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 AUTH. NAME                      AUTHOR AFFILIATION  
 KEISER, H. W.                    Pennsylvania Power & Light Co.  
 RECIP. NAME                      RECIPIENT AFFILIATION  
 ADENSAM, E.                      BWR Project Directorate 3

SUBJECT: Forwards revised listing of responses to App R Concern 1, explanation of each rev & revised Concern 1 sheets. Rev include reanalysis of Fire Zones 1-5B, 2-5B, 1-5A & 2-5A.

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	NRR BWR DIR		1	1	NRR BWR PD1		1	1
	NRR PWR-A DIR		1	1	NRR PWR-B DIR		1	1
	NRR SHEA, J	01	2	2	NRR/DHFT DIR		1	1
	NRR/DSRB DIR		1	1	NRR/ORAS	08	1	1
	<u>REG FILES</u>	04	1	1	RGN1	07	1	1
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	NRC PDR	02	1	1	NSIC	06	1	1
NOTES:			3	3				

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Pennsylvania Power & Light Company

Two North Ninth Street • Allentown, PA 18101 • 215 / 770-5151

Harold W. Keiser  
Vice President-Nuclear Operations  
215/770-7502

DEC 18 1985

Director of Nuclear Reactor Regulation  
Attention: Ms. E. Adensam, Project Director  
BWR Project Directorate No. 3  
Division of Licensing  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION  
APPENDIX R - NRC CONCERN 1 RESPONSE - REVISION  
ER 100450 FILE 841-2  
PLA-2574

Docket Nos. 50-387  
50-388

Dear Ms. Adensam:

Because of the analyses in response to the Appendix R Concerns Number 2 and 4a, our response to Concern Number 1 must be revised. Attached is a listing of the revisions, an explanation of each revision and the revised Concern Number 1 sheets.

If you have any questions, please contact us.

Very truly yours,

H. W. Keiser  
Vice President-Nuclear Operations

cc: M. J. Campagnone - NRC  
R. H. Jacobs - NRC

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CONCERN #1

REVISION 12-16-85

<u>PAGE</u>		<u>REASON FOR REVISION</u>
Appendix A		
Exemption No. 5	Table 5-1	Reanalysis of Fire Zones 1-5B, 2-5B
Exemption No. 6	Page 1	Reanalysis of Fire Zone 1-5B
Exemption No. 6	Page 2	Reanalysis of Fire Zones 1-5B, 2-5B
Appendix B	Attachment No. 1	
	Page 2	Reanalysis of Fire Zone 2-5B, the
	Page 3	Combination of Non Safe Shutdown
		Fire Zones within the control
		structure and the recognition that
		Fire Zone 0-24L is in Area CS-7 and
		not in Fire Area CS-4
Appendix B	Attachment No. 2	
	Figure 2.0	Response to Concern 4a
	Figure 3.0	Response to Concern 4a
	Figure 4.0	Response to Concern 4a
	Figure 5.0	Response to Concern 4a
		and Reanalysis of Fire
		Zones 1-5A, 2-5A
	Figure 6.0	Reanalysis of Fire Zones
		1-5A, 2-5A
	Figure 9.0	Response to Concern 4a
	Figure 10.0	Response to Concern 4a
	Figure 11.0	Same as Figure 5.0
Appendix C	Unit 1	Reanalysis of Fire Zone 1-5B
	Unit 2	Reanalysis of Fire Zone 2-5B
Appendix D	Table D-1	Additional Core Spray Raceway
	Page 1	Raceways identified in Concern 2
	Page 2	Raceways identified in Concern 4a

SUSQUEHANNA STEAM ELECTRIC STATION - UNITS 1 & 2  
FIRE PROTECTION PROGRAM - CONCERN #1  
DOCKETS NO. 50-387  
50-388

APPENDIX A - EXEMPTION REQUESTS

LIST OF PARTIAL RATING OF WALLS AND FLOOR/CEILING  
BARRIER SEPARATING FIRE ZONES

Reactor Building Unit #1

<u>FIRE ZONE/FIRE ZONE</u>	<u>REF. FIG. IN APPENDIX B</u>
1-1E/1-3B-W	2, 3 & 9
1-1F/1-3B-W	2, 3 & 9
1-1E/1-3C-W	2, 3 & 10
1-1F/1-3C-W	2, 3 & 10
1-3A/1-4B	3, 4 & 11
1-3A/ 1-4G	3, 4 & 11
1-4A-W/1-5A-S	4, 5 & 10
1-4A-W/1-5A-W	4, 5 & 9
1-4A-N/1-5A-W	4, 5 & 10
1-5A-S/1-6A	5, 6 & 11
1-5A-S/1-6I	5, 6 & 11
1-5A-W/1-5E	5 & 10
1-5B/1-4G	5, 6 & 11

TABLE 5-1

LIST OF PARTIAL RATING OF WALLS AND FLOOR/CEILING  
BARRIER SEPARATING FIRE ZONES

Reactor Building Unit #2

<u>FIRE ZONE/FIRE ZONE</u>	<u>REF. FIG. IN APPENDIX B</u>
2-1E/2-3B-W	2, 3 & 9
2-1F/2-3B-W	2, 3 & 9
2-1E/2-3C-W	2, 3 & 9
2-1F/2-3C-W	2, 3 & 9
2-3B-N/2-4A-S	3, 4 & 11
2-3B-N/2-4G	3, 4 & 11
2-4A-W/2-5A-N	4, 5, 9 & 10
2-4A-W/2-5A-W	4, 5 & 9
2-4A-S/2-5A-W	4, 5 & 9
2-6A/2-4G	7 & 11
2-5A-S/2-6A	5, 6 & 11
2-5C/2-6A	5, 6 & 11
2-5A-W/2-5E	5 & 10
2-5B/2-5A-N	5 & 11
2-5B/2-6A	6 & 11

TABLE 5-1



APPENDIX R EXEMPTION REQUEST

NON FIREPROOFED STRUCTURAL STEEL

REQUEST NO. 6

REASON FOR EXEMPTION REQUEST:

Within the Unit 1 and 2 Reactor Buildings and Control Structure a few floor/ceiling assemblies are to be upgraded to a 3 hour fire rating, to separate redundant safe shutdown equipment. The structural steel supporting these floors is not protected.

FIRE ZONES AFFECTED:

The table below provides a list of the affected fire zones. For details on the extent of the required fire protection, see Figures 1.0 through 11.0 in Appendix B.

<u>FIRE ZONE BELOW/ FIRE ZONE ABOVE</u>	<u>SPRINKLER PROTECTION BELOW STRUCTURAL STEEL</u>	<u>COMBUSTIBLE LOADING FOR FIRE ZONE BELOW STRUCTURAL STEEL</u>
Unit #1 Reactor Building		
1-1E/1-3C-W	No	12 min
1-1E/1-3B-W	No	12 min
1-1F/1-3B-W	No	18 min
1-1F/1-3C-W	No	18 min
1-3A/1-4B	Yes	25 min
1-3A/1-4G	Yes	25 min
1-3B-W/1-4C	Yes	20 min
1-3B-W/1-4D	Yes	20 min
1-4A-N/1-5A-W	Yes	15 min
1-4A-W/1-5A-S	Yes	15 min
1-4A-W/1-5A-W	Yes	15 min
1-4A-W/1-5E	Yes	15 min
1-4A-W/1-5F	Yes	15 min
1-4A-W/1-5G	Yes	15 min
1-5A-S/1-6A	Yes	19 min
1-5A-S/1-6I	Yes	19 min
1-5B/1-4G	No	4 min
Unit #2 - Reactor Building		
2-1E/2-3B-W	No	13 min
2-1E/2-3C-W	No	13 min
2-1F/2-3B-W	No	18 min
2-1F/2-3C-W	No	18 min

FIRE ZONE BELOW/  
FIRE ZONE ABOVE

SPRINKLER  
PROTECTION BELOW  
STRUCTURAL STEEL

COMBUSTIBLE LOADING

Unit #2 - Reactor Building (Cont.)

