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MANGAN,C.V. Niagara Mohawk Power Corp.
RECIP.NAME RECIPIENT AFFILIATION
SCHWENCER,A. Licensing Branch 2

SUBJECT: Forwards info re primary containment hatch boundary conditions to close out open items of NRC structural audit of 831212-16.Equipment hatch uses STRUDL code capability.

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NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

March 30, 1984
(NMP2L 0018)

A. Schwencer, Chief
Licensing Branch No. 2
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Schwencer:

SUBJECT: Nine Mile Point Unit 2
Docket No. 50-410

Enclosed for your review are eight copies of information to close out certain open issues of the Nuclear Regulatory Commission Structural Audit. During the Structural Audit of December 12 through 16, 1983, we committed to provide this information.

Sincerely,

C. V. Mangan
Vice President
Nuclear Licensing and Engineering

CVM/TRL:lf

cc: W. Morrison
A. F. Zallnick, Jr.
M. Haughey
R. Pinney
Project File (W/Attachment)

A001
1/1

NINE MILE POINT UNIT 2

NRC REQUEST NO. 11

Provide a discussion on the primary containment hatch boundary conditions and the correlation of forces/displacements between the two models.

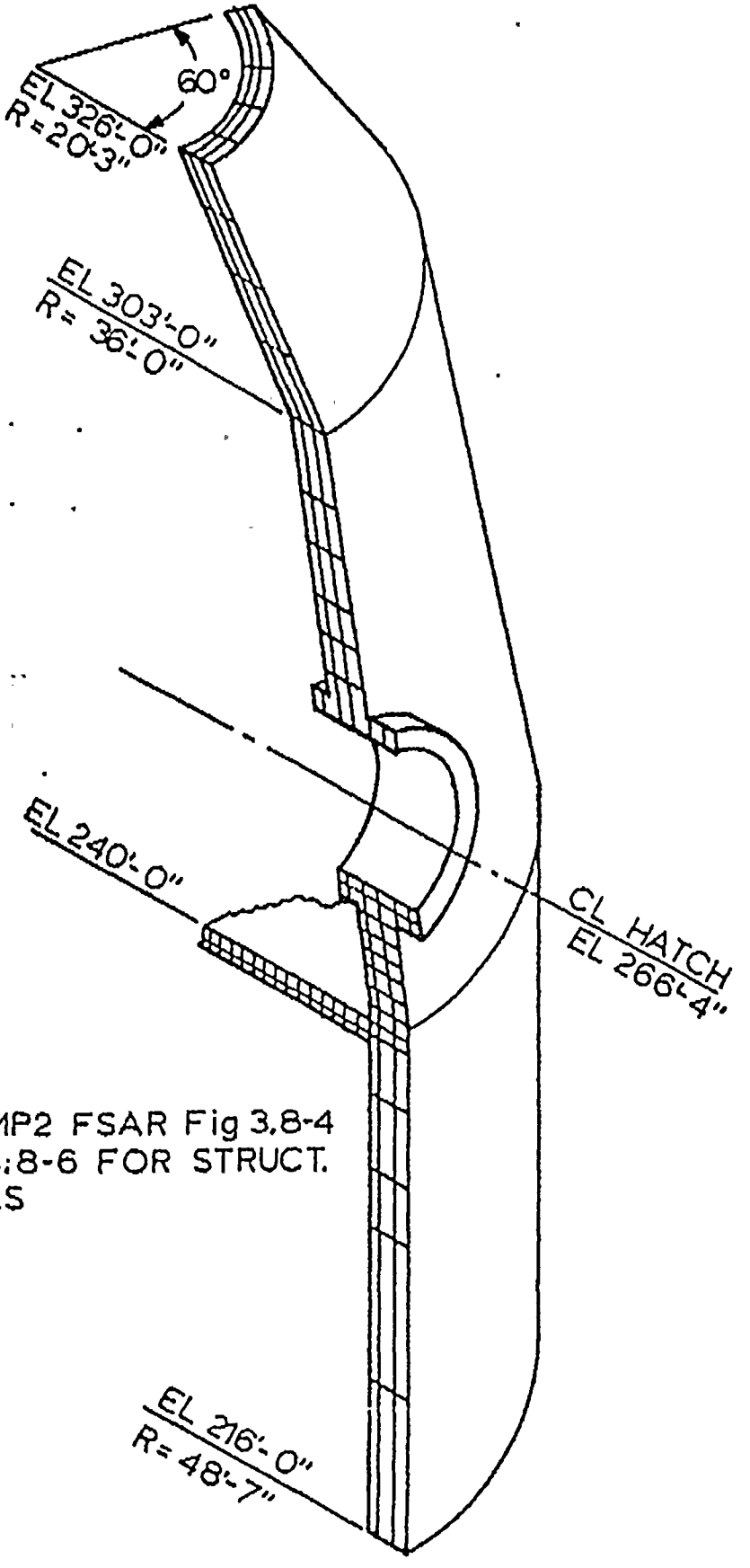
RESPONSE

The equipment hatch of the primary containment uses the finite element capability of the STRUDL computer code and is modeled with three dimensional solid finite elements (as shown in Figure 11-1).

To demonstrate the proper correlation of forces/displacements between the two models, a study was performed using as an example a load case of 45 psi internal pressure loading on the containment. The boundary conditions for this model, under axisymmetric loadings, are shown in Figure 11-2.

The forces and displacements at the edges A & B of the finite element model (FEM) (see Figure 11-2) are compared with those obtained from the axisymmetric shell analysis (Figure 11-3). The results of this study are illustrated in Figure 11-4. Additionally, the forces and displacements in the hoop direction at Edge C of the FEM are also compared for both models (as shown in Figures 11-5 and 11-6).

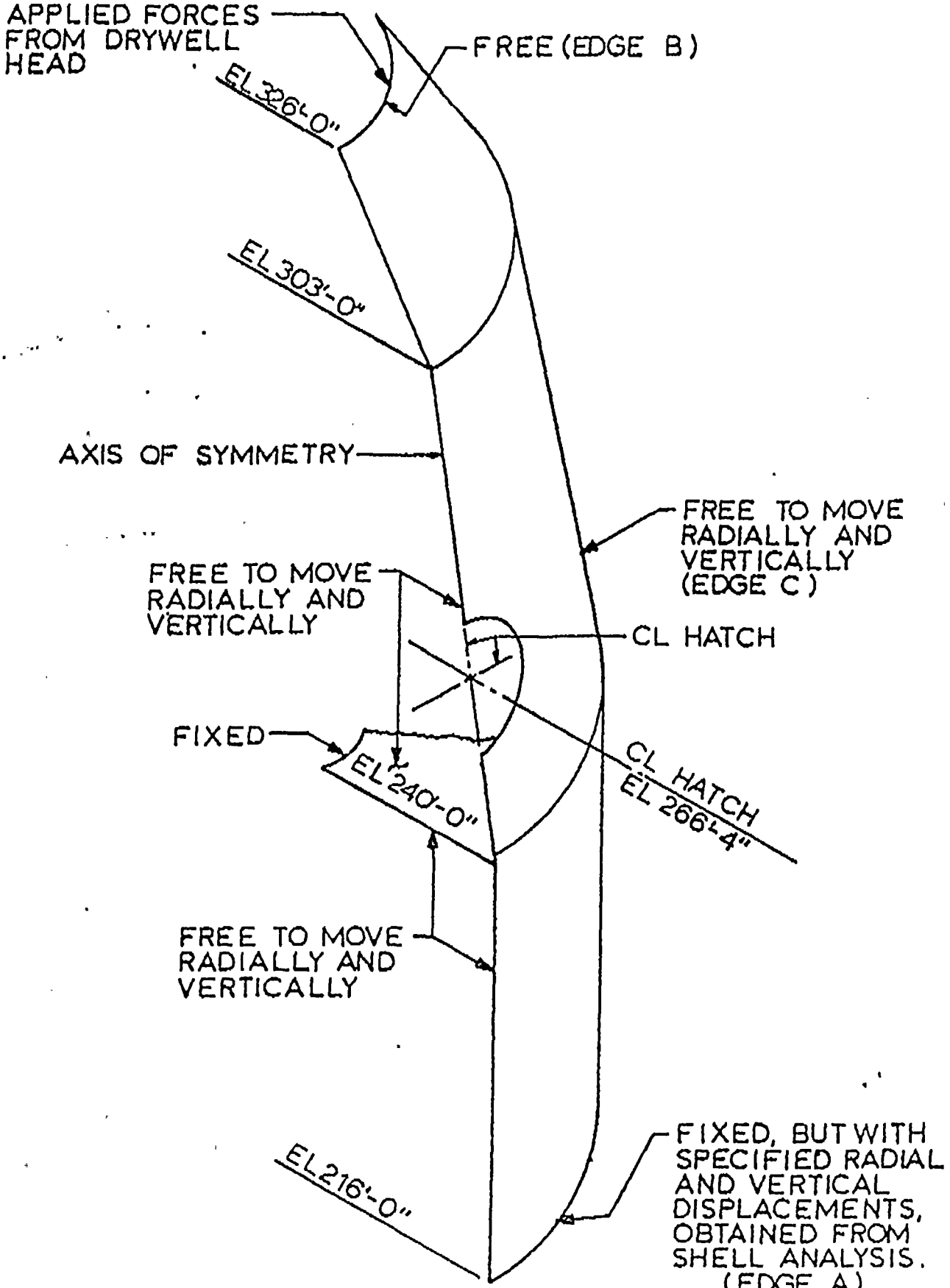
The results indicate that the boundary conditions for the FEM are appropriately specified.



