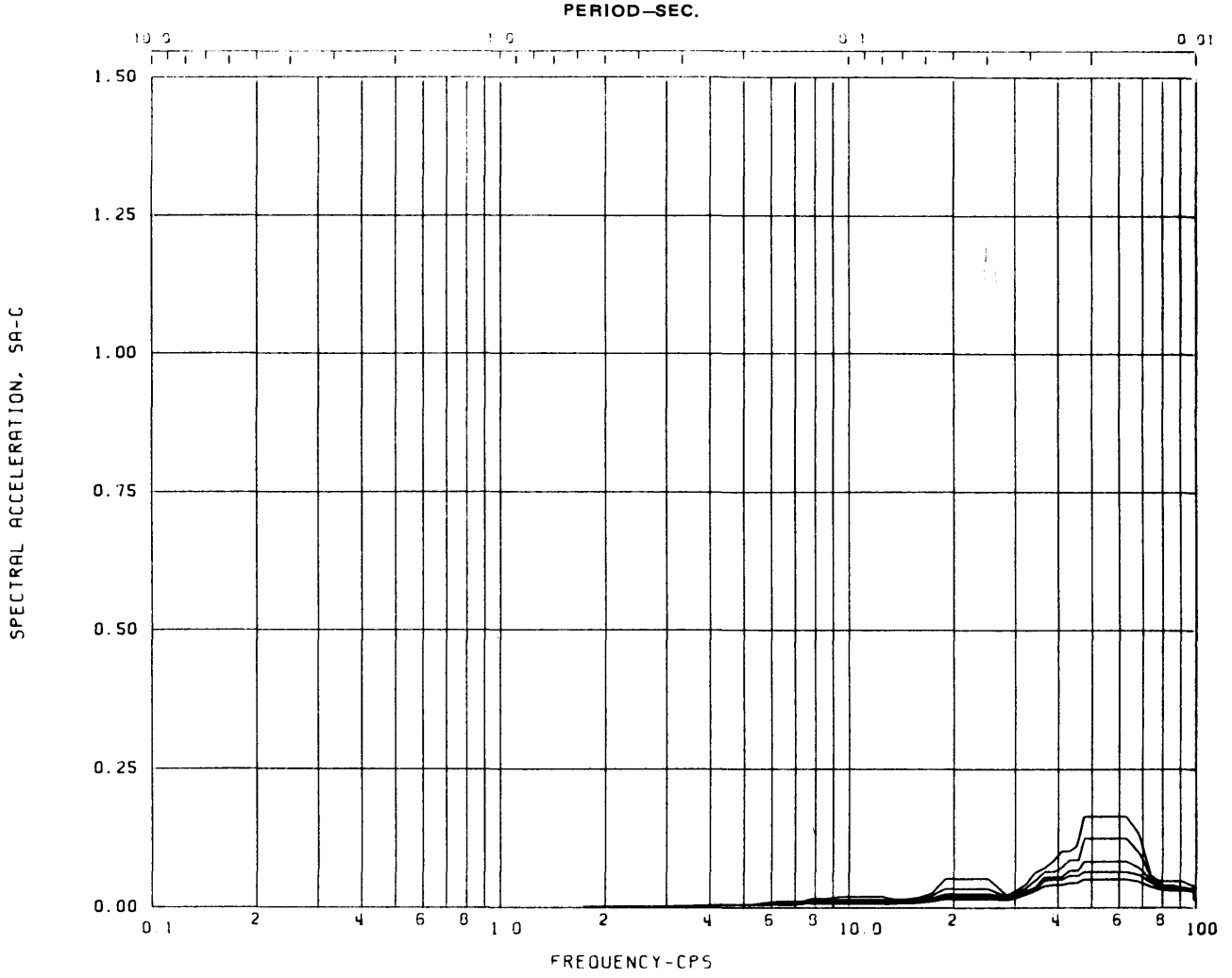

Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 154 Direction: VERTICAL Elev: 177'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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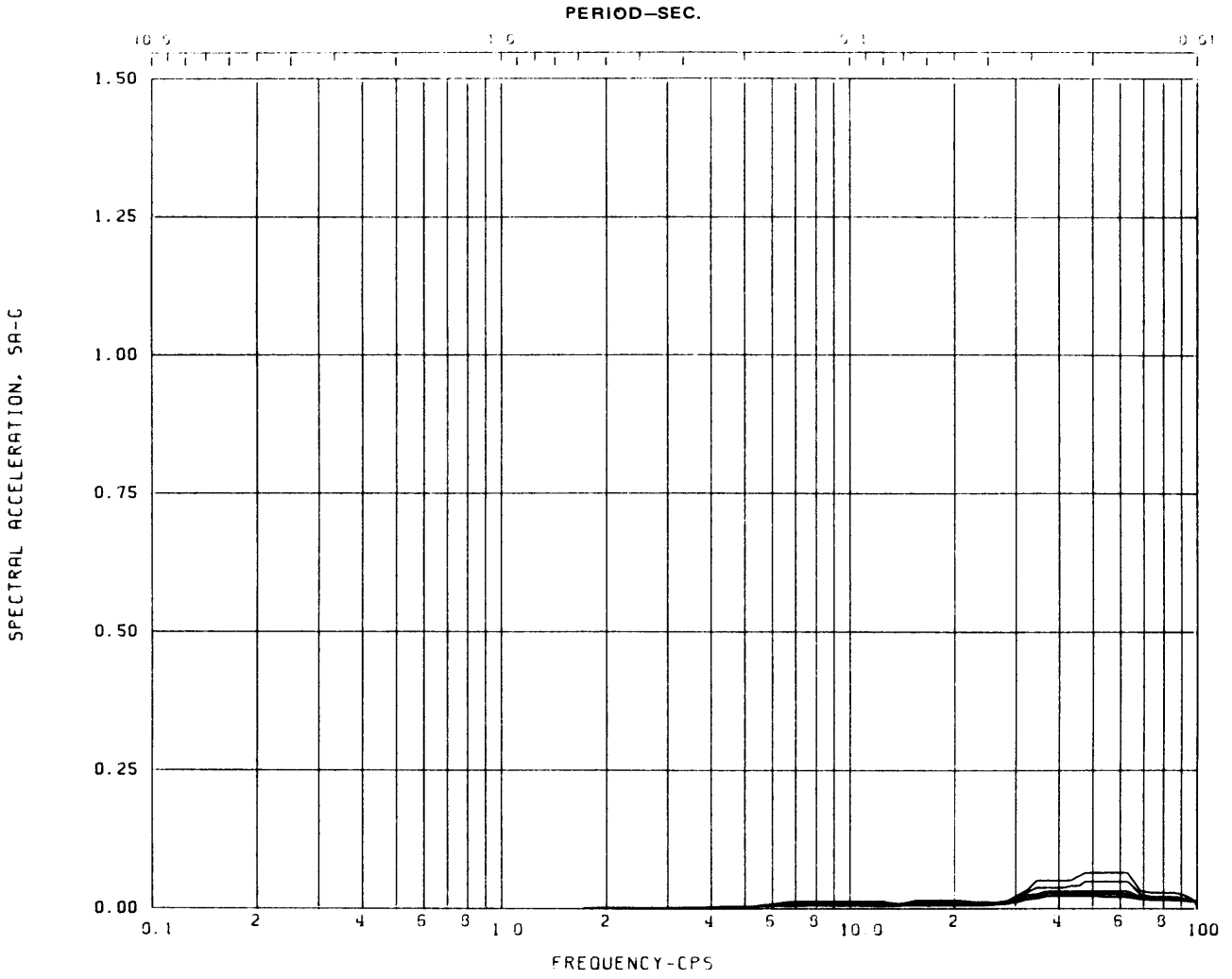
REACTOR ENCLOSUREGLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-320



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 128 Direction: VERTICAL Elev: 201'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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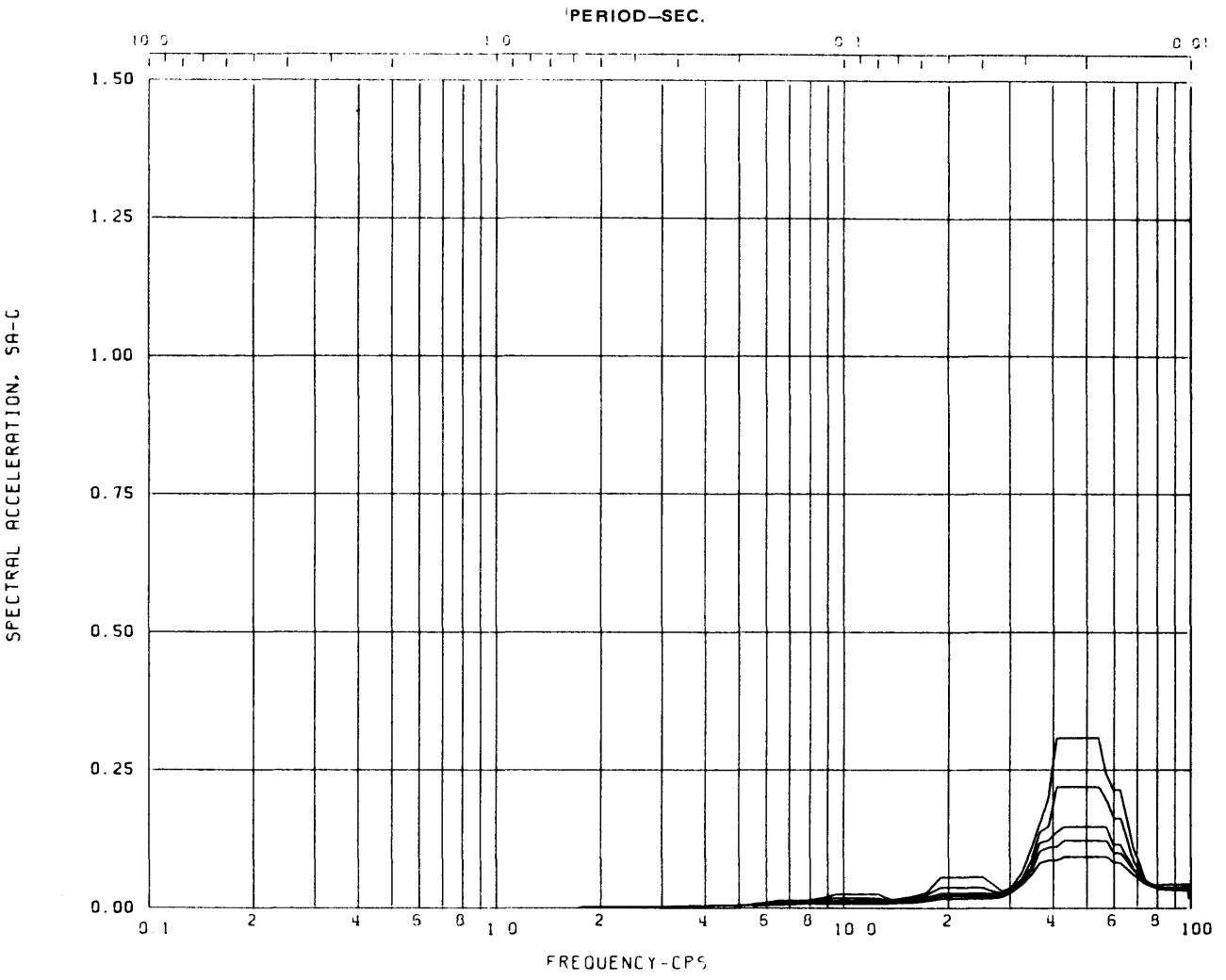
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-321



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 130 Direction: VERTICAL Elev: 201'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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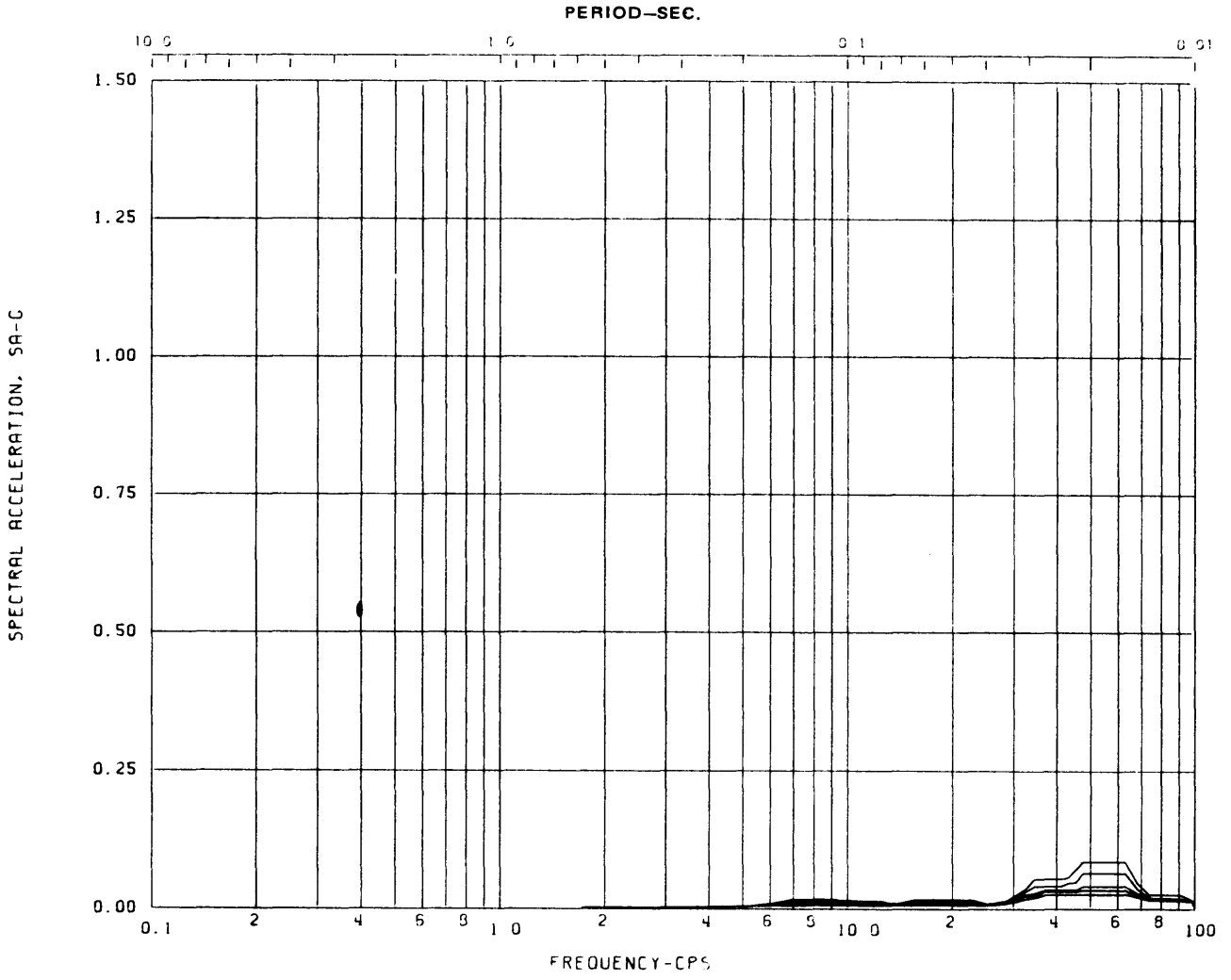
REACTOR ENCLOSUREGLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-322



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 106 Direction: VERTICAL Elev: 217'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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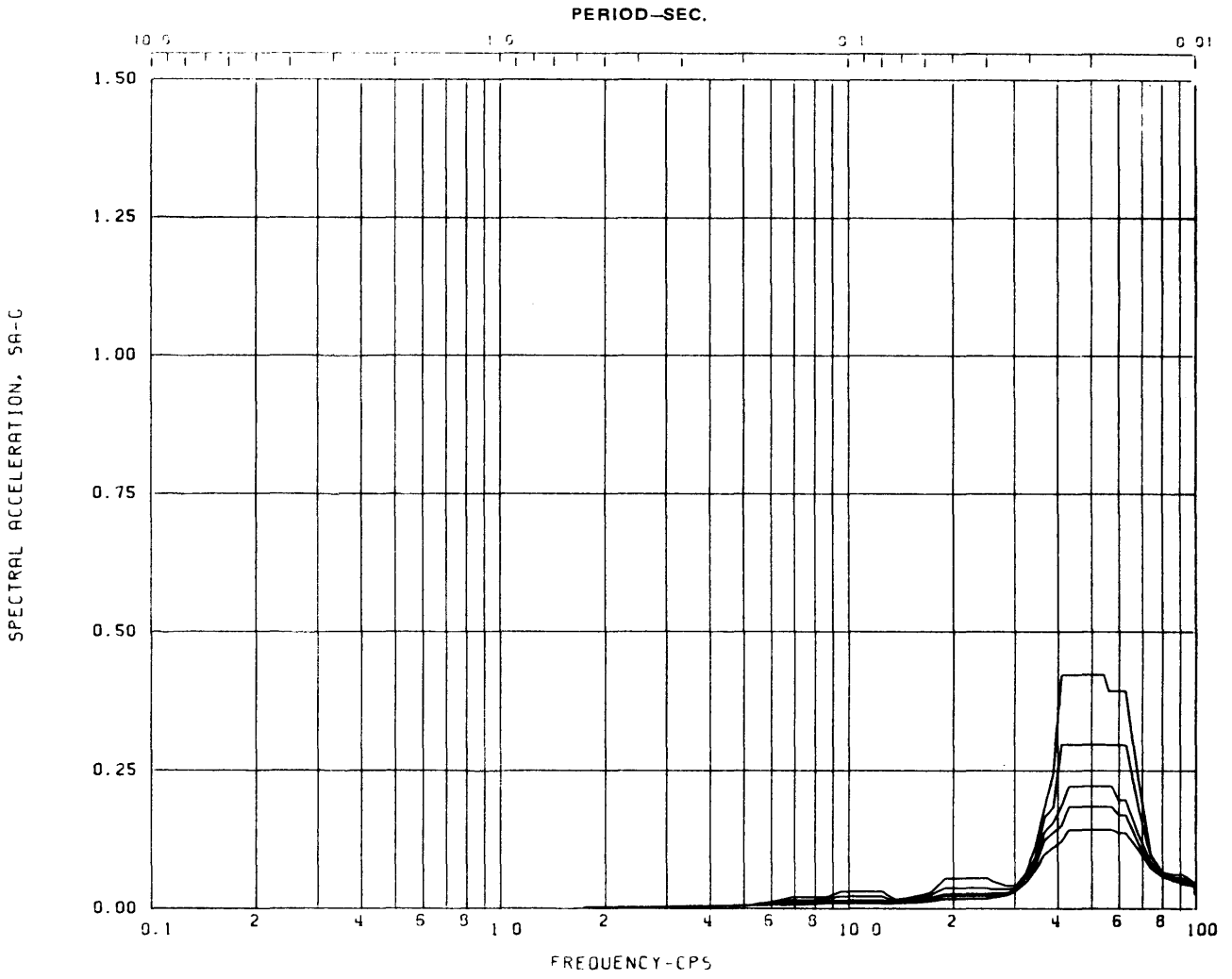
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-323



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 108 Direction: VERTICAL Elev: 217'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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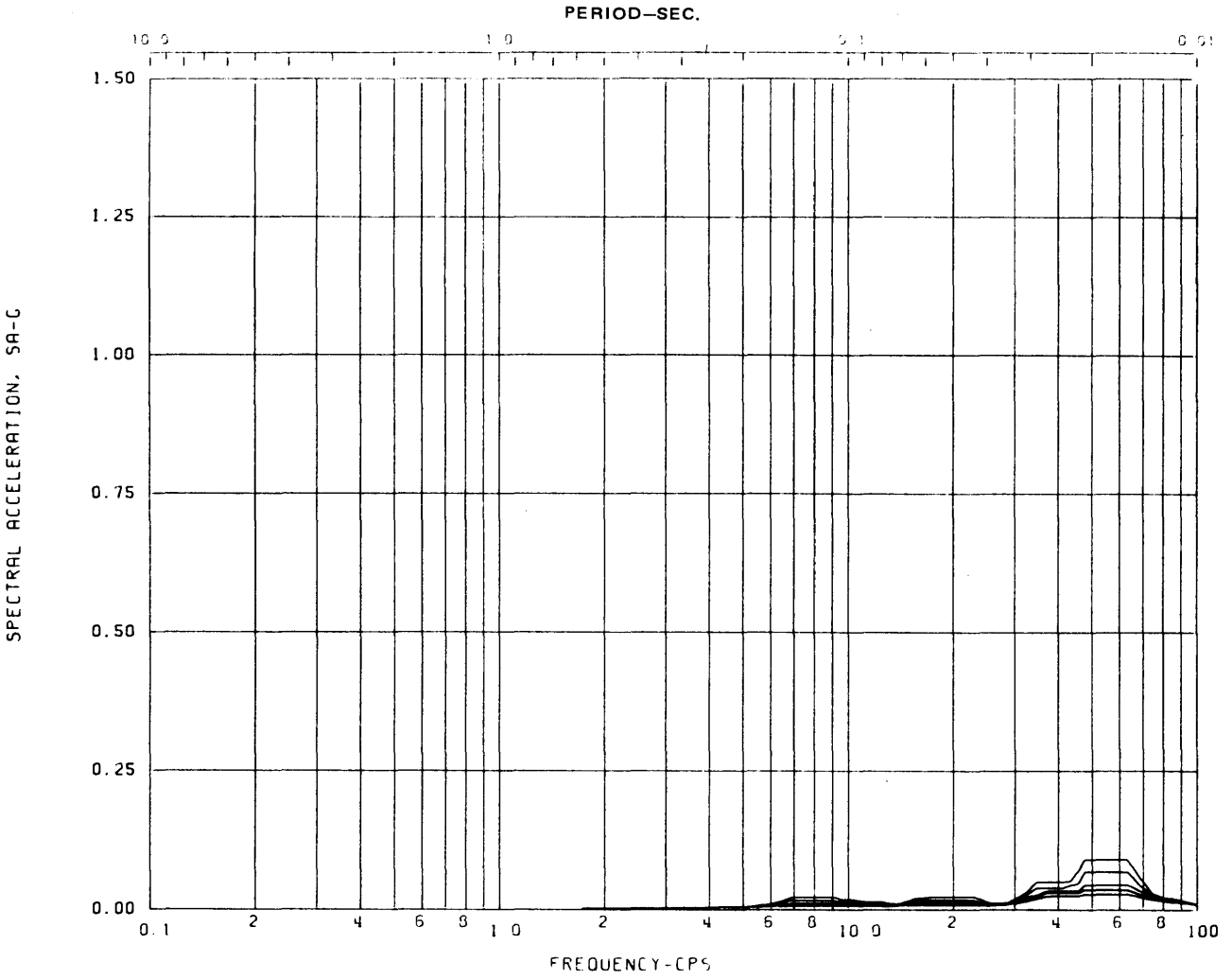
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-324



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 104 Direction: VERTICAL Elev: 239'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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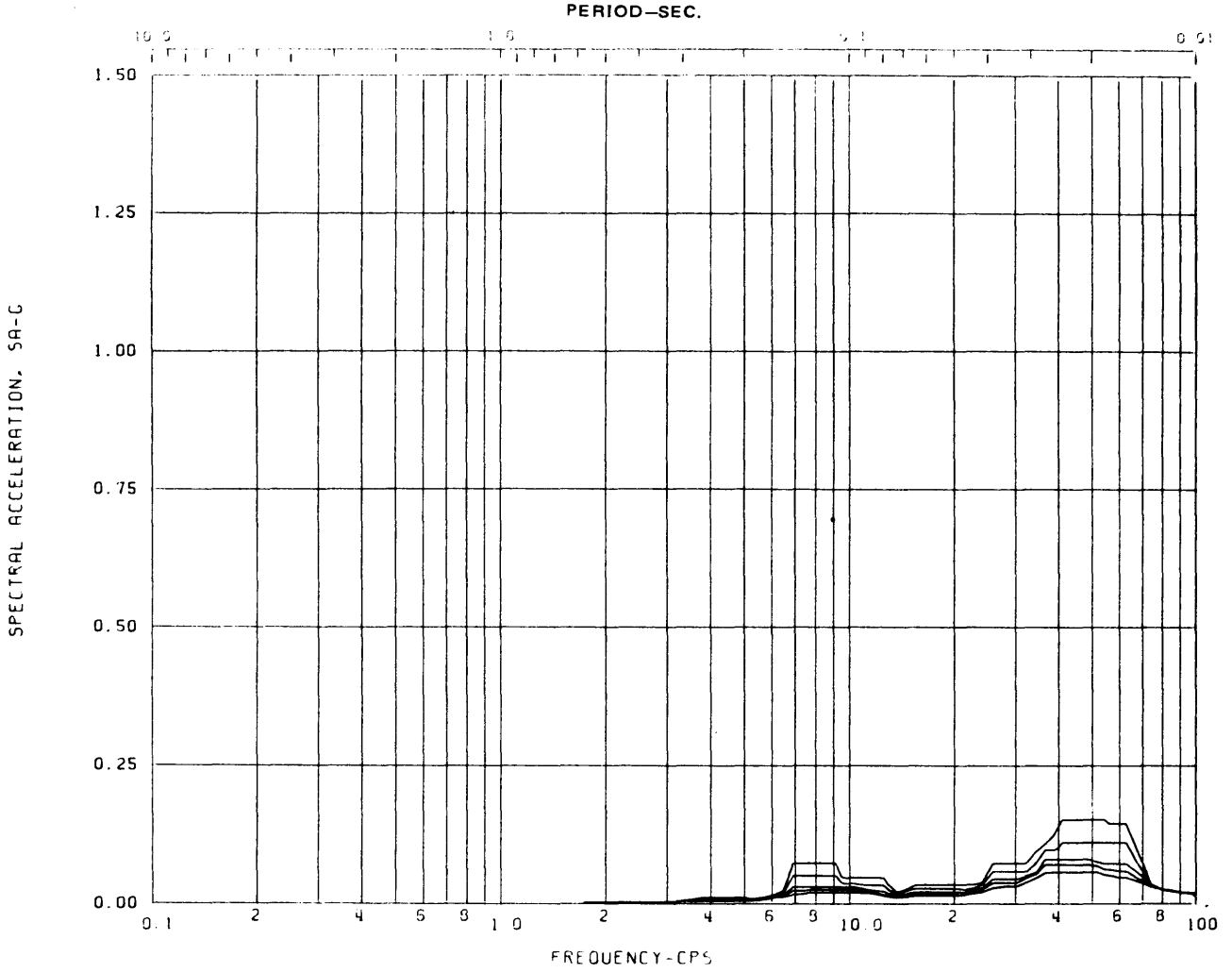
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-325



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 81 Direction: VERTICAL Elev: 253'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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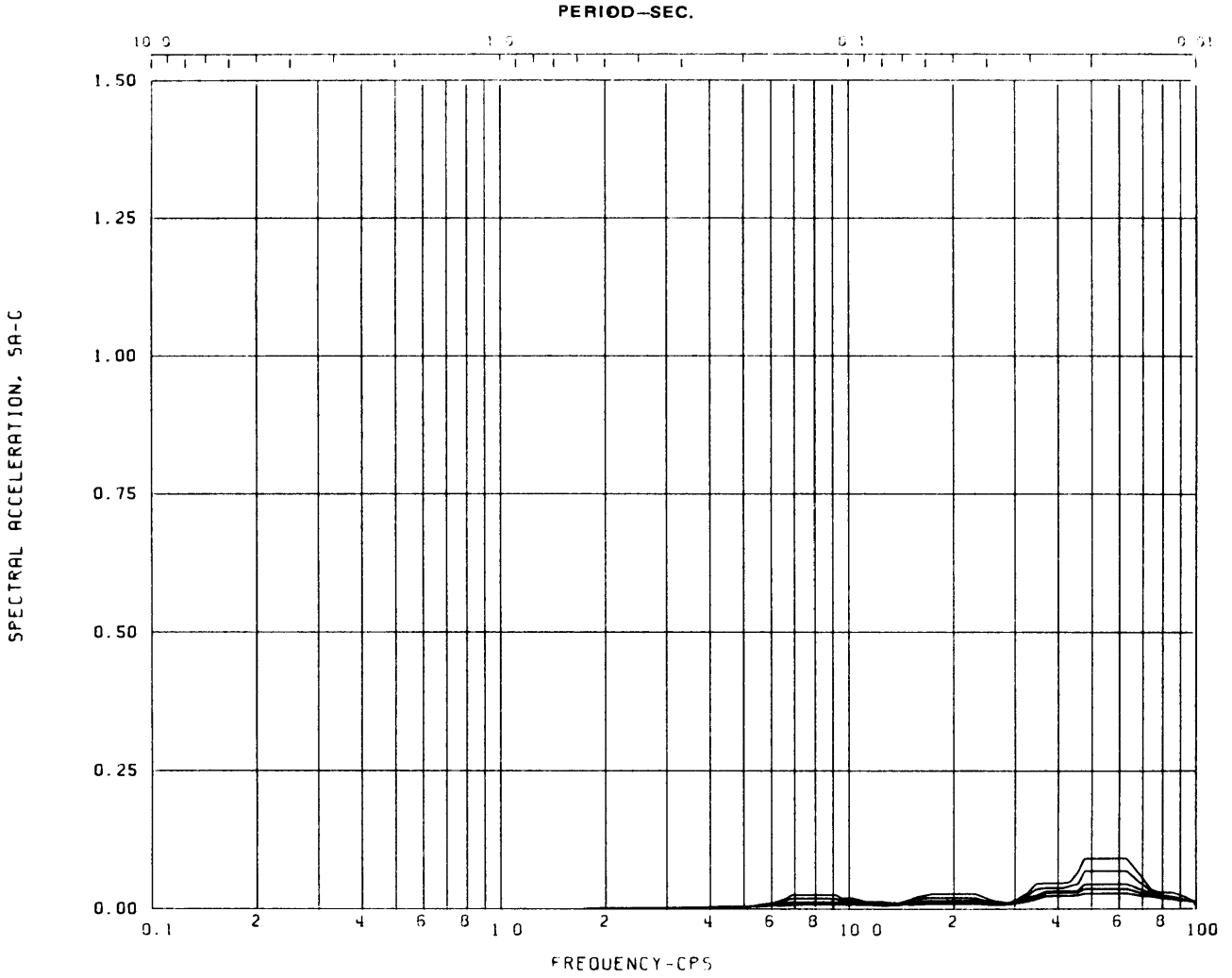
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-326



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 19 Direction: VERTICAL Elev: 253'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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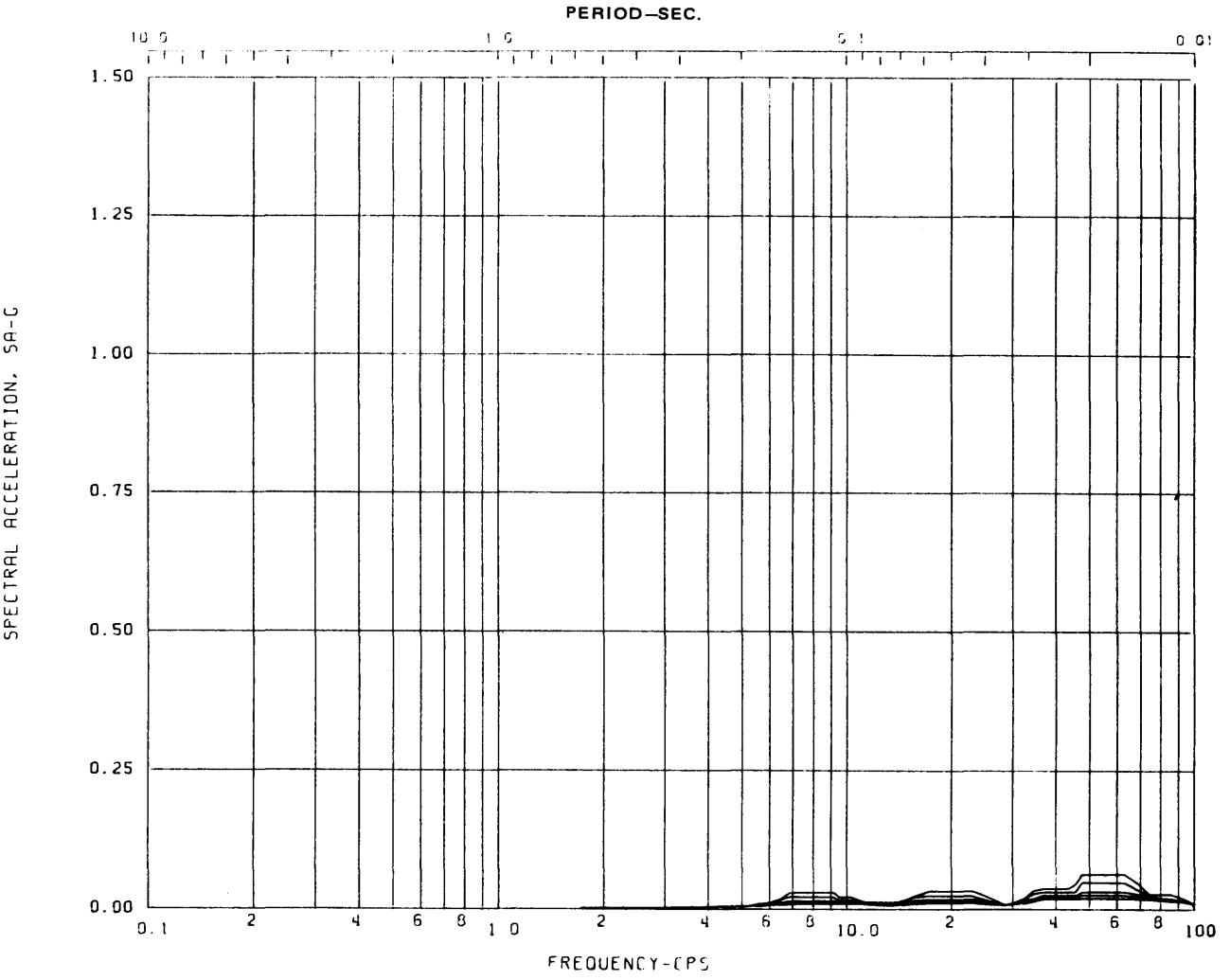
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-327



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 77 Direction: VERTICAL Elev: 269'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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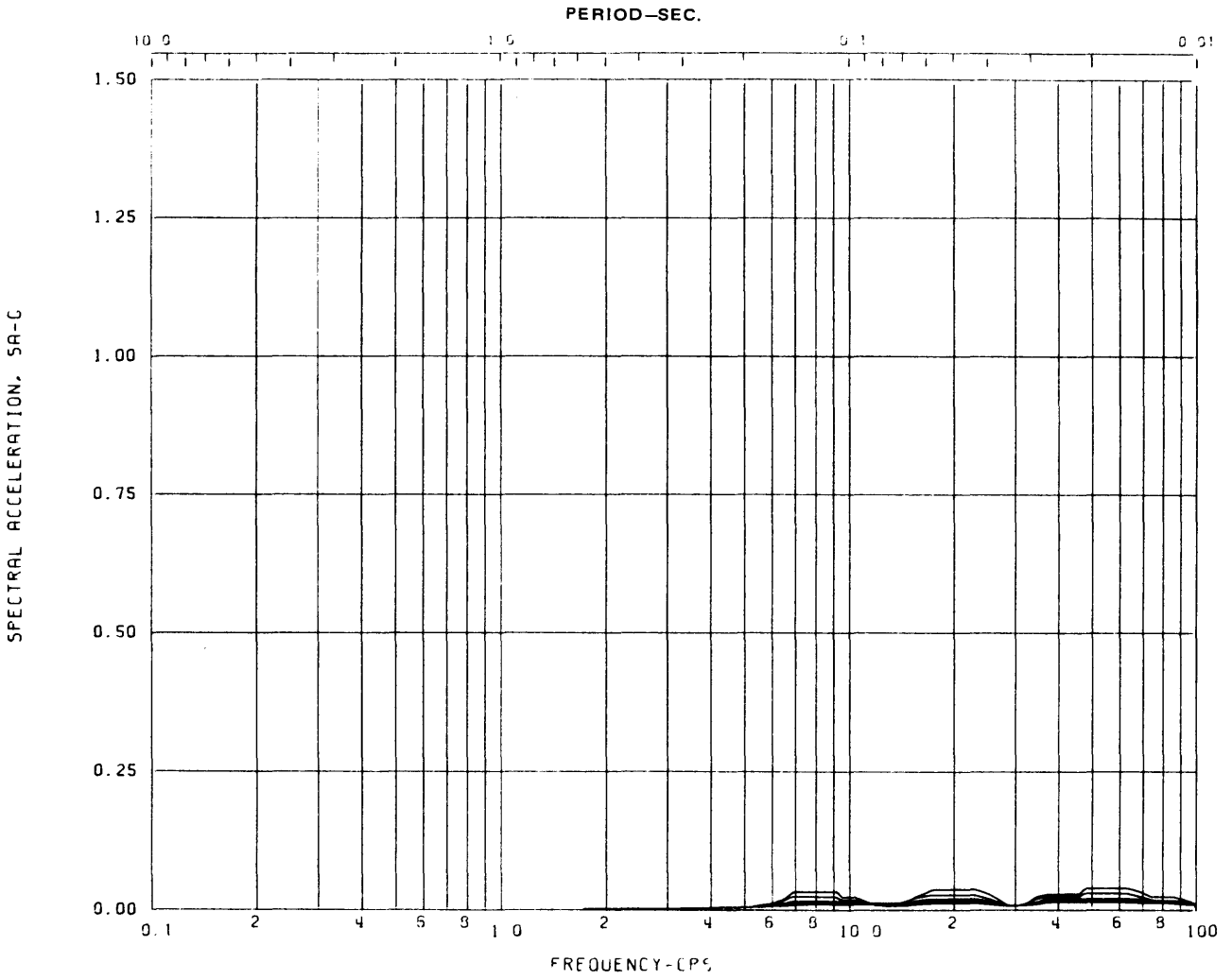
REACTOR ENCLOSUREGLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-328



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 58 Direction: VERTICAL Elev: 283'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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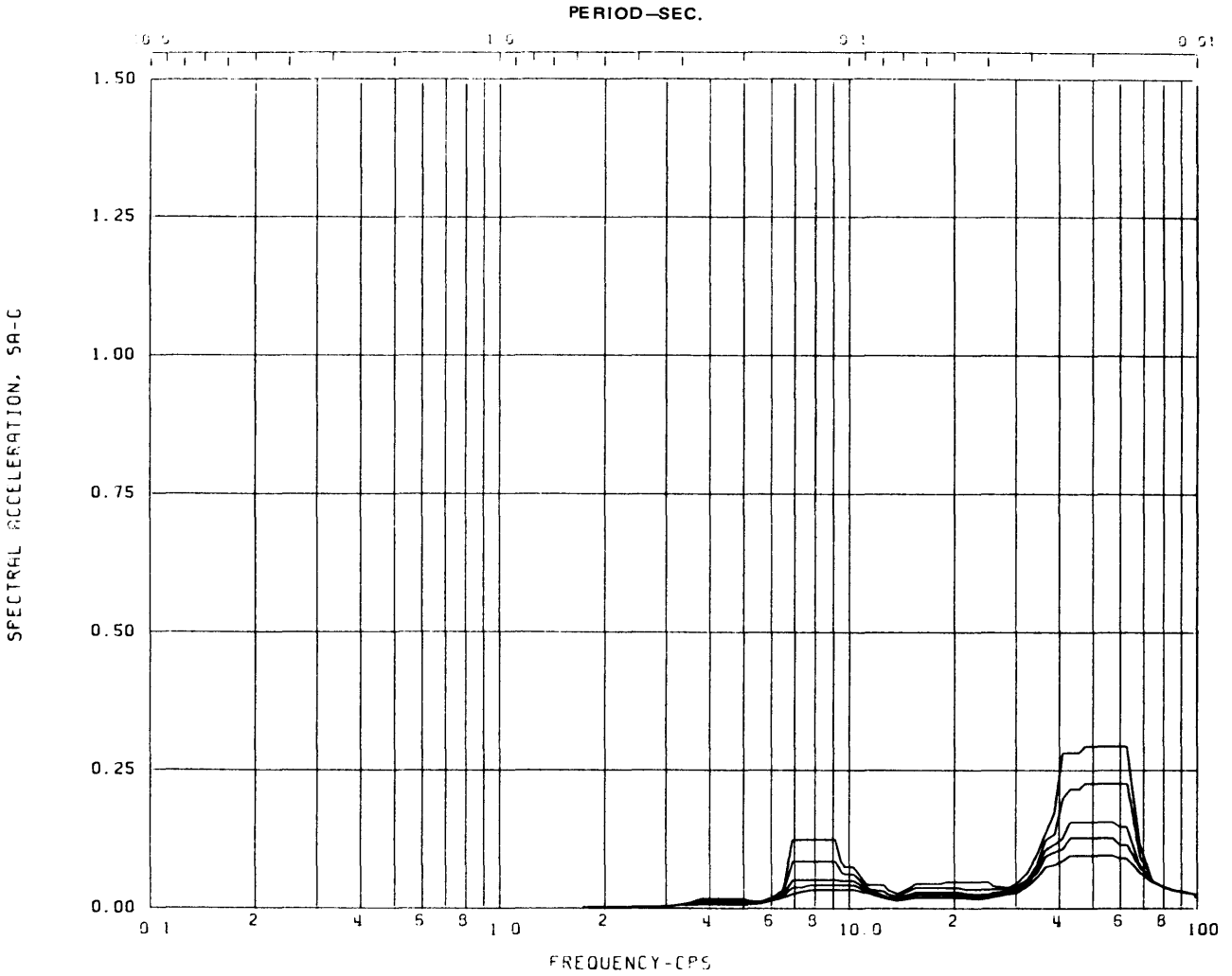
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-329



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 60 Direction: VERTICAL Elev: 283'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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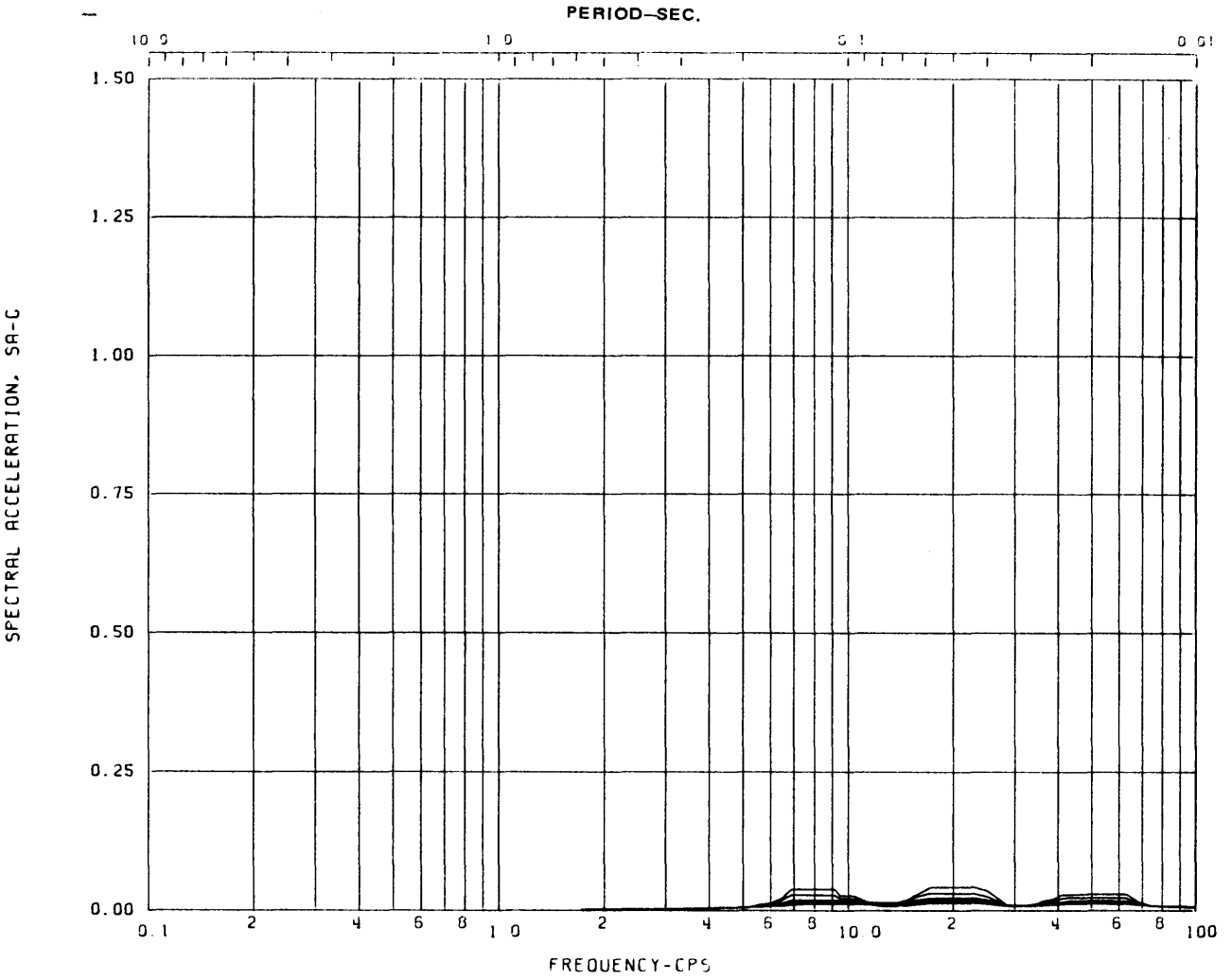
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-330



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 56 Direction: VERTICAL Elev: 304'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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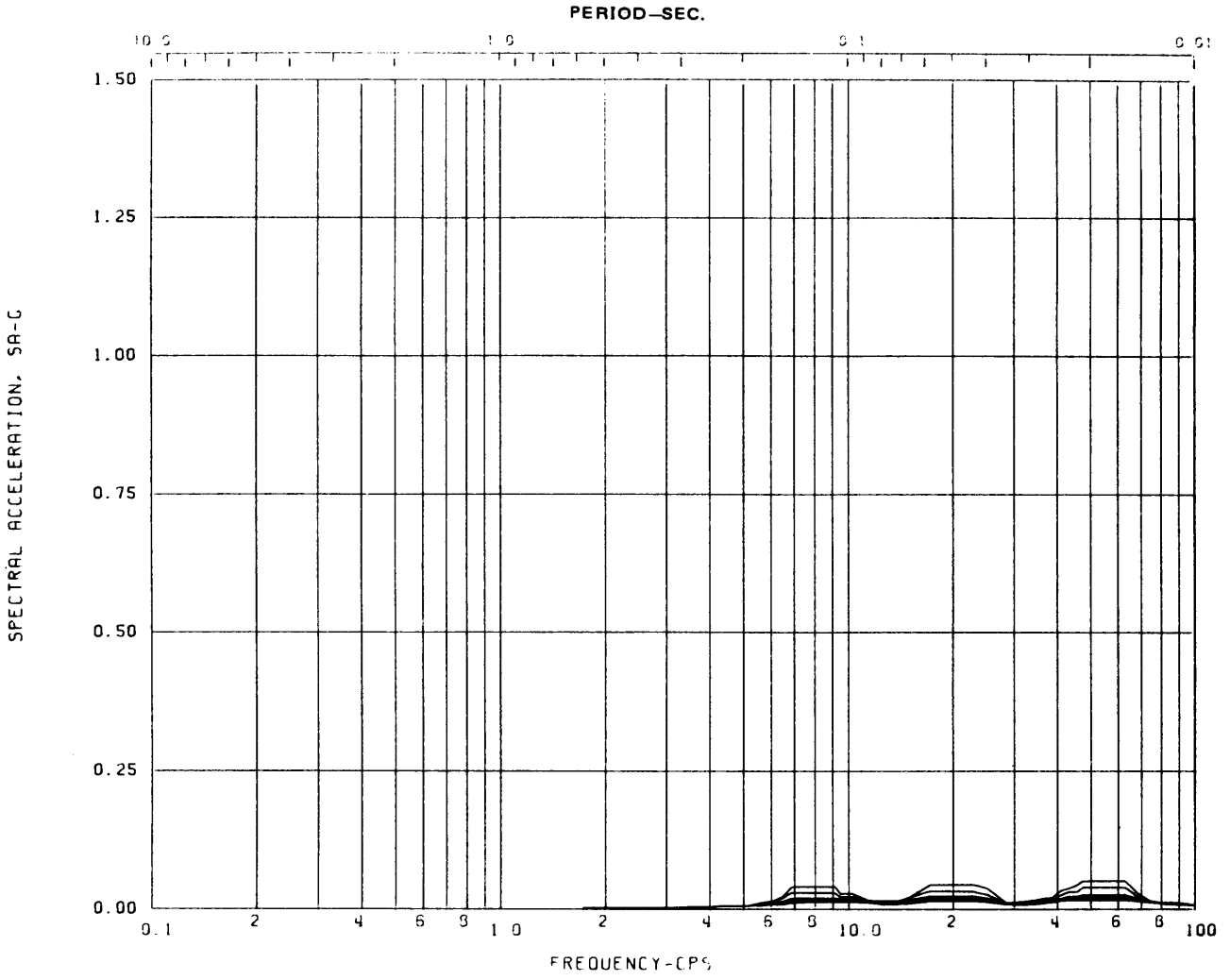
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-331



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 35 Direction: VERTICAL Elev: 313'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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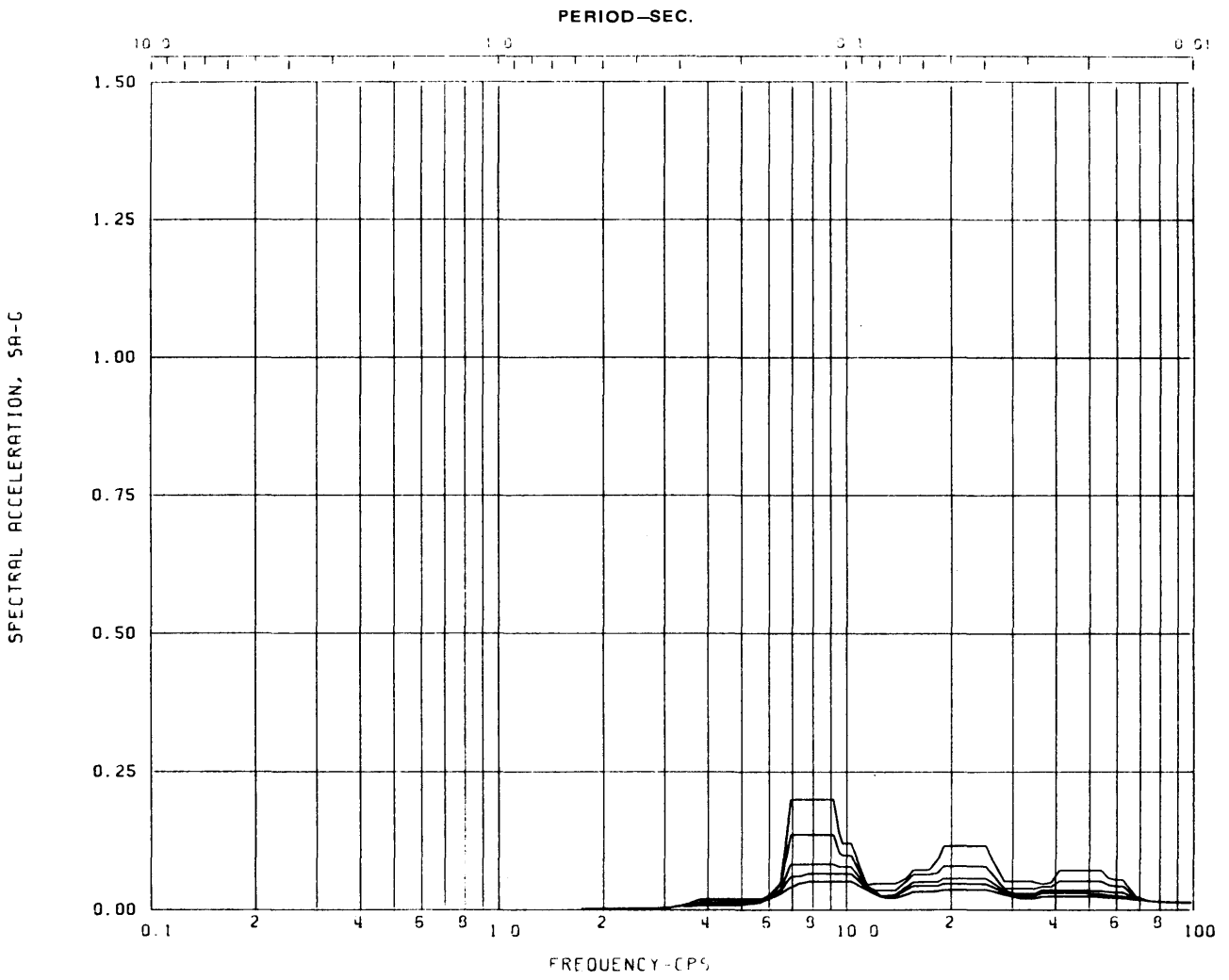
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-332



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 43 Direction: VERTICAL Elev: 313'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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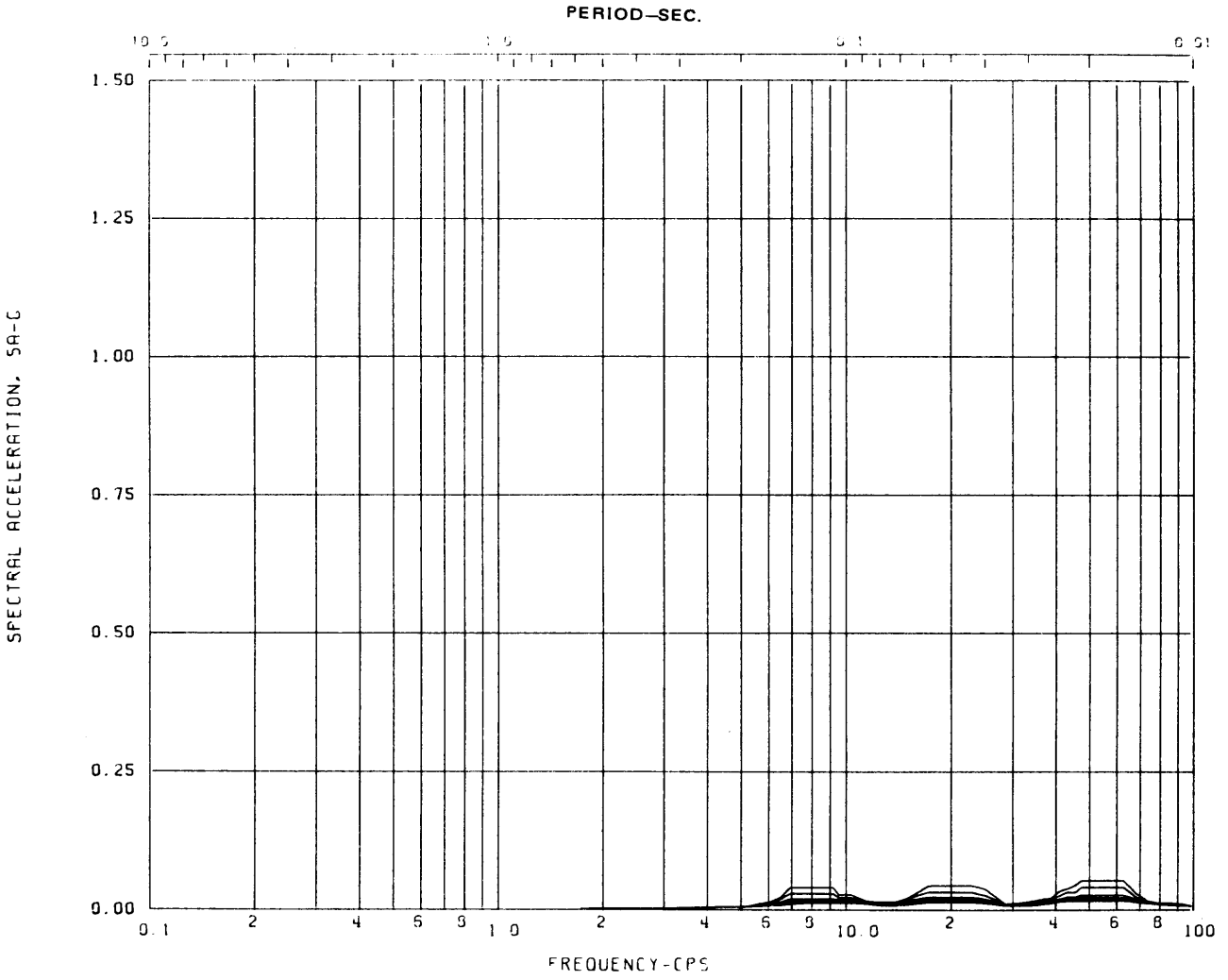
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-333



