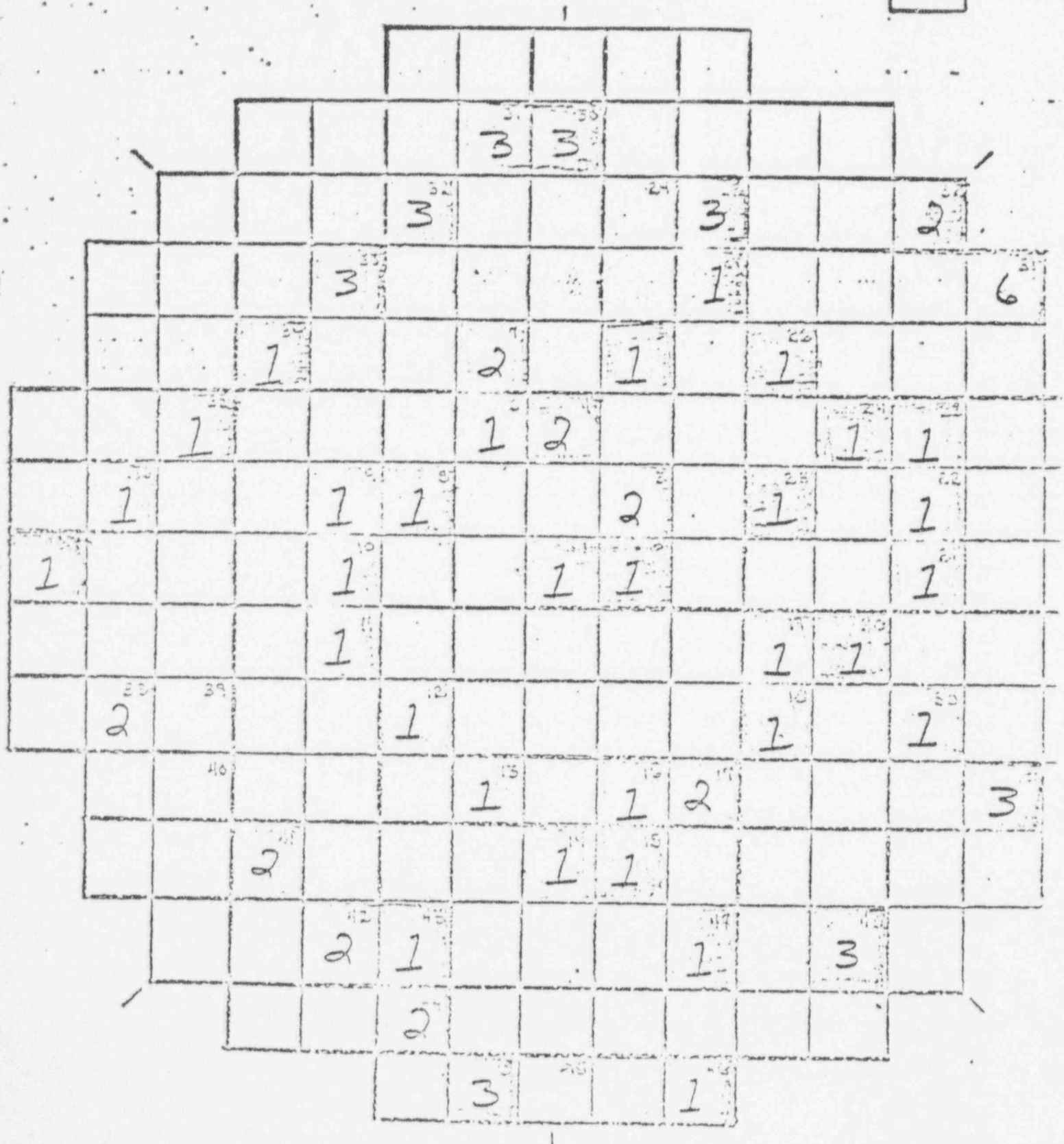

CUSTOMER

PROJECT

JOB NO.

07:44-07:47

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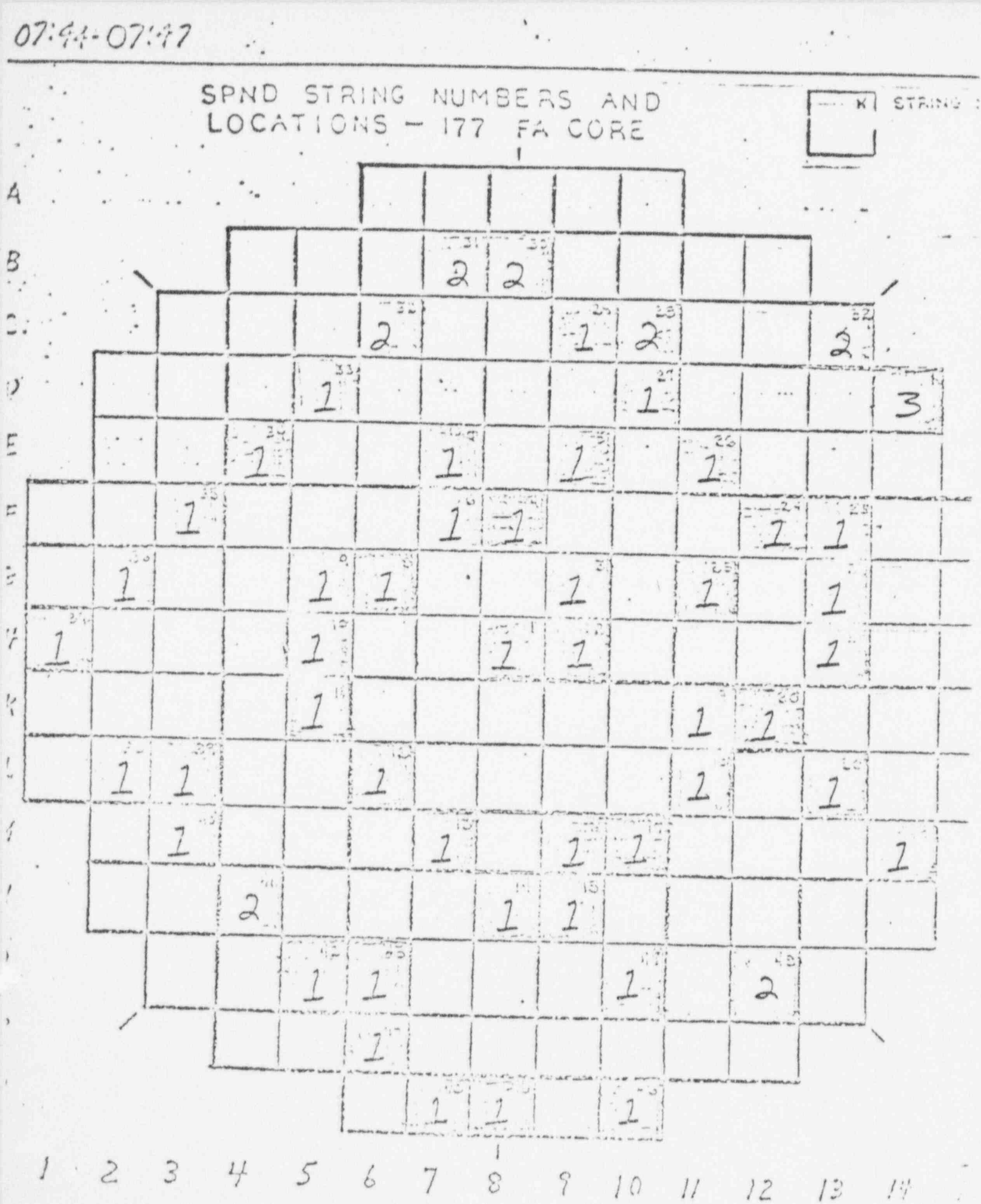

