PGE Portland General Electric Company

Donald J. Broehl Assistant Vice President

July 20, 1979

Trojan Nuclear Plant
Docket 50-344
License NPF-1

Director of Nuclear Reactor Regulation
ATTN: Mr. A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Sir:

Enclosed are three signed and 40 conformed copies of changed pages for Revision 2 to our report on design modifications for the Trojan Control Building (PGE-1020), prepared by Bechtel Power Corporation. Also enclosed are instructions for insertion of the new and revised pages into the binder provided with my letter of January 17, 1979.

Revision 2 to PGE-1020 supersedes and replaces the information supplied as enclosures to my letters dated January 17, 1979 and April 2, 1979 and supplies new information developed as a result of continued analysis of the test results, evaluation of wall capacities and refinement of design details for the modification, and constitutes an amendment to our request dated January 17, 1979 for any necessary licensing amendment as contemplated by Paragraph (3) of the NRC's May 26, 1978 Order for Modification of License.

Sincerely,

Donald J. Broehl

Subscribed and sworn to me this day 20th day of July 1979.

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Carole A. Hodgdon
Notary Public of Oregon

My Commission Expires August 9, 1979

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TROJAN NUCLEAR PLANT
REPORT ON DESIGN MODIFICATIONS
FOR THE TROJAN CONTROL BUILDING

REVISION 2

File this instruction sheet and the letter to the Director of Nuclear Reactor Regulation in the front of this volume as a record of changes.

The following information and checklist are furnished as a guide for the insertion of new sheets for Revision 2 into the Report on Design Modifications for the Trojan Control Building, PGE-1020. New or revised material is denoted by use of the revision number and date in the lower outside corner of the page, and where possible, a vertical line in the right-hand margin.

New sheet should be inserted as listed below:

Discard Old Page (Front/Back)	Insert New Page (Front/Back)
Section 3	
3-1/3-2	3-1/3-2
3-9/3-10	3-9/3-10
3-15/3-16	3-15/3-16
3-21/3-21a	3-21/3-21a
Table 3.3-1/blank	Table 3.3-1/blank
Table 3.5-1/blank	Table 3.5-1/blank
Table 3.5-2/blank	Table 3.5-2/blank
Figure 3.1-2/blank	Figure 3.1-2/blank
Figure 3.2-1/blank	Figure 3.2-1/blank
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Figure 3.2-5/blank	Figure 3.2-5/blank
Figure 3.2-6/blank	Figure 3.2-6/blank
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Figure 3.2-9/blank	Figure 3.2-9/blank

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Discard Old Page (Front/Back)	Insert New Page (Front/Back)
Figure 3.3-4/blank	Figure 3.3-4/blank
Figure 3.3-7/blank	Figure 3.3-7/blank
Figure 3.3-11a/blank	Figure 3.3-11a/blank
Figure 3.3-12a/blank	Figure 3.3-12a/blank
Figure 3.5-6/blank	Figure 3.5-6/blank
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Figure 3.5-9/blank	Figure 3.5-9/blank
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Figure 3.5-11/blank	Figure 3.5-11/blank
Section 4	
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Section 5	
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3 DESIGN MODIFICATIONS

3.1 GENERAL

As discussed in Section 2, the existing Control Building is capable of withstanding the vibratory ground motion for the 0.25g Trojan SSE. To meet the OBE requirements, proposed modifications will be made to the Control Building, consisting of strengthening the existing east and west walls and one interior wall by the addition of reinforced concrete walls and reinforcing portions of the west wall with a steel plate. (See Section 3.2.1 below for a detailed description.) These modifications necessitate rerouting the railroad tracks outside the Control Building as shown in Figure 3.1-1 and new provisions for combustion air supply for the Emergency Diesel Generators.

The Complex, with the proposed modifications to the Control Building (see Figure 3.1-2), has been analyzed using the seismic criteria stated in Section 2.1. The method of analysis, described in Section 3.3 below, is the same as that of the STARDYNE Analyses-Interim Operation. It employs the response spectrum method and combines the modal responses by the SRSS technique. The mathematical model of the combined structural system used in this analysis is obtained from a three-dimensional finite element model. The new analysis demonstrates that the proposed modifications will provide lateral capacity which, when added to the capacity of the existing structure establishes compliance with the OBE seismic design requirements of the FSAR (as demonstrated in Section 3.5). 1

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3.2 CONTROL BUILDING MODIFICATIONS

3.2.1 Description

The structural elements comprising the modifications are shown in Figure 3.1-2 and Figures 3.2-1 through 3.2-4, and are described below.

3.2.1.1 Control Building East Wall

The east wall will be strengthened along column line N by the addition of a new reinforced concrete wall and footing across the existing railroad bay opening and, above the opening, adjacent to the east face of the wall. It will run from column lines 41 to 46 and from elevations 45 ft to 95'-6". This new wall will be structurally connected to the existing north and east walls of the Control Building as shown schematically in Figure 3.2-5. A section of this wall and details of the connections to the Control Building east wall are shown schematically in Figures 3.2-6 and 3.2-6a. The existing access opening above elevation 65 ft will be reduced in size from approximately 8 feet height and 7 feet width to 4 feet height and 4 feet width. 2

3.2.1.2 Control Building West Wall

The west wall, along column line R, will be strengthened by the addition of a new reinforced concrete wall and footing across the existing railroad bay opening and, above the opening, adjacent to the west face of the wall. It will run from column lines 41 to 46 and from elevations 45 ft to 77 ft. It continues from column line 46 approximately 14 feet south on the east face of the existing wall from elevation 45 ft to elevation 61 ft. This new wall will be structurally connected to the existing north and west walls of the Control Building.

b. Initial relaxation of the bolt

c. Long-term relaxation of the bolt

d. Temperature losses ⚠2

3.2.4.3 Criteria for Shear Studs

The allowable design shear force for shear studs is one-half the values given in Table 15 of the Nelson Division of TRW, Inc., publication, "Design Data 10--Embedment Properties of Headed Studs."

3.2.4.4 Transfer of Shear Forces to Base Rock

The new concrete shear walls are supported by reinforced concrete grade beams placed on base rock and those beams are connected to the existing structure. Therefore, they will participate with the existing foundation in the transfer of shear forces to the base rock.

Shear forces are transferred to the base rock through:

3.2.4.4.1 Grade Beam to Rock Shear Resistance

Resistance to sliding is provided by shear resistance between the bottom of the grade beams and the rock. Shear resistance to sliding (S_r) can be expressed using Coulomb's formula as:

$$S_r = C + \mu D$$

where

C = cohesion at zero confinement (psi) = 130 psi

μ = coefficient of friction = 0.7

D = dead load (psi)

The application of this formula and the appropriateness of the values of the coefficients used for this Plant is described in the "Trojan Control Building Supplemental Structural Evaluation," dated September 19, 1978.

3.2.4.4.2 Column to Spread Footing Friction

Friction between the steel columns and the concrete spread footings provides additional resistance to sliding. A coefficient of friction equal to 0.7 between the steel column base plates and concrete is used in calculating the available resistance to sliding.

3.2.4.5 Welding of Steel Plate

Sections of the plate will be welded to each other by partial penetration welds in accordance with AWS D1.1. The weld size is governed by stress, and the effect of partial penetration welds on overall plate stiffness is minimal. Completed welds will be nondestructively tested.

3.2.5 Materials

The following structural materials are used in the new structural elements.

Concrete	f_c' = 3,500 psi
Reinforcing Steel	ASTM A 615-76a, Grade 60 (f_y = 60 ksi)

2

east to west corresponds to the column spacing in that direction (19.25 ft). In the north-south direction, the element size (15.5 ft) corresponds to one-half of the column spacing. Around openings and for the steel plate, smaller elements were used. Vertically, the element boundaries are generally determined by floor slab locations and correspond to a maximum height of 20 ft along the north wall of the Control Building in the lower level. At all other locations, the element height is 16 ft or less. These element sizes are adequate for both the mass and the stiffness distribution.

The full thickness of each of the new walls was used since these structural elements are composed exclusively of reinforced concrete. For the composite walls of the Complex, an equivalent thickness equal to the core plus one-half the thickness of the blocks was used. An equivalent modulus for an existing wall is determined by equating the stiffness of the actual composite wall to that of the equivalent wall as described in Appendix B. The stiffness of the existing and new reinforced concrete walls and slabs was calculated using ACI code equations. The thickness of the reinforced concrete slabs in the existing structures was taken as their full depth. 1

The weight of the Complex was obtained by adding the weight of the structural system and all of the equipment, components, piping, etc, supported by the structural system. Items supported on or below the slab at elevation 45 ft were not considered since this is the elevation of the top of the foundation. The weight of nonstructural elements, not included in the model for stiffness, has been included in the total dead weight.

The connections between the existing and new structural elements are indicated in Section 3.2. These connections are designed to maintain strain compatibility be n the existing and new structural elements by limiting the allowable loads on the connections to a level considerably below their yield loads; therefore the connections are not modeled explicitly. The finite element model is based on maintaining this strain compatibility.

3.3.6 Response Spectrum Analysis

A response spectrum analysis of the model shown in Figure 3.3-7 was made using STARDYNE. This analysis included earthquake motions separately for the north-south and the east-west directions for the OBE. For this analysis, the first 30 modes were used in determining the structural response. The frequencies and the associated modal effective weights are shown in Table 3.3-1. As indicated by the effective weights, the first and second modes dominate the global response in the north-south and the east-west directions, respectively. By including the first 30 modes, the sums of the effective weights in the north-south and the east-west directions are 65,787 kips and 66,779 kips, respectively. With the total weight of the model being 73,100 kips, the sum of effective weights represents approximately 90% of the total weight which is reasonable, particularly since the response is being dominated by a single mode in each direction. Typical results for the forces in the walls of the Control Building indicate the forces due to the two dominant modes are approximately 95% of SRSS forces, considering all 30 modes. 2 1

The mode shapes of the two most dominant modes are shown in Figures 3.3-11a through 3.3-11d, and 3.3-12a through 3.3-12d respectively. The first mode, shown in Figures 3.3-11c and

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The loads are determined based on an elastic analysis which assumes that each wall in the system has a yield strength higher than the load. All the major shear walls in the modified Complex have an elastic capacity which is higher than the loads resulting from either the OBE or SSE. Tables 3.5-1 and 3.5-2 show the loads and capacities for the OBE condition of the minor shear walls in the Control Building and in the Auxiliary Building to column line H for both the north-south and east-west directions at all elevations. The comparisons show that in most cases capacities exceed load by a sizable margin.

The minor shear wal' which have a capacity-to-force ratio of less than 1.0 will continue to absorb shear force until they reach their ultimate capacity. Redistribution of load will occur when the unfactored capacity-to-force ratio is less than 0.64.

2

For the factored OBE condition, the minor walls which have a capacity-to-force ratio of less than 1.0 in Table 3.5-1, will undergo inelastic deformation, and redistribution of loads will occur to adjacent walls. The amount of the re- distributed load, which is approximately 1% of the total base shear, will be small and will not exceed the excess capacities which exist in adjacent major walls. 1

The vertical shear forces transferred from sidewalls to end walls have also been investigated. At the two south corners of the Control Building, R-55 and N-55, where no modification work is planned, the vertical shear forces are 1686 kips and 1593 kips, respectively. 2

The capacity of these corners to resist vertical shear force depends upon both the capacity of the beam-column connections and the shear friction developed by the continuous horizontal reinforcing steel in the concrete block masonry. It has been shown(*) that the ultimate capacity of a beam-column connection in the Complex walls is 2.8 times the AISC Table I values and that of the shear-friction of the reinforcing steel is 1.4 $A_s f_y$, where A_s is the area of continuous horizontal reinforcing steel in the masonry and f_y is the yield strength (40,000 ksi). It has also been demonstrated(*) that both of these capacities are deformation compatible. The vertical shear resistance corresponding to unfactored OBE condition is obtained by dividing this ultimate capacity by the load factor of 1.4 after reducing the contribution of shear-friction of reinforcing steel by the capacity reduction factor of 0.85. 2

Based on the above, the total vertical shear force capacity for corners R-55 and N-55, obtained by summing the contributions from the beam-column connections and the shear-friction of reinforcing steel, exceeds the vertical shear forces at these locations, as follows:

Corner	Vertical Shear Force (kips)	Capacity (kips)
R-55	1686	2742
N-55	1593	1763

3.6 RESTORATION TO DESIGN REQUIREMENTS

3.6.1 NRC Requirements

The Original Analysis of the Complex was completed in 1971. The intent of the original design was to meet the requirements

(*) See response to Question No. 16 of the "Requests for Additional Information by NRC", dated May 18, 1979. 2

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TABLE 3.3-1

Frequencies
and
Modal Effective Weights

Mode	Frequency (cps)	Effective Weights (kips) North-South	Effective Weights (kips) East-West
1	7.62	30,909	860
2	9.89	111	48,495
3	10.91	15,966	3,761
4	13.36	4,581	5,077
5	13.52	4,775	2,356
6	13.79	21	1
7	13.91	158	68
8	14.34	3,039	437
9	14.67	112	113
10	15.83	5	171
11	16.56	2	452
12	16.96	2	68
13	17.64	1,514	864
14	17.90	2,169	475
15	18.68	343	12
16	18.83	38	282
17	19.21	500	13
18	19.45	25	5
19	19.98	68	227
20	20.25	142	251
21	20.97	35	238
22	21.41	21	75
23	21.75	3	132
24	21.77	2	62
25	21.16	3	72
26	22.52	552	3
27	22.98	85	1,640
28	23.43	25	0
29	23.63	354	11
30	23.97	227	558

