

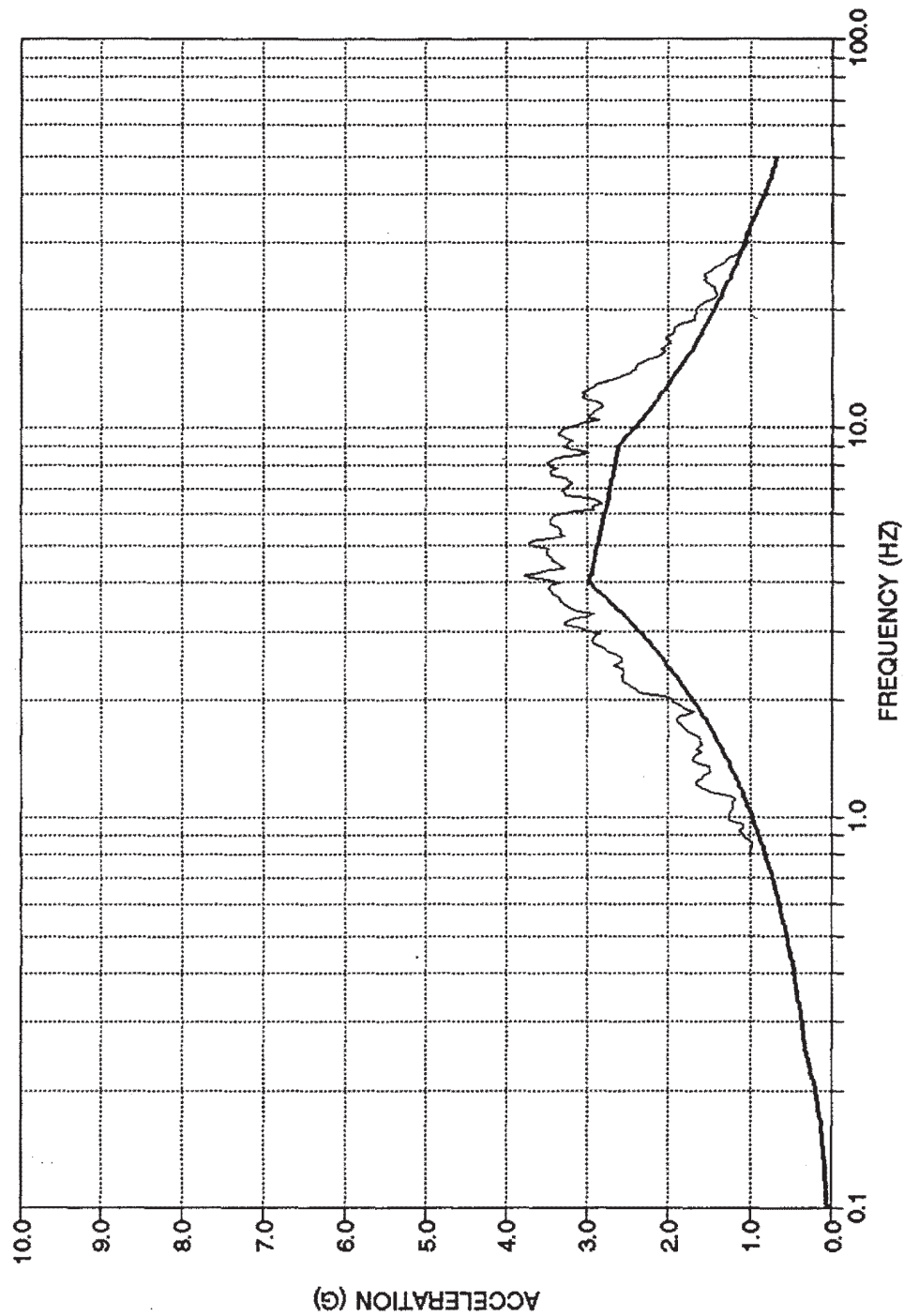
FREQUENCY IN CYCLES/SECOND

Amendment 68
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COMANCHE PEAK S.E.S.
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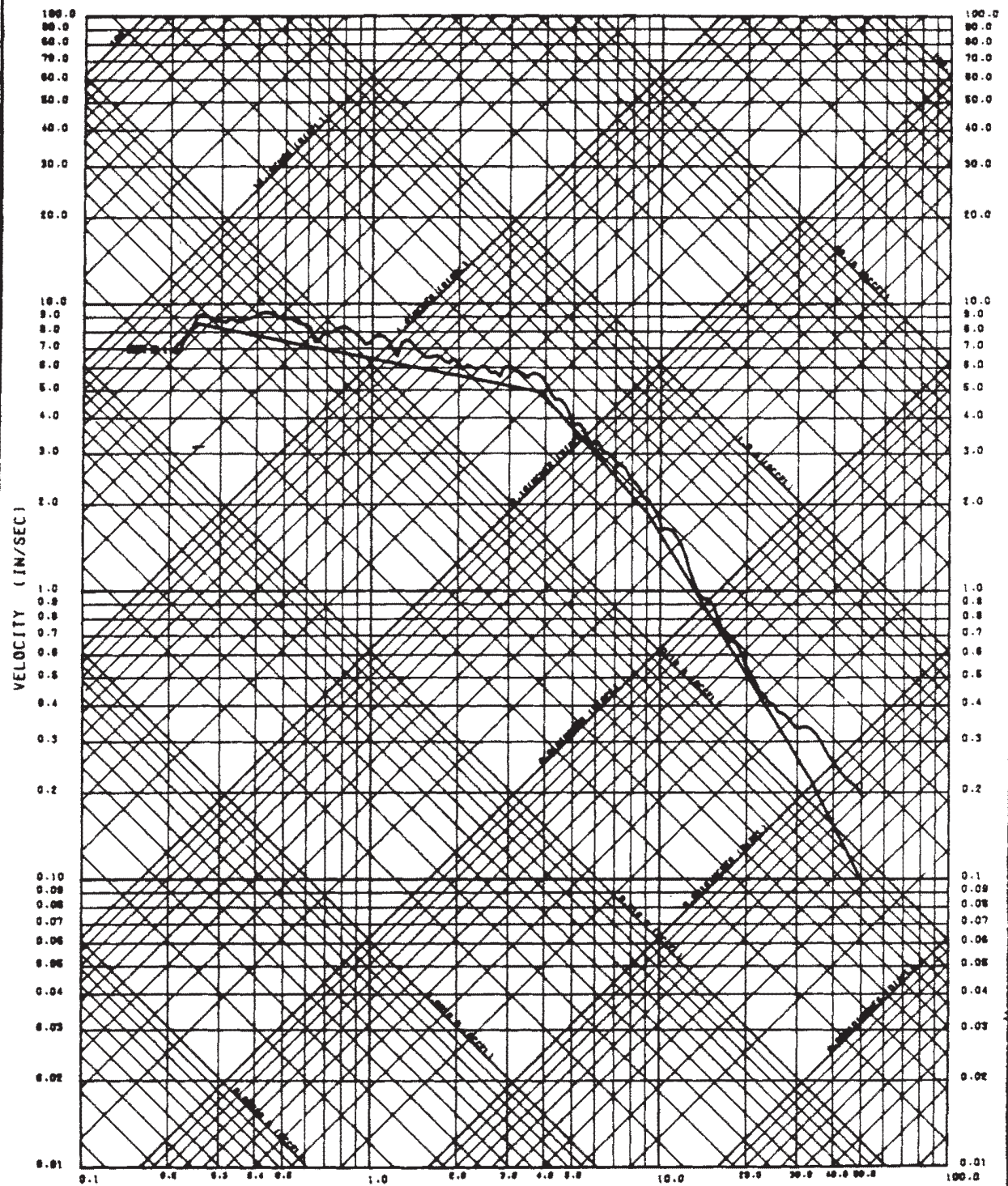
VERTICAL RESPONSE SPECTRA
SAFE SHUTDOWN EARTHQUAKE
5 PERCENT DAMPING

FIGURE 3.7B-9



Amendment 98

COMANCHE PEAK S E S FINAL SAFETY ANALYSIS REPORT UNITS 1 AND 2
FUEL BUILDING RE-ANALYSIS VERTICAL RESPONSE SPECTRA SAFE SHUTDOWN EARTHQUAKE 5 PERCENT DAMPING
FIGURE 3.7B-9A



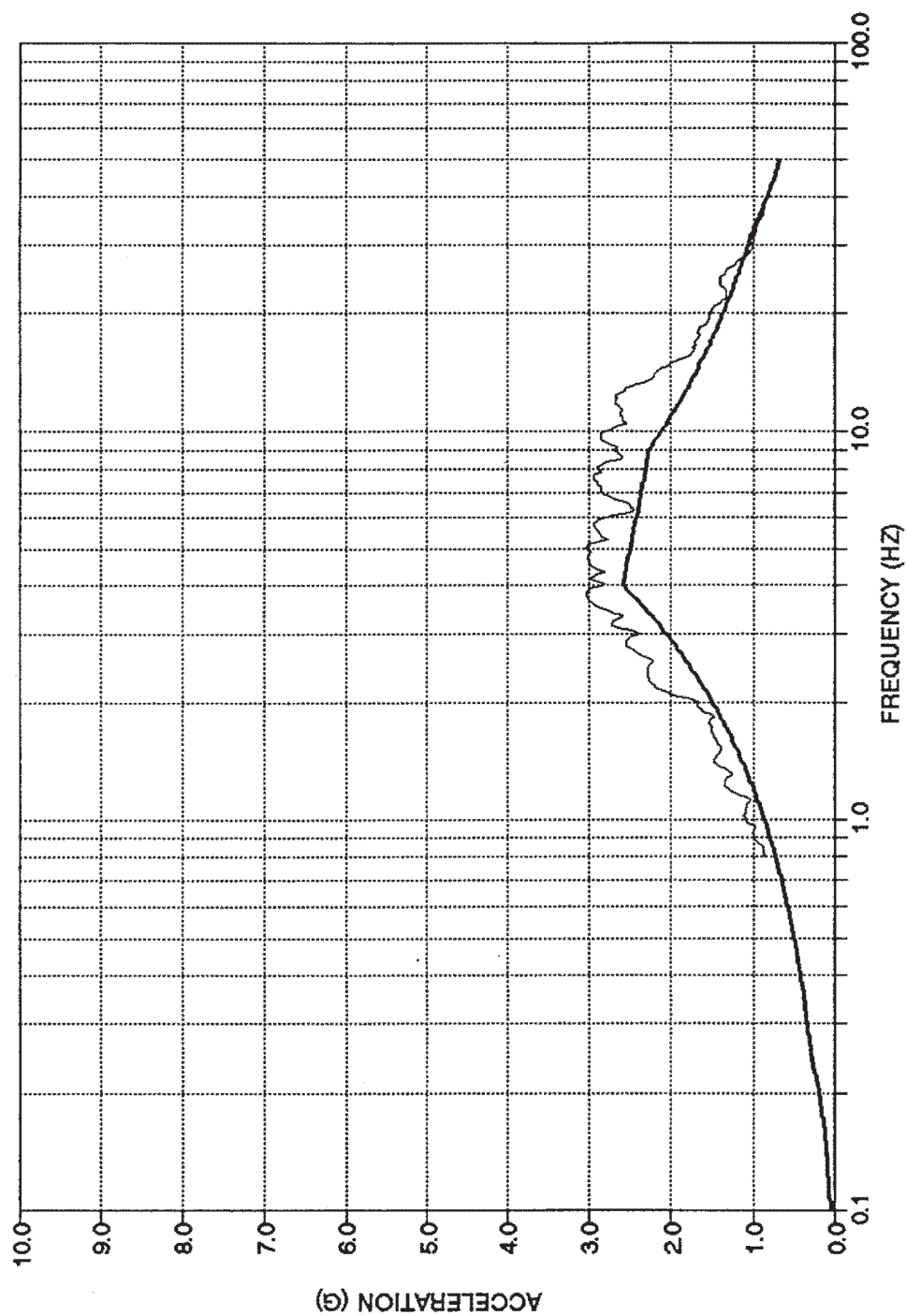
FREQUENCY IN CYCLES/SECOND

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VERTICAL RESPONSE SPECTRA
SAFE SHUTDOWN EARTHQUAKE
7 PERCENT DAMPING

FIGURE 3.7B-10

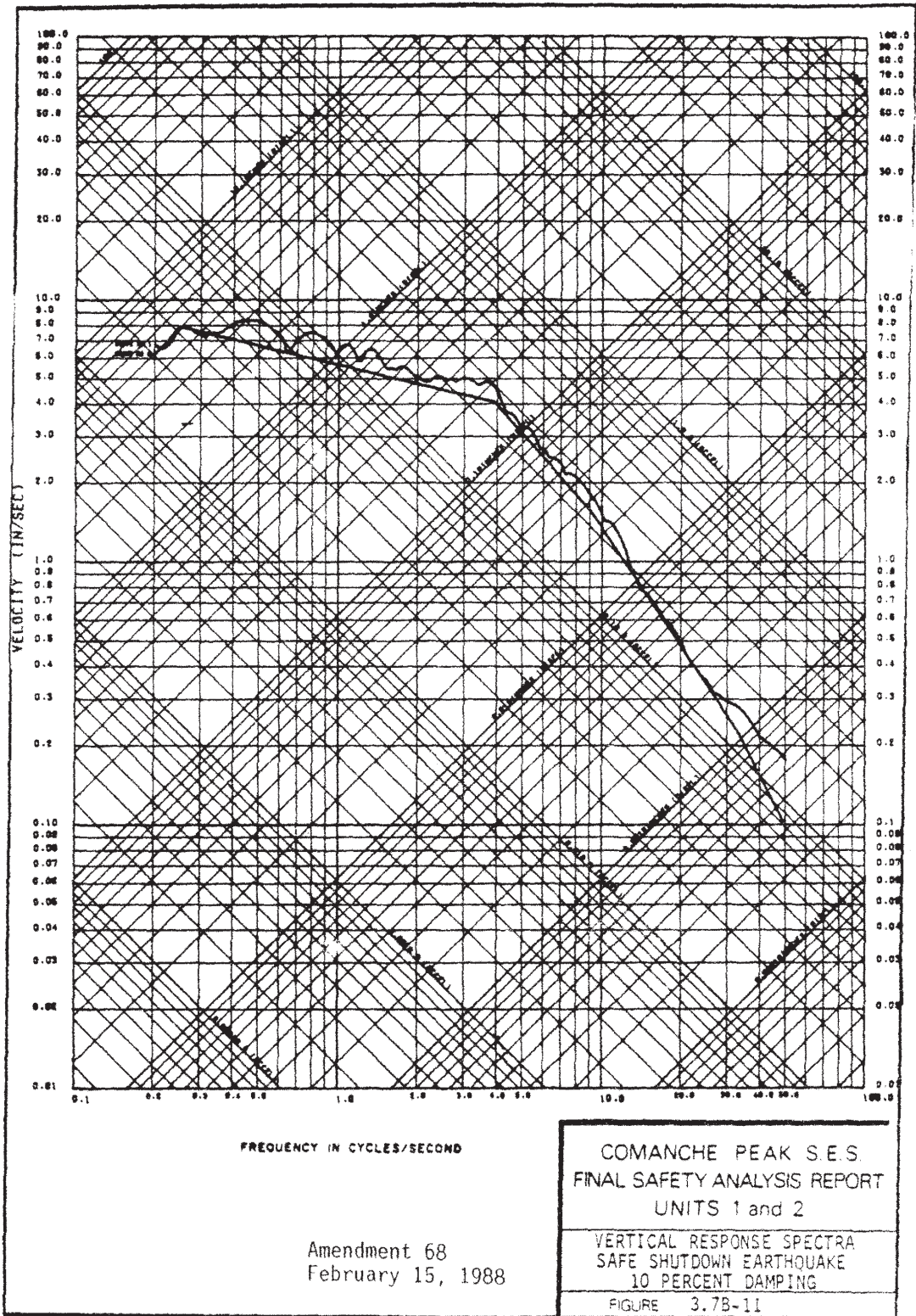


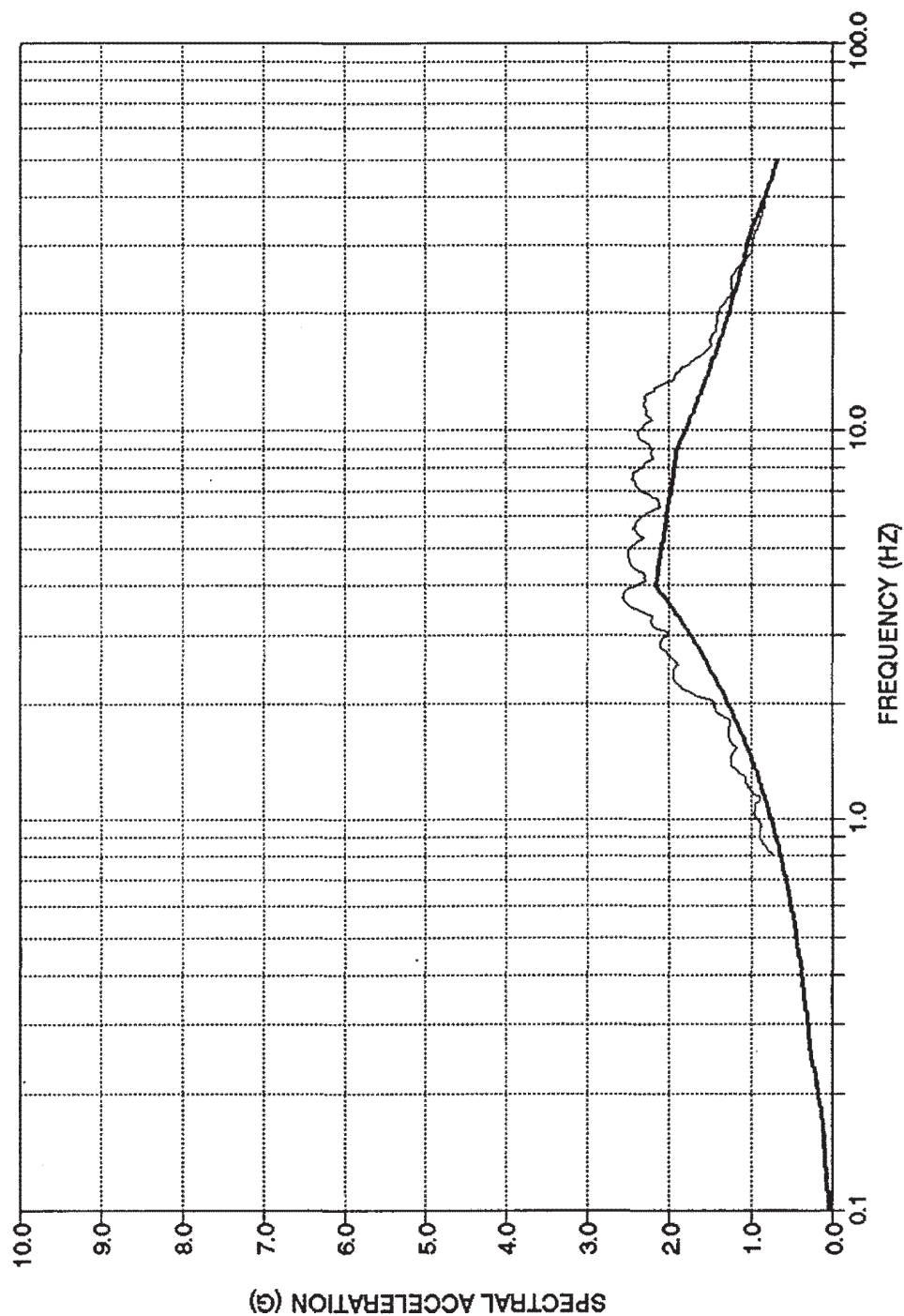
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COMANCHE PEAK S E S
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UNITS 1 AND 2

FUEL BUILDING RE-ANALYSIS
VERTICAL RESPONSE SPECTRA
SAFE SHUTDOWN EARTHQUAKE
7 PERCENT DAMPING

FIGURE 3.7B-10A



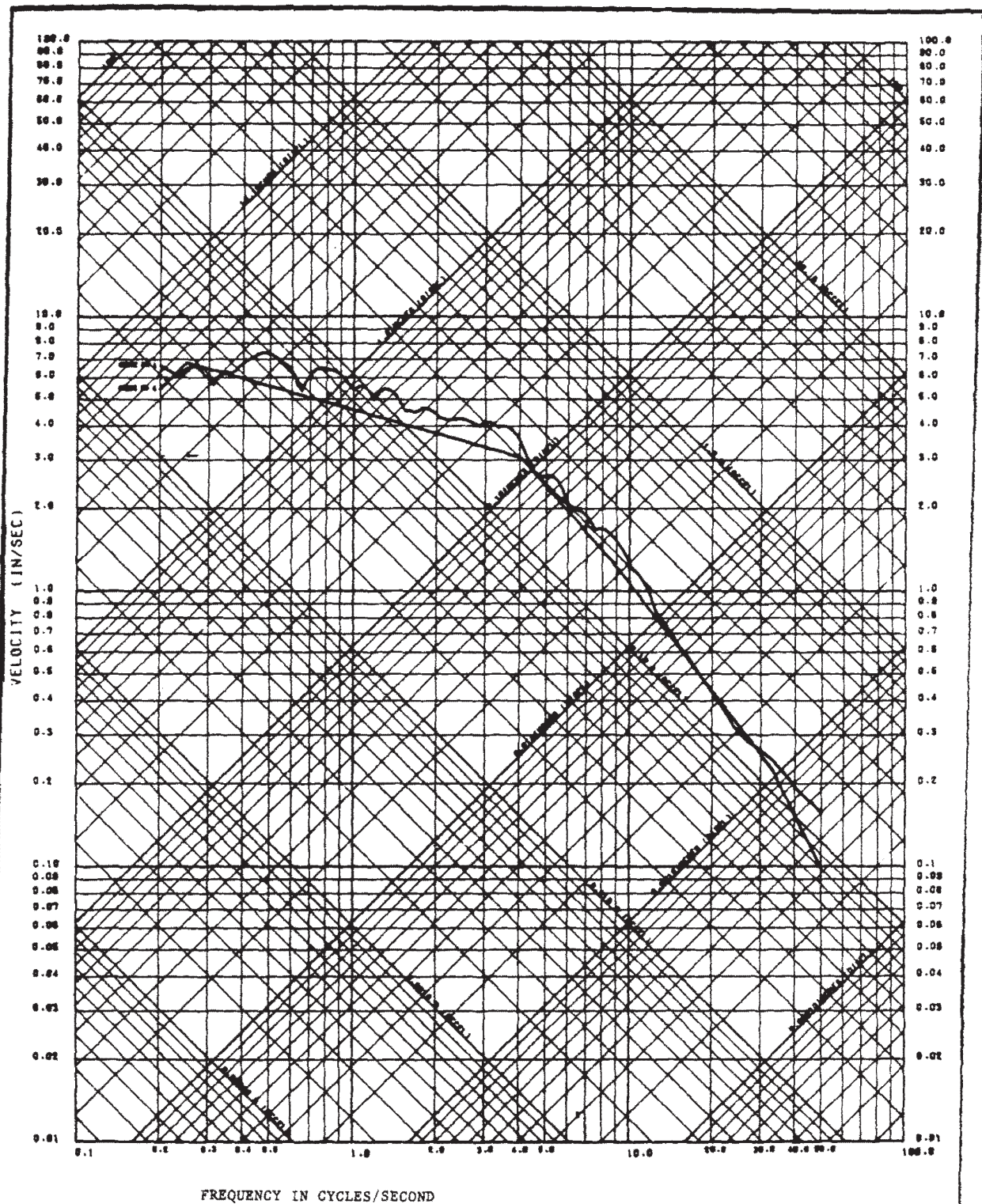


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COMANCHE PEAK S E S
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2

FUEL BUILDING RE-ANALYSIS
VERTICAL RESPONSE SPECTRA
SAFE SHUTDOWN EARTHQUAKE
10 PERCENT DAMPING

FIGURE 3.7B-IIA



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VERTICAL RESPONSE SPECTRA
SAFE SHUTDOWN EARTHQUAKE
15 PERCENT DAMPING

FIGURE 3.7B-12

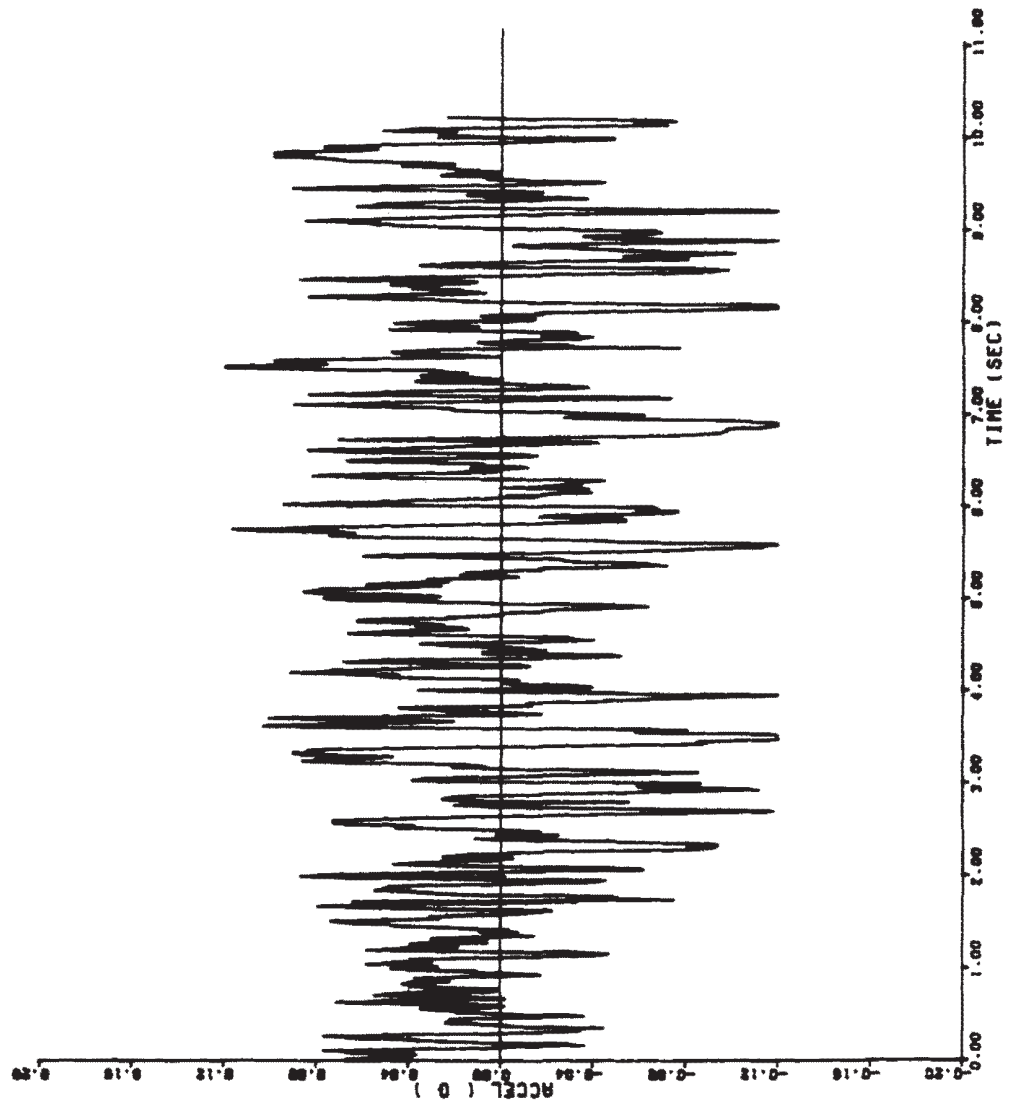
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COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

FIGURE 3.7B-13

MAX -0.12000
AT 6.170

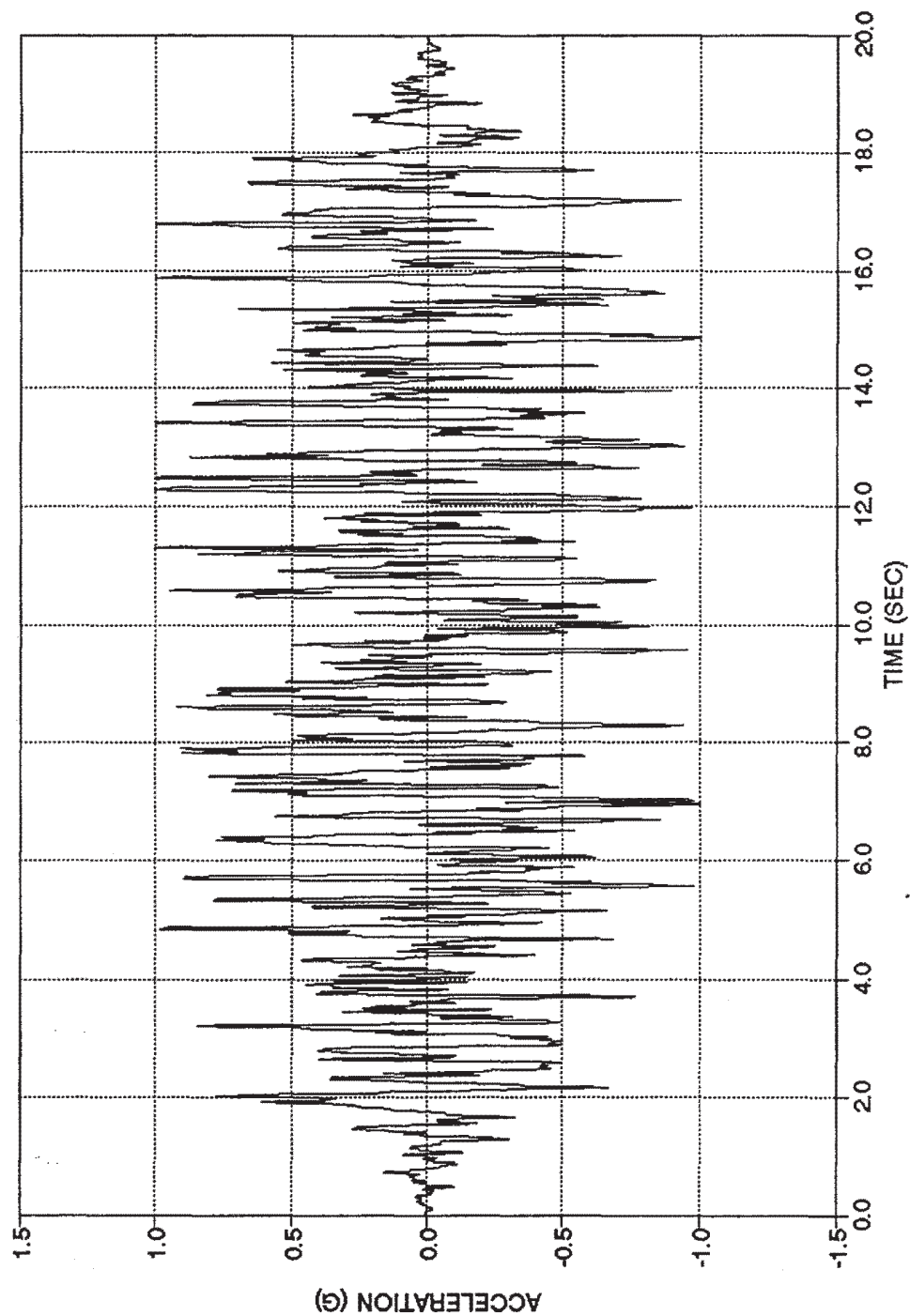


COMANCHE PEAK S.E.S.
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HORIZONTAL ARTIFICIAL
ACCELERATION TIME HISTORY

FIGURE 3.78-14

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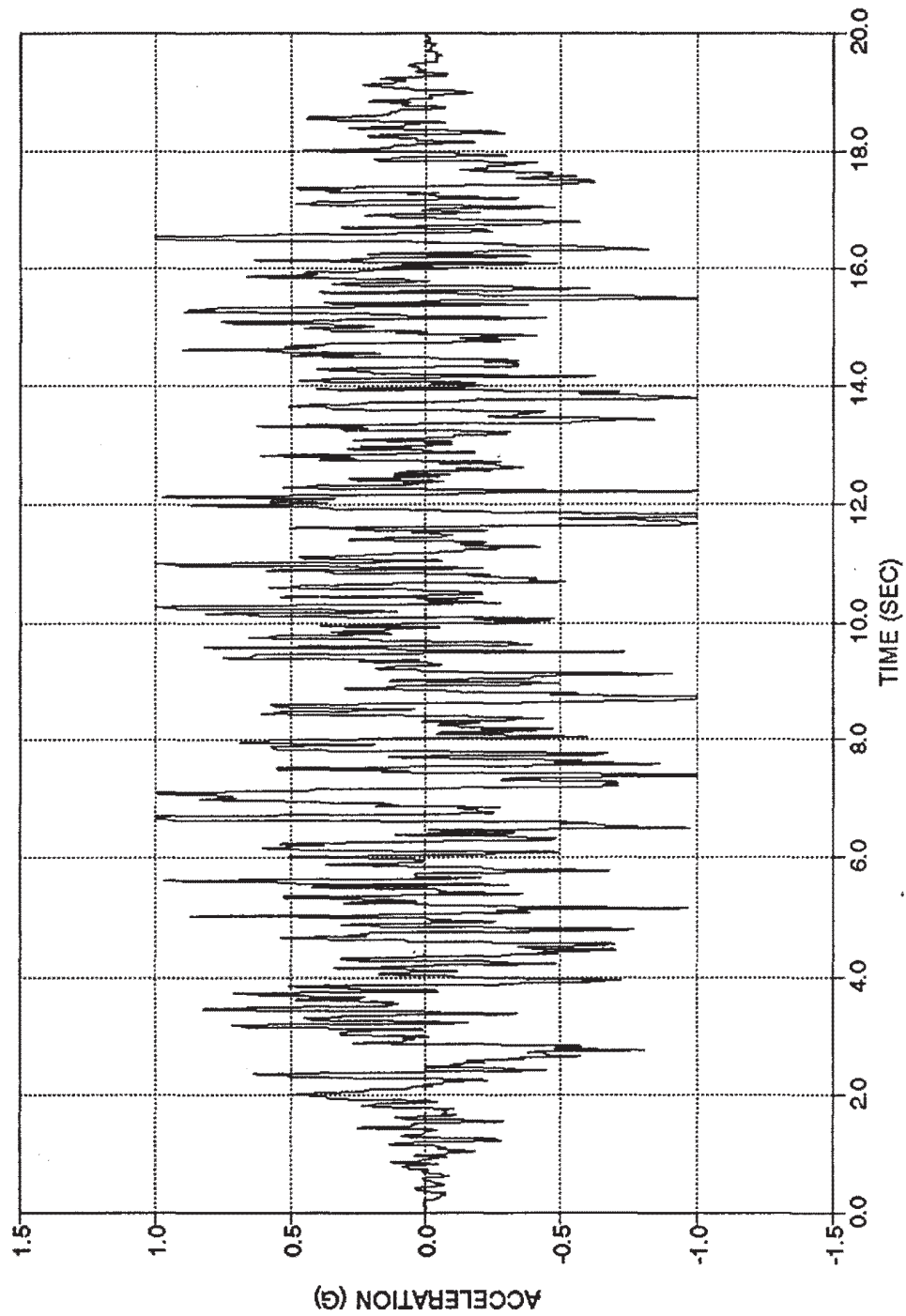


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COMANCHE PEAK S E S
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UNITS 1 AND 2

FUEL BUILDING RE-ANALYSIS
EAST-WEST ARTIFICIAL
ACCELERATION TIME HISTORY

FIGURE 3.7B-14A



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FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2

FUEL BUILDING RE-ANALYSIS
NORTH-SOUTH ARTIFICIAL
ACCELERATION TIME HISTORY

FIGURE 3.7B-14B

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COMANCHE PEAK S.E.S
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FIGURE 3.7B-15

INTENTIONALLY BLANK

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COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
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FIGURE 3.7B-16

INTENTIONALLY BLANK

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COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

FIGURE 3.73-17

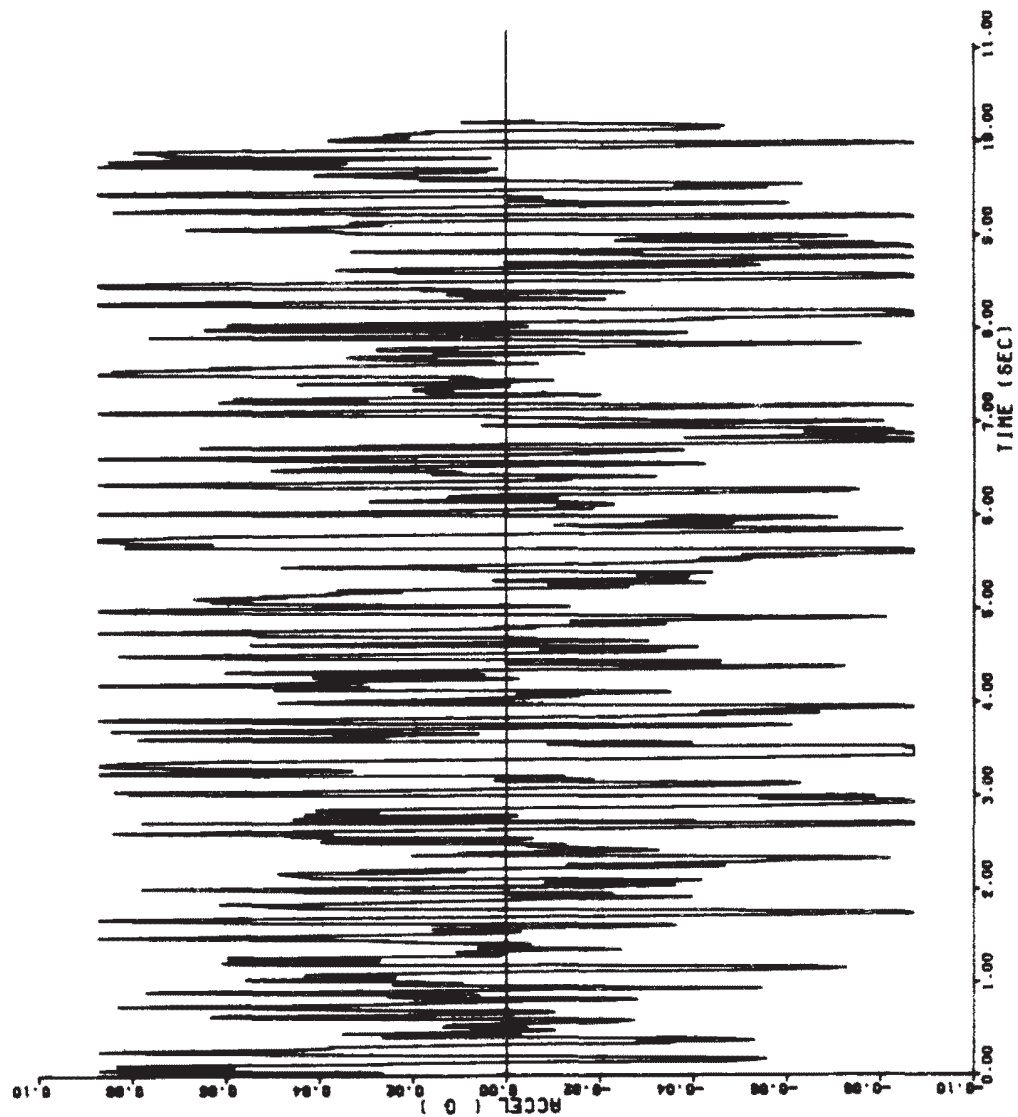
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COMANCHE PEAK S.E.S.
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UNITS 1 and 2

FIGURE 3.7B-18

MAX -0.08720
AT 9.990

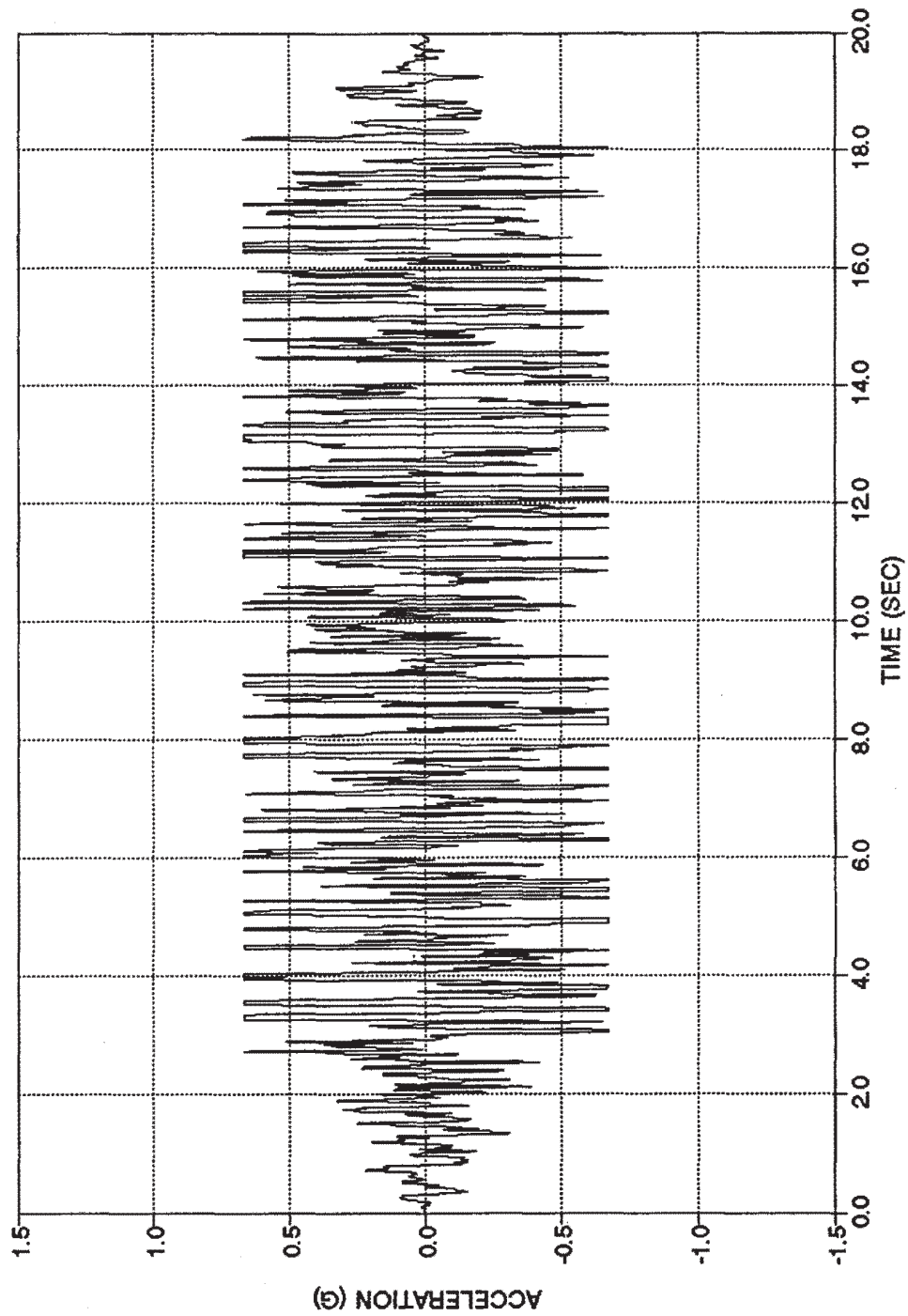


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COMANCHE PEAK S E S
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

VERTICAL ARTIFICIAL
ACCELERATION TIME HISTORY

FIGURE 3.7B-19

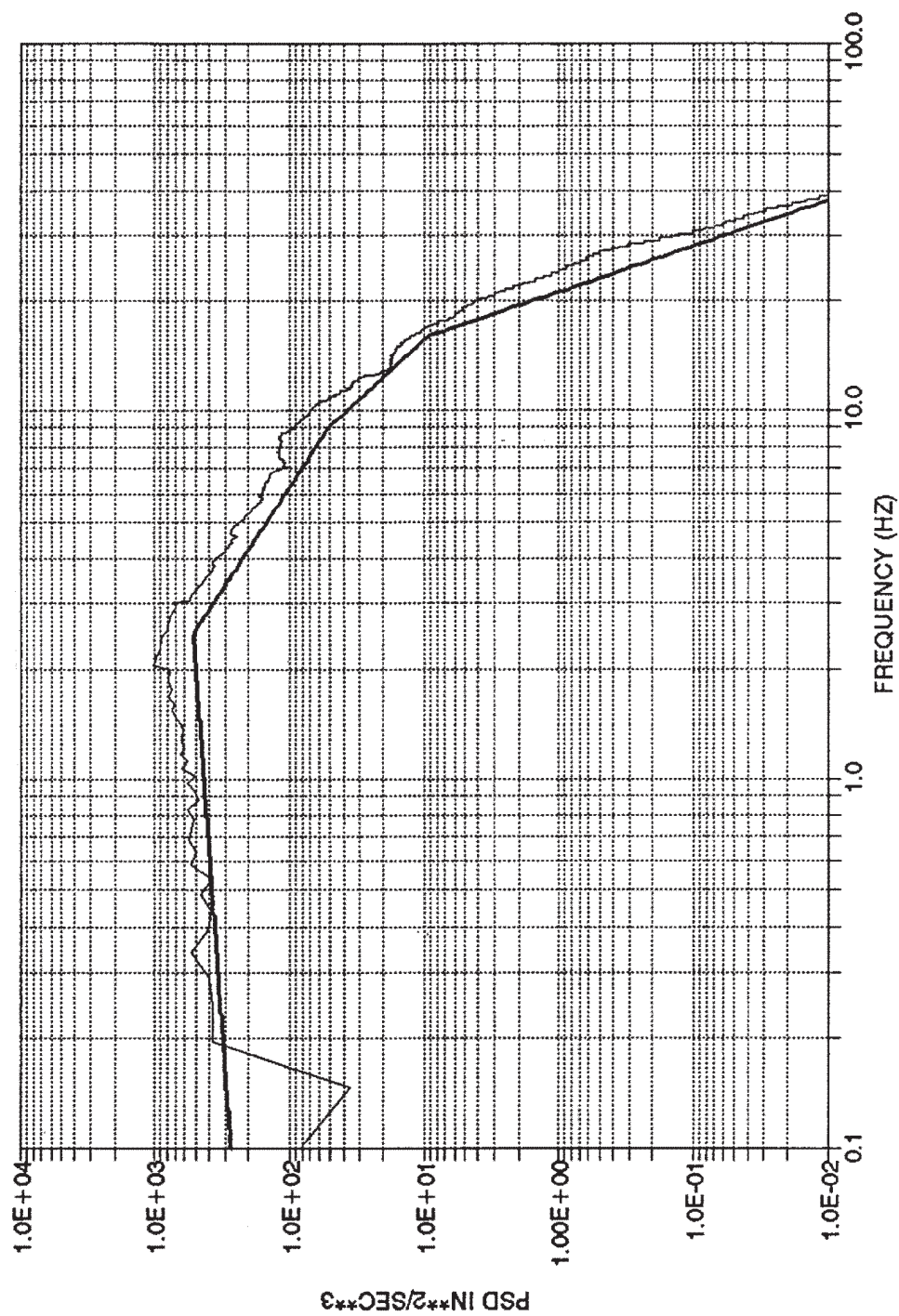


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COMANCHE PEAK S E S
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UNITS 1 AND 2

FUEL BUILDING RE-ANALYSIS
VERTICAL ARTIFICIAL
ACCELERATION TIME HISTORY

FIGURE 3.7B-19A

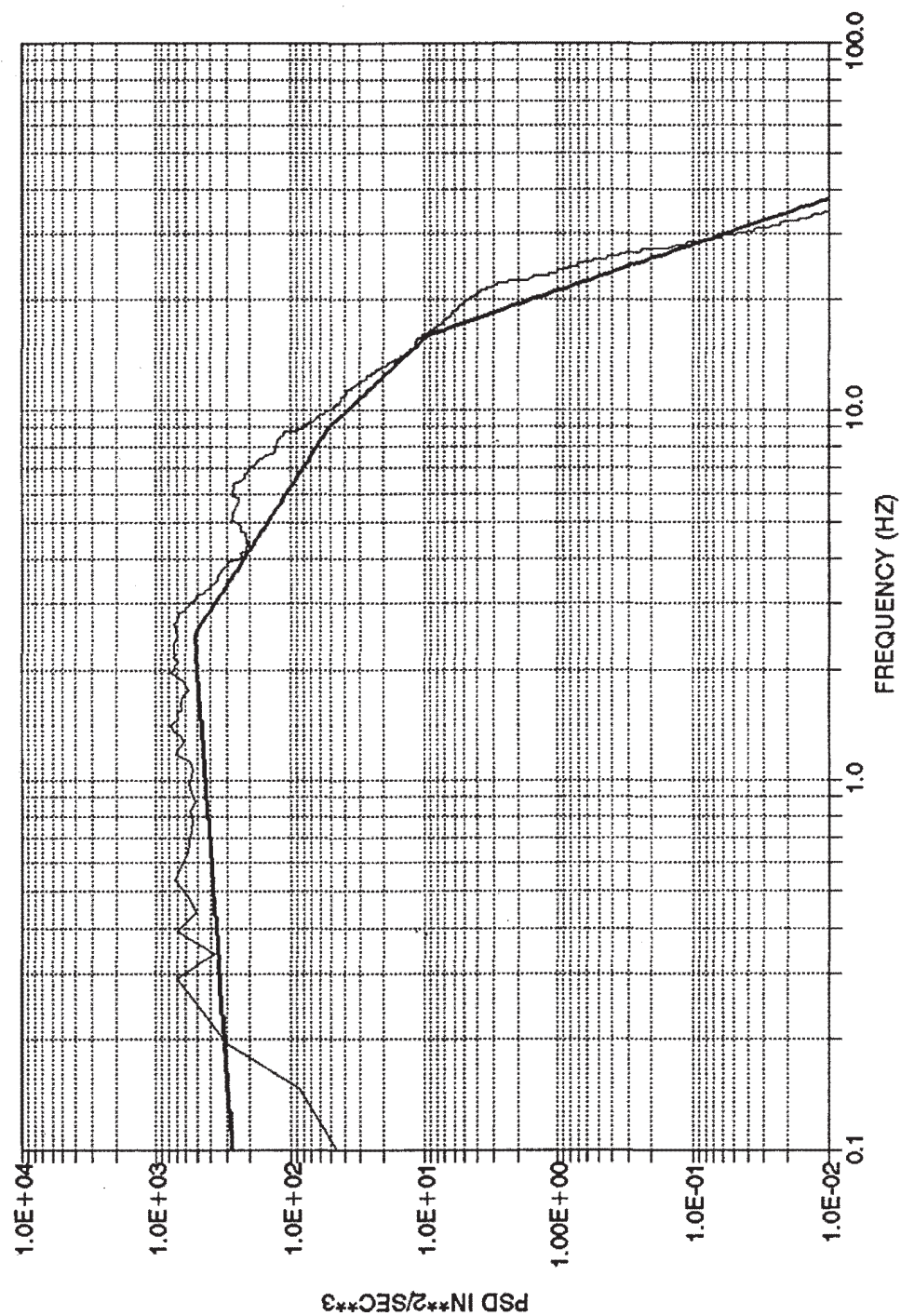


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COMANCHE PEAK S E S
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FUEL BUILDING RE-ANALYSIS
EAST-WEST
POWER SPECTRAL DENSITY

FIGURE 3.7B-20



Amendment 98

COMANCHE PEAK S E S
FINAL SAFETY ANALYSIS REPORT
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FUEL BUILDING RE-ANALYSIS
NORTH-SOUTH
POWER SPECTRAL DENSITY

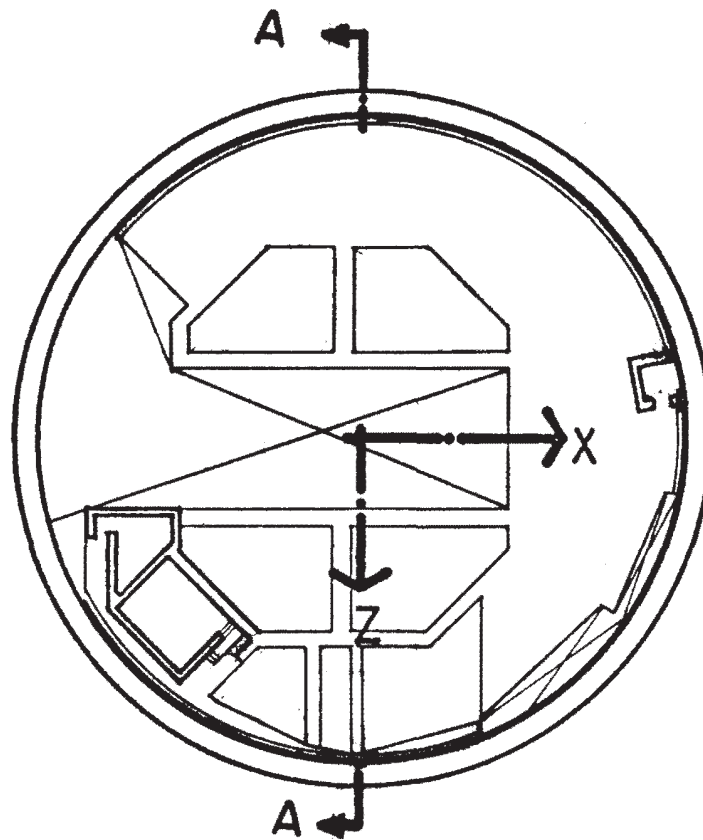
FIGURE 3.7B-21

INTENTIONALLY BLANK

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COMANCHE PEAK S.E.S
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

FIGURE 3.7B-22



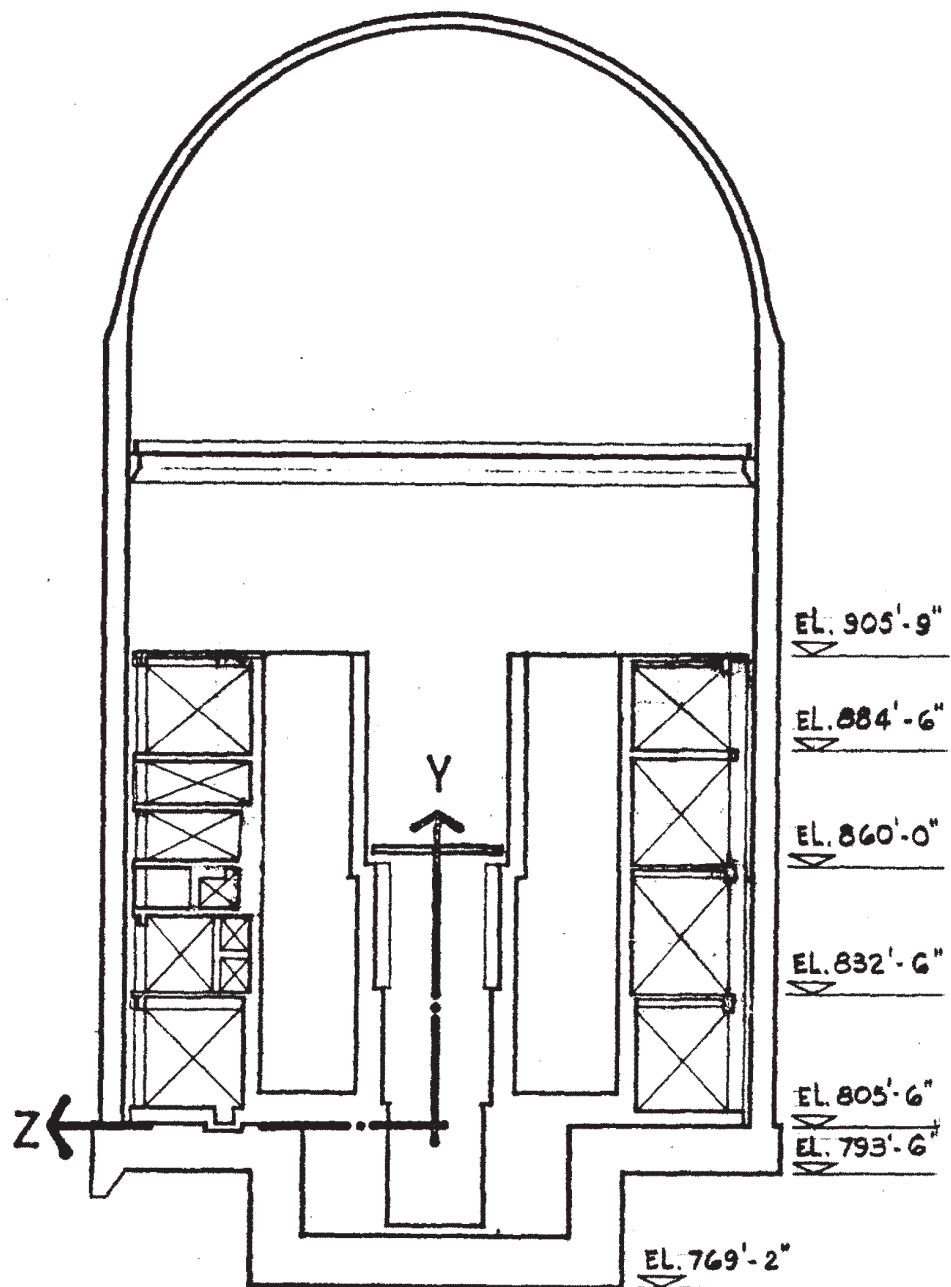
PLAN EL. 905'-9"