SEE NMP2 FSAR Fig 3.8-4 & Fig 3.8-6 FOR STRUCT. DETAILS

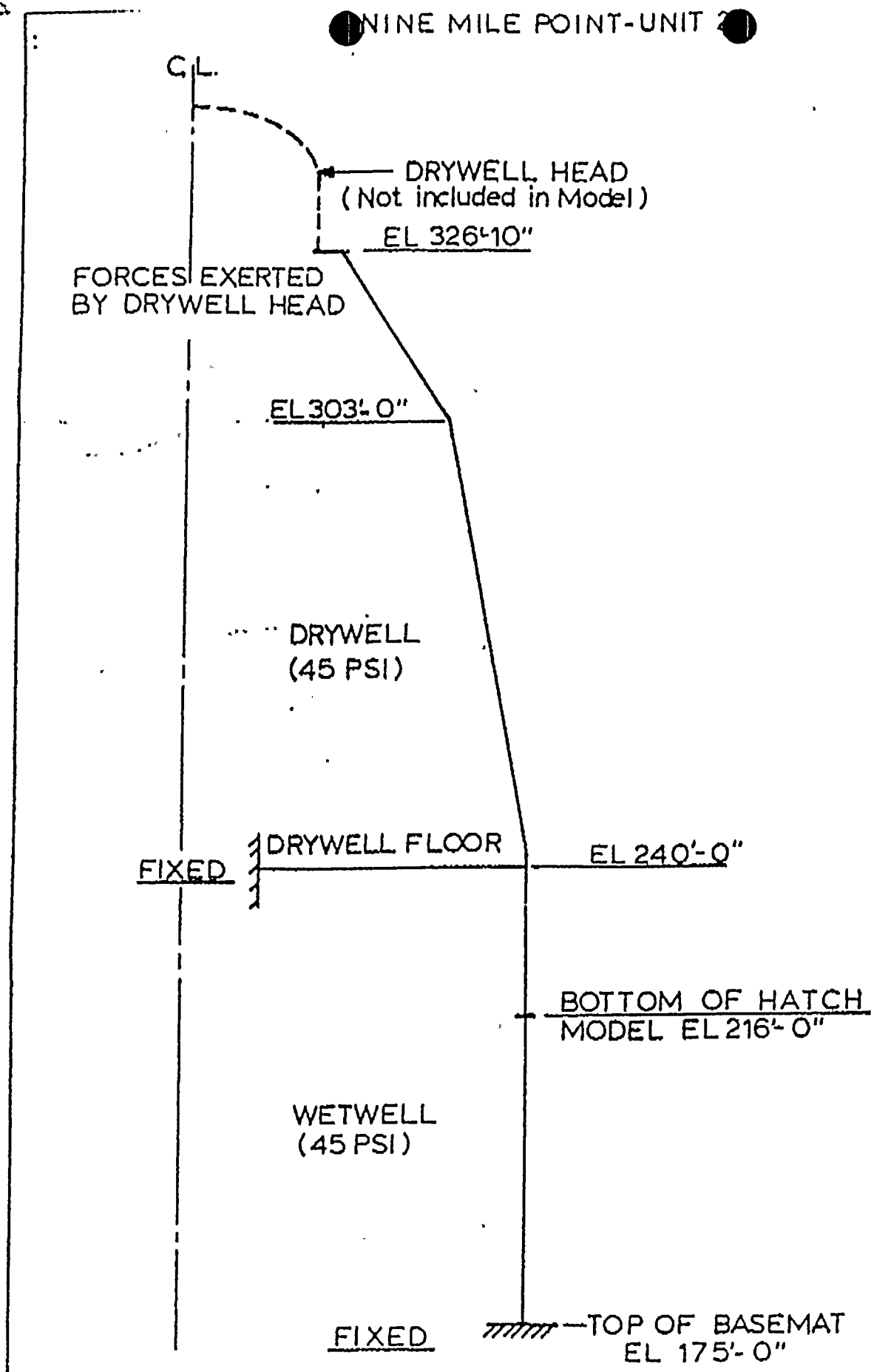
FINITE ELEMENT MODEL OF HATCH AREA

Figure 11-1