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 21 Direction: VERTICAL Elev: 333'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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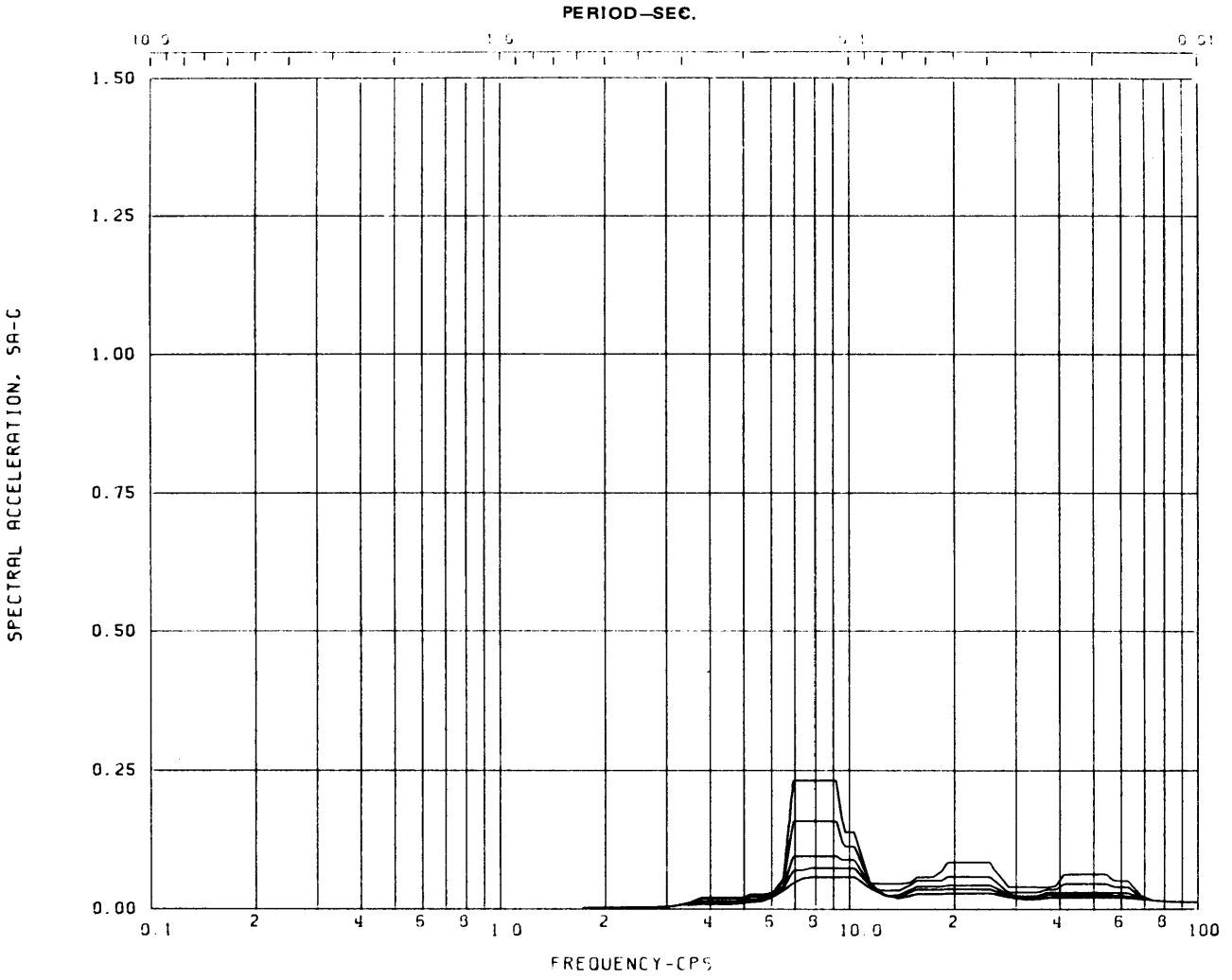
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-334



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 33 Direction: VERTICAL Elev: 333'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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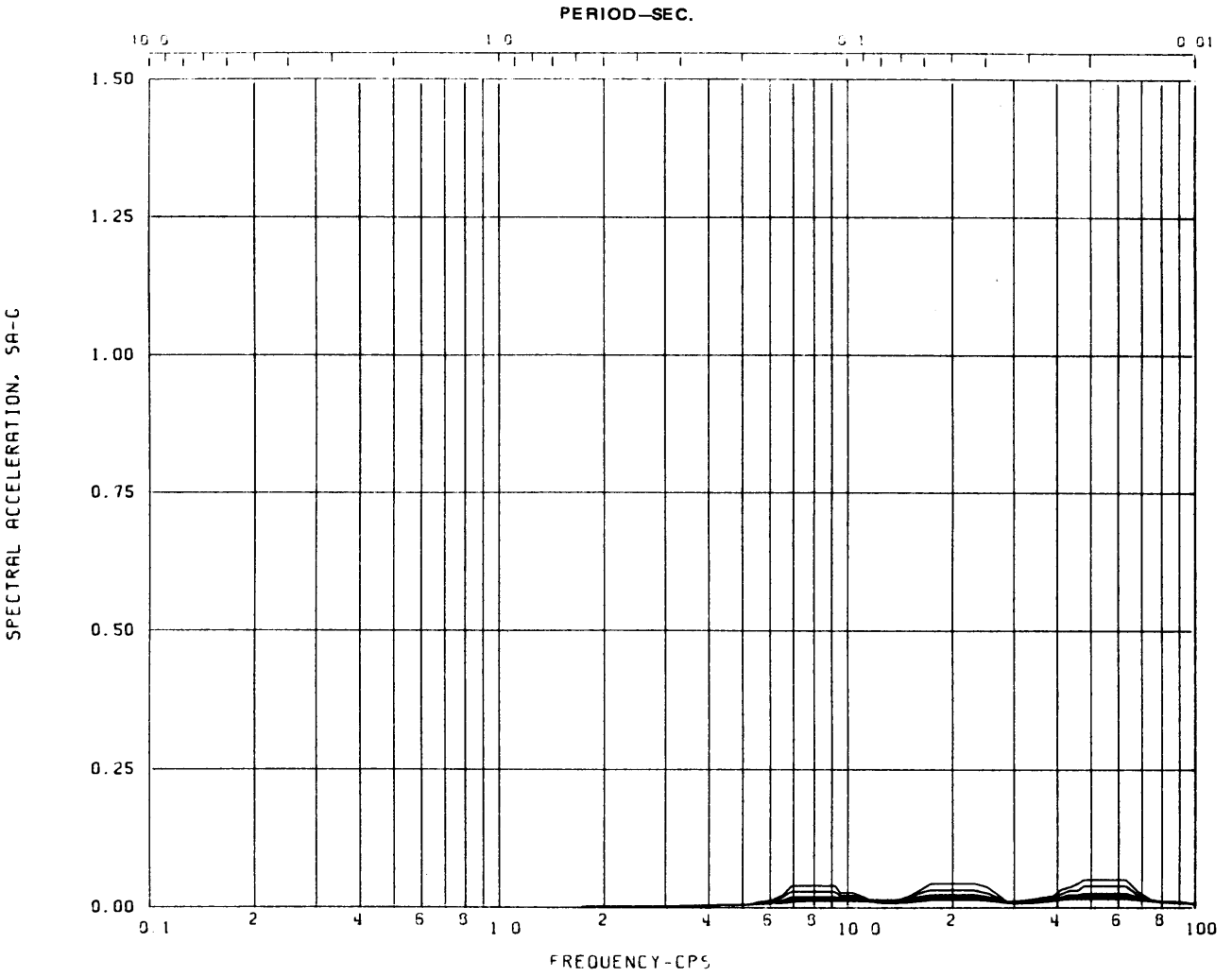
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-335



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 9 Direction: VERTICAL Elev: 352'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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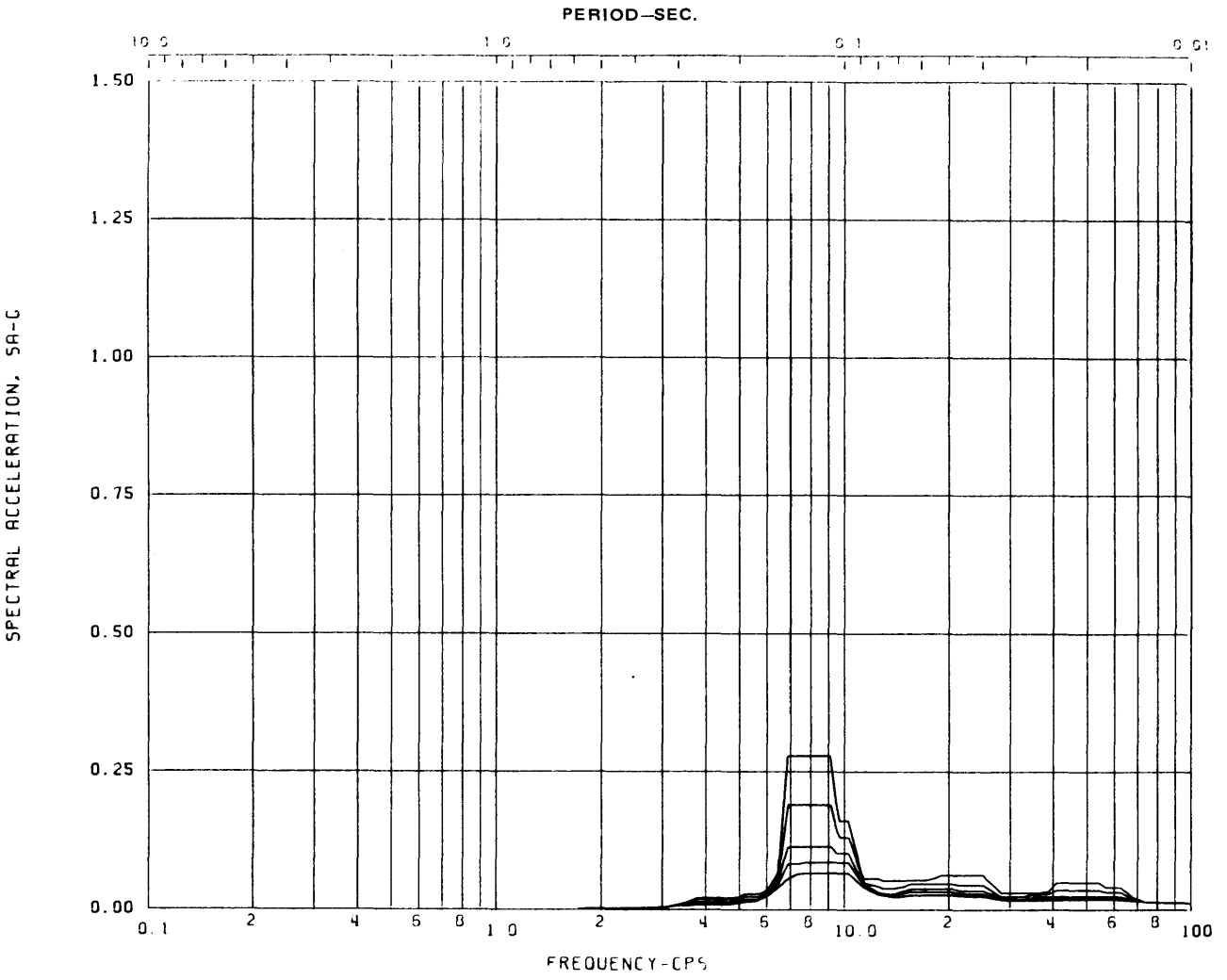
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-336



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 13 Direction: VERTICAL Elev: 352'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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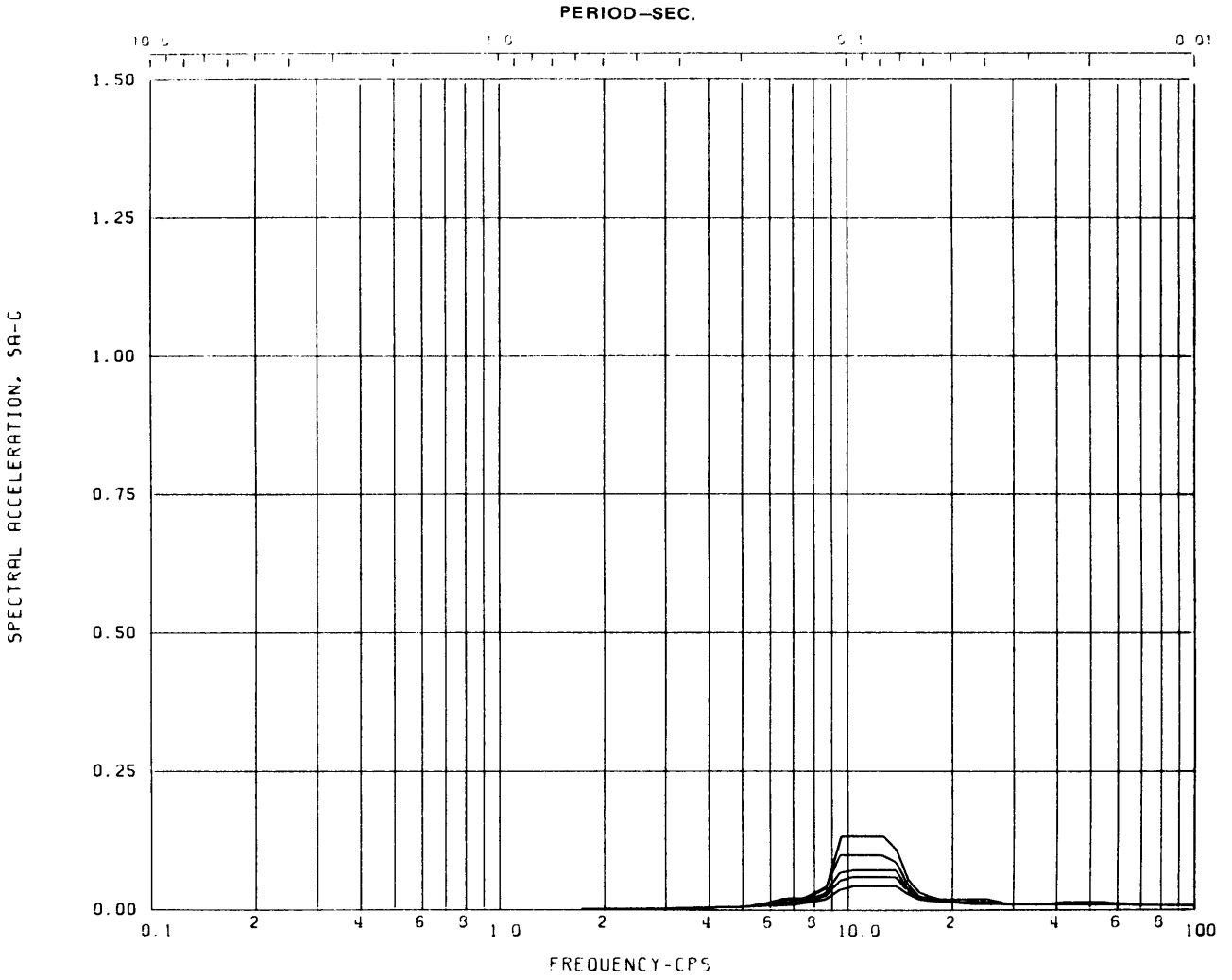
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-337



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 129 Direction: VERTICAL Elev: 201'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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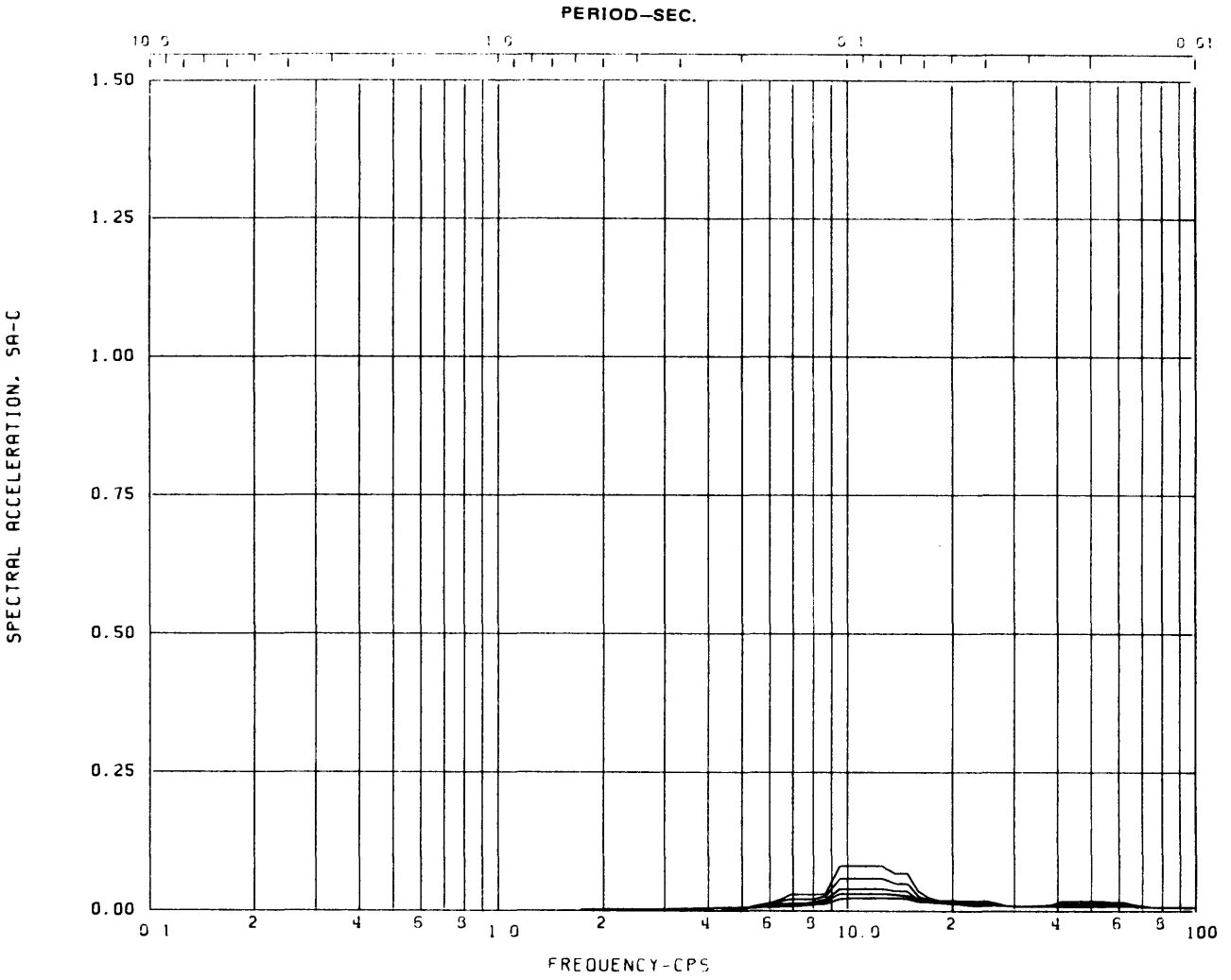
REACTOR ENCLOSUREGLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-338



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 107 Direction: VERTICAL Elev: 217'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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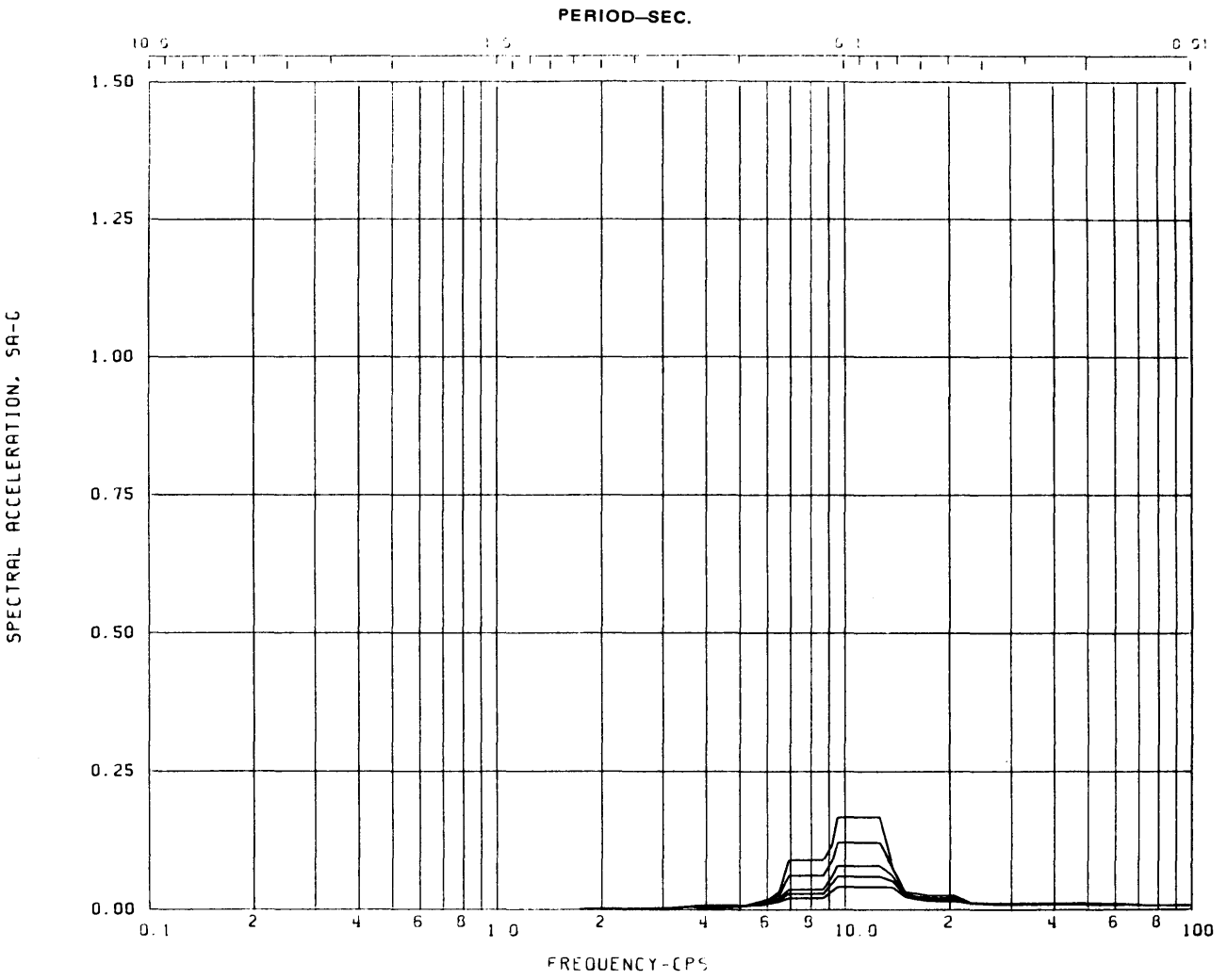
REACTOR ENCLOSUREGLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-339



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 80 Direction: VERTICAL Elev: 253'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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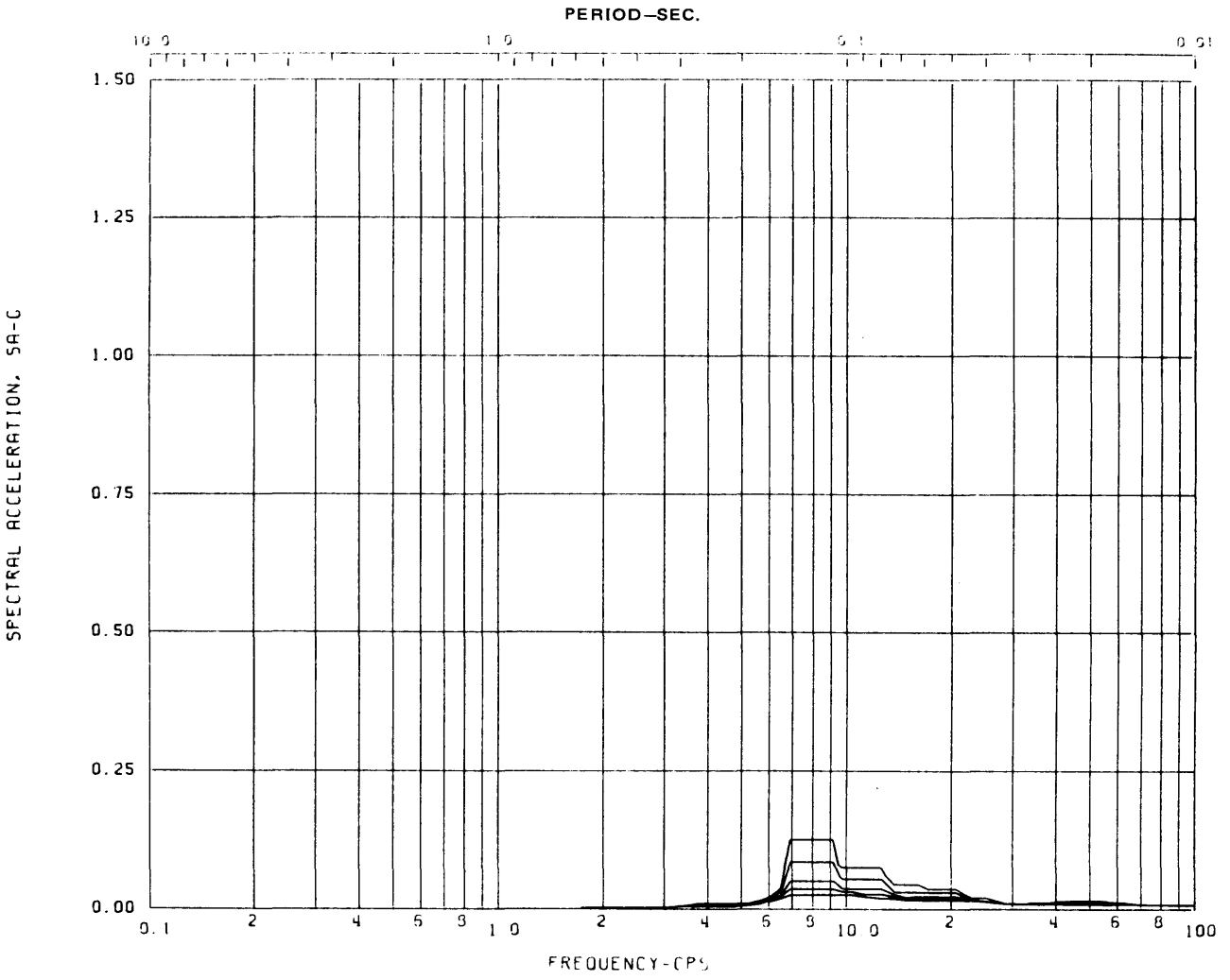
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-340



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 59 Direction: VERTICAL Elev: 283'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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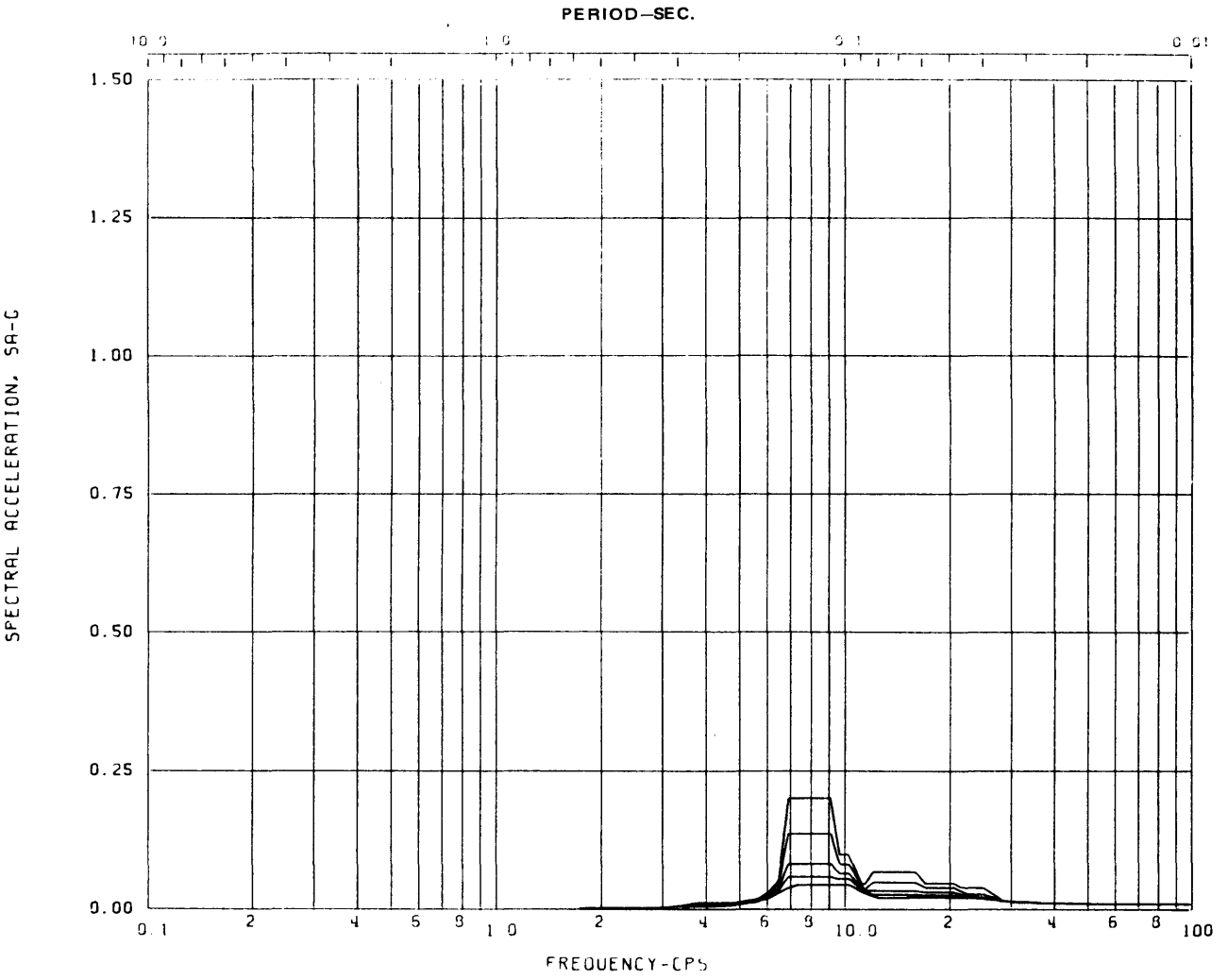
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-341



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 54 Direction: VERTICAL Elev: 313'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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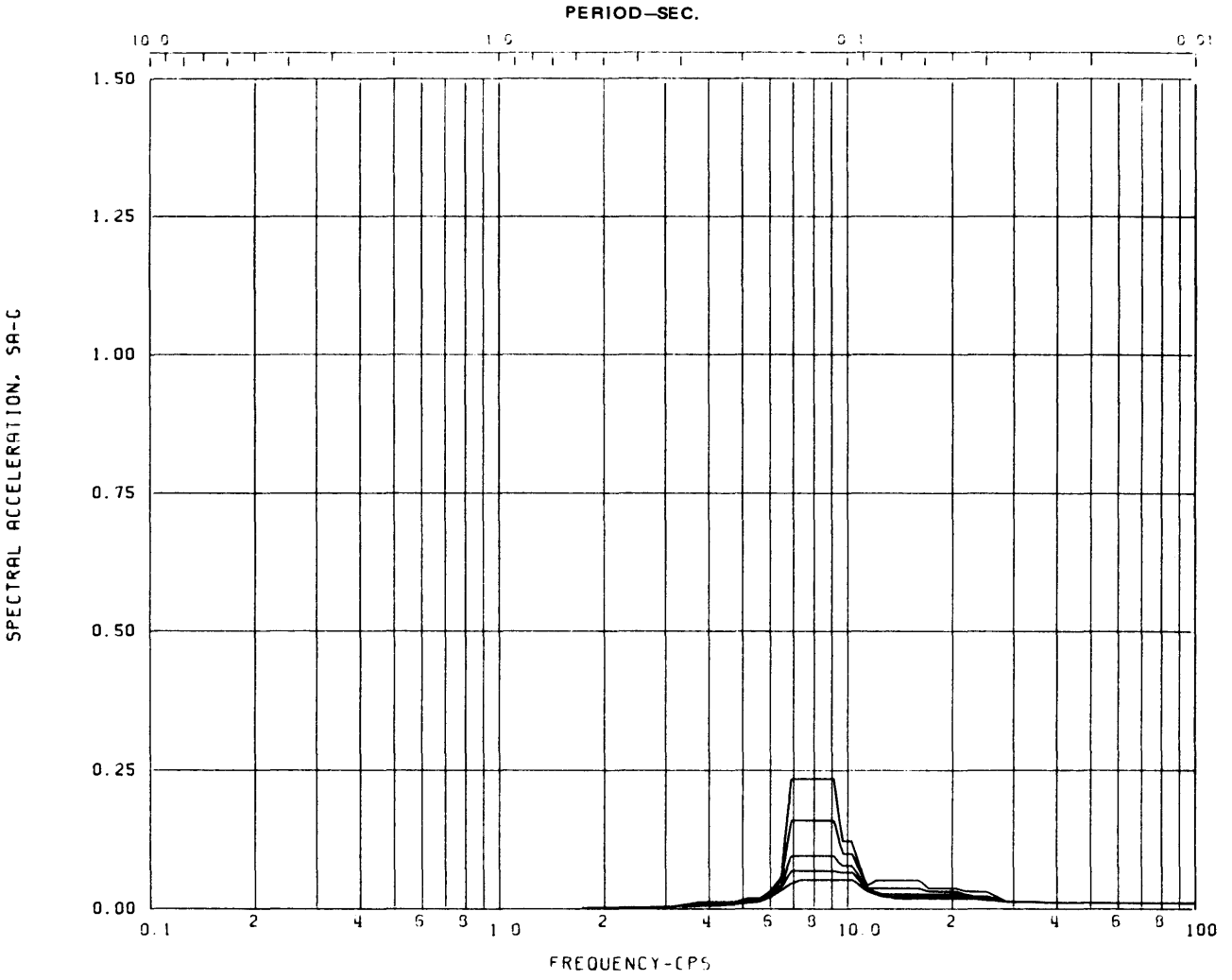
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-342



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 32 Direction: VERTICAL Elev: 333'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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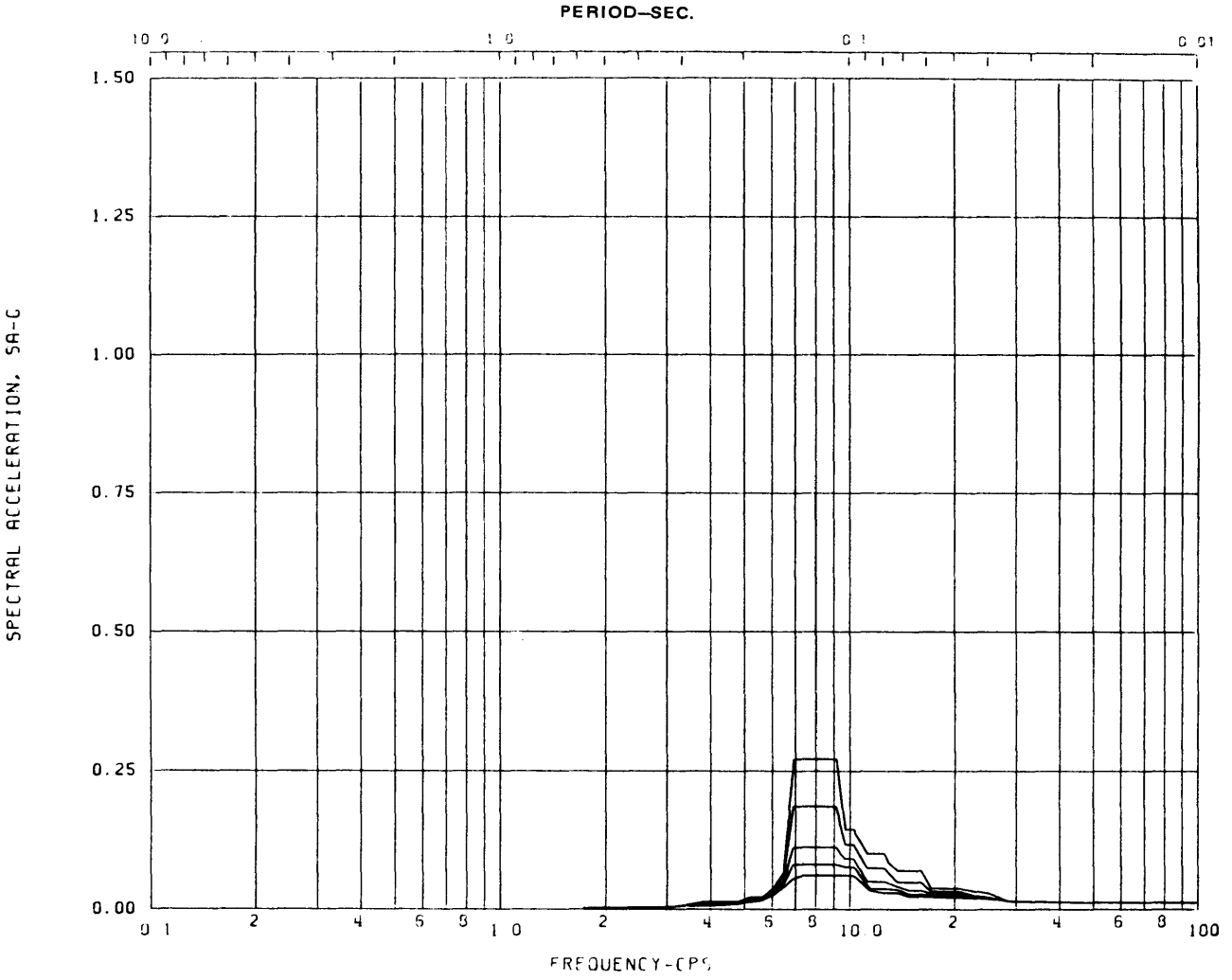
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-343



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 12 Direction: VERTICAL Elev: 352'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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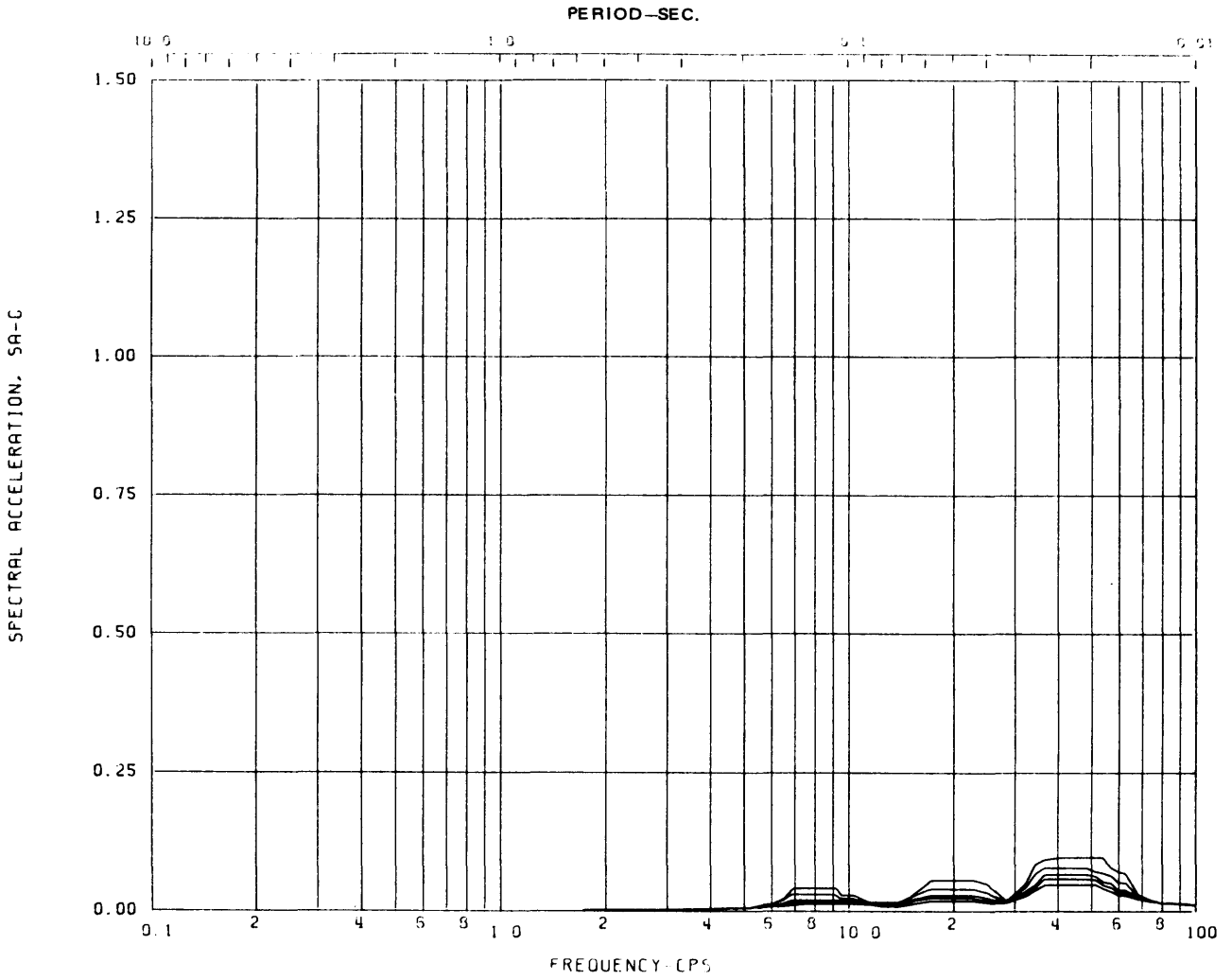
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO – ADS AXISYMMETRIC

FIGURE 3A-344



Acceleration Spectra for REACTOR ENCL.

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 6 Direction: VERTICAL Elev: 410'-0

Damping: 0.005,0.01,0.02,0.03,0.05

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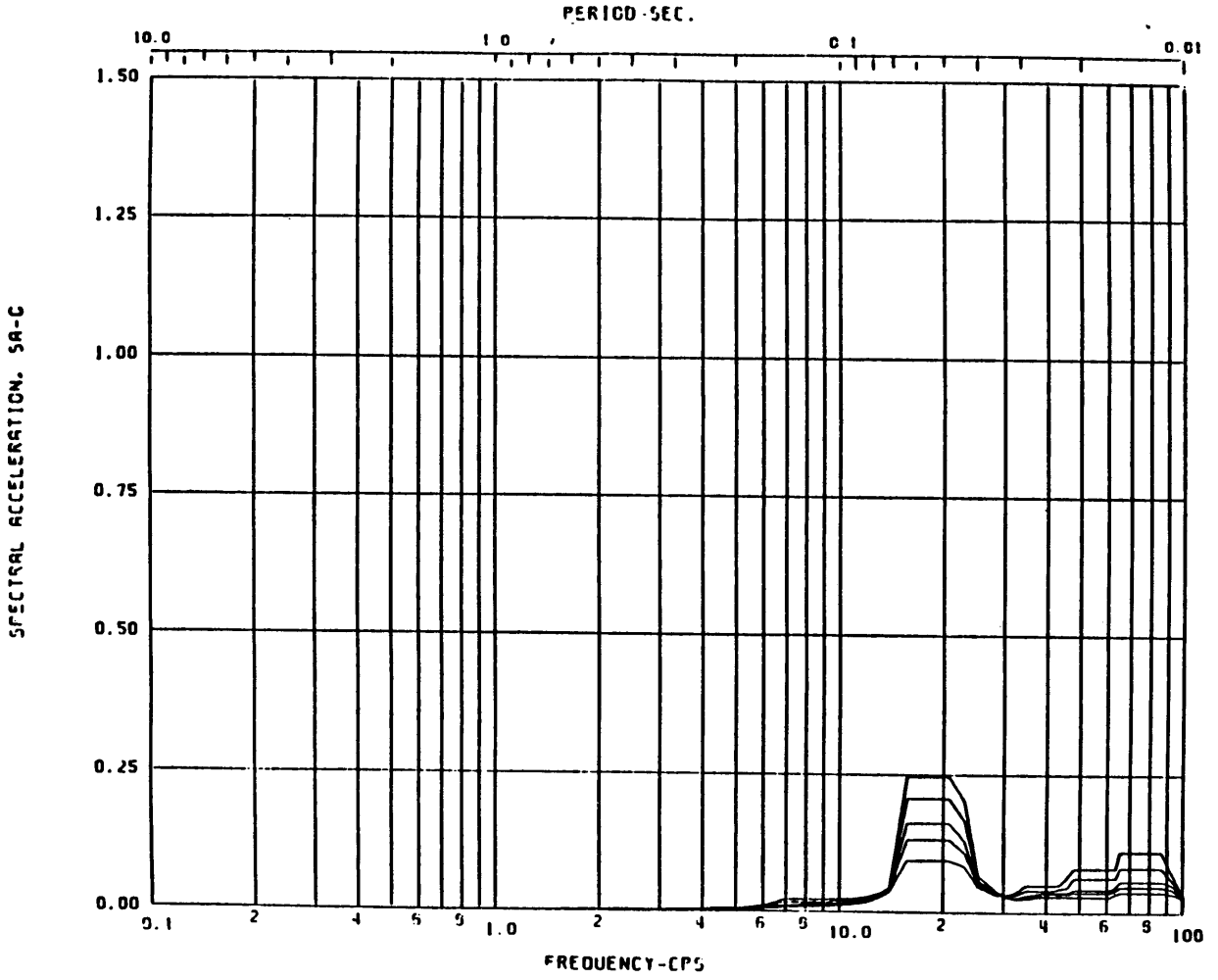
REACTOR ENCLOSURE GLOBAL RESPONSE SPECTRA, VERTICAL, CO—ADS AXISYMMETRIC

FIGURE 3A-345



Acceleration Spectra for CONTROL STRUCTURE

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 7 Direction: VERTICAL Elev: 217'

Damping: 0.005,0.01,0.02,0.03,0.05

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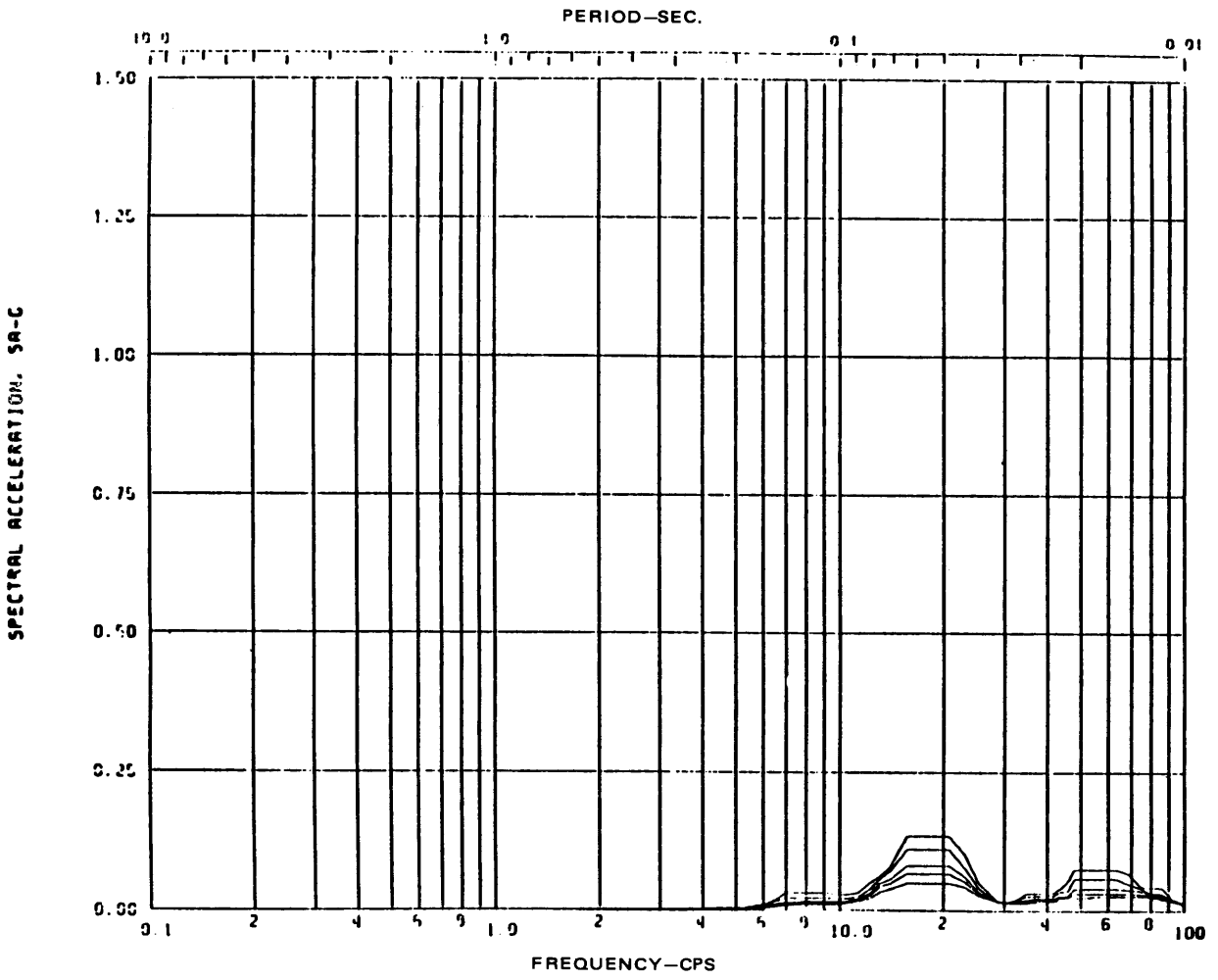
DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
LOCAL RESPONSE SPECTRA, VERTICAL,
CO – ADS AXISYMMETRIC

FIGURE 3A-346



Acceleration Spectra for CONTROL STRUCTURE

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

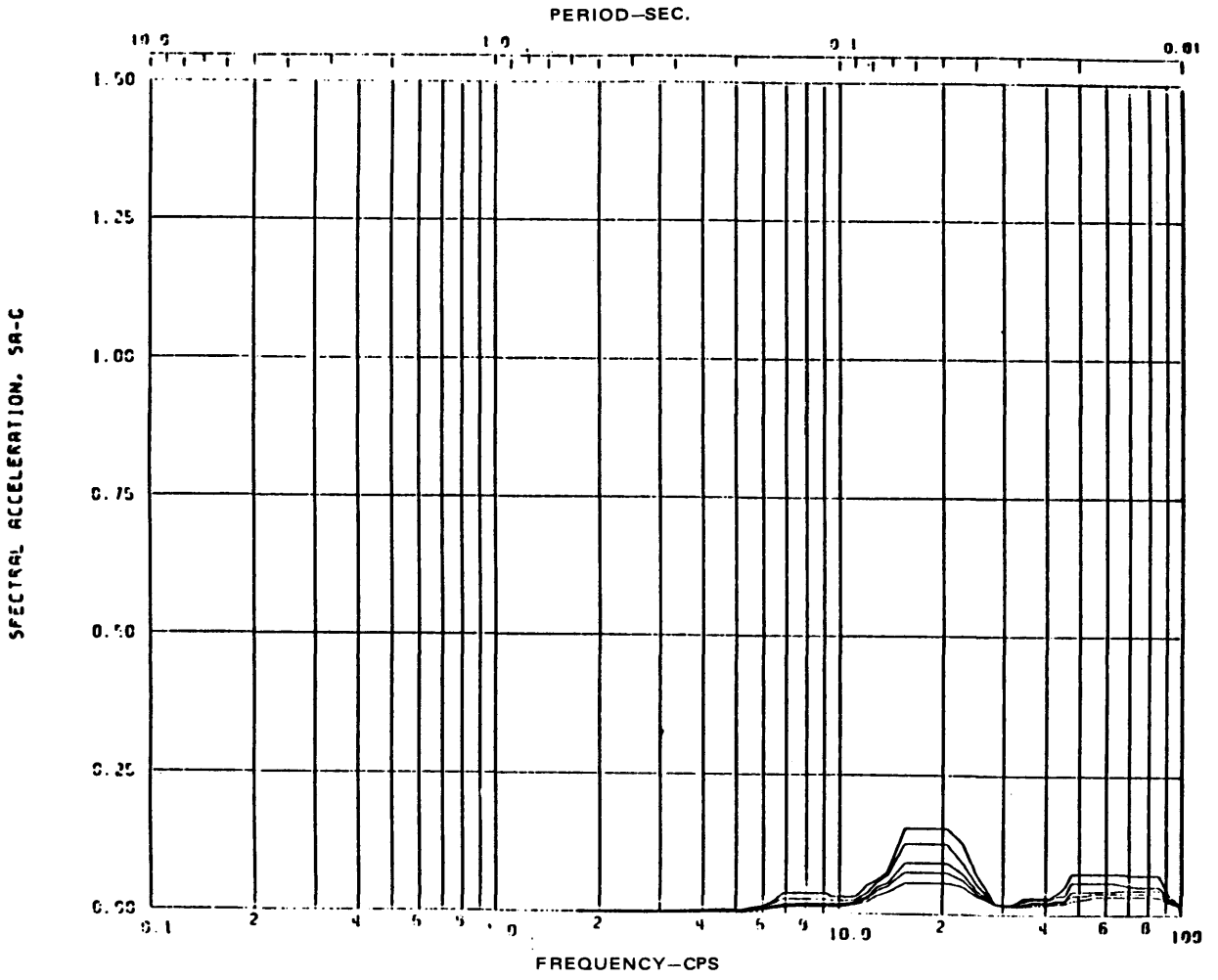
Node: 7 Direction: VERTICAL Elev: 239'

Damping: 0.005,0.01,0.02,0.03,0.05

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
LOCAL RESPONSE SPECTRA, VERTICAL,
CO – ADS AXISYMMETRIC

FIGURE 3A-347



Acceleration Spectra for CONTROL STRUCTURE

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 7 Direction: VERTICAL Elev: 254'

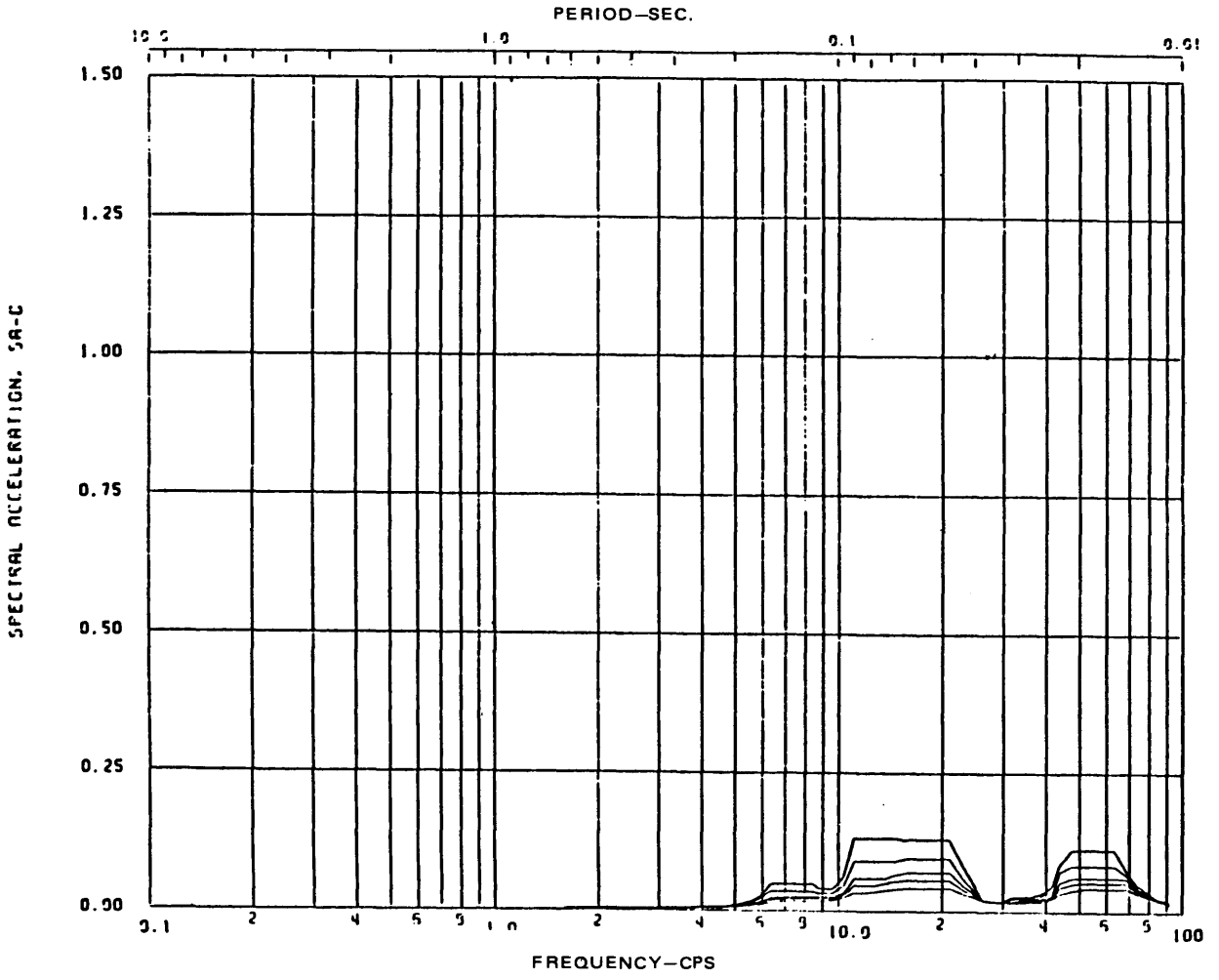
Damping: 0.005,0.01,0.02,0.03,0.05

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

CONTROL STRUCTURE
LOCAL RESPONSE SPECTRA, VERTICAL,
CO – ADS AXISYMMETRIC

FIGURE 3A-348



Acceleration Spectra for CONTROL STRUCTURE

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 7 Direction: VERTICAL Elev: 269'-0