NOTE: ORIGIN OF COORDINATES IS AT EL. 805'-6"

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

PLAN VIEW
CONTAINMENT & INTERNAL
STRUCTURES

FIGURE 3.7B-23

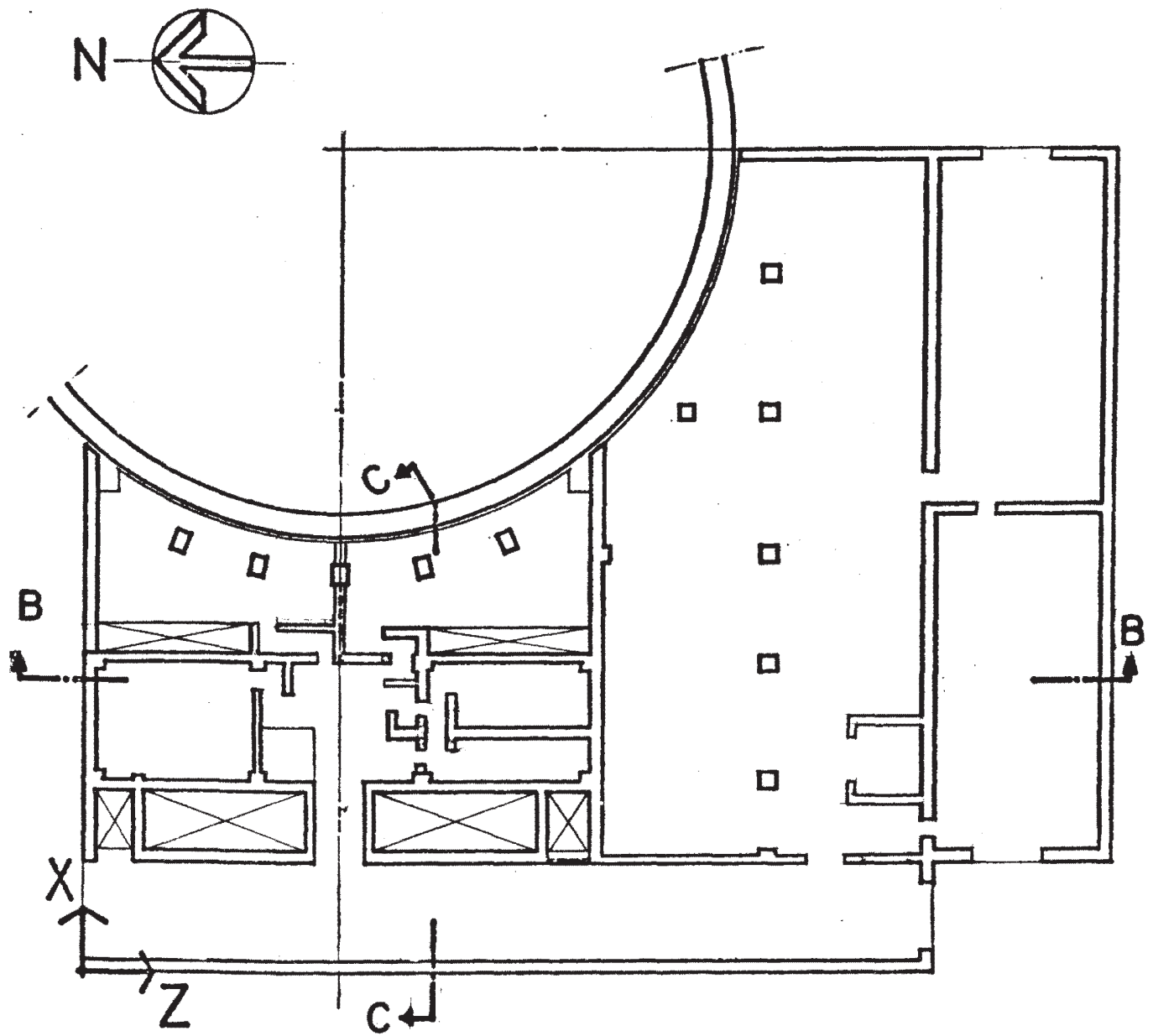


SECTION A-A

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

ELEVATION VIEW
CONTAINMENT & INTERNAL
STRUCTURES

FIGURE 3.7B-24



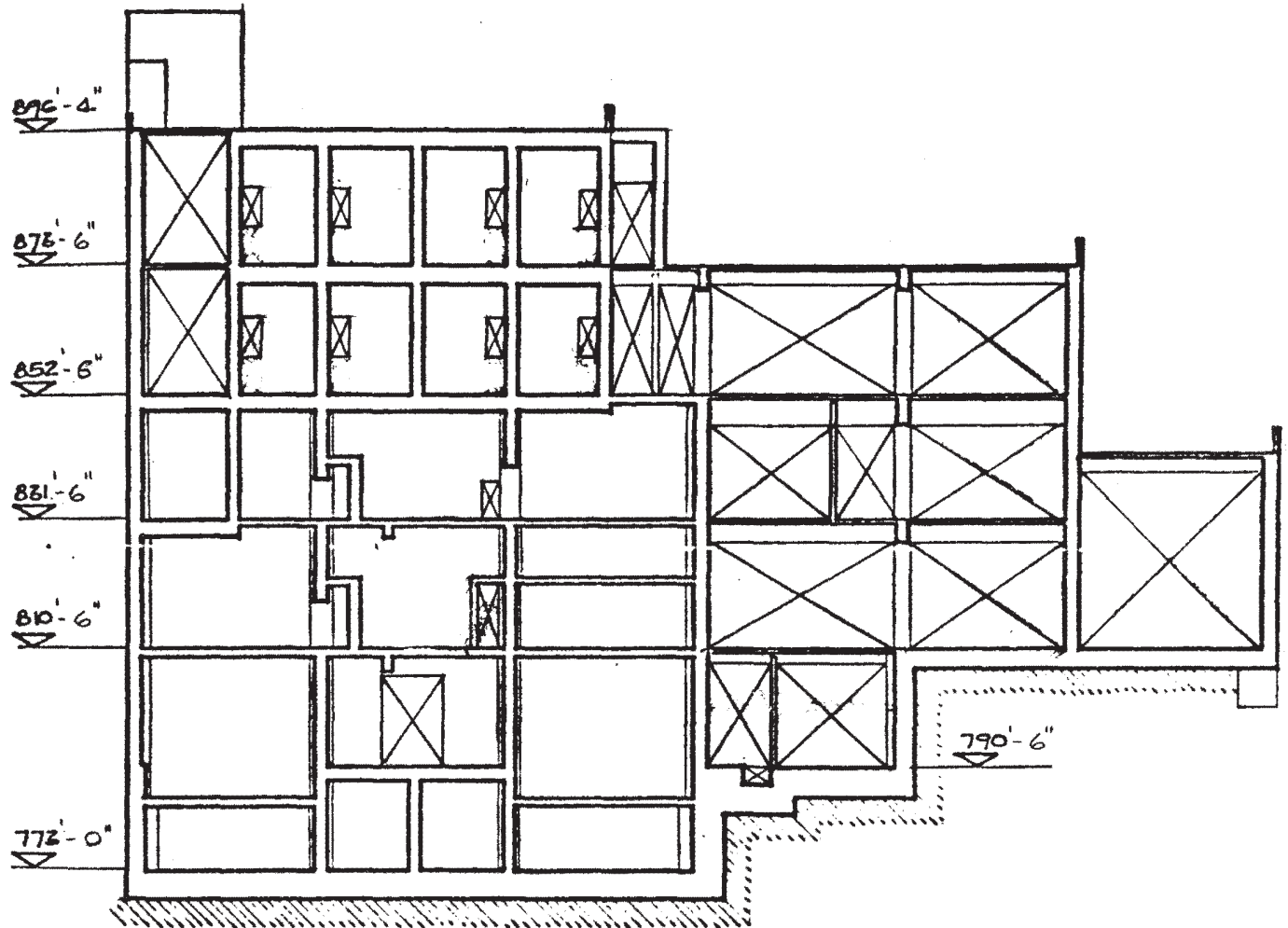
PLAN EL. 810' - 6"

NOTE: ORIGIN OF COORDINATES IS AT EL. 0.00'

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

PLAN VIEW
SAFEGUARDS BUILDING

FIGURE 3.7B-25

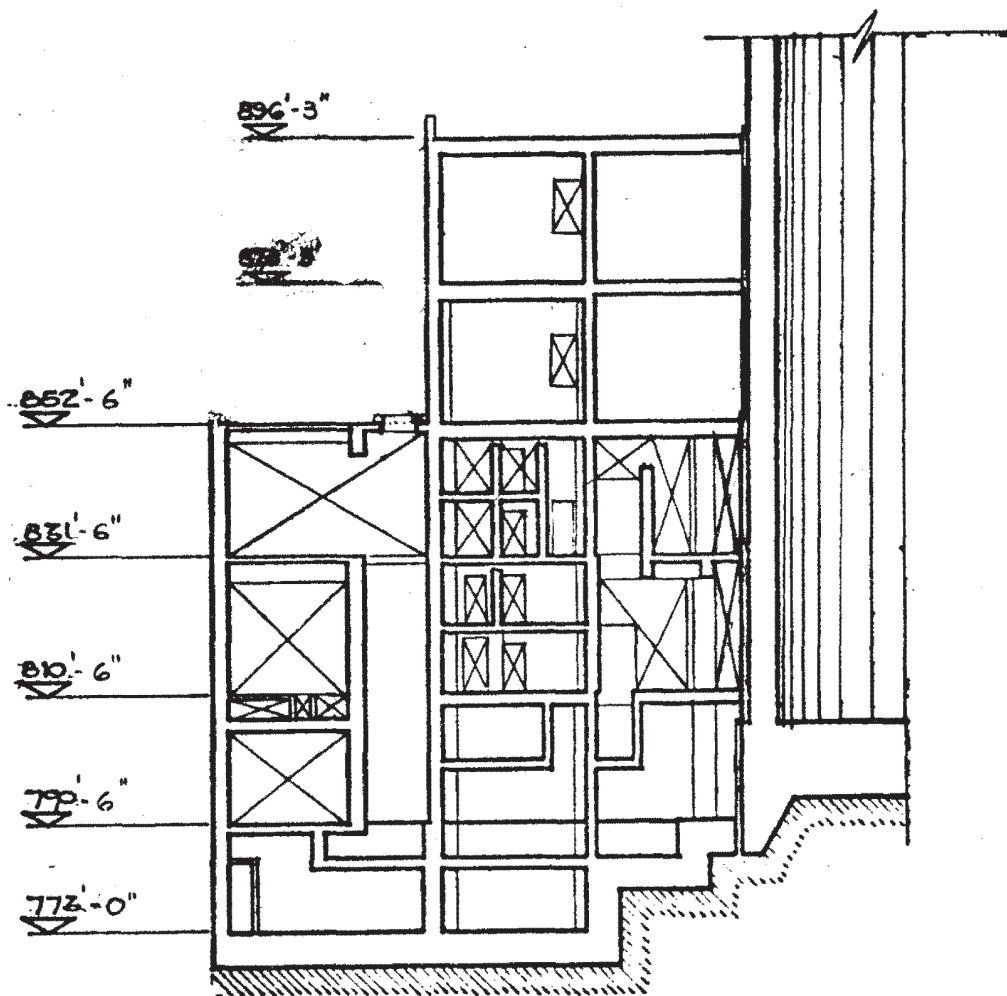


SECTION B-B

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

ELEVATION VIEW (1)
SAFEGUARDS BUILDING

FIGURE 3.7B-26

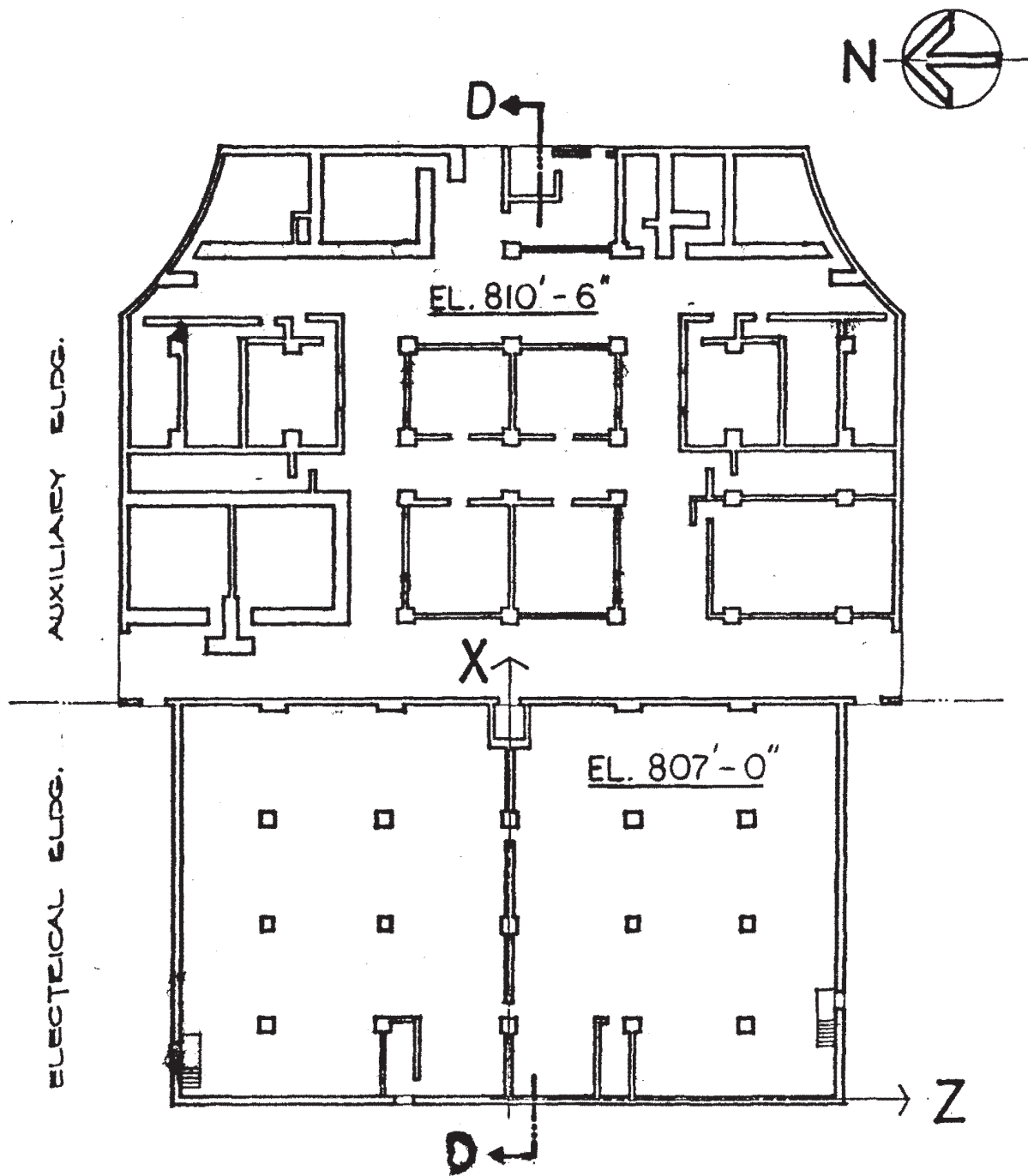


SECTION C-C

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

ELEVATION VIEW (2)
SAFEGUARDS BUILDING

FIGURE 3.7B-27



PLAN EL. 810'-6" & 807'-0"

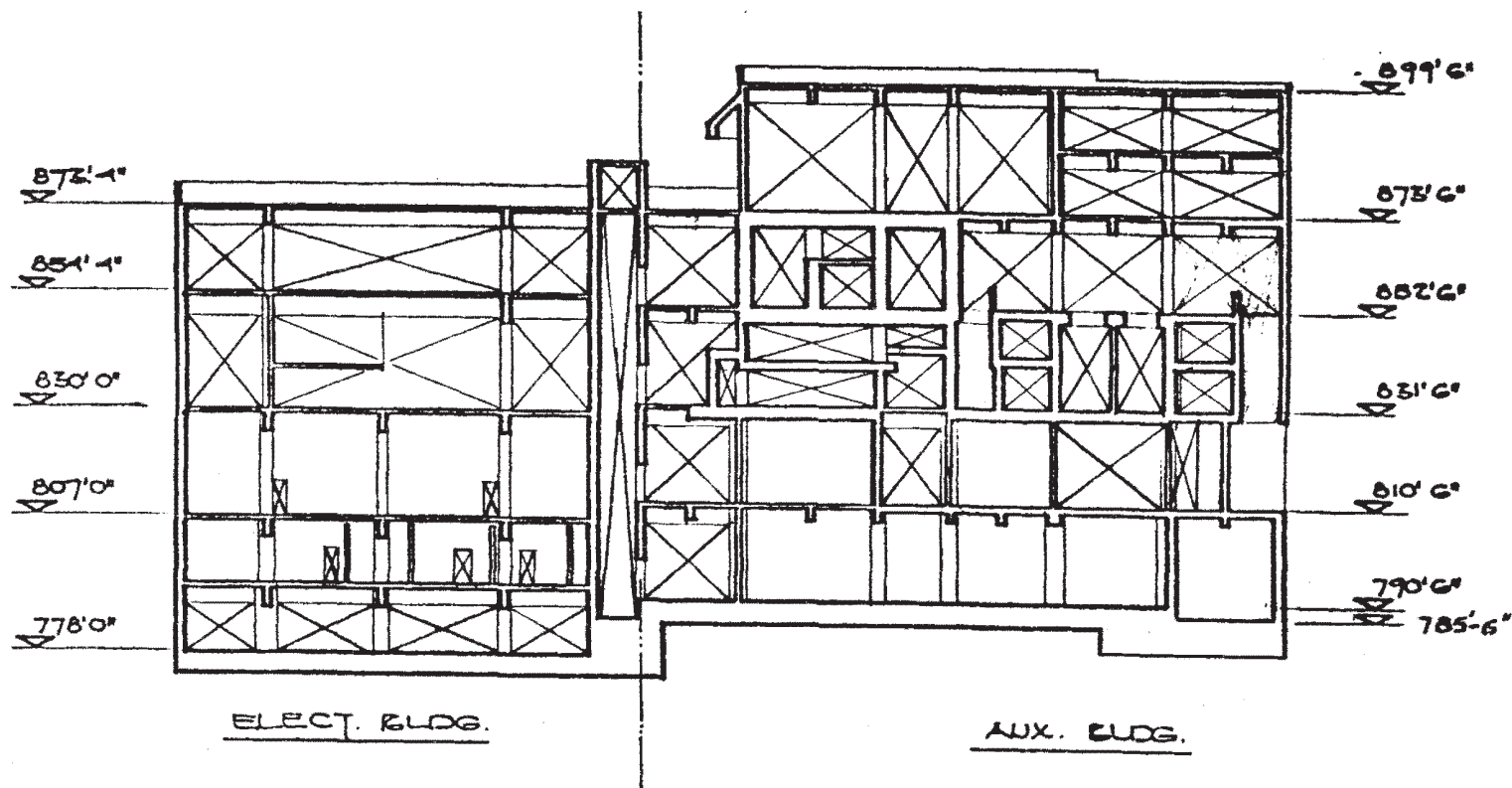
NOTE: ORIGIN OF COORDINATES IS

AT EL. 0.00

COMANCHE PEAK S.E.S.
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UNITS 1 and 2

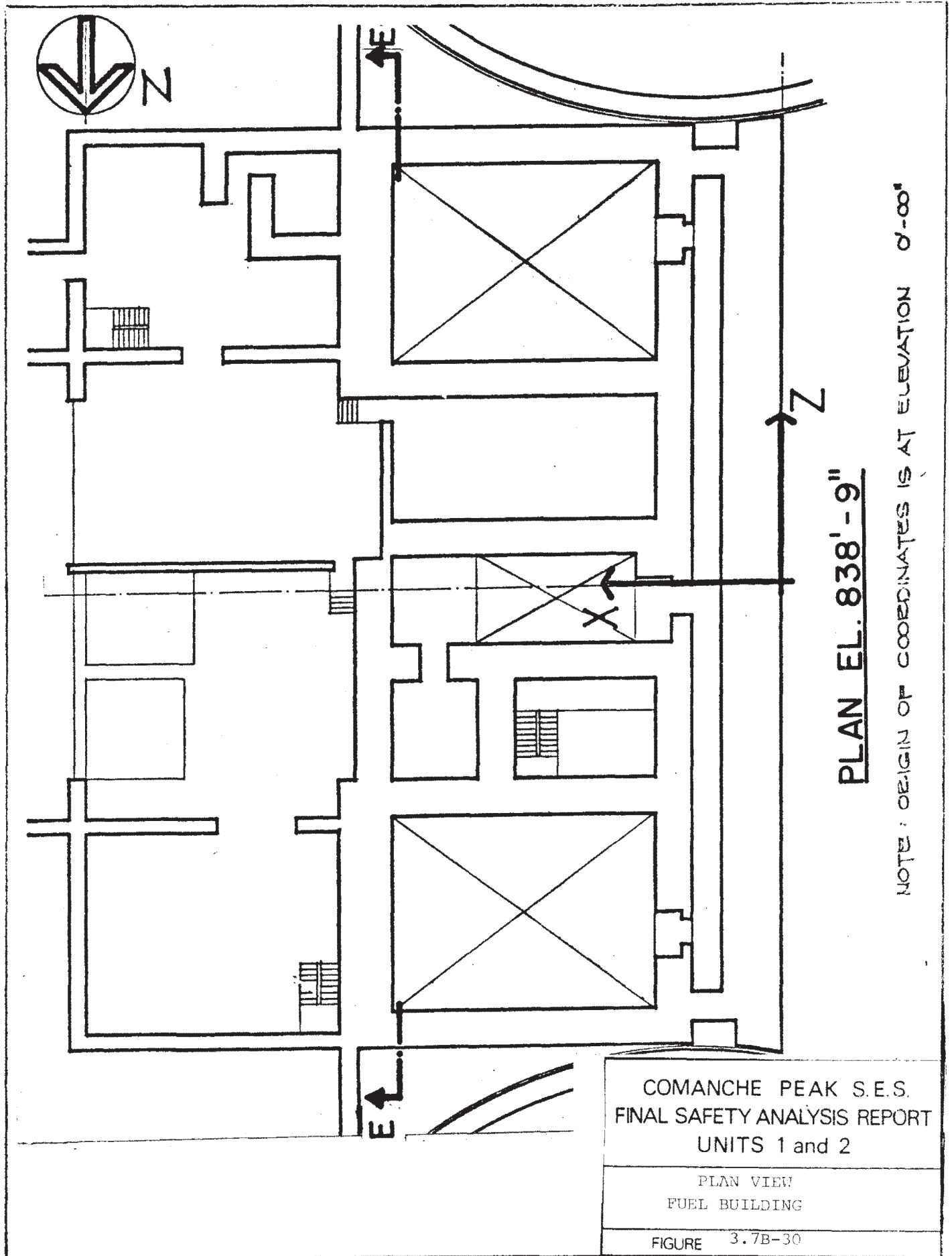
PLAN VIEW
ELECTRICAL & AUXILIARY
BUILDINGS

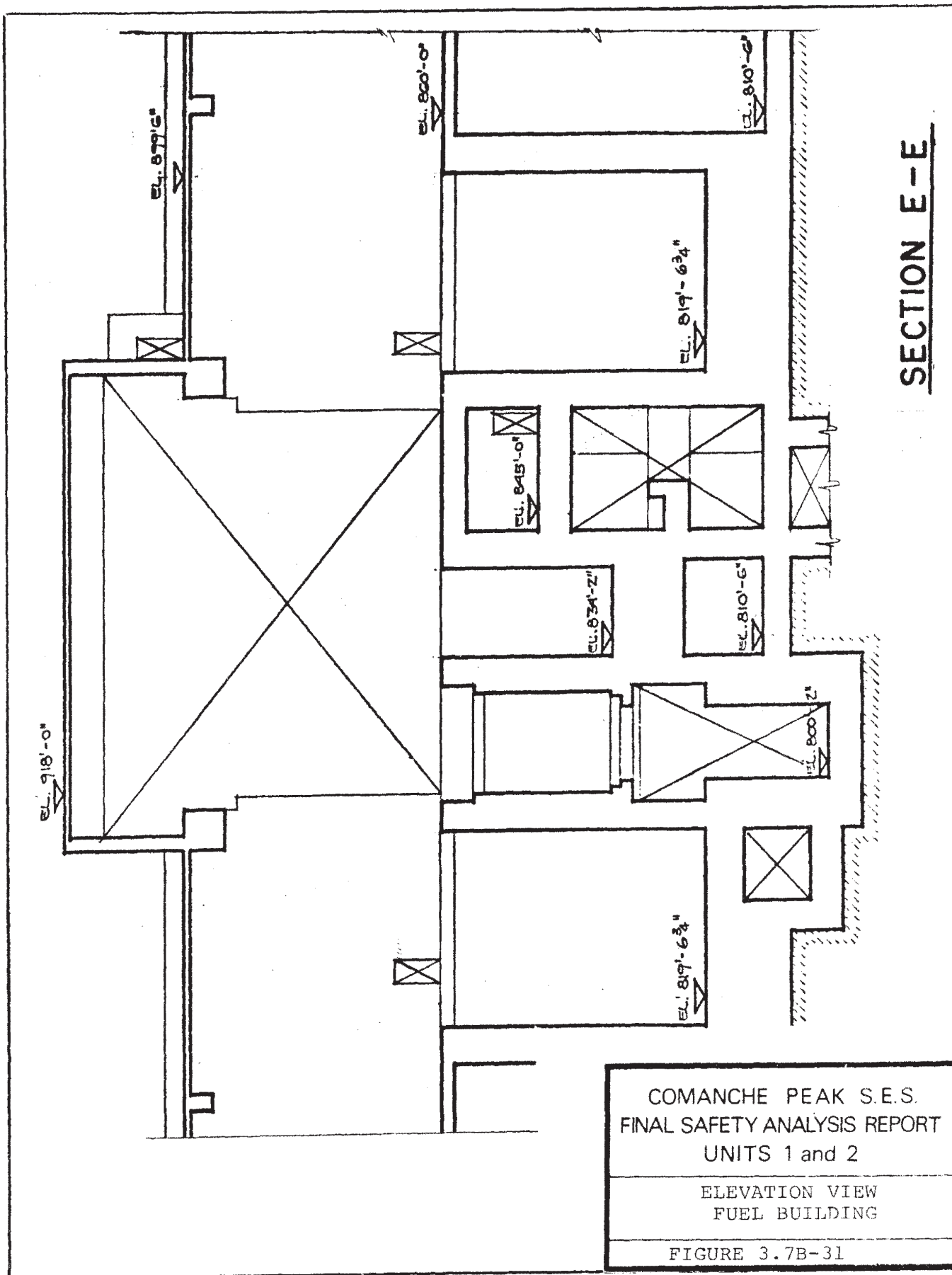
FIGURE 3.7B-28

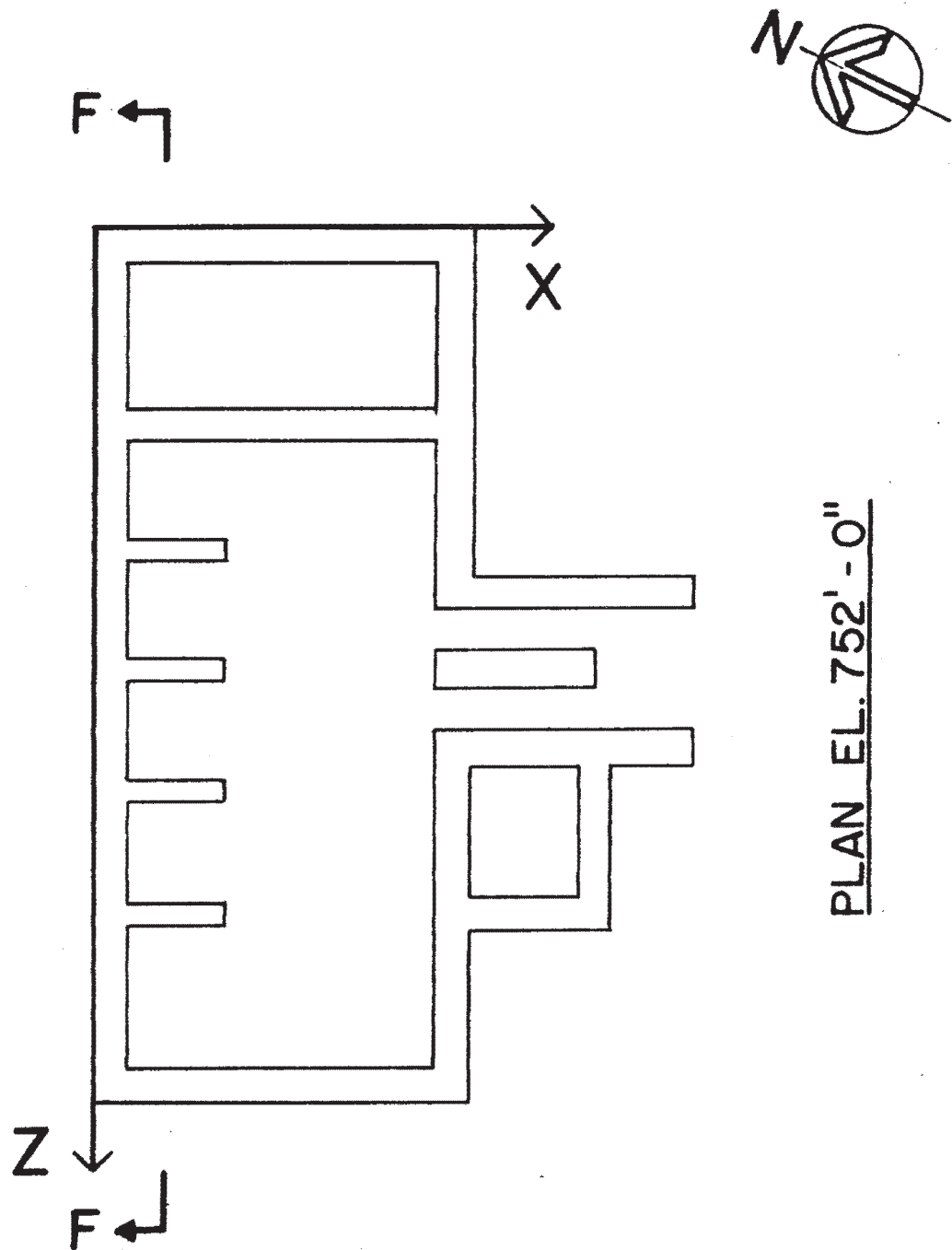


SECTION D-D

COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
ELEVATION VIEW ELECTRICAL & AUXILIARY BUILDINGS
FIGURE 3.7B-29



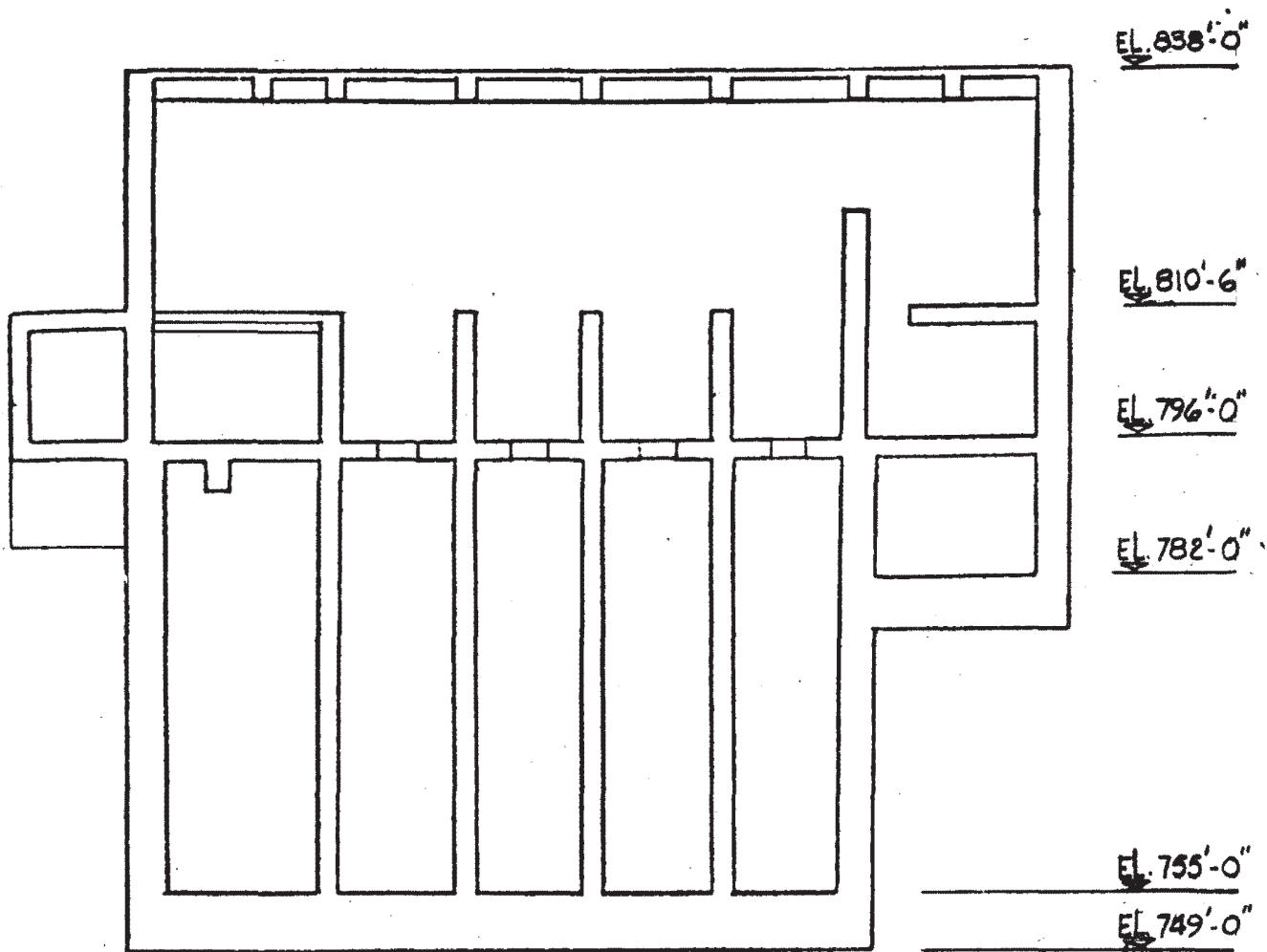




NOTE: ORIGIN OF COORDINATES IS AT EL. 752' - 0"

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

PLAN VIEW
SERVICE WATER
INTAKE STRUCTURE
FIGURE 3.7B-32

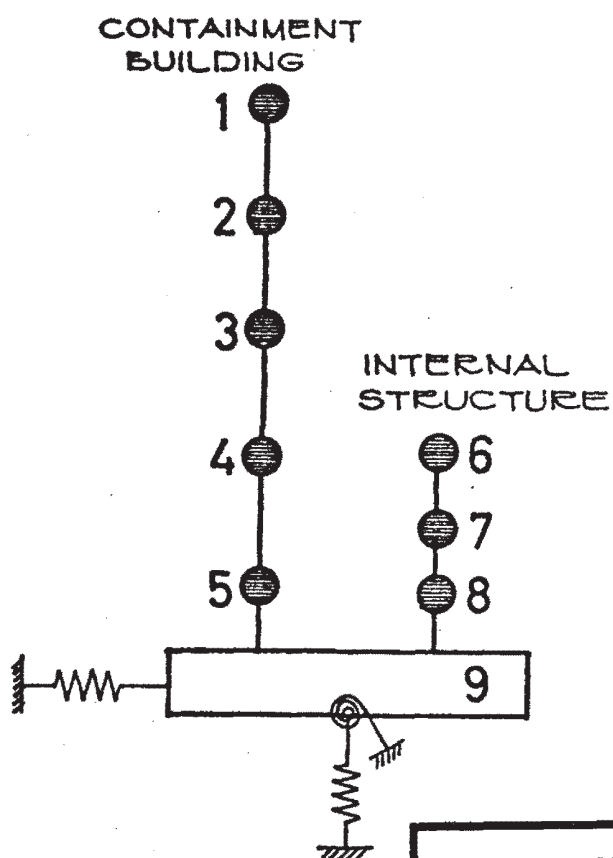
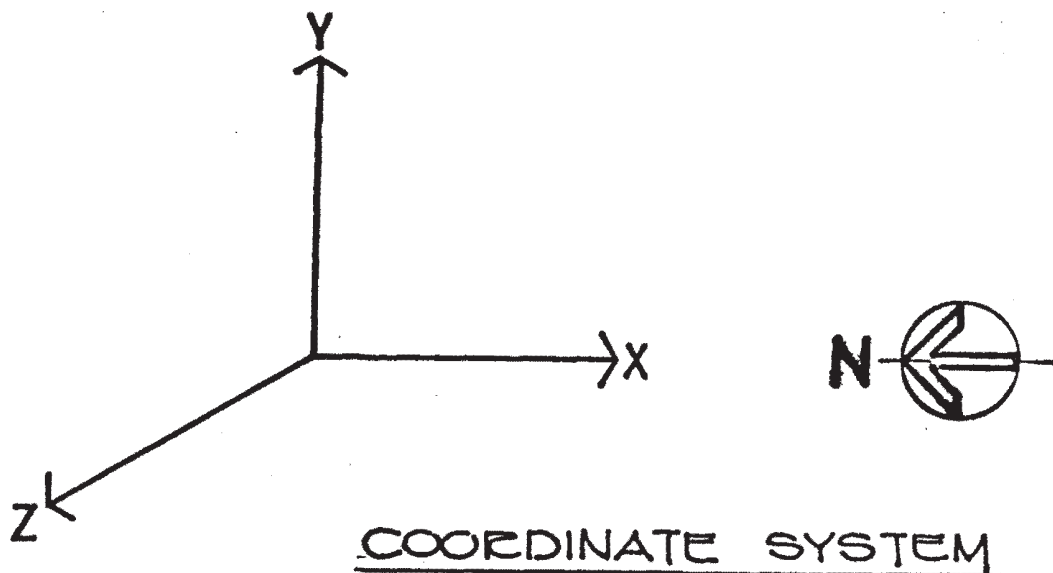


SECTION F-F

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

ELEVATION VIEW
SERVICE WATER
INTAKE STRUCTURE

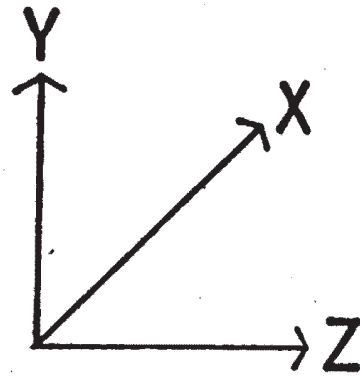
FIGURE 3.7B-33



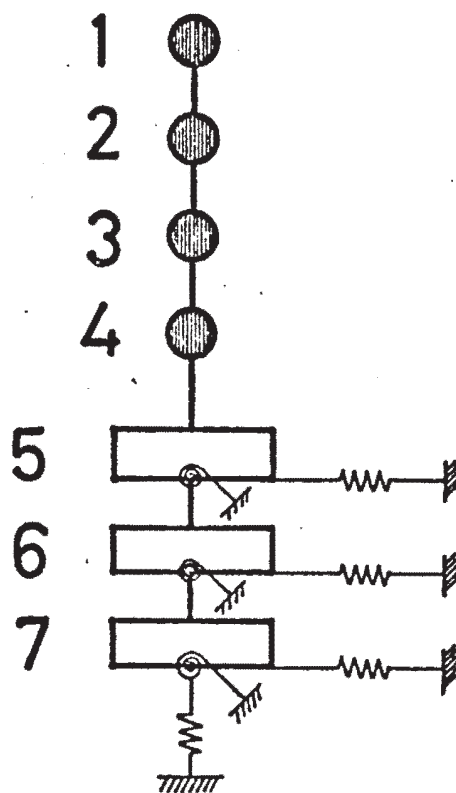
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

DYNAMIC MODEL
CONTAINMENT & INTERNAL
STRUCTURES

FIGURE 3.7B-34



COORDINATE SYSTEM

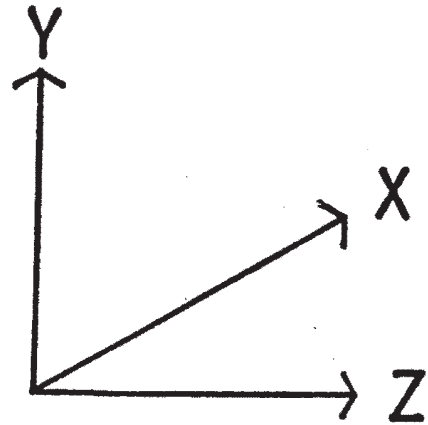


DYNAMIC MODEL

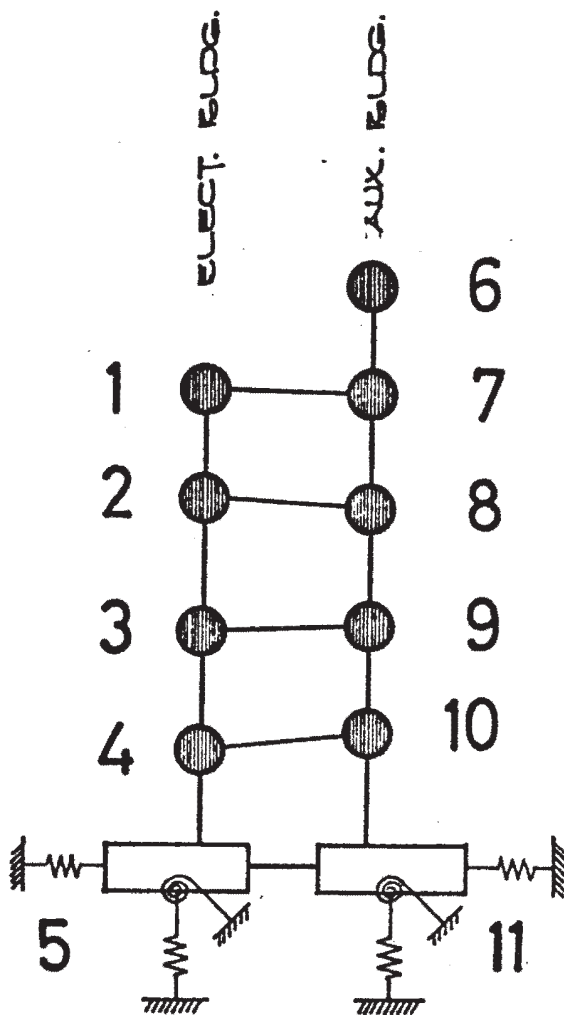
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

DYNAMIC MODEL
SAFEGUARDS BUILDING

FIGURE 3.7B-35



COORDINATE SYSTEM

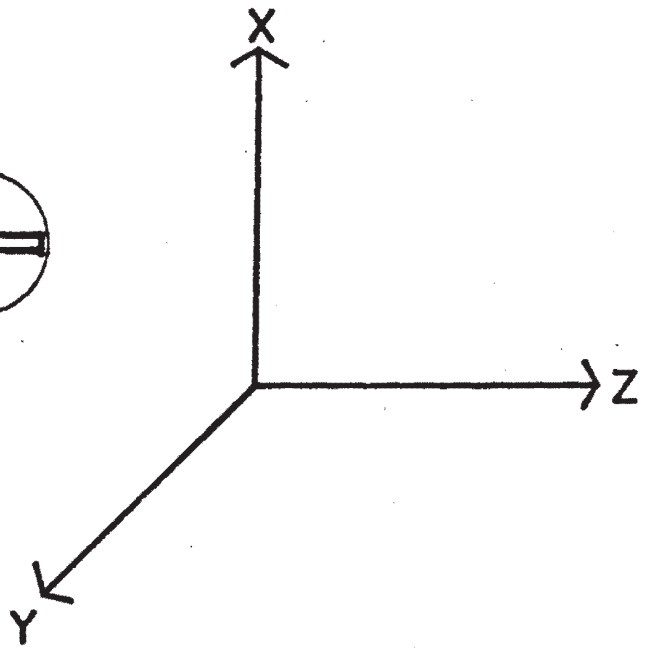


DYNAMIC MODEL

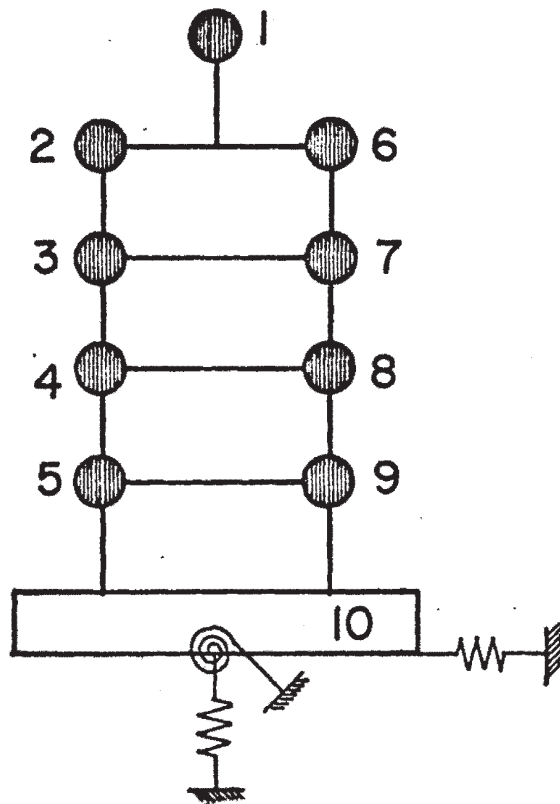
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

DYNAMIC MODEL
ELECTRICAL & AUXILIARY
BUILDINGS

FIGURE 3.7B-36



COORDINATE SYSTEM

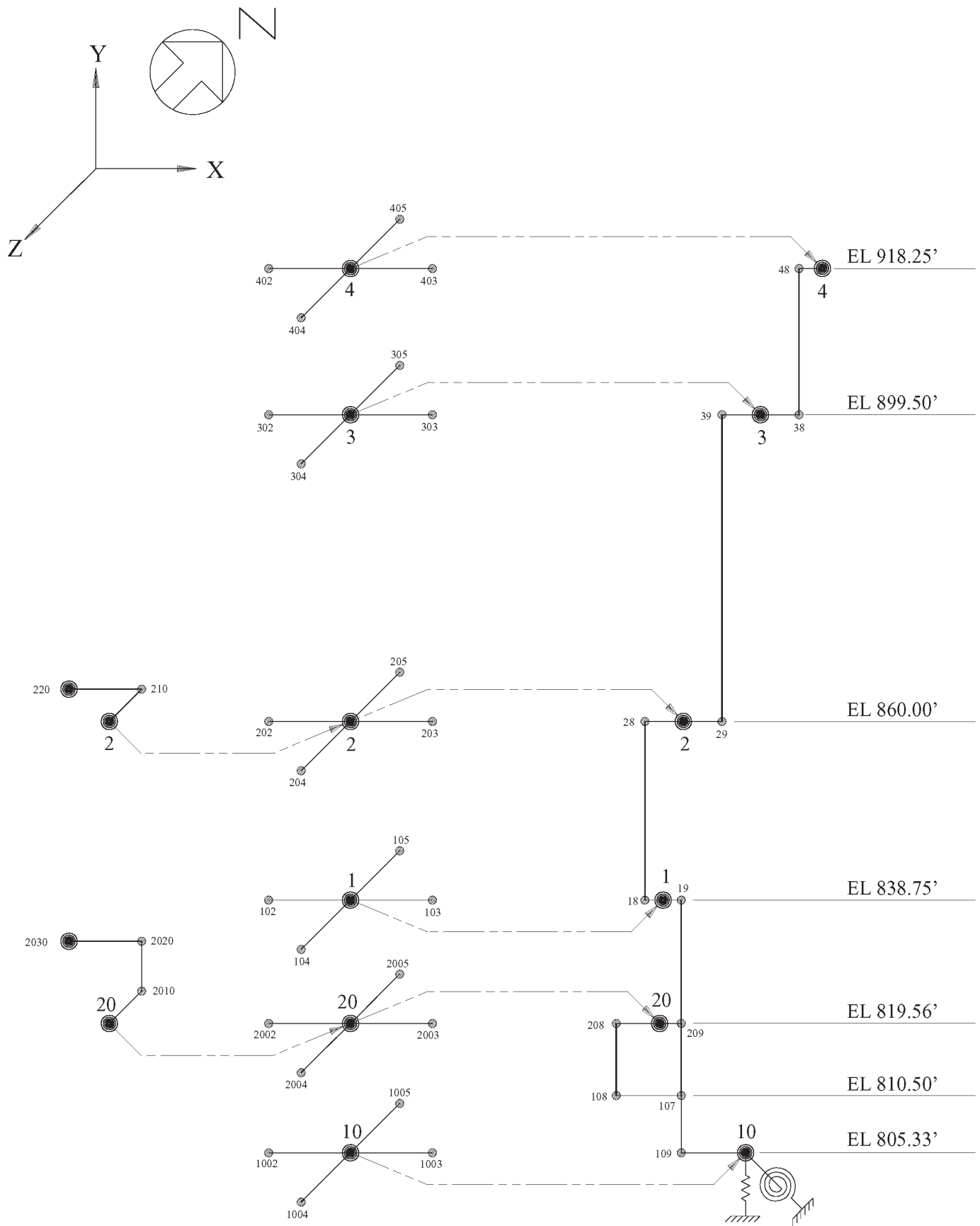


DYNAMIC MODEL

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

DYNAMIC MODEL
FUEL BUILDING

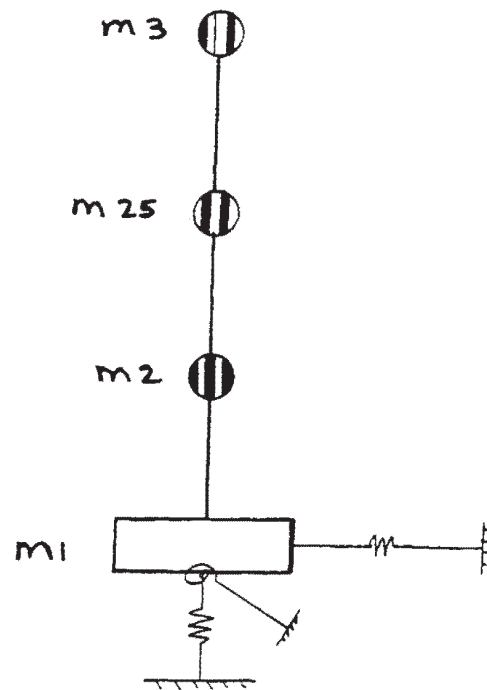
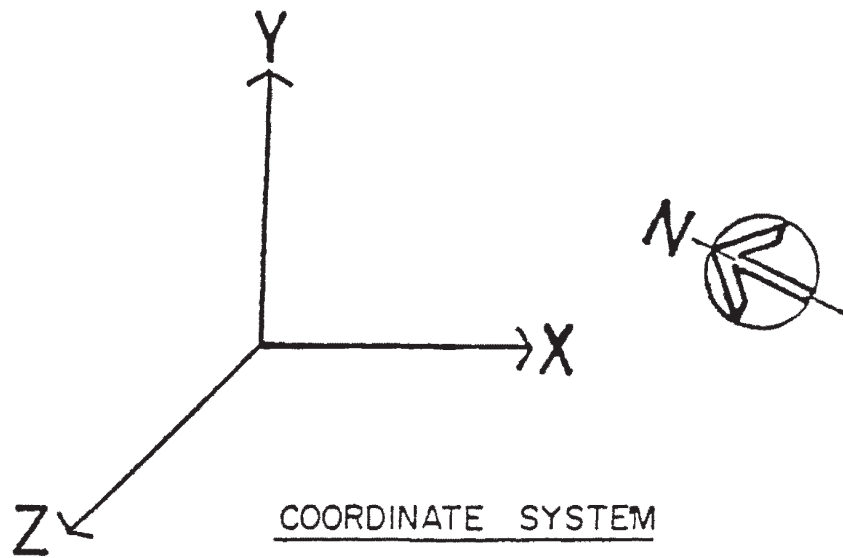
FIGURE 3.7B-37



COMANCHE PEAK S E S
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2

DYNAMIC MODEL
FUEL BUILDING RE-ANALYSIS

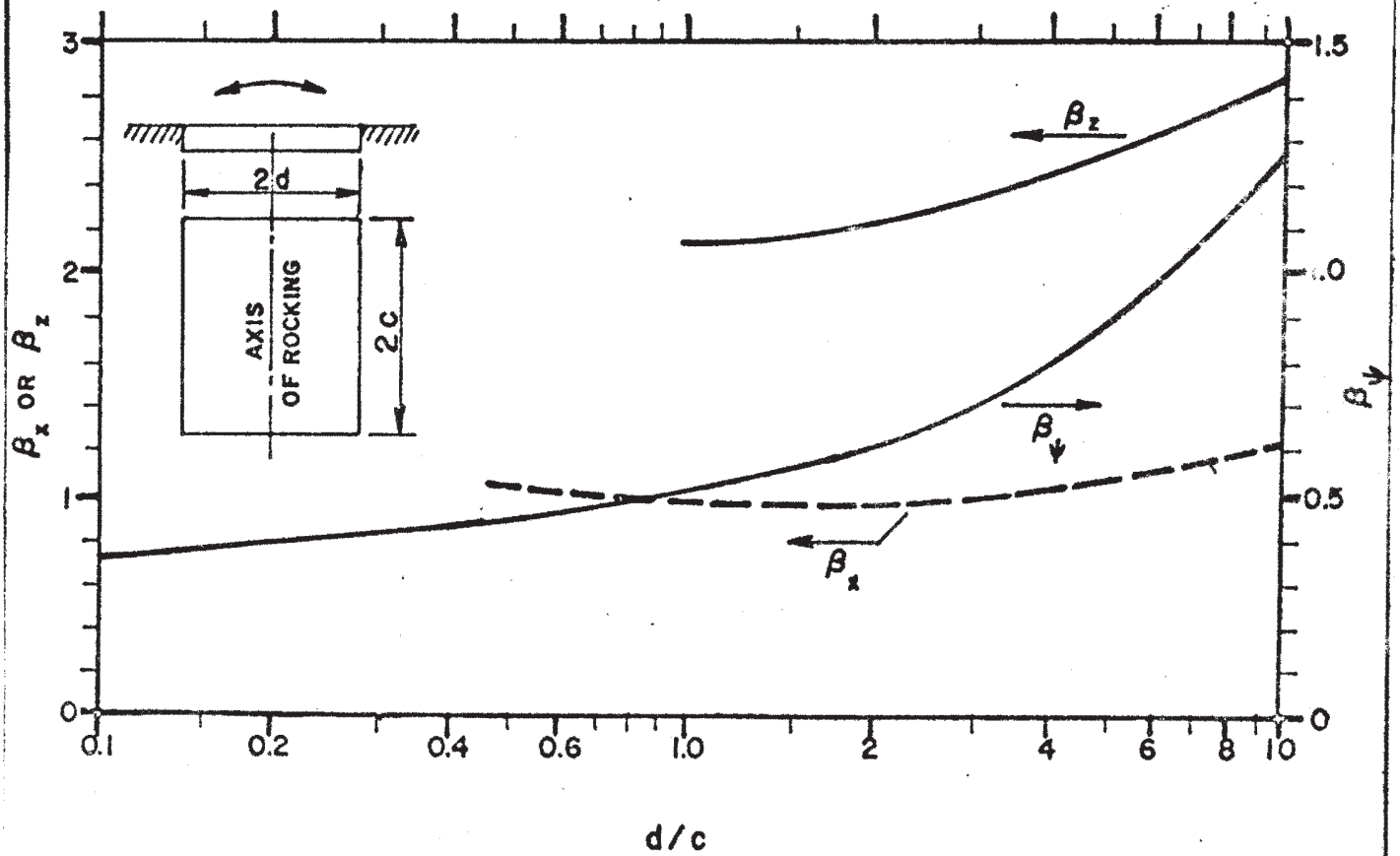
FIGURE 3.7B-37A



DYNAMIC MODEL

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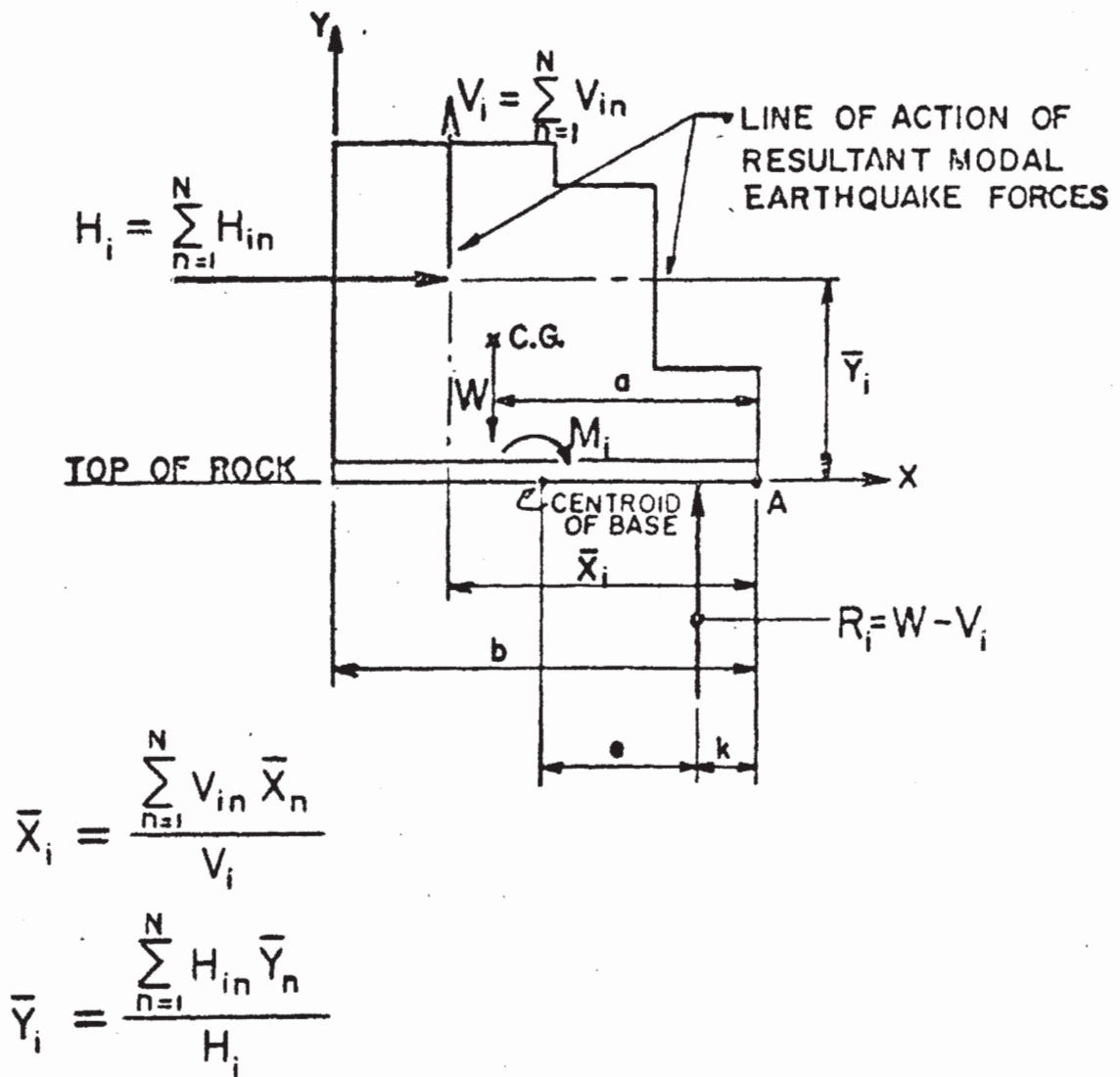
COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
DYNAMIC MODEL SERVICE WATER INTAKE STRUCTURE
FIGURE 3.7B-38