2

TABLE 3.5-1

FORCE CAPACITY COMPARISON
NORTH-SOUTH MOTION
NORTH-SOUTH MINOR WALLS

OBE = 0.15g, β = 2%

Elevation	Wall Number	Shear Force (Kips)	Capacity (Kips)	Capacity / Force
45'-61'	2	451	776	1.72
	3	292	616	2.11
	5	2042	4399	2.15
	6	239	177	0.74
	7	377	472	1.25
	8	171	113	0.66
61'-77'	2	427	509	1.19
	5	1371	1892	1.38
	6	455	898	1.97
	7	523	729	1.39
77'-93'	5	681	1093	1.60
	6	344	654	1.90
	8	329	584	1.78
93'-105'	6	344	575	1.67
105'-117'	6	226	556	2.46

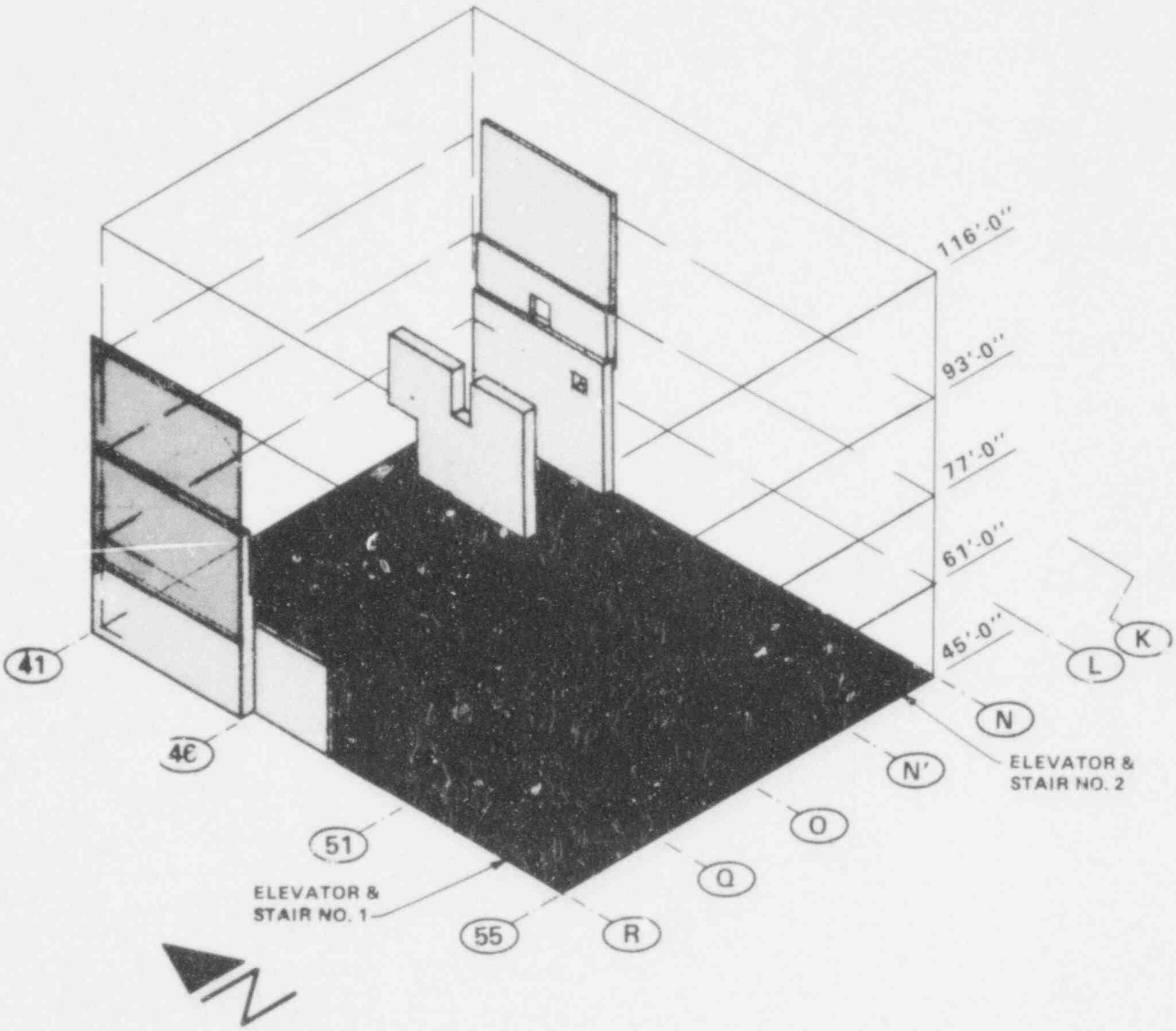
2

TABLE 3.5-2

FORCE CAPACITY COMPARISON
EAST-WEST MOTION
EAST-WEST MINOR WALLS

OBE = 0.15g, β = 2%

Elevation	Wall Number	Shear Force (Kips)	Capacity (Kips)	Capacity / Force
45'-61'	11	264	373	1.41
	12	310	433	1.40
	14	260	332	1.28
	15	566	764	1.35
61'-77'	14	1170	2875	2.46
	15	864	996	1.15
	16	405	1291	3.19
77'-93'	14	984	3614	3.67
	15	1163	2973	2.56
93'-105'	15	1060	1493	1.41
105'-117'	15	814	1493	1.83



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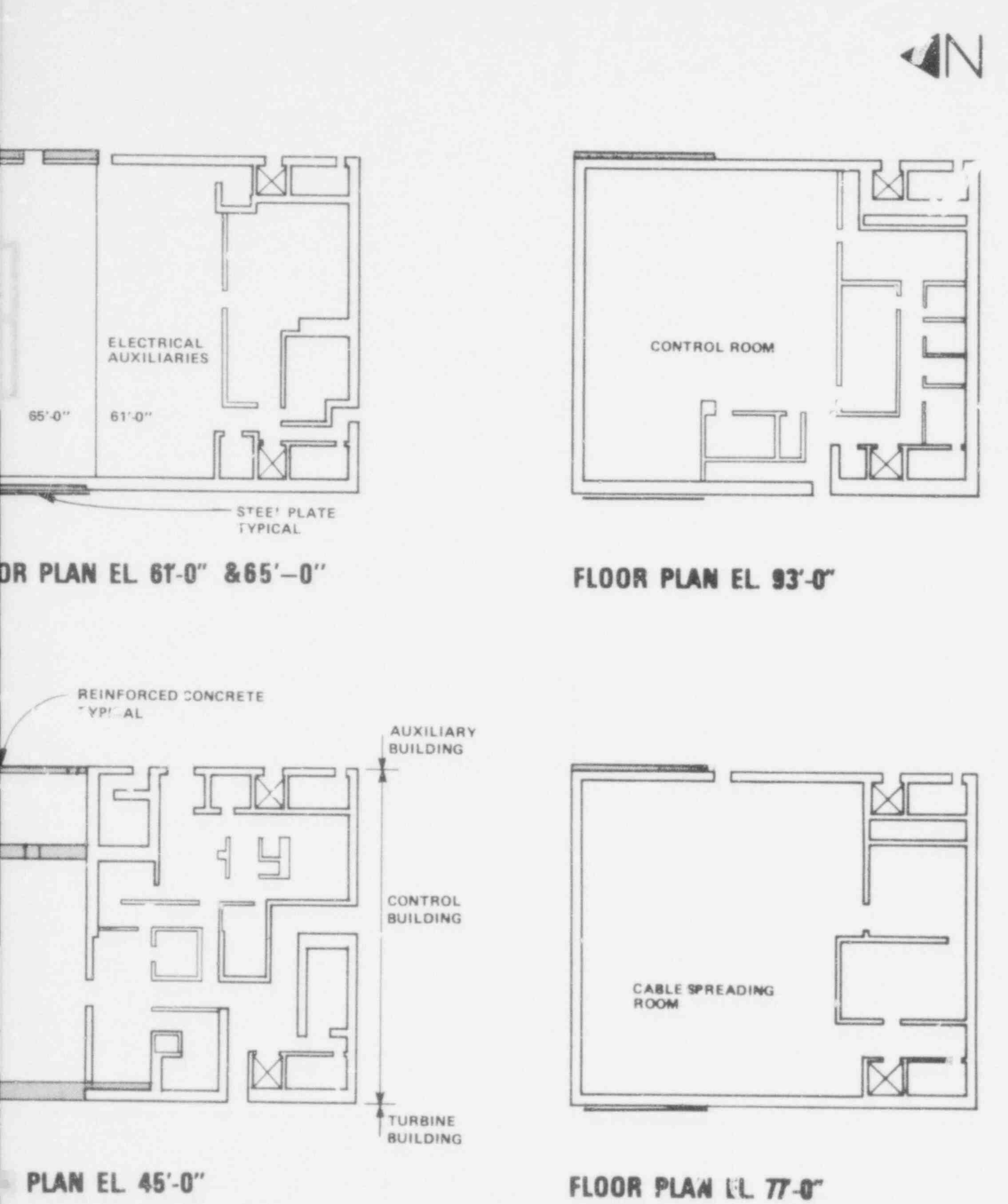

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FIGURE 3.1-2

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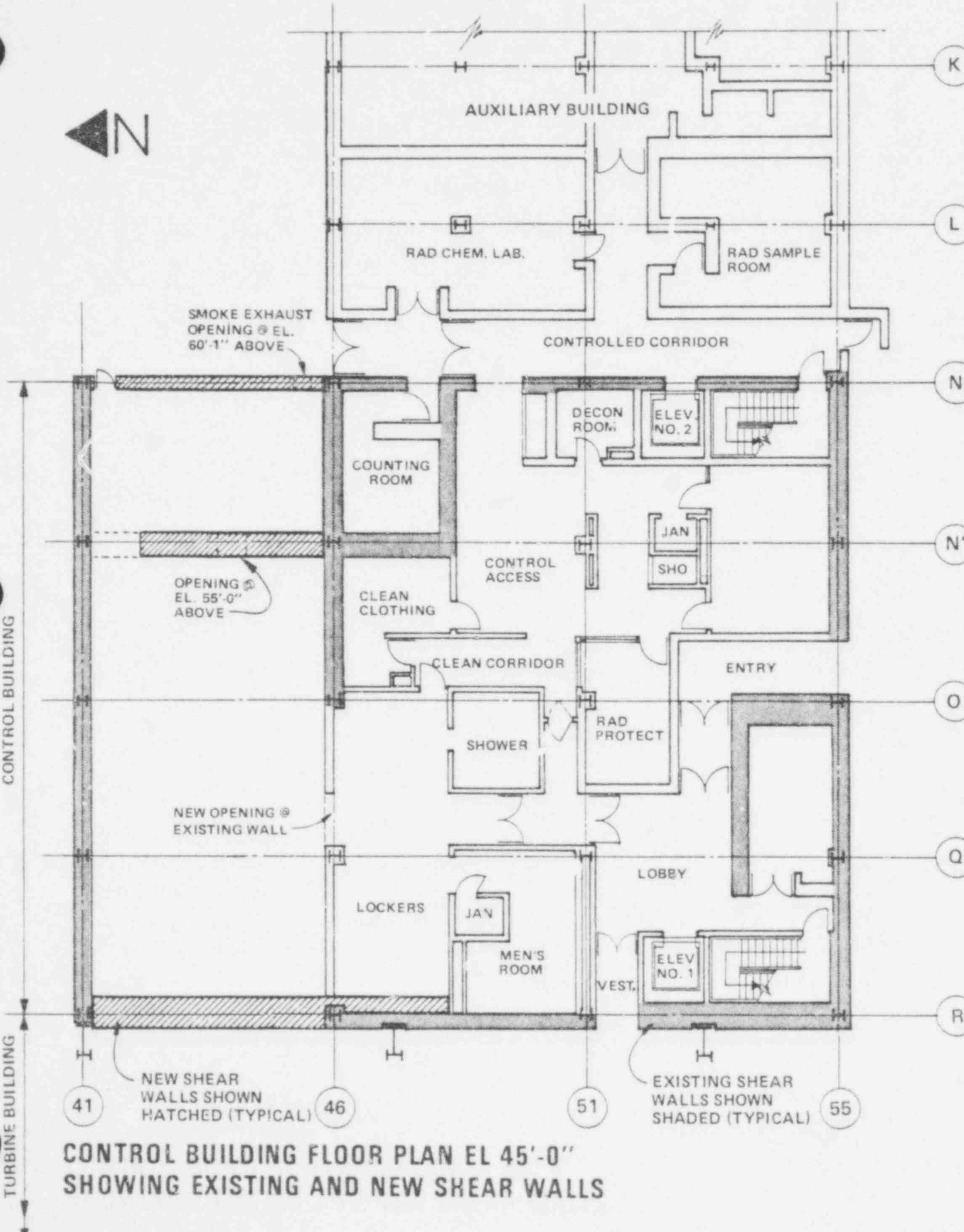