08:34-08:47

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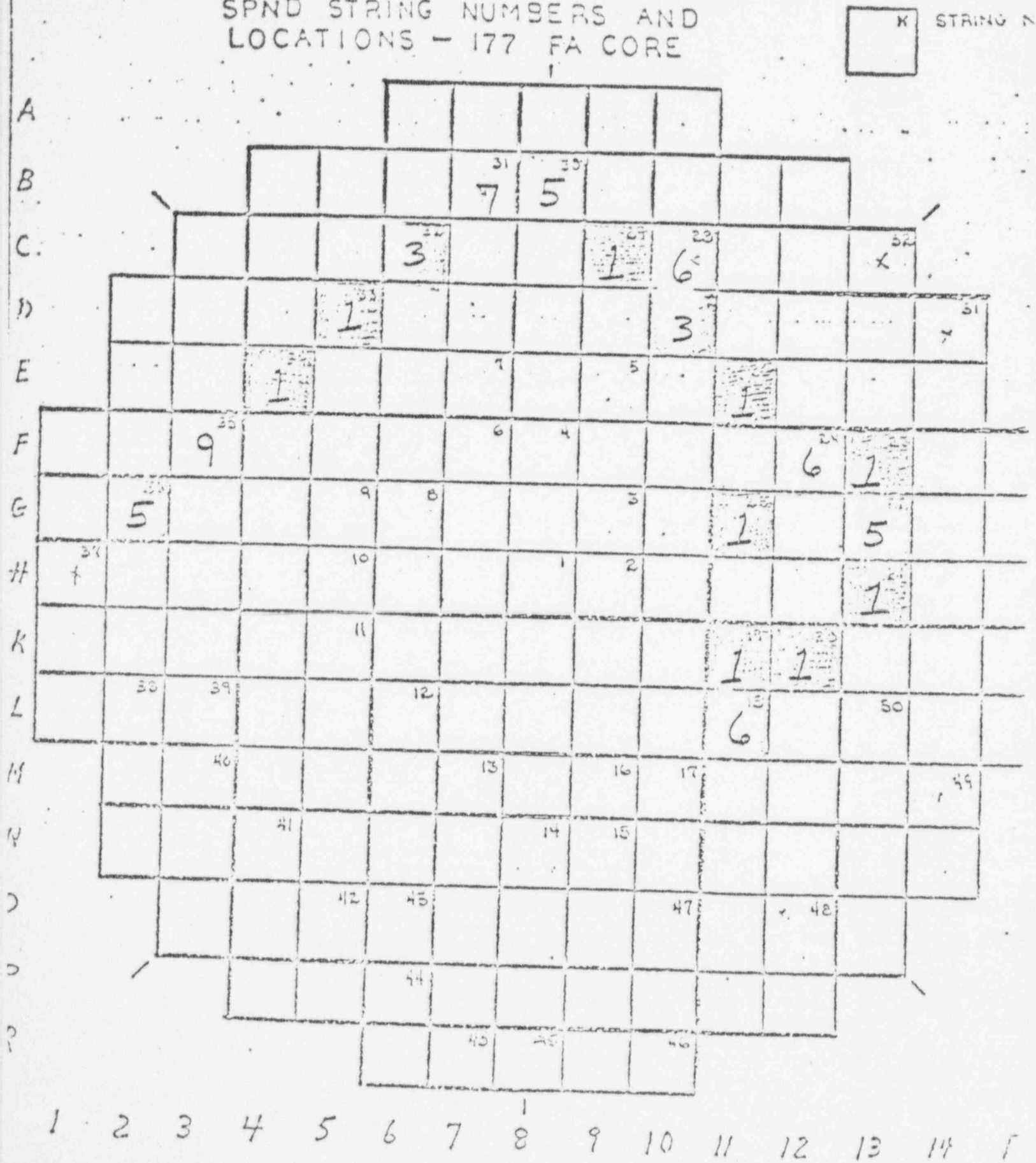

CUSTOMER

SUBJECT

JOB NO.