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

COEFFICIENTS β_x , β_z AND
 β_ψ FOR RECTANGULAR FOOT-
INGS

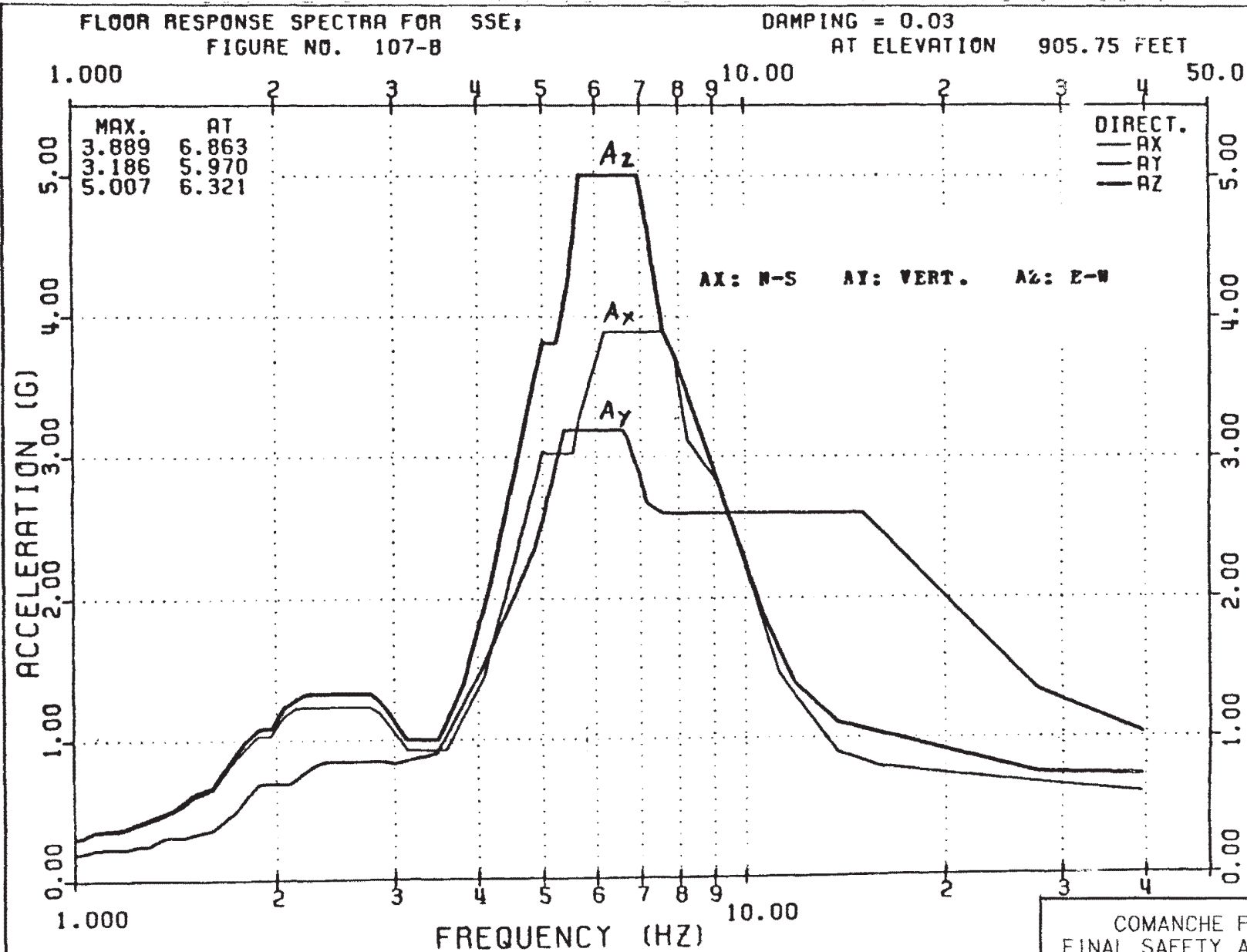
FIGURE 3.7B-39



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

DETERMINATION OF
OVERTURNING MOVEMENT

FIGURE 3.7B-40



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2

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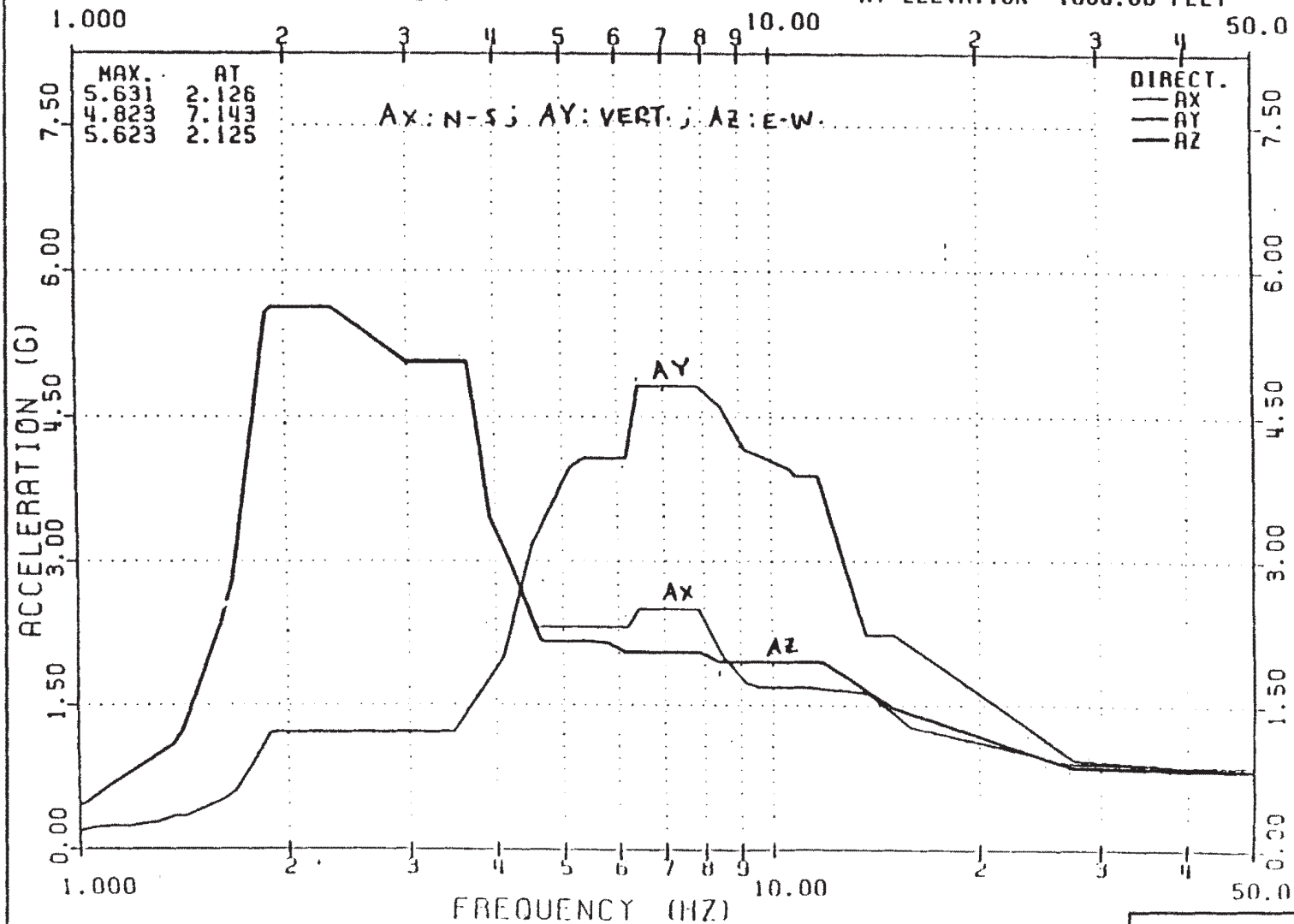
R.B. INTERNAL STR.
REFINED RESPONSE SPECTRA

FIGURE: 3.7B-41

DS1589020.DGN

FLOOR RESPONSE SPECTRA FOR SSE;
FIGURE NO. 3062-B

DAMPING = 0.030
AT ELEVATION 1068.00 FEET

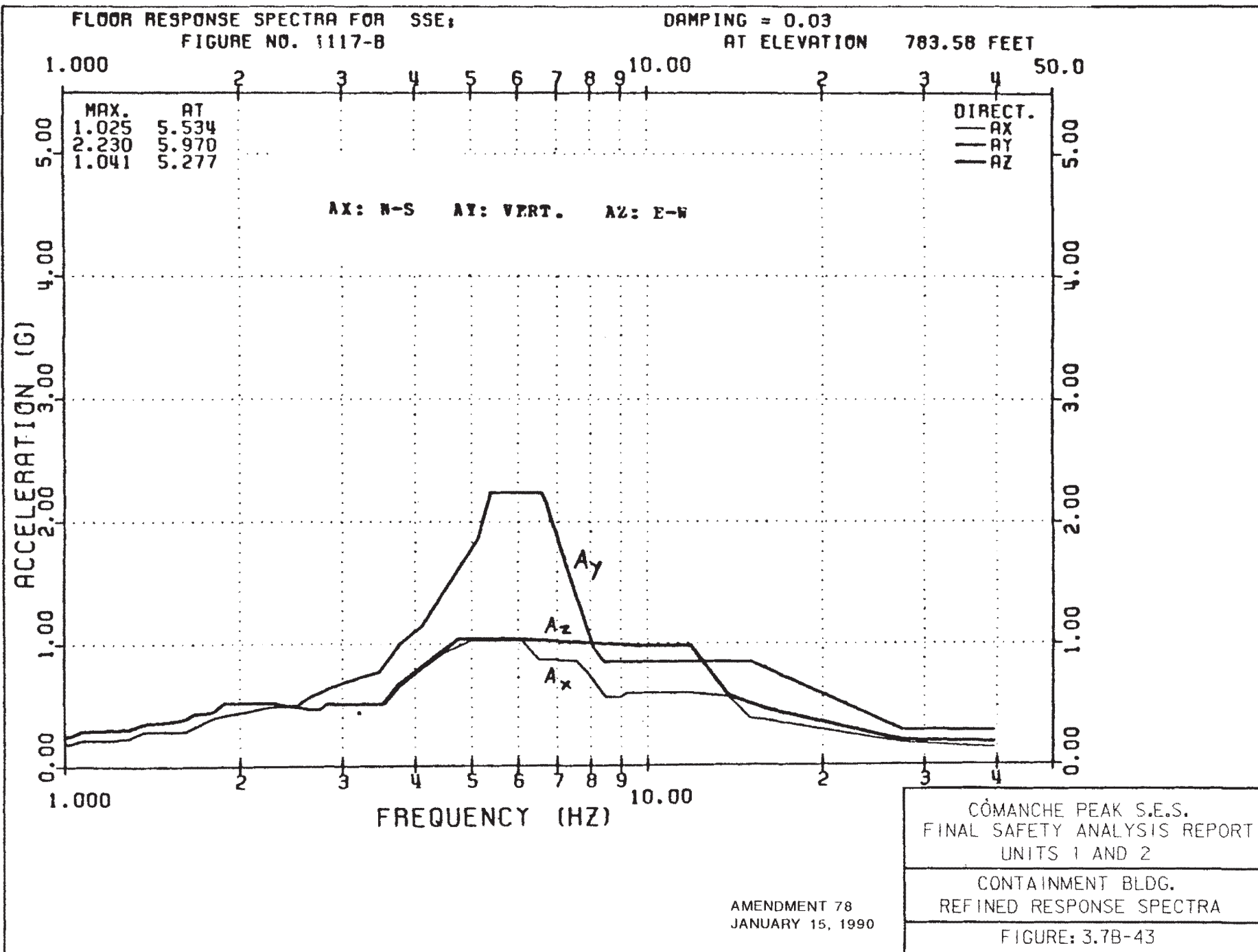


COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2

CONTAINMENT BLDG.
REFINED RESPONSE SPECTRA

FIGURE: 3.7B-42

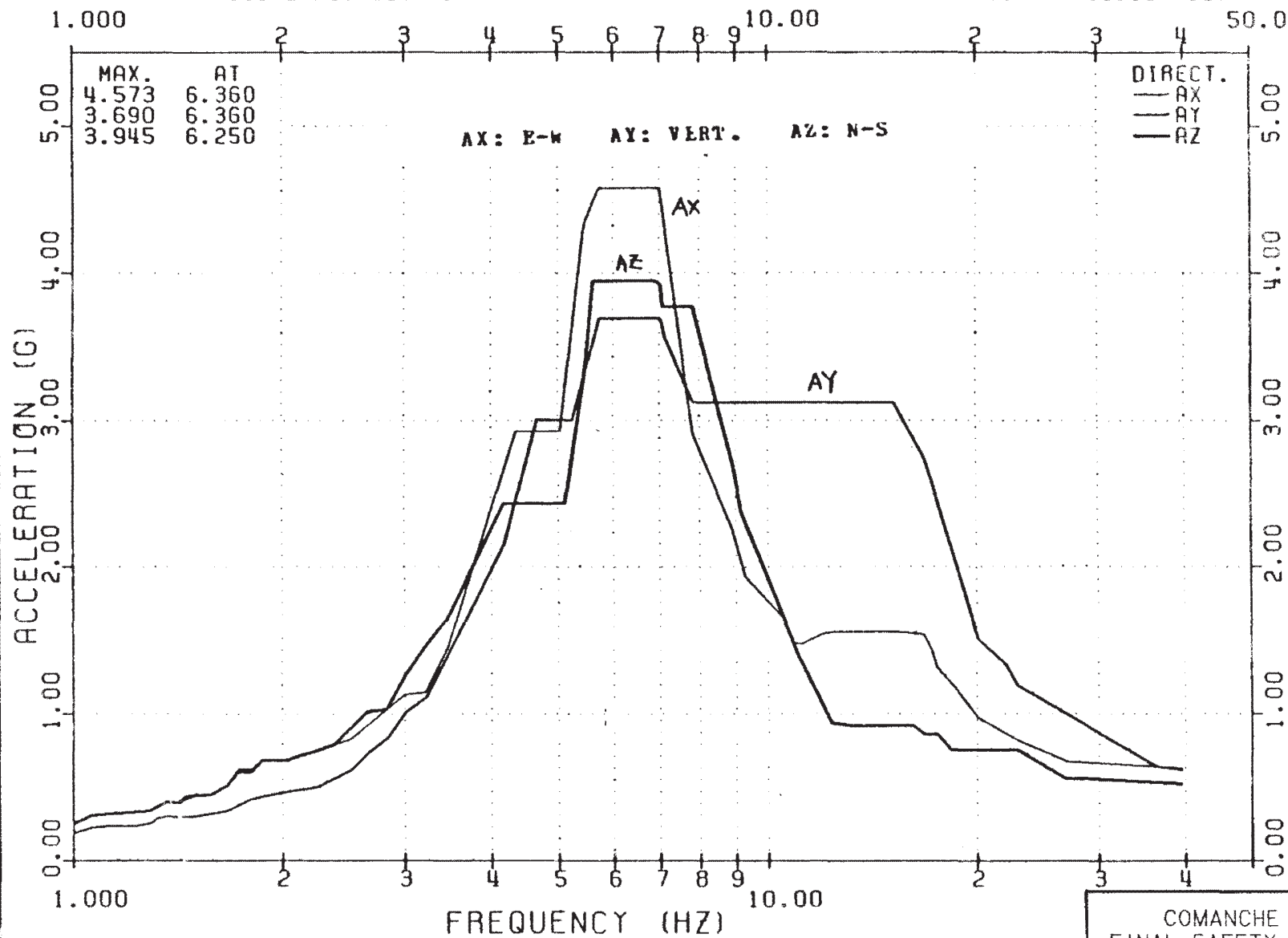
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FLOOR RESPONSE SPECTRA FOR SSE;
FIGURE NO. 1302-B

DAMPING = 0.03

AT ELEVATION 899.50 FEET

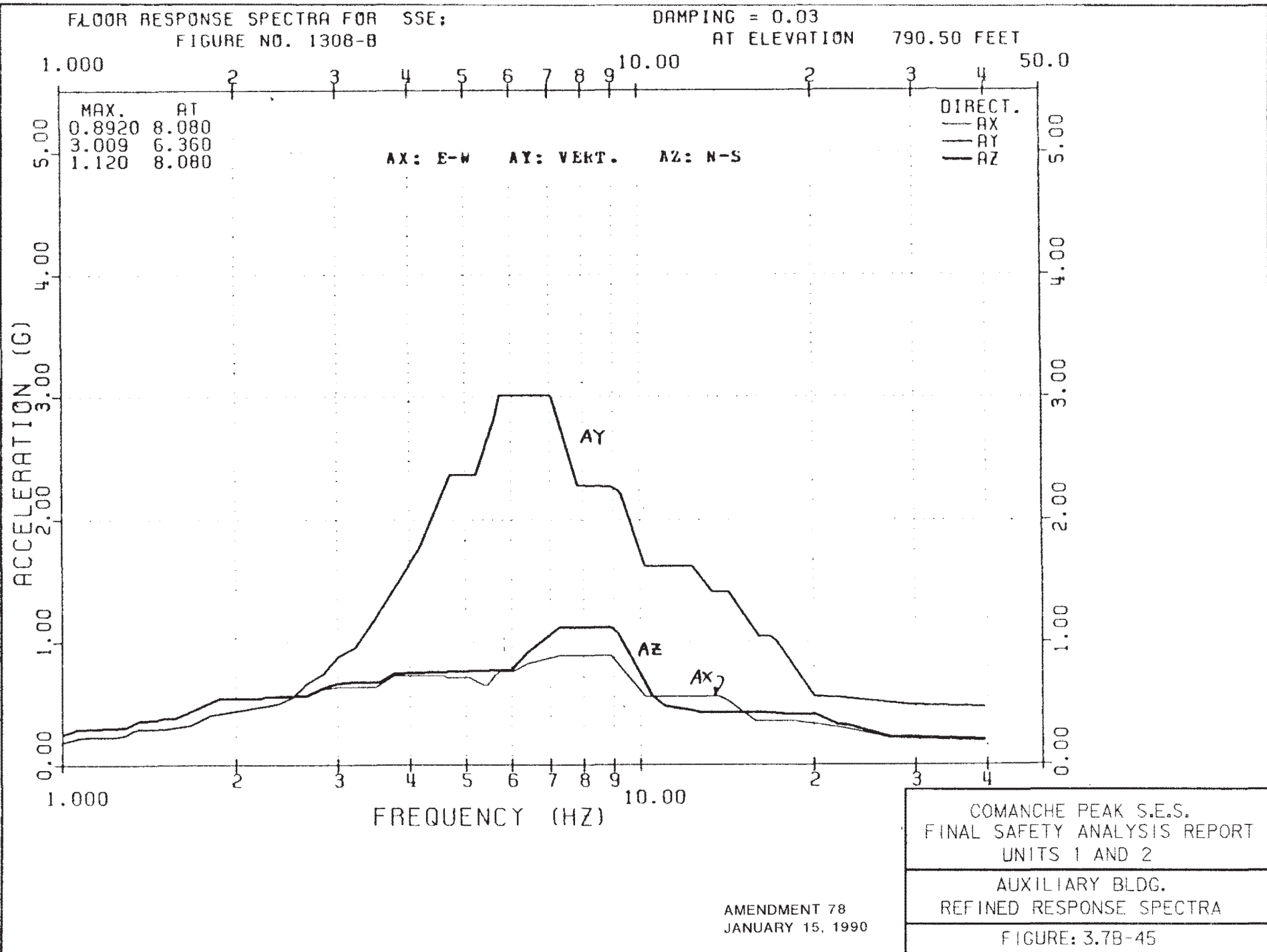


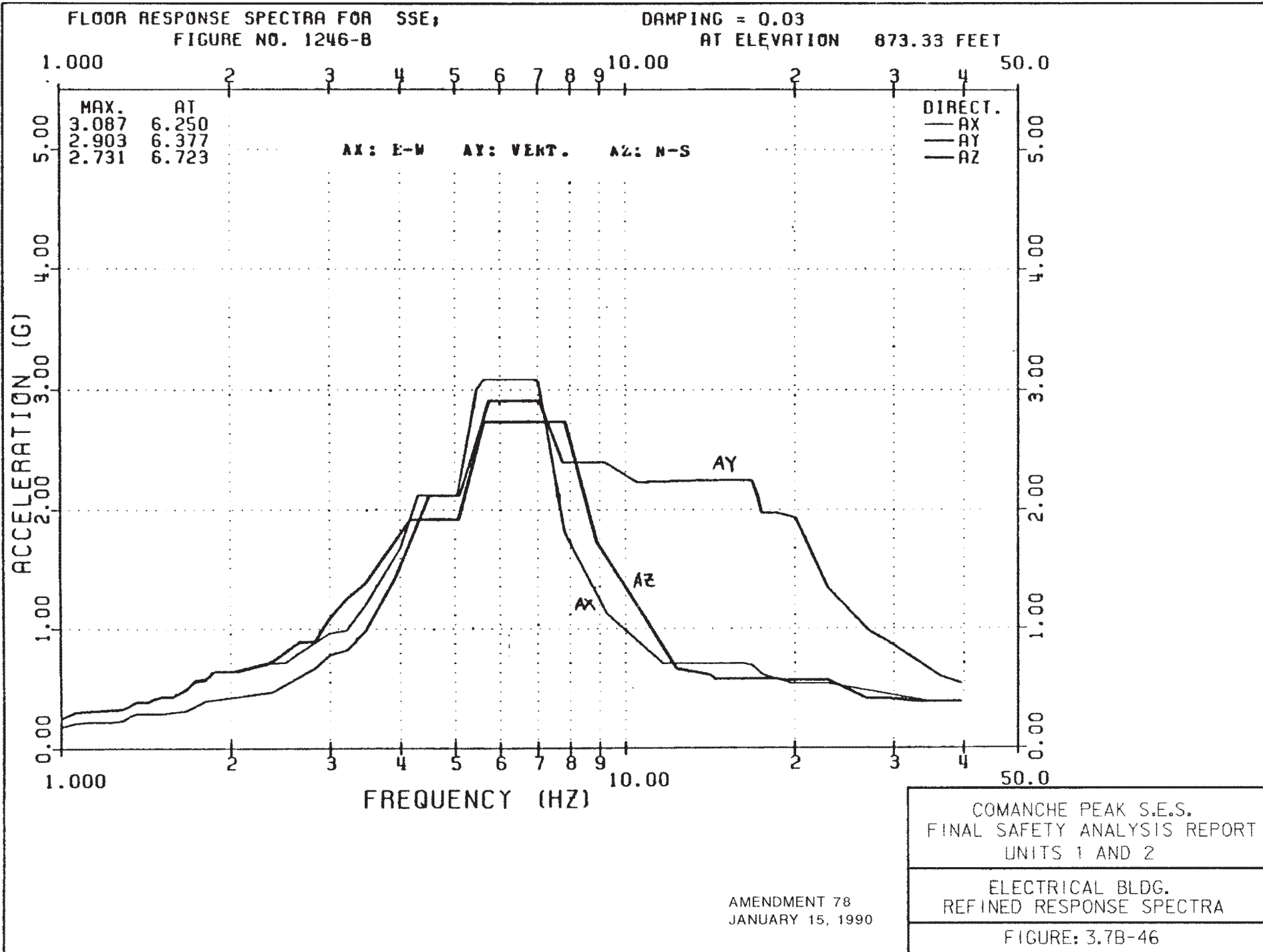
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2

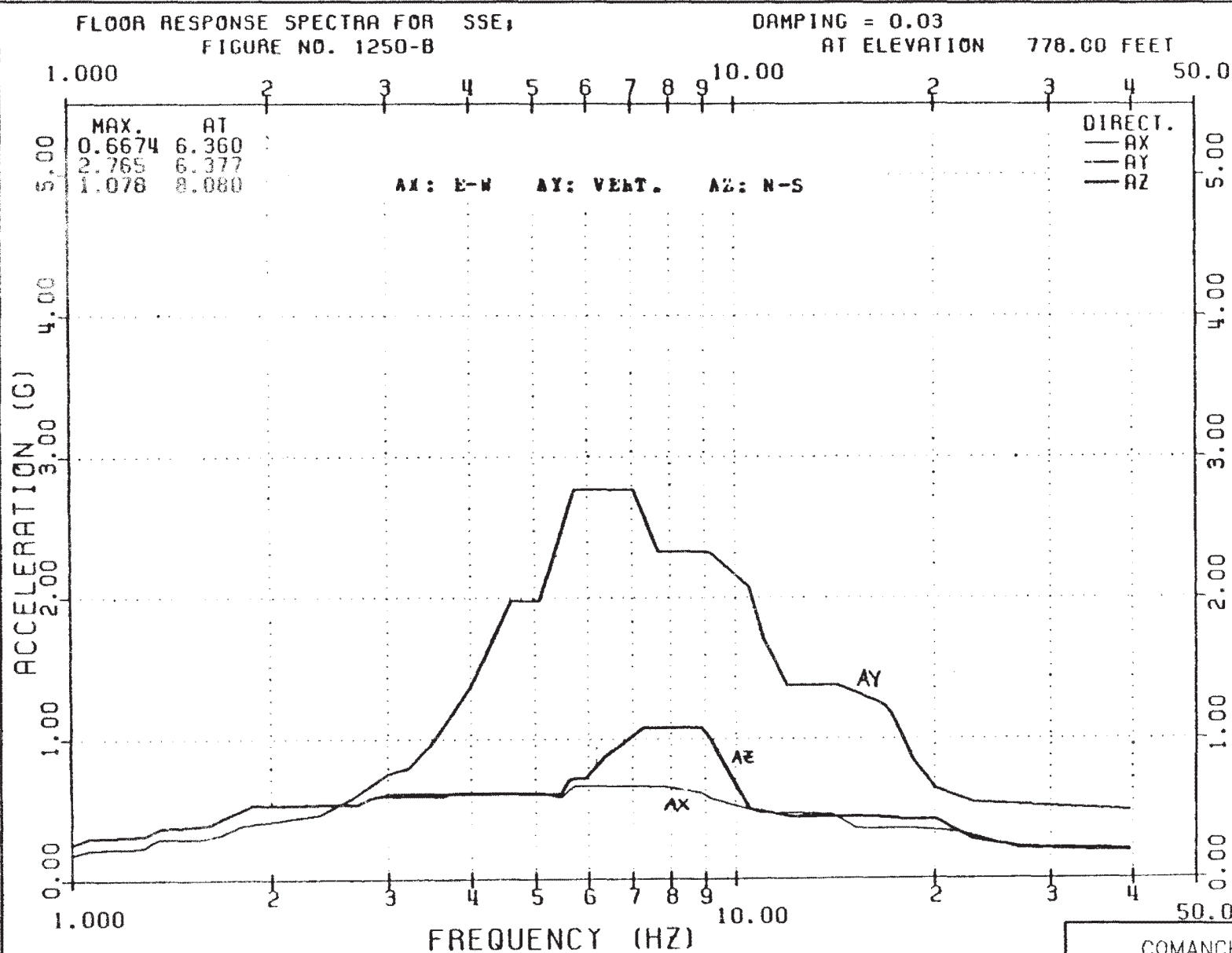
AUXILIARY BLDG.
REFINED RESPONSE SPECTRA

FIGURE: 3.7B-44

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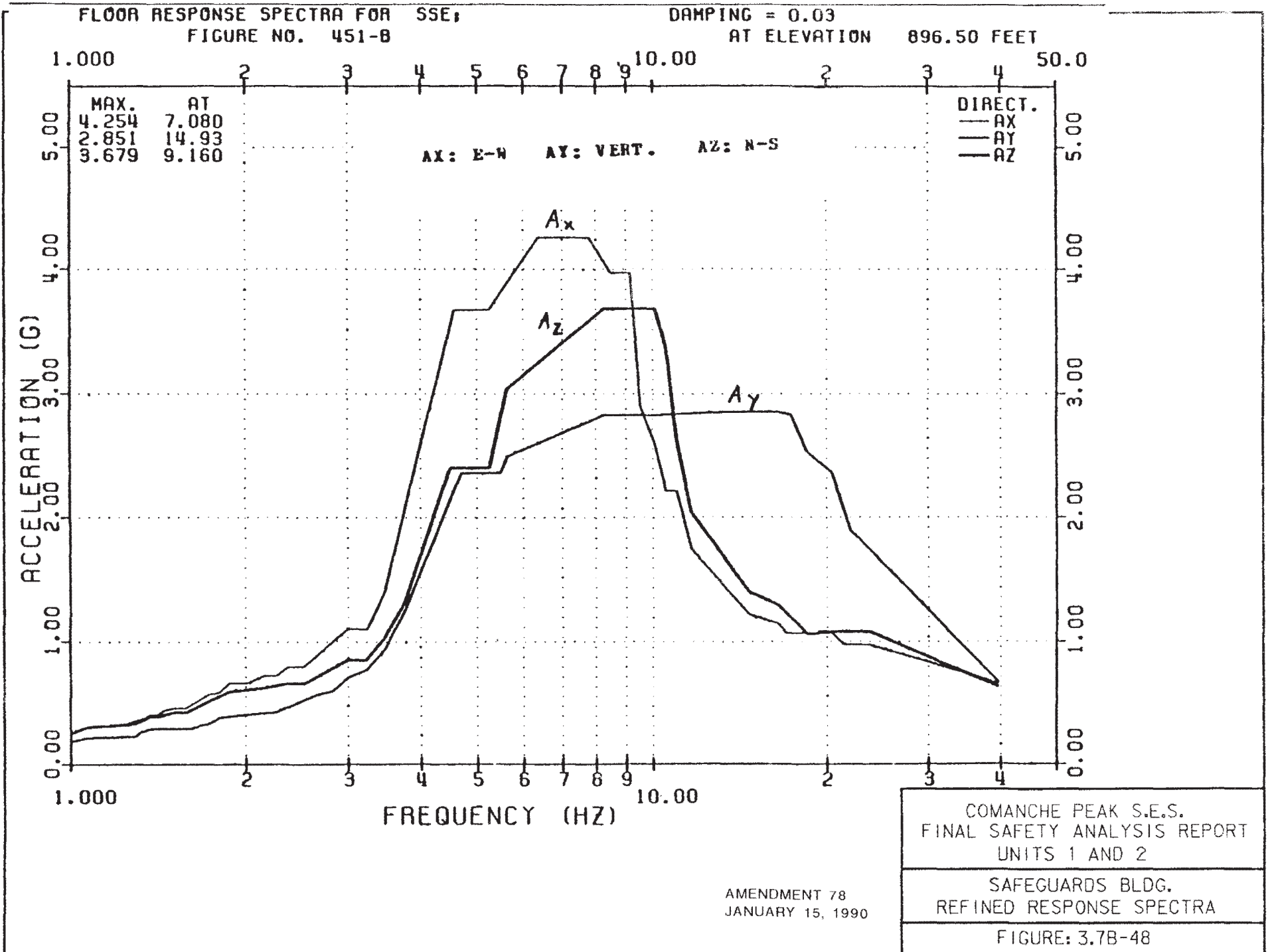


COMANCHE PEAK S.E.S.
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UNITS 1 AND 2

ELECTRICAL BLDG.
REFINED RESPONSE SPECTRA

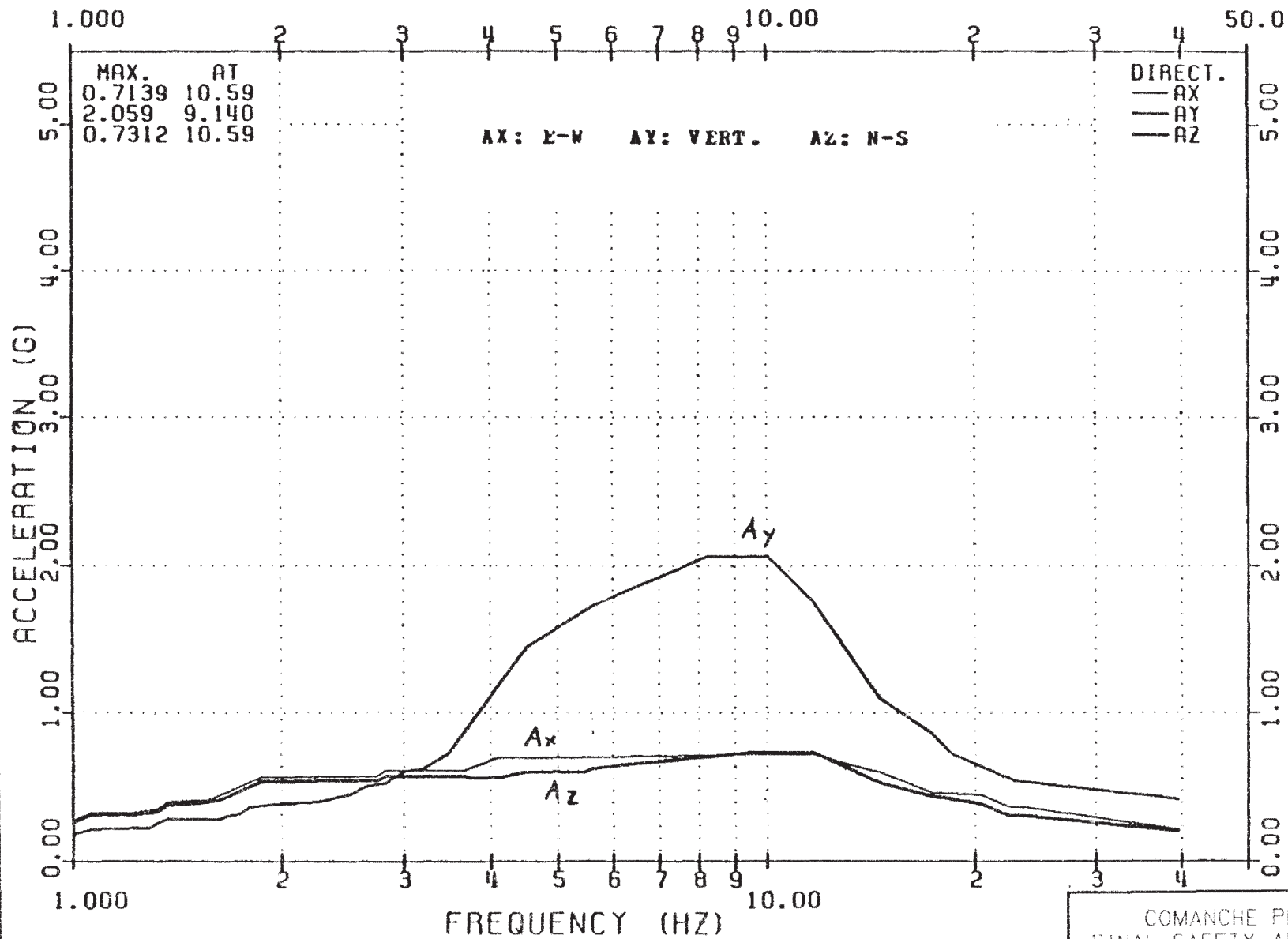
FIGURE: 3.7B-47

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FLOOR RESPONSE SPECTRA FOR SSE;
FIGURE NO. 458-B

DAMPING = 0.03
AT ELEVATION 773.50 FEET

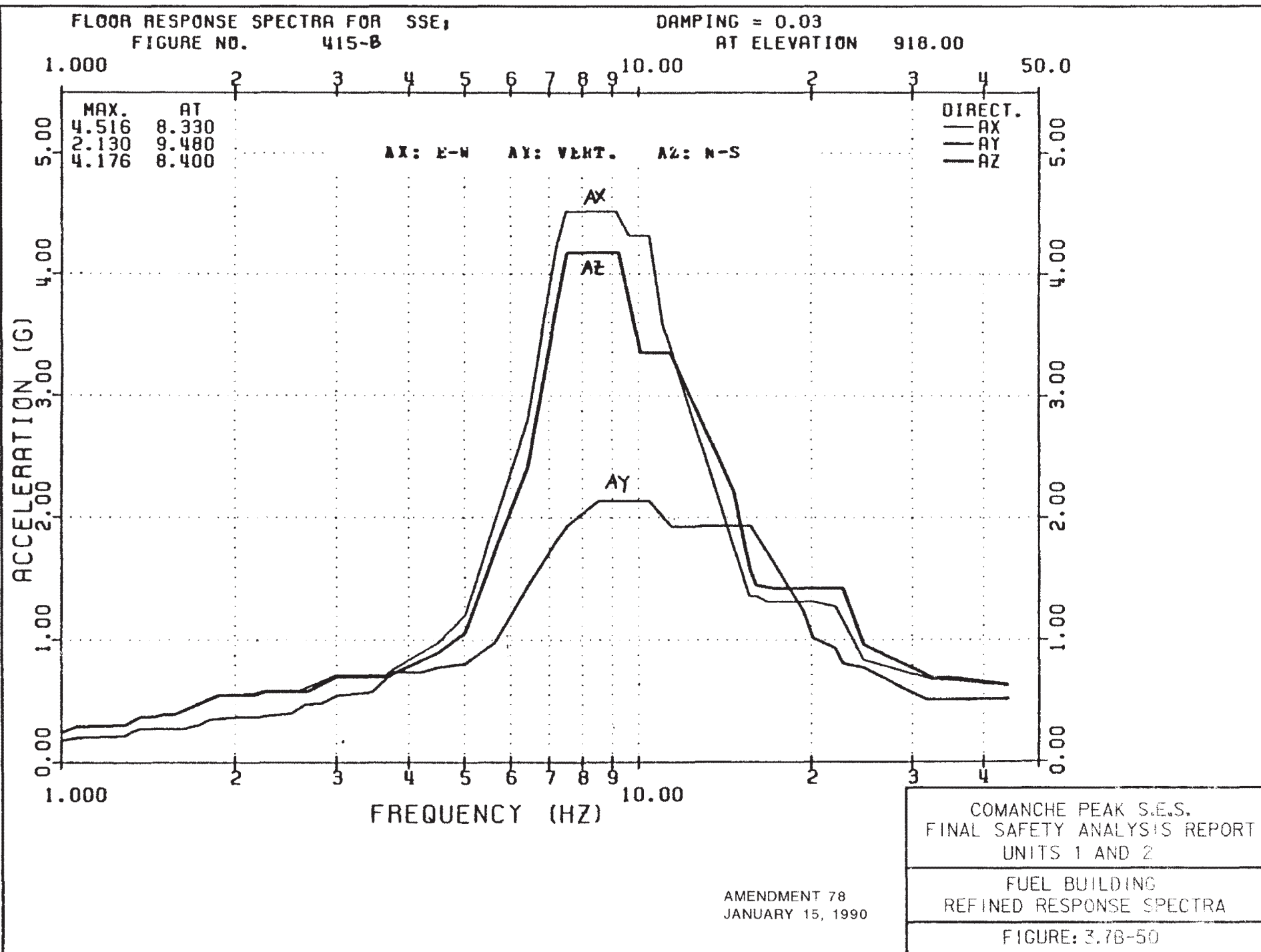


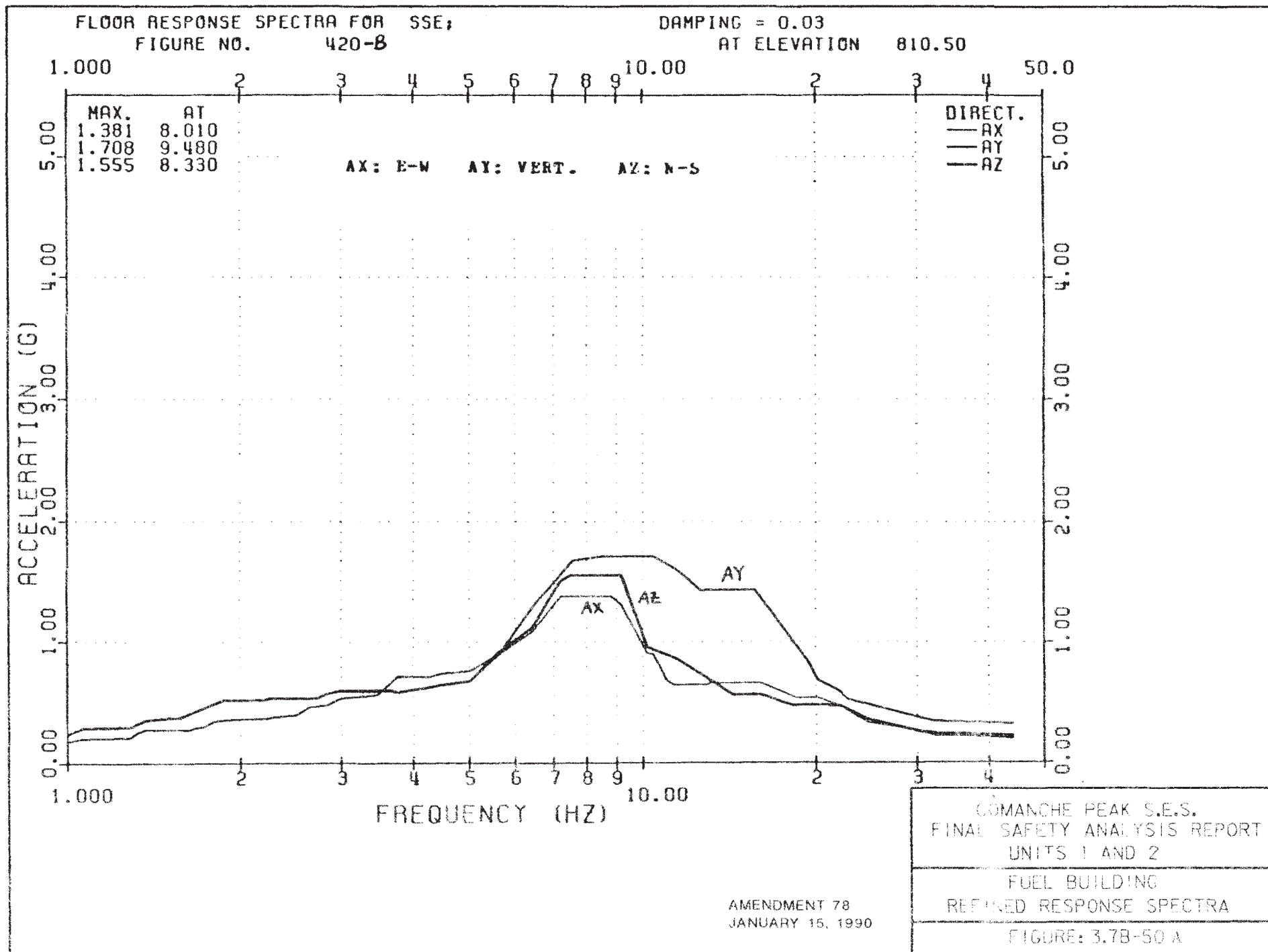
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2

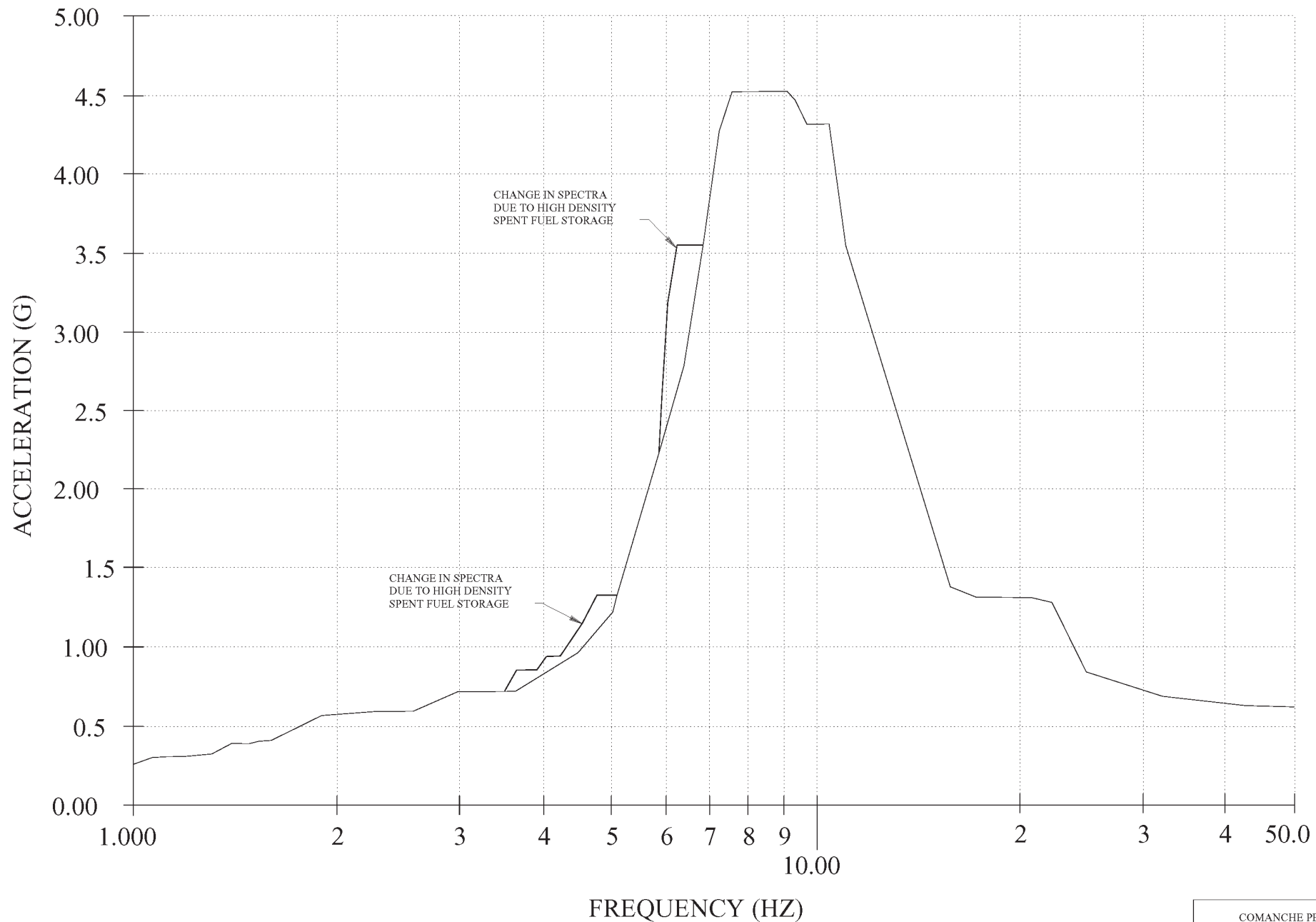
SAFEGUARDS BLDG.
REFINED RESPONSE SPECTRA

FIGURE: 3.7B-49

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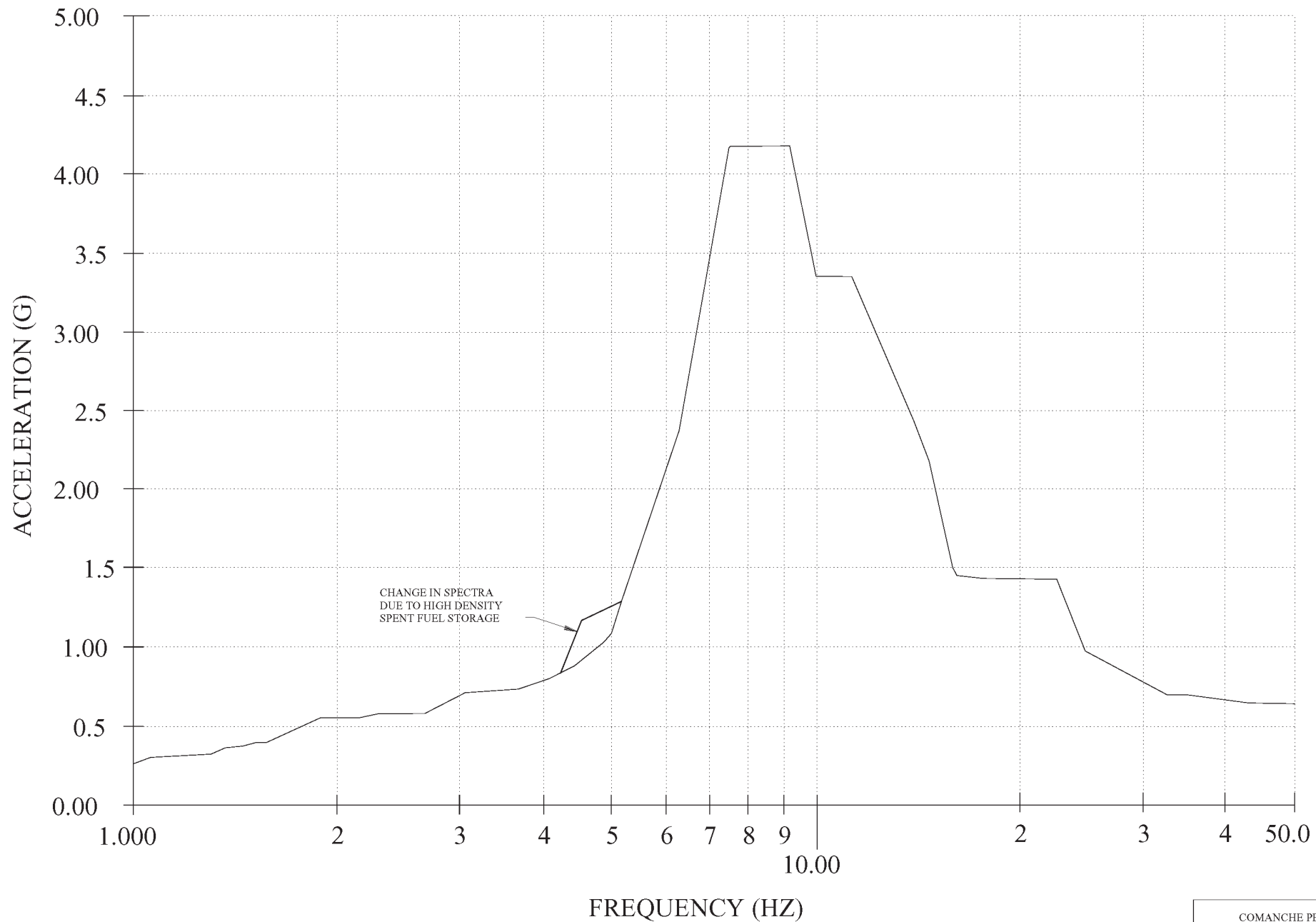


SSE FLOOR RESPONSE SPECTRA
EL 918.25', EAST-WEST (AX), 3% DAMPING

COMANCHE PEAK S E S
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2

FUEL BUILDING
REFINED RESPONSE SPECTRA

FIGURE 3.7B-50AA



SSE FLOOR RESPONSE SPECTRA
EL 918.25', NORTH-SOUTH (AY), 3% DAMPING

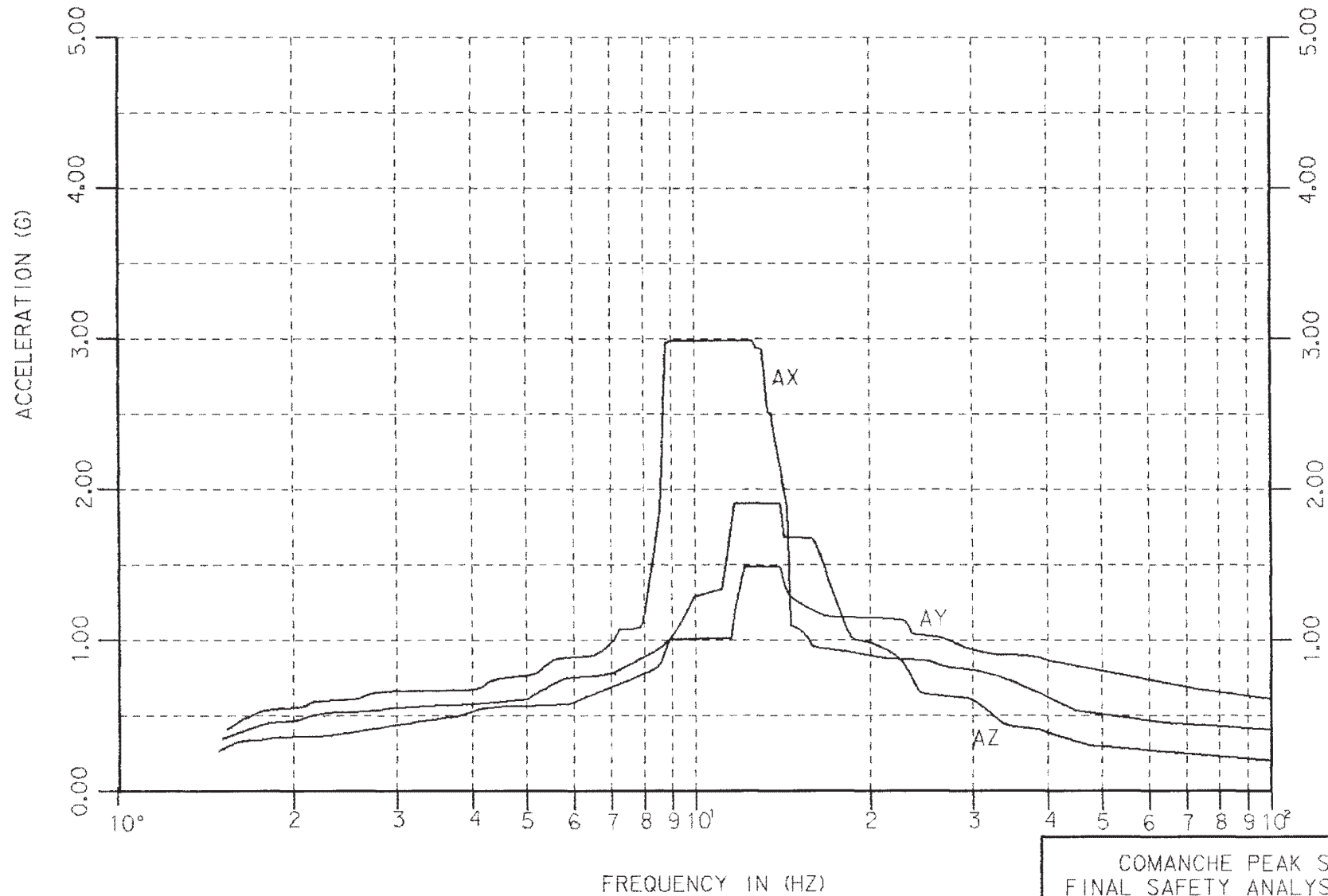
COMANCHE PEAK S E S
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2