CONTROL BUILDING FLOOR PLAN EL 45'-0"
SHOWING EXISTING AND NEW SHEAR WALLS

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FIGURE 3.2-1

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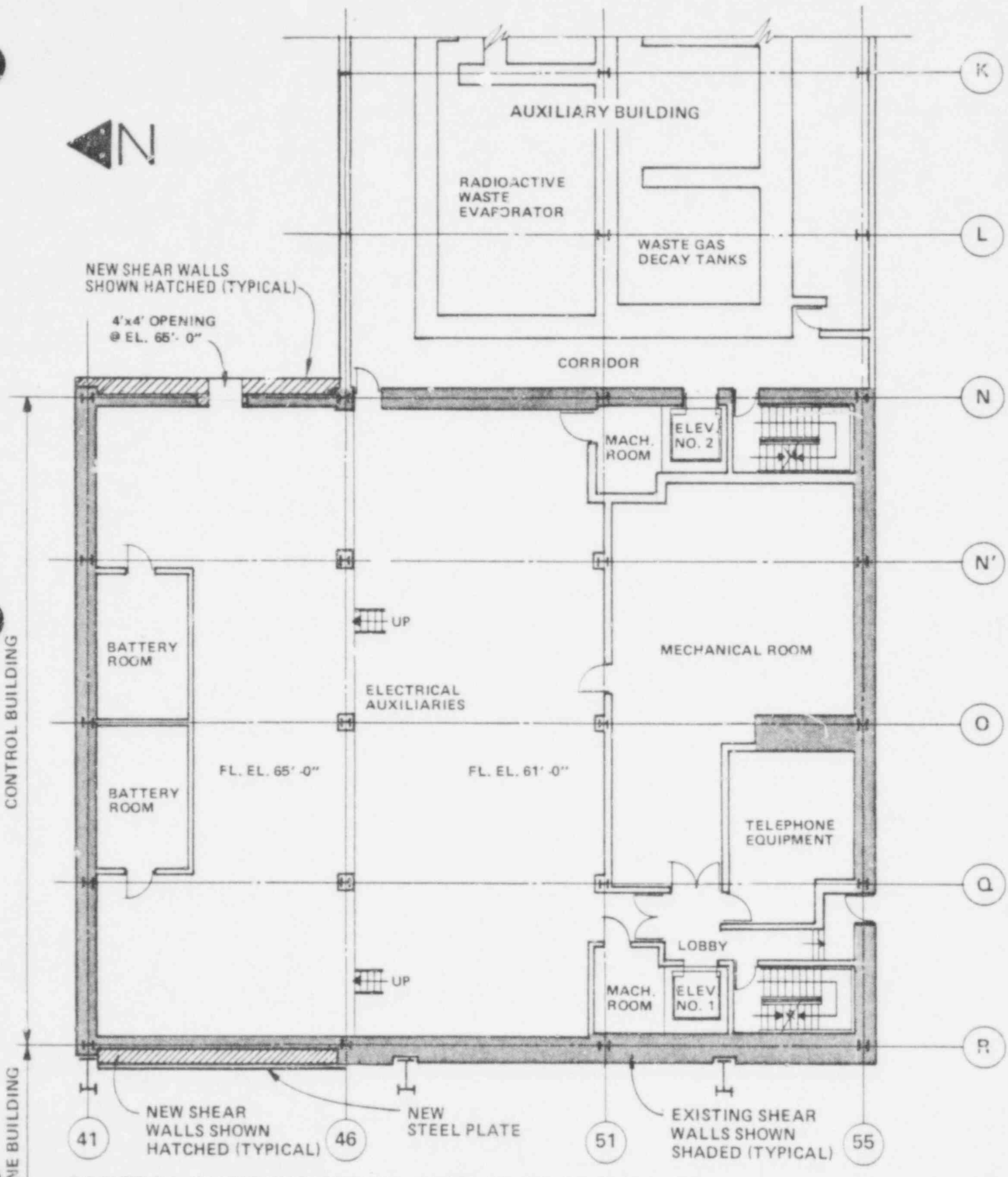

CONTROL BUILDING FLOOR PLAN EL 61'-0" &65'-0"
SHOWING EXISTING AND NEW SHEAR WALLS

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FIGURE 3.2-2

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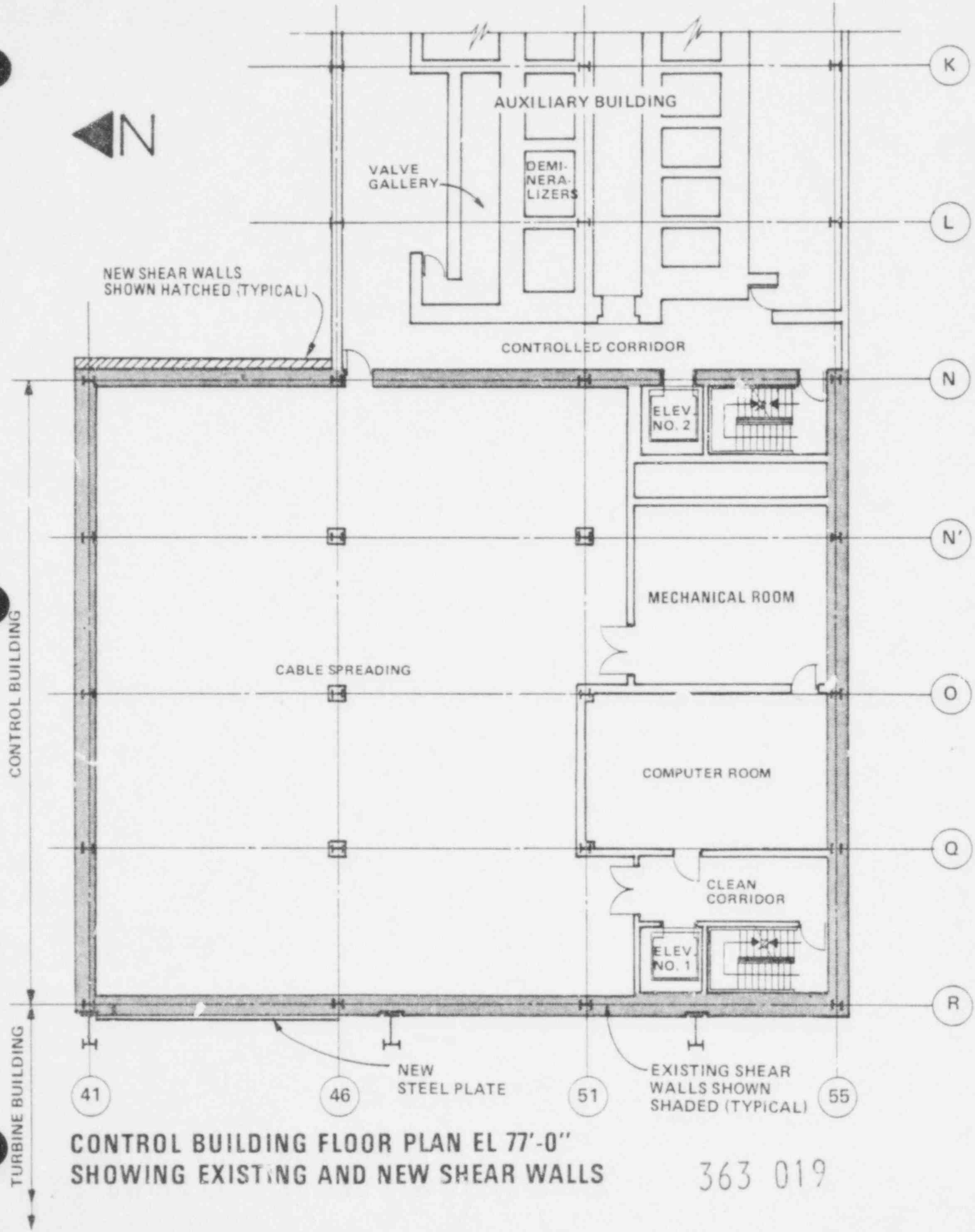

CONTROL BUILDING FLOOR PLAN EL 77'-0"
SHOWING EXISTING AND NEW SHEAR WALLS

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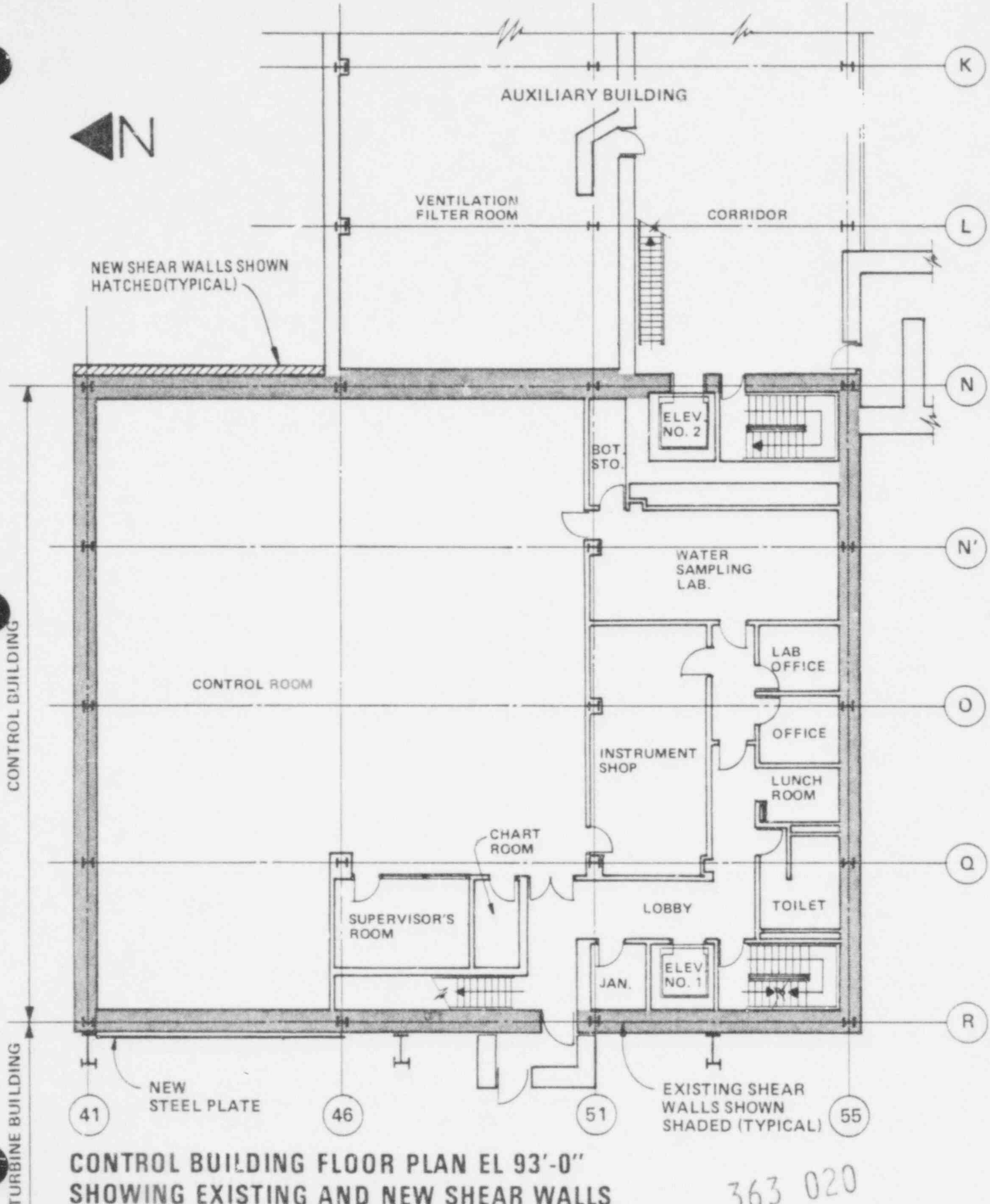
FIGURE 3.2-3