12:40-12:44

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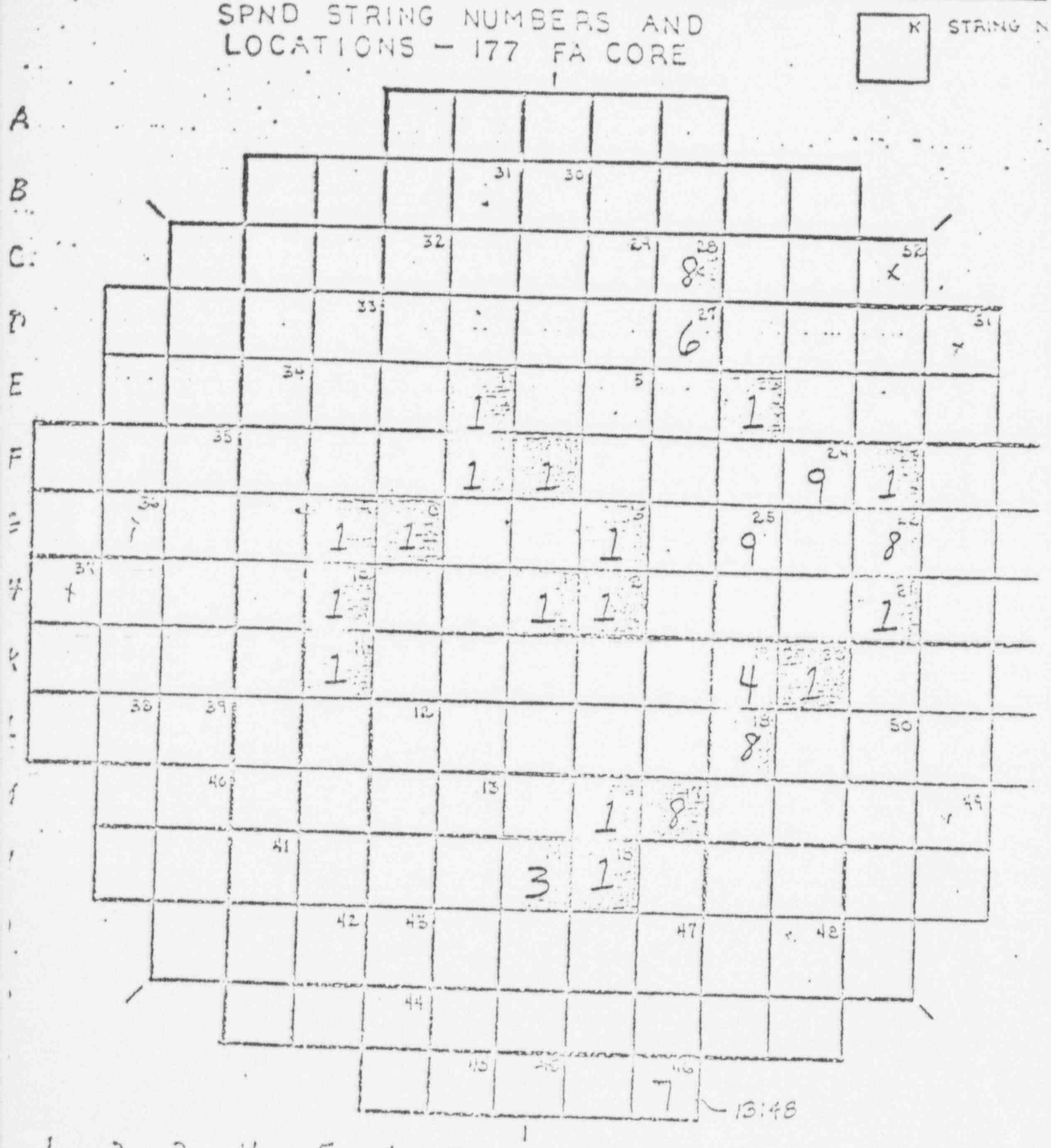

JOB No.

3-28-74
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A B C D E F G H K L M N P R S T

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SUBJECT

JOB No.

3-27-79
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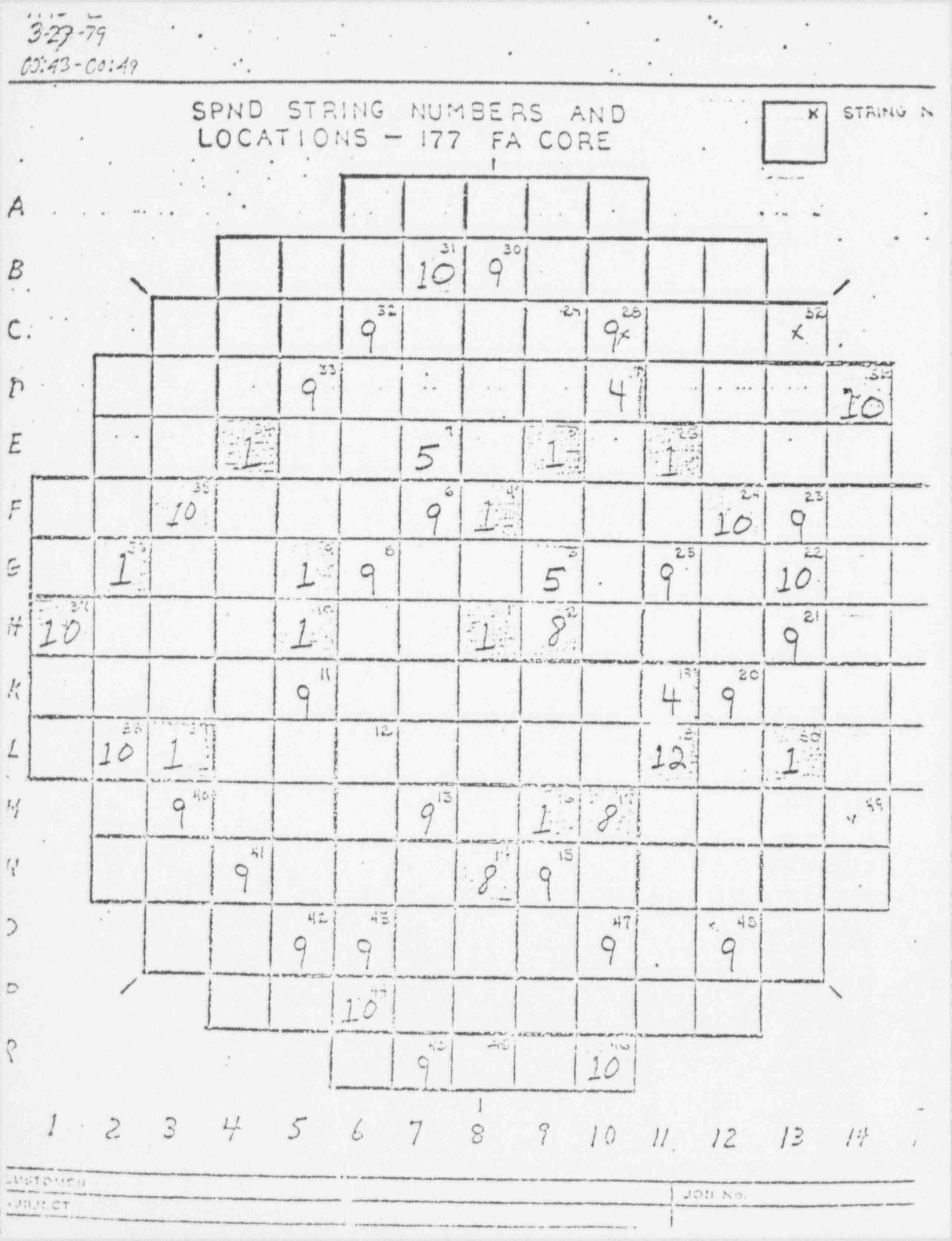

CUSTOMER
PROJECT
JOB NO.