2-3B-N/2-4A-S	Yes	16 min
2-3B-N/2-4G	Yes	16 min
2-3B-W/2-4C	Yes	16 min
2-3B-W/2-4D	Yes	16 min
2-4A-S/2-5A-W	Yes	15 min
2-4A-W/2-5A-N	Yes	15 min
2-4A-W/2-5A-W	Yes	15 min
2-4G/2-5B	No	4 min
2-4A-W/2-5E	Yes	15 min
2-4A-W/2-5F	Yes	15 min
2-4A-W/2-5G	Yes	15 min
2-5A-S/2-6A	Yes	6 min
2-5C/2-6A	No	6 min
2-6A/2-4G	No	6 min
2-5B/2-6A	No	3 min

Control Structure		
Elevation 754'-0	Yes (Part)	62 min
Support Steel		

JUSTIFICATION:

Unit #1 and #2 Reactor Buildings:

All fire zones have sprinkler protection below the exposed structural steel except for Fire Zones 1-1E, 1-1F, 1-4G, 2-1E, 2-1F, 2-4G, 2-5B, 2-5C and 2-6A. In these fire zones the maximum combustibility rating is 18 minutes, and minimal transient combustibles are expected. Finally, the in-situ combustibles in these fire zones are generally located near the floor at a distance from where the structural steel forming the fire area barrier is located.

CONTROL STRUCTURE:

Automatic detection and protection is provided below the exposed structural steel. The majority of the combustibles in the area below the exposed structural steel are cables. The majority of the cables are located either below the raised (computer type) floor in the Control Room or in 2 hour fire rated cable chases on the north and south walls of the control structure where only one structural member is effected. There is approximately 20 feet between the raised computer floor and the exposed structural steel supporting elevation 754'-0. Finally, the Control Room comprises the majority of the area beneath this steel and it is continually staffed.

EXEMPTION REQUEST:

Exposed structural steel supporting the identified fire area barriers is acceptable and does not require fire proofing.

SUSQUEHANNA STEAM ELECTRIC STATION - UNITS 1 & 2

FIRE PROTECTION PROGRAM - CONCERN #1

DOCKETS NO. 50-387

50-388

APPENDIX B - SAMPLE DOCUMENTATION

ATTACHMENT NO. 1

FIRE AREA R-2A

FIRE AREA R-2B

FIRE AREA R-2C

FIRE AREA R-2D

2-1B  
2-1F  
2-1G  
2-1I  
  
2-2A  
2-2C  
2-3A  
2-3B-W \*  
2-3B-S  
2-3B-W \*  
2-3C-S  
2-4A-W \*  
2-4A-S  
2-4D  
2-4E  
2-4G  
2-5A-W \*  
2-5A-S  
2-5C  
2-5D  
2-5G  
2-5H  
2-6B  
2-6D \*\*  
2-6E  
2-6F \*\*  
2-7A \*\*  
0-8A \*\*

2-1A  
2-1C  
2-1D  
2-1E  
2-1J  
2-3B-N  
2-3B-W \*  
2-3C-N  
2-3C-W \*  
2-4A-N  
2-4A-W \*  
2-4B  
2-4C  
2-5A-N  
2-5A-W \*  
  
2-5E  
2-5F  
2-6A  
2-6C  
2-6D \*\*  
2-6F \*\*  
  
2-7A \*\*  
0-8A \*\*  
2-2B

2-1H \*\*\*  
2-4F \*\*\*

2-5B

- \* These fire zone subdivisions, known as Wraparound Areas, function as a fire rated barrier separating fire area R-2A from R-2B.
- \*\* These fire zones contain no safe shutdown cables and function as a "buffer" fire zone.
- \*\*\* These fire zones are the primary containment and have an inerted atmosphere.

CONTROL STRUCTURE

<u>FIRE AREA</u>	<u>FIRE ZONE(S)</u>
CS-1	0-21B,029A
CS-2	0-22B, 0-29C
CS-3	0-21A, 0-22A, 0-22C, 0-23, 0-24A-G, 0-25A,E
CS-4	0-24I, 0-24K, 0-28S, 0-29B,D, 0-30A,B*
CS-5	(None - Spare Number)
CS-6	0-24J, 0-25B, 0-26B,S, 0-27F, 0-28P
CS-7	0-24L,M, 0-25C,D, 0-26C,D, 0-26T,V, 0-27G,H, 0-28Q,R
CS-8	(None - Spare Number)
CS-9**	0-26A,E-N,P,R
CS-10**	0-27A-E
CS-11	0-28A Subzone I (Room C-613)
CS-12	0-28C
CS-13	0-28E
CS-14	0-28G
CS-15	0-28H
CS-16	0-28J
CS-17	0-28B Subzone I (Room C-604)
CS-18	0-28M
CS-19	0-28N
CS-20	0-28A Subzone II (Rooms C-611, C-612)
CS-21	0-28T
CS-22	0-28D
CS-23	0-28F
CS-24	0-28B Subzone II (Rooms C-605, C-606)
CS-25	0-28I
CS-26	0-28K
CS-27	0-28L

\* These fire zones contain no safe shutdown cables and function as a "buffer" fire zone.

\*\* The floor/ceiling between Fire Area CS-9 and CS-10 has unprotected support steel. See Exemption Request Number 6.