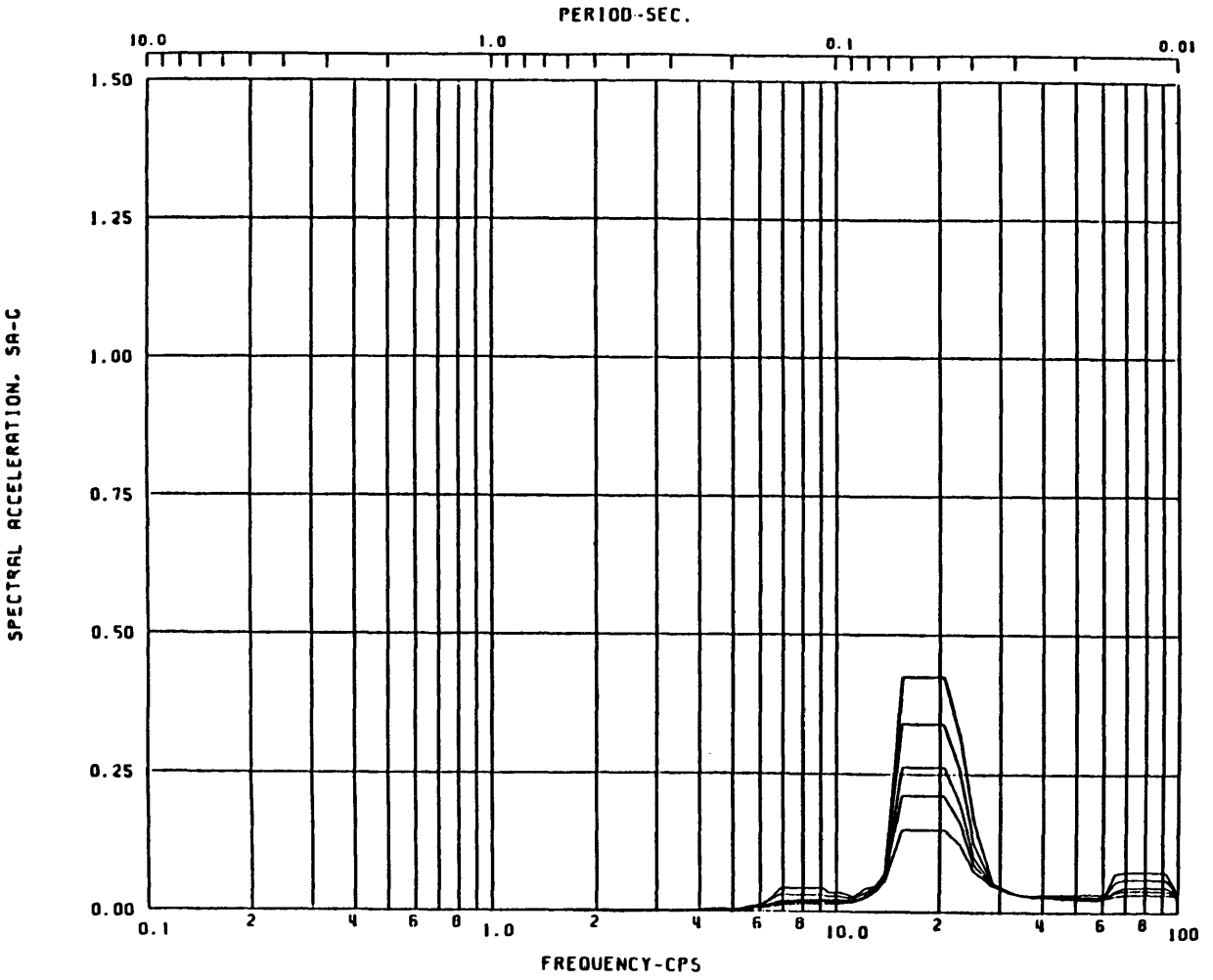
Damping: 0.005,0.01,0.02,0.03,0.05

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

CONTROL STRUCTURE
LOCAL RESPONSE SPECTRA, VERTICAL,
CO – ADS AXISYMMETRIC

FIGURE 3A-349



Acceleration Spectra for CONTROL STRUCTURE

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 7 Direction: VERTICAL Elev: 289'

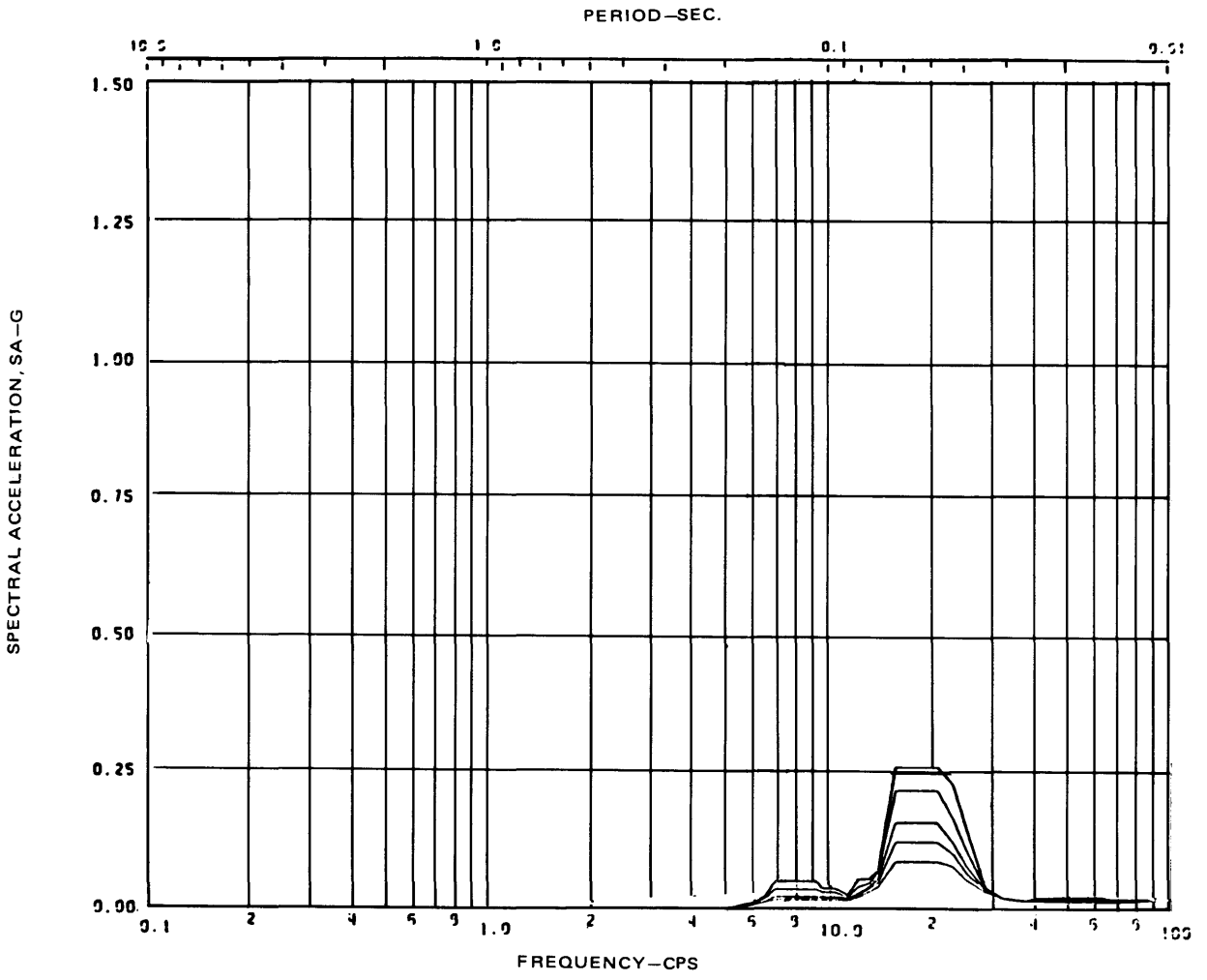
Damping: 0.005,0.01,0.02,0.03,0.05

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

CONTROL STRUCTURE
LOCAL RESPONSE SPECTRA, VERTICAL,
CO – ADS AXISYMMETRIC

FIGURE 3A-350



Acceleration Spectra for CONTROL STRUCTURE

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 7 Direction: VERTICAL Elev: 304'-0

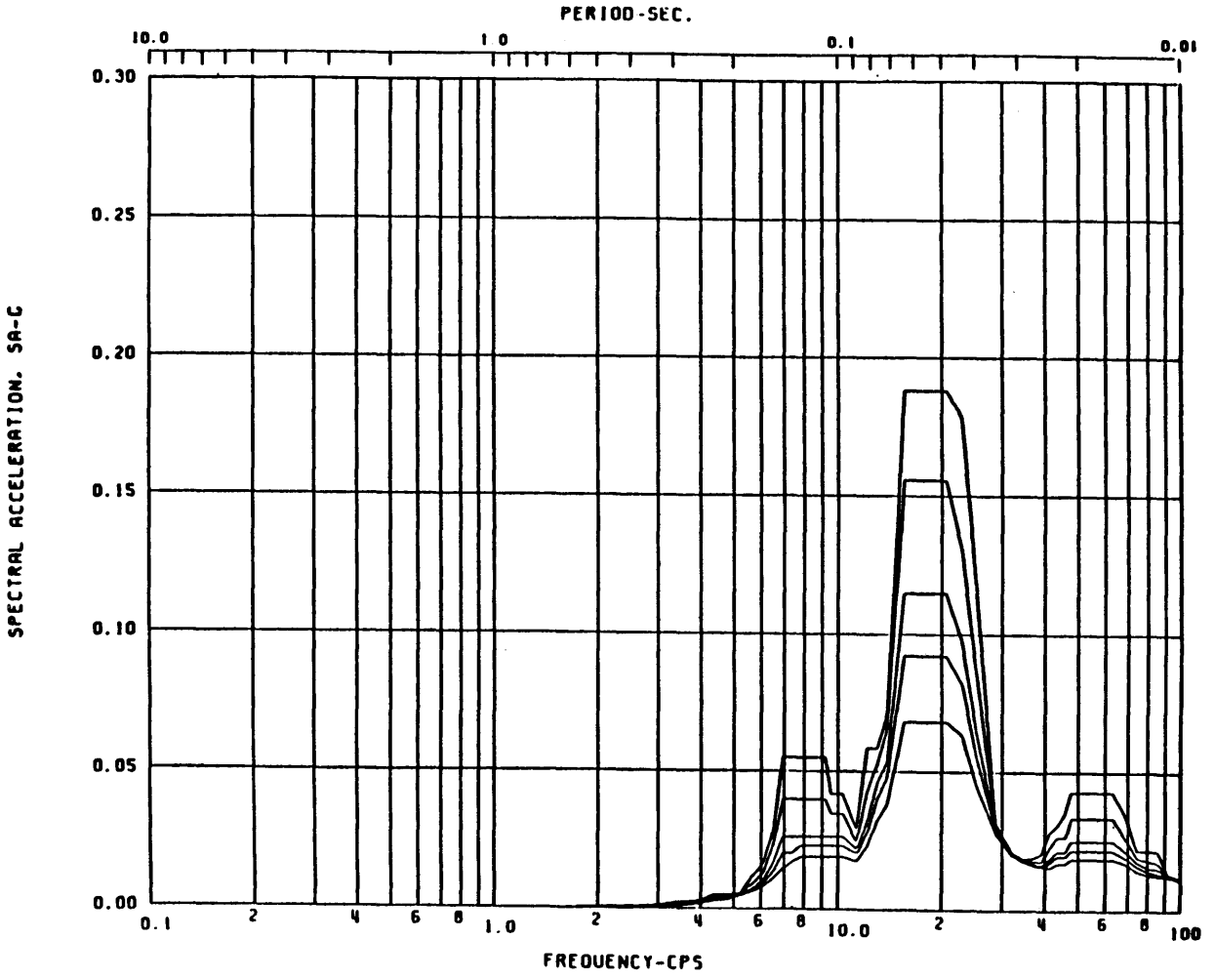
Damping: 0.005,0.01,0.02,0.03,0.05

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

CONTROL STRUCTURE
LOCAL RESPONSE SPECTRA, VERTICAL,
CO – ADS AXISYMMETRIC

FIGURE 3A-351



Acceleration Spectra for CONTROL STRUCTURE

Load Case: AXISYMMETRIC GE CO-ADS ENVELOPE (WIDENED - 15%)

Node: 7 Direction: VERTICAL Elev: 332'

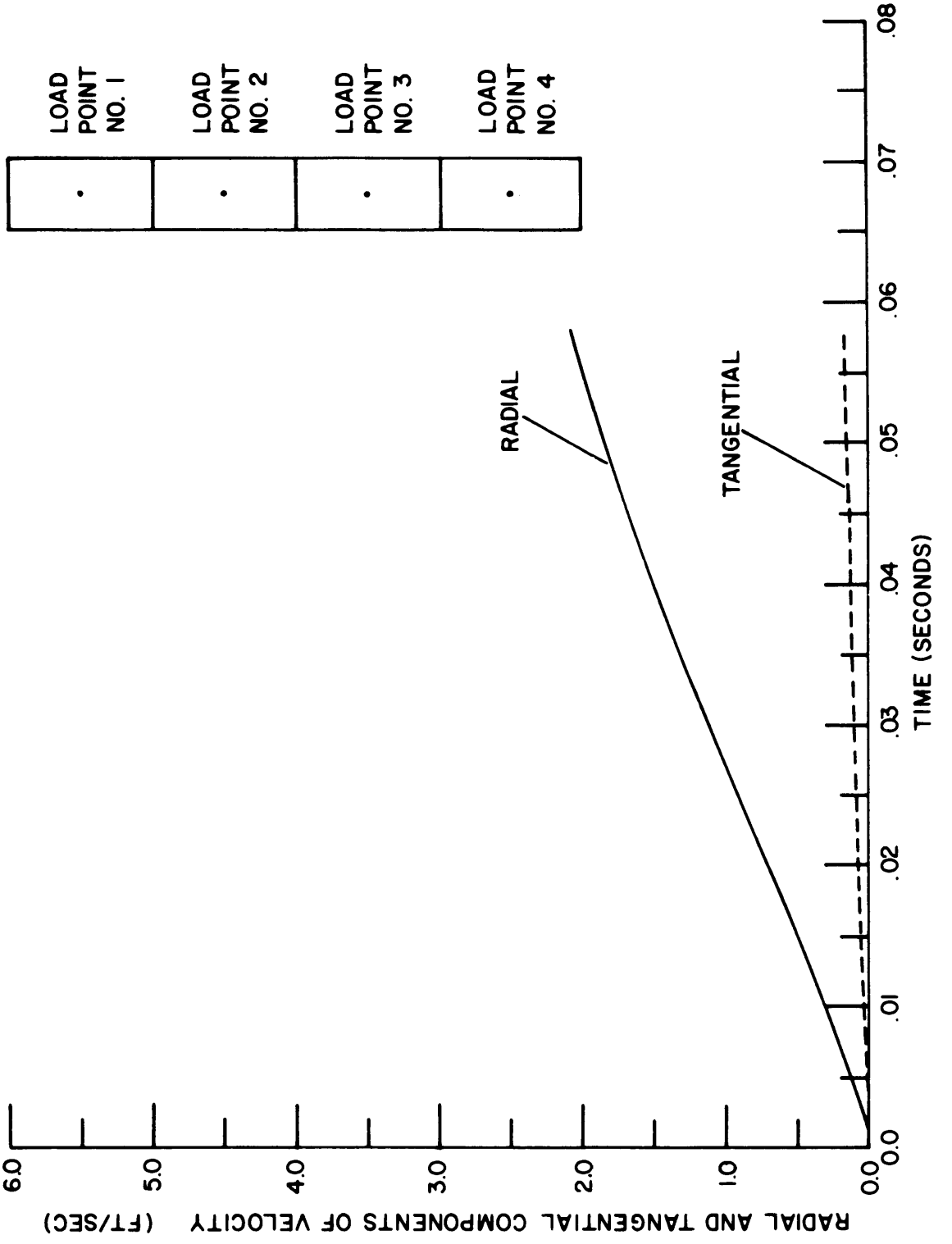
Damping: 0.005,0.01,0.02,0.03,0.05

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

CONTROL STRUCTURE
LOCAL RESPONSE SPECTRA, VERTICAL,
CO – ADS AXISYMMETRIC

FIGURE 3A-352



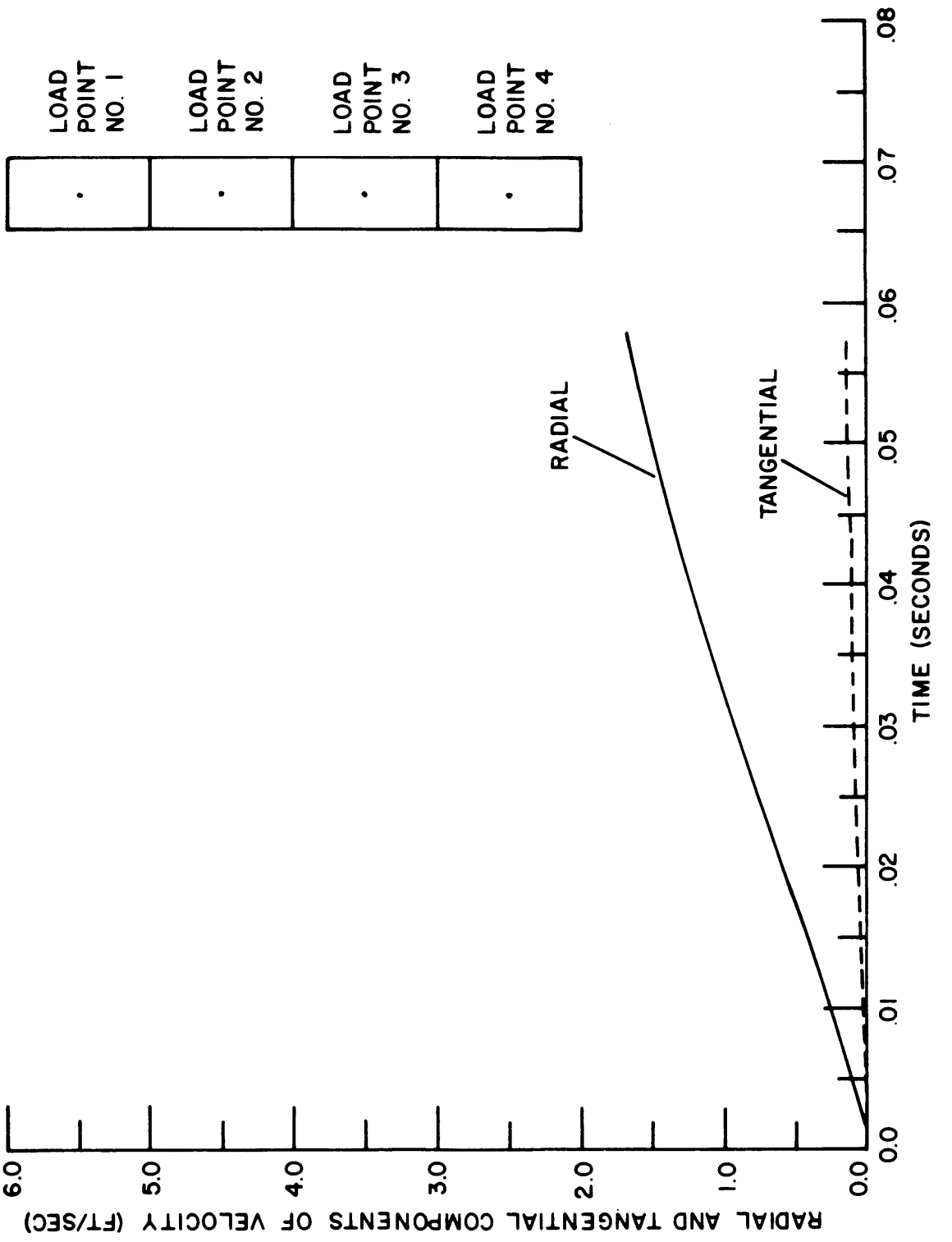
LOAD POINT NO. 1

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

LOCA AIR CLEARING VELOCITY (SHEET 1 OF 4)

FIGURE 3A-353



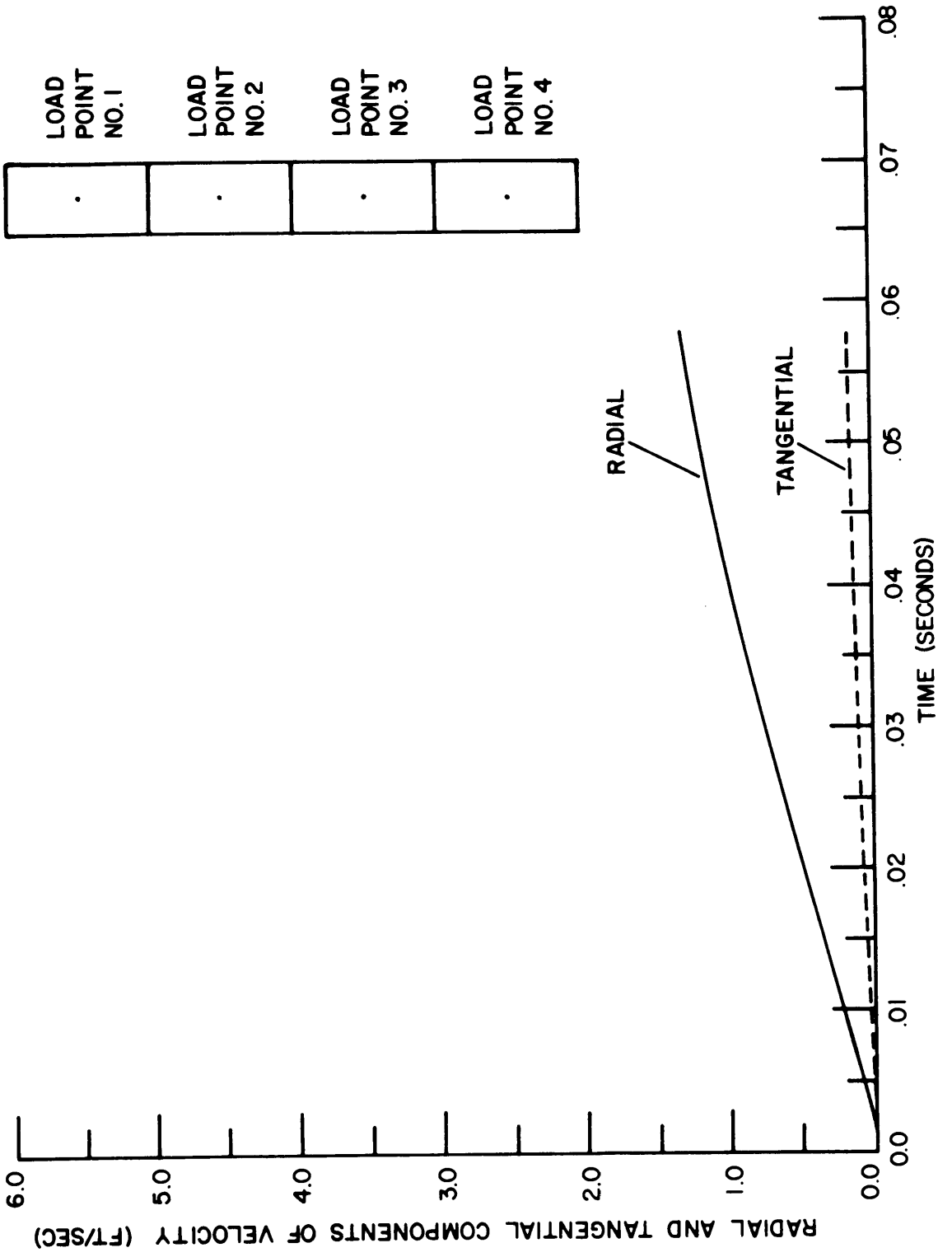
LOAD POINT NO. 2

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

LOCA AIR CLEARING VELOCITY (SHEET 2 OF 4)

FIGURE 3A-353



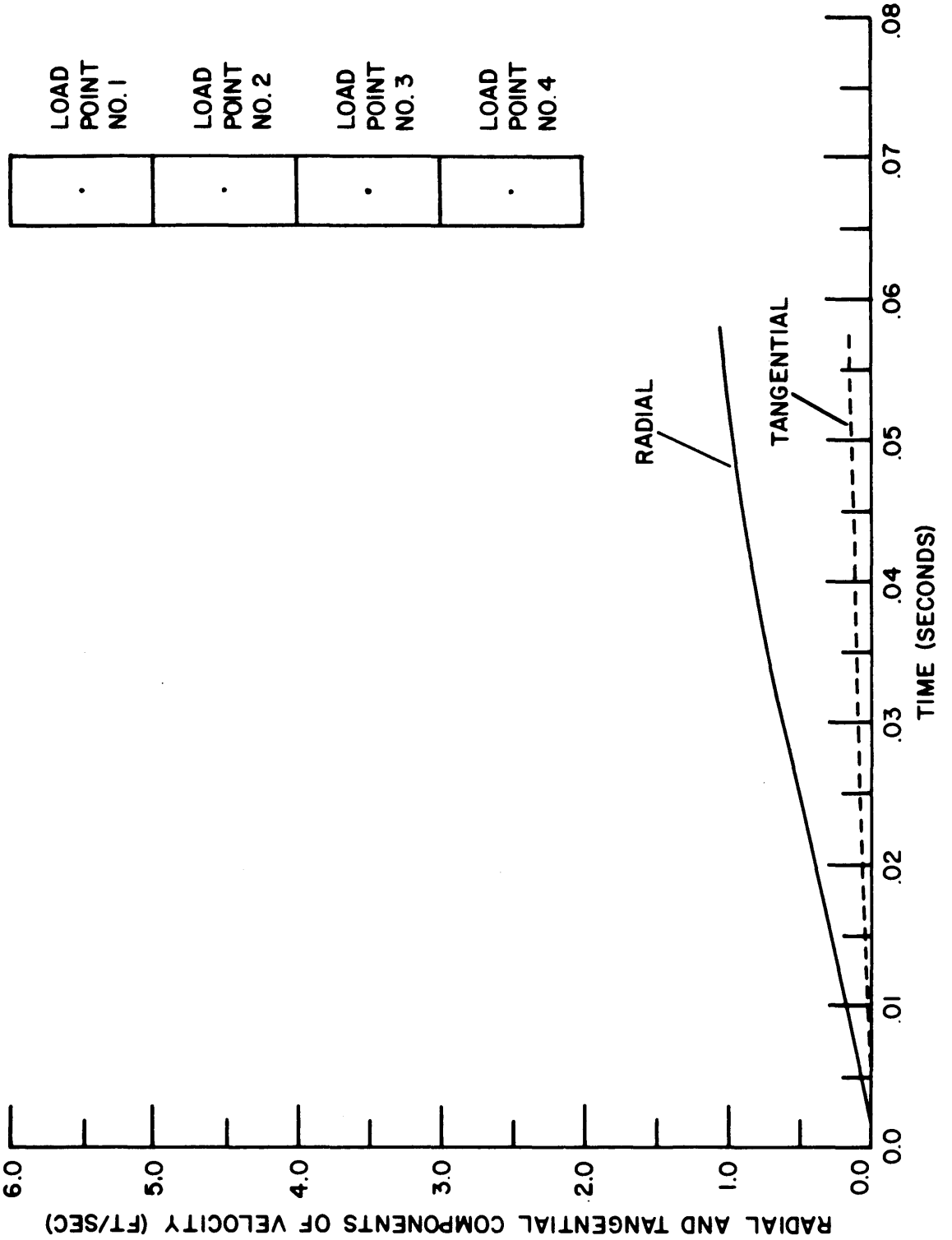
LOAD POINT NO. 3

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

LOCA AIR CLEARING VELOCITY (SHEET 3 OF 4)

FIGURE 3A-353



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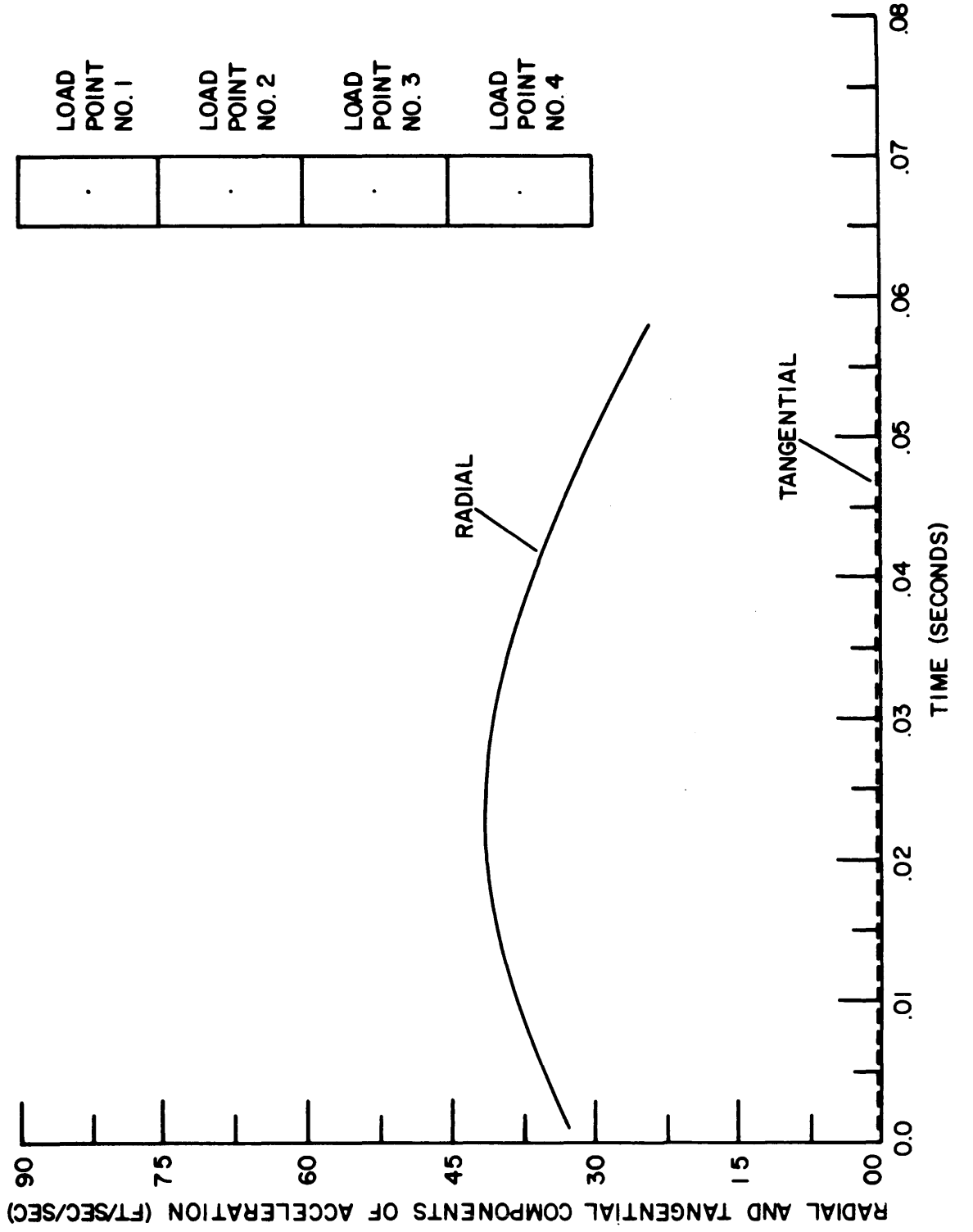
LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

LOCA AIR CLEARING VELOCITY (SHEET 4 OF 4)

FIGURE 3A-353



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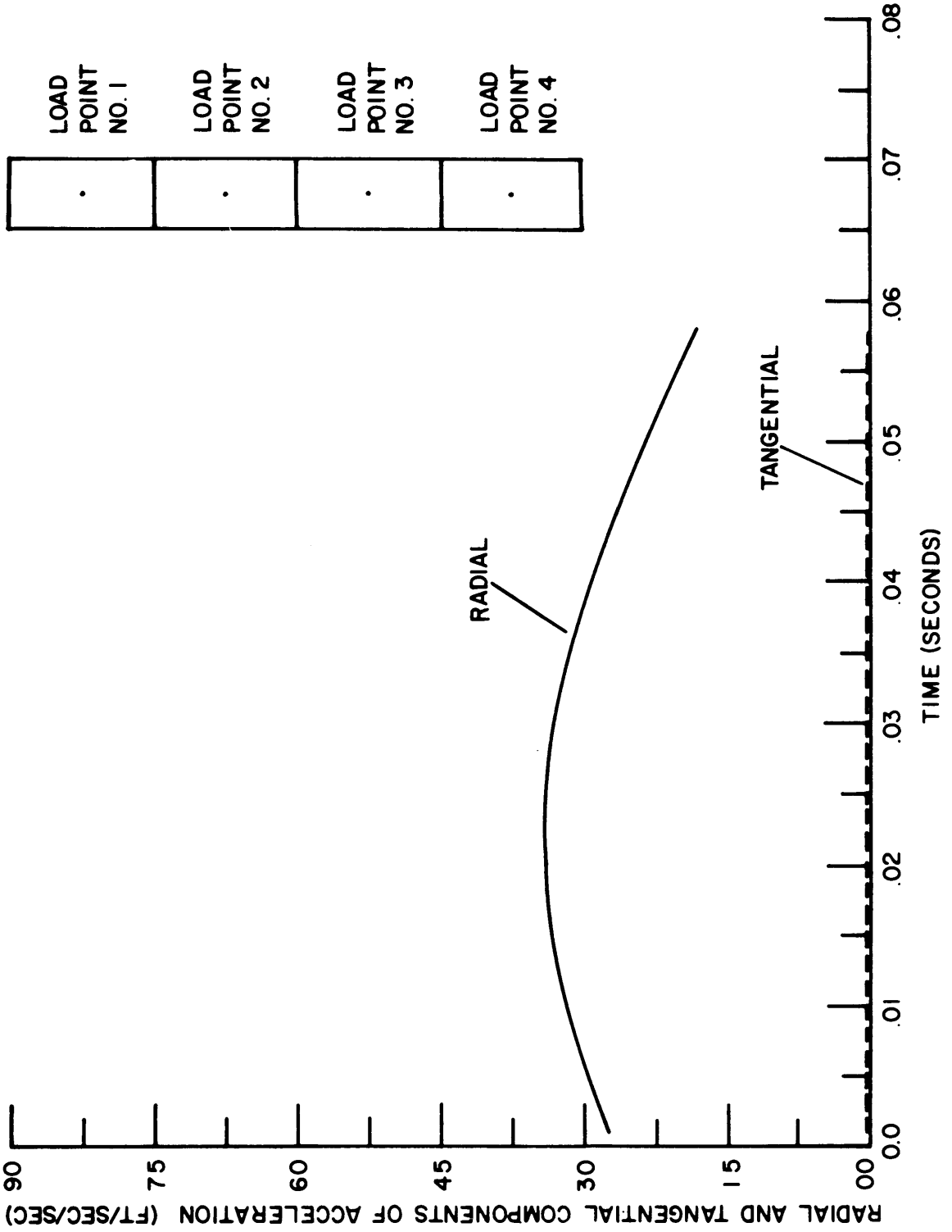
LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
LOCA AIR CLEARING ACCELERATION (SHEET 1 OF 4)

FIGURE 3A-354



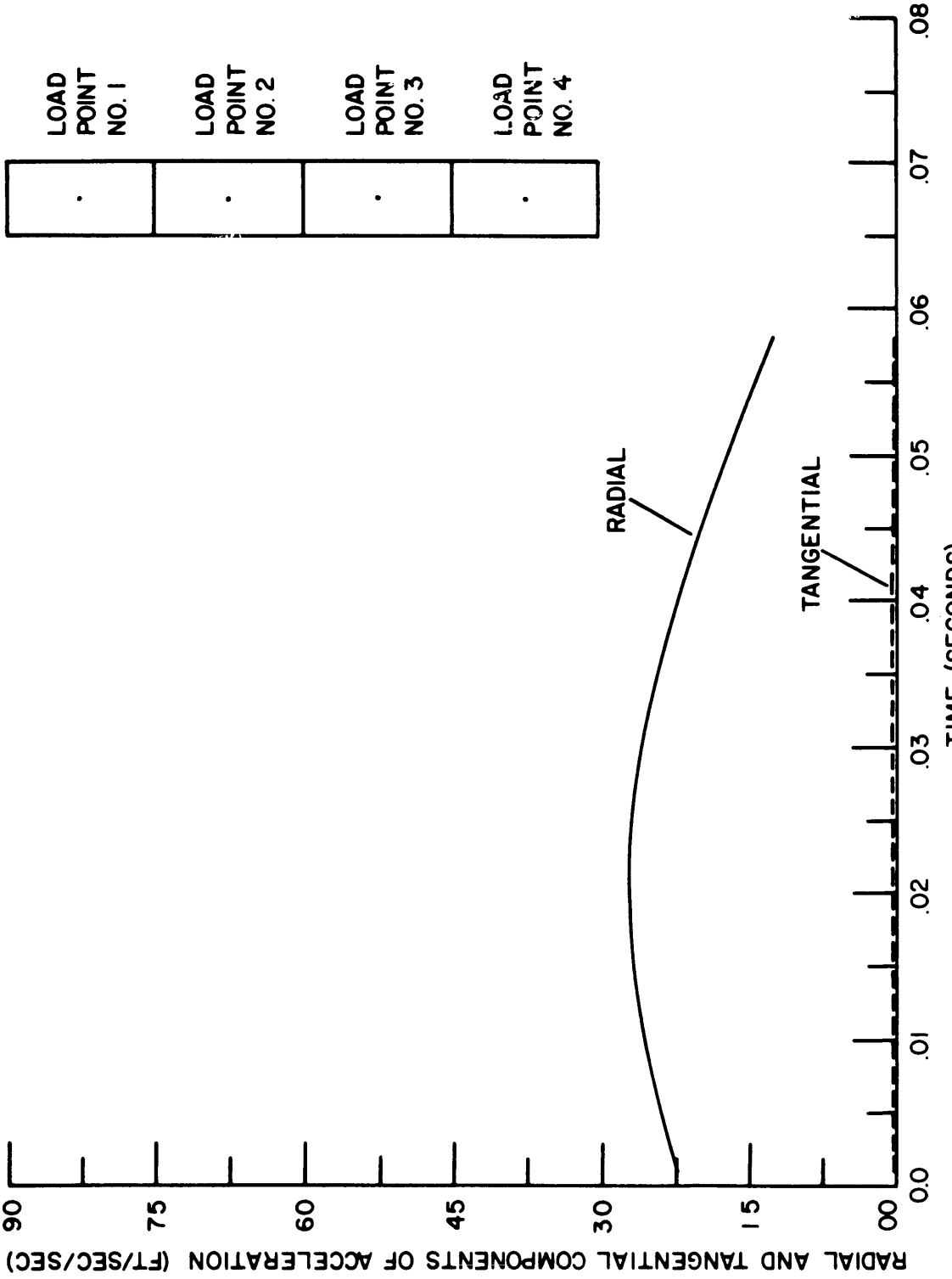
LOAD POINT NO. 2

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

LOCA AIR CLEARING ACCELERATION (SHEET 2 OF 4)

FIGURE 3A-354



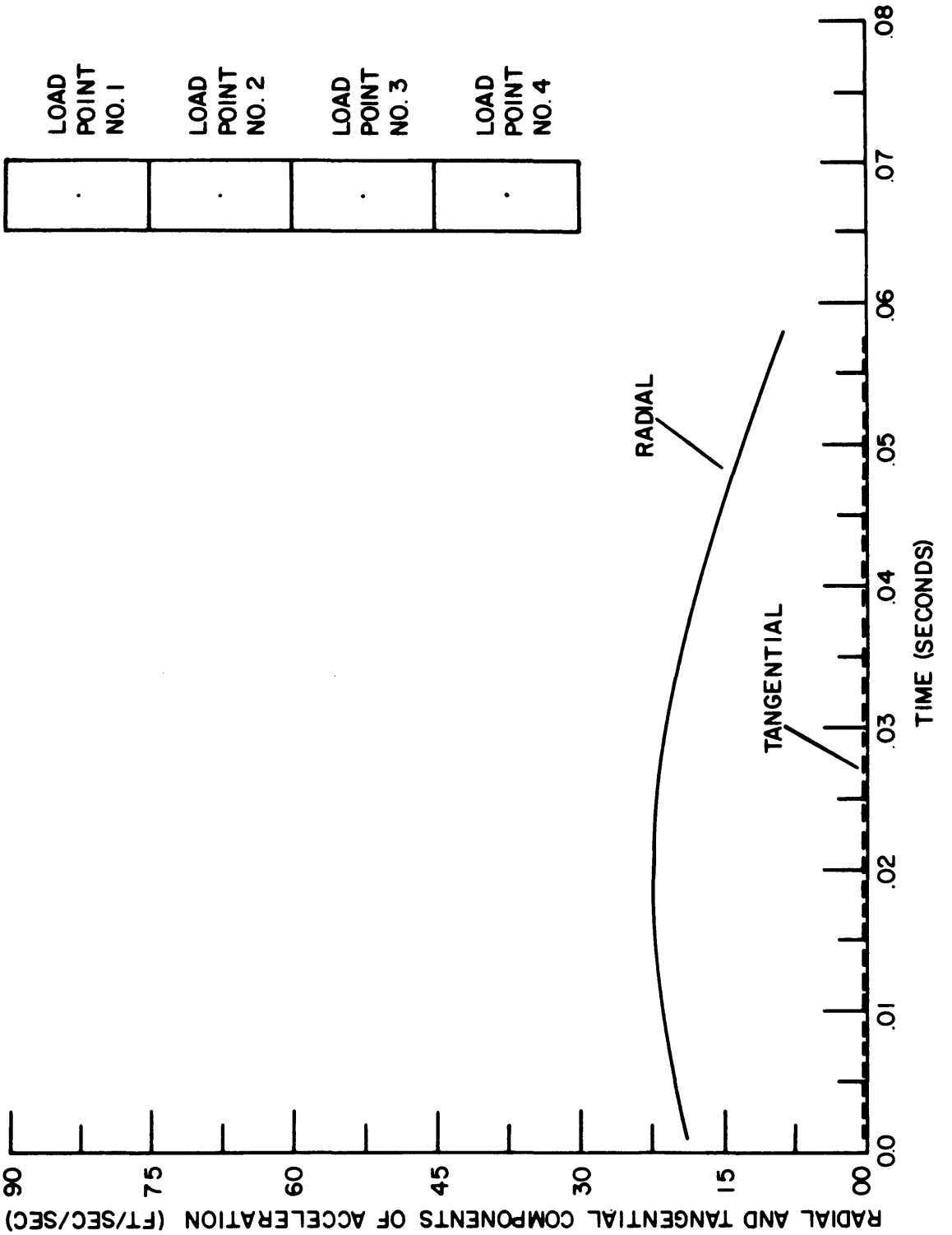
LOAD POINT NO. 3

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

LOCA AIR CLEARING ACCELERATION (SHEET 3 OF 4)

FIGURE 3A-354



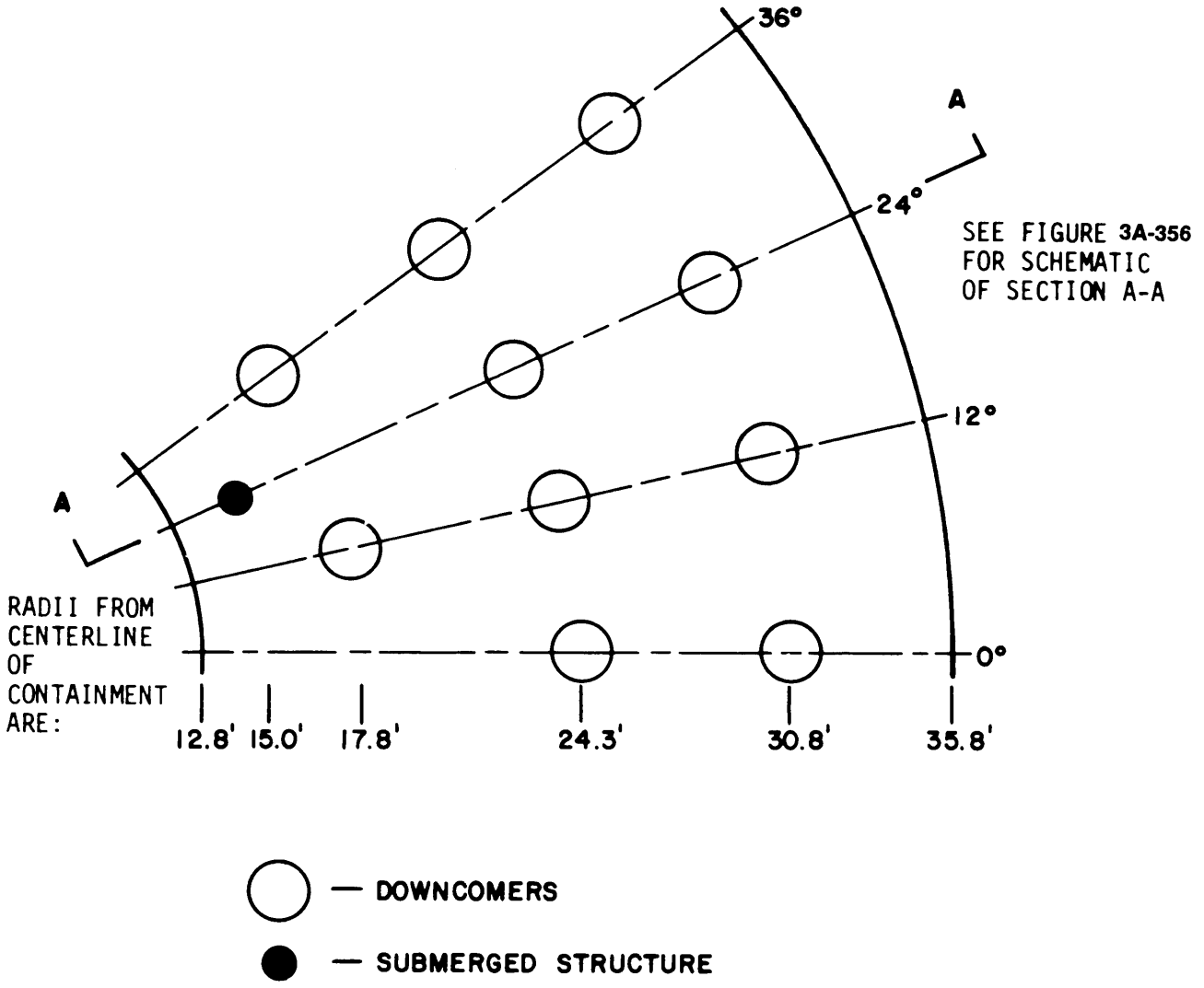
LOAD POINT NO. 4

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

LOCA AIR CLEARING ACCELERATION (SHEET 4 OF 4)

FIGURE 3A-354

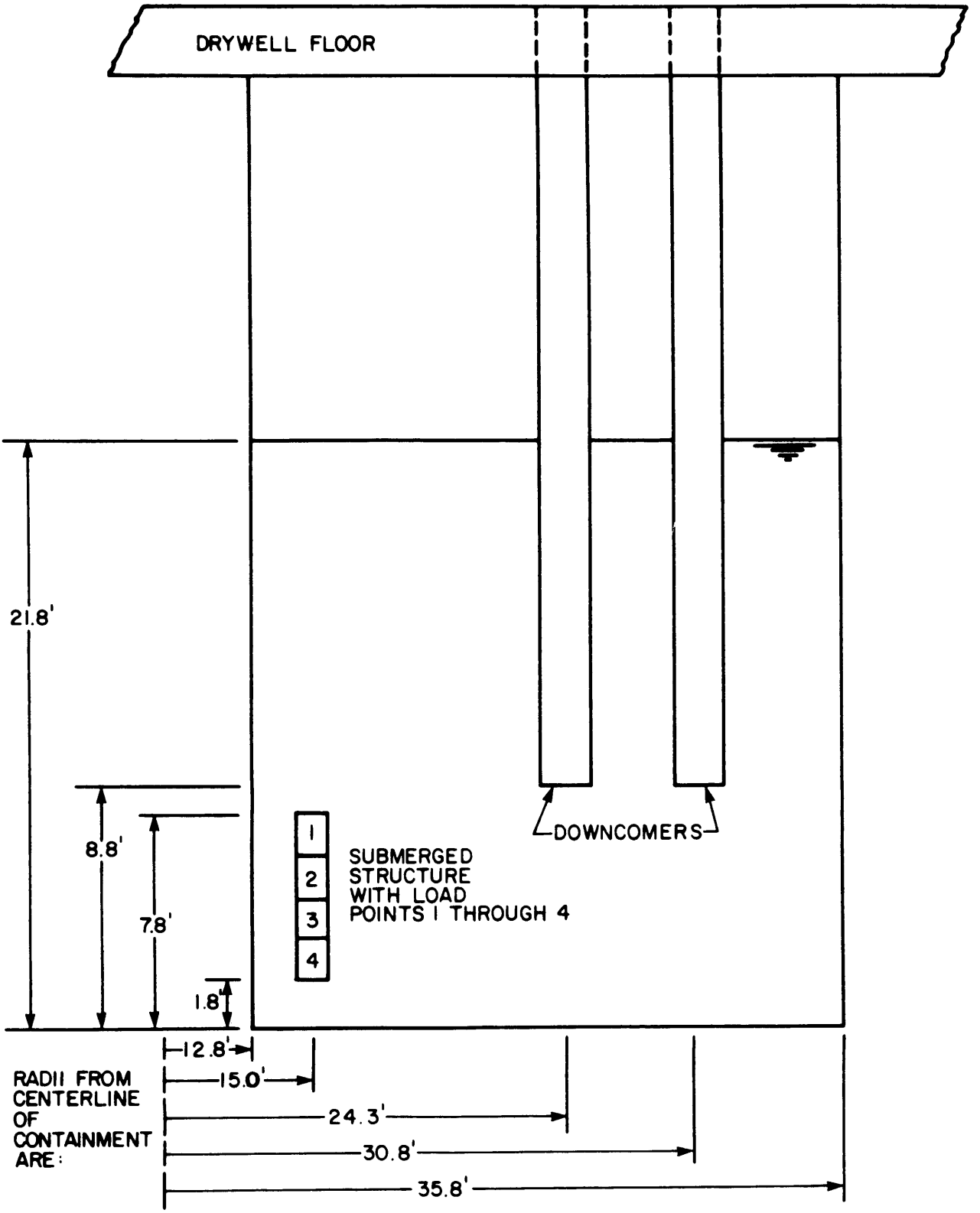


LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

TOP VIEW OF 36° SECTOR OF A TYPICAL MARK II SUPPRESSION POOL

FIGURE 3A-355

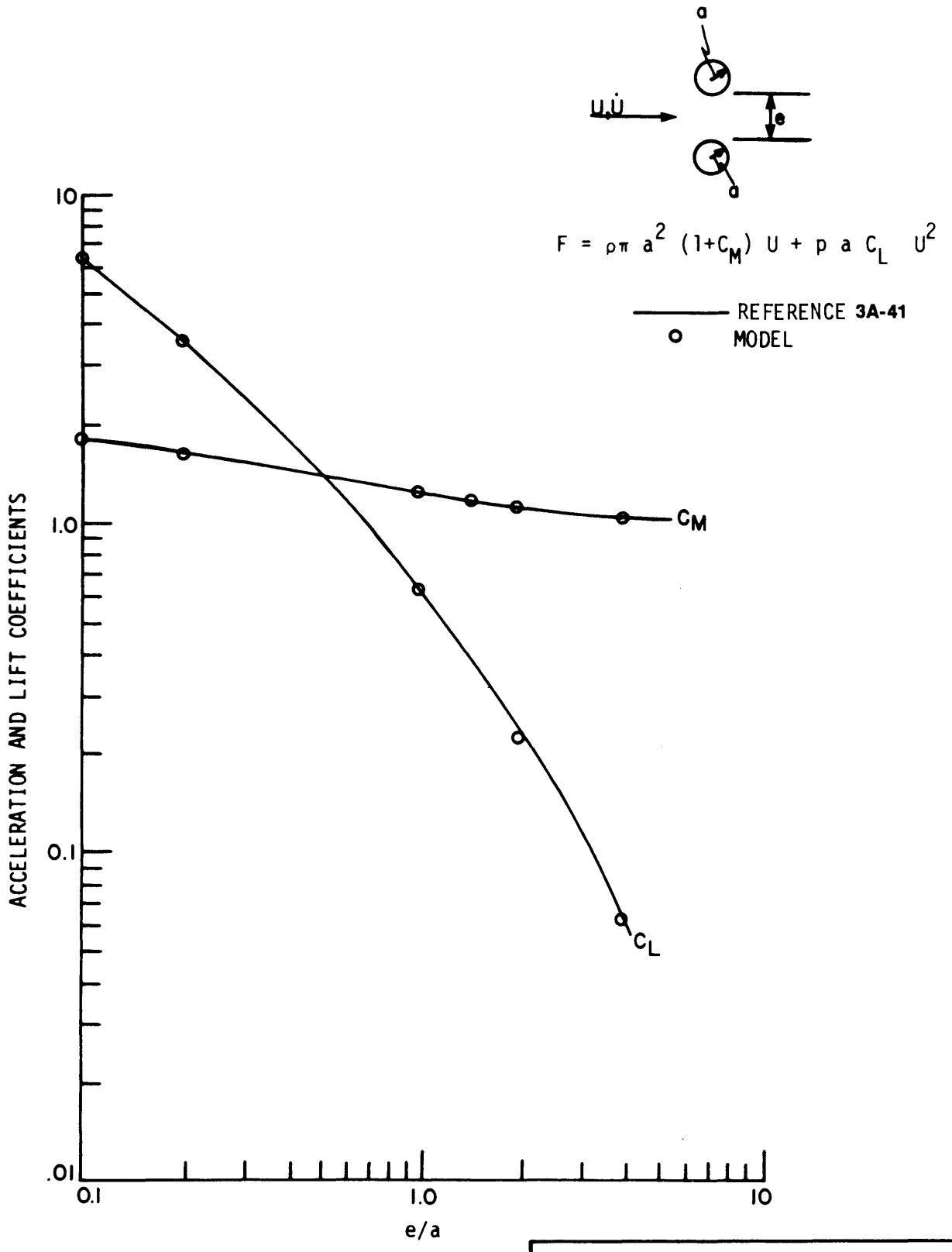


LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

SCHEMATIC VIEW OF SECTION A-A OF TYPICAL MARK II SUPPRESSION POOL

FIGURE 3A-356



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

MODEL/DATA COMPARISONS (SHEET 1 OF 4)