3-29-79
07:57-09:06

SPND STRING NUMBERS AND LOCATIONS – 177 FA CORE

CUSTOMER

JOB NO.

3-29-79
11:51-12:00 ?

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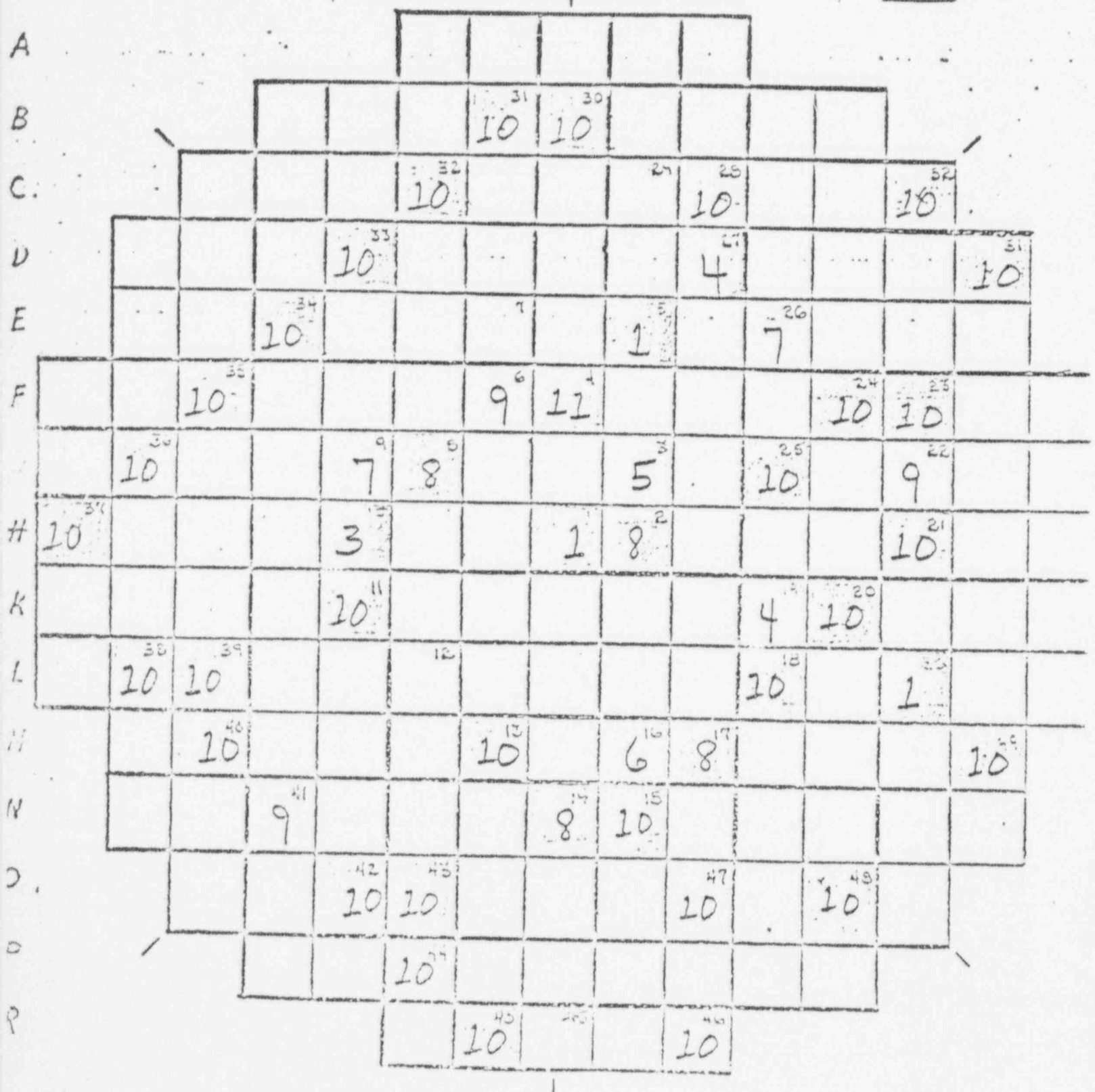

CUSTOMER
PROJECT
JOB NO.

TMI-2
4-01-79
10:22

THE BABCOCK & WILCOX CO.

