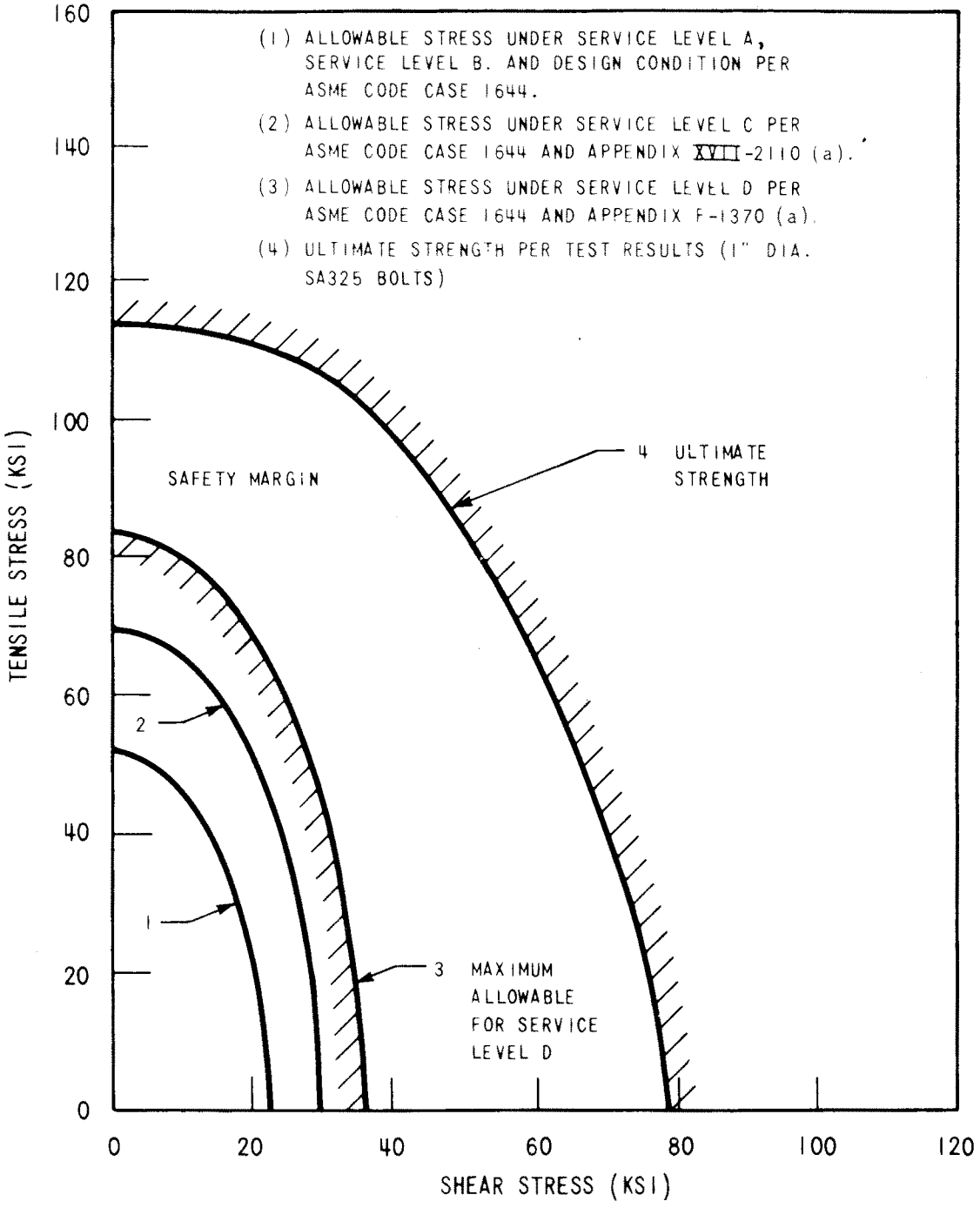

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FIGURE 3A-1

COMPARISON OF TENSILE STRESS FOR BOLTS

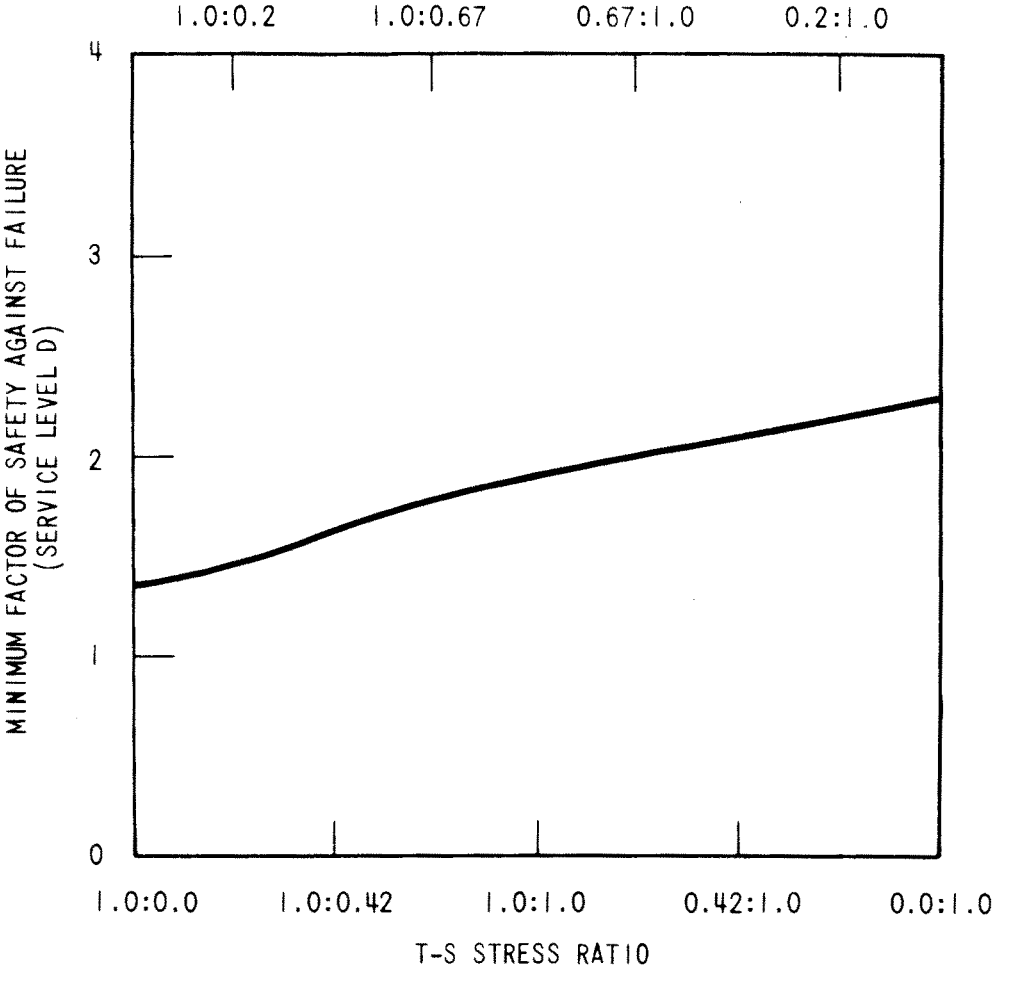

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FIGURE 3A-2

FACTOR OF SAFETY AGAINST FAILURE UNDER SERVICE LEVEL D AS A FUNCTION OF T-S RATIO

FSAR Figure 3B-1 withheld per RIS 2015-17

FSAR Figure 3B-1 withheld per RIS 2015-17

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FIGURE 3B – 1

AUXILIARY BUILDING EL. 1974
HAZARDS ANALYSIS
ROOM LOCATIONS

FSAR Figure 3B-2 withheld per RIS 2015-17

H

G

F

E

D

C

B

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FIGURE 3B-2
PLAN AND ELEVATION
VIEW OF MAIN
STEAM/MAIN FEEDWATER
ISOLATION VALVE
COMPARTMENT
(SK-C-250)

8 7 6 5 4 3 2 1

FSAR Figure 3B-2 withheld per RIS 2015-17

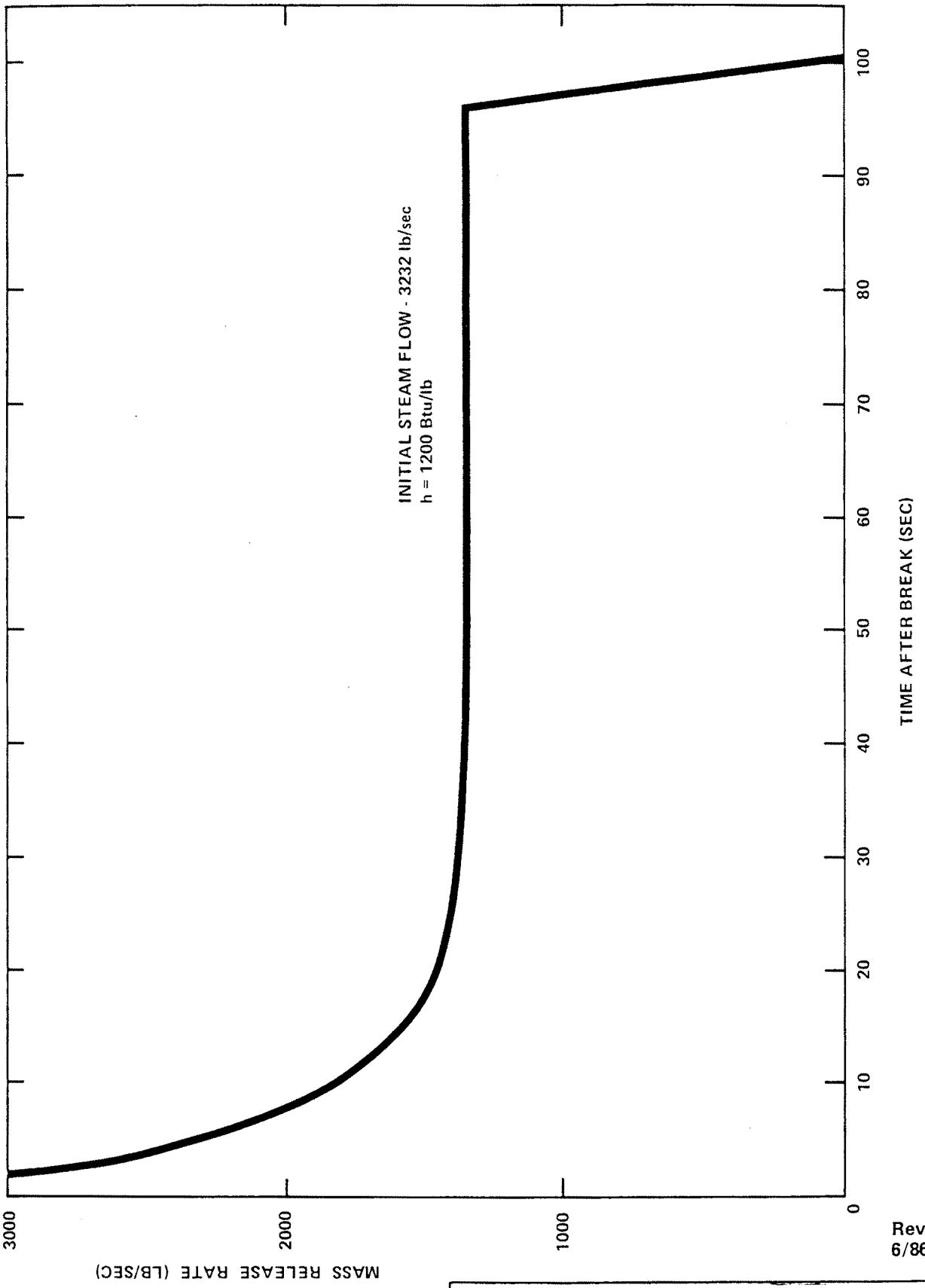

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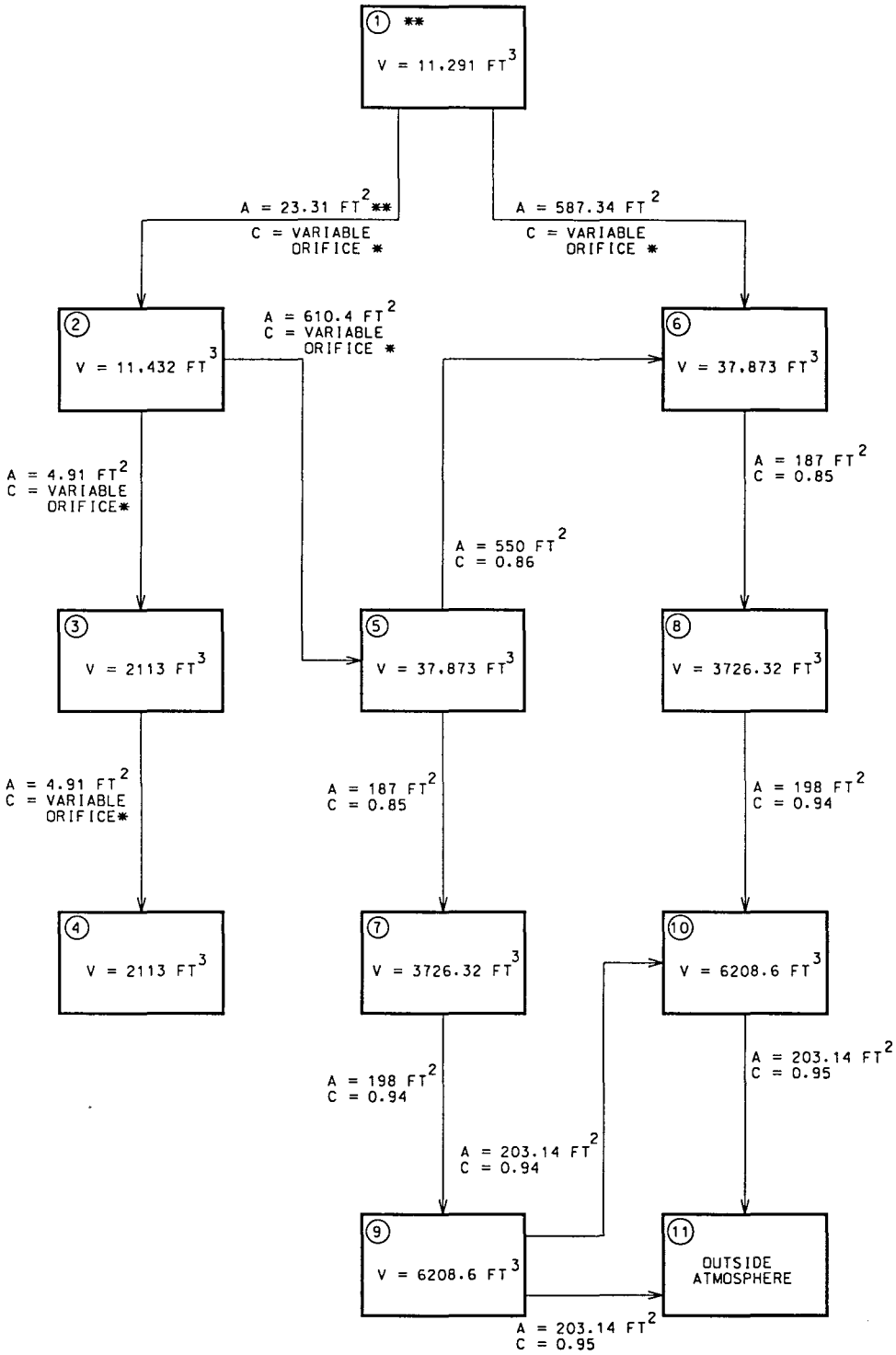
FIGURE 3B-3

MASS RELEASE RATE
FOLLOWING A 1.4 FT^2 STEAM LINE BREAK



* VARIABLE ORIFICE FLOW COEFFICIENT IS DESCRIBED IN REFERENCE 2

** SEE SECTION 3B.4.2.4 FOR DESCRIPTION OF SUBCOMPARTMENT VOLUMES AND VENT AREAS

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11/98

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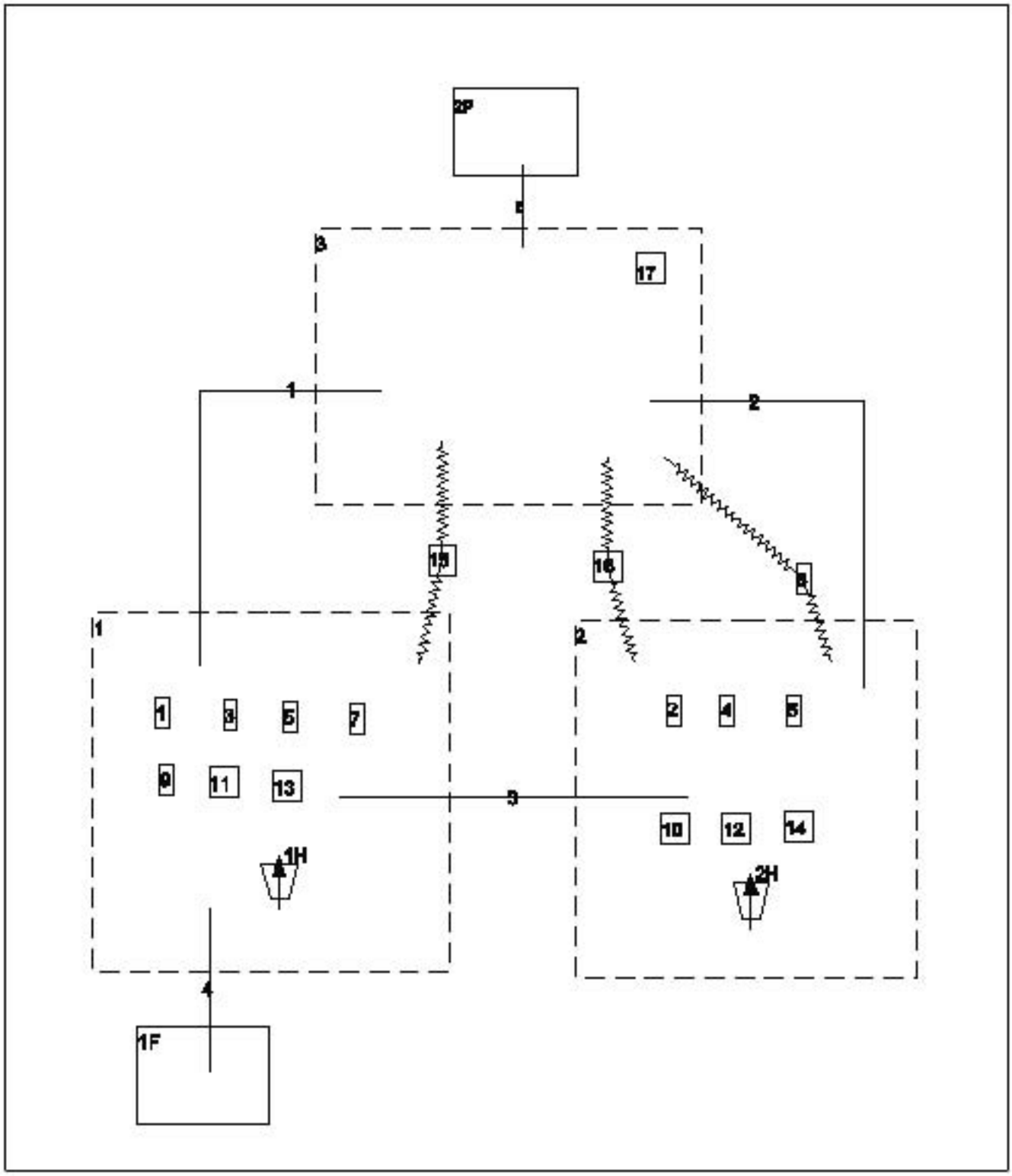
FIGURE 3B-4

NODALIZATION MODEL FOR MAIN STEAM / MAIN FEEDWATER ISOLATION VALVE COMPARTMENT PRESSURE ANLYSIS



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5/06

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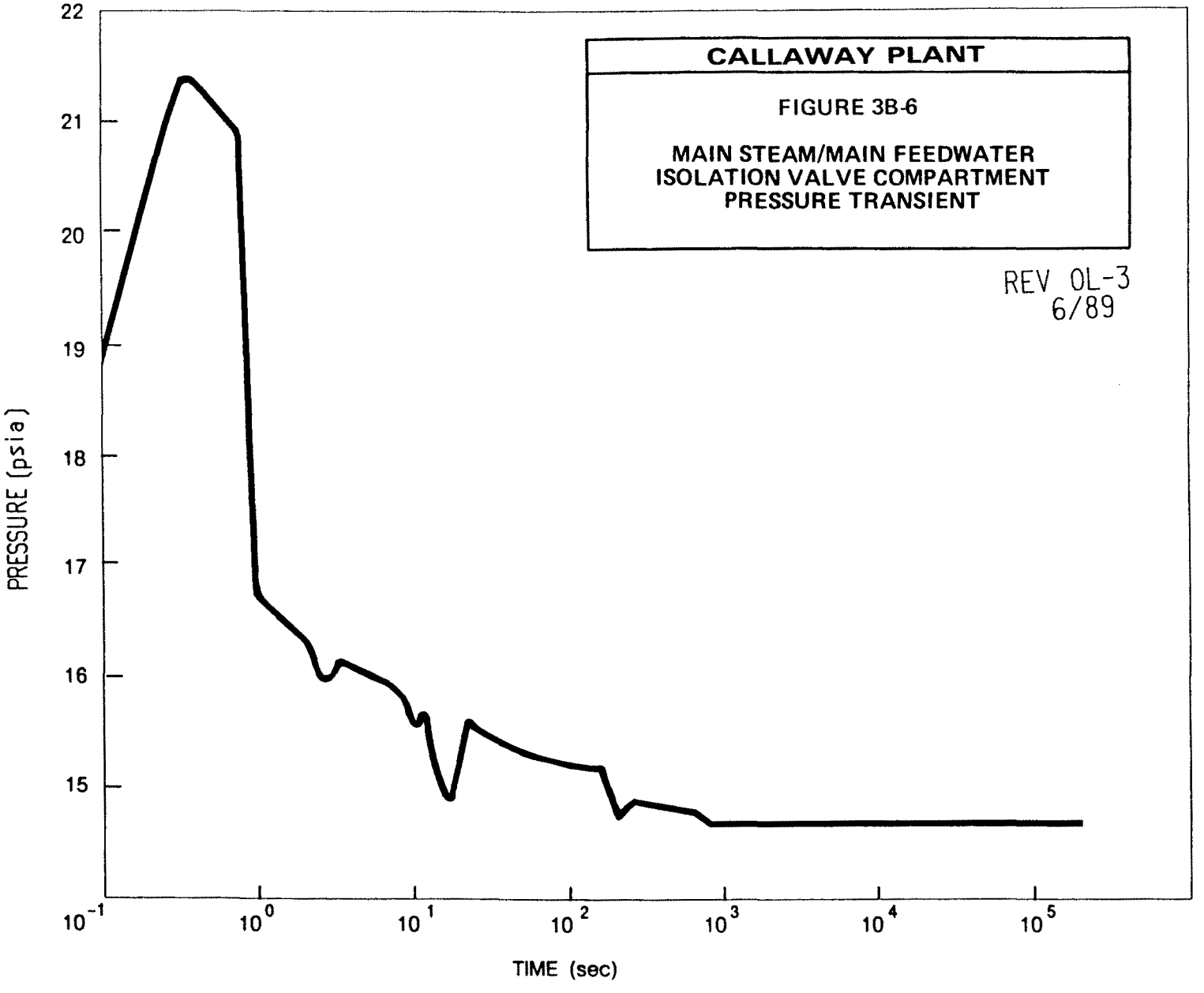
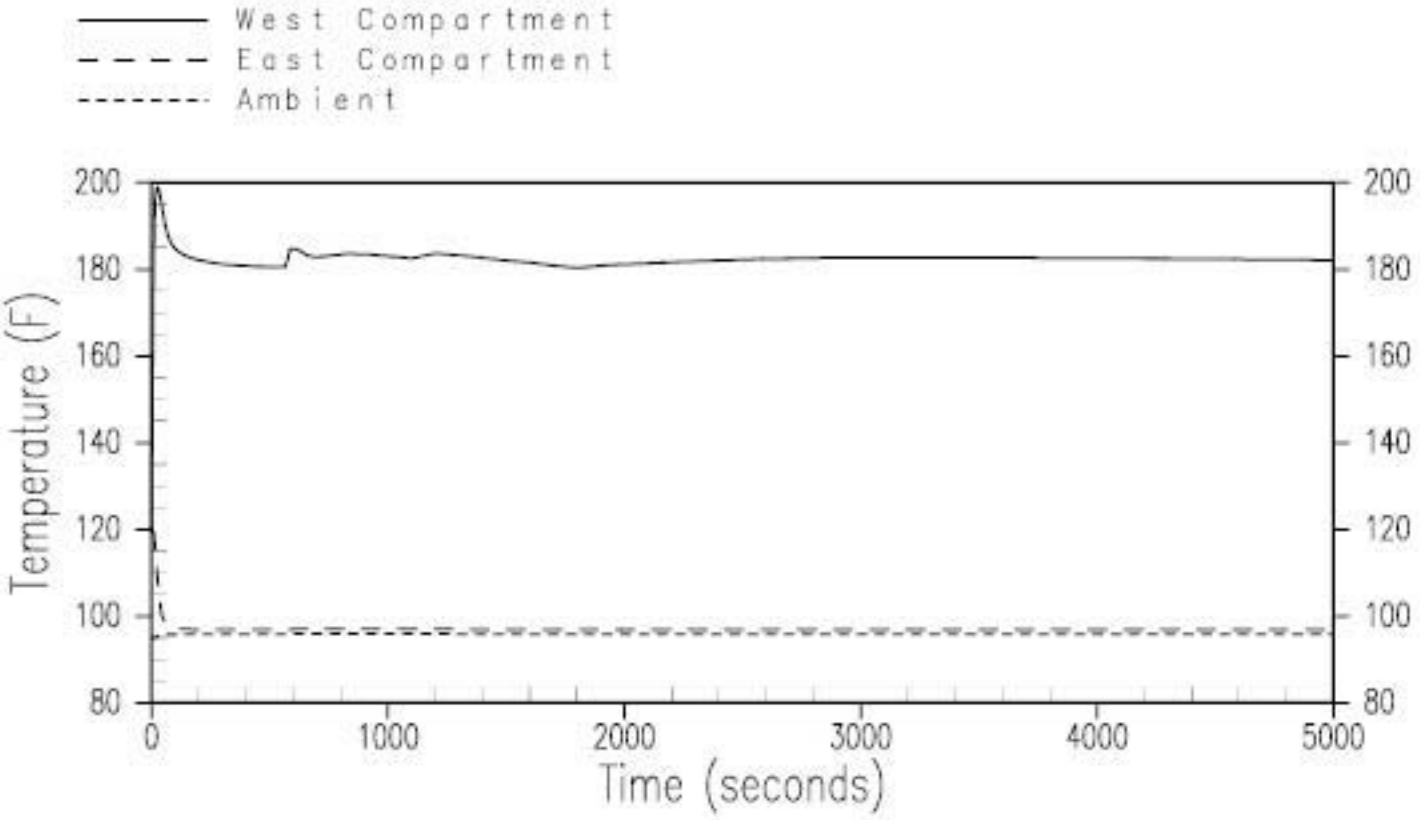
FIGURE 3B-5

NODALIZATION MODEL FOR
MAIN STEAM / MAIN FEEDWATER
ISOLATION VALVE COMPARTMENT
TEMPERATURE ANALYSIS


CALLAWAY PLANT
FIGURE 3B-6
MAIN STEAM/MAIN FEEDWATER
ISOLATION VALVE COMPARTMENT
PRESSURE TRANSIENT
REV OL-3
6/89
PRESSURE (psia)
22
21
20
19
18
17
16
15
10^{-1}
10^{0}
10^{1}
10^{2}
10^{3}
10^{4}
10^{5}
TIME (sec)



REV. OL-16
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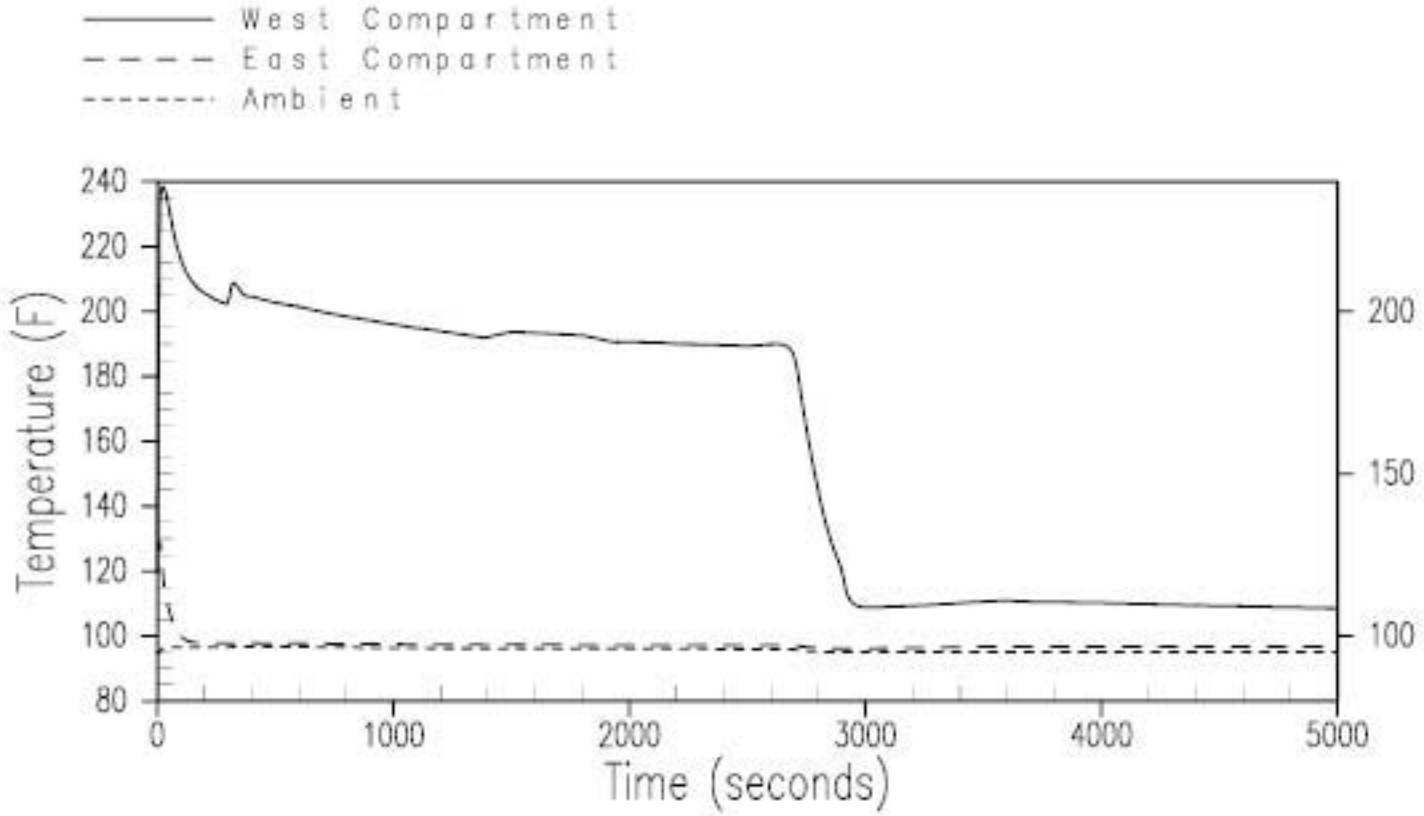
FIGURE 3B-7

MAIN STEAM/MAIN FEEDWATER ISOLATION
VALVE COMPARTMENT TEMPERATURE TRANSIENT
0.05 FT² BREAK CASE



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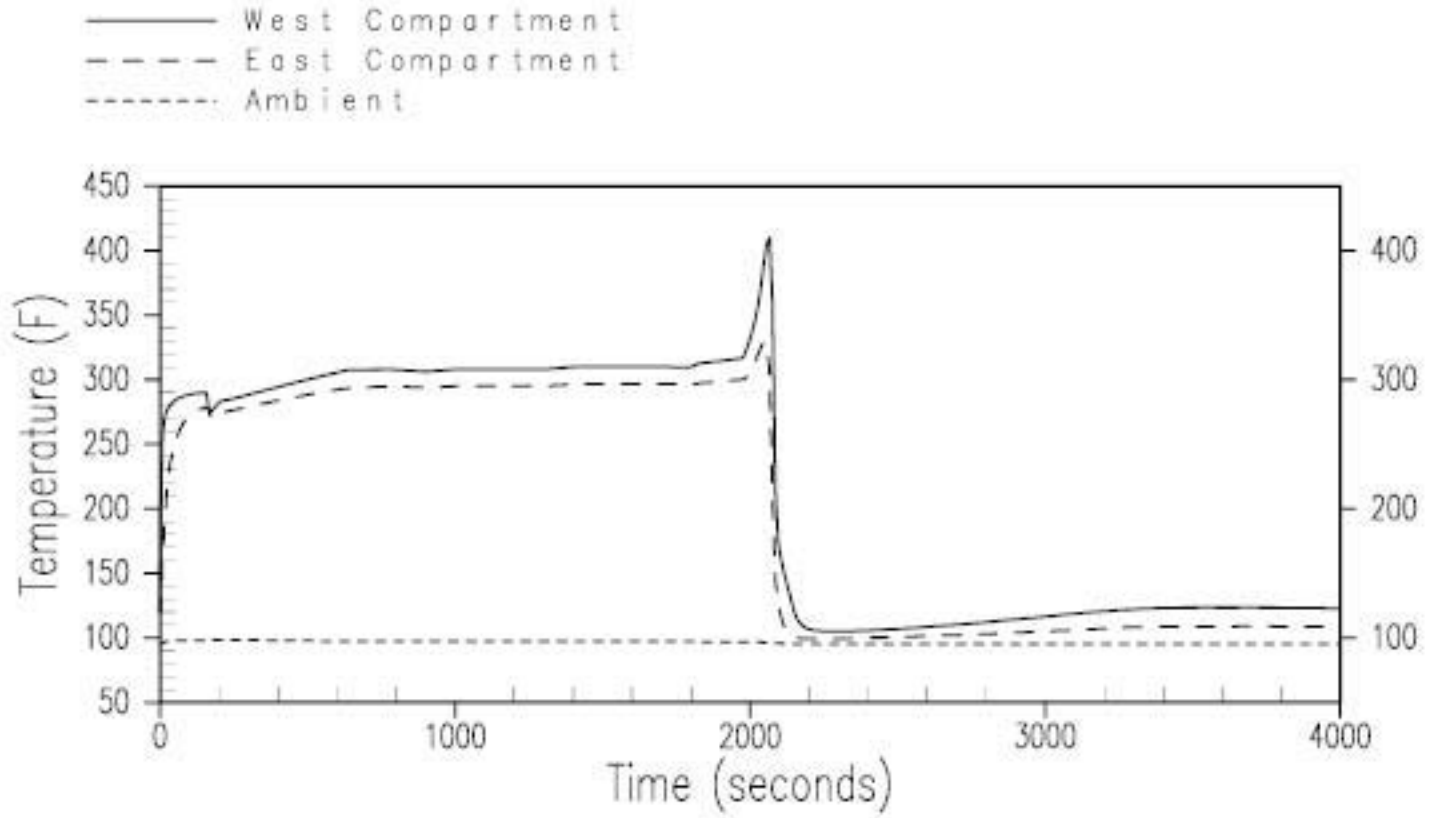
CALLAWAY PLANT

FIGURE 3B-8

MAIN STEAM/MAIN FEEDWATER ISOLATION
VALVE COMPARTMENT TEMPERATURE TRANSIENT
0.1 FT² BREAK CASE



REV. OL-16
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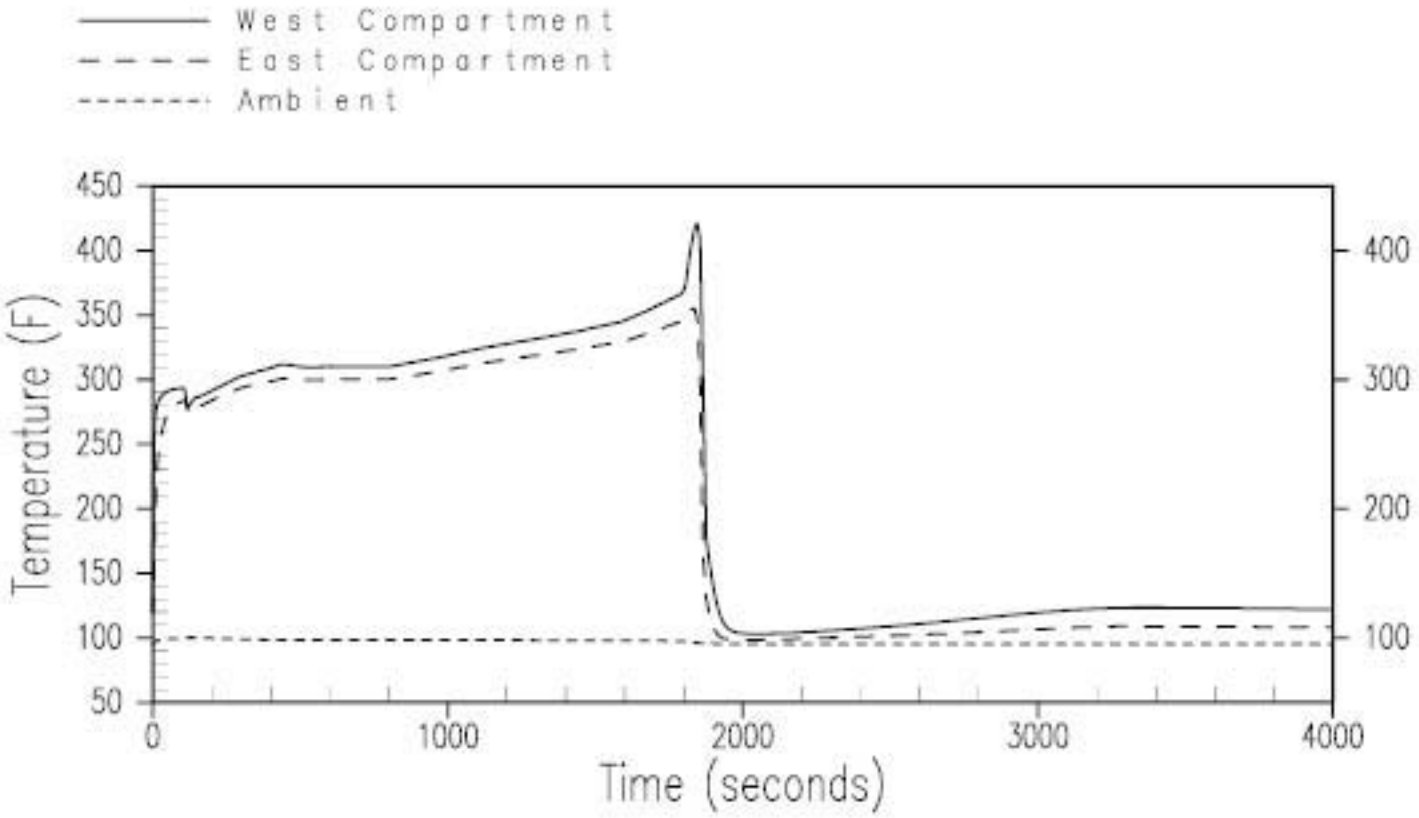
CALLAWAY PLANT

FIGURE 3B-9

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 0.2 FT² BREAK CASE



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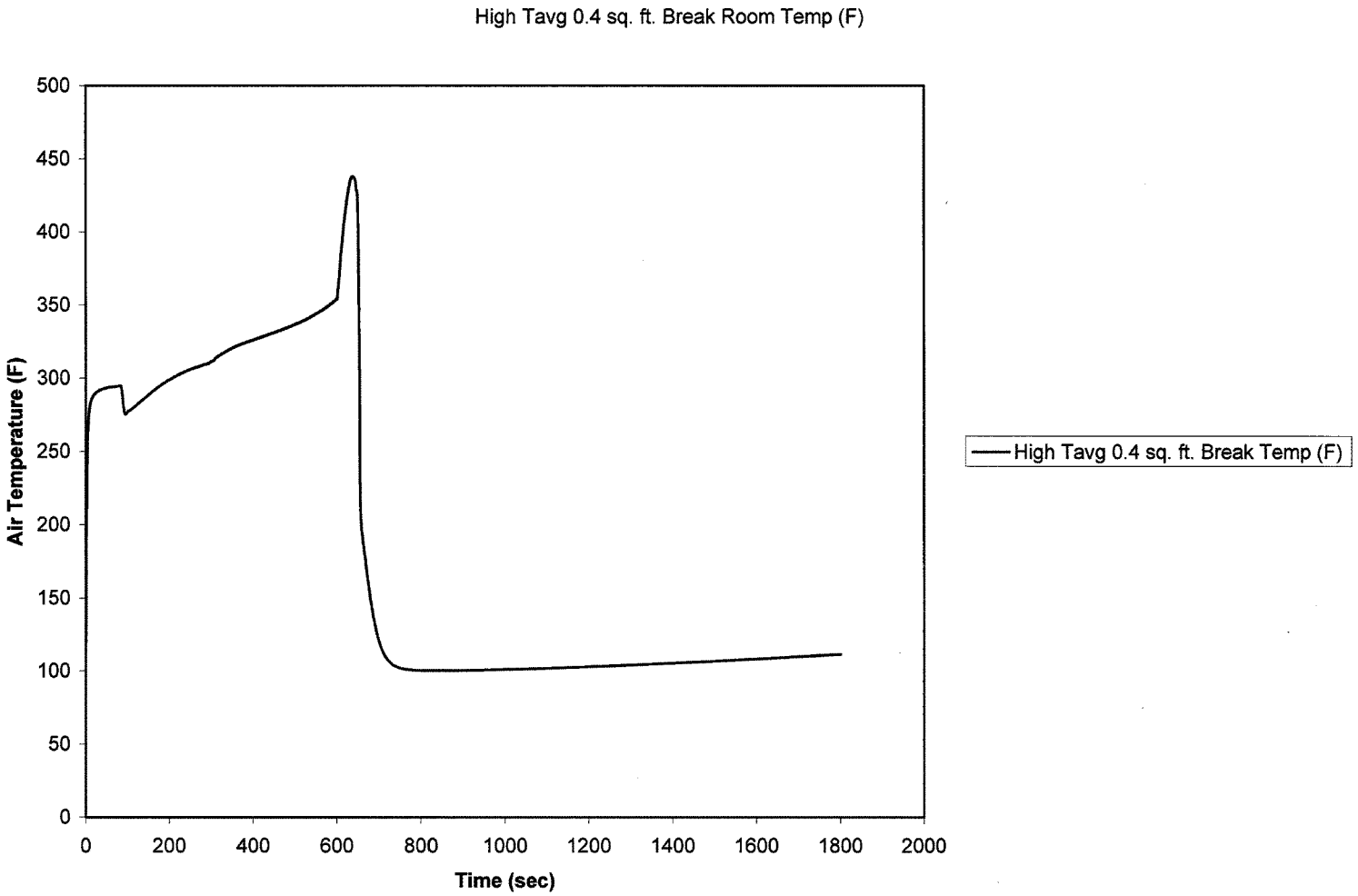
CALLAWAY PLANT

FIGURE 3B-10

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 0.5 FT² BREAK CASE

Figure 3B-10A Deleted



CALLAWAY PLANT

FIGURE 3B-11

MAIN STEAM / MAIN FEEDWATER ISOLATION
VALVE COMPARTMENT TEMPERATURE TRANSIENT
0.4 FT^2 BREAK CASE

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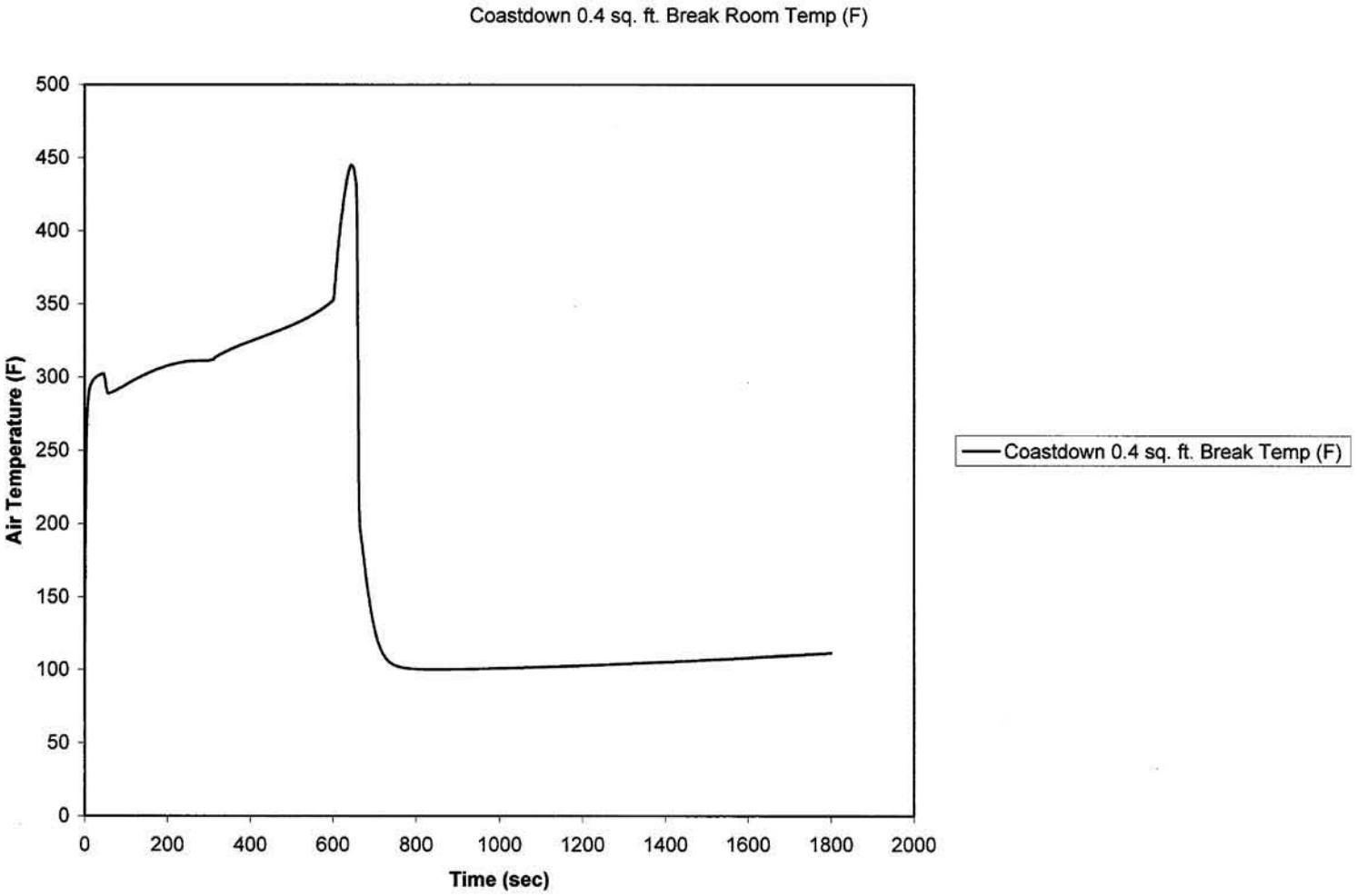

CALLAWAY PLANT

FIGURE 3B-11A

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 0.4 FT² BREAK CASE FOR TAVG COASTDOWN

REV. 1 1/10

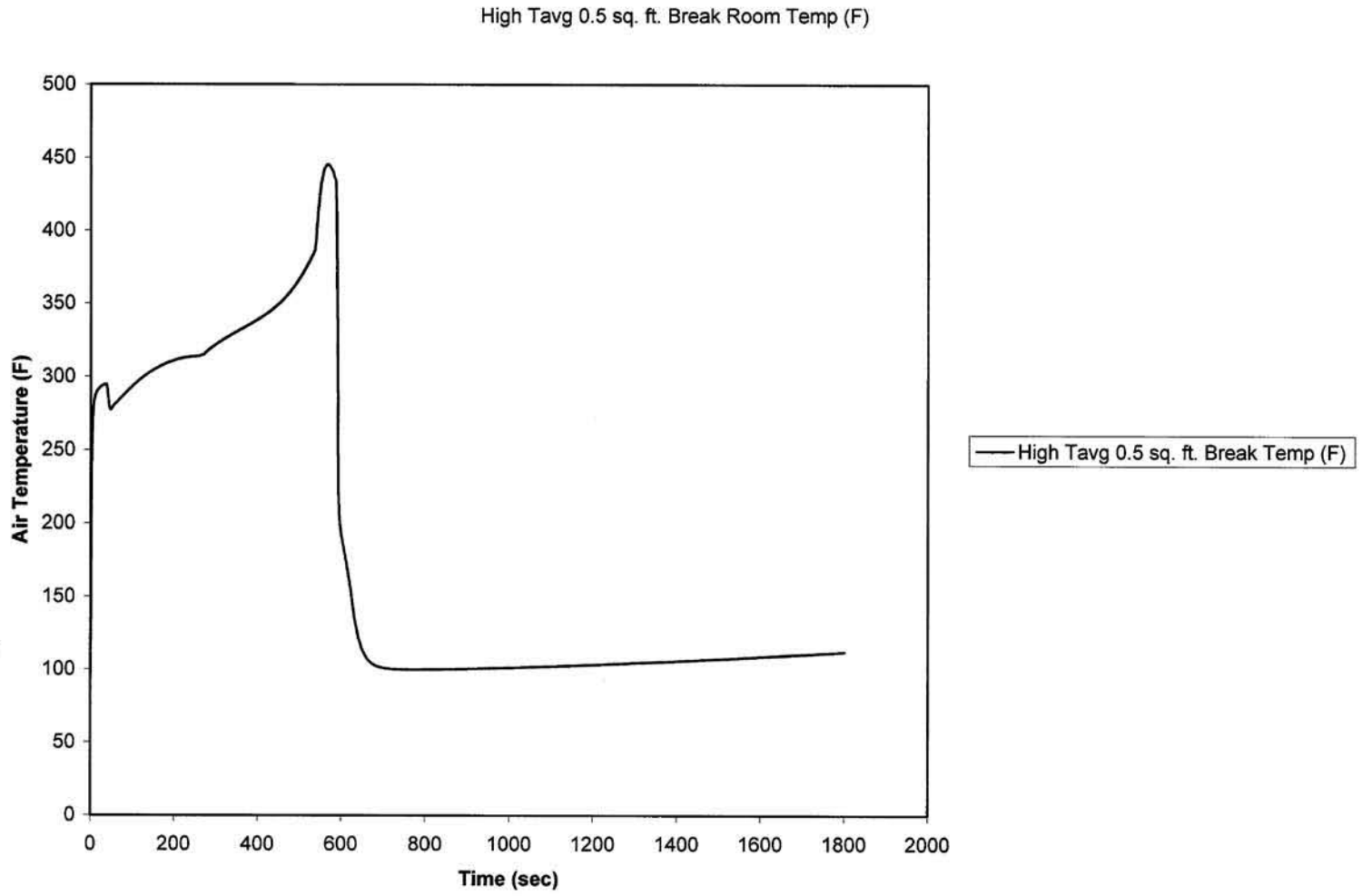

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FIGURE 3B-12

MAIN STEAM/MAIN FEEDWATER ISOLATION
VALVE COMPARTMENT TEMPERATURE TRANSIENT
0.5 FT^2 BREAK CASE

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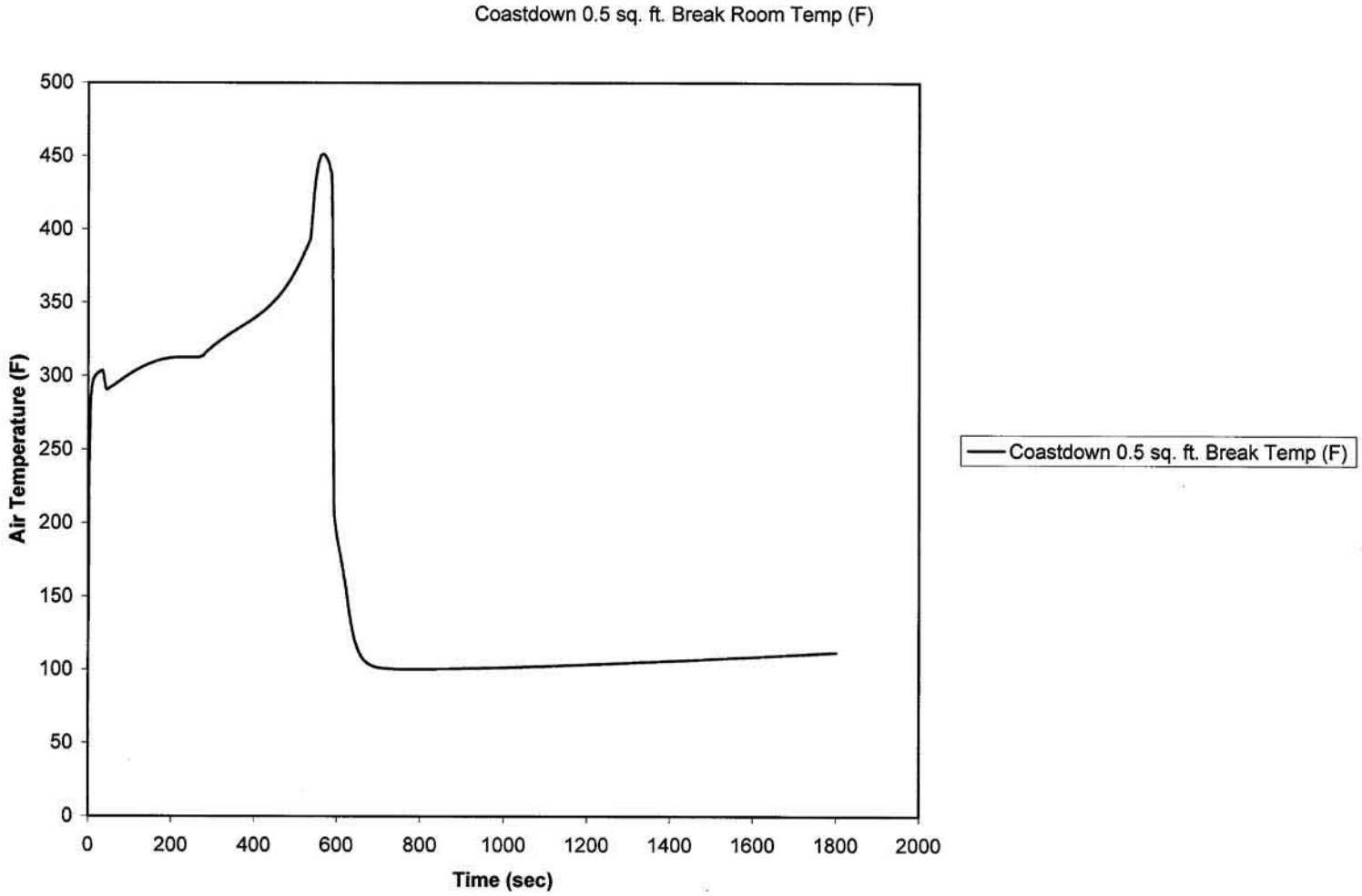
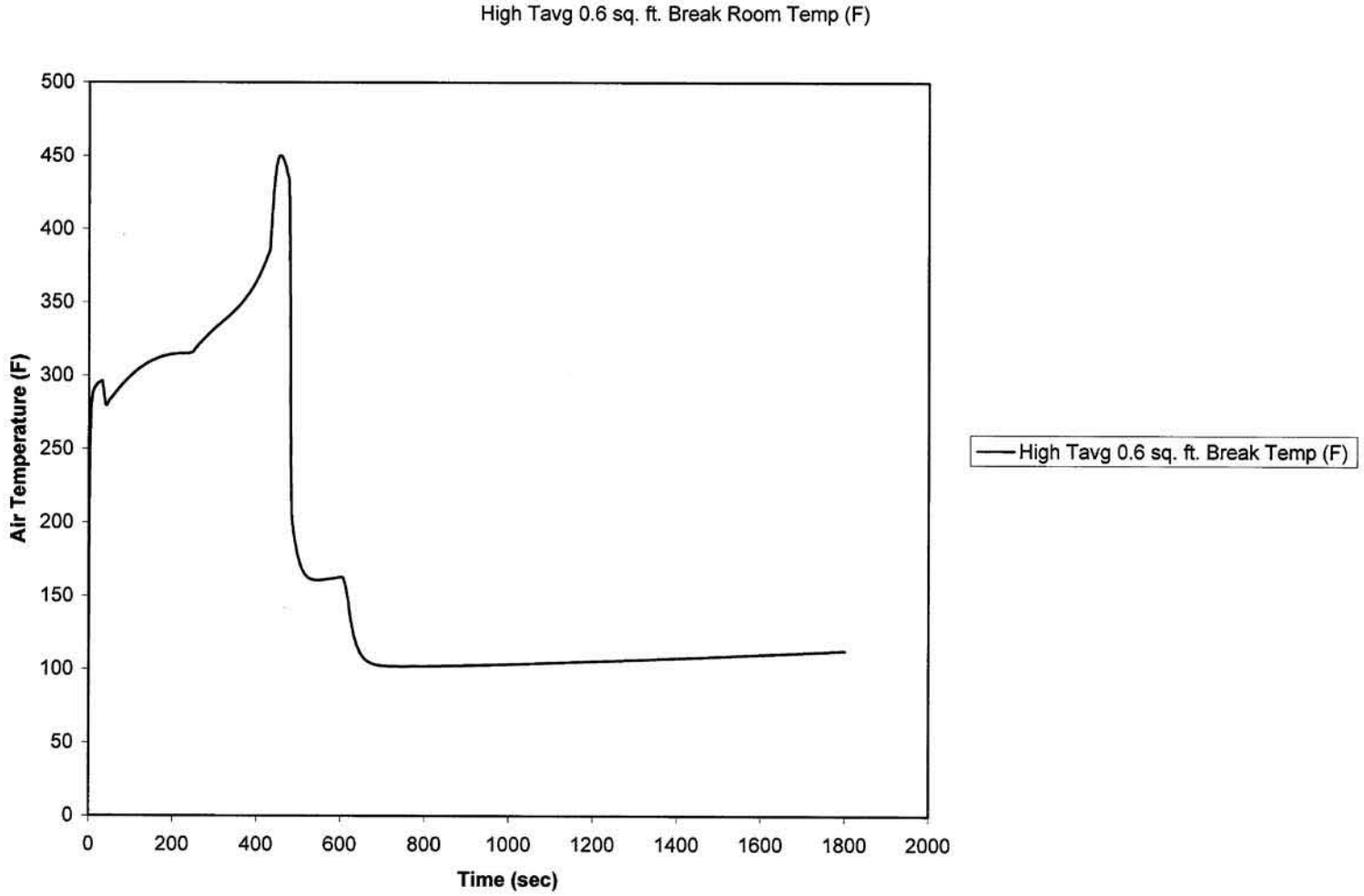


CALLAWAY PLANT

FIGURE 3B-12A

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 0.5 FT² BREAK CASE FOR TAVG COASTDOWN

REV. 1 1/10

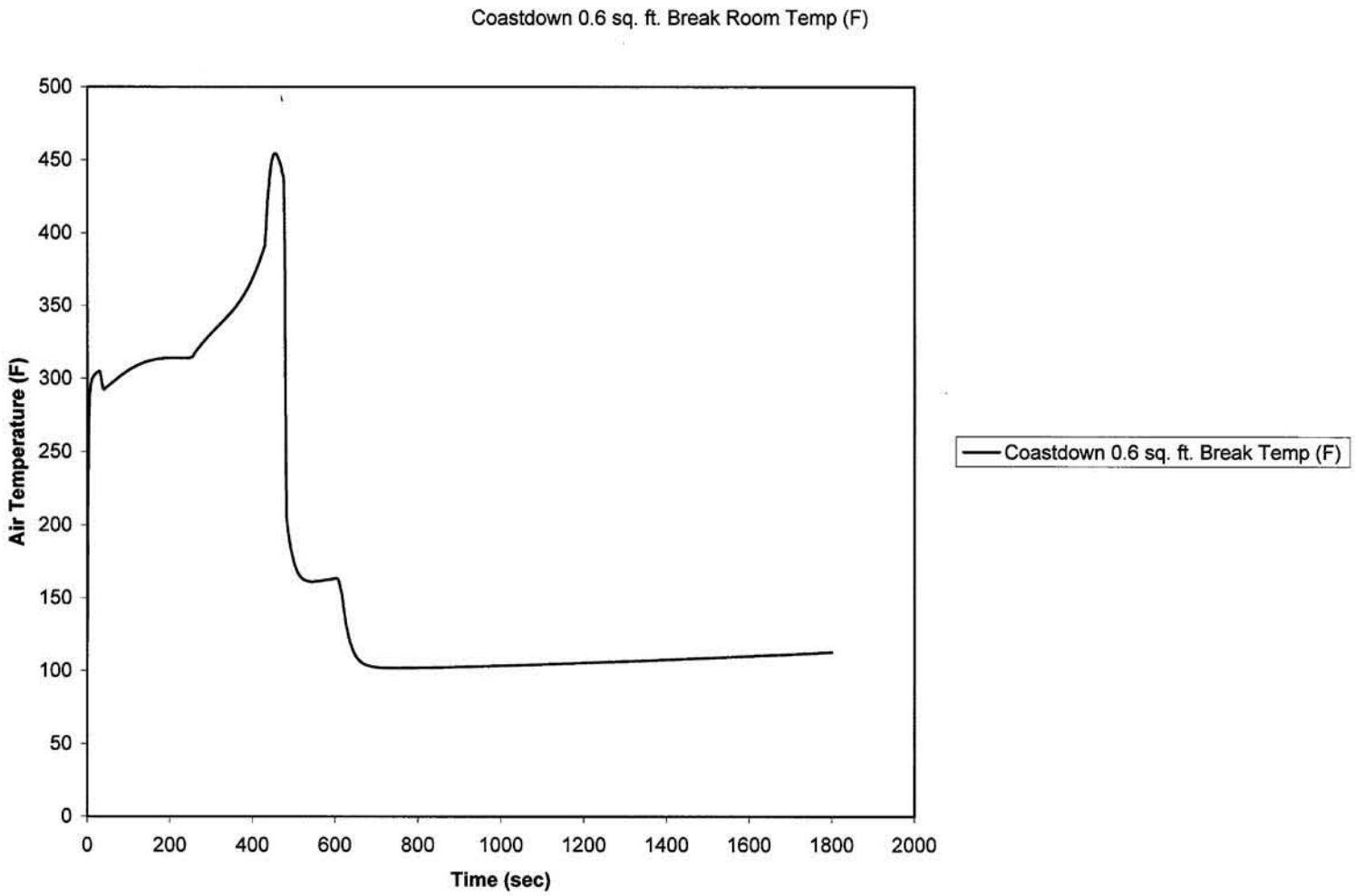


CALLAWAY PLANT

FIGURE 3B-13

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 0.6 FT² BREAK CASE

REV. 16 1/10

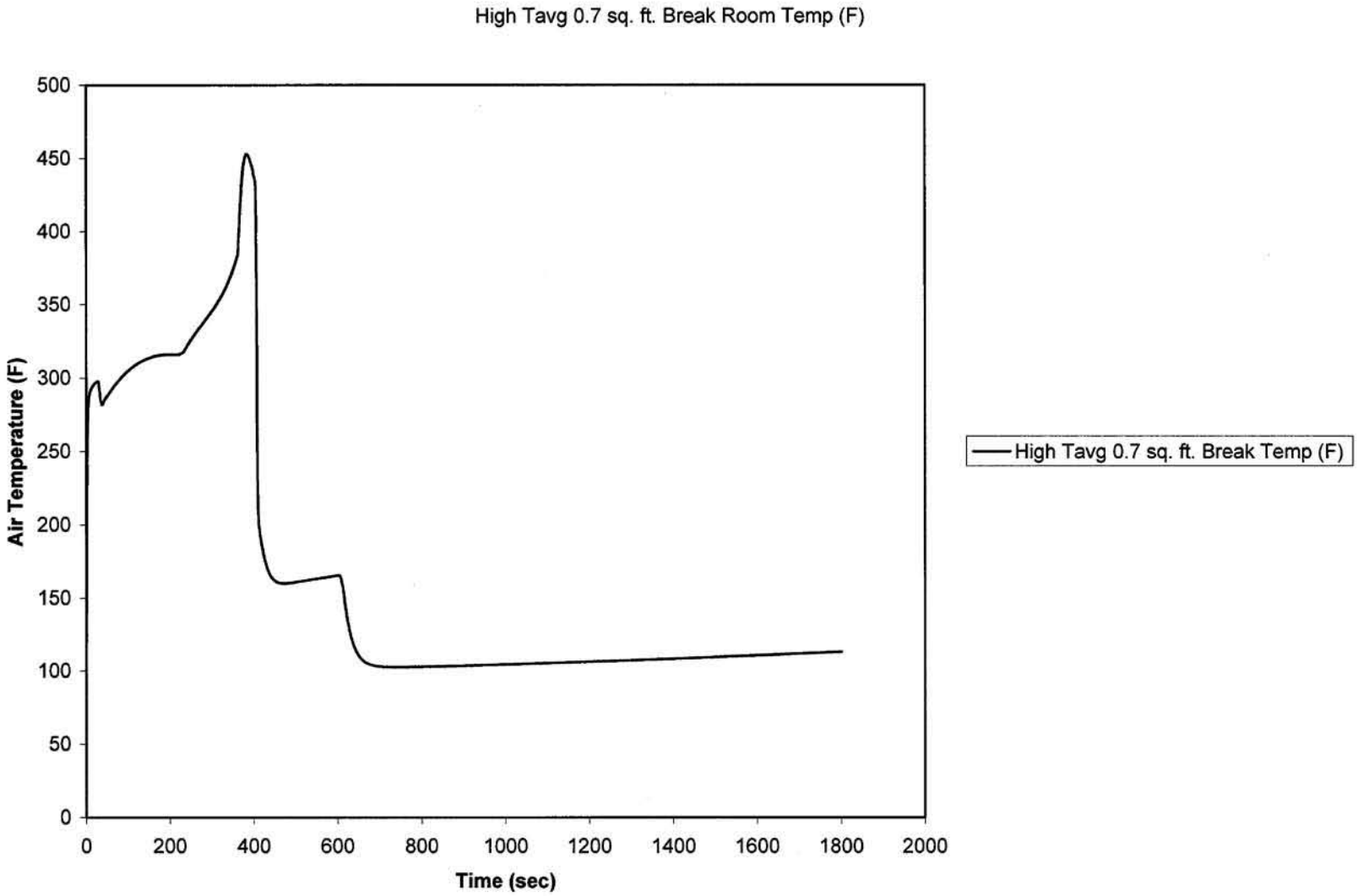


CALLAWAY PLANT

FIGURE 3B-13A

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 0.6 FT² BREAK CASE FOR TAVG COASTDOWN

REV. 1 1/10

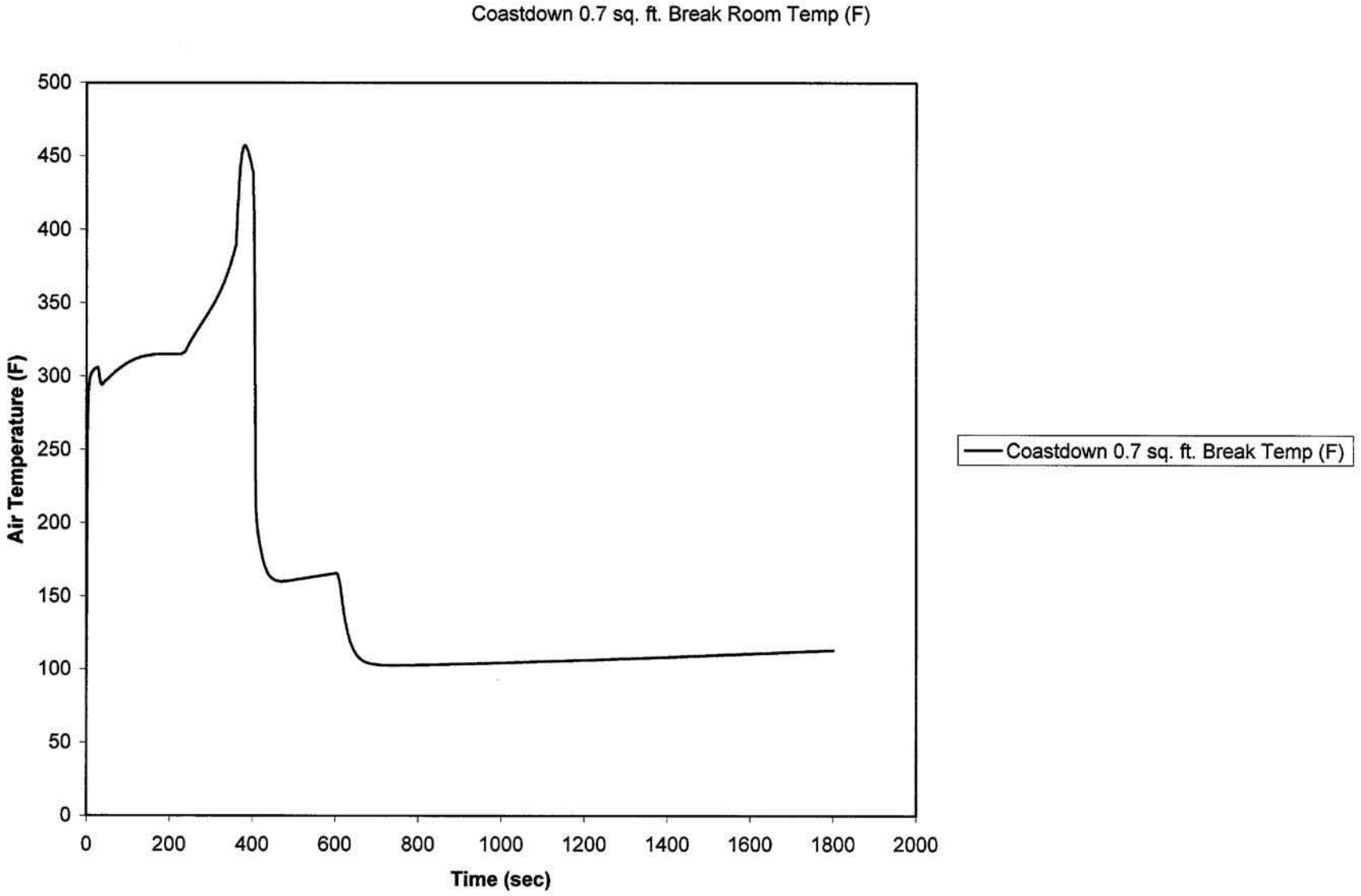


CALLAWAY PLANT

FIGURE 3B-14

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 0.7 FT² BREAK CASE

REV. 16 1/10

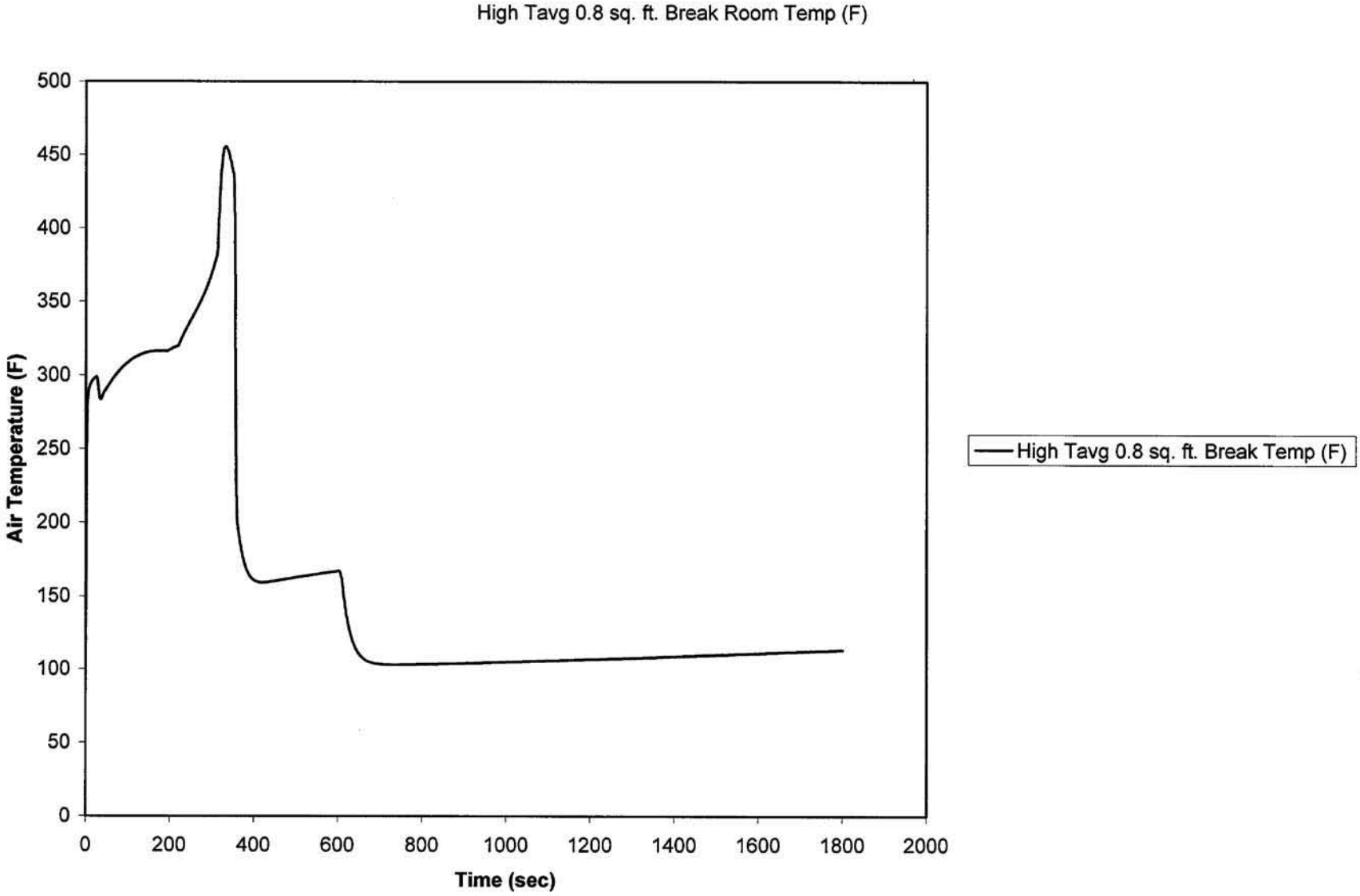


CALLAWAY PLANT

FIGURE 3B-14A

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 0.7 FT^2 BREAK CASE FOR TAVG COASTDOWN