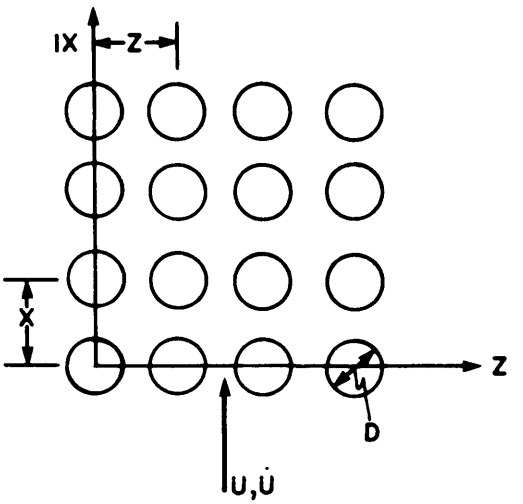
FIGURE 3A-357

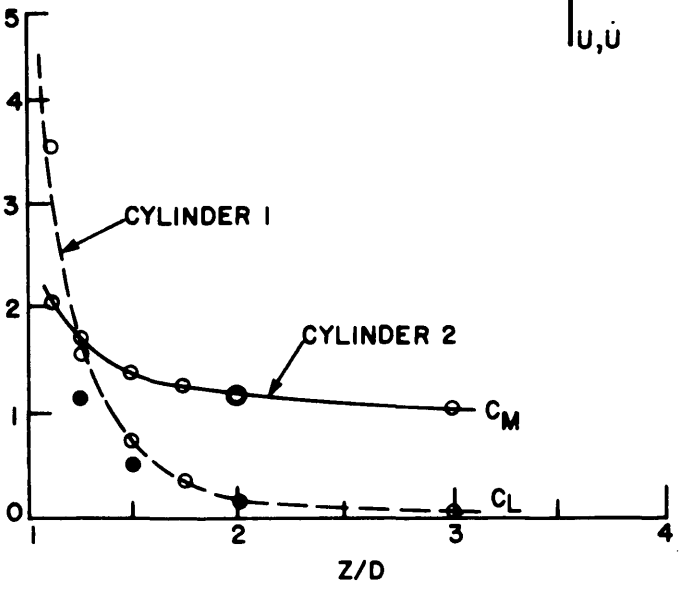
$$F = (1 + C_M)\,\rho\pi\,a^2\,U + \rho a\,C_L\,U\,U$$

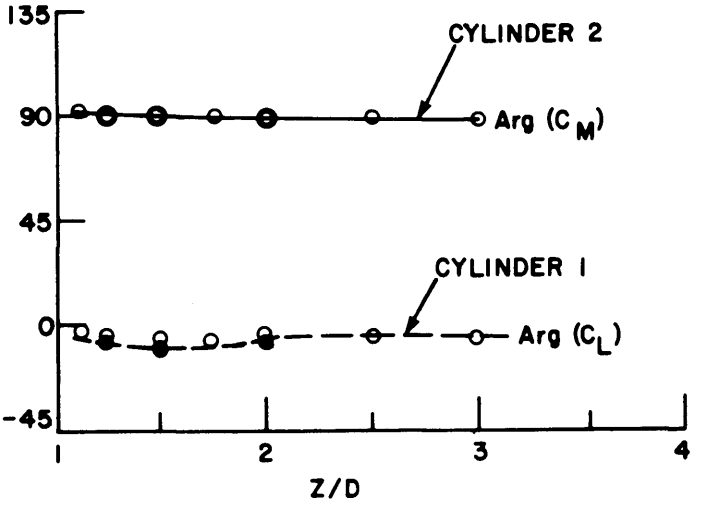
where $a = D/2$

o, O, —, - - - REFERENCE 3A-42

o MODEL





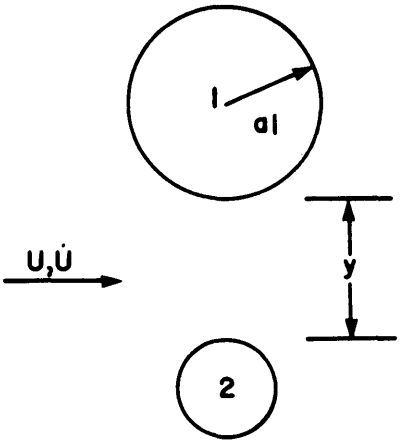


LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

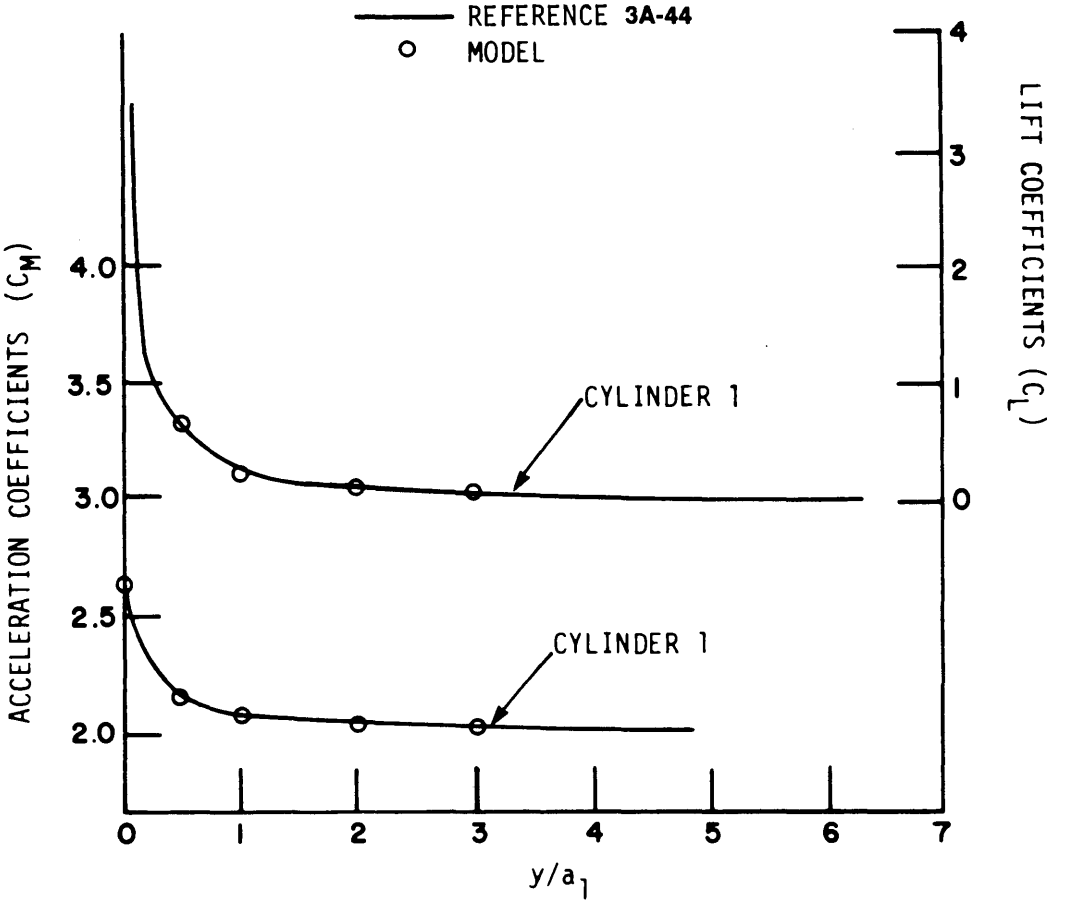
DESIGN ASSESSMENT REPORT

MODEL/DATA COMPARISONS (SHEET 2 OF 4)

FIGURE 3A-357



$$F = C_M \rho \pi a^2 \dot{U} + C_L \rho a U^2$$

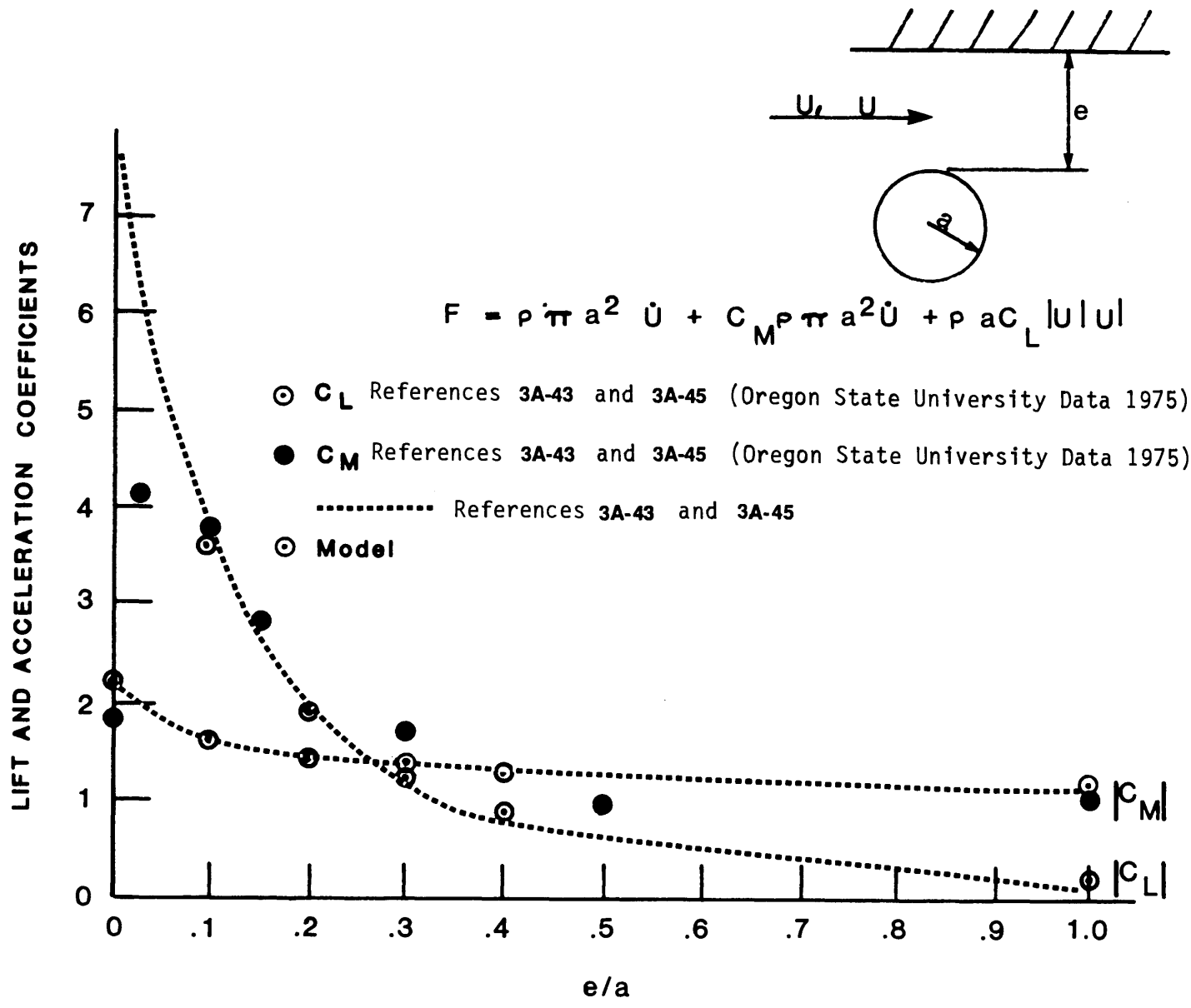


LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

MODEL/DATA COMPARISONS (SHEET 3 OF 4)

FIGURE 3A-357

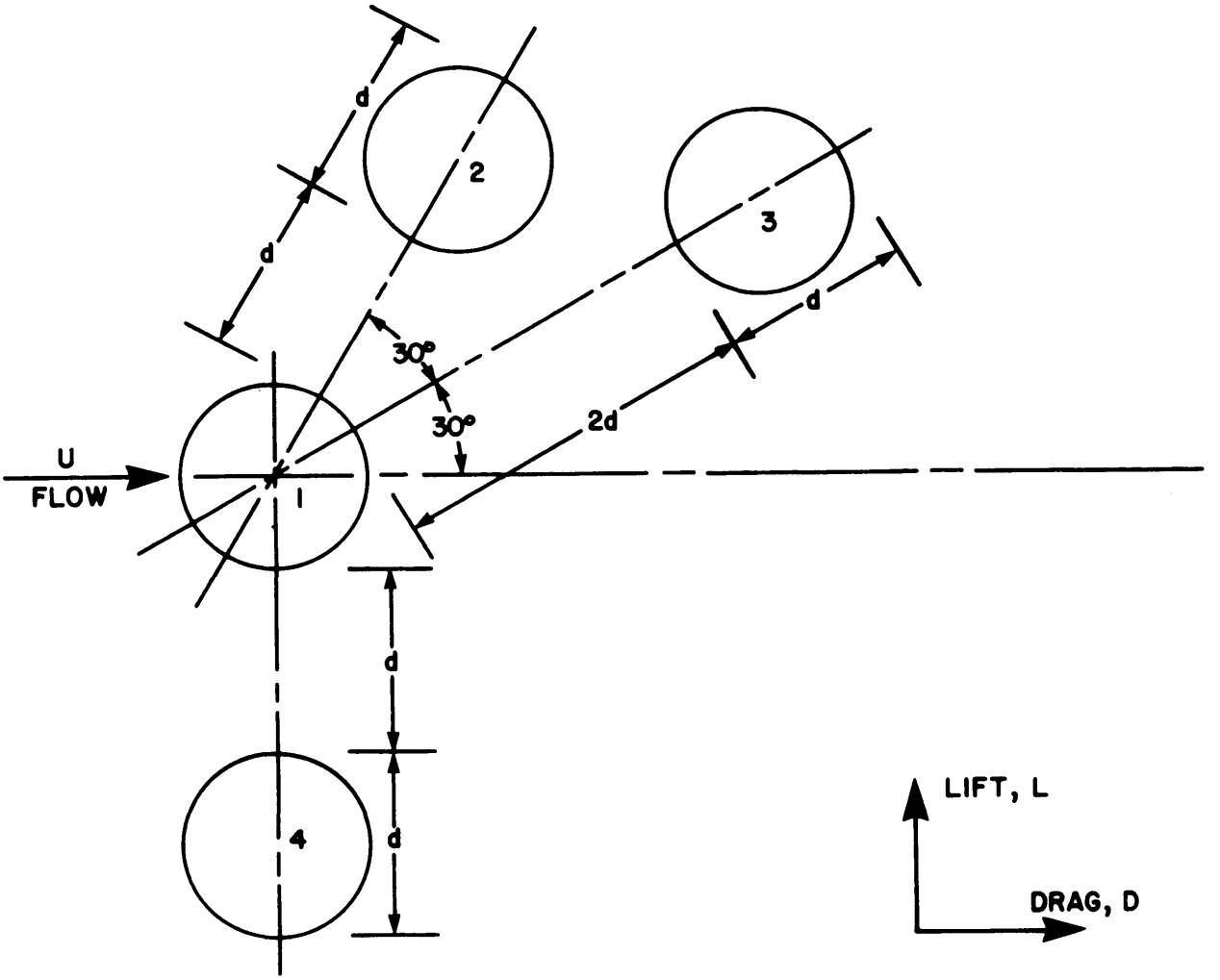


LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

MODEL/DATA COMPARISONS (SHEET 4 OF 4)

FIGURE 3A-357

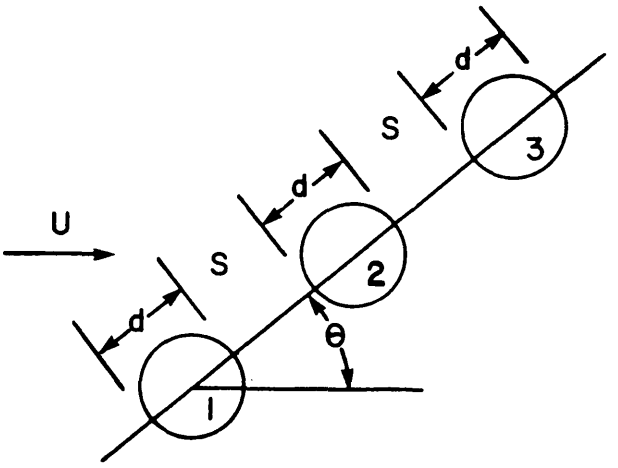


LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

CYLINDER LOCATIONS

FIGURE 3A-358

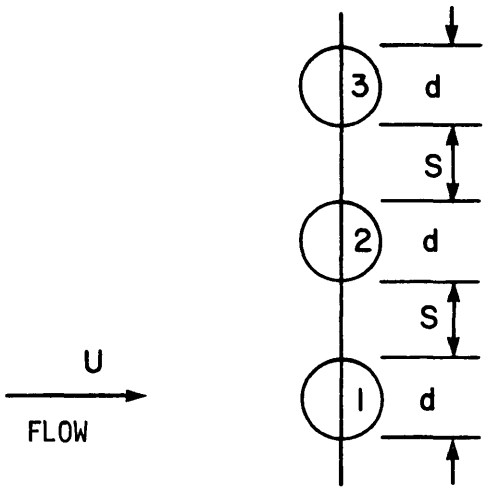


LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

INTERFERENCE ON STANDARD DRAG: THREE CYLINDER ARRANGEMENT

FIGURE 3A-359

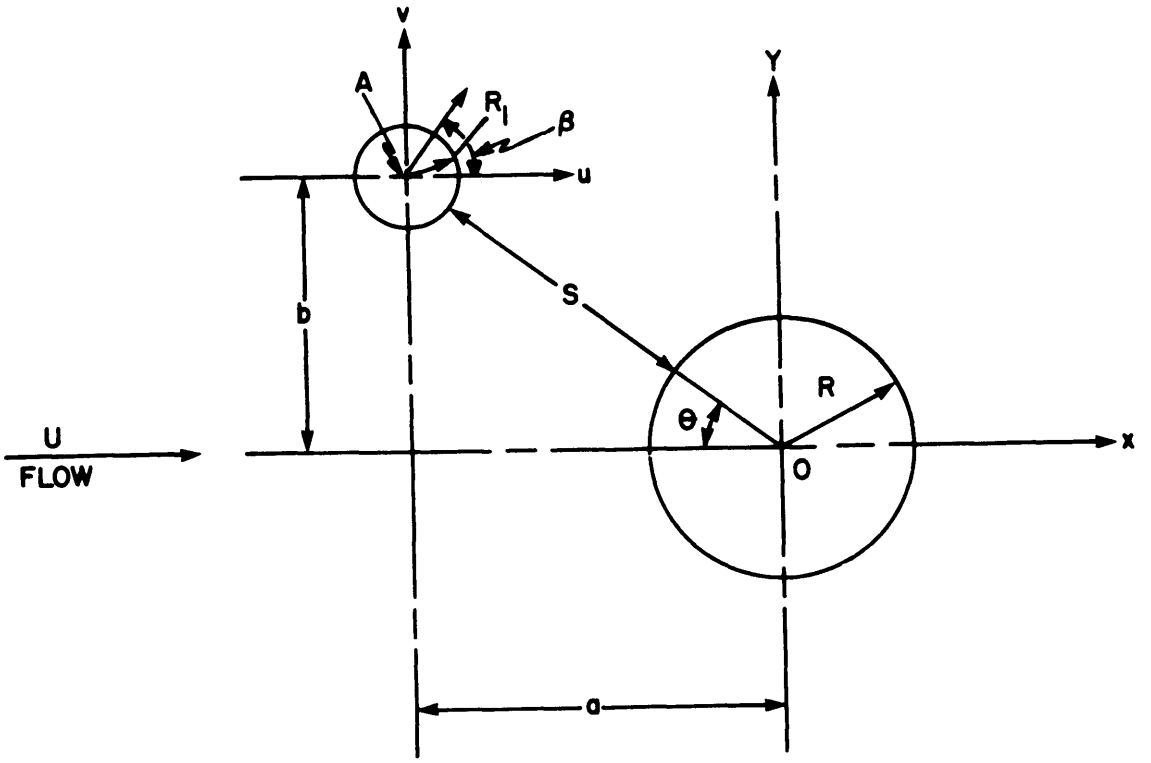


LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

INTERFERENCE ON STANDARD DRAG: THREE CYLINDER SIDE-BY-SIDE ARRANGEMENT

FIGURE 3A-360

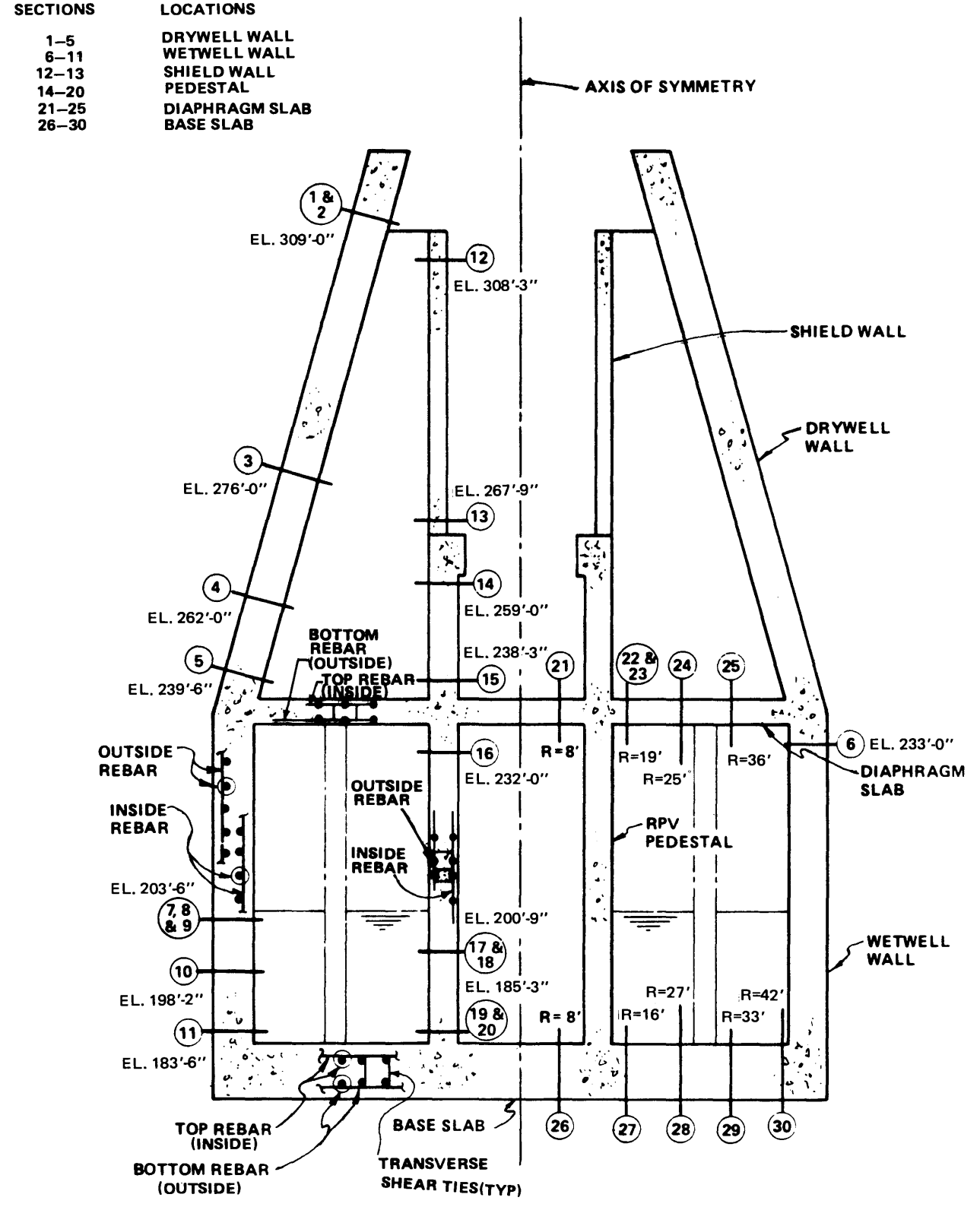


LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

FLOW AROUND UNEQUAL CYLINDERS

FIGURE 3A-361



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

CONTAINMENT ASSESSMENT SECTION LOCATION

FIGURE 3A-362

DRYWELL WALL
SECTIONS: 1, 2

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)						Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER			Transverse Ties	
	Vert	Hoop	Vert	Hoop	Diag.		
1	-	-	-	-	-	-	-
3, 6	-	-	-	-	-	-	-
4, 4a 4T, 4aT	18.57 7.14	31.36 6.83	5.82 13.4	13.90 19.75	11.17 16.83	6.50 10.99	-0.233 -0.967
5, 5a, 7, 7a 5T, 5aT, 7T, 7aT	25.66 11.36	30.66 -4.66	9.95 16.34	13.45 24.41	20.82 32.46	4.60 11.67	-0.257 -1.542

NOTES:
(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTAINMENT STRESSES
DRYWELL WALL

FIGURE 3A-363 **Rev. 12 9/04**

DRYWELL WALL
SECTIONS: 3

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)						Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER			Transverse Ties	
	Vert	Hoop	Vert	Hoop	Diag.		
1	-0.46	-0.07	-0.55	-0.04	-0.28	0.12	-0.432
3, 6	11.4	6.26	11.3	4.2	15.7	15.1	-0.200
4, 4a	9.97	43.0	14.8	19.5	17.4	11.4	-0.218
4T, 4aT	3.45	18.7	23.8	28.0	24.5	12.2	-0.926
5, 5a, 7, 7a	21.1	40.2	21.3	17.4	36.9	20.1	-0.460
5T, 5aT, 7T, 7aT	14.9	15.9	34.5	27.4	52.0	17.6	-1.38

NOTES:
(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

DRYWELL WALL
SECTIONS: 4

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)						Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER			Transverse Ties	
	Vert	Hoop	Vert	Hoop	Diag.		
1	-0.55	-0.02	-0.69	0.06	-0.35	0.15	-0.097
3, 6	13.0	6.44	13.0	4.2	17.1	20.31	-0.230
4, 4a	8.49	41.7	21.8	20.9	23.2	10.8	-0.202
4T, 4aT	4.43	20.3	29.2	30.2	32.4	11.4	-0.822
5, 5a, 7, 7a	26.3	39.3	28.7	17.5	39.7	24.9	-0.522
5T, 5aT, 7T, 7aT	16.8	16.3	40.6	28.6	48.0	21.8	-1.431

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTAINMENT STRESSES
DRYWELL WALL

FIGURE 3A-365 **Rev. 12 9/04**

DRYWELL WALL
SECTIONS: 5

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)						Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER			Transverse Ties	
	Vert	Hoop	Vert	Hoop	Diag.		
1	-0.73	1.04	-0.80	1.0	-0.35	0.16	-0.106
3, 6	15.5	10.3	14.6	5.5	20.0	18.6	-0.294
4, 4a	31.2	33.7	21.6	6.9	14.6	39.8	-0.671
4T, 4aT	22.6	13.2	24.1	24.4	22.7	36.5	-0.671
5, 5a, 7, 7a	43.6	33.2	32.8	9.5	37.6	54.0	-0.931
5T, 5aT, 7T, 7aT	30.4	9.9	45.5	22.1	47.7	46.2	-1.71

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTAINMENT STRESSES
DRYWELL WALL

FIGURE 3A-366 **Rev. 12 9/04**

DRYWELL WALL
SECTIONS: 6

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)						Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER			Transverse Ties	
	Vert	Hoop	Vert	Hoop	Diag.		
1	-1.2	1.08	-0.76	1.7	0.63	0.161	-0.99
3, 6	16.9	17.7	16.5	4.8	20.6	0.52	-0.361
4, 4a	31.1	39.6	26.8	9.2	18.6	43.7	-0.582
4T, 4aT	26.0	48.7	26.7	8.1	28.2	35.0	-0.718
5, 5a, 7, 7a	50.1	43.1	36.0	12.9	45.7	44.8	-1.009
5T, 5aT, 7T, 7aT	24.9	48.8	53.9	26.7	47.6	27.5	-1.592

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

DRYWELL WALL
SECTIONS: 7, 8, 9

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)						Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER			Transverse Ties	
	Vert	Hoop	Vert	Hoop	Diag.		
1	-1.36	9.7	-1.4	4.8	2.09	0.89	-0.210
3, 6	25.5	20.3	23.3	6.8	28.4	5.3	-0.427
4, 4a	14.8	38.4	26.8	25.5	26.2	13.6	-0.616
4T, 4aT	12.8	46.2	34.6	33.0	33.8	14.0	-1.31
5, 5a, 7, 7a	37.7	37.0	47.9	21.8	48.6	15.2	-0.819
5T, 5aT, 7T, 7aT	33.2	41.0	50.0	46.3	53.9	17.3	-2.12

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

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WETWELL WALL

FIGURE 3A-368 **Rev. 12 9/04**

DRYWELL WALL
SECTIONS: 10

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)						Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER			Transverse Ties	
	Vert	Hoop	Vert	Hoop	Diag.		
1	-1.68	15.8	-1.5	7.4	3.35	1.1	-0.254
3, 6	27.5	30.7	25.5	7.58	31.1	0.70	-0.503
4, 4a	16.6	42.4	29.1	35.3	31.4	5.3	-0.744
4T, 4aT	12.2	35.6	38.0	39.7	37.9	8.13	-1.50
5, 5a, 7, 7a	37.5	40.1	43.6	27.5	50.1	6.7	-1.13
5T, 5aT, 7T, 7aT	29.4	46.7	53.8	35.6	52.4	7.4	-2.25

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

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WETWELL WALL

FIGURE 3A-369 **Rev. 12 9/04**

DRYWELL WALL
SECTIONS: 11

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)						Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER			Transverse Ties	
	Vert	Hoop	Vert	Hoop	Diag.		
1	-1.57	4.95	-1.5	2.96	1.16	2.81	-0.233
3, 6	29.8	21.2	27.1	8.48	34.3	15.3	-0.527
4, 4a	38.1	35.5	33.2	6.48	20.3	42.9	-0.703
4T, 4aT	36.1	18.5	38.2	11.2	25.1	44.5	-0.990
5, 5a, 7, 7a	53.9	32.9	46.0	9.0	45.0	45.0	-1.04
5T, 5aT, 7T, 7aT	47.2	40.6	51.2	17.0	47.4	45.4	-1.69

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

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WETWELL WALL

FIGURE 3A-370 **Rev. 12 9/04**

DRYWELL WALL
SECTIONS: 12

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER PLATE		OUTER PLATE		Transverse Ties	
	Vert	Hoop	Vert	Hoop		
1	0.39	3.6	-0.11	1.2	1.0	-0.071
3, 6	7.1	8.7	2.1	2.9	1.4	-0.293
4, 4a 4T, 4aT	2.2 2.0	9.2 8.8	-0.64 0.81	3.7 3.3	7.5 7.5	-0.265 -0.265
5, 5a, 7, 7a 5T, 5aT, 7T, 7aT	8.5 8.3	12.8 12.4	2.7 2.5	5.1 4.7	9.5 9.5	-0.407 -0.407

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

DRYWELL WALL
SECTIONS: 13

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER PLATE		OUTER PLATE		Transverse Ties	
	Vert	Hoop	Vert	Hoop		
1	-0.28	0.08	-0.57	-0.10	0.128	-0.077
3, 6	9.7	3.5	2.9	1.1	0.63	-0.404
4, 4a 4T, 4aT	-0.65 -1.45	0.29 -1.73	-0.94 -0.53	-0.15 1.03	0.26 0.26	-0.128 -0.128
5, 5a, 7, 7a 5T, 5aT, 7T, 7aT	10.7 9.9	3.6 1.9	2.9 3.3	1.1 2.1	2.4 2.4	-0.444 -0.444

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

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SHIELD WALL

FIGURE 3A-372 **Rev. 12 9/04**

DRYWELL WALL
SECTIONS: 14

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-1.0	1.0	-1.2	1.2	0.34	-0.157
3, 6	17.2	13.4	29.2	17.4	3.9	-0.352
4, 4a	-1.3	2.4	-1.7	2.0	0.31	-0.230
4T, 4aT	7.98	7.0	-2.31	4.97	0.31	-0.230
5, 5a, 7, 7a	17.2	14.7	25.6	17.2	3.3	-0.432
5T, 5aT, 7T, 7aT	25.7	19.3	25.0	20.2	3.3	-0.432

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

DRYWELL WALL
SECTIONS: 15

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-1.5	0.94	-2.2	0.32	0.35	-0.290
3, 6	43.9	27.2	52.5	33.6	4.7	-0.649
4, 4a 4T, 4aT	4.5 14.5	32.2 -4.8	6.1 4.9	47.0 -5.9	21.1 48.3	-0.474 -0.910
5, 5a, 7, 7a 5T, 5aT, 7T, 7aT	52.9 49.9	50.1 8.2	52.9 51.9	51.8 -4.0	39.4 27.4	-0.856 -1.017

NOTES:
(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

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FIGURE 3A-374 **Rev. 12 9/04**

DRYWELL WALL
SECTIONS: 16

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-1.5	1.1	-2.0	3.1	0.34	-0.266
3, 6	30.3	13.02	39.4	29.1	0.86	-0.526
4, 4a 4T, 4aT	6.9 13.3	12.6 13.3	4.8 5.7	30.4 28.0	7.9 15.0	-0.678 -1.051
5, 5a, 7, 7a 5T, 5aT, 7T, 7aT	45.0 37.3	26.1 16.0	42.7 22.7	36.8 15.5	19.6 27.9	-0.931 -1.249

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

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FIGURE 3A-375 **Rev. 12 9/04**

DRYWELL WALL
SECTIONS: 17, 18

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-2.1	5.0	-2.7	12.9	9.0	-0.382
3, 6	9.9	8.5	10.5	17.0	12.9	-0.690
4, 4a	-4.1	11.9	-4.8	28.3	17.0	-0.681
4T, 4aT	4.13	13.8	-4.3	28.9	26.8	-0.635
5, 5a, 7, 7a	18.6	15.7	20.5	29.8	22.5	-1.017
5T, 5aT, 7T, 7aT	23.0	22.1	22.0	32.6	38.9	-0.968

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

DRYWELL WALL
SECTIONS: 19, 20

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-2.01	-0.176	-2.95	0.27	0.59	-0.424
3, 6	17.9	5.26	11.8	5.4	4.7	-0.483
4, 4a	4.86	3.69	-5.2	7.1	5.68	-0.744
4T, 4aT	5.2	-6.1	-5.39	-4.8	5.68	-0.744
5, 5a, 7, 7a	25.9	7.2	32.5	12.8	15.9	-0.851
5T, 5aT, 7T, 7aT	26.2	-5.8	32.3	8.2	15.9	-0.851

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

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RPV PEDESTAL

FIGURE 3A-377 **Rev. 12 9/04**

DRYWELL WALL
SECTIONS: 21

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-	-	-	-	-	-
3, 6	8.5	8.6	6.9	7.7	1.01	-0.073
4, 4a 4T, 4aT	38.8 32.8	30.2 21.6	28.9 35.9	22.7 27.6	8.8 9.5	-0.374 -1.82
5, 5a, 7, 7a 5T, 5aT, 7T, 7aT	35.6 31.7	30.1 21.5	29.3 34.6	23.3 28.0	8.8 8.9	-0.365 -1.83

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

DRYWELL WALL
SECTIONS: 22, 23

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-	-	-	-	-	-
3, 6	7.9	9.5	10.2	13.0	4.46	-0.370
4, 4a 4T, 4aT	14.1 -11.1	21.5 12.3	18.4 26.2	24.2 29.8	16.1 7.0	-0.383 -1.367
5, 5a, 7, 7a 5T, 5aT, 7T, 7aT	16.4 -13.1	23.1 16.0	23.7 25.5	27.9 35.9	18.0 7.2	-0.623 -1.727

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

DRYWELL WALL
SECTIONS: 24

Load Combination Equation (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-	-	-	-	-	-
3, 6	10.2	9.6	9.1	8.0	3.0	-0.272
4, 4a 4T, 4aT	22.8 -8.61	22.6 -8.29	30.5 33.2	21.1 29.4	5.9 4.2	-0.842 -1.59
5, 5a, 7, 7a 5T, 5aT, 7T, 7aT	27.9 -10.3	25.4 12.3	33.4 35.5	24.4 30.8	6.2 4.9	-0.931 -1.738

NOTES:

(1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

(5) Values reflect analysis with an initial Drywell air temperature of 135°F. Increasing this temperature to 150°F does not adversely impact the results of this Design Assessment Report.

DIAPHRAGM SLAB
SECTION: 25

Load Combination Equations (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-	-	-	-	-	-
3, 6	13.0	15.5	12.1	14.5	0.66	-.157
4, 4a	26.7	28.0	23.5	30.6	9.9	-.336
4T, 4aT	12.9	24.0	26.1	35.4	6.5	-2.04
5, 5a, 7, 7a	33.6	38.5	28.6	35.9	10.4	-.423
5T, 5aT, 7T, 7aT	19.3	31.8	41.1	42.4	9.5	-2.40

NOTES: (1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table **3A-14**, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

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DIAPHRAGM SLAB

FIGURE 3A-381

BASE SLAB
SECTION: 26

Load Combination Equations (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stabs, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-	-	-	-	-	-
3, 6	1.7	16.6	5.93	6.22	5.29	-0.318
4, 4a	2.72	1.61	7.10	3.29	0.43	-0.213
4T, 4aT	-5.21	-5.63	15.2	14.9	3.4	-1.21
5, 5a, 7, 7a	10.9	20.7	10.4	9.51	4.03	-0.443
5T, 5aT, 7T, 7aT	-6.36	-4.95	18.4	17.3	3.12	-1.34

NOTES: (1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

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CONTAINMENT STRESSES
BASE SLAB

FIGURE 3A-382

BASE SLAB
SECTION: 27

Load Combination Equations (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-	-	-	-	-	-
3, 6	25.4	26.8	15.5	6.43	24.7	-0.479
4, 4a	10.3	-0.43	11.1	0.65	23.9	-0.309
4T, 4aT	22.4	-7.3	29.8	13.3	33.1	-1.70
5, 5a, 7, 7a	39.8	34.4	29.3	13.9	41.0	-0.540
5T, 5aT, 7T, 7aT	30.0	20.2	29.0	17.1	39.8	-1.79

NOTES: (1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

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CONTAINMENT STRESSES
BASE SLAB

FIGURE 3A-383

BASE SLAB
SECTION: 28

Load Combination Equations (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-	-	-	-	-	-
3, 6	34.0	17.8	11.1	10.6	17.5	-0.910
4, 4a	21.7	9.15	16.9	8.7	12.5	-0.304
4T, 4aT	-8.25	-8.07	17.7	13.4	6.7	-1.59
5, 5a, 7, 7a	42.1	21.2	18.2	16.1	25.2	-0.985
5T, 5aT, 7T, 7aT	25.4	-8.4	23.7	19.8	18.7	-1.72

NOTES: (1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table 3A-14, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

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CONTAINMENT STRESSES
BASE SLAB

FIGURE 3A-384

BASE SLAB
SECTION: 29

Load Combination Equations (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-	-	-	-	-	-
3, 6	12.7	15.6	9.01	8.52	11.1	-0.524
4, 4a	11.8	9.51	17.3	7.95	11.0	-0.243
4T, 4aT	9.32	-6.40	20.6	12.6	12.0	-1.23
5, 5a, 7, 7a	17.7	18.9	19.0	13.3	18.5	-0.508
5T, 5aT, 7T, 7aT	14.4	-6.22	21.5	16.1	18.9	-1.18

NOTES: (1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table **3A-14**, 4T, 4aT, 5T, 5aT, 7T, 7aT include thermal components.

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CONTAINMENT STRESSES
BASE SLAB

FIGURE 3A-385

BASE SLAB
SECTION: 30

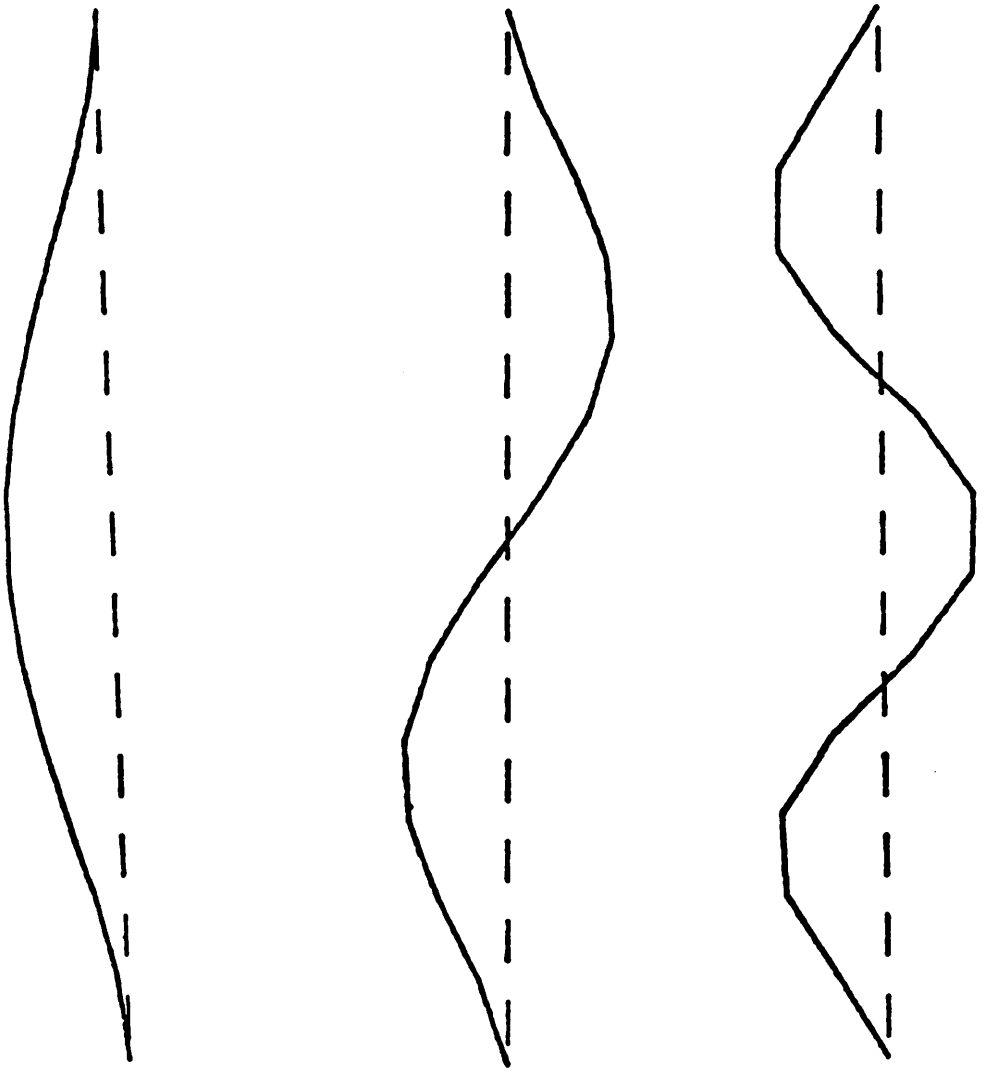
Load Combination Equations (4)	MAXIMUM REBAR STRESSES, KSI (1)(3)					Max. Concrete Stress, KSI (2)(3)
	INNER		OUTER		Transverse Ties	
	Radial	Hoop	Radial	Hoop		
1	-	-	-	-	-	-
3, 6	9.32	16.9	9.14	8.54	7.0	-0.414
4, 4a	29.9	33.5	34.1	10.2	25.6	-0.430
4T, 4aT	29.2	5.5	38.5	12.9	27.4	-0.902
5, 5a, 7, 7a	23.9	36.5	32.9	16.6	28.4	-0.688
5T, 5a%, 7T, 7aT	22.5	-6.36	36.5	19.6	28.9	-0.915

NOTES: (1) Allowable Reinforcing Steel Stress = 54 KSI

(2) Allowable Concrete Compressive Stress = 3.4 KSI

(3) "+" for Tensile Stress; "-" for Compressive Stress

(4) Load Combination Equations are taken from Table **3A-14**, 4T, 4aT, 5T, 5aT, 7T, 7aT include Thermal Components.



MODE 1
f=20 HZ

MODE 2
f=53 HZ

MODE 3
f=93 HZ

(WITH WATER MASS)

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SUPPRESSION CHAMBER COLUMNS MODE SHAPES

FIGURE 3A-387

SUPPRESSION CHAMBER COLUMNS

COLUMN	MAXIMUM AXIAL STRESS (KSI)	ALLOWABLE AXIAL STRESS (KSI)	MAXIMUM FLEXURAL STRESS (KSI)	ALLOWABLE FLEXURAL STRESS (KSI)	COMBINED STRESS RATIO	STRESS MARGIN %
42" dia pipe (shell element)	11.7	27.3	8.7	28.0	0.74	26
Top Anchorage	22.6	29.9	-	-	0.76	24
Bottom Anchorage	-	-	-	-	-	10

NOTE: These stress margins are based on load combination 7 of Table 3A-15 which is the critical load combination.

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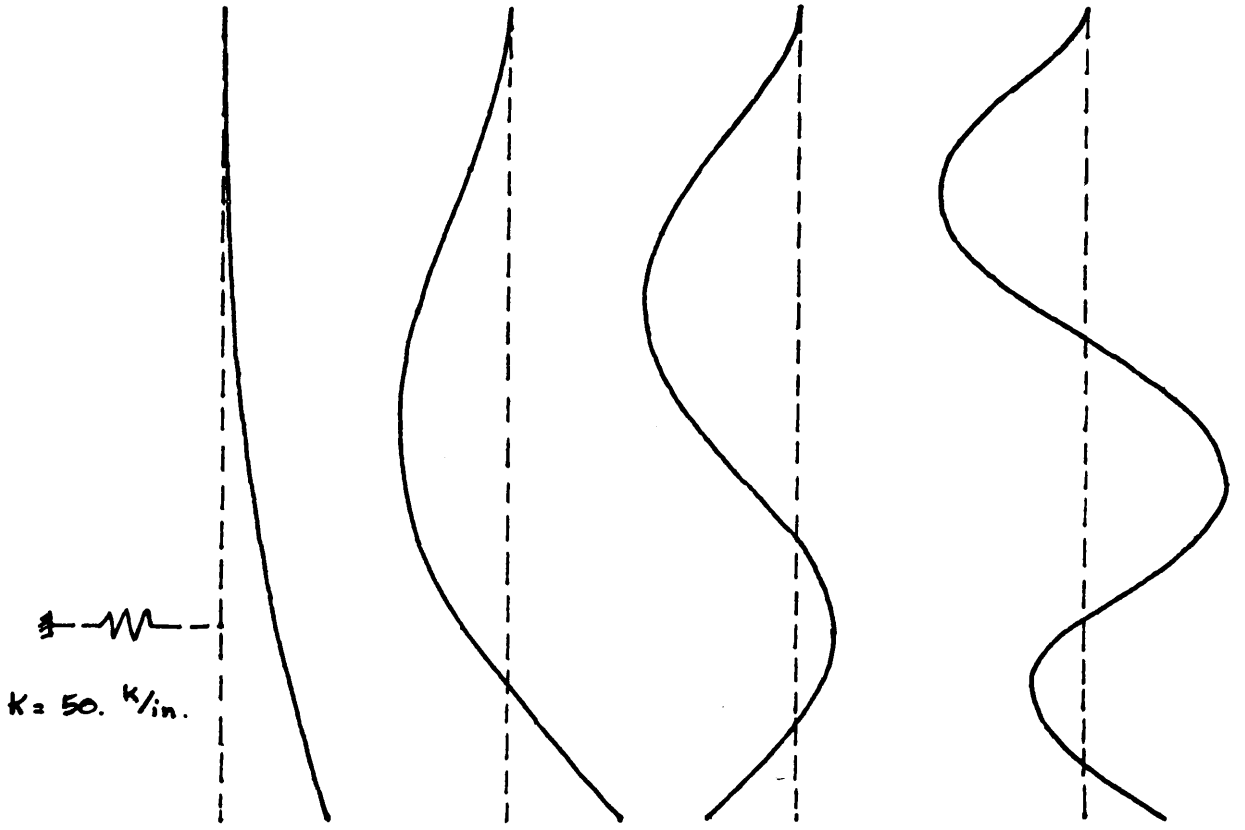
SUPPRESSION CHAMBER COLUMNS DESIGN MARGIN

FIGURE 3A-388



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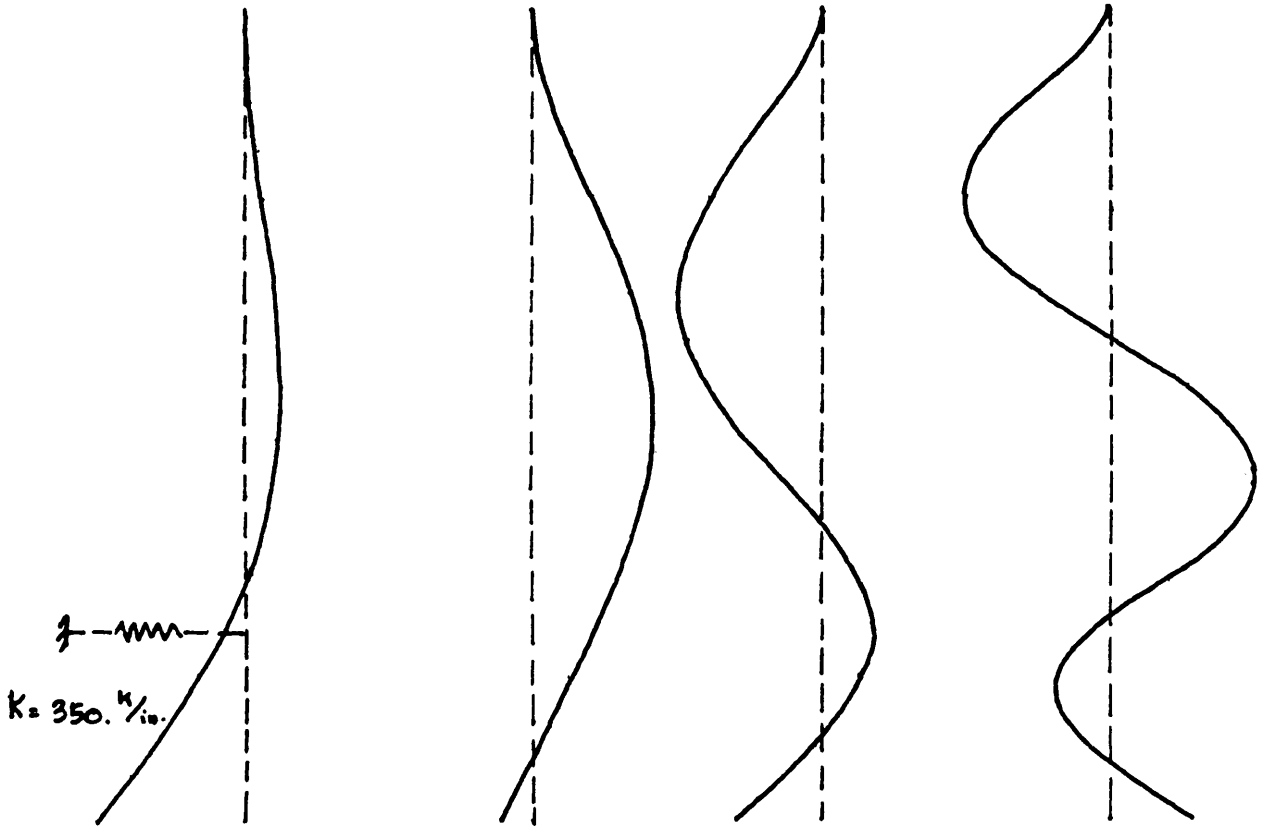
DOWNCOMER MODE SHAPES, K = 50k/in

FIGURE 3A-389



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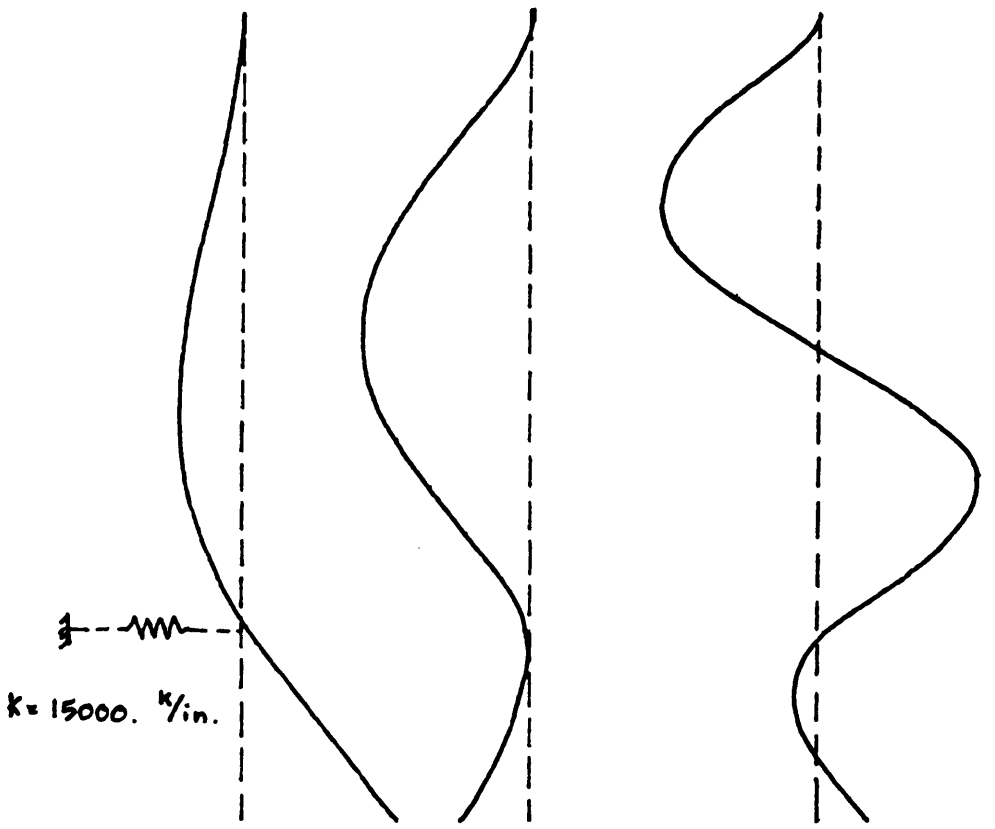
DESIGN ASSESSMENT REPORT

DOWNCOMER MODE SHAPES, K = 350k/in

FIGURE 3A-390



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DOWNCOMER MODE SHAPES, K = 15000k/in

FIGURE 3A-391

DOWNCOMER - STRESS SUMMARY AND DESIGN MARGINS

LOAD COMBINATION	CONDITION	ALLOWABLE STRESS (KSI)	STRESS (KSI)	DESIGN MARGIN (%)
Equation 1	Upset	28.4	17.5	38.4
Equation 2	Emergency	42.5	19.9	53.2
Equation 3	Emergency	42.5	37.4	12.0
Equation 4	Faulted	56.7	20.0	64.7
Equation 5	Faulted	56.7	37.4	34.0
Equation 6	Faulted	56.7	37.5	33.9
Equation 7	Faulted	56.7	24.5	56.8

NOTE: Equation numbers are based on Table 3A-17.