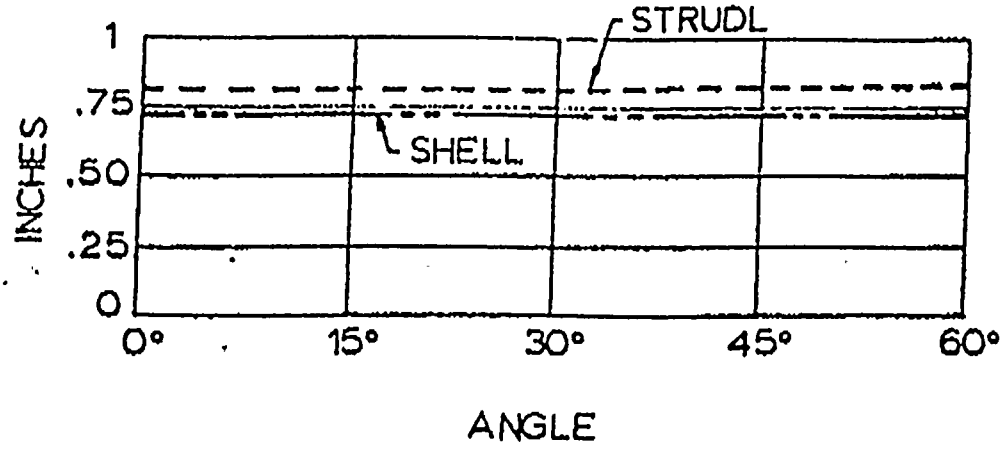
BOUNDARY CONDITIONS FOR HATCH FINITE ELEMENT MODEL

Figure 11-2

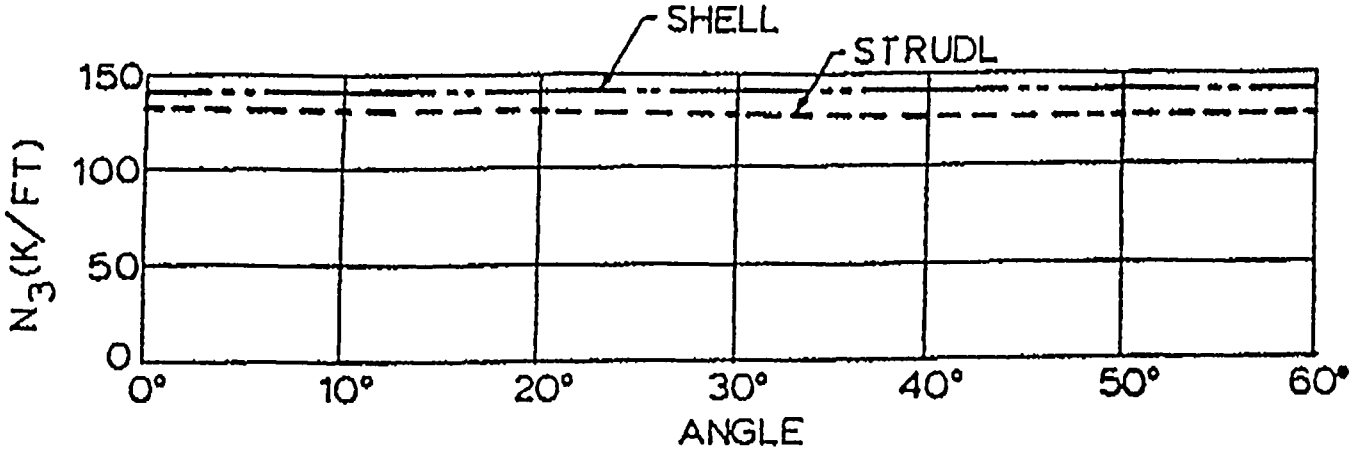