REV. 1 1/10

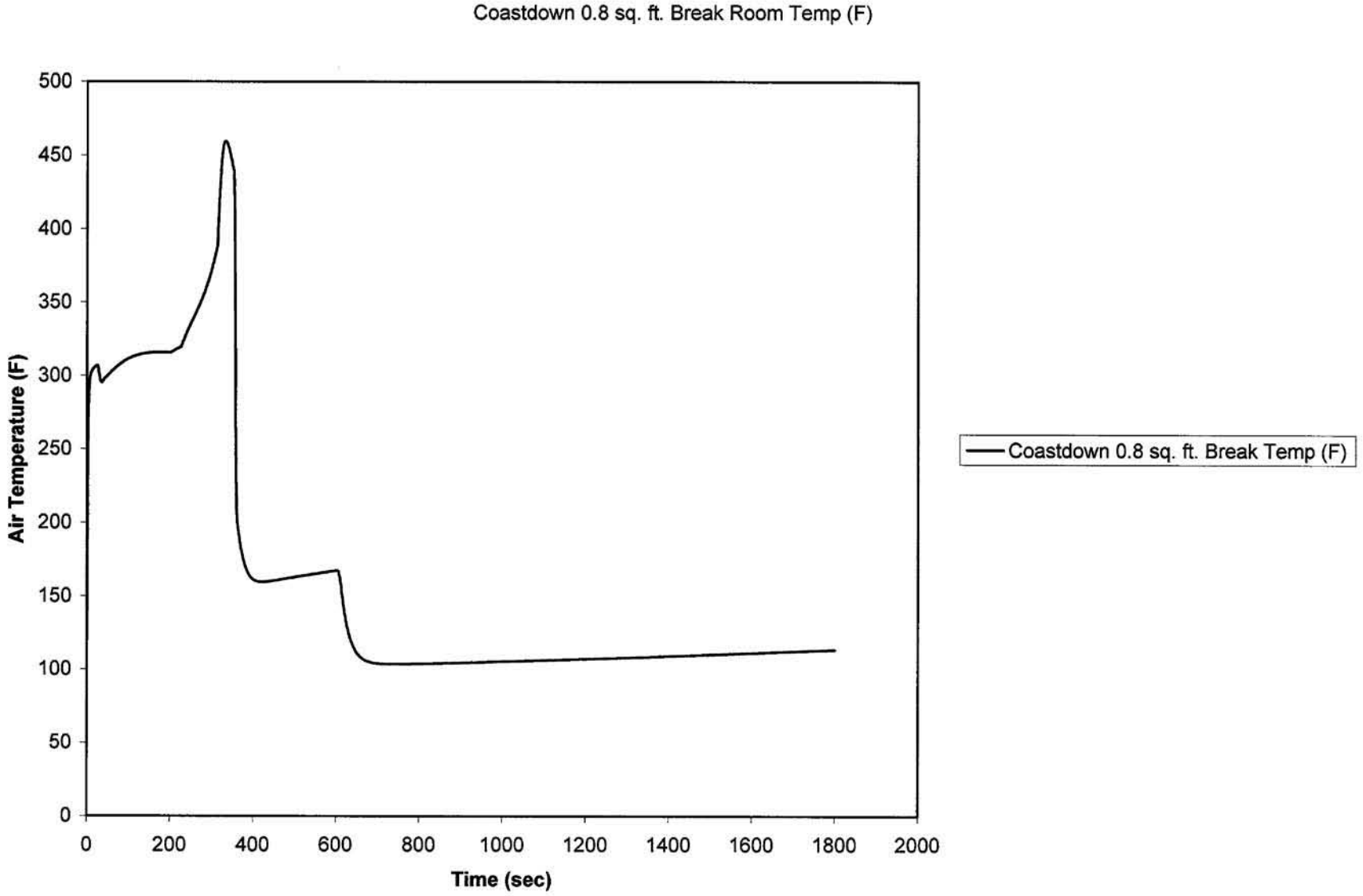


CALLAWAY PLANT

FIGURE 3B-15

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 0.8 FT² BREAK CASE

REV. 16 1/10



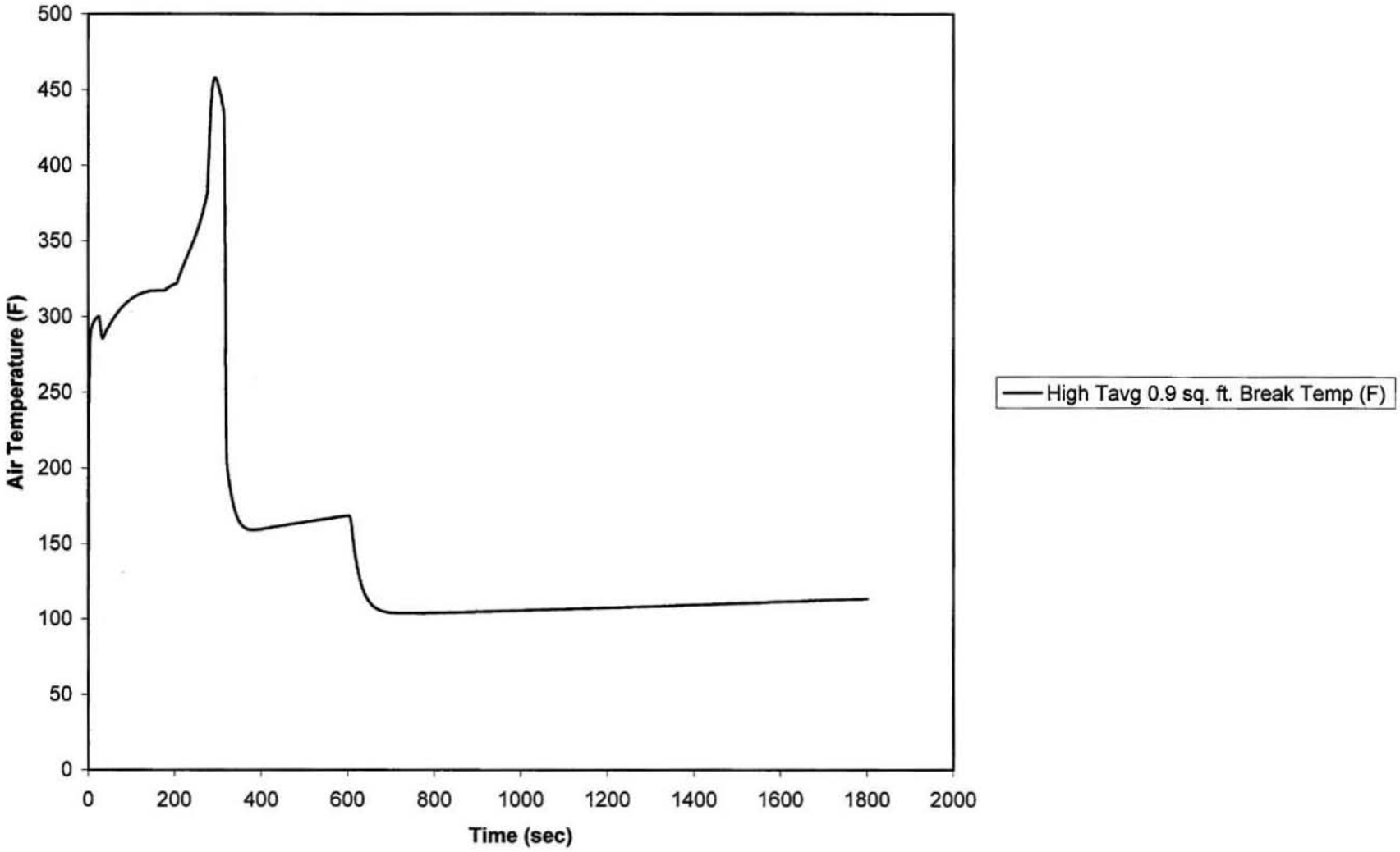
CALLAWAY PLANT

FIGURE 3B-15A

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 0.8 FT^2 BREAK CASE FOR TAVG COASTDOWN

REV. 1 1/10

High Tavg 0.9 sq. ft. Break Room Temp (F)

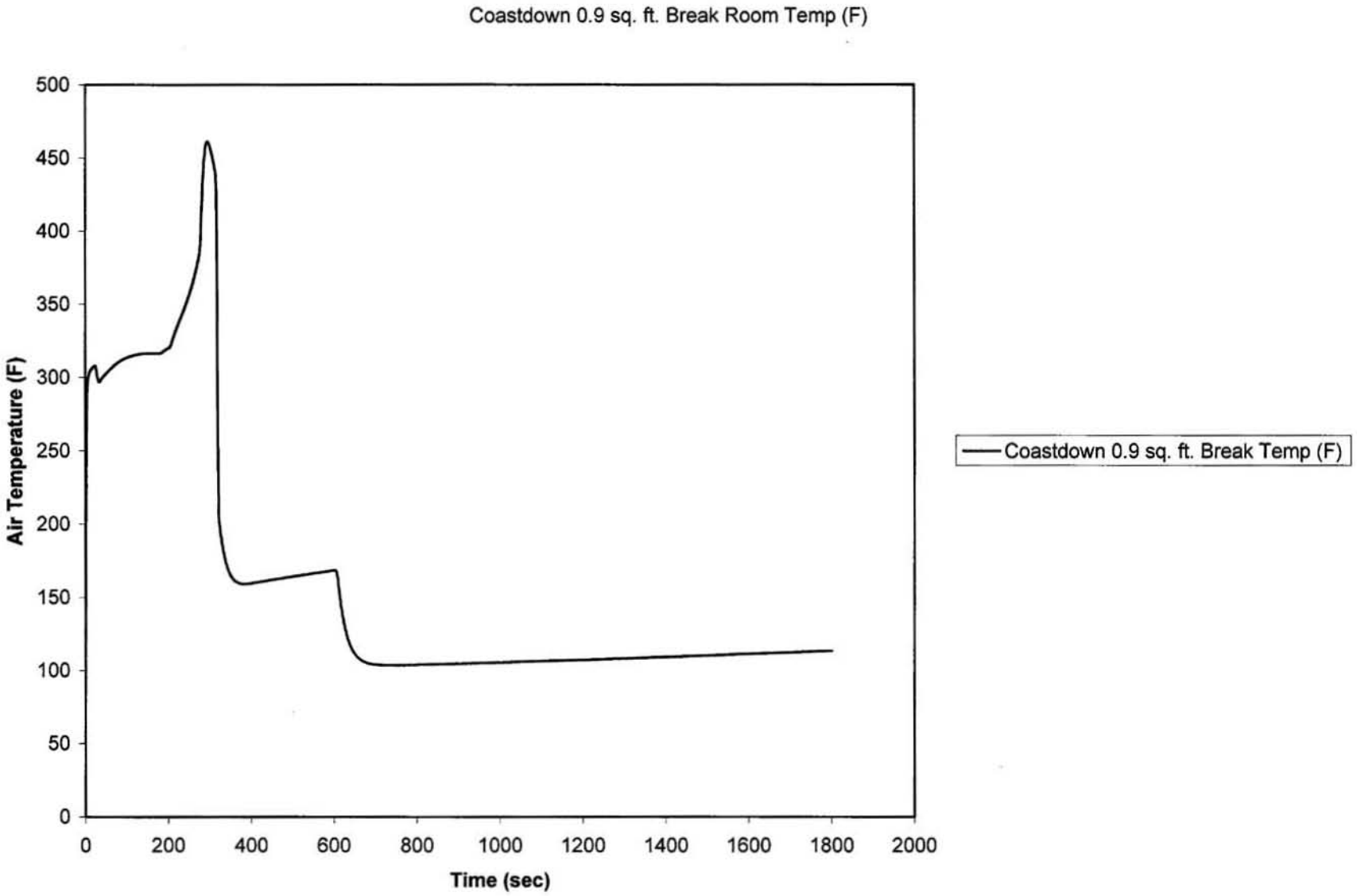


CALLAWAY PLANT

FIGURE 3B-16

MAIN STEAM/ MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 0.9 FT² BREAK CASE

REV. 16 1/10

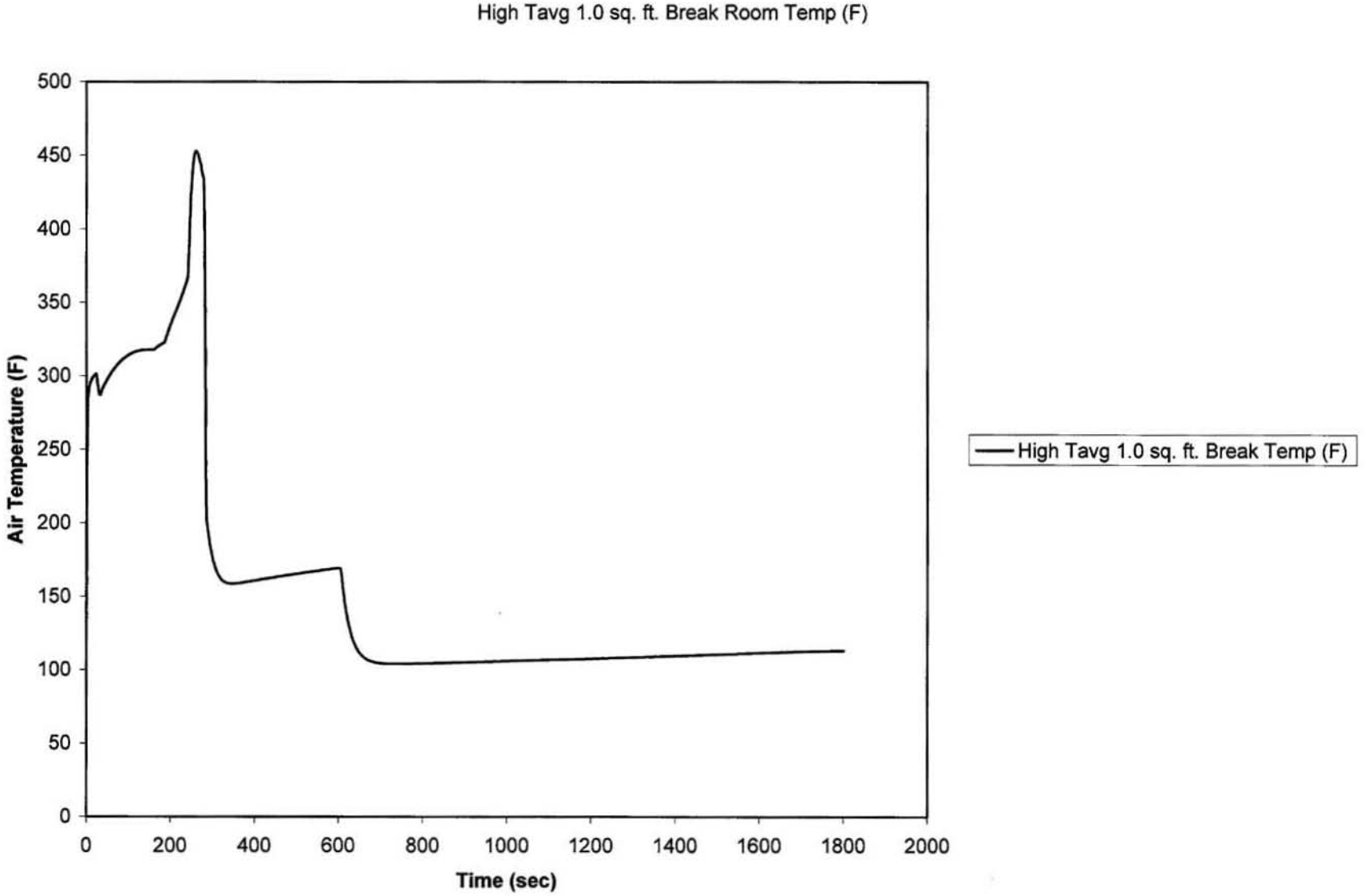


CALLAWAY PLANT

FIGURER 3B-16A

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 0.9 FT^2 BREAK CASE FOR TAVG COASTDOWN

REV. 1 1/10

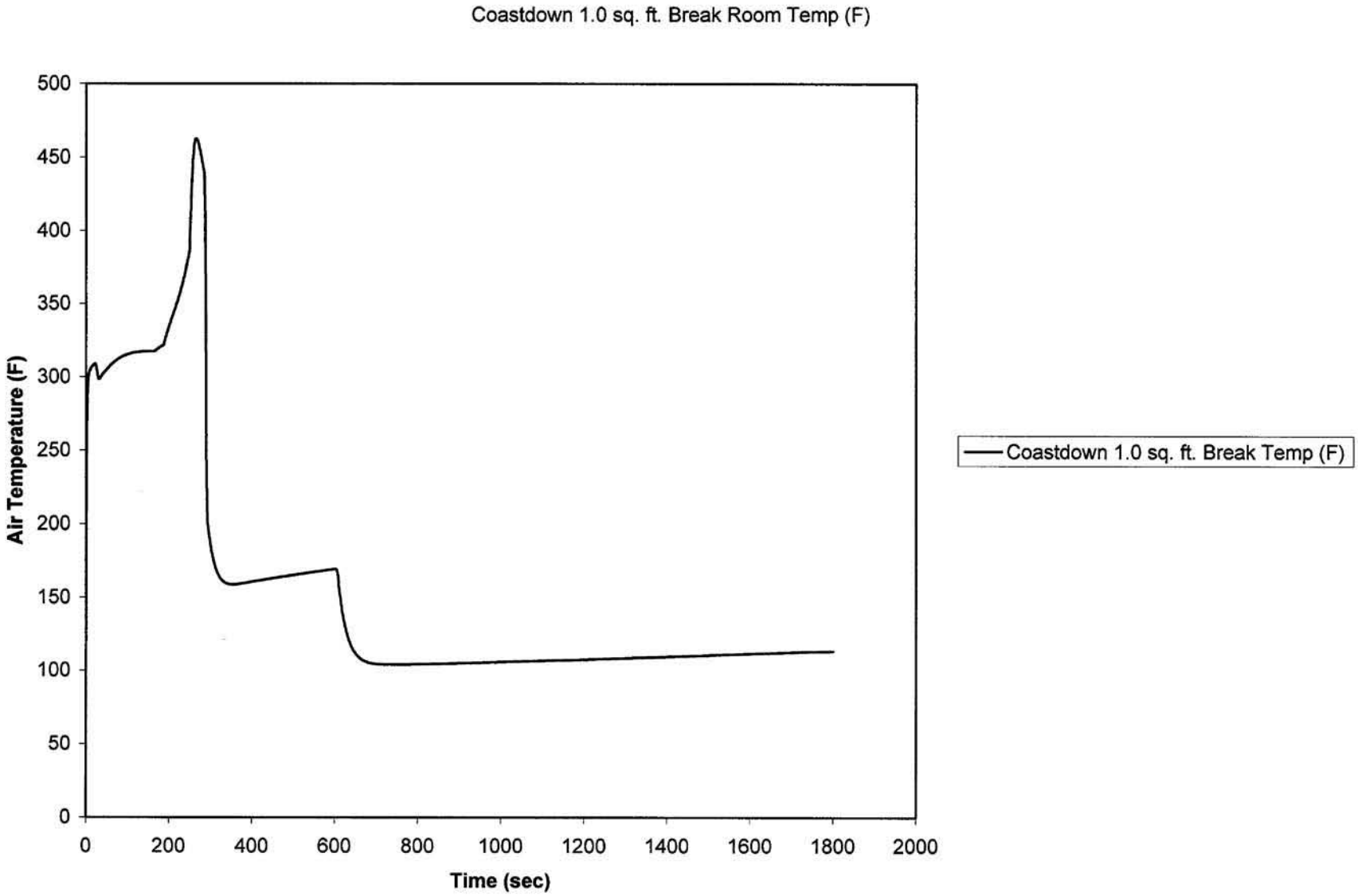


CALLAWAY PLANT

FIGURE 3B-17

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 1.0 FT² BREAK CASE

REV. 16 1/10



CALLAWAY PLANT

FIGURE 3B-17A

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 1.0 FT^2 BREAK CASE FOR TAVG COASTDOWN

REV. 1 1/10

High Tavg 1.2 sq. ft. Break Room Temp (F)

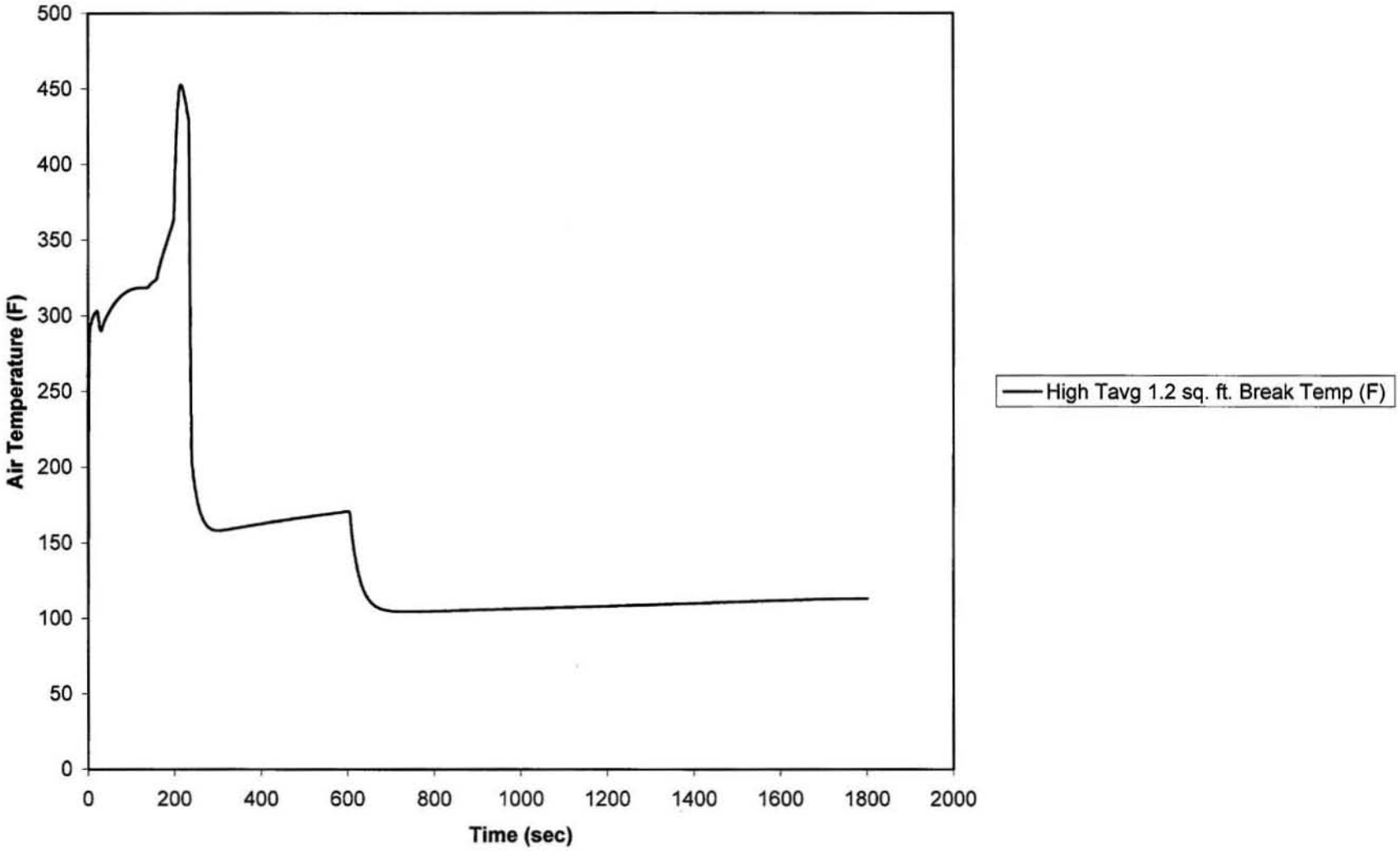


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FIGURE 3B-18

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 1.2 FT² BREAK CASE

REV. 16 1/10

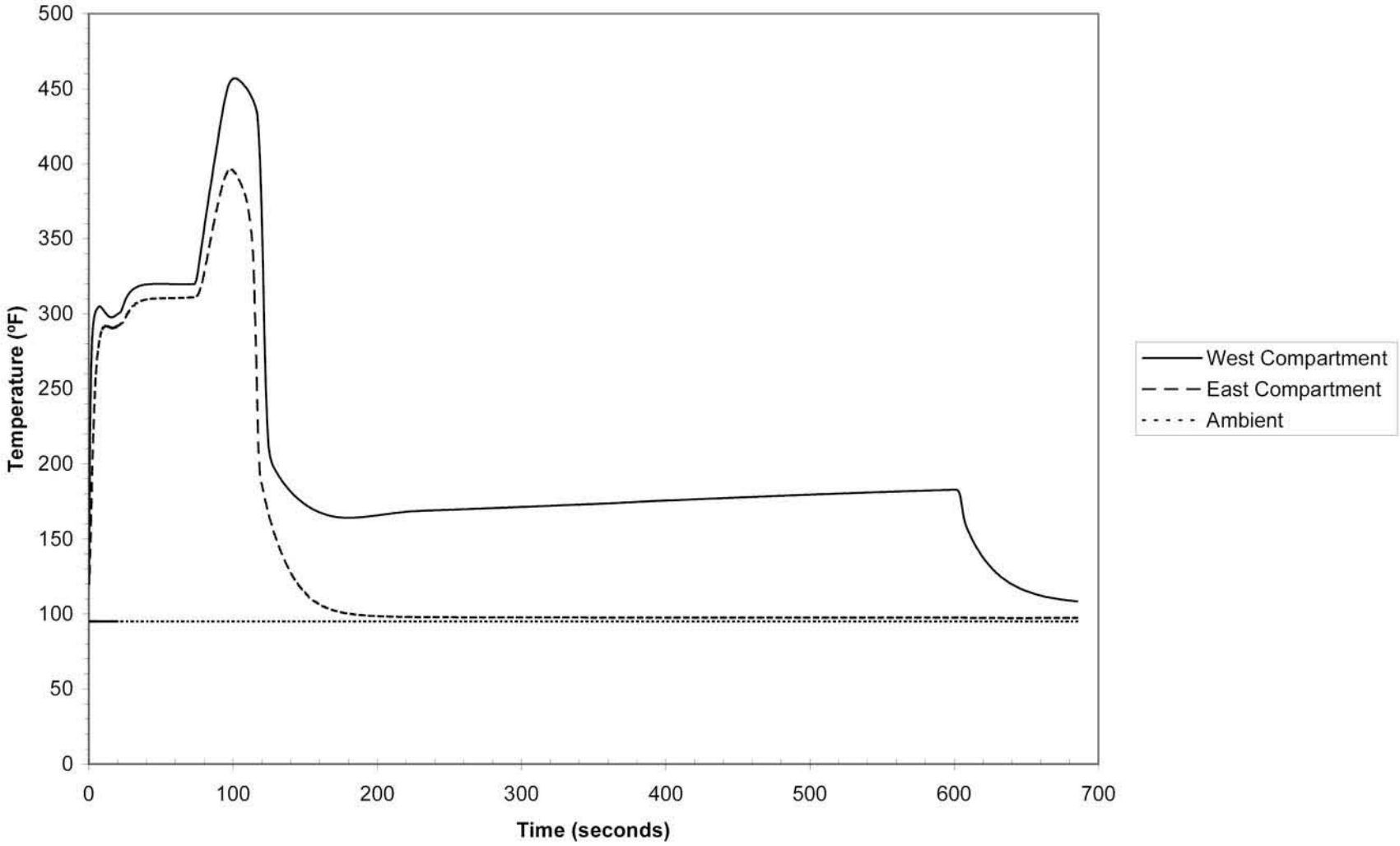

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FIGURE 3B-18A

MAIN STEAM/MAIN FEEDWATER ISOLATION VALVE COMPARTMENT TEMPERATURE TRANSIENT 1.2 FT² BREAK CASE FOR TAVG COASTDOWN

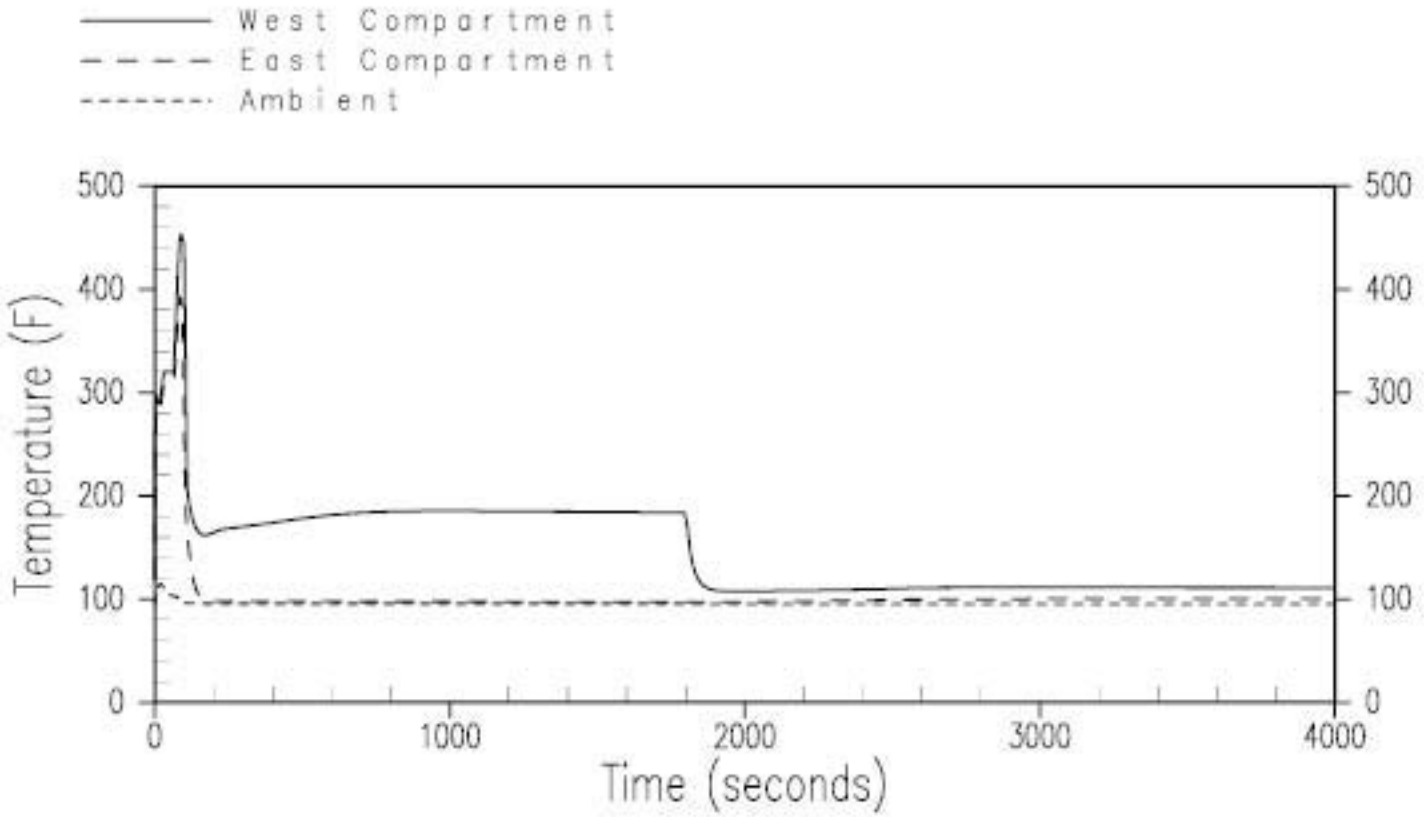

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FIGURE 3B-19

MAIN STEAM/MAIN FEEDWATER ISOLATION
VALVE COMPARTMENT TEMPERATURE TRANSIENT
1.4 FT² BREAK CASE

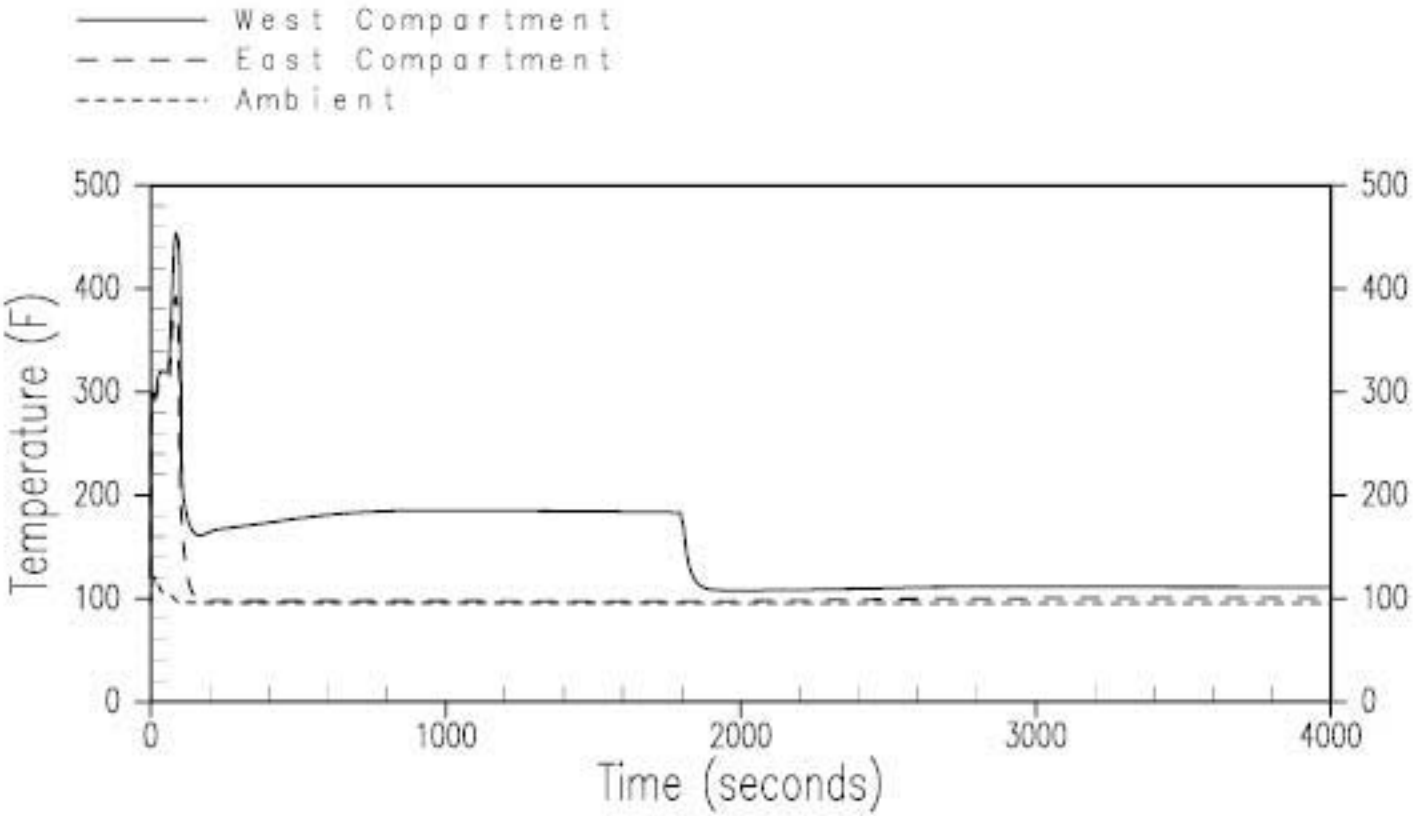

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FIGURE 3B-20

MAIN STEAM/MAIN FEEDWATER ISOLATION
VALVE COMPARTMENT TEMPERATURE TRANSIENT
2.0 FT² BREAK CASE

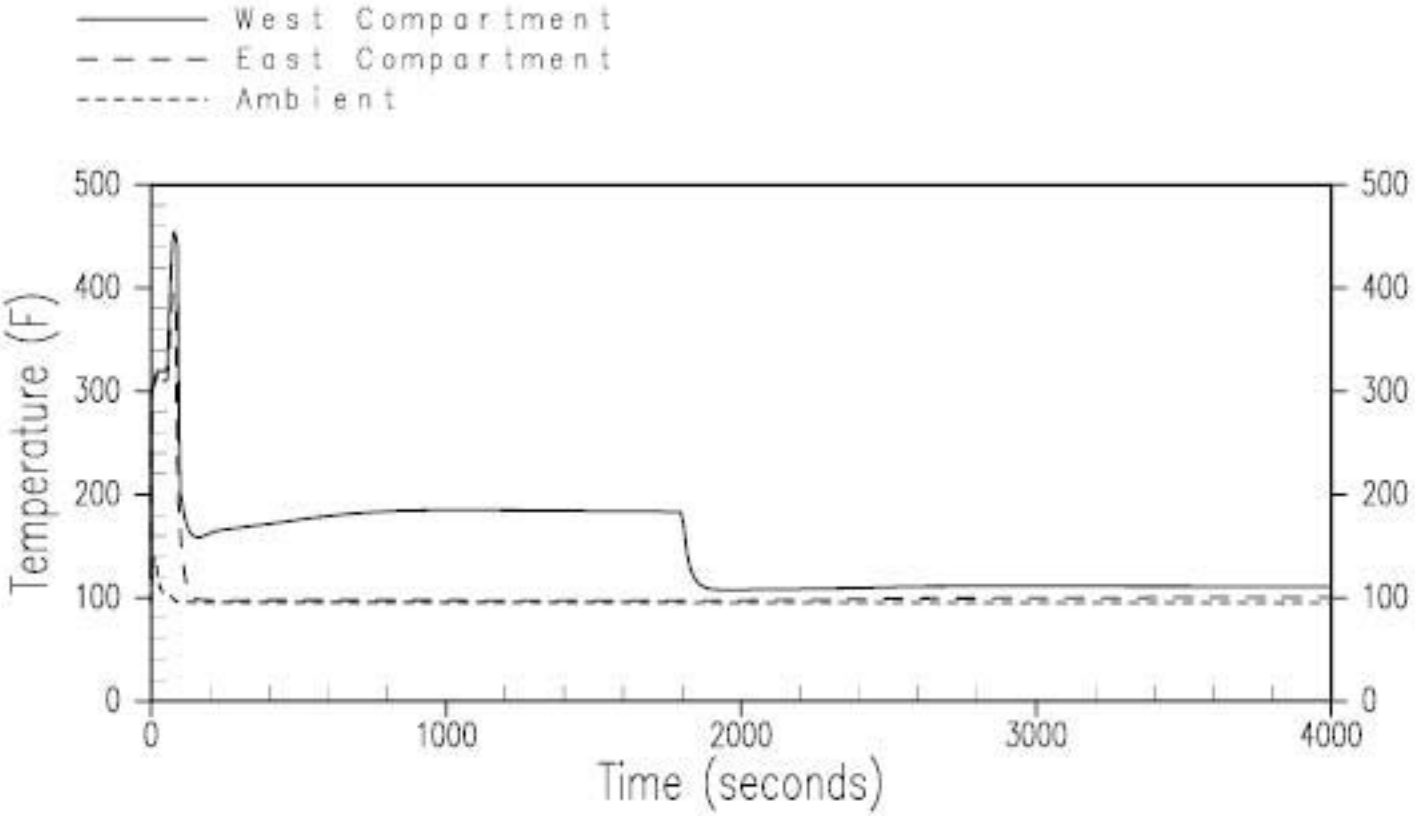

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FIGURE 3B-21

MAIN STEAM/MAIN FEEDWATER ISOLATION
VALVE COMPARTMENT TEMPERATURE TRANSIENT
4.6 FT² BREAK CASE

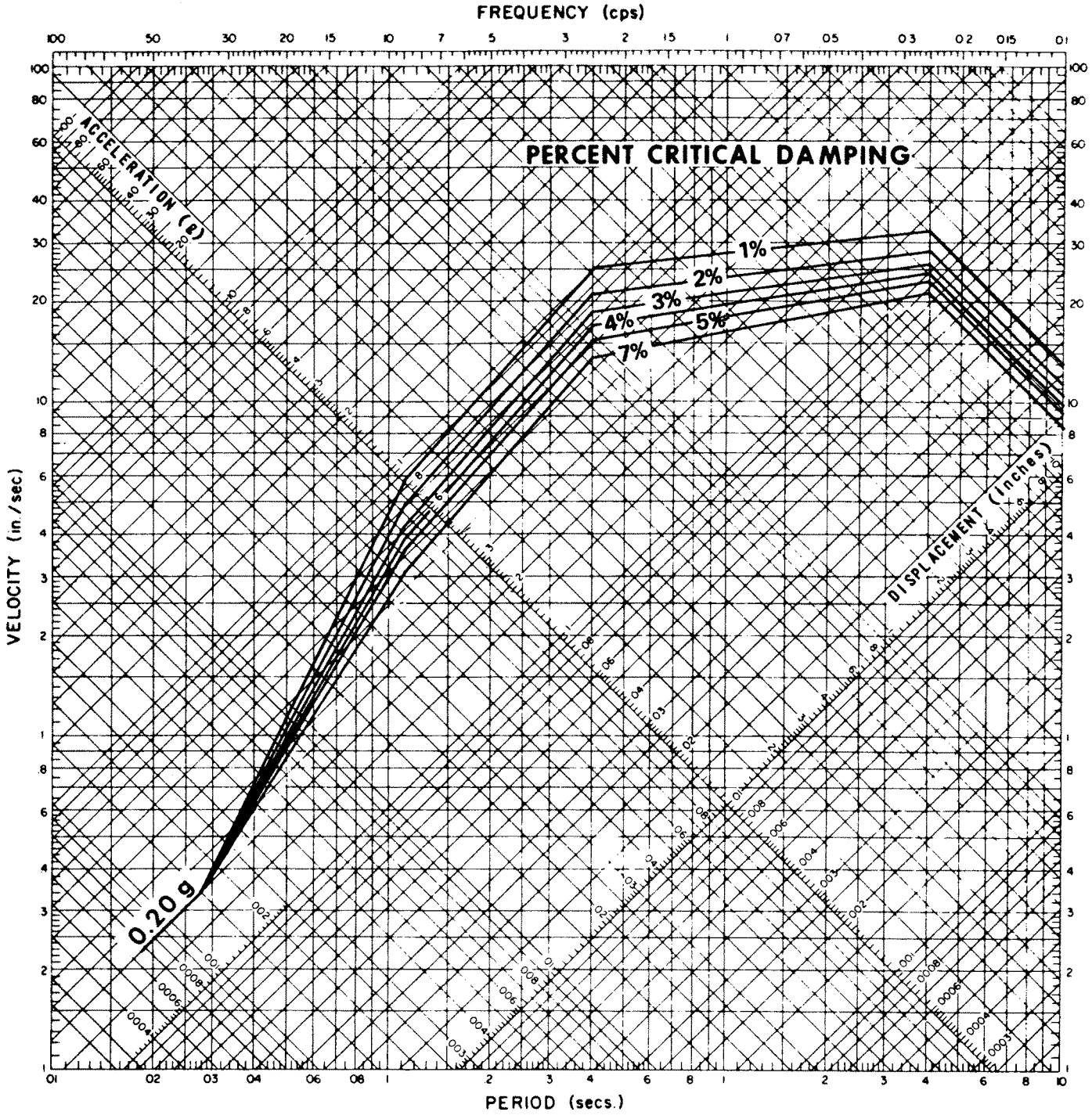

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FIGURE 3.7(B)-1

SSE HORIZONTAL GROUND SPECTRA
0.20g

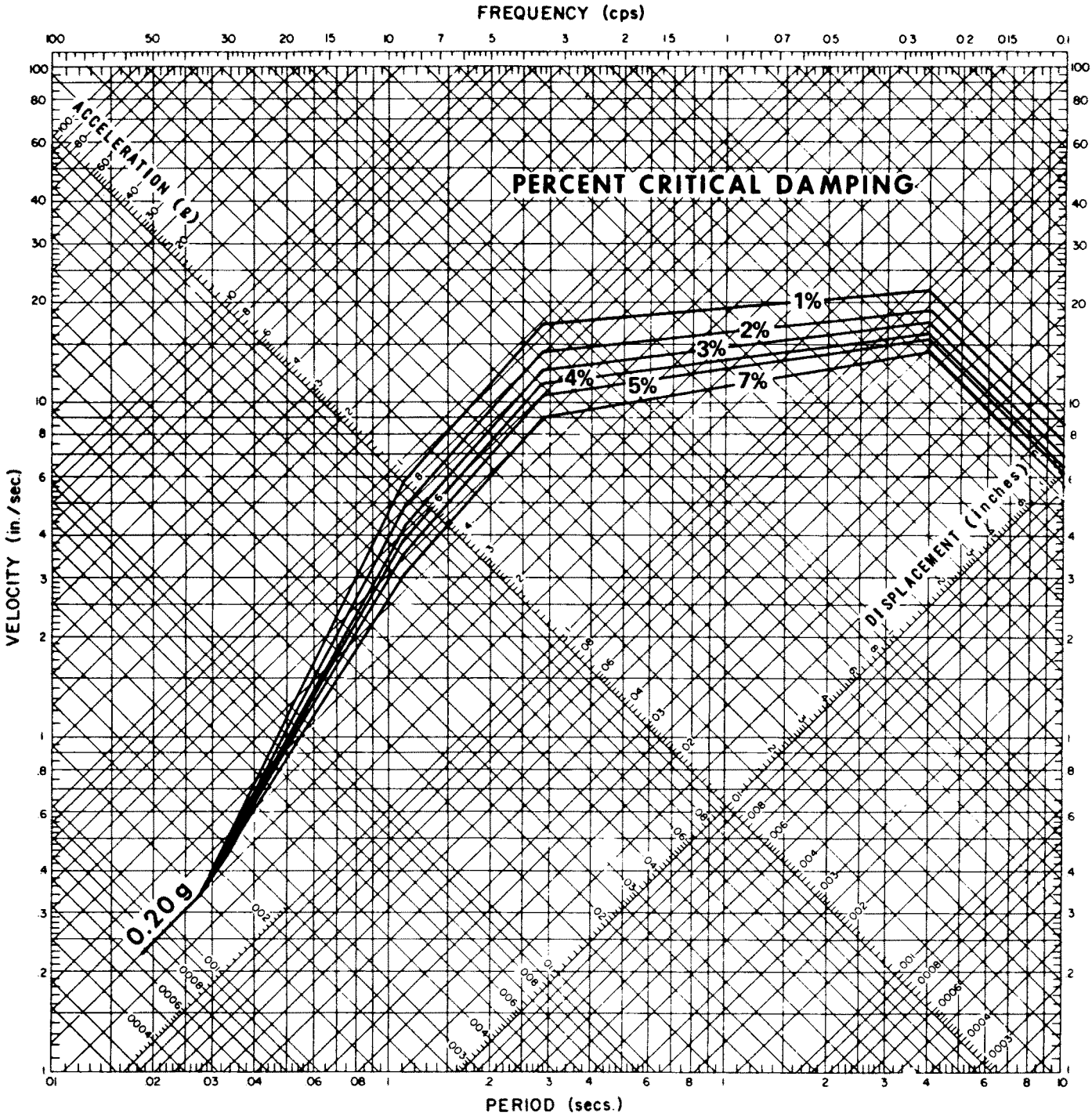

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FIGURE 3.7(B)-2

SSE VERTICAL GROUND SPECTRA
0.20g

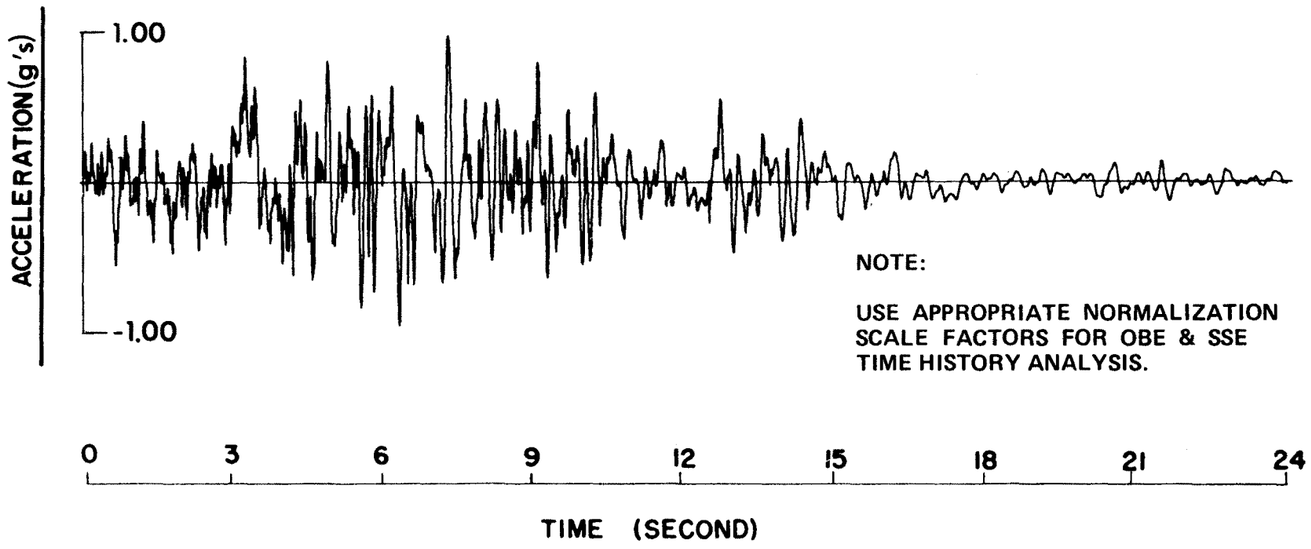

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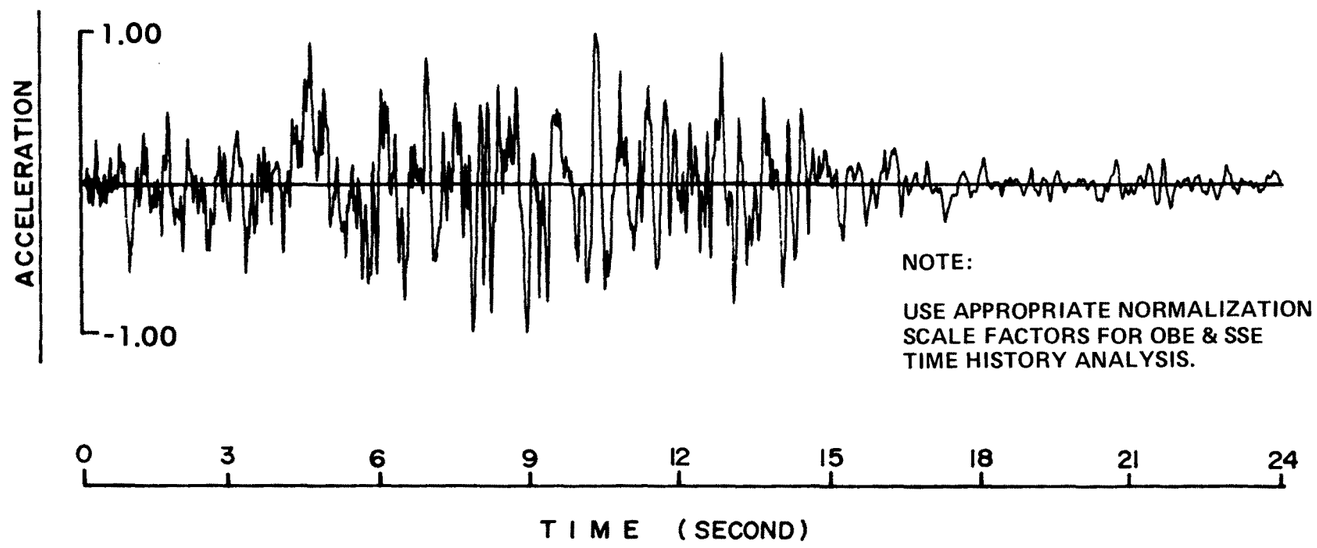
FIGURE 3.7(B)-3

SYNTHESIZED TIME HISTORY VERTICAL (OBE AND SSE)



NOTE:

USE APPROPRIATE NORMALIZATION SCALE FACTORS FOR OBE & SSE TIME HISTORY ANALYSIS.

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FIGURE 3.7(B)-4

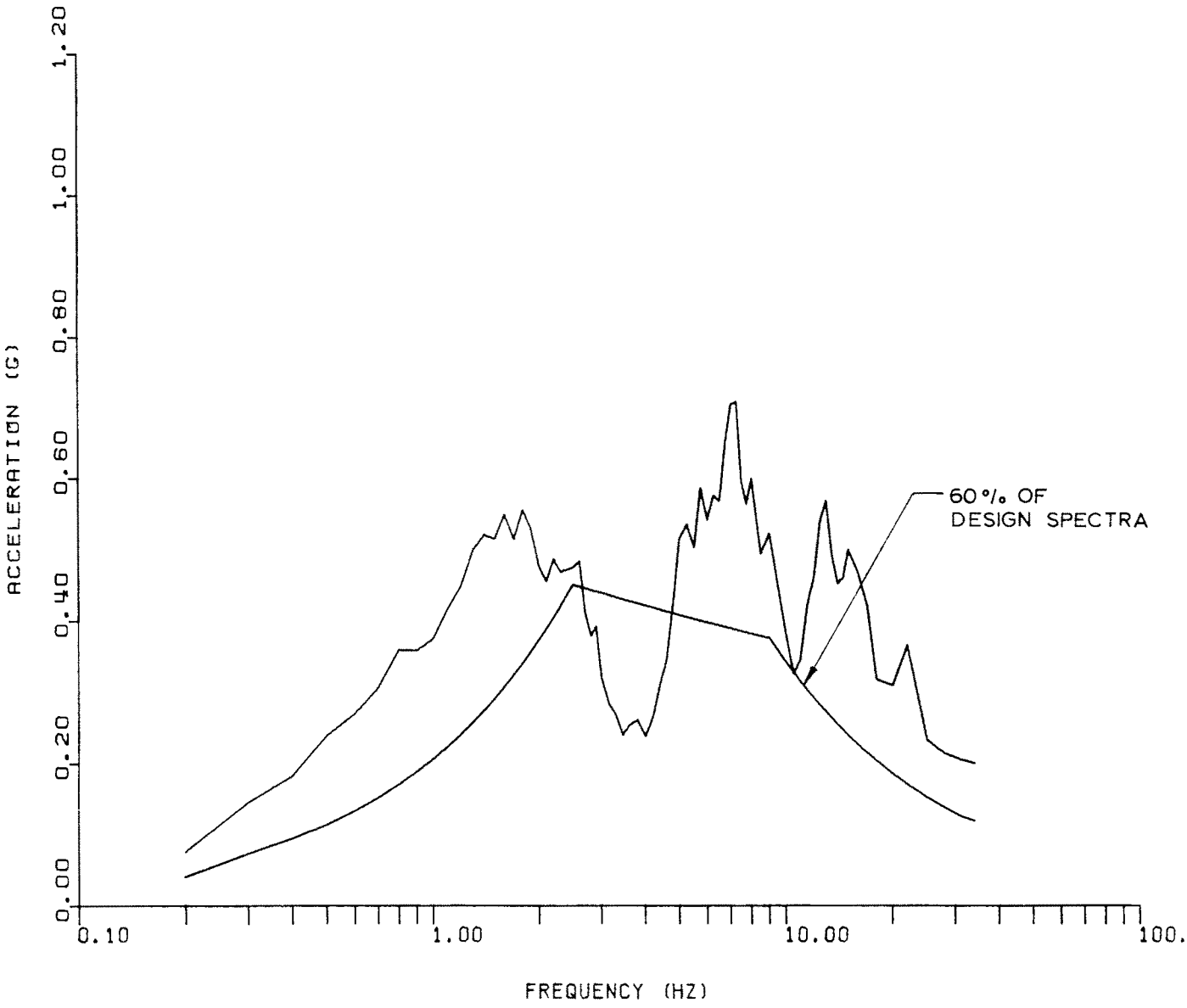
SYNTHESIZED TIME HISTORY HORIZONTAL (OBE AND SSE)

Figure 3.7(B)-5 Deleted

Figure 3.7(B)-6 Deleted

Figure 3.7(B)-7 Deleted

Figure 3.7(B)-8 Deleted



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CALLAWAY PLANT

FIGURE 3.7(B)-9A

TYPICAL FREE-FIELD BASE ELEVATION SPECTRA CALLAWAY SITE

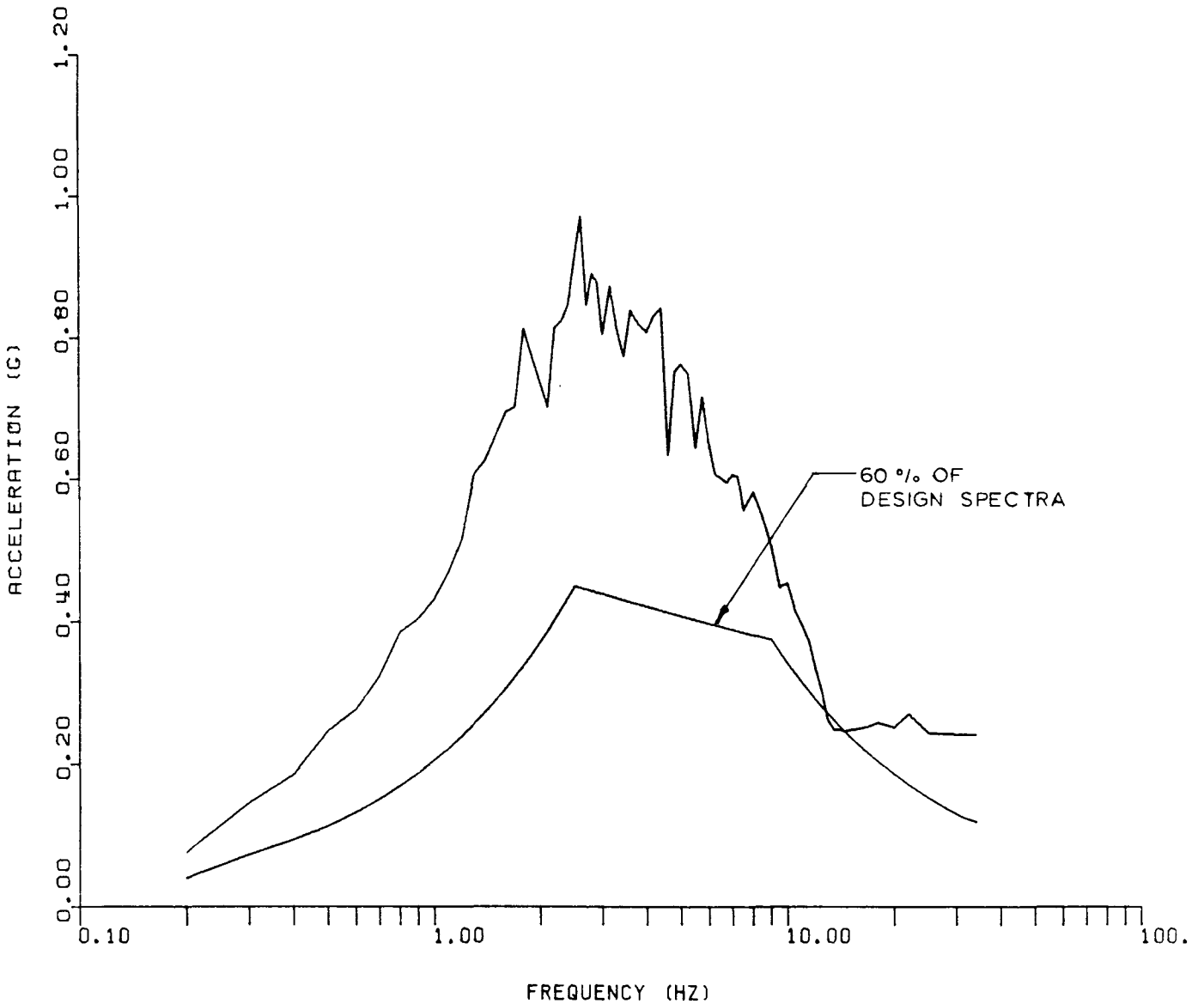

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FIGURE 3.7(B)-9B

TYPICAL FREE-FIELD BASE ELEVATION SPECTRA STERLING SITE

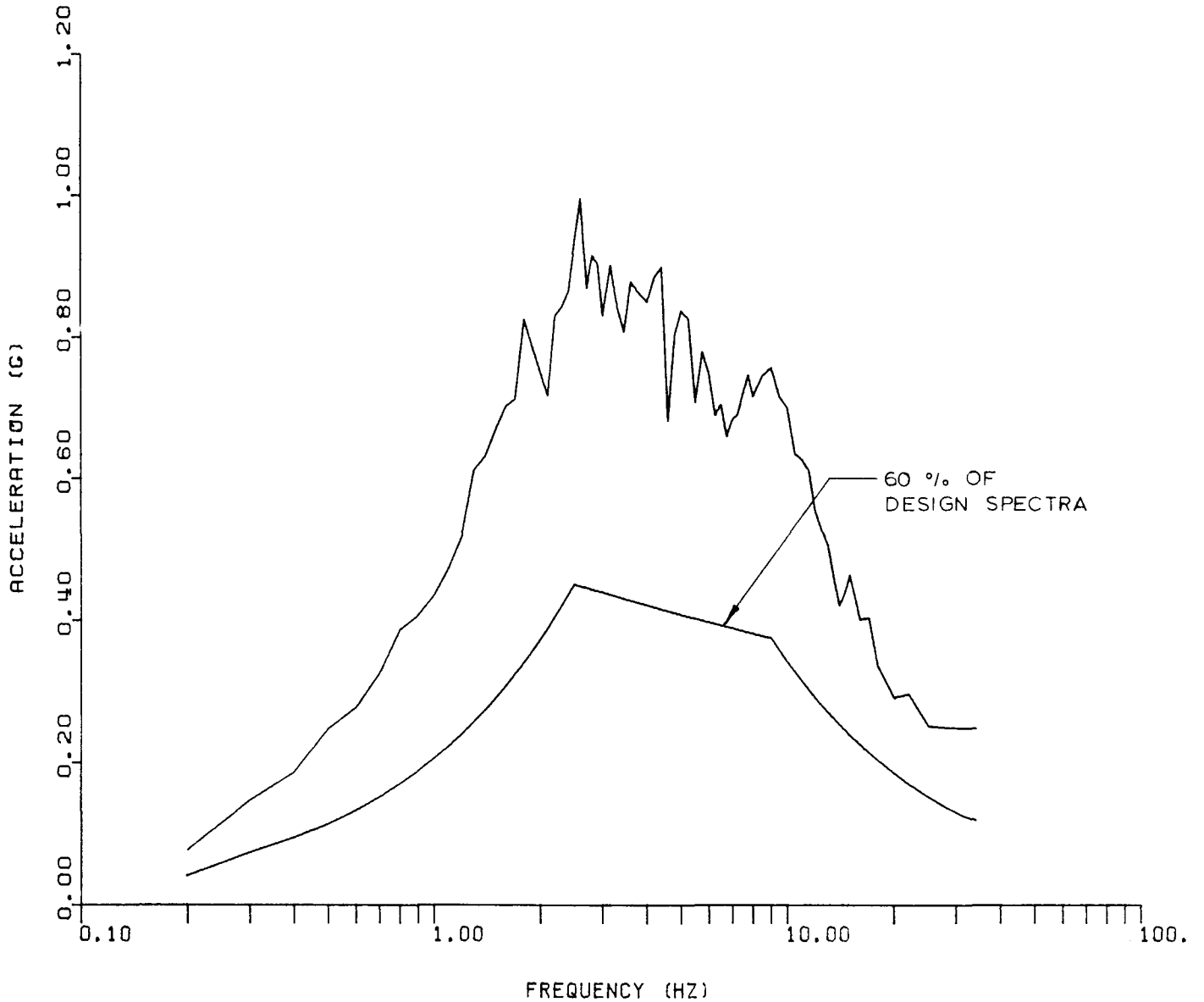

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FIGURE 3.7(B)-9C

TYPICAL FREE-FIELD BASE ELEVATION SPECTRA TYRONE SITE

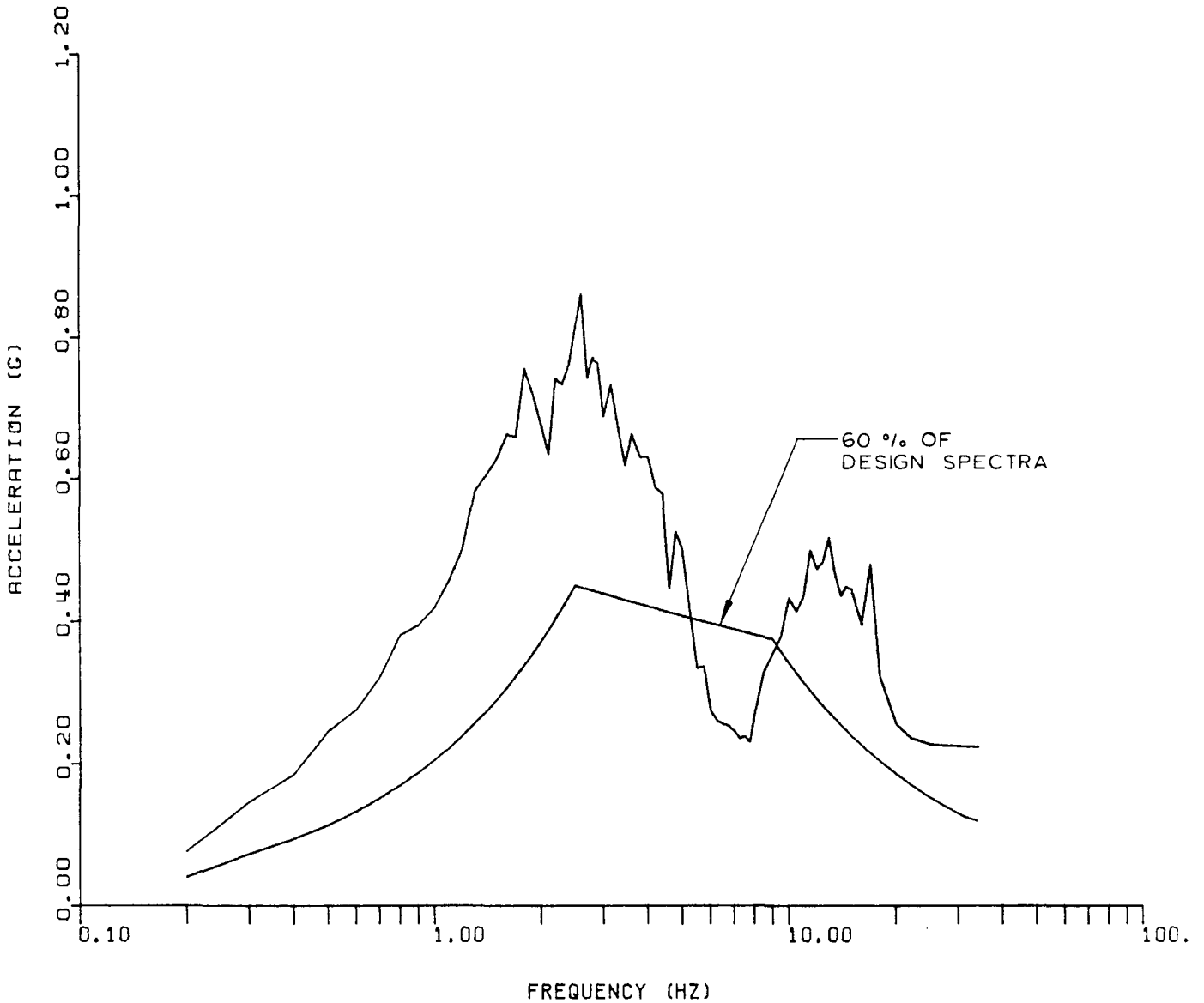

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FIGURE 3.7(B)-9D

TYPICAL FREE-FIELD BASE ELEVATION SPECTRA WOLF CREEK SITE

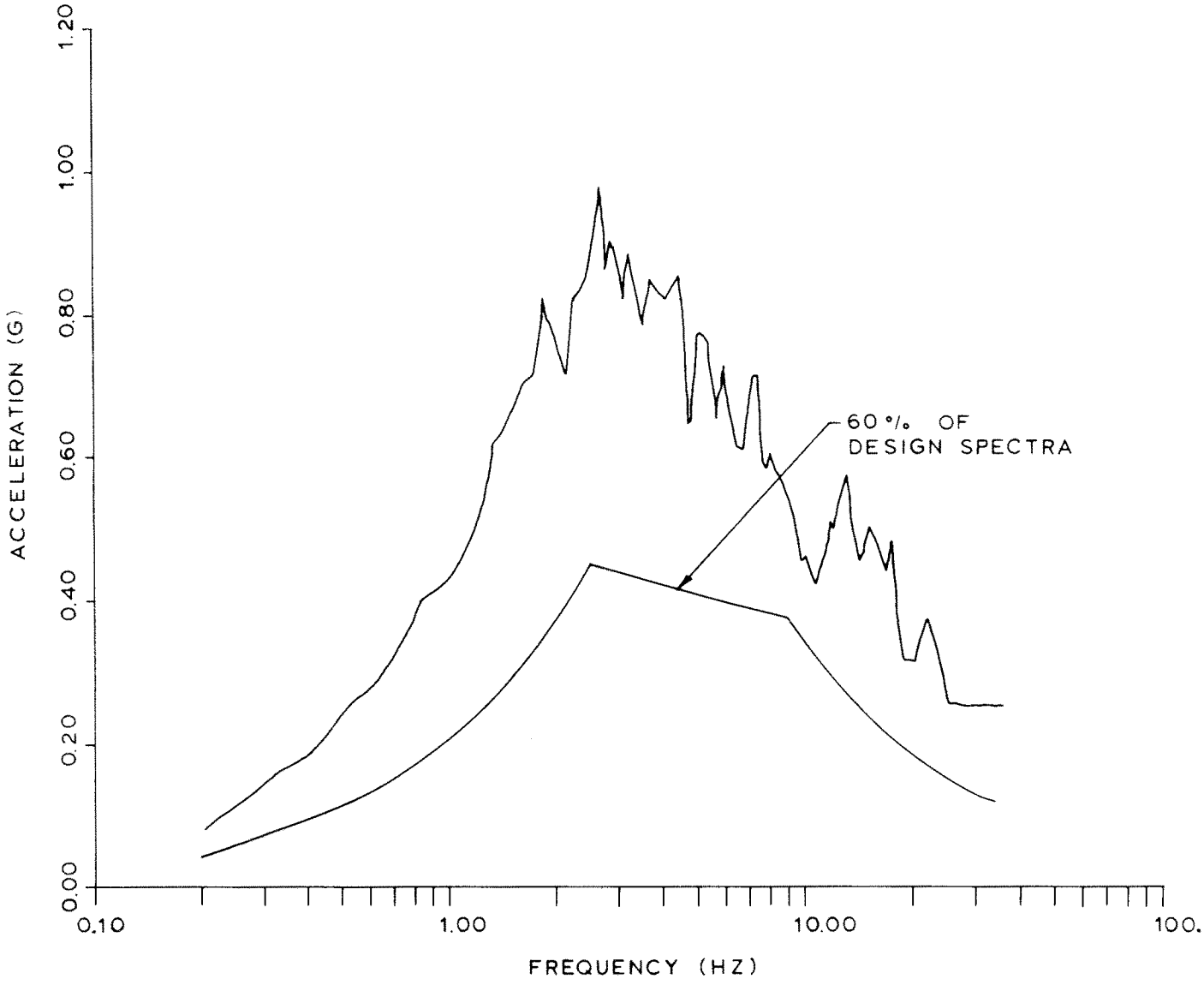

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FIGURE 3.7(B)-10

TYPICAL, FREE-FIELD BASE ELEVATION SPECTRA THREE SITE ENVELOPE

Figure 3.7(B)-11A Deleted

Figure 3.7(B)-11B Deleted

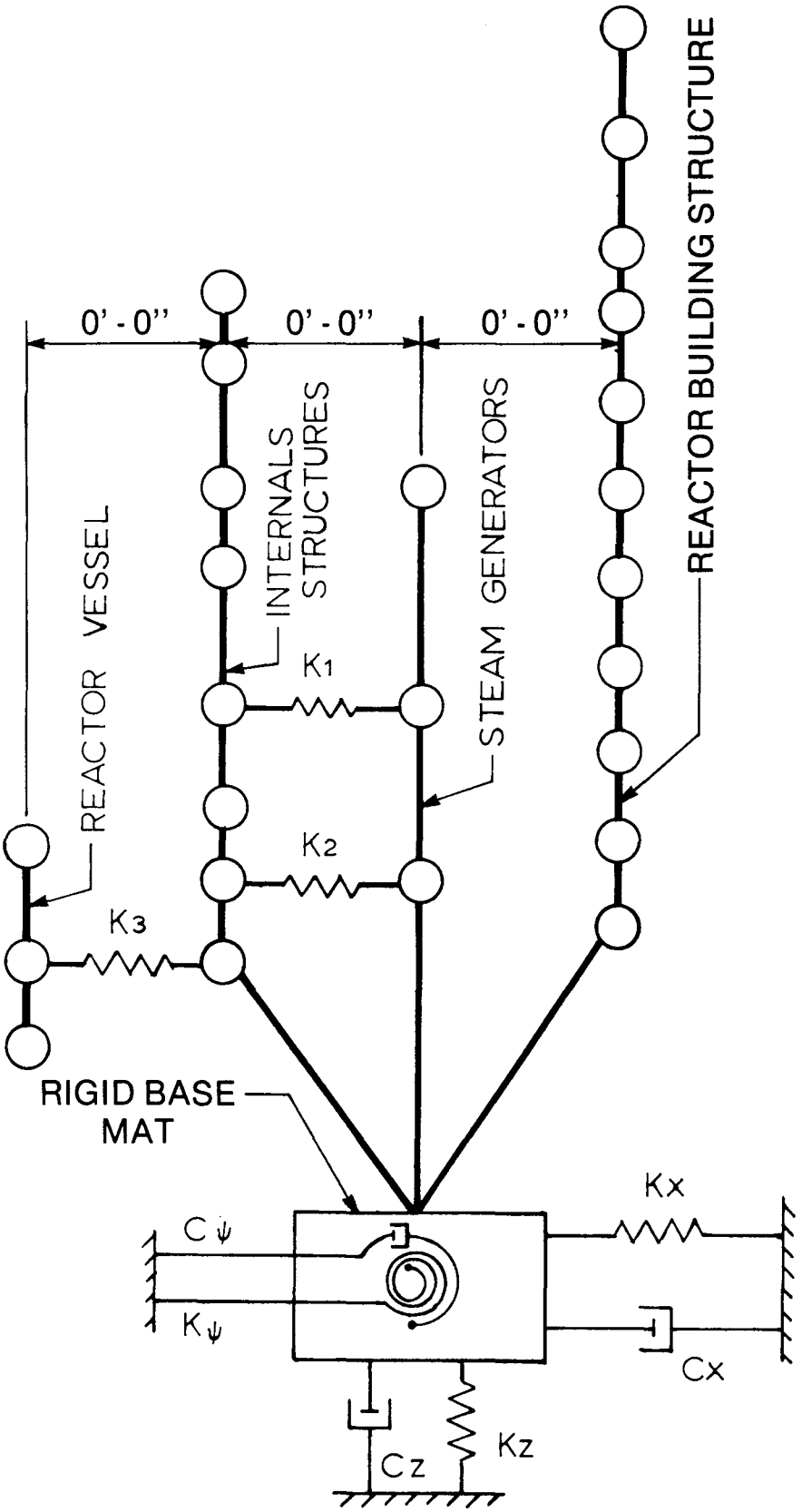

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FIGURE 3.7(B)-12

MATH. MODEL FOR REACTOR BUILDING AND INTERNAL STRUCTURES

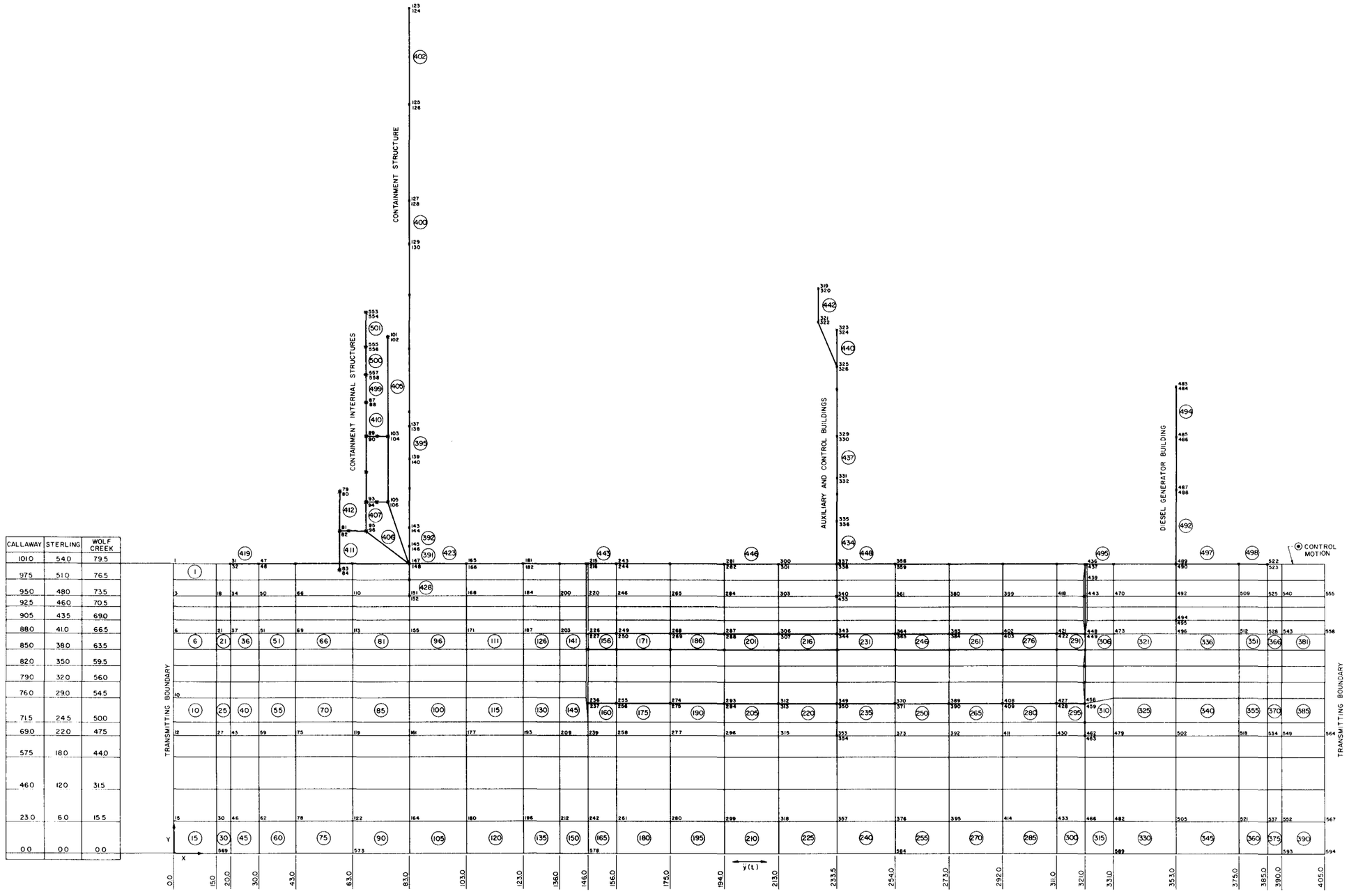

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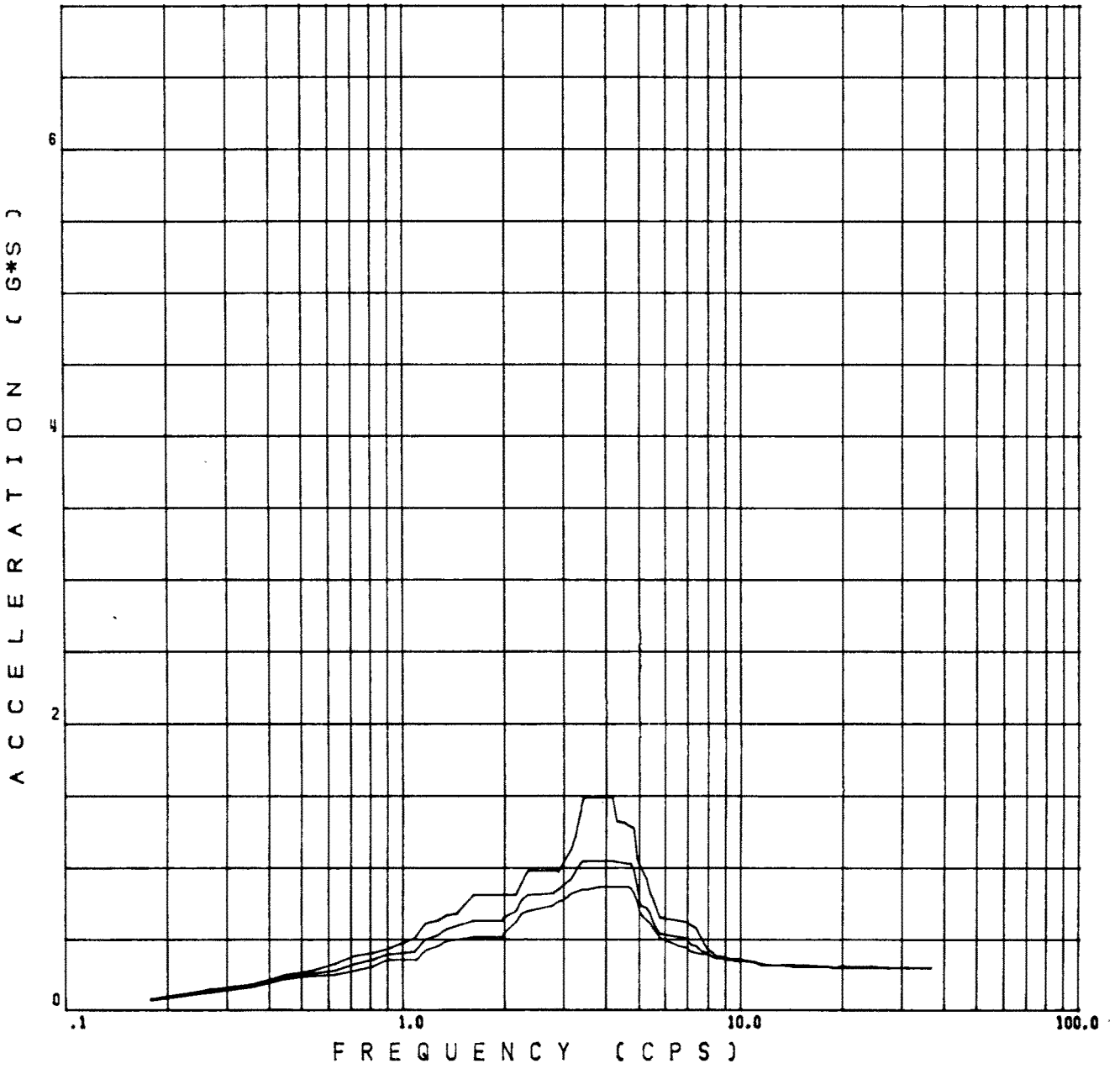
FIGURE 3.7(B)-13
FINITE-ELEMENT MODEL