SUSQUEHANNA STEAM ELECTRIC STATION - UNITS 1 & 2

FIRE PROTECTION PROGRAM - CONCERN #1

DOCKETS NO. 50-387

50-388

APPENDIX B - SAMPLE DOCUMENTATION

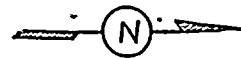
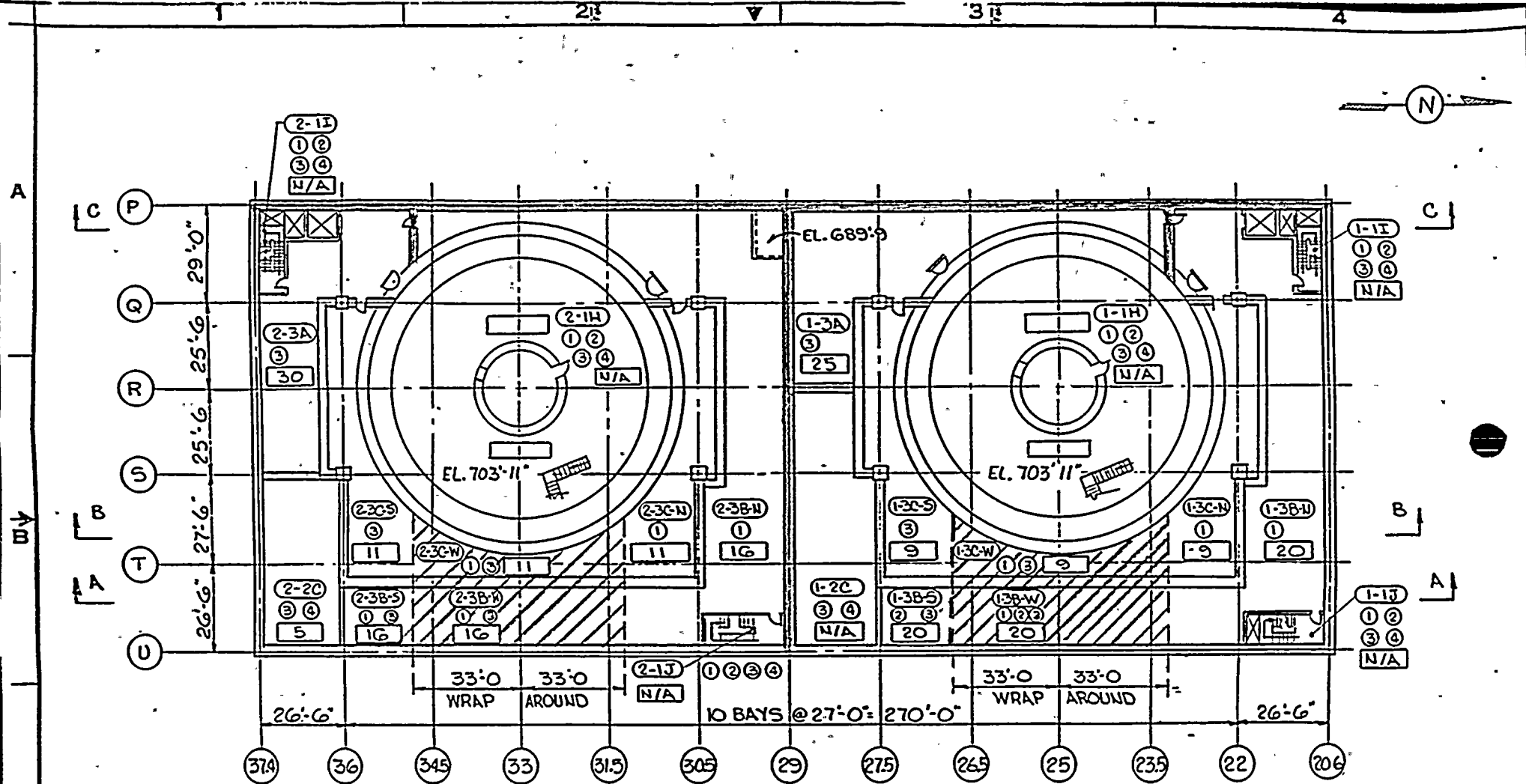
ATTACHMENT NO. 2

CHANGES TO FIGURES

<u>Figure</u>	<u>Zone</u>	<u>Change</u>
2.0	2-1E	Path 2 Removed
3.0	1-3B-N 1-3A 2-3A	Path 2 Removed Path 4 Removed Path 4 Removed
4.0	1-4A-S 1-4A-W 1-4C 1-4D 2-4A-S 2-4A-W 2-4C 2-4D	Path 4 Removed Path 2 Removed Path 2 Removed Path 4 Removed Path 4 Removed Path 2, 4 Removed Path 2 Removed Path 4 Removed
5.0	1-5B  2-5B	Path 1 Removed Wall & Floor to Fire Zone 1-4G Upgraded Wall to Fire Zone 2-5A-N Upgraded
6.0	2-6A	Floor to Fire Zone 2-5B

9, 10, 11 Section views reflect changes to Fig. 2.0, 3.0, 4.0, 5.0 6.0

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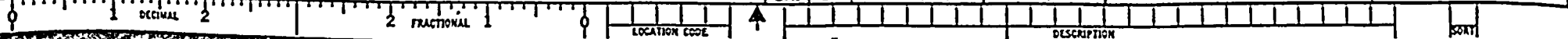
MEZZANINE FLOOR PLAN @ EL. 683'-0

FIGURE 3.0

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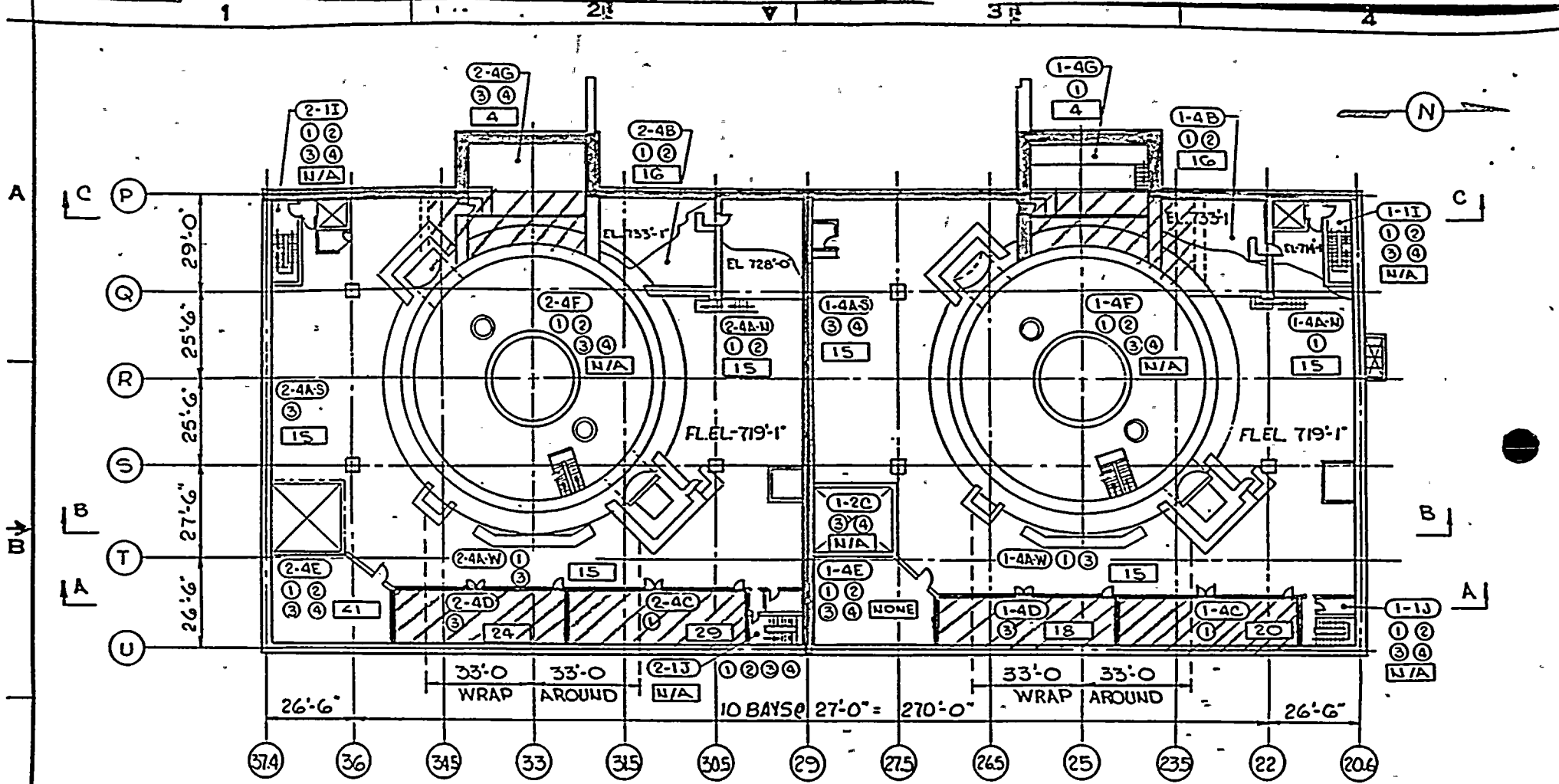
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FLOOR PLAN @ EL 719'-1"