REV. 2



CONTROL BUILDING FLOOR PLAN EL 93'-0"
SHOWING EXISTING AND NEW SHEAR WALLS

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FIGURE 3.2-4

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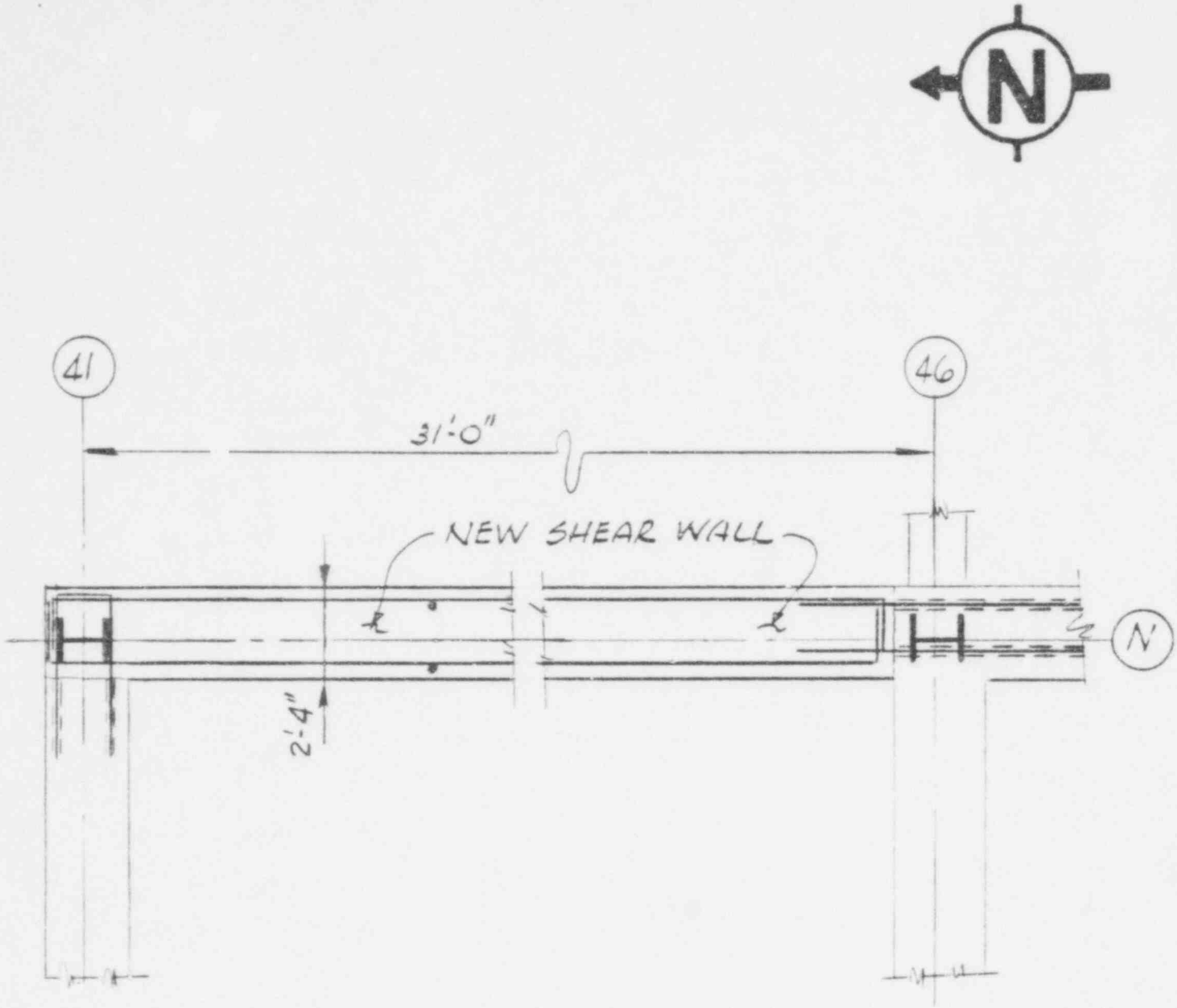

PLAN AT CONTROL BLDG. EAST WALL

EL. 45 FT.

FIG. 3.2-5

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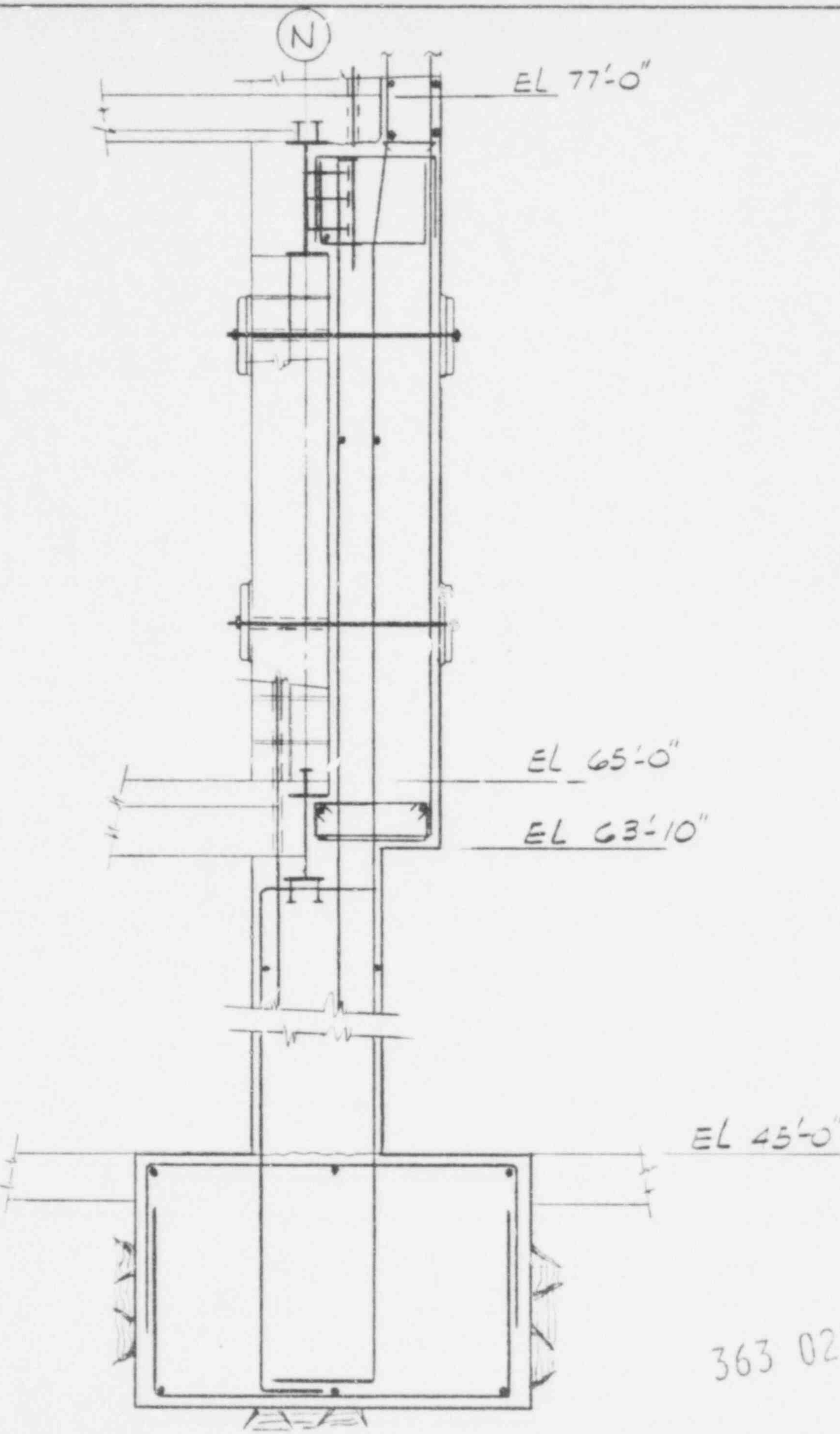

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SECTION @ CONTROL BLDG. EAST WALL
BETWEEN COLUMN LINES (41) & (46)
FIG. 3.2-6

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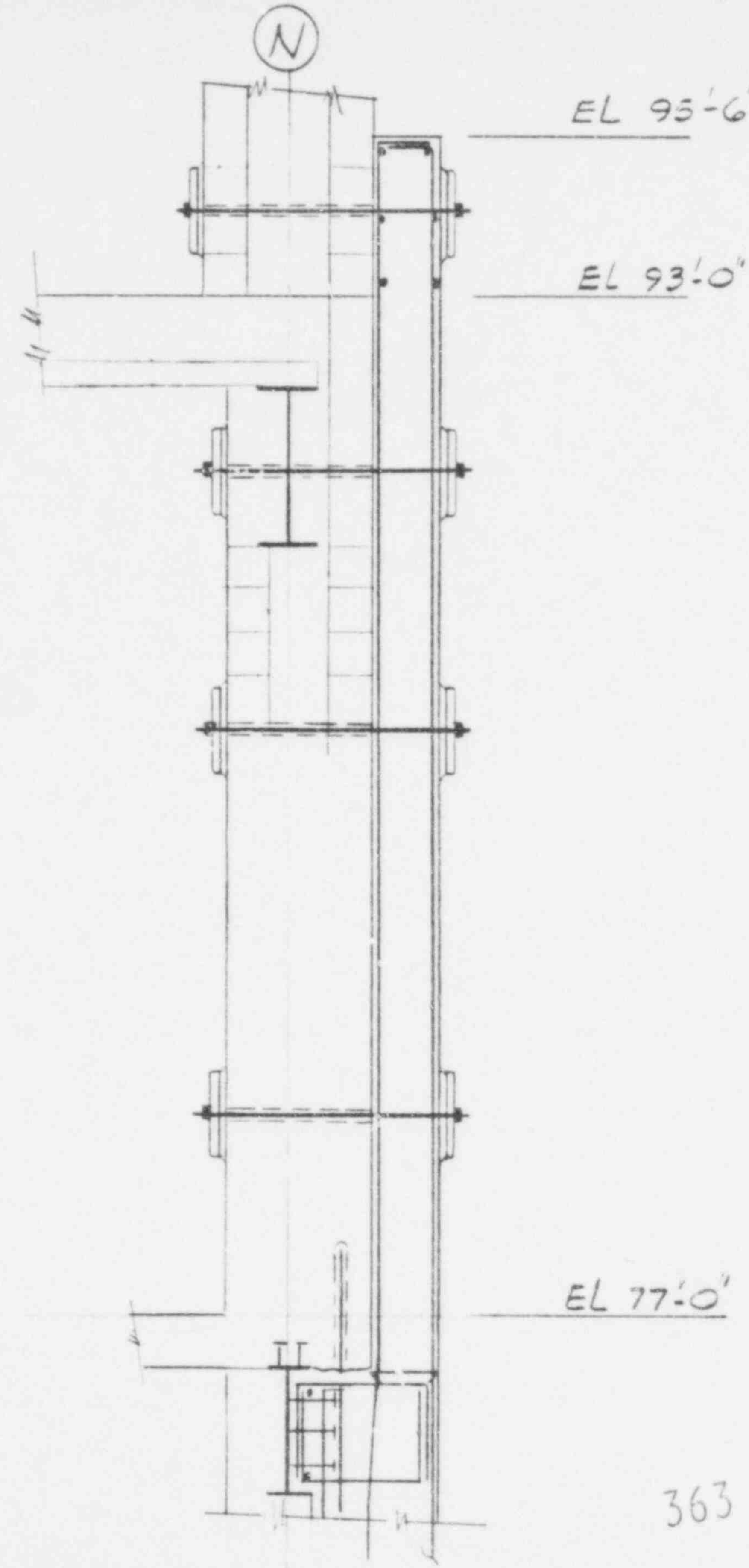

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SECTION @ CONTROL BLDG EAST WALL
BETWEEN COLUMN LINES (41) & (46)
FIG. 3.2-6a

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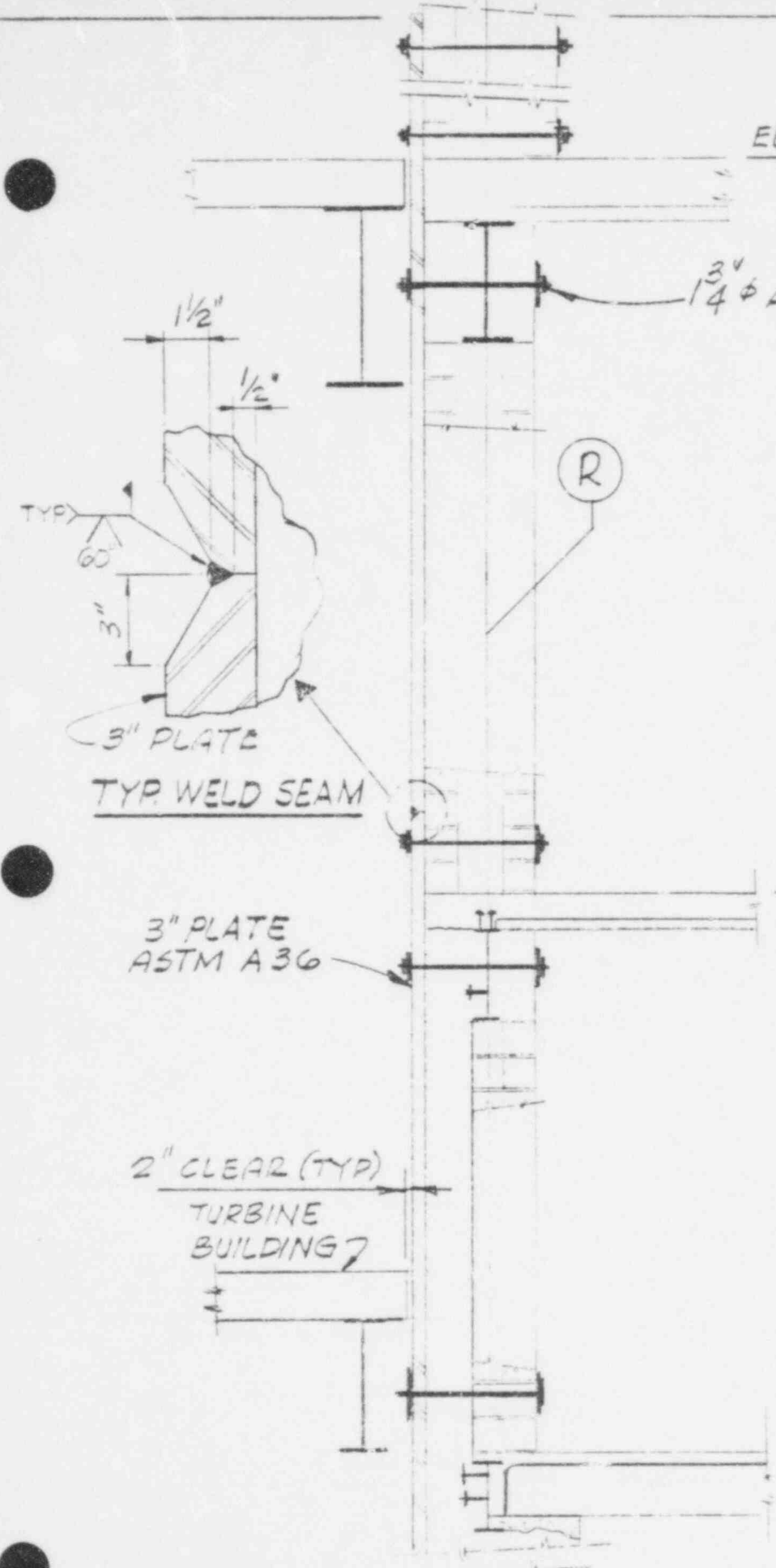