DAMPING VALUES

.0300, .0500, .0700,



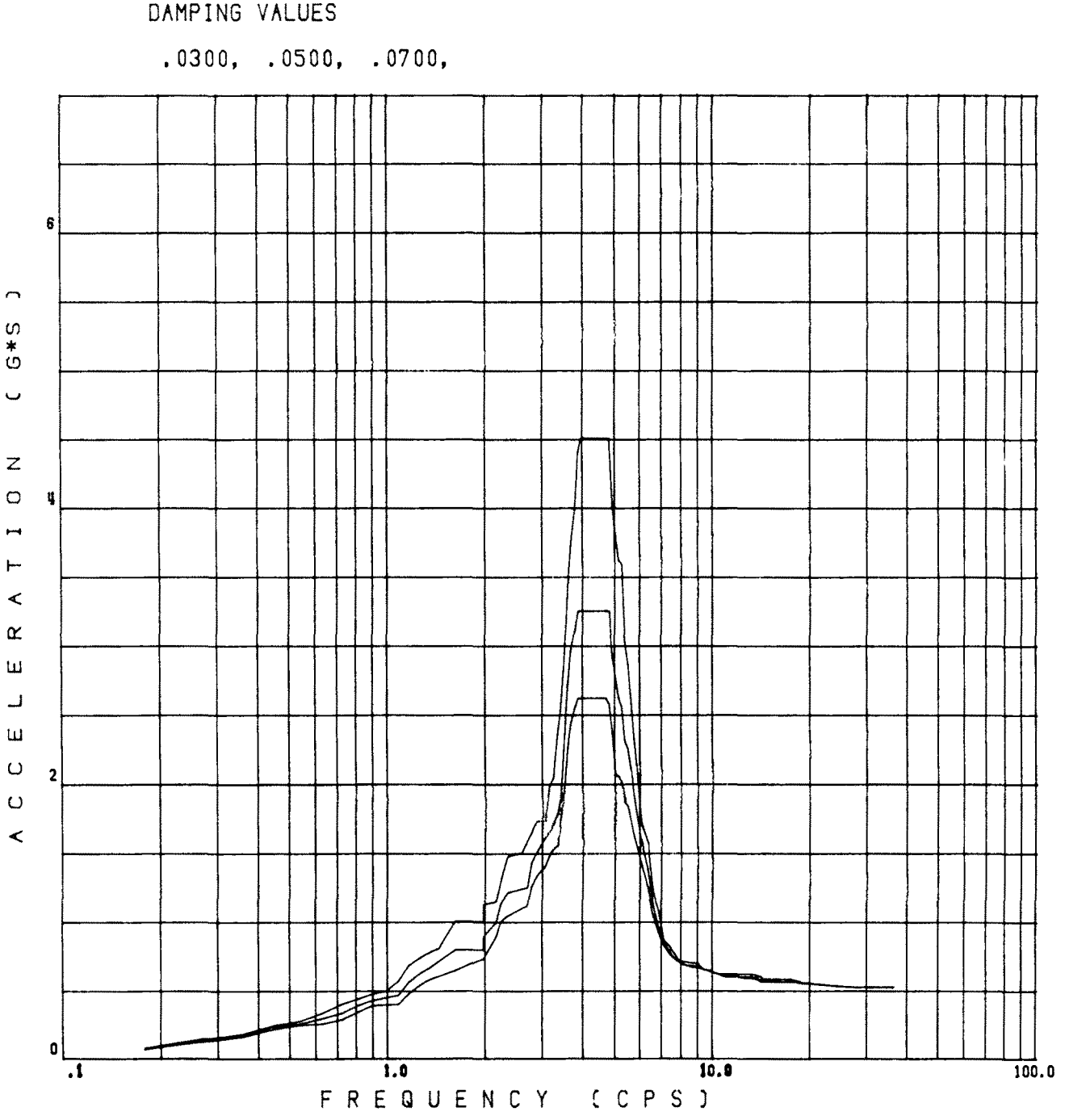
DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14A
SPECTRA - CONTAINMENT BUILDING
SSE
NORTH-SOUTH DIRECTION
POLAR CRANE LOCATION
CALLAWAY SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14B
SPECTRA - CONTAINMENT BUILDING
SSE
NORTH-SOUTH DIRECTION
POLAR CRANE LOCATION
STERLING SITE

Figure 3.7(B)-14C Deleted

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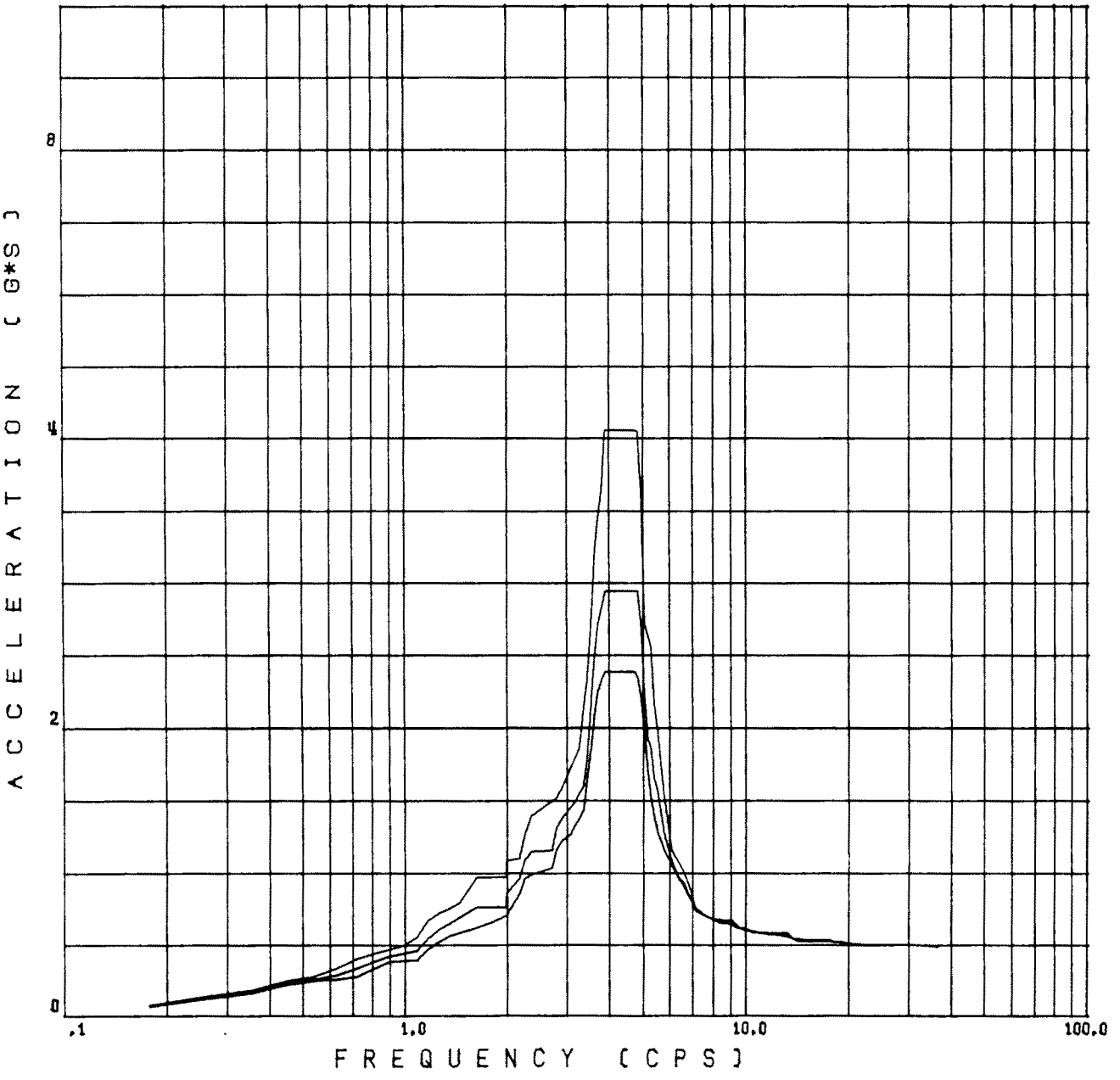


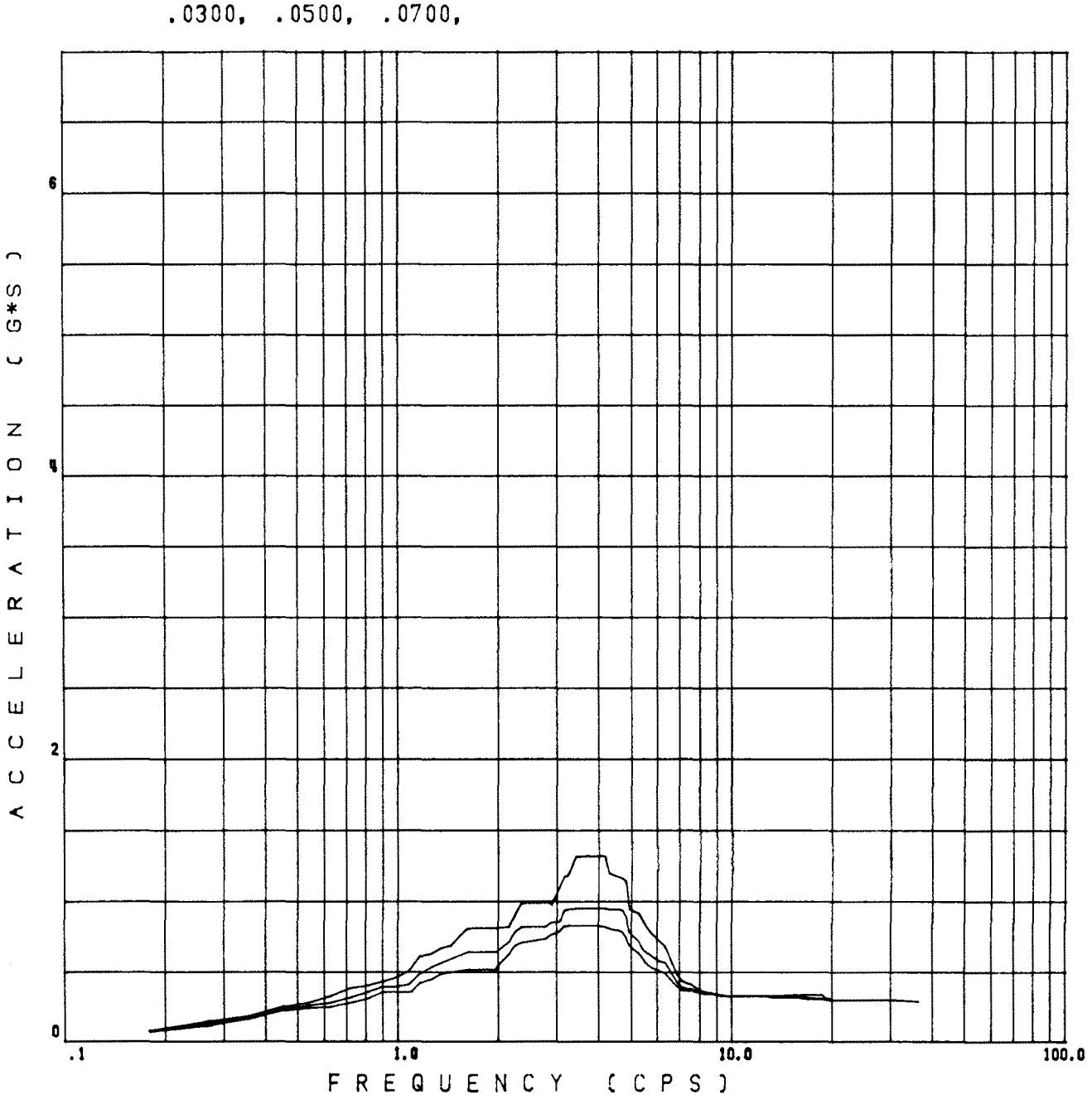
DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14D
SPECTRA - CONTAINMENT BUILDING
SSE
NORTH-SOUTH DIRECTION
POLAR CRANE LOCATION
WOLF CREEK SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14E
SPECTRA - CONTAINMENT BUILDING
SSE
EAST-WEST DIRECTION
POLAR CRANE LOCATION
CALLAWAY SITE

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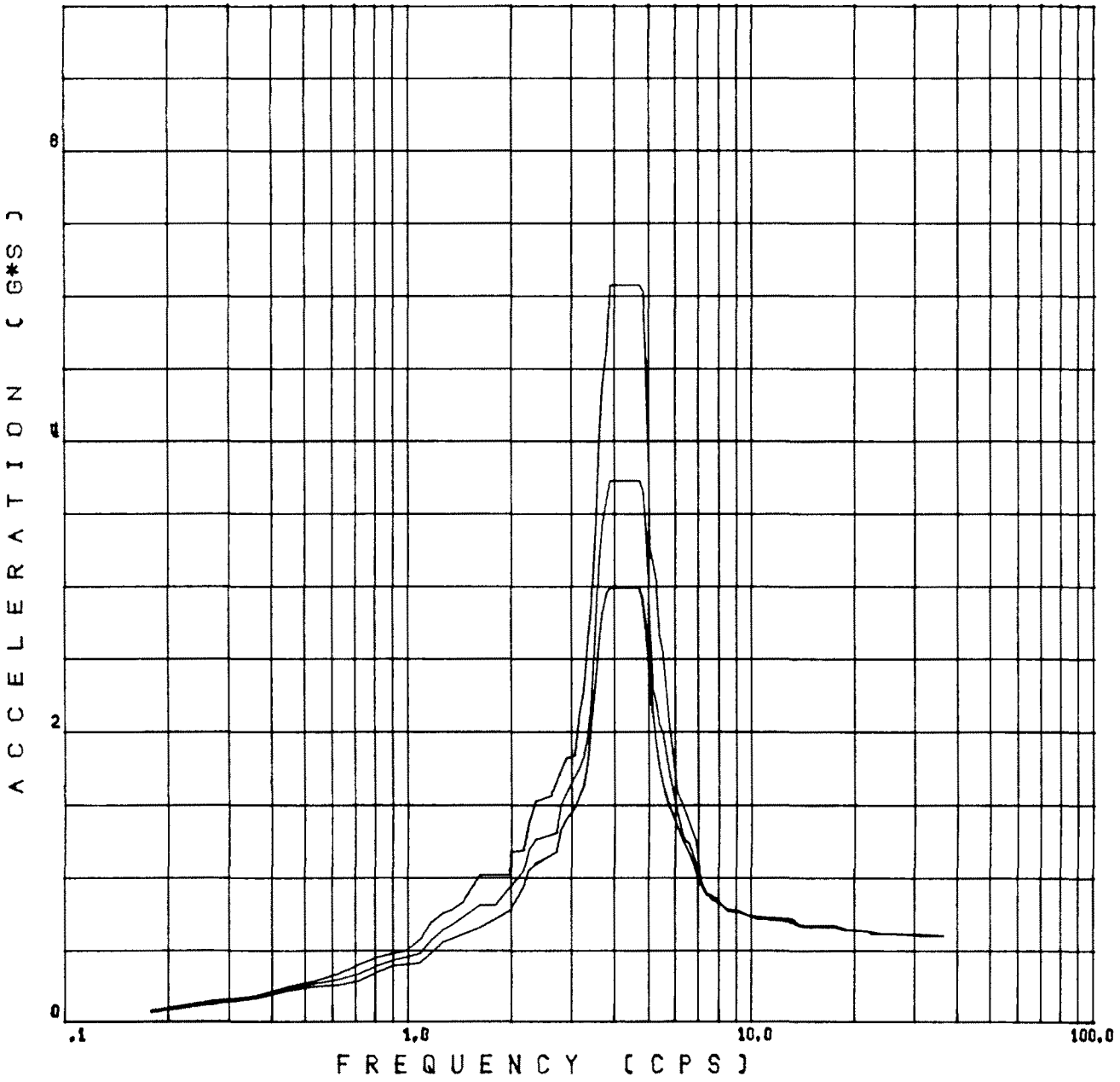

DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
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CALLAWAY PLANT

FIGURE 3.7(B)-14F
SPECTRA - CONTAINMENT BUILDING
SSE
EAST-WEST DIRECTION
POLAR CRANE LOCATION
STERLING SITE

Figure 3.7(B)-14G Deleted

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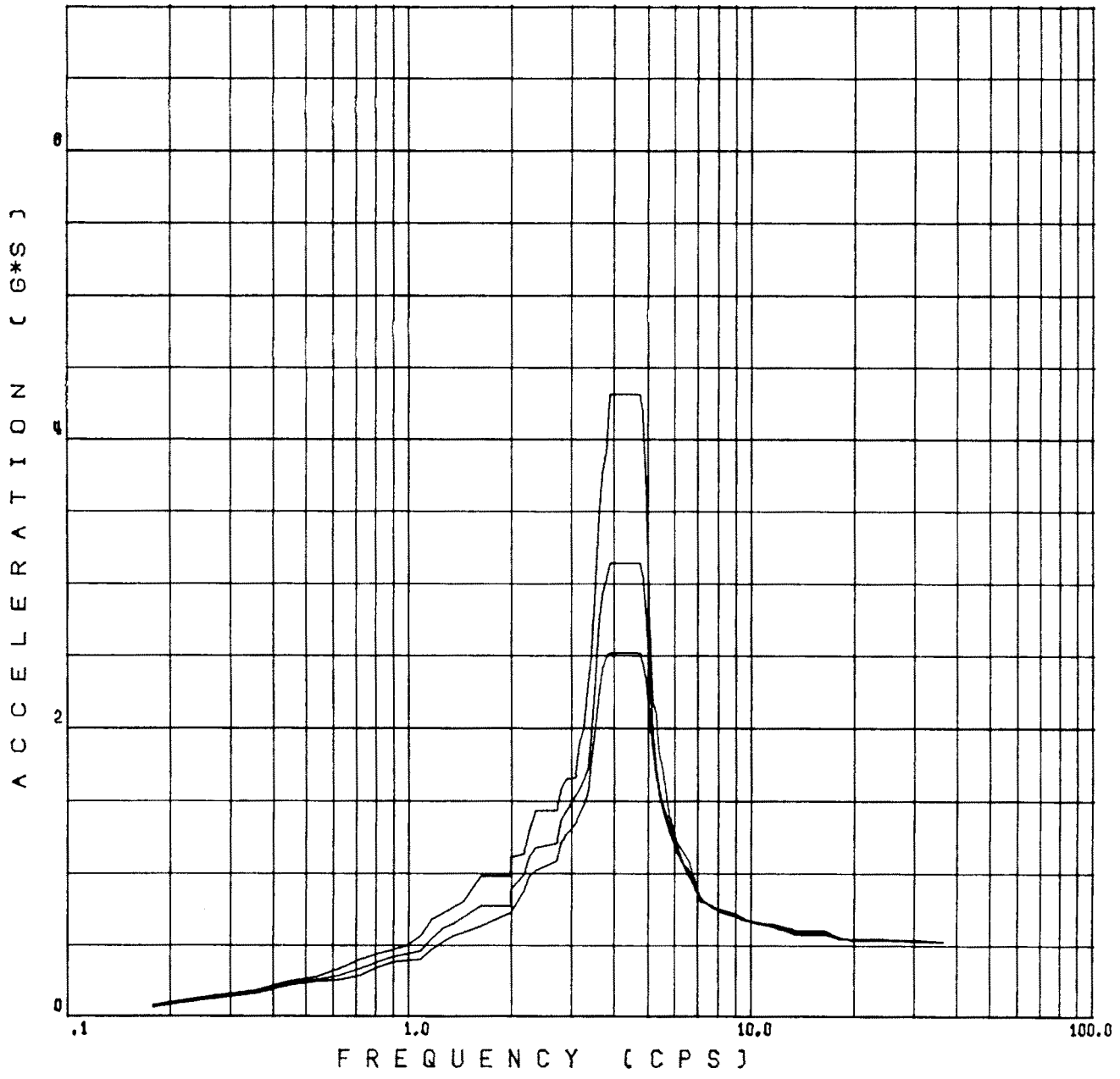


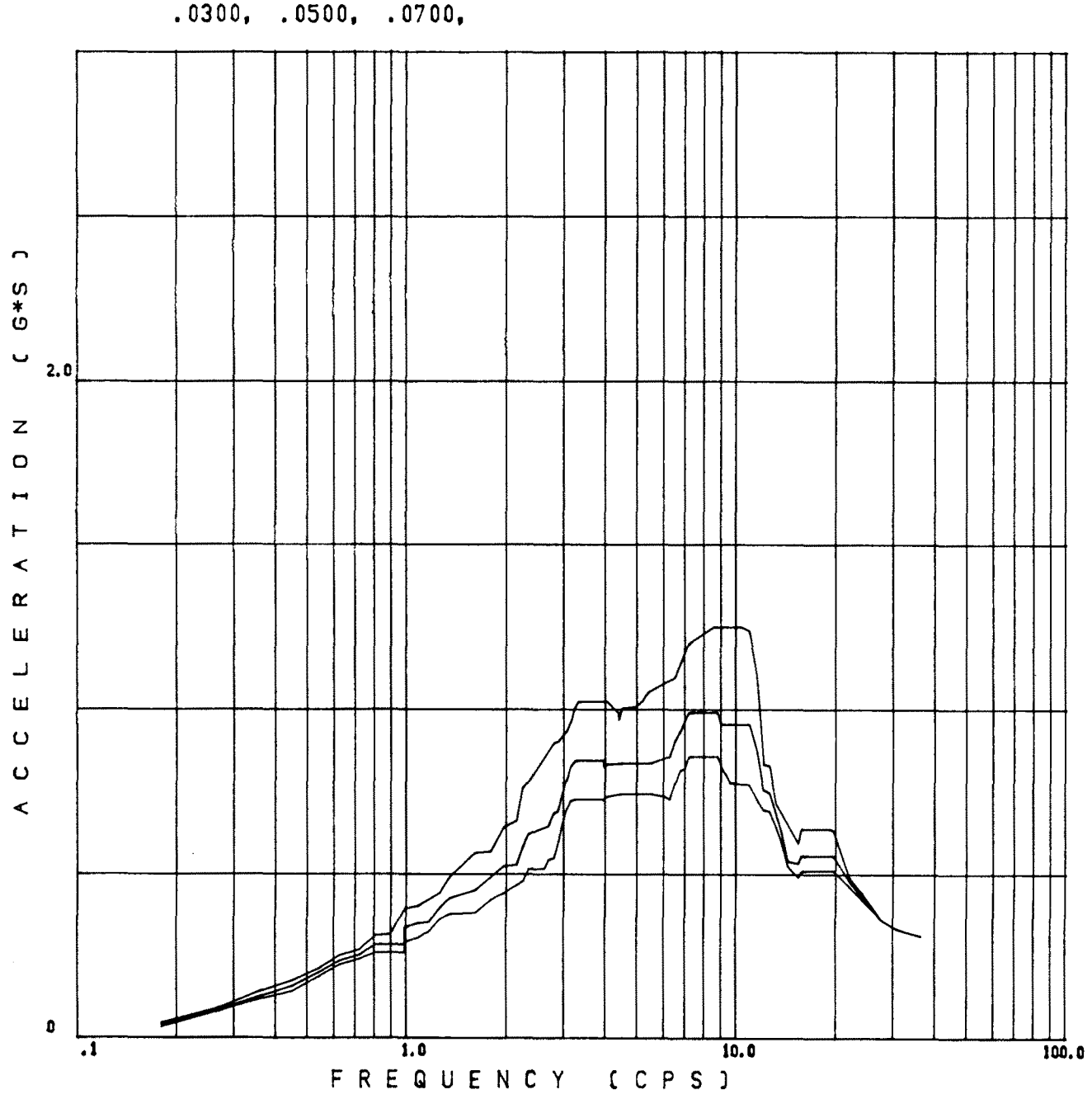
DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14H
SPECTRA - CONTAINMENT BUILDING
SSE
EAST-WEST DIRECTION
POLAR CRANE LOCATION
WOLF CREEK SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

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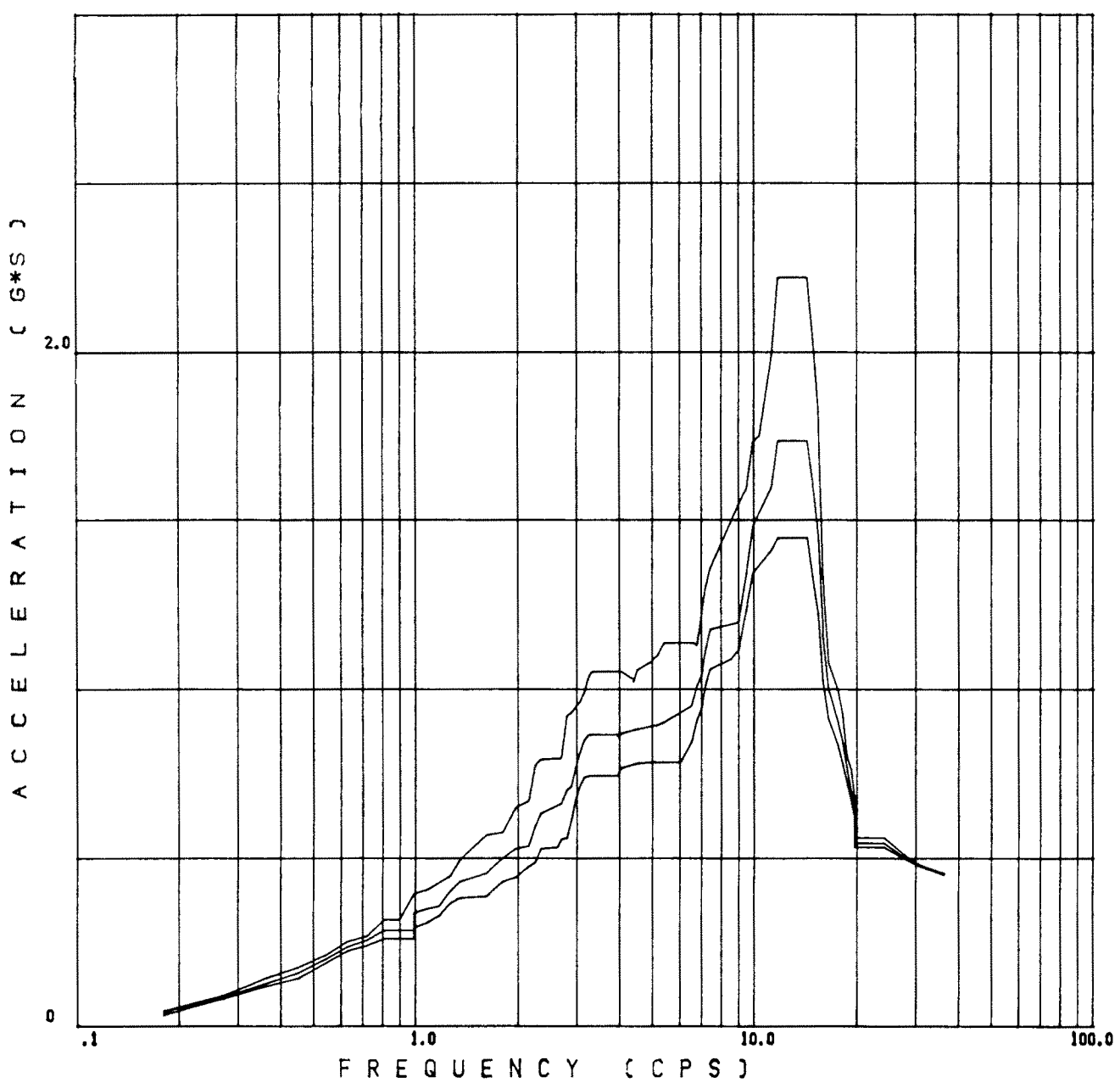
CALLAWAY PLANT

FIGURE 3.7(B)-14I
SPECTRA - CONTAINMENT BUILDING
SSE
VERTICAL DIRECTION
POLAR CRANE LOCATION
CALLAWAY SITE



DESIGN FLOOR RESPONSE SPECTRA

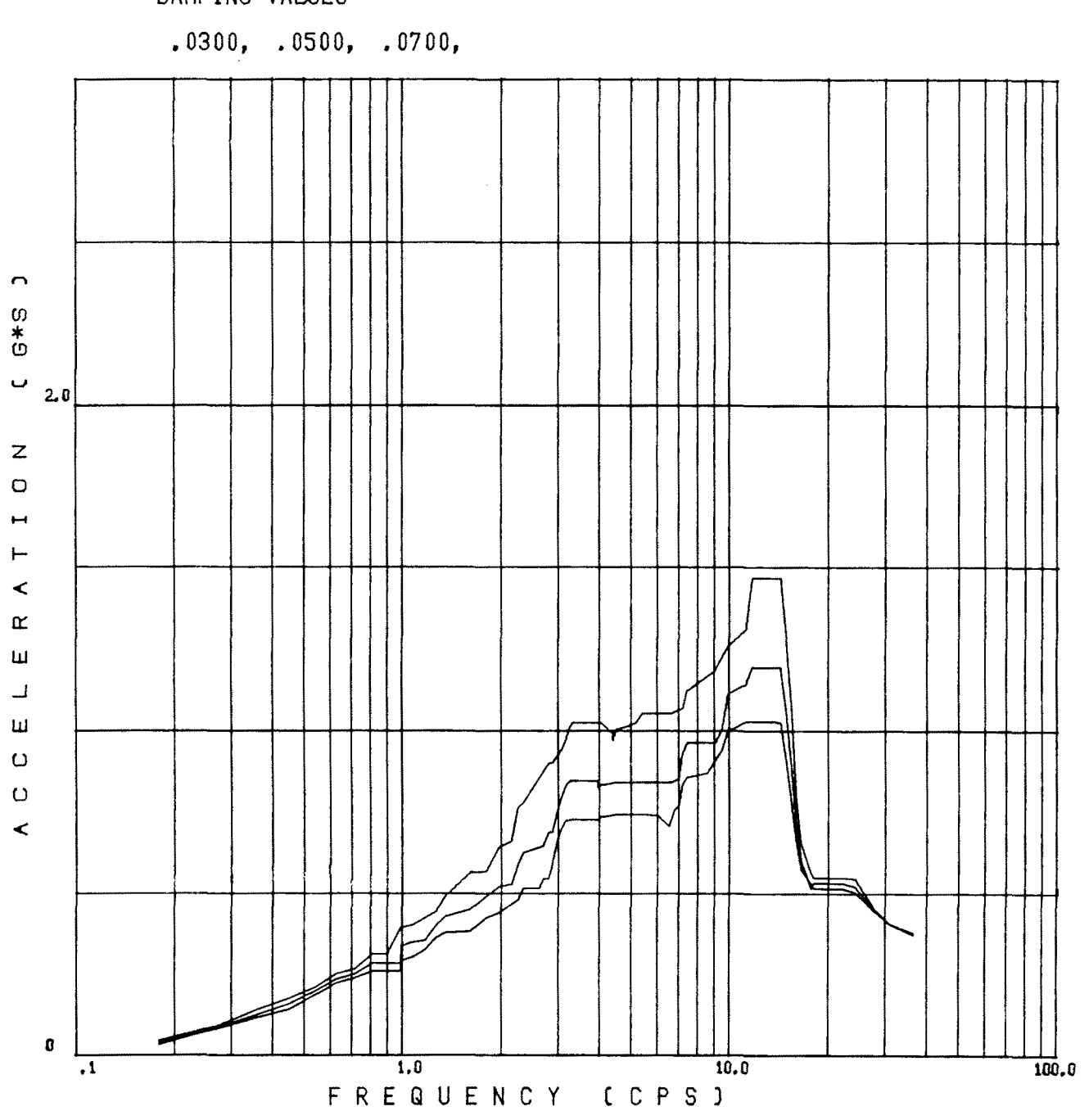
EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14J
SPECTRA - CONTAINMENT BUILDING
SSE
VERTICAL DIRECTION
POLAR CRANE LOCATION
STERLING SITE

Figure 3.7(B)-14K Deleted



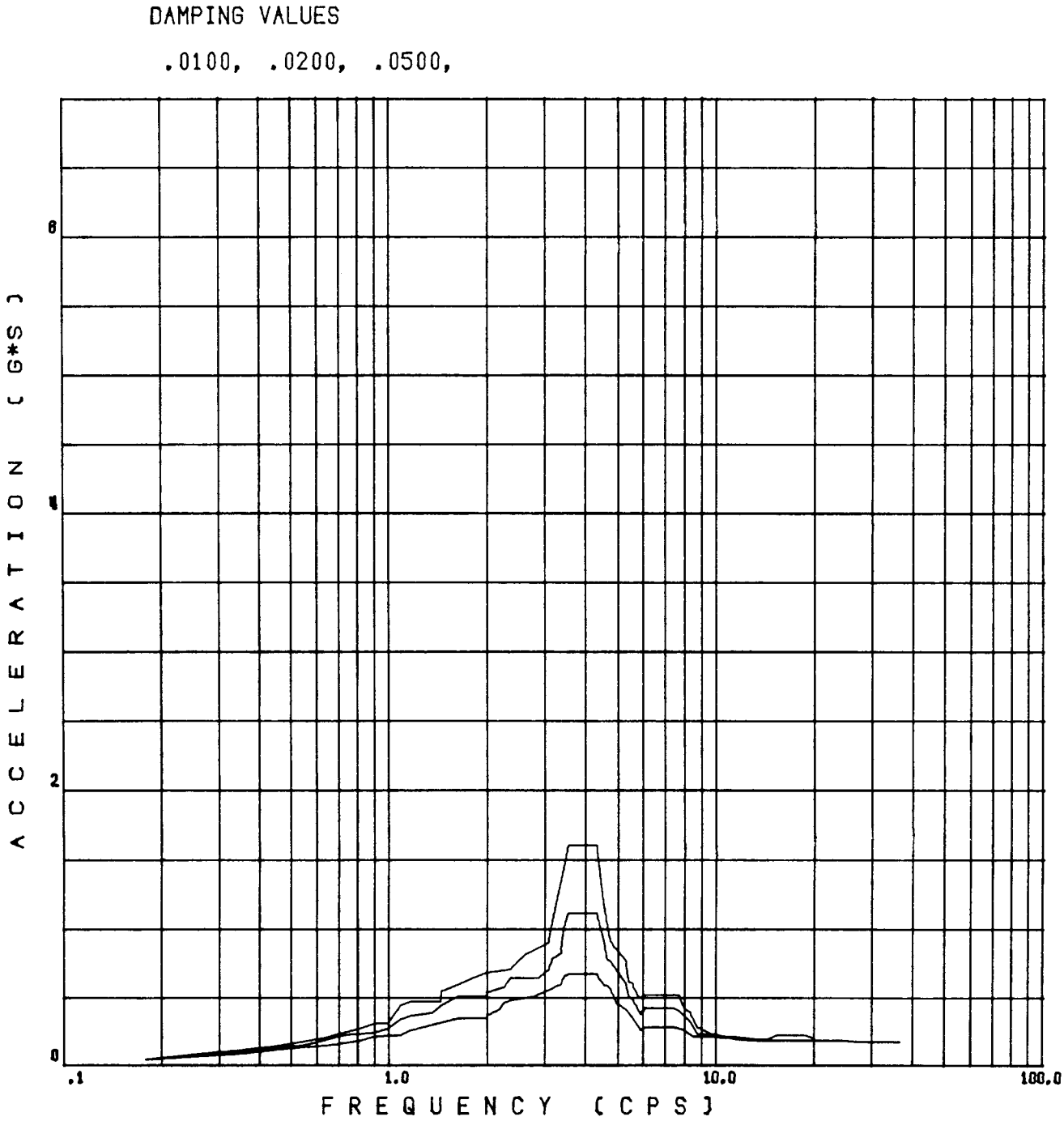
DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14L
SPECTRA - CONTAINMENT BUILDING
SSE
VERTICAL DIRECTION
POLAR CRANE LOCATION
WOLF CREEK SITE



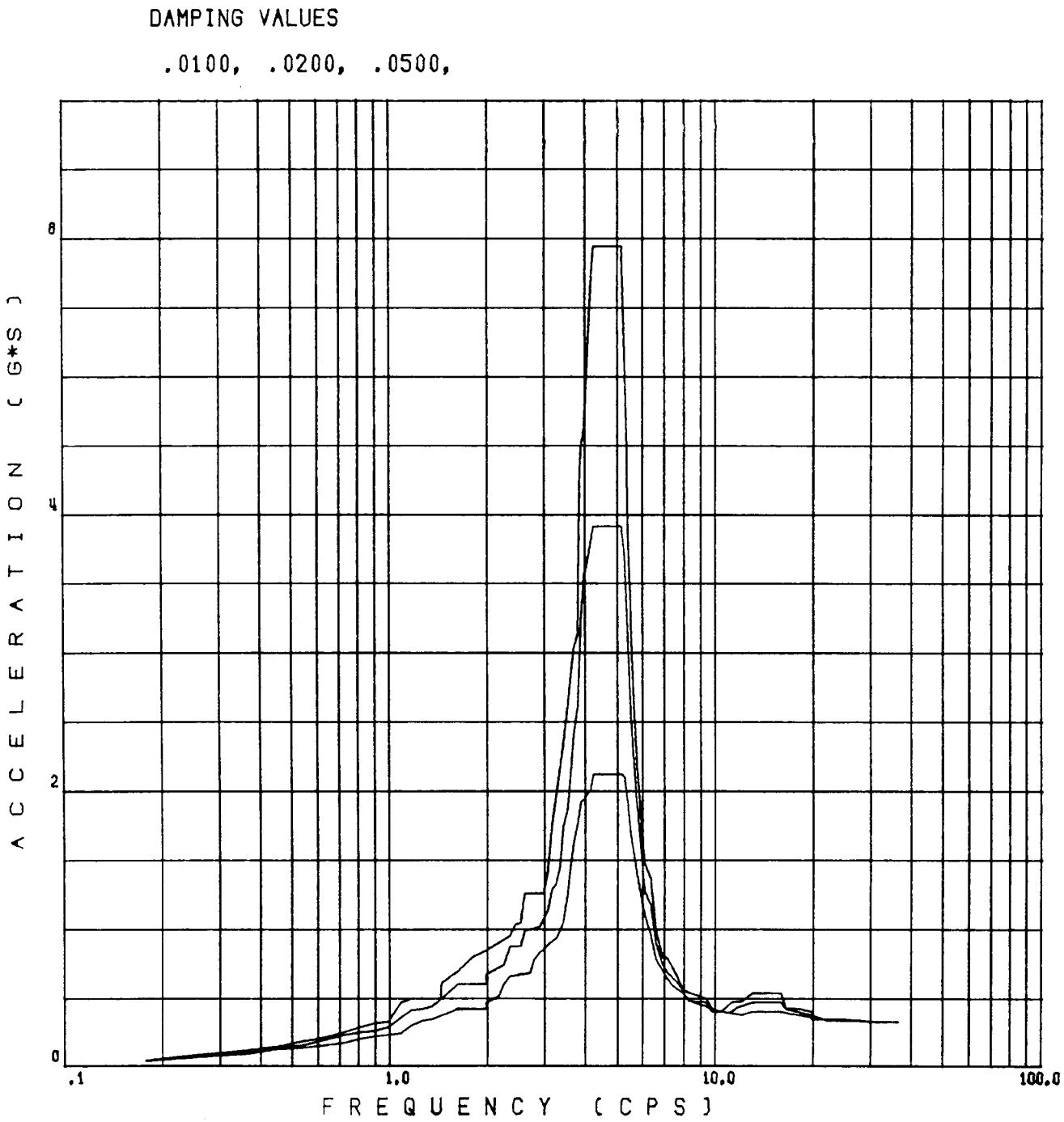
DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14M
SPECTRA - CONTAINMENT BUILDING
OBE
NORTH-SOUTH DIRECTION
POLAR CRANE LOCATION
CALLAWAY SITE



DESIGN FLOOR RESPONSE SPECTRA

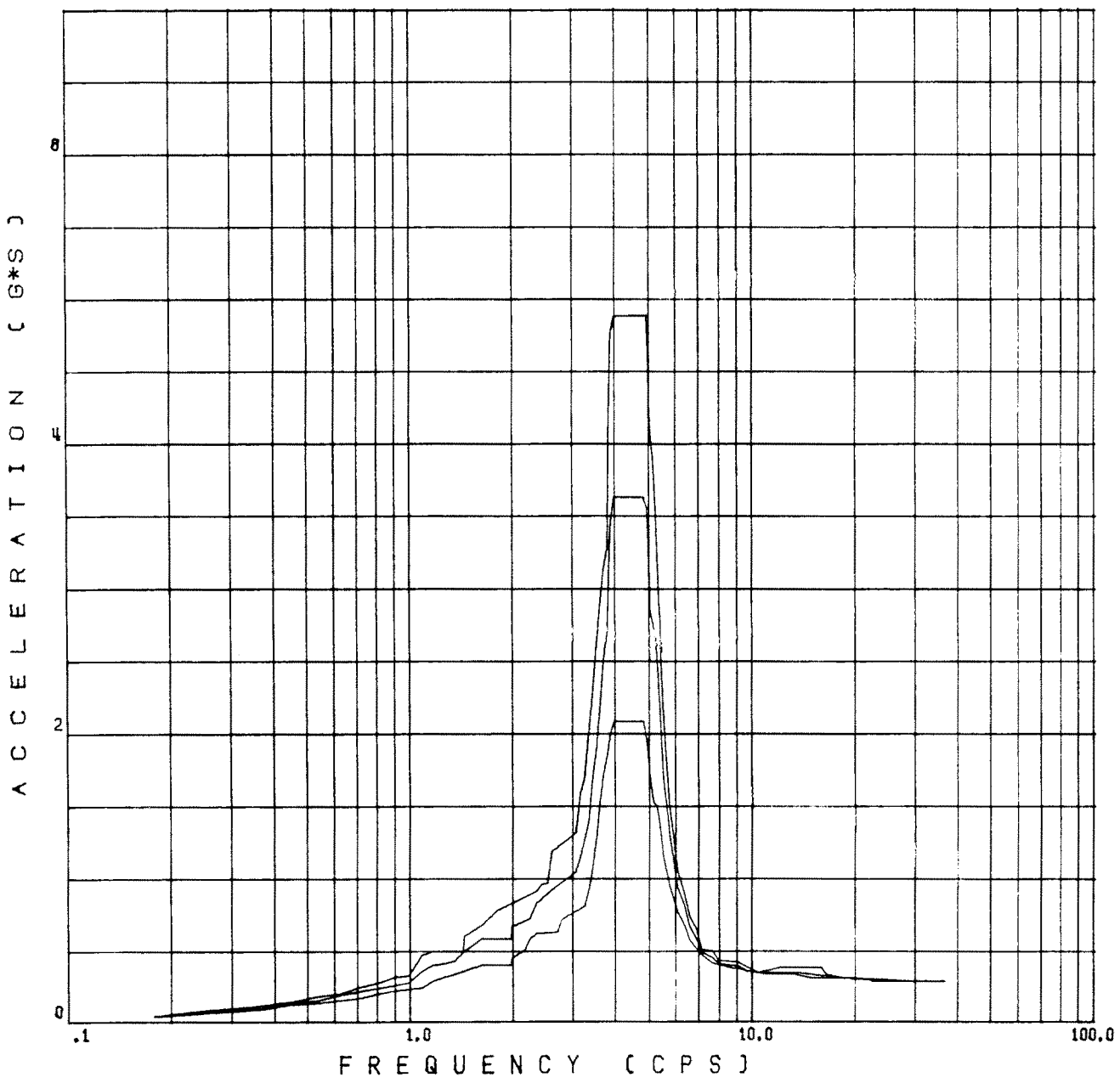
EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14N
SPECTRA - CONTAINMENT BUILDING
OBE
NORTH-SOUTH DIRECTION
POLAR CRANE LOCATION
STERLING SITE

Figure 3.7(B)-140 Deleted



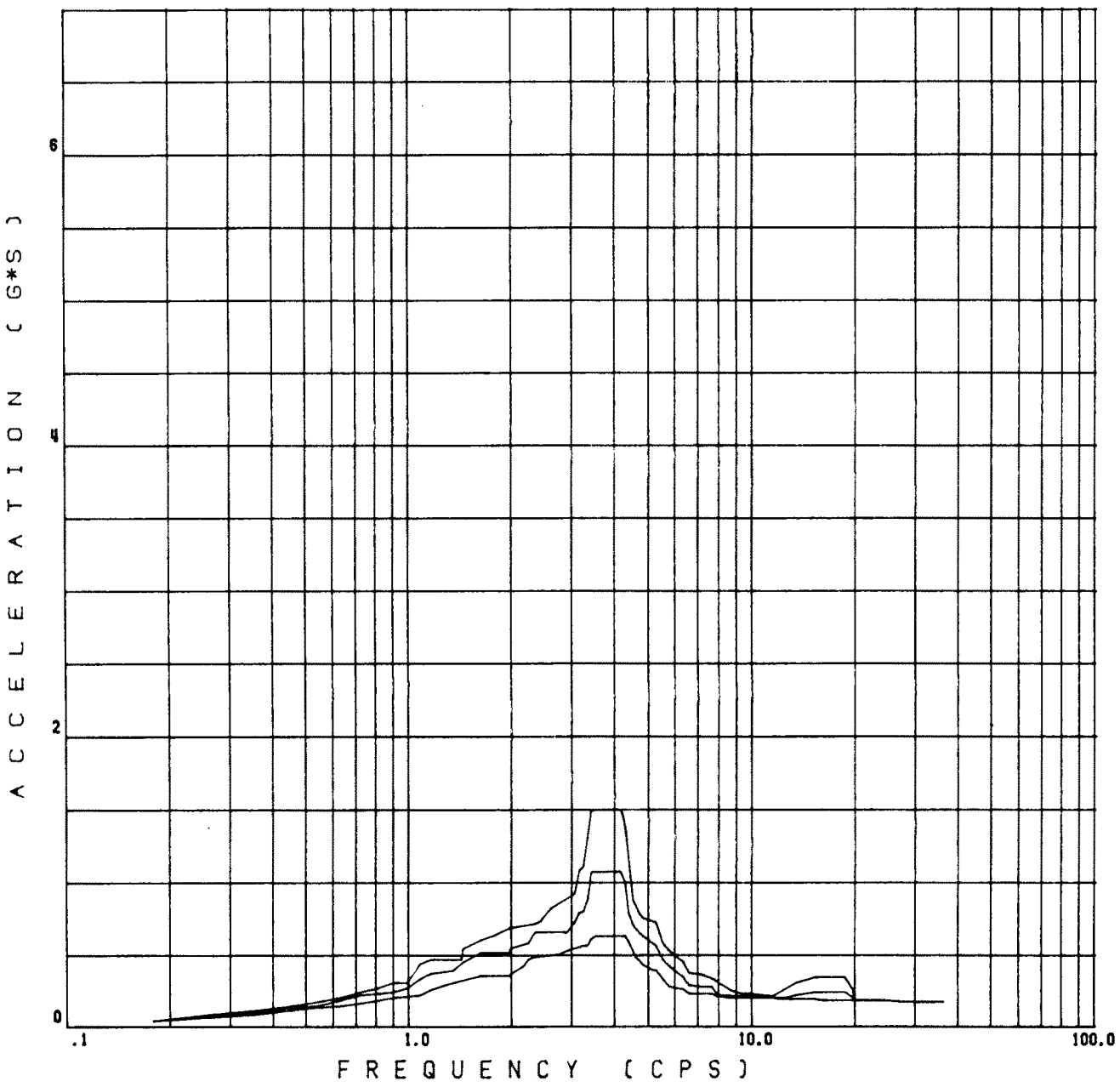
DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14P
SPECTRA - CONTAINMENT BUILDING
OBE
NORTH-SOUTH DIRECTION
POLAR CRANE LOCATION
WOLF CREEK SITE



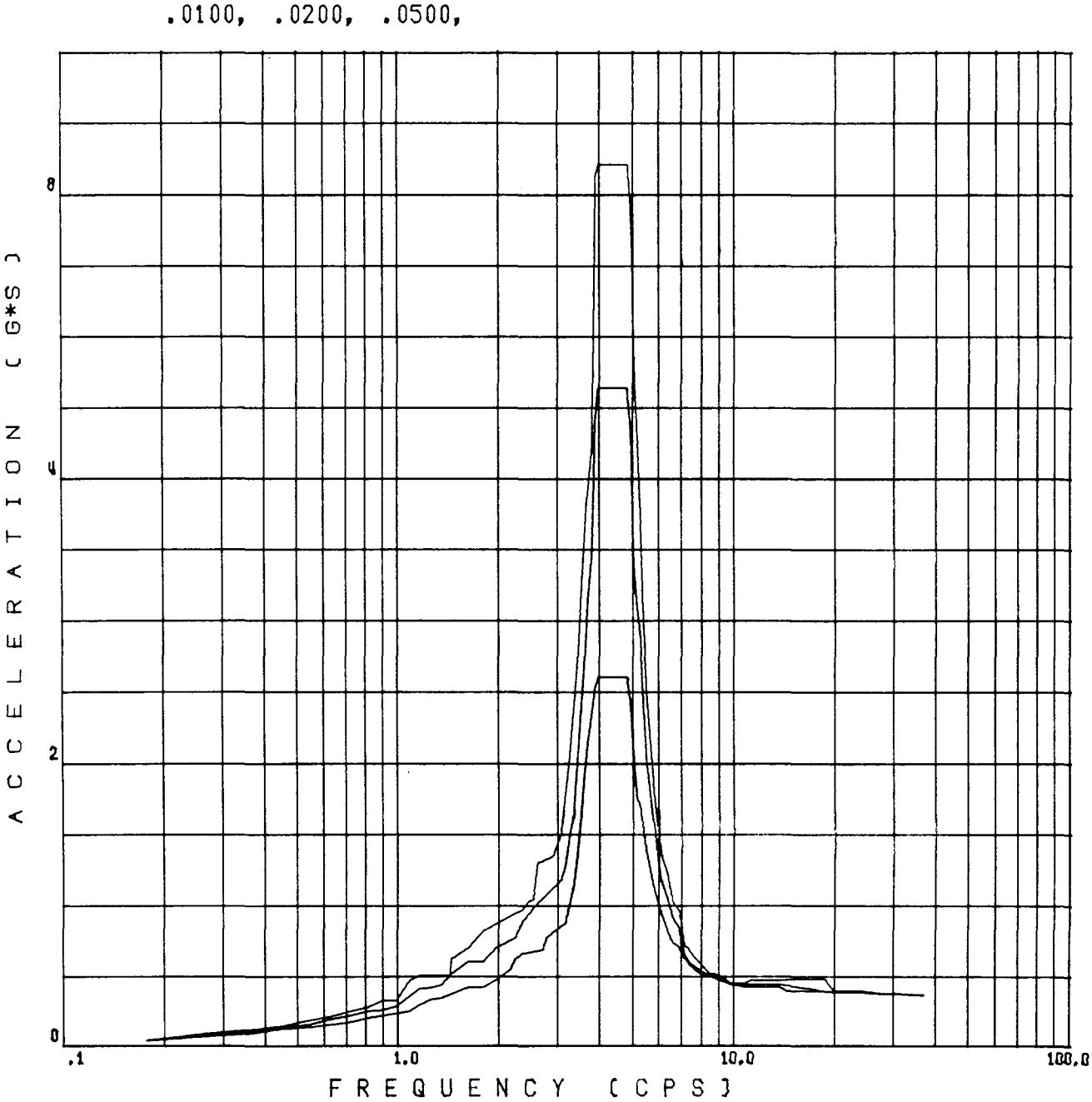
DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14Q
SPECTRA - CONTAINMENT BUILDING
OBE
EAST-WEST DIRECTION
POLAR CRANE LOCATION
CALLAWAY SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14R
SPECTRA - CONTAINMENT BUILDING
OBE
EAST-WEST DIRECTION
POLAR CRANE LOCATION
STERLING SITE

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DAMPING VALUES

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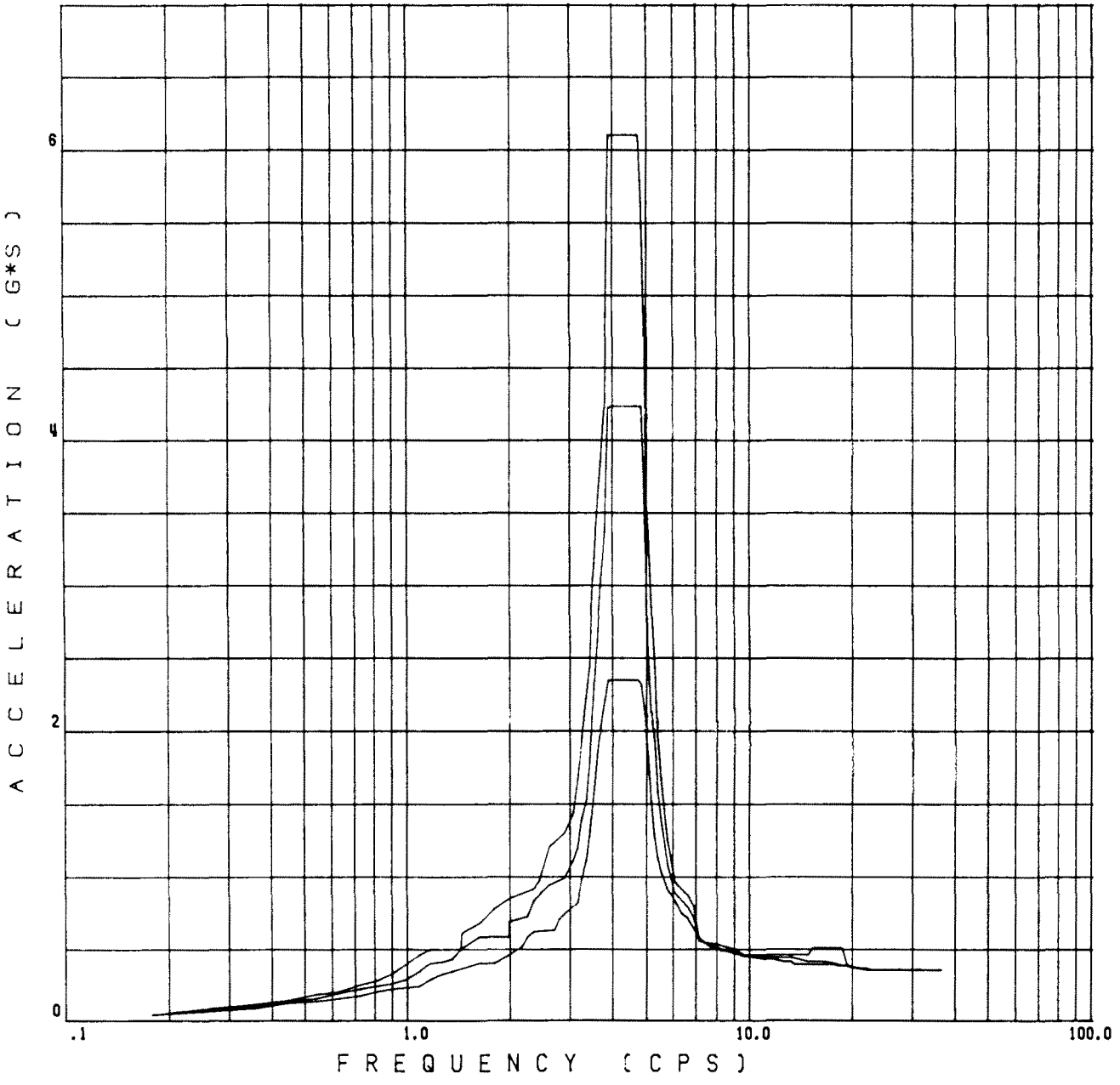


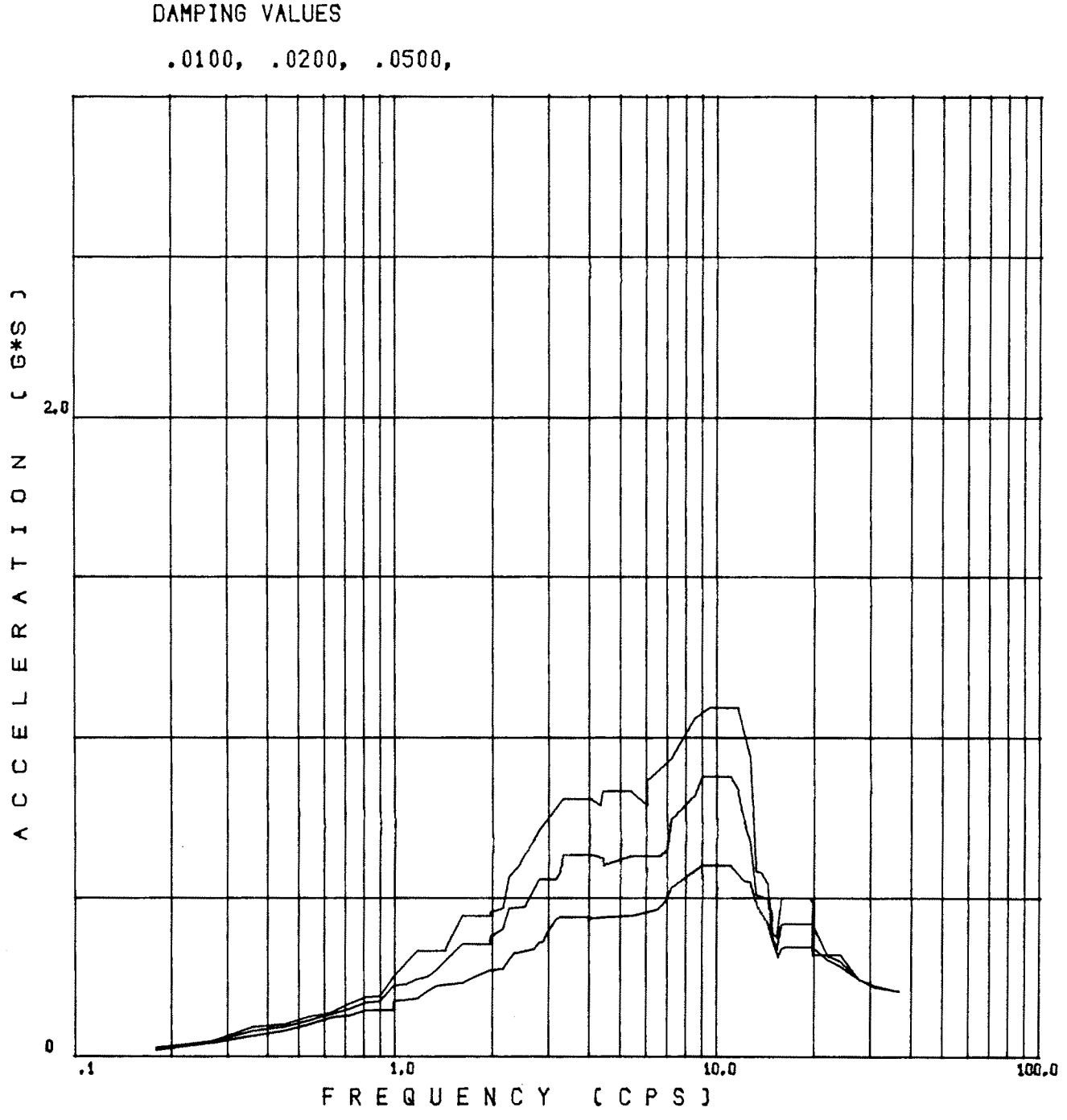
DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14T
SPECTRA - CONTAINMENT BUILDING
OBE
EAST-WEST DIRECTION
POLAR CRANE LOCATION
WOLF CREEK SITE



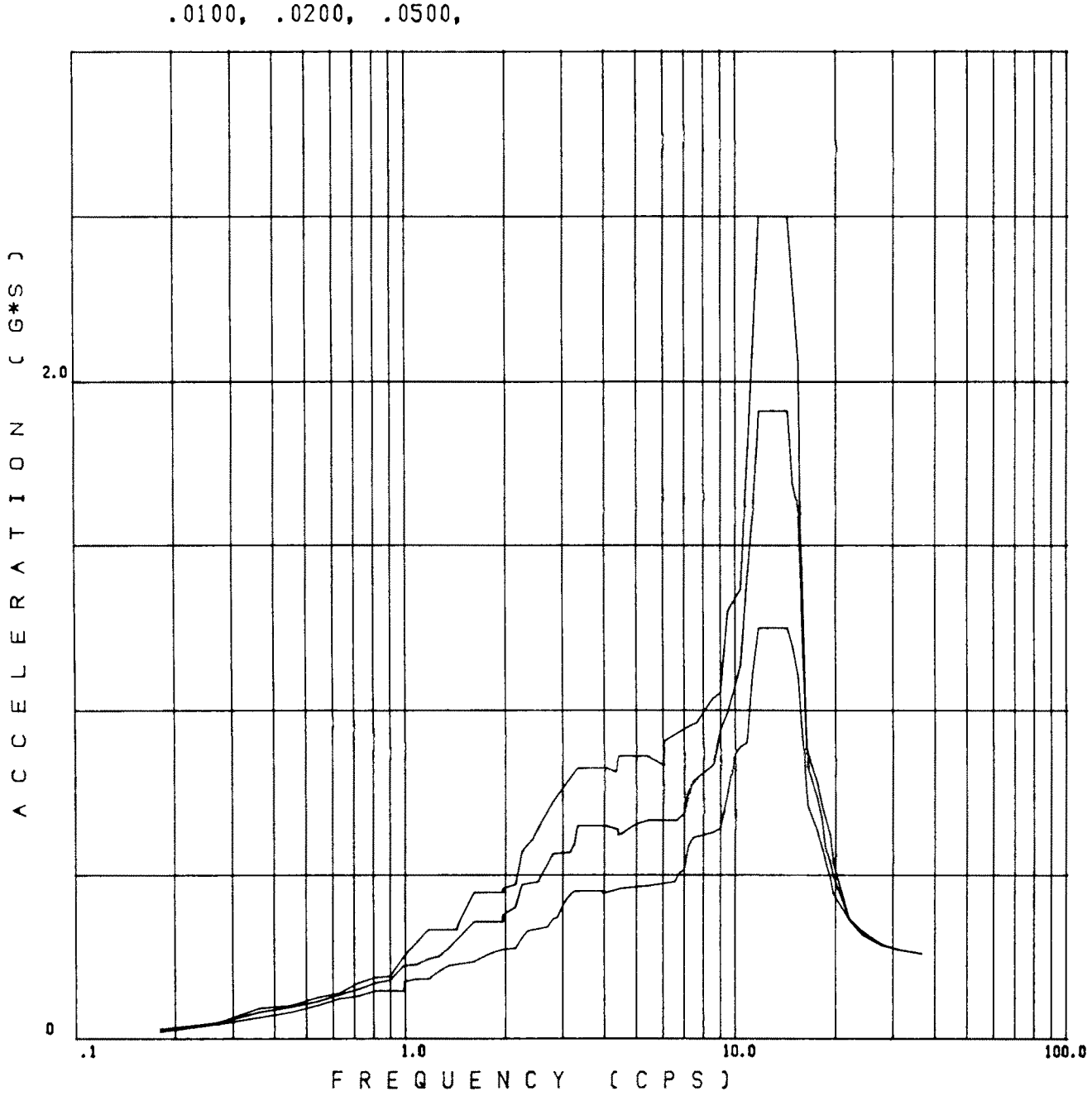
DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14U
SPECTRA - CONTAINMENT BUILDING
OBE
VERTICAL DIRECTION
POLAR CRANE LOCATION
CALLAWAY SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
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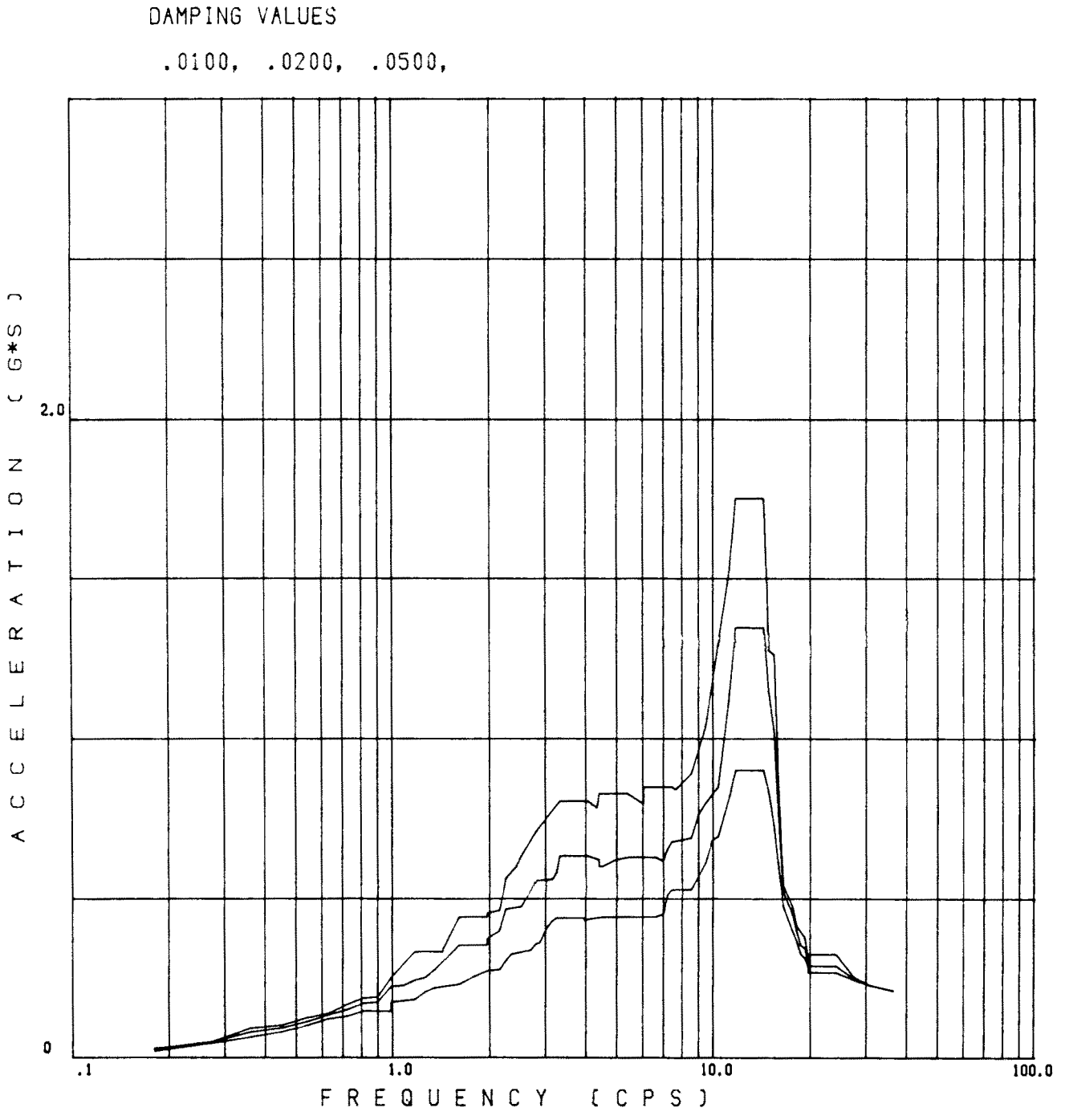
CALLAWAY PLANT

FIGURE 3.7(B)-14V
SPECTRA - CONTAINMENT BUILDING
OBE
VERTICAL DIRECTION
POLAR CRANE LOCATION
STERLING SITE

Figure 3.7(B)-14W Deleted



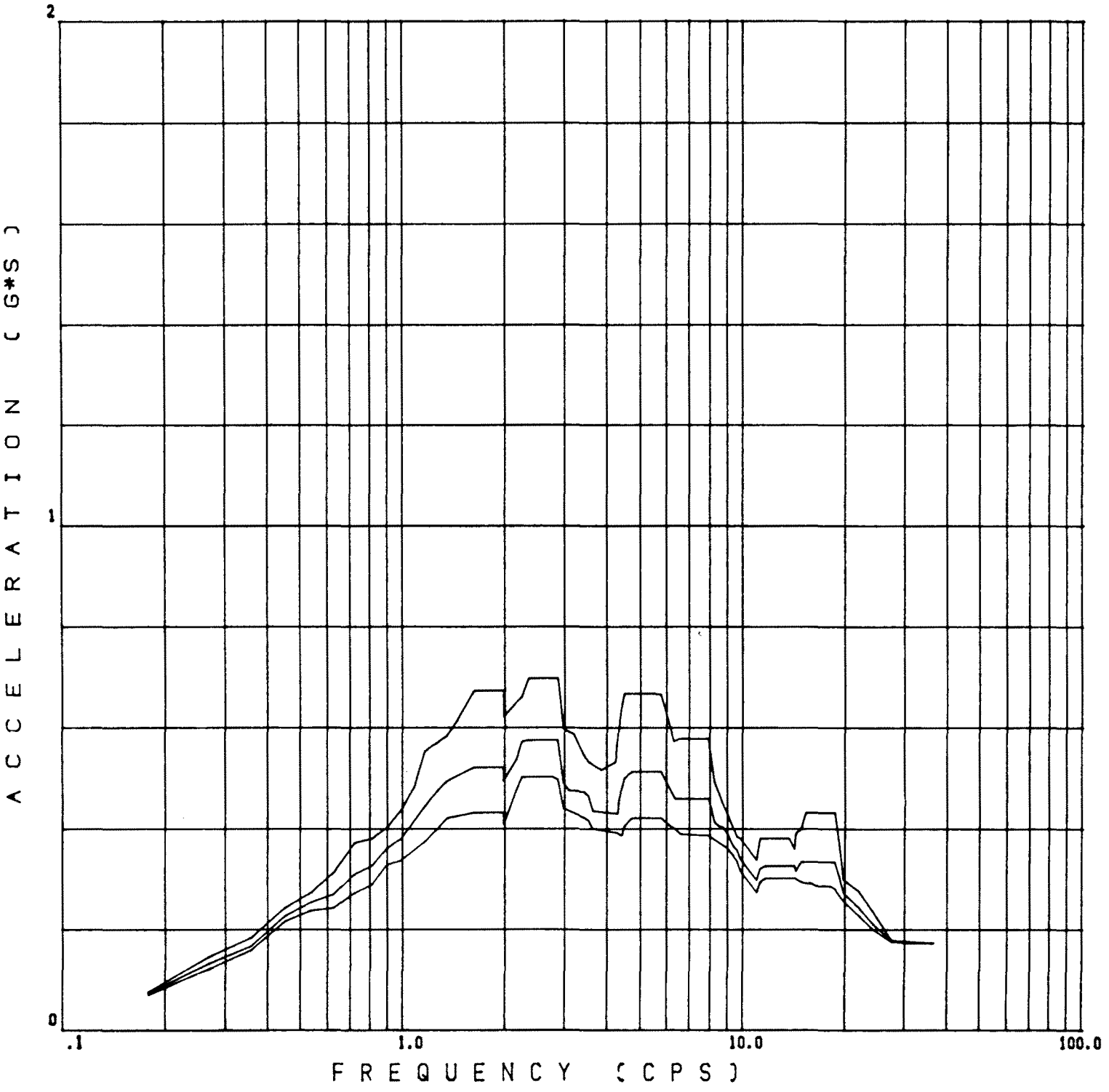
DESIGN FLOOR RESPONSE SPECTRA

EL. 2119' - 0"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-14X
SPECTRA - CONTAINMENT BUILDING
OBE
VERTICAL DIRECTION
POLAR CRANE LOCATION
WOLF CREEK SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