AXISYMMETRIC SHELL MODEL OF PRIMARY CONTAINMENT

Figure 11-3



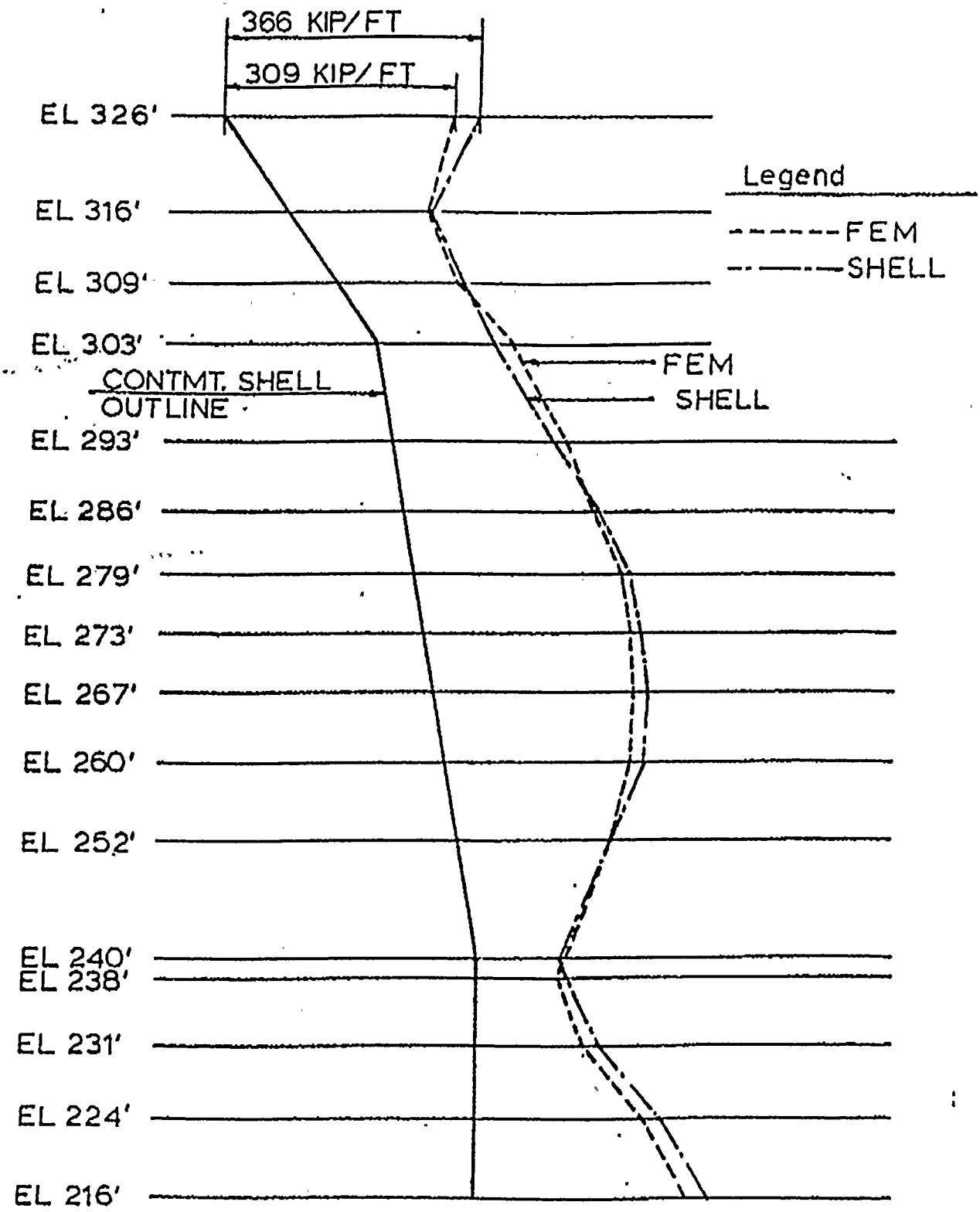
VERTICAL DISPLACEMENT AT EDGE "B"
(Fig 11-2)