FUEL BUILDING
REFINED RESPONSE SPECTRA

FIGURE 3.7B-50AB

FLOOR RESPONSE SPECTRA: SSE
AX: N-S AY: VERT AZ: E-W

DAMPING VALUE = 0.030
AT ELEVATION 838.0 FT



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2

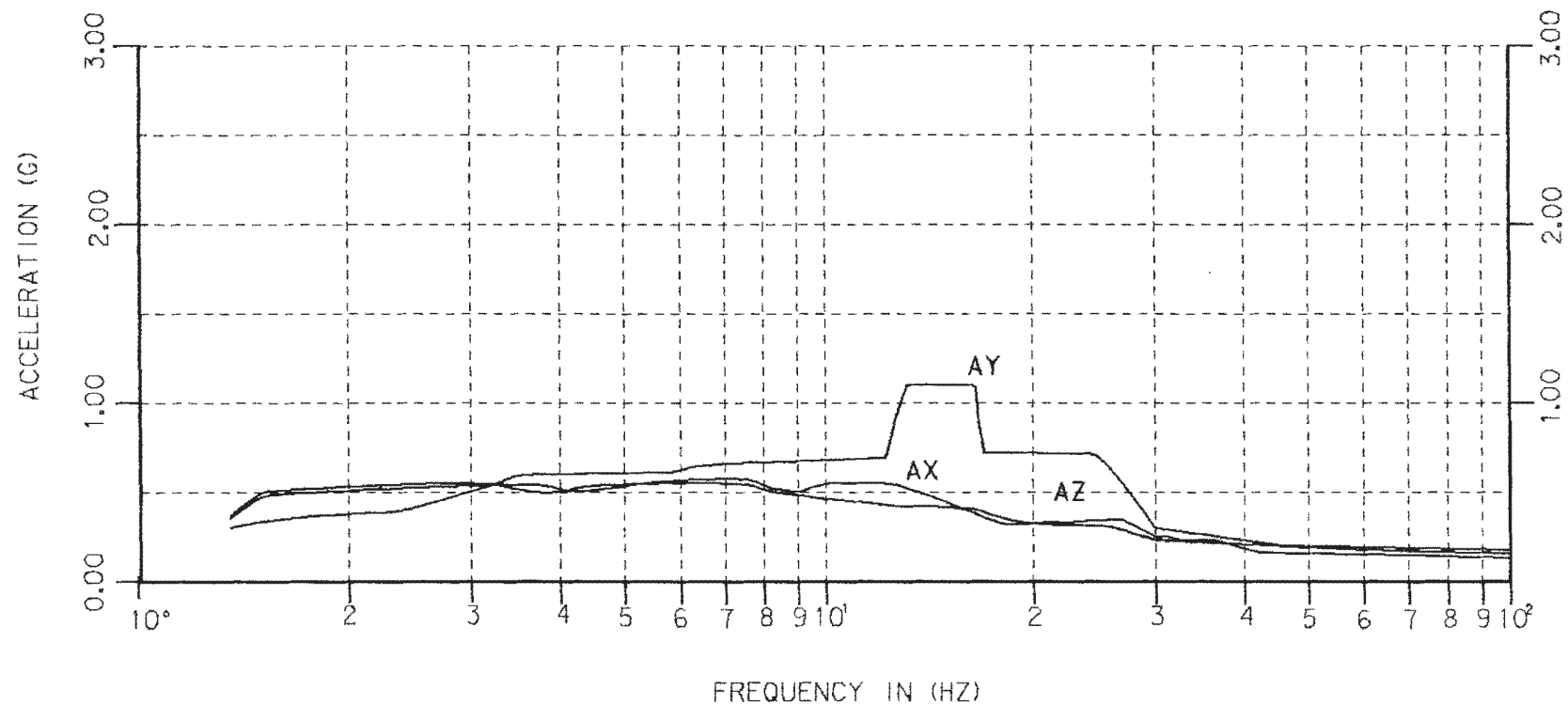
SERVICE WATER INTAKE STRUCTURE
REFINED RESPONSE SPECTRA

FIGURE: 3.7B-50B

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FLOOR RESPONSE SPECTRA: SSE
AX: N-S AY: VERT AZ: E-W

DAMPING VALUE = 0.030
AT ELEVATION 782.0 FT

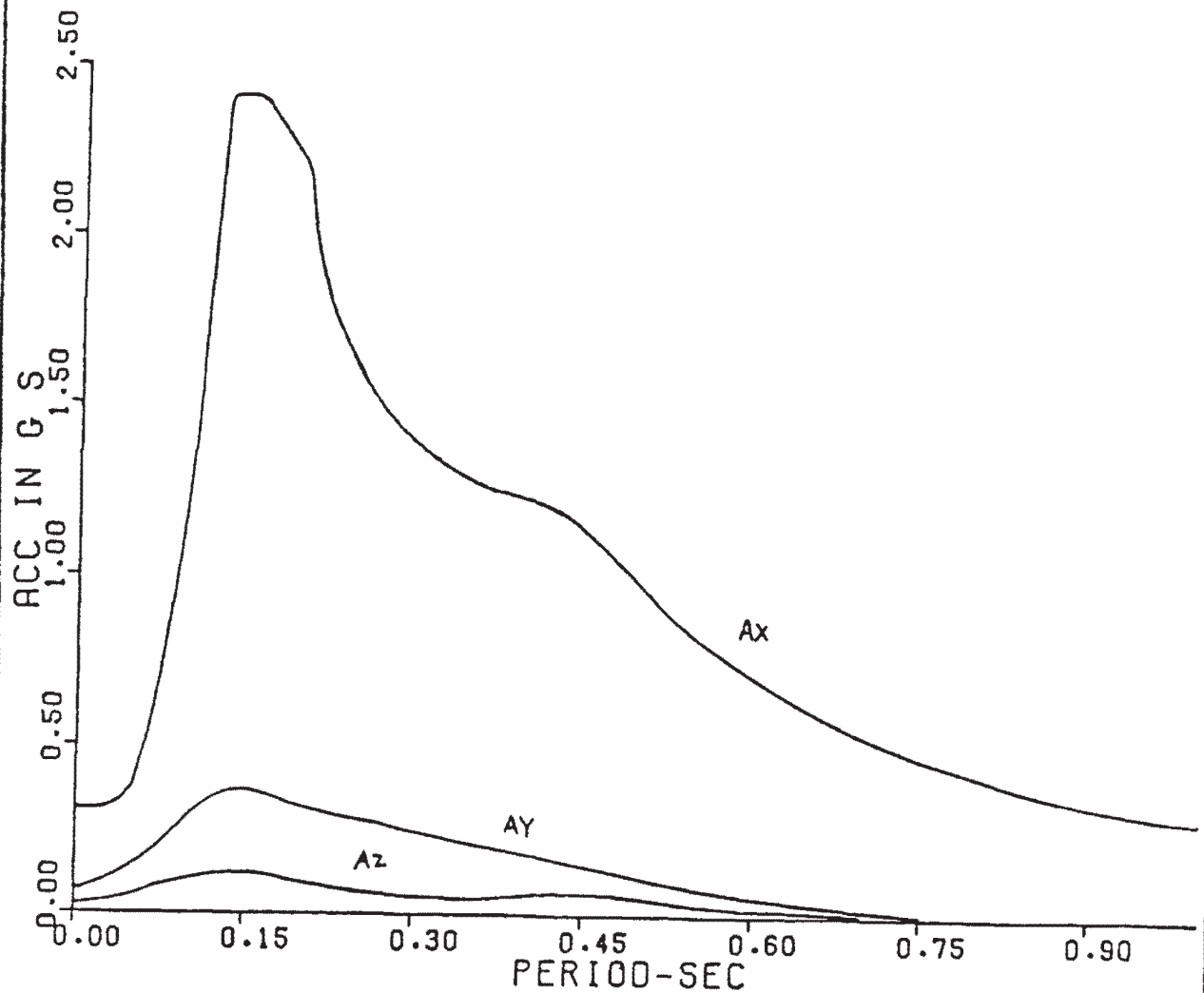


COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2
SERVICE WATER INTAKE STRUCTURE
REFINED RESPONSE SPECTRA
FIGURE: 3.7B-50C

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INSTRUCTURE RESPONSE SPECTRA FOR:

STEAM GENERATOR SUPPORT
SSE EARTHQUAKE DIRECTION: X
EQUIPMENT DAMPING: 0.02
RESPONSE SPECTRA DUE TO NODAL TRANSLATION:
AX: N-S AY: VERT. AZ: E-W



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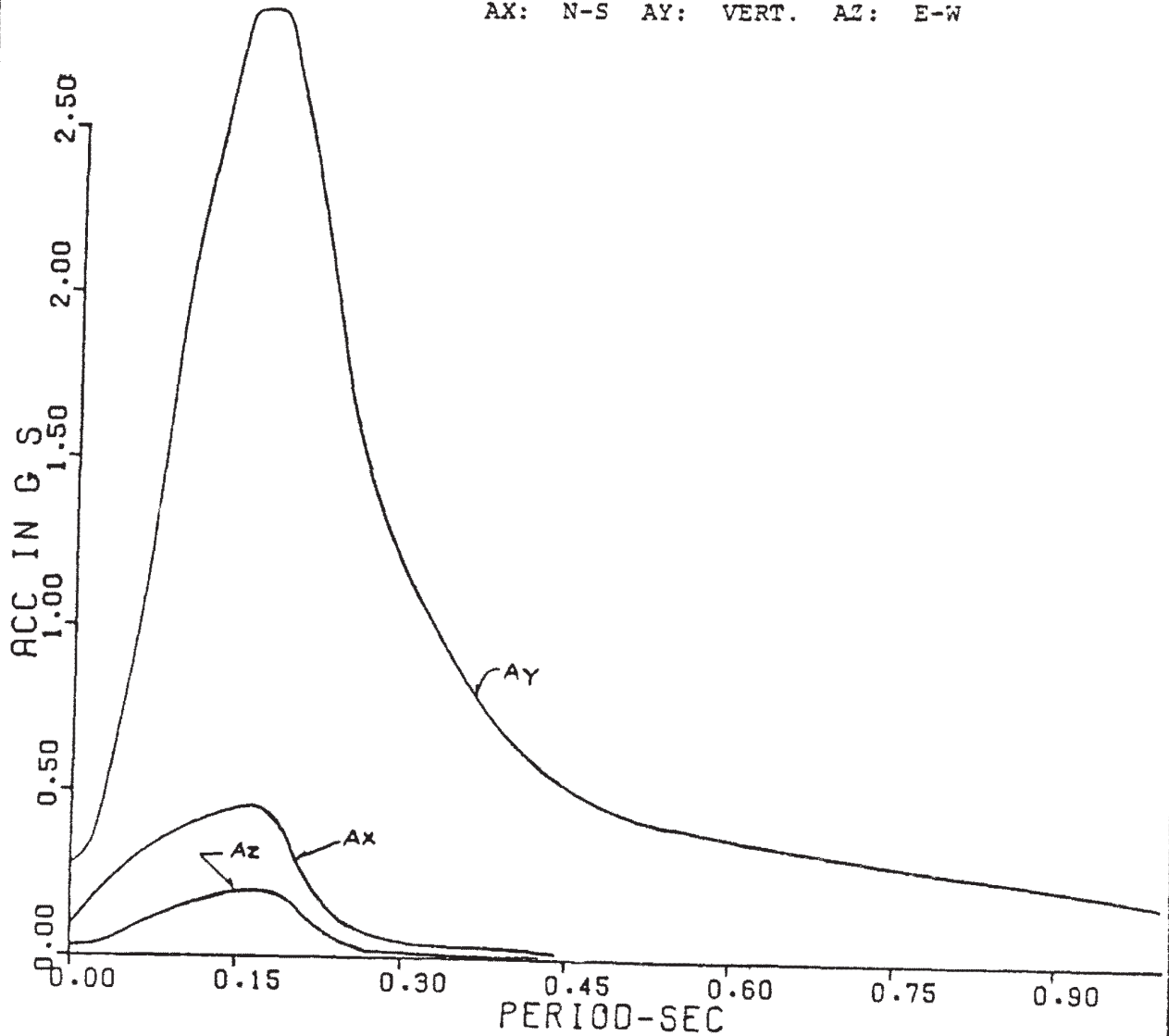
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

INSTRUCTURE RESPONSE SPECTRA
STEAM GENERATOR SUPPORT
X-EARTHQUAKE
SSE, 2 PERCENT DAMPING

FIGURE 3.7B-51

INSTRUCTURE RESPONSE SPECTRA FOR:

STEAM GENERATOR SUPPORT
SSE EARTHQUAKE DIRECTION: Y
EQUIPMENT DAMPING: 0.02
RESPONSE SPECTRA DUE TO NODAL TRANSLATION:
AX: N-S AY: VERT. AZ: E-W



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INSTRUCTURE RESPONSE SPECTRA
STEAM GENERATOR SUPPORT
SSE, 2 PERCENT DAMPING

FIGURE 3.7B-52

INSTRUCTURE RESPONSE SPECTRA FOR:

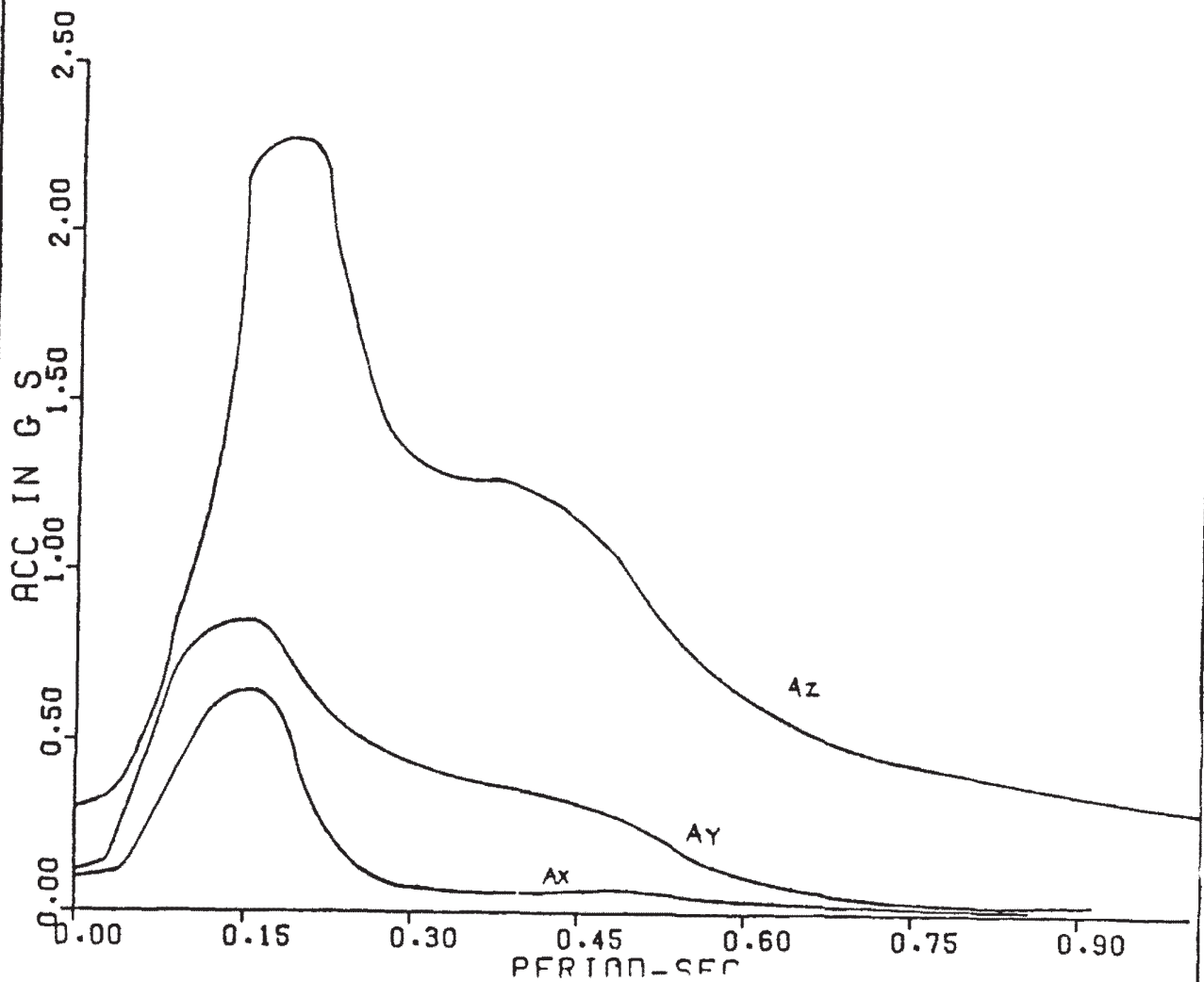
STEAM GENERATOR SUPPORT

SSE EARTHQUAKE DIRECTION: Z

EQUIPMENT DAMPING: 0.02

RESPONSE SPECTRA DUE TO MODAL TRANSLATION:

AX: N-S AY: VERT. AZ: E-W

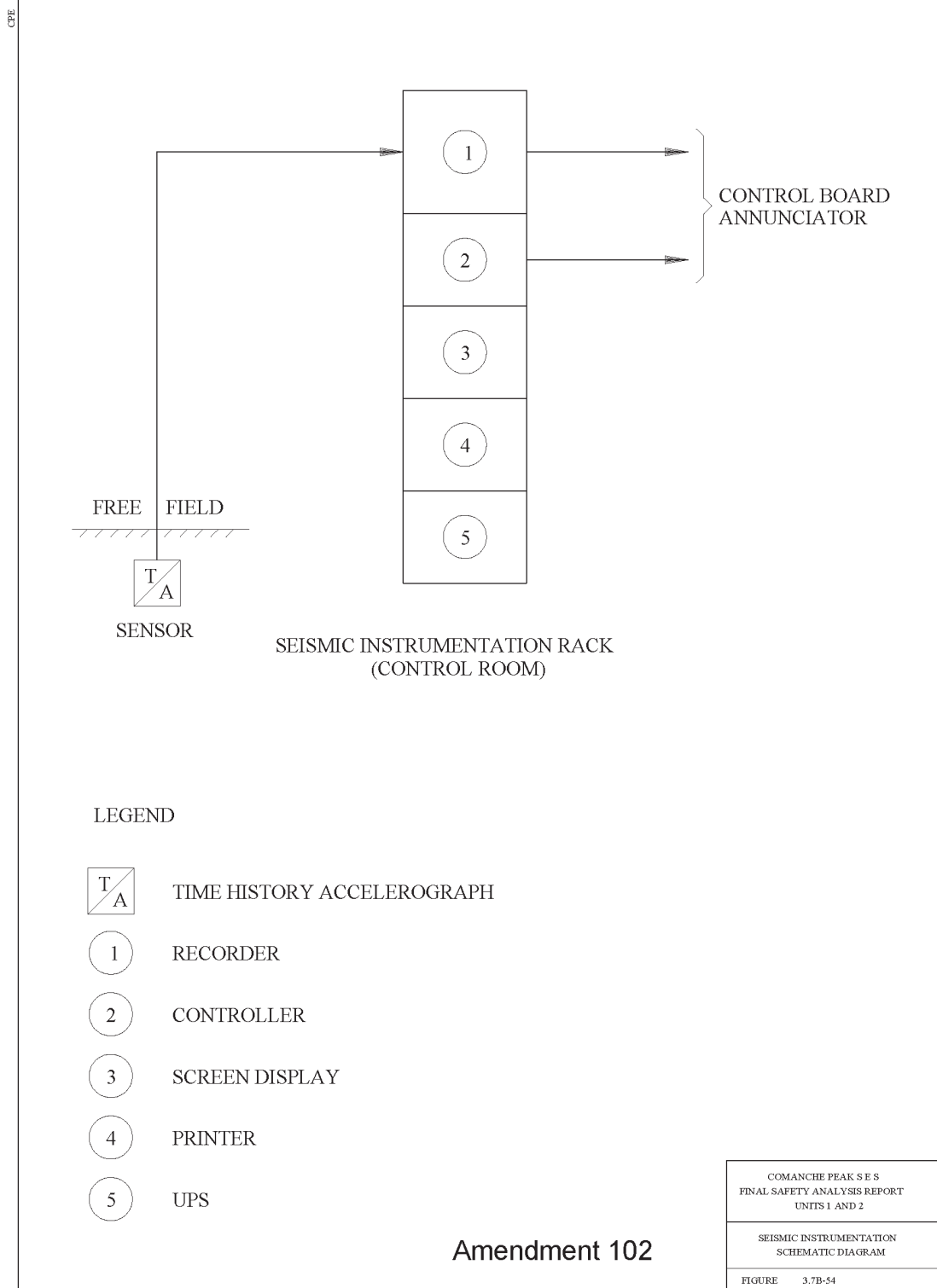


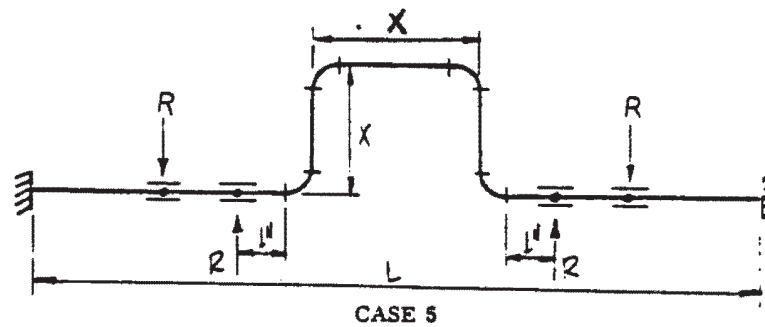
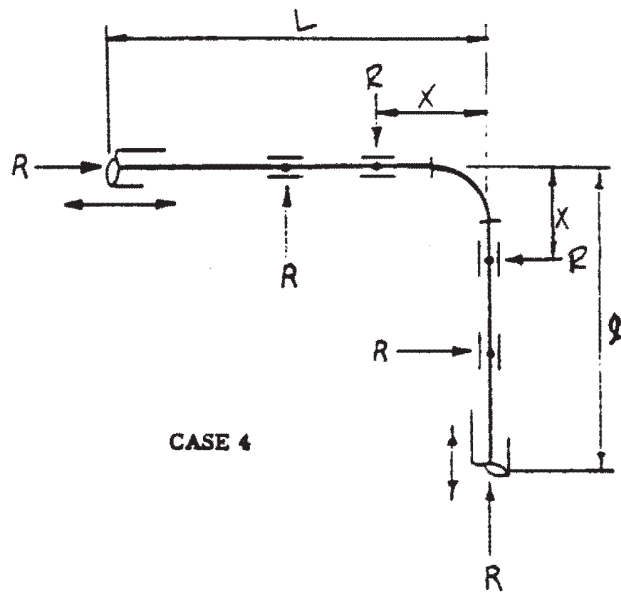
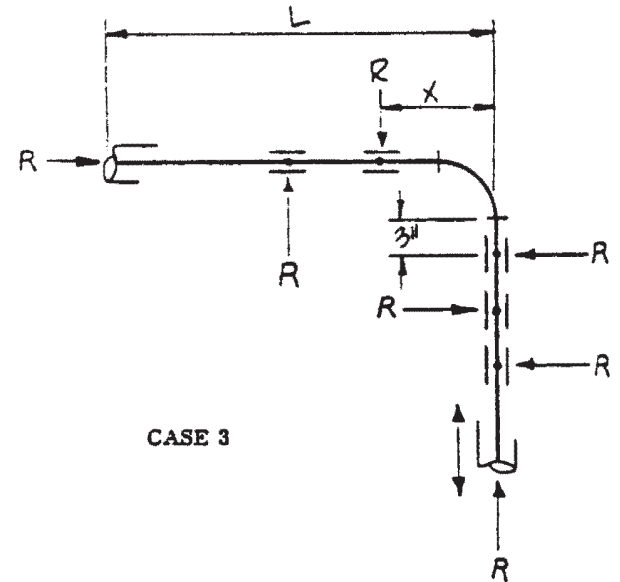
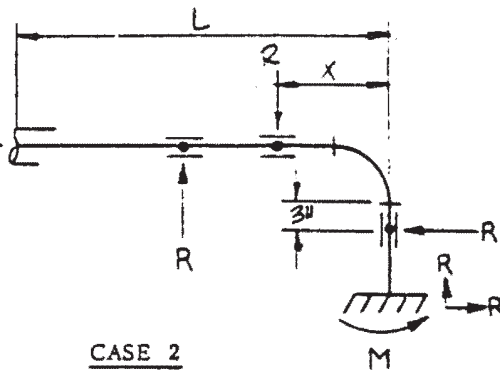
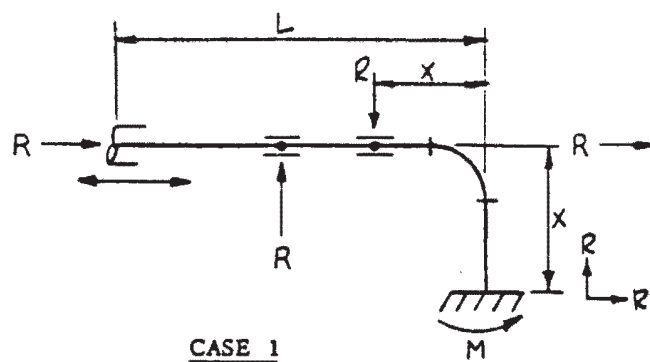
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UNITS 1 and 2

INSTRUCTURE RESPONSE SPECTRA
STEAM GENERATOR SUPPORT
Z-EARTHQUAKE
SSE, 2 PERCENT DAMPING

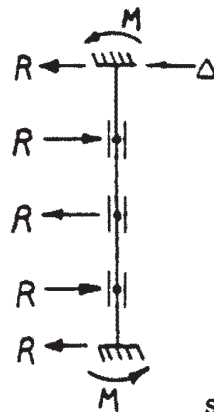
FIGURE 3.7B-53

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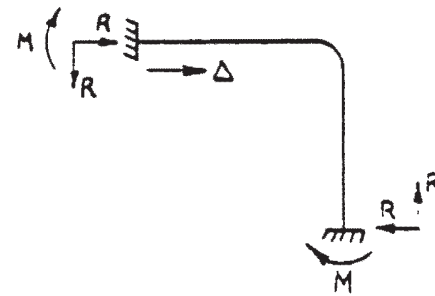




THERMAL EXPANSION LOOP



SPECIAL THERMAL CASES



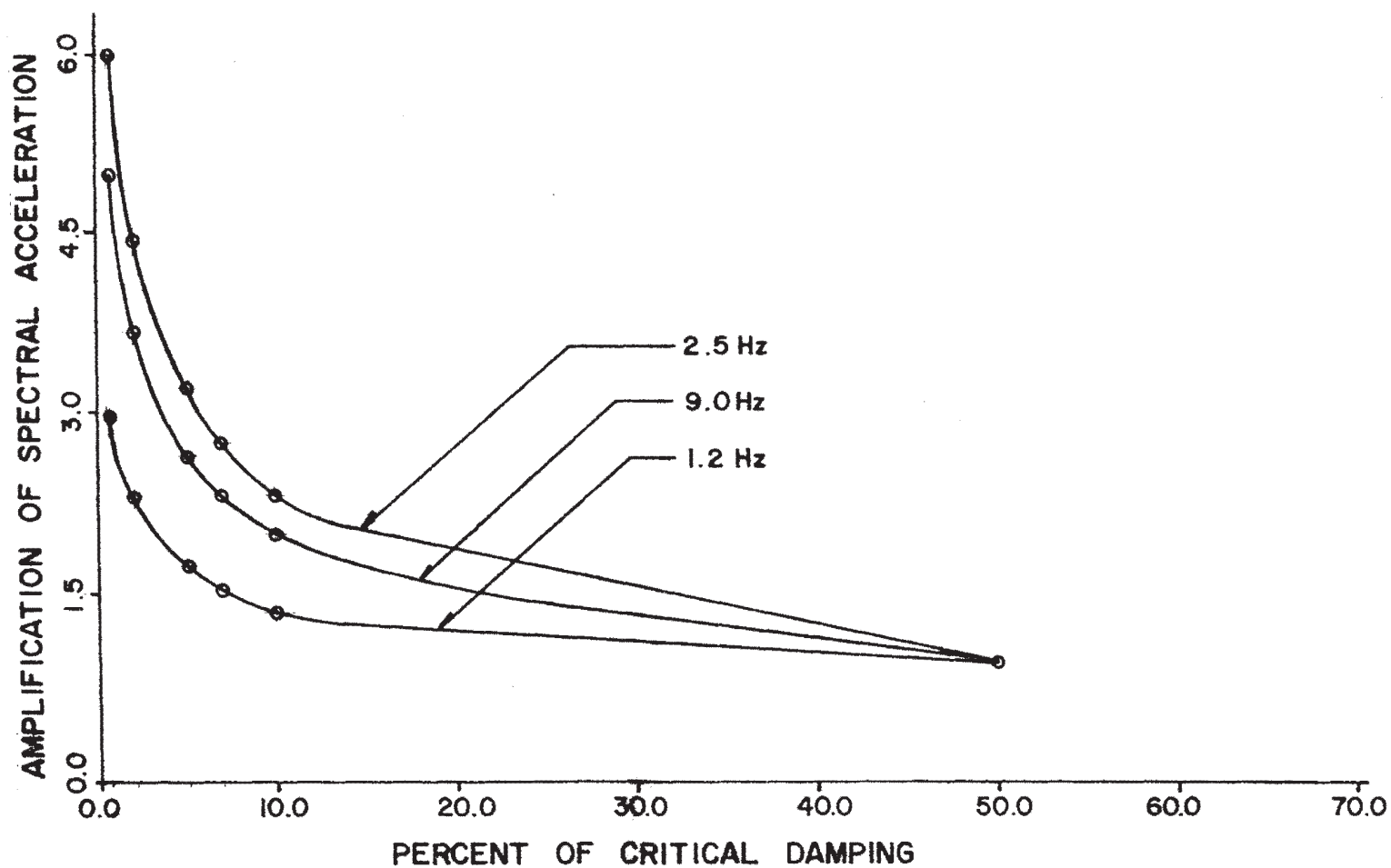
LEGEND

- L - Allowable Spad
- M - Moment
- R - Reaction Force
- X - Distance to Guide
- Δ = Thermal Movement

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UNITS 1 and 2

SIMPLIFIED DYNAMIC ANALY.
FOR PIPING SYSTEMS

FIGURE 3.7B-55



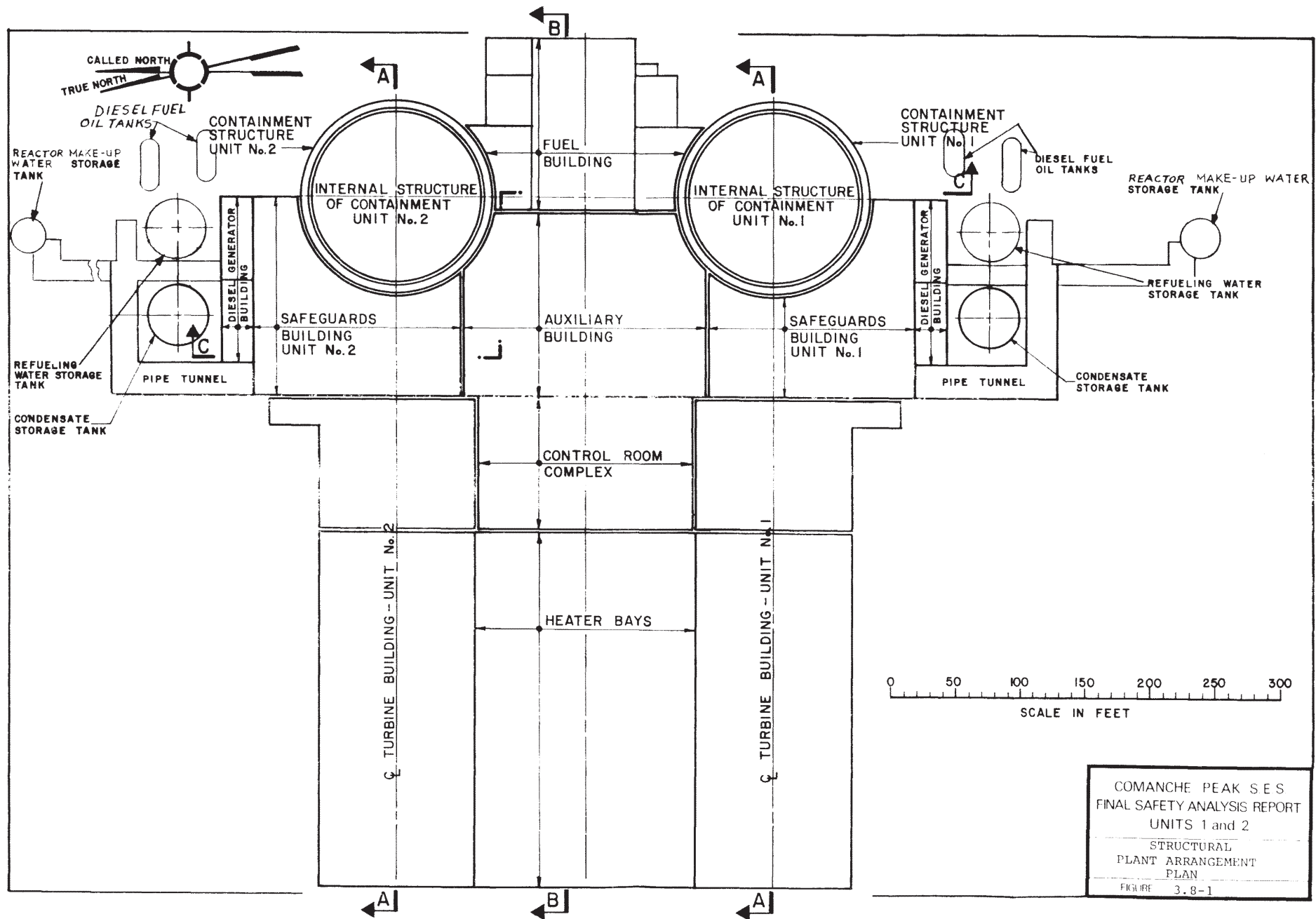
AMPLIFICATION CURVES USING LEAST SQUARE POLYNOMIAL FIT OF FREQUENCY
CONTROL POINTS FOR HORIZONTAL GROUND RESPONSE SPECTRA

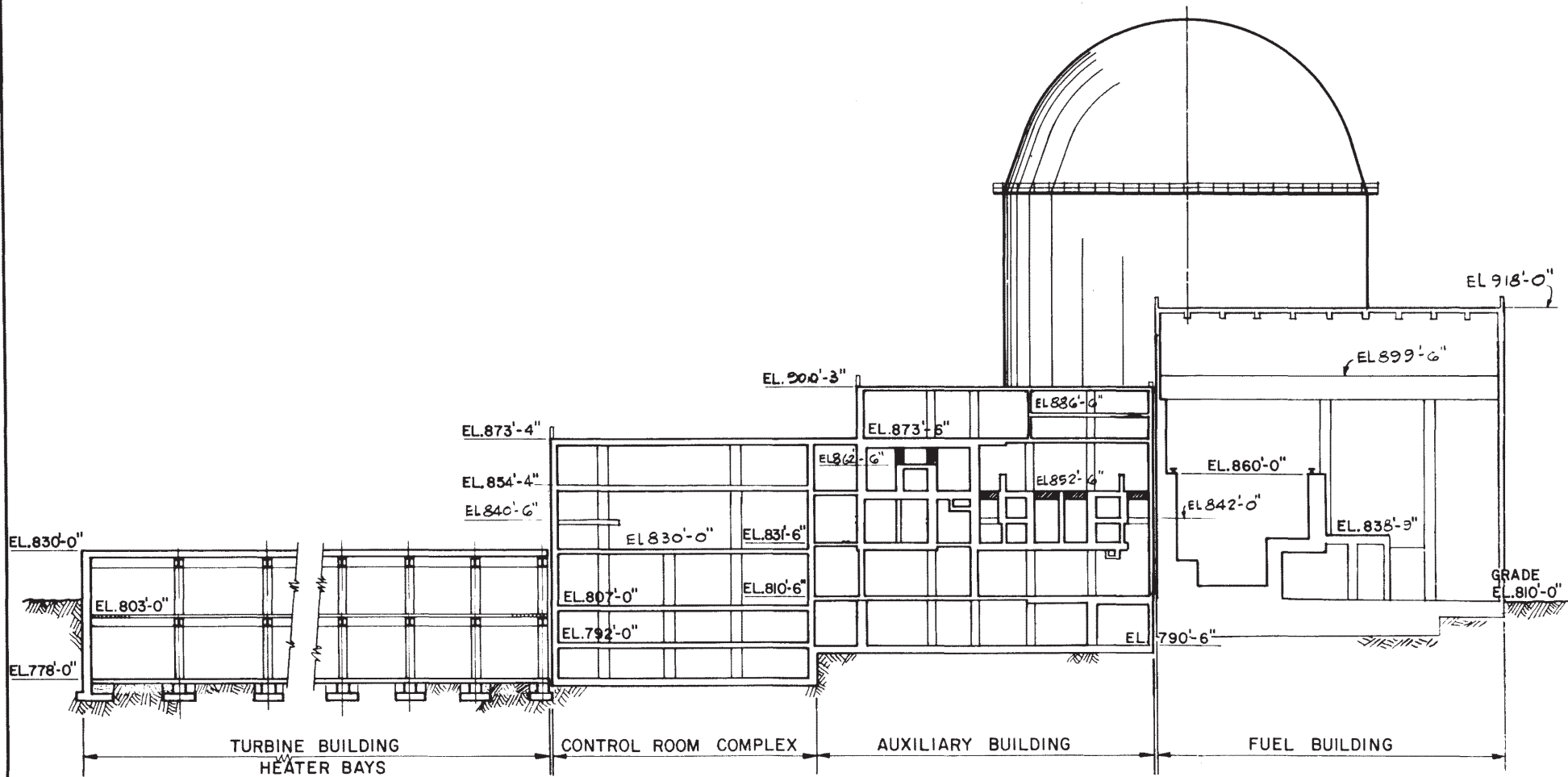
COMANCHE PEAK S.E.S.
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UNITS 1 and 2

MAXIMUM

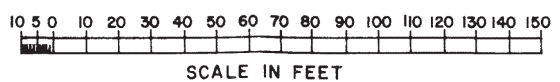
AMPLIFICATION CURVE

FIGURE 3.7B(A) - 1





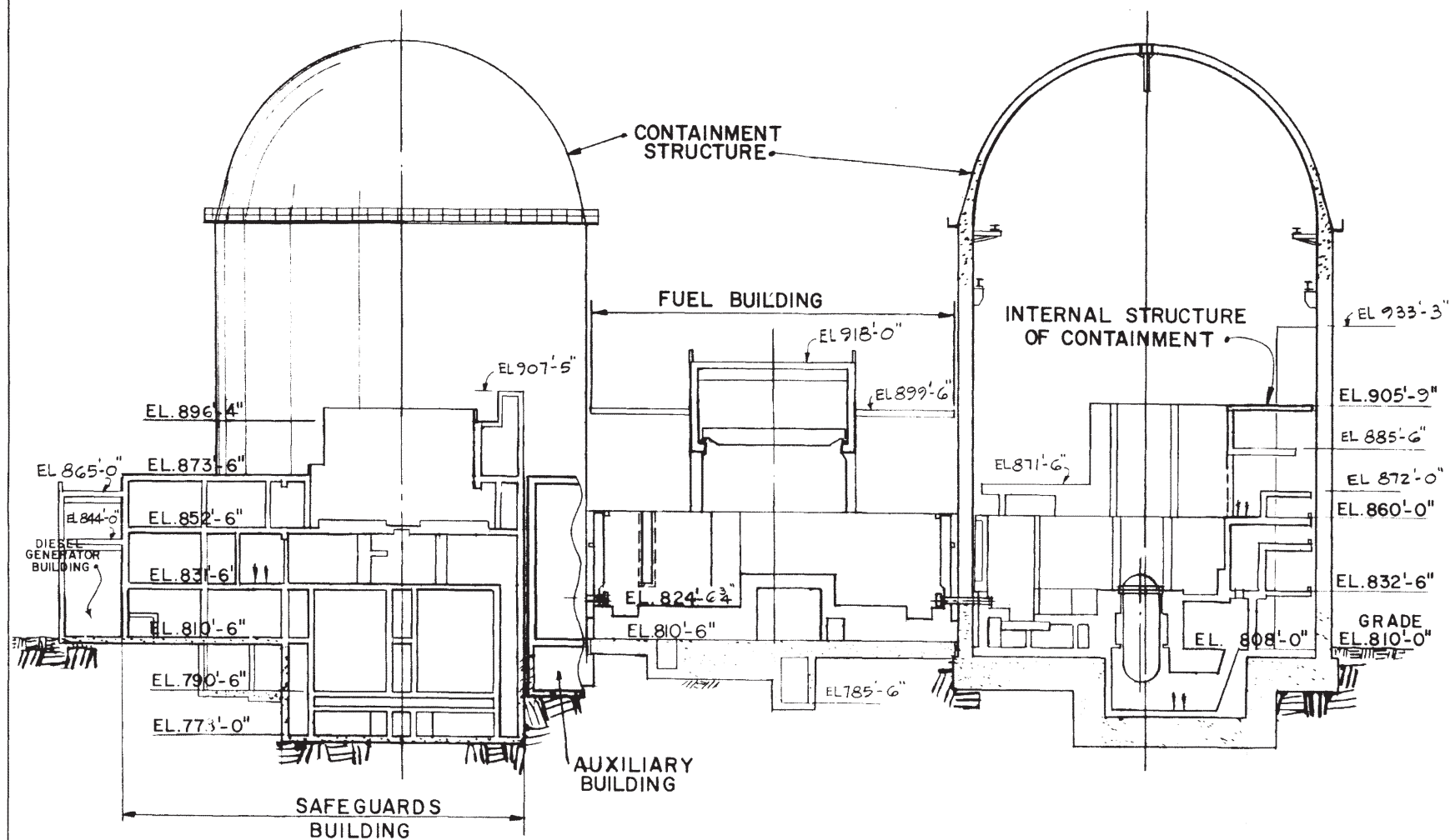
SECTION B-B



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 UNITS 1 and 2

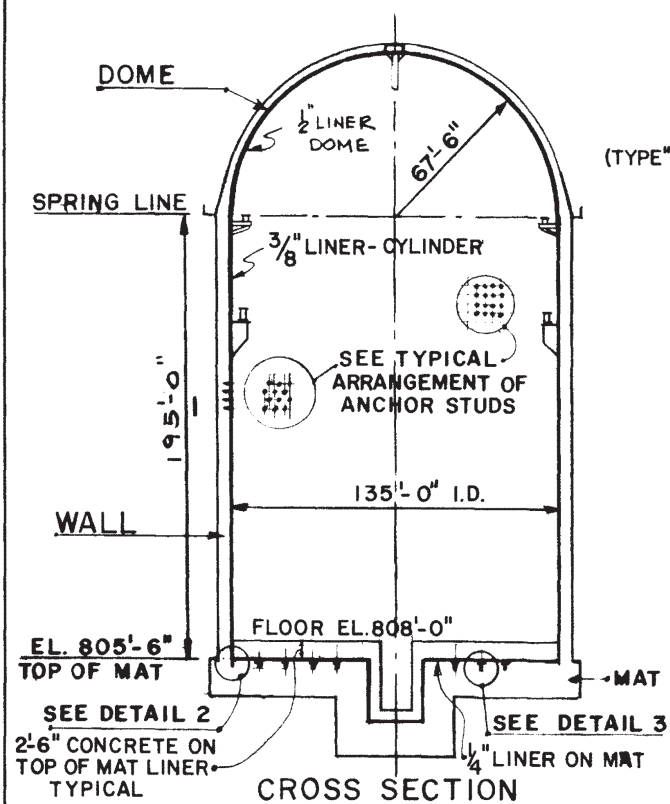
STRUCTURAL
 PLANT ARRANGEMENT
 SECTION B-B

FIGURE 3-8-3



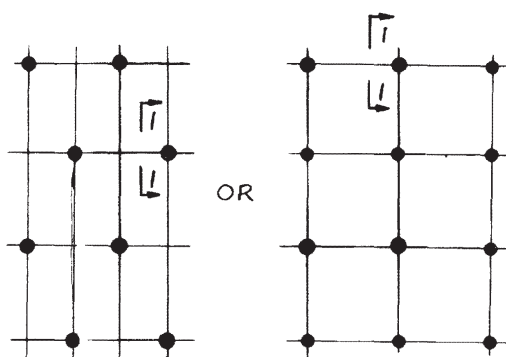
SECTION C-C

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2
STRUCTURAL
PLANT ARRANGEMENT
SECTION C-C
FIGURE 3.8-4

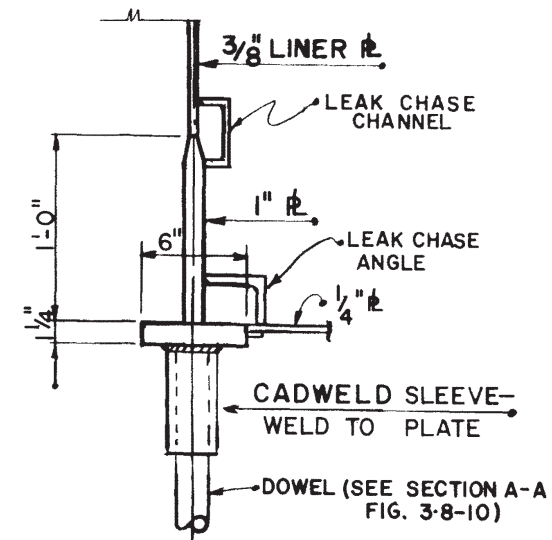


5/8" ϕ ANCHOR STUD
X 6 3/8" LONG
(TYPE "H4" BY NELSON STUD CO)

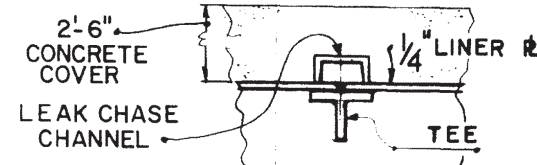
SECTION 1-1 (TYP)



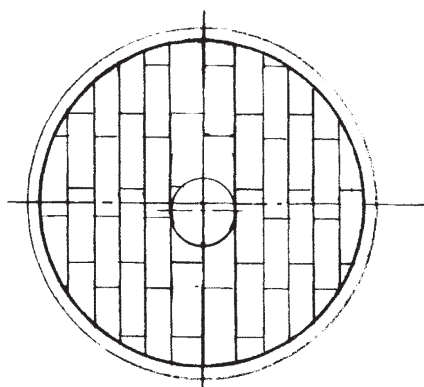
TYPICAL ARRANGEMENT OF ANCHOR STUDS IN WALL & DOME



DETAIL 2



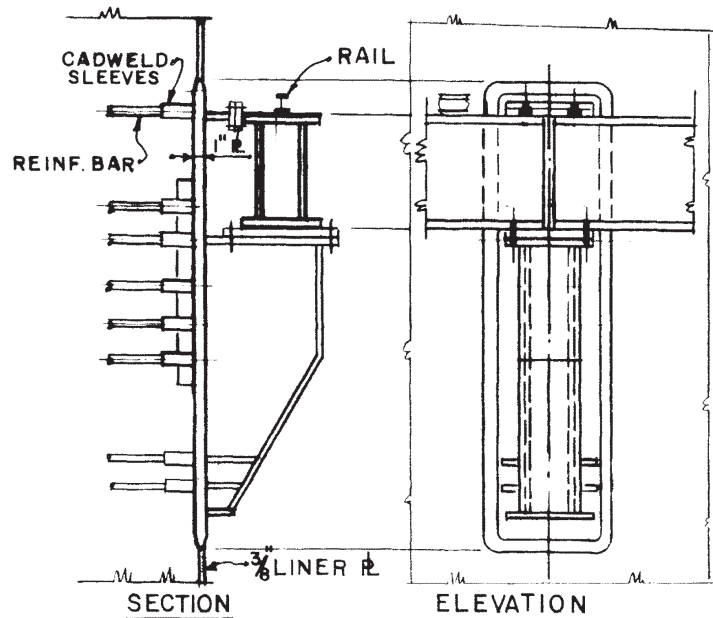
DETAIL 3



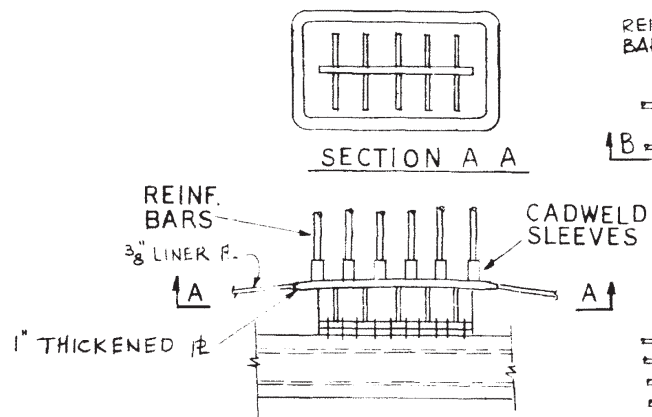
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

CONTAINMENT LINER
DETAILS

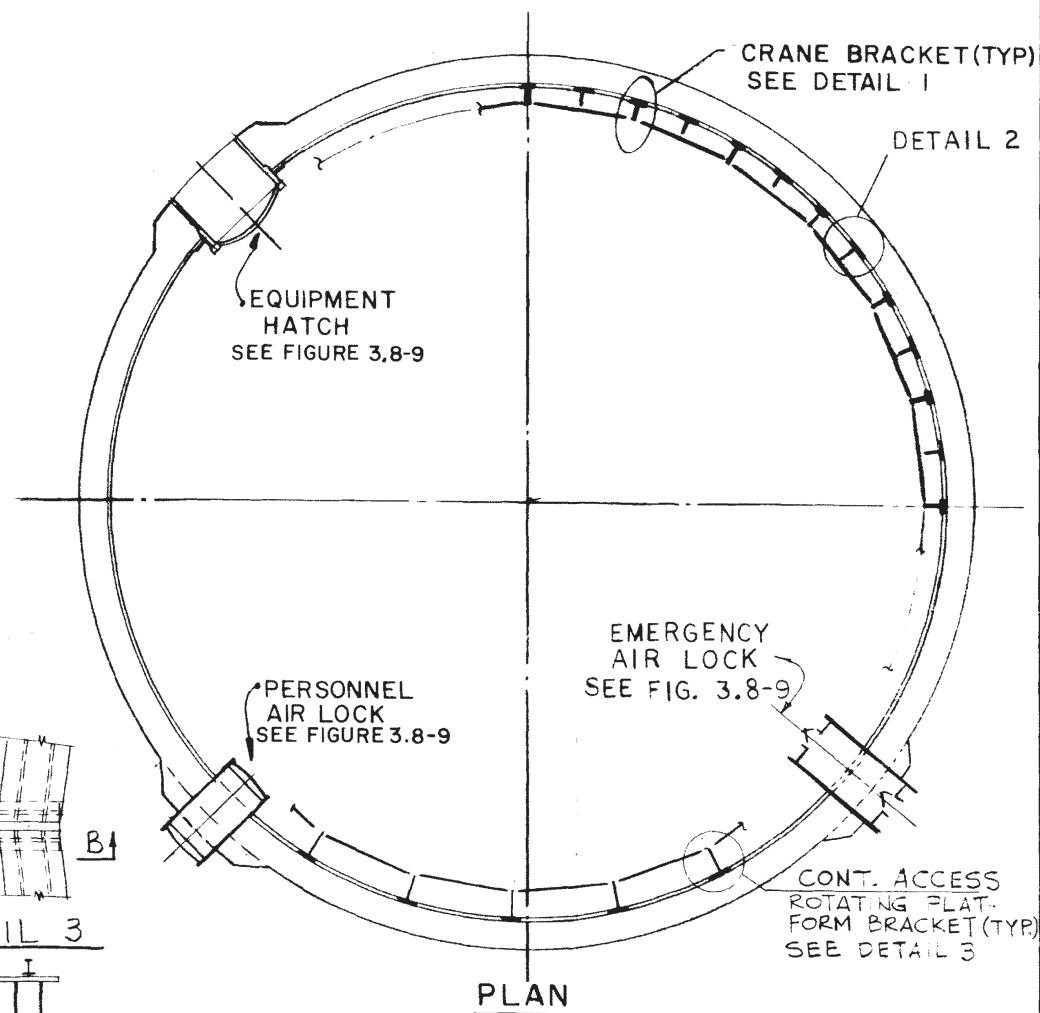
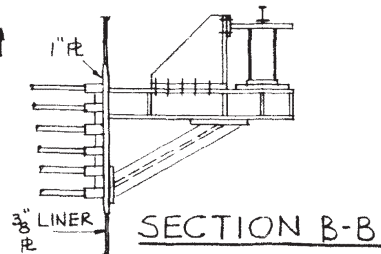
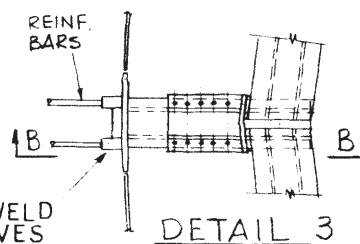
FIGURE 3.8-5



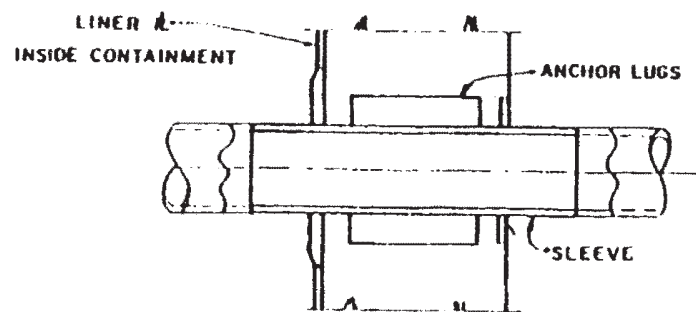
DETAIL 1
CRANE BRACKET(TYP)



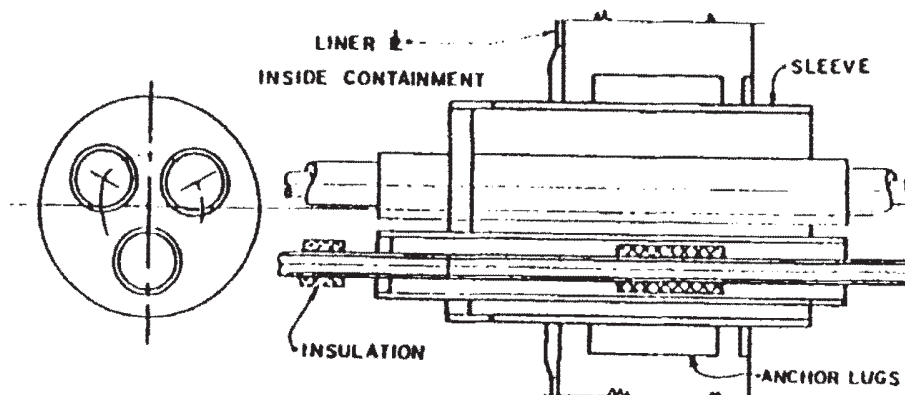
DETAIL 2



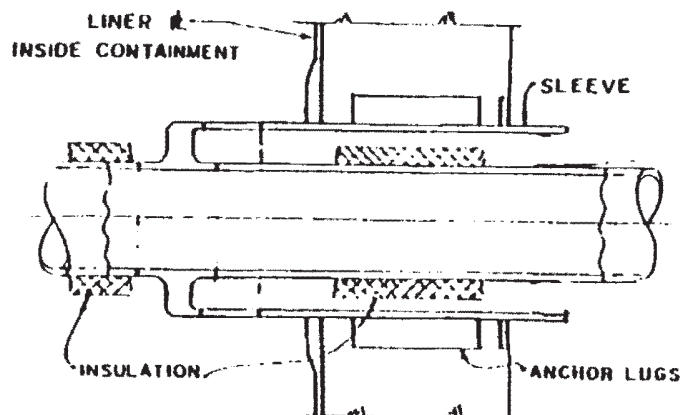
COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
CONTAINMENT LINER DETAILS
FIGURE 3.8-6