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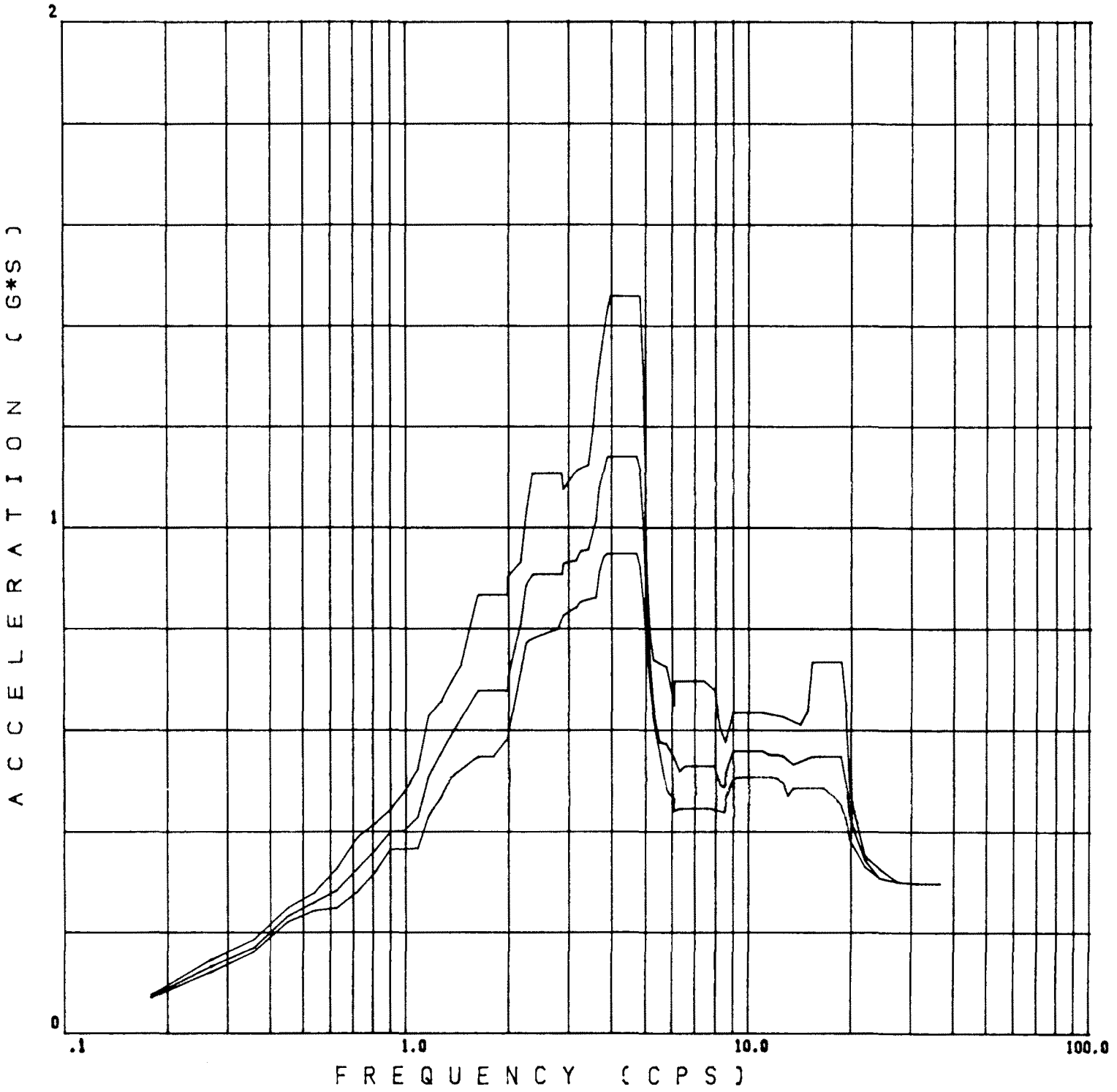
CALLAWAY PLANT

FIGURE 3.7(B)-15A
SPECTRA - CONTAINMENT BUILDING
SSE
NORTH-SOUTH DIRECTION
STEAM GENERATOR UPPER SUPPORT
CALLAWAY SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

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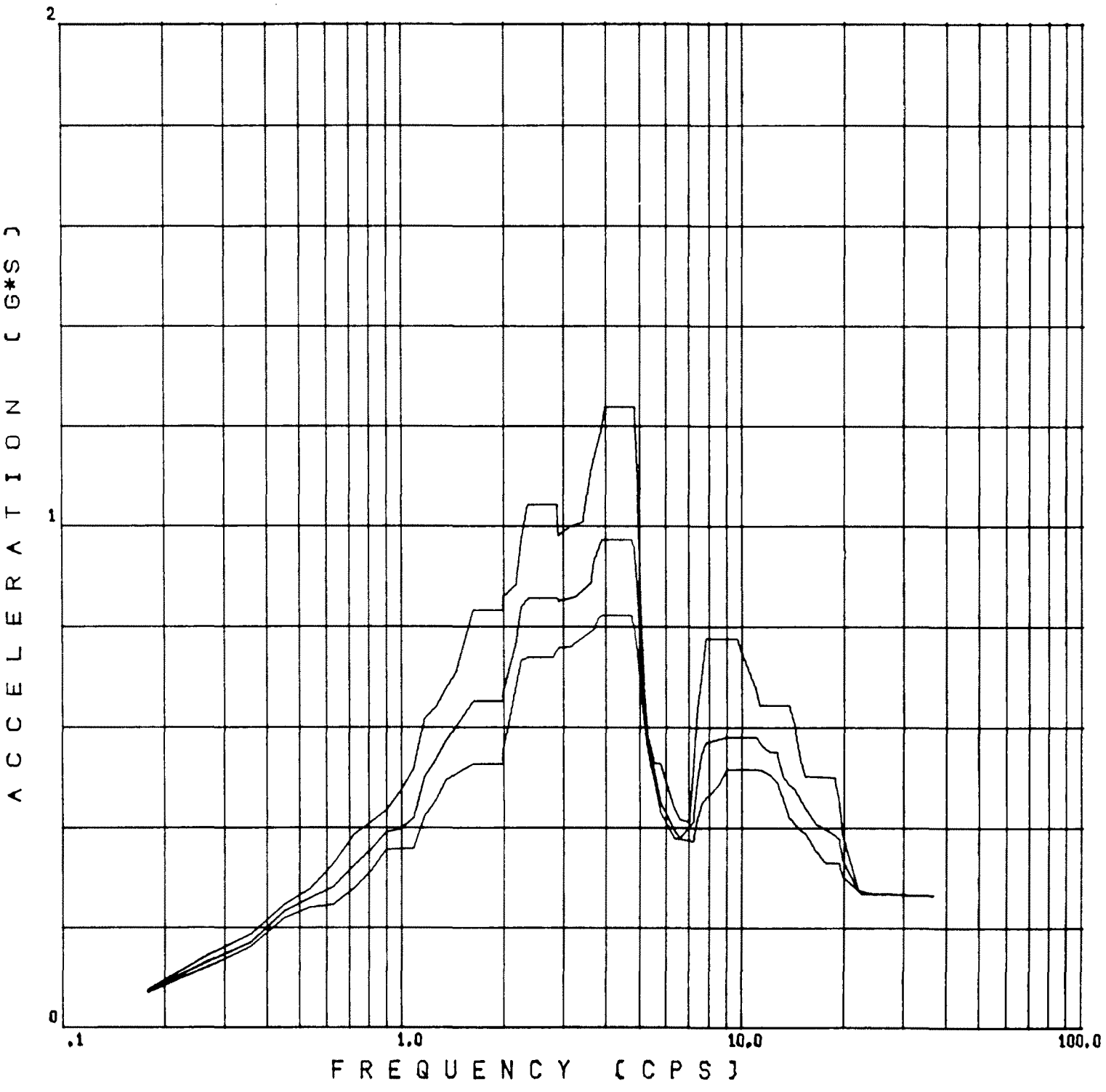
CALLAWAY PLANT

FIGURE 3.7(B)-15B
SPECTRA - CONTAINMENT BUILDING
SSE
NORTH-SOUTH DIRECTION
STEAM GENERATOR UPPER SUPPORT
STERLING SITE

Figure 3.7(B)-15C Deleted



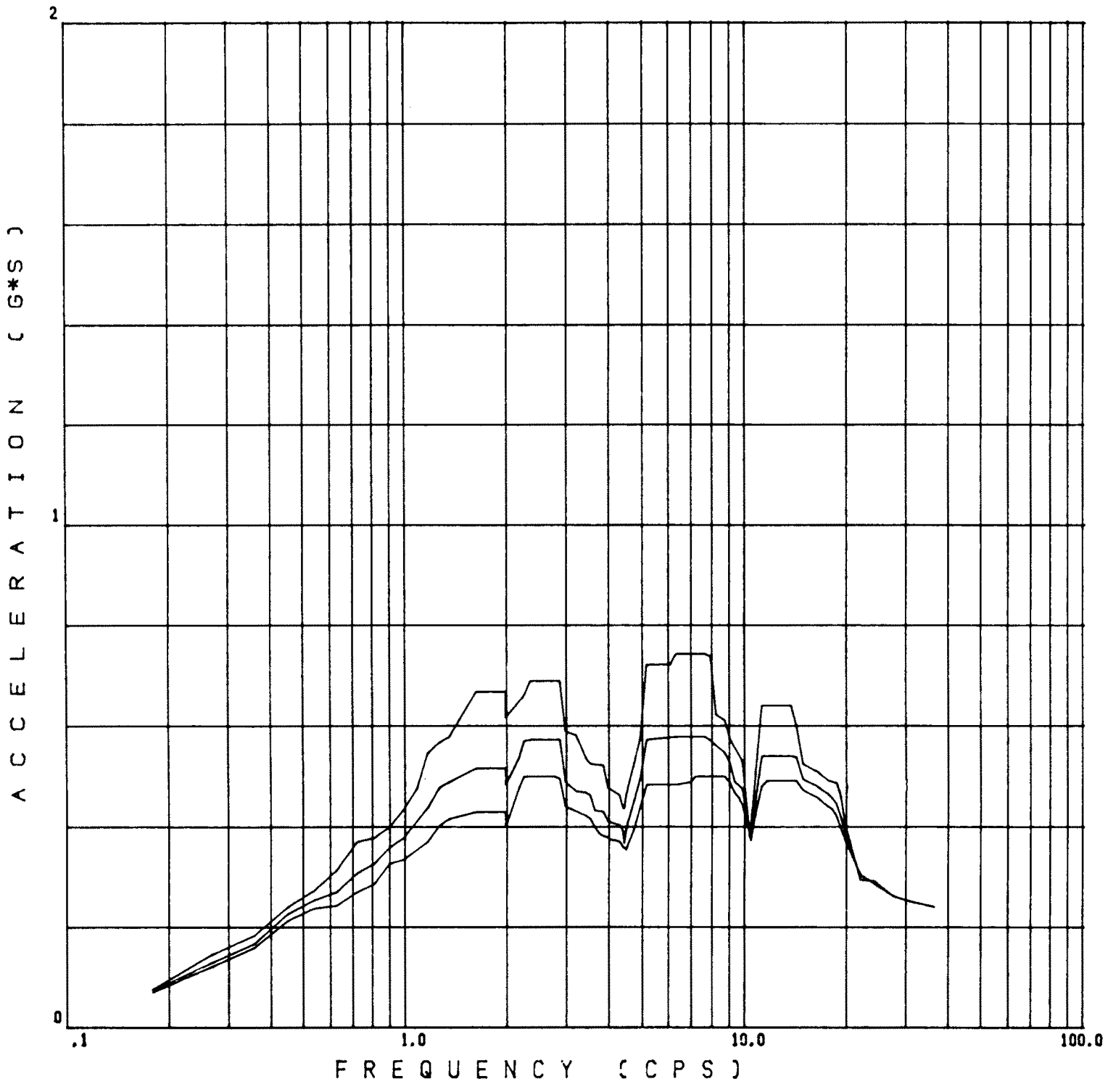
DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-15D
SPECTRA - CONTAINMENT BUILDING
SSE
NORTH-SOUTH DIRECTION
STEAM GENERATOR UPPER SUPPORT
WOLF CREEK SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

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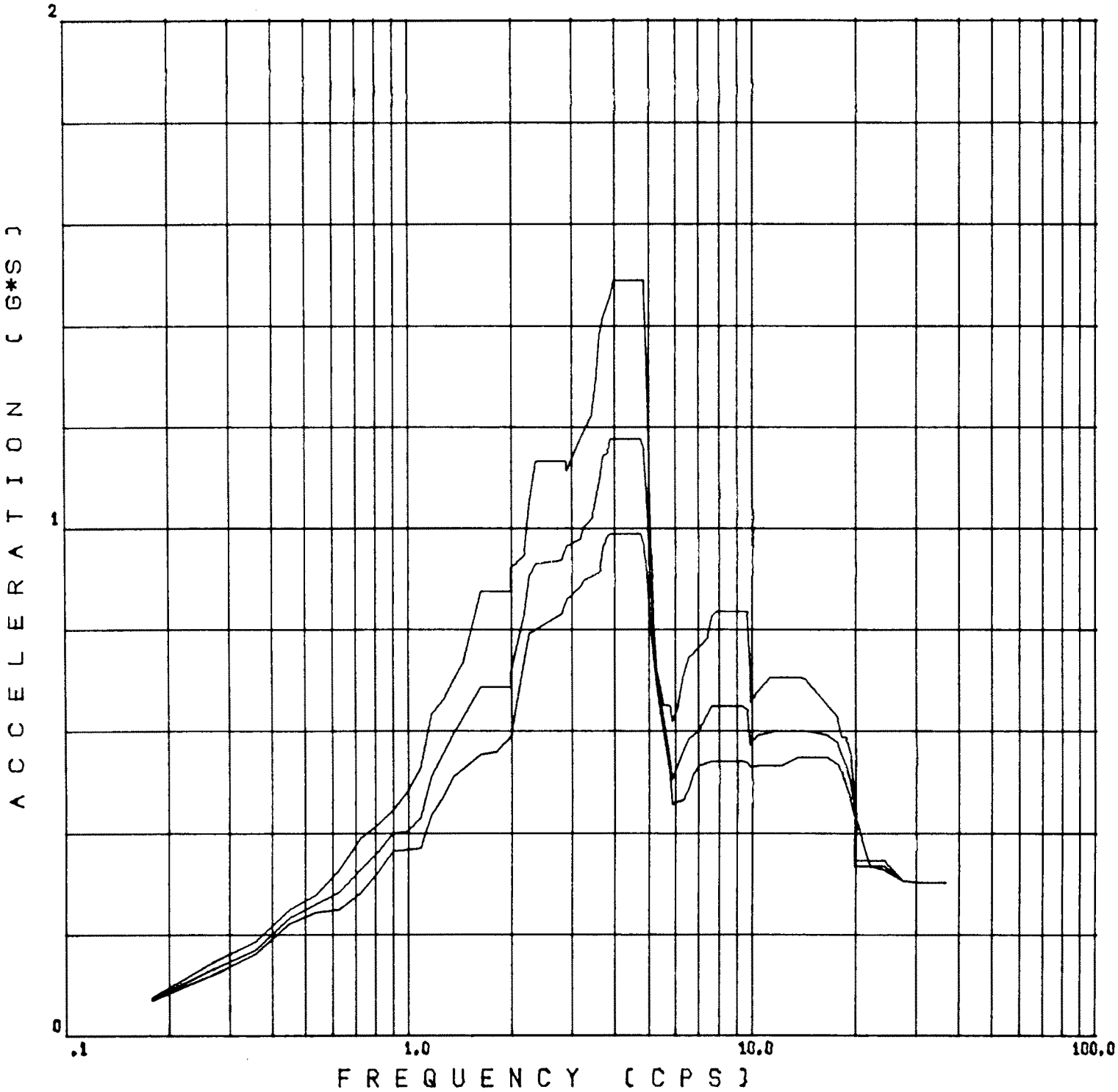
CALLAWAY PLANT

FIGURE 3.7(B)-15E
SPECTRA - CONTAINMENT BUILDING
SSE
EAST-WEST DIRECTION
STEAM-GENERATOR UPPER SUPPORT
CALLAWAY SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

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CALLAWAY PLANT

FIGURE 3.7(B)-15F
SPECTRA - CONTAINMENT BUILDING
SSE
EAST-WEST DIRECTION
STEAM GENERATOR UPPER SUPPORT
STERLING SITE

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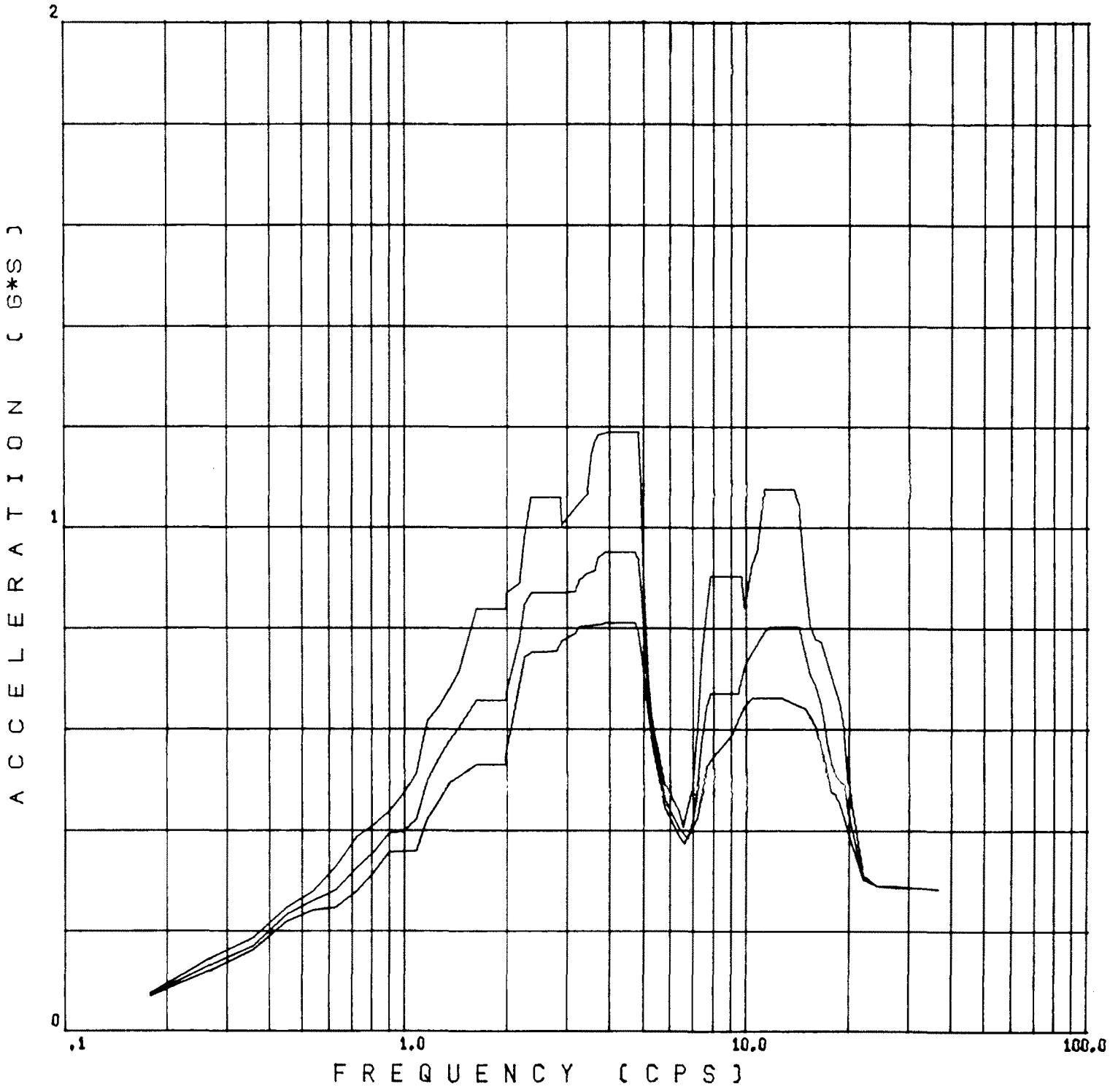


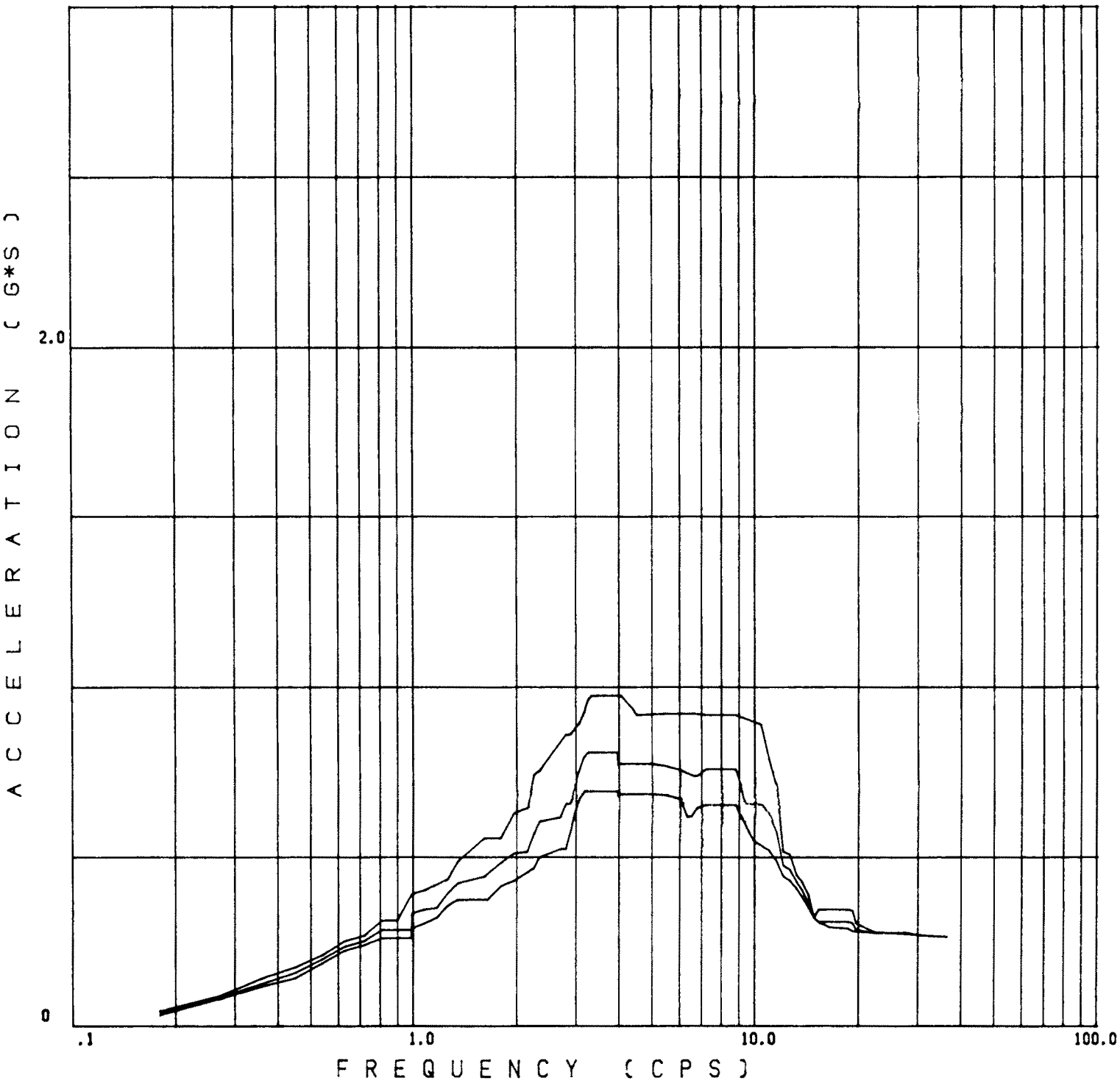
DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-15H
SPECTRA - CONTAINMENT BUILDING
SSE
EAST-WEST DIRECTION
STEAM GENERATOR UPPER SUPPORT
WOLF CREEK SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

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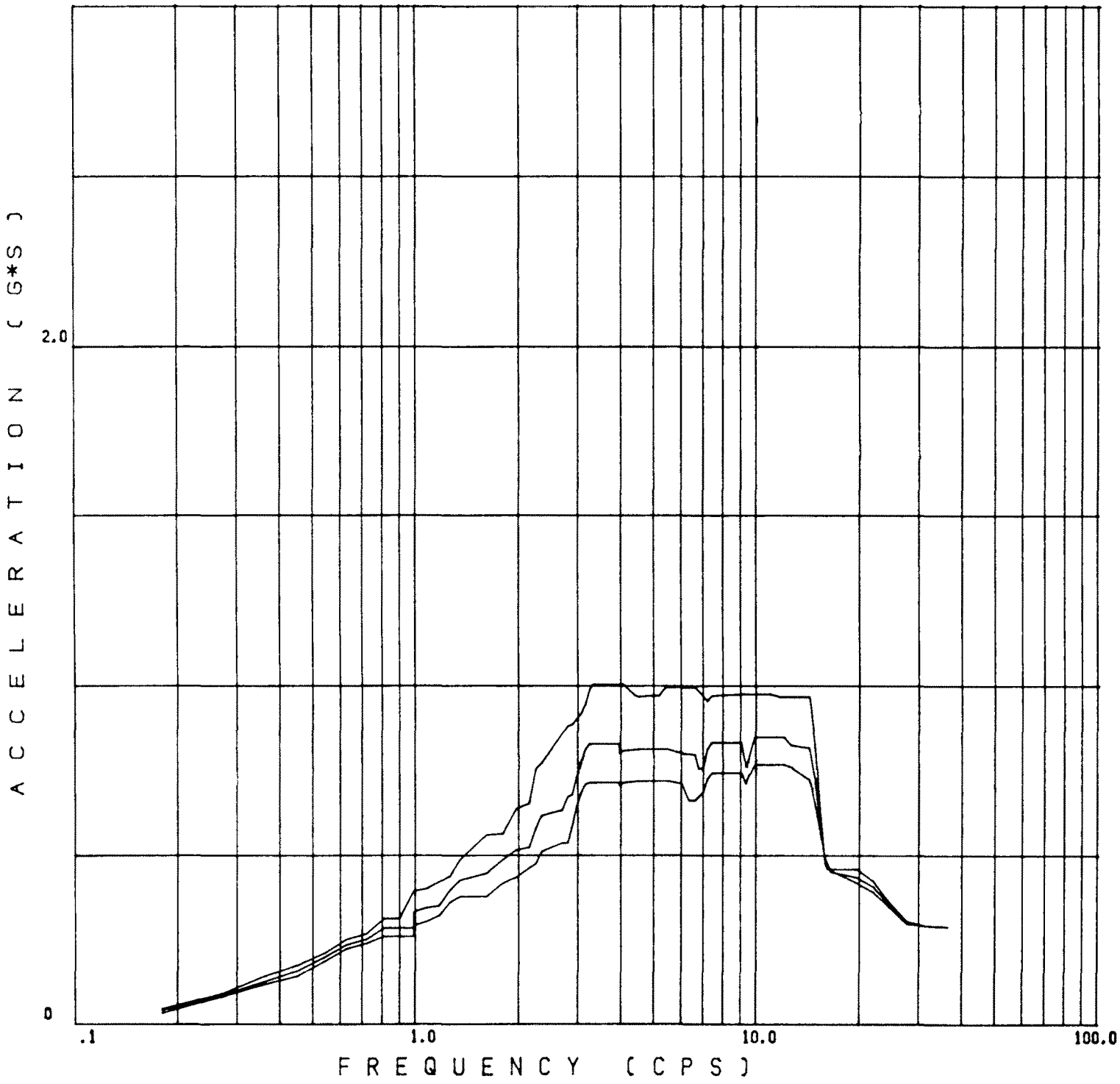
CALLAWAY PLANT

FIGURE 3.7(B)-15I
SPECTRA - CONTAINMENT BUILDING
SSE
VERTICAL DIRECTION
STEAM GENERATOR UPPER SUPPORT
CALLAWAY SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

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CALLAWAY PLANT

FIGURE 3.7(B)-15J
SPECTRA - CONTAINMENT BUILDING
SSE
VERTICAL DIRECTION
STEAM GENERATOR UPPER SUPPORT
STERLING SITE

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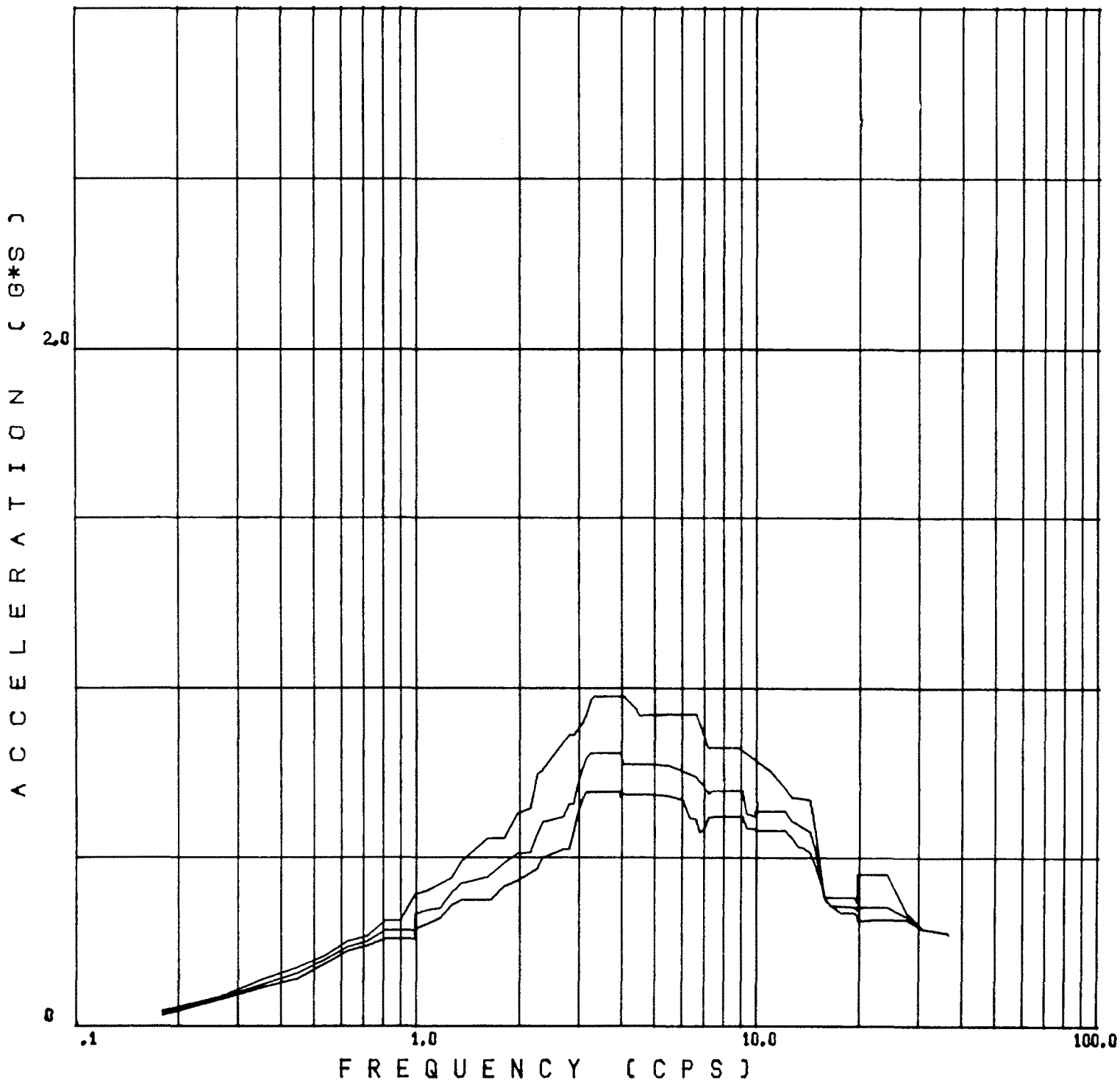

DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

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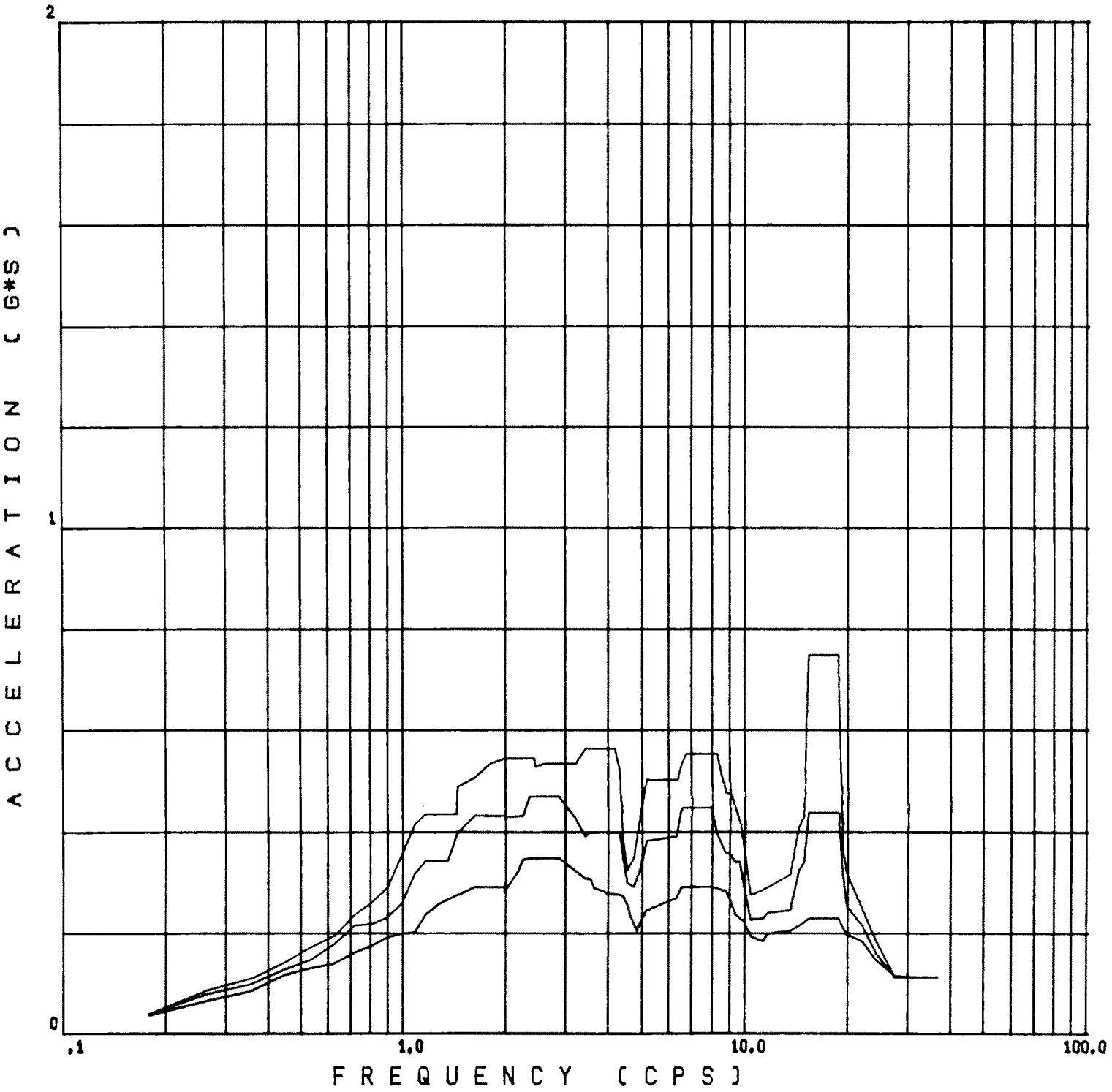
CALLAWAY PLANT

FIGURE 3.7(B)-15L
SPECTRA - CONTAINMENT BUILDING
SSE
VERTICAL DIRECTION
STEAM GENERATOR UPPER SUPPORT
WOLF CREEK SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

Rev. OL-0
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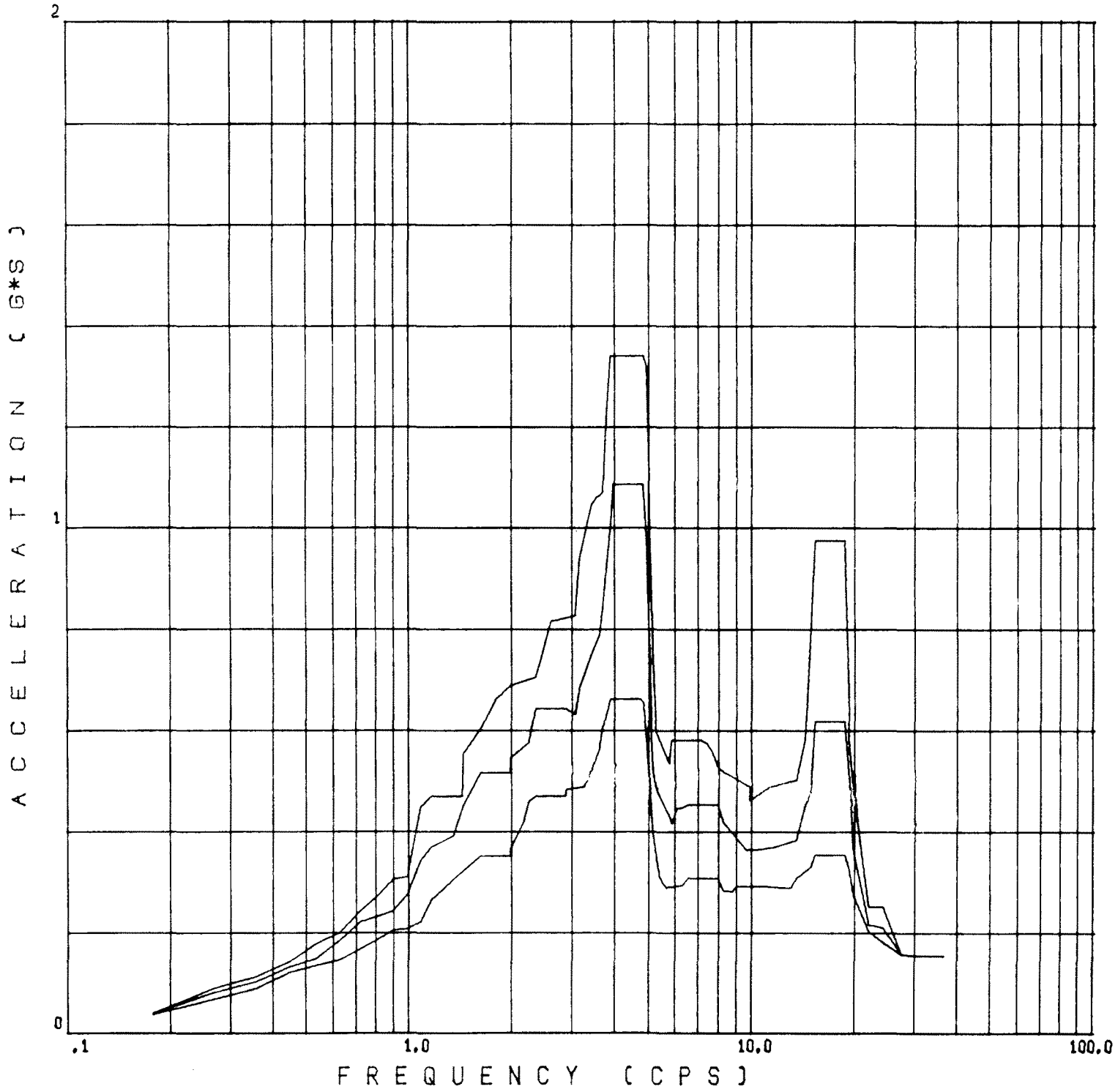
CALLAWAY PLANT

FIGURE 3.7(B)-15M
SPECTRA - CONTAINMENT BUILDING
OBE
NORTH-SOUTH DIRECTION
STEAM GENERATOR UPPER SUPPORT
CALLAWAY SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

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CALLAWAY PLANT

FIGURE 3.7(B)-15N
SPECTRA - CONTAINMENT BUILDING
OBE
NORTH-SOUTH DIRECTION
STEAM GENERATOR UPPER SUPPORT
STERLING SITE

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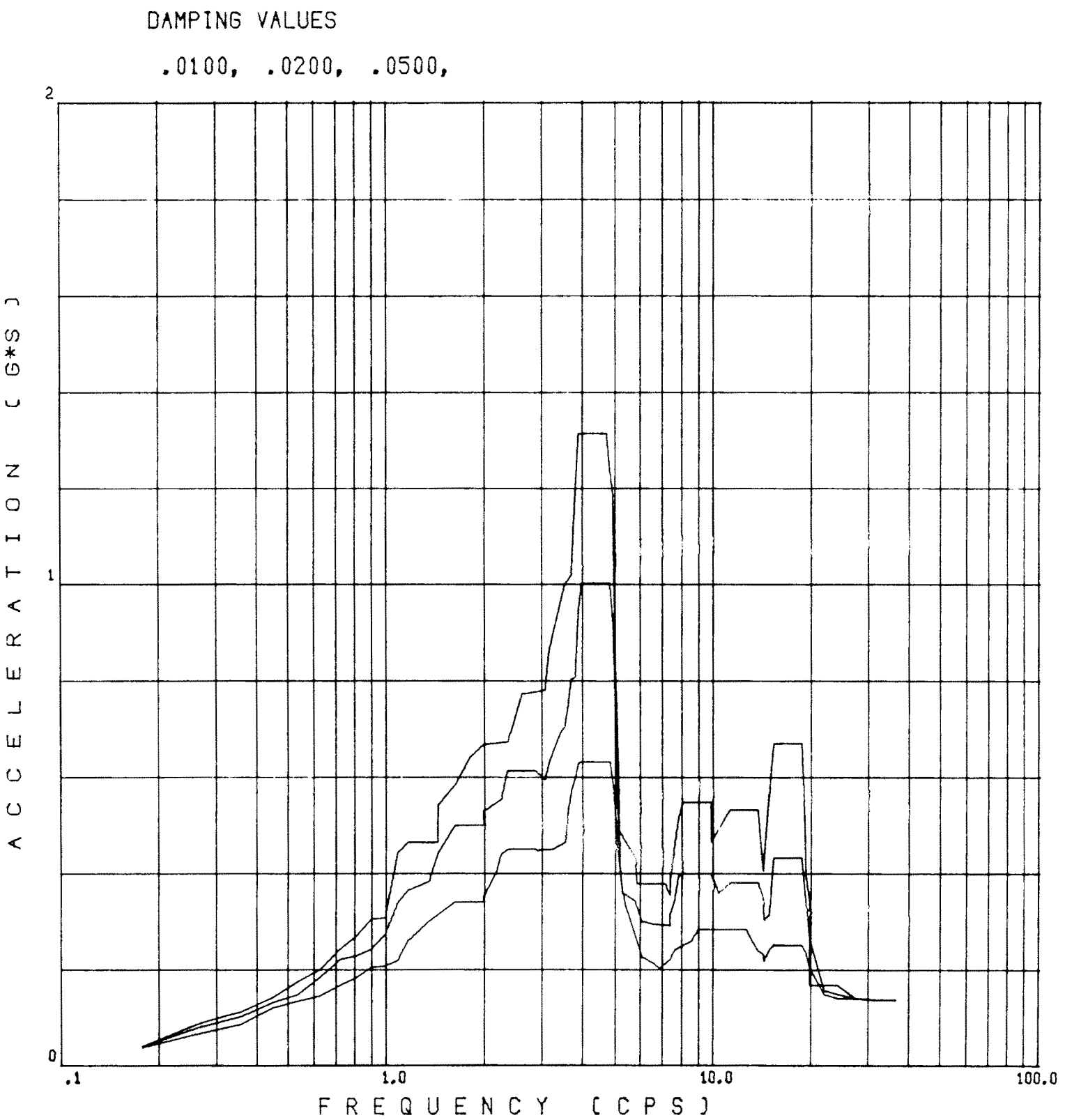

DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

Rev. OL-0
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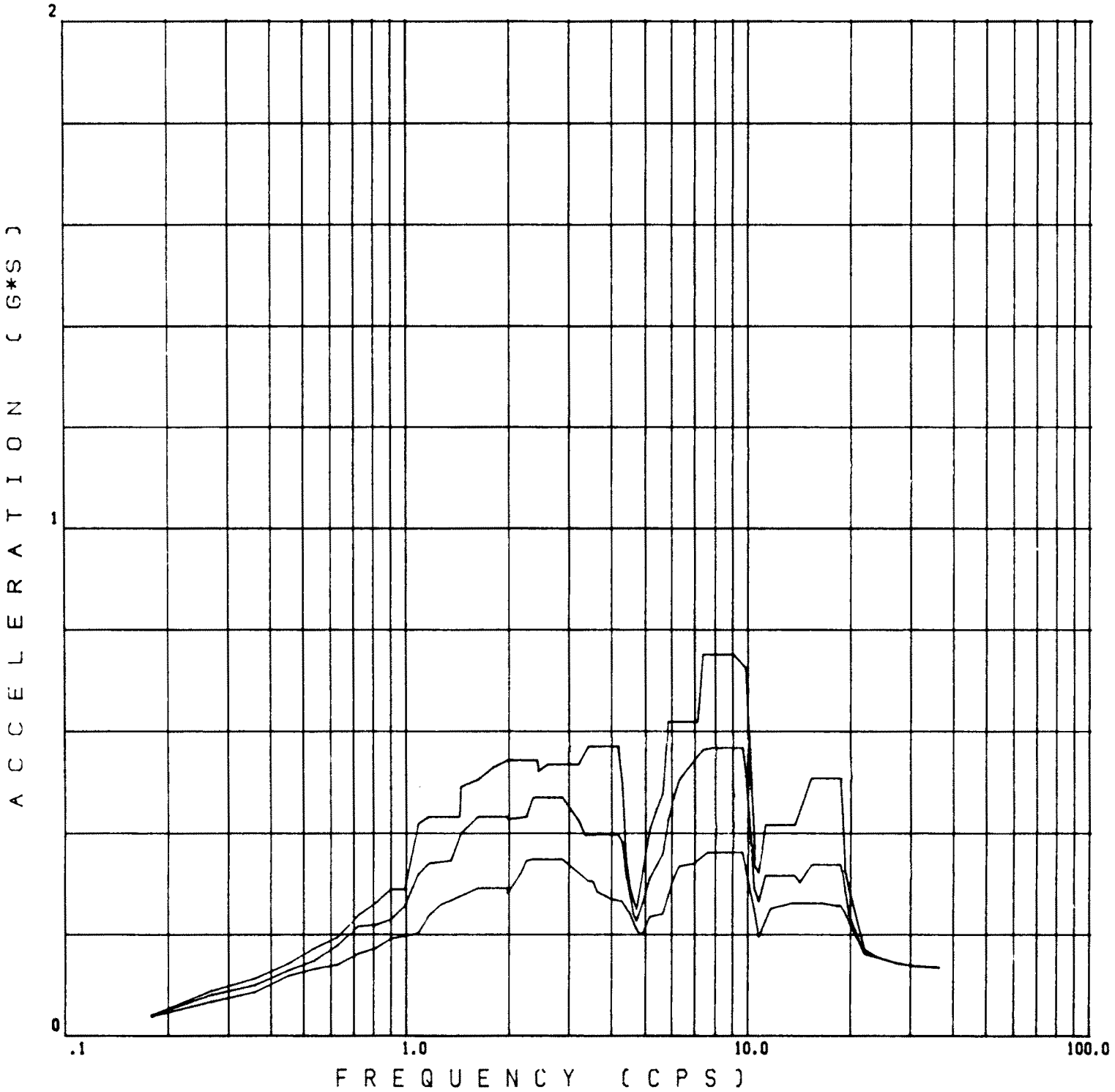
CALLAWAY PLANT

FIGURE 3.7(B)-15P
SPECTRA - CONTAINMENT BUILDING
OBE
NORTH-SOUTH DIRECTION
STEAM GENERATOR UPPER SUPPORT
WOLF CREEK SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

Rev. OL-0
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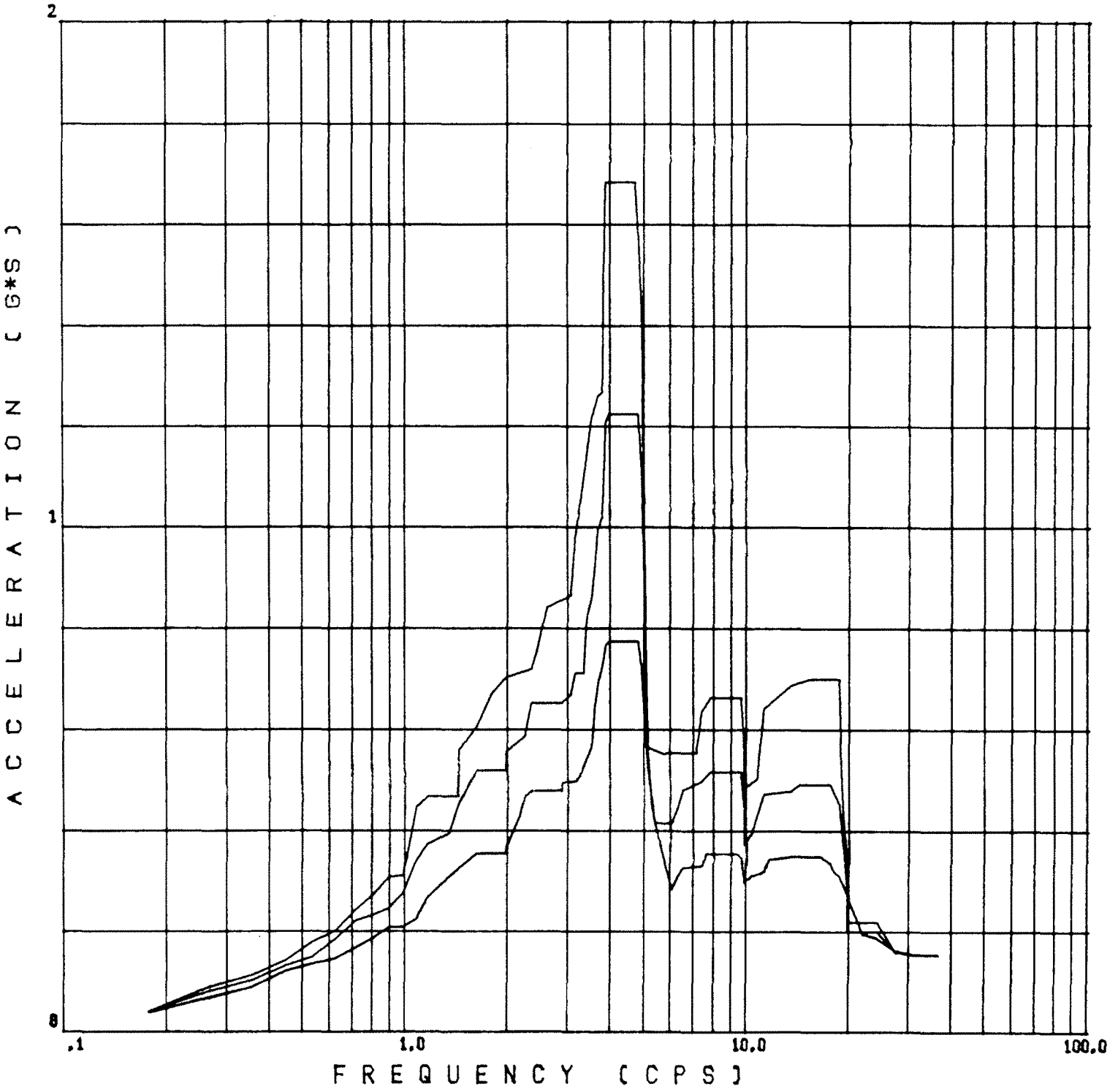
CALLAWAY PLANT

FIGURE 3.7(B)-15Q
SPECTRA - CONTAINMENT BUILDING
OBE
EAST-WEST DIRECTION
STEAM GENERATOR UPPER SUPPORT
CALLAWAY SITE

DAMPING VALUES

.0100, .0200, .0500,



DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-15R
SPECTRA - CONTAINMENT BUILDING
OBE
EAST-WEST DIRECTION
STEAM GENERATOR UPPER SUPPORT
STERLING SITE

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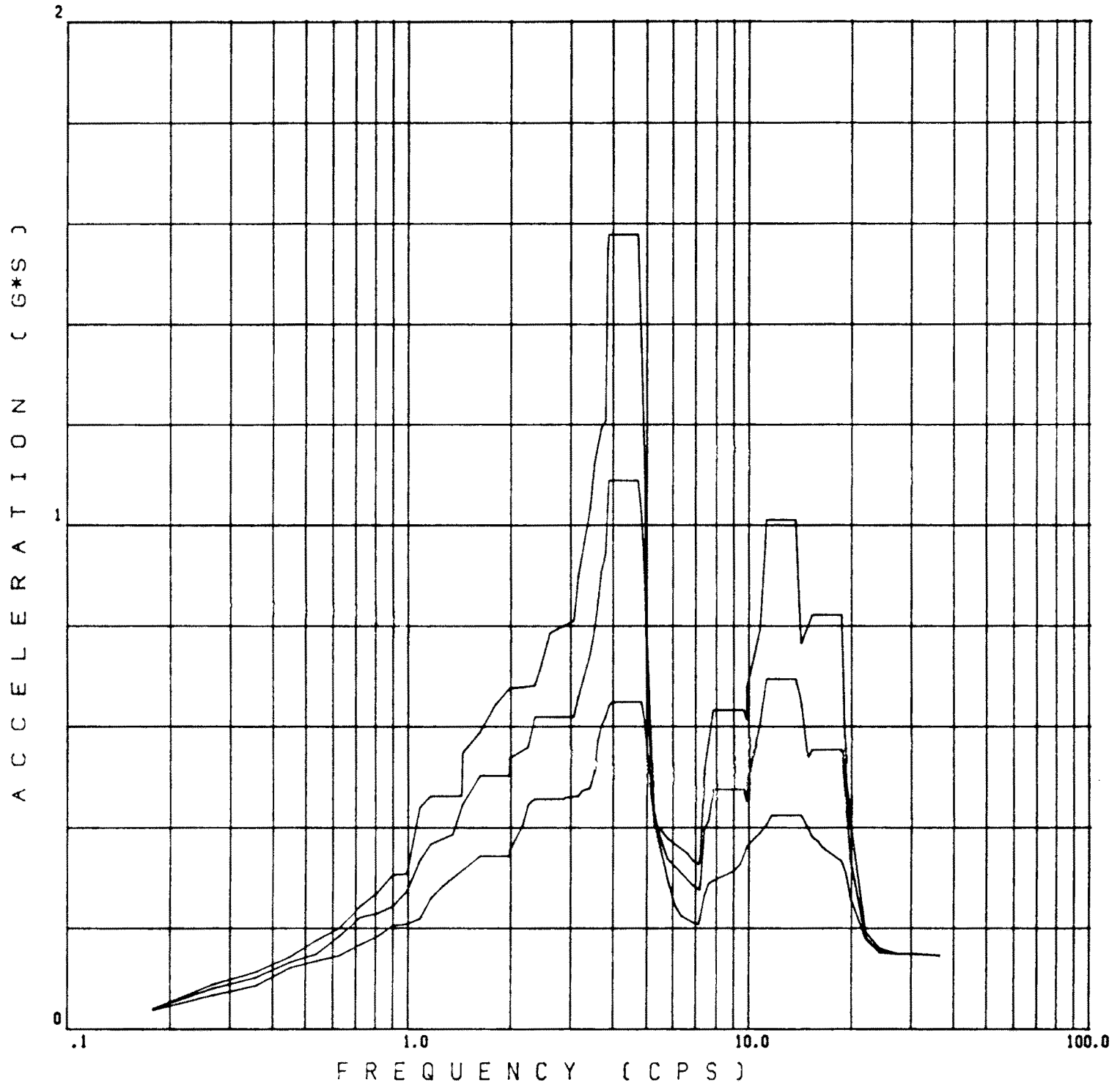


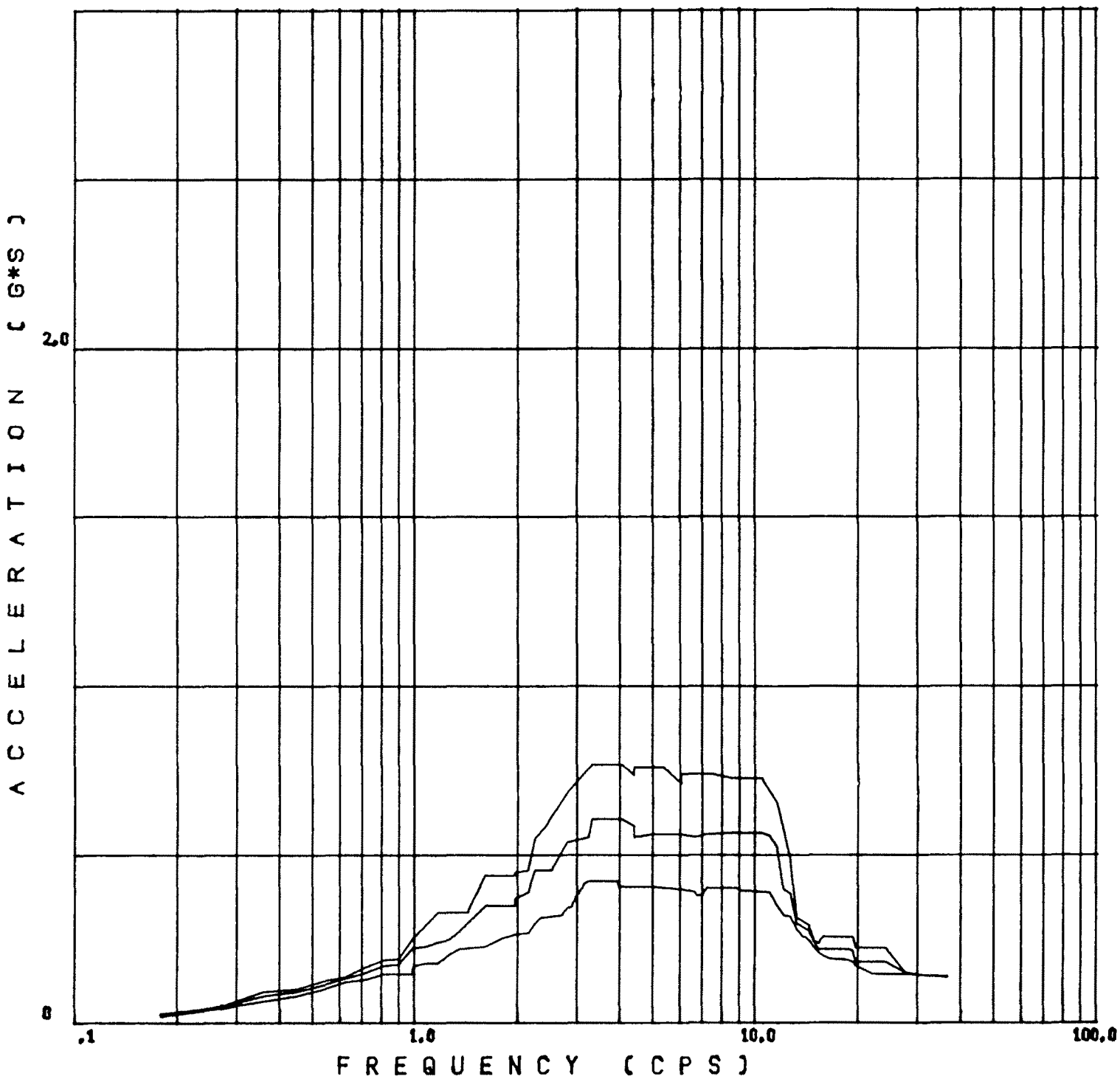
DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

Rev. OL-0
6/86

CALLAWAY PLANT

FIGURE 3.7(B)-15T
SPECTRA - CONTAINMENT BUILDING
OBE
EAST-WEST DIRECTION
STEAM GENERATOR UPPER SUPPORT
WOLF CREEK SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

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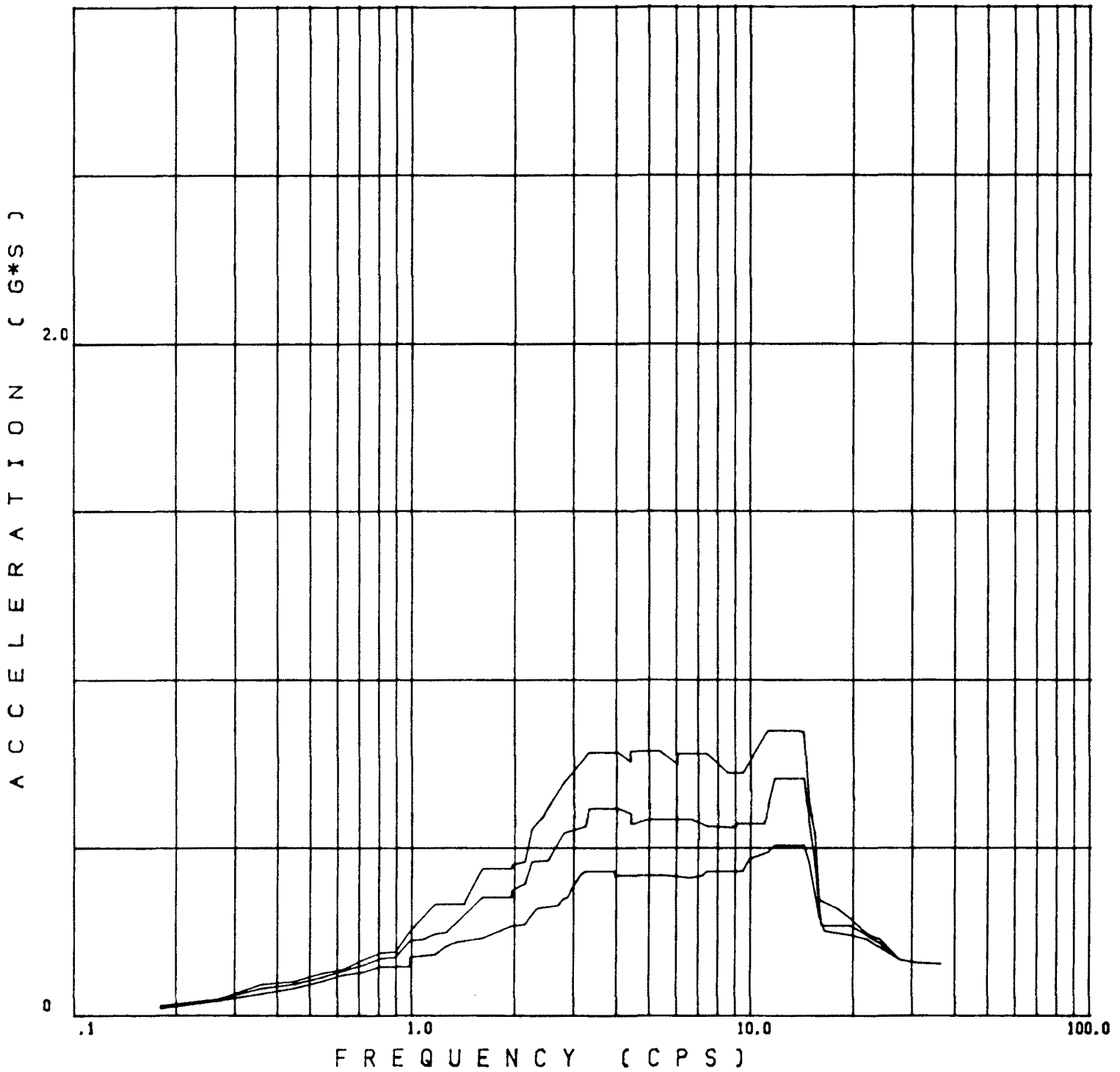
CALLAWAY PLANT

FIGURE 3.7(B)-15U
SPECTRA - CONTAINMENT BUILDING
OBE
VERTICAL DIRECTION
STEAM GENERATOR UPPER SUPPORT
CALLAWAY SITE



DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

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FIGURE 3.7(B)-15V
SPECTRA - CONTAINMENT BUILDING
OBE
VERTICAL DIRECTION
STEAM GENERATOR UPPER SUPPORT
STERLING SITE

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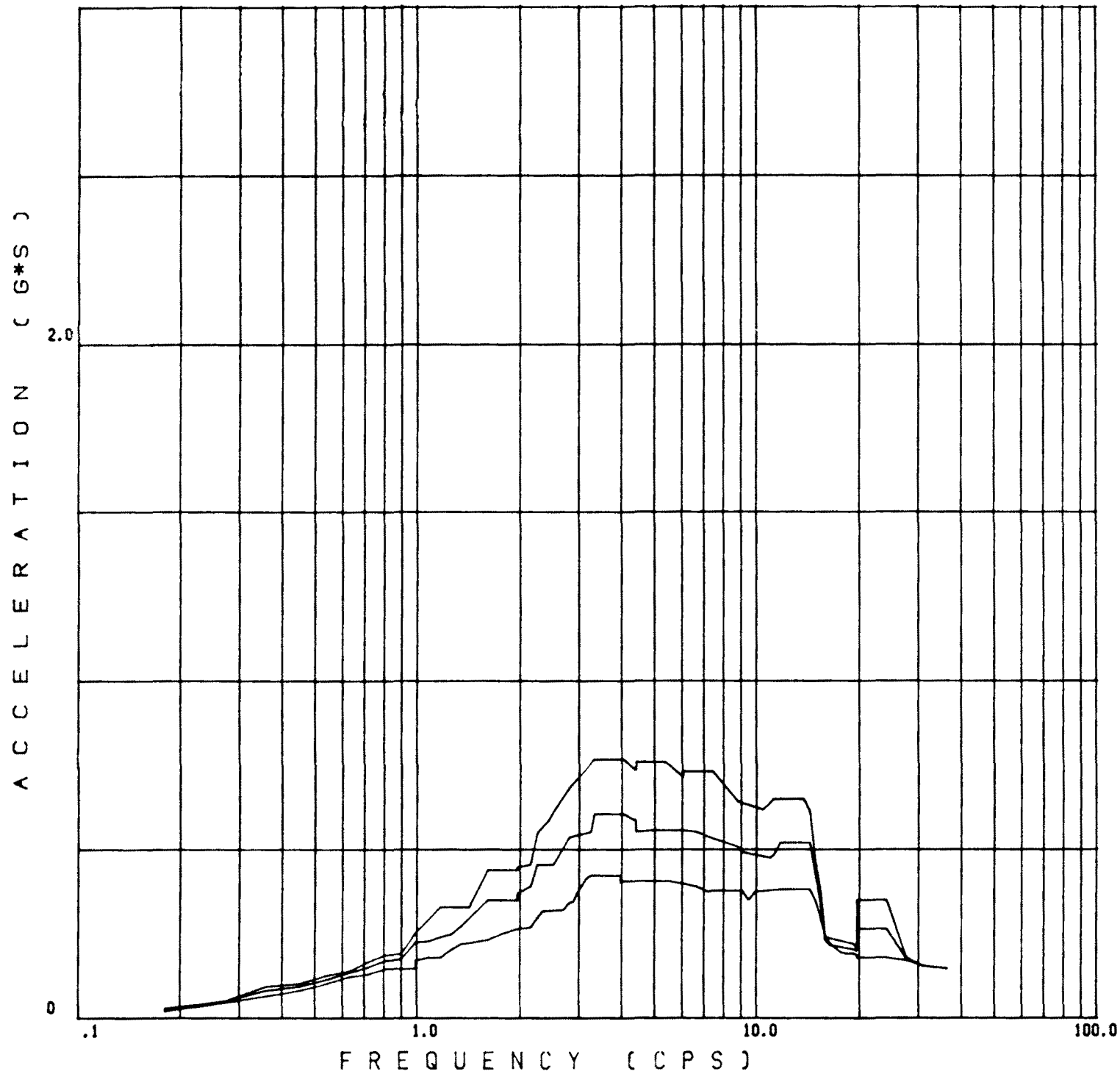

DESIGN FLOOR RESPONSE SPECTRA

EL. 2047' - 6"
REF. FIGURE 3.7(B)-17

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FIGURE 3.7(B)-15X
SPECTRA - CONTAINMENT BUILDING
OBE
VERTICAL DIRECTION
STEAM GENERATOR UPPER SUPPORT
WOLF CREEK SITE

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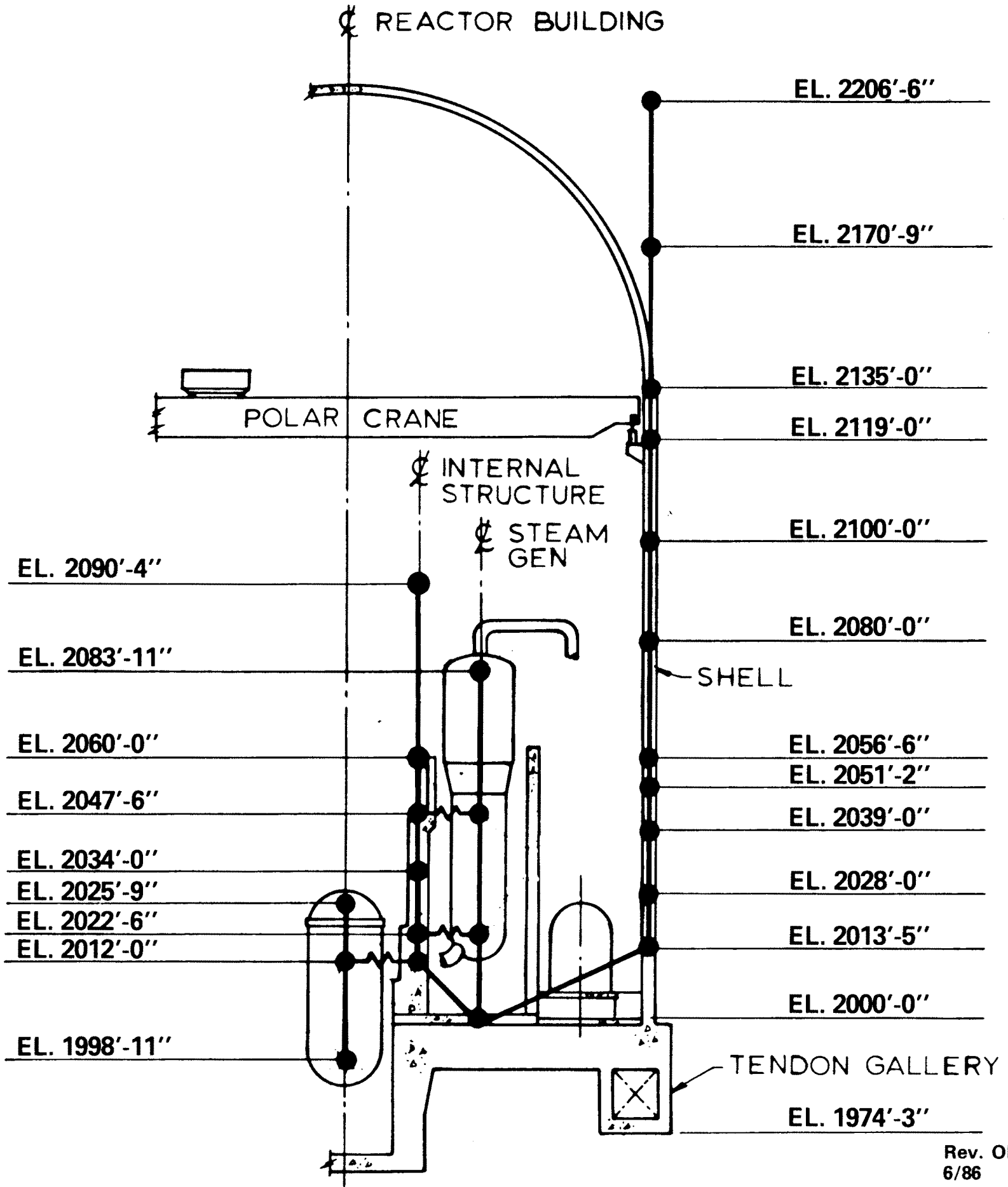