VERTICAL FORCES N_3 AT EDGE "A" (Fig 11-2)

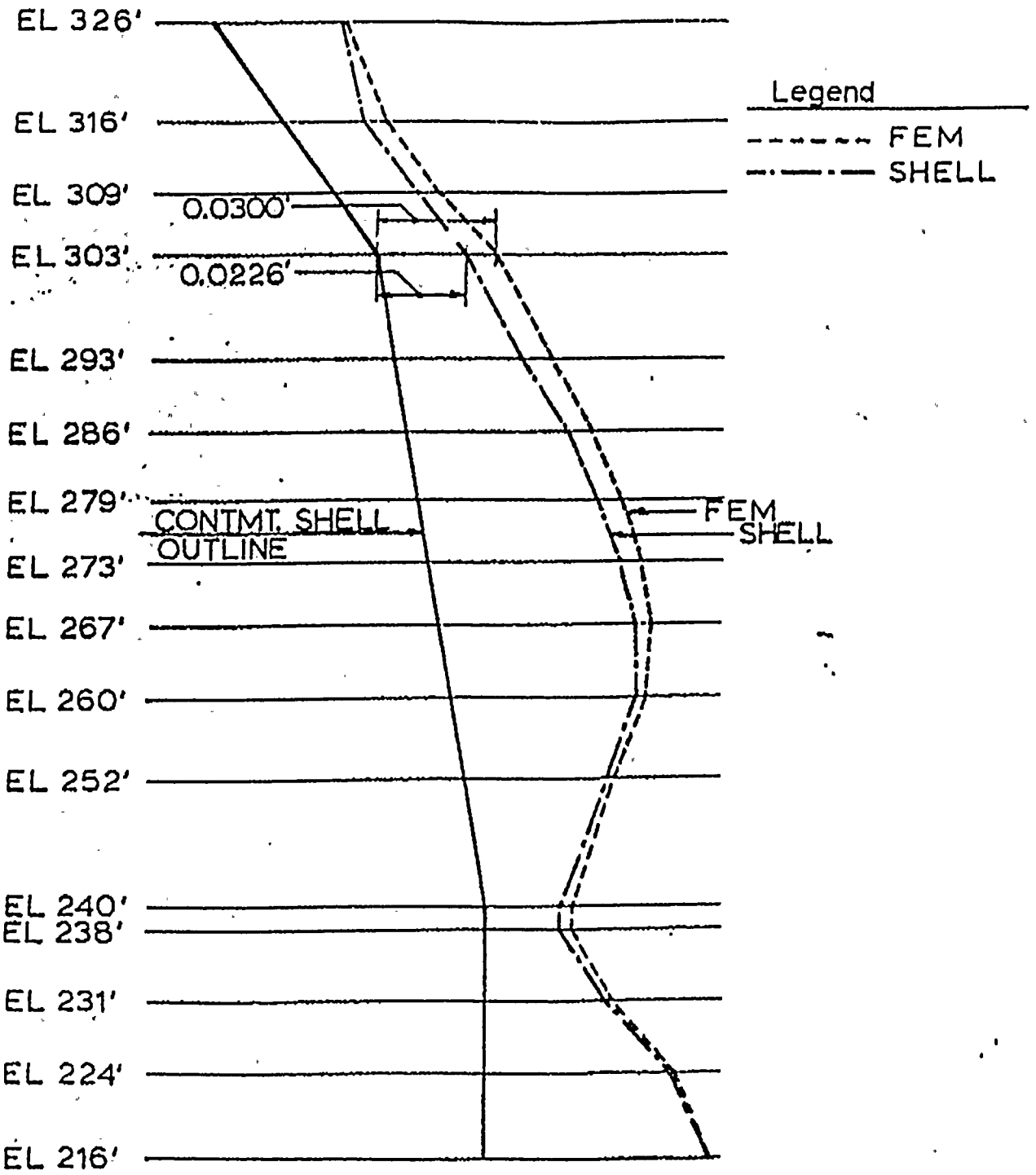
Figure 11-4

NINE MILE POINT-UNIT 2



HOOP FORCES ALONG EDGE "C" (Fig 11-2)

Figure 11-5



COMPARISON OF RADIAL DISPLACEMENTS
(EDGE "C" Fig 11-2)

Figure 11-6

NINE MILE POINT UNIT 2

NRC REQUEST NO. 14

Verify all Category I foundations for stability considering upward seismic forces.

RESPONSE

A review of all Category I stability analyses showed that except for the screenwell building calculations, all other calculations considered the effects of upward seismic forces. The stability calculations for the screenwell building are now revised to include the upward seismic forces. The factors of safety against sliding and overturning are listed in revised Table 3.8-14 (attached). This table will be amended in the FSAR.

NINE MILE POINT UNIT 2 FSAR

TABLE 3.8-14

FACTORS OF SAFETY FOR OVERTURNING, SLIDING AND FLOATATION OF MAJOR CATEGORY I STRUCTURES