SPND STRING NUMBERS AND LOCATIONS – 177 FA CORE

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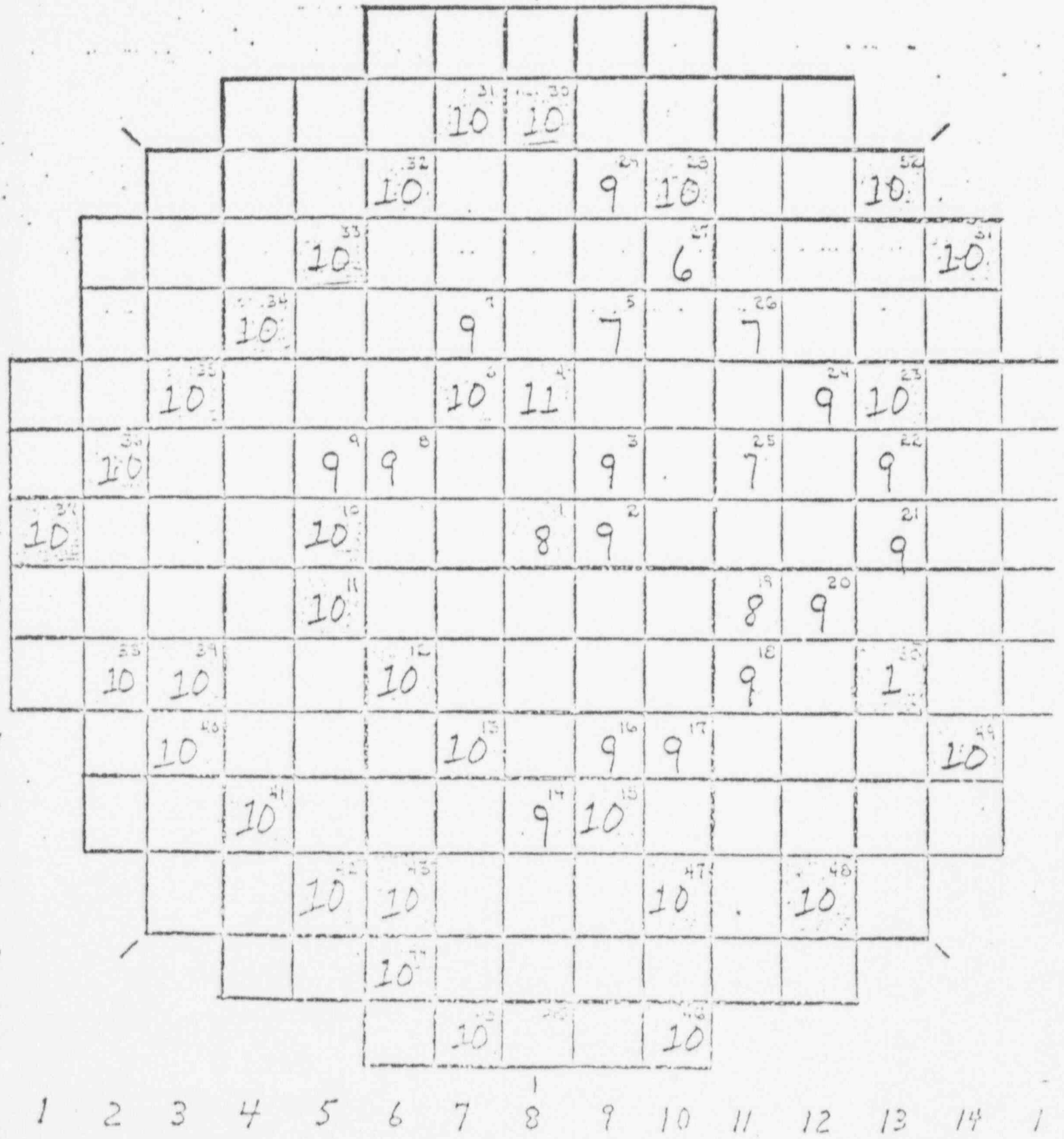


CUSTOMER

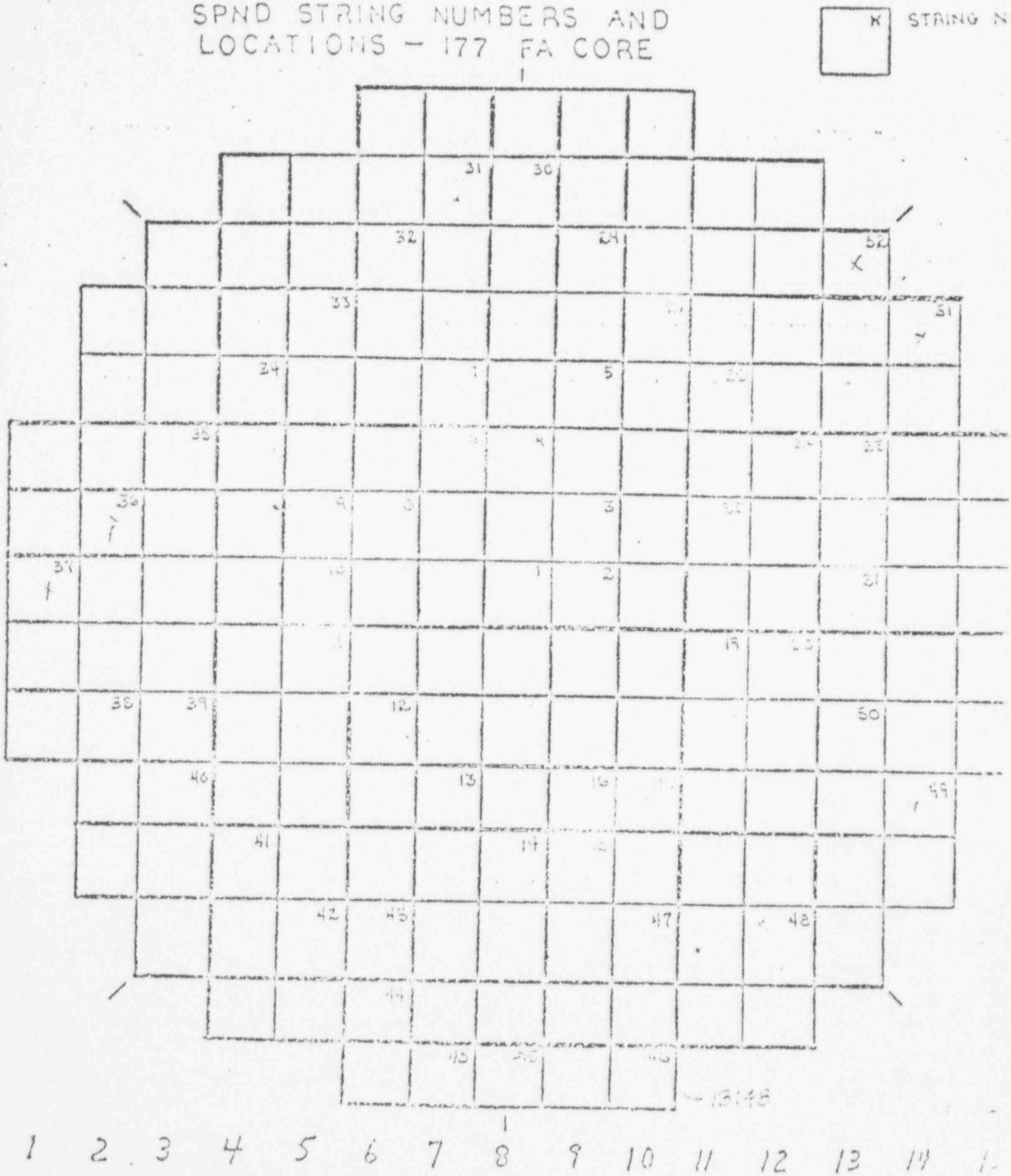
JOB NO.

PROJECT

THS-2
3-28-71
12:40-12:44

WILCOX CO. Computer

SPND STRING NUMBERS AND LOCATIONS – 177 FA CORE



CUSTOMER

SUBJECT

JOB NO.