FIGURE 4.0

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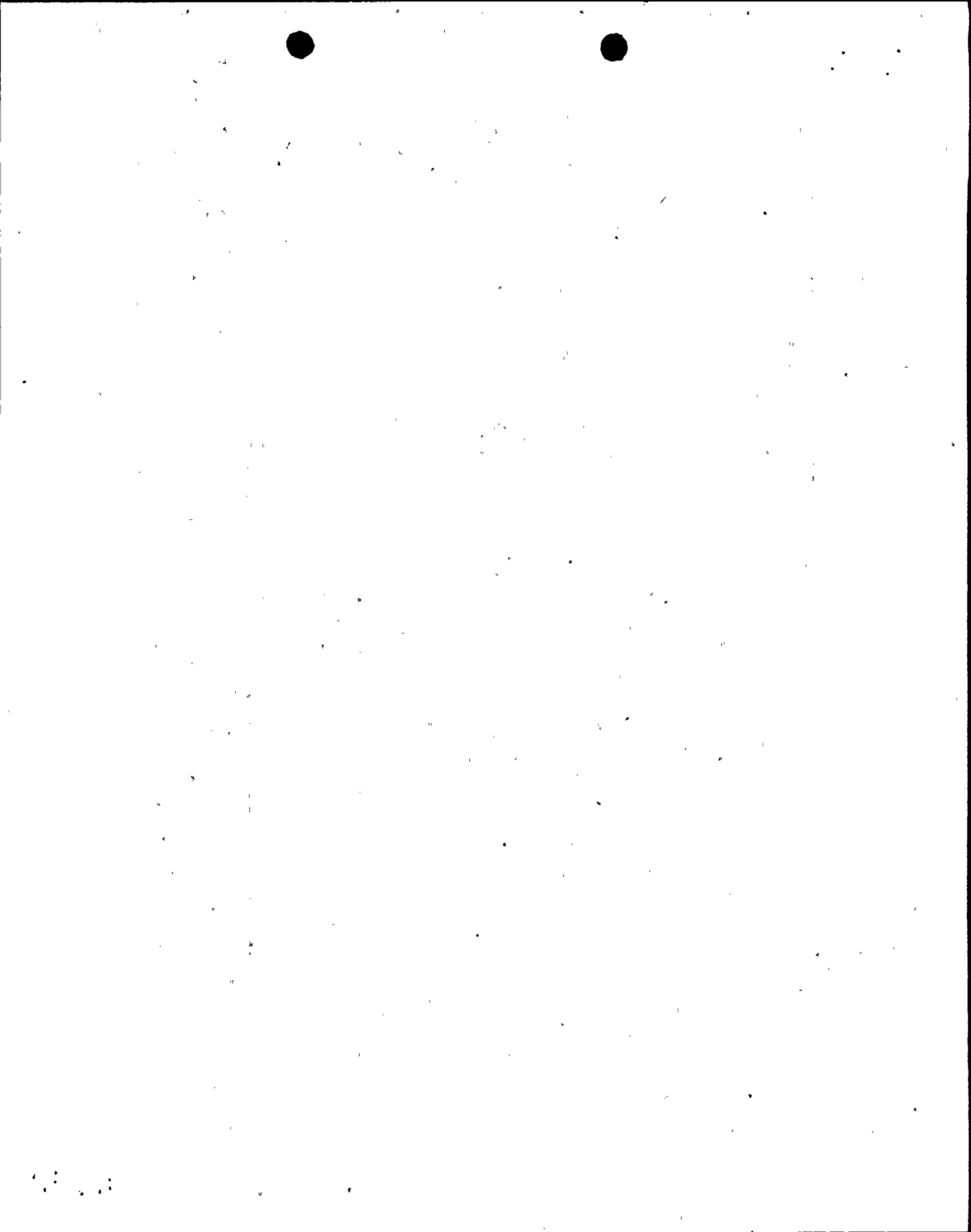
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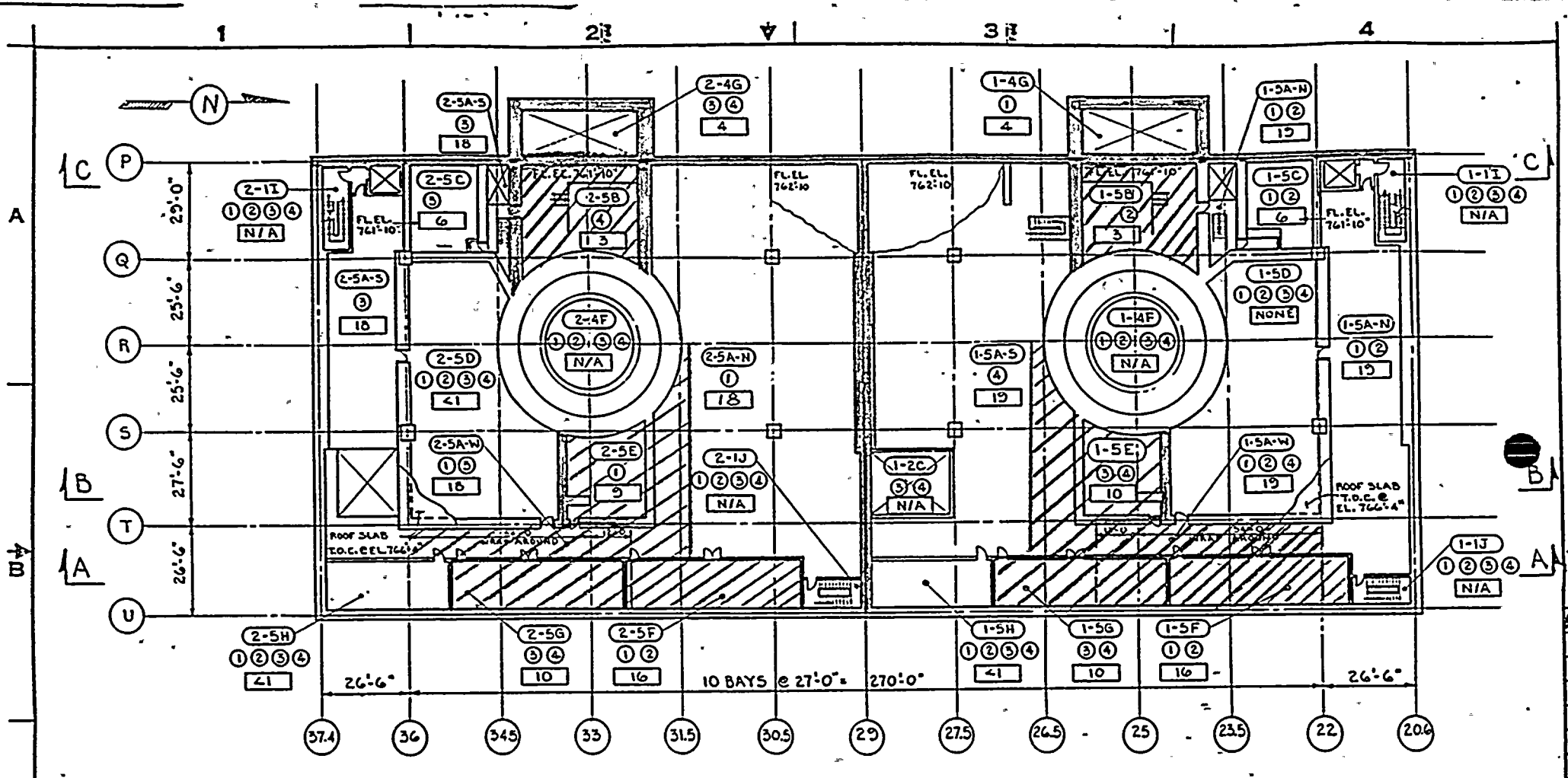
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FLOOR PLAN @ EL. 749'-1"