COLD PIPE PENETRATION



MULTIPLE PIPE PENETRATION



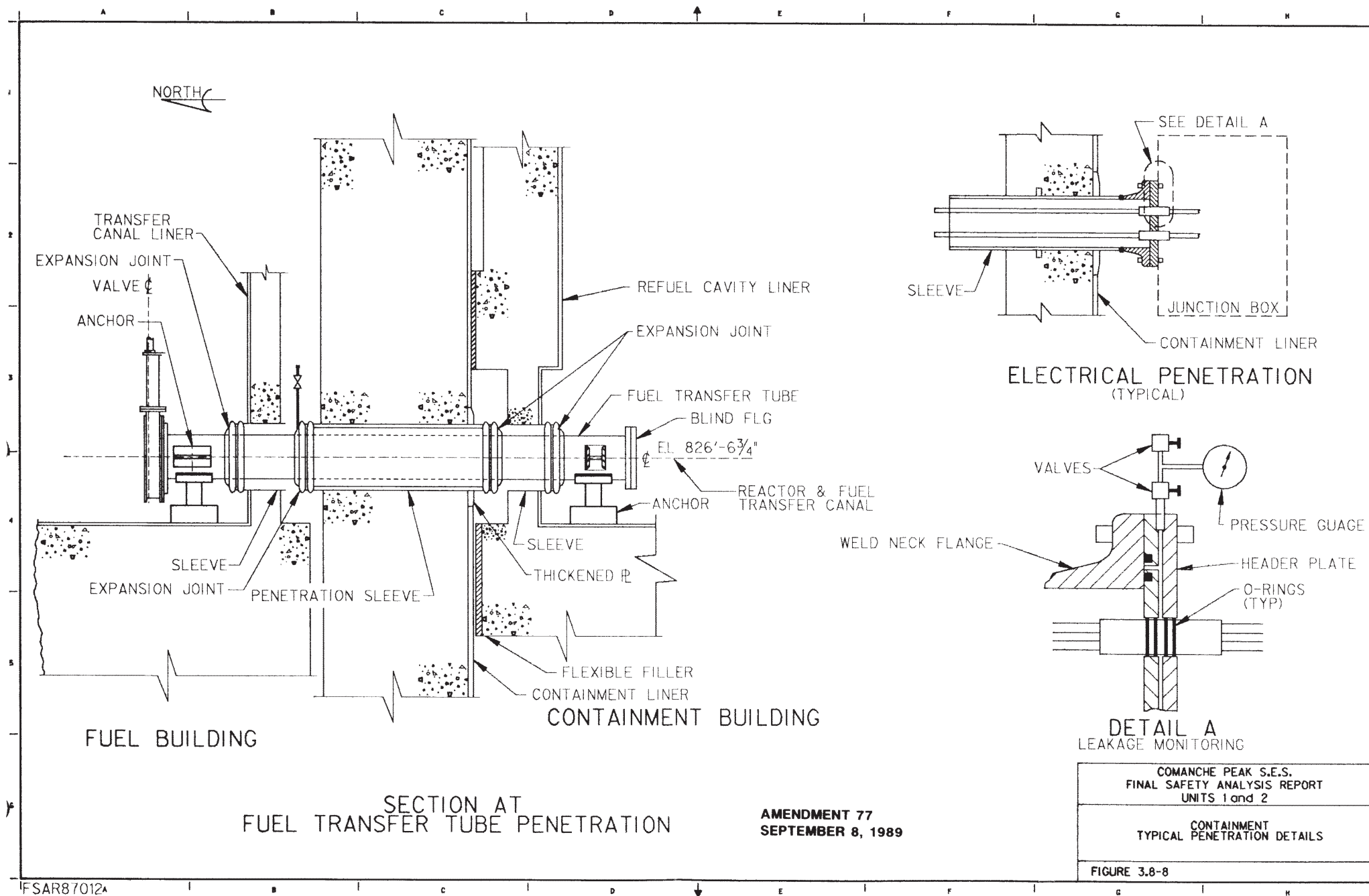
HOT PIPE PENETRATION

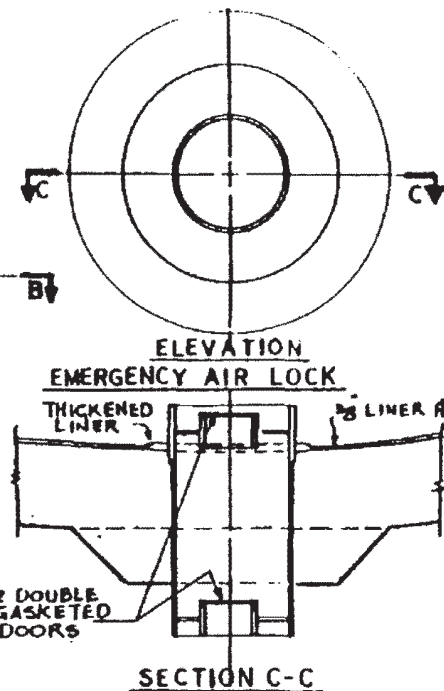
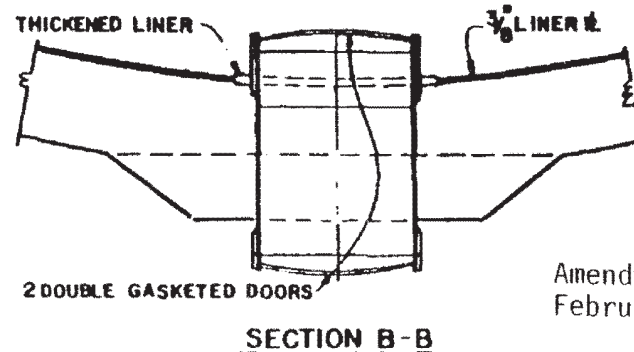
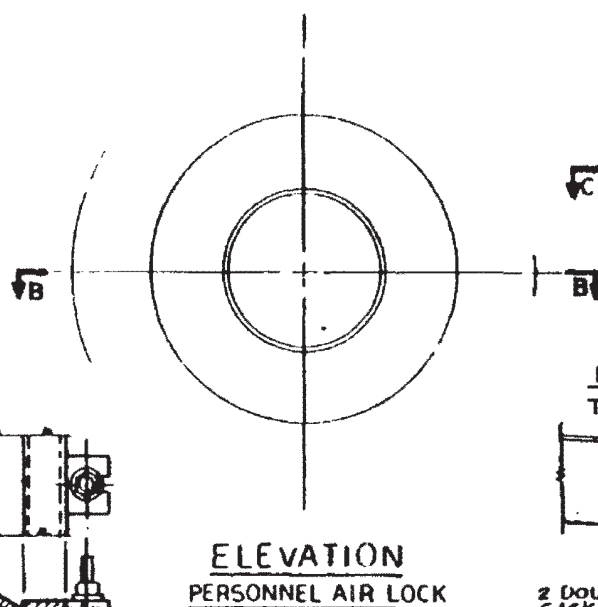
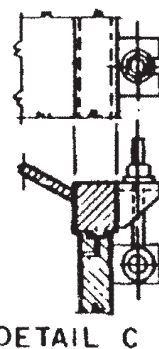
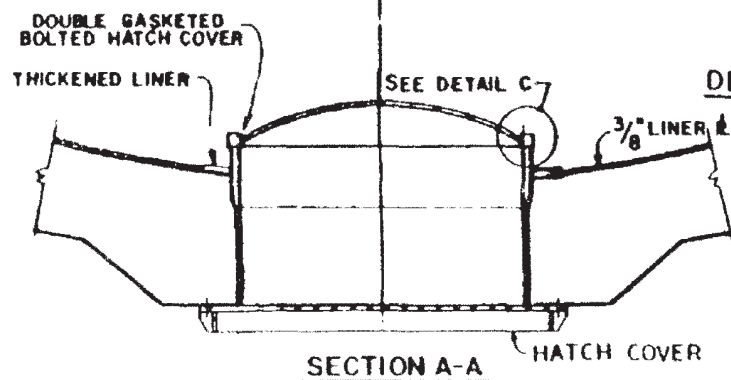
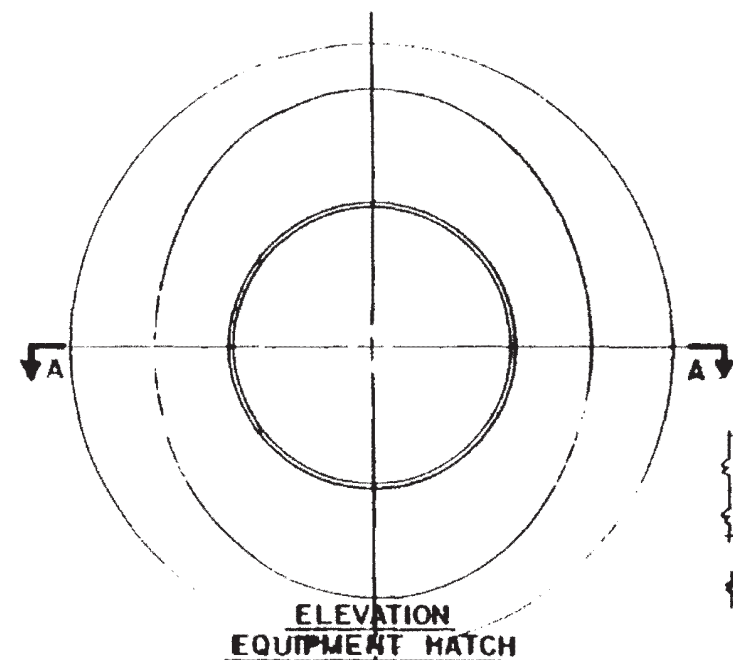
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**COMANCHE PEAK S.E.S
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2**

CONTAINMENT
TYPICAL PENETRATION DETAILS

FIGURE 3.8-7





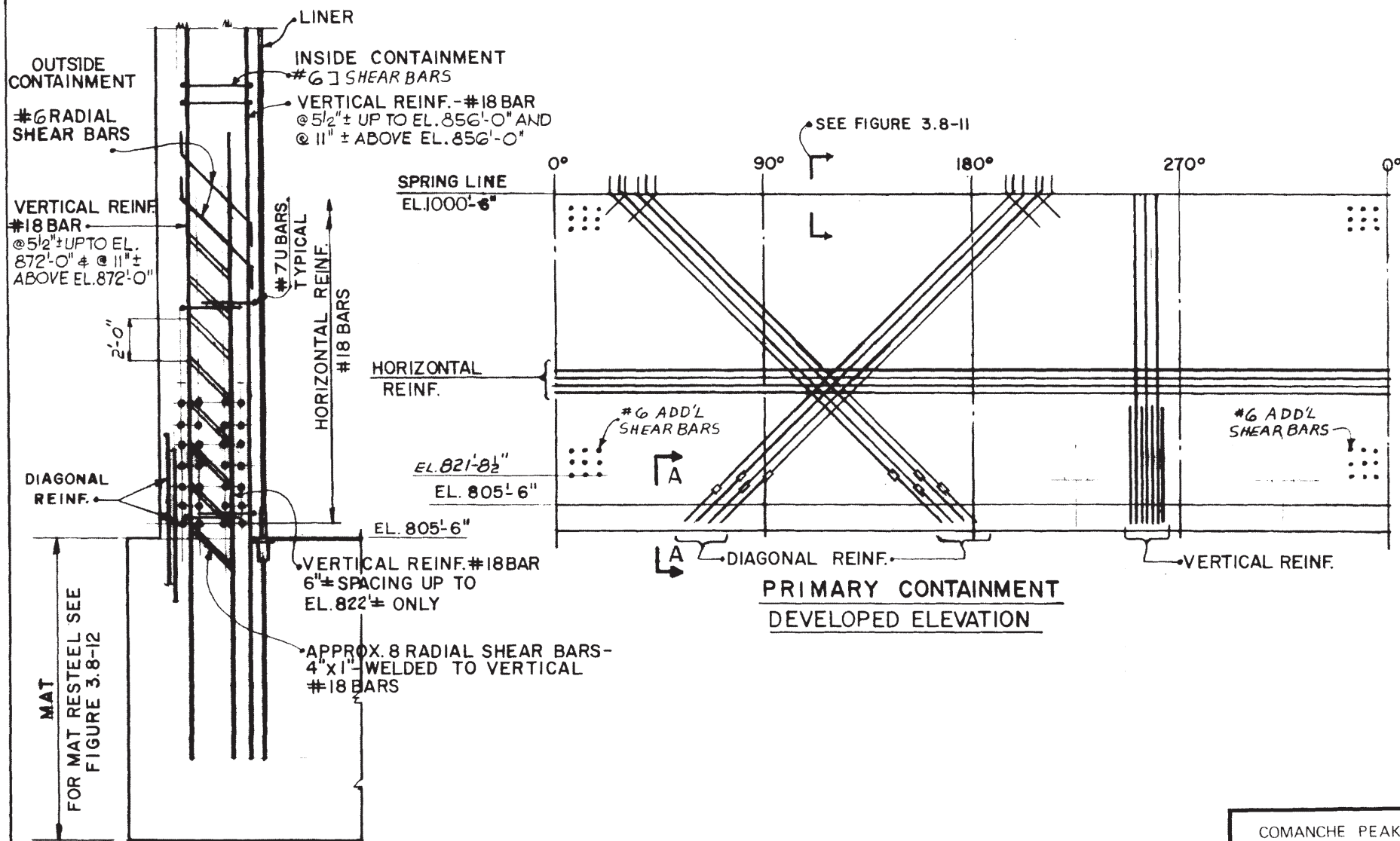
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2323-S2-0504
2323-S1-0504

**COMANCHE PEAK S.E.S
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2**

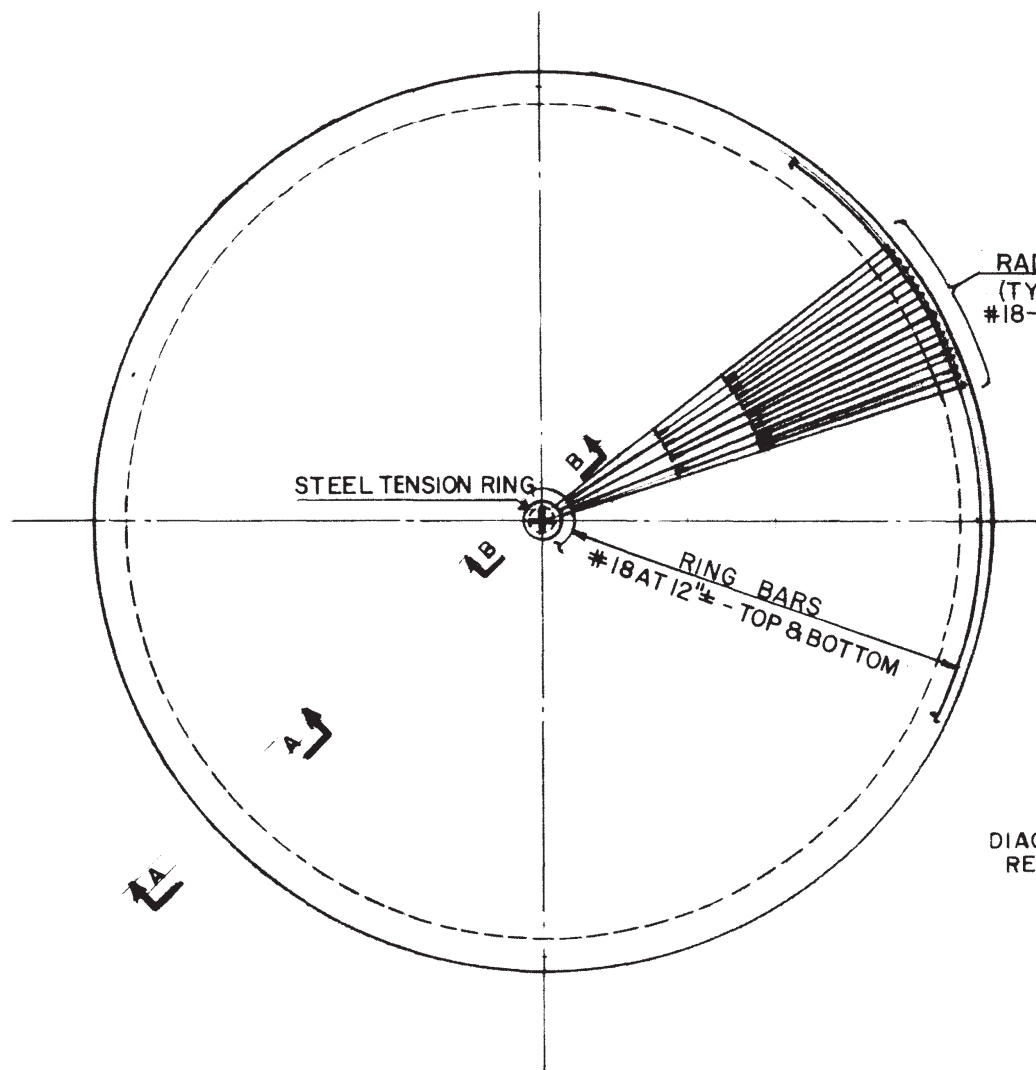
CONTAINMENT
ARRANGEMENT OF AIR LOCKS &
EQUIPMENT HATCH

FIGURE 3.8-9



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2
CONTAINMENT
TYPICAL WALL REINFORCEMENT

FIGURE 3.8-10

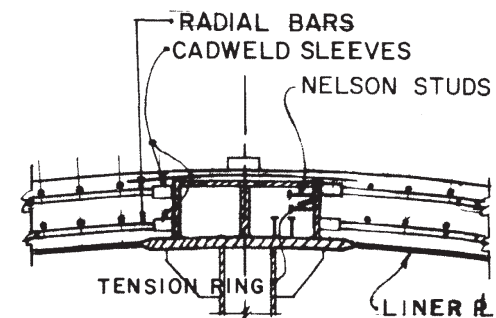


DOMES REINFORCEMENT - PLAN
SHOWING MAIN REINFORCEMENT

RADIAL BARS
(TYPICAL)
#18-TOP & BOTTOM

DIAGONAL
REINF.

SECTION A-A



SECTION B-B

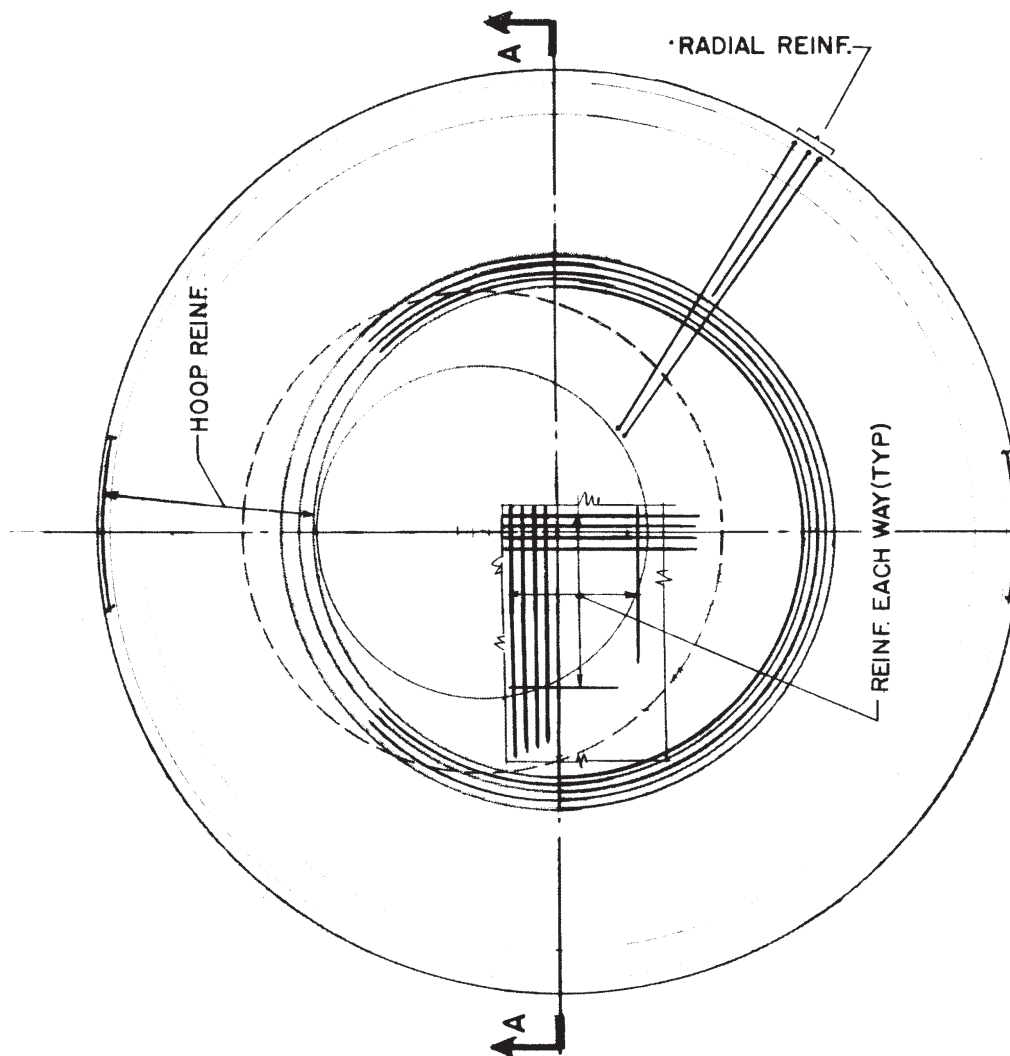
RADIAL (MERIDIONAL) BARS IN DOME ARE
CONTINUATION OF VERTICAL WALL BARS

SPRING LINE

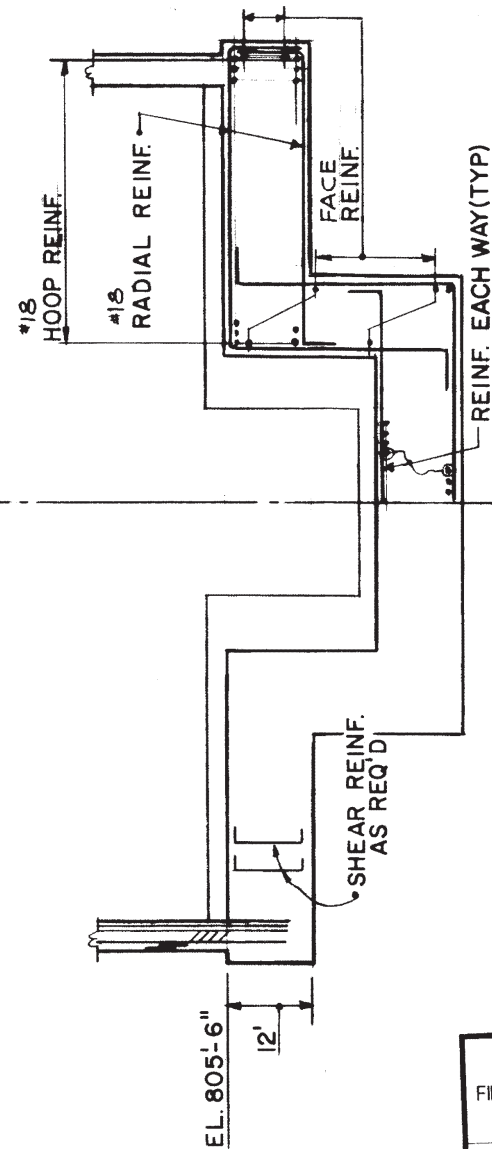
LINER

FOR TYPICAL MAIN WALL REINF.
SEE FIGURE 3.8-10

COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2 CONTAINMENT TYPICAL DOME REINFORCEMENT FIGURE 3.8-11



ARRANGEMENT OF
MAT REINFORCEMENT - PLAN

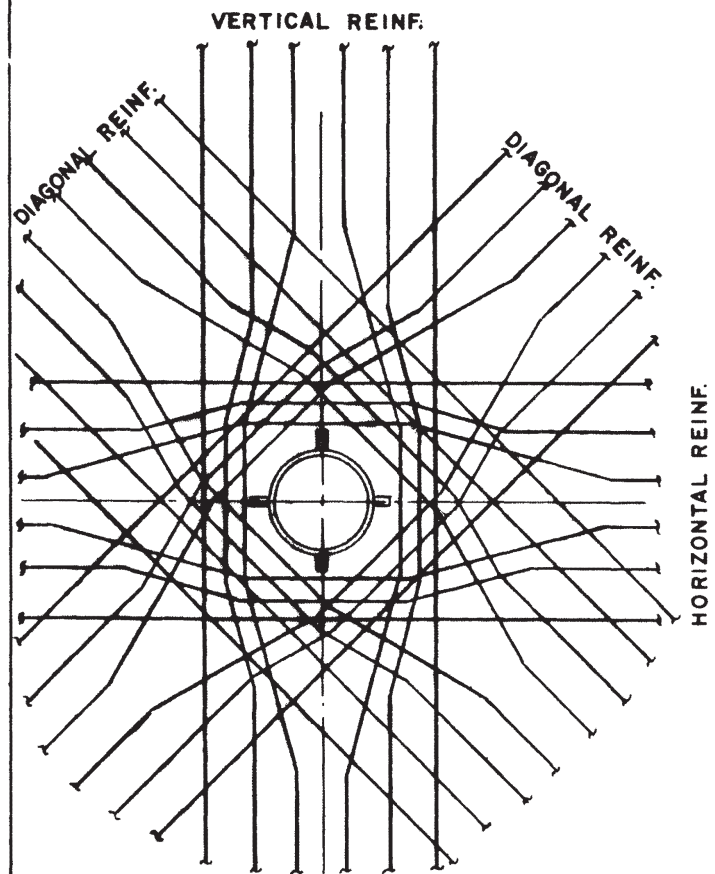


SECTION A-A

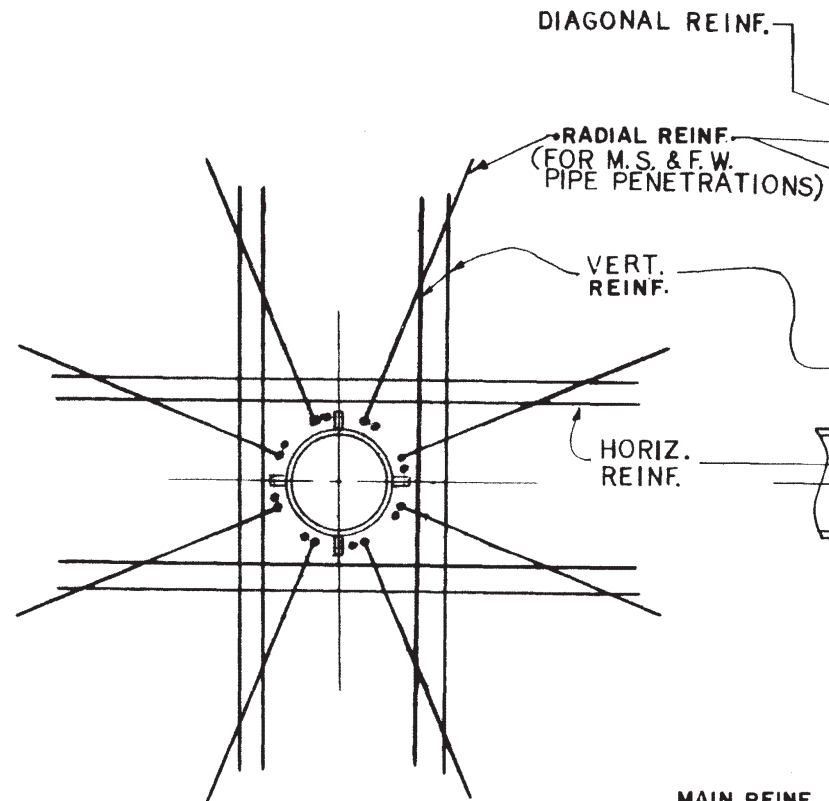
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

CONTAINMENT
TYPICAL MAT REINFORCEMENT

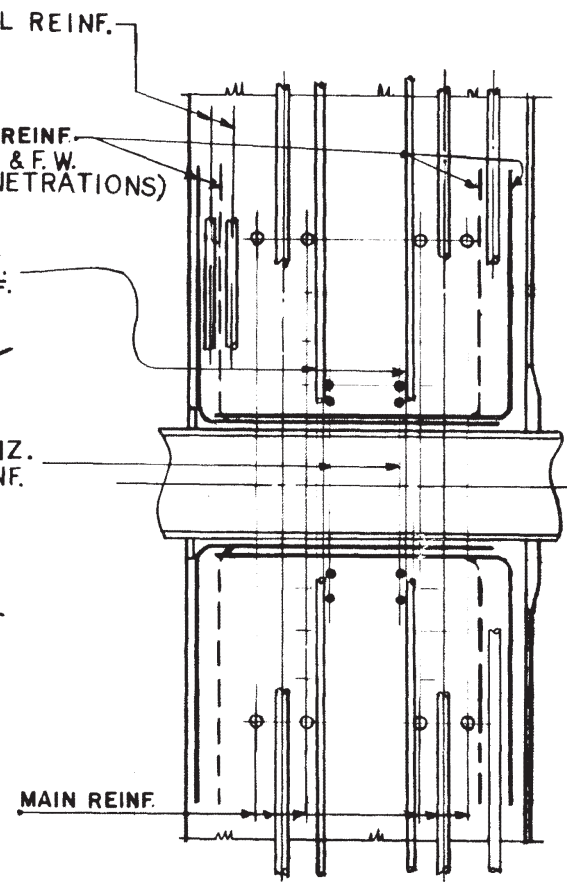
FIGURE 3.8-12



ELEVATION
MAIN REINF.



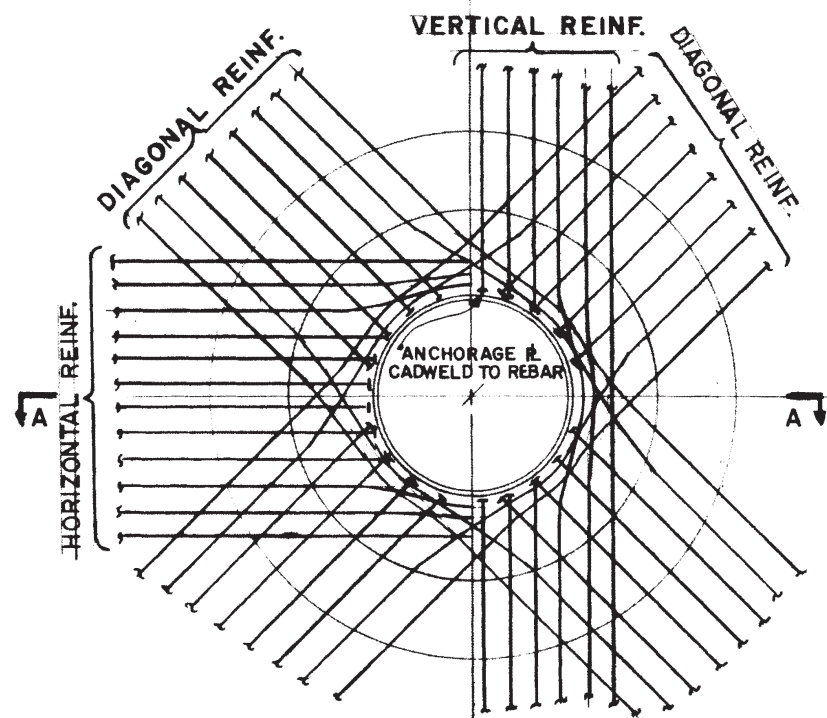
ELEVATION
SECONDARY REINF.



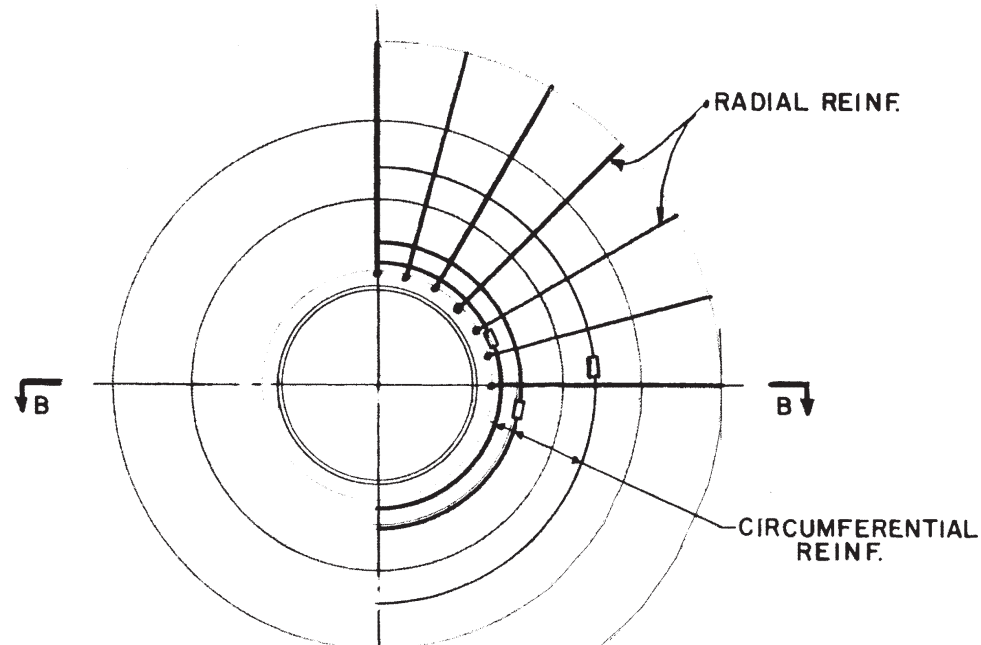
SECTION

REINFORCEMENT FOR PIPE PENETRATIONS

COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
CONTAINMENT TYPICAL REINFORCEMENT AT PENETRATIONS
FIGURE 3.8-13



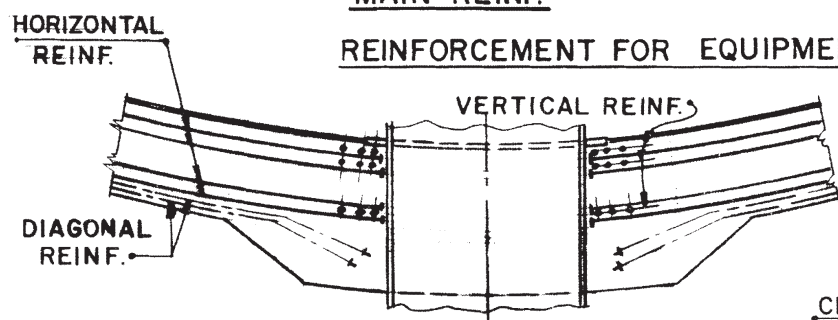
ELEVATION
MAIN REINF.



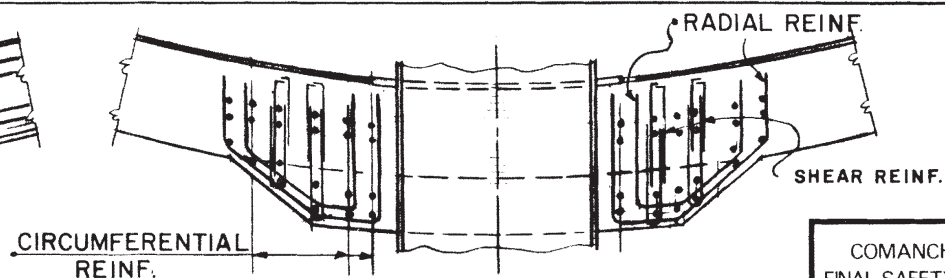
ELEVATION
SECONDARY REINF.

REINFORCEMENT FOR EQUIPMENT HATCH

PERSONNEL AIR LOCK & EMERGENCY AIR LOCK



SECTION A-A

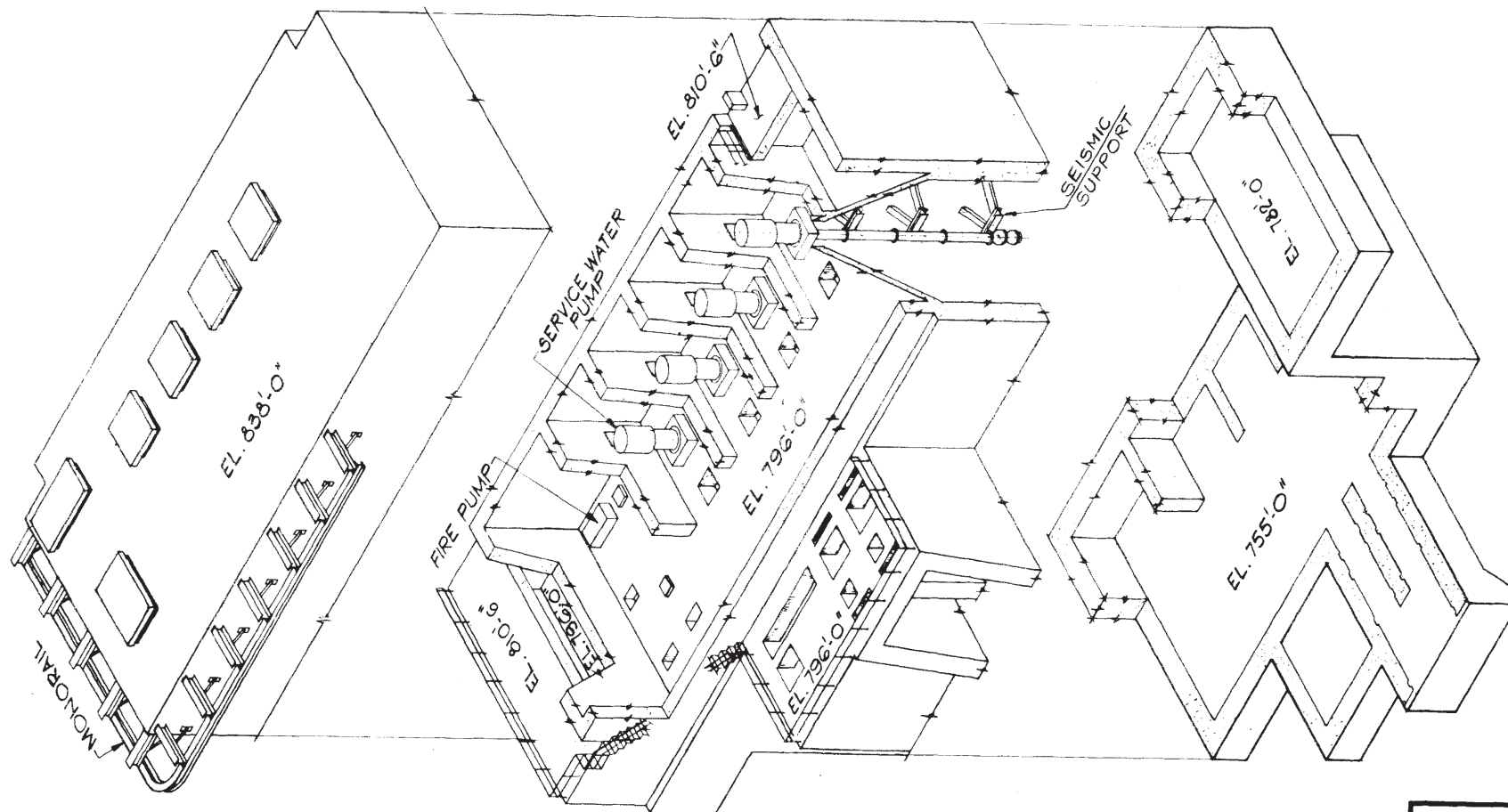


SECTION B-B

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2
CONTAINMENT
TYPICAL REINFORCEMENT AT
AIRLOCK & EQUIPMENT HATCH
FIGURE 3.8-14



FIGURE 3.8-15

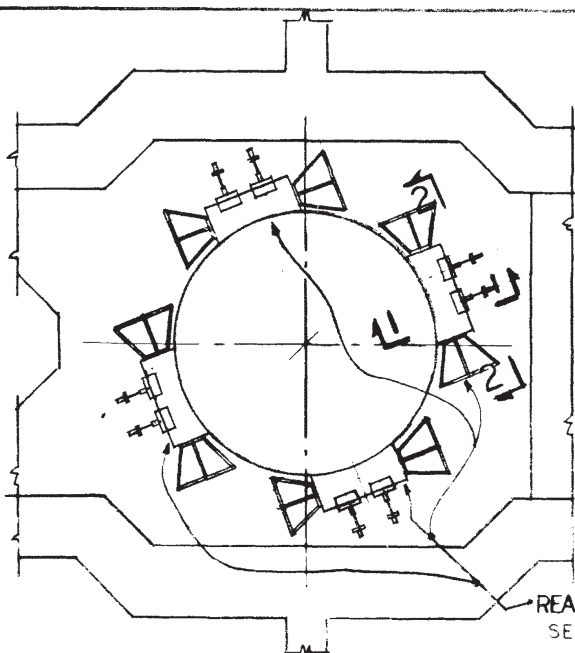


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UNITS 1 and 2

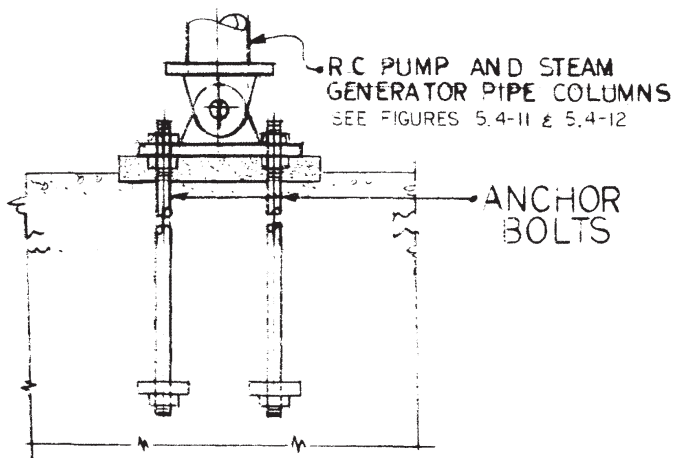
SERVICE WATER INTAKE
STRUCTURE

FIGURE 3.8-16



REACTOR SUPPORTS
SEE FIG. 5.4-10

PLAN-REACTOR SUPPORTS

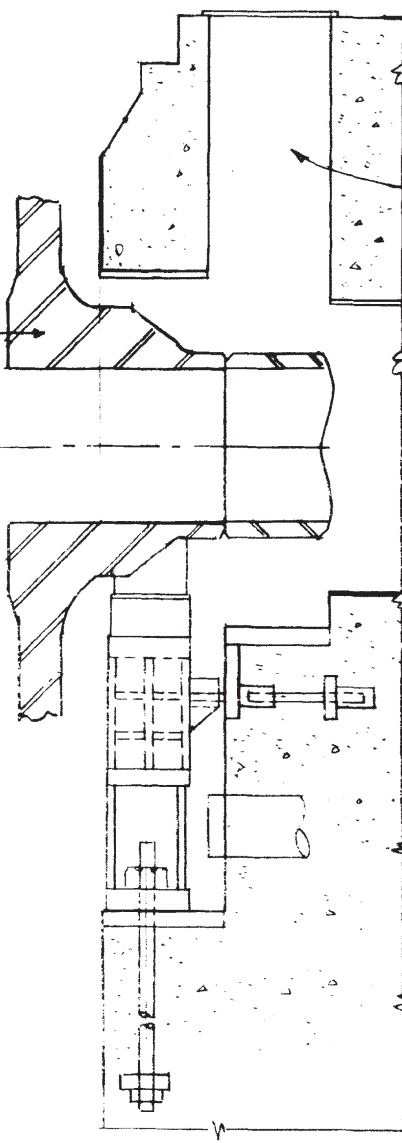


R.C. PUMP AND STEAM
GENERATOR PIPE COLUMNS
SEE FIGURES 5.4-11 & 5.4-12

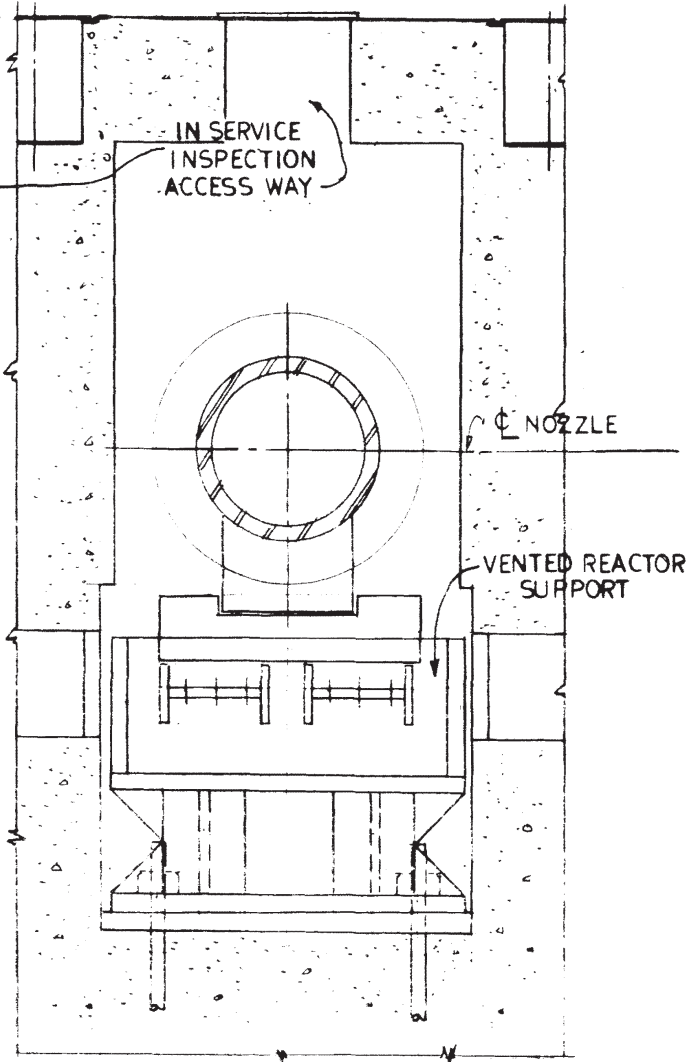
ANCHOR
BOLTS

RC PUMP & STEAM GEN. VERTICAL SUPPORTS

REACTOR



SECTION 1-1



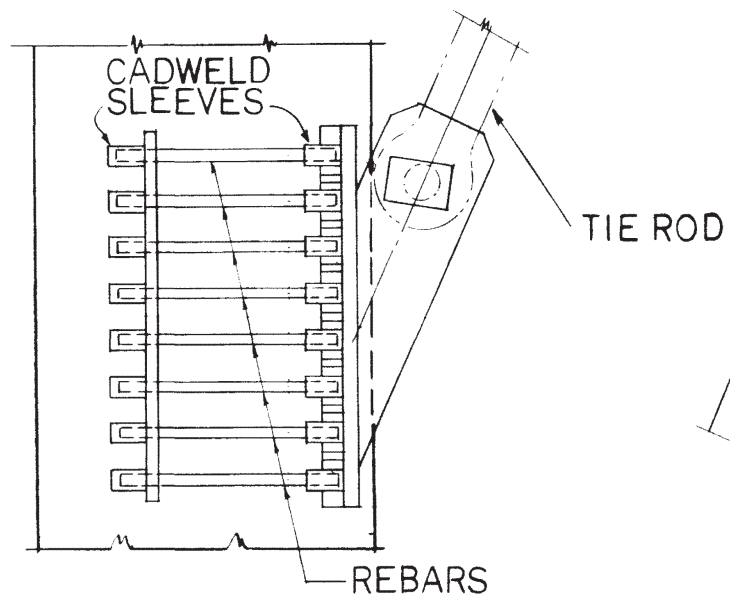
IN SERVICE
INSPECTION
ACCESS WAY

NOZZLE

VENTED REACTOR
SUPPORT

SECTION 2-2

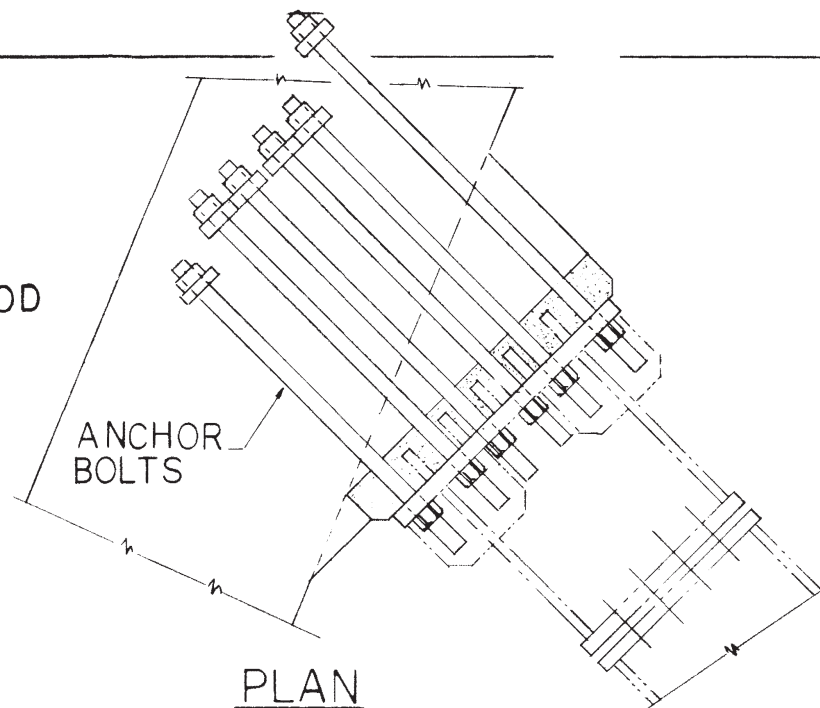
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2
REACTOR SUPPORTS
R.C. PUMP & S.G. VERT. SUP'TS
FIGURE 3.8-17



PLAN

TYPICAL R.C. PUMP TIE ROD SUPPORT

(SEE FIG. 5.4-12)



PLAN

STEAM GEN. LOWER LATERAL SUPPORT

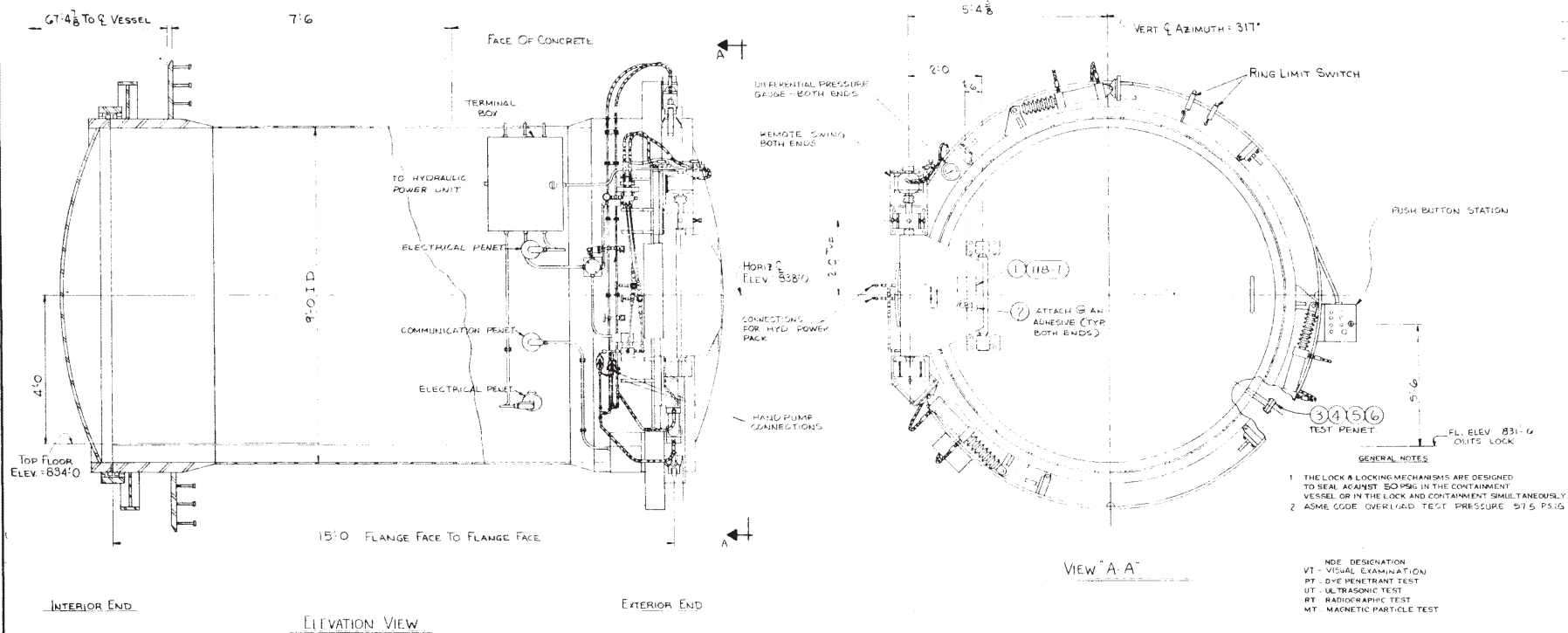
(SEE FIG. 5.4-11)

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

R.C. PUMP TIE ROD SUP'T
S.G. LOWER LATERAL SUP'T

FIGURE 3.8-18

FIGURE 3.8-19a
HAS BEEN DELETED

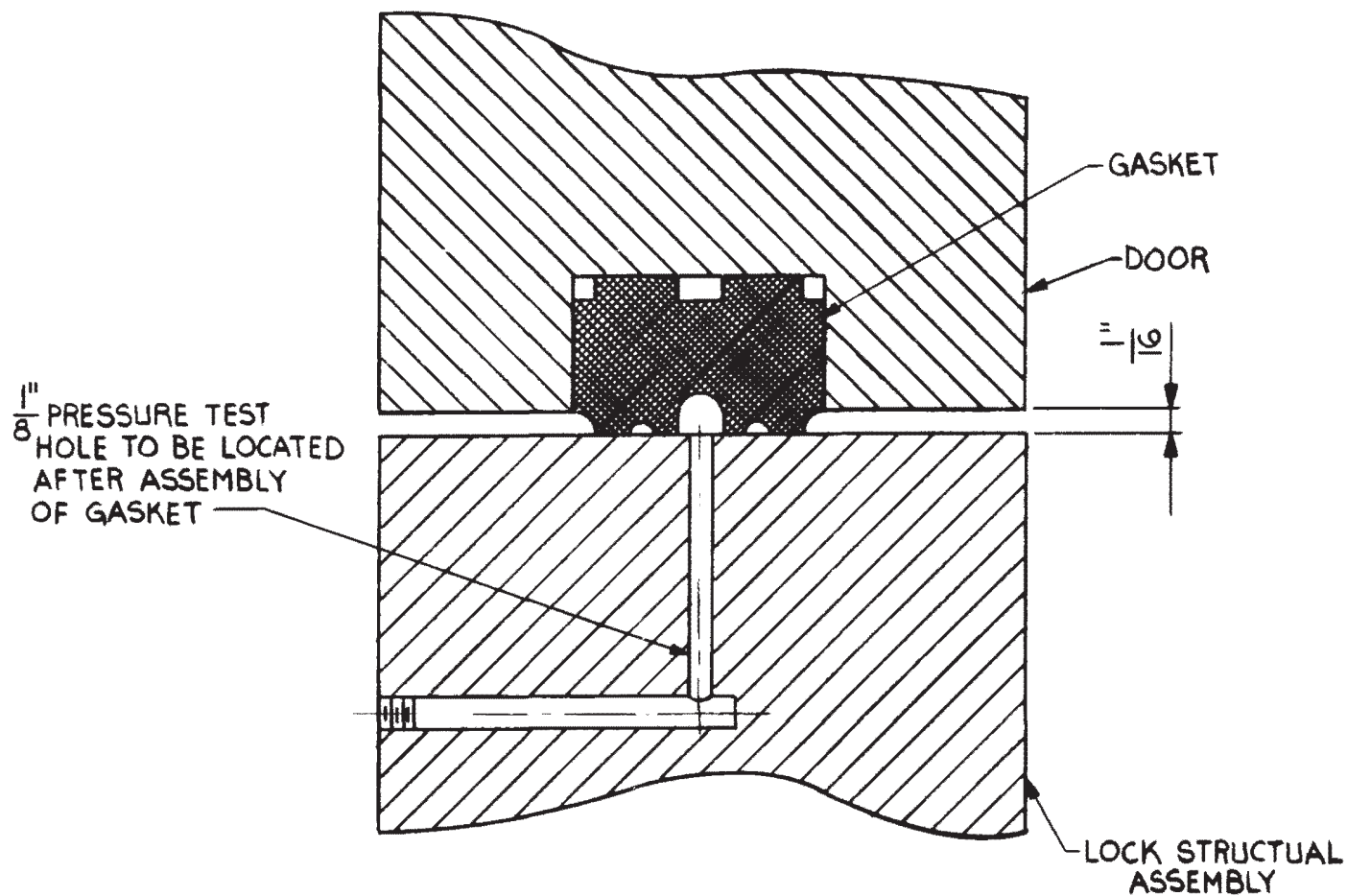


COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

GENERAL ARRANGEMENT
PERSONNEL AIR LOCK

FIGURE 3.8-20

AMENDMENT 5
MARCH 30, 1979



NOTE:
GASKET CONFIGURATION
PAT #3,831,950

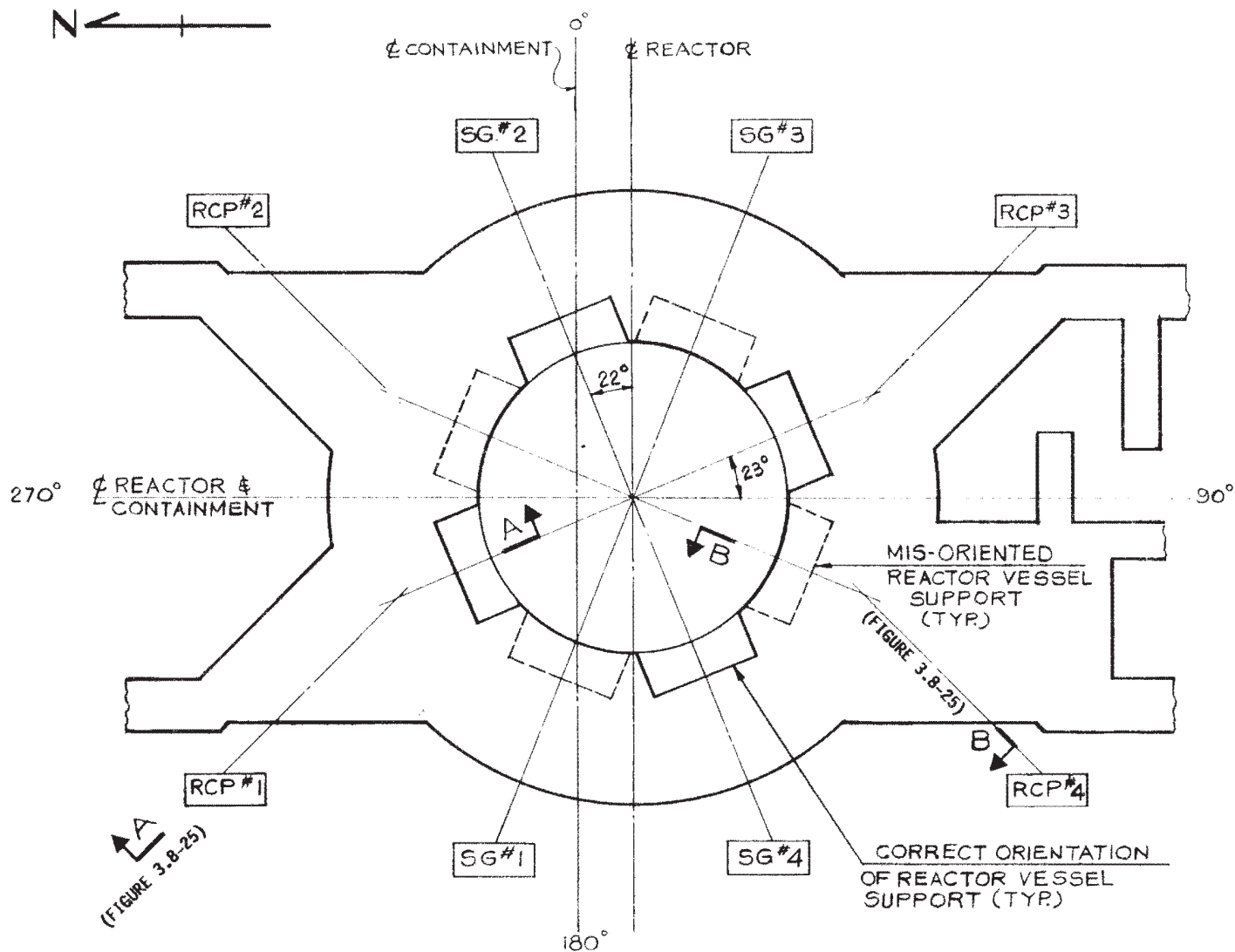
AMENDMENT 5

MARCH 30, 1979

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

PERSONNEL AIR LOCK
GASKET TESTING ARR'G'T. SEC.