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FIGURE 3.7(B)-17

LUMPED-MASS/FLUSH MODEL, CONTAINMENT BUILDING

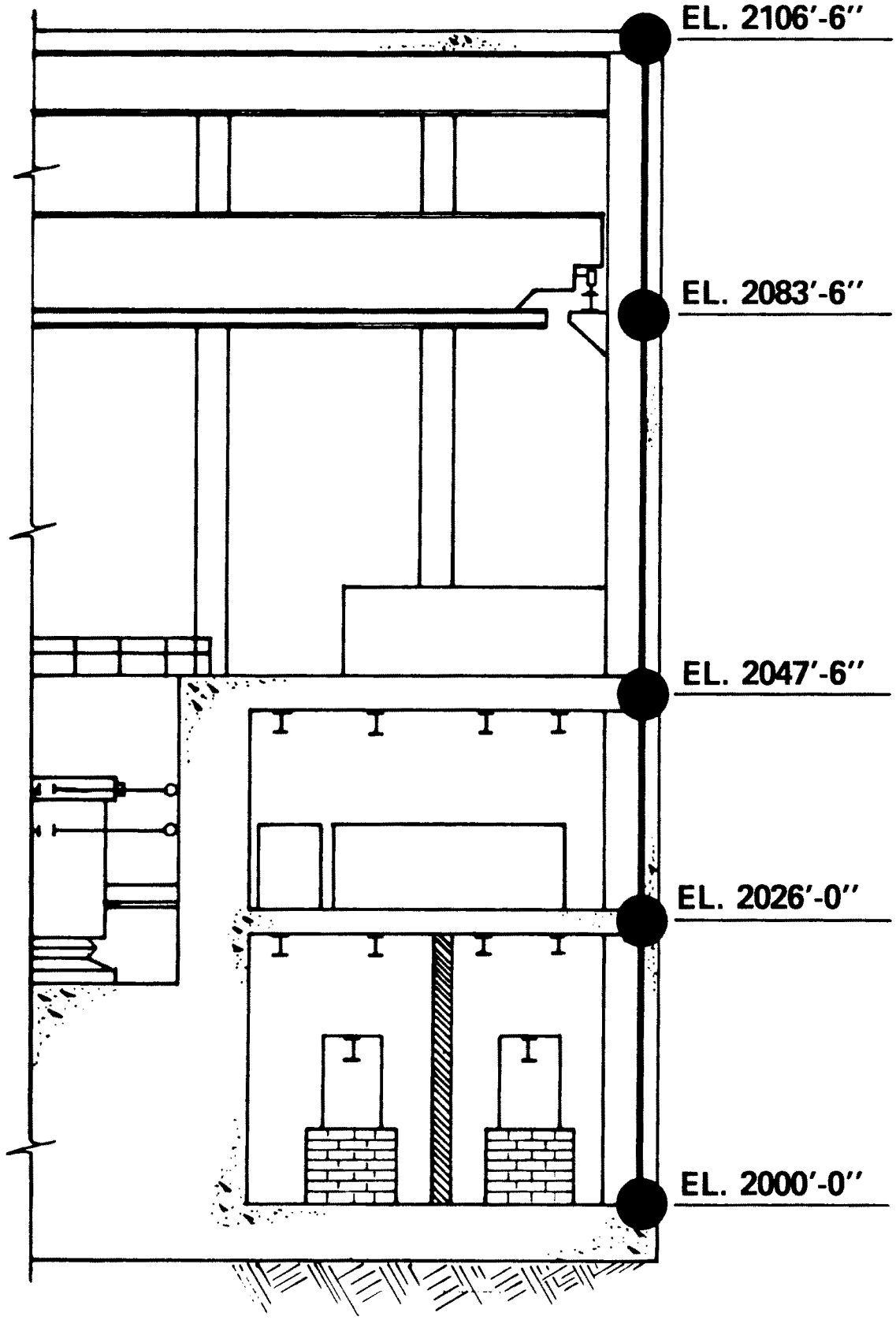

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FIGURE 3.7(B)-18

LUMPED–MASS/FLUSH MODEL
FUEL BUILDING

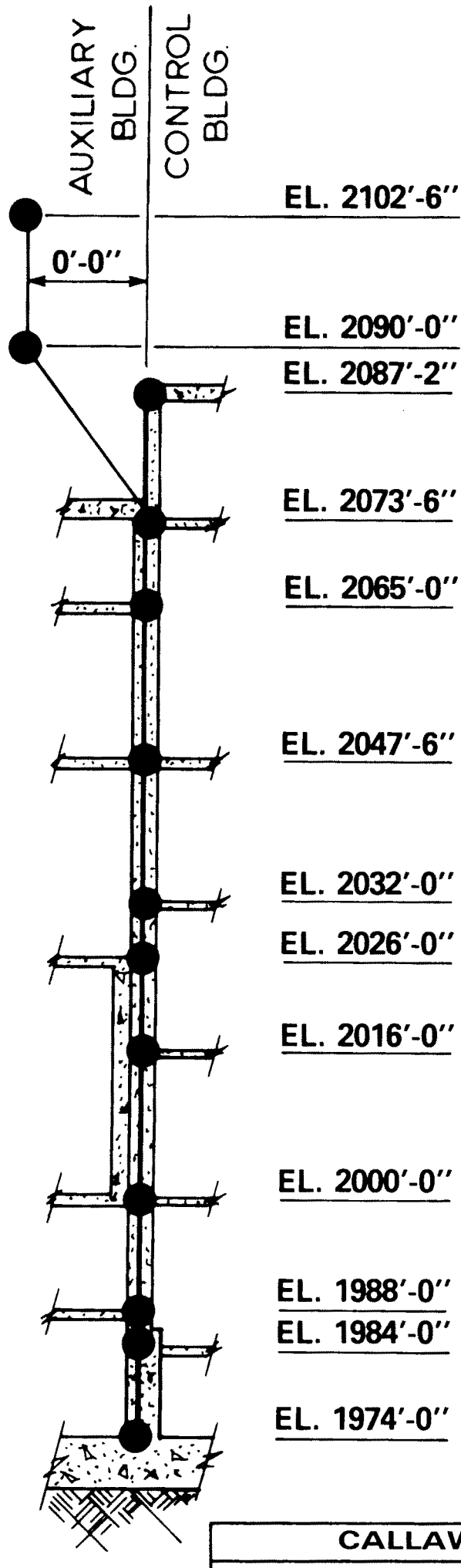

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FIGURE 3.7(B)-19

LUMPED-MASS/FLUSH
MODEL AUXILIARY/CONTROL
BUILDING

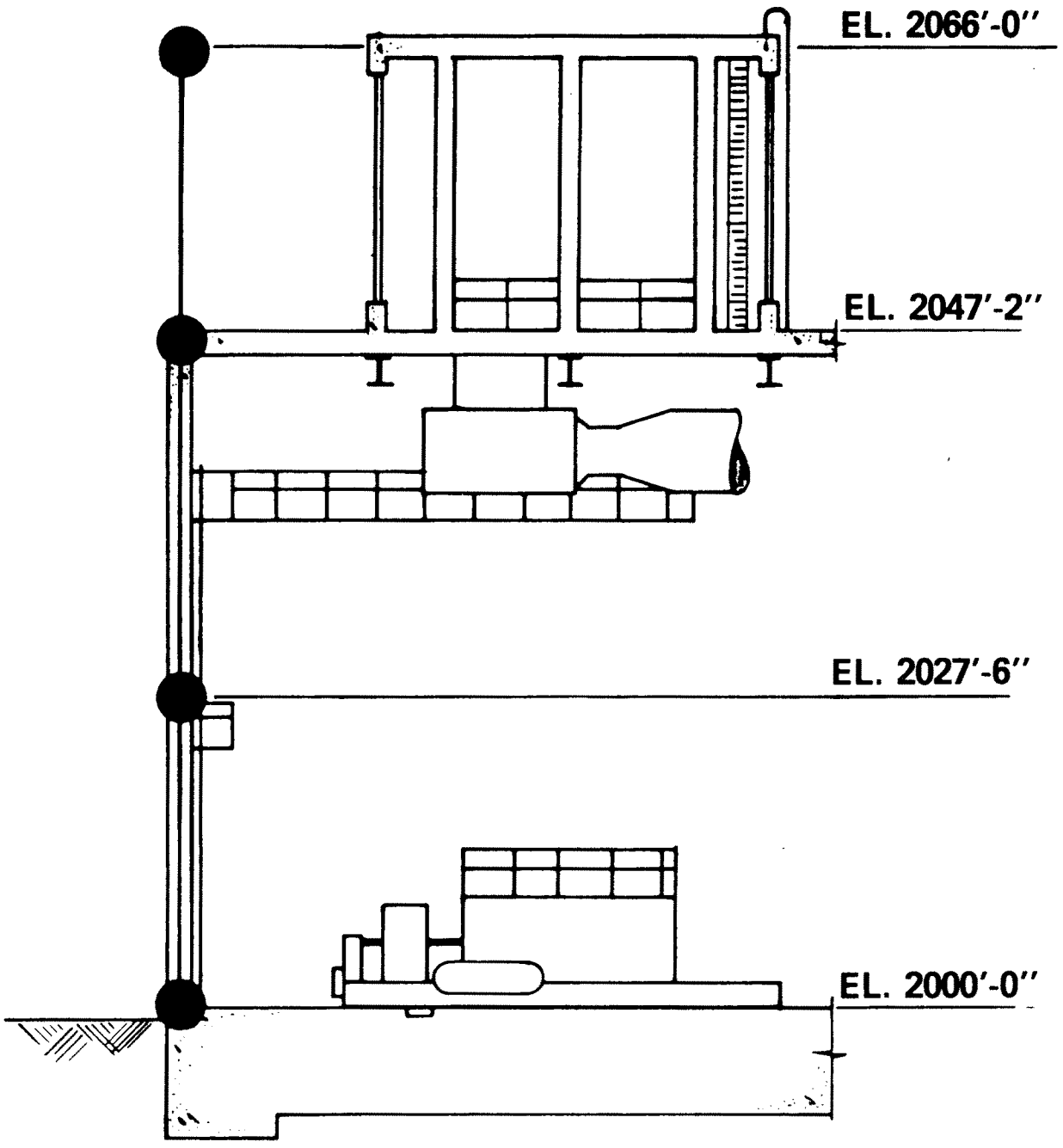

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FIGURE 3.7(B)-20

LUMPED-MASS/FLUSH
MODEL DIESEL GENERATOR
BUILDING

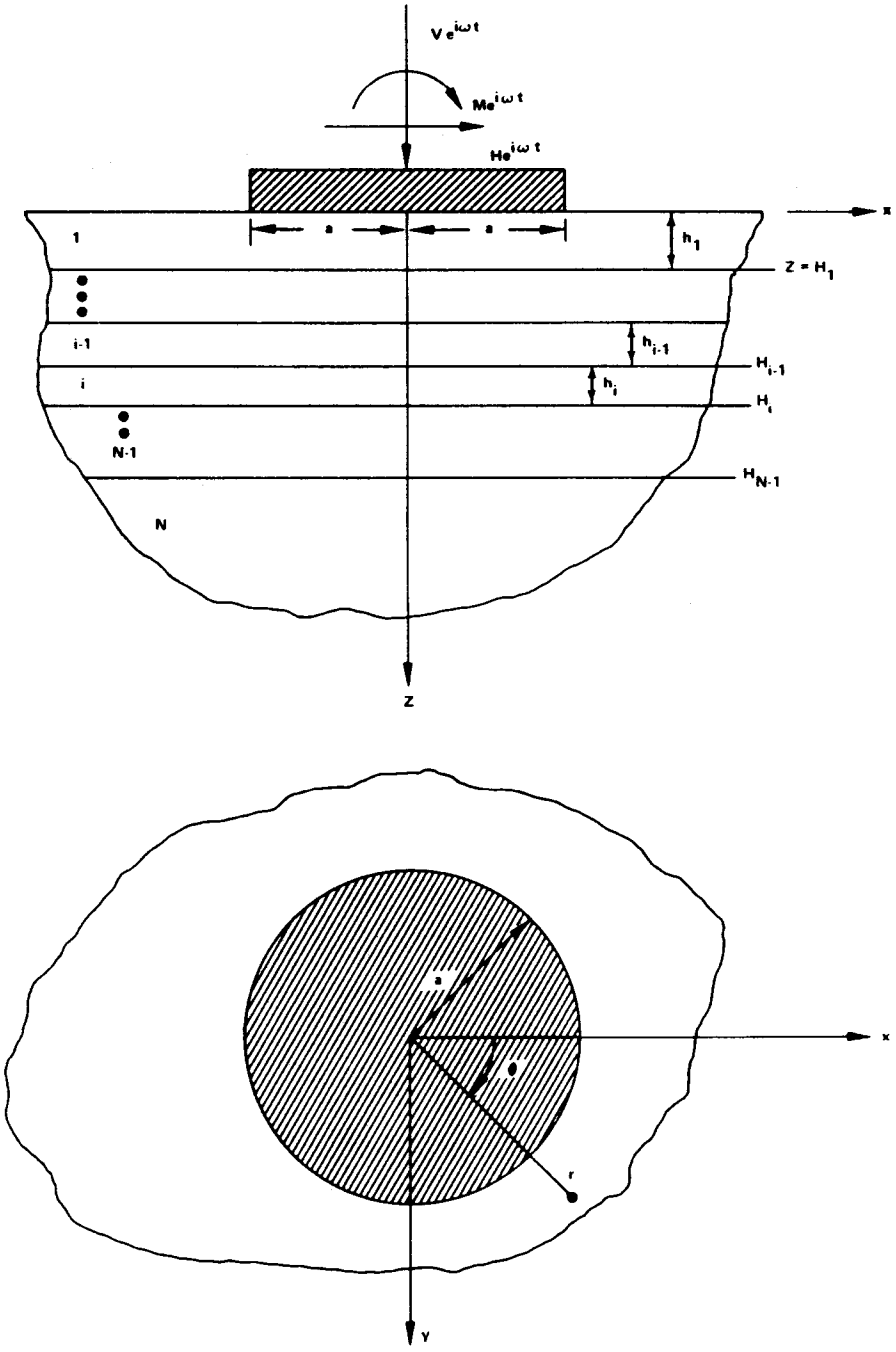

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FIGURE 3.7(B) A-1
DESCRIPTION OF THE MODEL
REV. OL-14 12/04

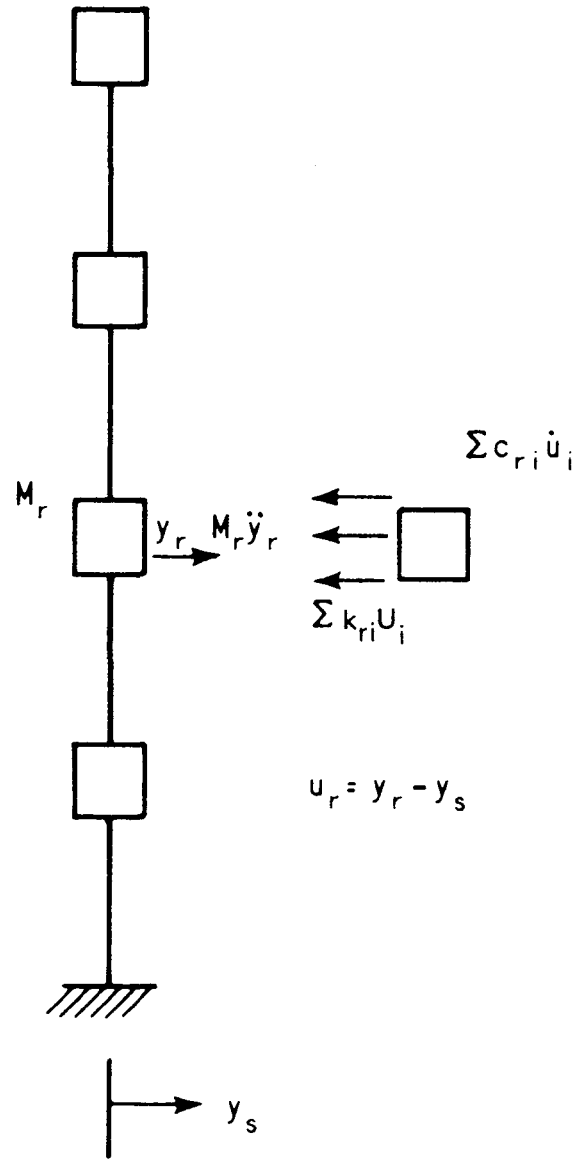

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FIGURE 3.7(N)-1

MULTI–DEGREE–OF–FREEDOM SYSTEM

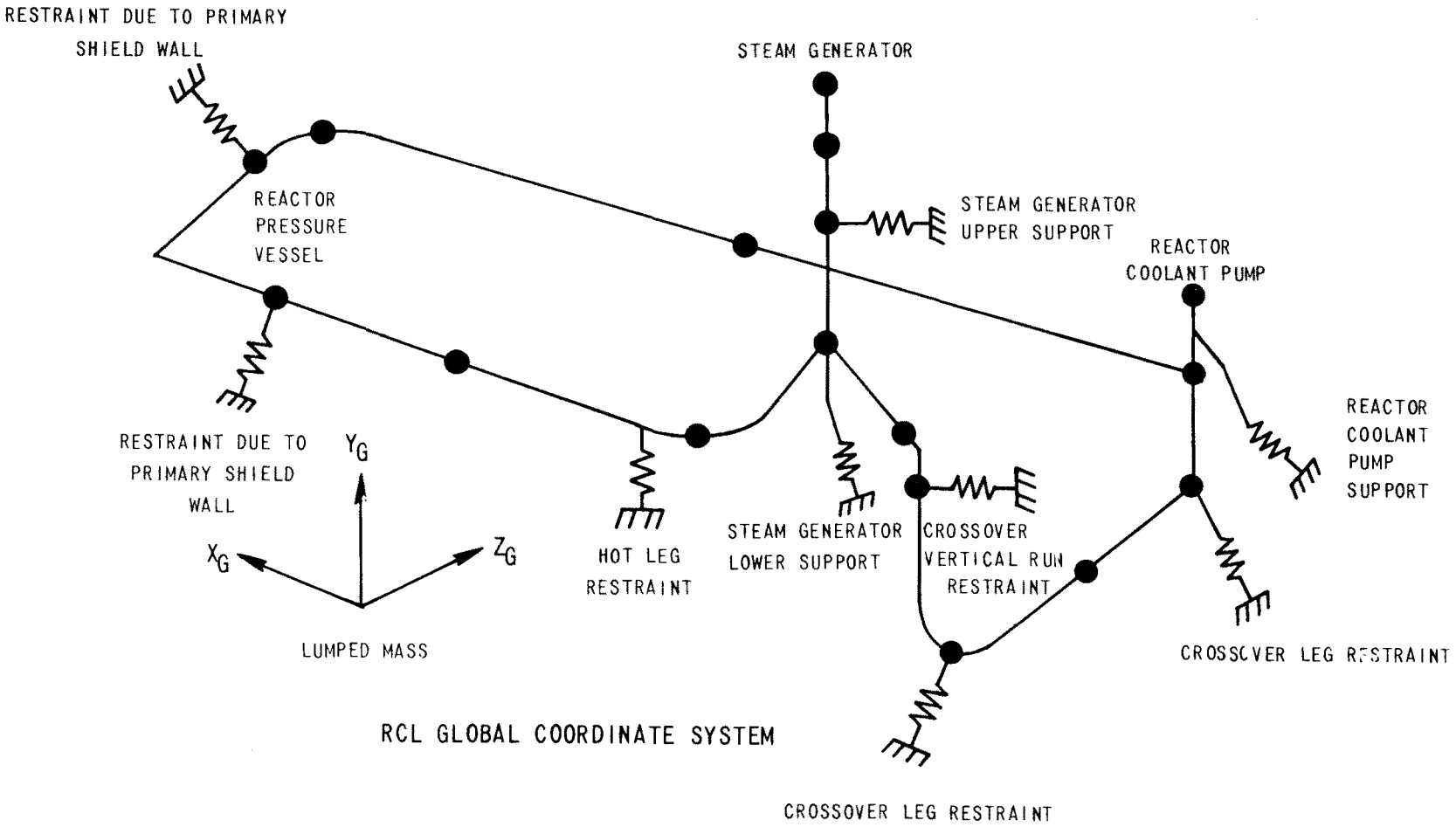

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FIGURE 3.9(N)-1

REACTOR COOLANT LOOP SUPPORTS SYSTEM, DYNAMIC STRUCTURAL MODEL

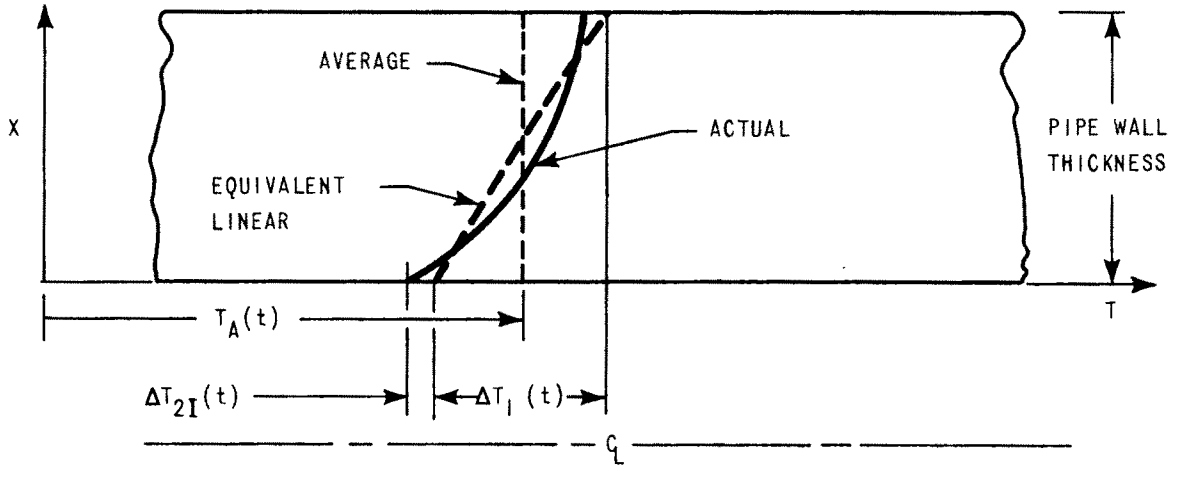

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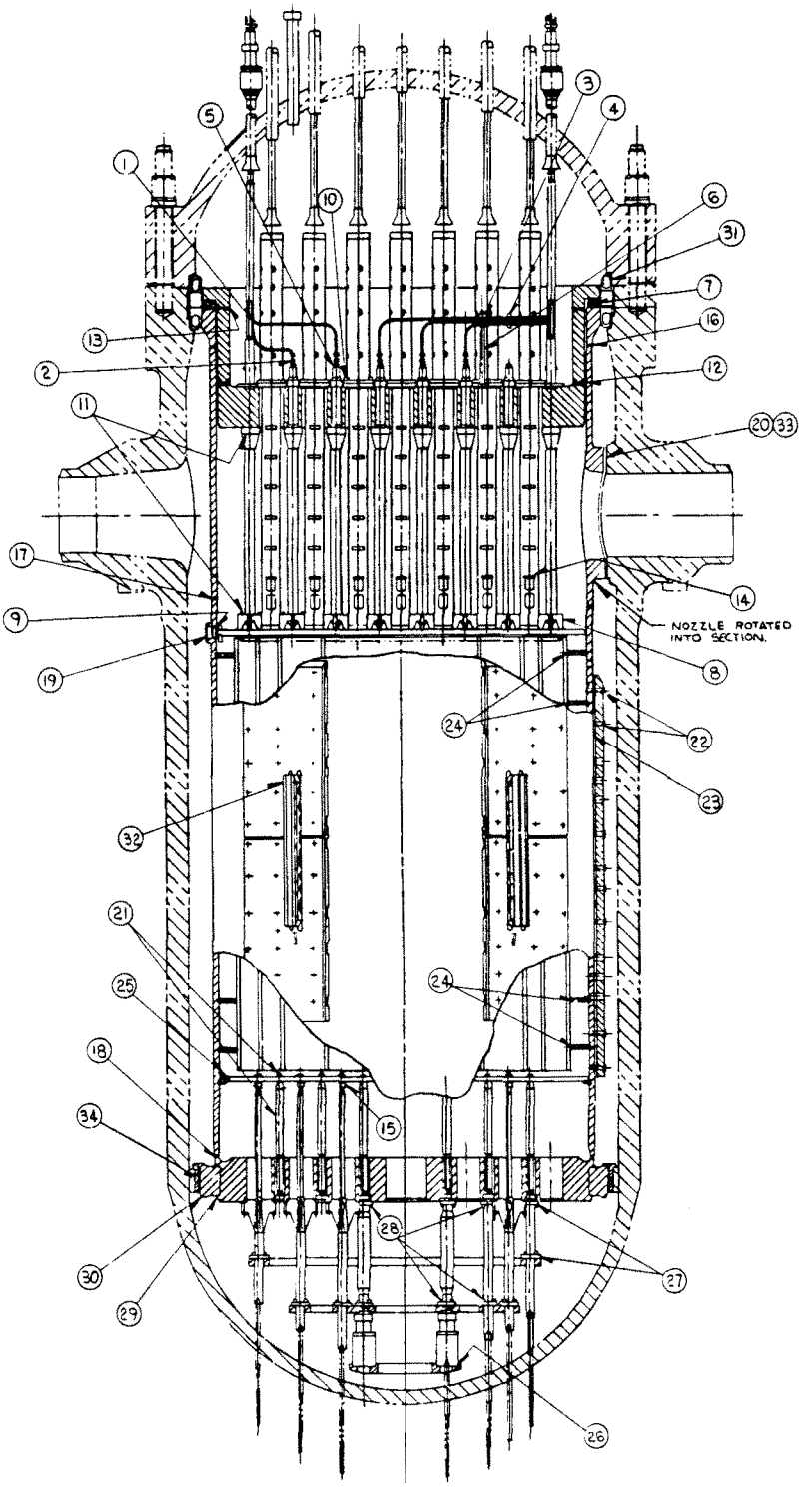
FIGURE 3.9(N)-2

THROUGH-WALL THERMAL GRADIENTS



SEE NOTES	STEP	FEATURES TO BE EXAMINED
1	1	THERMOCOUPLE CONDUIT CLAMPS INSIDE THE THERMOCOUPLE COLUMN
1,5	2	CONDUIT SWAGELOK FITTINGS - THEIR BANDINGS, AND THE TAB TYPE LOCKS
1	3	CLAMP ARRANGEMENTS AT THE MOUNTING BRACKET LOCATIONS
1	4	CONDUIT CLAMP WELDS
1	5	UPPER SUPPORT COLUMN NUT TO EXTENSION WELDS
1	6	ACCESSIBLE CONDUIT SUPPORT BRACKET WELDS
6	7	HOLD DOWN SPRING INTERFACE SURFACE CONDITION
1	8	ACCESSIBLE WELDS ON SUPPORT COLUMN LOWER NOZZLES
3,6	9	UPPER CORE PLATE INSERTS
2	10	THERMOCOUPLE COLUMN AND GUIDE TUBE SCREW LOCKING DEVICES
2	11	ACCESSIBLE SUPPORT COLUMN AND CORE PLATE INSERT SCREW LOCKING DEVICES
1	12	UPPER SUPPORT SKIRT TO PLATE GIRTH WELD
1	13	UPPER SUPPORT SKIRT TO FLANGE GIRTH WELD
1	14	ACCESSIBLE GUIDE TUBE WELDS
6	15	ACCESSIBLE (2) INSTRUMENTATION GUIDE COLUMN LOCKING COLLARS NEAREST THE MANWAY
1	16	UPPER BARREL TO FLANGE GIRTH WELD
1	17	UPPER BARREL TO LOWER BARREL GIRTH WELD
1	18	LOWER BARREL TO CORE SUPPORT GIRTH WELD
1,4	19	UPPER CORE PLATE ALIGNING PIN WELDS AND BEARING SURFACES
6	20	OUTLET NOZZLE INTERFACE SURFACE CONDITION
1,2 4,7	21	CORE SUPPORT COLUMNS AND THEIR SCREW LOCKING DEVICES
1,2	22	NEUTRON SHIELD PANEL SCREW LOCKING DEVICES
7	23	INTERFACE SURFACES AT THE SPACER PADS ALONG THE TOP AND BOTTOM ENDS OF THE NEUTRON PANELS
1	24	BAFFLE ASSEMBLY SCREW LOCKING ARRANGEMENTS AT THE TWO TOP AND THE TWO BOTTOM FORMER ELEVATIONS
7	25	LOWER CORE PLATE TO CORE BARREL SCREW LOCKING DEVICES ACCESSIBLE AT THE 0°, 90°, 180°, AND 270° AXES
1	26	SECONDARY CORE SUPPORT HOUSING TO BASE PLATE WELD
1,2 7	27	LOCKING DEVICES AND CONTACT OF THE BOTTOM INSTRUMENTATION GUIDE COLUMNS WHERE ATTACHED TO THE CORE SUPPORT AND TIE PLATES
1,2	28	LOCKING DEVICES OF THE SECONDARY CORE SUPPORT COLUMNS WHERE ATTACHED TO THE CORE SUPPORT AND TIE PLATE
1	29	RADIAL SUPPORT KEY WELDS
1,4	30	RADIAL SUPPORT KEY LOCKING ARRANGEMENTS AND BEARING SURFACES
1,4	31	HEAD AND VESSEL ALIGNING PINS SCREW LOCKING DEVICES AND BEARING SURFACES
1,2	32	IRRADIATION SPECIMEN GUIDE SCREW LOCKING DEVICES AND DOWEL PINS
6	33	VESSEL NOZZLE INTERFACE SURFACE CONDITION
1,3 4	34	VESSEL CLEVIS LOCKING ARRANGEMENTS AND BEARING SURFACES

NOTES:

1. VISUALLY EXAMINE WELDS USING 5-10X MAGNIFICATION. NO CRACKS ALLOWED
2. VERIFY THAT LOCKING DEVICES ARE CRIMPED AND UNDAMAGED
3. VERIFY THAT INSERTS ARE SEATED (.0015 (0.038) FEELER MUST NOT PASS THRU INTERFACE)
4. VISUALLY EXAMINE FACES FOR DAMAGE USING 5-10X MAGNIFICATION
5. VERIFY THAT FITTINGS ARE TIGHT
6. VISUALLY EXAMINE INTERFACE SURFACES FOR ANY EVIDENCE OF DAMAGE
7. VERIFY SEATING USING A .0015 (0.038) FEELER GAGE. FEELER MUST NOT PASS THRU 90°
8. VERIFY THAT LOCKING COLLARS ARE TIGHT. NO MOVEMENT ALLOWED

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VIBRATION CHECKOUT FUNCTIONAL TEST INSPECTION POINTS

FIGURE 3.9(N)-3

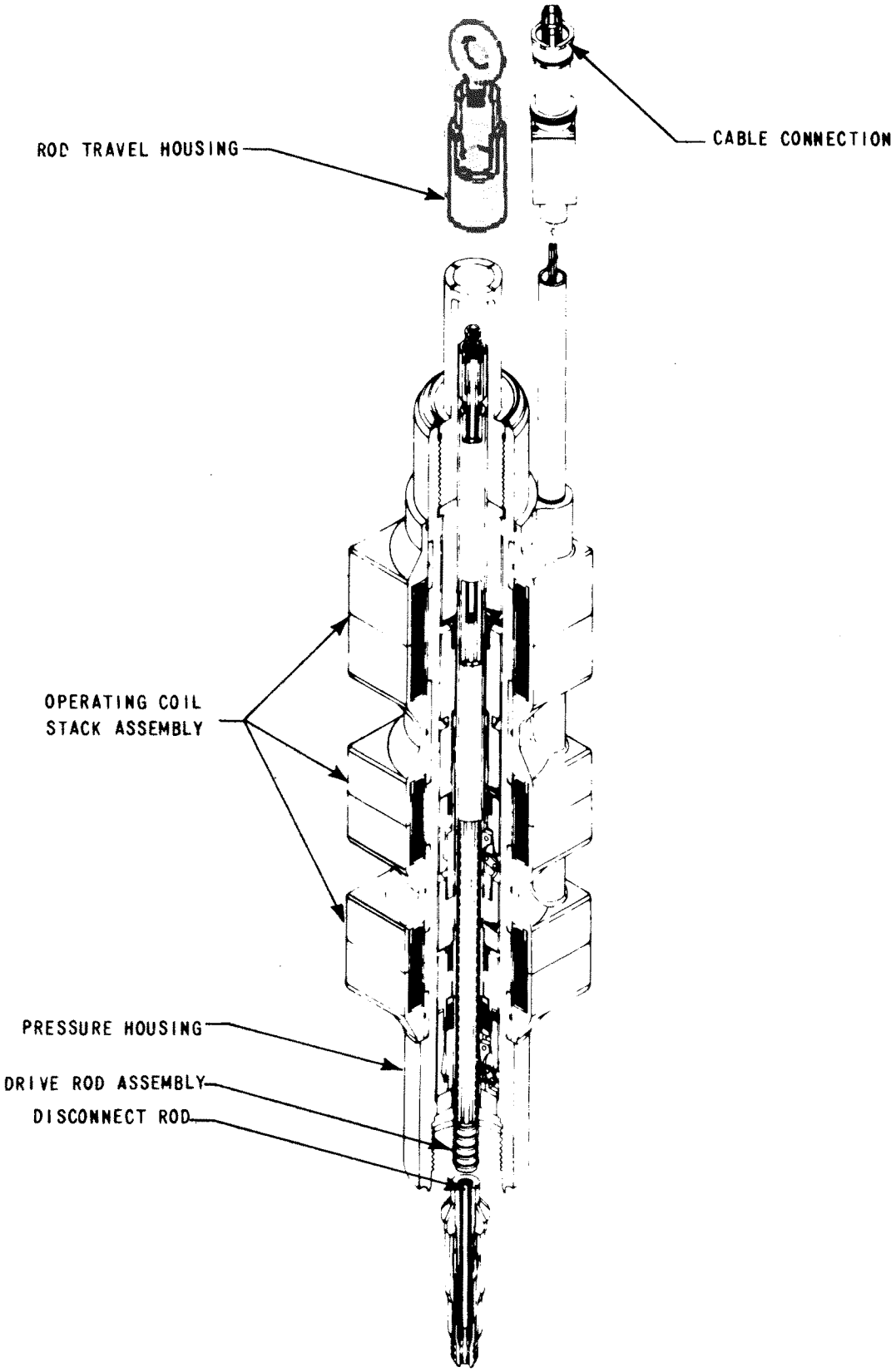

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FIGURE 3.9(N)-4

FULL LENGTH CONTROL ROD DRIVE MECHANISM

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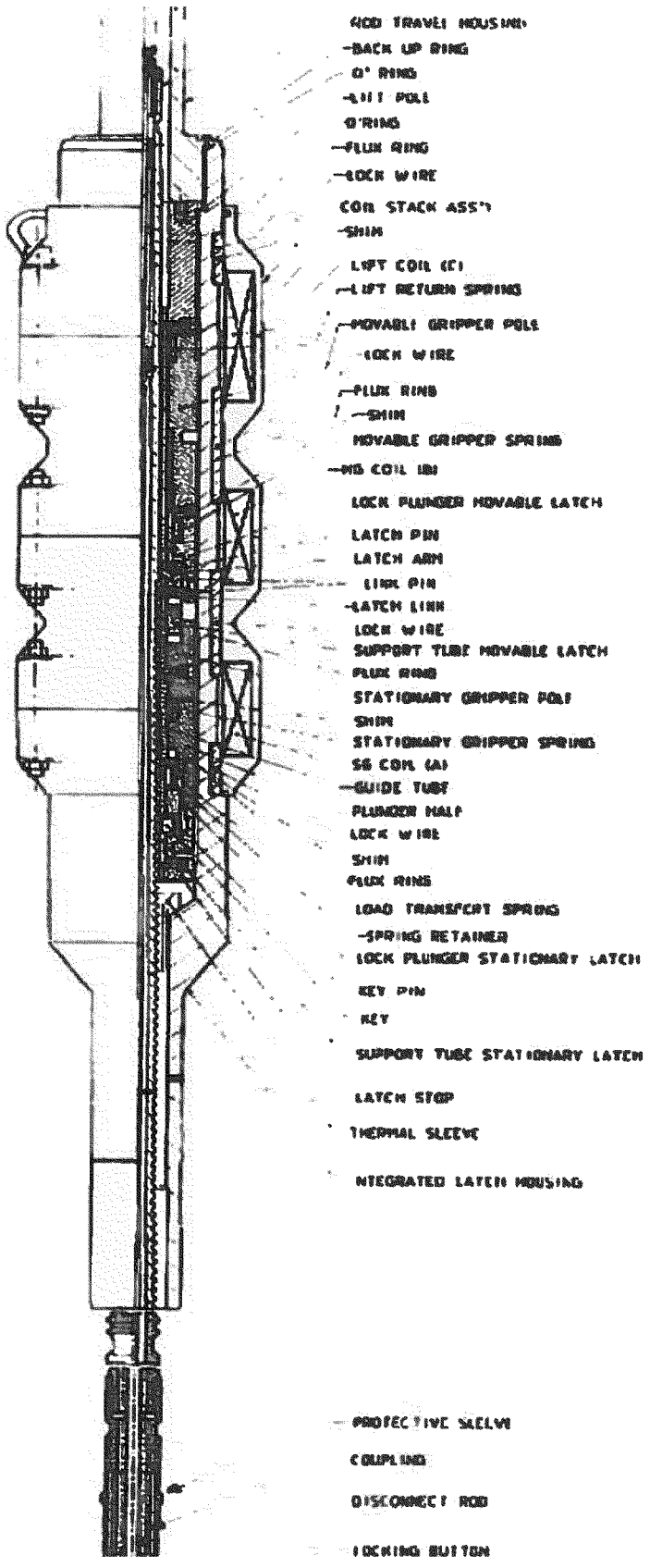

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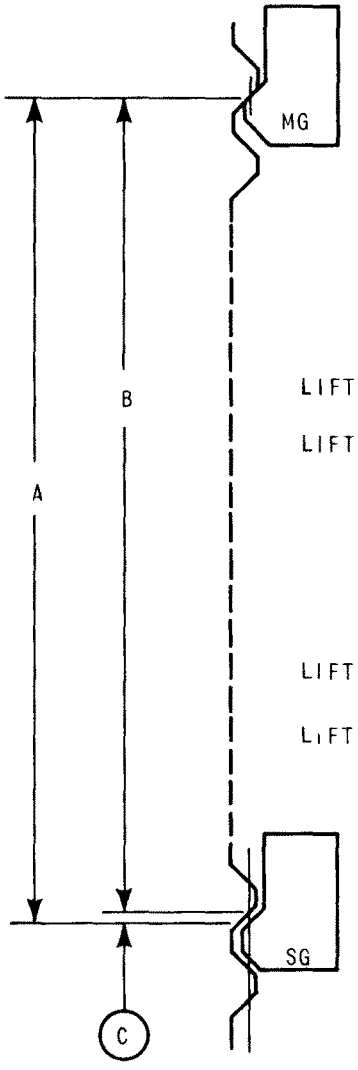
FIGURE 3.9(N)-5

FULL-LENGTH CONTROL ROD
DRIVE MECHANISM SCHEMATIC

REV. 1 5/15

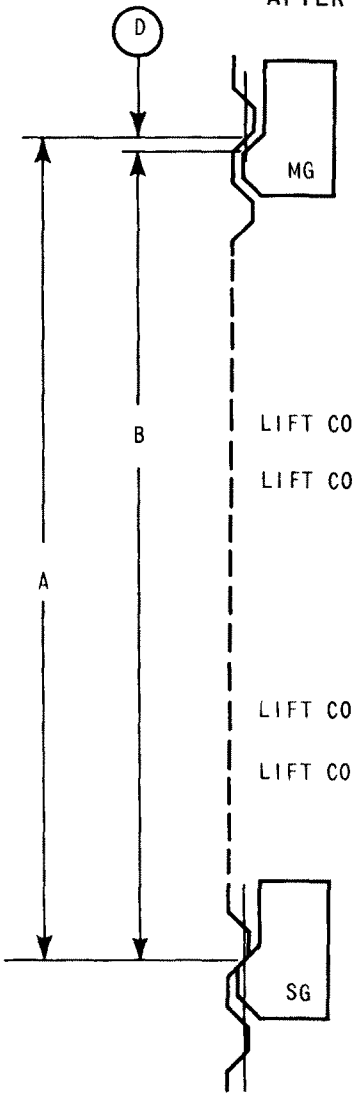
BEFORE LOAD TRANSFER



	AT 70°		
	A	B	C
LIFT COIL OFF	15.640	15.625	0.015
LIFT COIL ON	16.265	16.250	0.015

	AT 650°		
	A	B	C
LIFT COIL OFF	15.725	15.679	0.046
LIFT COIL ON	16.375	16.387	0.068

AFTER LOAD TRANSFER



	AT 70°		
	A	B	D
LIFT COIL OFF	15.625	15.578	0.047
LIFT COIL ON	16.258	16.203	0.047

	AT 650°		
	A	B	D
LIFT COIL OFF	15.679	15.641	0.038
LIFT COIL ON	16.387	16.291	0.016

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FIGURE 3.9(N)-6

NOMINAL LATCH CLEARANCE AT MINIMUM AND MAXIMUM TEMPERATURE

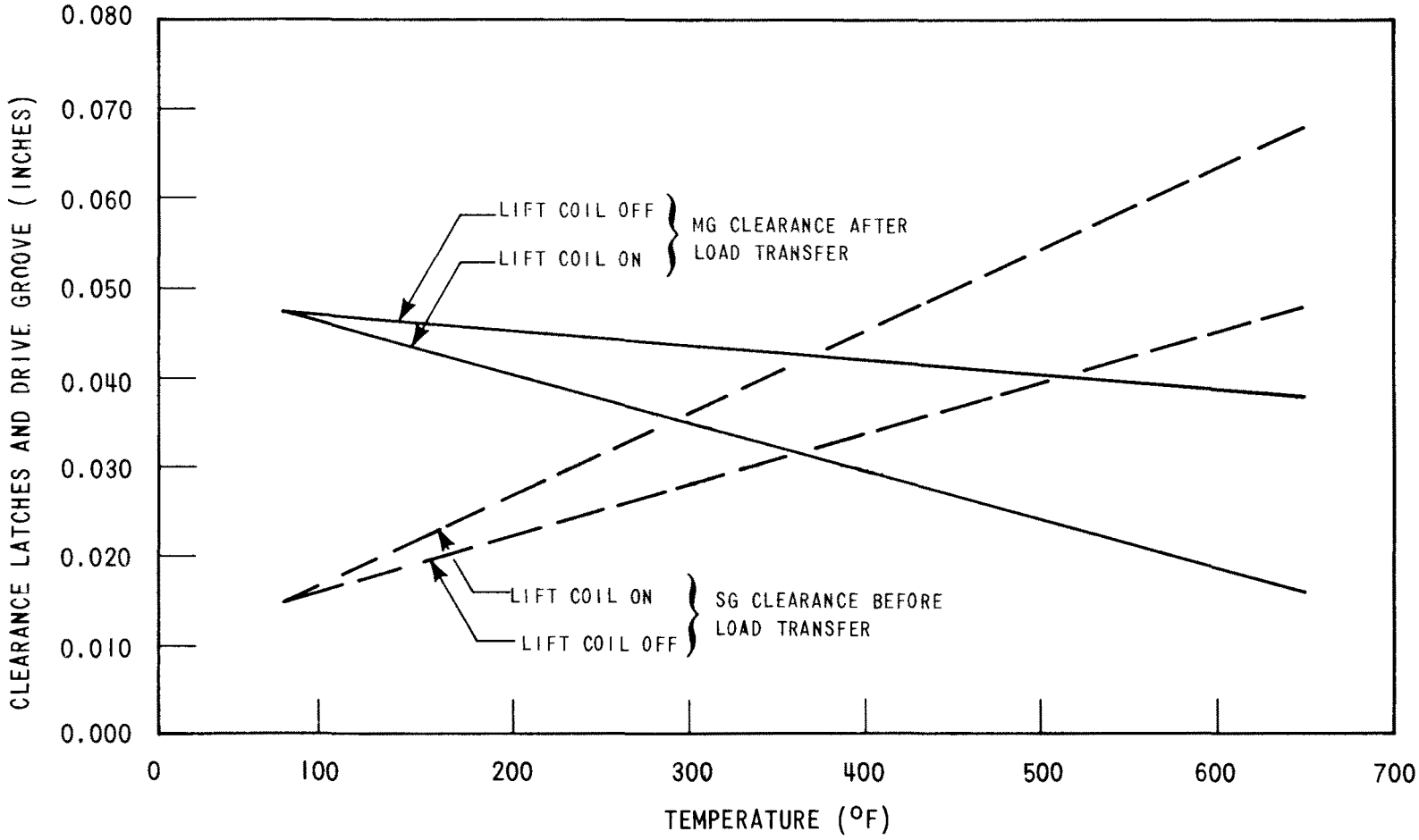

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FIGURE 3.9(N)-7

CONTROL ROD DRIVE MECHANISM LATCH CLEARANCE THERMAL EFFECT

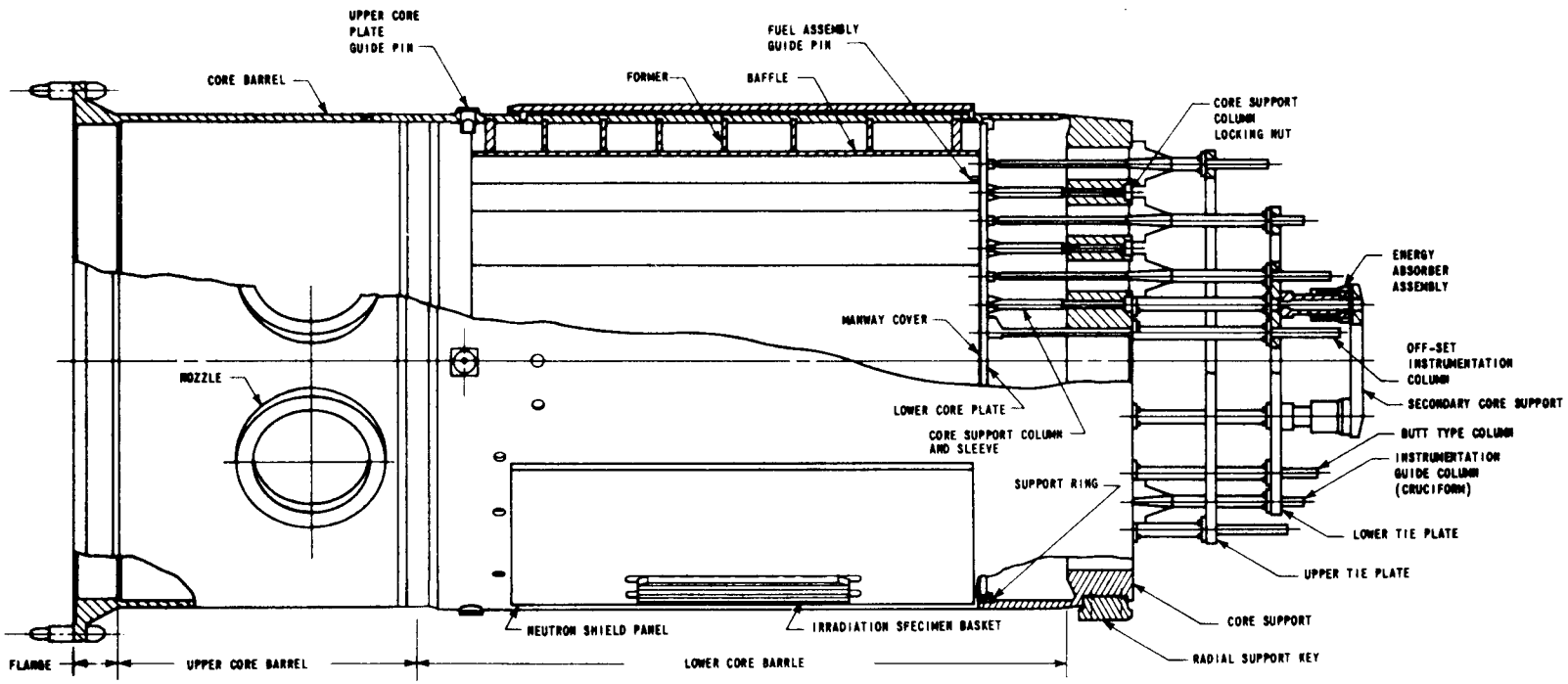

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FIGURE 3.9(N)-8

LOWER CORE SUPPORT ASSEMBLY
(CORE BARREL ASSEMBLY)

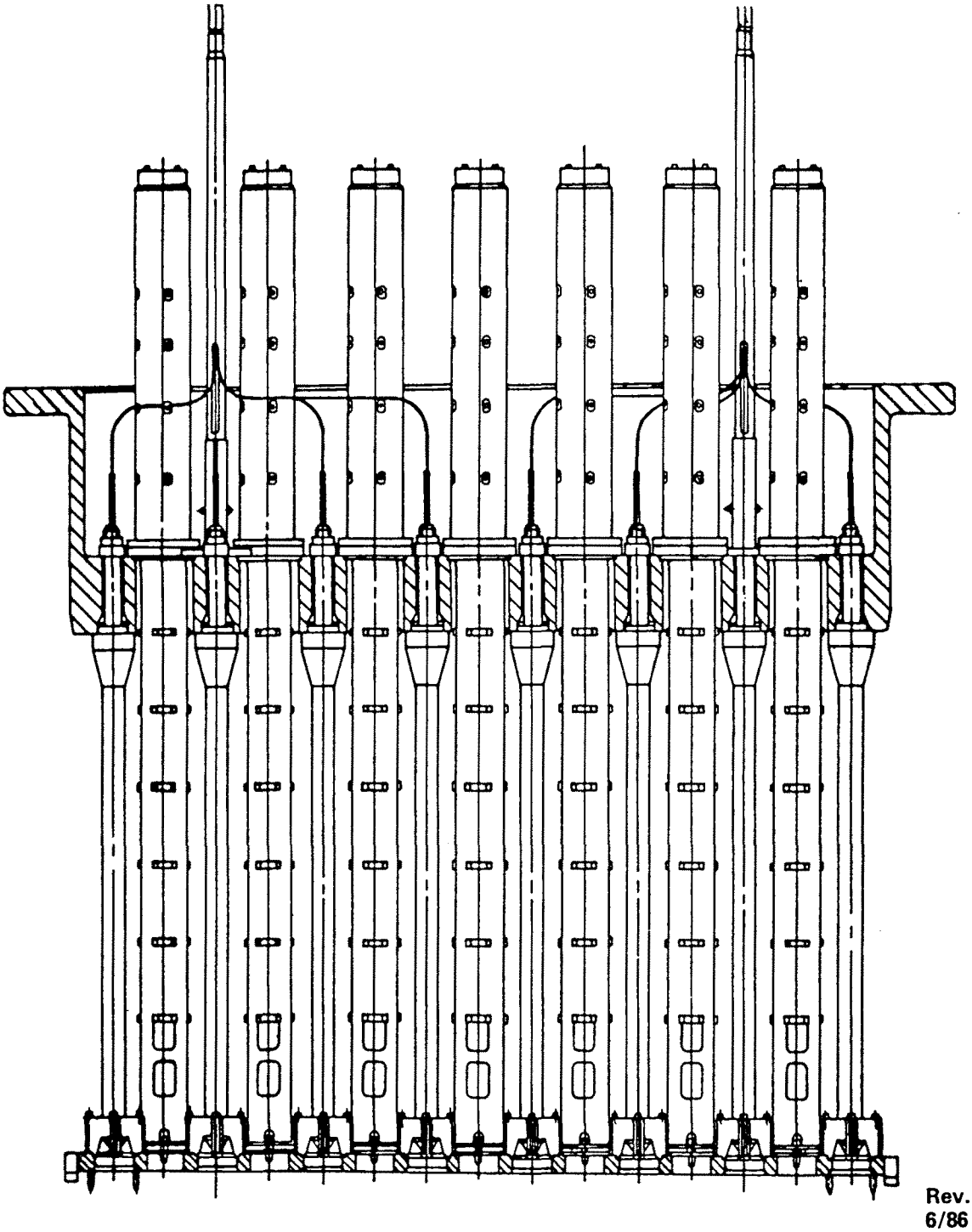

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FIGURE 3.9(N)-9

UPPER CORE SUPPORT STRUCTURE

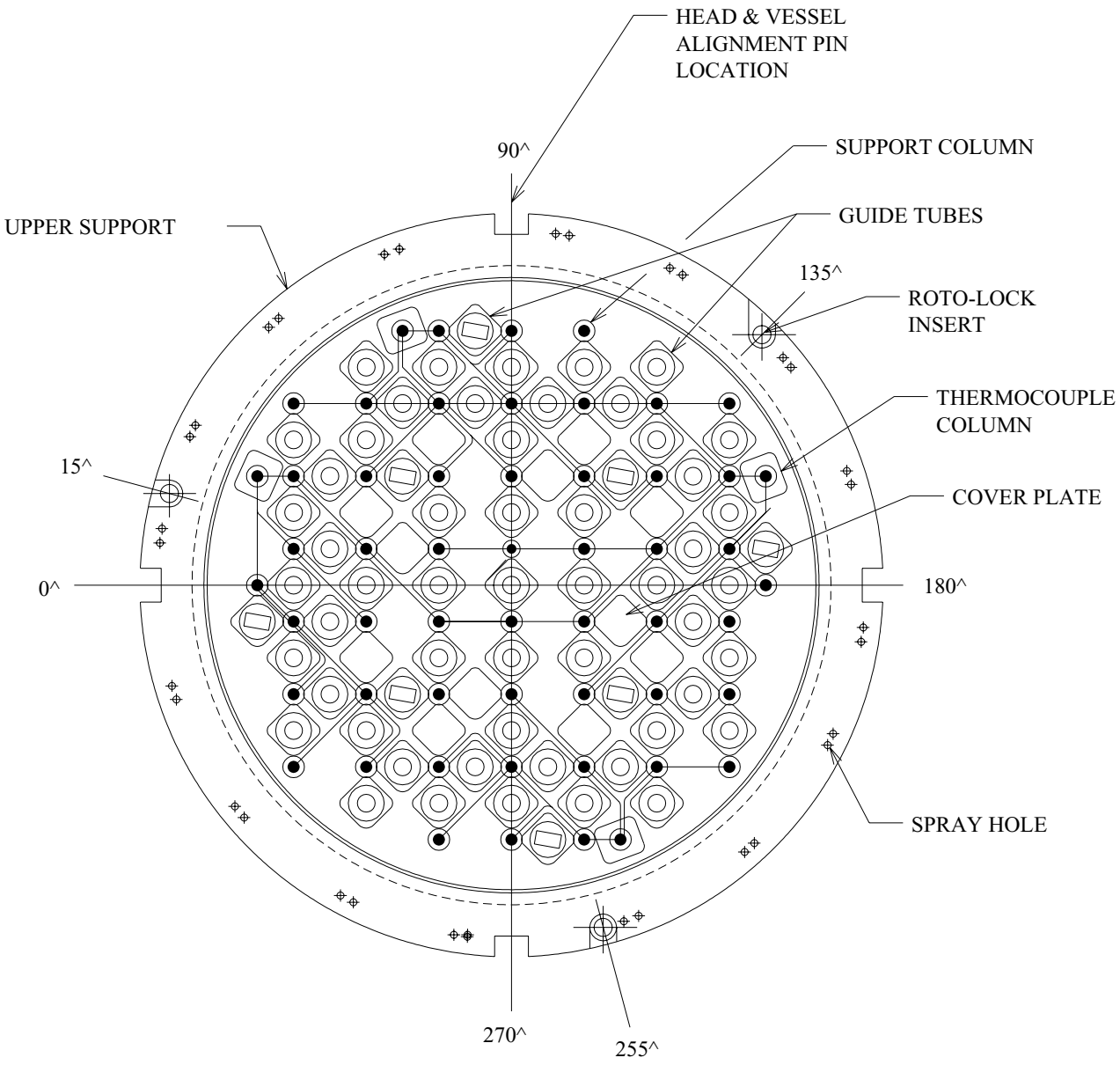

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FIGURE 3.9(N)-10

PLAN VIEW OF UPPER CORE
SUPPORT STRUCTURE

REV OL-11 05/00

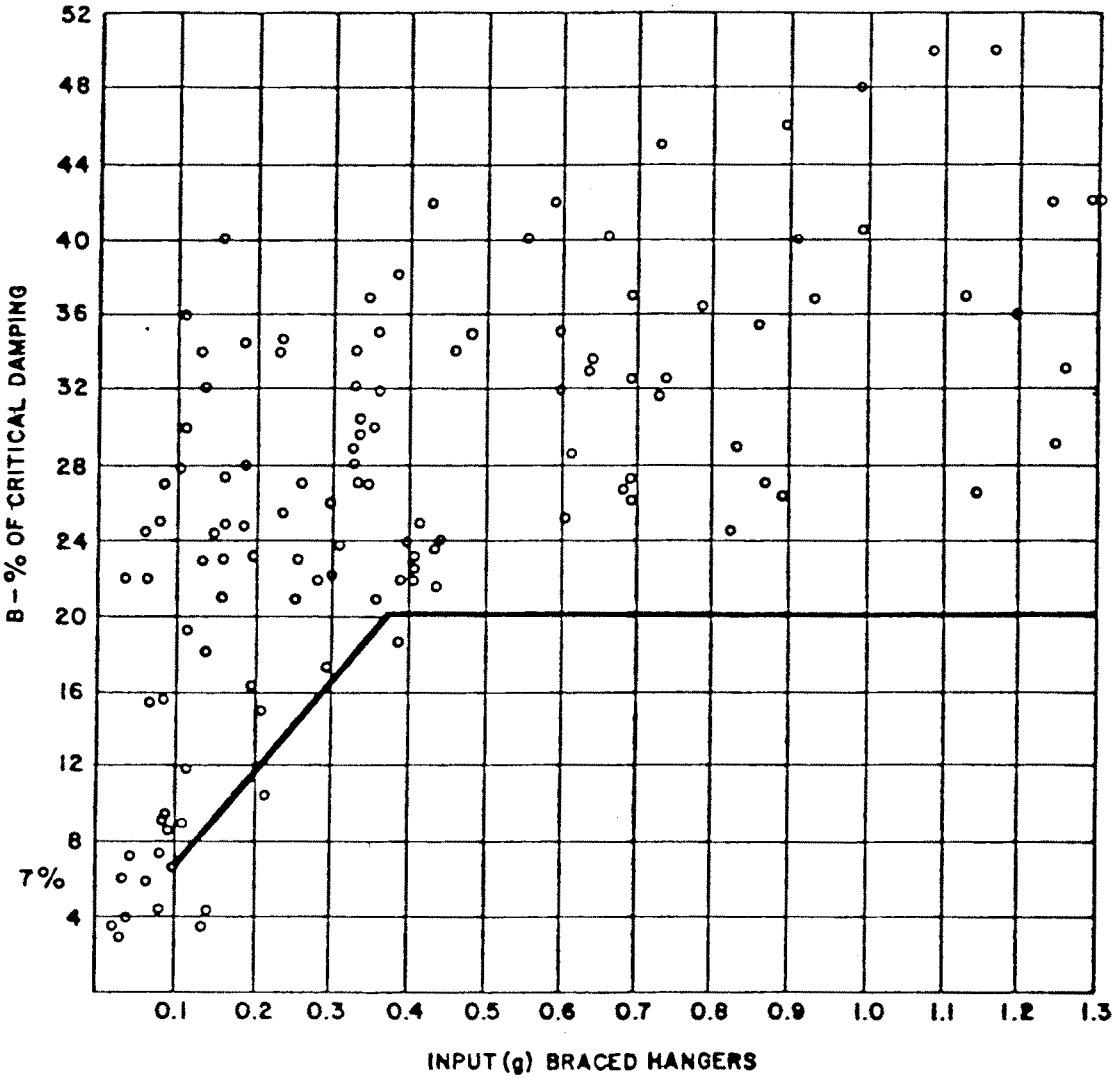

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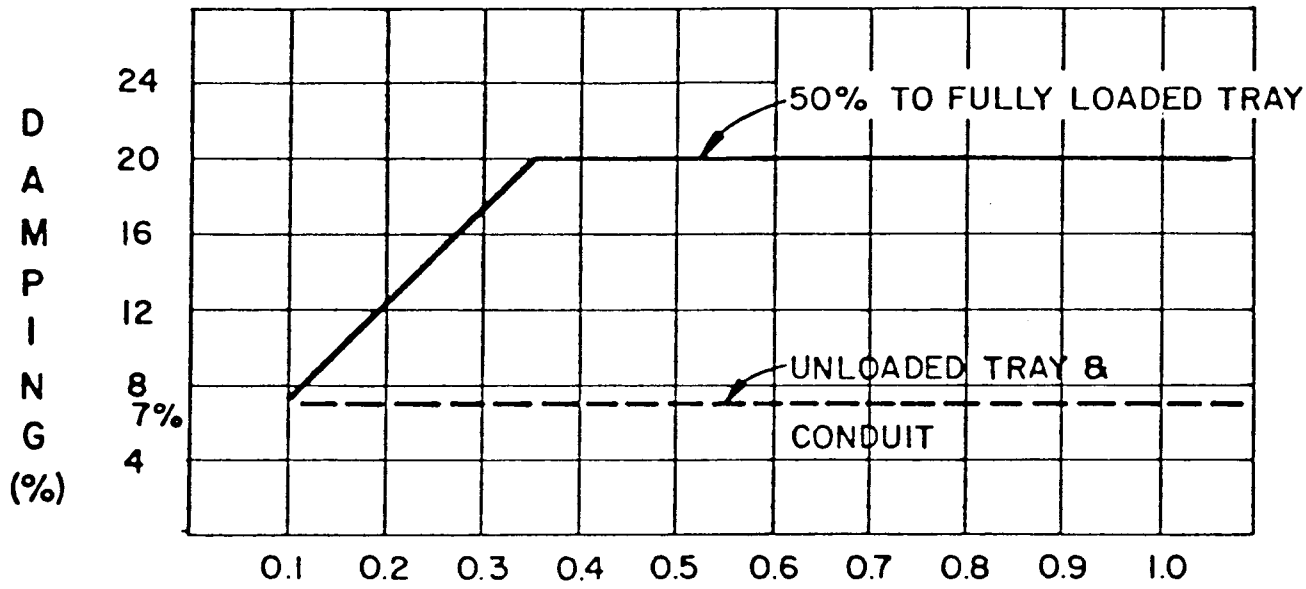
FIGURE 3.10(B)-1

DAMPING VS. INPUT LEVEL FOR
BRACED HANGER SYSTEMS



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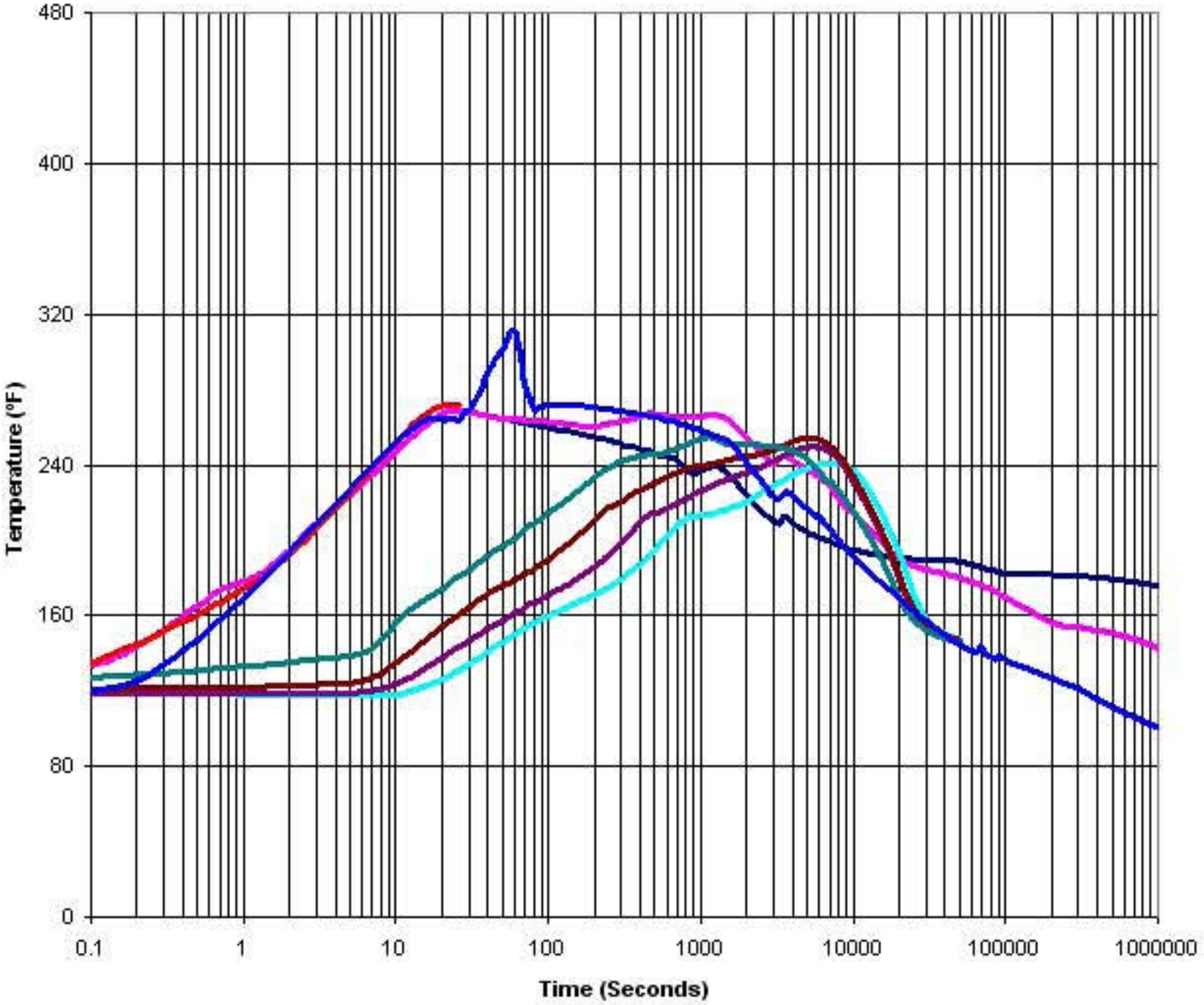
CALLAWAY PLANT
FIGURE 3.10(B)-2 LOWER BOUND DAMPING AS A FUNCTION OF INPUT ZPA



REV. 16
10/07

CALLAWAY PLANT

FIGURE 3.11(B)-1

CONTAINMENT TEMPERATURE (LOCA)

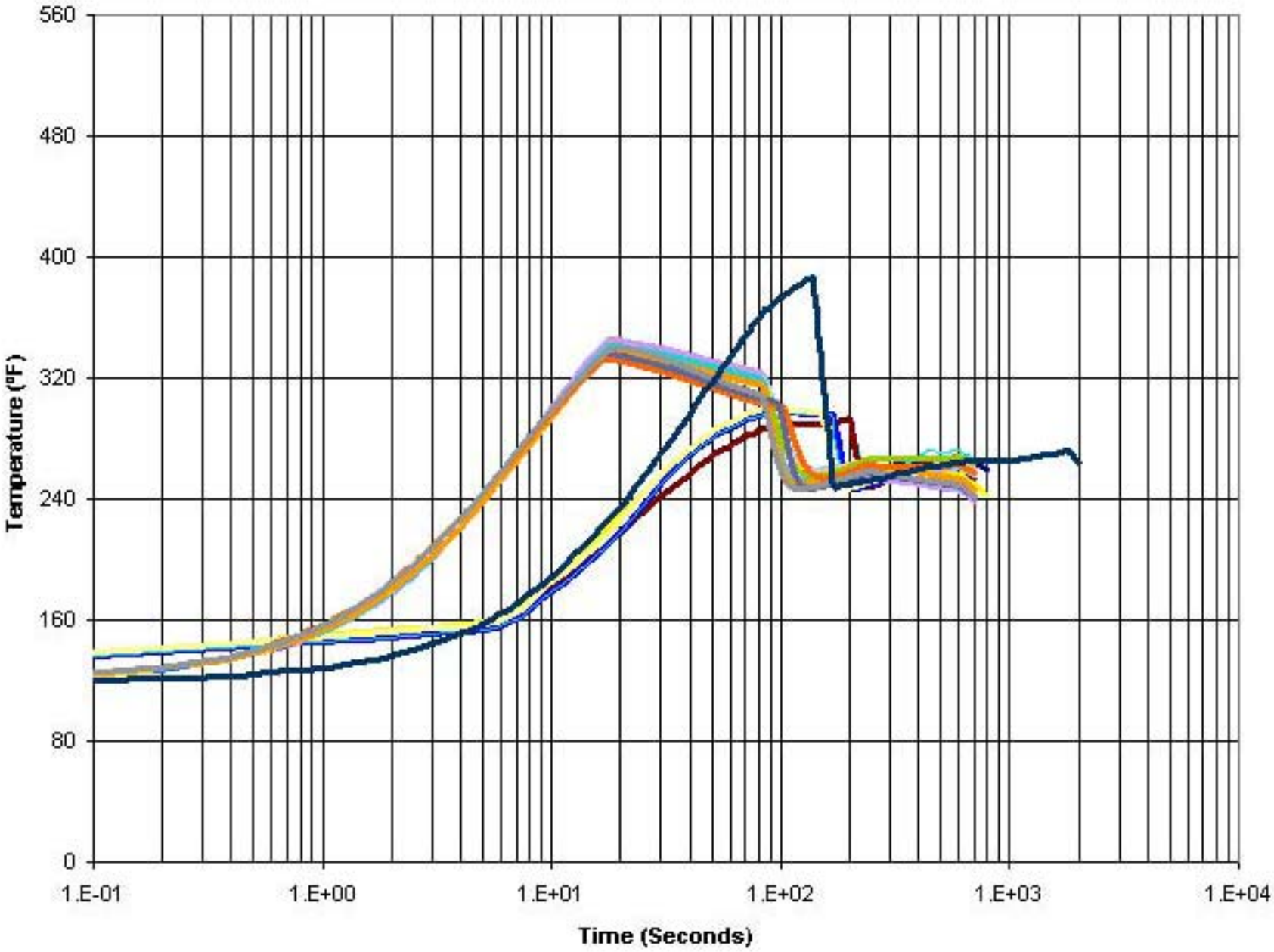


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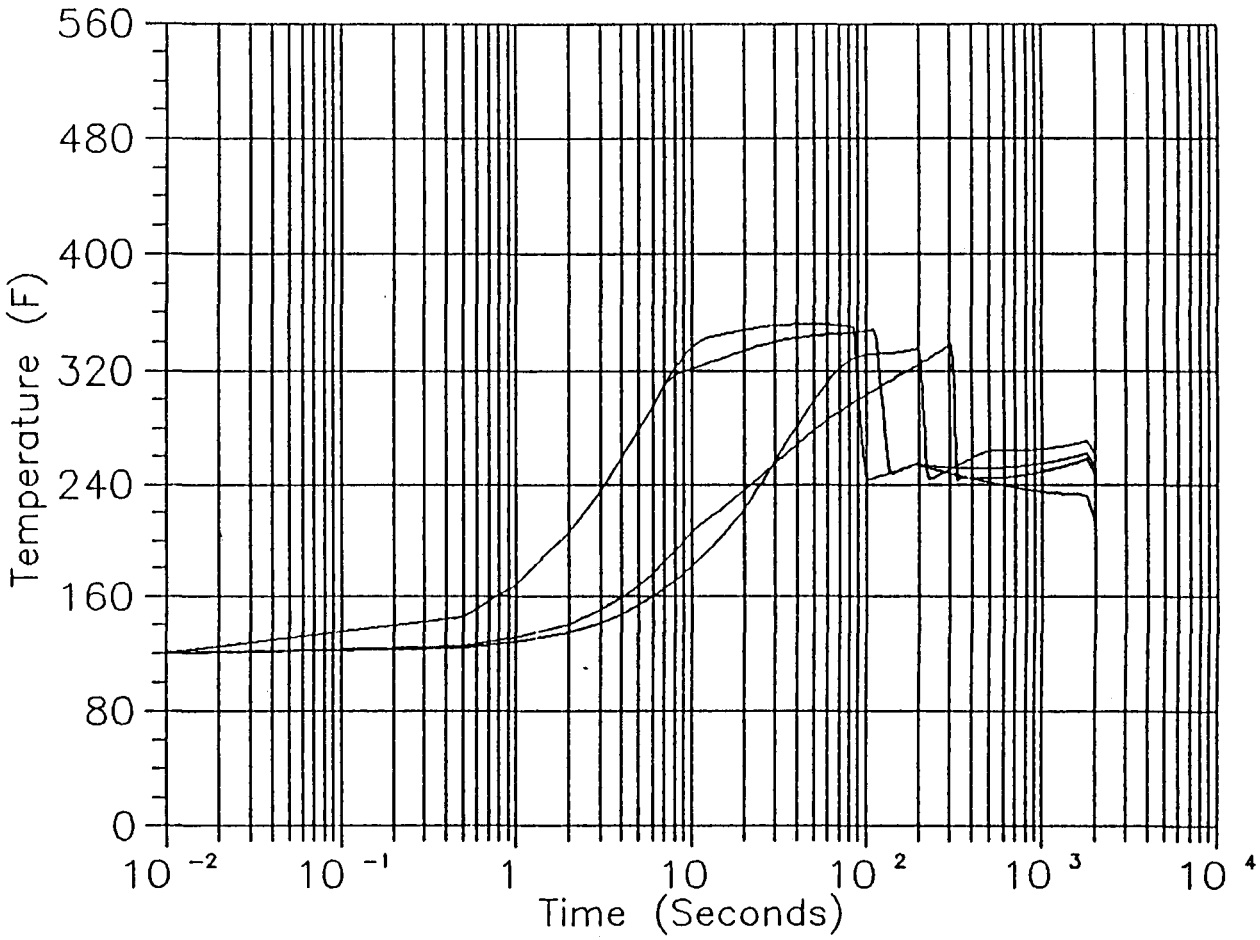
FIGURE 3.11(B)-2

CONTAINMENT TEMPERATURE (MSLB)

REV. 17 10/08



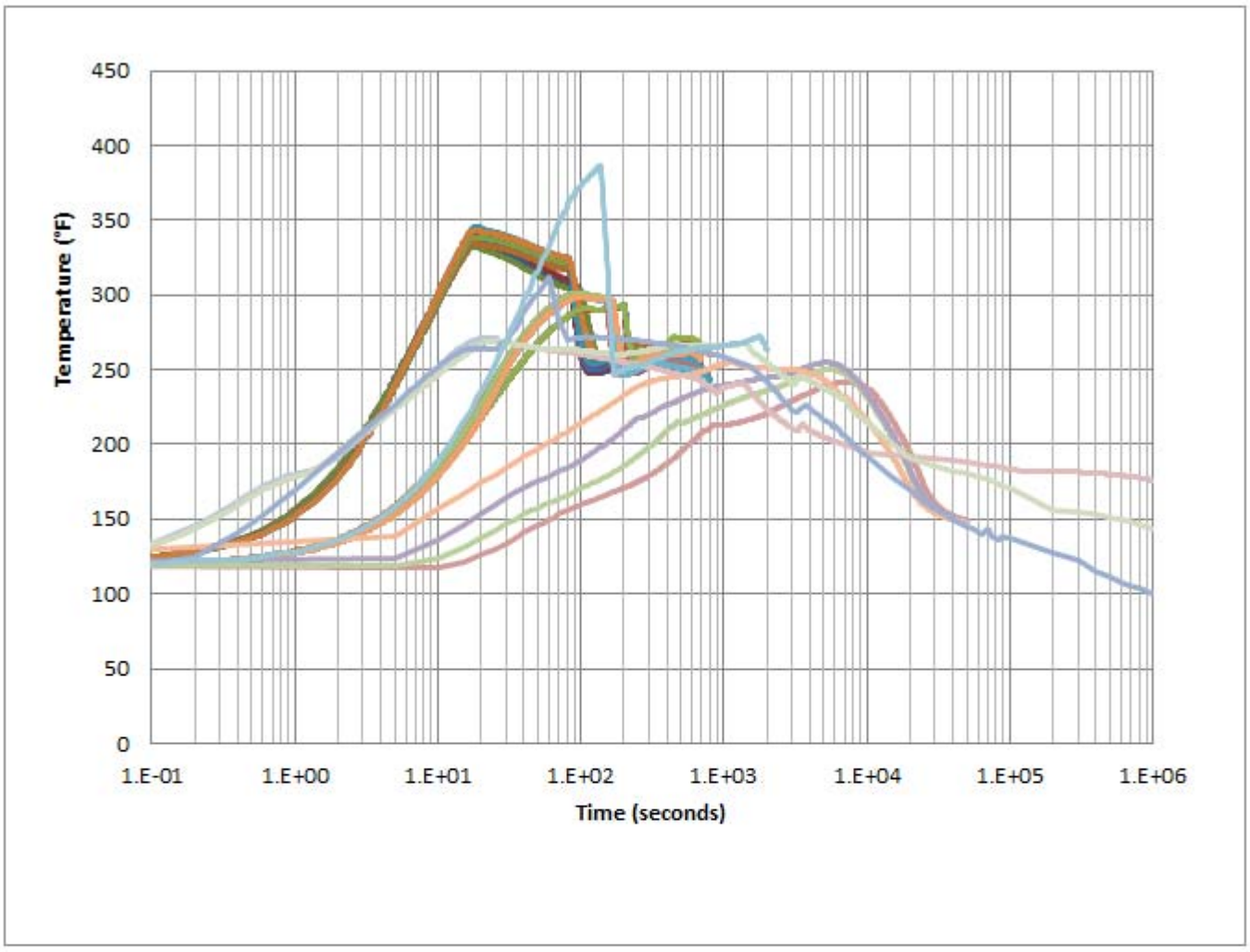
REV OL-12
11/01

NOTE: Containment pressure and temperature response for limiting cases was re-analyzed in June, 2000 to assess a reduction in containment cooler performance. However, the curves were bounded by the curves above or only slightly exceeded the curves well after the peaks. Existing figures in Section 3.11(B) have not been revised since they remain bounding except for portions of the response curves which are exceeded slightly and would result in negligible curve changes relative to scale values utilized.