STRUCTURE	OVERTURNING LOADING CONDITIONS 1	2	3	4	SLIDING LOADING CONDITIONS 1	2	3	4	FLOATATION LOADING CONDITION 5
Control and Diesel-Generator Buildings	2.9	2.4	1.7	2.3	1.5	1.5	1.1	2.3	1.1
North and South Electrical Tunnels	3.7	3.7(1)	3.7(1)	3.7(1)	2.4	2.4(1)	2.4(1)	2.4(1)	2.1
Main Stack	4.2(1)	4.2	4.2(1)	4.2(1)	19.8(1)	19.8	19.8(1)	19.8(1)	11.6
Reactor Building	1.6(1)	7.4	1.1	2.4	2.6	5.8	1.6	2.3	1.7
Screenwell Building	1.8(1)	1.8(1)	1.8(1)	1.8(1)	1.5	1.5(1)	1.5(1)	1.5(1)	1.3
Standby Gas Treatment	3.6(1)	3.6(1)	1.7	1.7(1)	1.5	1.5(1)	1.2	1.2(1)	2.1

LEGEND:

1 D+H+E
2 D+H+W
3 D+H+E'
4 D+H+W_t
5 D+F'

(1) Indication and/or evaluation of the structure for these loading conditions indicates that the actual factors of safety would meet or exceed the values listed herein.

NINE MILE POINT UNIT 2

NRC REQUEST NO. 16

For all Category I buildings, verify vermiculite concrete-bearing capacity against sliding resistance.

RESPONSE

No Category I structure utilizes vermiculite conceret to resist sliding in its stability analysis.