FIGURE 3.8-21

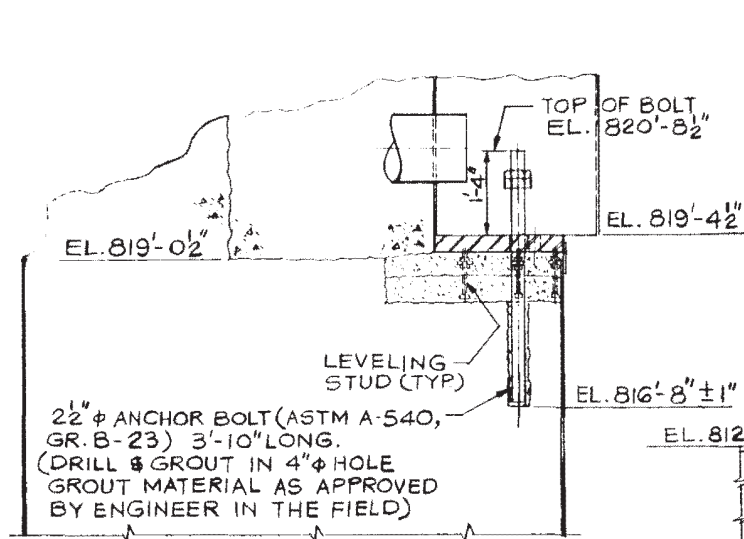


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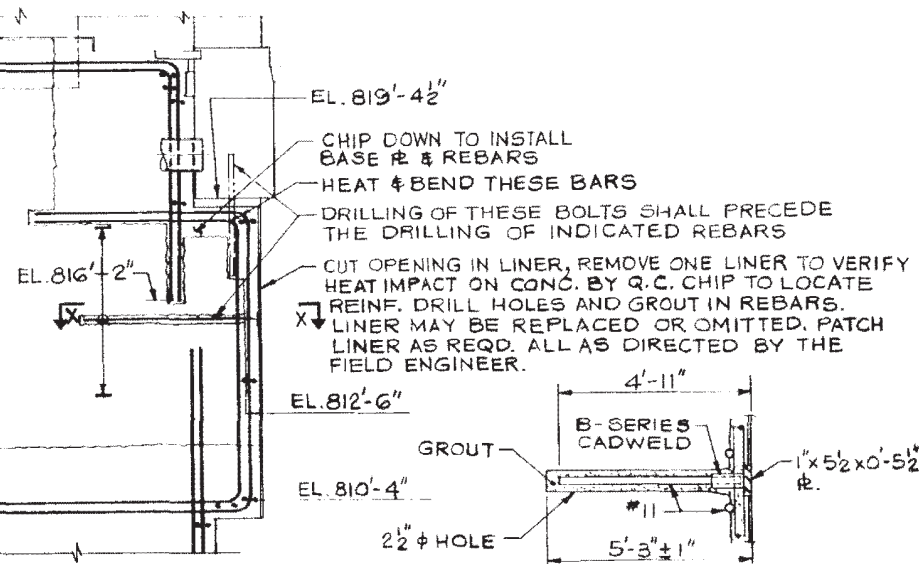
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

LOCATION OF
MIS-ORIENTED SUPPORTS

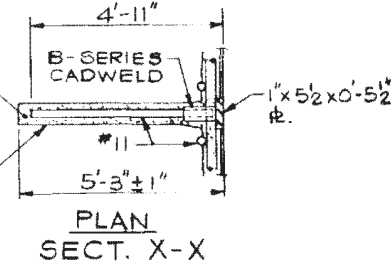
FIGURE 3.8-24



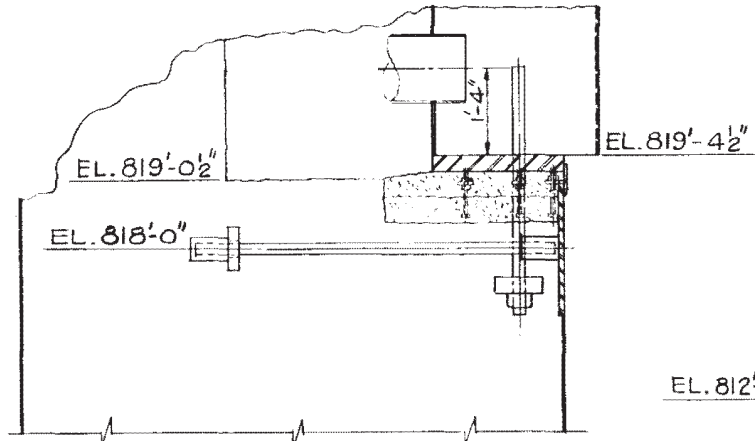
SECT. A-A (FIGURE 3.8-24)
(MASONRY)



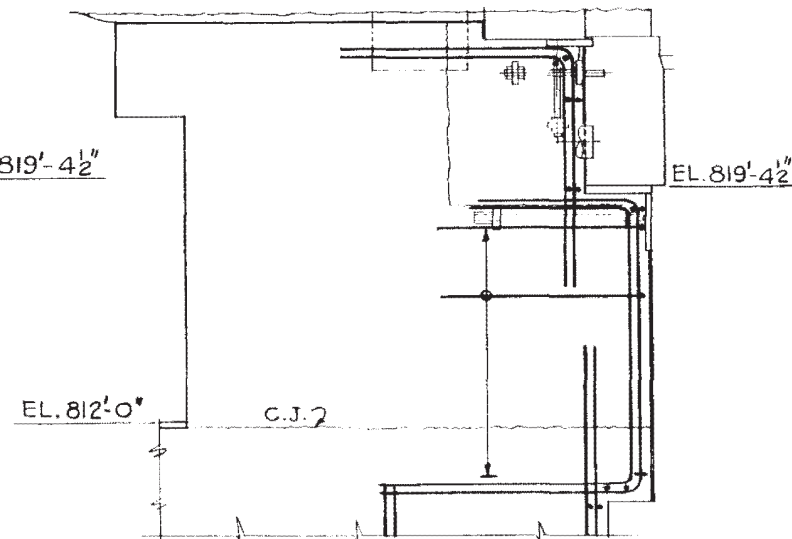
SECT. A-A (FIGURE 3.8-24)
(REINF.)



PLAN
SECT. X-X



SECT. B-B (FIGURE 3.8-24)
(MASONRY)



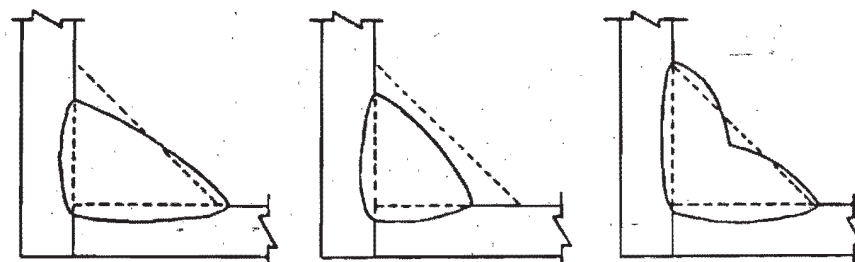
SECT. B-B (FIGURE 3.8-24)
(REINF.)

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COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

UNIT 2 REINFORCED
CONCRETE RPV SUPPORTS

FIGURE 3.8-25

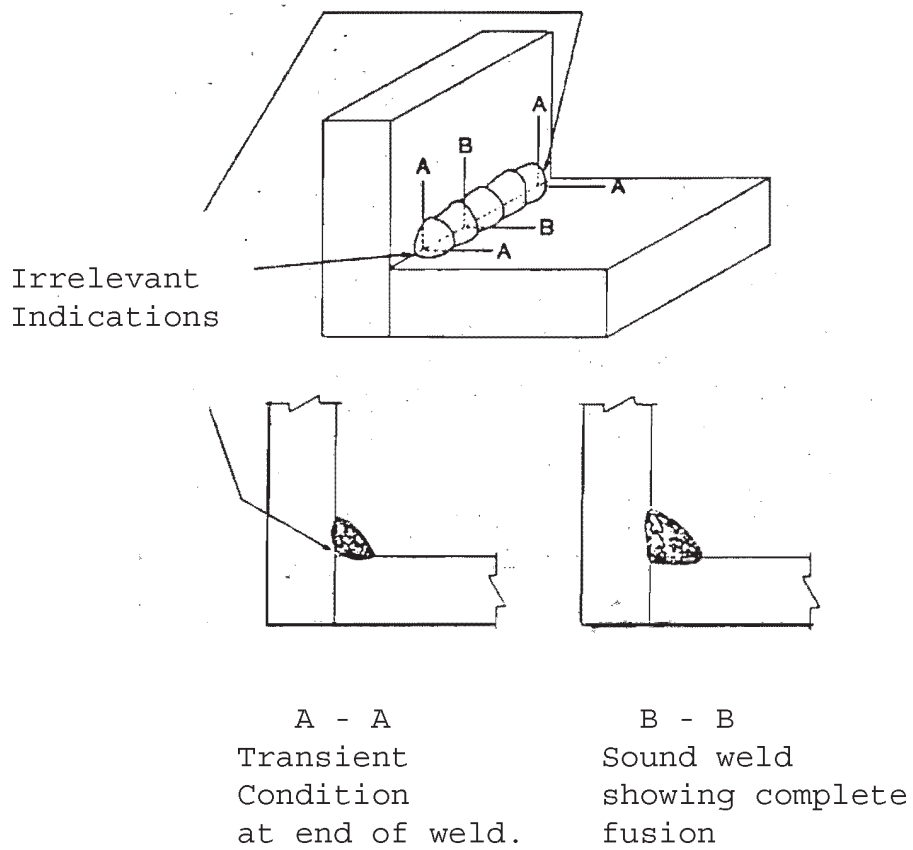


Leg

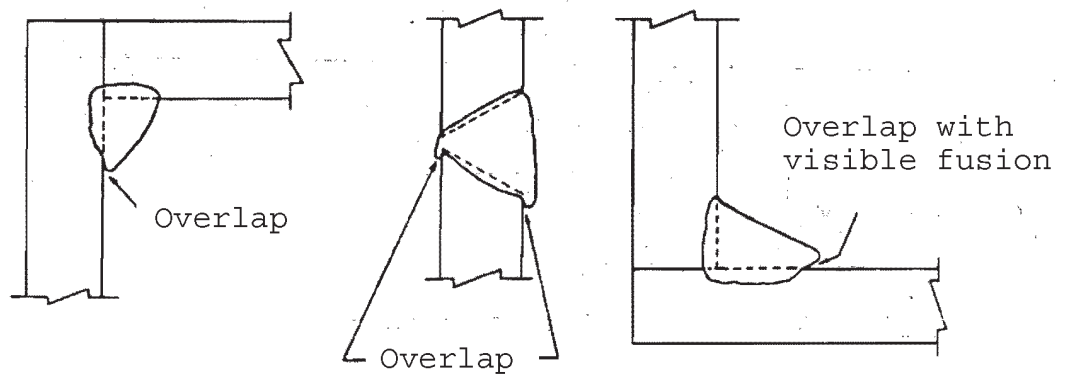
Leg & Throat

Throat

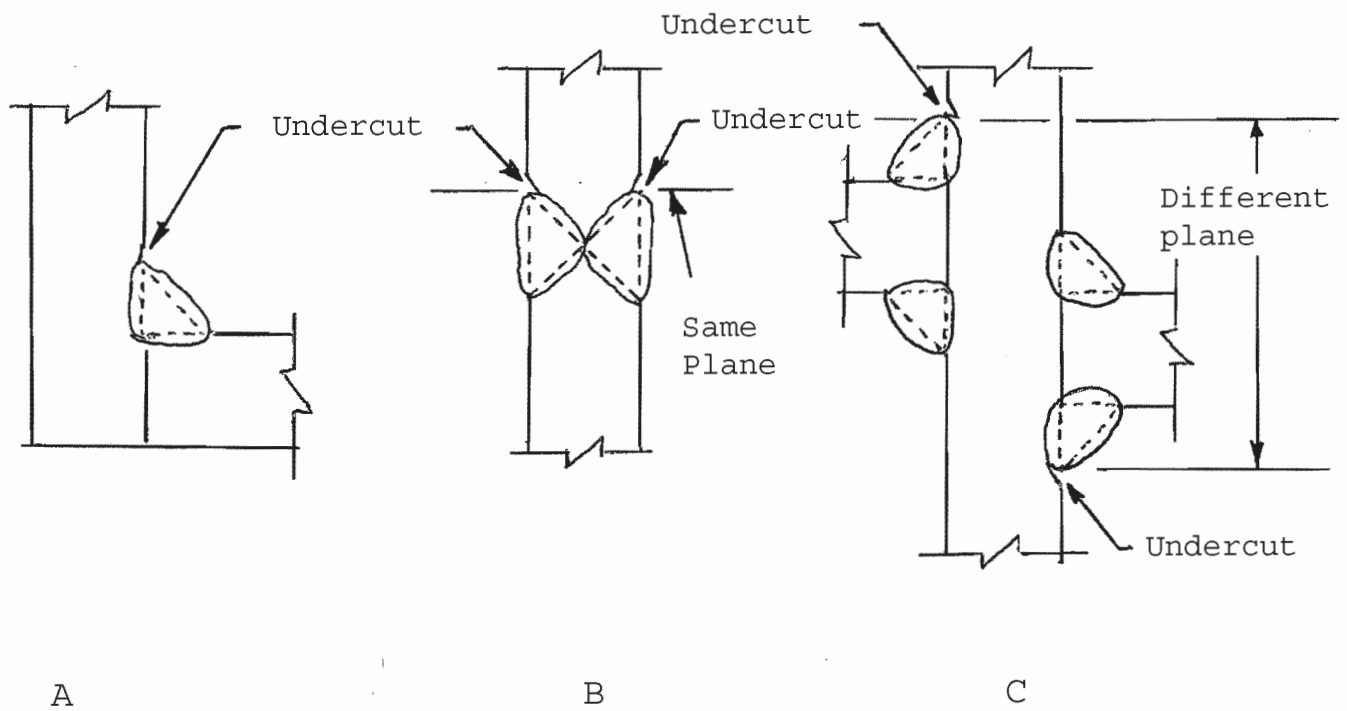
Appendix 3.8A - Figure 3-1



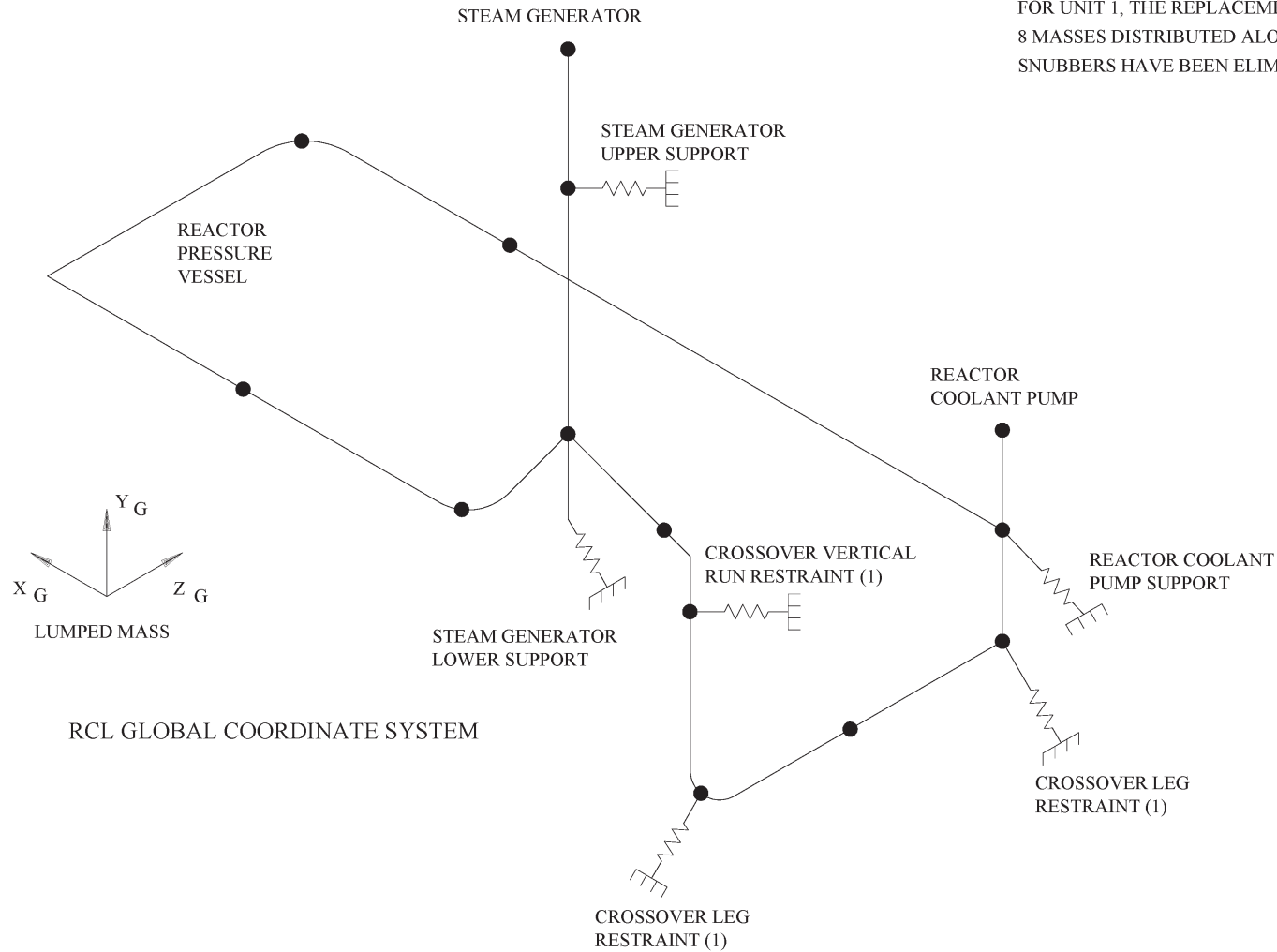
Appendix 3.8A - Figure 3-2



Appendix 3.8A - Figure 3-3



Appendix 3.8A - Figure 3-4



NOTE (1):

BASED ON GDC 4, LEAK-BEFORE-BREAK APPLICATION
(SECTION 5.4.14) THE LOOP RESTRAINTS ARE NOT
REQUIRED AND MAY BE ELIMINATED.

NOTE:

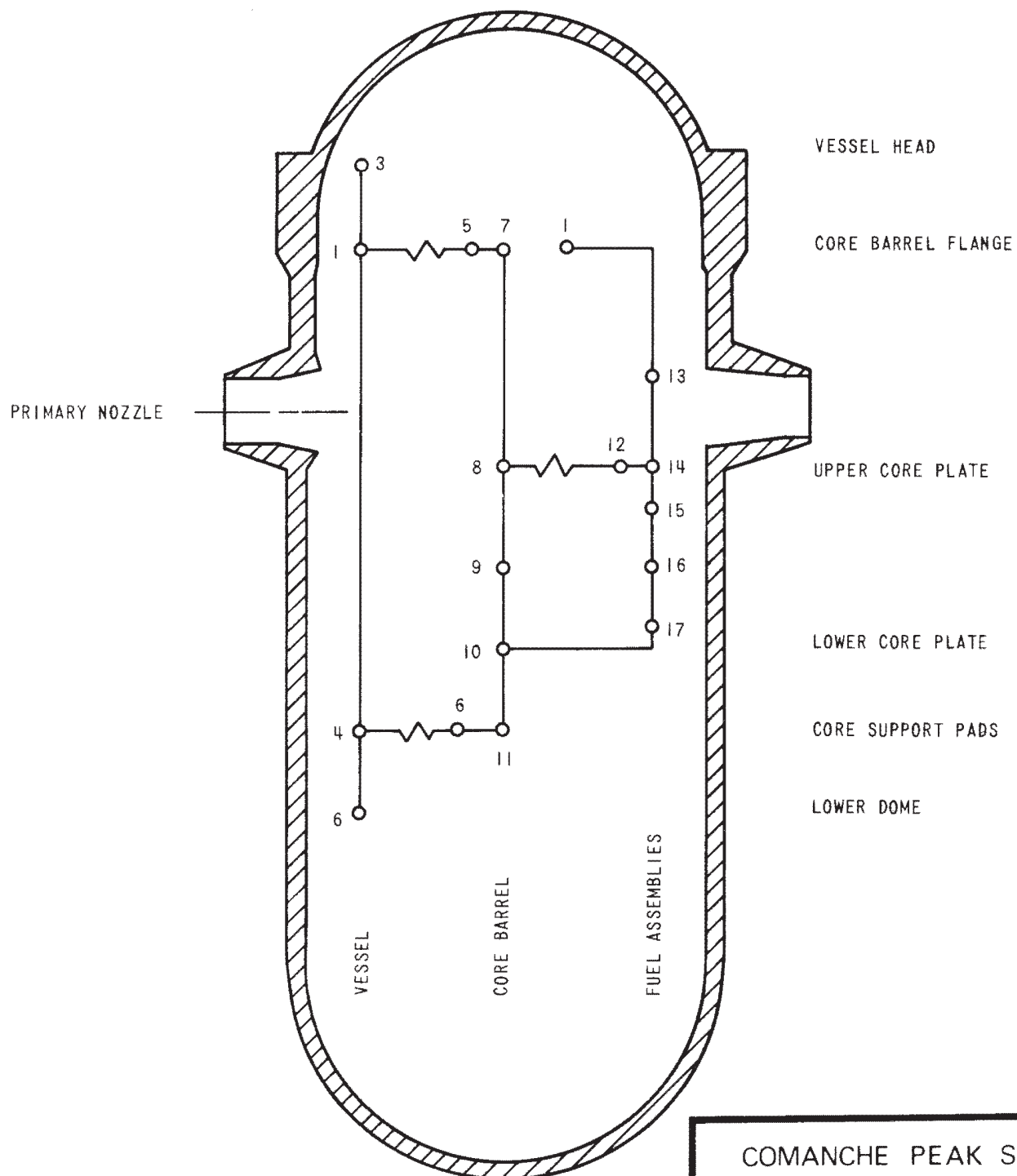
FOR UNIT 1, THE REPLACEMENT STEAM GENERATOR ACTUALLY HAS
8 MASSES DISTRIBUTED ALONG THE VERTICAL CENTERLINE, AND THE
SNUBBERS HAVE BEEN ELIMINATED FROM THE UPPER SUPPORT.

Amendment 102

COMANCHE PEAK S E S
FINAL SAFETY ANALYSIS REPORT
UNITS 1 AND 2

REACTOR COOLANT LOOP SUPPORTS
SYSTEM, DYNAMIC STRUCTURAL
MODEL

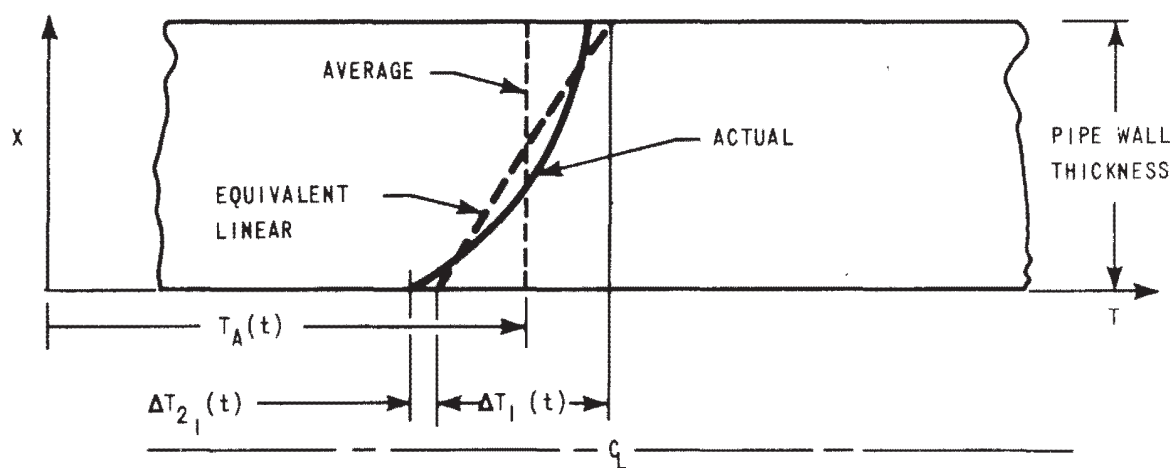
FIGURE 3.9N-1



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

Reactor Pressure Vessel
Lumped Mass Model

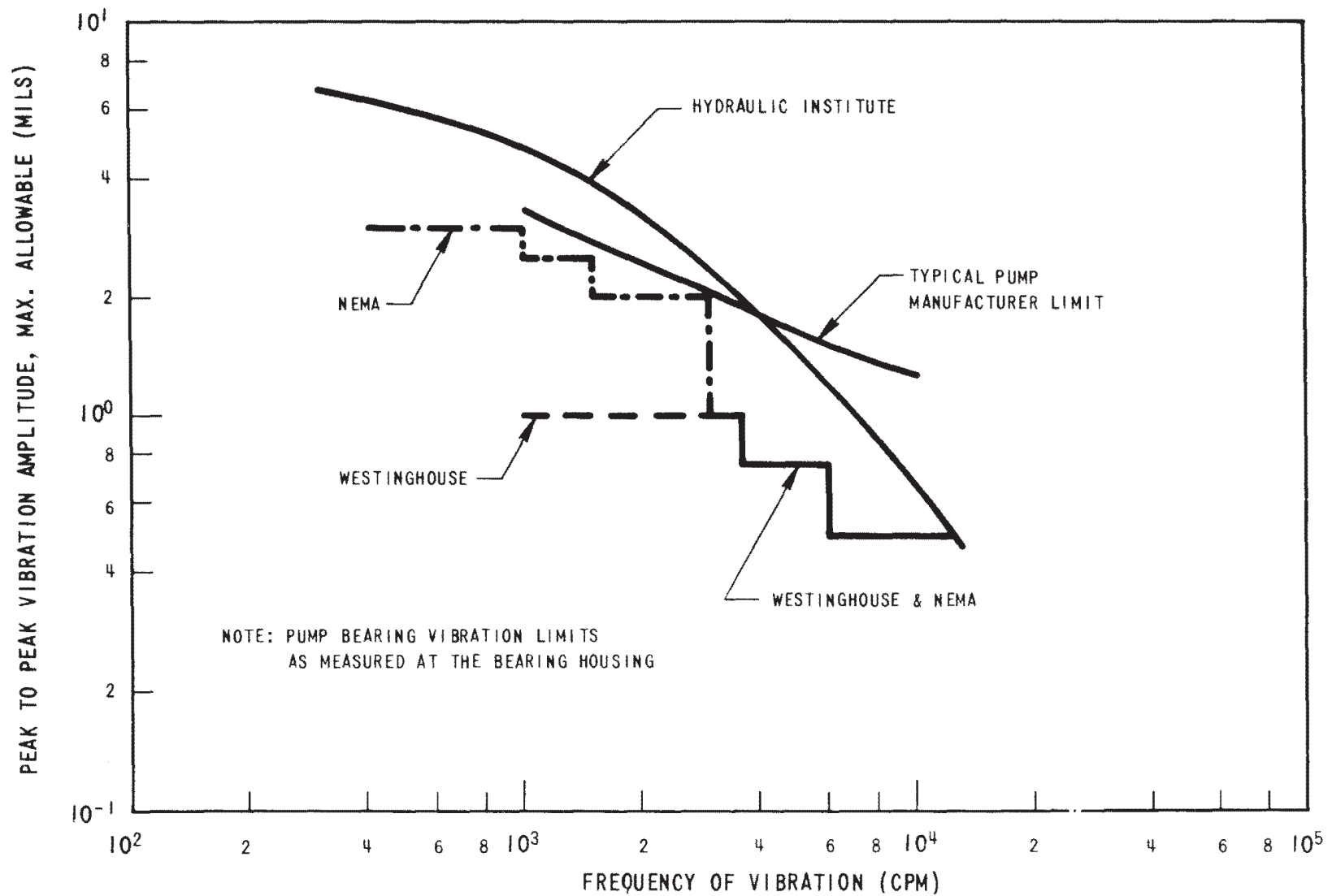
FIGURE 3.9N-2



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

Through-Wall Thermal
Gradients

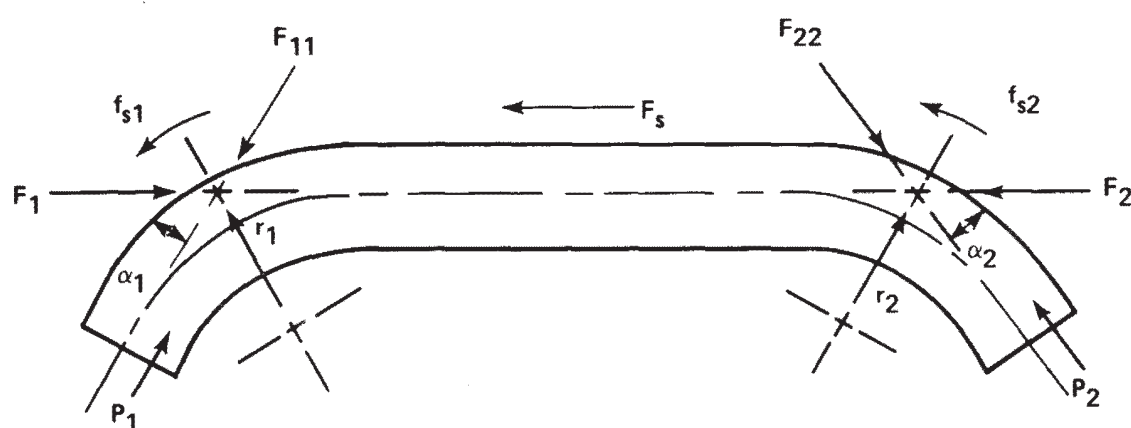
FIGURE 3.9N-3



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

Westinghouse Pump Bearing
Vibration Limits Compared
to Industry Standards

FIGURE 3.9N-4

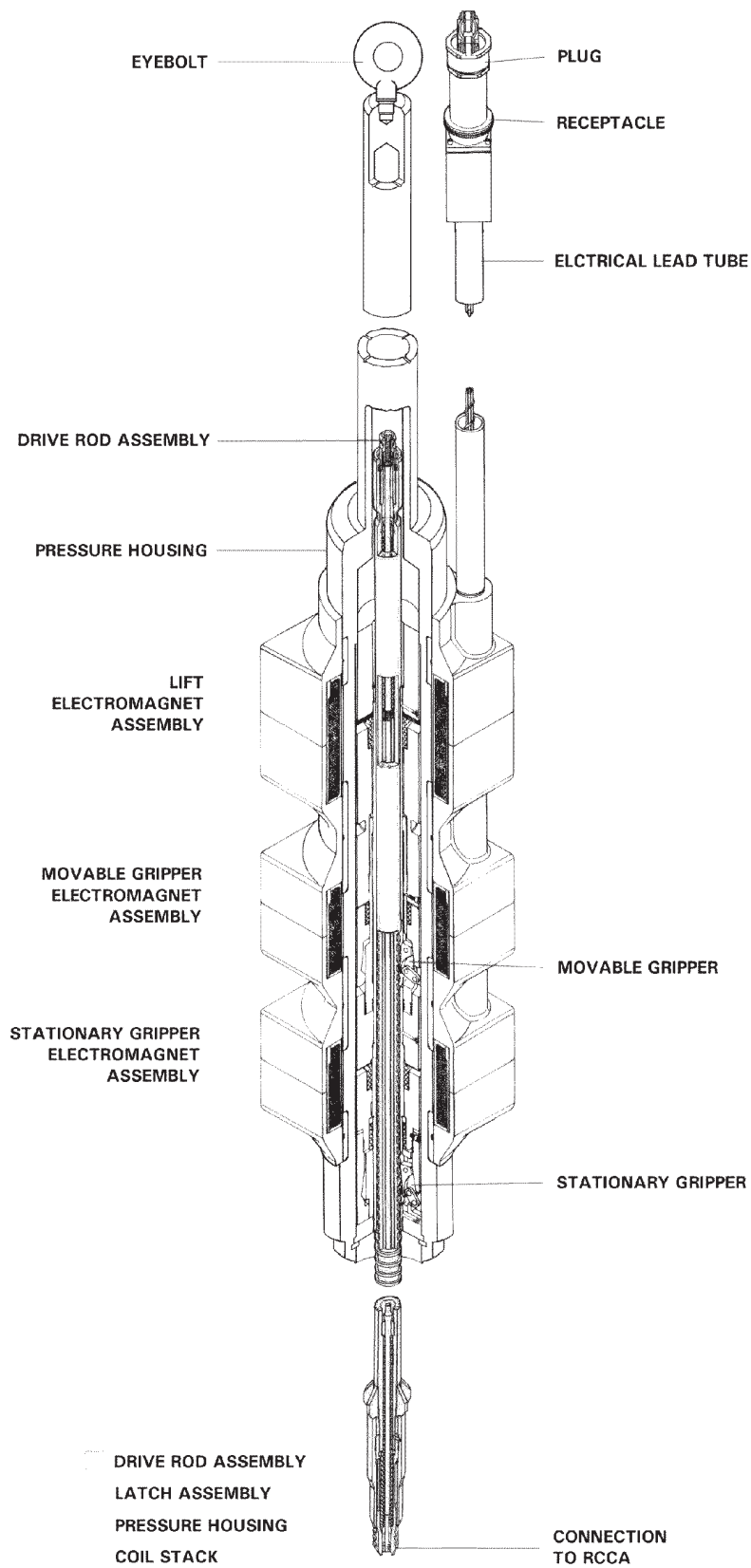


AMENDMENT 21
MAY 21, 1981

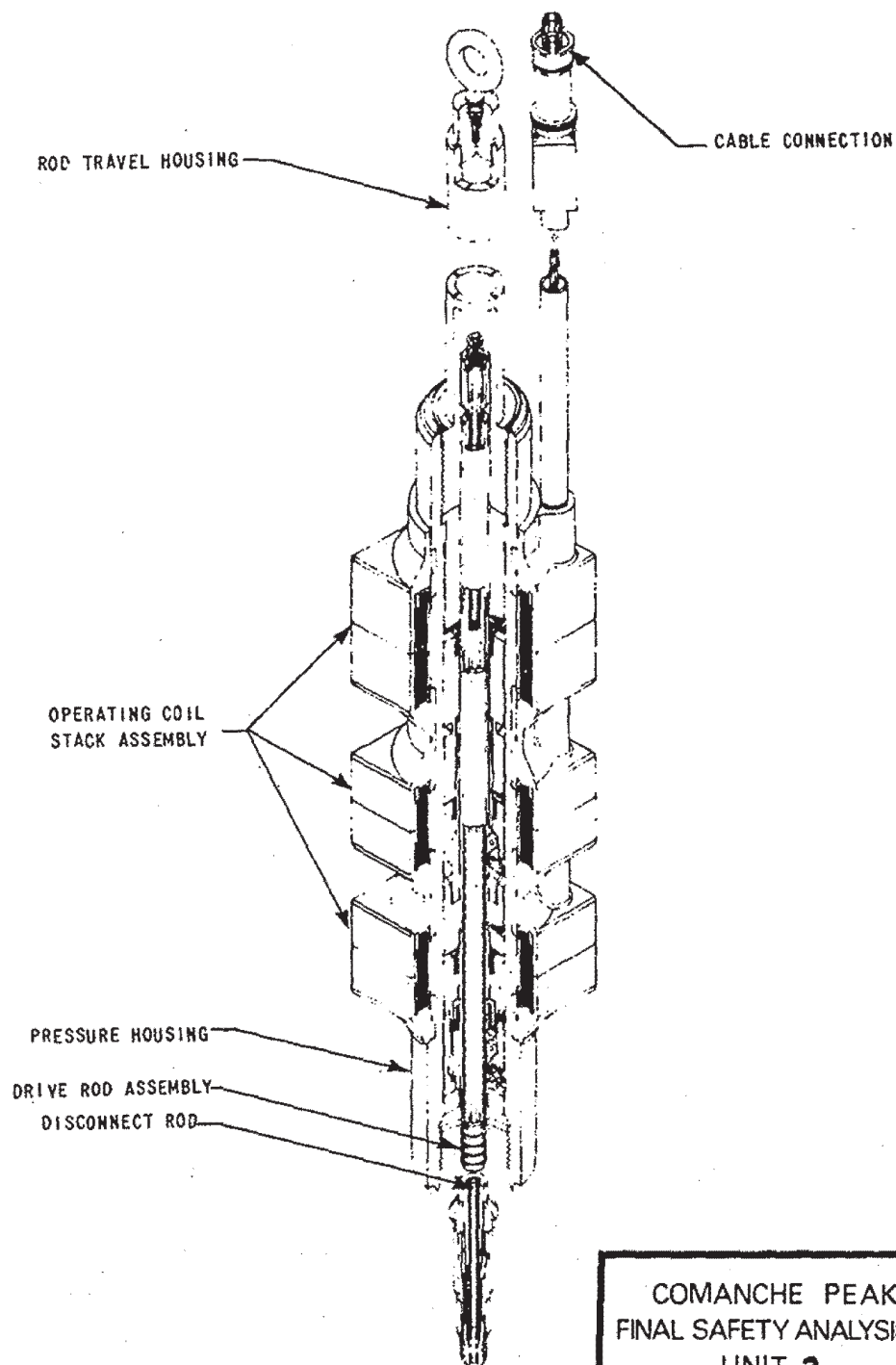
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

Control Volume for Momentum Equation

FIGURE 3.9N-4a.



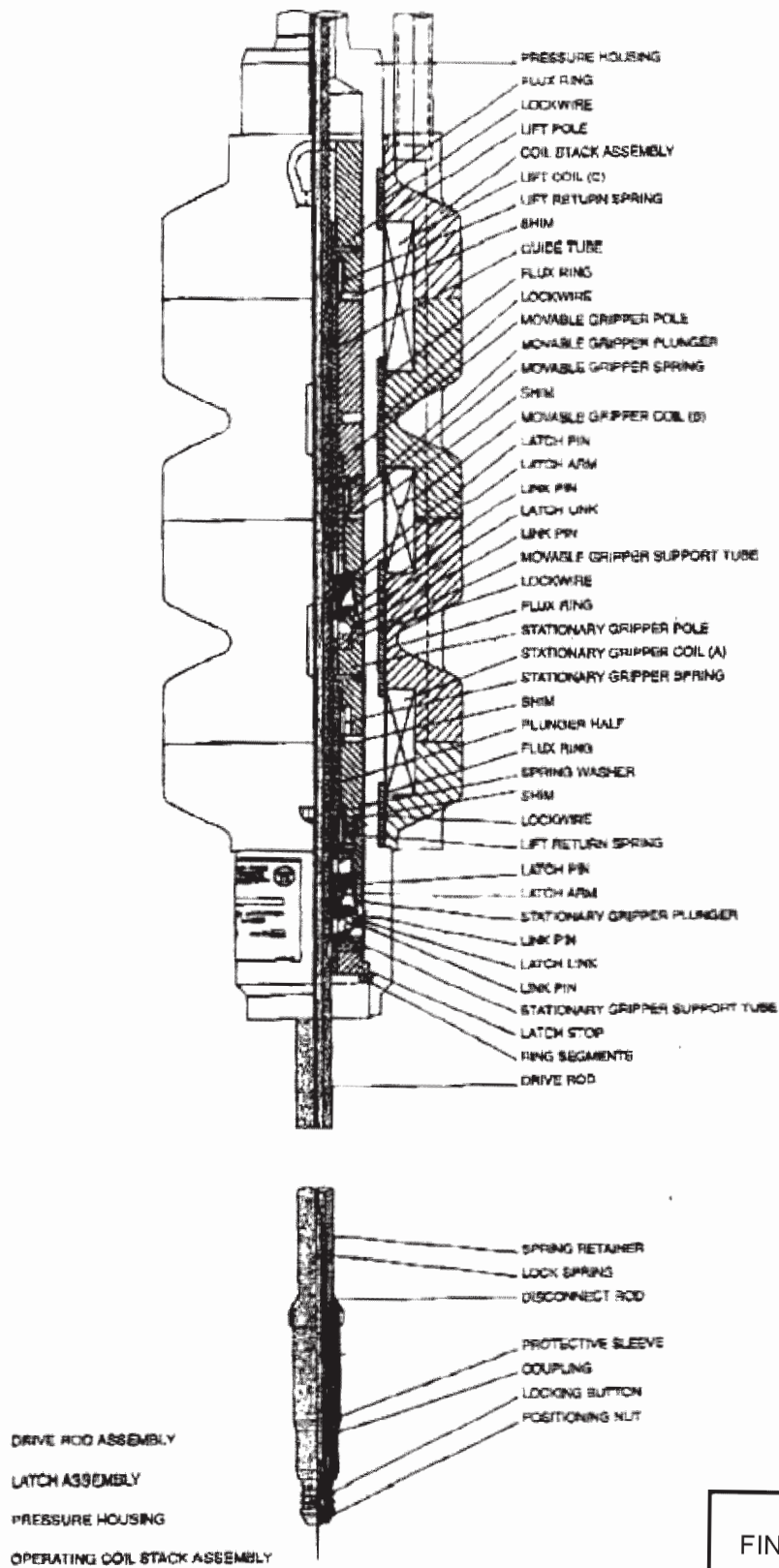
COMANCHE PEAK S.E.S FINAL
SAFETY ANALYSIS REPORT
UNIT 1
FULL LENGTH CONTROL ROD
DRIVE MECHANISM
FIGURE 3.9N-5A



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNIT 2

Full Length Control Rod
Drive Mechanism

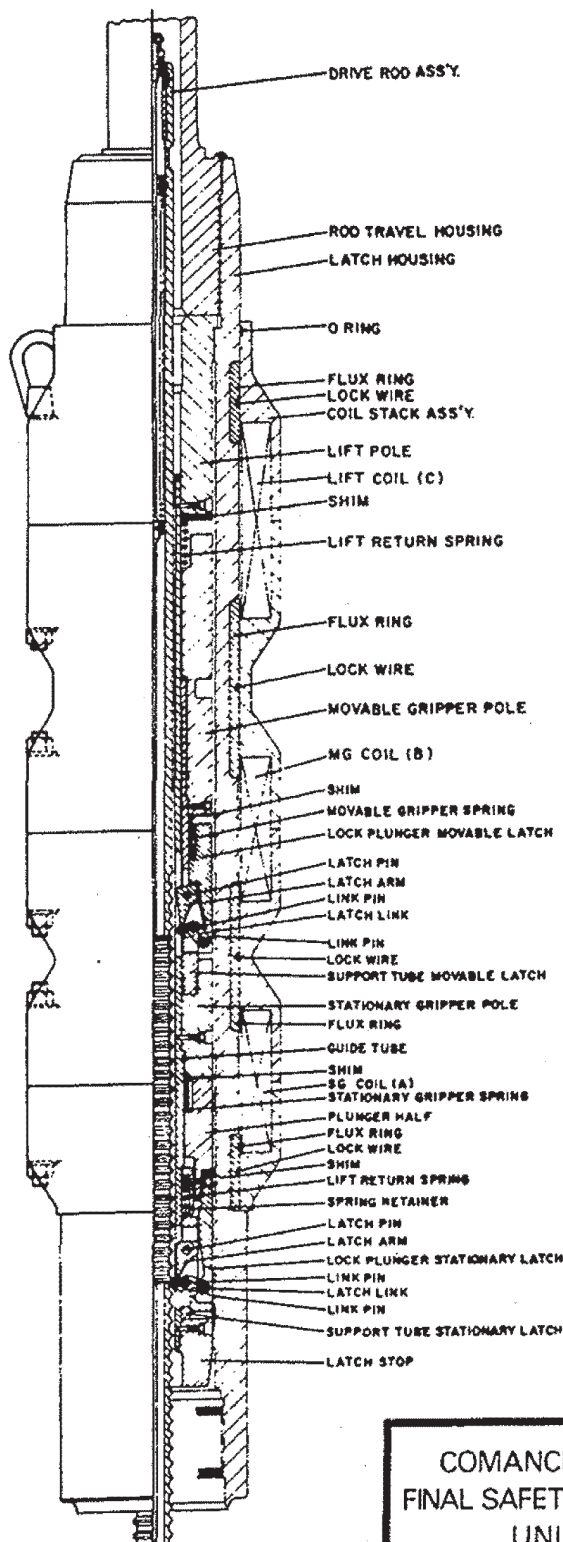
FIGURE 3.9N-5B



Amendment 102

COMANCHE PEAK S.E.S
 FINAL SAFETY ANALYSIS REPORT
 UNIT 1
 Full Length Control Rod Drive
 Mechanism Schematic
 FIGURE 3.9N-6A

4026-303

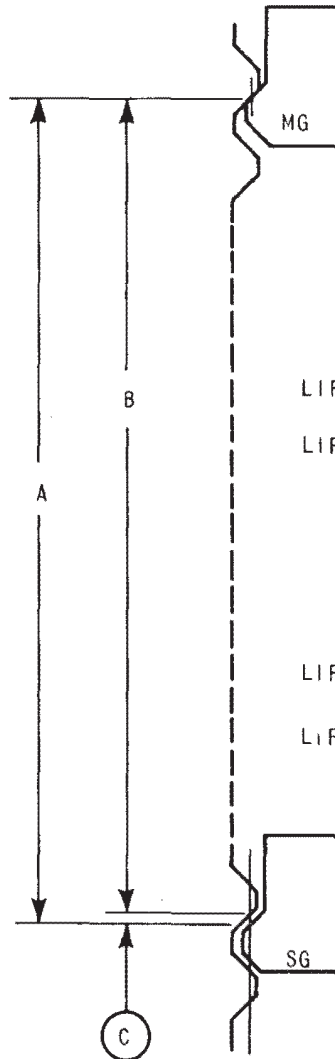


COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNIT **2**

Full Length Control Rod
Drive Mechanism Schematic

FIGURE 3.9N-6 B

BEFORE LOAD TRANSFER



LIFT COIL OFF

LIFT COIL ON

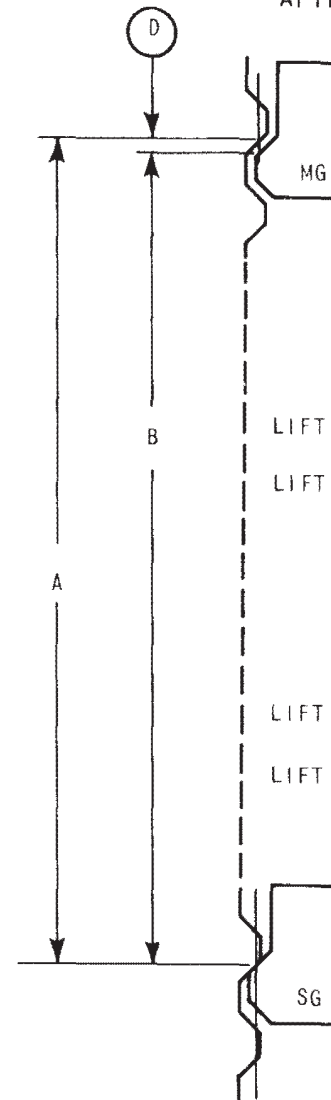
AT 70°		
A	B	C
15.640	15.625	0.015
16.265	16.250	0.015

LIFT COIL OFF

LIFT COIL ON

AT 650°		
A	B	C
15.725	15.679	0.046
16.375	16.387	0.068

AFTER LOAD TRANSFER



LIFT COIL OFF

LIFT COIL ON

AT 70°		
A	B	D
15.625	15.578	0.047
16.258	16.203	0.047

LIFT COIL OFF

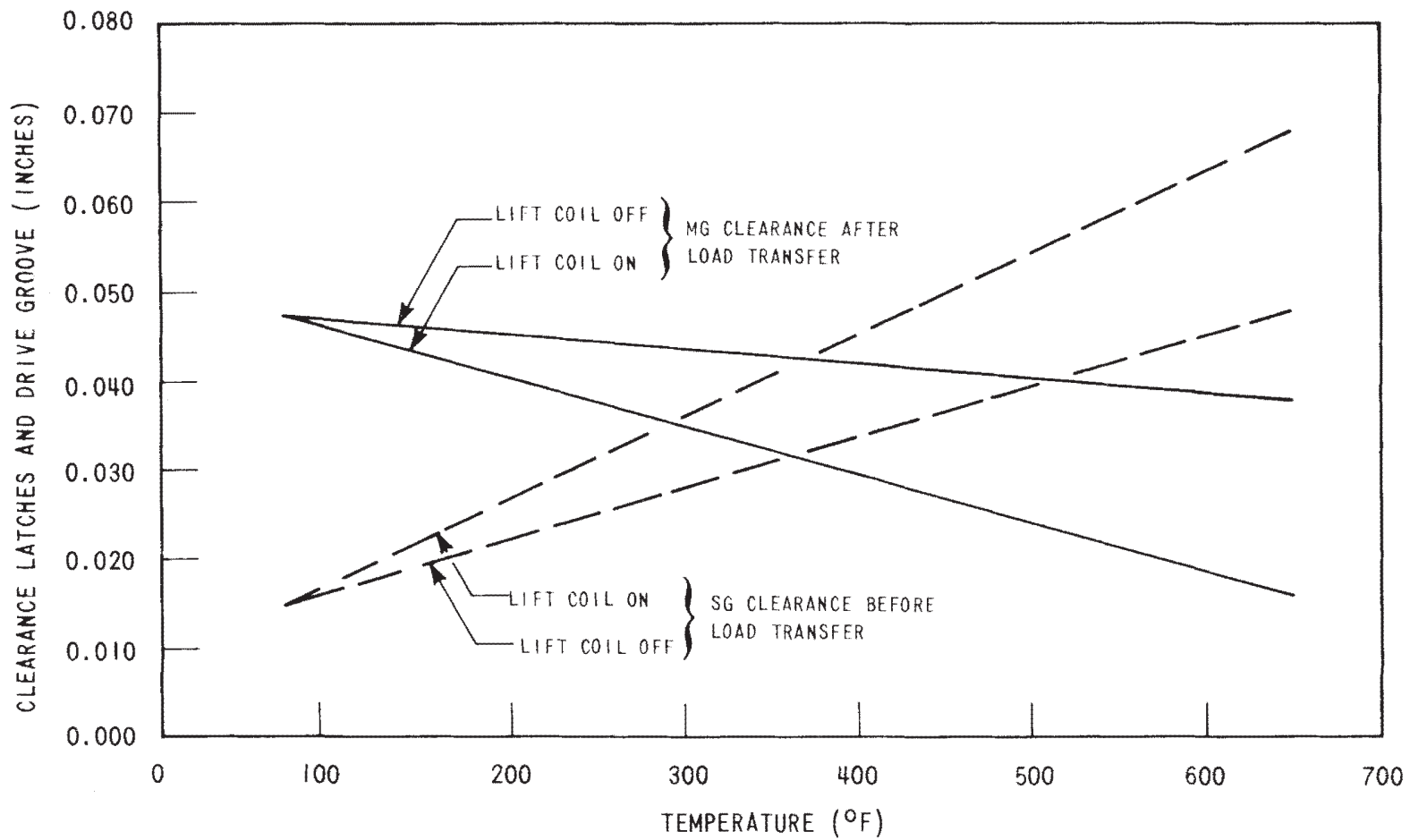
LIFT COIL ON

AT 650°		
A	B	D
15.679	15.641	0.038
16.387	16.291	0.016

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

Nominal Latch Clearance
at Minimum and Maximum
Temperature

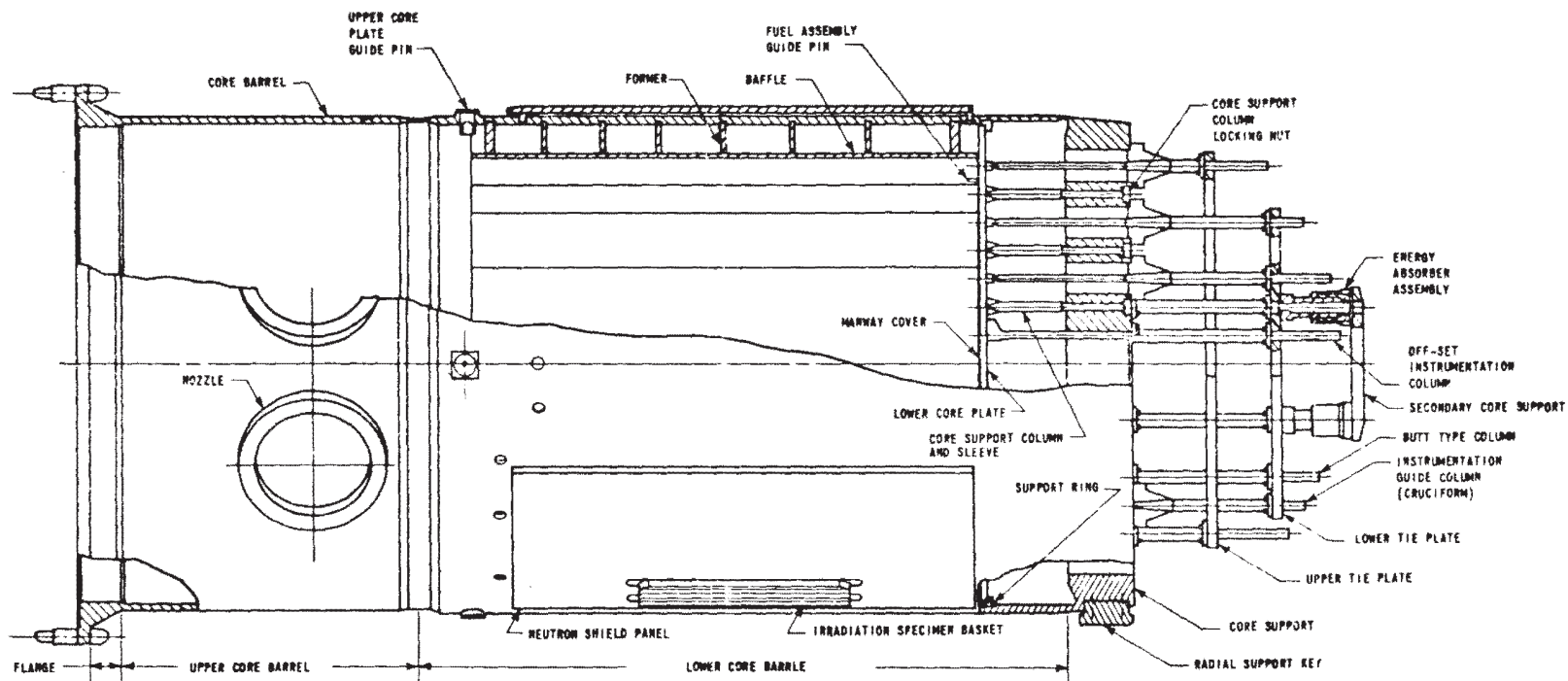
FIGURE 3.9N-7



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

Control Rod Drive Mechanism
Latch Clearance Thermal Effect

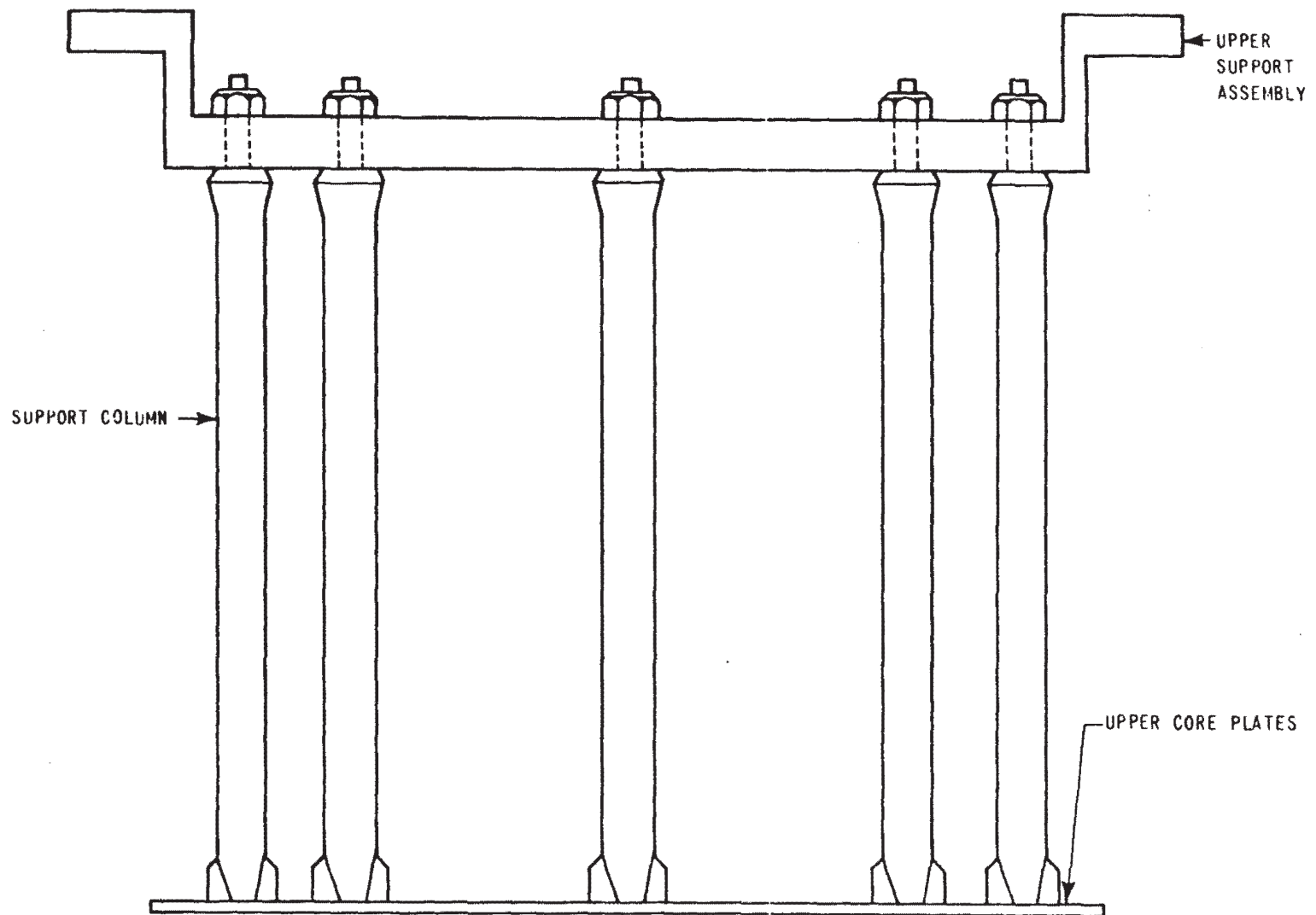
FIGURE 3.9N-8



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

Lower Core Support Assembly
(Core Barrel Assembly)