3-23-74

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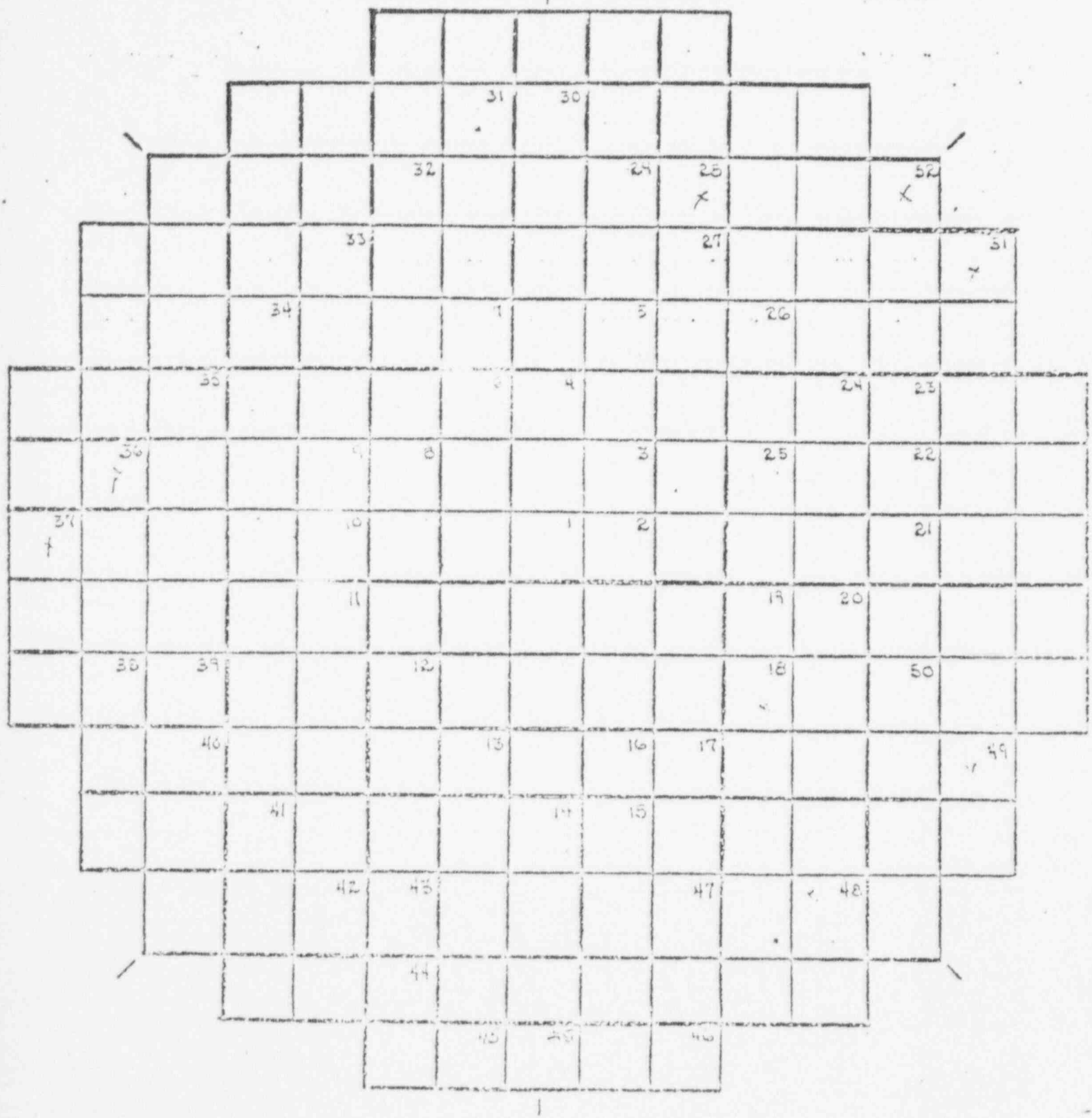

CUSTOMER	JOB NO.
PROJECT	

3-28-77

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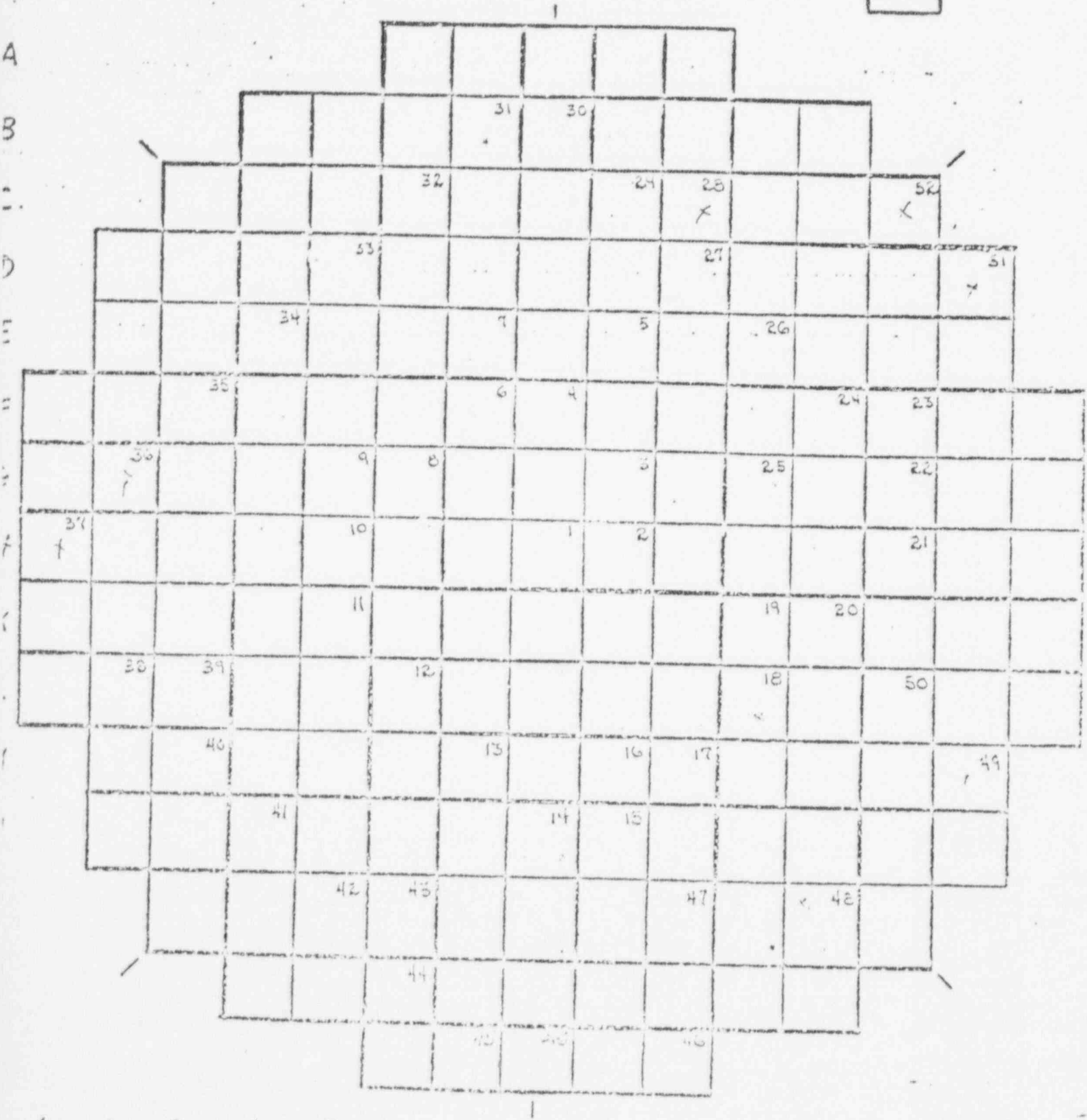