FIGURE 5.0

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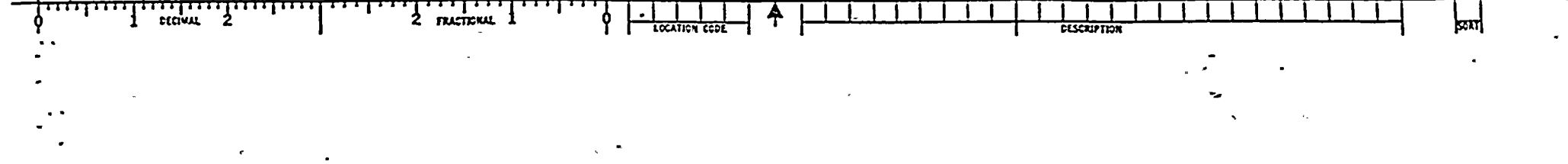
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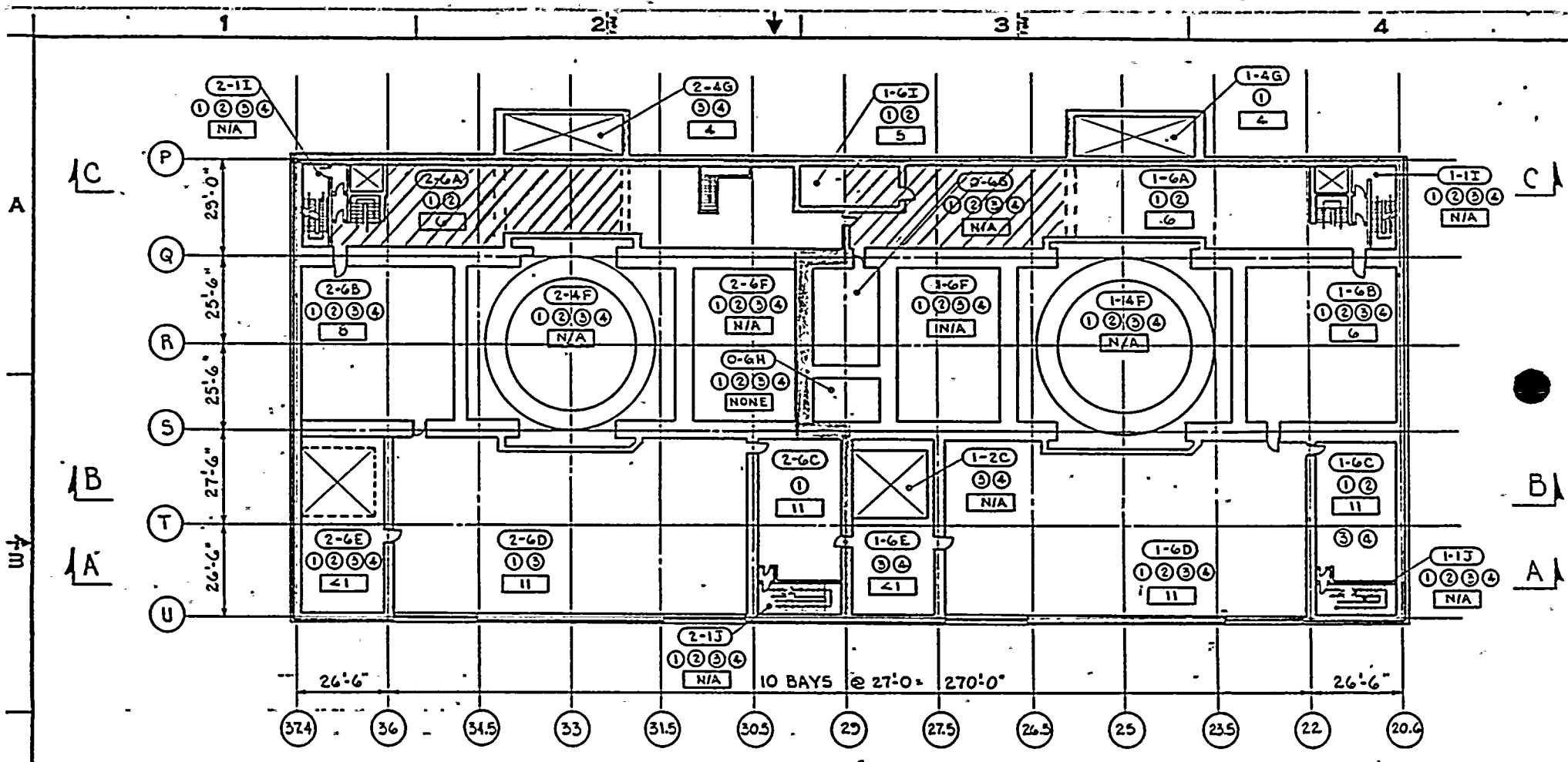