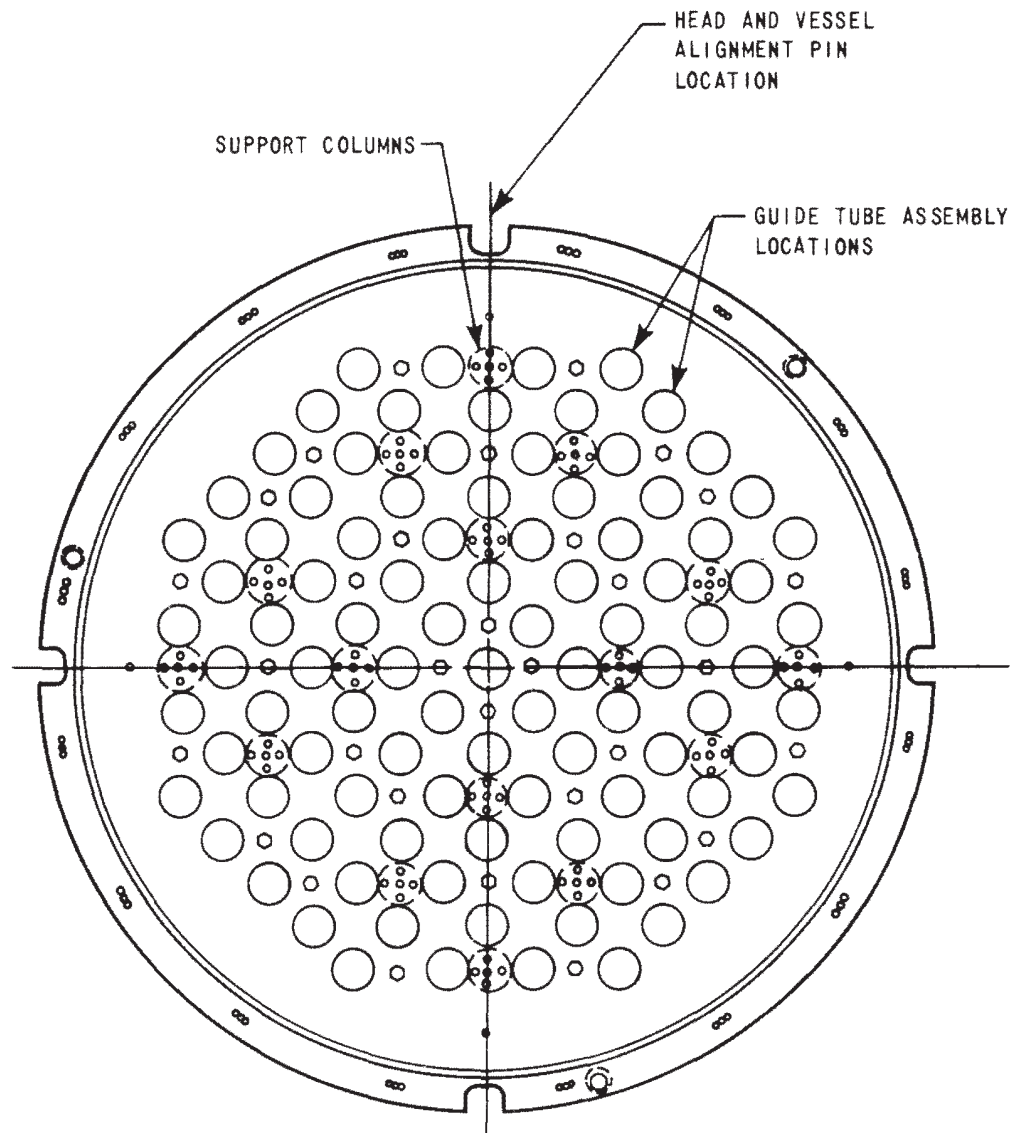
FIGURE 3.9N-9



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

Upper Core Support Structure

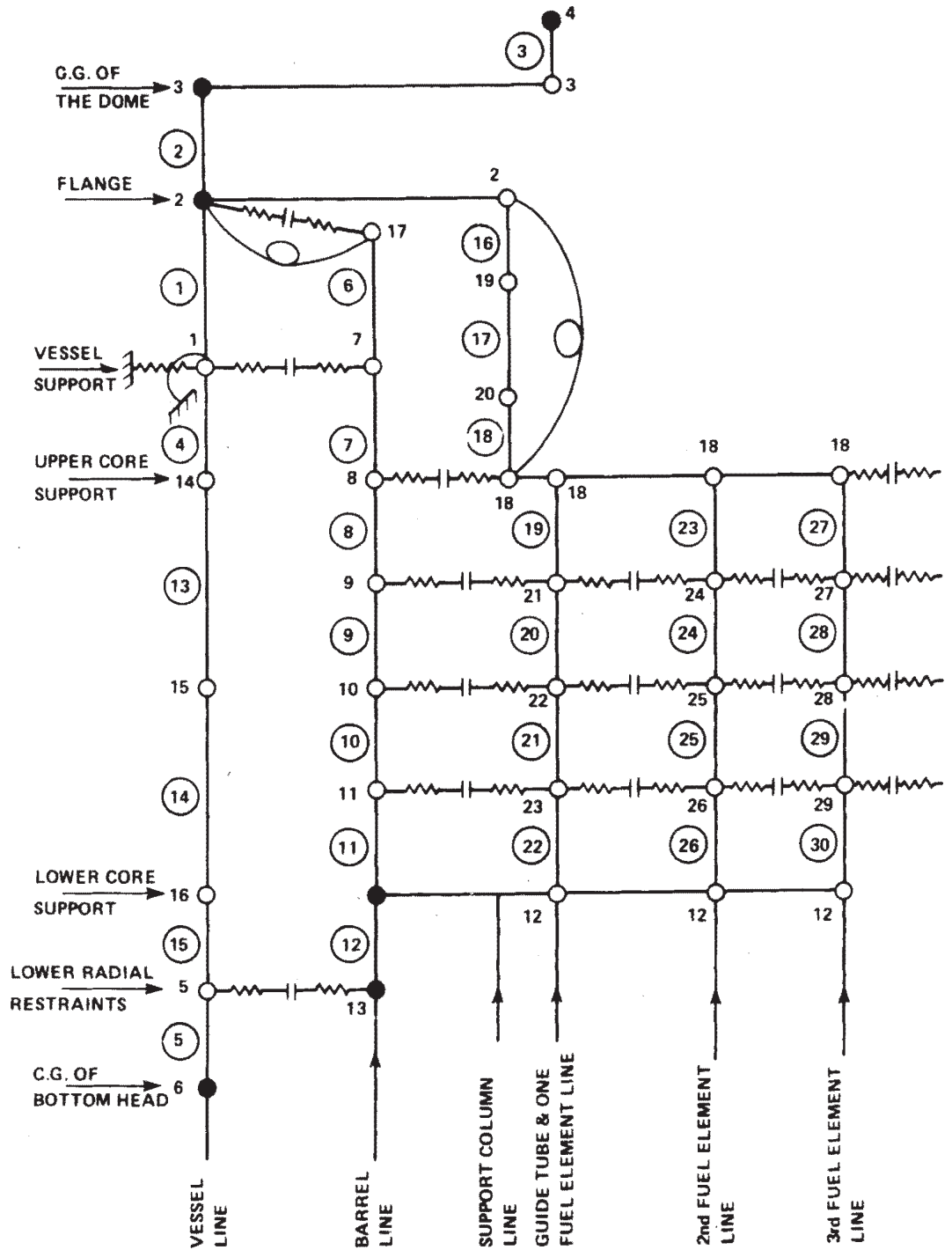
FIGURE 3.9N-10



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

Plan View of Upper Core
Support Structure

FIGURE 3.9N-11

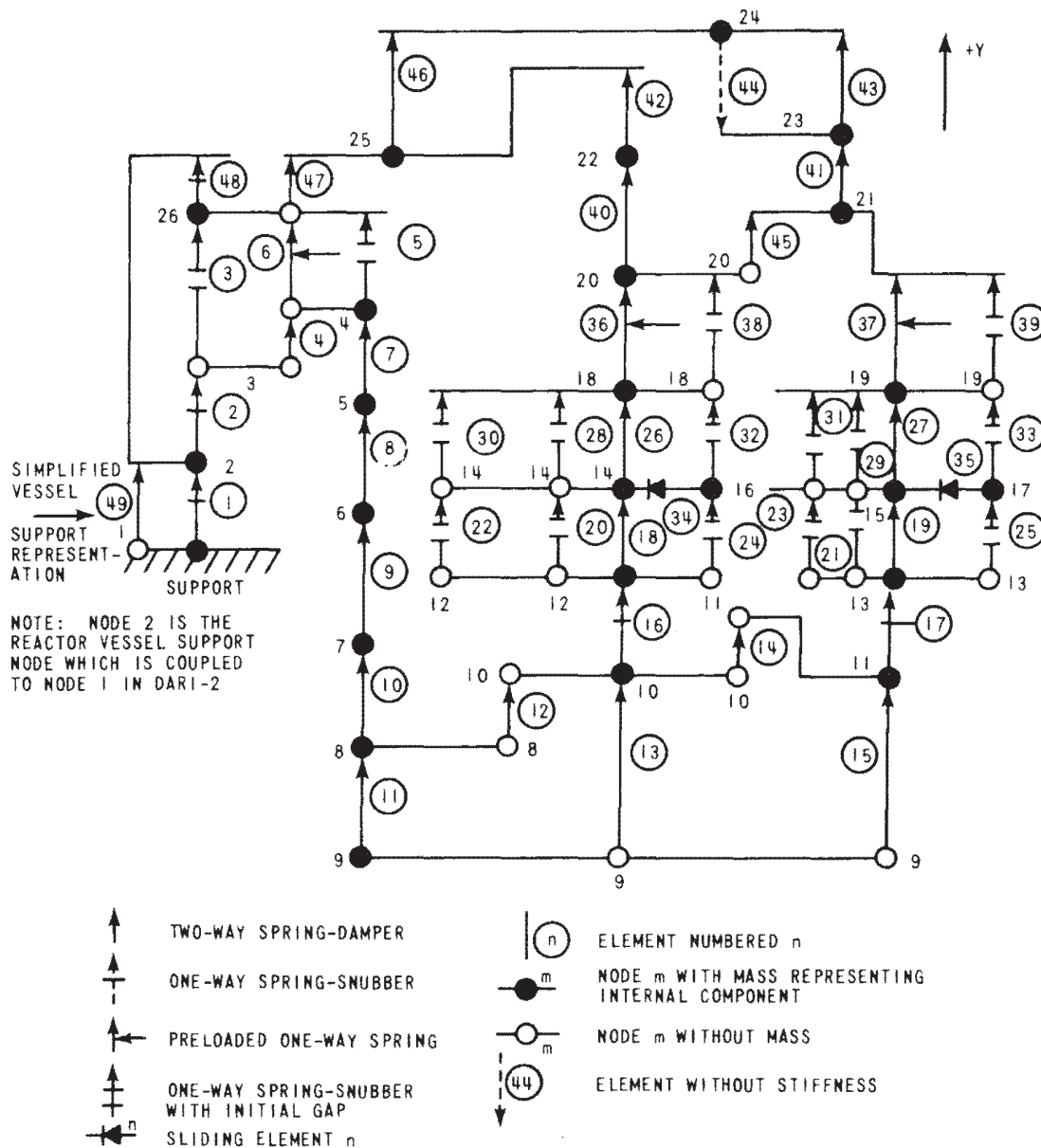


COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

Reactor Internals Model for
DARI Variables

Figure 3.9N-12

MARCH 31, 1980

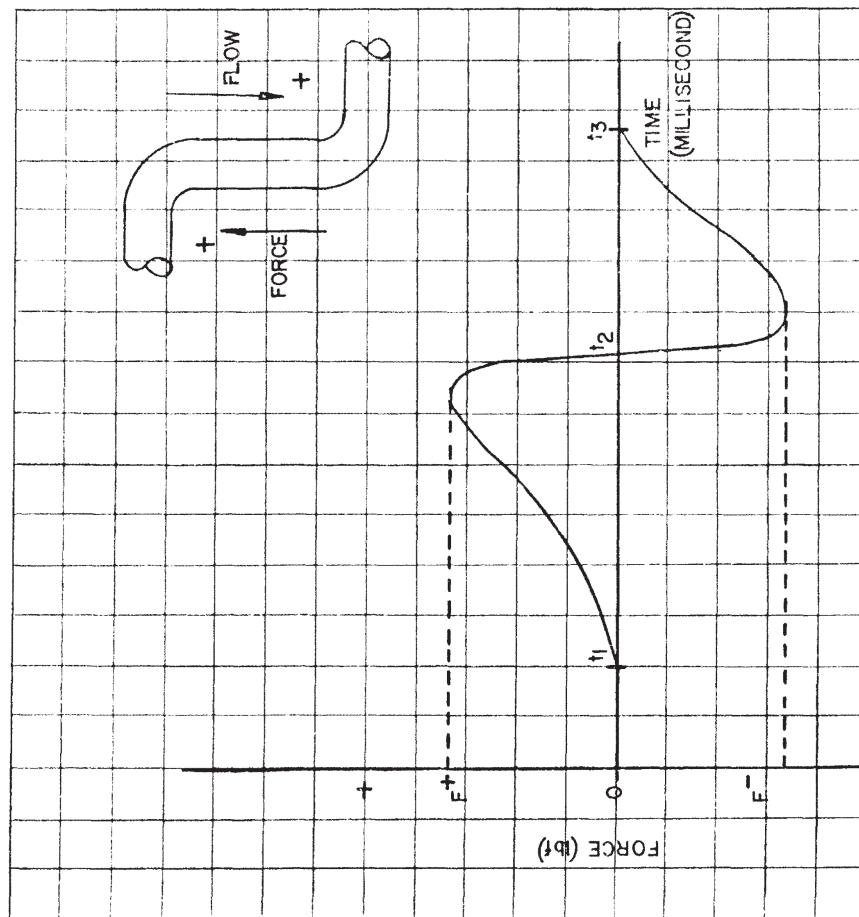


MARCH 31, 1980

COMANCHE PEAK S.E.S.
 FINAL SAFETY ANALYSIS REPORT
 UNITS 1 and 2

Reactor Internals Mathematical
 Model for WOSTAS Variables

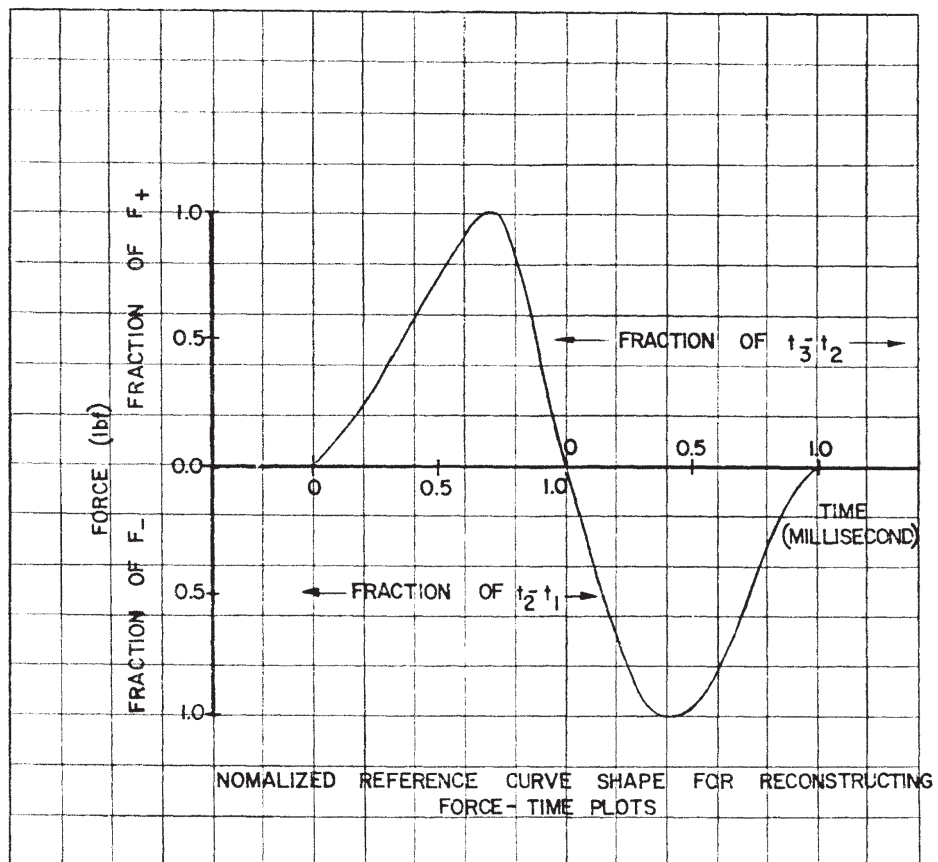
Figure 3.9N-13



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

TYPICAL FORCE-TIME PLOT
FOR ONE LEG OF PIPING

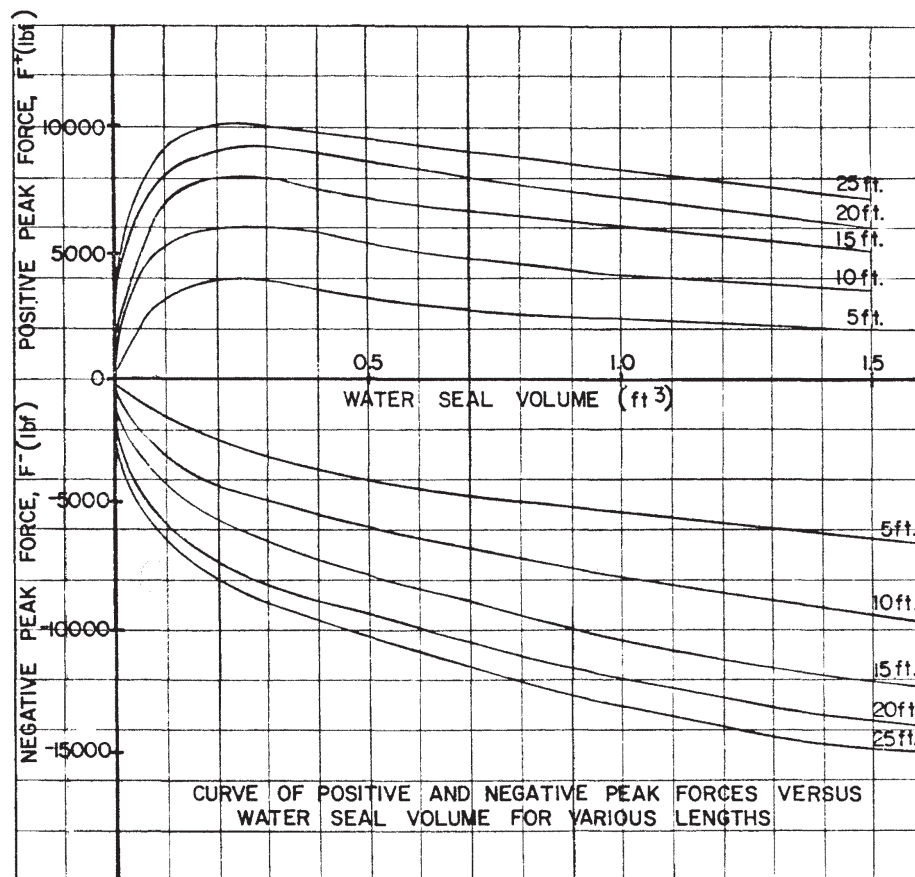
FIGURE 3.9B-1



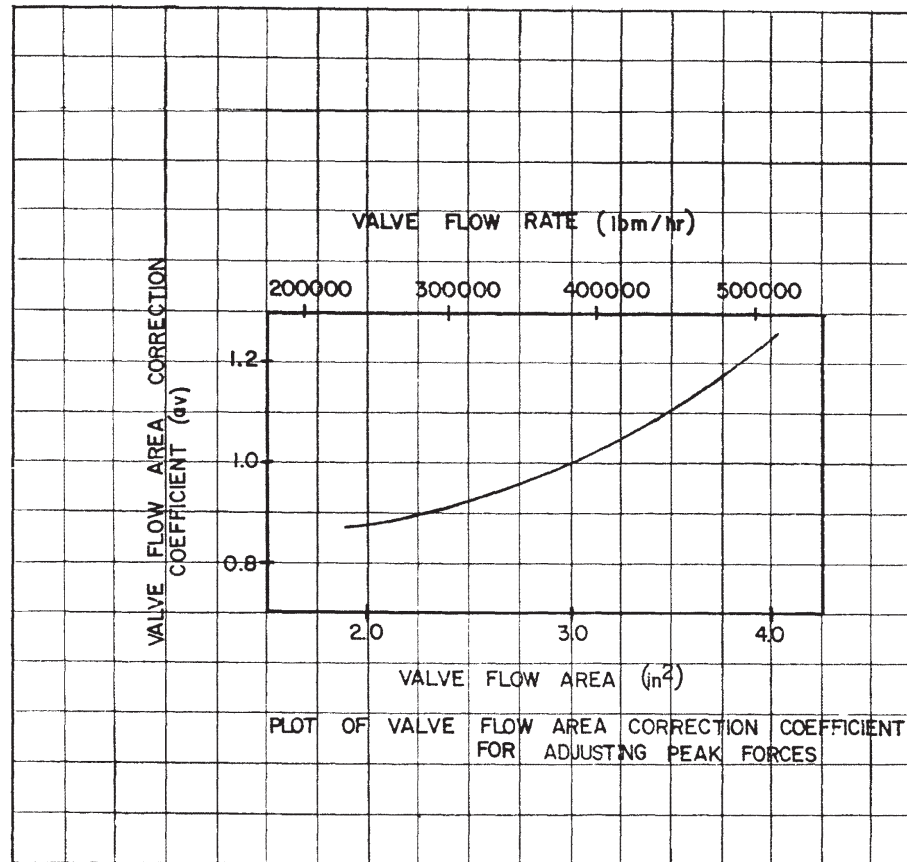
COMANCHE PEAK S.E.S
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

NORMALIZED REFERENCE
CURVE

FIGURE 3.9B-2



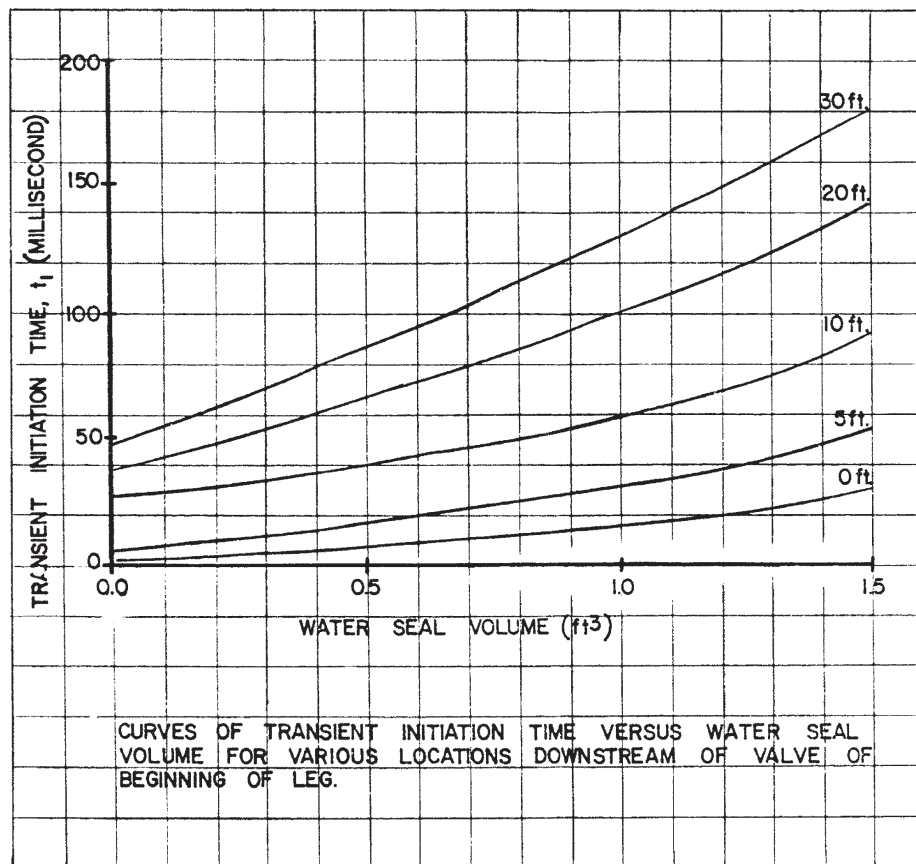
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2
PEAK FORCES VERSUS VOLUME
FOR VARIOUS LEG LENGTHS
FIGURE 3.9B-3



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

VALVE FLOW AREA CORRECTION
COEFFICIENT

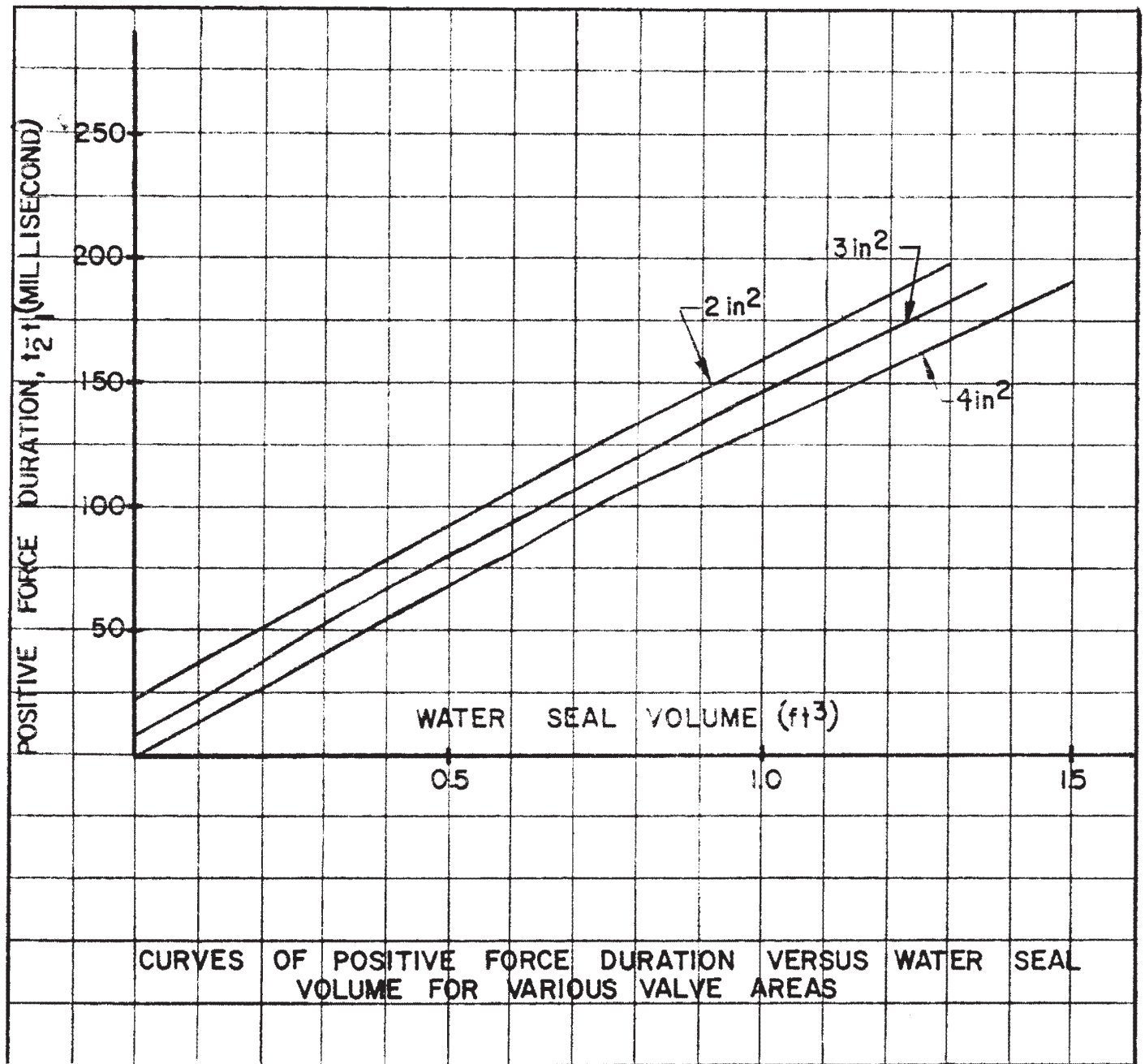
FIGURE 3.9B-4



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

TRANSIENT INITIATION TIME

FIGURE 3.9B-5

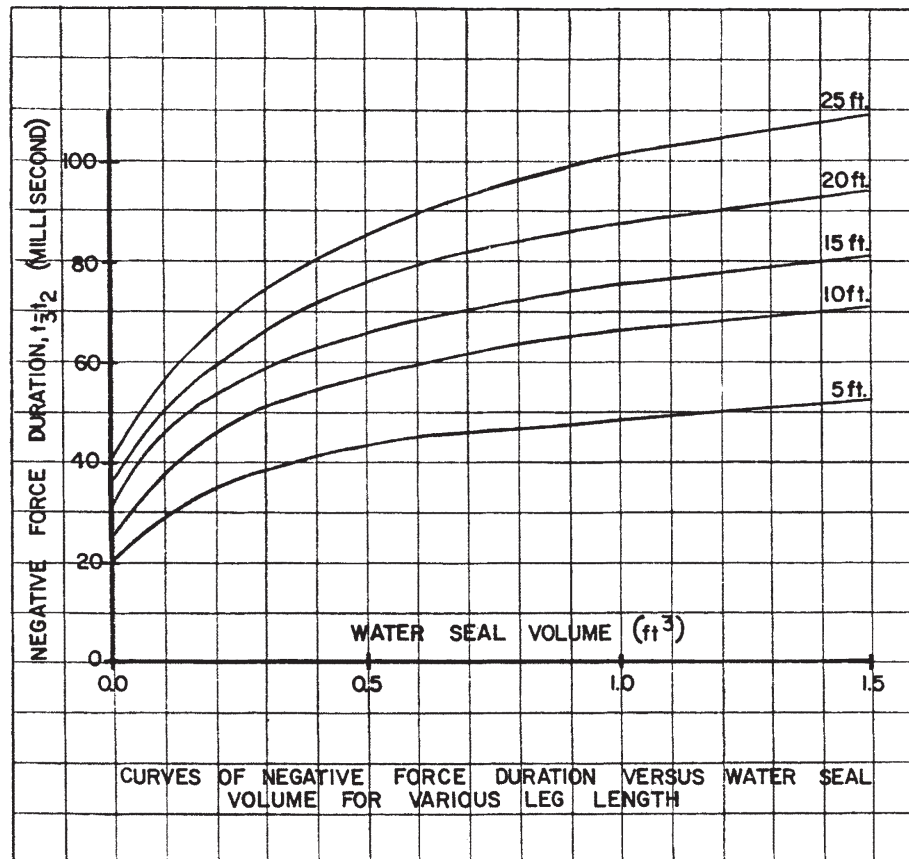


Amendment 74
October 14, 1988

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

POSITIVE FORCE DURATION

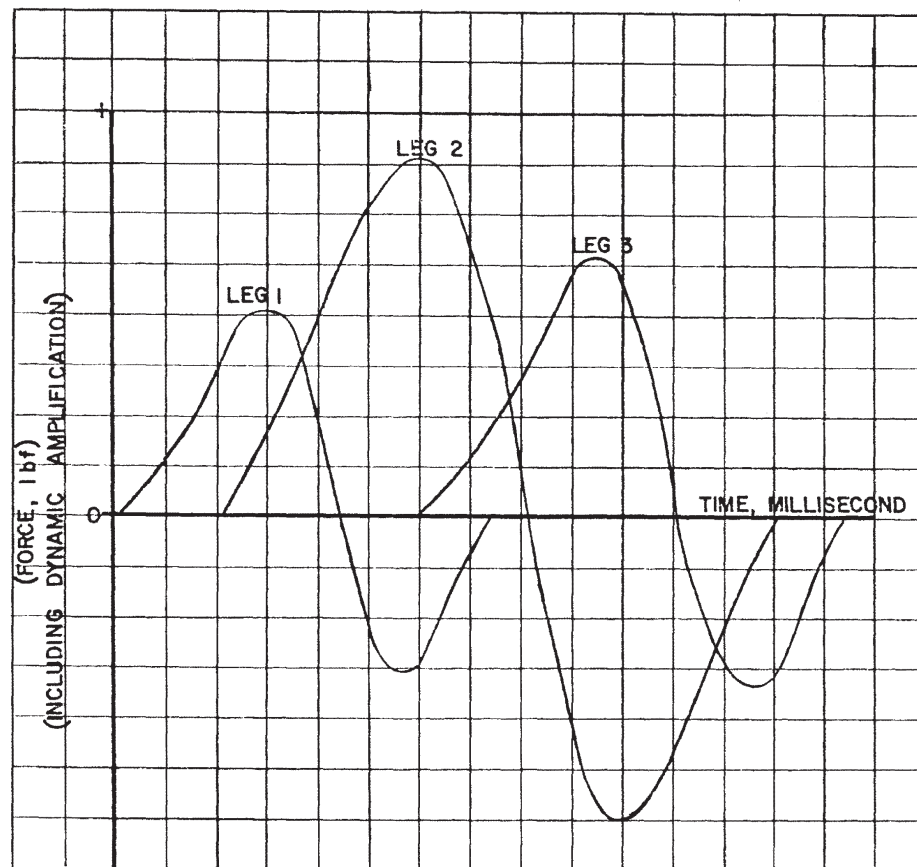
FIGURE 3.9B-6



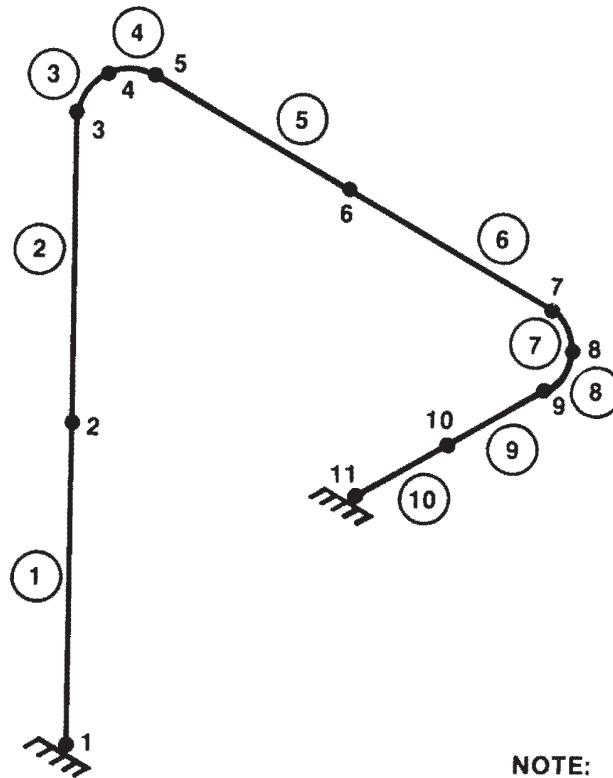
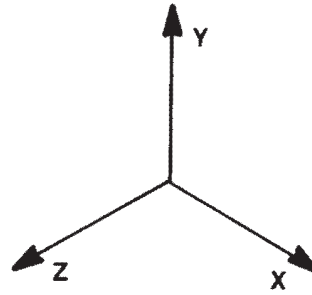
COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

NEGATIVE FORCE DURATION

FIGURE 3.9B-7



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2
TYPICAL FORCE - TIME
TRACES FOR A THREE LEG
PIPING SYSTEM
FIGURE 3.9B-8



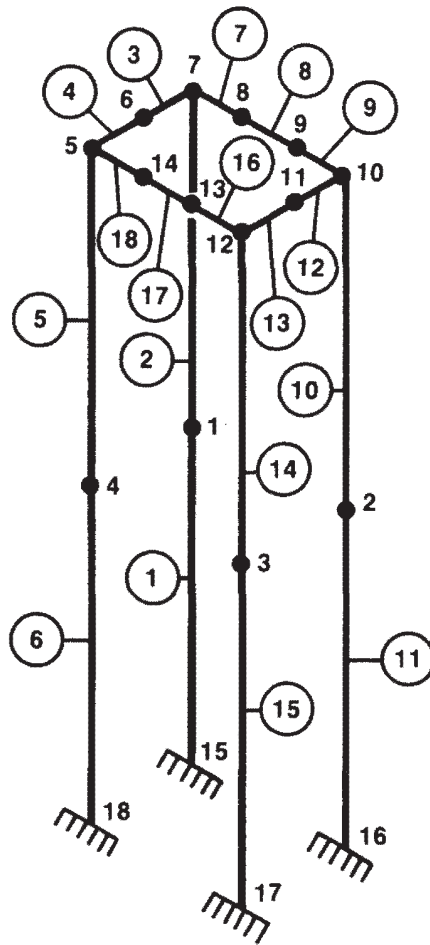
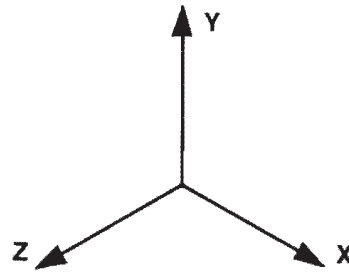
NOTE:
CIRCLED NUMBERS ARE
ELEMENT NUMBERS.

AMENDMENT 61
DECEMBER 19, 1986

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

MATHEMATICAL MODEL FOR RESPONSE
SPECTRA SEISMIC VERIFICATION

FIGURE 3B.1-1



NOTE:
CIRCLED NUMBERS ARE
ELEMENT NUMBERS.

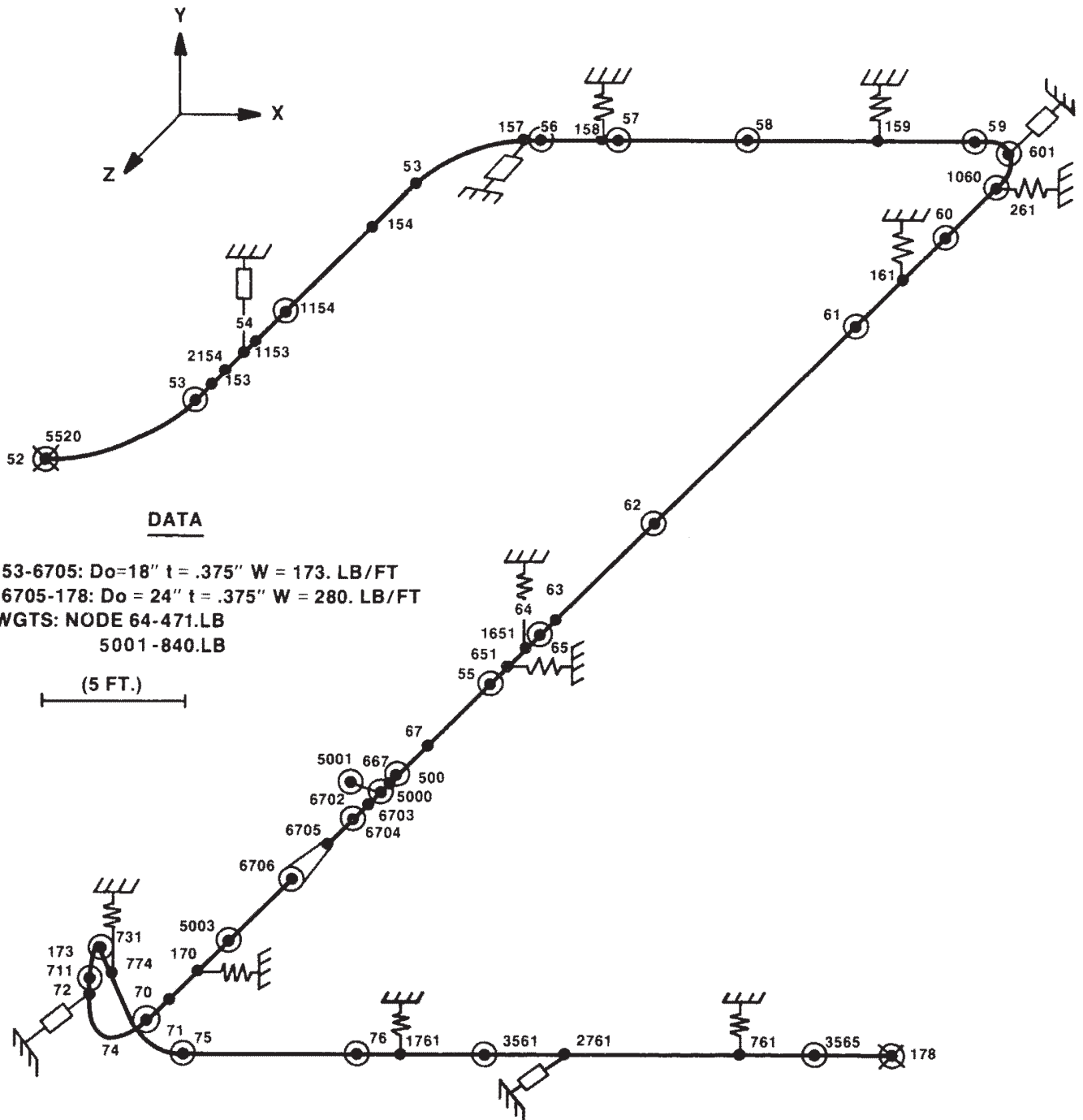
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DECEMBER 19, 1986

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

MATHEMATICAL MODEL FOR RESPONSE
SPECTRA SEISMIC VERIFICATION

FIGURE

3 B.1-2



DATA

NODES 53-6705: Do=18" t = .375" W = 173. LB/FT
 NODES 6705-178: Do = 24" t = .375" W = 280. LB/FT
 CONC. WGTS: NODE 64-471.LB
 5001-840.LB

SCALE: (5 FT.)

KEY

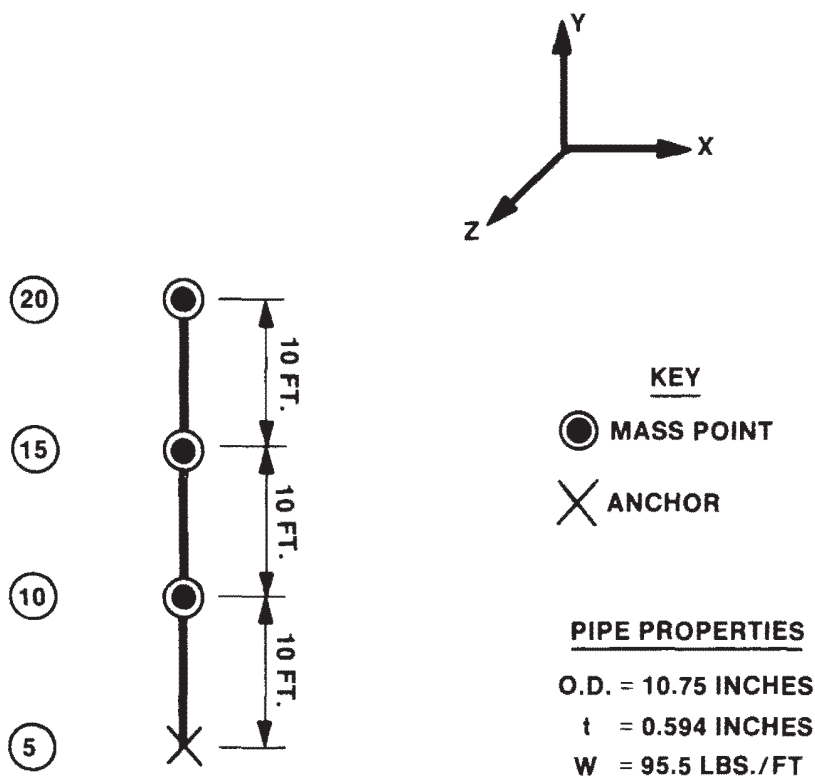
- ANCHOR
- RESTRAINT
- SNUBBER
- MASS POINT

COMANCHE PEAK S.E.S.
 FINAL SAFETY ANALYSIS REPORT
 UNITS 1 and 2

MATHEMATICAL MODEL FOR MISSING
 MASS VERIFICATION

FIGURE 3B.1-3

AMENDMENT 61
 DECEMBER 19, 1986

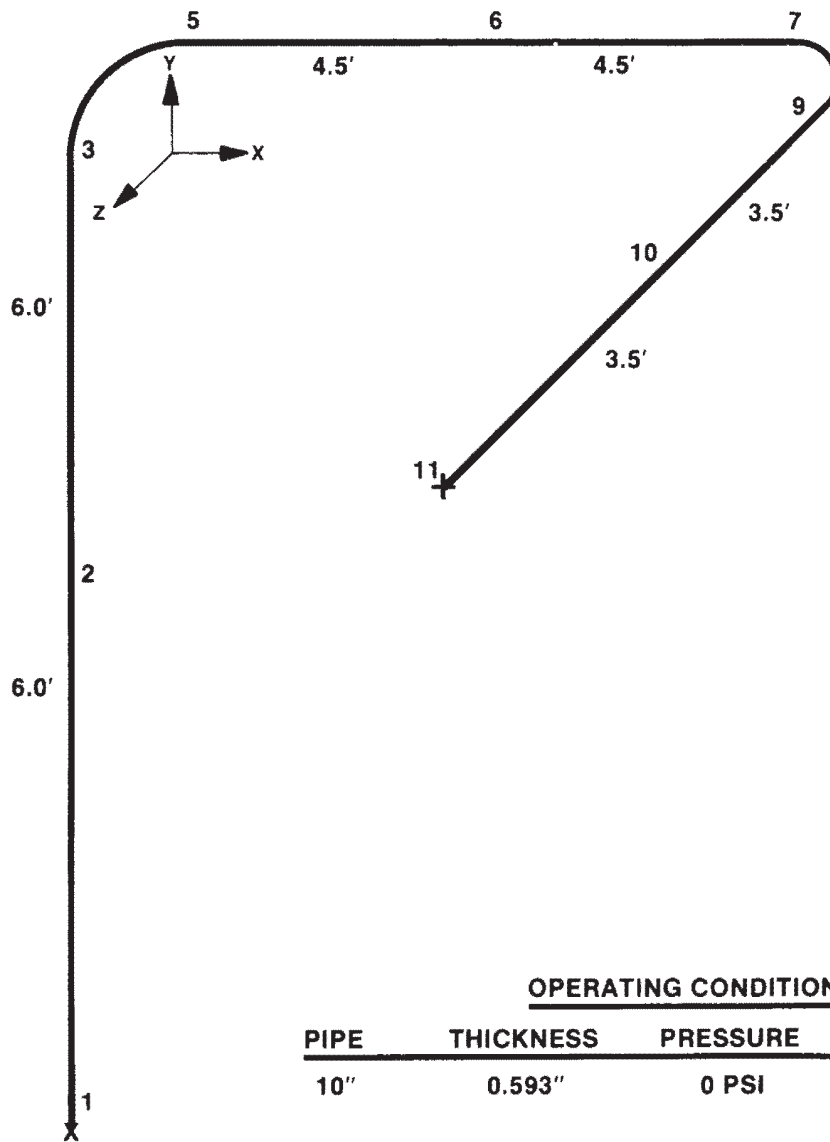


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COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

MATHEMATICAL MODEL FOR MISSING
MASS VERIFICATION

FIGURE 3B.1-4



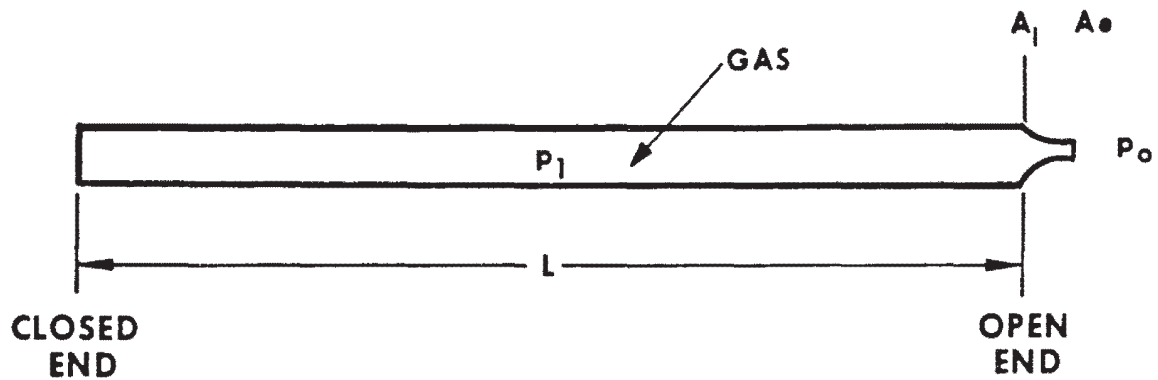
OPERATING CONDITIONS			
PIPE	THICKNESS	PRESSURE	TEMPERATURE
10"	0.593"	0 PSI	350°F

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FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

MATHEMATICAL MODEL FOR THERMAL
ANALYSIS

FIGURE 3B.1-5



CASE (A) FOR COMPARISON WITH ANALYTICAL RESULTS

INITIAL CONDITIONS =

$$p_1/p_0 = 4.72, a_0/a_1 = 0.80$$

DIMENSIONS =

$$A_2/A_1 = 0.6, L = \text{PIPE LENGTH}$$

SPECIFIC HEAT RATIO =

$$\gamma = C_p/C_v = 1.4$$

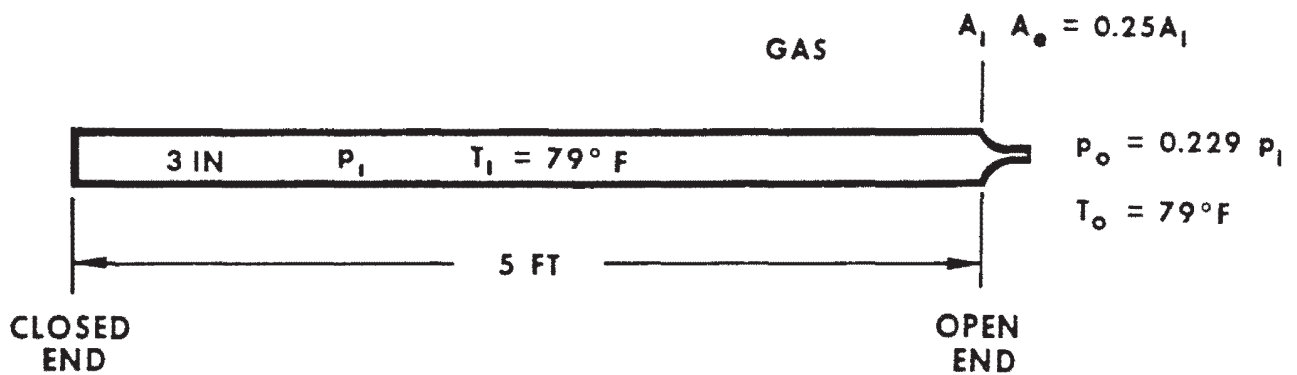
p = PRESSURE, a = SOUND VELOCITY, A = FLOW AREA

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COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

SUDDEN DISCHARGE OF A GAS FROM
A PIPELINE THROUGH A NOZZLE
(CASE A)