LIMERICK GENERATING STATION
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DESIGN ASSESSMENT REPORT

DOWNCOMER DESIGN MARGIN

FIGURE 3A-392

USAGE FACTOR SUMMARY OF DOWNCOMERS

LOADS	NORMAL/UPSET CONDITION				EMERGENCY/FAULTED CONDITIONS			CUMULATIVE USAGE
	± OBE ± SRV_1 ± SRV_2	± SRV_1 ± SRV_2 ± CHUG	± SRV_1 ± SRV_2	± SRV_1	SBA o PRESSURE o THERMAL TRANSIENT o STEAM FLOW ± CHUG ± SRV_1 ± SRV_2	IBA OR SBA o PRESSURE o THERMAL TRANSIENT o STEAM FLOW ± CHUG ± SRV_1 ± SRV_2 ± SSE	DBA o PRESSURE o THERMAL TRANSIENT o STEAM FLOW ± CHUG ± SSE	
AT PLATFORM RING	0.001	0.600	0.116	0.080	0.003			0.80
AT 24" x 24" VACUUM BREAKER TEE	0.002	0.194	0.160	0.151	0.001			0.51
AT PIPE ATTACHMENT (1) ELEV. 221'-0"	0.001	0.545	0.078	0.071	0.003			0.70

(1) ORIGINAL LOCATION OF VACUUM BREAKER (ABANDONED)

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DESIGN ASSESSMENT REPORT
DOWNCOMER FATIGUE USAGE FACTOR
FIGURE 3A-393

STRESS CYCLES FOR FATIGUE EVALUATION OF DOWNCOMERS

LOAD TYPE	No. OF CYCLES
N_{SRV1}	14100
N_{SRV2}	7700
N_{OBE}	50
N_{CHUG}	3000
N_{SSE}	10

N_{OBE} = Cycles associated with OBE
N_{SRV1} = Cycles associated with SRV_1 (Submerged Structure Load)
N_{SRV2} = Cycles associated with SRV_2 (Inertia)
N_{CHUG} = Cycles associated with Chugging
N_{SSE} = Cycles associated with SSE

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DOWNCOMER FATIGUE CYCLES

FIGURE 3A-394

FATIGUE LOAD HISTOGRAM FOR DOWNCOMERS

NORMAL/UPSET CONDITION				EMERGENCY	FAULTED	
				SBA	IBA or SBA	DBA
± OBE ± SRV_1 ± SRV_2	± SRV_1 ± SRV_2 ± CHUG	± SRV_1 ± SRV_2	± SRV_1	° Pressure ° Thermal Transient ° Steam Flow ± CHUG ± SRV_1 ± SRV_2	° Pressure ° Thermal Transient ° Steam Flow ± CHUG ± SRV_1 ± SRV_2 ± SSE	° Pressure ° Thermal Transient ° Steam Flow ± CHUG ± SSE
1 2	3 4	5 6	7 8	9 10	9 10	9 10
50 cycles	3000 cycles	4650 cycles	6400 cycles	Load set pair 9-10 is for one of the three above events which produce the largest combined stress. The cycles associated with oscillatory loads combined with SSE are assumed conservatively to be 10.		

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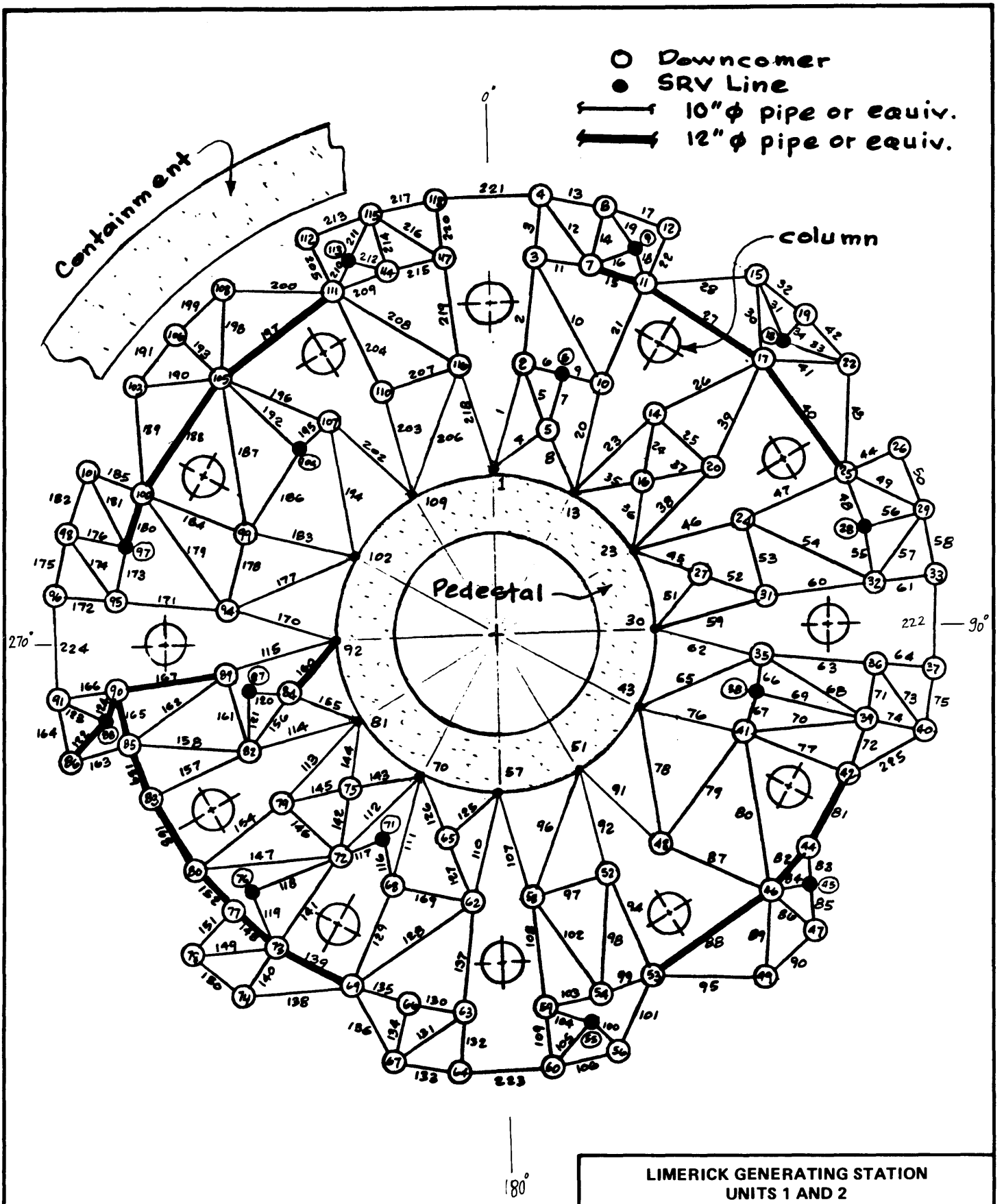
DESIGN ASSESSMENT REPORT
DOWNCOMER FATIGUE HISTOGRAM

FIGURE 3A-395



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DESIGN ASSESSMENT REPORT

DOWNCOMER BRACING MATHEMATICAL MODEL

FIGURE 3A-396

DOWNCOMER BRACING SYSTEM - STRESS SUMMARY

BRACING MEMBER DESIGN MARGINS FOR CRITICAL MEMBERS AND GOVERNING LOAD COMBINATION

QUADRANT(2)	MEMBER(2)	EQUATION(1)	MARGIN - %
1	58	7	5%
2	75	7	6%
3	126	7	5%
4	217	7	4%
Link between Quadrants	221	7	3%

NOTES: (1) Equation number is based on Table 3A-15

(2) Figure 3A-396 gives location reference

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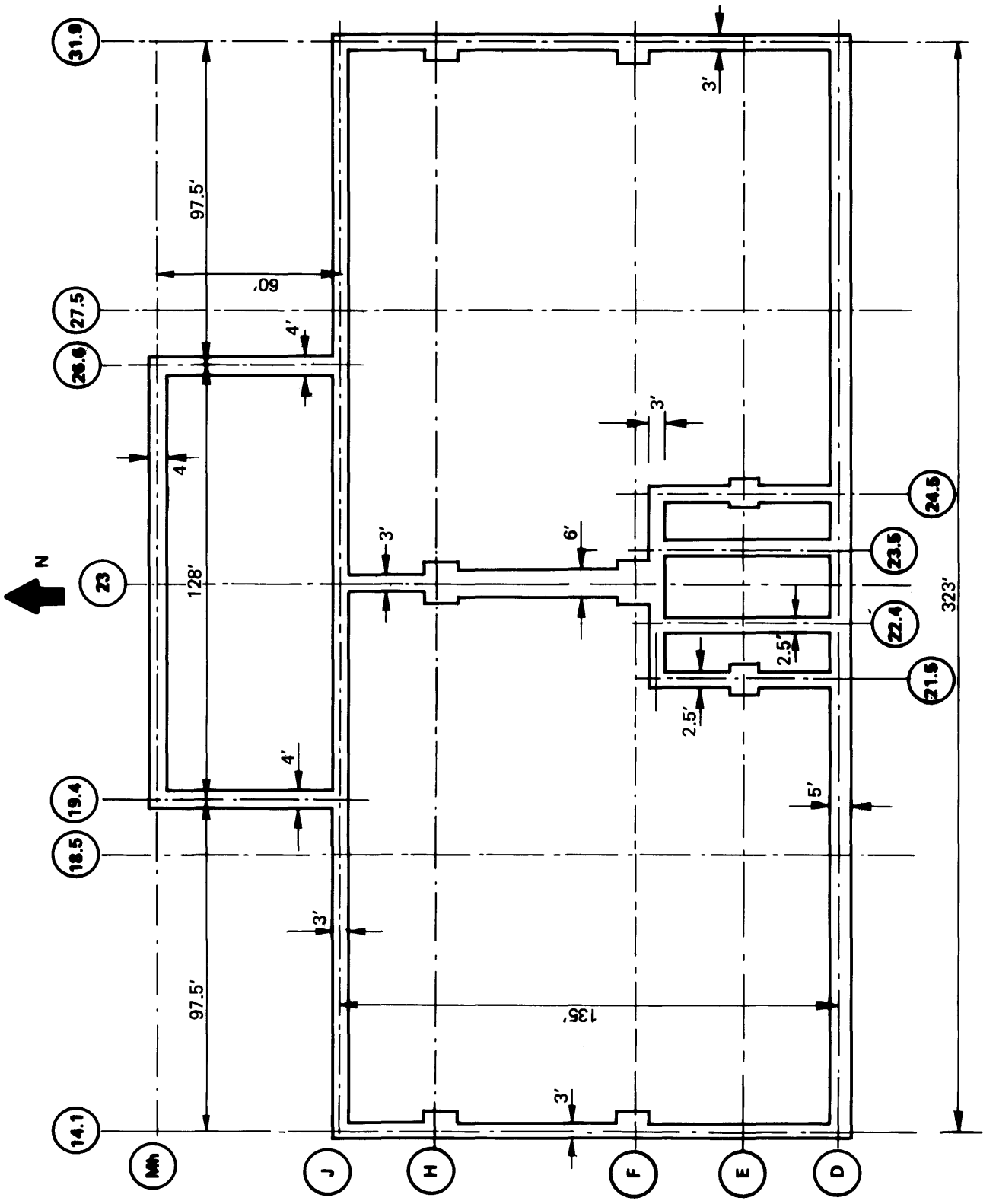
DESIGN ASSESSMENT REPORT

DOWNCOMER BRACING SYSTEM DESIGN MARGIN

FIGURE 3A-397



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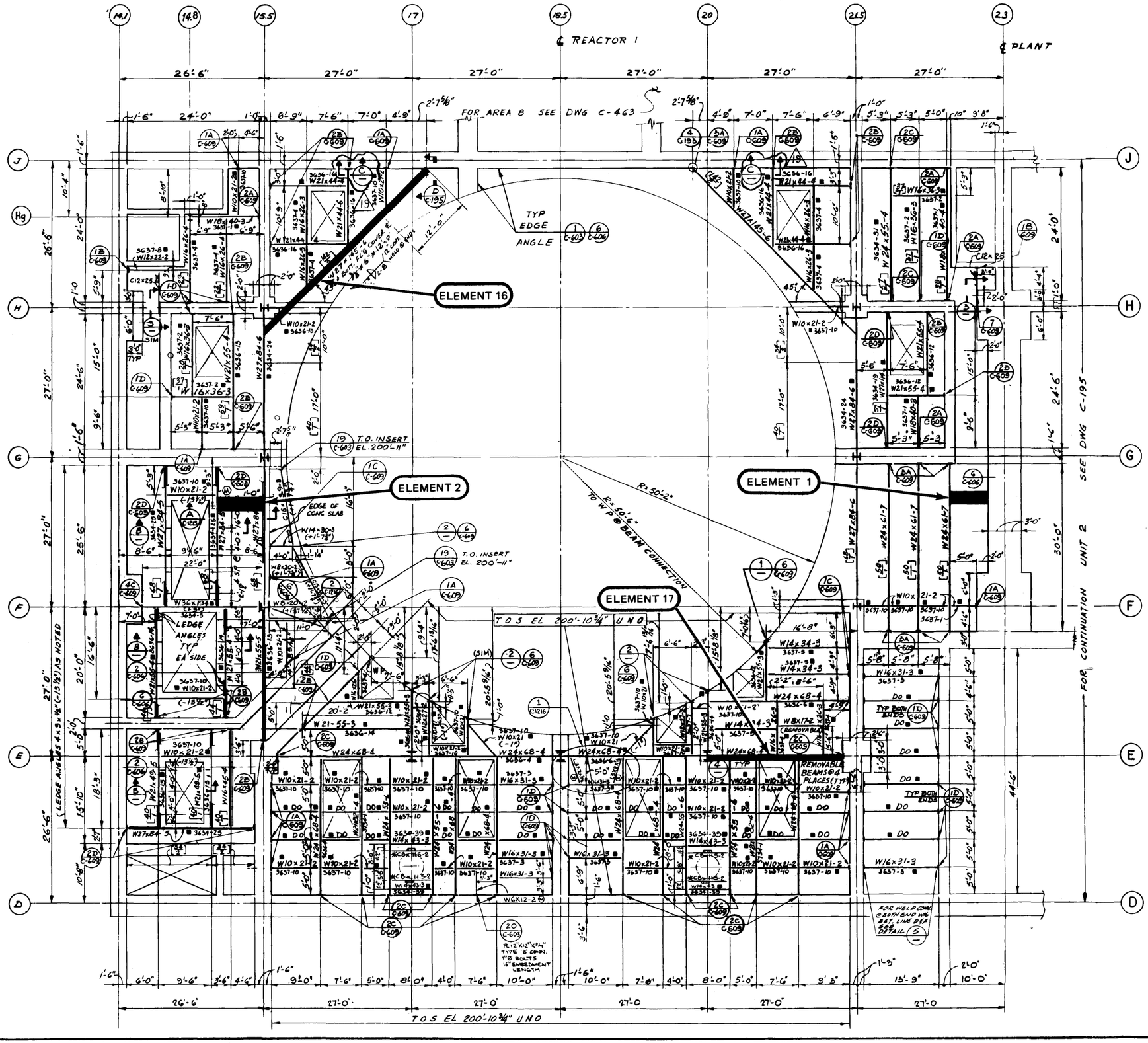
DESIGN ASSESSMENT REPORT

REACTOR ENCLOSURE & CONTROL STRUCTURE FLOOR PLAN AT ELEVATION 177 FT.

FIGURE 3A-398



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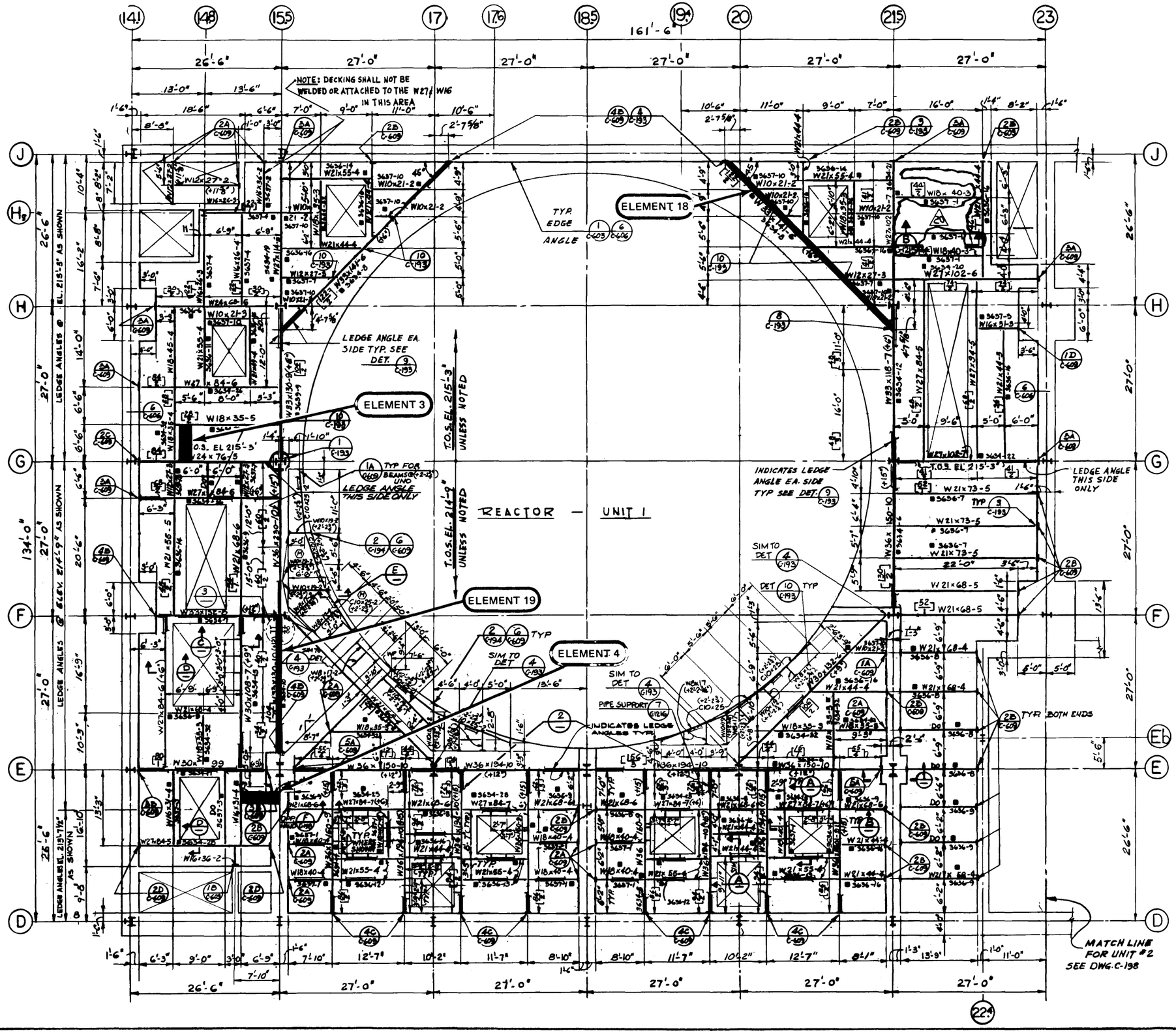
DESIGN ASSESSMENT REPORT
REACTOR ENCLOSURE
STEEL FRAMING PLAN
EL. 201'

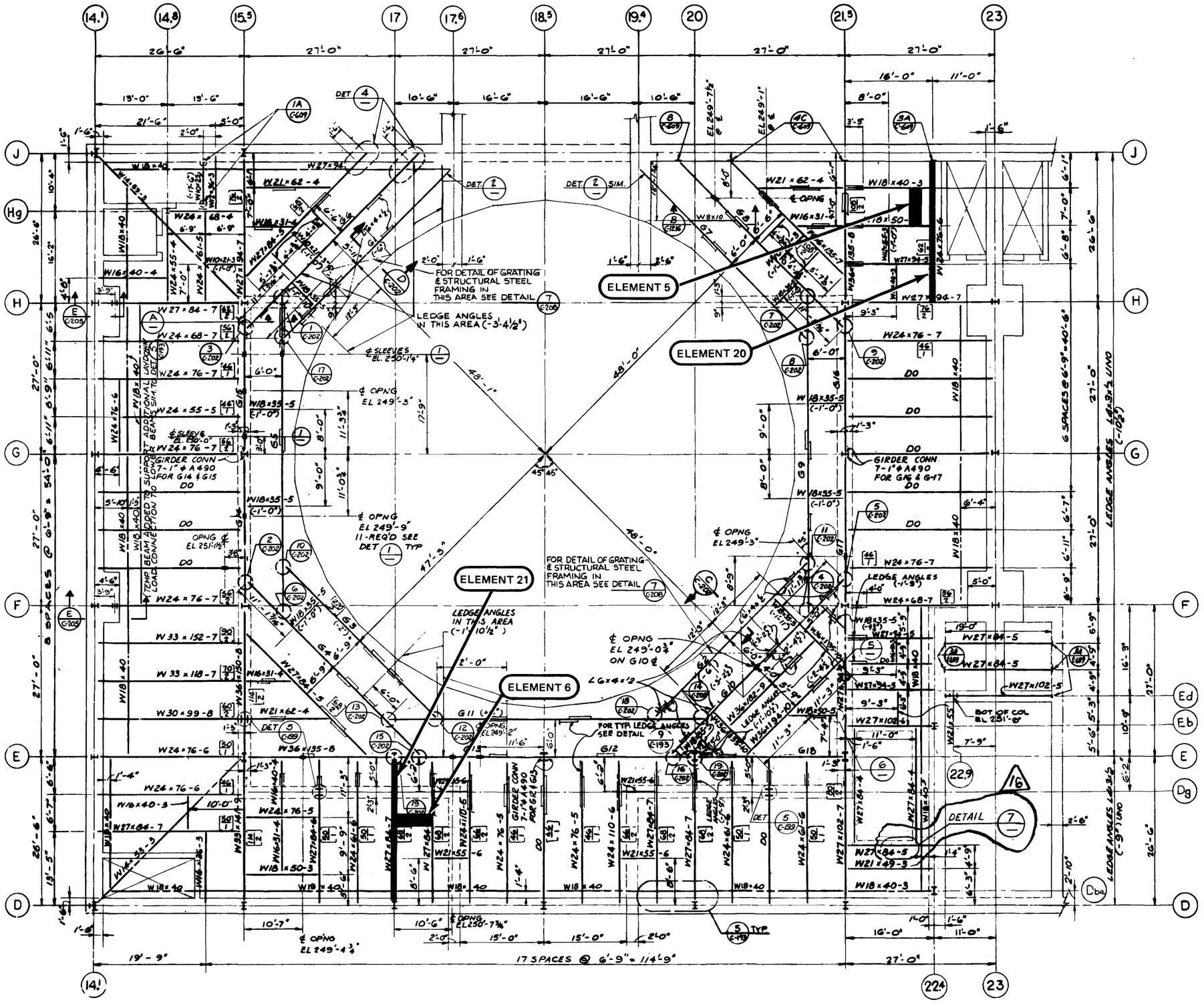
FIGURE 3A-399



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
REACTOR ENCLOSURE
STEEL FRAMING PLAN
EL. 217'

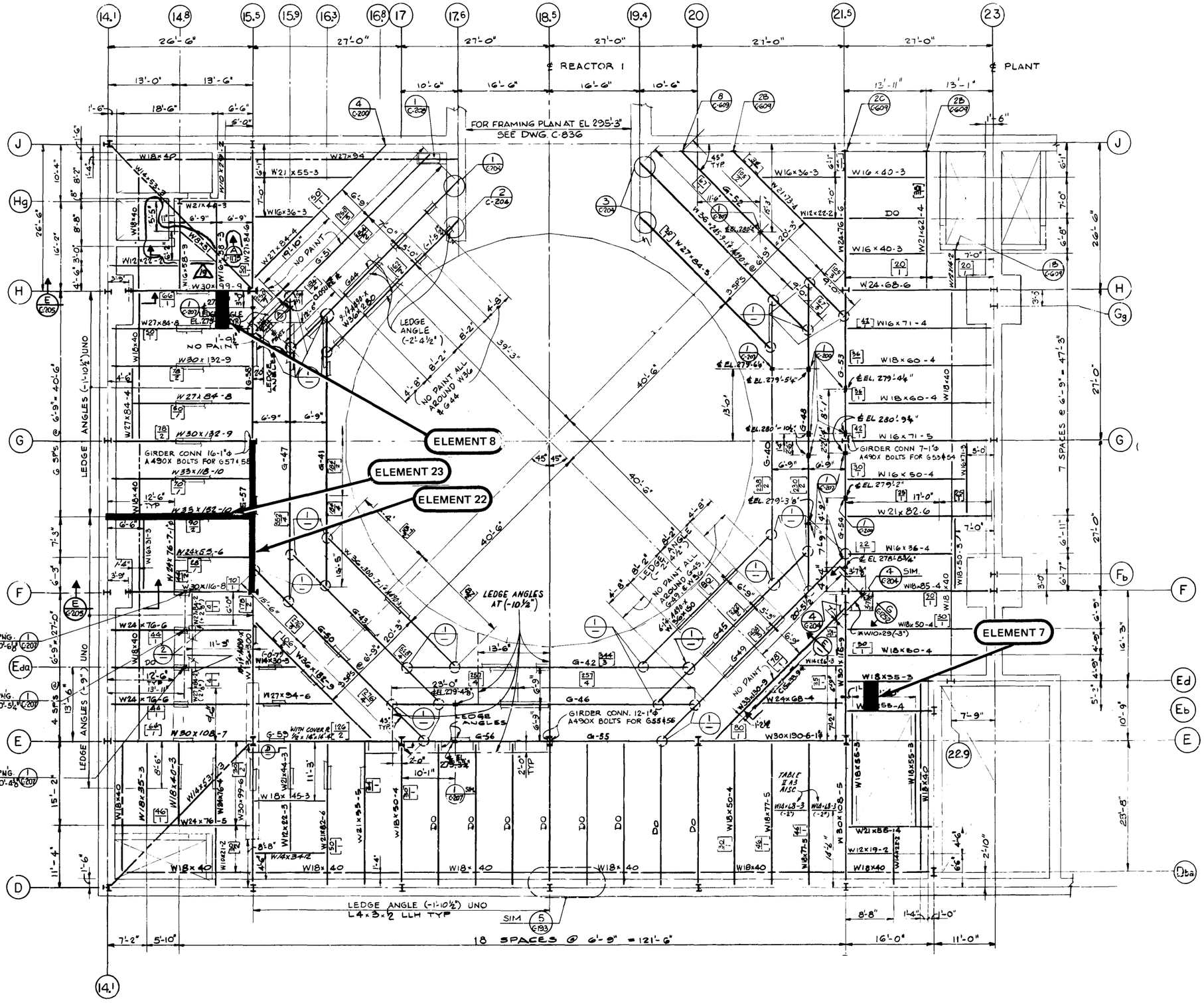
FIGURE 3A-400



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
REACTOR ENCLOSURE
STEEL FRAMING PLAN
EL. 253'

FIGURE 3A-401



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
REACTOR ENCLOSURE
STEEL FRAMING PLAN
EL. 283'

FIGURE 3A-402

ELEMENT 10

ELEMENT 11

ELEMENT 24

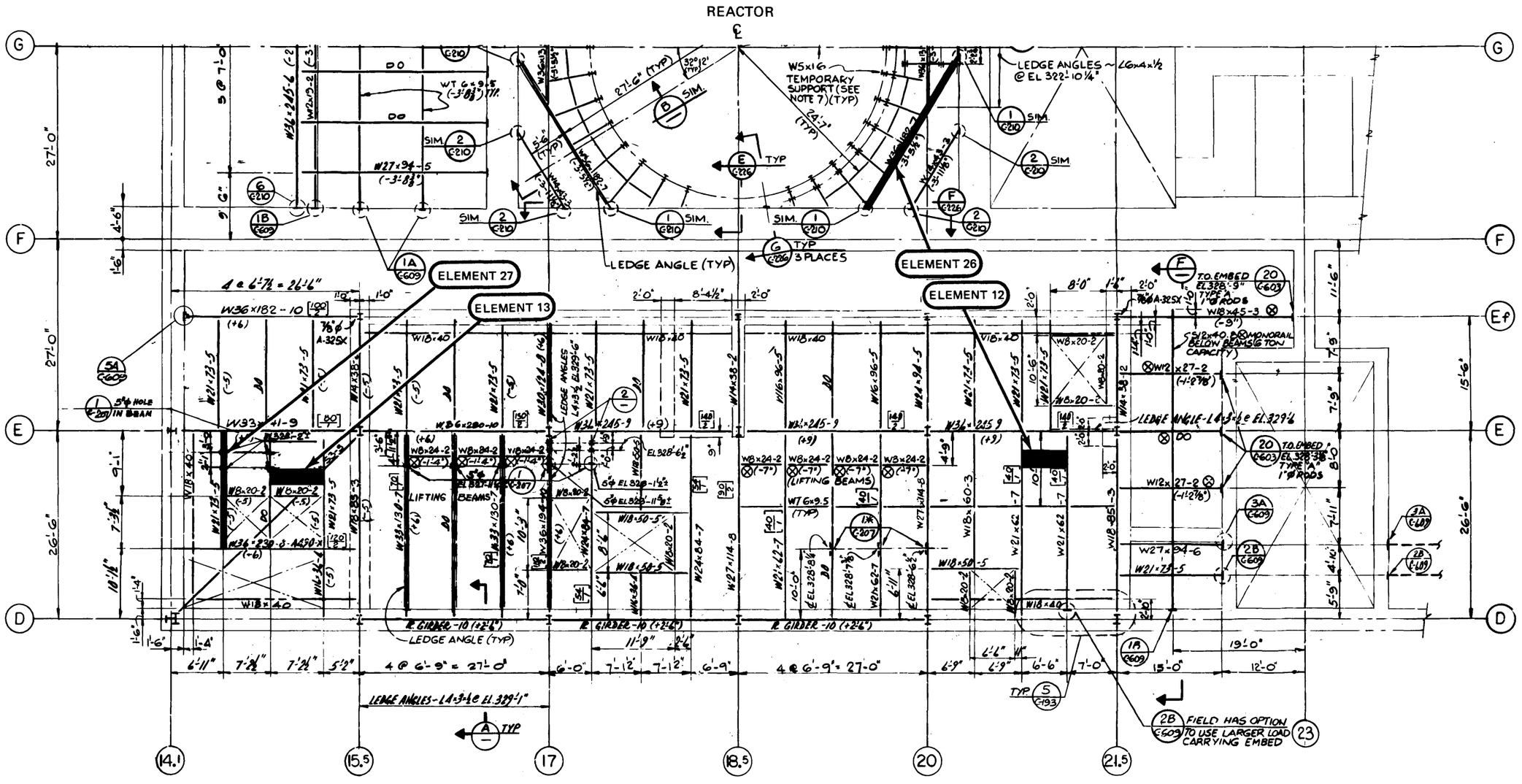
ELEMENT 9

ELEMENT 25

LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
REACTOR ENCLOSURE
STEEL FRAMING PLAN
EL. 313'

FIGURE 3A-403

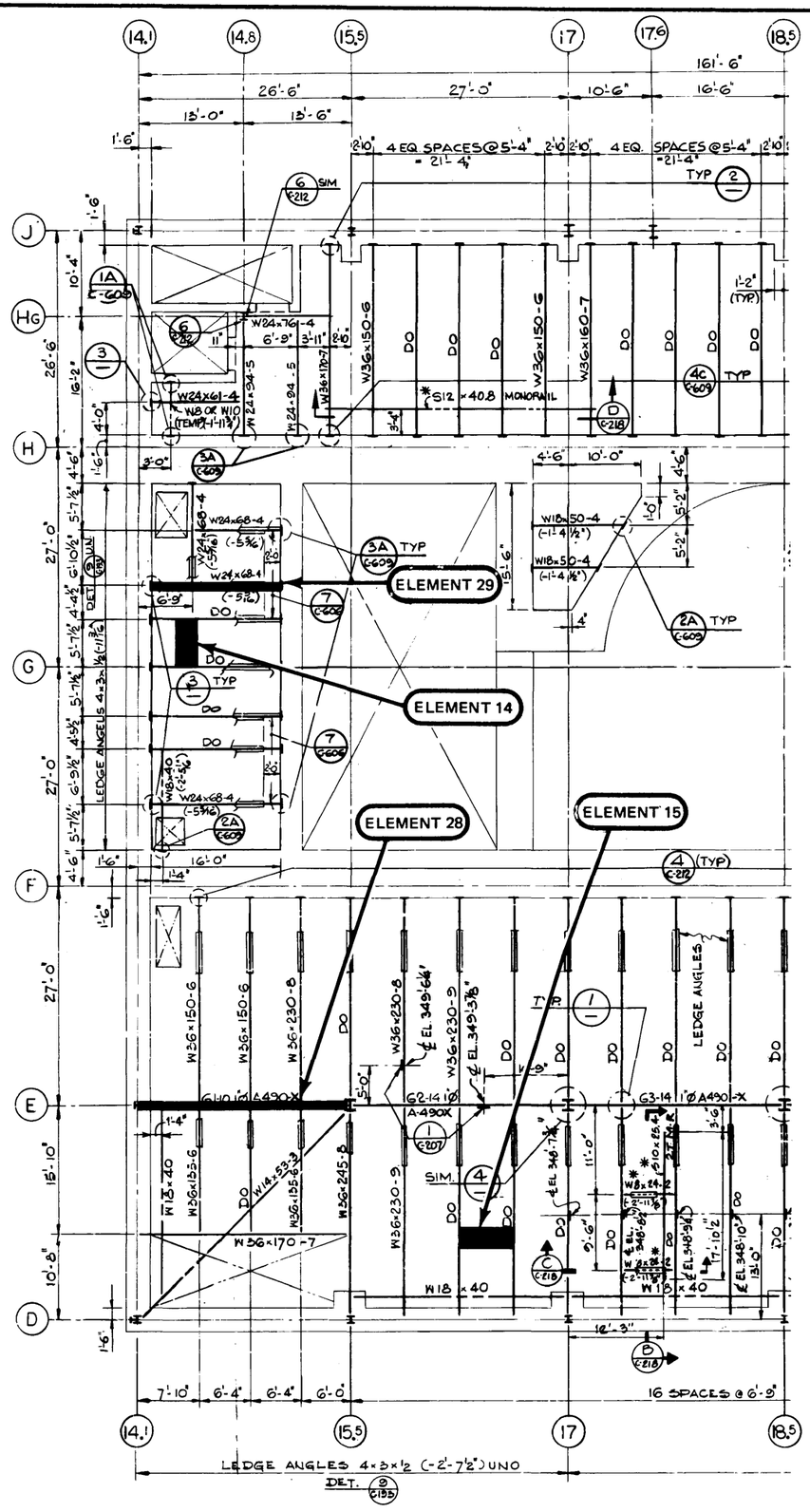


LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

REACTOR ENCLOSURE STEEL FRAMING PLAN EL. 331'

FIGURE 3A-404



LIMERICK GENERATING STATION
UNITS 1 AND 2
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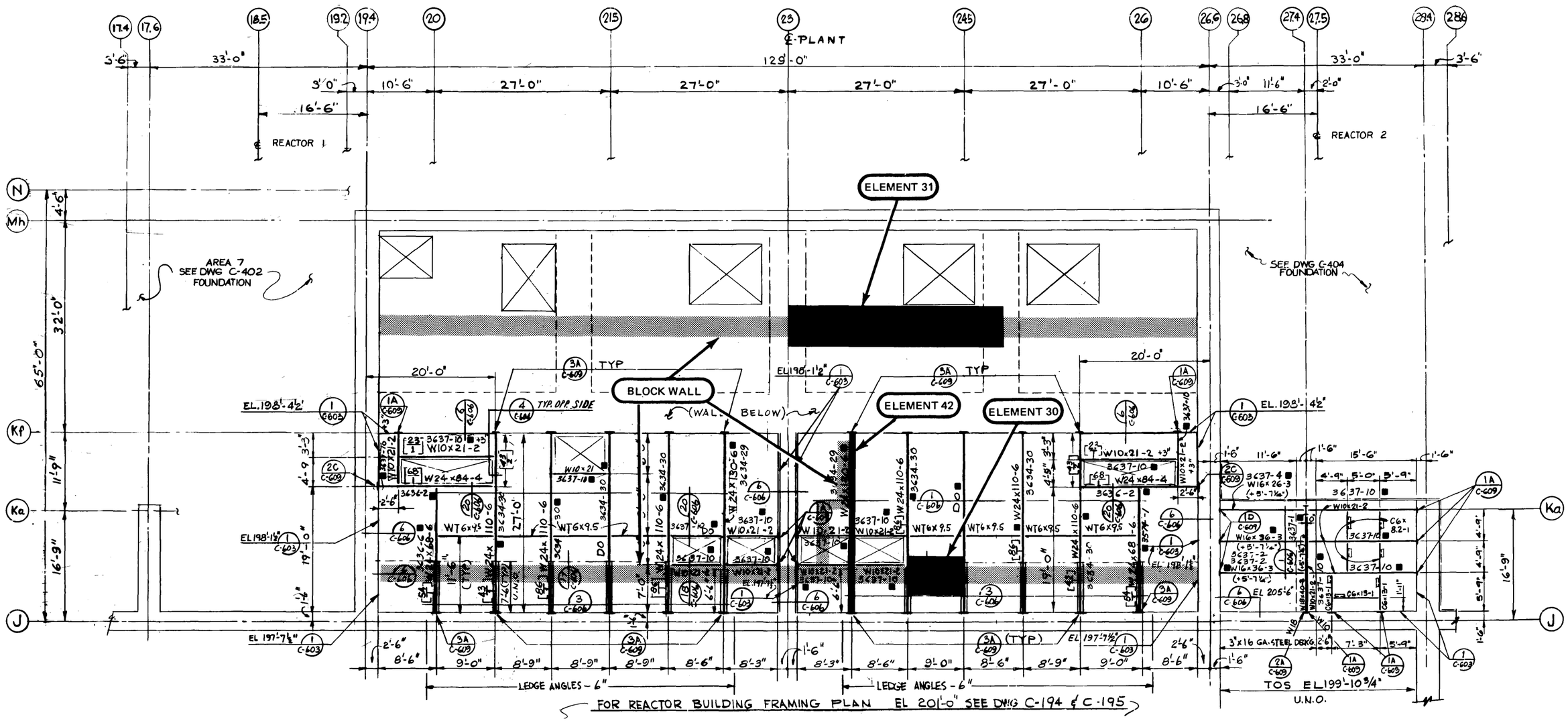
DESIGN ASSESSMENT REPORT
REACTOR ENCLOSURE
STEEL FRAMING PLAN
EL. 352'

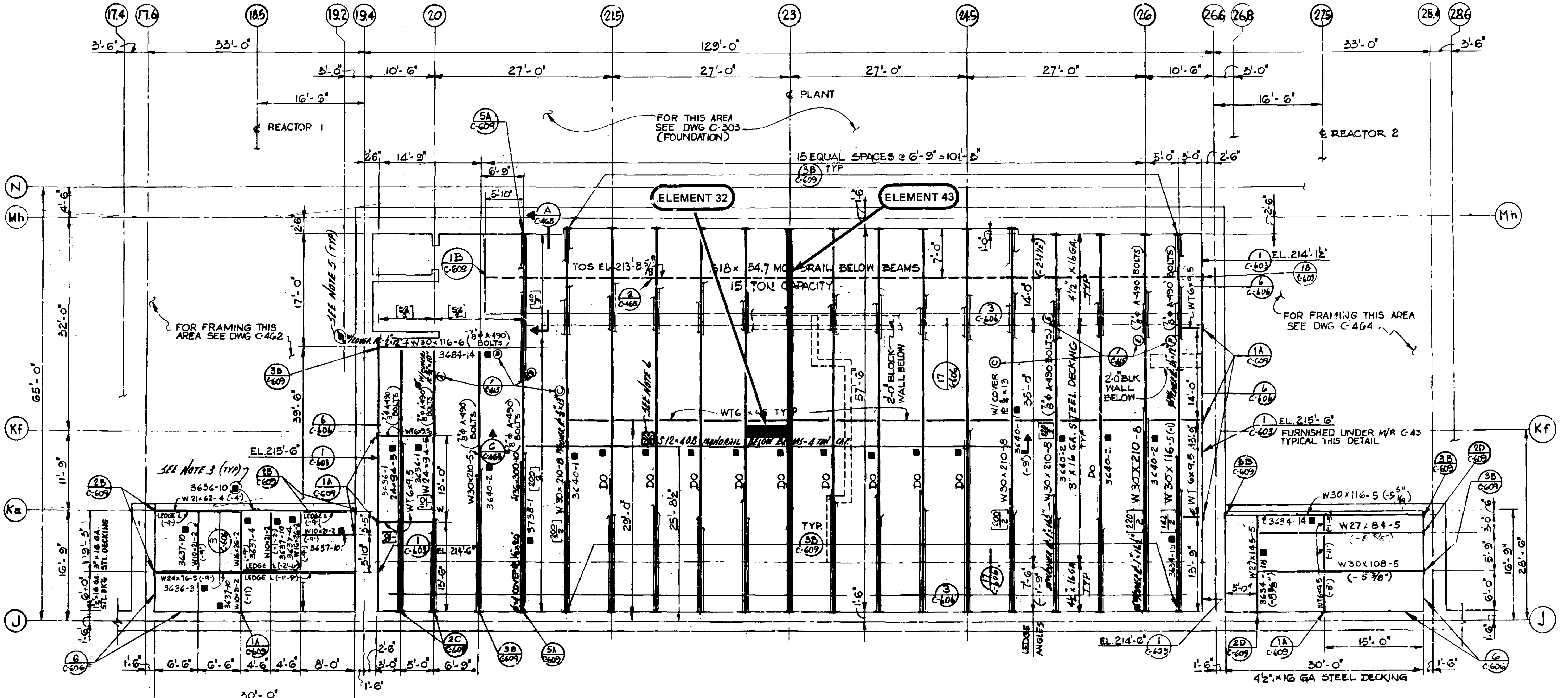
FIGURE 3A-405



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
STEEL FRAMING PLAN
EL. 200'

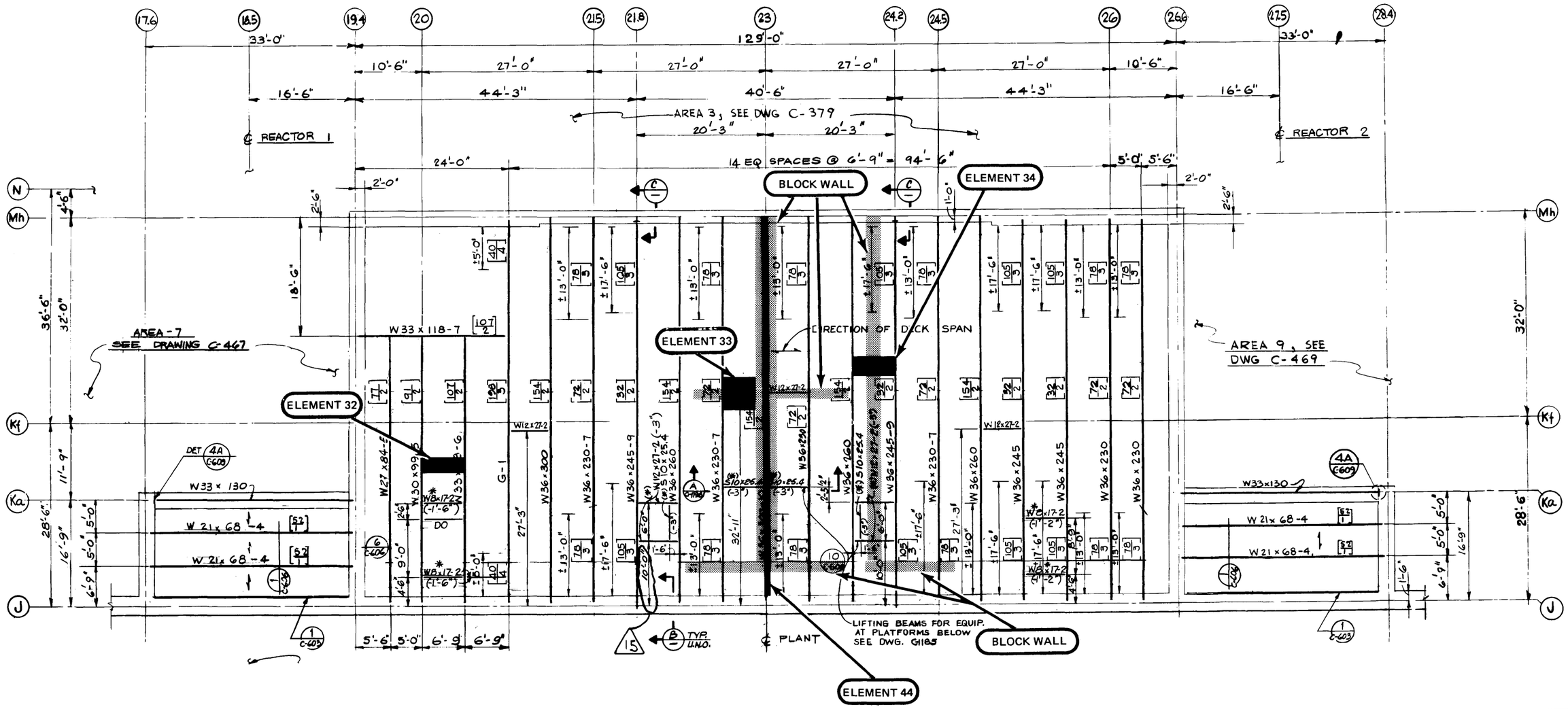
FIGURE 3A-406



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
STEEL FRAMING PLAN
EL. 217'

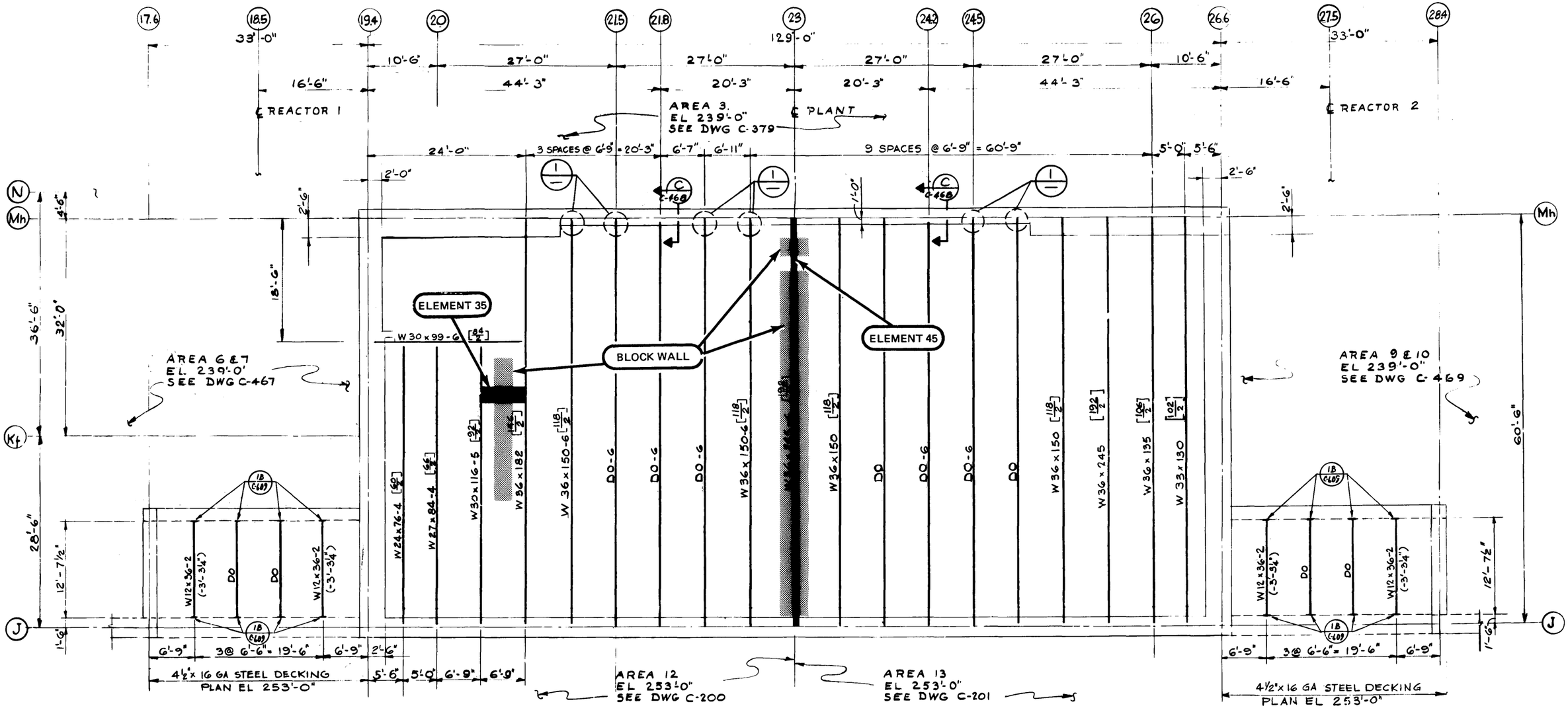
FIGURE 3A-407



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
STEEL FRAMING PLAN
EL. 239'

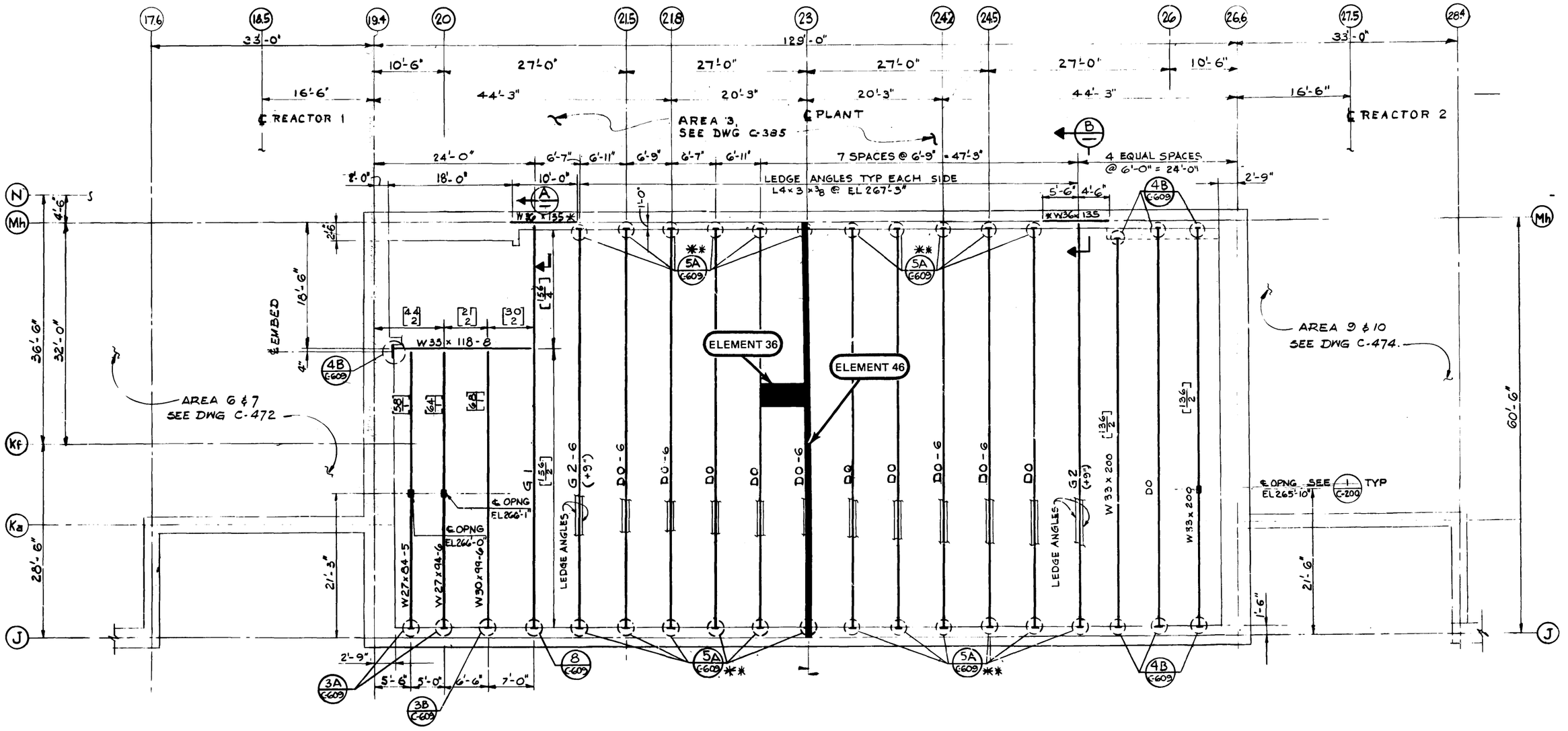
FIGURE 3A-408



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
STEEL FRAMING PLAN
EL. 254'

FIGURE 3A-409



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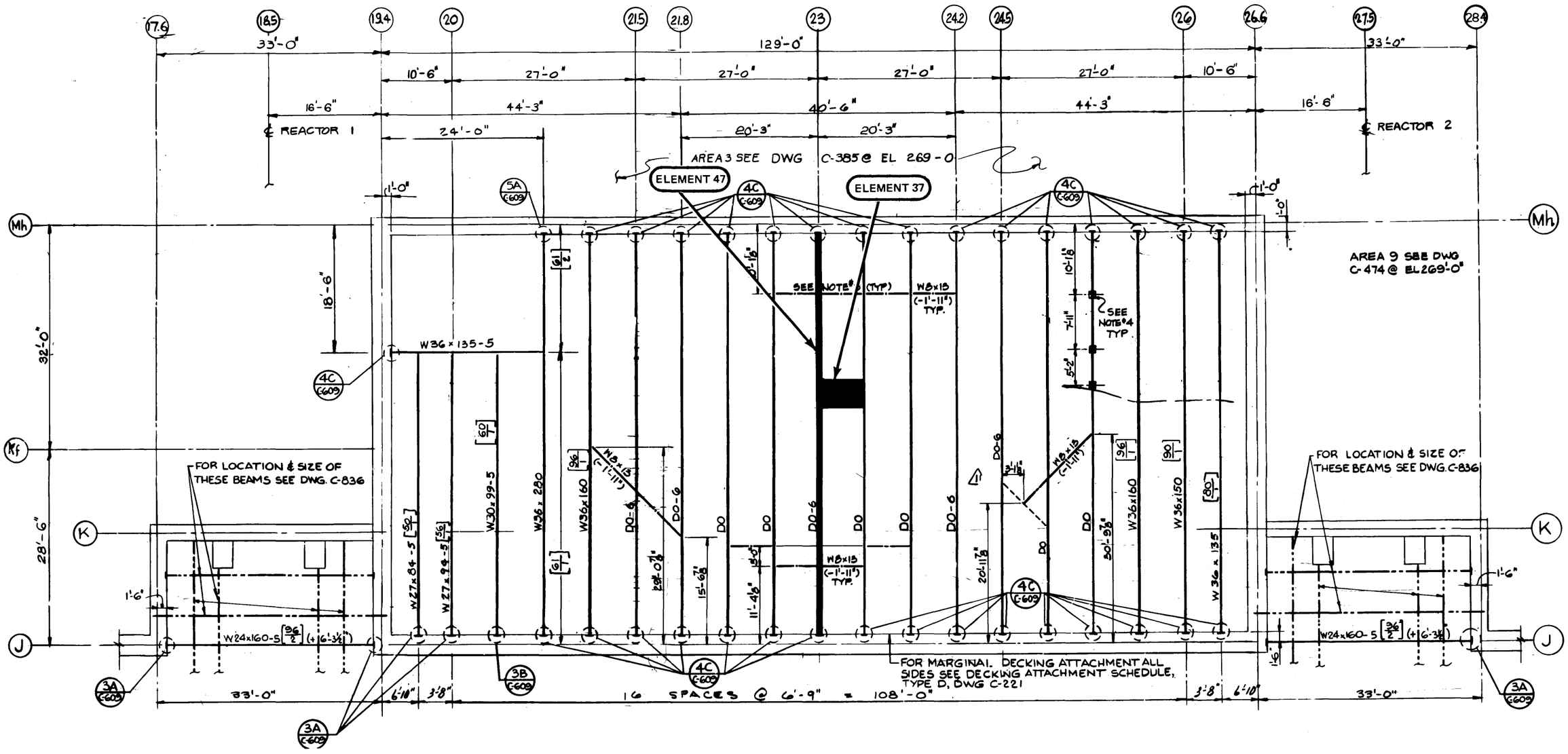
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
STEEL FRAMING PLAN
EL. 269'