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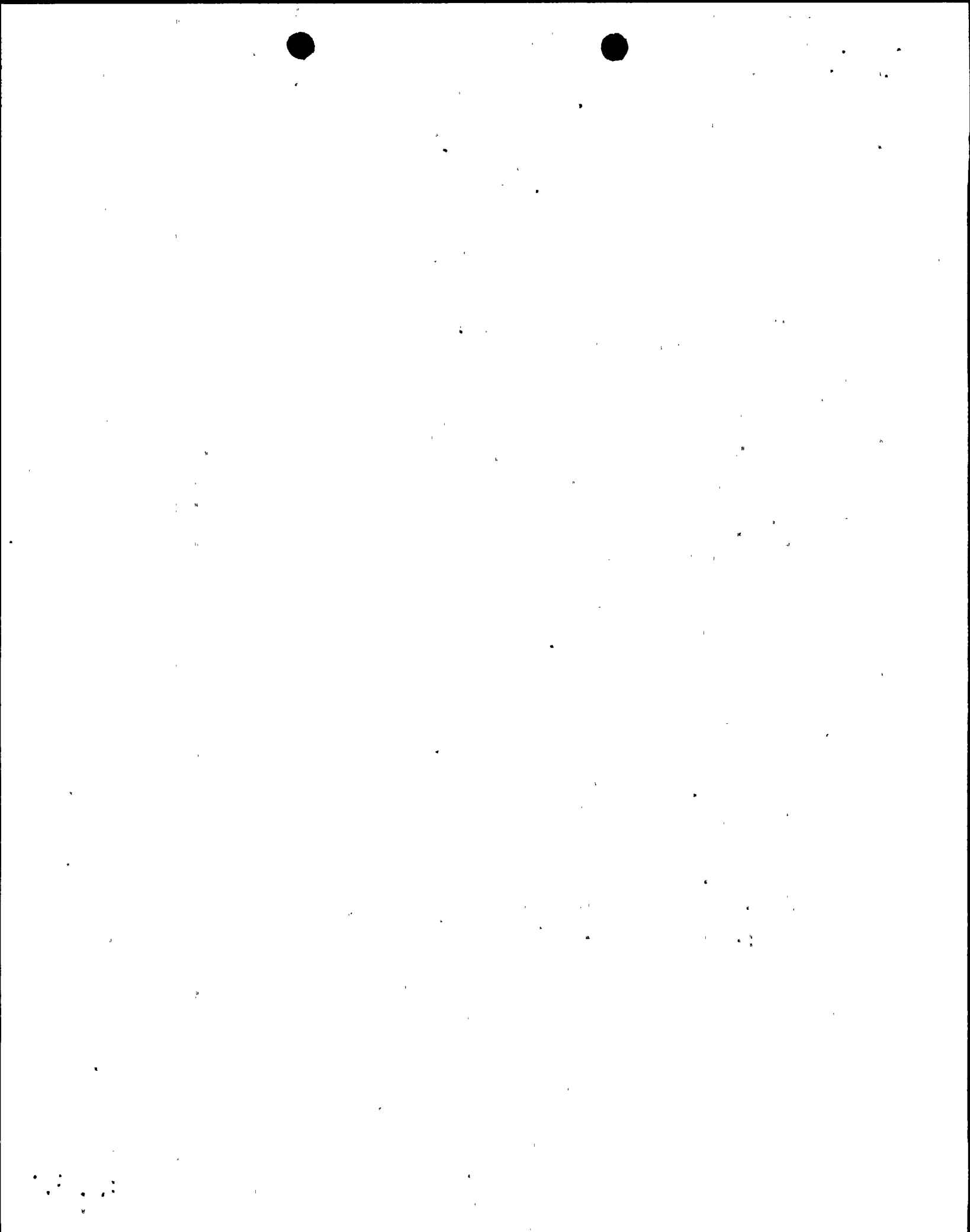
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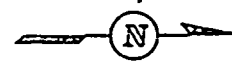
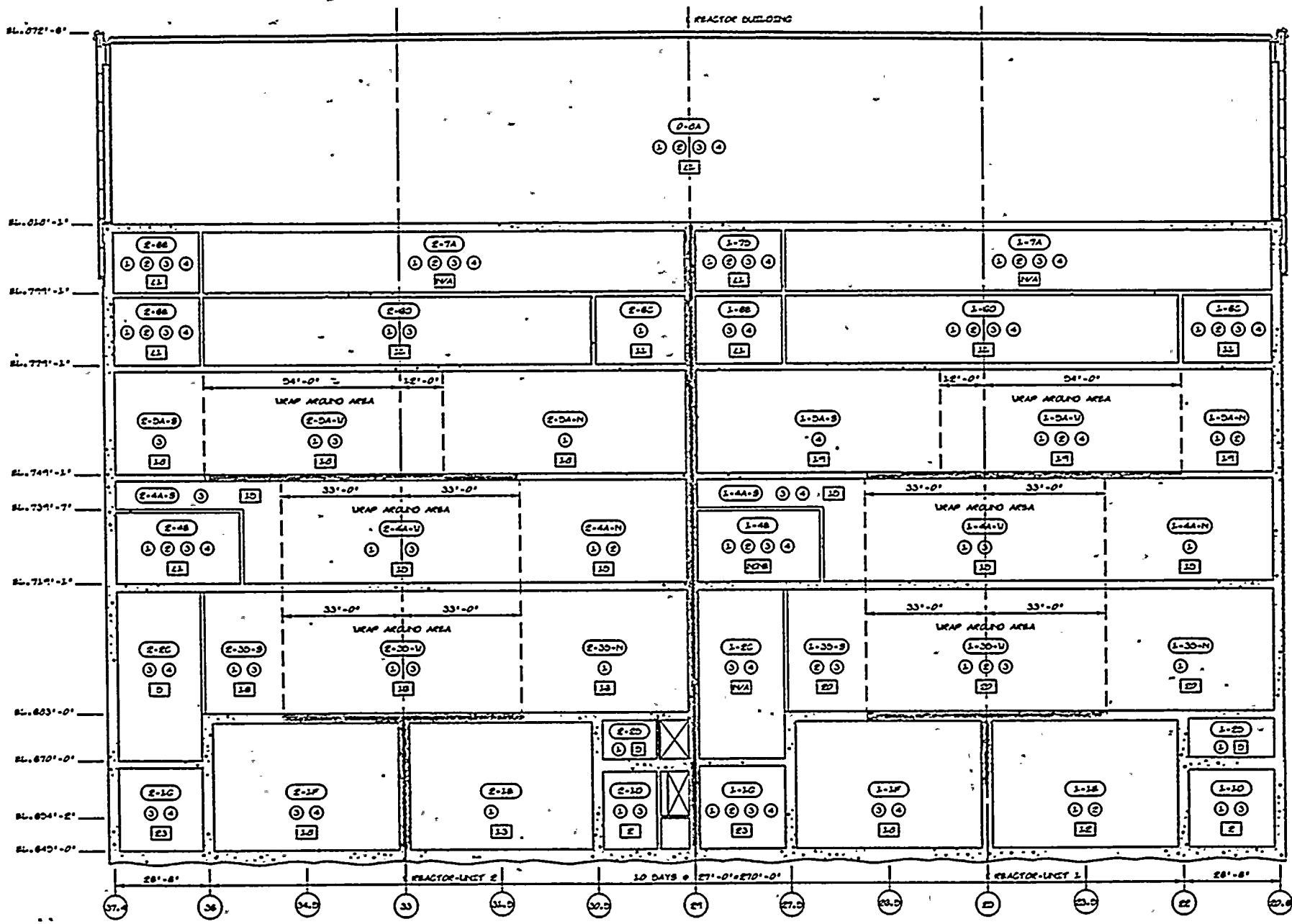