CALLAWAY PLANT

FIGURE 3.11(B)-2A

CONTAINMENT TEMPERATURE (MSLB) UPRATED CONDITIONS

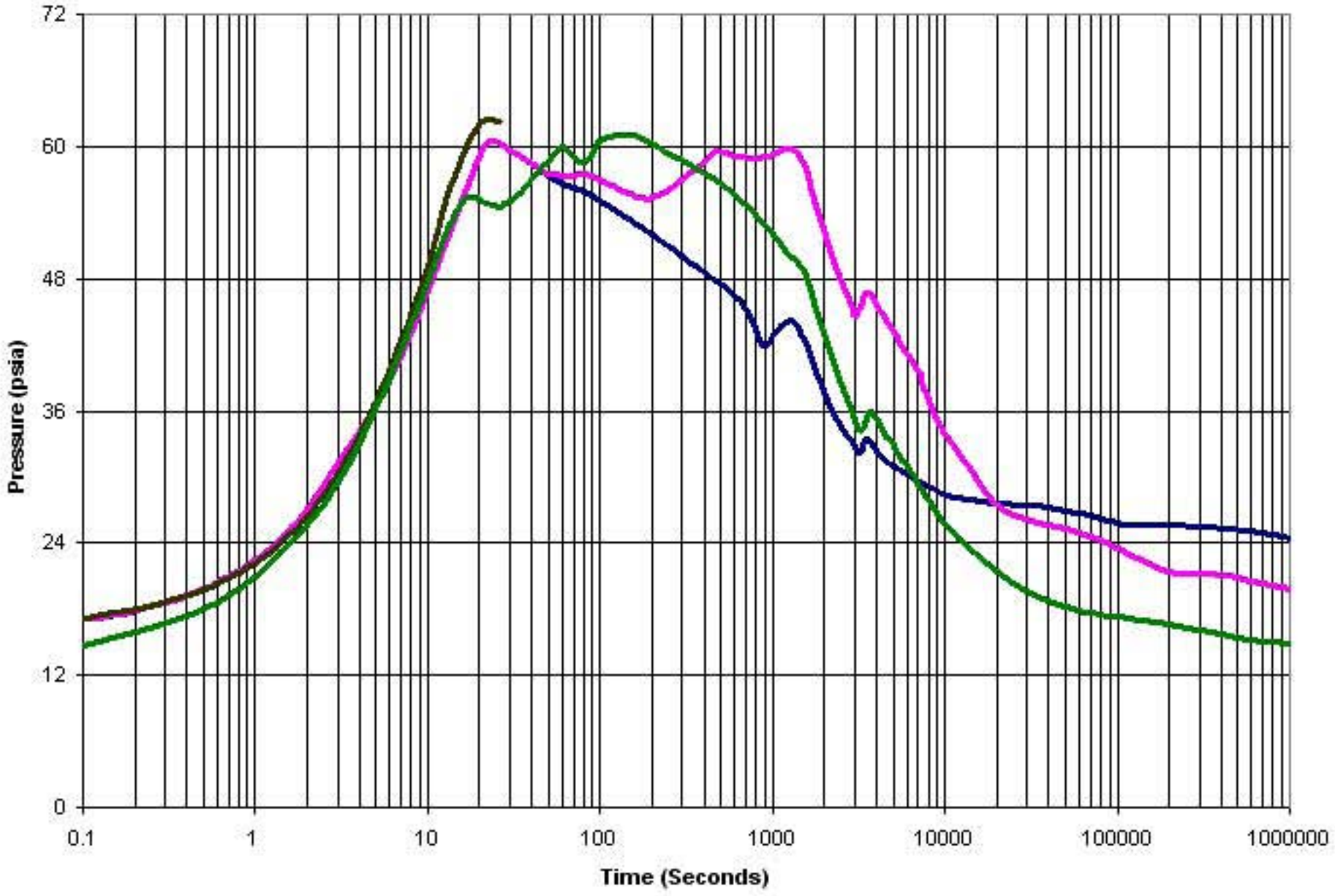


CALLAWAY PLANT

FIGURE 3.11(B)-3

CONTAINMENT TEMPERTURE (MSLB AND LOCA)

REV. 18 10/13



REV. 18
10/07

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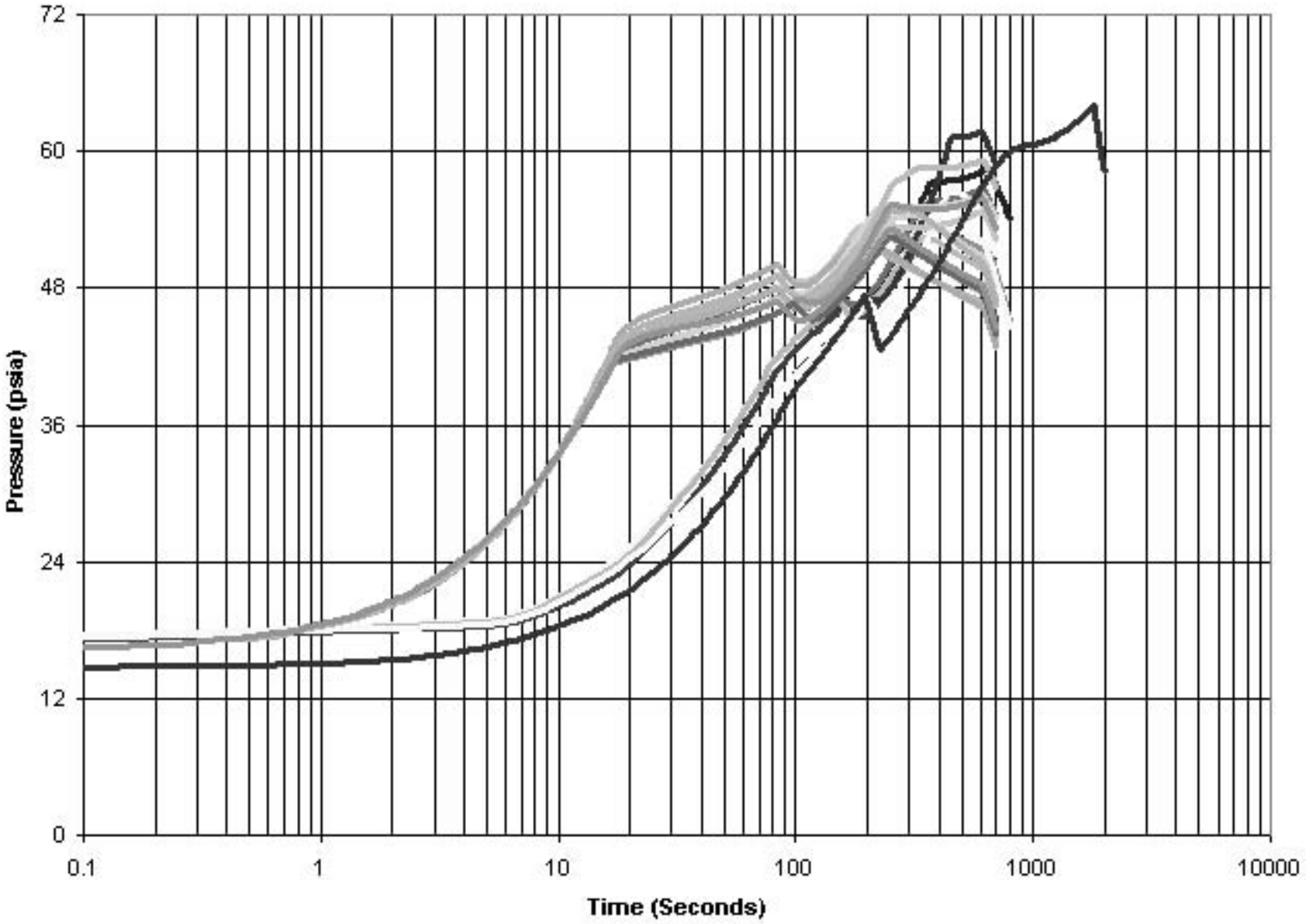
FIGURE 3.11(B)-4

CONTAINMENT PRESSURE
(LOCA)



REV. 17
10/08

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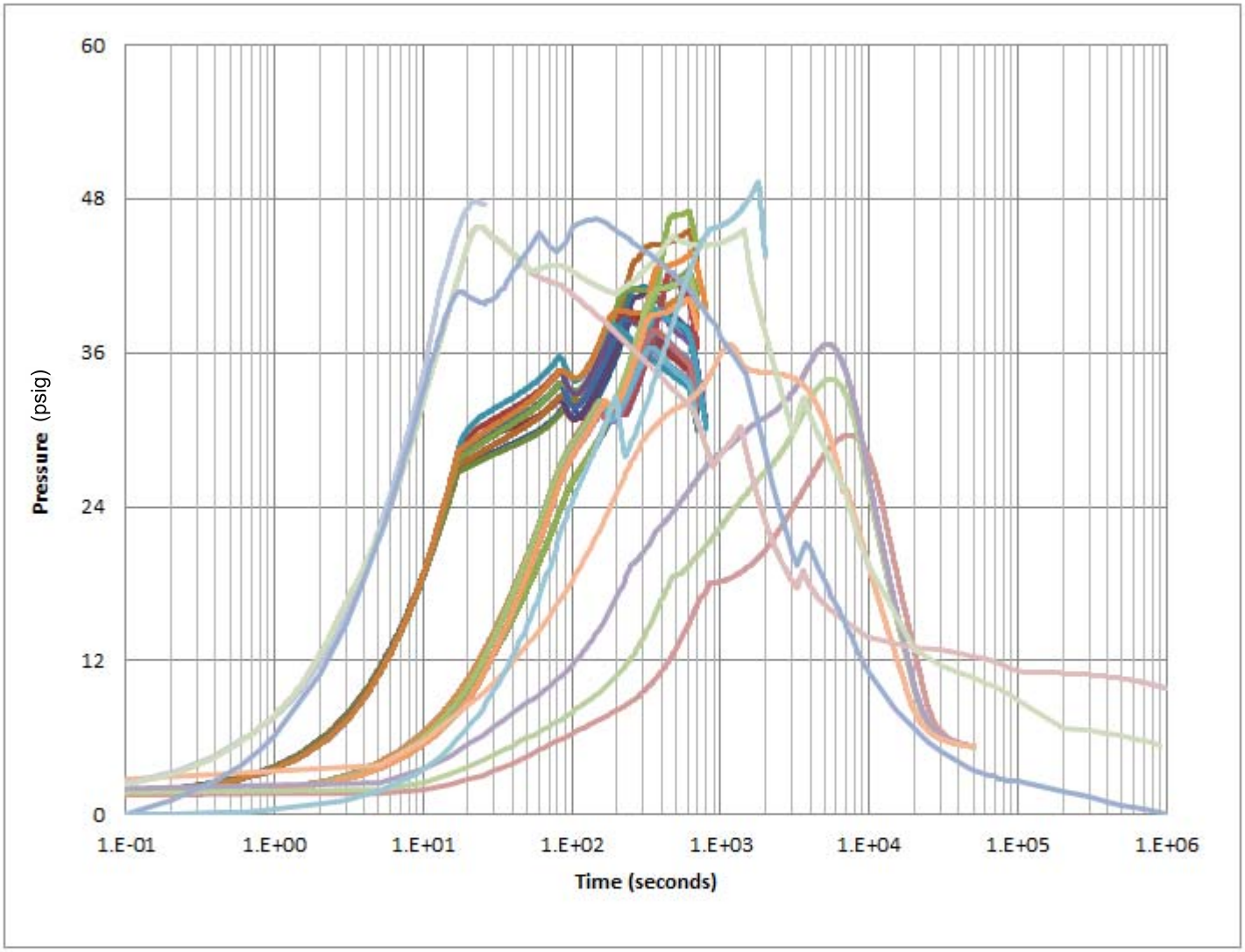
FIGURE 3.11(B)-5

CONTAINMENT PRESSURE
(MSLB)

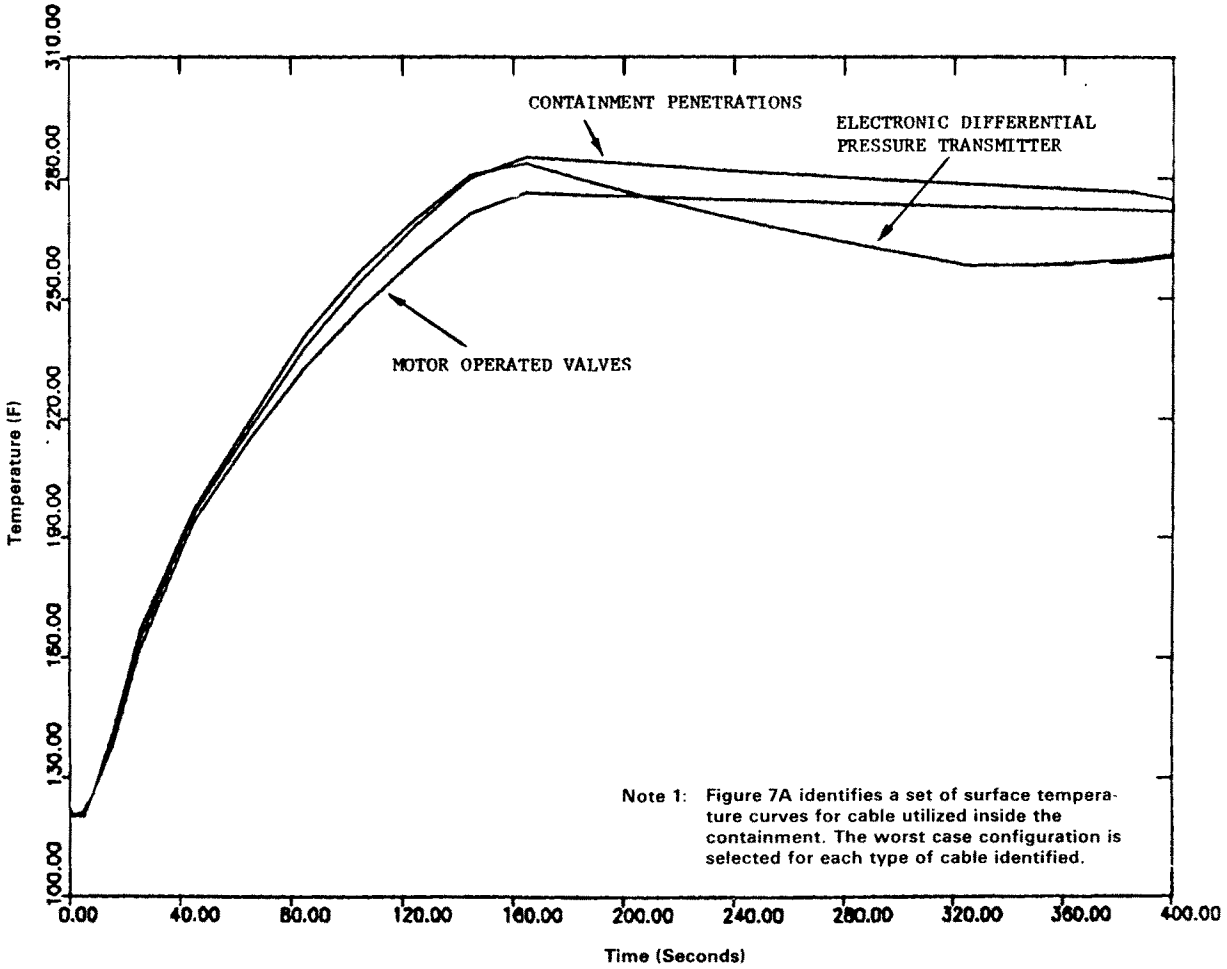


CALLAWAY PLANT

FIGURE 3.11(B)-6

CONTAINMENT PRESSURE (MSLB AND LOCA)

REV. 18 10/13

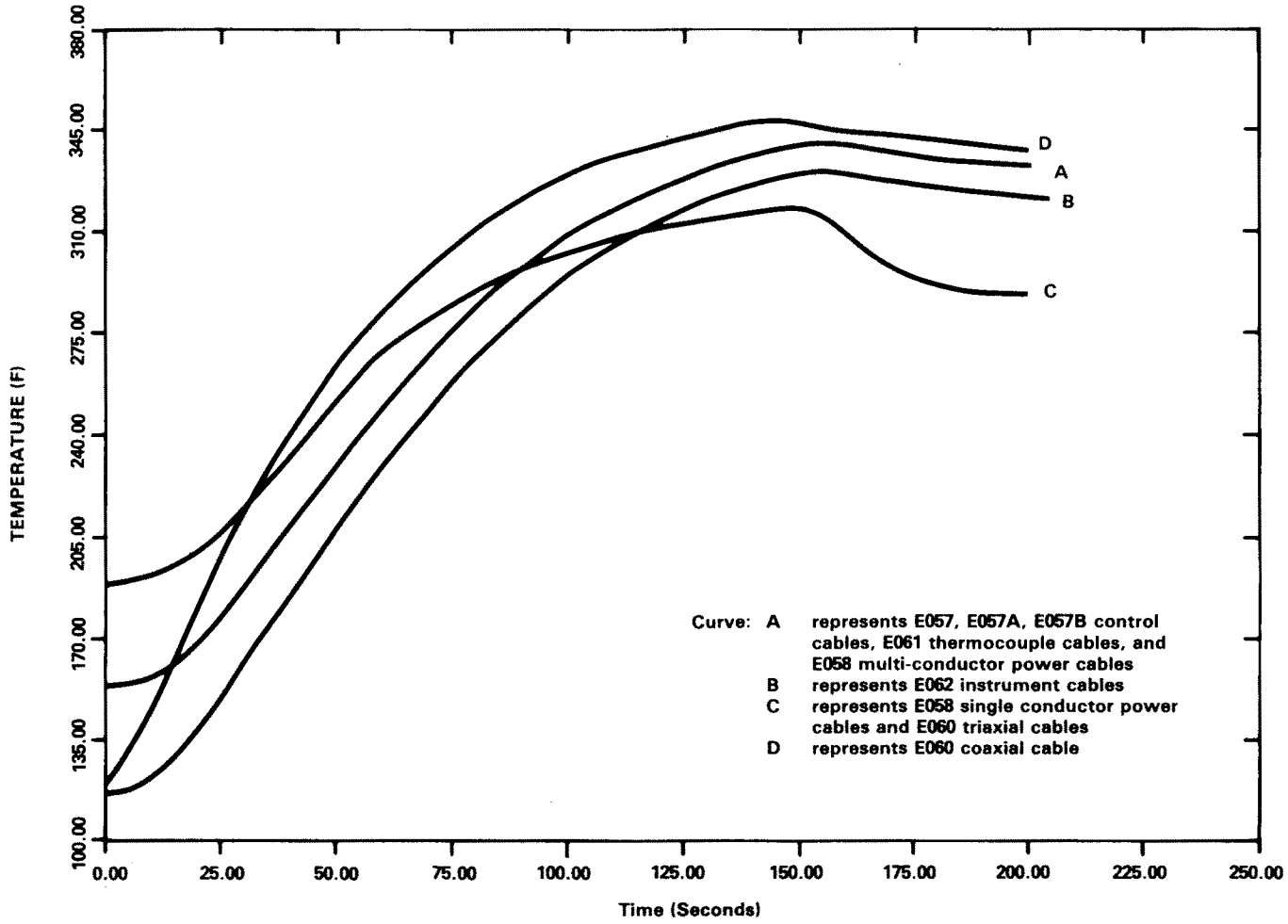


REV. 16
10/06

CALLAWAY PLANT

FIGURE 3.11(B)-7

SURFACE TEMPERATURE
(MSLB)
FOR OLD STEAM GENERATORS

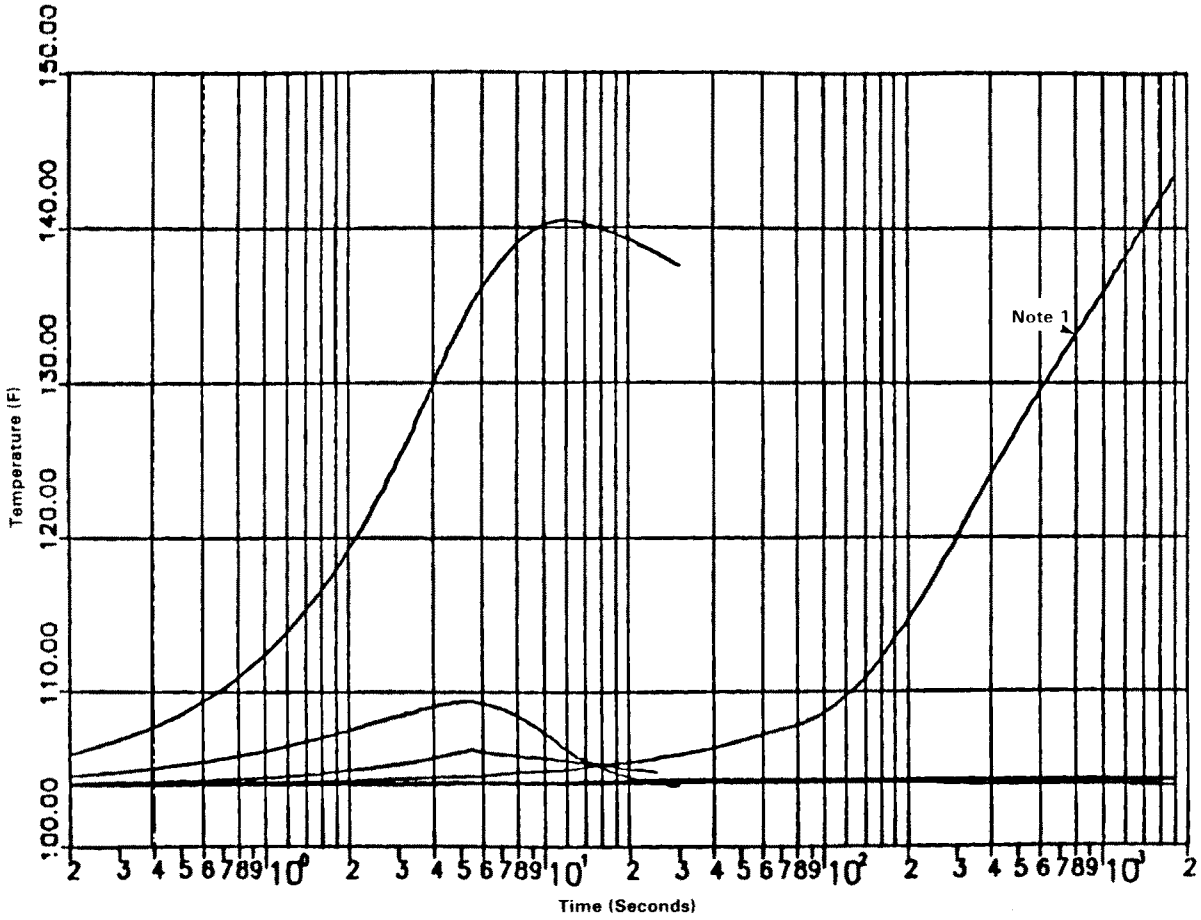


REV. 16
10/06

CALLAWAY PLANT

FIGURE 3.11(B)-7A

CABLE SURFACE TEMPERATURE (MSLB) FOR OLD STEAM GENERATORS



Note 1: Based on finalized values, this curve no longer applies but may have been used in performing detailed equipment qualification. As elimination of this curve results in a decrease in qualification requirements, equipment qualification documentation is conservative and may not have been revised.

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FIGURE 3.11(B)-8

AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1101-LEFT, 1102, 1119, 1120, AND 1121)

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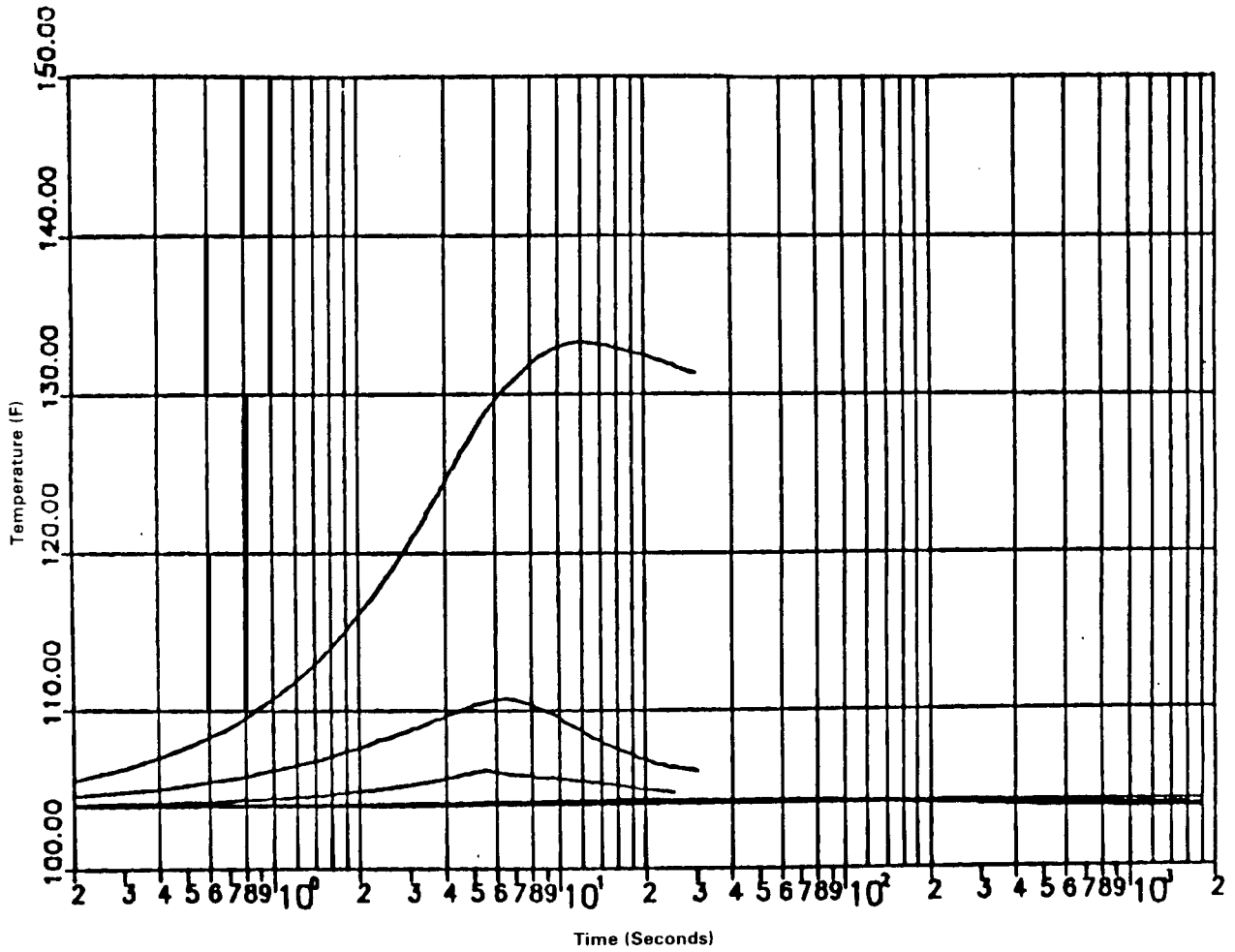

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FIGURE 3.11(B)-9

AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1101-RIGHT, 1122, 1128, 1129, AND 1130)

Rev. 9 11/13

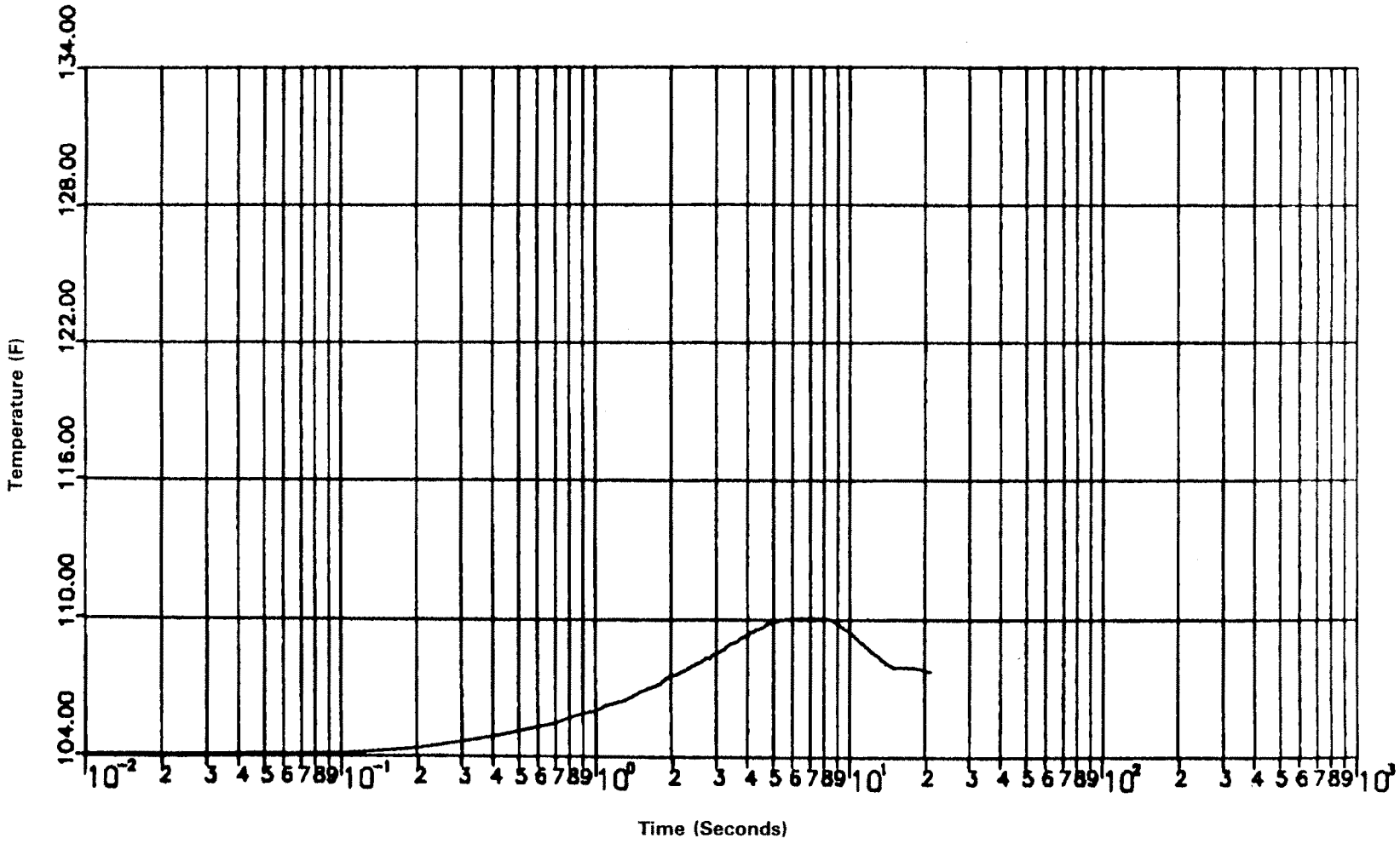

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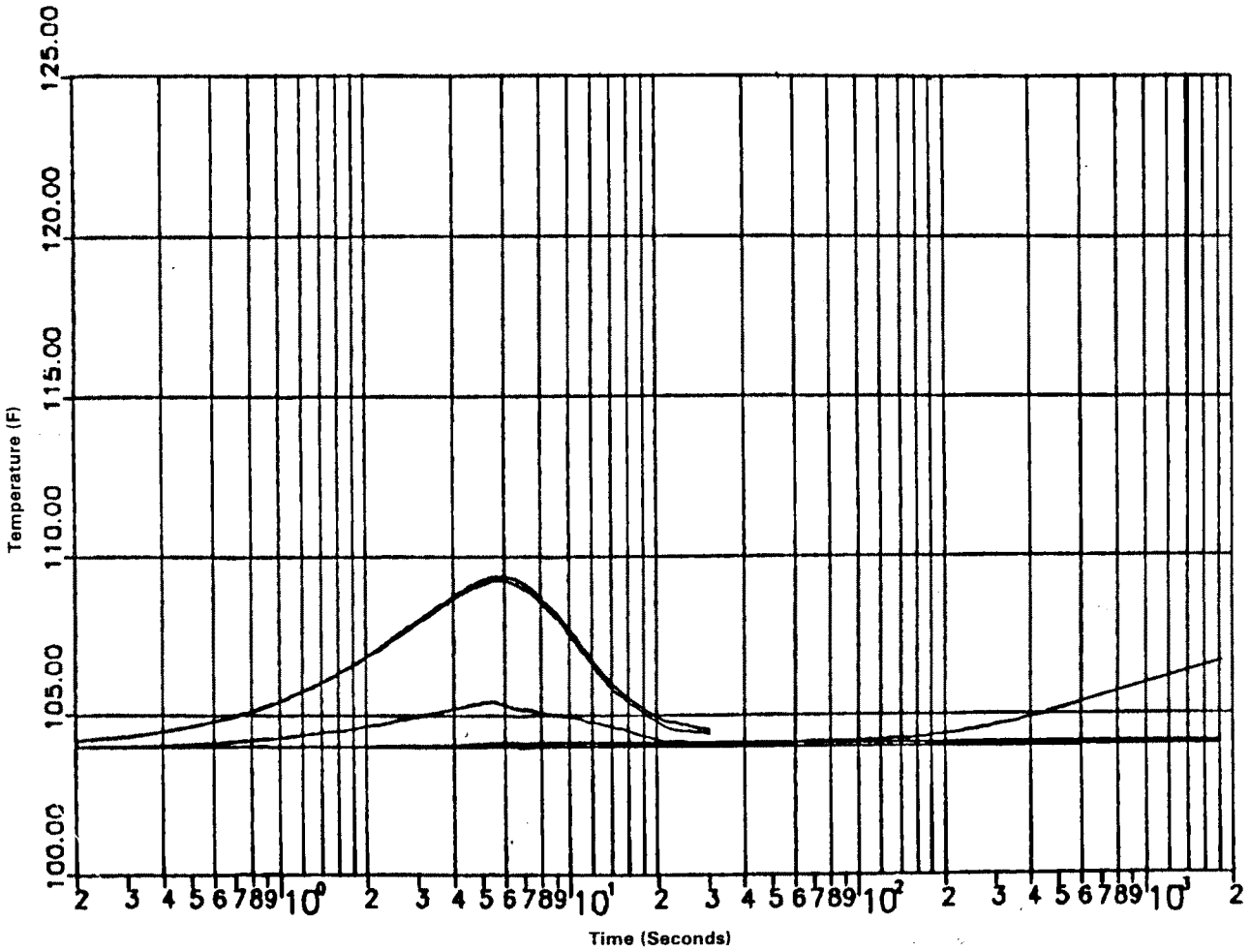
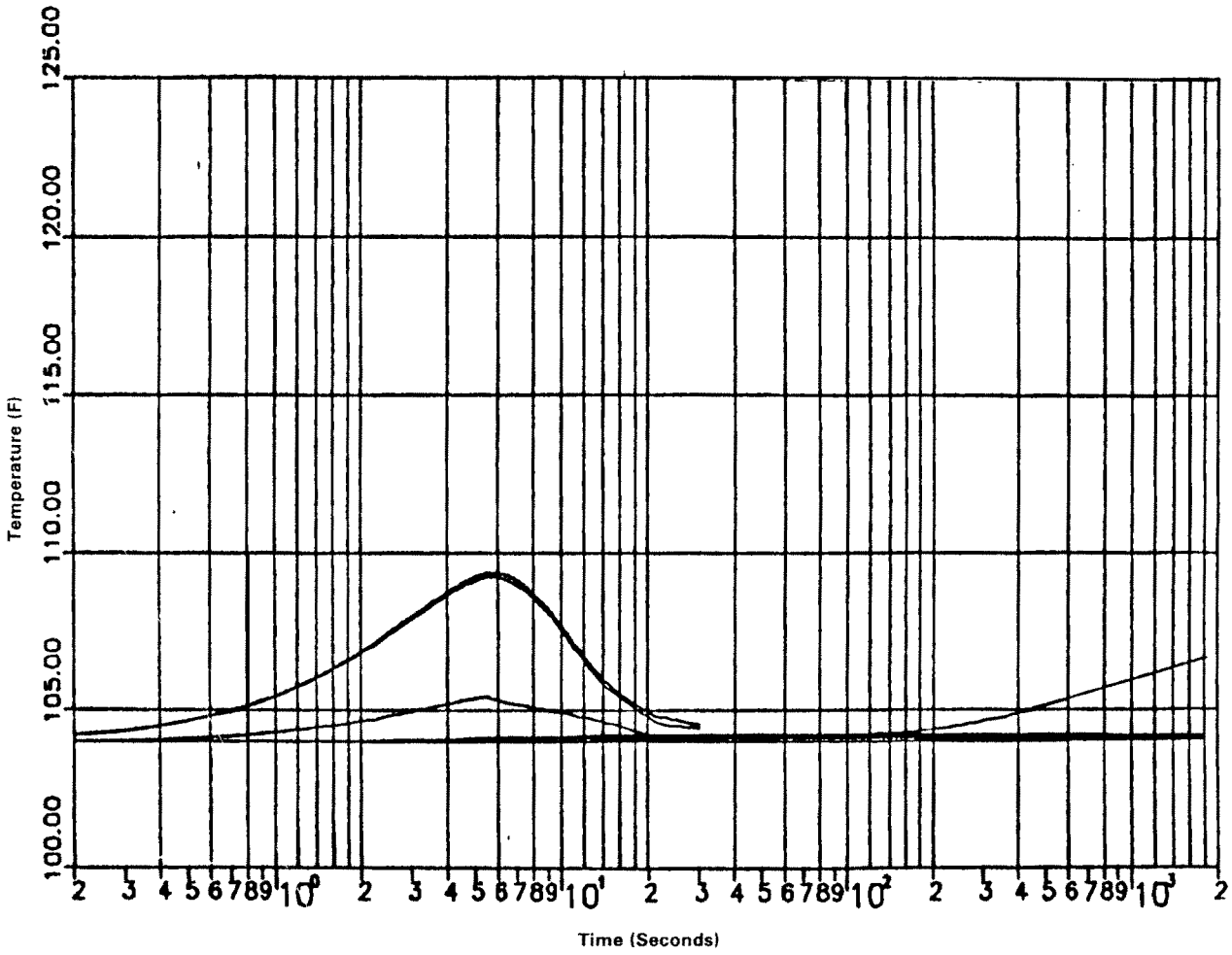
FIGURE 3.11(B)-9A AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1206 AND 1207) Rev. 9 11/13



CALLAWAY PLANT
FIGURE 3.11(B)-10 AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1107 THROUGH 1114, AND 1127) Rev. 9 11/13



CALLAWAY PLANT
FIGURE 3.11(B)-11
AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1115, 1116, AND 1117)
Rev. 9 11/13

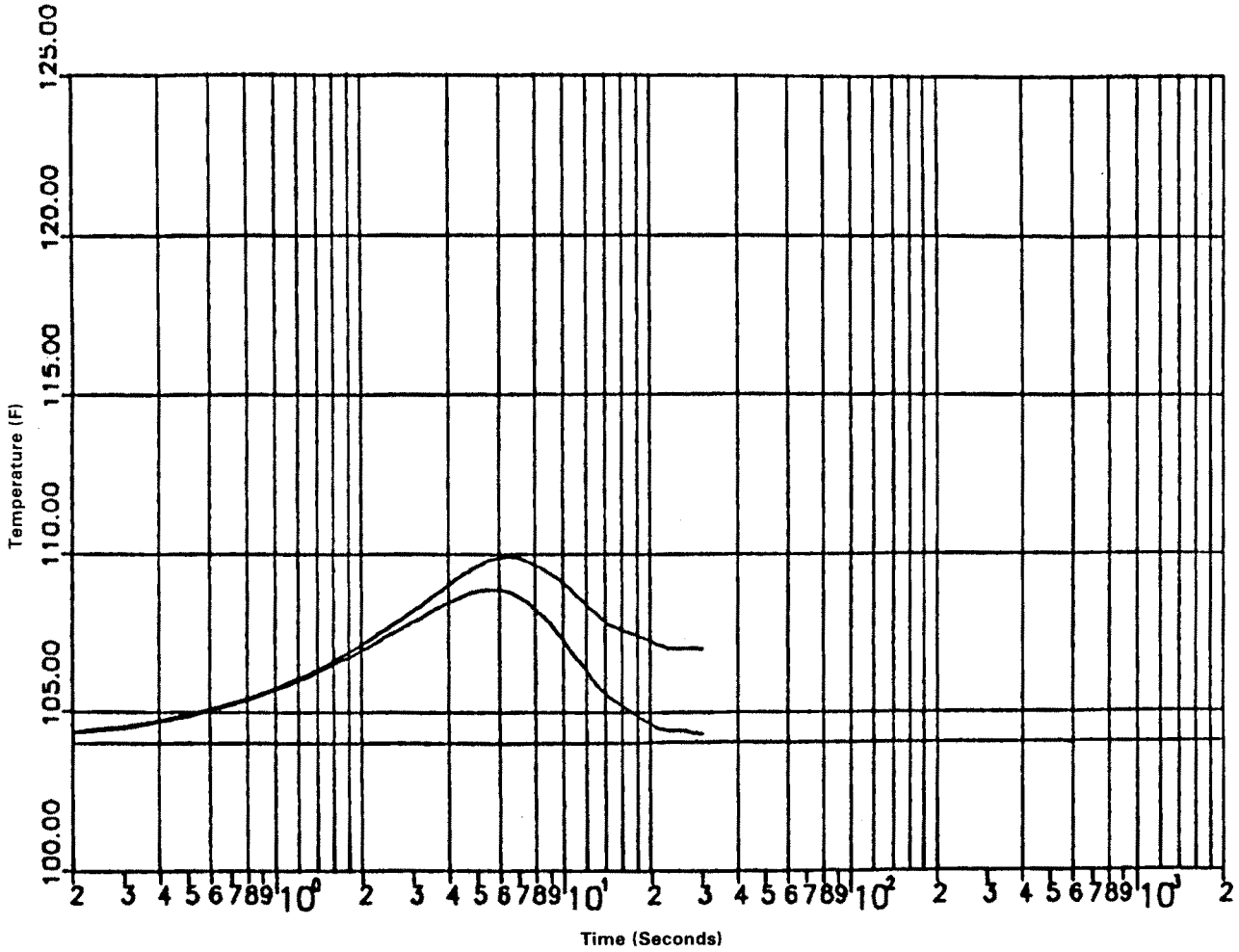


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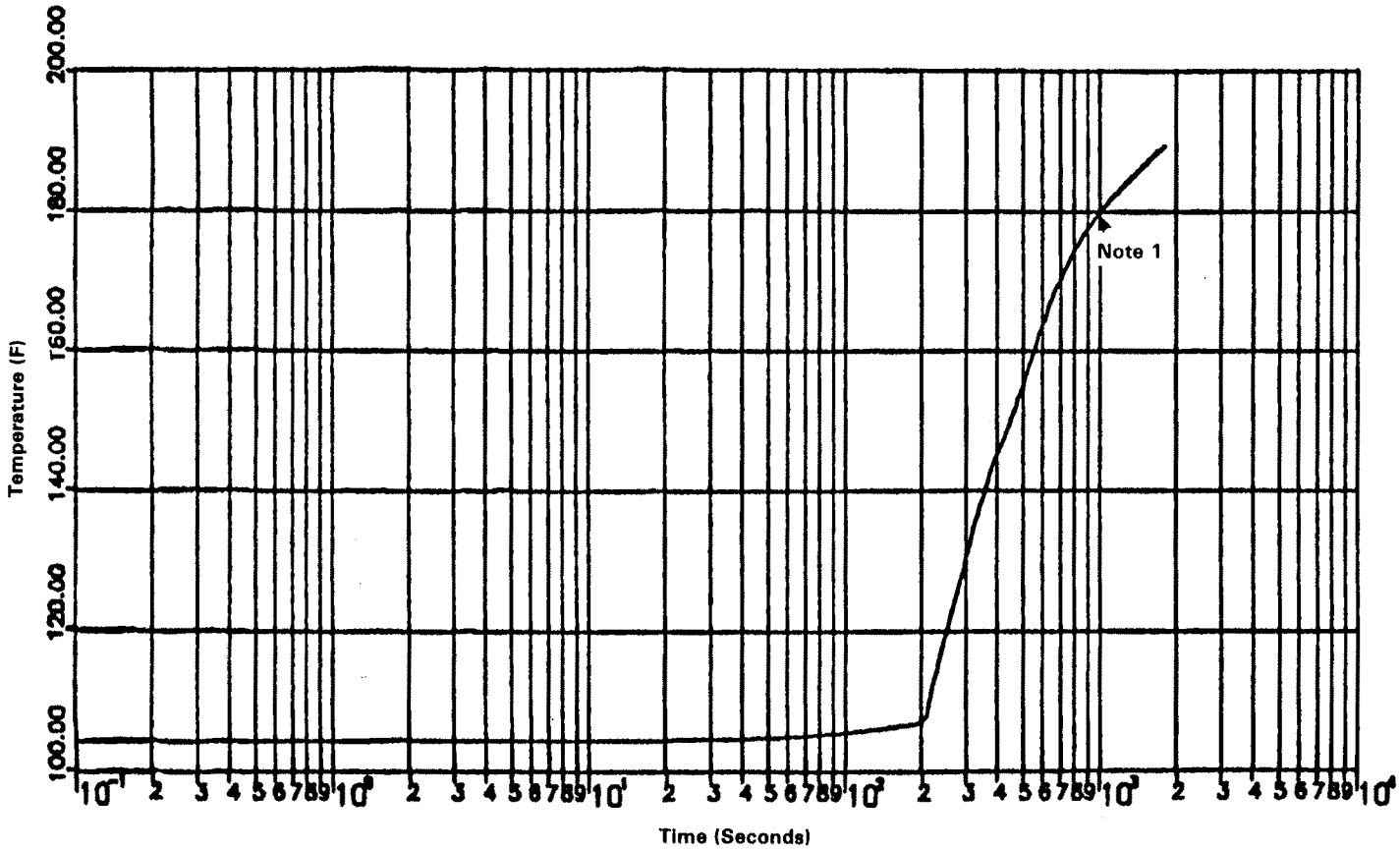
FIGURE 3.11(B)-12 AUXILIARY BUILDING HELB TEMPERATURE (ROOM 1126) Rev. 9 11/13



Note 1: Based on finalized values, this curve no longer applies but may have been used in performing detailed equipment qualification. As elimination of this curve results in a decrease in qualification requirements, equipment qualification documentation is conservative and may not have been revised.

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FIGURE 3.11(B)-13

AUXILIARY BUILDING HELB TEMPERATURE (ROOM 1314-CORRIDOR)

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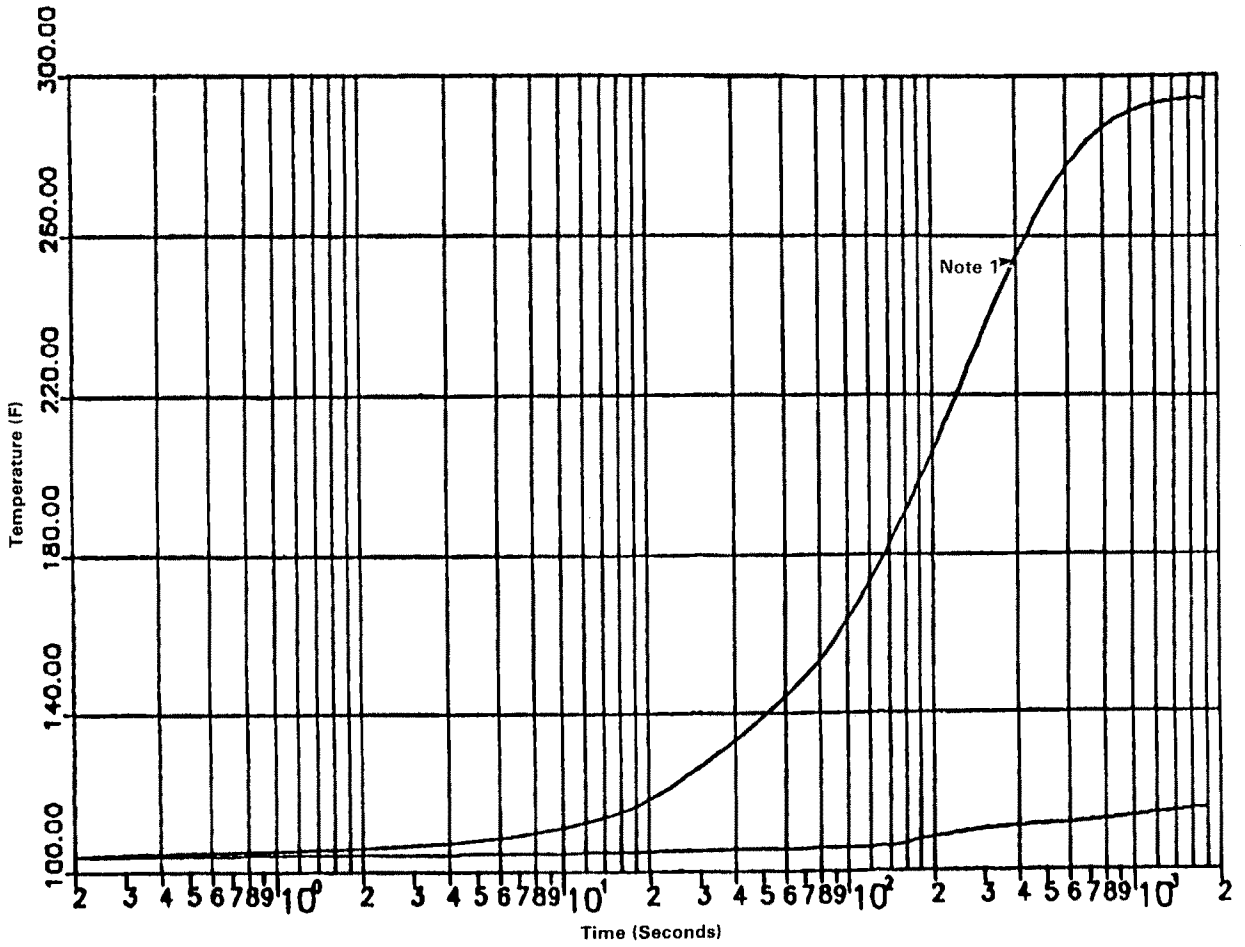

Note 1: Based on finalized values, this curve no longer applies but may have been used in performing detailed equipment qualification. As elimination of this curve results in a decrease in qualification requirements, equipment qualification documentation is conservative and may not have been revised.

Note 2: Curves based on CVCS letdown flowrate of 75 gpm at time of break.

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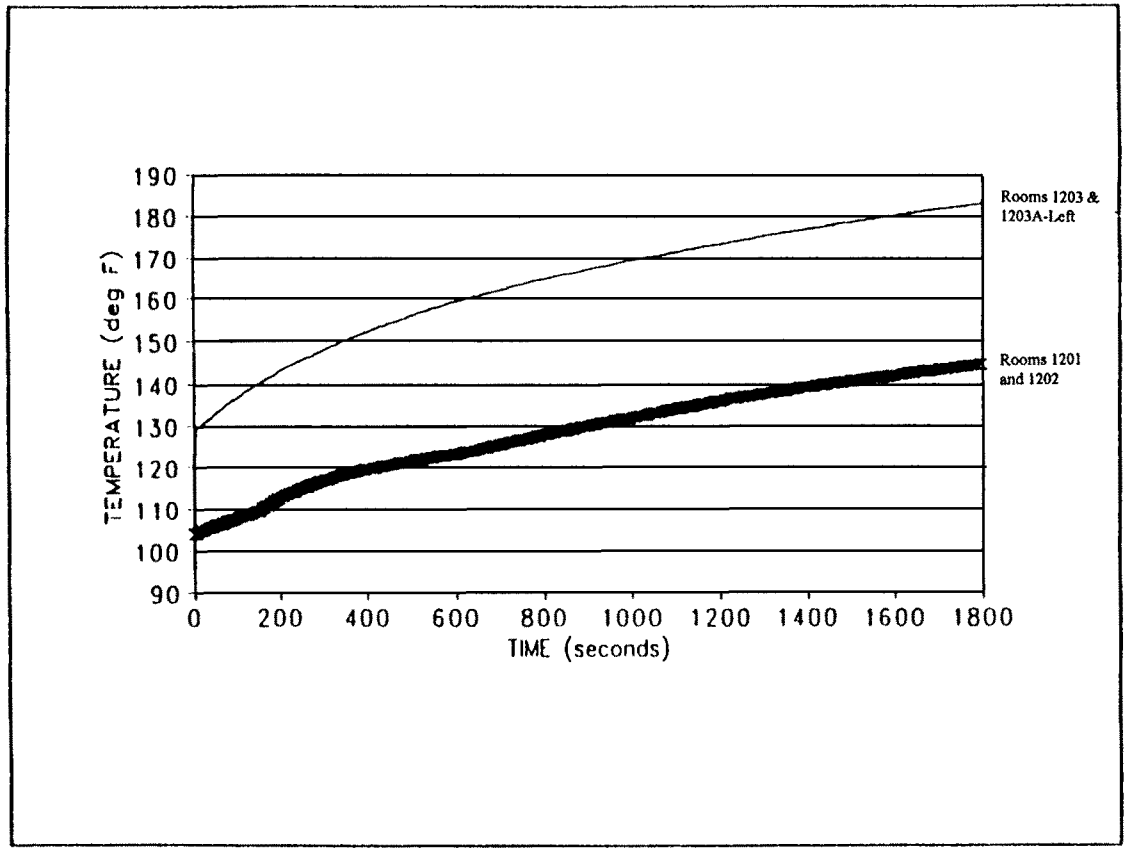
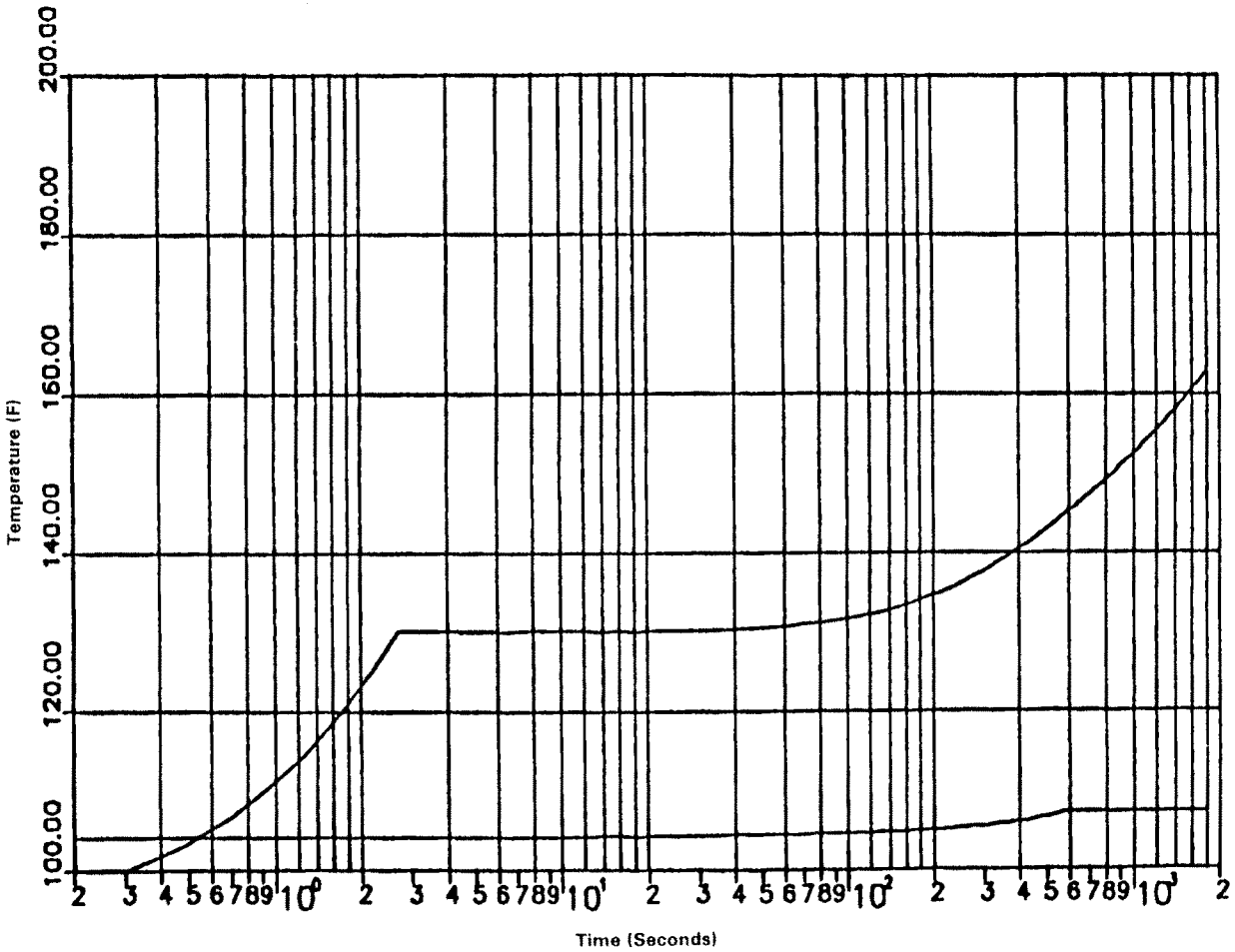
FIGURE 3.11(B)-14
SHEET 1
AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1201 AND 1202)
Rev. 9 11/13



Note: Curves based on CVCS letdown flowrate of 120 gpm at time of break.

CALLAWAY PLANT
FIGURE 3.11(B)-14 SHEET 2 AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1201 AND 1202) Rev. 9 11/13



Note: For encapsulated valves, temperatures will be greater than 110 F but below the curve shown.

Curves based on CVCS letdown flowrate of 75 gpm at time of break.

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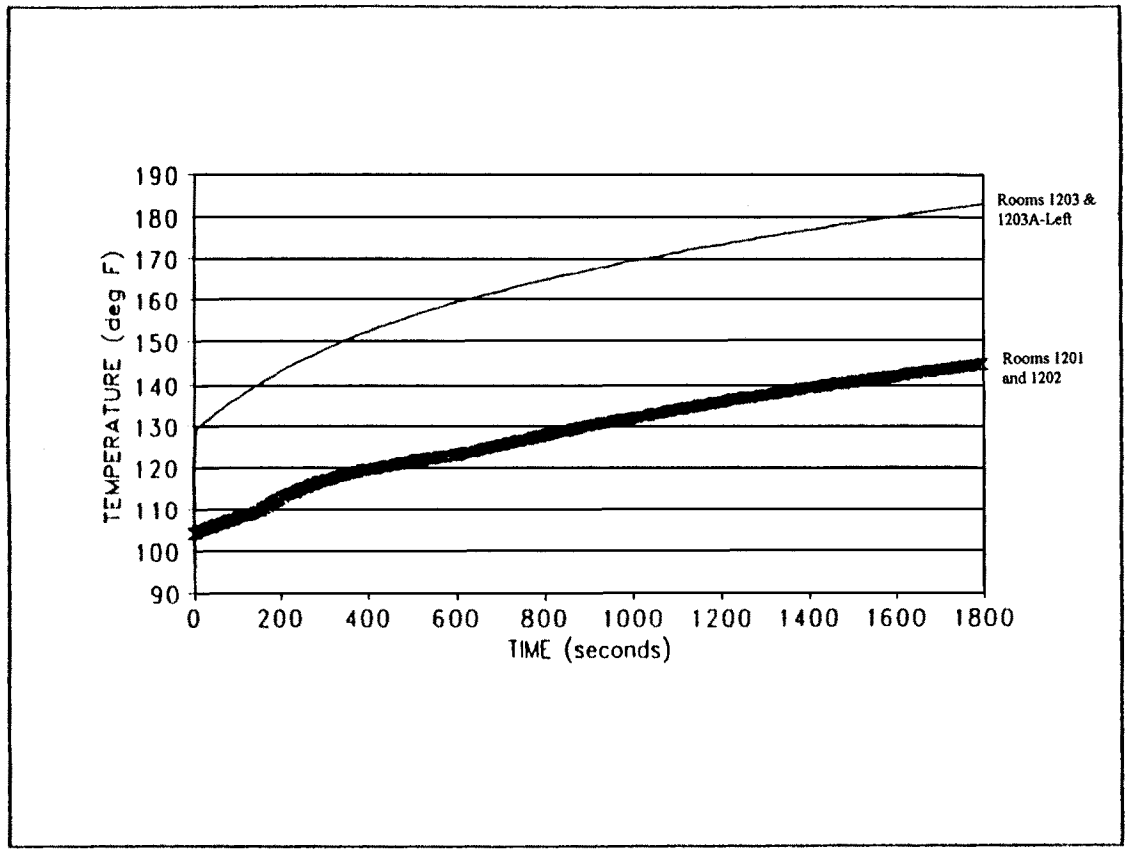
FIGURE 3.11(B)-15
SHEET 1
AUXILIARY BUILDING HELB TEMPERATURE
(ROOMS 1203 AND 1203A-LEFT)
Rev. 9 11/13



Note: Curves based on CVCS letdown flowrate of 120 gpm at time of break.

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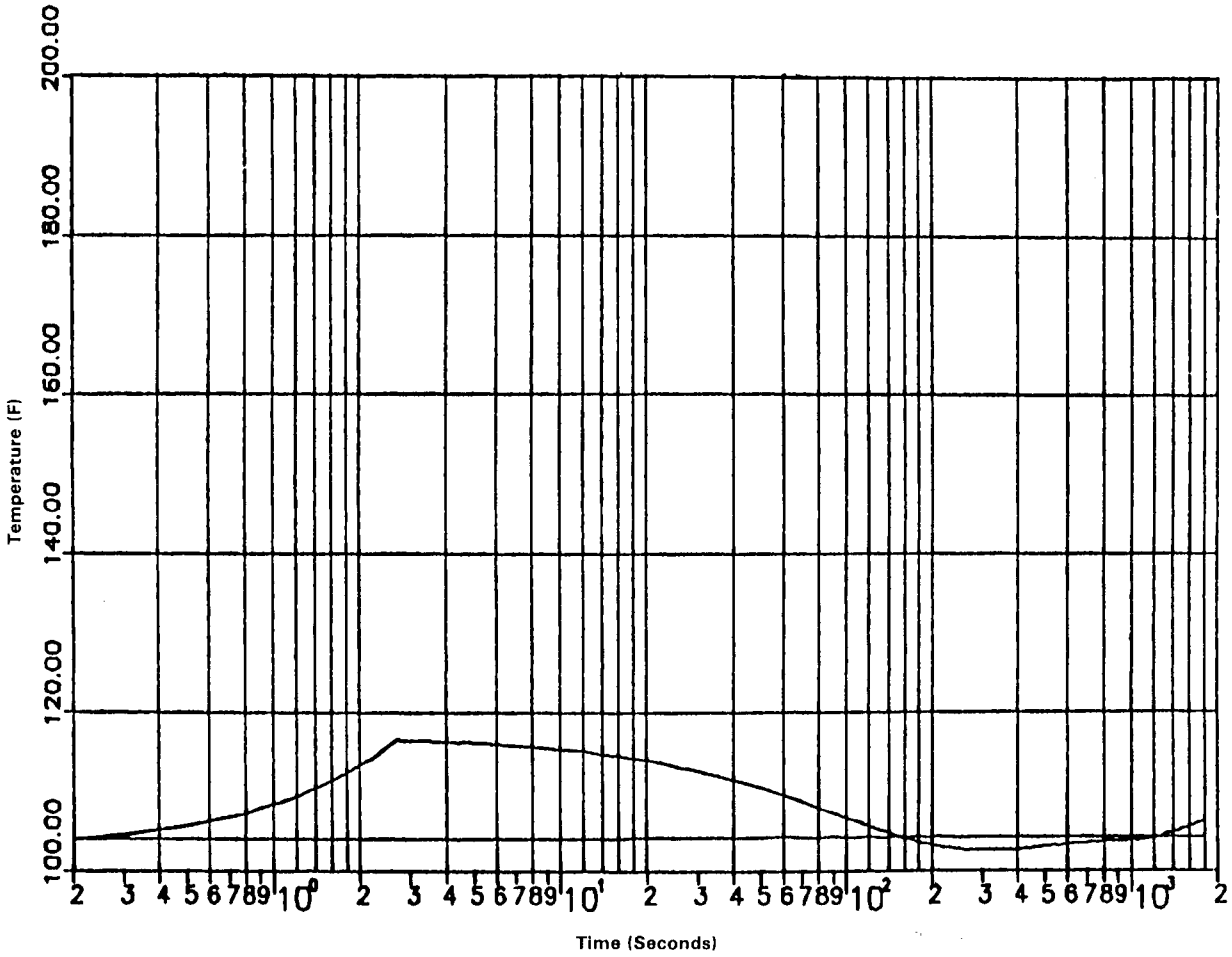
FIGURE 3.11(B)-15
SHEET 2
AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1203 AND 1203A-LEFT)

Rev. 9 11/13



Note: For encapsulated valves, temperatures will be greater than 110 F but below the curve shown.

Curves based on CVCS letdown flowrate of 75 gpm at time of break.

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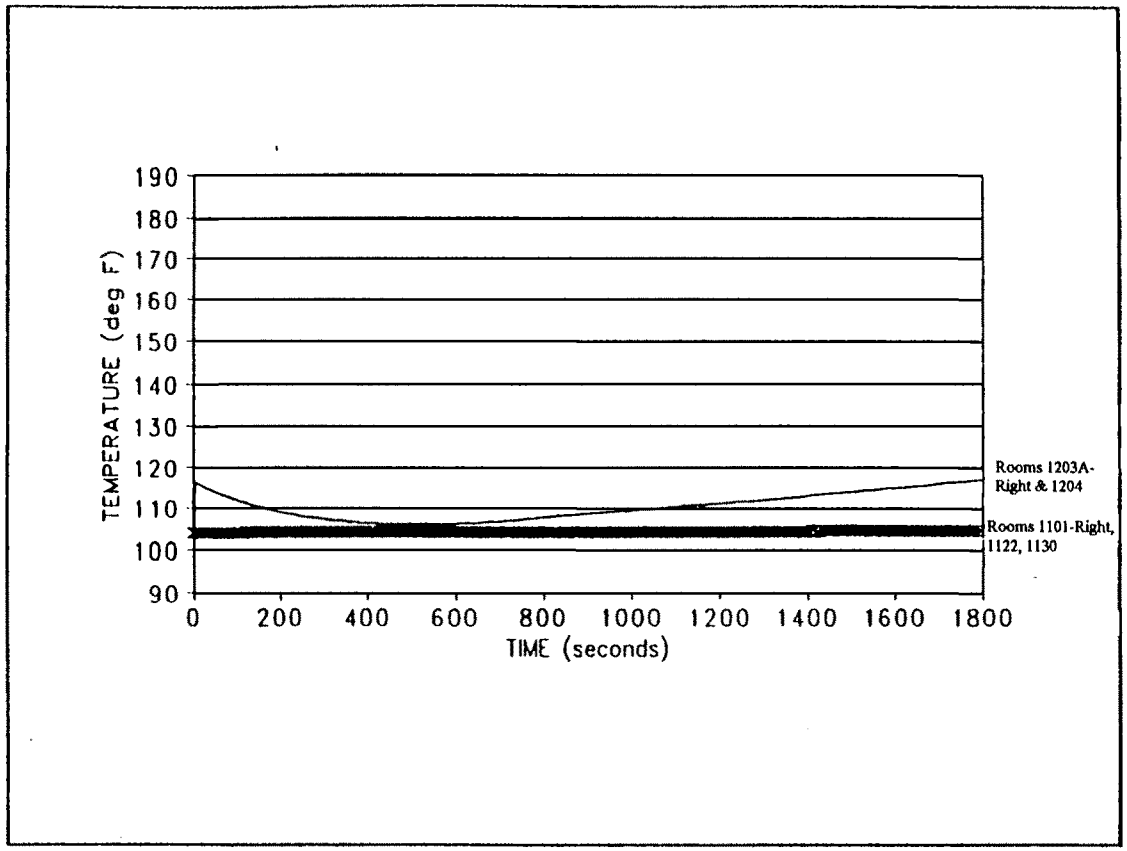
FIGURE 3.11(B)-16
SHEET 1
AUXILIARY BUILDING HELB TEMPERATURE
(ROOMS 1203A-RIGHT AND 1204)
Rev. 9 11/13



Note: Curves based on CVCS letdown flowrate of 120 gpm at time of break.