FIGURE 3A-410



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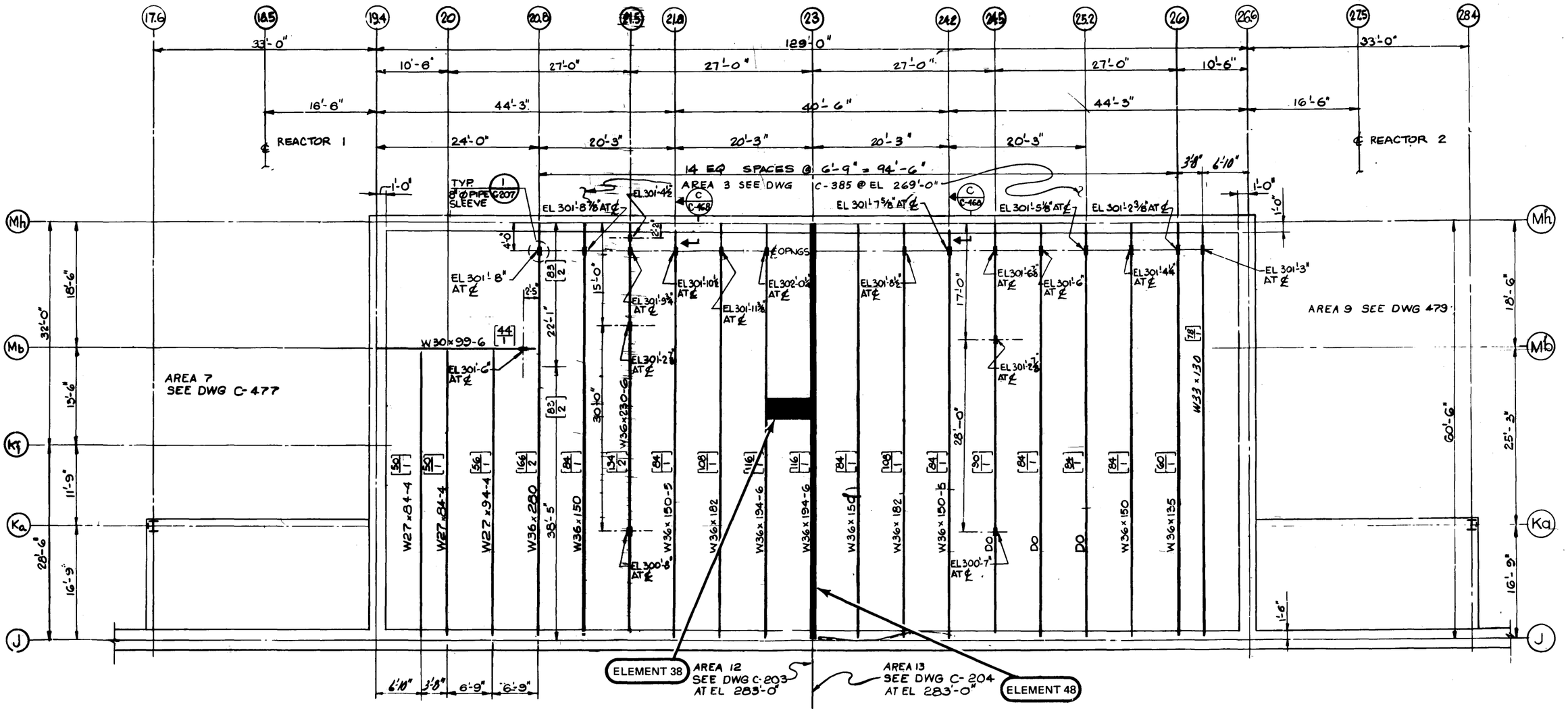
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
STEEL FRAMING PLAN
EL. 289'

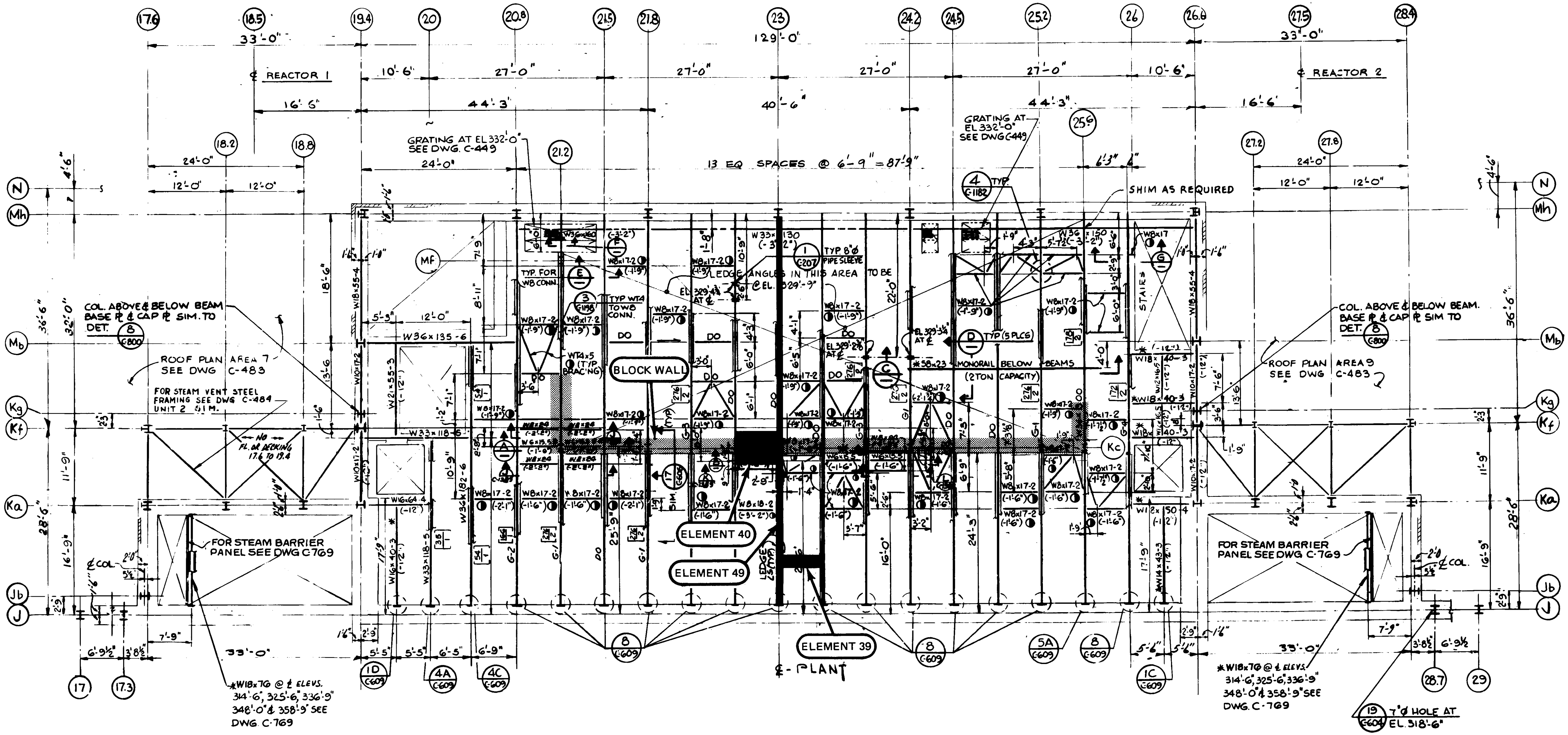
FIGURE 3A-411



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
STEEL FRAMING PLAN
EL. 304'

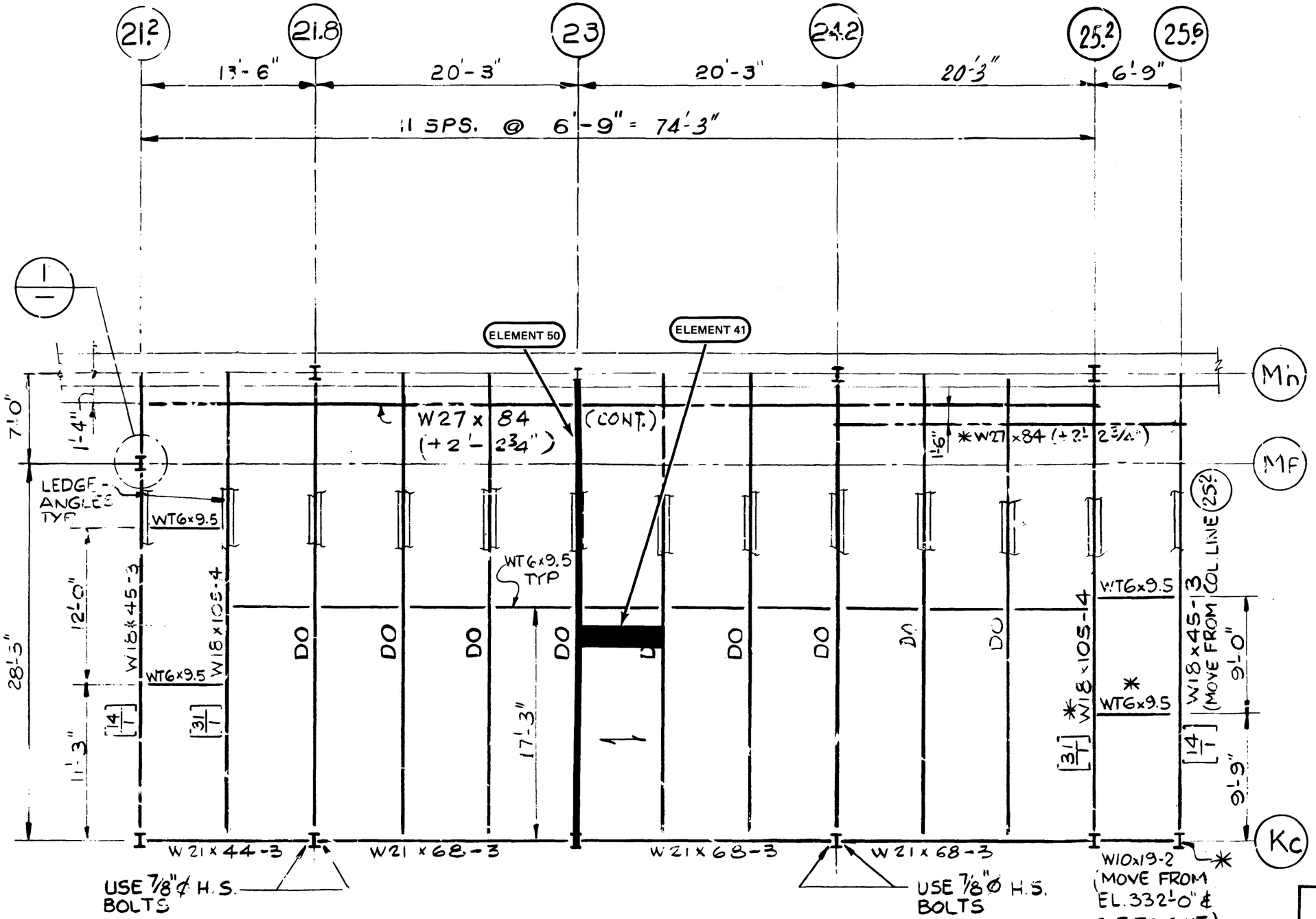
FIGURE 3A-412



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
STEEL FRAMING PLAN
EL. 332'

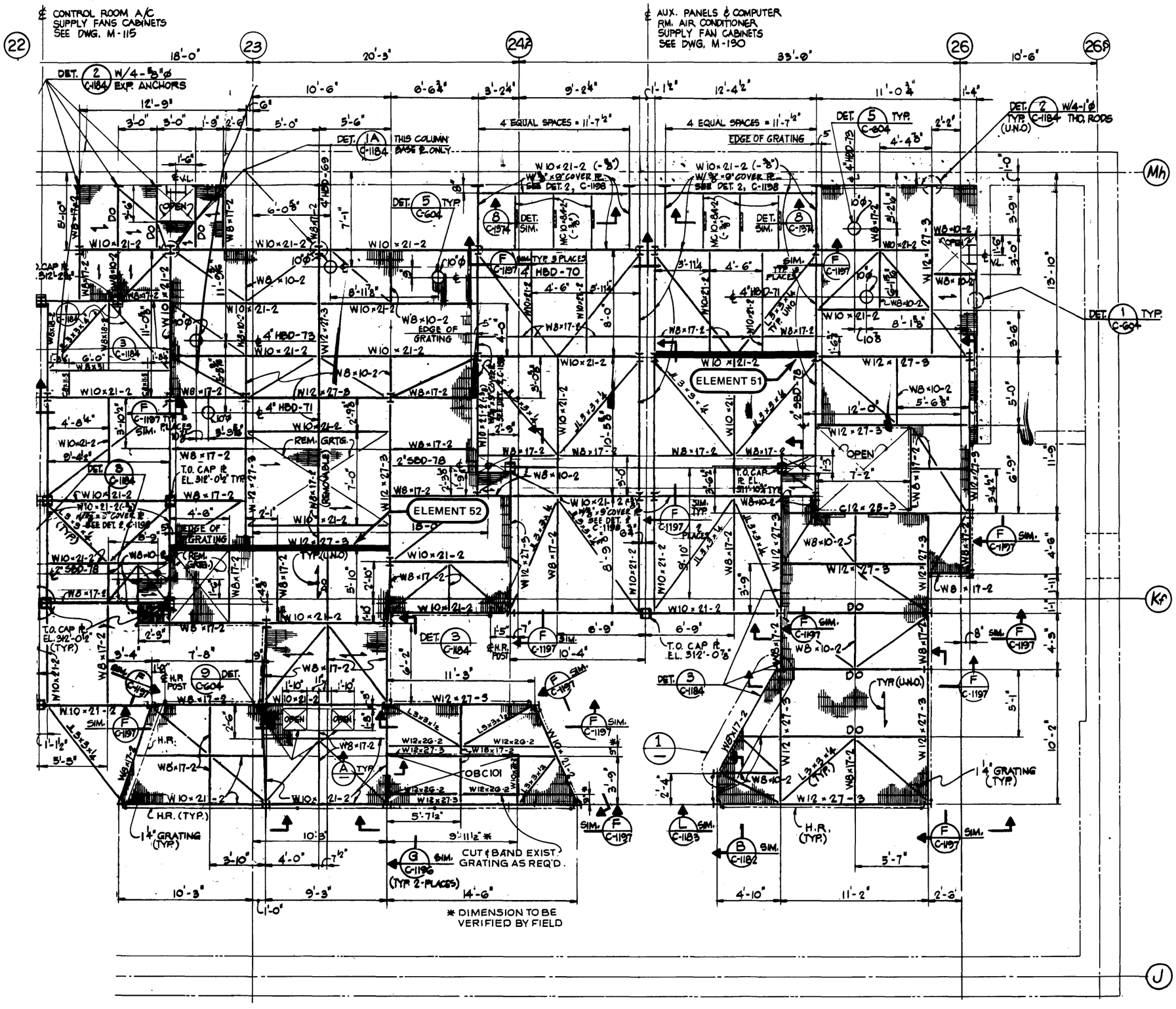
FIGURE 3A-413



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
STEEL FRAMING PLAN
EL. 350'

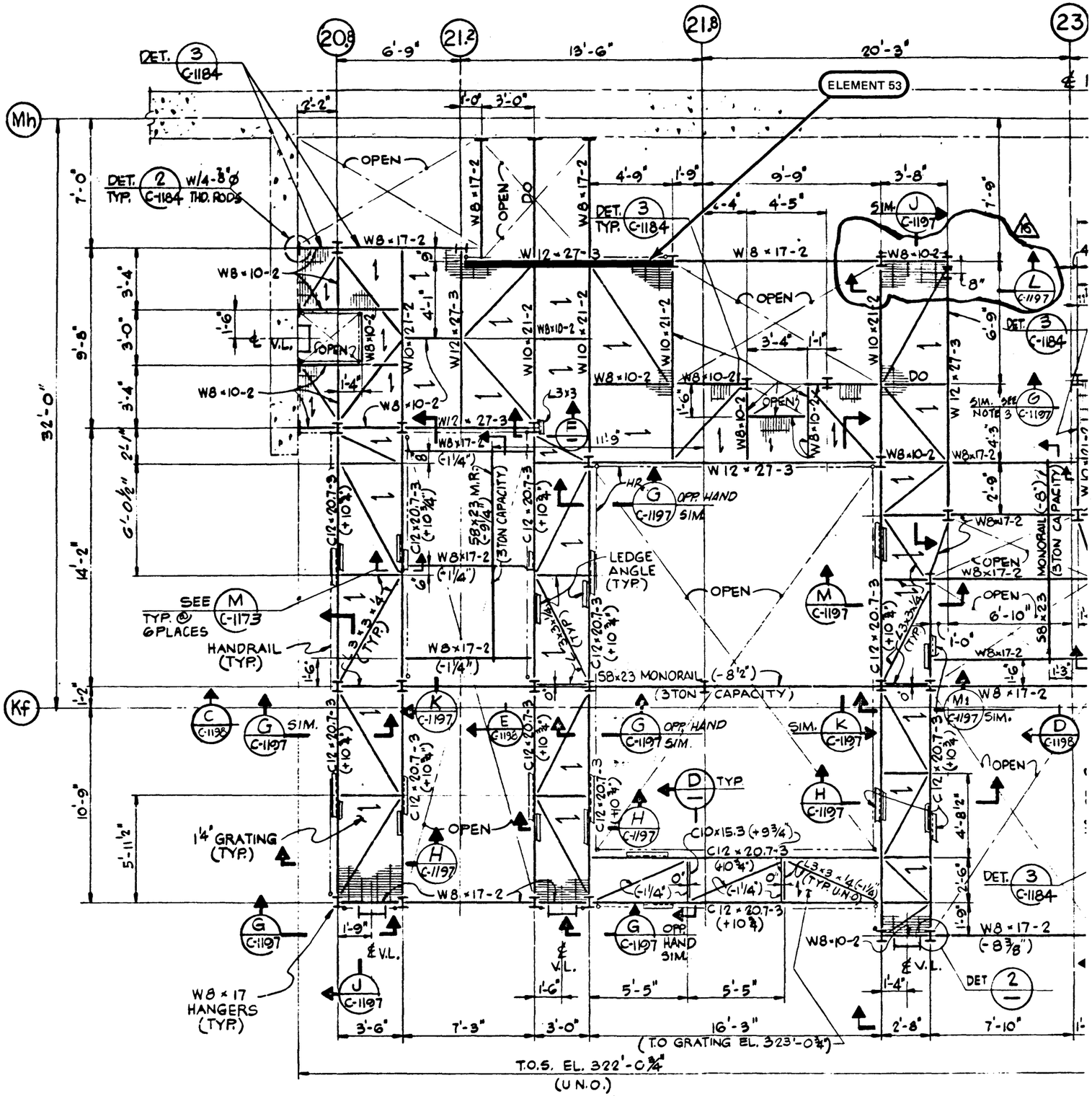
FIGURE 3A-414



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
PLATFORMS
EL. 313'

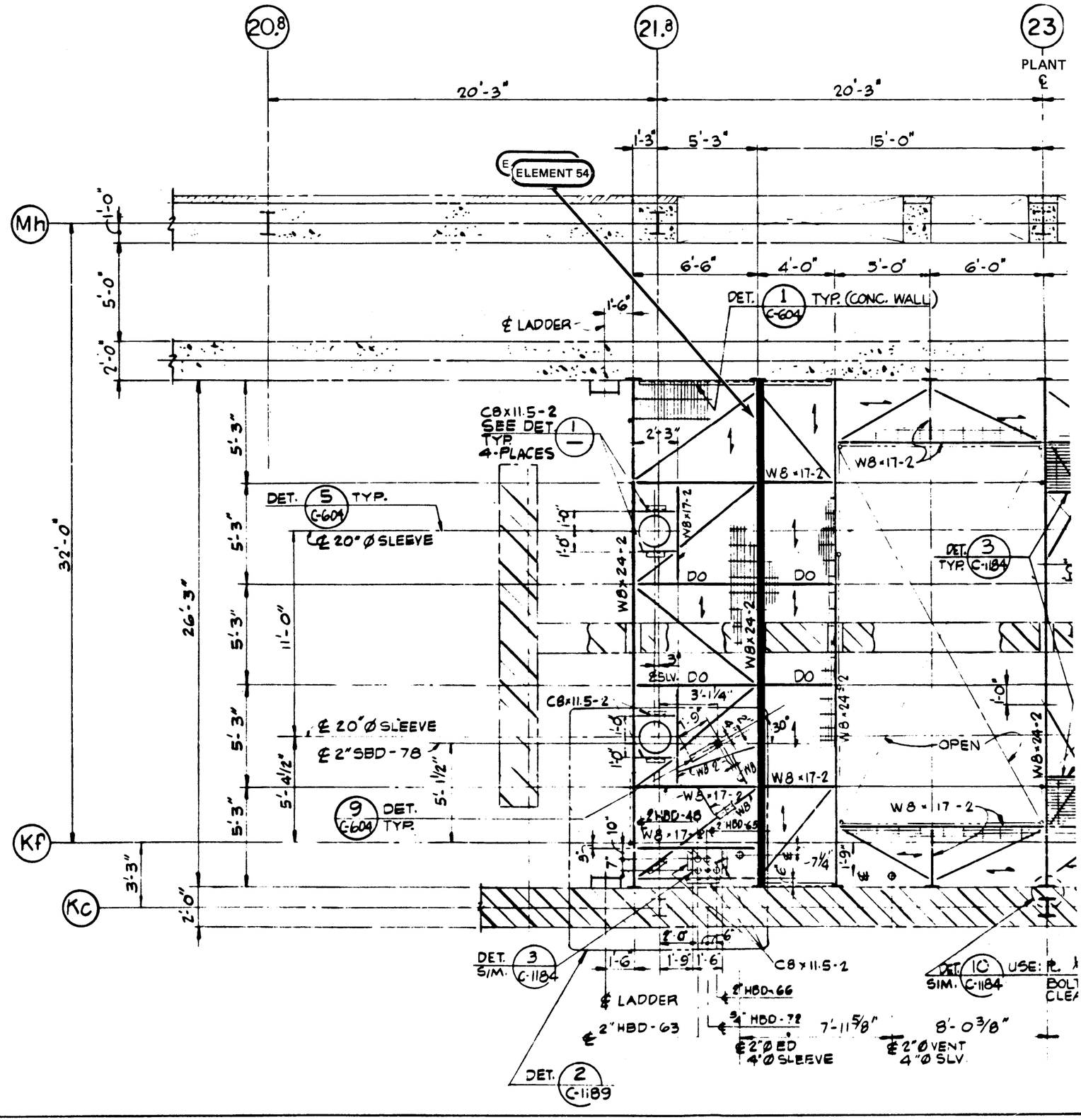
FIGURE 3A-415



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE PLATFORMS EL. 322'

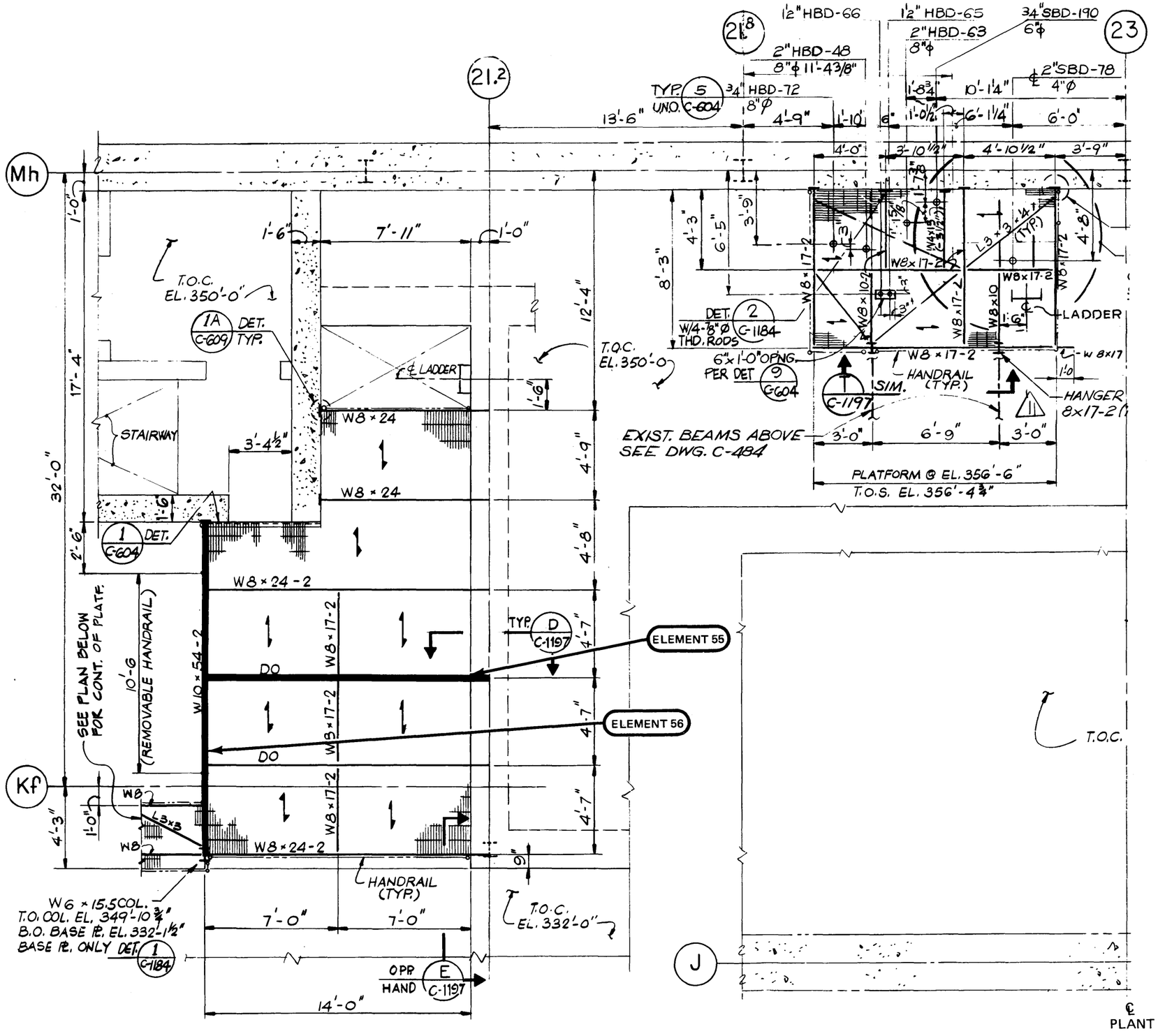
FIGURE 3A-416



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
PLATFORMS
EL. 340'

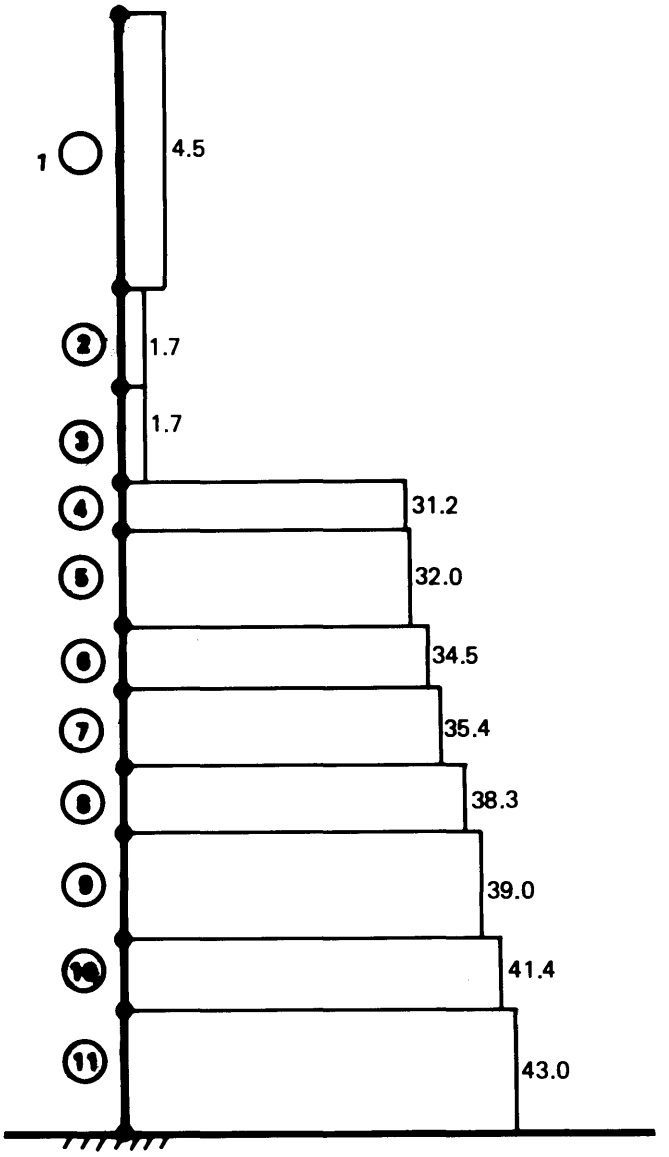
FIGURE 3A-417



LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE
PLATFORMS
EL. 350'

FIGURE 3A-418

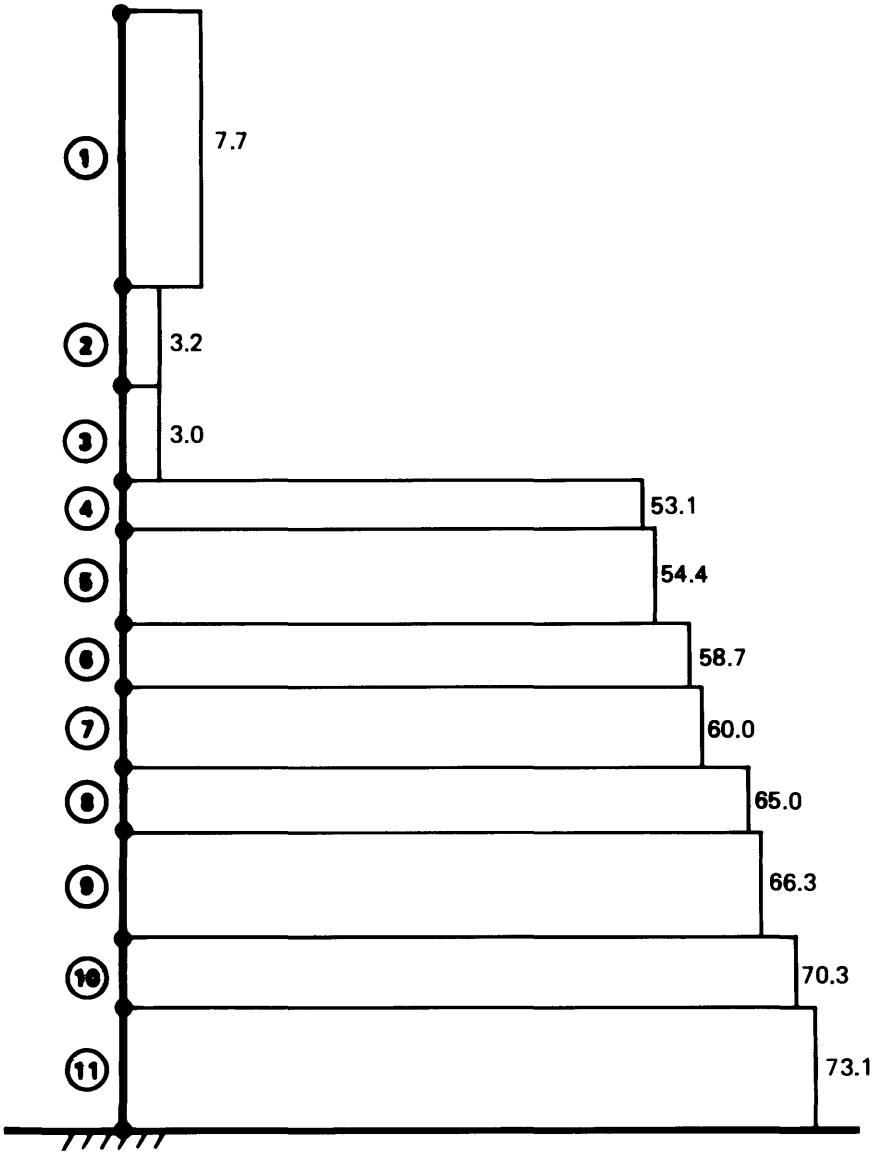


LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

REACTOR ENCLOSURE & CONTROL STRUCTURE VERTICAL AXIAL FORCES ($X10^3$ KIPS)
OBE+SRV (2% DAMPING)

FIGURE 3A-419

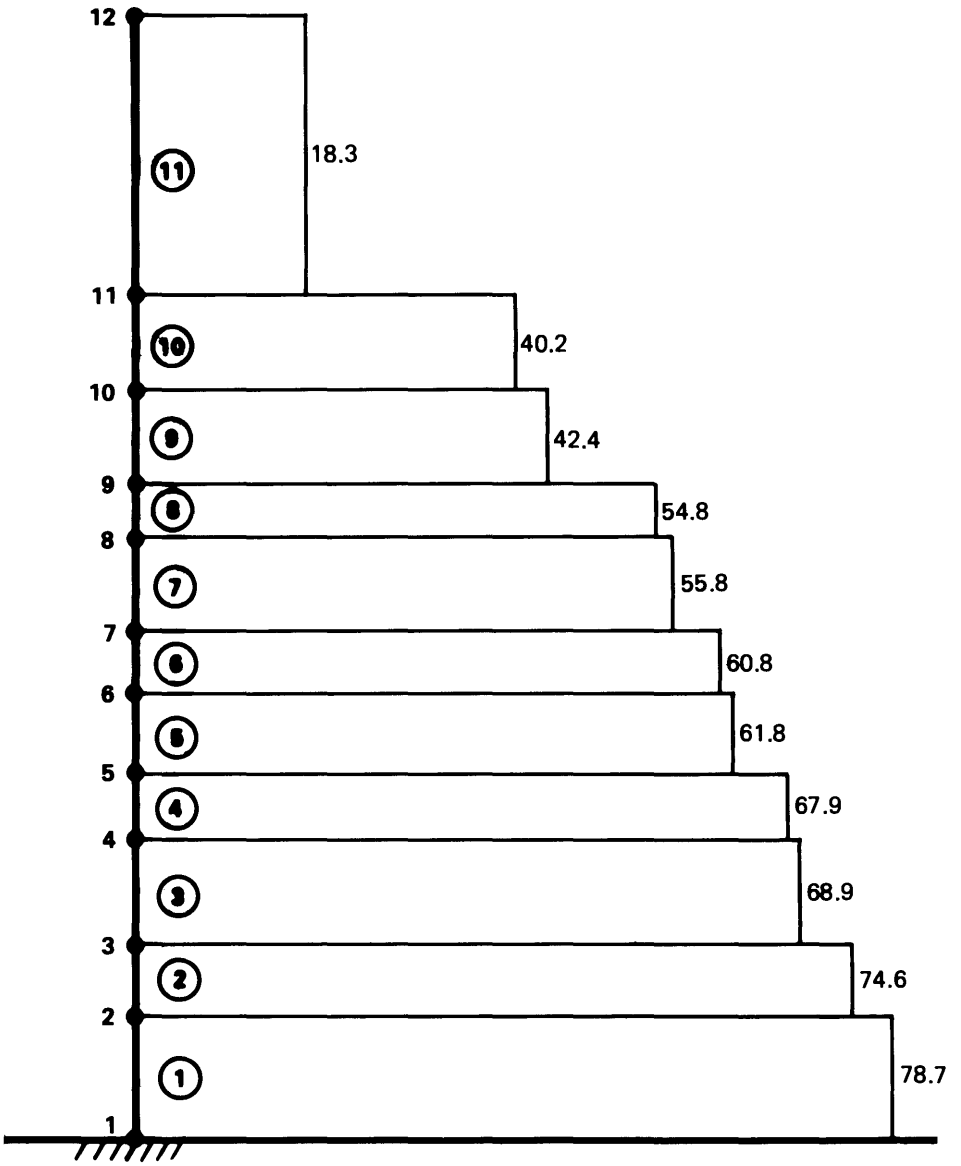


LIMERICK GENERATING STATION
UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT

DESIGN ASSESSMENT REPORT

REACTOR ENCLOSURE & CONTROL STRUCTURE VERTICAL AXIAL FORCES ($X\ 10^3$ KIPS)
DBE+SRV+LOCA (5% DAMPING)

FIGURE 3A-420



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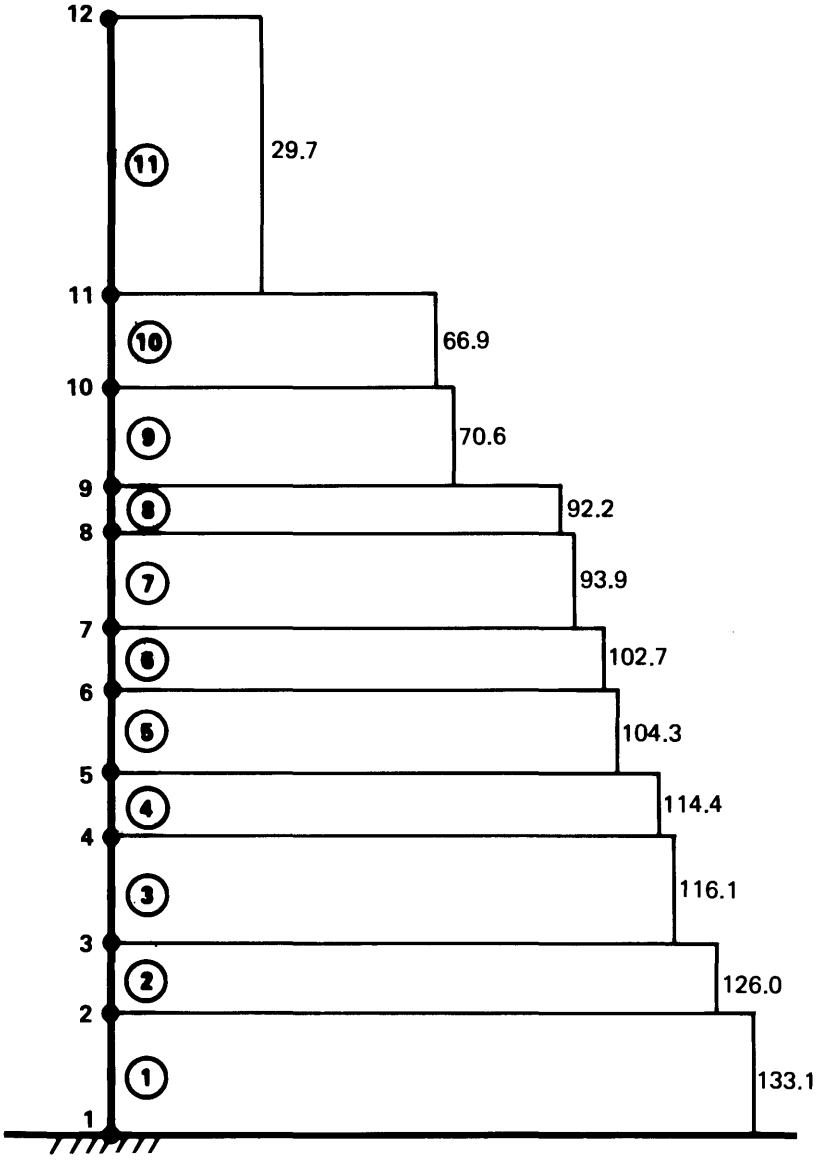
REACTOR ENCLOSURE & CONTROL STRUCTURE N-S SHEAR FORCES ($X10^3$ KIPS) OBE+SRV (2% DAMPING)

FIGURE 3A-421



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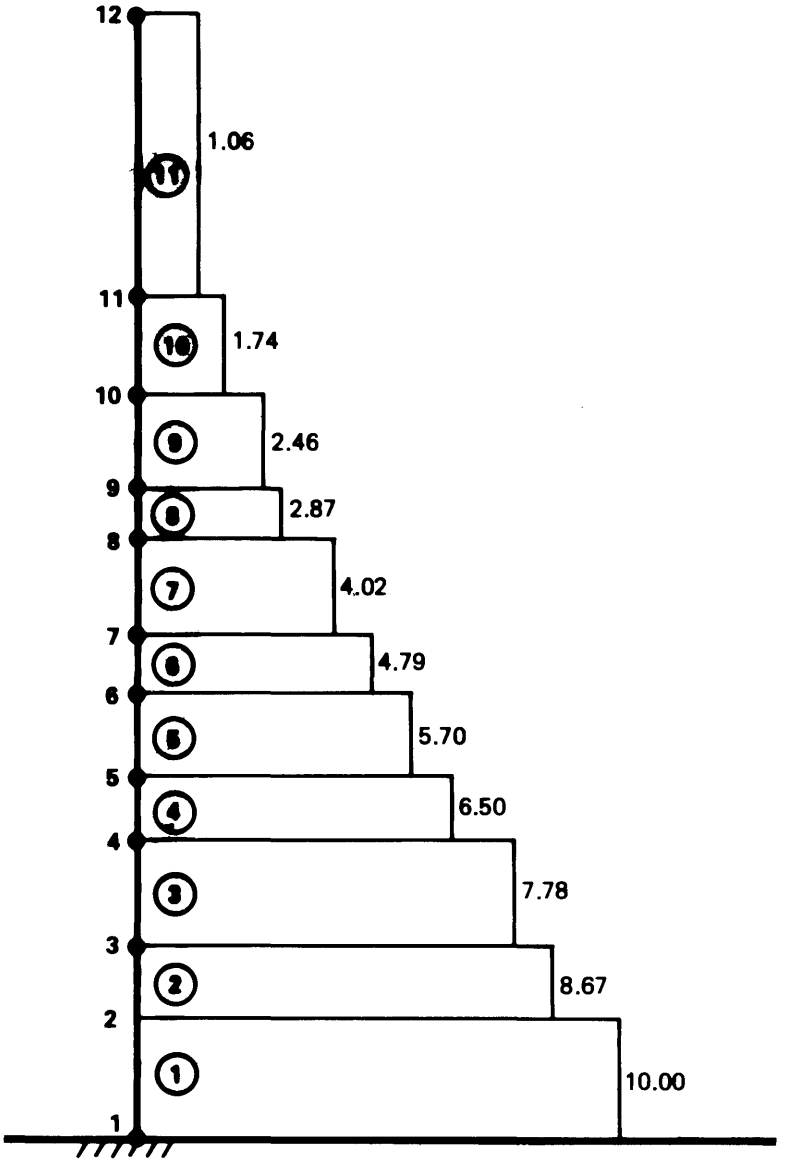
REACTOR ENCLOSURE & CONTROL STRUCTURE N–S SHEAR FORCES ($X10^3$ KIPS)
DBE+LOCA+SRV (5% DAMPING)

FIGURE 3A-422



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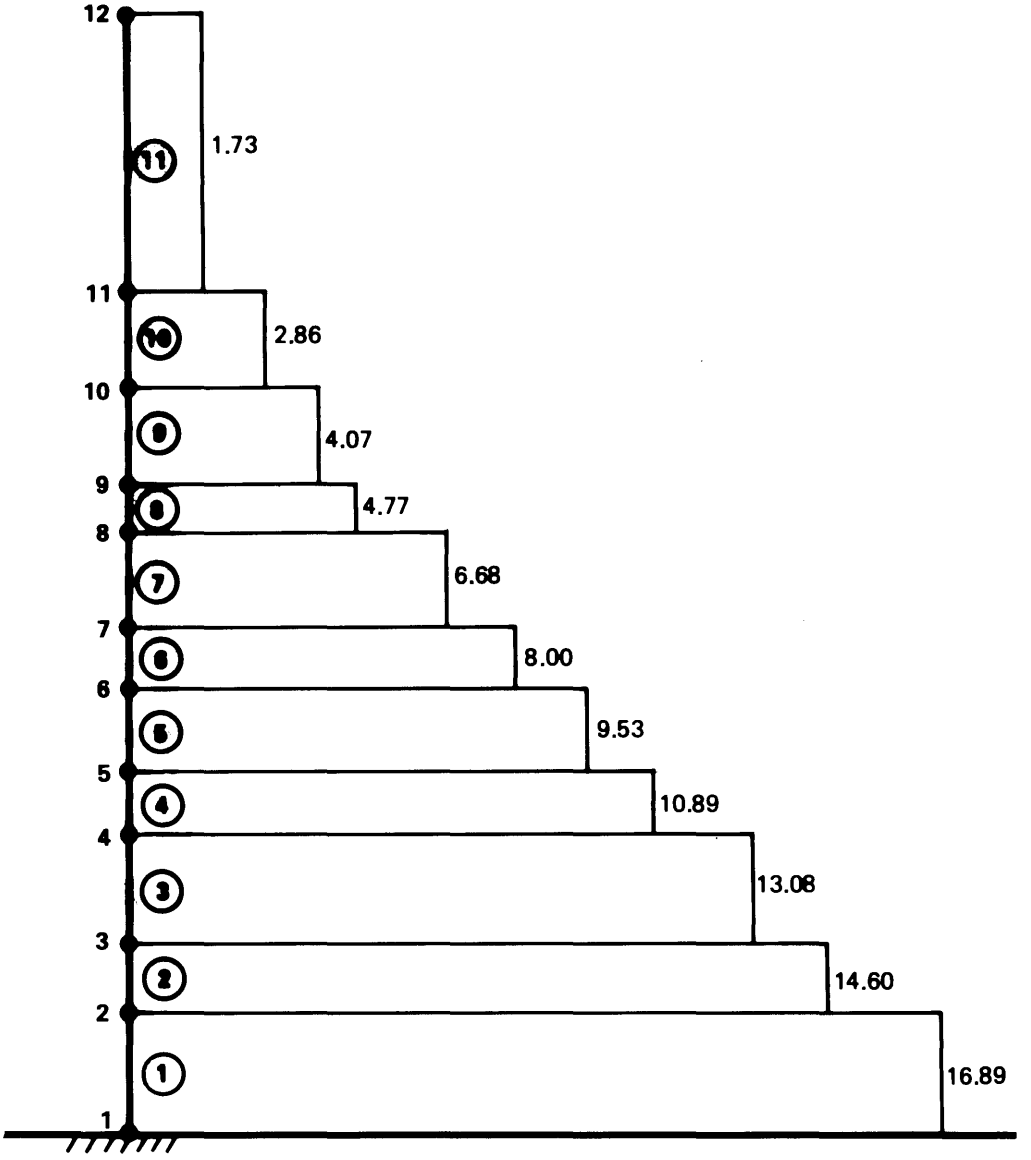
REACTOR ENCLOSURE & CONTROL STRUCTURE N–S OVERTURNING MOMENTS ($X10^6$K–FT)
OBE+SRV (2% DAMPING)

FIGURE 3A-423



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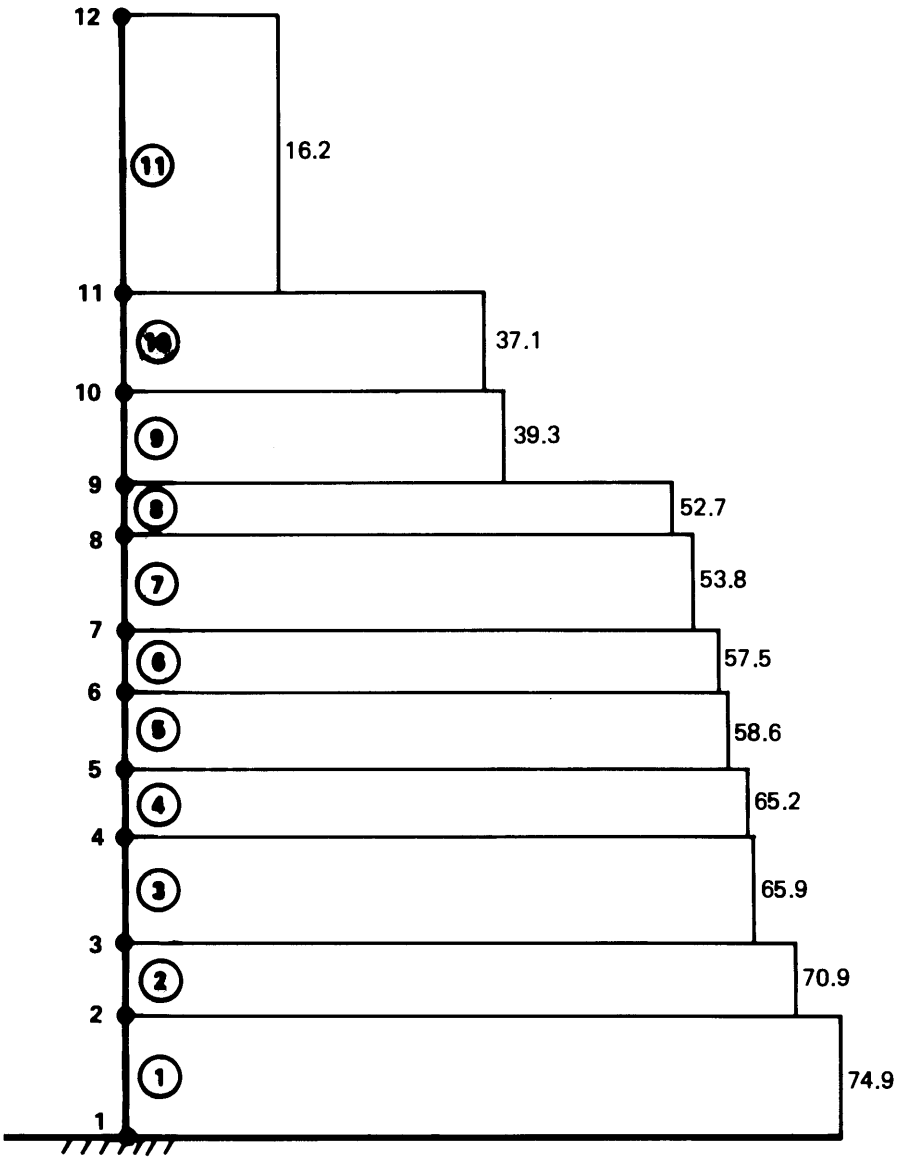
REACTOR ENCLOSURE & CONTROL STRUCTURE N–S OVERTURNING MOMENTS ($X10^6$ K-FT)
DBE+LOCA+SRV (5% DAMPING)

FIGURE 3A-424



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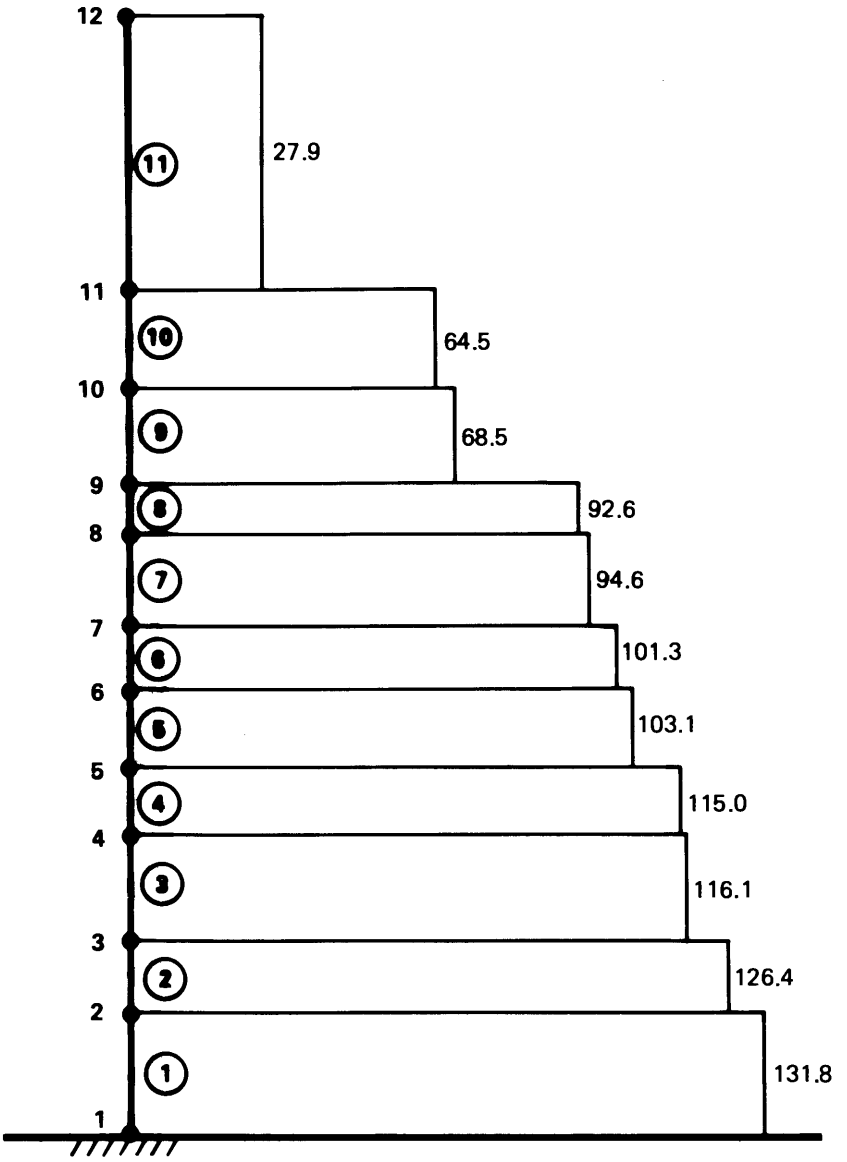
REACTOR ENCLOSURE & CONTROL STRUCTURE E-W SHEAR FORCES ($X10^3$KIPS) OBE+SRV (2% DAMPING)

FIGURE 3A-425



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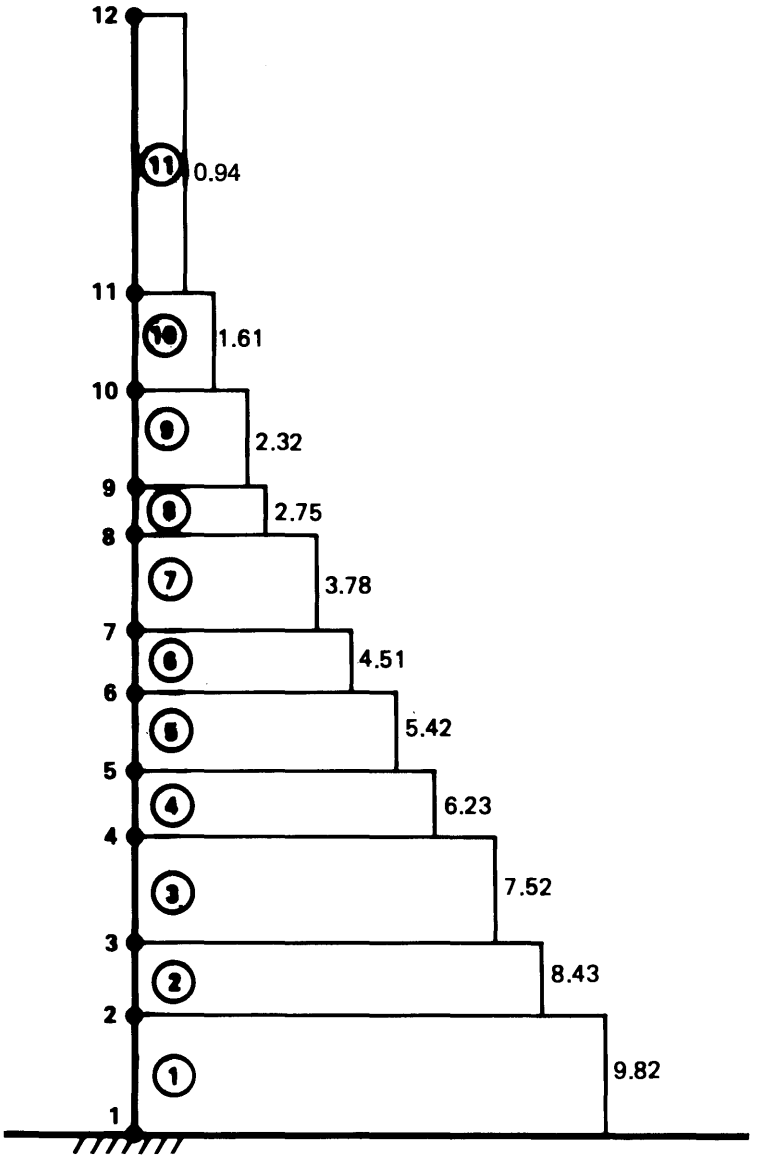
REACTOR ENCLOSURE & CONTROL STRUCTURE E-W SHEAR FORCES ($X10^3$ KIPS) DBE+LOCA+SRV (5% DAMPING)
FIGURE 3A-426



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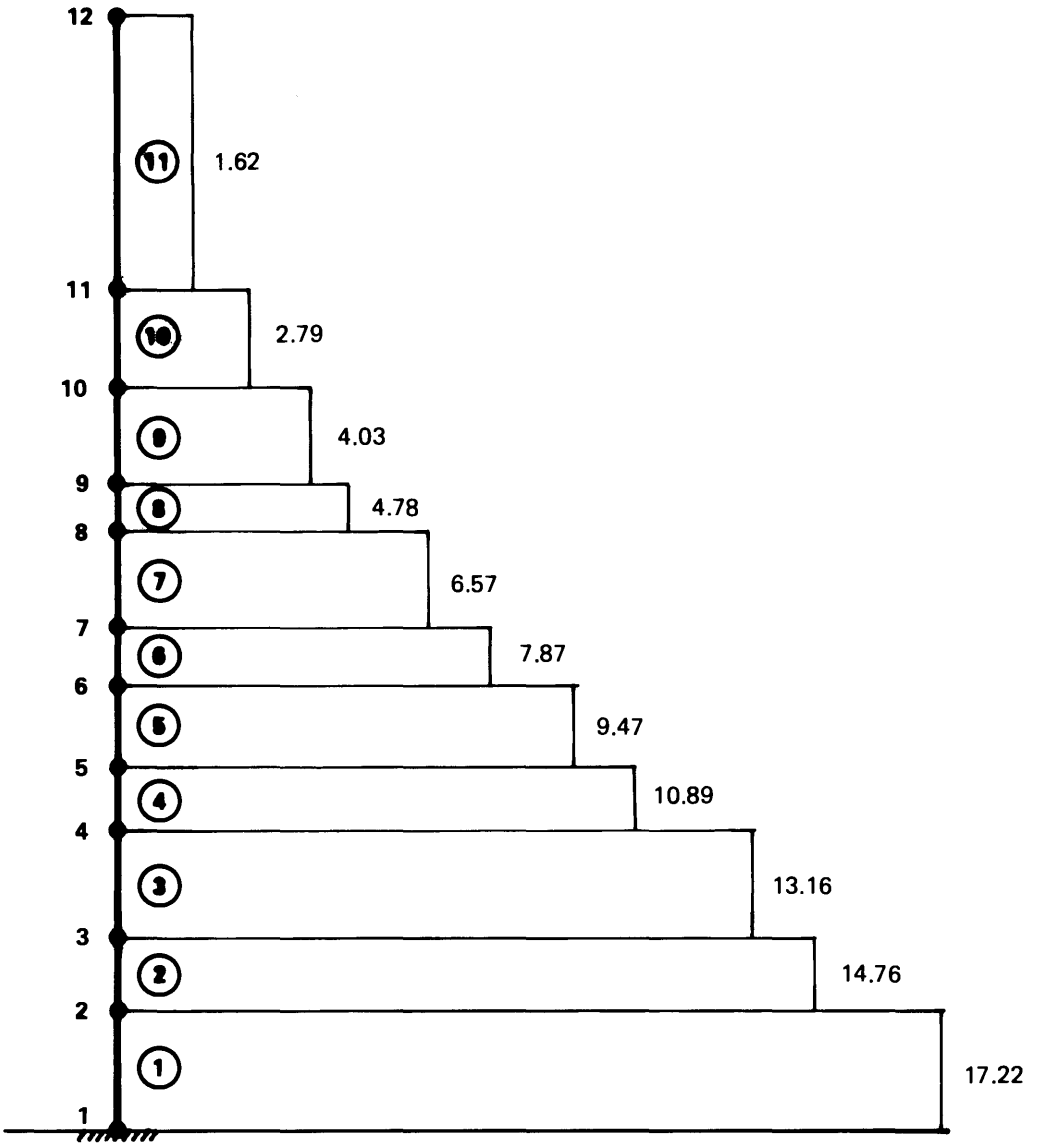
REACTOR ENCLOSURE & CONTROL STRUCTURE E-W OVERTURNING MOMENTS ($X10^6$ K-FT) OBE+SRV (2% DAMPING)

FIGURE 3A-427



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REACTOR ENCLOSURE & CONTROL STRUCTURE E-W OVERTURNING MOMENTS ($X10^6$ K-FT) DBE+LOCA+SRV (5% DAMPING)

FIGURE 3A-428

REACTOR ENCLOSURE FLOOR SLABS

ELEMENT NUMBER	ELEVATION (FT)	SLAB THICKNESS (FT)	GOVERNING EQUATION(1)	REBAR(2) STRESS (KSI)	STRESS MARGIN (%)
1	201	1.5	1	13.13	75.7
2	201	2.5	1	30.55	43.4
3	217	1.5	7a	30.90	42.8
4	217	2.0	7a	27.70	48.7
5	253	1.25	7a	51.26	5.1
6	253	2.0	1	20.40	62.2
7	283	1.25	7a	42.74	20.9
8	283	2.75	1	28.13	47.9
9	313	1.75	1	30.52	43.5
10	313	2.0	7a	23.83	55.9
11	313	3.0	7a	28.16	47.9
12	333	1.25	1	21.22	60.7
13	333	1.67	1	15.47	71.4
14	352	2.0	7a	36.35	32.7
15	352	3.25	7a	11.18	79.3

NOTES: (1) Taken from Table 3A-14 as follows:

Load Combination EQN 1 = 1.4D + 1.7L + 1.5 SRV
Load Combination EQN 7a = 1.0D + 1.0L + 1.0 ESS + 1.0 SRV + 1.0 LOCA

(2) Allowable Reinforcing Steel Stress = 54 KSI

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REACTOR ENCLOSURE MARGINS
FLOOR SLABS

FIGURE 3A-429

REACTOR ENCLOSURE FLOOR STEEL BEAM(1)

ELEMENT NUMBER	ELEVATION (FT)	STEEL SIZE	GOVERNING EQUATION(2)	BENDING STRESS (KSI)	STRESS MARGIN(3) %
16	201	W27 x 145	1	23.00	4.2
17	201	W24 x 68	1	20.00	16.7
18	217	W33 x 141	1	21.90	8.6
19	217	W33 x 130	7	27.40	15.5
20	253	W24 x 76	1	22.66	5.6
21	253	W27 x 84	1	20.92	12.8
22	283	72" Girder	1	24.00	0.
23	283	W33 x 152	1	19.27	19.7
24	313	56" Girder	7	30.28	6.5
25	313	W36 x 300	7	29.44	9.1
26	331	W36 x 182	7	23.58	27.2
27	331	W21 x 73	7	20.31	37.3
28	352	W36 x 300	7	18.54	42.7
29	352	W24 x 68	7	16.94	47.7

NOTES: (1) All beams are A-36 steel.