CUSTOMER

PROJECT

JOB NO.

THE BABCOCK & WILCOX CO.

3-23-77

7151-20.02

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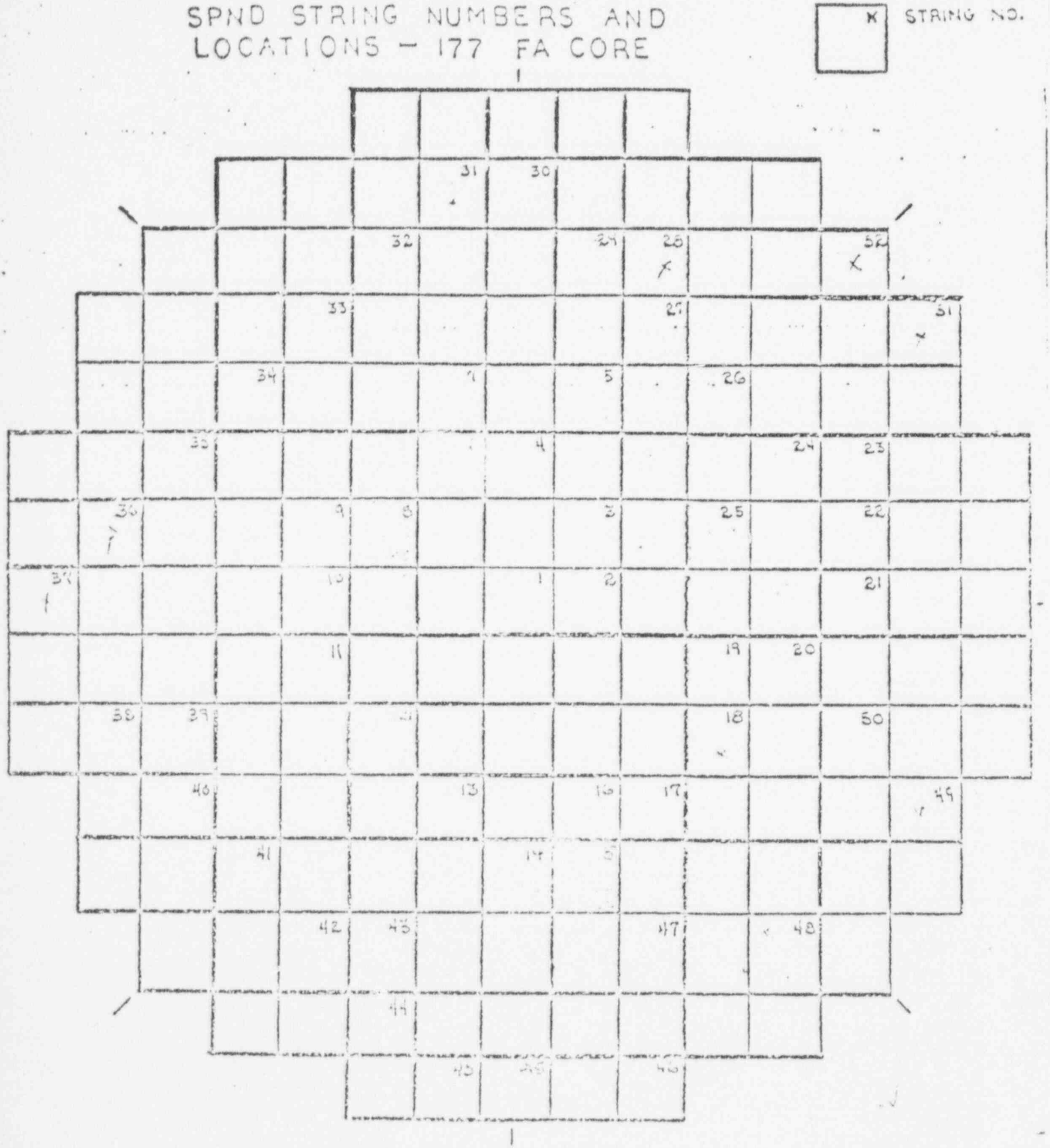

CUSTOMER

JOB NO.

PROJECT

3-28-7?