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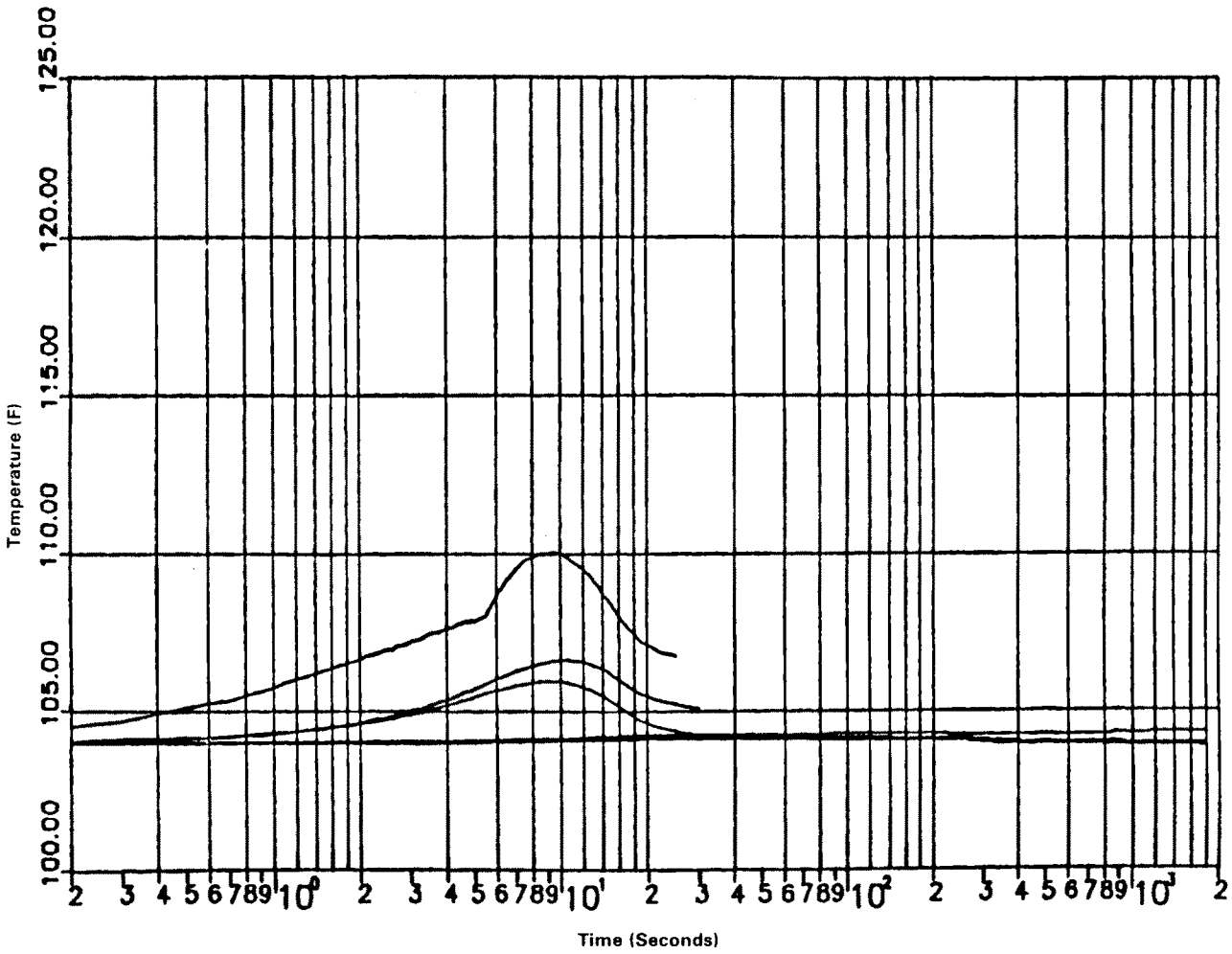
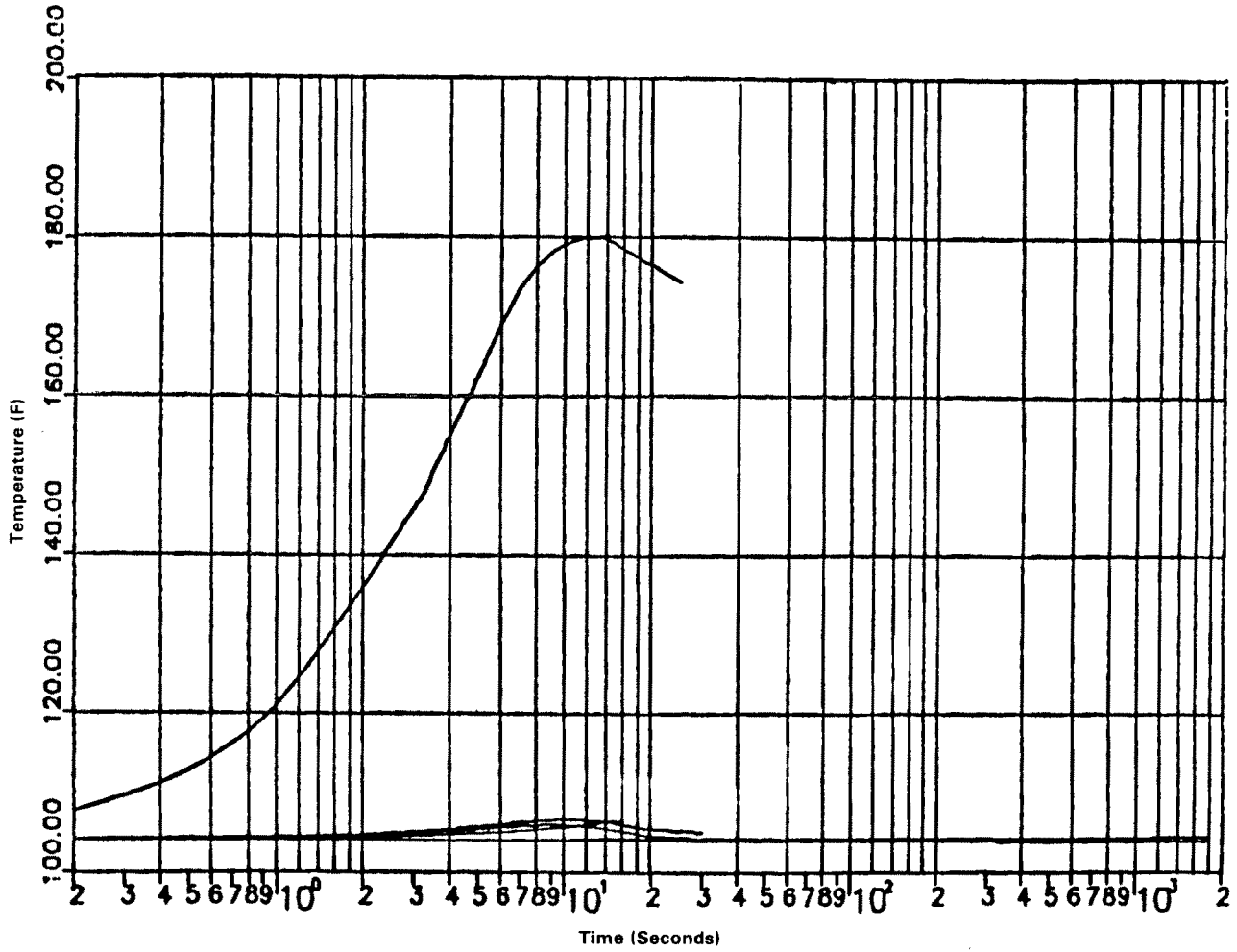
FIGURE 3.11(B)-16
SHEET 2
AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1203A-RIGHT AND 1204)

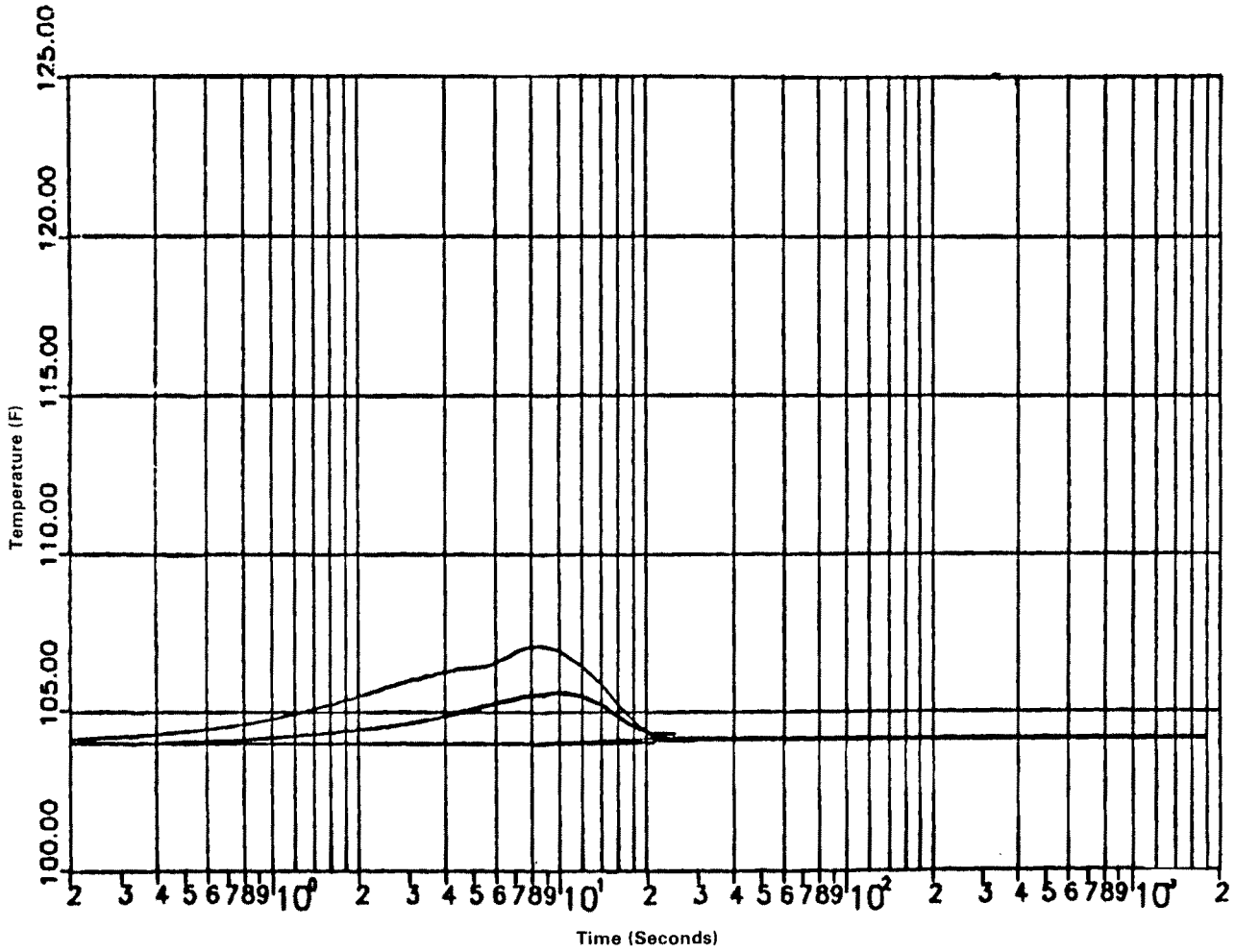
Rev. 9 11/13



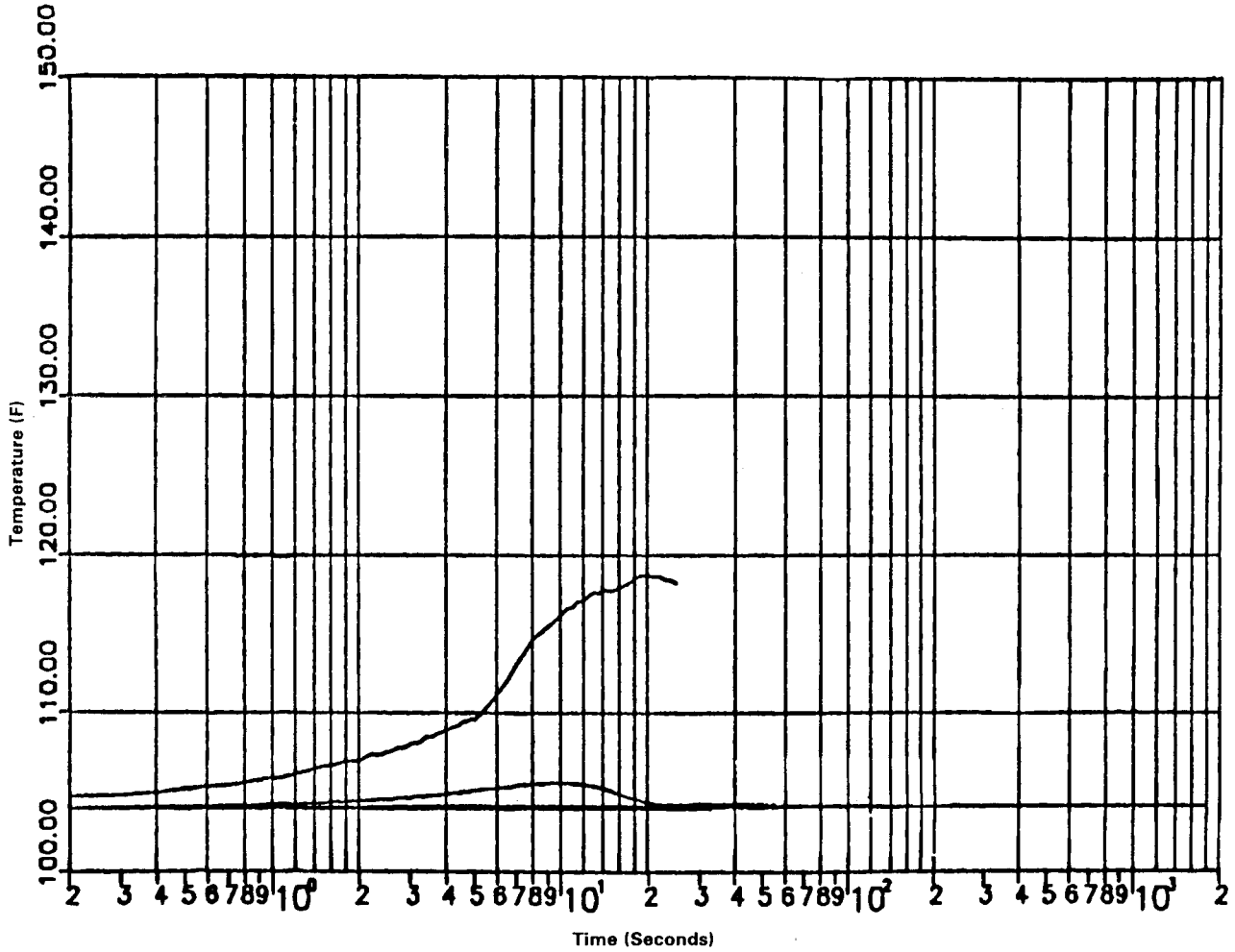
CALLAWAY PLANT
FIGURE 3.11(B)-17 AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1301-WEST, 1314, AND 1315) Rev. 9 11/13



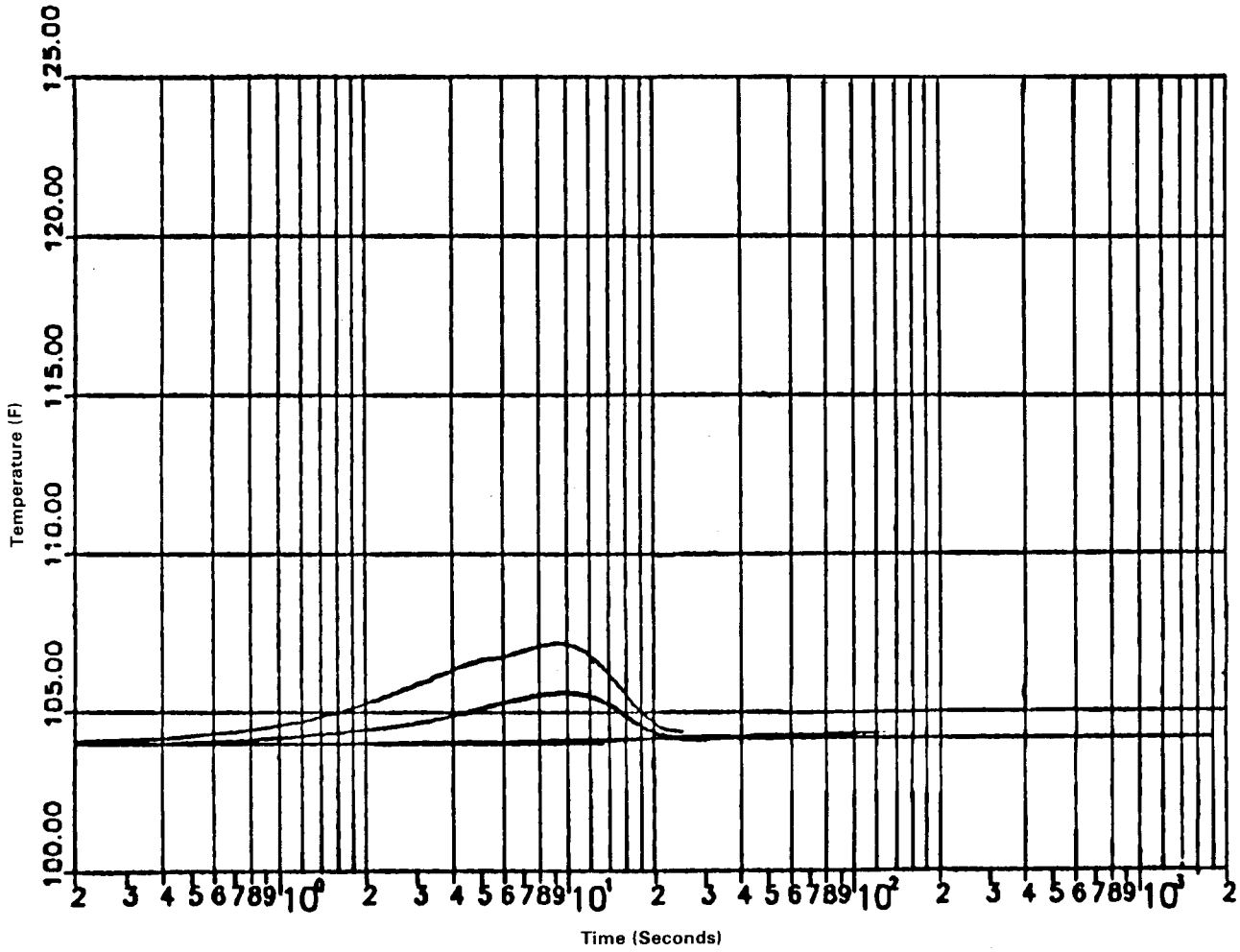
CALLAWAY PLANT
FIGURE 3.11(B)-18 AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1301-NORTH AND 1320) Rev. 9 11/13



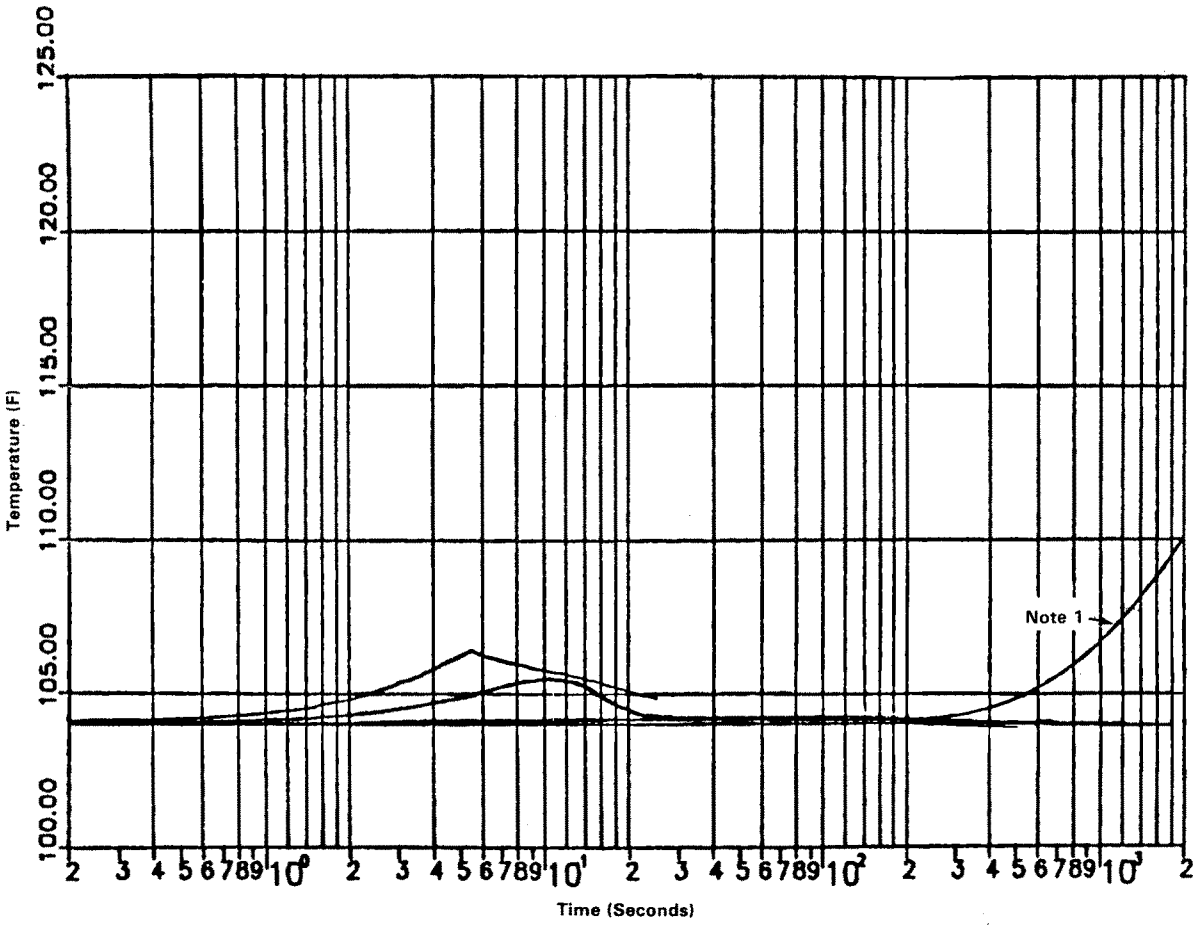
CALLAWAY PLANT
FIGURE 3.11(B)-19 AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1302, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1316, AND 1317) Rev. 9 11/13



CALLAWAY PLANT
FIGURE 3.11(B)-20 AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1313 AND 1318) Rev. 9 11/13



CALLAWAY PLANT
FIGURE 3.11(B)-21 AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1322 AND 1323) Rev. 9 11/13



Note 1: Based on finalized values, this curve no longer applies but may have been used in performing detailed equipment qualification. As elimination of this curve results in a decrease in qualification requirements, equipment qualification documentation is conservative and may not have been revised.

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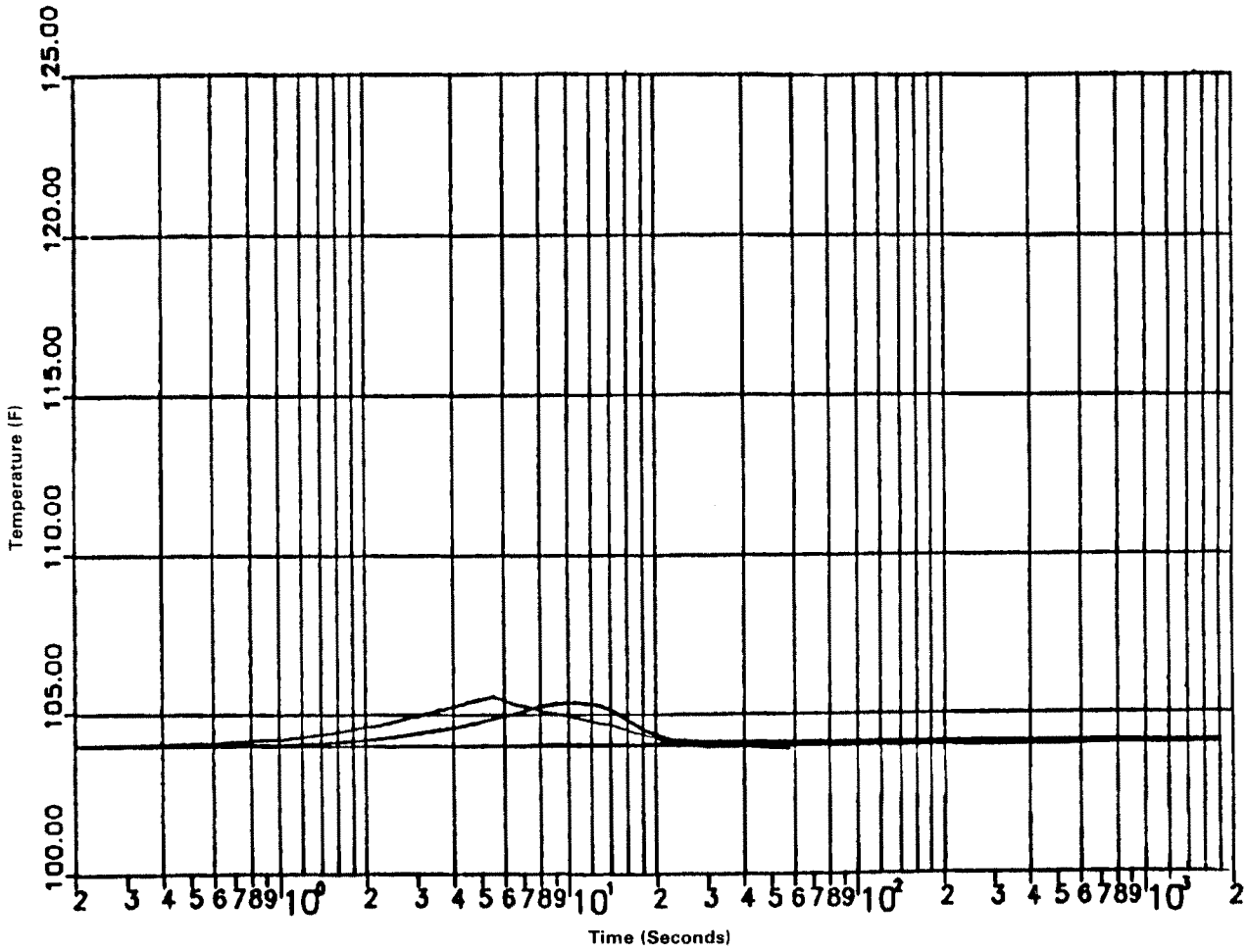
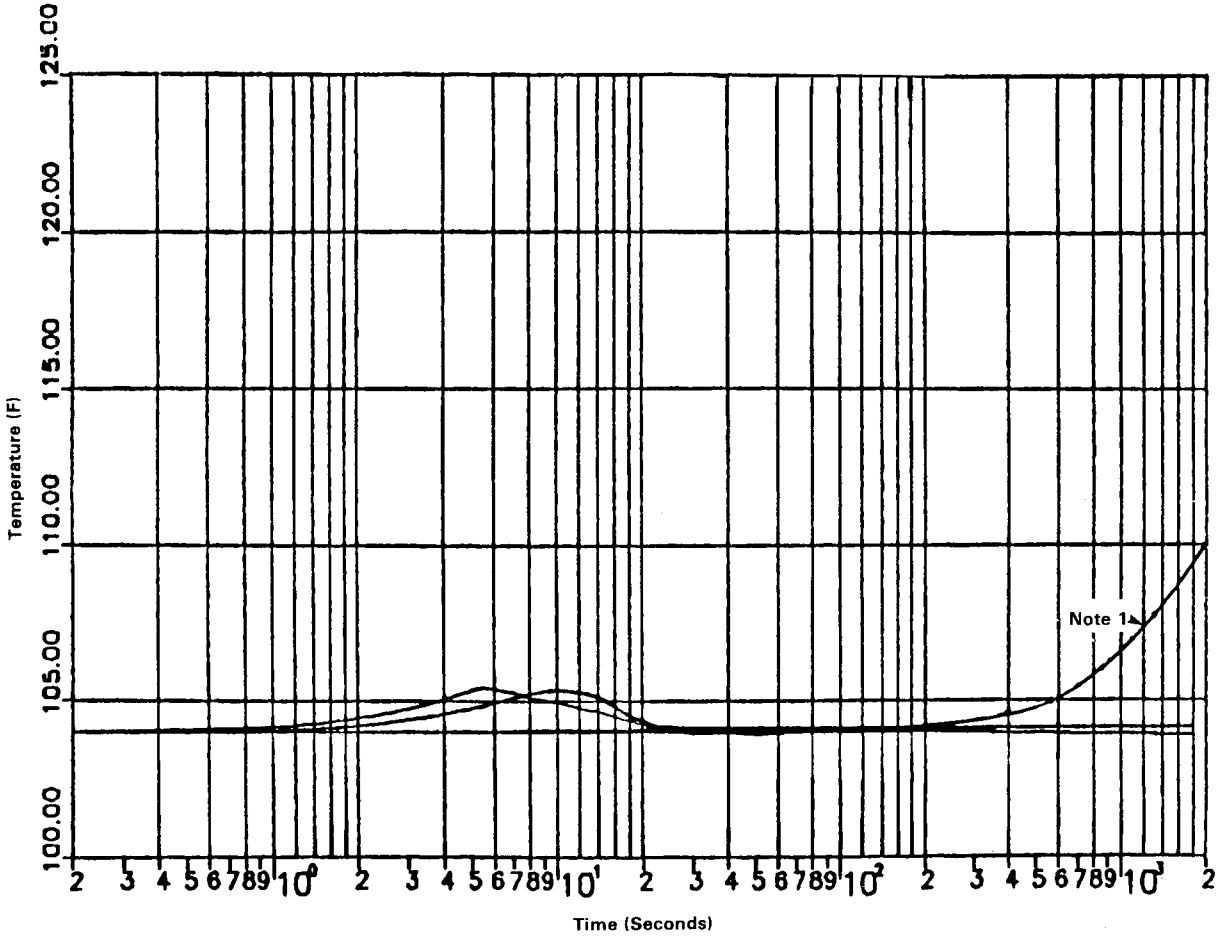
FIGURE 3.11(B)-22

AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1401, 1402, 1406, AND 1408)

Rev. 9 11/13



CALLAWAY PLANT
FIGURE 3.11(B)-23 AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1405, 1409, AND 1410) Rev. 9 11/13



Note 1: Based on finalized values, this curve no longer applies but may have been used in performing detailed equipment qualification. As elimination of this curve results in a decrease in qualification requirements, equipment qualification documentation is conservative and may not have been revised.

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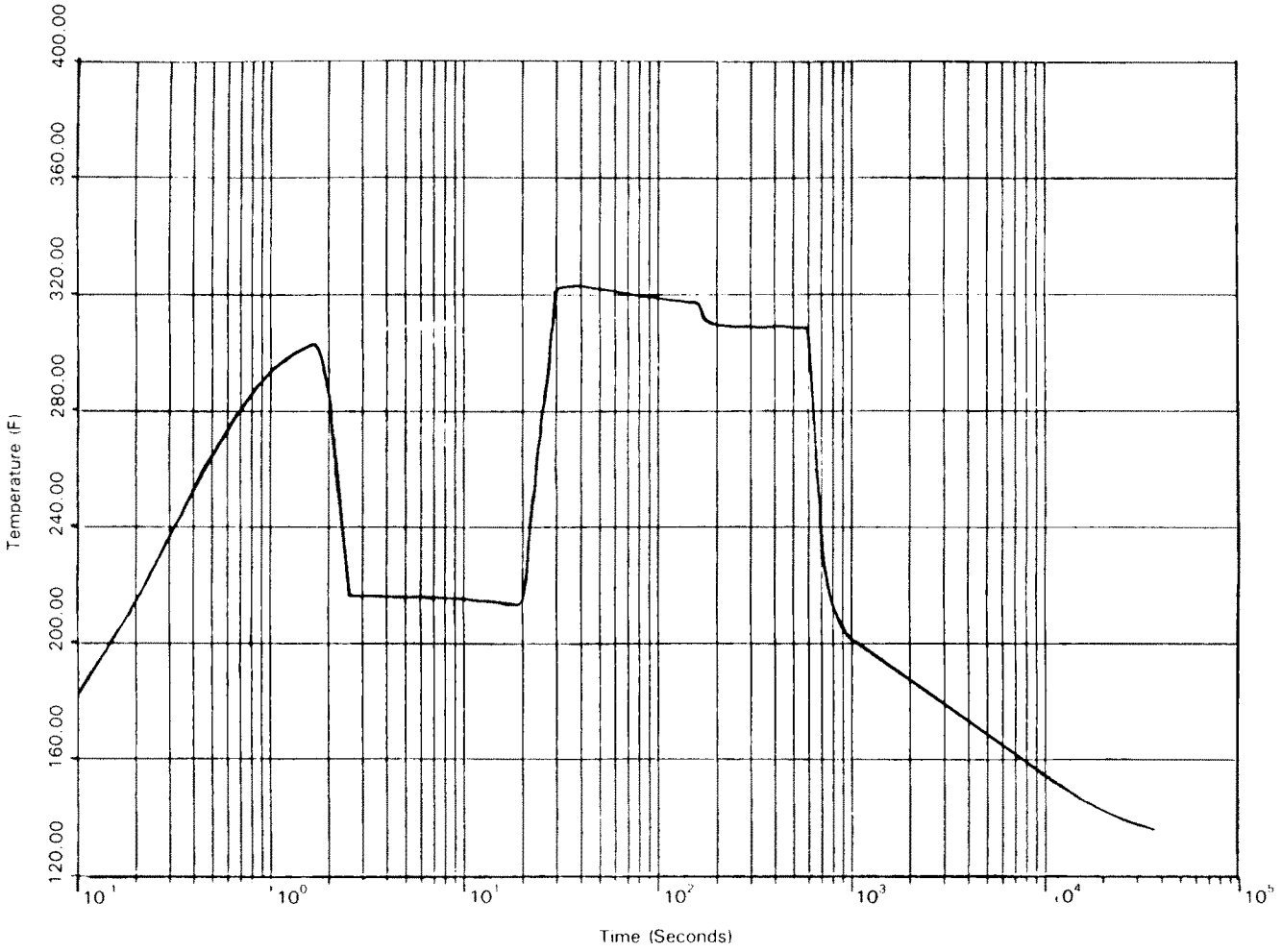
FIGURE 3.11(B)-24

AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1502 THROUGH 1507, AND 1513)

Rev. 9 11/13



NOTE : This figure corresponds to the design value of 324 F, with consideration given to super-heated blowdowns, this figure is supplemented by Figures 3B-7, 3B-8, 3B-9, and 3B-10. Refer to Section 3B.4.2.

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FIGURE 3.11(B)-25

AUXILIARY BUILDING MSLB TEMPERATURE (ROOMS 1411, 1412, 1508, AND 1509)

REV. 5 11/10

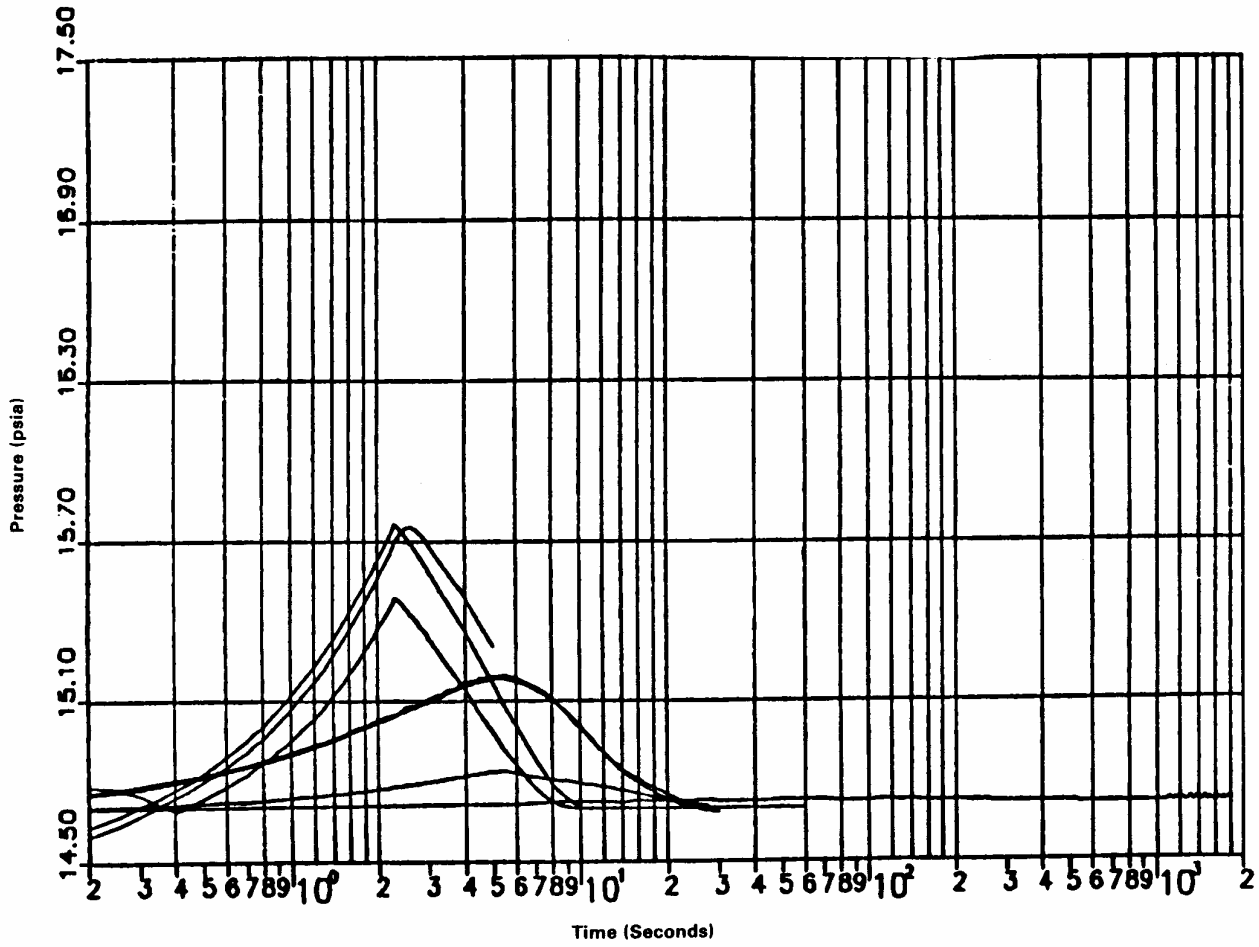

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FIGURE 3.11(B)-26

AUXILIARY BUILDING HELB PRESSURE (ROOMS 1101, 1102, 1119, 1120, AND 1121)

Rev. 9 11/13

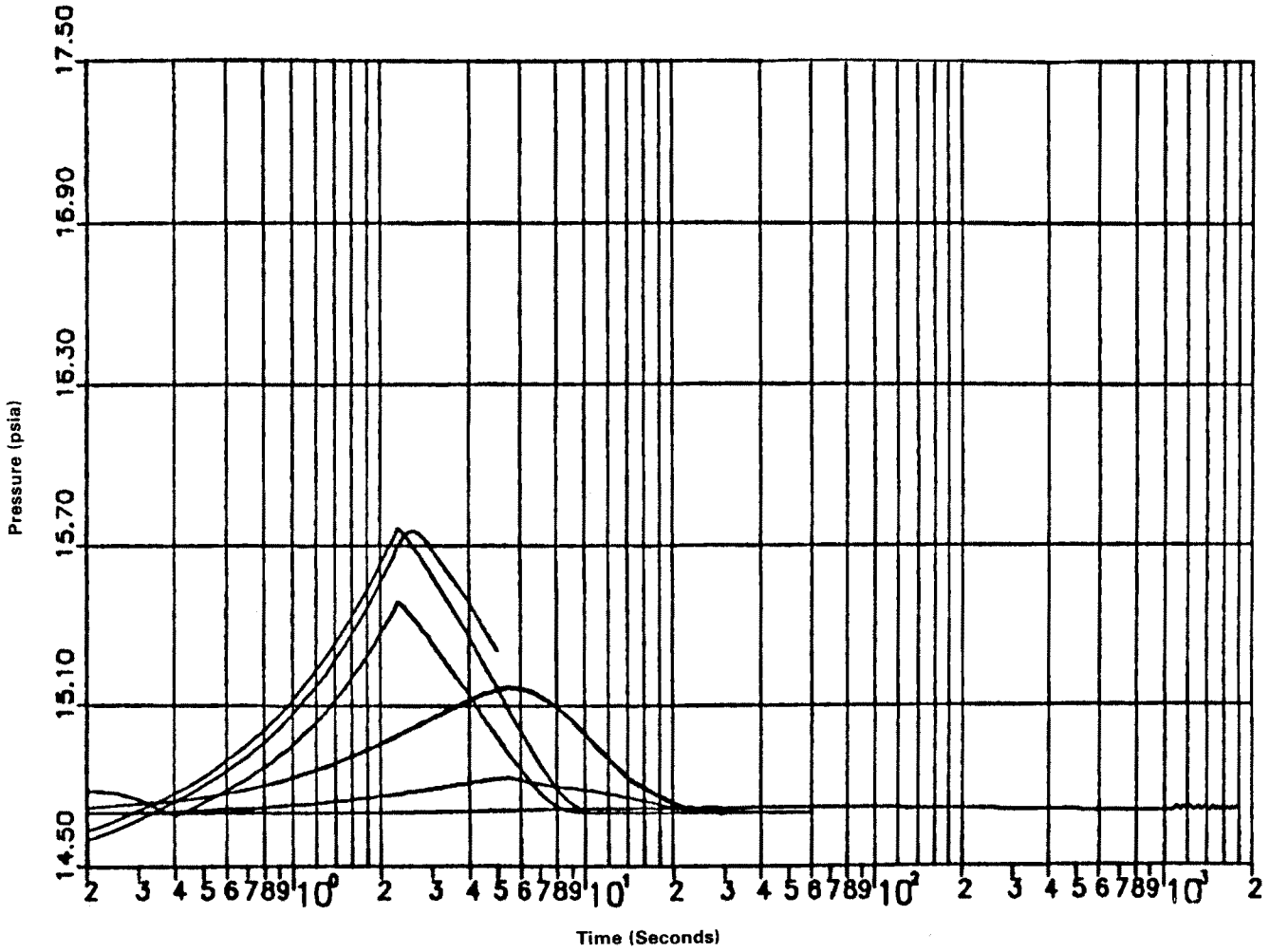

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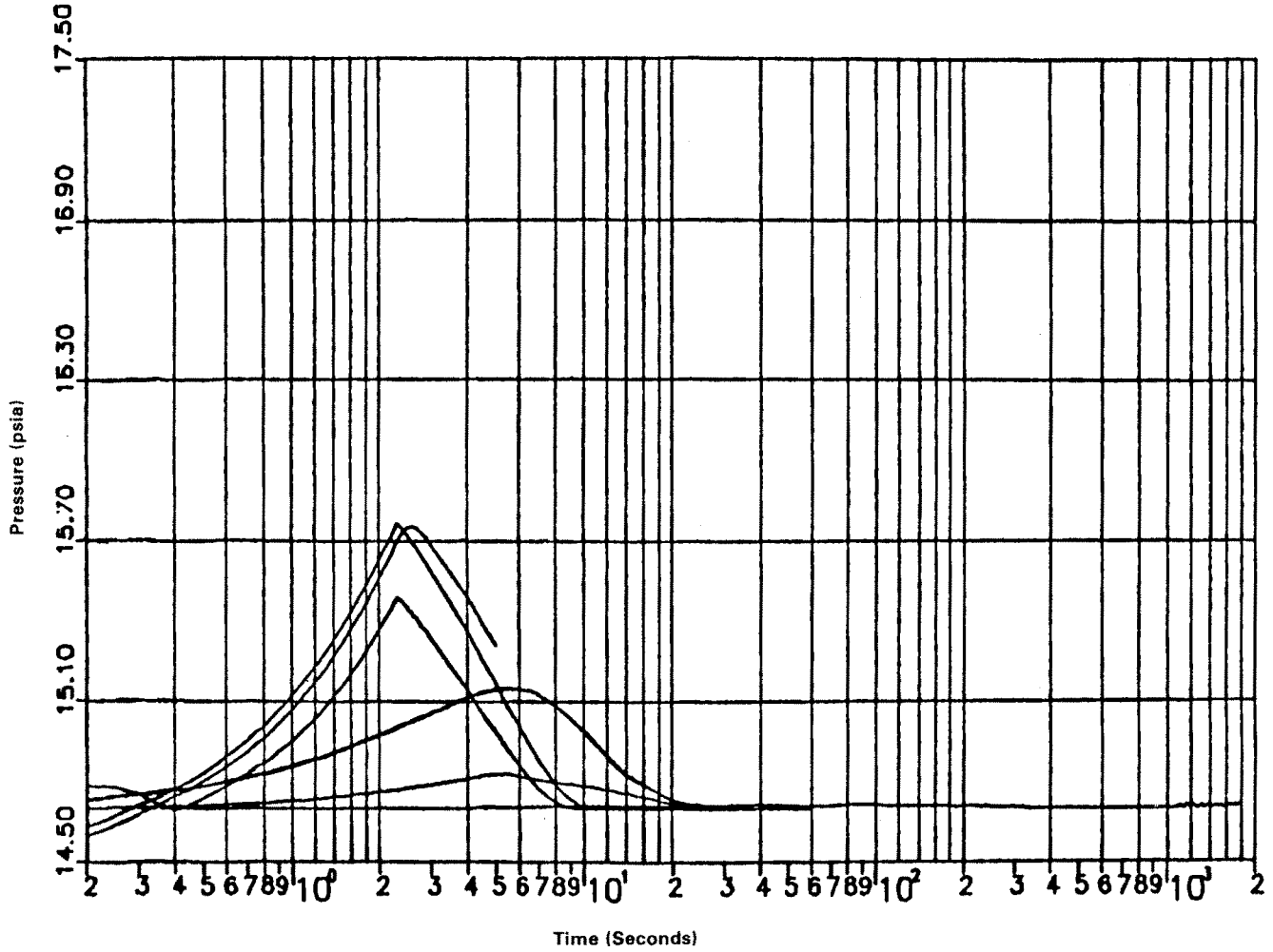
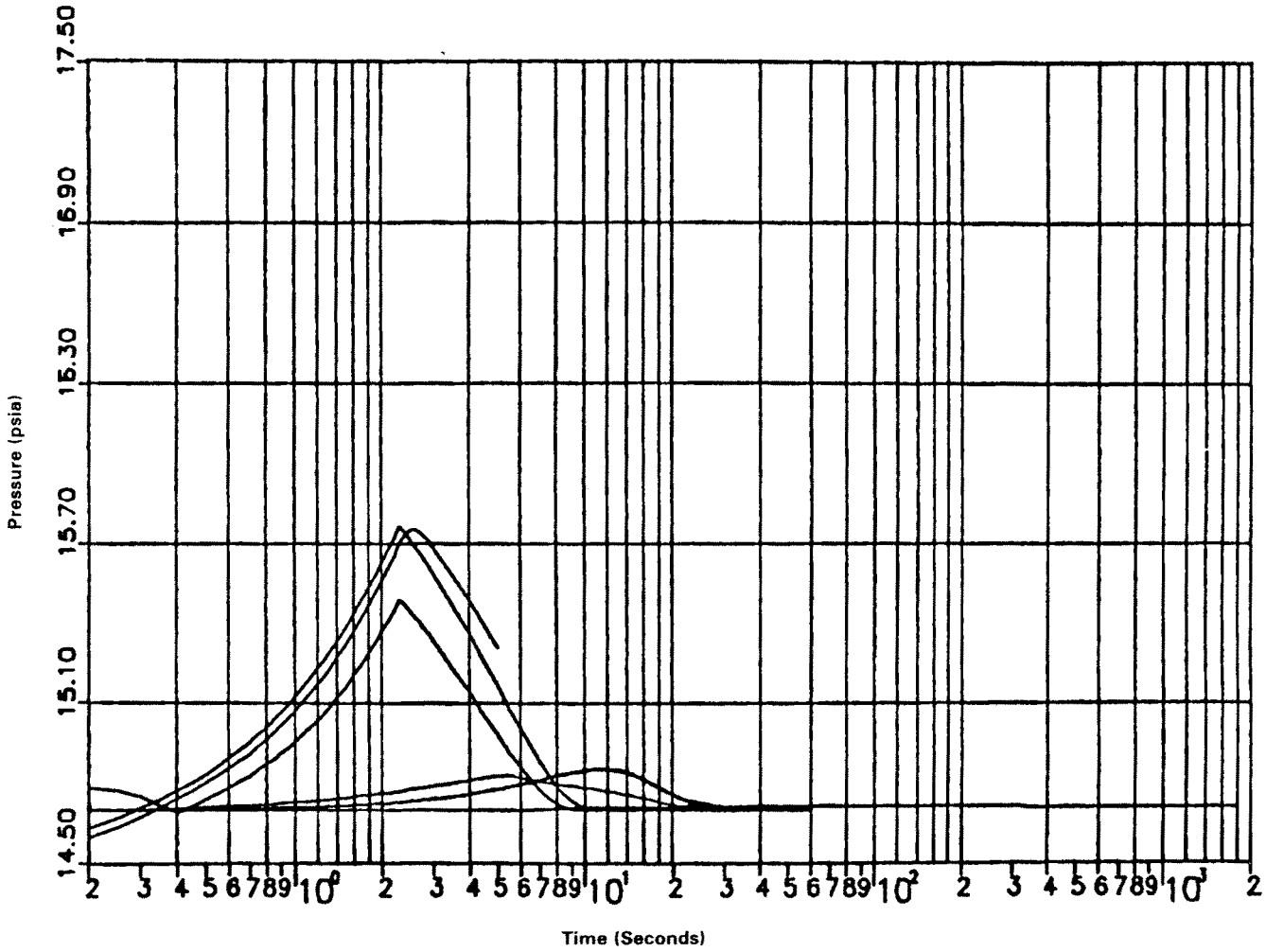
FIGURE 3.11(B)-27

AUXILIARY BUILDING HELB PRESSURE (ROOMS 1107 THROUGH 1114)

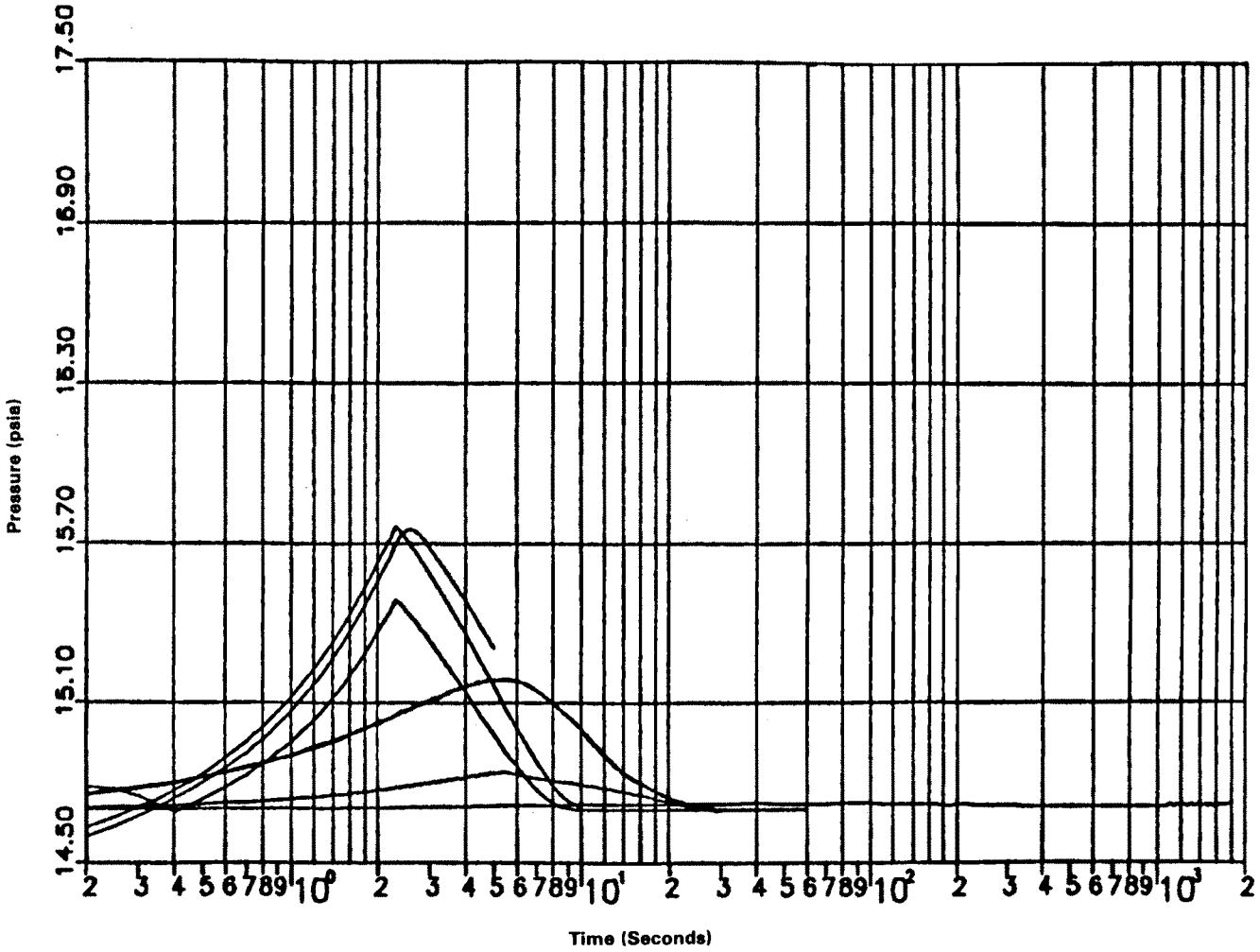
Rev. 9 11/13



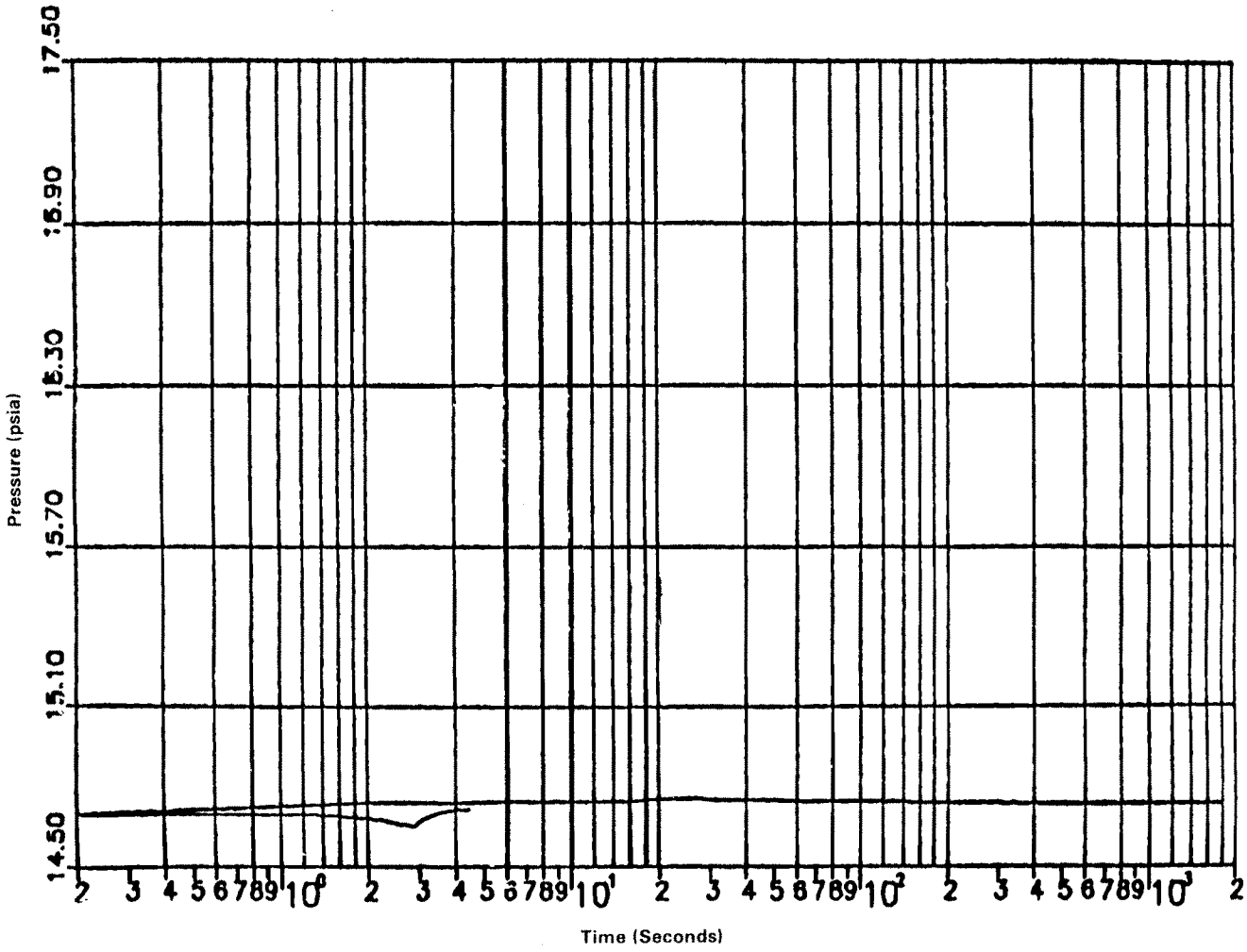
CALLAWAY PLANT
FIGURE 3.11(B)-28 AUXILIARY BUILDING HELB PRESSURE (ROOM 1126) Rev. 9 11/13



CALLAWAY PLANT
FIGURE 3.11(B)-29 AUXILIARY BUILDING HELB PRESSURE (ROOM 1127) Rev. 9 11/13



CALLAWAY PLANT
FIGURE 3.11(B)-30 AUXILIARY BUILDING HELB PRESSURE (ROOMS 1122, 1128, 1129, 1130, 1206, AND 1207) Rev. 9 11/13



Note Curves based on CVCS letdown flowrate of 75 gpm at time of break.

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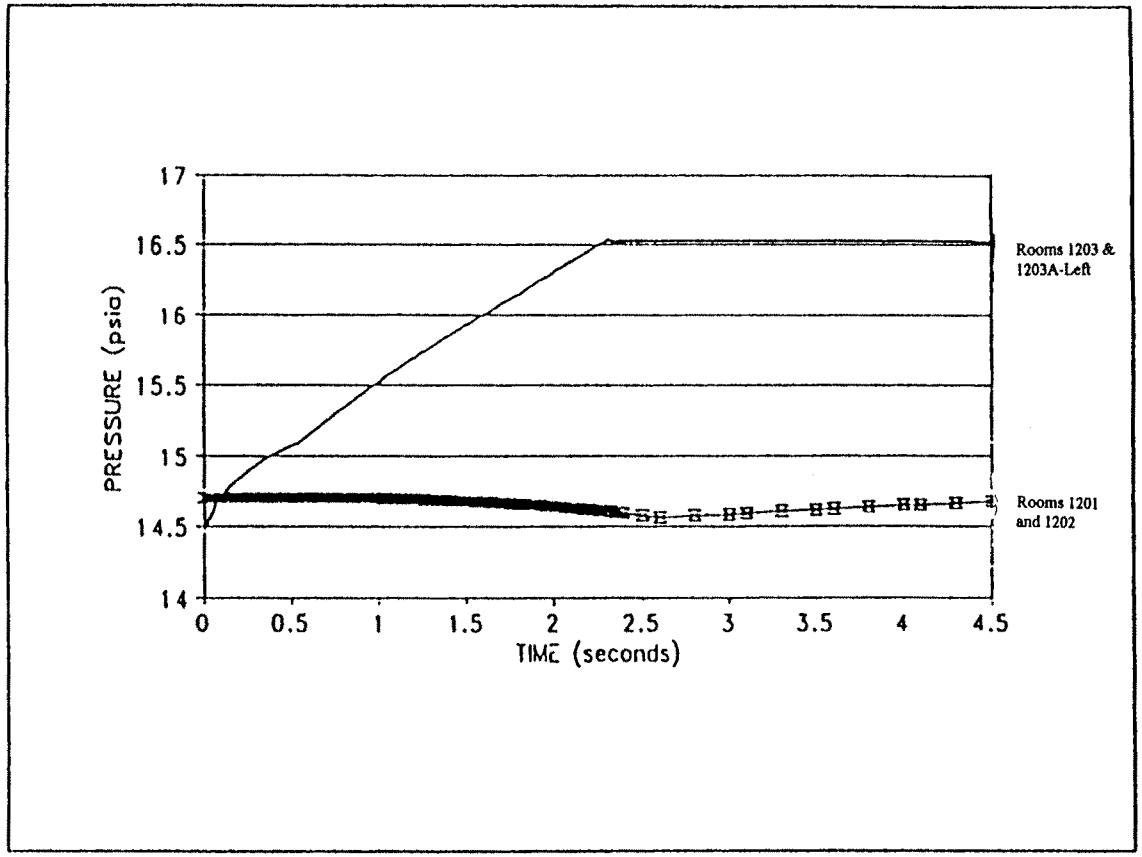
FIGURE 3.11(B)-31
SHEET 1
AUXILIARY BUILDING HELB PRESSURE
(ROOMS 1201 AND 1202)

Rev. 9 11/13



Note: Curves based on CVCS letdown flowrate of 120 gpm at time of break.

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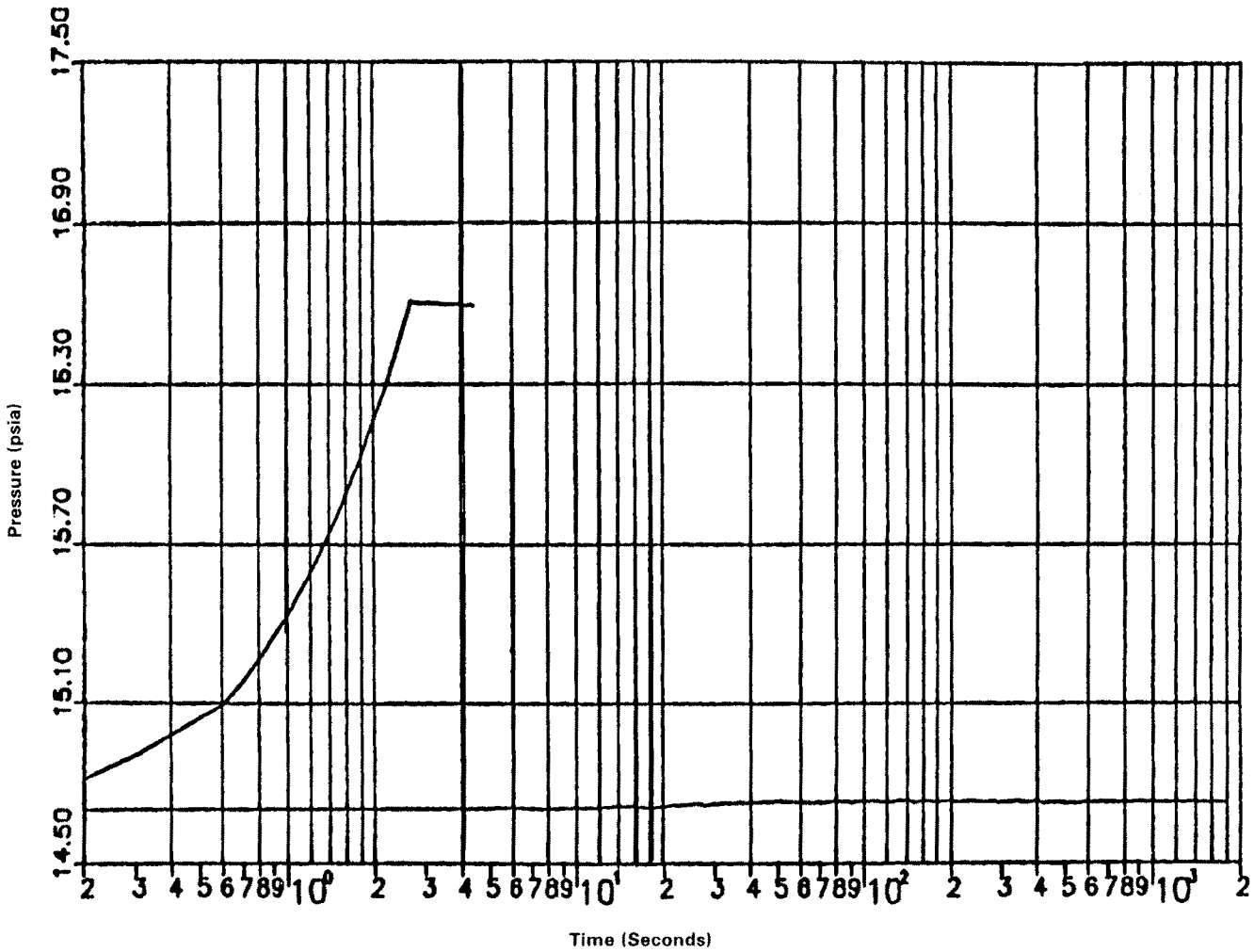
FIGURE 3.11(B)-31
SHEET 2
AUXILIARY BUILDING HELB PRESSURE (ROOMS 1201 AND 1202)

Rev. 9 11/13



Note : Curves based on CVCS letdown flowrate of 75 gpm at time of break.

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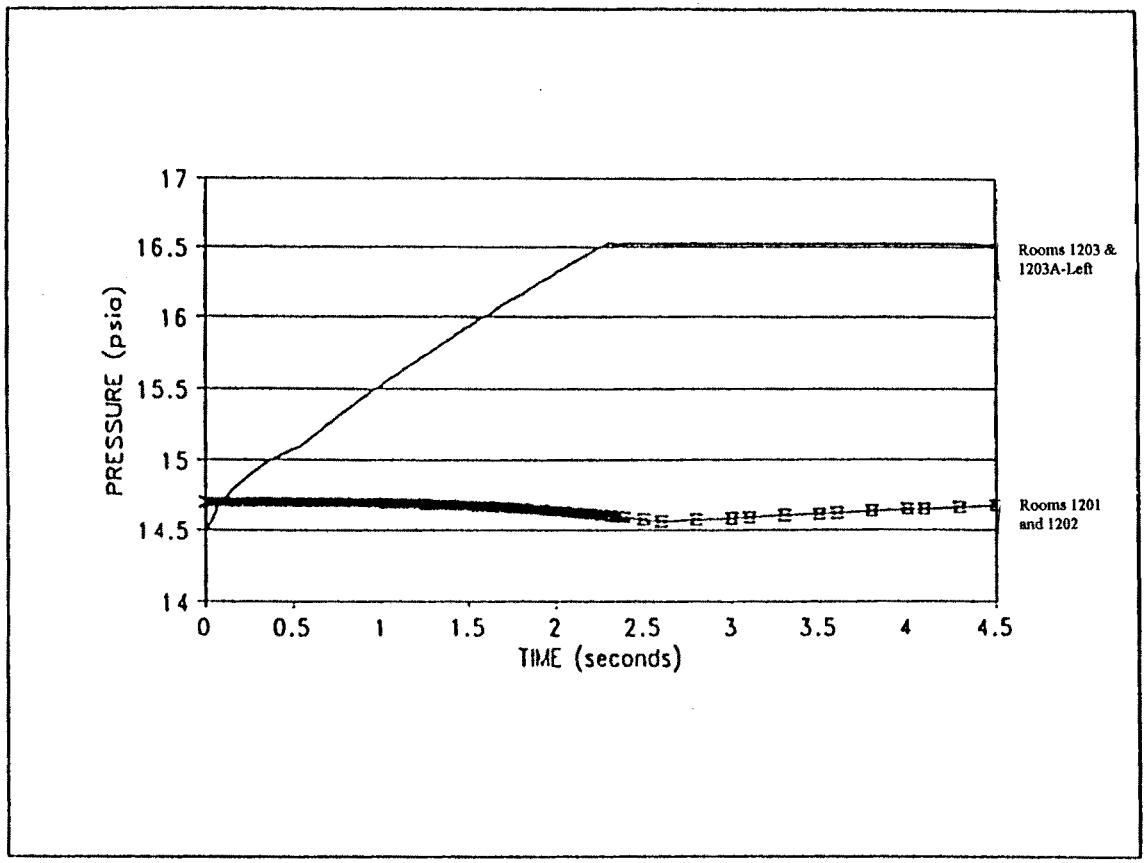
FIGURE 3.11(B)-32
SHEET 1
AUXILIARY BUILDING HELB PRESSURE (ROOM 1203)
Rev. 9 11/13

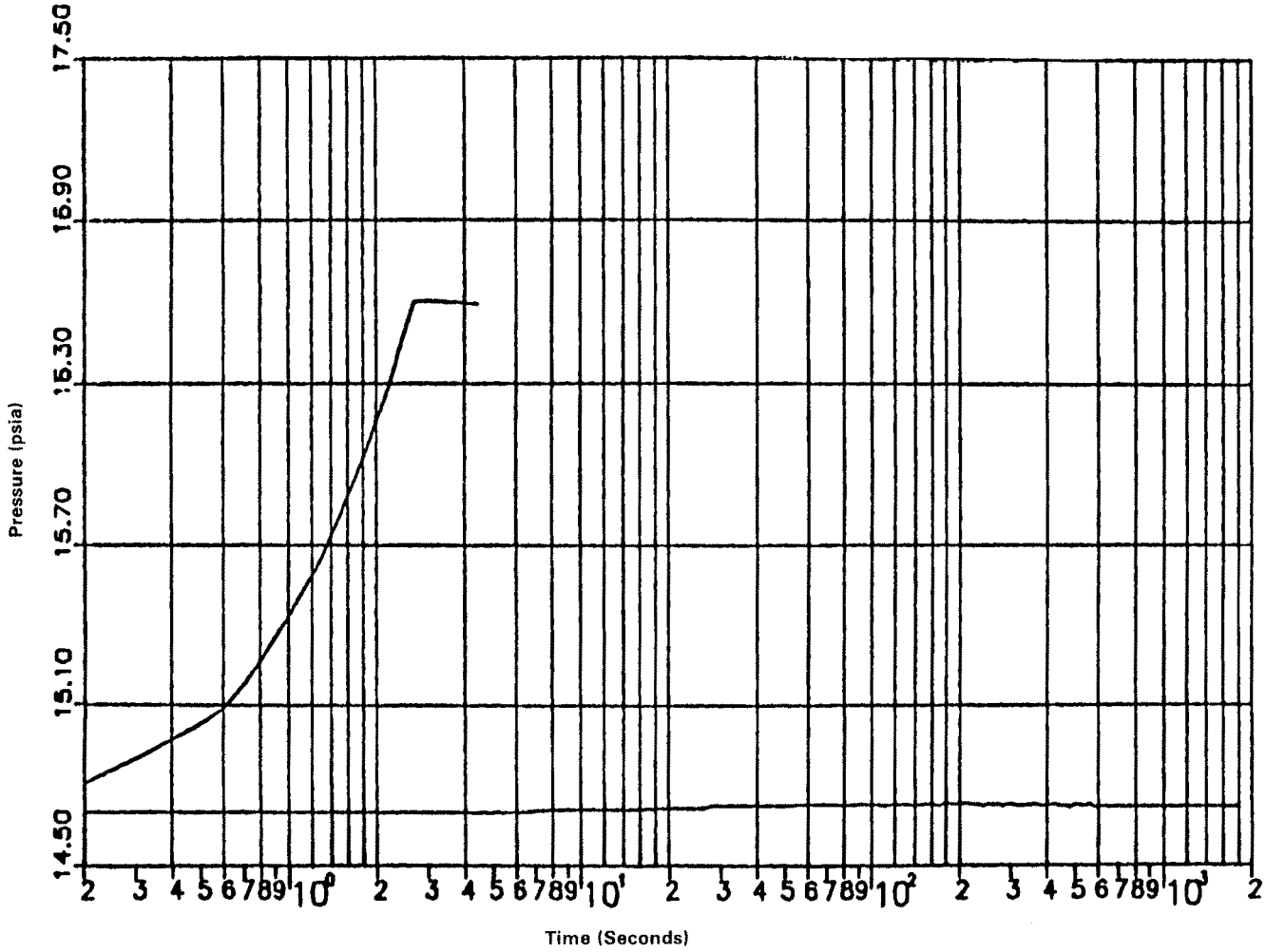


Note: Curves based on CVCS letdown flowrate of 120 gpm at time of break.

CALLAWAY PLANT

FIGURE 3.11(B)-32
SHEET 2
AUXILIARY BUILDING HELB PRESSURE (ROOM 1203)

Rev. 9 11/13



Note : Curves based on CVCS letdown flowrate of 75 gpm at time of break.

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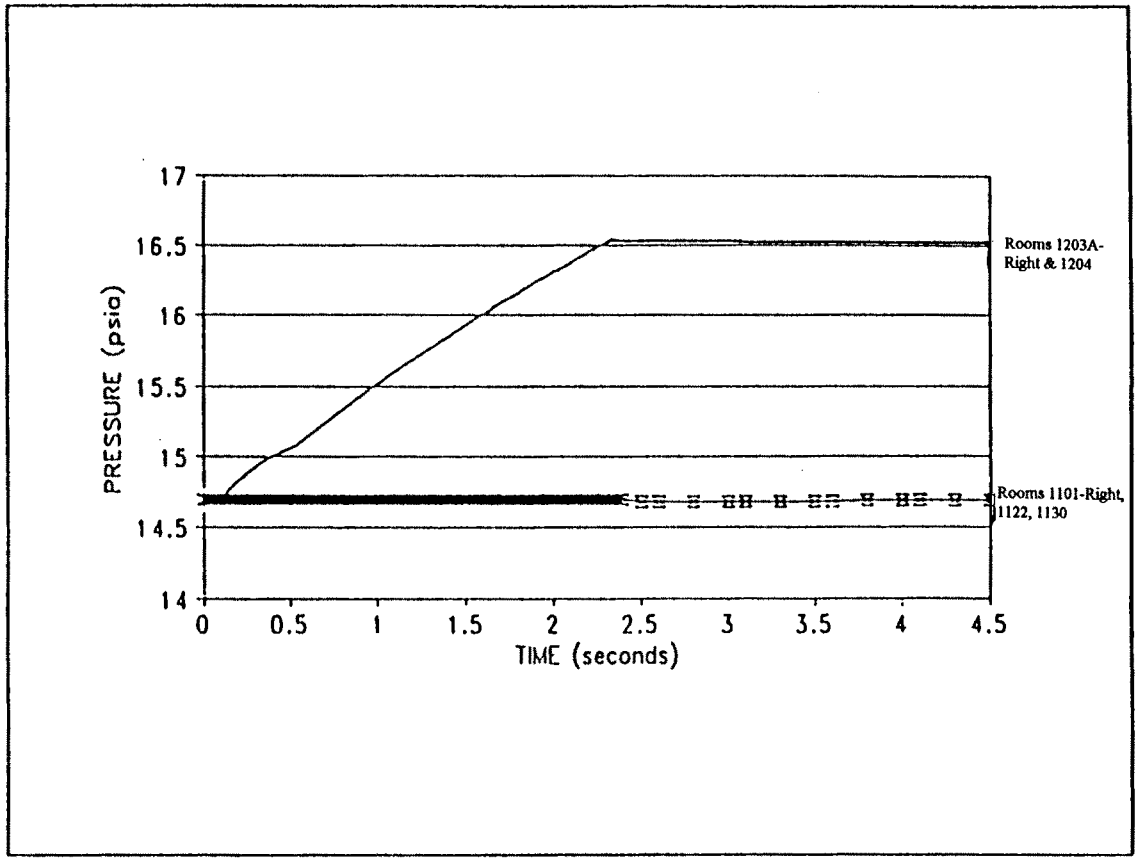
FIGURE 3.11(B)-33
SHEET 1
AUXILIARY BUILDING HELB PRESSURE
(ROOMS 1203A AND 1204)

Rev. 9 11/13



Note: Curves based on CVCS letdown flowrate of 120 gpm at time of break.

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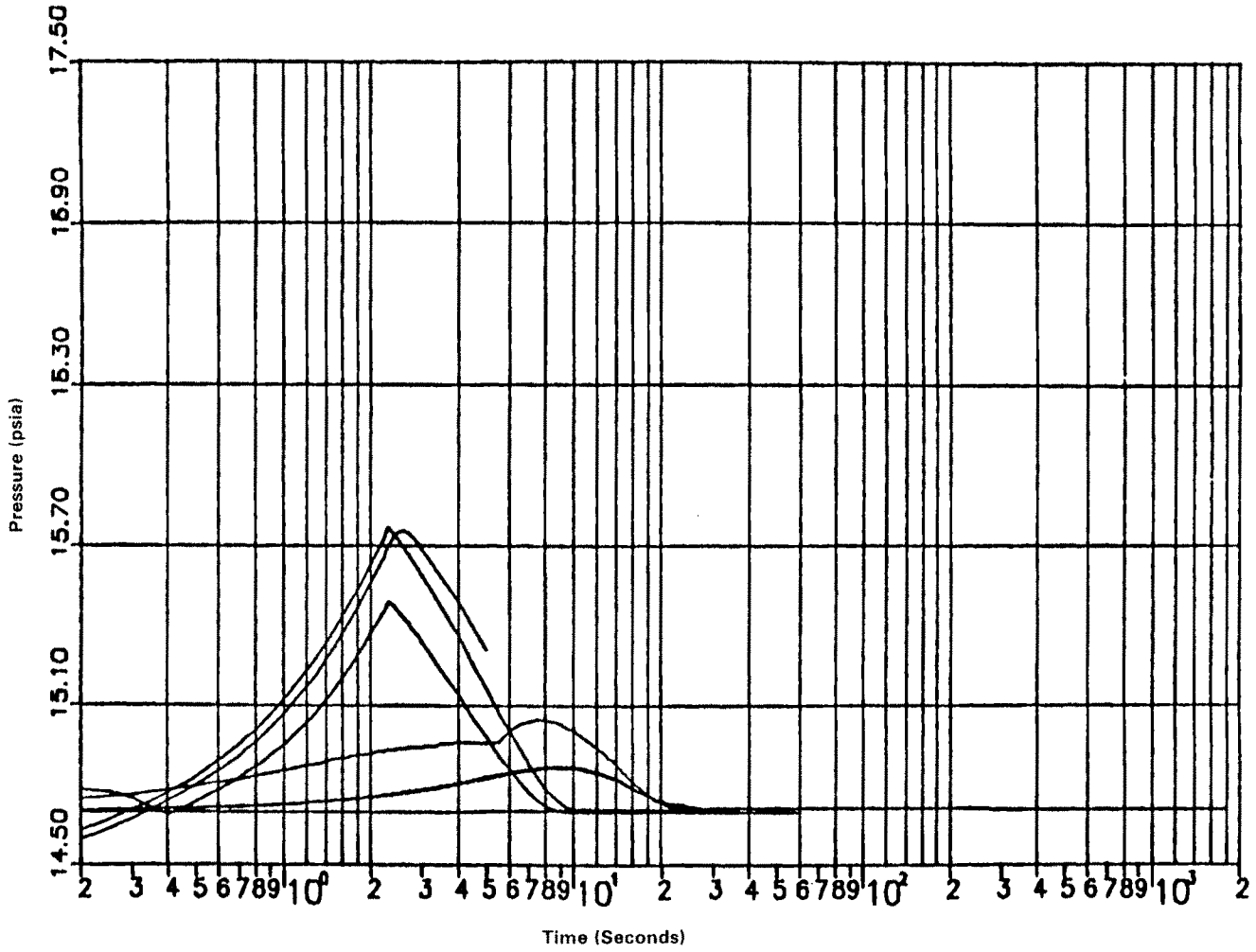
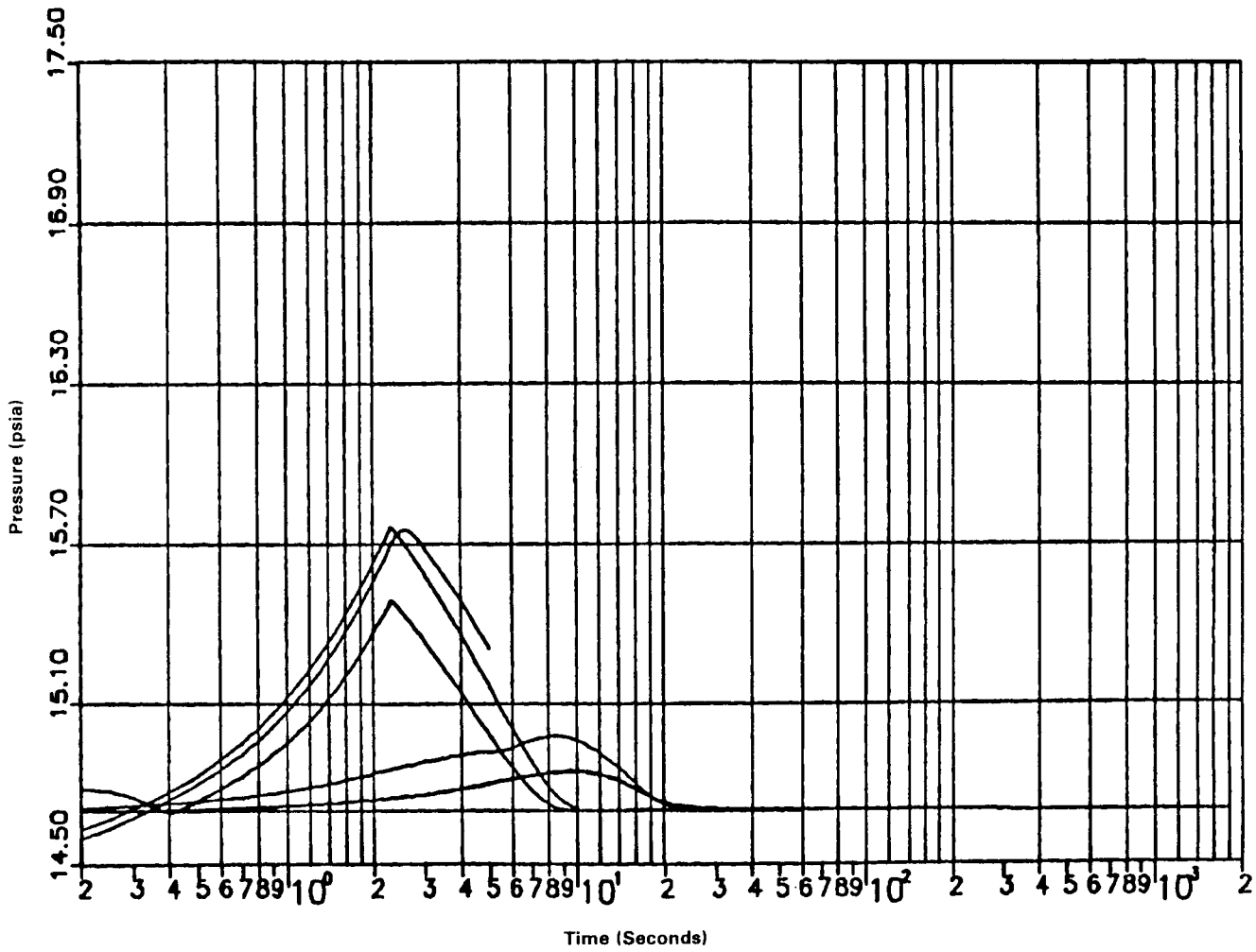
FIGURE 3.11(B)-33
SHEET 2
AUXILIARY BUILDING HELB PRESSURE (ROOMS 1203A AND 1204)

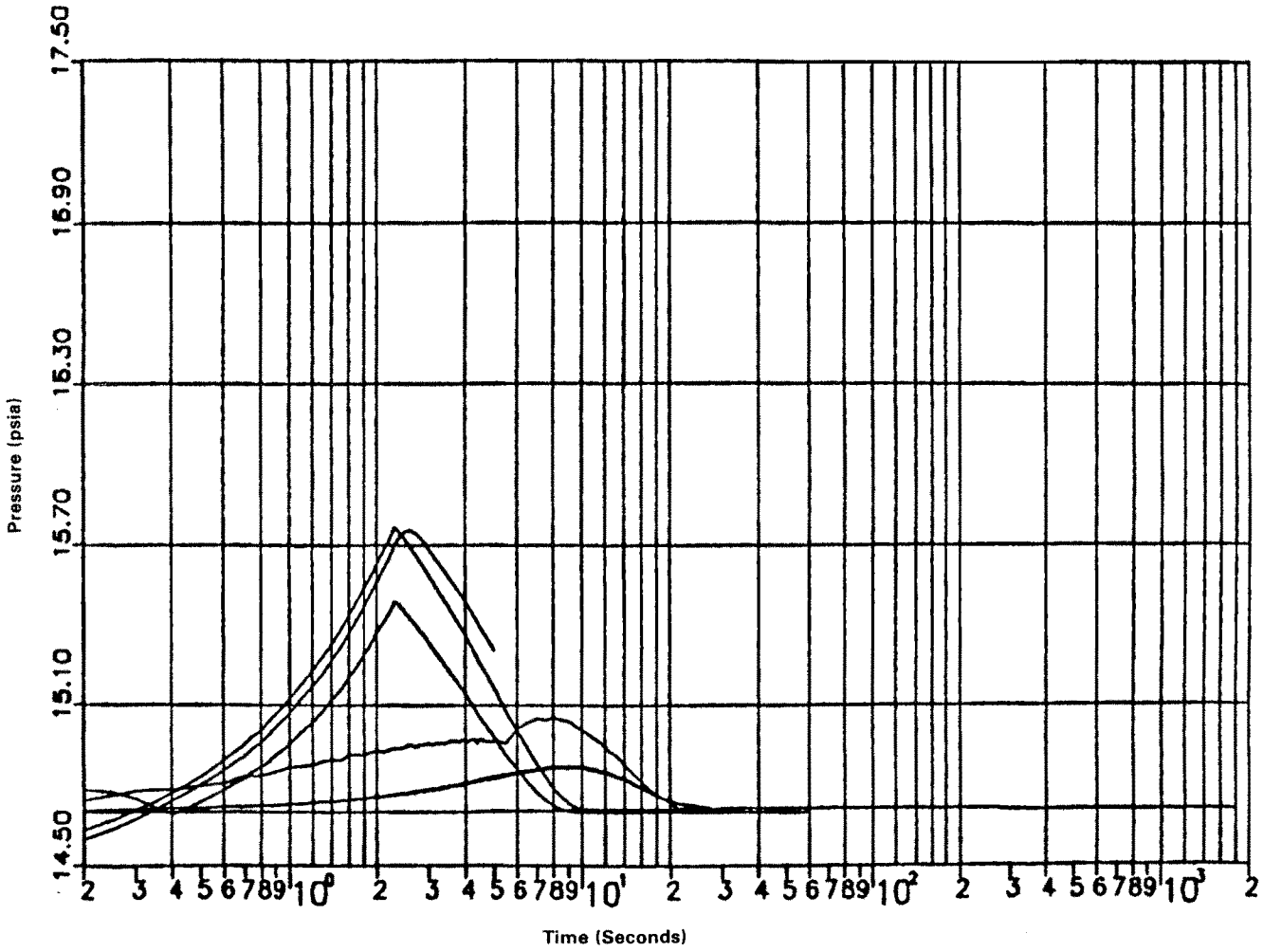
Rev. 9 11/13



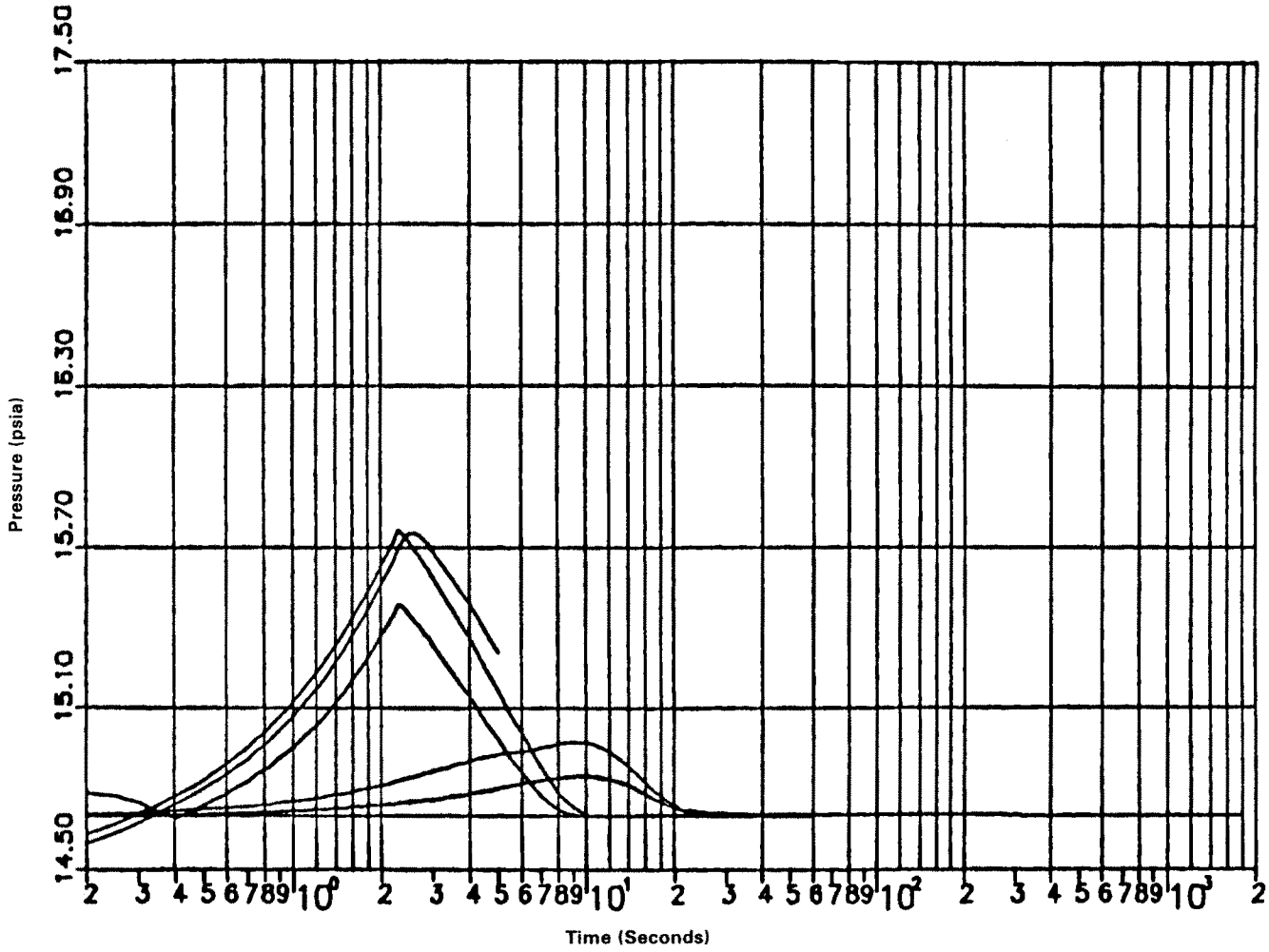
CALLAWAY PLANT
FIGURE 3.11(B)-34 AUXILIARY BUILDING HELB PRESSURE (ROOM 1301) Rev. 9 11/13