(2) Taken from Table **3A-15** as follows:

Load Combination EQN 1 = D + L + SRV
Load Combination EQN 7 = D + L + E^1 + SRV + LOCA

(3) Allowable Bending Stresses for Governing Equations 1 and 7 are 24.0 KSI and 32.4 KSI, respectively.

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REACTOR ENCLOSURE MARGINS FLOOR STEEL BEAM

FIGURE 3A-430

REACTOR ENCLOSURE SUPPORTING COLUMNS

ELEVATION RANGE	LOCATION(1)	MATERIALS(2)	INTERACTION EQUATION	STRESS MARGIN%
177'-201'	29 & E	Steel	0.77	23
177'-201'	30.5 & E	Reinforced Concrete	-	8
201'-217'	29 & E	Steel	0.78	22
201'-217'	30.5 & E	Reinforced Concrete	-	1
217'-253'	30.5 & E	Steel	1.02	0
253'-283'	30.5 & E	Steel	0.88	12
283'-313'	30.5 & E	Steel	0.78	22
313'-333'	27.5 & E	Steel	0.97	3
313'-333'	30.5 & E	Steel	0.91	9
333'-352'	29 & E	Steel	0.65	35

NOTES: (1) Figure **3A-398** gives location reference

(2) For Steel Supports, Load Combination EQN (7) of Table 5.3-1 is used: D + L + E + LOCA + SRV + P.

For Reinforced Concrete Supports, Load Combination EQN (7) of Table **3A-14** is used:
$D + L + E_O + LOCA + SRV + P_B$

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REACTOR ENCLOSURE MARGINS SUPPORTING COLUMNS

FIGURE 3A-431

REACTOR ENCLOSURE SHEAR WALLS

WALL ELEVATION (FT)	WALL MARK(1)	GOVERNING EQUATION(2)	COMBINED AXIAL & BENDING STRESS MARGIN (%) (3)	SHEAR STRESS MARGIN (%) (4)
177	Line 14.1	7a	67	1
177	Line 31.9	7a	67	1
177	D	7a	48	12
177	Line 23	7a	24	8
177	Line 21.5	7a	29	9

NOTES: (1) Figure **3A-398** gives location reference

(2) Taken from Table **3A-14** as follows:

Load Combination EQN 7a = D + L + Ess + SRV + LOCA

(3) Allowable Reinforcing Steel Stress = 54 KSI

(4) Allowable Reinforcing Steel Stress = 51 KSI

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REACTOR ENCLOSURE MARGINS SHEAR WALLS

FIGURE 3A-432

CONTROL STRUCTURE FLOOR SLABS

ELEMENT NUMBER	ELEVATION (FT)	SLAB THICKNESS (FT)	GOVERNING EQUATION(1)	REBAR STRESS(2) KSI	STRESS MARGIN (%)
30	200	1.5	1	14.47	73.2
31	200	6.0	1	37.64	30.3
32	217	1.25	1	14.15	73.8
33	237	1.0	1	31.10	42.4
34	237	1.0	1	30.89	42.8
35	254	1.0	1	27.86	48.4
36	269	1.5	1	12.15	77.5
37	289	1.5	1	10.26	81.0
38	304	1.0	1	22.95	57.5
39	332	1.5	1	16.92	68.7
40	332	2.0	1	41.4	23.3
41	350	1.5	1	16.65	69.2

NOTES: (1) Taken from Table 3A-14 as follows:

Load Combination EQN 1 = 1.4D + 1.7L + 1.5 SRV

(2) Allowable Reinforcing Steel Stress = 54 KSI

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DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE MARGINS
FLOOR SLABS

FIGURE 3A-433

CONTROL STRUCTURE FLOOR STEEL BEAM[1]

ELEMENT NUMBER	ELEVATION (FT)	STEEL SIZE	GOVERNING EQUATION(2)	BENDING STRESS (KSI)	STRESS MARGIN(3) %
42	200	W24 x 130	1	23.78	0.9
43	217	W30 x 210	7	29.90	7.7
44	237	W36 x 300	7	27.60	14.8
45	254	W36 x 245	7	28.80	11.1
46	269	42" Girder	7	25.53	21.2
47	289	W36 x 160	7	27.90	13.9
48	304	W36 x 194	7	30.00	7.4
49	332	38" Girder	7	24.80	23.5
50	350	W18 x 105	7	10.30	68.2

NOTES: (1) All beams are A-36 steel.

(2) Taken from Table **3A-15** as follows:

Load Combination EQN 1 = D + L + SRV
Load Combination EQN 7 = D + L + E' + SRV + LOCA

(3) Allowable bending stresses for governing equations 1 and 7 are 24.0 KSI and 32.4 KSI, respectively.

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DESIGN ASSESSMENT REPORT
CONTROL STRUCTURE MARGINS
FLOOR STEEL BEAM

FIGURE 3A-434

CONTROL STRUCTURE SHEAR WALLS

WALL ELEVATION (FT)	WALL MARK	GOVERNING EQUATION(2)	COMBINED AXIAL & BENDING STRESS MARGIN (%)(3)	SHEAR STRESS MARGIN (%)(4)
177	Mh	7a	2	12
200	Mh	7a	39	2
269	J	1	44	24
239	J	1	48	19
177	Line 19.4	7a	23	0
239	Line 19.4	1	3.4	24
177	Line 26.6	7a	28	0

NOTES: (1) Figure **3A-398** gives location reference.

(2) Taken from Table **3A-14** as follows:

Load Combination EQN 1 = 1.4D + 1.7L + 1.5 SRV
Load Combination EQN 7a = 1.0D + 1.0L + 1.0 E_{SS} + 1.0 SRV + 1.0 LOCA

(3) Allowable Reinforcing Steel Stress = 54 KSI
Allowable Concrete Compressive Stress = 2.8 KSI

(4) Allowable Reinforcing Steel Stress = 51 KSI

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CONTROL STRUCTURE MARGINS SHEAR WALLS

FIGURE 3A-435

CONTROL STRUCTURE STEEL PLATFORM (1)

ELEMENT NUMBER	ELEVATION (FT)	STEEL GRADE	GOVERNING EQUATION(2)	BENDING STRESS (KSI)	STRESS MARGIN(3) (%)
51	313	W10x21	2	14.7	38.8
52	313	W12x27	2	18.9	21.3
53	322	W12x27	2	10.7	55.4
54	340	W8x24	2	10.0	58.3
55	350	W8x24	2	17.6	26.7
56	350	W10x54	2	10.6	55.8

NOTES: (1) All beams are A-36 steel.
(2) Allowable bending stress = 24 KSI
(3) Taken from Table **3A-15** as follows:

Load Combination EQN 2 = D + L + To + SRV

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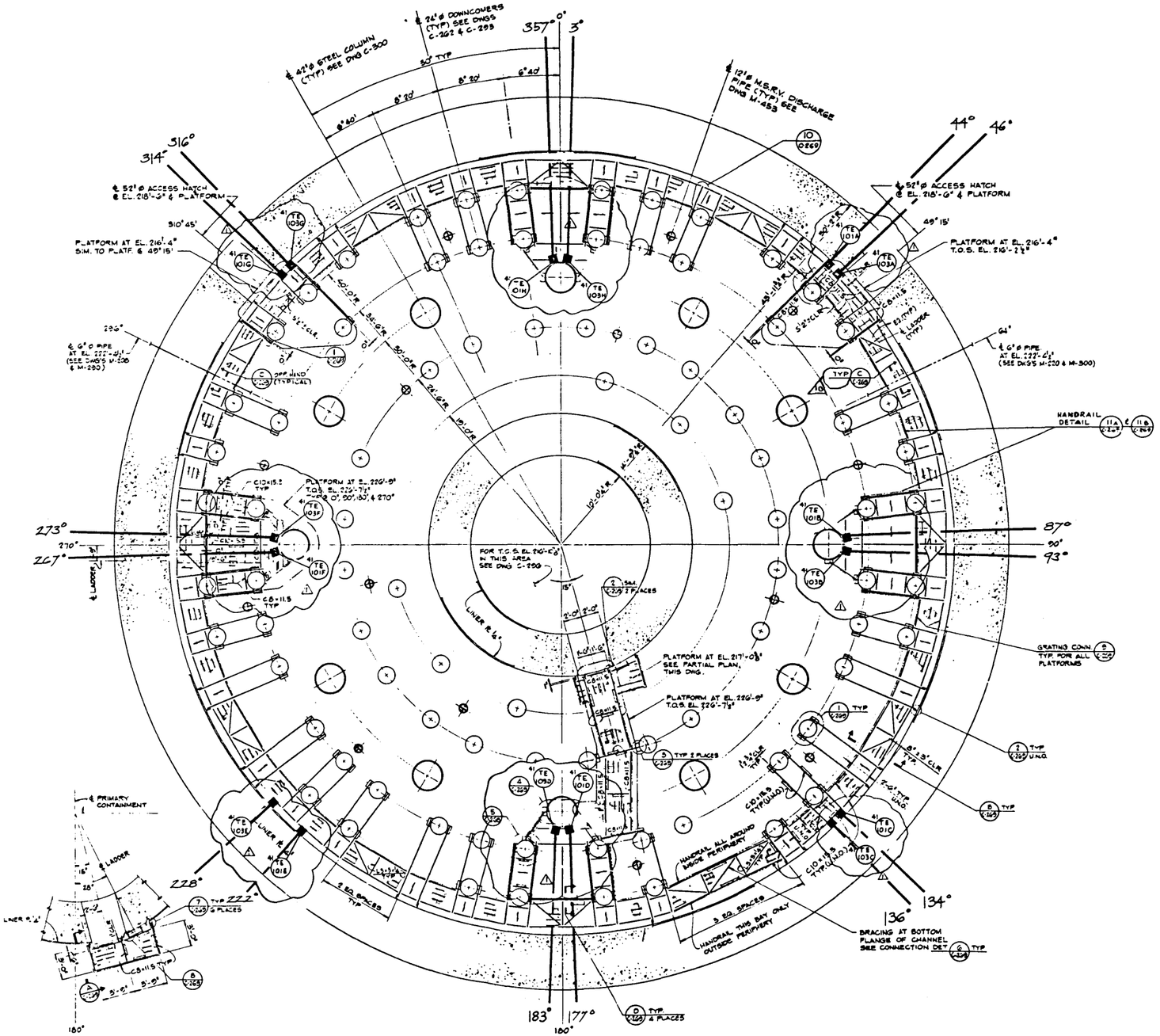
CONTROL STRUCTURE MARGINS STEEL PLATFORM

FIGURE 3A-436



PLATFORM AT EL. 217'-0 3/8"
T.O.S. EL. 216'-10 7/8"
W/ 1 1/2" x 3/16" GRATING

PLATFORM AT EL. 223'-4" U.N.O.
T.O.S. EL. 223'-2 1/2" U.N.O.
W/ 1 1/2" x 3/16" GRATING TYP

KEY PLAN

NOTES:
1. FOR LEGEND AND GENERAL NOTES SEE DWG M-705
2. DISTANCE BETWEEN TWO REDUNDANT SENSORS (E.G. TE-4-1016 & TE-41-1038) SHOULD BE AT LEAST 12' OR MORE.
3. APPROX ELEV OF SUPPRESSION POOL TEMP CONN CENTER LINE IS 228'-3". FOR EXACT ELEV SEE INSTALLATION DETAIL 8031-4-850-1029.

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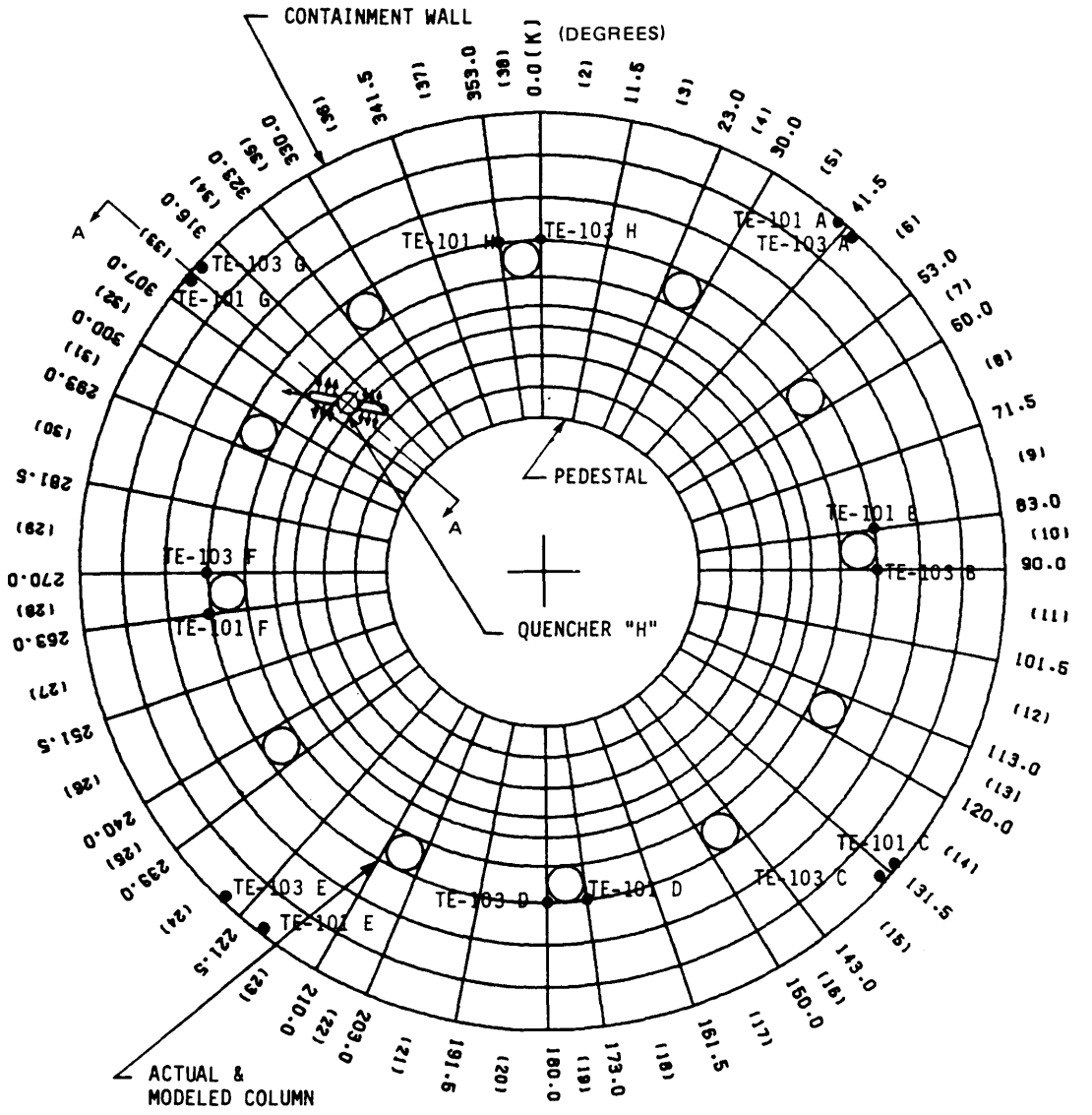
SUPPRESSION POOL TEMPERATURE MONITORING SYSTEM SENSOR LOCATIONS

FIGURE 3A-437



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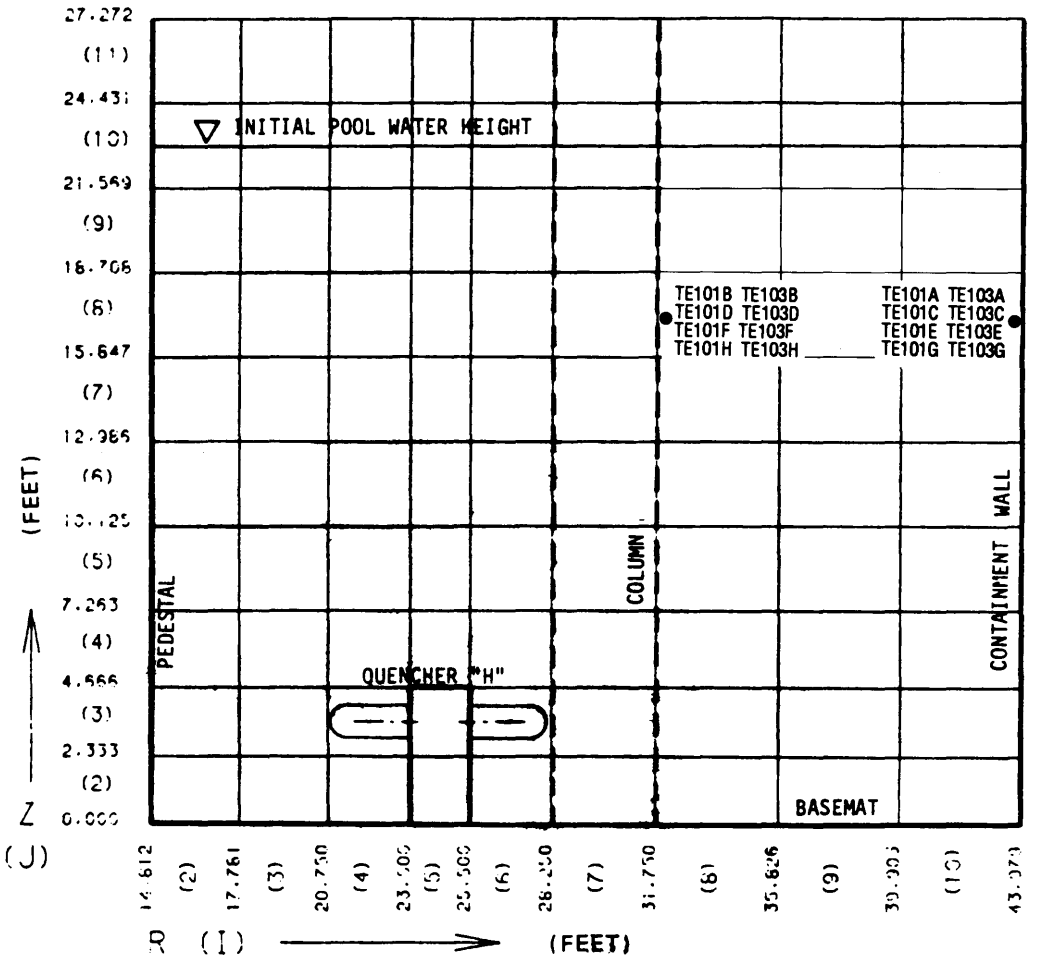
PLAN VIEW OF MESH SYSTEM MODELING OF SUPPRESSION POOL FOR SRV-H HIGH AND LOW REACTOR PRESSURE BLOWDOWN (WITH SPTMS SENSOR LOCATIONS)

FIGURE 3A-438

VIEW A-A OF FIGURE 3A-438



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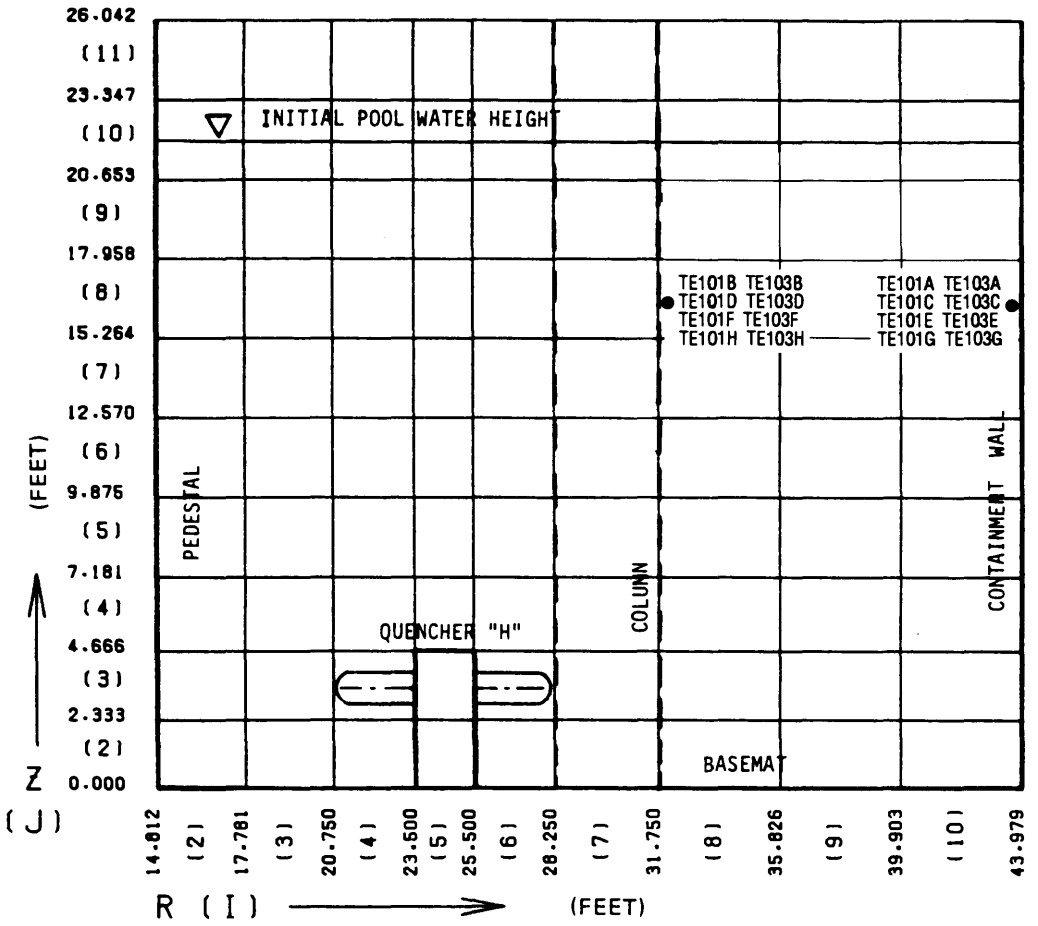
SECTION VIEW OF MESH SYSTEM MODELING OF SUPPRESSION POOL FOR SRV-H HIGH REACTOR PRESSURE BLOWDOWN (WITH SPTMS SENSOR LOCATIONS)

FIGURE 3A-439

VIEW A-A OF FIGURE 3A-438



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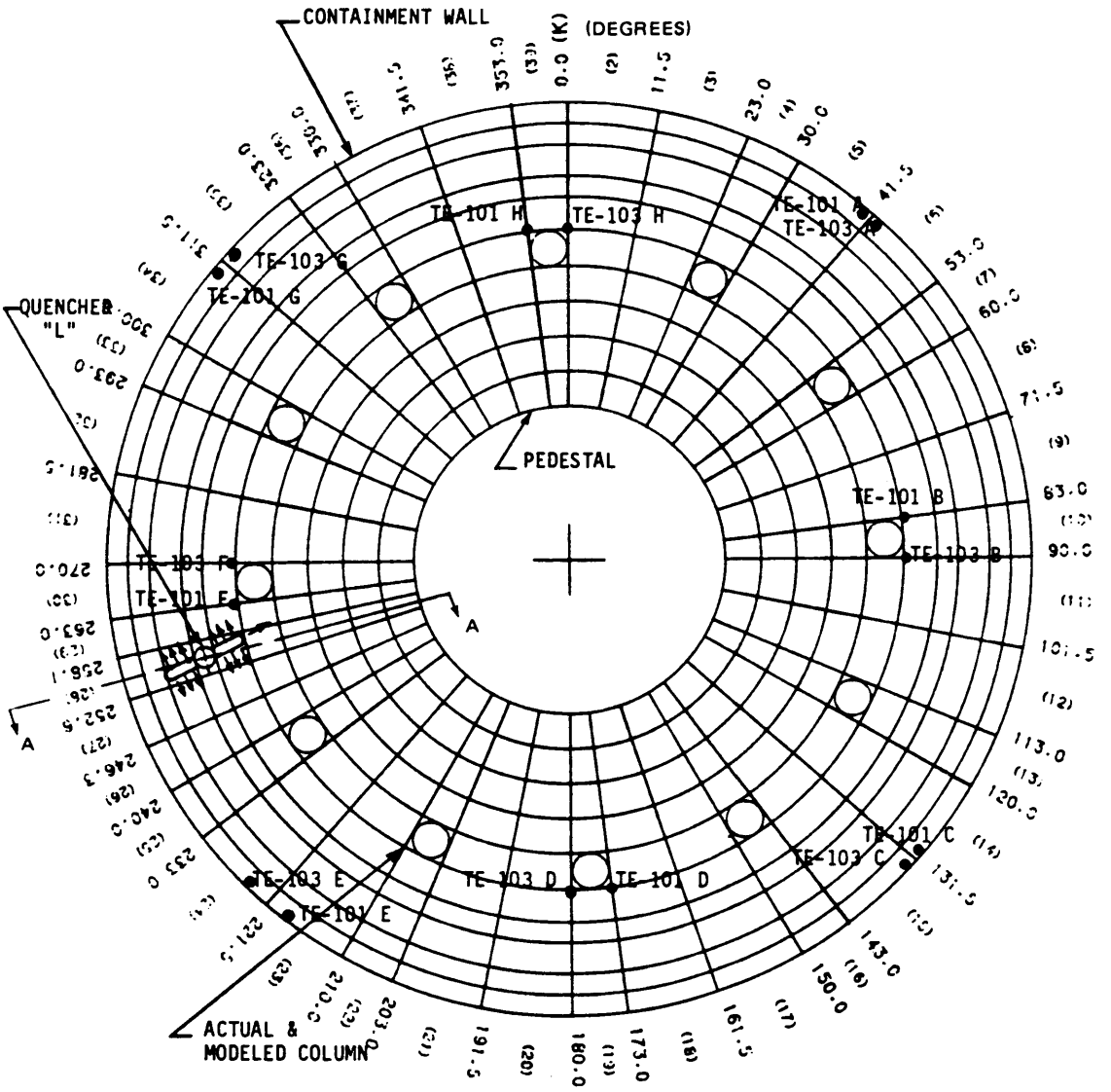
SECTION VIEW OF MESH SYSTEM MODELING OF SUPPRESSION POOL FOR SRV-H LOW REACTOR PRESSURE BLOWDOWN (WITH SPTMS SENSOR LOCATIONS)

FIGURE 3A-440



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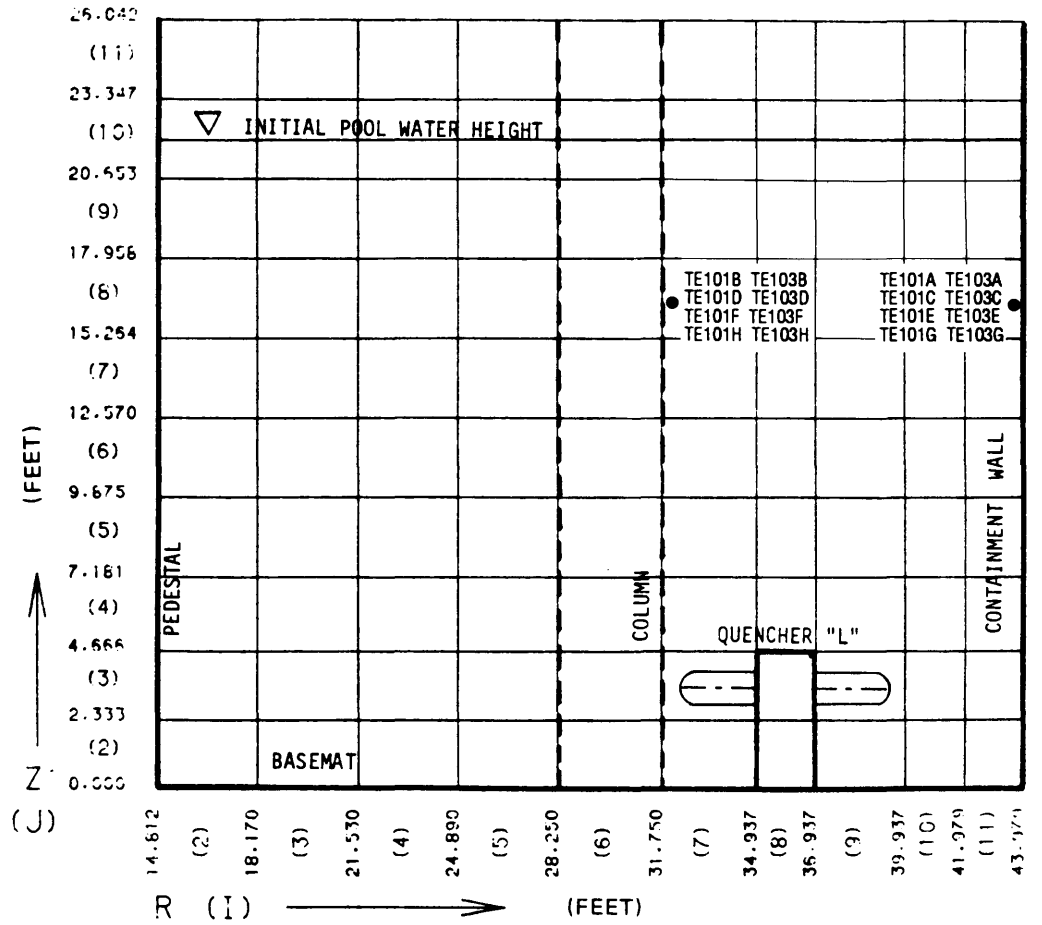
PLAN VIEW OF MESH SYSTEM MODELING OF SUPPRESSION POOL FOR SRV-L HIGH REACTOR PRESSURE BLOWDOWN (WITH SPTMS SENSOR LOCATIONS)

FIGURE 3A-441

VIEW A-A OF FIGURE 3A-441



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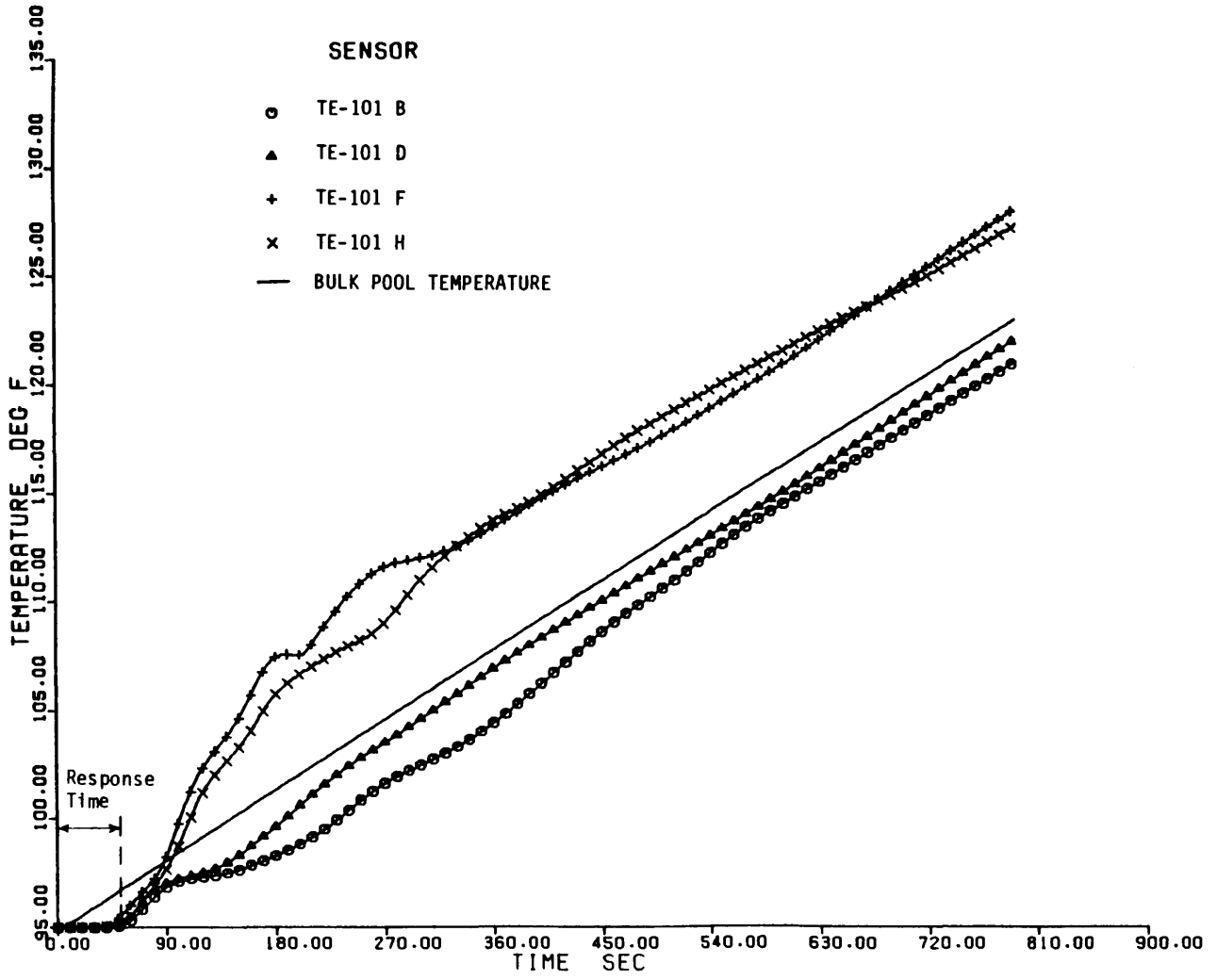
DESIGN ASSESSMENT REPORT
SECTION VIEW OF MESH
SYSTEM MODELING OF SUPPRESSION
POOL FOR SRV-L HIGH REACTOR BLOWDOWN
(WITH SPTMS SENSOR LOCATIONS)
FIGURE 3A-442



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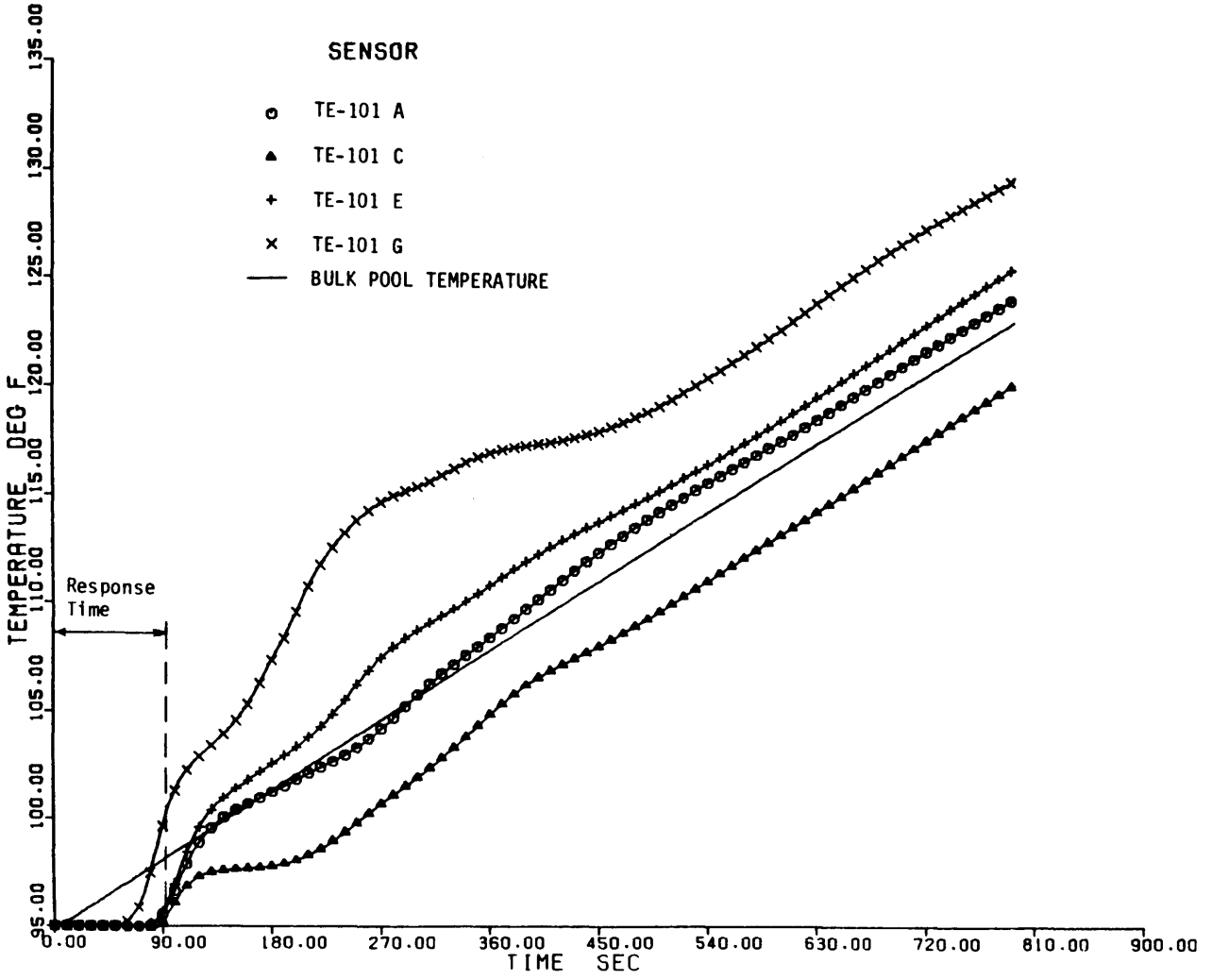
TEMPERATURE TIME HISTORIES OF COLUMN MOUNTED SPTMS SENSORS (TE-101 B, D, F & H) FOR SRV-H HIGH REACTOR PRESSURE BLOWDOWN

FIGURE 3A-443



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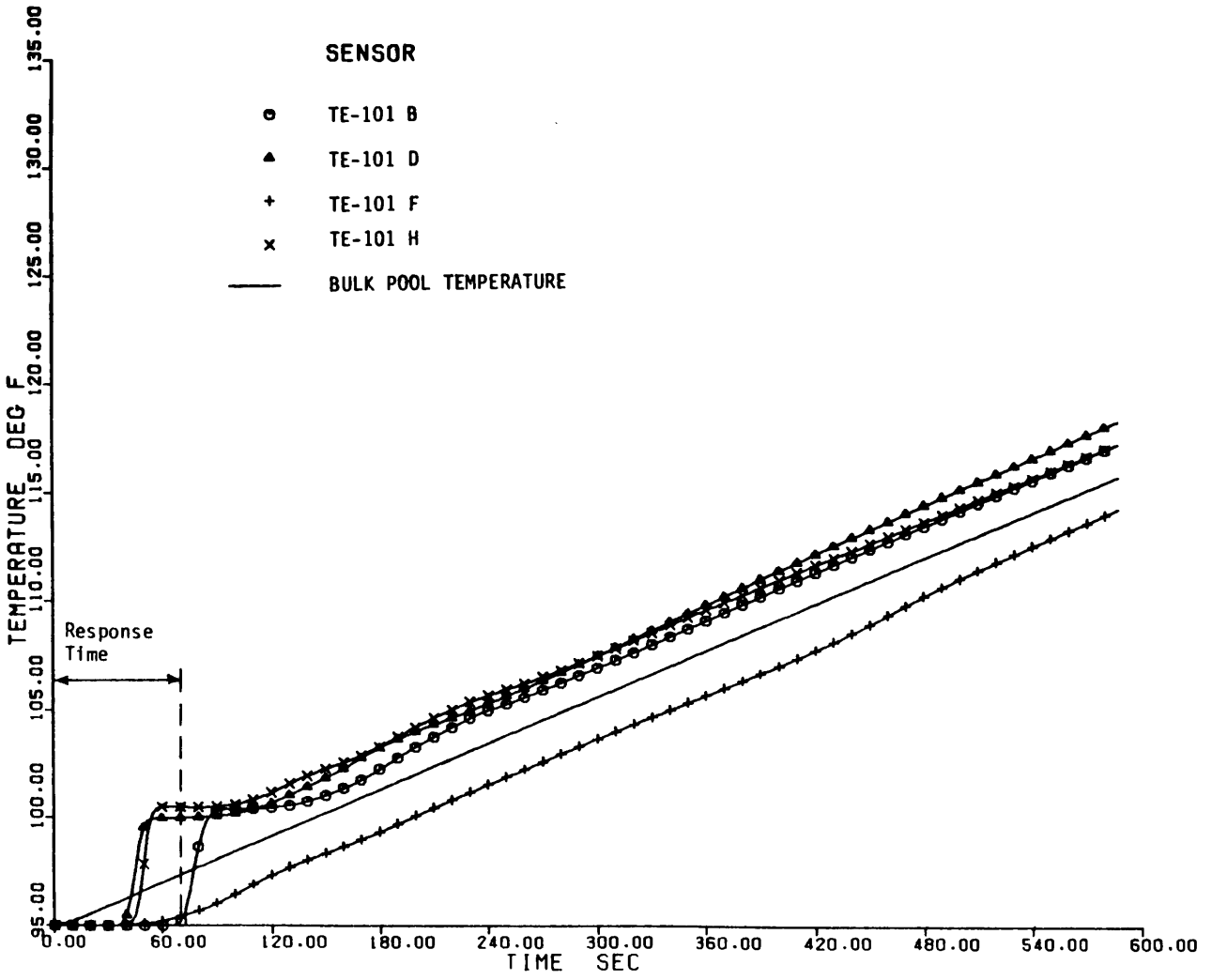
TEMPERATURE TIME HISTORIES OF CONTAINMENT WALL MOUNTED SPTMS SENSORS (TE-101 A, C, E & G) FOR SRV-H HIGH REACTOR PRESSURE BLOWDOWN

FIGURE 3A-444



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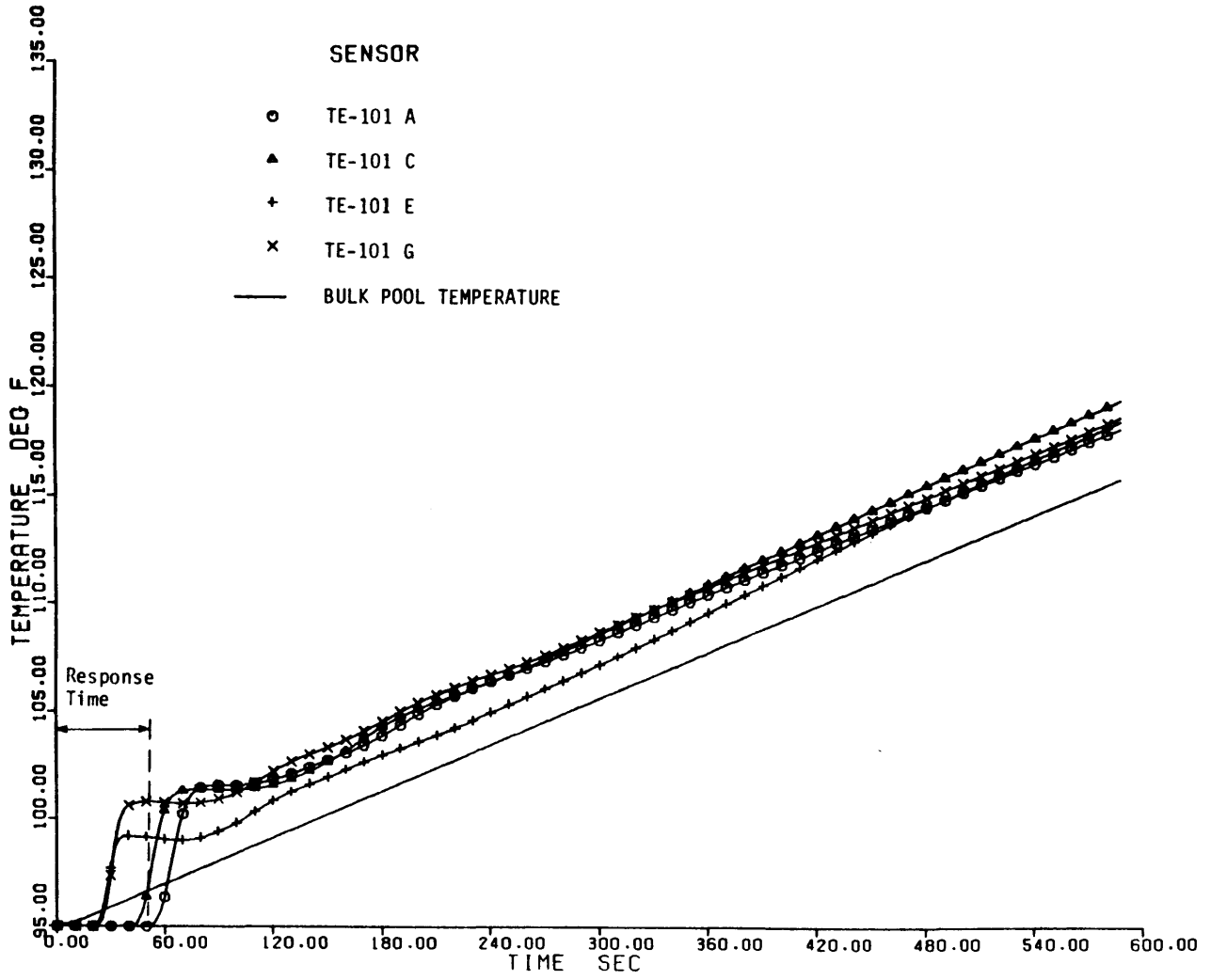
TEMPERATURE TIME HISTORIES OF COLUMN MOUNTED SPTMS SENSORS (TE-101 B, D, F & H) FOR SRV-L HIGH REACTOR PRESSURE BLOWDOWN

FIGURE 3A-445



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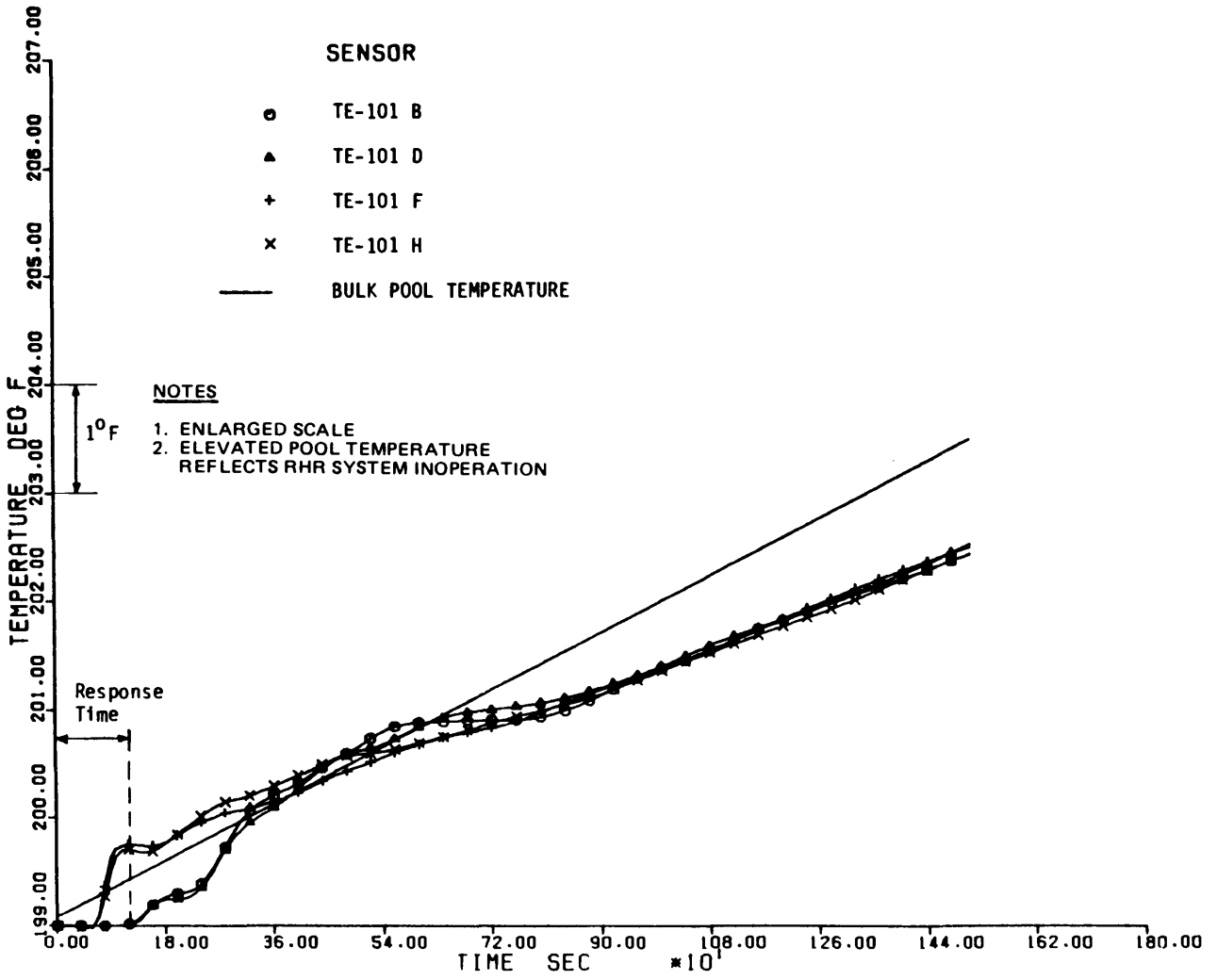
TEMPERATURE TIME HISTORIES OF CONTAINMENT WALL MOUNTED SPTMS SENSORS (TE-101 A, C, E & G) FOR SRV-L HIGH REACTOR PRESSURE BLOWDOWN