FLOOR PLAN @ EL. 779'-1

FIGURE 6.0

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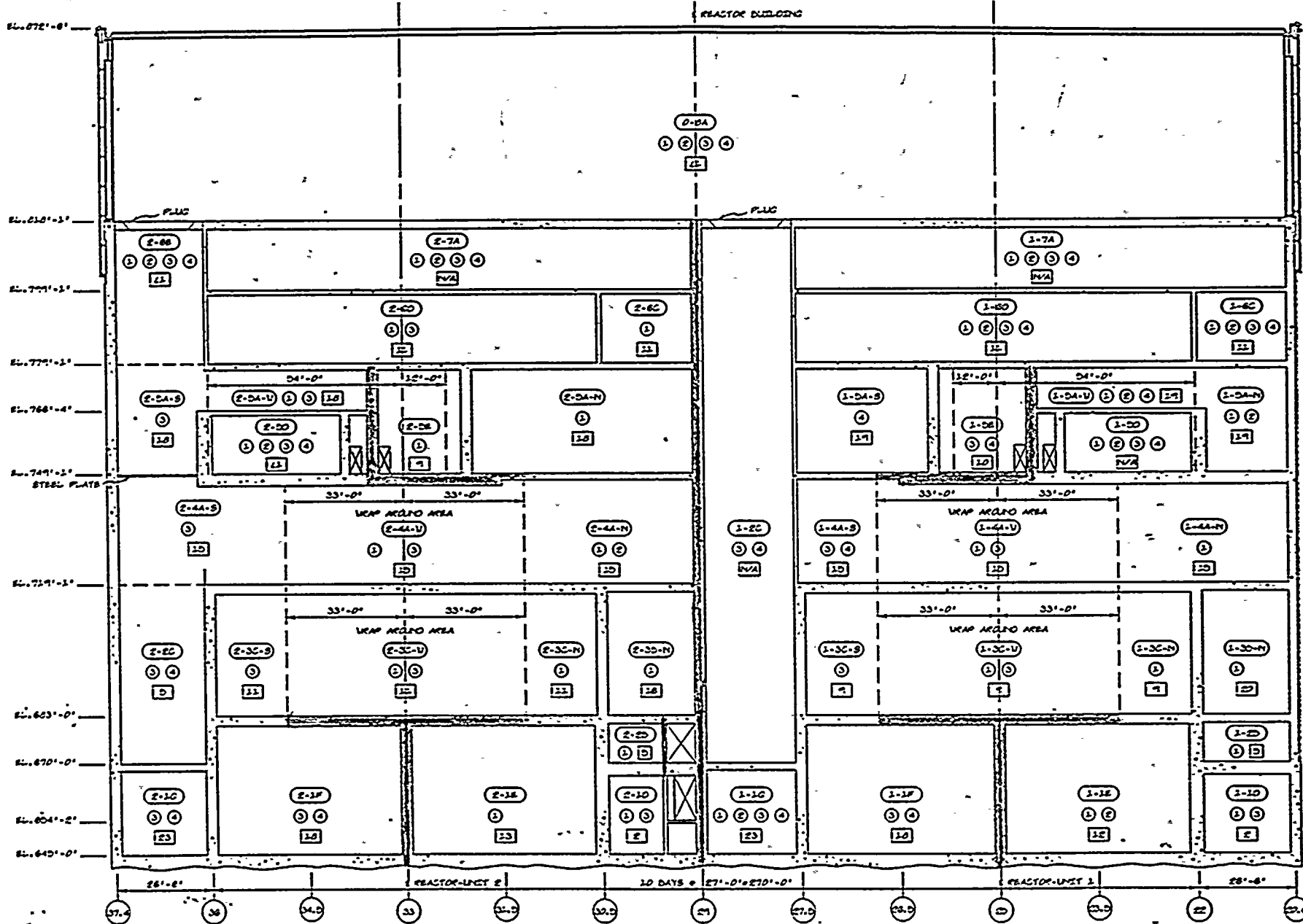
SECTION A-A





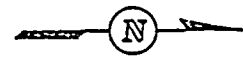
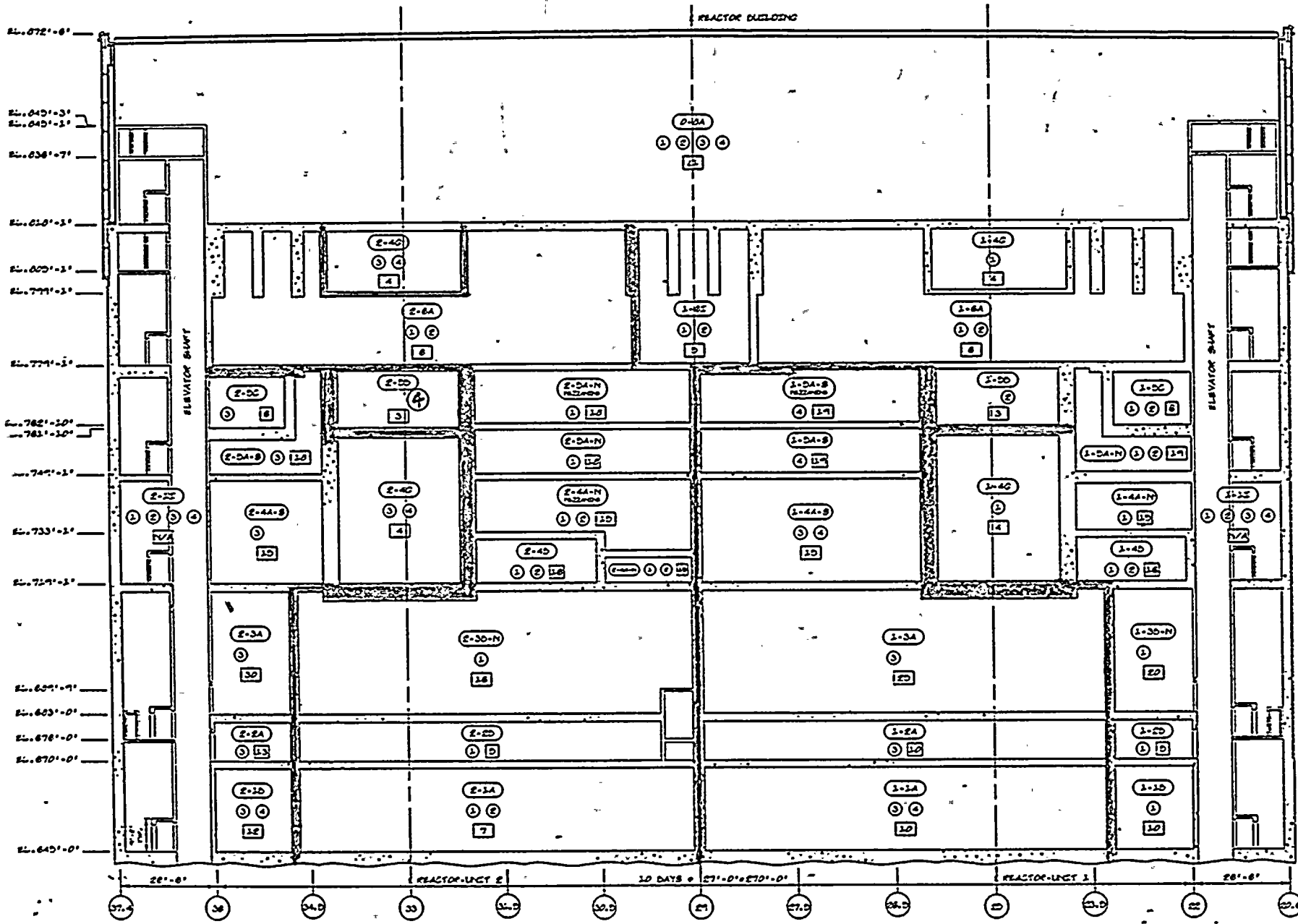
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SECTION B-B

REVISED 12-16-85



REVISED 12-16-85

SCALE: NOD  
 FIGURE 11.