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FIG. 3.2-9 STEEL PLATE @ LINE (R)

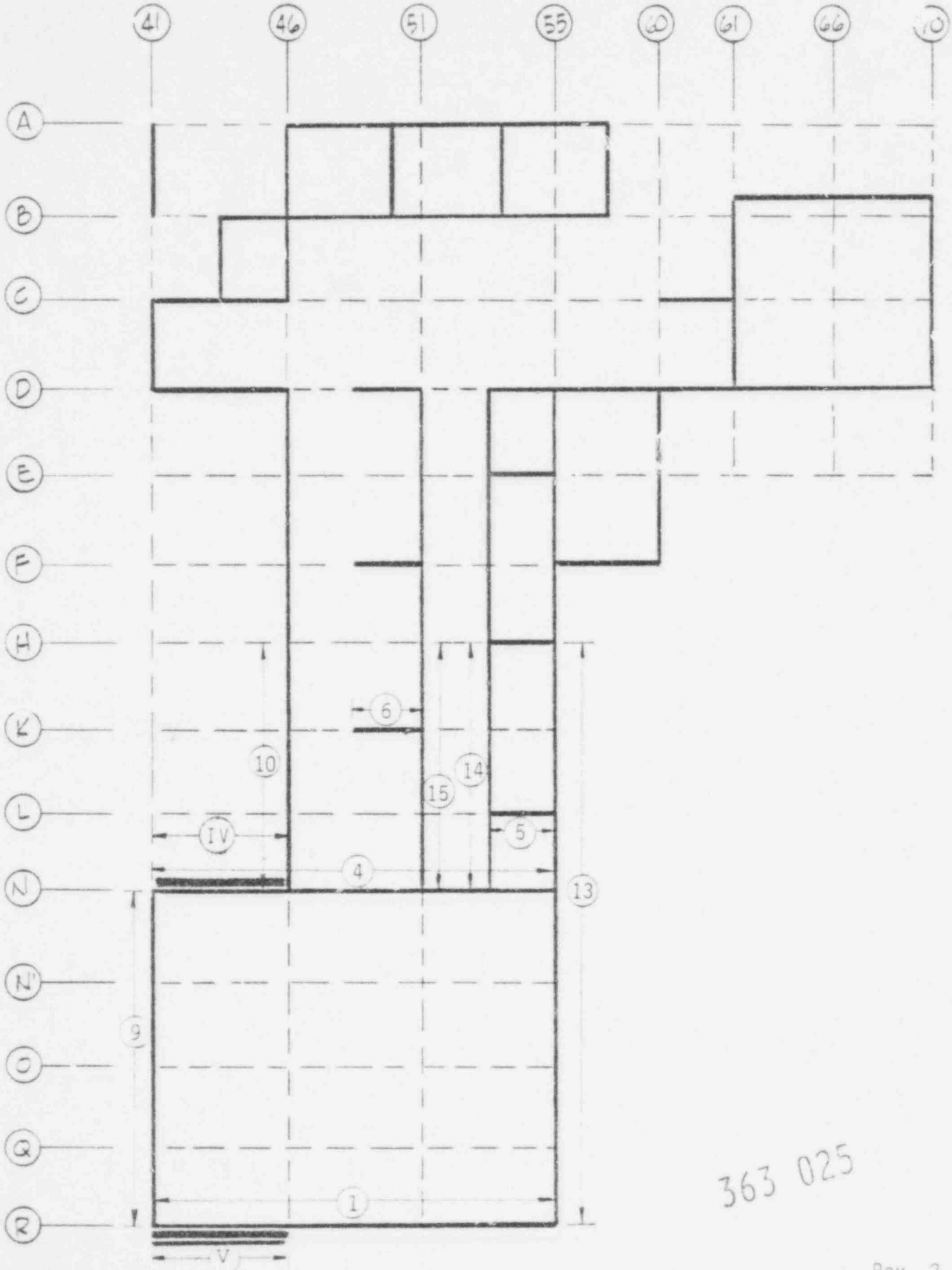

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Figure 3.3-4 Wall Key Plan For Elevation 77-93

CONTROL BUILDING

AUXILIARY BUILDIN

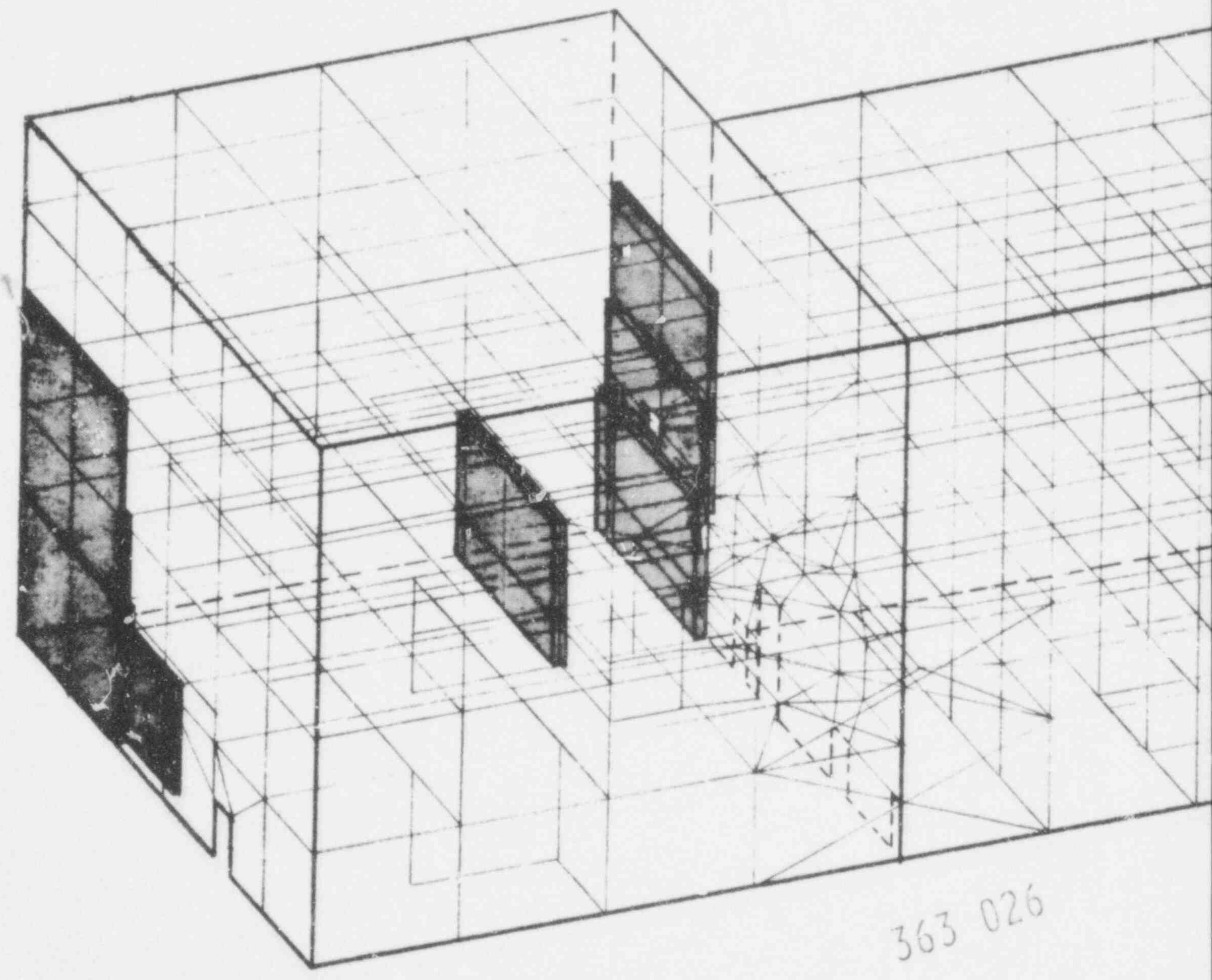

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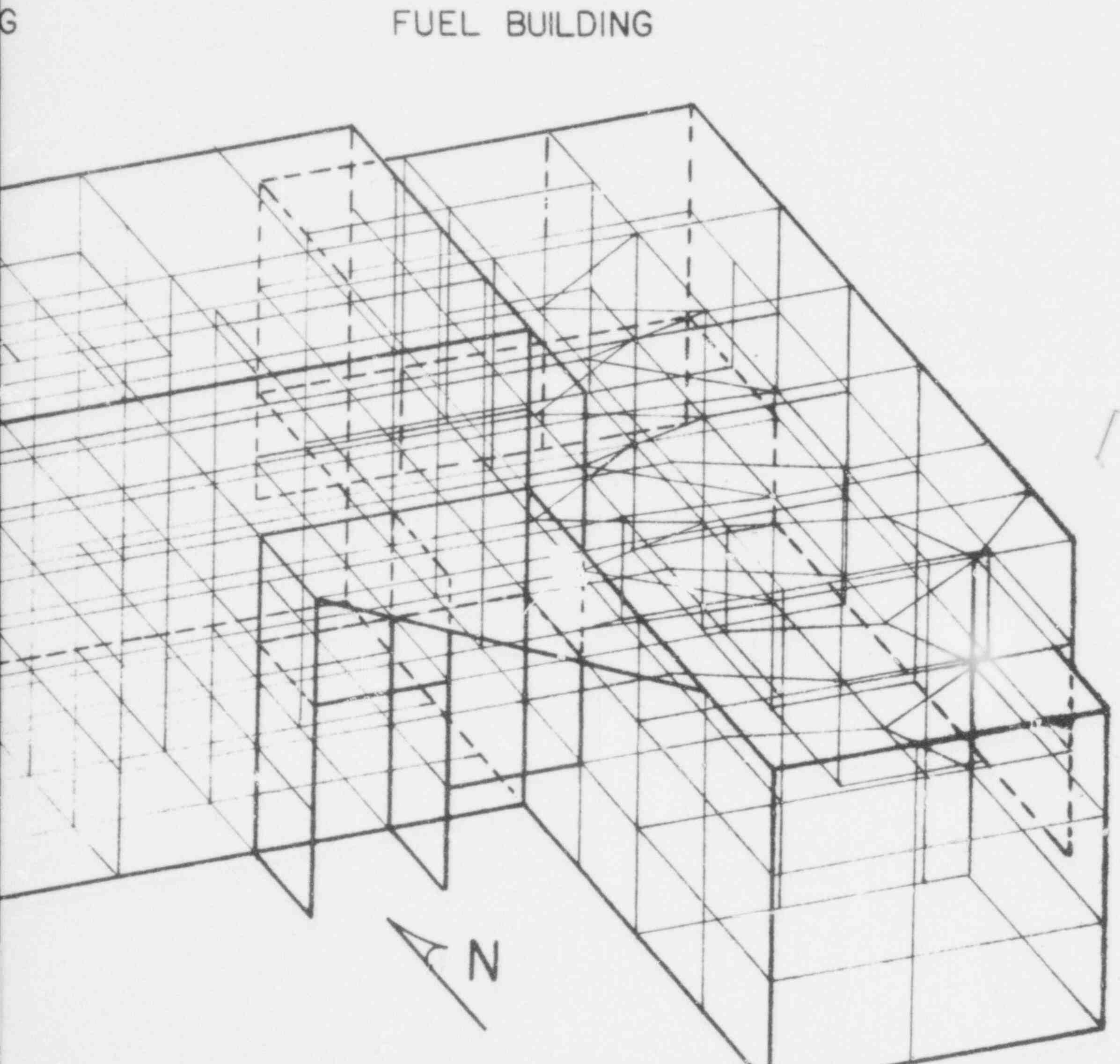
FIGURE 3.3-7 ST