FIGURE 3A-446



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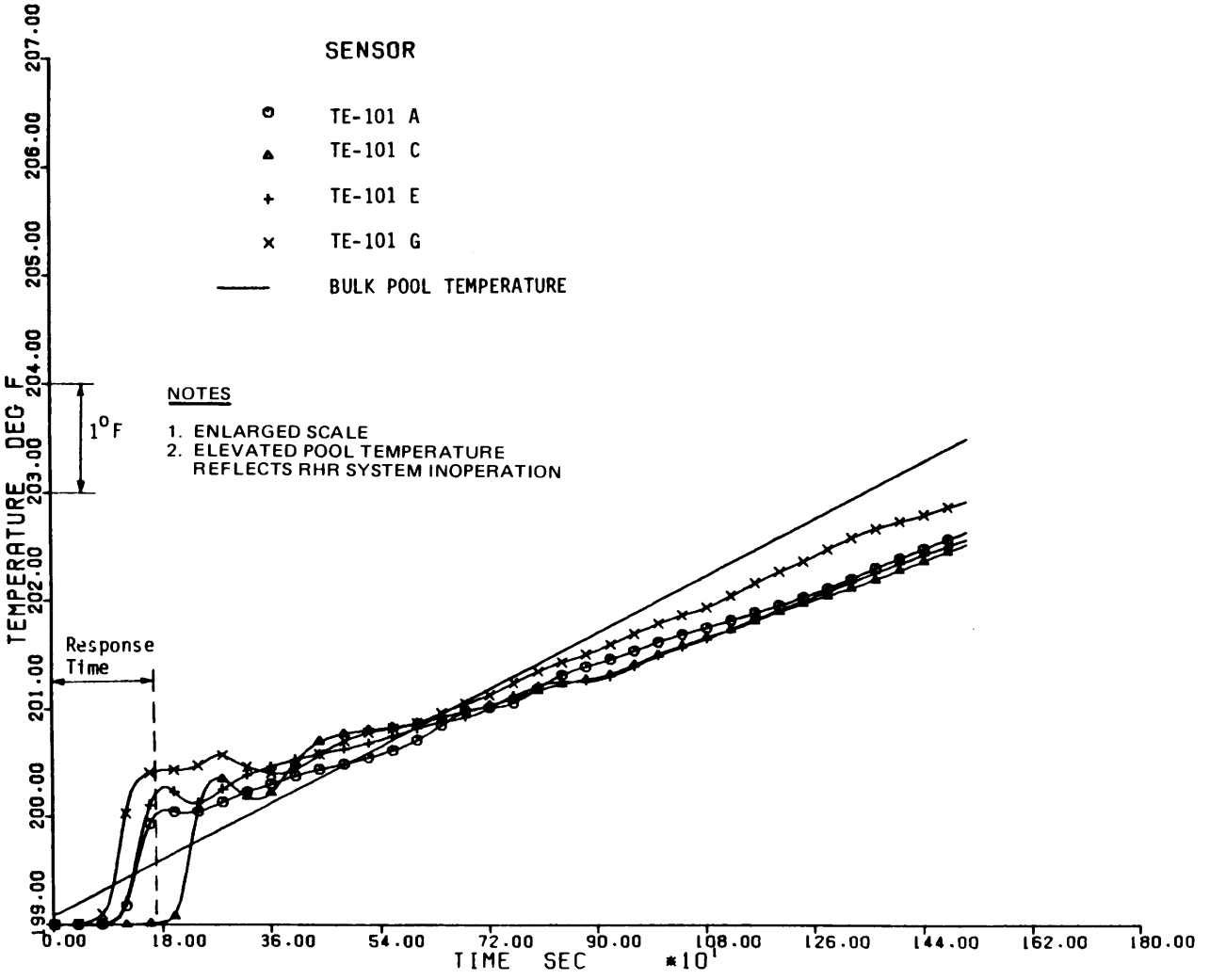
TEMPERATURE TIME HISTORIES OF COLUMN MOUNTED SPTMS SENSORS (TE-101 B, D, F & H) FOR SRV-H LOW REACTOR PRESSURE BLOWDOWN

FIGURE 3A-447



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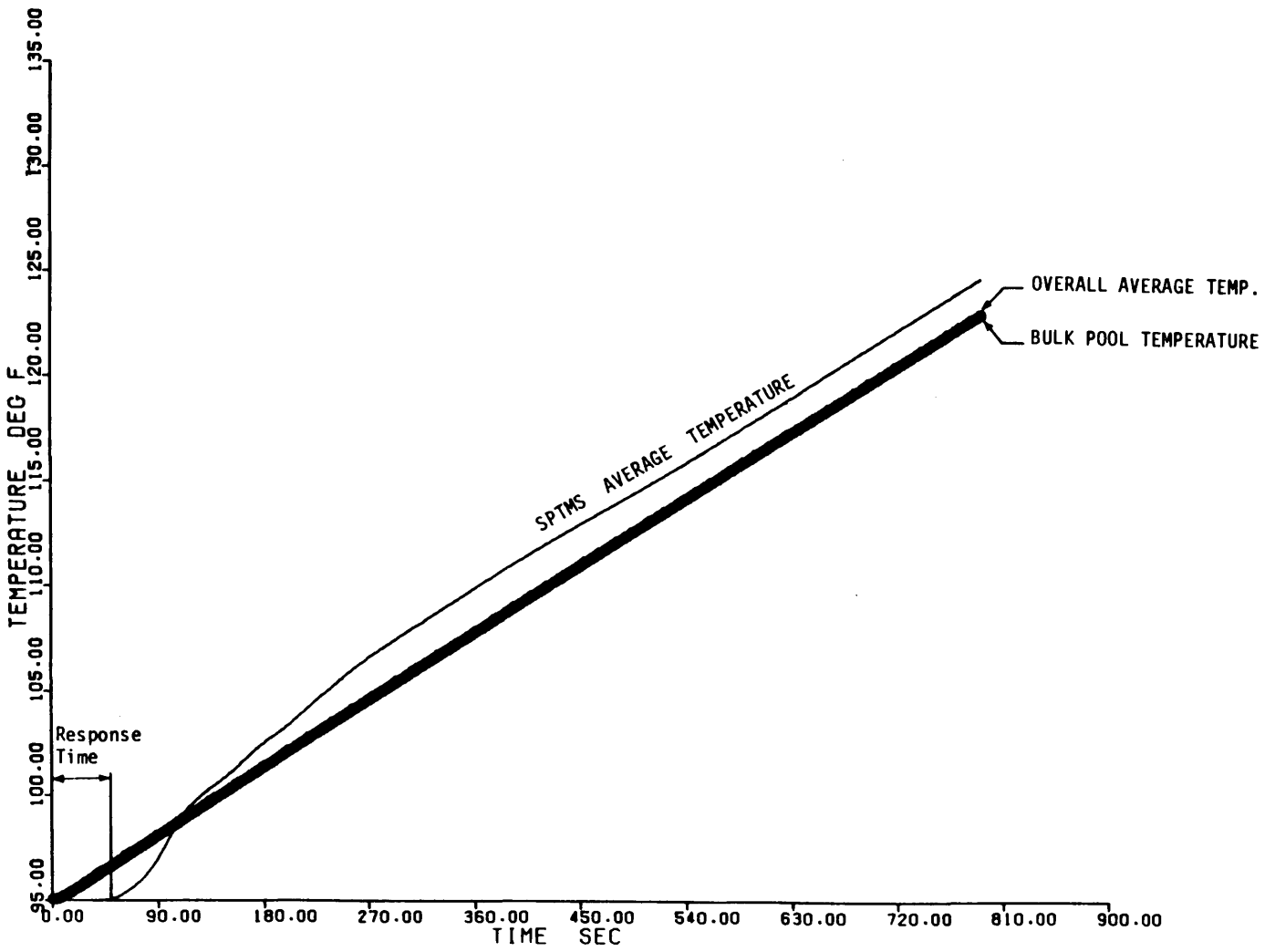
TEMPERATURE TIME HISTORIES OF CONTAINMENT WALL MOUNTED SPTMS SENSORS (TE-101 A, C, E & G) FOR SRV-H LOW REACTOR PRESSURE BLOWDOWN

FIGURE 3A-448



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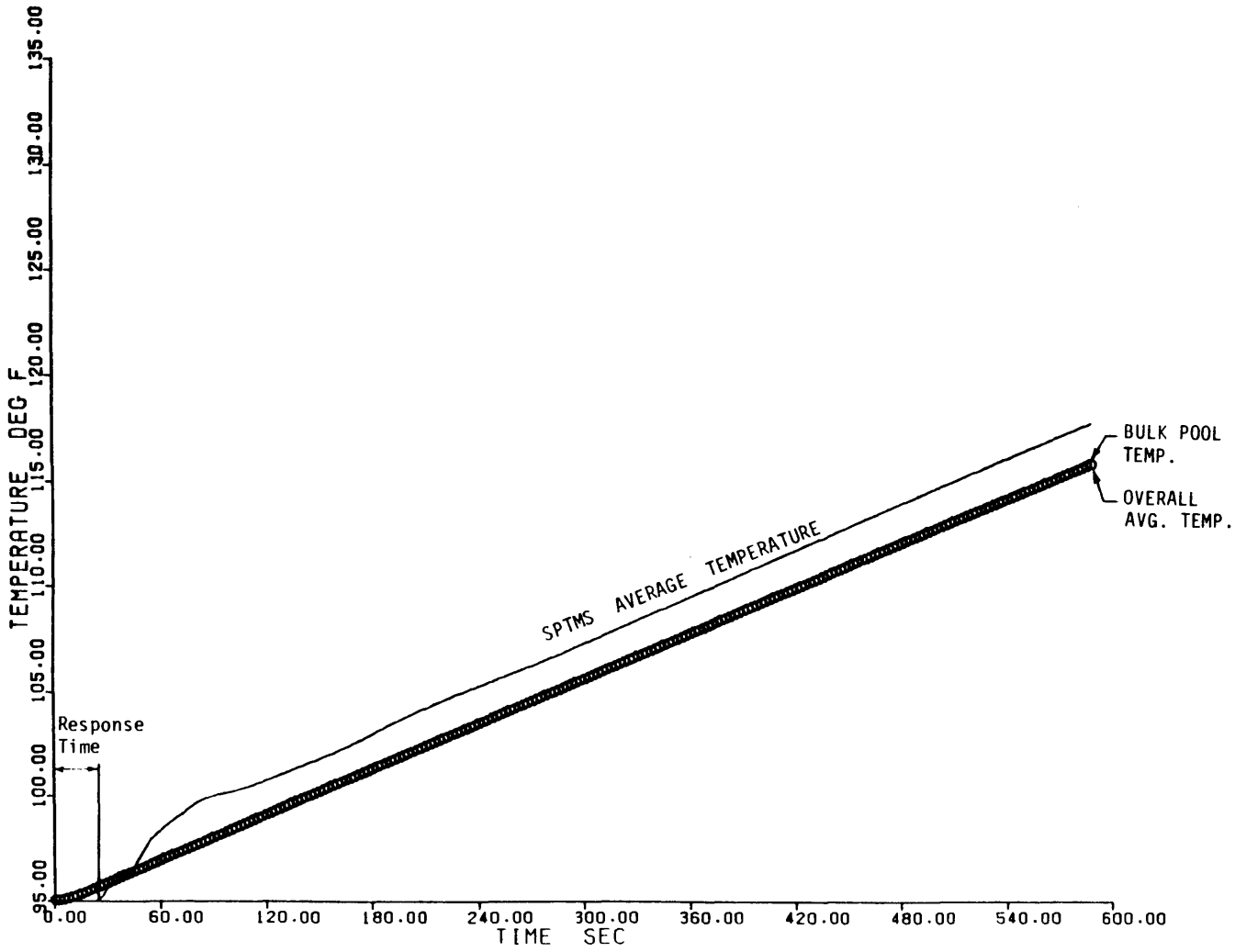
BULK TEMPERATURE VERSUS AVERAGE TEMPERATURE FROM SPTMS DIVISION 1 (TE 101A...TE-101H) FOR SRV-H HIGH REACTOR PRESSURE BLOWDOWN

FIGURE 3A-449



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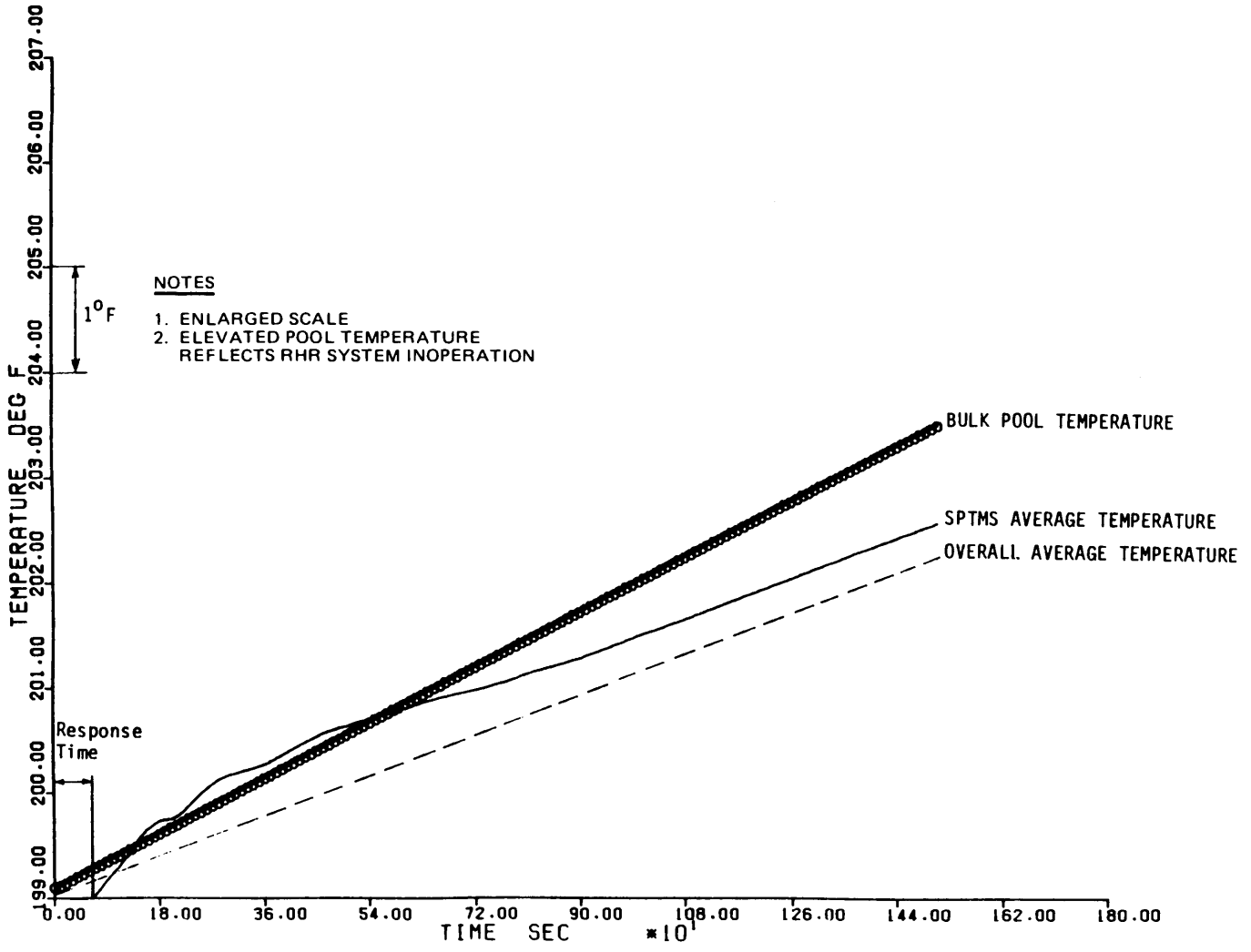
BULK TEMPERATURE VERSUS AVERAGE TEMPERATURE FROM SPTMS DIVISION 1 (TE 101A...TE-101H) FOR SRV-L HIGH REACTOR PRESSURE BLOWDOWN

FIGURE 3A-450



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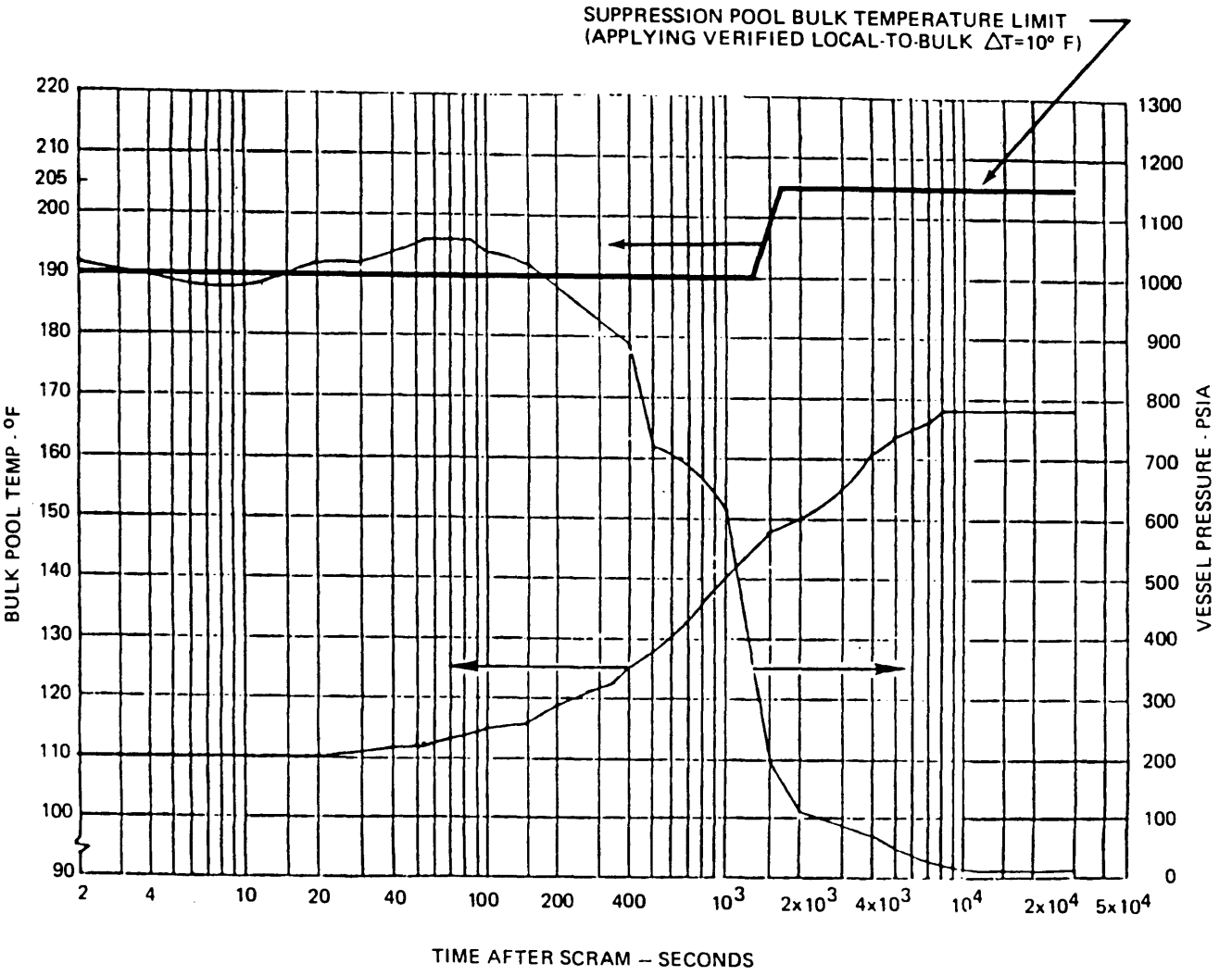
BULK TEMPERATURE VERSUS AVERAGE TEMPERATURE FROM SPTMS DIVISION 1 (TE 101A...TE-101H) FOR SRV-H LOW REACTOR PRESSURE BLOWDOWN

FIGURE 3A-451



NOTE: The information presented in this figure is based on the original design basis conditions. The current suppression pool temperature response results are discussed in Section 3A.15.2. The results reasonably represent the general characteristics of the suppression pool temperature response.

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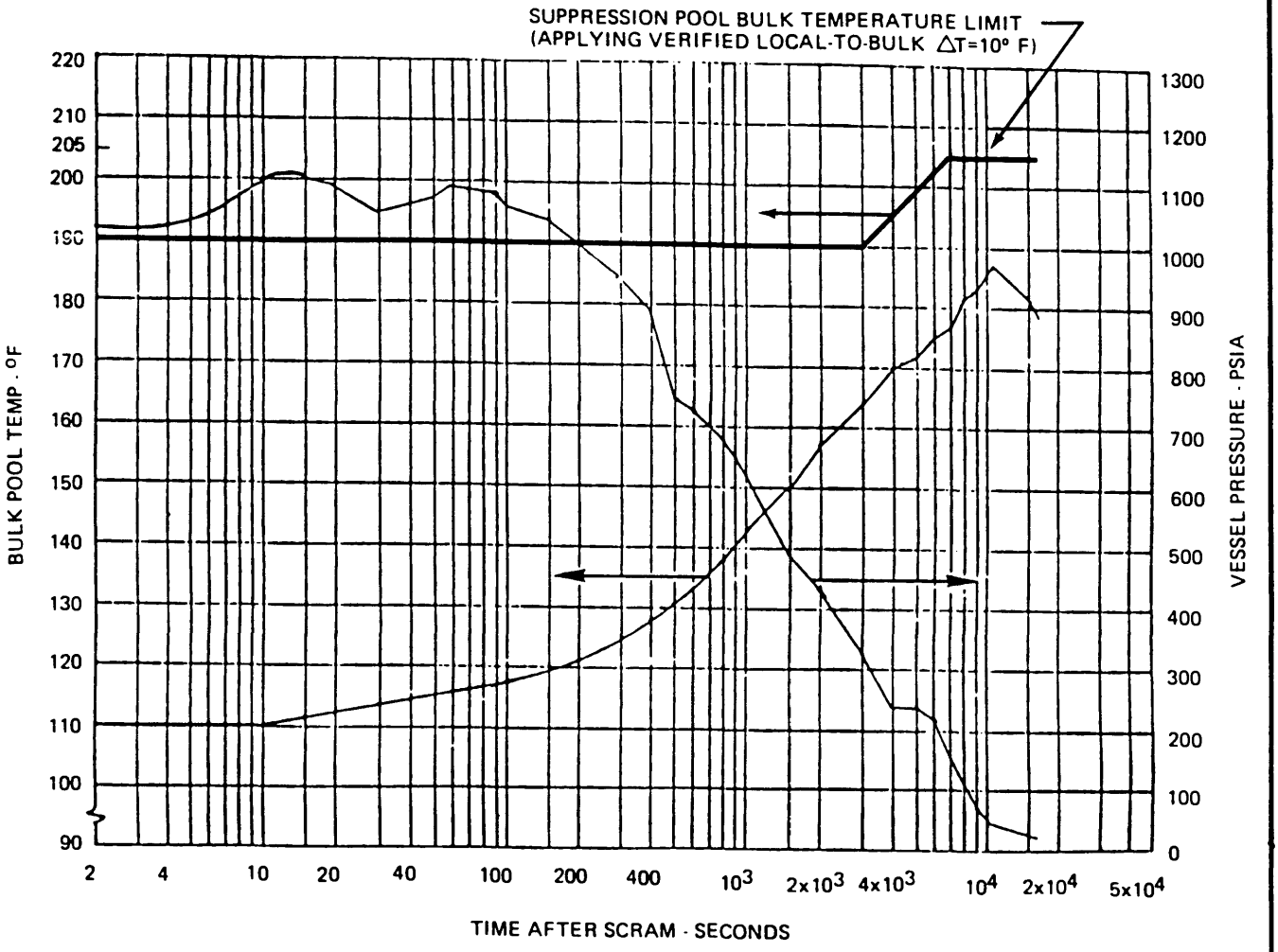
SUPPRESSION POOL TEMPERATURE TRANSIENT CASE 1.a

FIGURE 3A-452 Rev. 5, 4/96



NOTE: The information presented in this figure is based on the original design basis conditions. The current suppression pool temperature response results are discussed in Section 3A.15.2. The results reasonably represent the general characteristics of the suppression pool temperature response.

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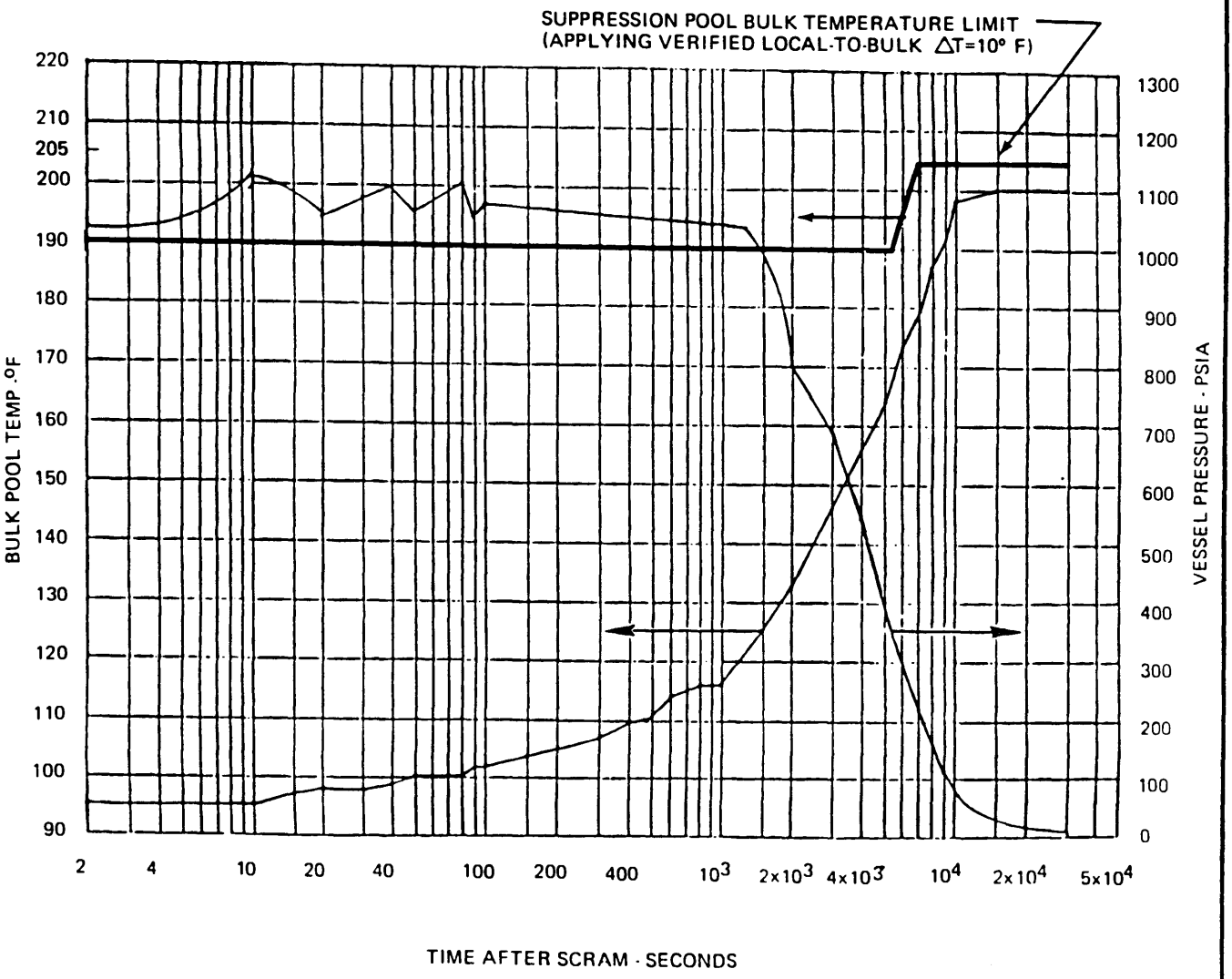
SUPPRESSION POOL TEMPERATURE TRANSIENT CASE 1.b

FIGURE 3A-453 Rev. 5, 4/96



NOTE: The information presented in this figure is based on the original design basis conditions. The current suppression pool temperature response results are discussed in Section 3A.15.2. The results reasonably represent the general characteristics of the suppression pool temperature response.

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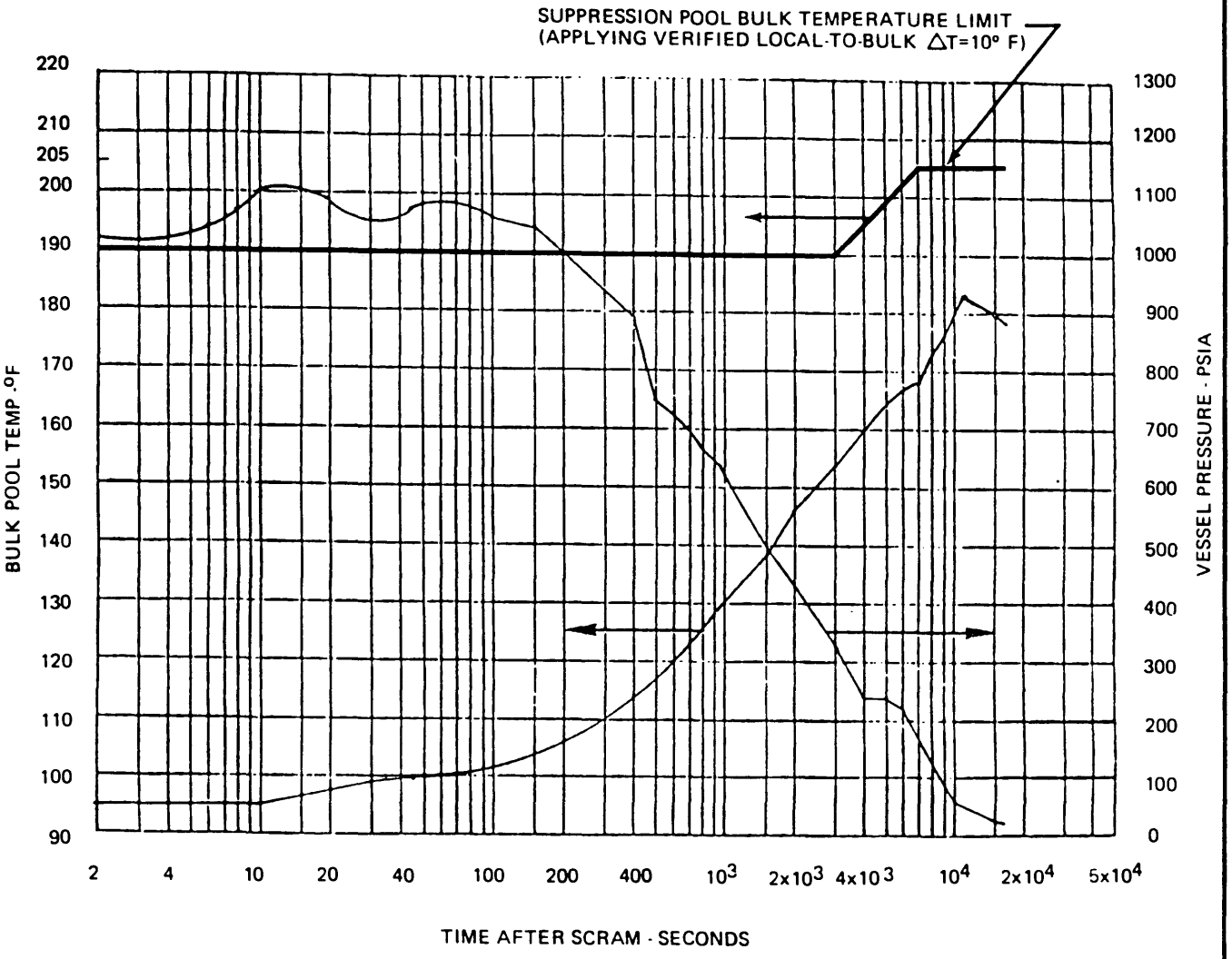
SUPPRESSION POOL TEMPERATURE TRANSIENT CASE 2.a

FIGURE 3A-454 Rev. 5, 4/96



NOTE: The information presented in this figure is based on the original design basis conditions. The current suppression pool temperature response results are discussed in Section 3A.15.2. The results reasonably represent the general characteristics of the suppression pool temperature response.

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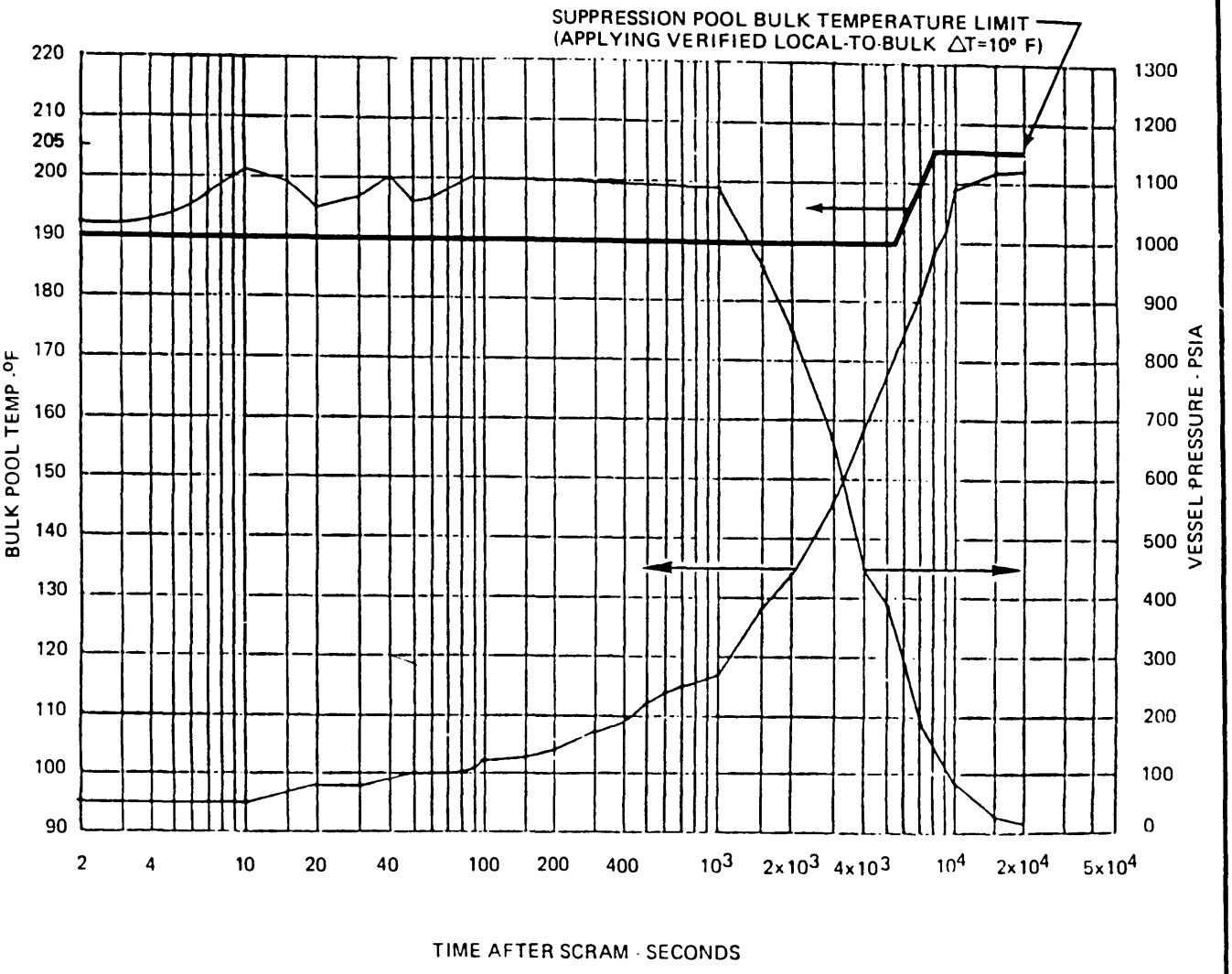
SUPPRESSION POOL TEMPERATURE TRANSIENT CASE 2.b

FIGURE 3A-455 Rev. 5, 4/96



NOTE: The information presented in this figure is based on the original design basis conditions. The current suppression pool temperature response results are discussed in Section 3A.15.2 and Table 3A-30. The results reasonably represent the general characteristics of the suppression pool temperature response.

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SUPPRESSION POOL TEMPERATURE TRANSIENT CASE 3.a

FIGURE 3A-456

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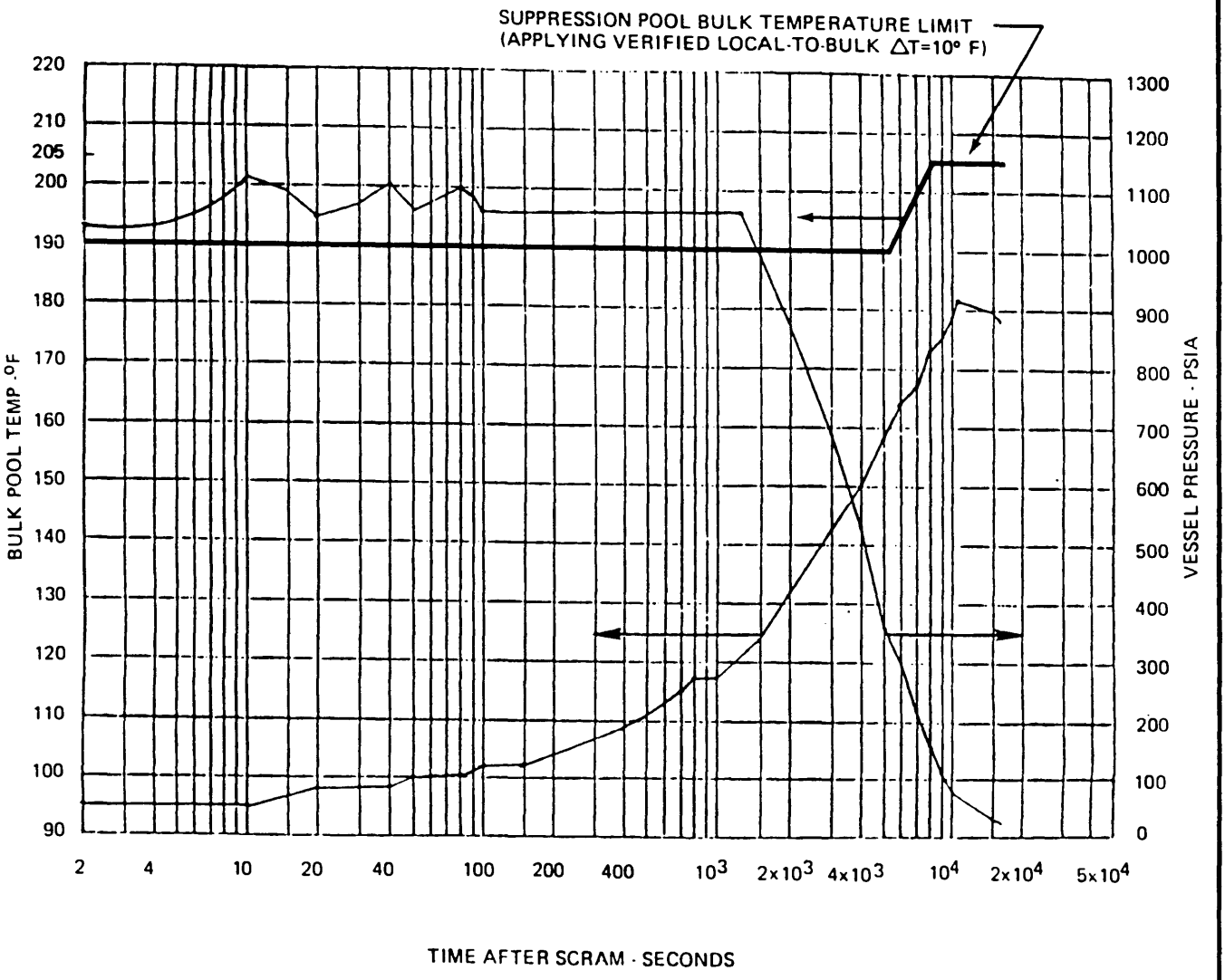

NOTE: The information presented in this figure is based on the original design basis conditions. The current suppression pool temperature response results are discussed in Section 3A.15.2. The results reasonably represent the general characteristics of the suppression pool temperature response.

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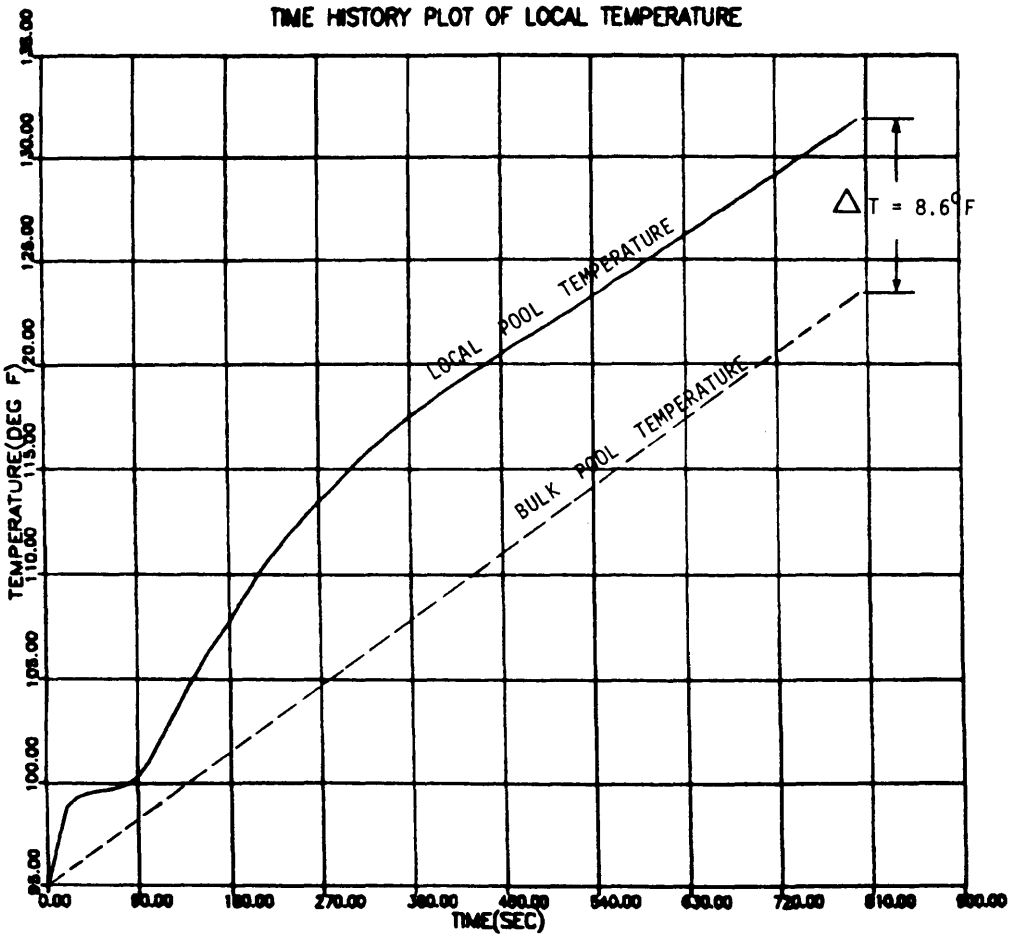
SUPPRESSION POOL TEMPERATURE TRANSIENT CASE 3.b

FIGURE 3A-457 Rev. 5, 4/96



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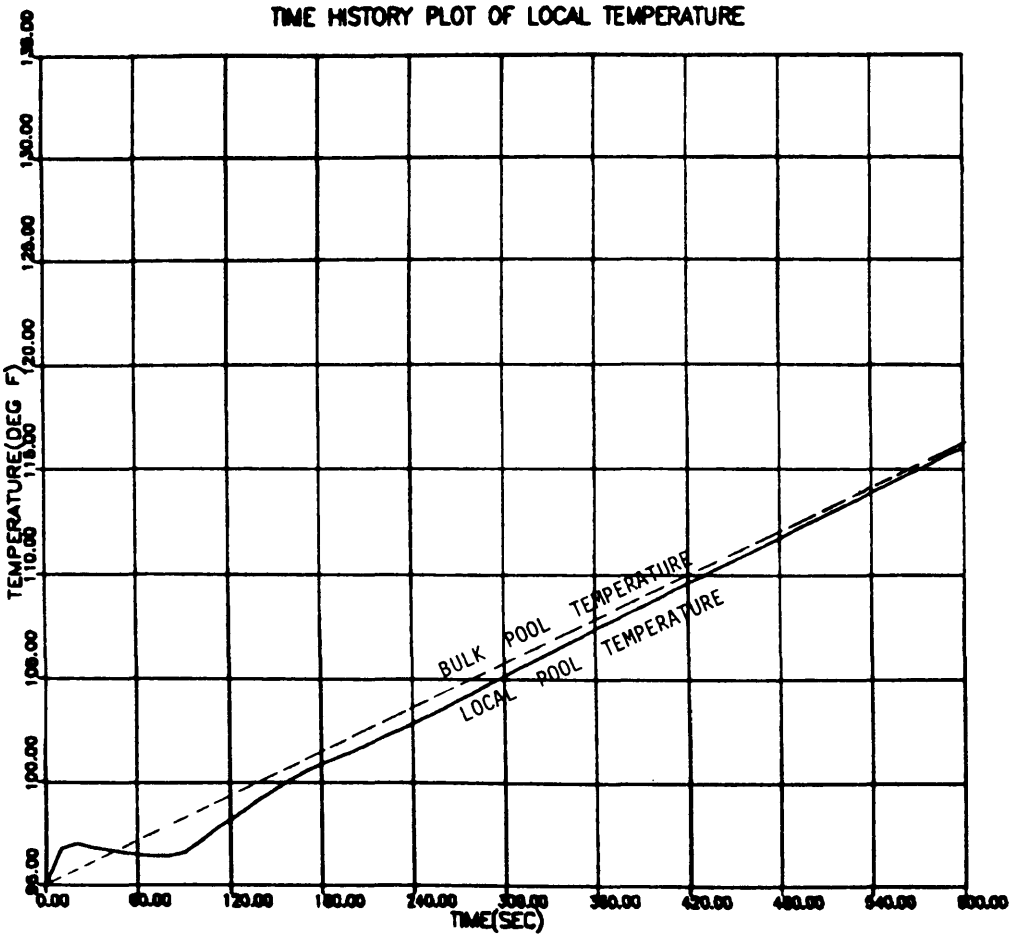
LOCAL-TO-BULK TEMPERATURE DIFFERENCE (ΔT) TRACE FOR SRV-H BLOWDOWN UNDER HIGH REACTOR PRESSURE

FIGURE 3A-458



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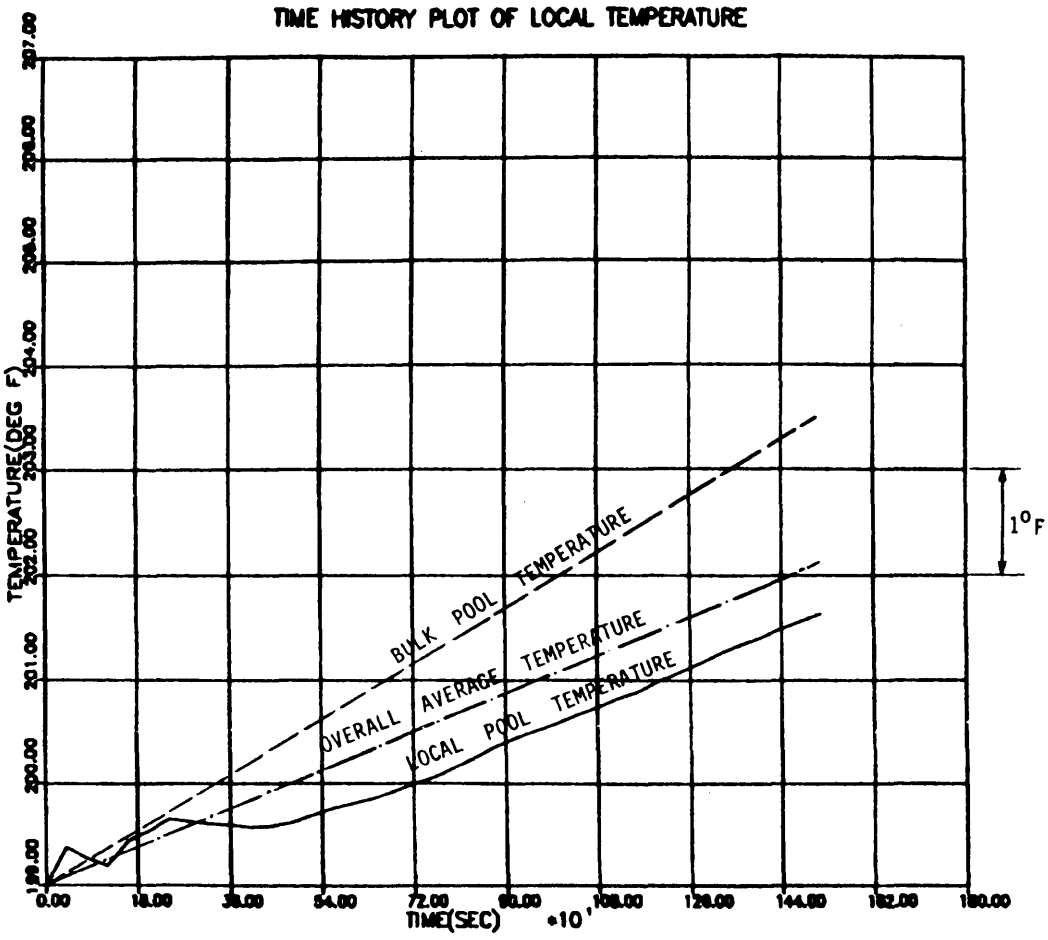
LOCAL-TO-BULK TEMPERATURE DIFFERENCE (ΔT) TRACE FOR SRV-L BLOWDOWN UNDER HIGH REACTOR PRESSURE
FIGURE 3A-459



NOTES

1. ENLARGED SCALE
2. ELEVATED POOL TEMPERATURE REFLECTS RHR SYSTEM INOPERATION

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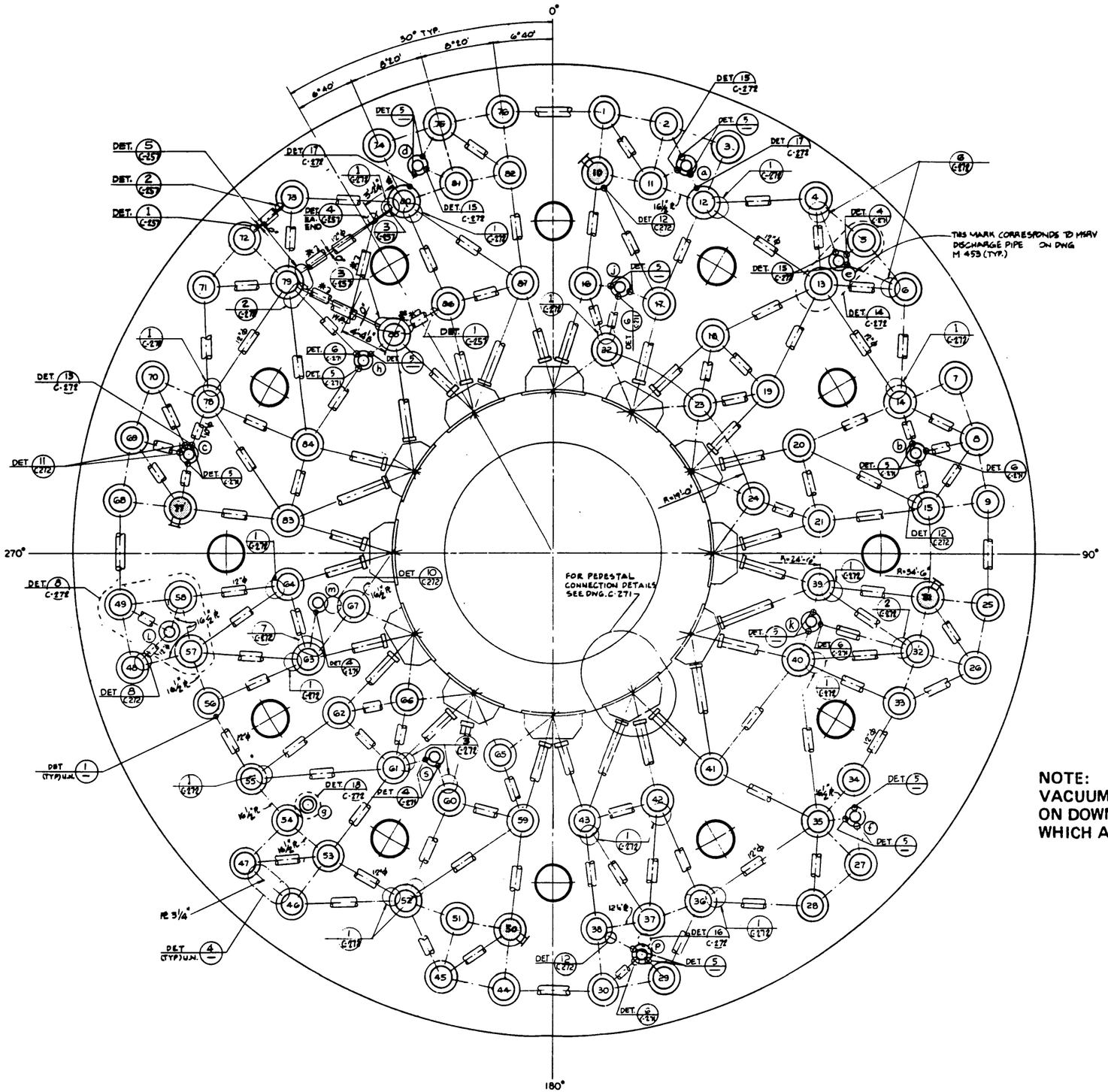
LOCAL-TO-BULK TEMPERATURE DIFFERENCE (ΔT) TRACE FOR SRV-H BLOWDOWN UNDER LOW REACTOR PRESSURE
FIGURE 3A-460



NOTE:
VACUUM BREAKERS ARE INSTALLED ON DOWNCOMERS 10, 31, 50 AND 77 WHICH ARE CAPPED (E.G., ⊗)

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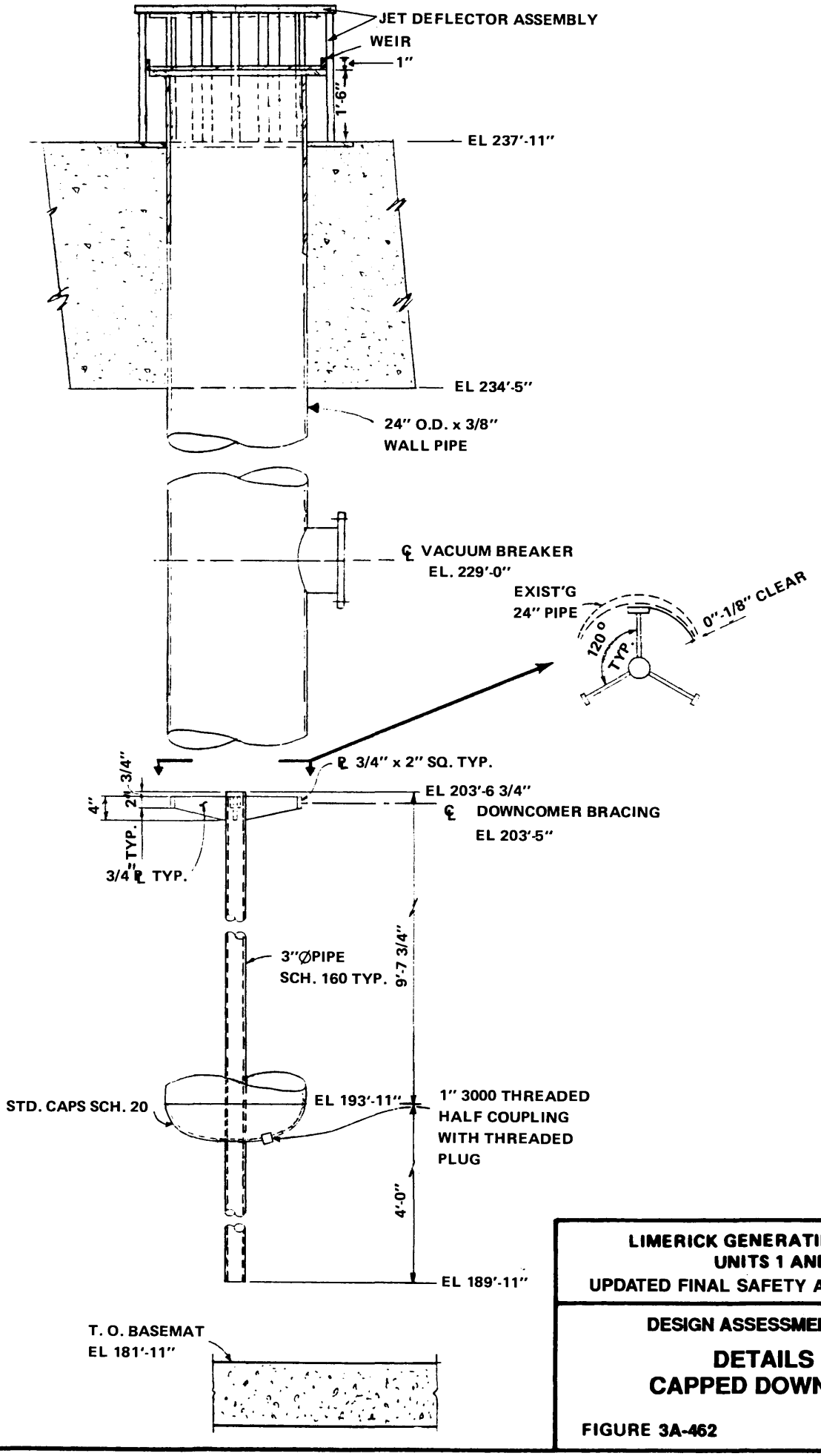
LOCATION OF CAPPED DOWNCOMERS WITH VACUUM BREAKERS

FIGURE 3A-461



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DETAILS OF CAPPED DOWNCOMER

FIGURE 3A-462