Small cluster of black dots at the bottom left corner.

SUSQUEHANNA STEAM ELECTRIC STATION - UNITS 1 & 2

FIRE PROTECTION PROGRAM - CONCERN #1

DOCKETS NO. 50-387

50-388

APPENDIX C - FIRE BARRIERS TO BE UPGRADED

APPENDIX C

LISTING OF FIRE ZONE BOUNDARIES REQUIRING UPGRADE

UNIT #1 - REACTOR BUILDING

BARRIER BETWEEN FIRE ZONE/FIRE ZONE	TYPE	COMBUSTIBLE LOADING FIRE ZONE/FIRE ZONE
1-1A/1-1B	Wall	10/10
1-1E/1-3B-W	Slab	12/20
1-1E/1-3C-W	Slab	12/9
1-1E/1-1F	Wall	12/18
1-1F/1-3B-W	Slab	18/20
1-1F/1-3C-W	Slab	18/9
1-2A/1-2B	Wall	10/5
1-3A/1-3B-N	Wall	25/20
1-3A/1-4B	Slab	25/16
1-3A/1-4G	Slab	25/4
1-4A-W/1-5A-W	Slab	15/19
1-4A-W/1-5E	Slab	15/10
1-4A-W/1-5A-S	Slab	15/19
1-4A-S/1-4G	Wall	15/4
1-4G/1-5A-S	Wall	4/19
1-5A-W/1-5E	Wall	19/10
1-5A-S/1-5B	Wall	19/3
1-5A-S/1-6A	Slab	19/6
1-5A-S/1-6I	Slab	19/5
1-5D/1-5E	Wall	None/10
1-3B-W/1-4D	Slab	20/18*
1-3B-W/1-4C	Slab	20/20*
1-4A-N/1-5A-W	Slab	15/19
1-4A-W/1-5F	Slab	15/16*
1-4A-W/1-5G	Slab	15/10*
1-5B/1-4G	Wall	3/19
1-5B/1-4G	Floor	3/19*

\* Structural Steel only (Exemption Request filed).

APPENDIX C - Cont.

UNIT #2 - REACTOR BUILDING

BARRIER BETWEEN FIRE ZONE/FIRE ZONE	TYPE	COMBUSTIBLE LOADING FIRE ZONE/FIRE ZONE
2-1A/2-1B	Wall	7/12
2-1E/2-1F	Wall	13/18
2-1E/2-3B-W	Slab	13/16
2-1E/2-3C-W	Slab	13/11
2-1F/2-3B-W	Slab	18/16
2-1F/2-3C-W	Slab	18/11
2-2A/2-2B	Wall	13/5
2-3A/2-3B-N	Wall	30/16
2-3B-N/2-4A-S	Slab	16/15
2-3B-N/2-4G	Slab	16/4
2-3B-W/2-4C	Slab	16/29*
2-3B-W/2-4D	Slab	16/24*
2-4A-W/2-5A-N	Slab	15/18
2-4A-W/2-5A-W	Slab	15/18
2-4A-W/2-5E	Slab	15/9
2-4A-W/2-5F	Slab	15/16*
2-4A-W/2-5G	Slab	15/10*
2-4A-N/2-4G	Wall	15/4
2-4A-S/2-5A-W	Slab	15/18
2-4G/2-4B	Wall	4/16
2-4G/2-5A-N	Wall	4/18
2-4G/2-5B	Wall/Slab	4/3
2-4G/2-6A	Wall/Slab	4/6
2-5A-W/2-5E	Wall	18/9
2-5A-S/2-5B	Wall	18/3
2-5A-S/2-6A	Slab	18/6
2-5C/2-6A	Slab	6/6
2-5D/2-5E	Wall	1/9
2-5B/2-5A-N	Wall	3/18
2-5B/2-6A	Floor	3/18*

\*Structural Steel only (Exemption Request filed)

SUSQUEHANNA STEAM ELECTRIC STATION - UNITS 1 & 2

FIRE PROTECTION PROGRAM - CONCERN #1

DOCKETS NO. 50-387

50-388

APPENDIX D - CONDUIT & RACEWAY REQUIRING PROTECTION



APPENDIX D (Cont.)

<u>FIRE ZONE</u>	<u>EXISTING PATH</u>	<u>NEW PATH ANALYZED FOR</u>	<u>ADDITIONAL RACEWAY REQUIRING PROTECTION TO SUPPORT THE AVAILABILITY OF THE NEW PATH</u>
1-1D	Div. II ADS/CS	Div. I ADS/CS	None
1-3A	Div. II HPCI	Div. II ADS/CS	F1KL12,13,14,15 F1KH14,15 F1M321 F1K036 F1KR25 F1M327 F1M321 JB0342 F1M303 JB0338 F1KY11 F1K992
1-4A-S	Div. II HPCI	Div. II ADS/CS	F1KR21 F1KJ01,02,03 F1K118 F1KR23
1-4A-W	Div. I ADS/CS Div. II HPCI	Div. II ADS/CS	None
1-3B-N	Div. I RCIC	Div. I ADS/CS	A1P019,E1K954 C1P023, C1K057
1-3B-W	Div. I RCIC	Div. I ADS/CS Div. II ADS/CS	E1F137, C1F056
1-3B-S	Div. I RCIC	Div. II ADS/CS	None
1-6A	Div. I RCIC	Div. I ADS/CS	None
2-1D	Div. II ADS/CS	Div. I ADS/CS	None
2-3B-W	Div. I ADS/CS	Div. II ADS/CS	F2KH29,30,31,32 F2PH29,30,31,32
2-3B-S	Div. I ADS/CS	Div. II ADS/CS	None
2-6D	Div. I ADS/CS	Div. II ADS/CS	None

TABLE D-1 Page 1

RACEWAY IDENTIFIED IN RESPONSE TO CONCERN #2

<u>Fire Zone</u>	<u>Path/Comment</u>	<u>Additional Raceway Requiring Protection to Support Path</u>
1-5B	2	E1K053 E1K489 JB1253
2-5B	4	E2KK24 E2KK25 E2KK26 E2KK27 E2K1C8 D2P006
1-3A	To Complete Wrapping "Wall to Wall" 3 hr. required because no automatic protection is available	F1M344 1W300 F1KL12 F1KL13 F1KL14 F1KL15 F1KH12 F1KH13 F1KH14 F1KH15
1-4A	To Complete Wrapping "Wall to Wall"	F1K017
0-26R	Remote Shutdown	B2K006

TABLE D-1

RACEWAY IDENTIFIED IN RESPONSE TO CONCERN #4a Table 1

<u>Fire Zone</u>	<u>Path</u>	<u>Additional Raceway Requiring Protection to Support Path</u>
1-4A-S	4	E1K985 E1K990 JB3941 E1PJ07-15 E1KJ09-15 E1K704
1-5A-S	4	E1K990

NOTE: Additional analysis has shown that the paths identified for each Fire Zone identified in the Response to Concern 4a Table 1 are not required to support Concern #1 with the exception of Fire Zones 1-4A-S and 1-5A-S above.

TABLE D-1

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