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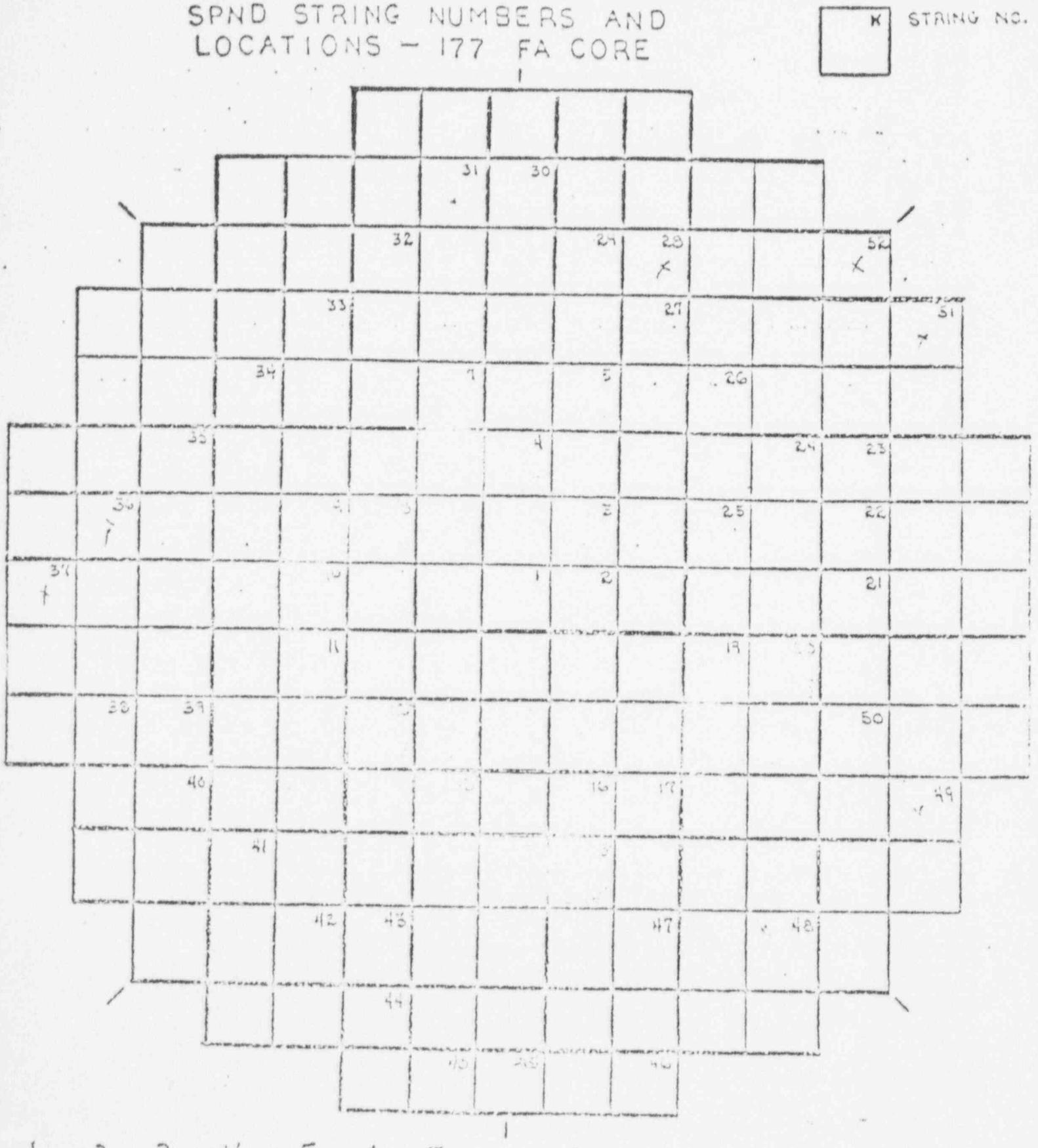

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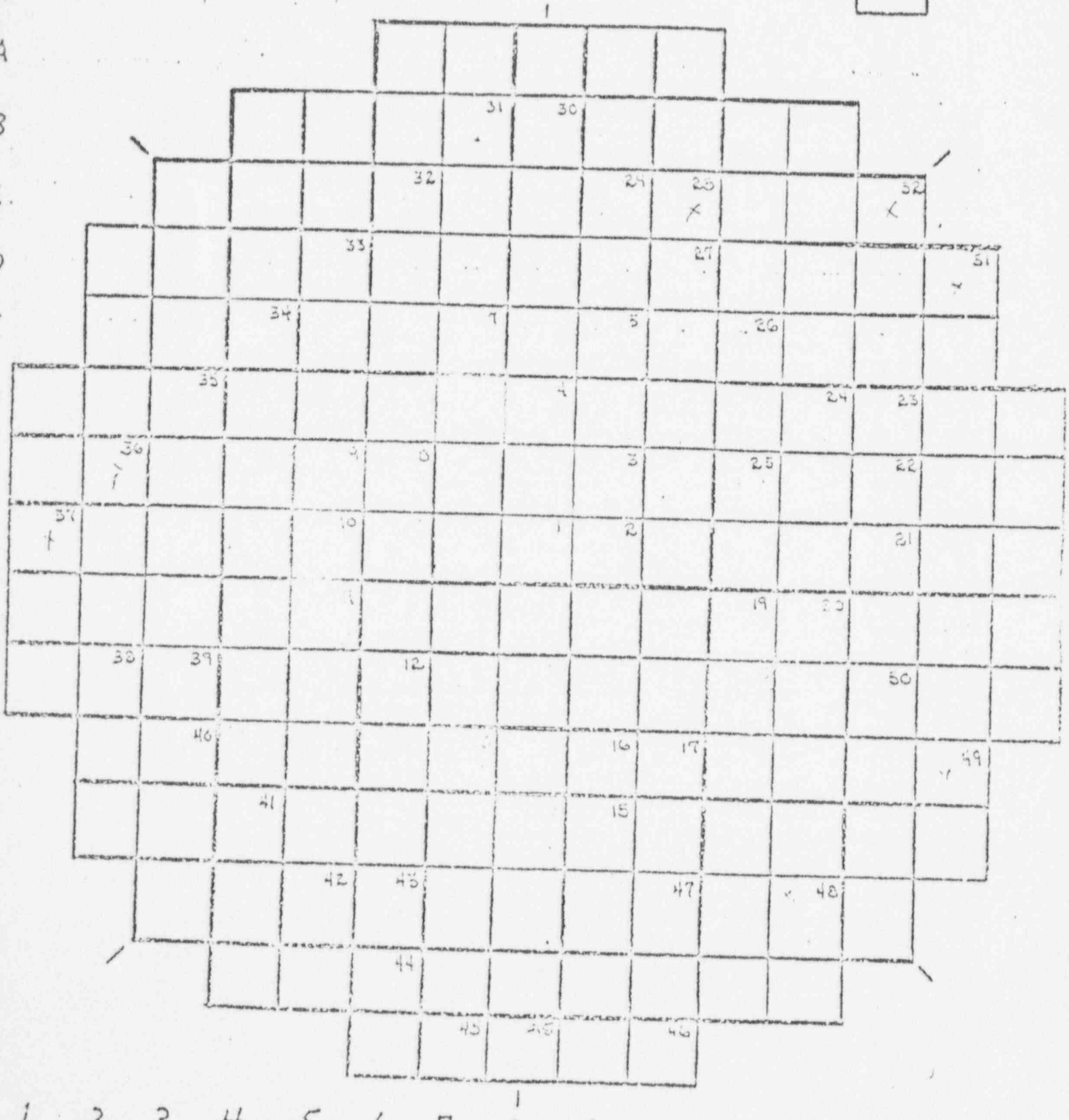

CUSTOMER

PROJECT

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