RDYNE MODEL

FIGURE 3.3-7

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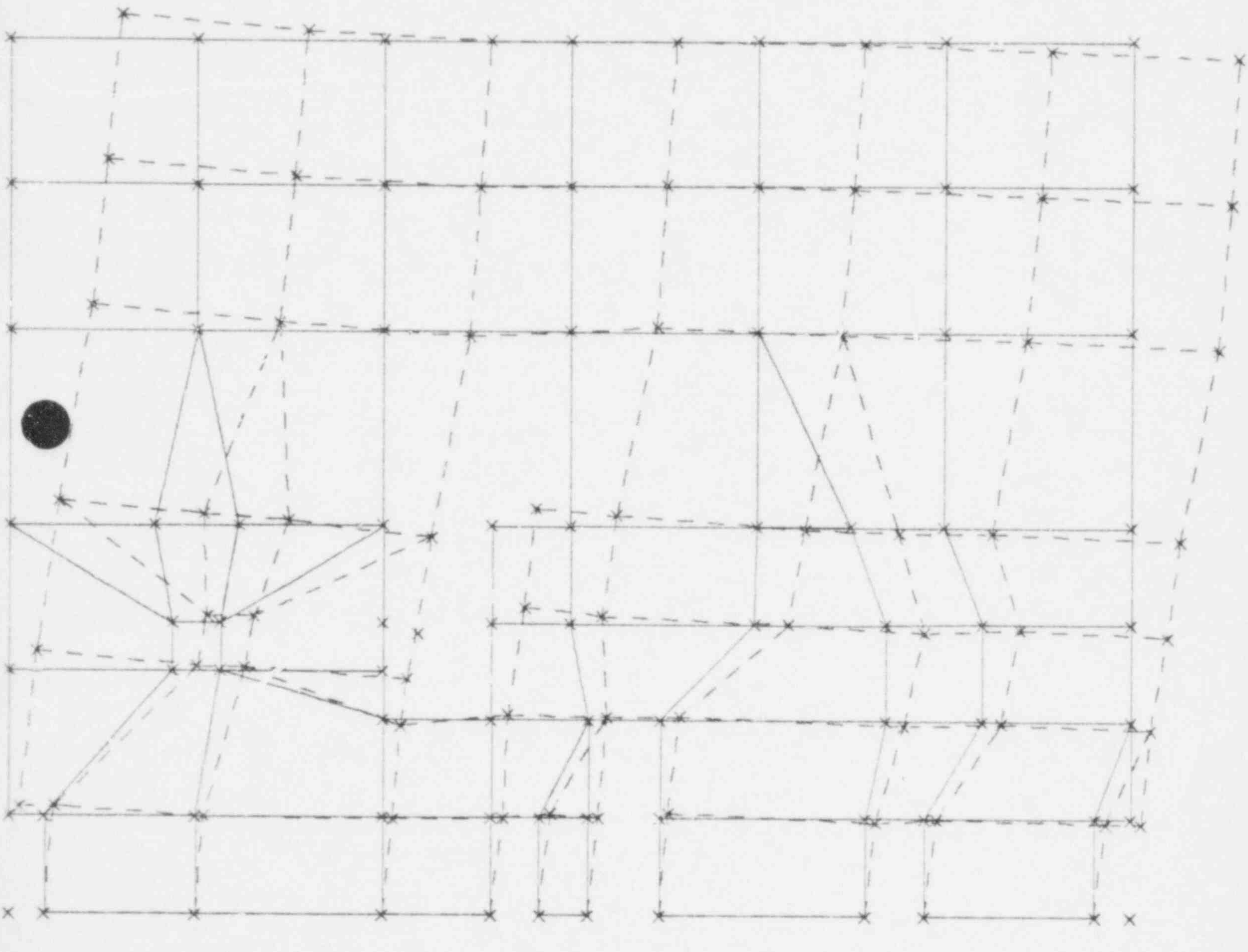

Figure 3.3-11a Fundamental North-South Mode Shape,
Wall (1), Column Line (N) (Not to Scale)

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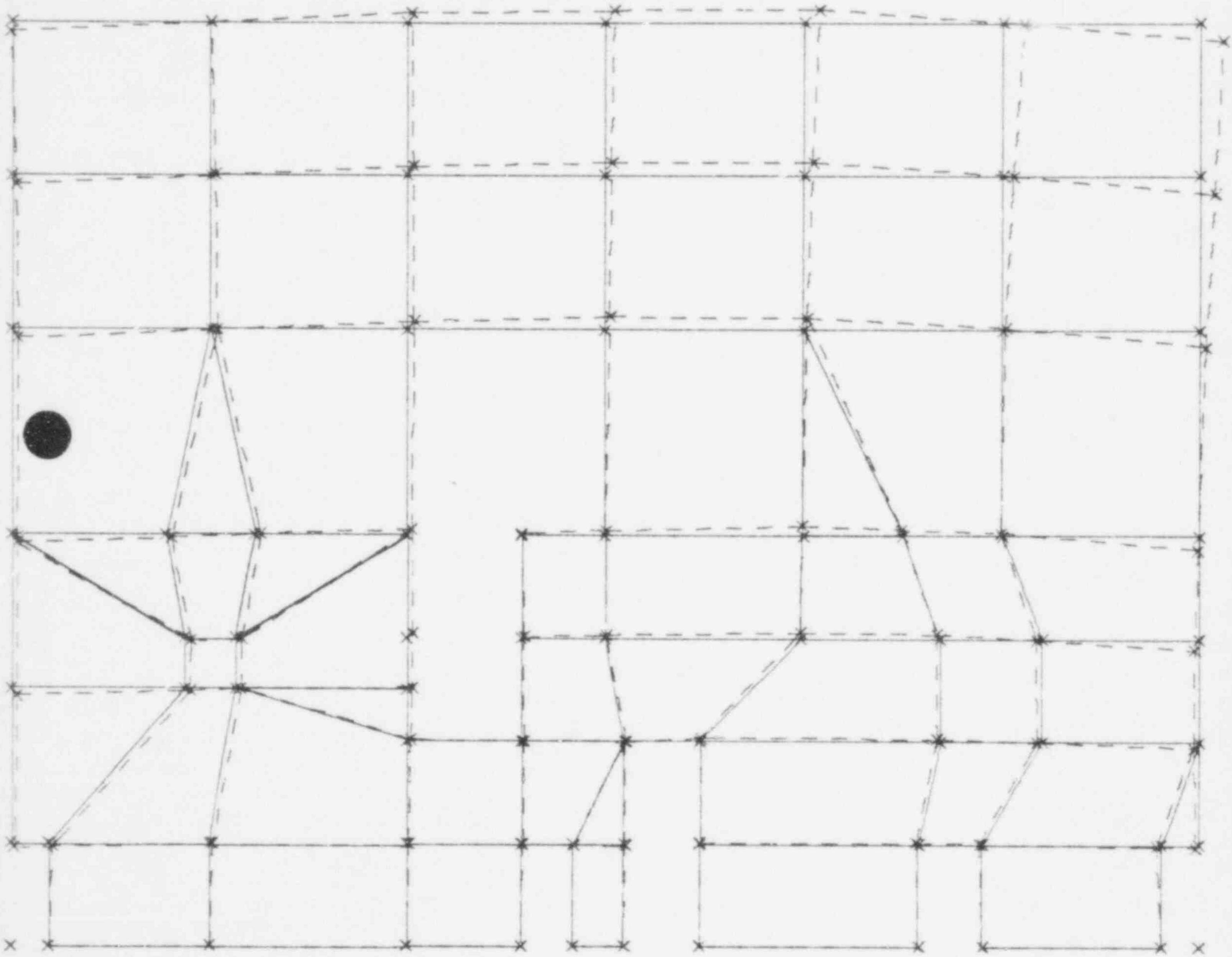

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Figure 3.3-12a Fundamental East-West Mode Shape, Wall (1), Column Line (N) (Not to Scale)

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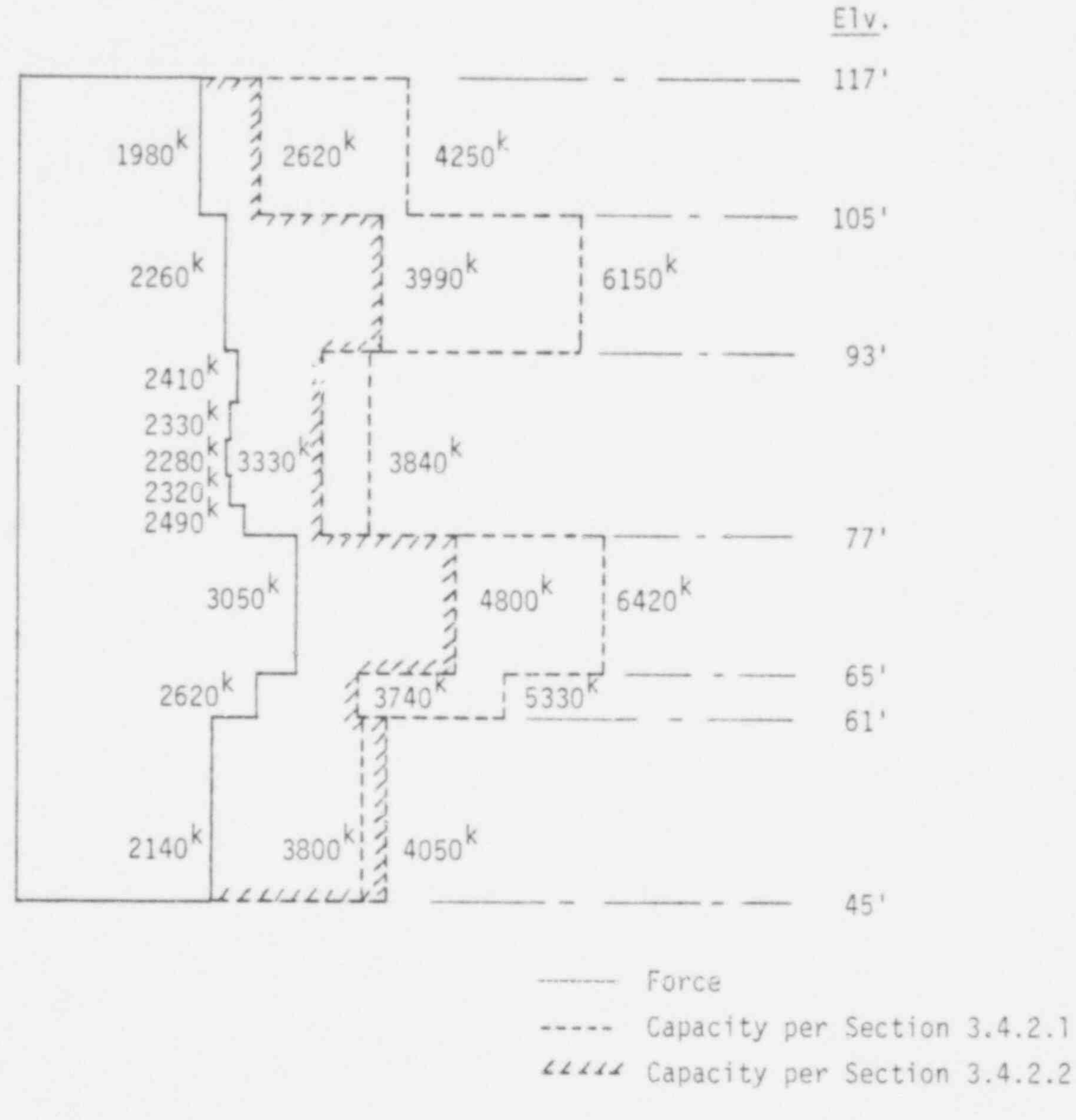

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Figure 3.5-6 Force Capacity Comparison
Modified Structure, OBE = 0.15g, β = 2%
Wall (1) Along Column Line R