FIGURE 3B.8-1



**CASE (B) FOR COMPARISON WITH EXPERIMENTAL DATA
AND HAND CALCULATION**

PRESSURE = $p_o = 14.7$ psia, $p_1 = 14.7/0.229 = 64.2$ psia

AREA = $A_1 = \frac{\pi}{4} (0.25)^2 = 0.0491$ ft², $A_* = 0.25A_1 = 0.0123$ ft²

GAS CONSTANT = $R = 53.35$ ft - lb_f/lb^oR

TEMPERATURE = $T_o = 79^\circ\text{F} = 539^\circ\text{R}$, $T_1 = T_o$

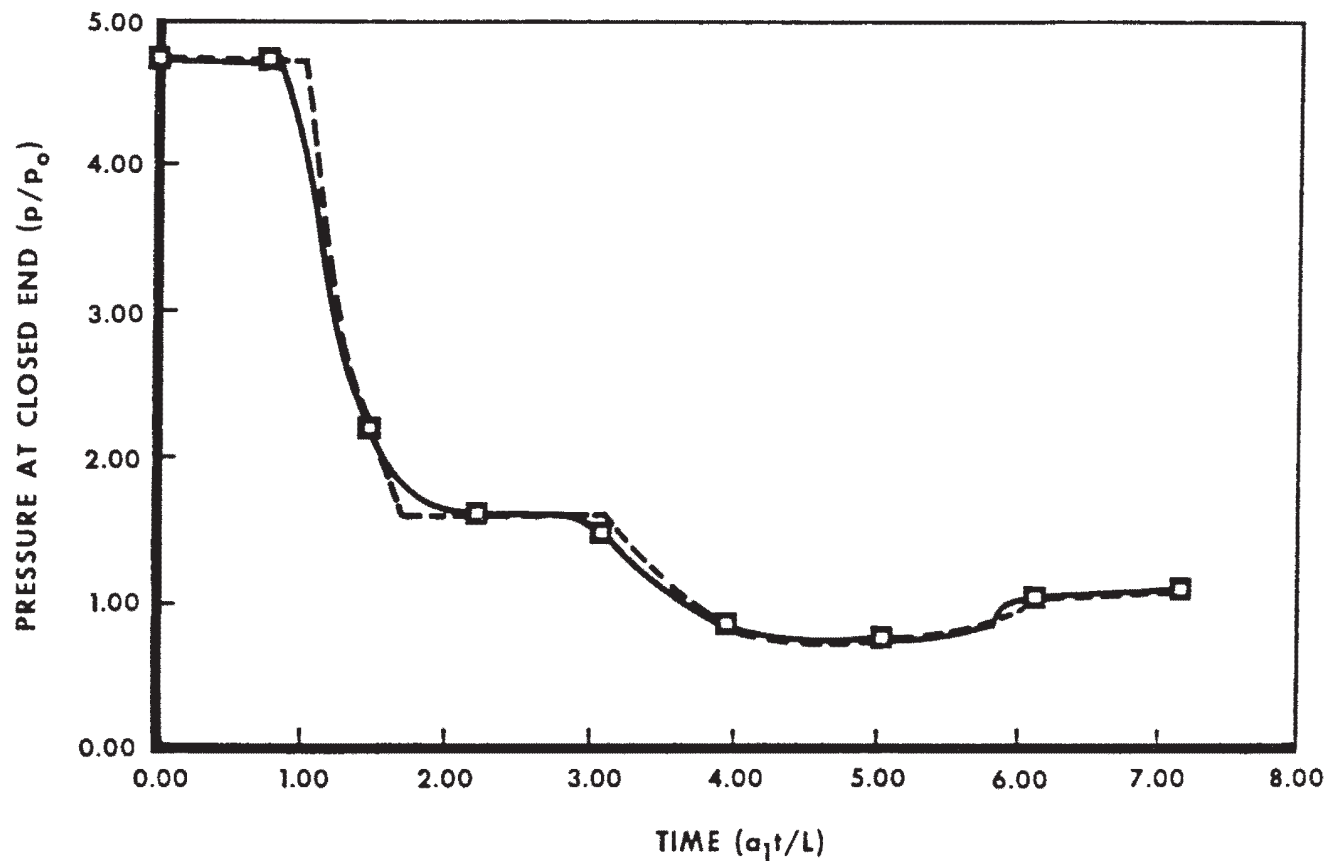
DENSITY = $\rho_o = \frac{P_o}{RT_o} = 0.0736$ lb/ft³, $\rho_1 = \frac{P_1}{RT_1} = 0.3215$ lb/ft³

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COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

SUDDEN DISCHARGE OF A GAS FROM
A PIPELINE THROUGH A NOZZLE
(CASE B)

FIGURE 3B.8-2



LEGEND

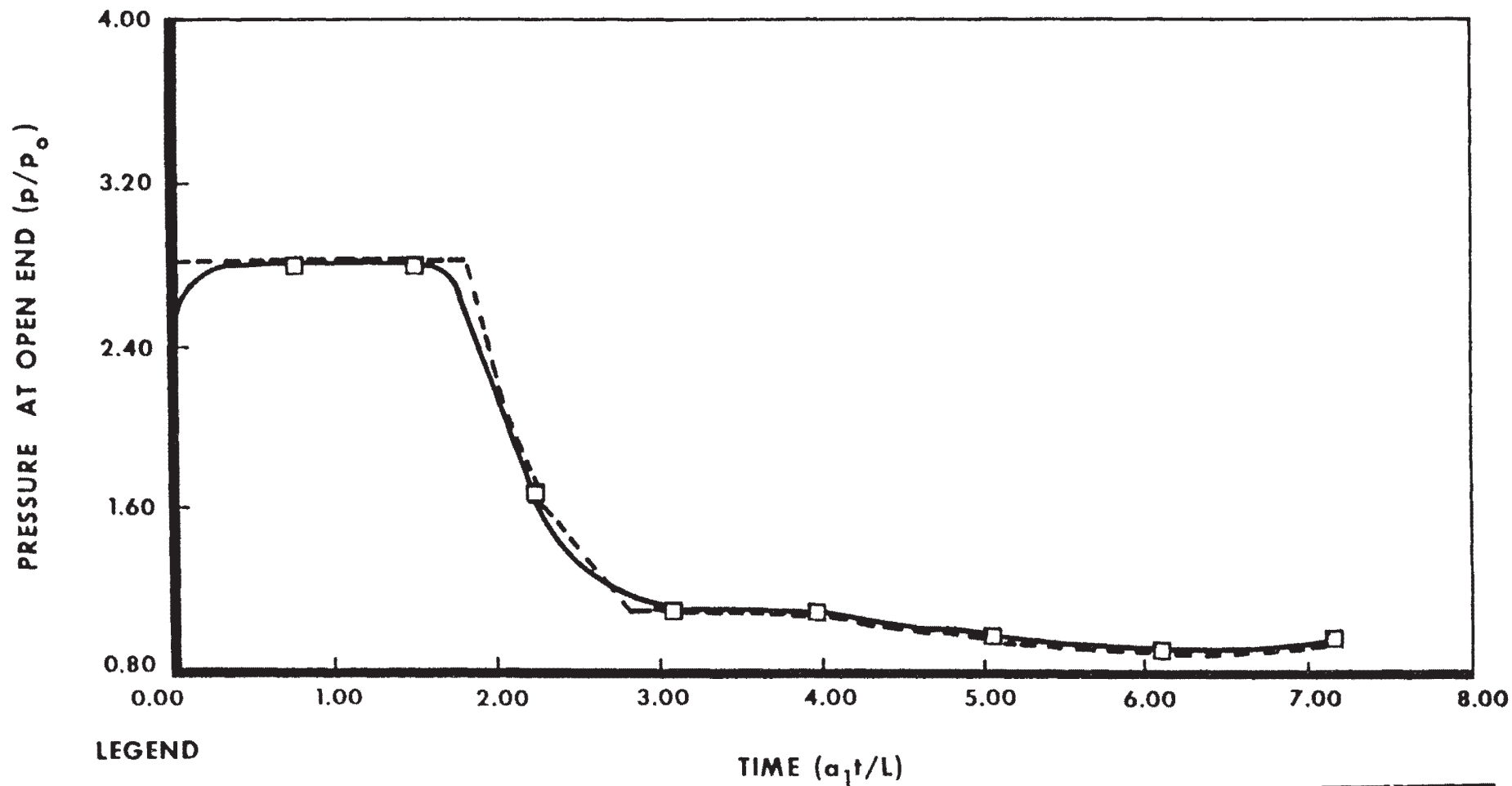
- (CASE A)
- STEHAM
- - - ANALYTICAL SOLUTION (REF 4 & 5)

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DECEMBER 19, 1986

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

COMPARISON OF PRESSURE RESPONSE
AT THE CLOSED END

FIGURE 3B.8-3



LEGEND

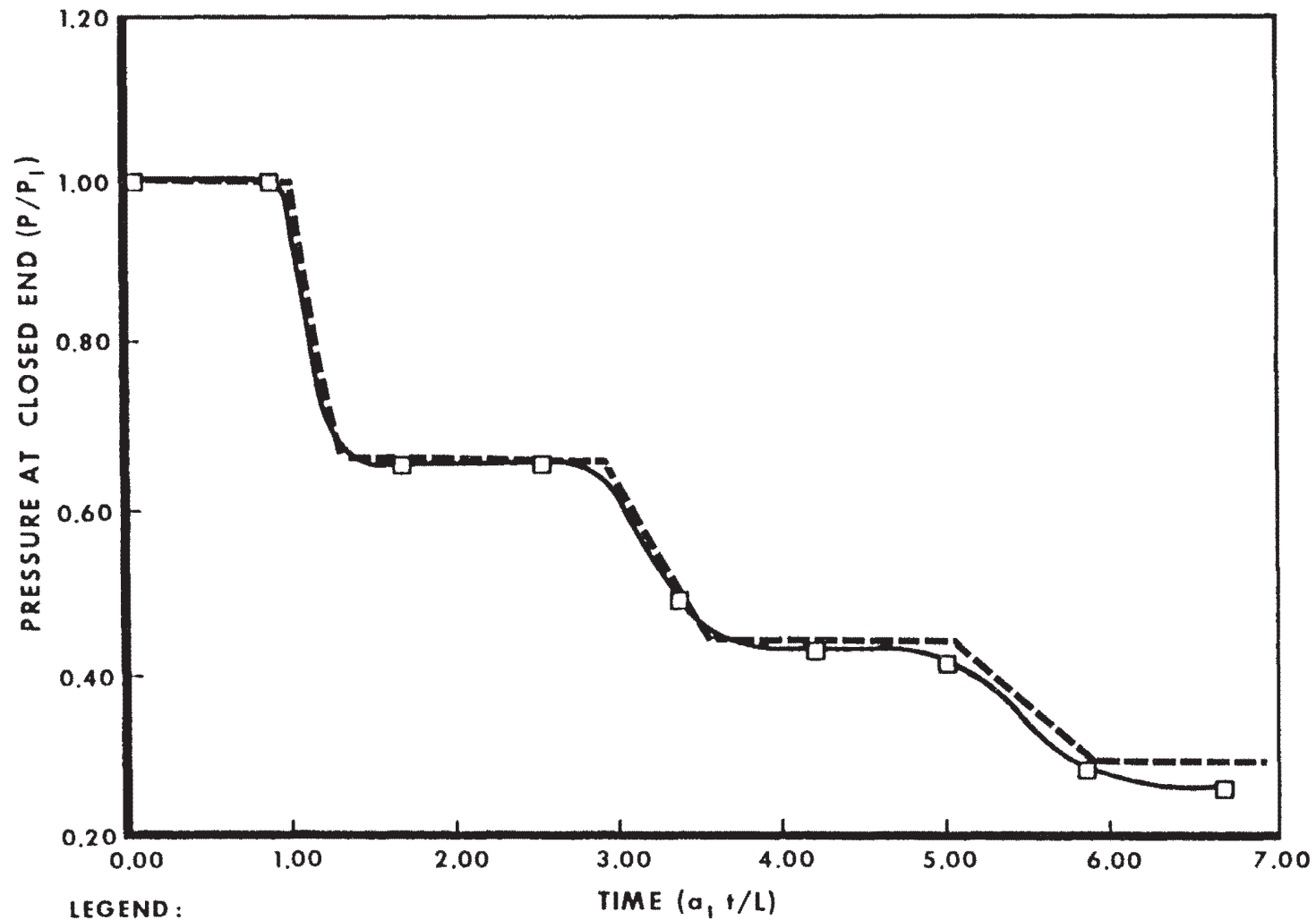
- (CASE A)
- STEHAM
- - - ANALYTICAL SOLUTION
- (REF 4 & 5)

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UNITS 1 and 2

COMPARISON OF PRESSURE RESPONSE
AT THE OPEN END

FIGURE 3B.8-4

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LEGEND:

(CASE B)

— STEAM

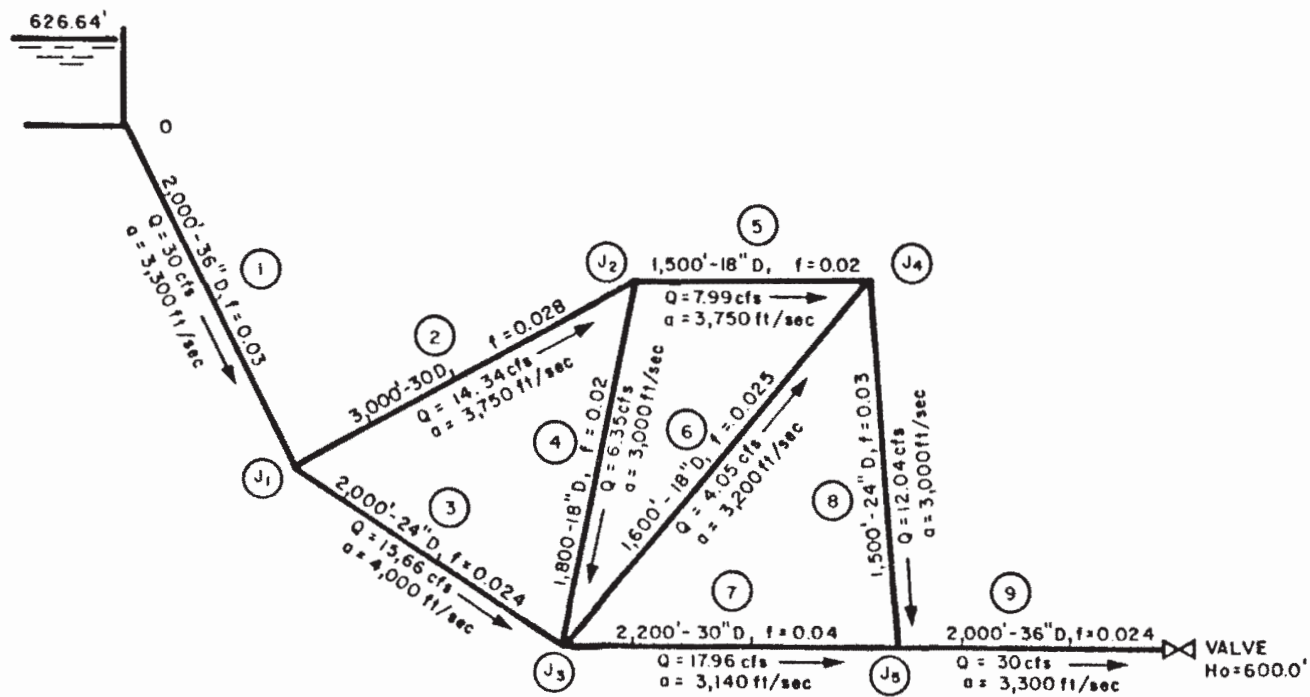
- - - ANALYTICAL SOLUTION (REF 4&5)

AMENDMENT 61
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COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

COMPARISON OF PRESSURE
RESPONSES BY STEAM &
EXPERIMENT

FIGURE 3B.8-5

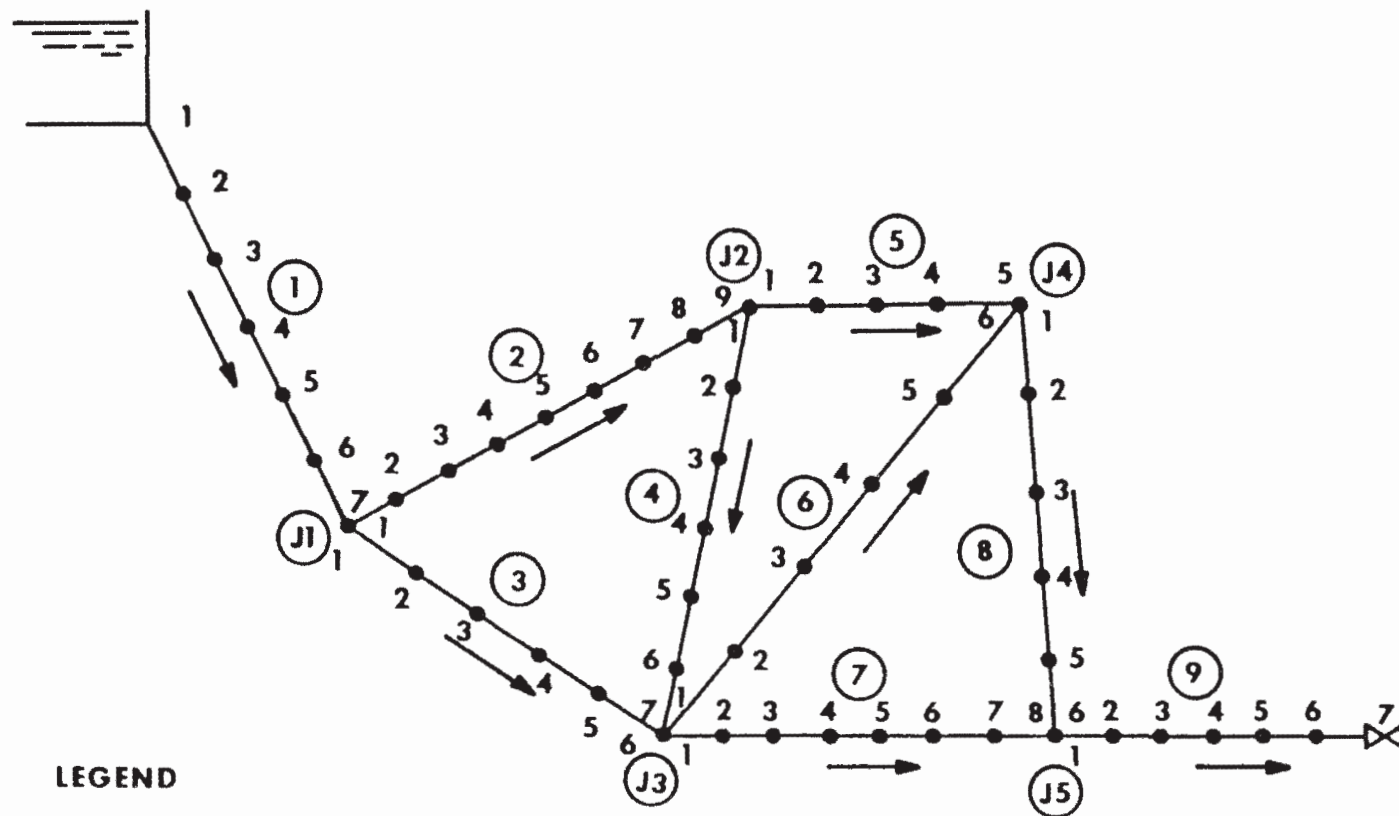


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COMANCHE PEAK S.E.S.
 FINAL SAFETY ANALYSIS REPORT
 UNITS 1 and 2

HYDRAULIC NETWORK FOR
 VERIFICATION PROGRAM

FIGURE 3B.9-1



LEGEND

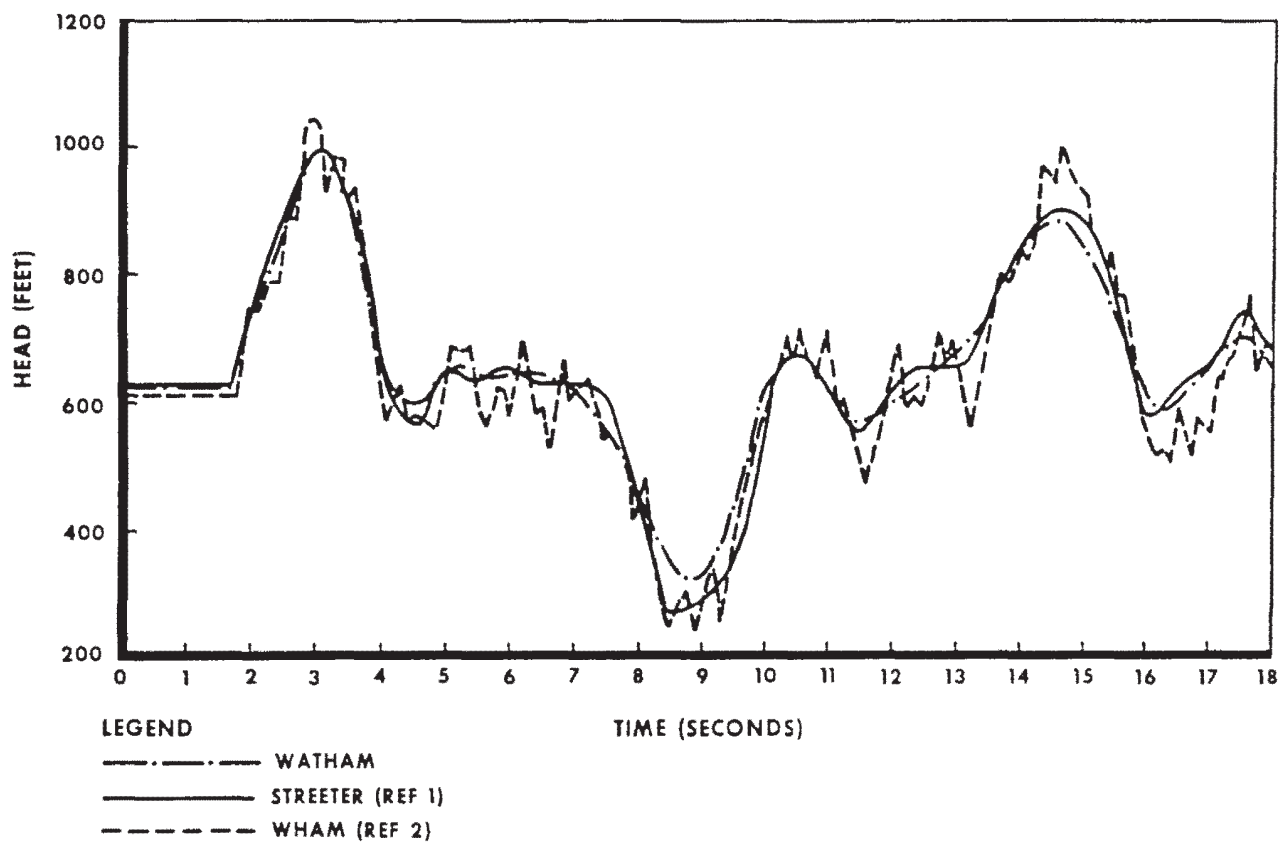
- (5) PIPE NUMBER
- (J1) PIPE JUNCTION
- 5 NODE NUMBER
- X— VALVE

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FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

HYDRAULIC NETWORK FOR
WATHAM VERIFICATION

FIGURE 3B.9-2

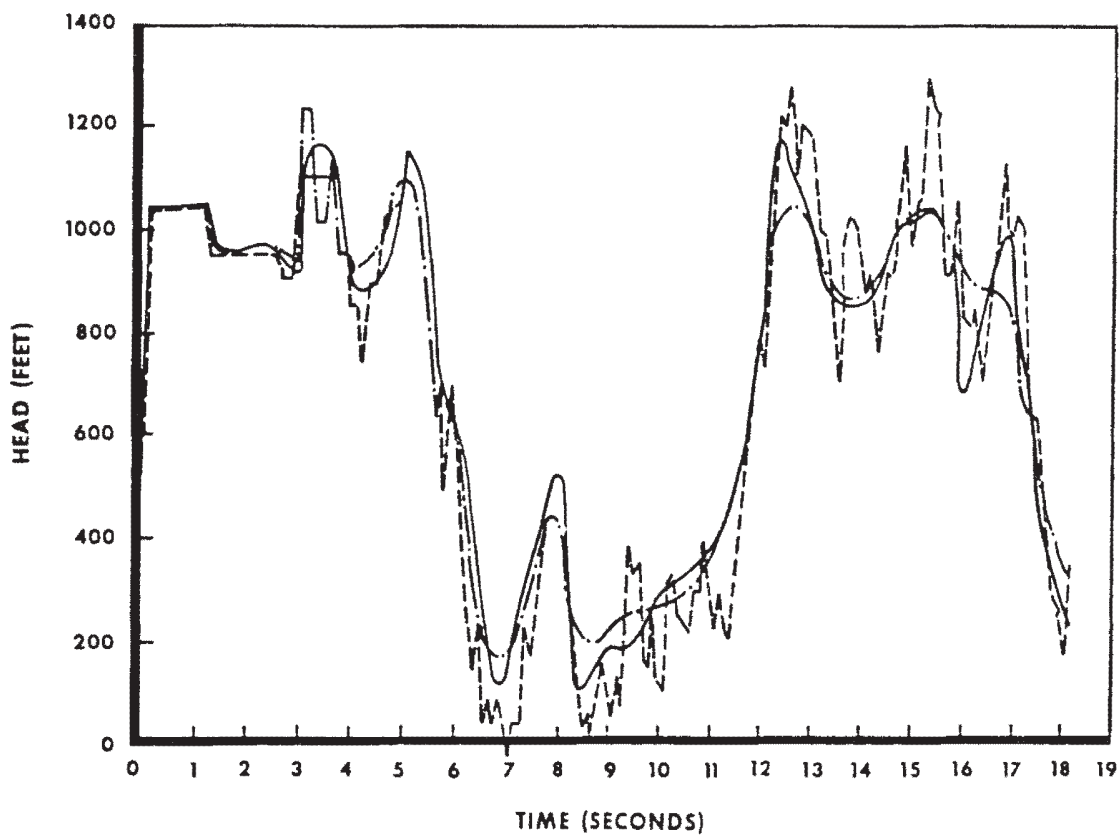


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COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

HEAD-VERSUS-TIME PLOT
FOR JUNCTION J

FIGURE 3B.9-3



LEGEND

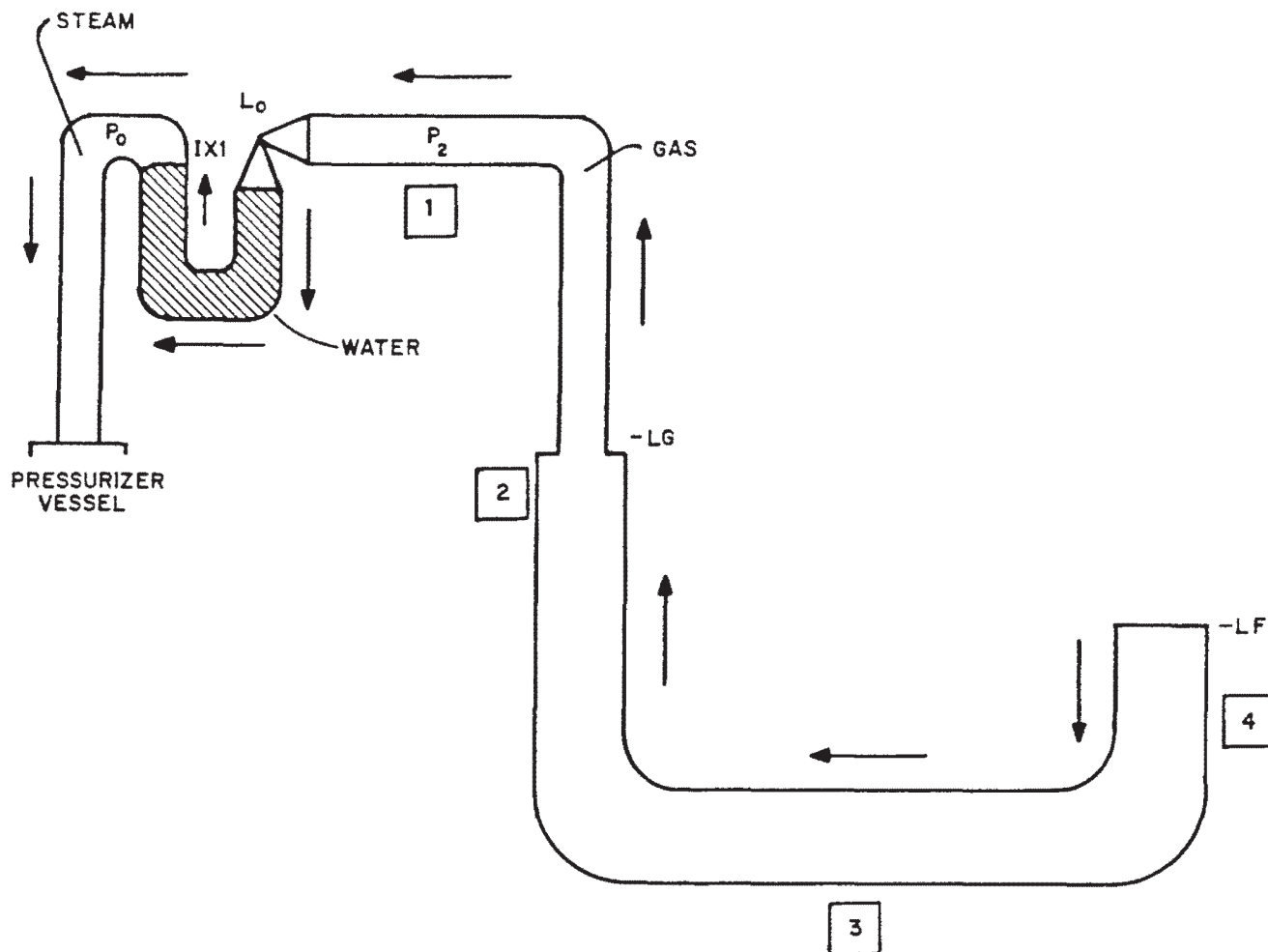
— · — · — WATHAM
—— STREETER (REF 1)
- - - - - WHAM (REF 2)

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COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

HEAD-VERSUS-TIME PLOT AT VALVE

FIGURE 3B.9-4



DISTANCES FROM PRESSURIZER VESSEL:

L_0 = SAFETY/RELIEF VALVE

LG = DOWNSTREAM AREA CHANGE

LF = PIPE EXIT

$IX1$ = TRAILING EDGE OF SLUG 1

← FORCING FUNCTION DIRECTION, +



EPRI TEST 908
SEGMENT NO.

WATSLUG MODEL PIPE NUMBER

1 - PRESSURIZER TO L_0

2 - L_0 TO LG

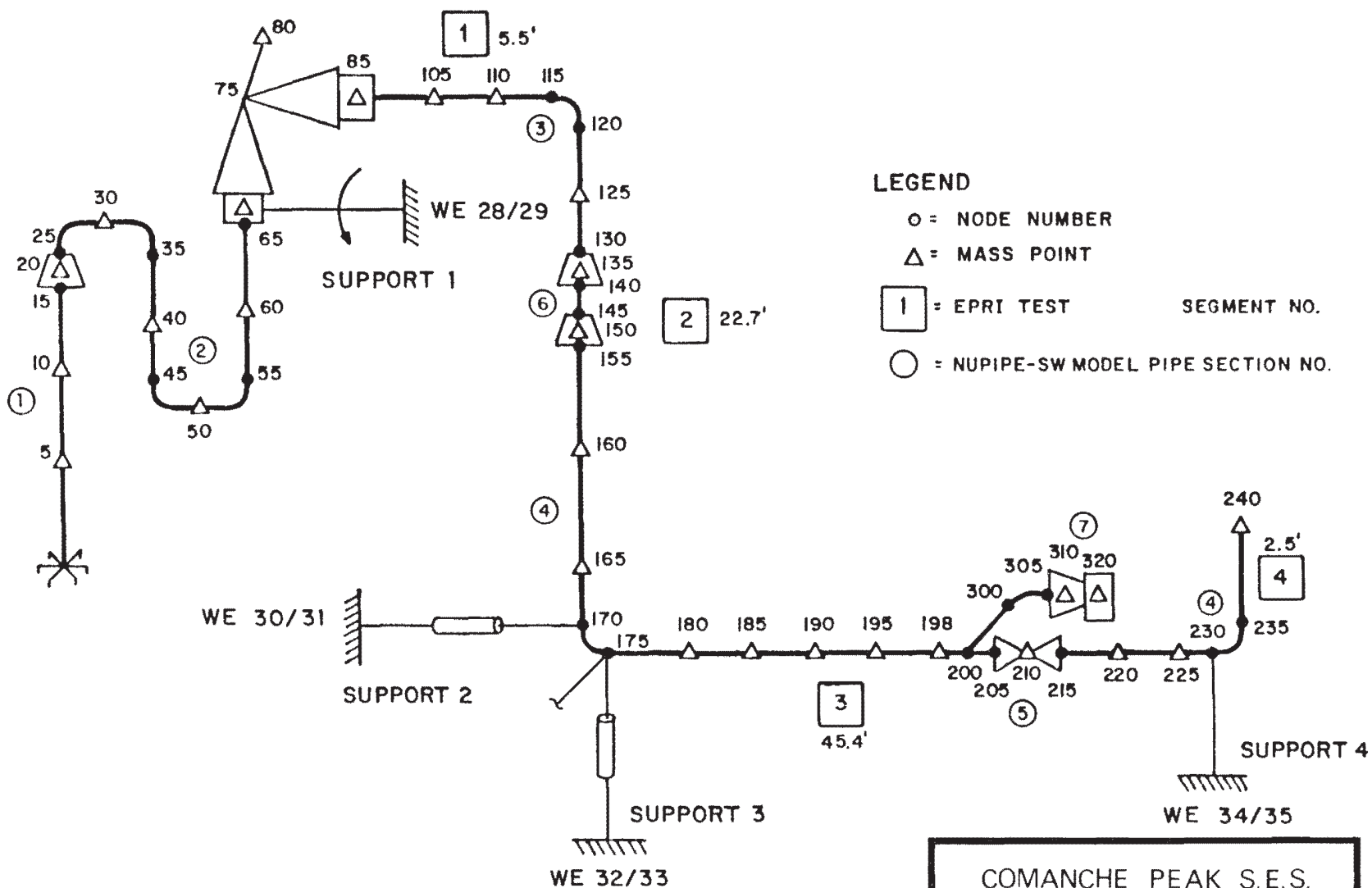
3 - LG TO LF

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COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

WATSLUG MODEL OF EPRI
SAMPLE PROBLEM

FIGURE 3B.10-1

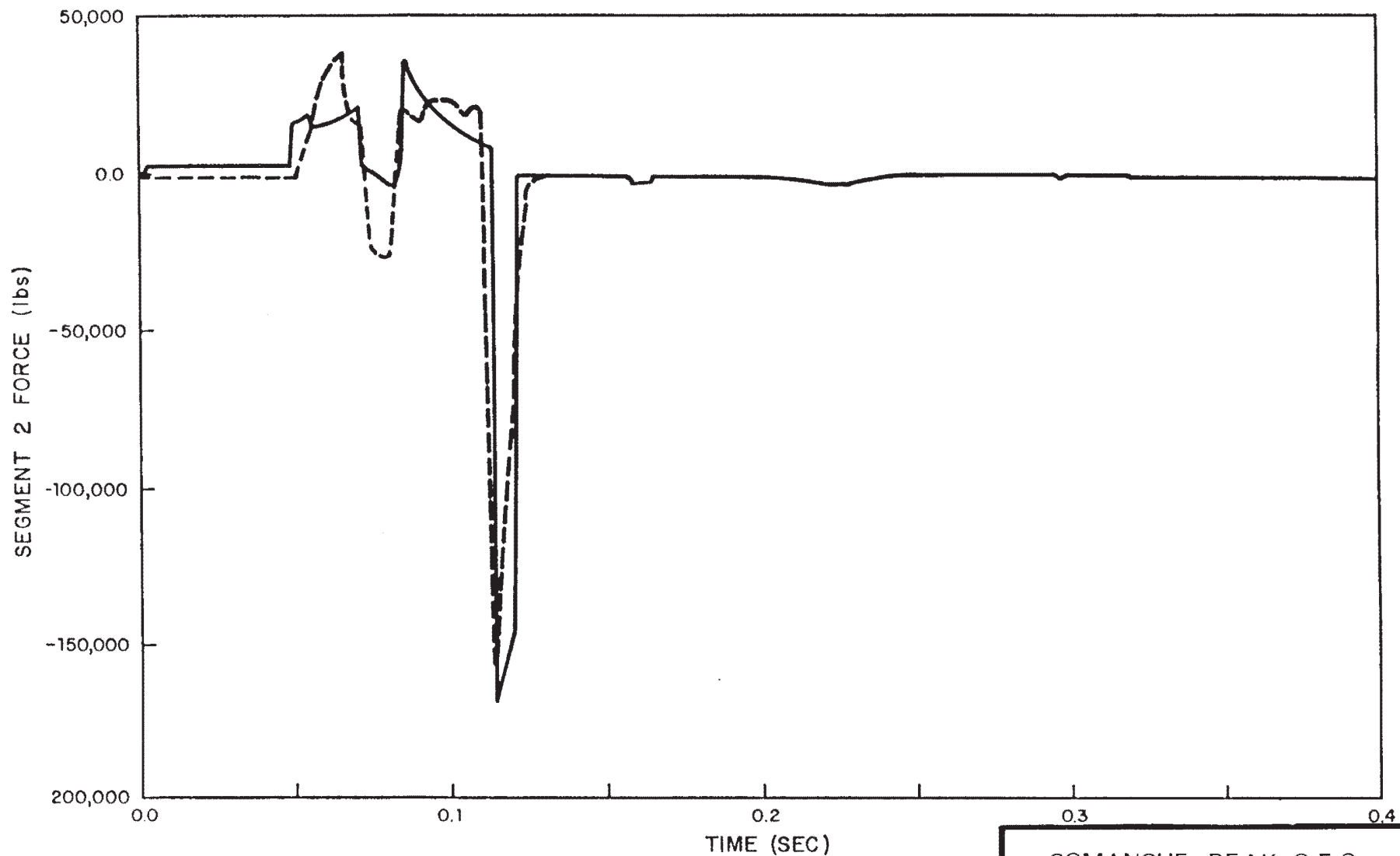


COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

NUPIPE-SW MODEL OF EPRI
SAMPLE PROBLEM

FIGURE 3B.10-2

AMENDMENT 61
DECEMBER 19, 1986



LEGEND

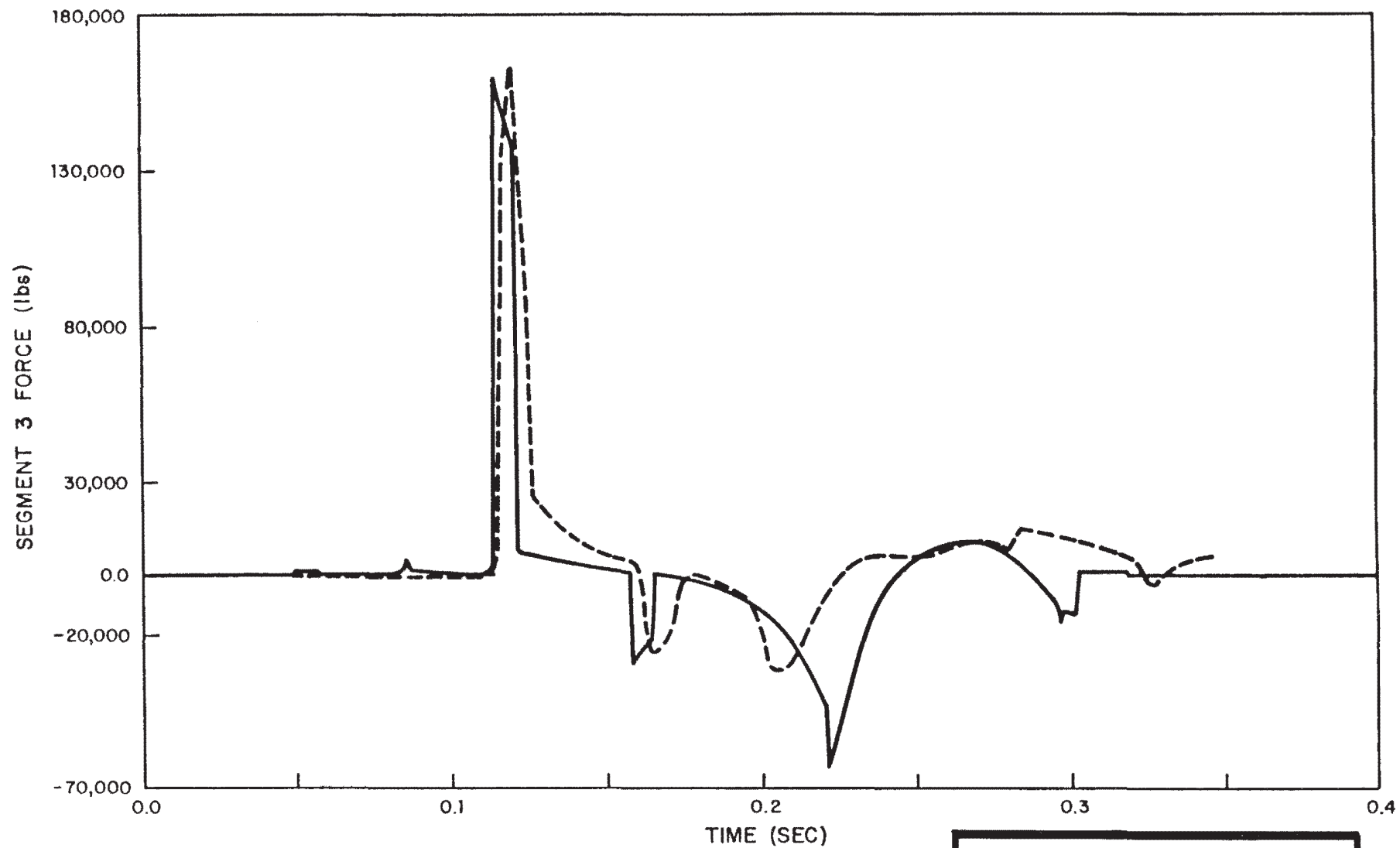
———— WATSLUG
----- RELAP 5/MOD 1

AMENDMENT 61
DECEMBER 19, 1986

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

COMPARISON OF SEGMENT 2
FORCING FUNCTION

FIGURE 3B.10-3



LEGEND

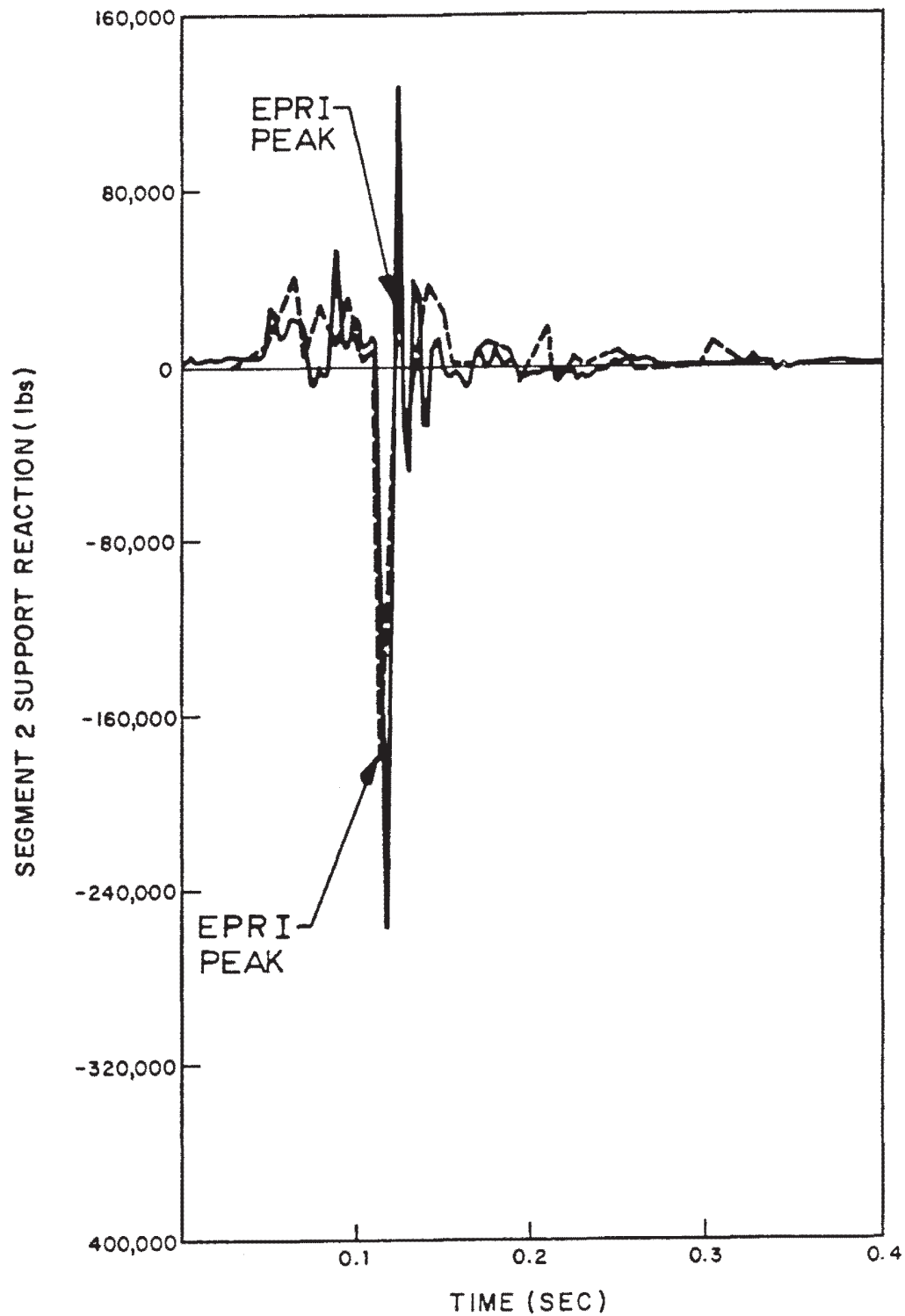
—— WATSLUG
----- RELAP 5/MOD 1

AMENDMENT 61
DECEMBER 19, 1986

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

COMPARISON OF SEGMENT 3
FORCING FUNCTION

FIGURE 3B.10-4



LEGEND

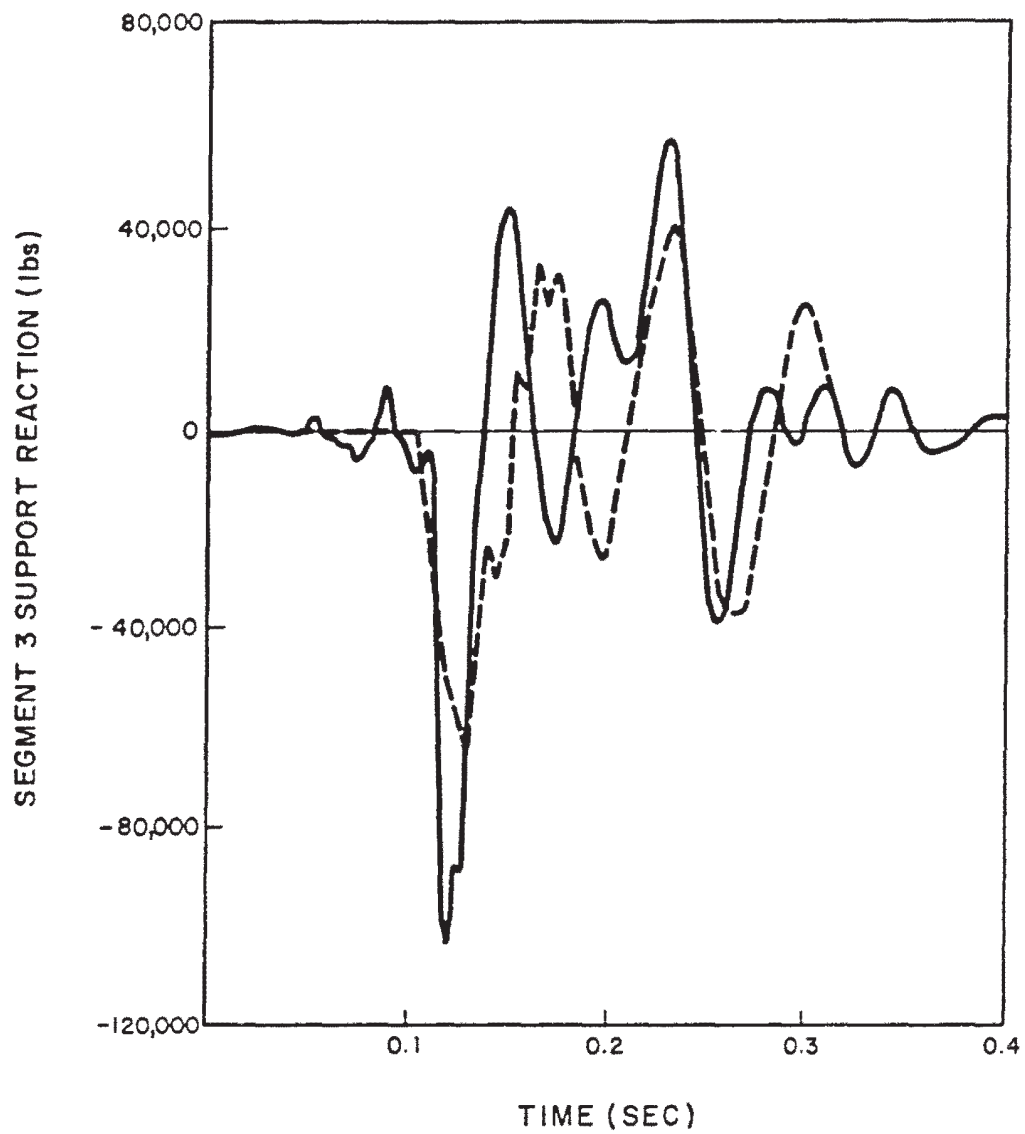
— NUPIPE-SW
- - - EPRI TEST RESULTS

AMENDMENT 61
DECEMBER 19, 1986

COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNITS 1 and 2

COMPARISON OF SEGMENT 2
SUPPORT REACTION

FIGURE 3B.10-5



LEGEND

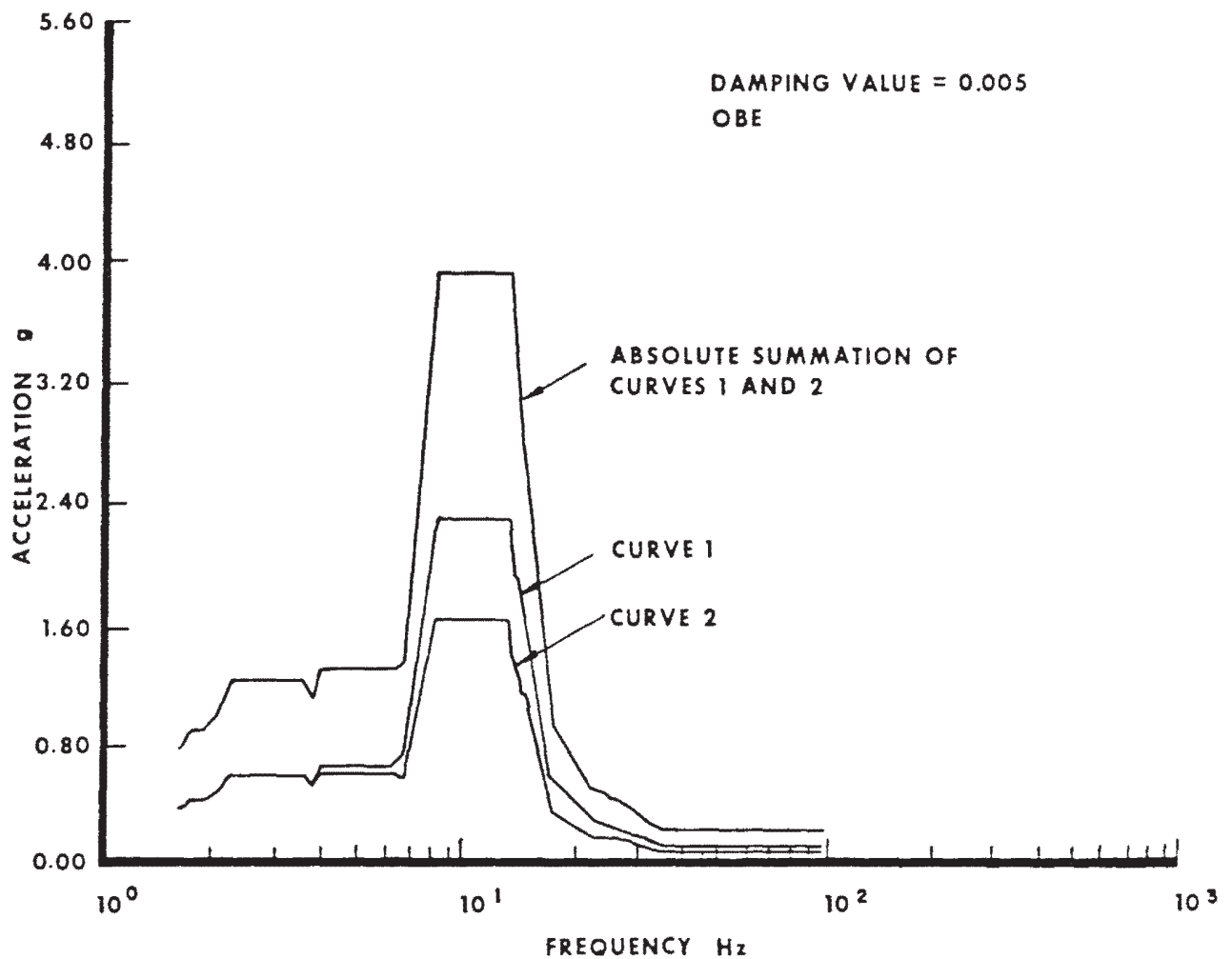
———— NUPIPE-SW
----- EPRI TEST RESULTS

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COMPARISON OF SEGMENT 3
SUPPORT REACTION

FIGURE 3B.10-6

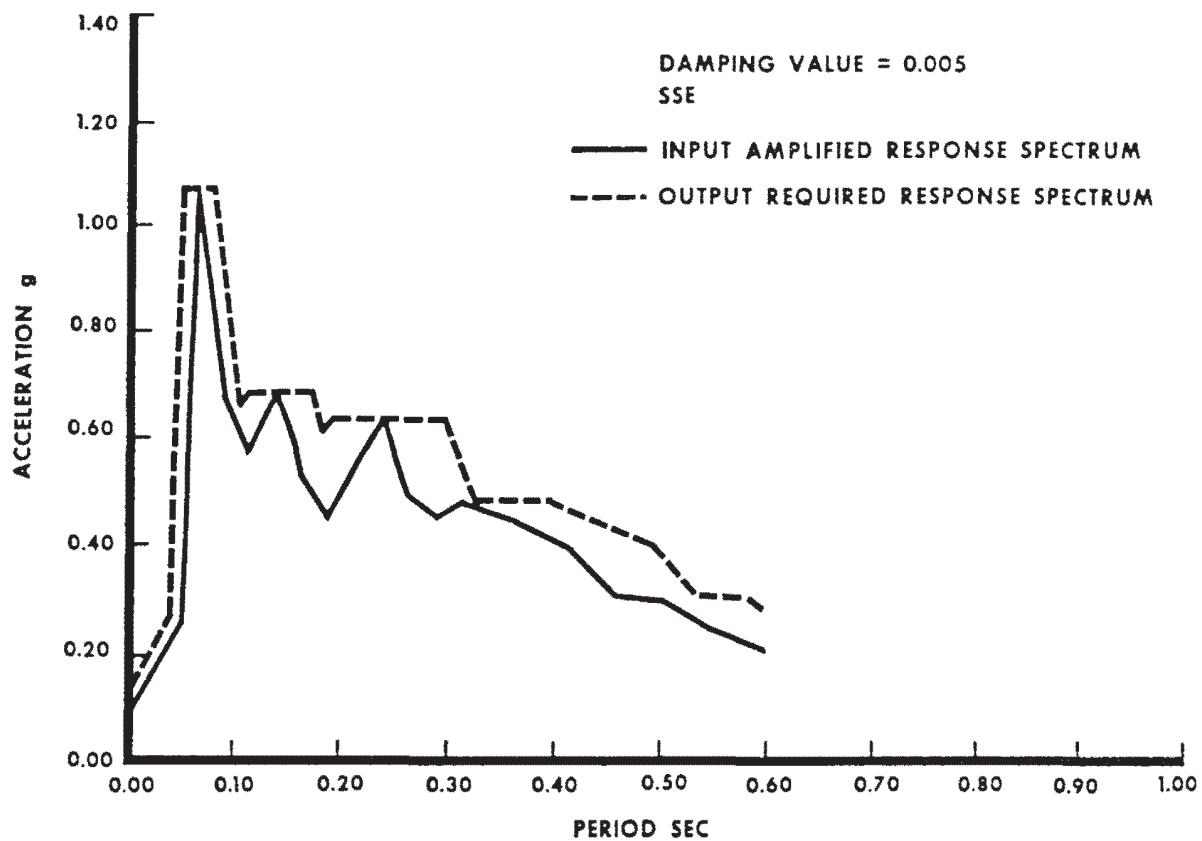


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PSPECTRA-ABSOLUTE
SUMMATION OF ARS CURVES

FIGURE 3B.12-1



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PSPECTRA-REQUIRED RESPONSE
SPECTRUM GENERATION

FIGURE 3B.12-2