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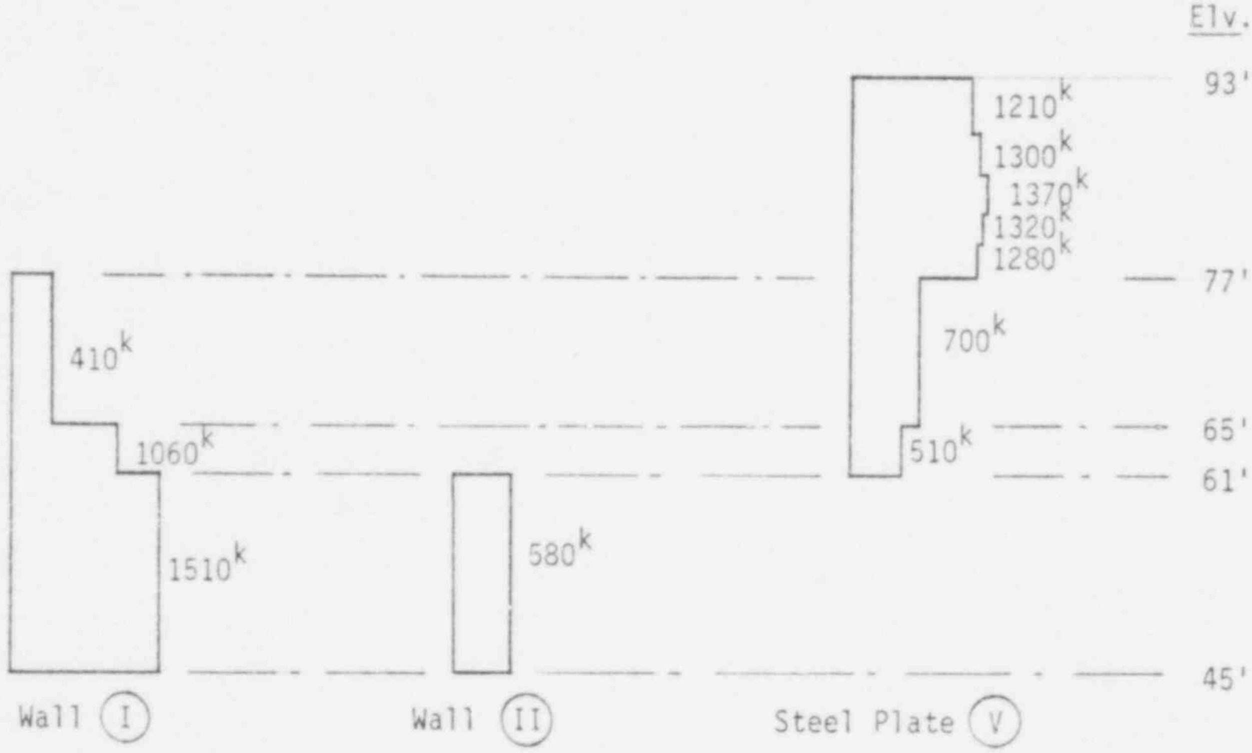

Figure 3.5-7 Force In New Shear Elements
Along Column Line R
OBE = 0.15g, β = 2%

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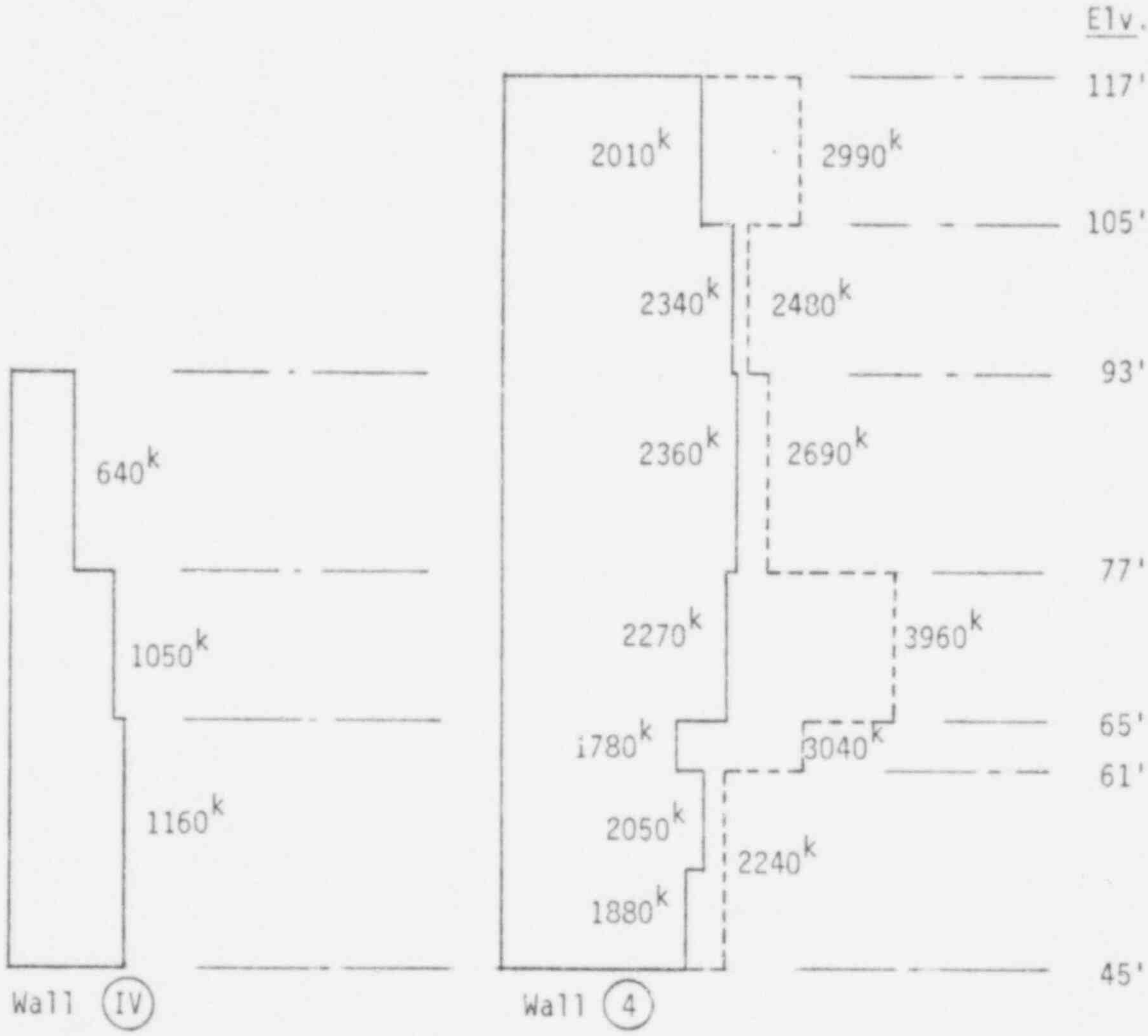

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Figure 3.5-8 Force Capacity Comparison
Modified Structure Along Column Line N
OBE = 0.15g, β = 2%

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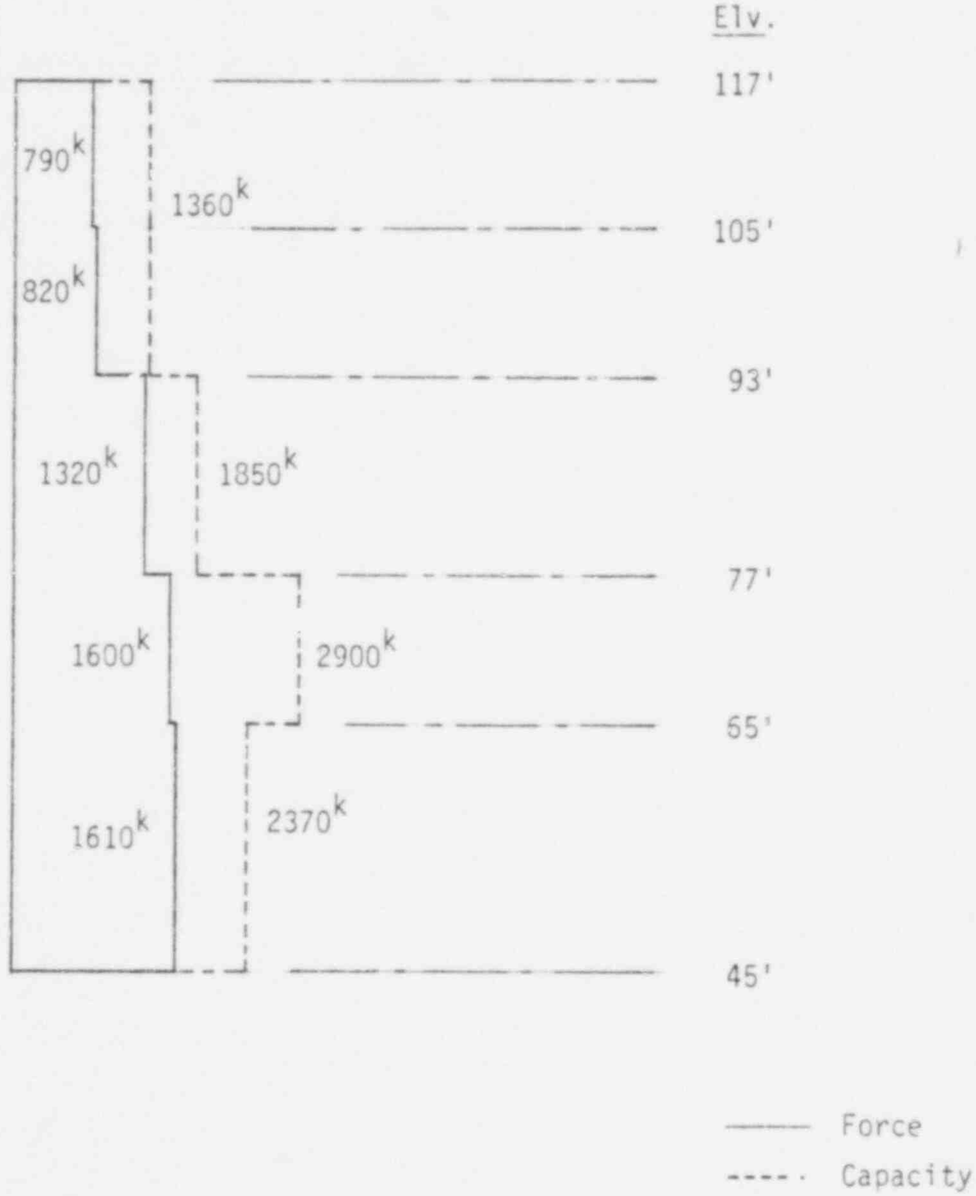

Figure 3.5-9 Force Capacity Comparison
Modified Structure, OBE = 0.15g, β = 2%
Wall (9) Along Column Line 41

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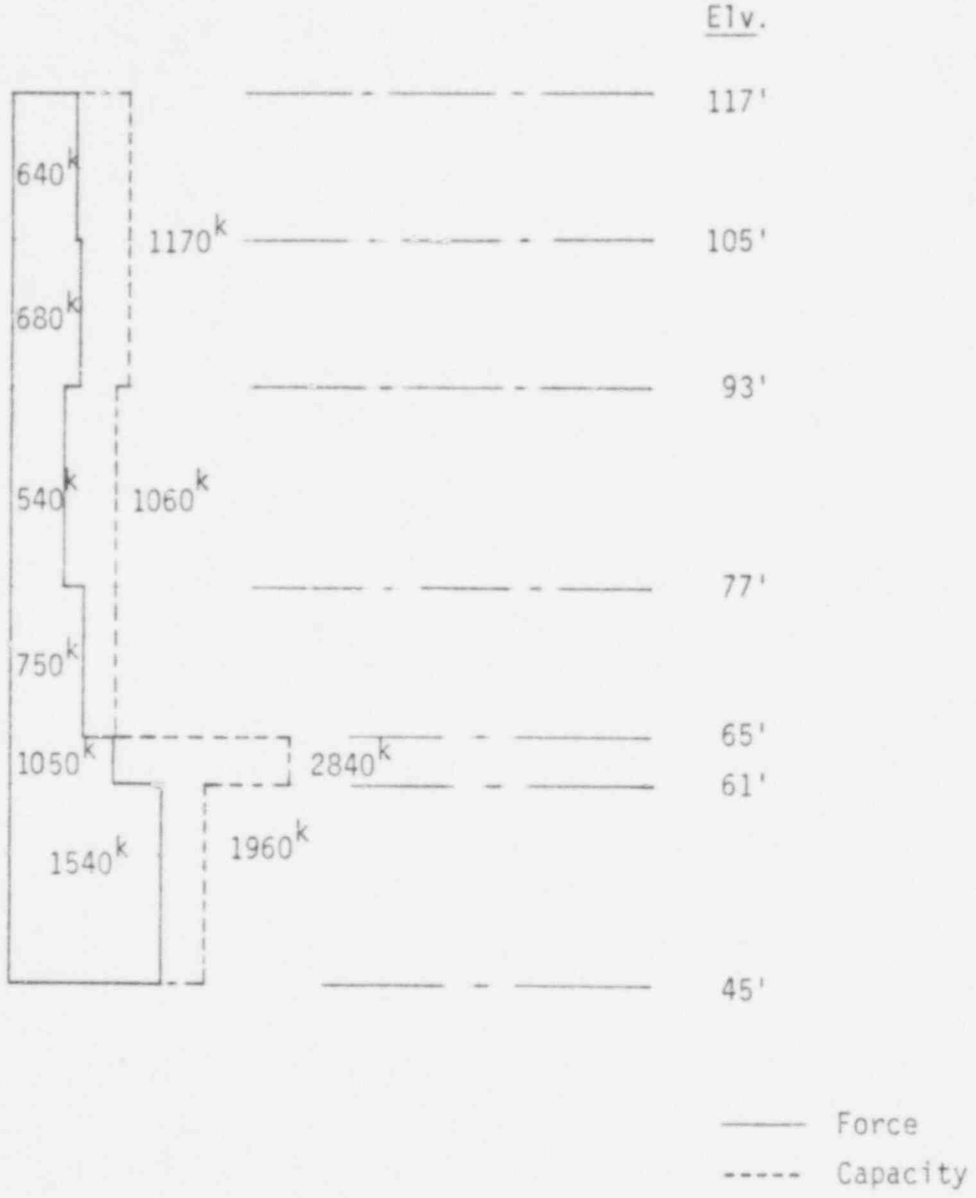

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Figure 3.5-10 Force Capacity Comparison
Modified Structure, OBE = 0.15g, β = 2%
Wall (10) Along Column Line 46

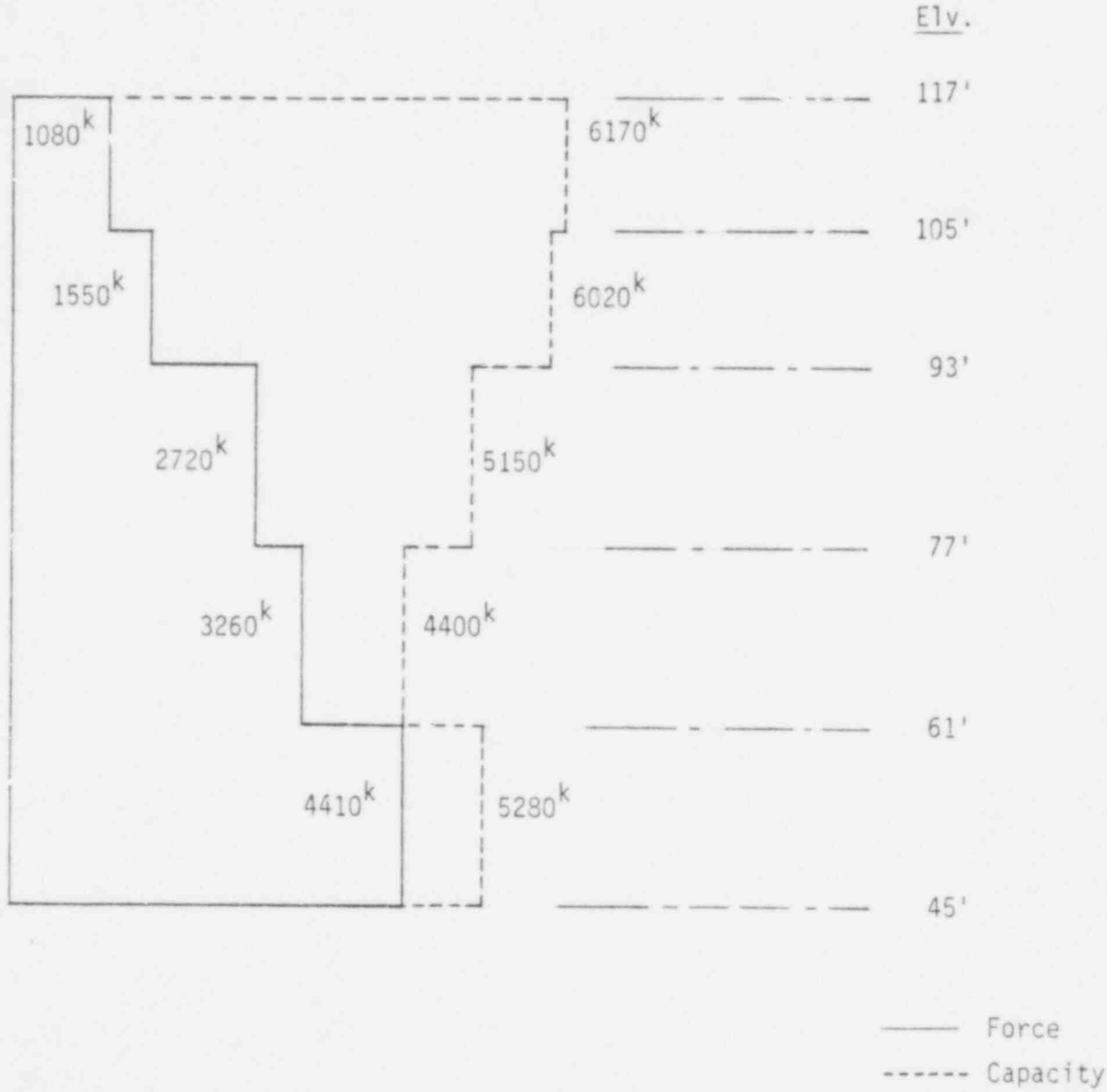

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Figure 3.5-11 Force Capacity Comparison
Modified Structure, OBE = 0.15g, β = 2%
Wall (13) Along Column Line 55

and extending south approximately 20 feet. It is recognized that all this work may not be completed prior to completion of the N' shear wall, and may finish during the period when other tasks are under way.

4.2.3 Task 2--Provide New Shear Wall at Column Line R From Column 41 to Beyond Column 46

Once the shear wall at N' is in place, work on the new shear wall at column R between column line 41 and extending approximately 14 feet south of column line 46 may begin. The remainder of the excavation necessary for the foundations will be completed and a portion of the block facing will be removed from the west face of the wall at column line R between columns 46 and 47, from ground level to approximately elevation 77 ft to provide a plane surface for steel plate installation. During the activities of Task 1, necessary bolt holes through the R line wall may be drilled. Drilling for and installing the wall and ceiling embeds at the interface surfaces will be done concurrently with the installation of the wall reinforcing steel. 2

Form work and reinforcing steel installation for the new R-Line shear wall between columns 41 and 46 will be of conventional construction, with forms on both surfaces up to the El. 59 ft. 3in. At that elevation, a steel ledger angle will be embedded to facilitate the installation of steel plate #1. 2 Once the elevation of the steel plate is reached, the steel plate becomes the form for the west face of the wall to the top of concrete approximately at elevation 76 ft. Conventional forming extends on the east face of the new R line shear wall from elevation 45 ft. to the underside of the floor at elevation 65 ft.

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Steel plates for the west face of the wall will be located between columns 41 and 46, and from elevation 59 ft, 3 in. to 97 ft, 3 in. (See Section 3.2.1.1.) Preparation for steel plate installation includes removal of portions of the edge of the slab and girder in the Turbine Building at elevation 93 ft and the edge of the slab at elevation 69 ft. The slab removal will be between column lines 41 and 46. Rigging for plate installation will be provided in the Turbine Building above elevation 93 ft. Preparations will also include temporary removal of platforms, stairs, and other interfering facilities above elevation 93 ft of the Turbine Building. This will provide access to the west face of the wall at column R. Plate sections 1 through 6 will be brought into the railroad bay and raised into the position below the cable trays. These plates will be raised by two chain hoists with a third one attached nominally above the center of gravity to follow the load as a safety measure. The final plate sections will be raised to the turbine floor level at El. 93 ft and placed in their final position from above the four electric cable tray openings.

After the R line wall concrete has been placed to the elevation of the bottom of the first plate section and has attained adequate strength, steel plate #1 will be raised into place from elevation 45 ft, pulling it to the south as necessary to clear fire lines below El. 69 ft.

Following positioning of plate #1 through-bolts will be installed, forms on the north and south ends of the plate will be installed, and concrete will be placed to within approximately 3 inches of the top of the plate section.

At any time during the modification work, concrete may be removed from the concrete beam along the R line between columns 41 and , from elevation 74 ft, 3 in. to approximately elevation 76 ft, 6 in.. Next, plate section #2 will be lifted into place from El. 64 ft. to El. 70 ft., bolts will be installed, the two plates will be welded together and concrete will be placed as in the first plate section. △2

Plate #3 will then be lifted into position, from El. 70 ft. to El. 74 ft. 3 in.. The bolts will be installed and the plate will be welded to the one below it. Concrete will be placed behind the plate. Additional sections of plate below the electrical cable trays will be installed in the manner, using grout rather than concrete above approximately El. 76 ft. △2 △2

The plate above the electrical cable trays (#7 & 8) will be raised to the Turbine Building El. 93 ft. floor with the Turbine Building crane. These plates will then be maneuvered to the R-Line wall and lowered into place using chain hoists. Cable tray protection from washers and tools will be provided by cable tray covers of standard design and construction. △2

Following the erection of the last plate section, final welding, grouting, and bolt tensioning, will be accomplished. Later, rigging equipment and guides will be removed, and general clean-up will be done. Stairways, platforms, and any other facilities in the area which have been disturbed will be restored. △2

4.2.4 Task 3--Provide New Shear Wall at Column Line N Between Column Lines 41 and 46

After the new shear wall at the R line has progressed to elevation 69 ft, 9 in., the excavation along column line N will be completed and erection of the new shear wall will begin. The siding, girt steel, and precast panels may be removed during Task 1 or any time thereafter. After the foundation is placed, the new shear wall at column line N will be erected by conventional construction methods.

4.2.5 Ancillary Work

Any modifications to safety-related equipment, components, and piping required to ensure their seismic qualification with the new response spectra will be made at appropriate times as addressed in Section 5 and Appendix B. 2

A seismic Category I air supply for the Emergency Diesel Generators will be provided by installation of a 182 sq ft louvered section in the column line 41 wall of the Turbine Building approximately 9 ft west of column S. The existing Turbine Building rollup door between column lines S' and T will be relocated west to column line U to maintain an air path. This air supply will be provided prior to sealing off either end of the railroad bay.

A new railroad spur to the Fuel Building will be provided to replace the track through the Control Building, as shown in Figure 3.1-1. Excavation for the spur will be done by the same means as to be used for the foundation work discussed in Task 1. 2 No explosives will be utilized for the removal of rock. The railroad spur into the Turbine Building will be fitted with a rail stop. This work can be done independently of the structural modification work.

The enclosed space in the Control Building railroad bay will be developed for use as additional office space and work stations. A lightweight structural floor system will be installed at approximately elevation 55 ft.

4.3 BECHTEL-PGE INTERFACE

Prior to beginning modification work, the following activities will be performed by Bechtel and PGE.

4.3.1 PGE Review

PGE Engineering, Quality Assurance, Licensing, Construction, and Operations personnel will review specifications and design criteria. PGE Engineering will review major drawings.

4.3.2 Plant Review Board and Nuclear Operations Board Review

Safety evaluations will be reviewed by the Plant Review Board and the Nuclear Operations Board in accordance with Technical Specifications 6.5.1 and 6.5.2.

4.3.3 Plant Staff Review

Bechtel construction work plans will be reviewed by the Plant Staff to ensure that modification work will not violate Trojan Technical Specifications or Plant Administrative Controls. This review will be completed prior to commencing any activities to be performed in accordance with these plans.

4.4 EFFECTS OF MODIFICATION PROGRAM

The modification of the Control Building will occur within the existing perimeter of the Plant site. The general external appearance of the Complex will not change noticeably.

As many as 25 additional employees may be on the Trojan site during portions of the approximately 6 months of modification activity. Most of the additional workers are expected to come from the Portland metropolitan area, although some may be local residents. Normal manning on site consists of approximately 150 employees, and during periods such as a refueling, it is normal to have two to three times that number on site. Thus modification activities are not expected to stress any of the local social or community facilities, such as schools, sewers, water, or housing.

The relocation of the railroad spur will involve removal of approximately 350 cu yds of rock. This material will be used to fill a natural depression approximately 250 ft from the excavation or as a rock for a proposed embankment, both of which are within the perimeter of the PGE-controlled area. Standard construction practices will be used to control noise and dust. This material will be disposed of on or offsite as appropriate.

The work will require approximately 350 cu yds of concrete, 36 tons of reinforcing steel, and 83 tons of steel plate and miscellaneous steel. Aggregate, cement, and reinforcing steel will be purchased in the local area.

The structural work will generally be in covered areas, thus no appreciable runoff is expected. The railroad relocation work will take place in rock overlaid by gravel; therefore no significant suspended solids problems are expected.

Appropriate receptacles will be provided for the collection of solid waste to be disposed of off site. Sanitary facilities during construction will be provided by a toilet trailer which will be temporarily connected to the plant water and sewer systems.

Ecological impacts from the construction of the Control Building modification are expected to be of short duration. These impacts will be limited to disturbances caused by increased activity brought about by construction equipment and personnel in the area. Since heavy vehicle movement is already present nearby, the additional impacts are expected to be minimal.

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The site preparation and modification program activities will be conducted in compliance with OSHA safety requirements.

be unchanged. The work on the R line wall at elevation 45 ft will be conducted to the north of the passageway between the Control Building, Turbine Building, and the Emergency Diesel Generator room. The R line wall work will be near the safety-related switchgear room at elevation 69 ft with an access path maintained in this area at all times.

Normal access between various levels of the Control Building will be unchanged. Likewise, access between the Control Building and adjacent structures is unaffected.

Since most of the work that could cause vibration and noise (e.g., excavation through the floor slab) will be conducted at elevation 45 ft, it will not have noticeable effects in the control room at elevation 93 ft. While some drilling will occur at higher elevations on the R and N line walls, the noise and activity of the modification work will not adversely affect Plant operations. 2

5.3.16 Conclusions

The safety evaluations for the work activities involved demonstrate that the modifications can be performed without adversely affecting the operation or function of safety-related equipment, without significantly reducing the seismic capability of the Complex, and without impairing the ability of the Plant operations personnel to operate the Plant under normal or emergency conditions. The modifications can, therefore, be performed while the Plant is in operation without posing an undue risk to the health and safety of the public.

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