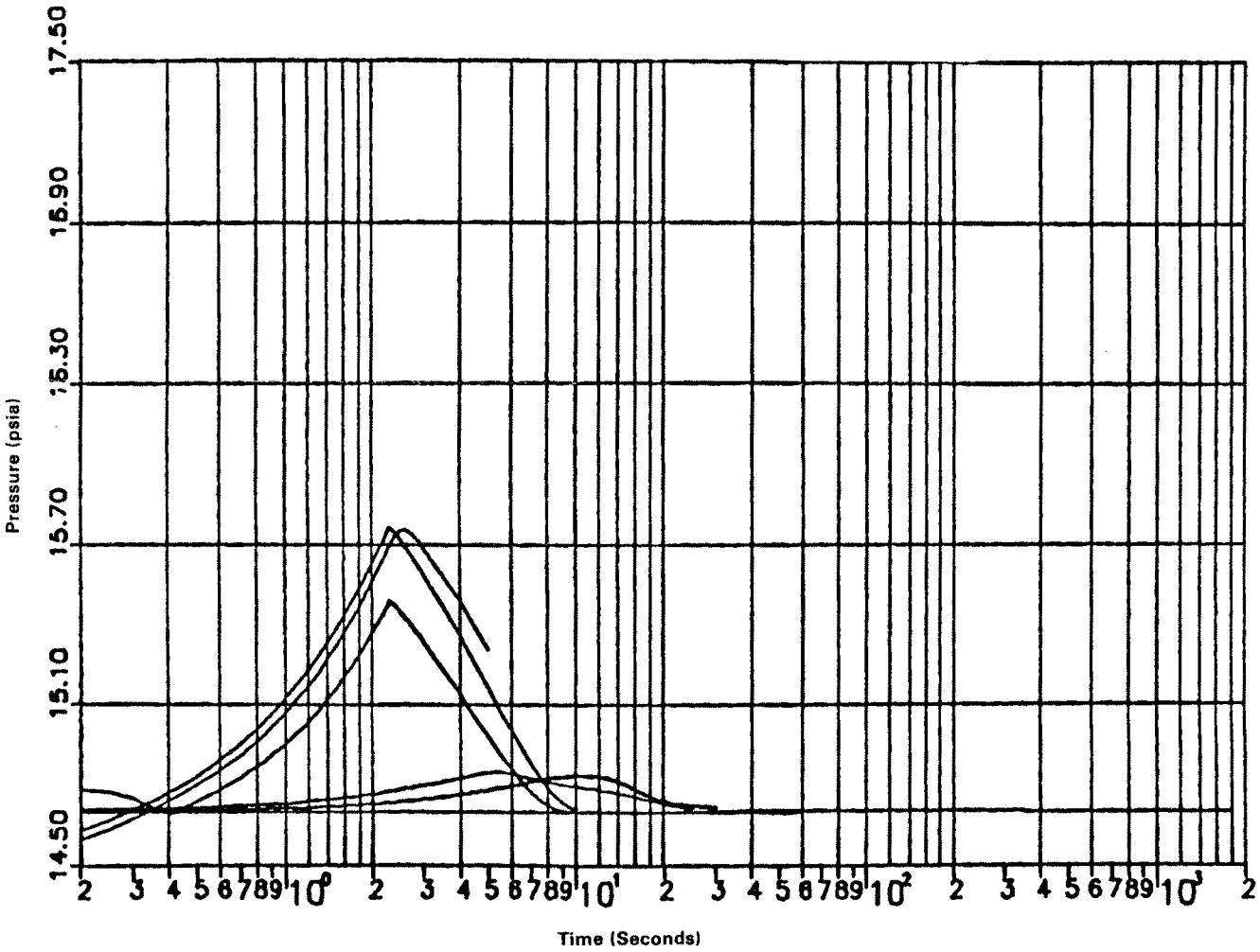
CALLAWAY PLANT
FIGURE 3.11(B)-35 AUXILIARY BUILDING HELB PRESSURE (ROOMS 1302, 1306, 1307 THROUGH 1312, 1316, AND 1317) Rev. 9 11/13



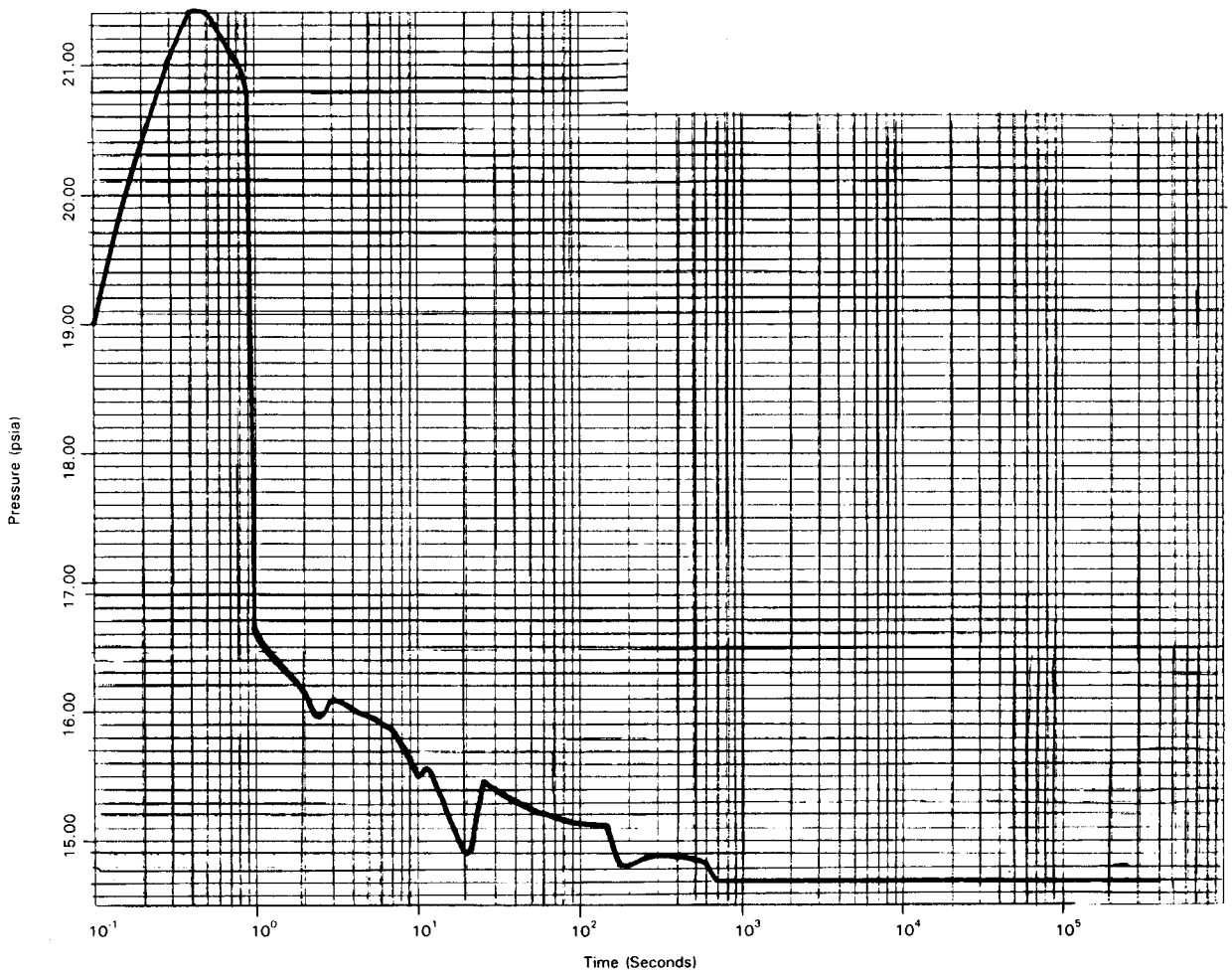
CALLAWAY PLANT
FIGURE 3.11(B)-36 AUXILIARY BUILDING HELB PRESSURE (ROOMS 1314, 1315, AND 1320) Rev. 9 11/13



CALLAWAY PLANT
FIGURE 3.11(B)-37 AUXILIARY BUILDING HELB PRESSURE (ROOMS 1322 AND 1323) Rev. 9 11/13



CALLAWAY PLANT
FIGURE 3.11(B)-38 AUXILIARY BUILDING HELB PRESSURE (ROOMS 1401, 1402, 1405 THROUGH 1410, 1502, 1507, AND 1513) Rev. 9 11/13

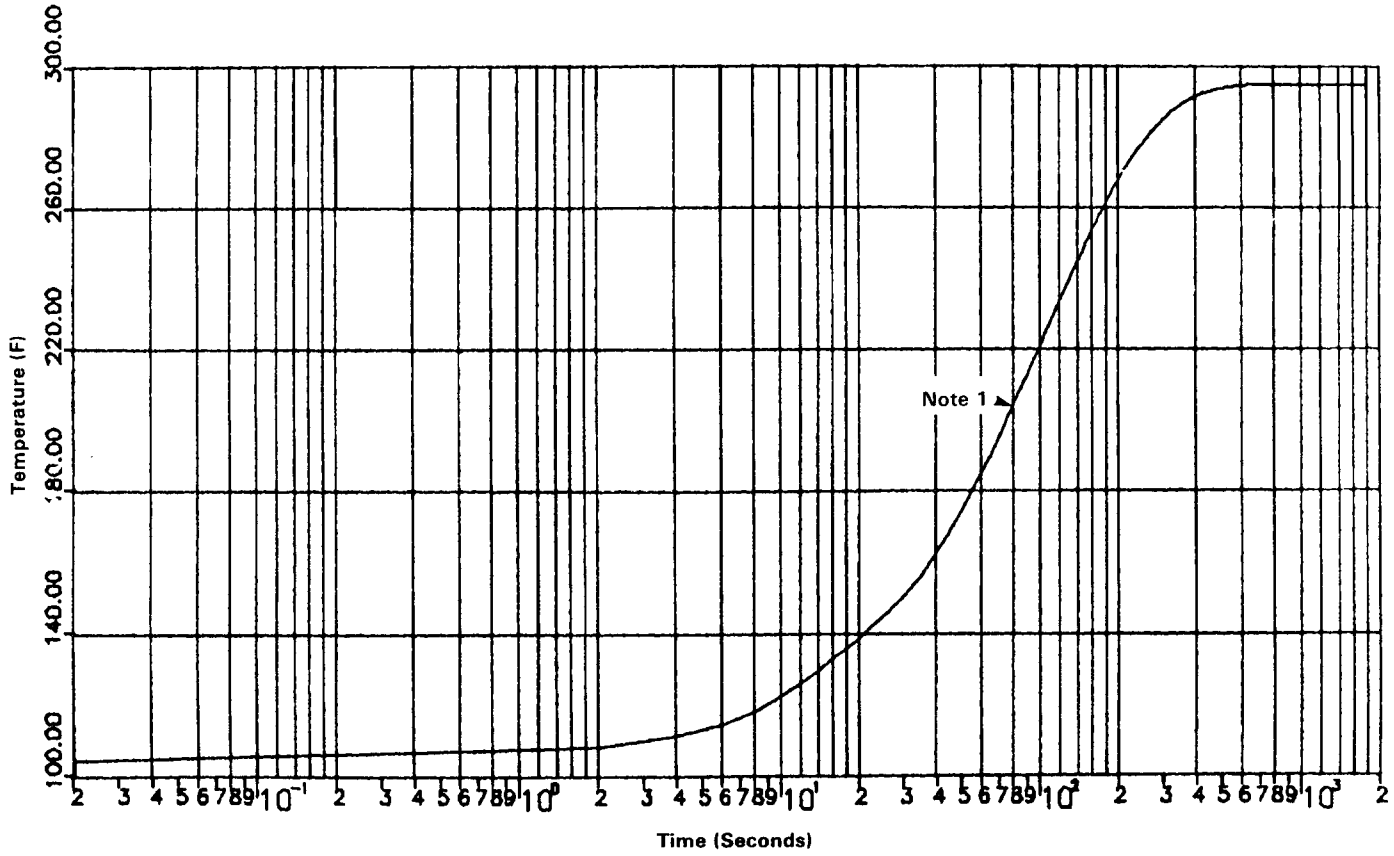


CALLAWAY PLANT

FIGURE 3.11(B)-39

AUXILIARY BUILDING MSLB PRESSURE (ROOMS 1411, 1412, 1508, AND 1509)

REV. 1 11/10



Note 1: Based on finalized values, this curve no longer applies but may have been used in performing detailed equipment qualification. As elimination of this curve results in a decrease in qualification requirements, equipment qualification documentation is conservative and may not have been revised.

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FIGURE 3.11(B)-40

AUXILIARY BUILDING HELB TEMPERATURE (ROOM 1321)

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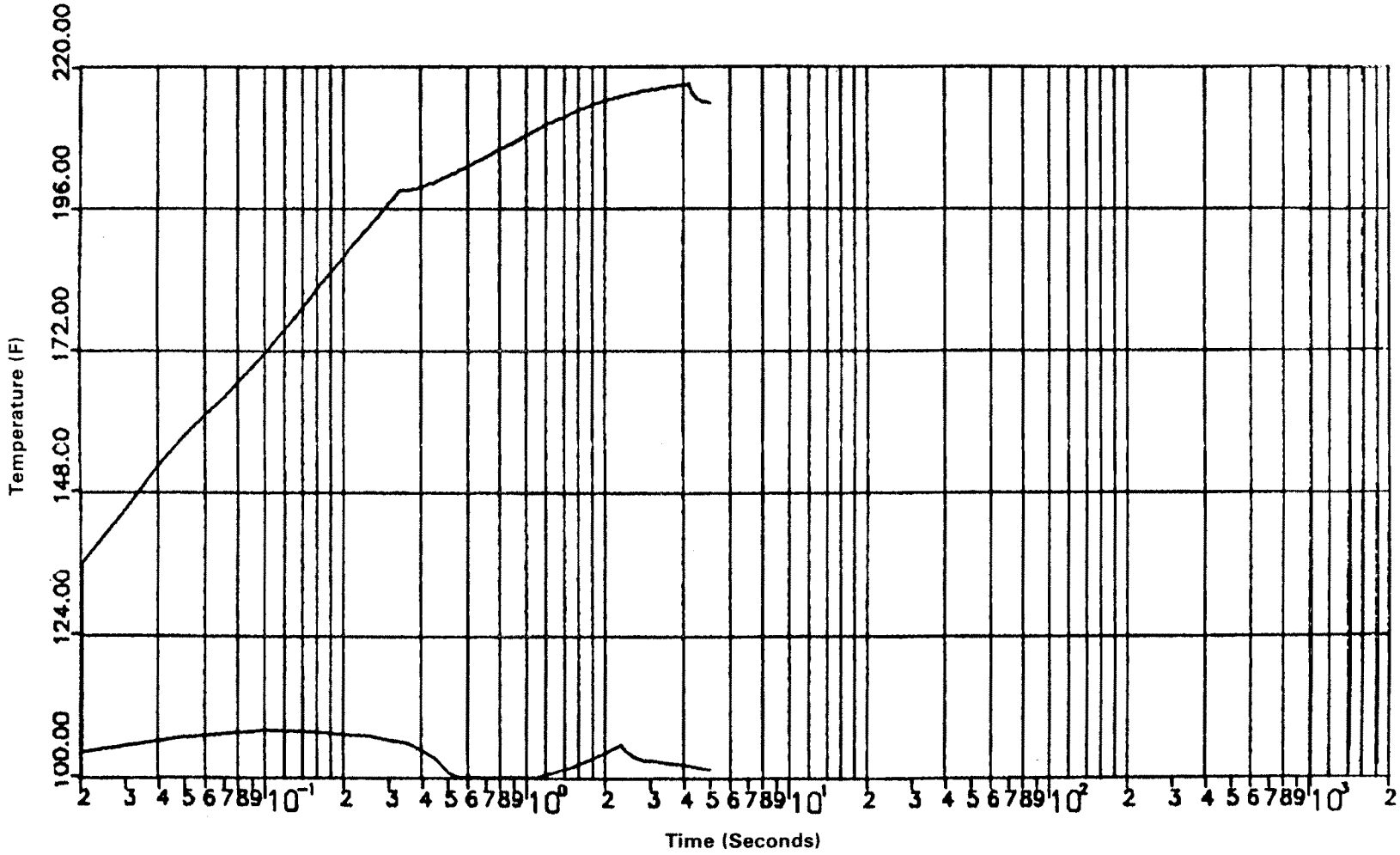
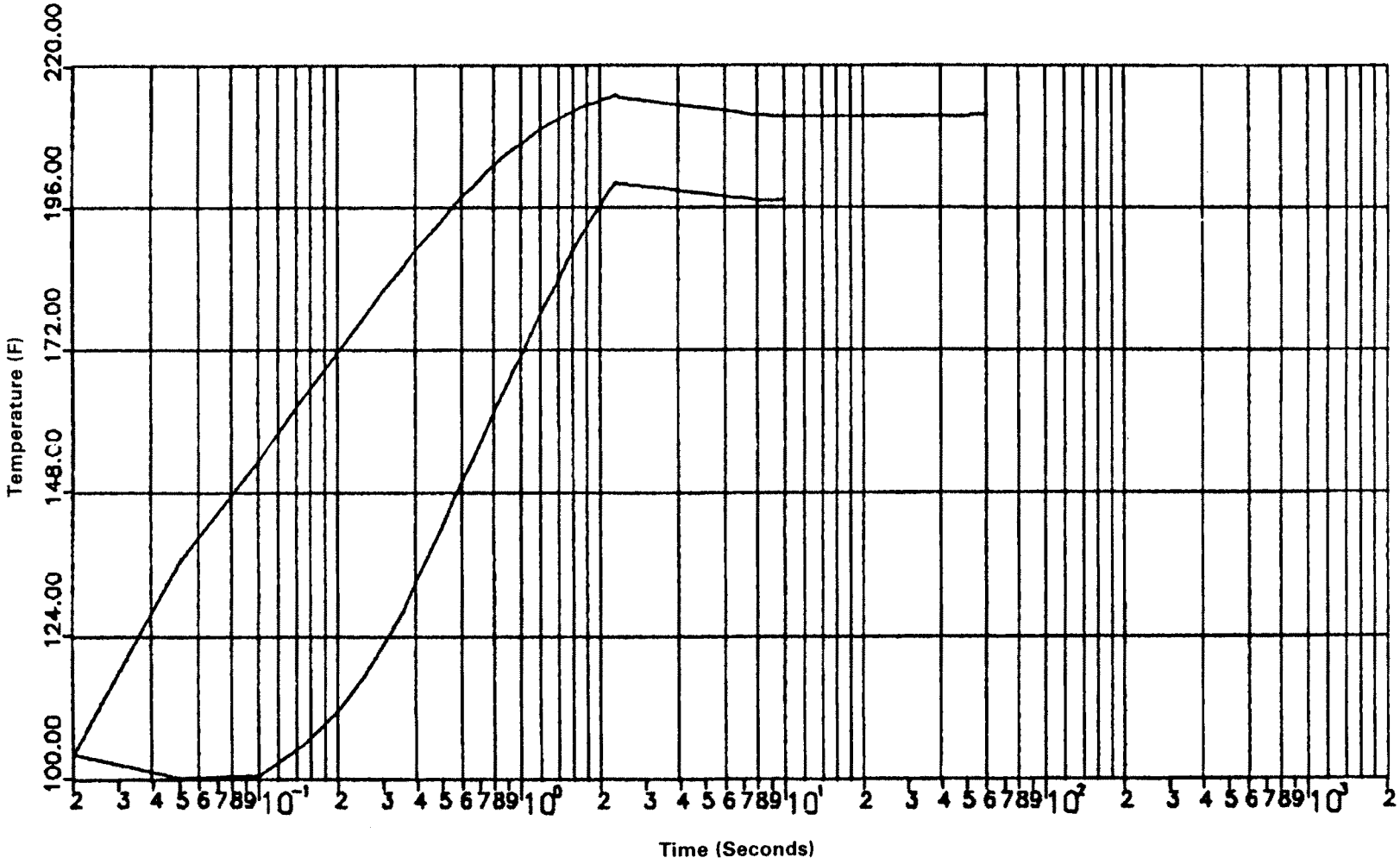
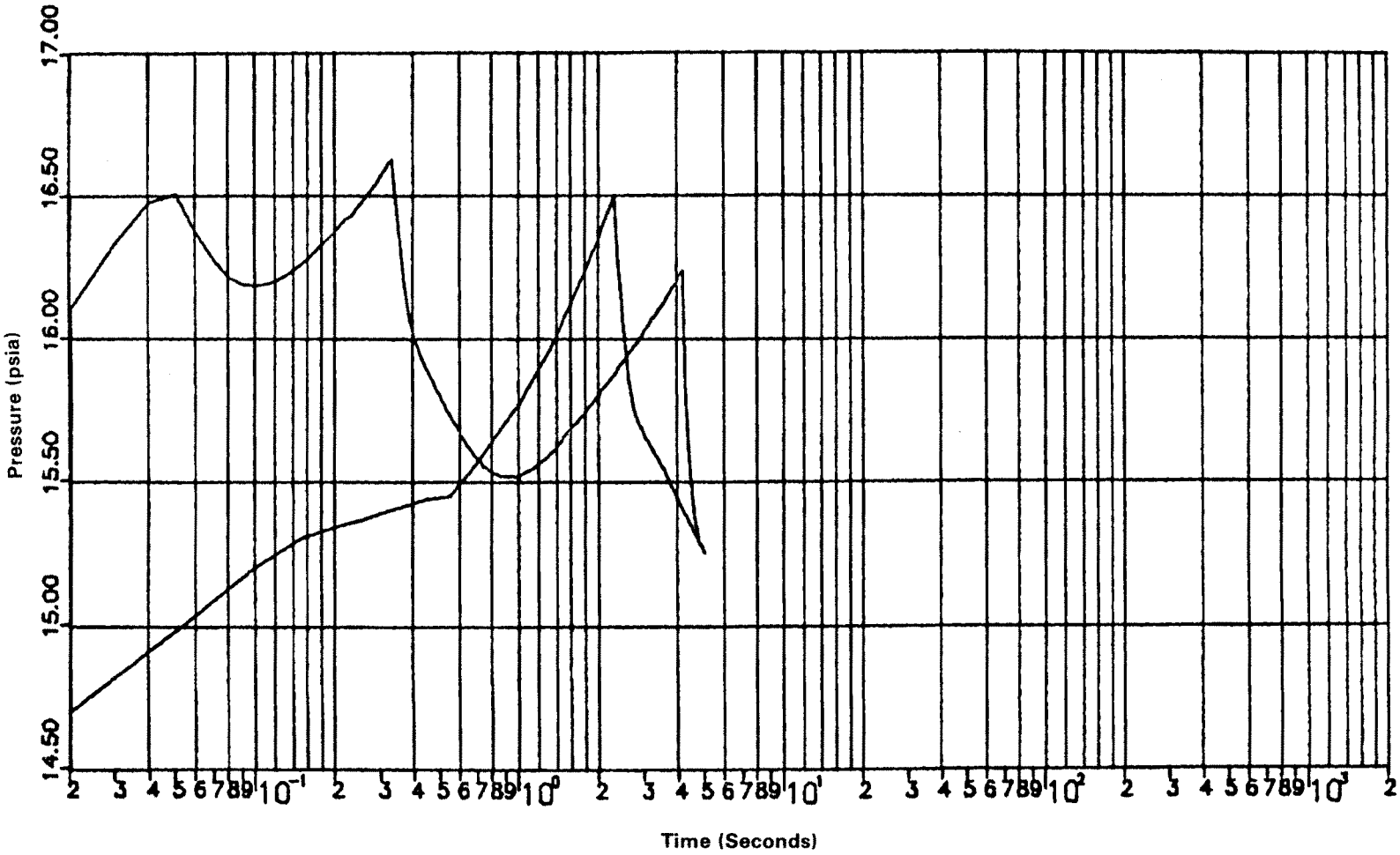


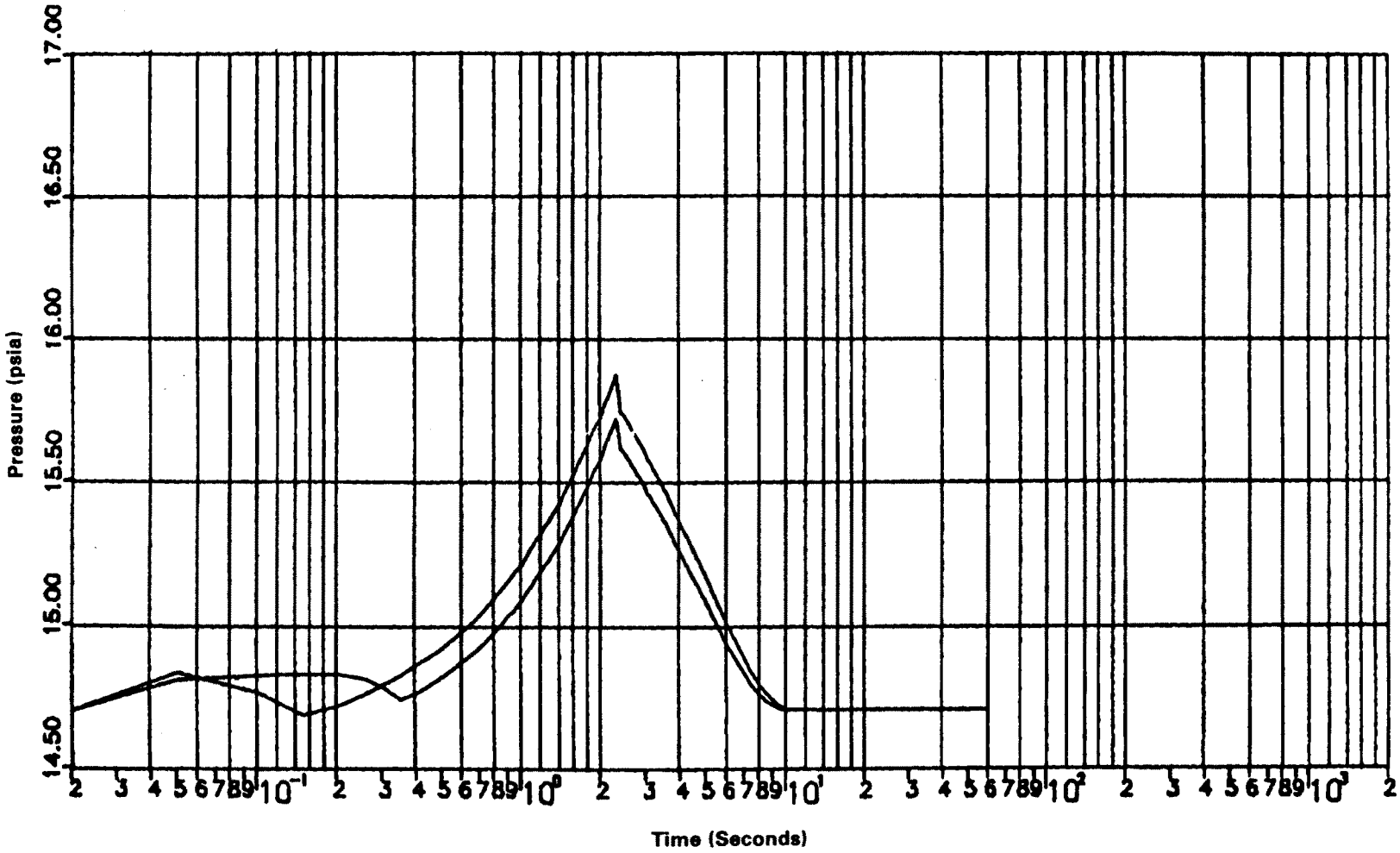
CALLAWAY PLANT
FIGURE 3.11(B)-41 AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1103 THROUGH 1106) Rev. 2 11/13



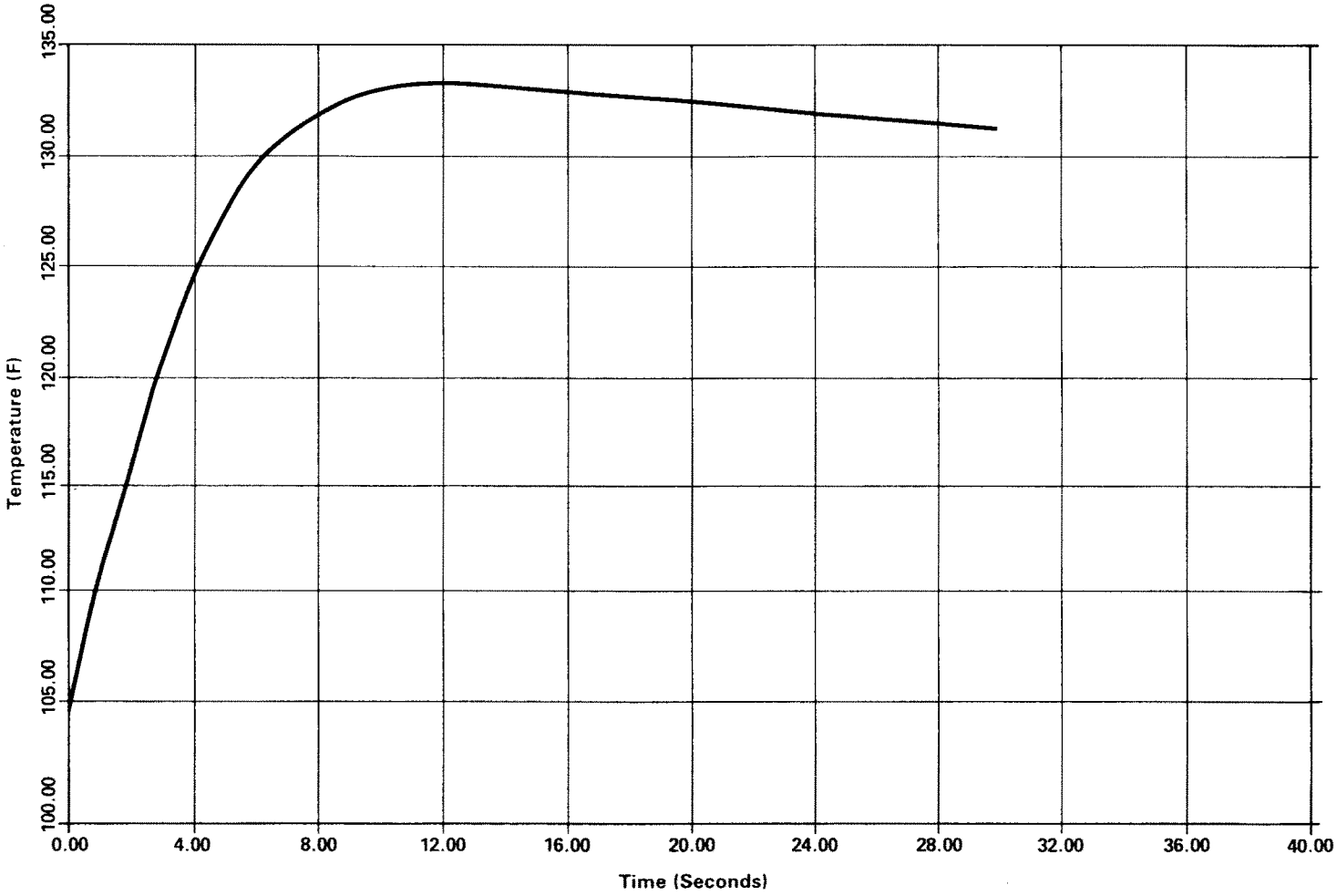
CALLAWAY PLANT
FIGURE 3.11(B)-42 AUXILIARY BUILDING HELB TEMPERATURE (ROOMS 1123 THROUGH 1125) Rev. 2 11/13



CALLAWAY PLANT
FIGURE 3.11(B)-43 AUXILIARY BUILDING HELB PRESSURE (ROOMS 1103 THROUGH 1106) Rev. 2 11/13



CALLAWAY PLANT
FIGURE 3.11(B)-44 AUXILIARY BUILDING HELB PRESSURE (ROOMS 1123 THROUGH 1125) Rev. 2 11/13



CALLAWAY PLANT

FIGURE 3.11(B)-45

AUXILIARY BUILDING HELB TEMPERATURE (ROOM 1205)

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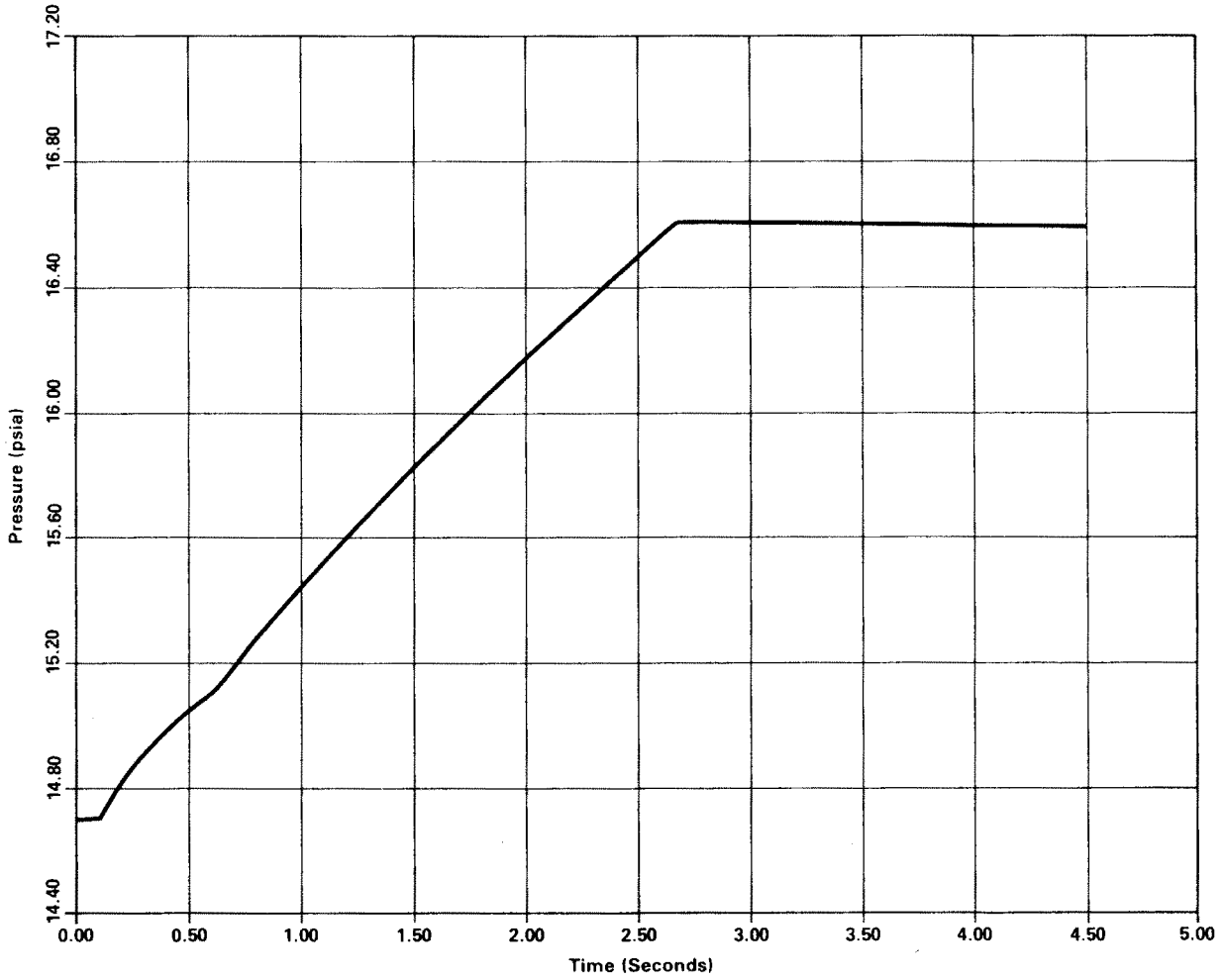

CALLAWAY PLANT

FIGURE 3.11(B)-46

AUXILIARY BUILDING HELB PRESSURE (ROOM 1205)

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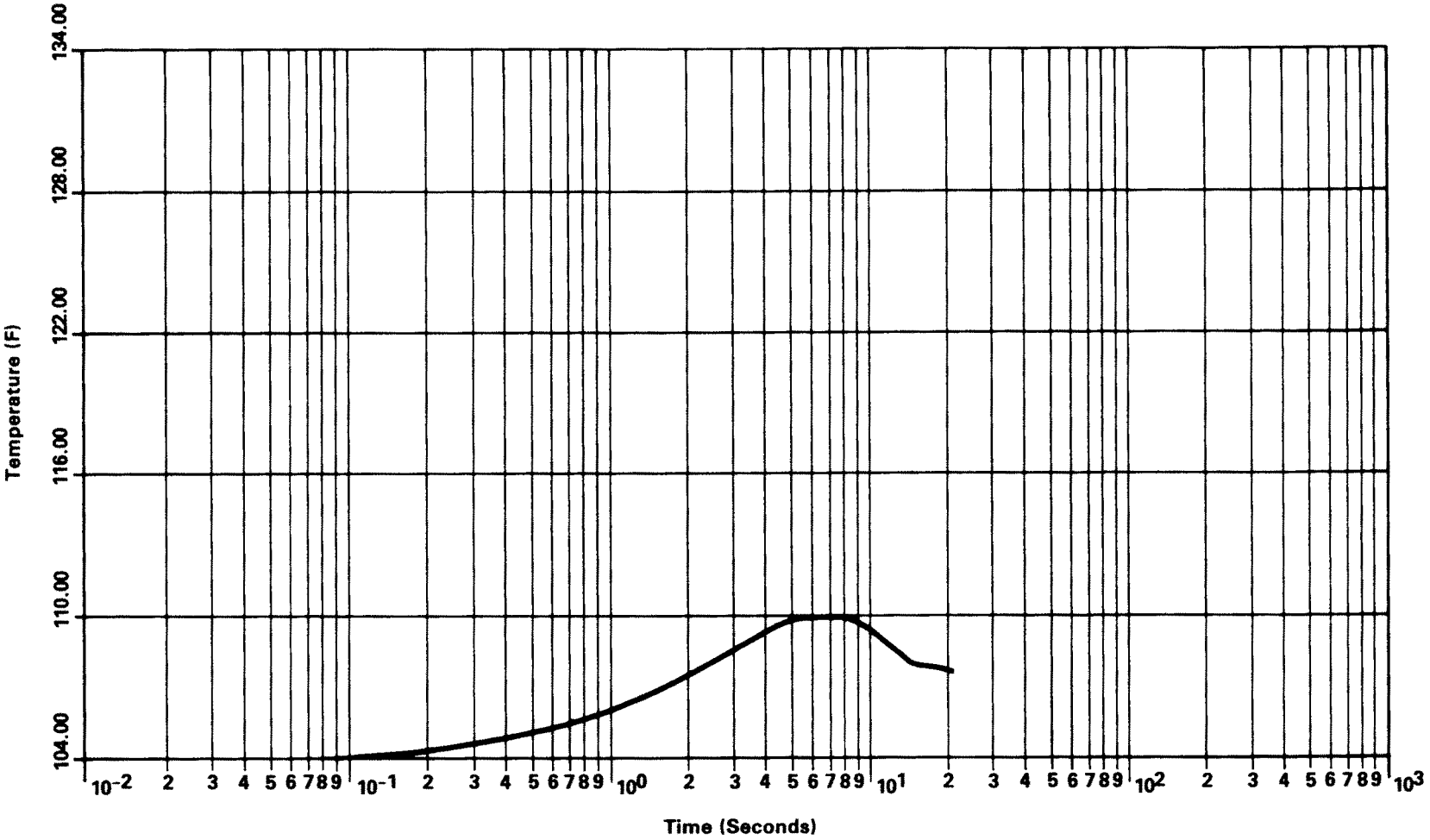
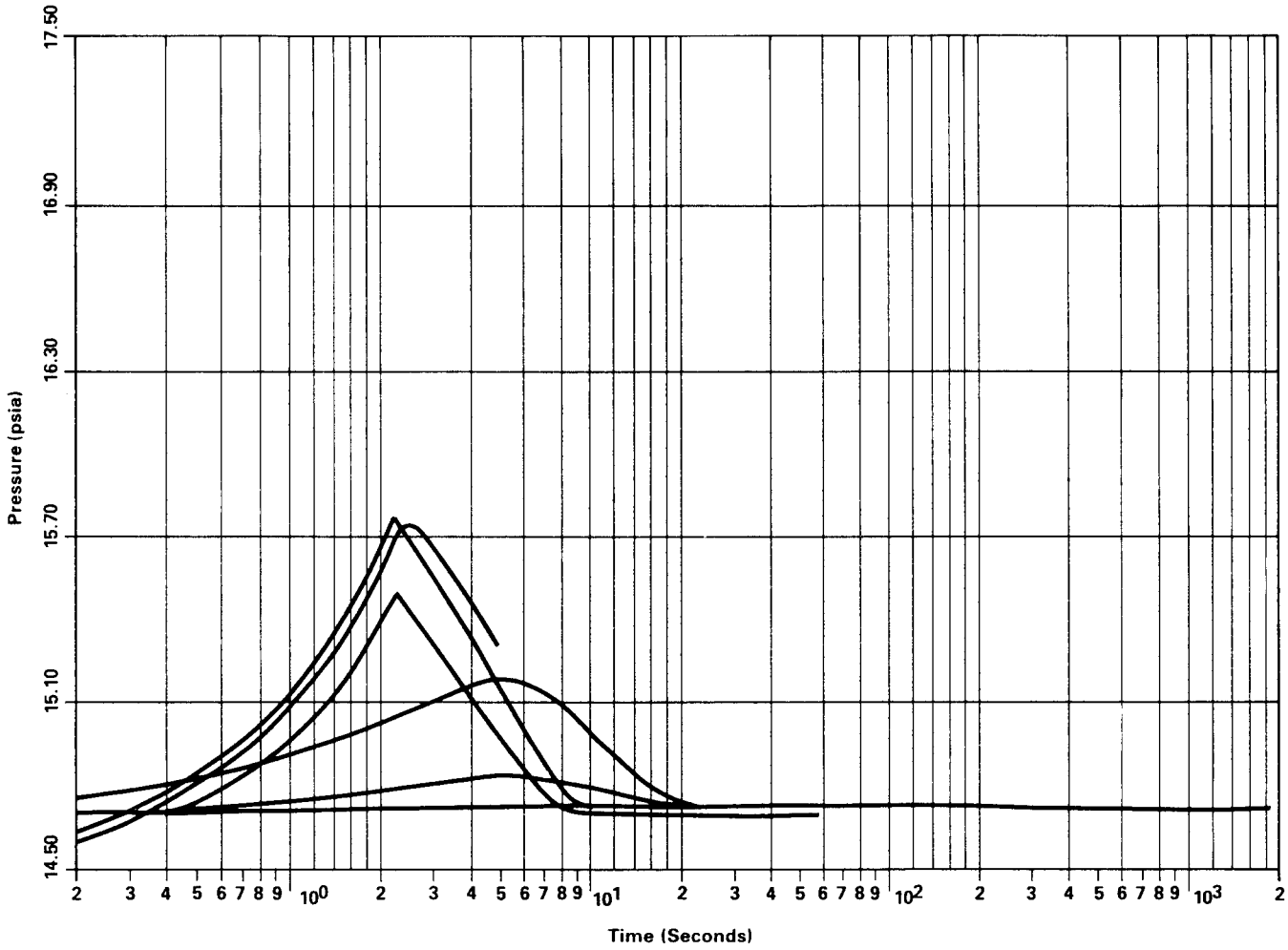


CALLAWAY PLANT

FIGURE 3.11(B)-47

AUXILIARY BUILDING HELB TEMPERATURE (ROOM 1329)

Rev. 2 11/13



CALLAWAY PLANT

FIGURE 3.11(B)-48

AUXILIARY BUILDING HELB PRESSURE (ROOM 1329)

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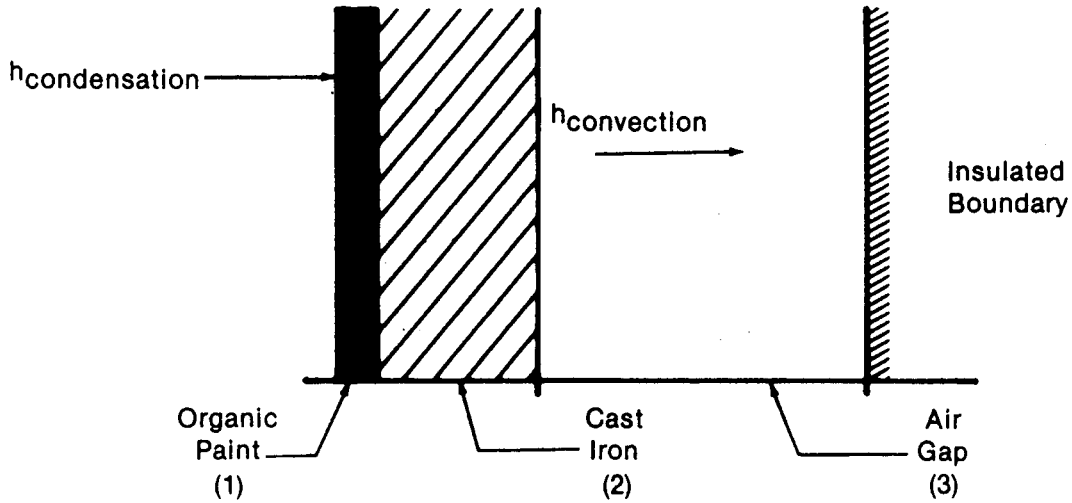
SLAB GEOMETRY (1-D)



Region	Material	Thickness (ft)	No. of Nodes	Thermal Properties K (Btu/hr-ft-°F)	ρCp (Btu/ft³-°F)
(1)	Organic Paint	.0005 (.006 in)	6	1.0	20.0
(2)	Cast Iron	.01092 (.131 in)	5	25.0	53.0
(3)	Air Gap	.0234 (.2808 in)	2	.017	.0145

Equiv. Dia = 2.83 ft
Surface Area = 8 ft²

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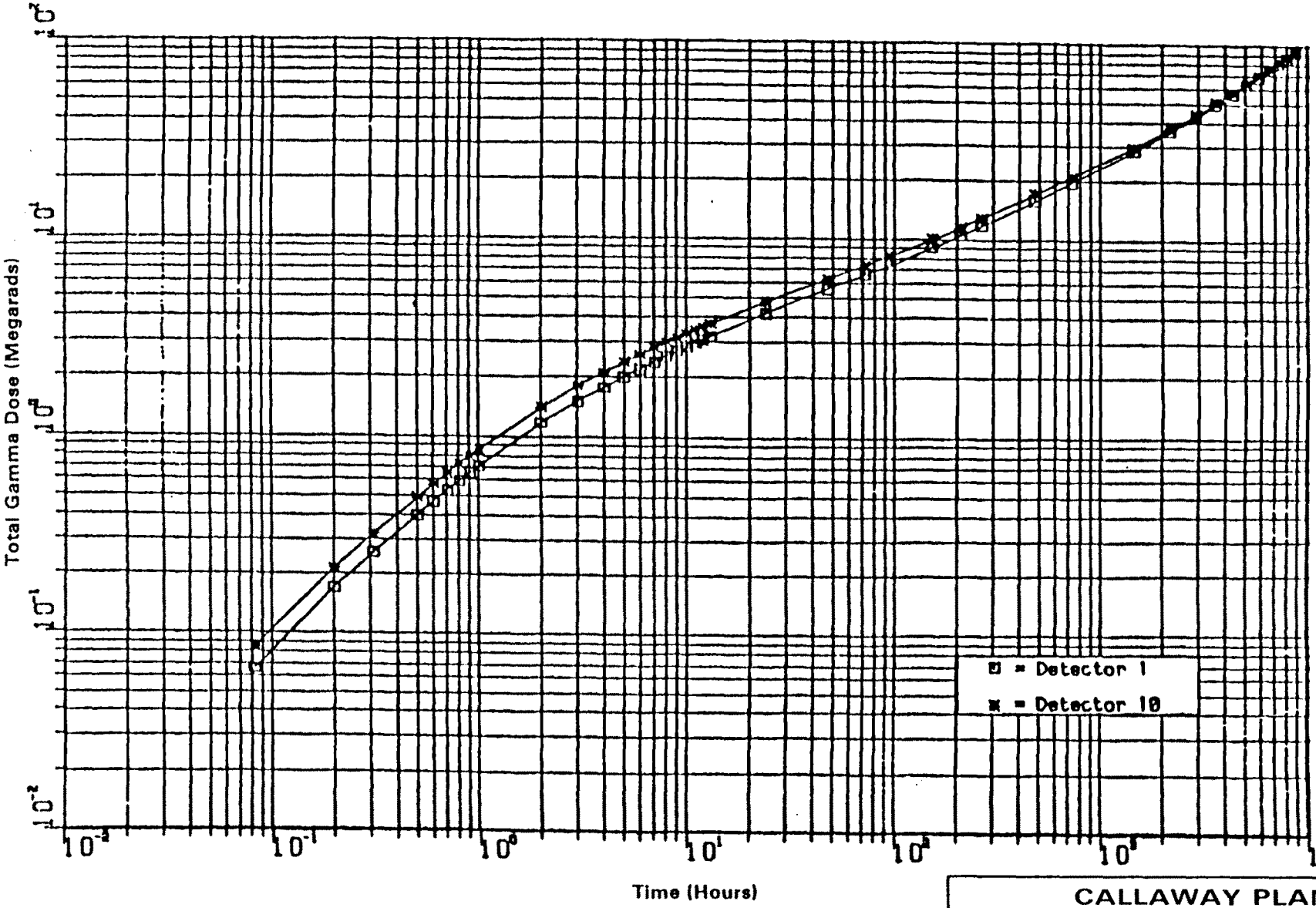
FIGURE 3.11(B)-49

TYPICAL THERMAL MODEL FOR ENVIRONMENTAL QUALIFICATION



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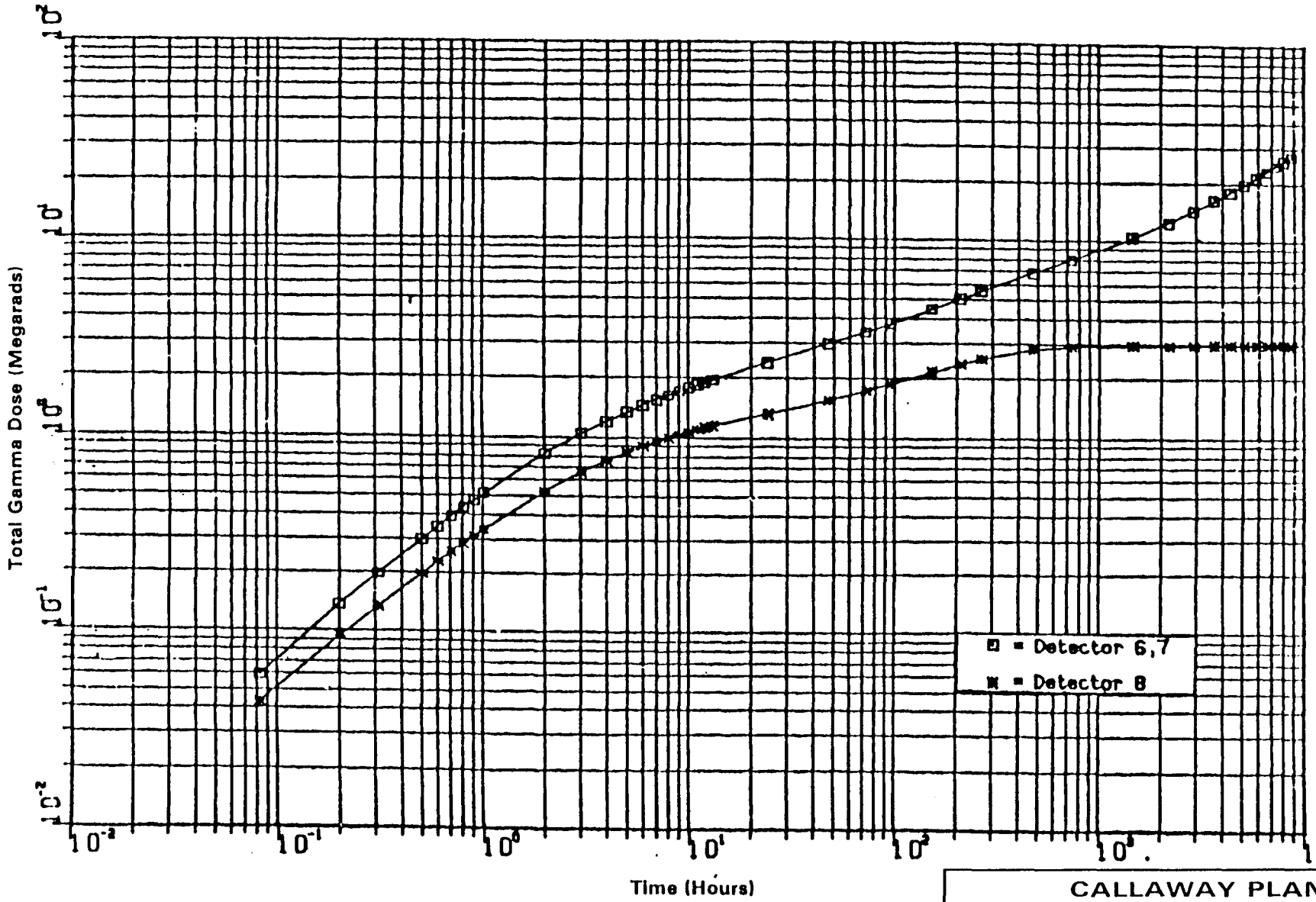
CALLAWAY PLANT
FIGURE 3.11(B)-50 GAMMA DOSE 50% Cs DETECTORS 1 & 10



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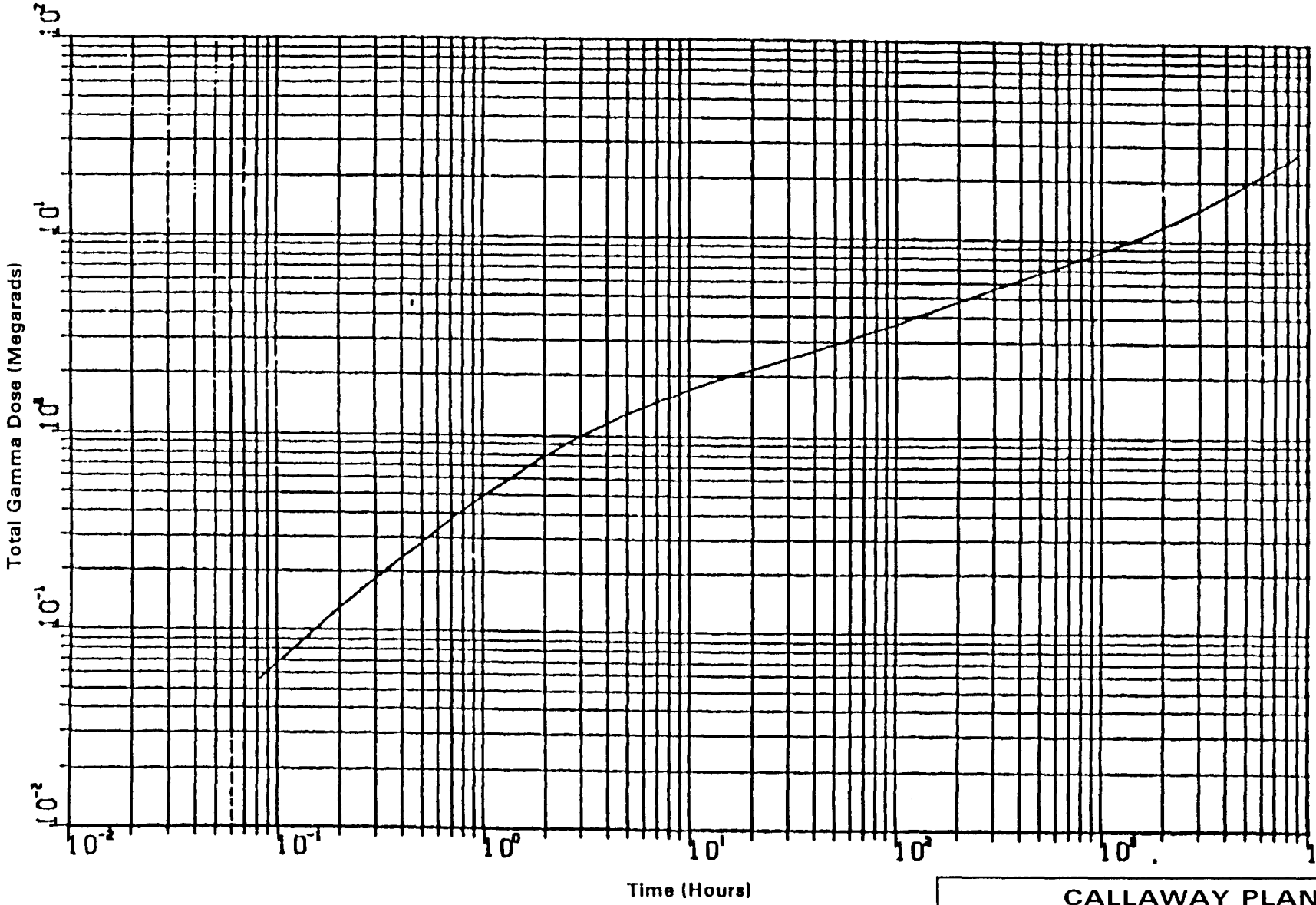
CALLAWAY PLANT
FIGURE 3.11(B)-51 GAMMA DOSE 50% Cs DETECTORS 6,7& 8



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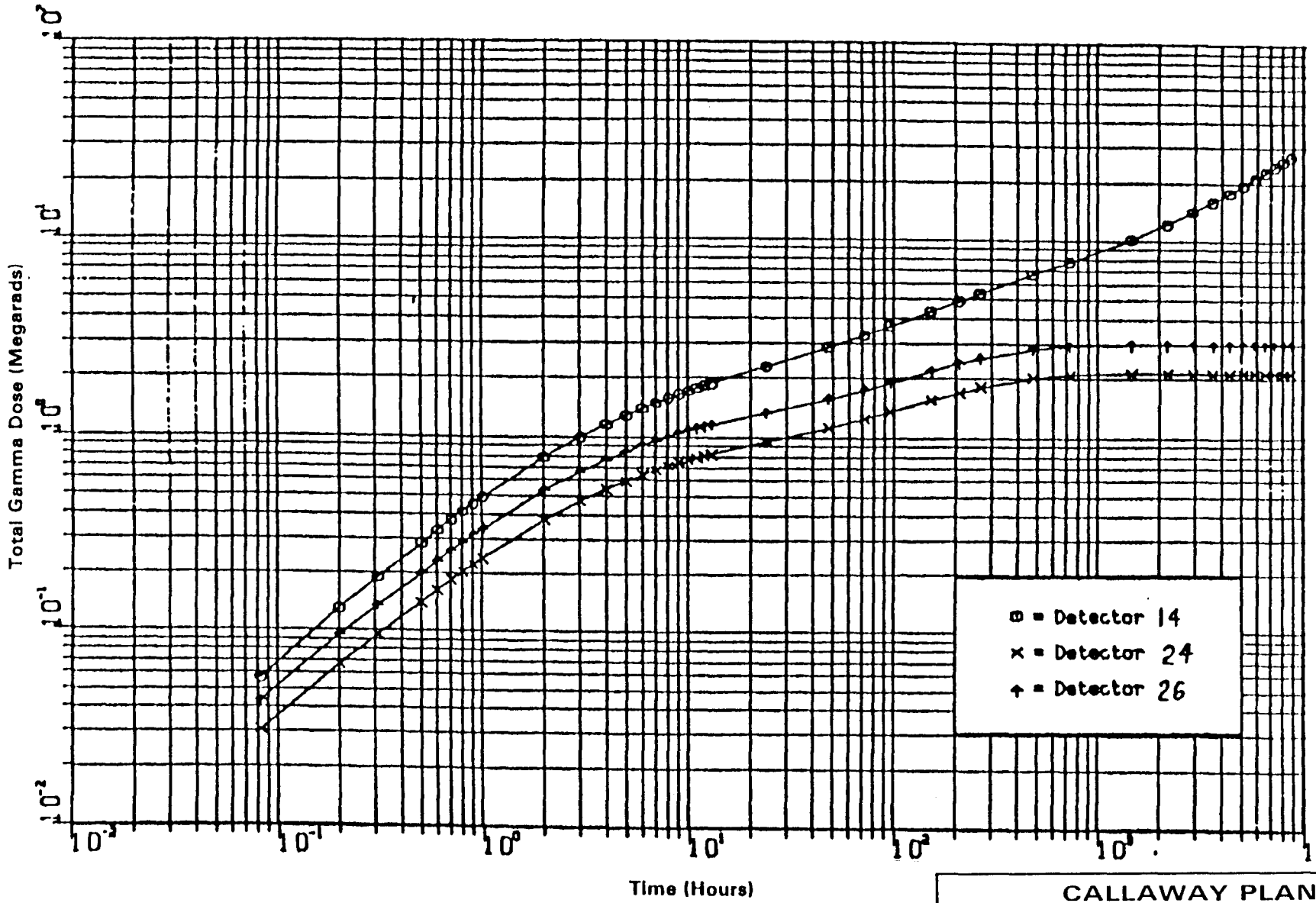
CALLAWAY PLANT
FIGURE 3.11(B)-52 GAMMA DOSE 50% Cs DETECTOR 13



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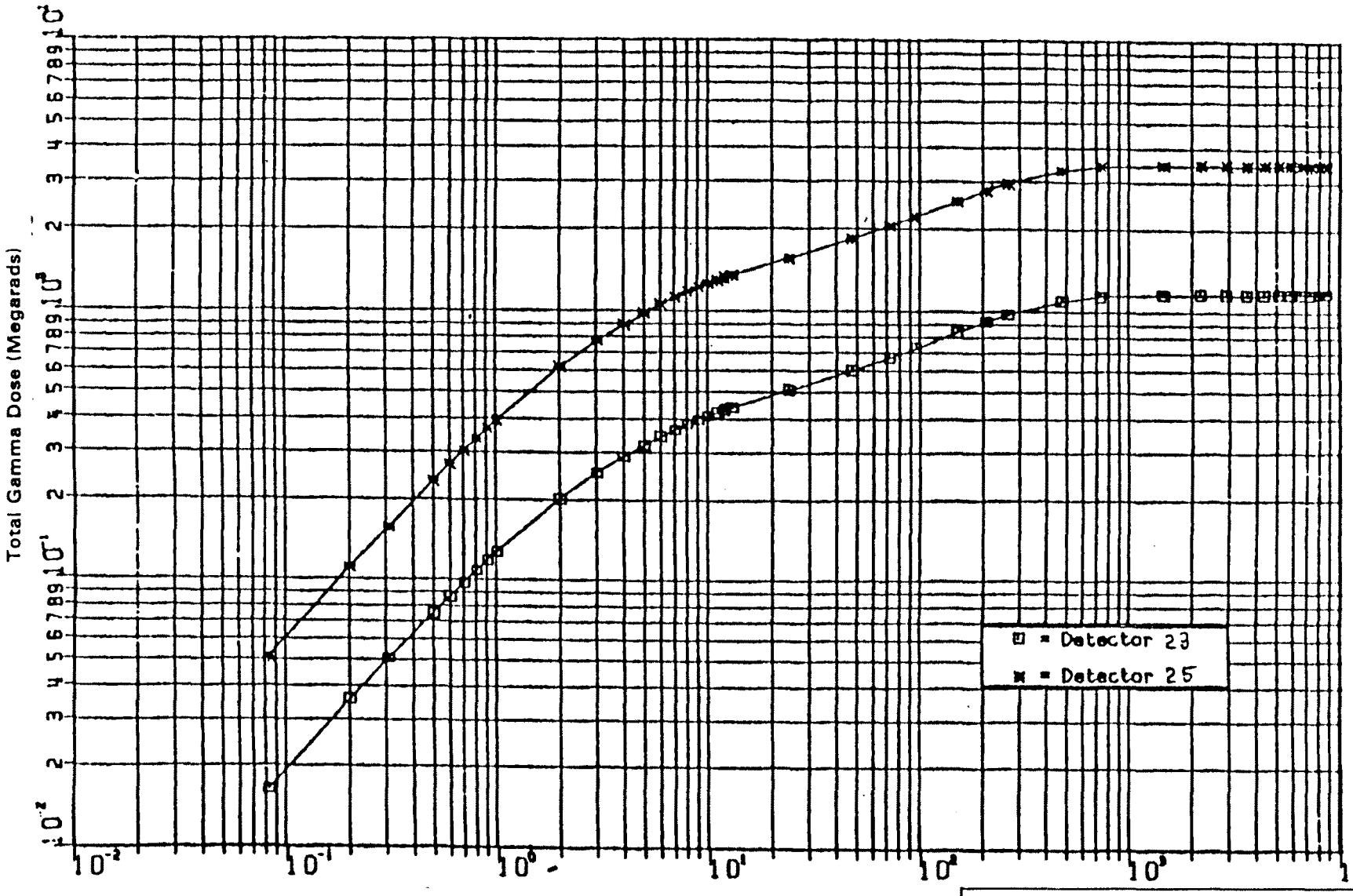
CALLAWAY PLANT

FIGURE 3.11(B)-53

GAMMA DOSE 50% Cs
DETECTORS 14,24&26



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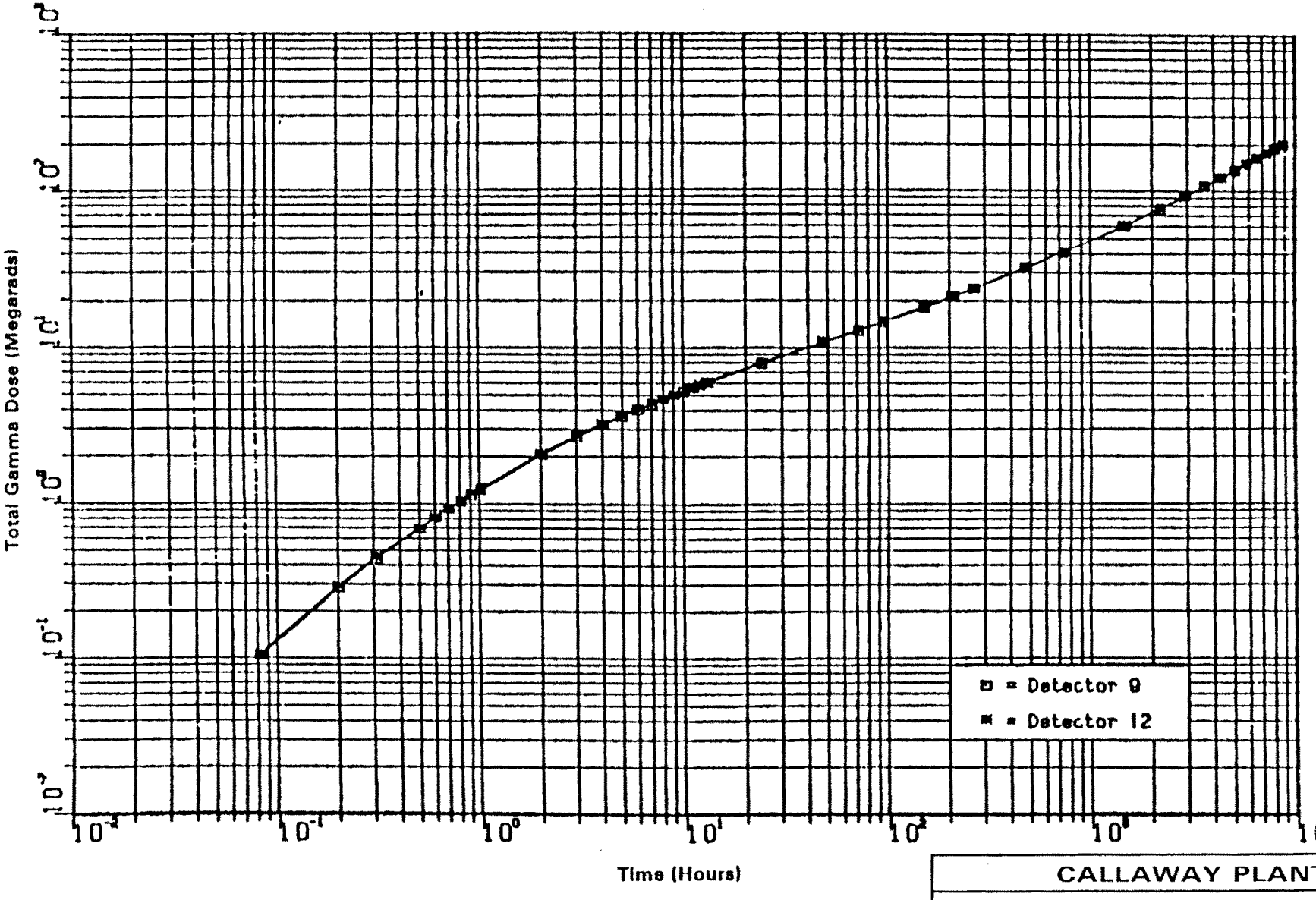
CALLAWAY PLANT

FIGURE 3.11(B)-54

GAMMA DOSE 50% Cs
DETECTORS 23&25



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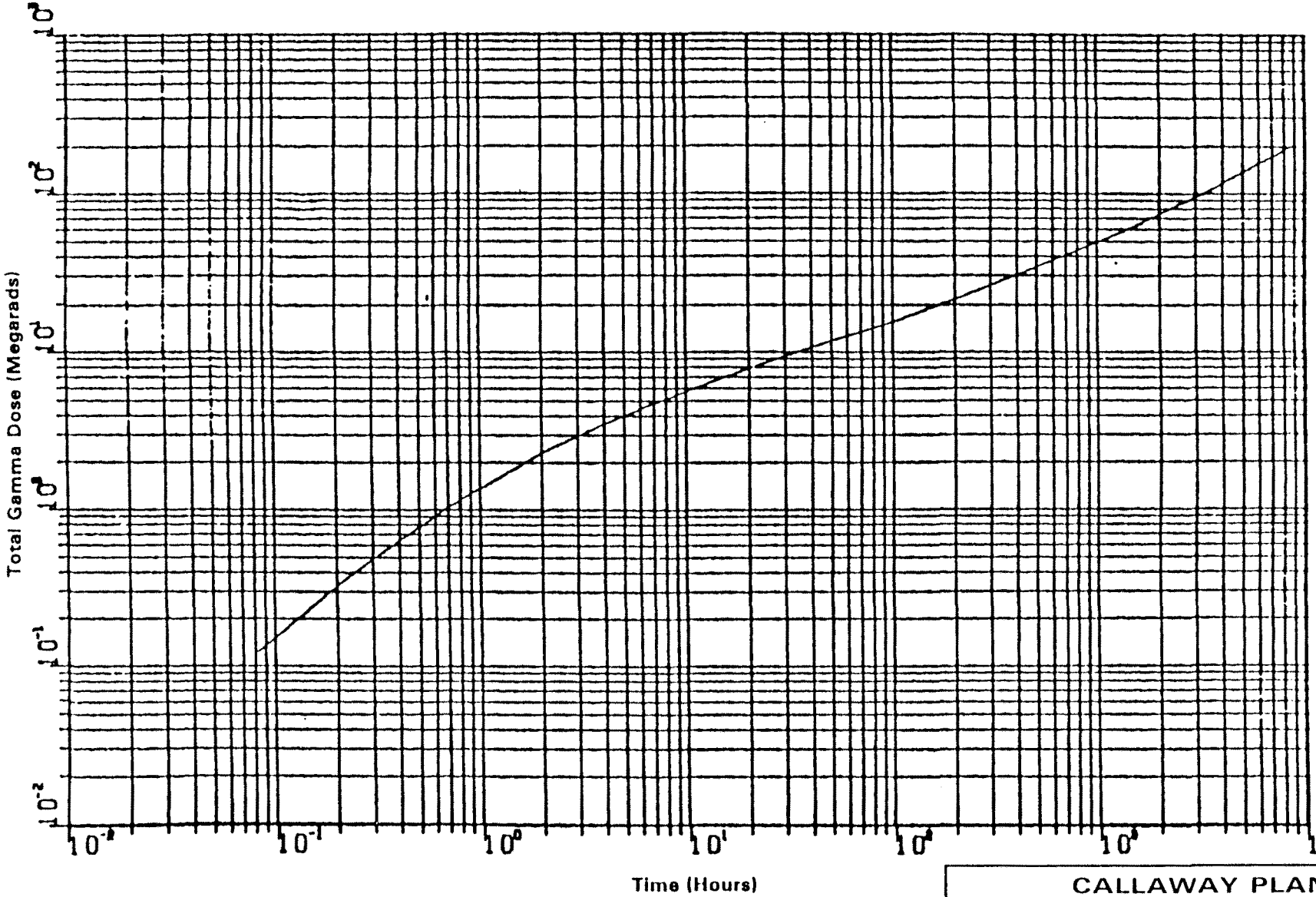
CALLAWAY PLANT

FIGURE 3.11(B)-55

GAMMA DOSE 50% Cs
DETECTORS 9&12,SUBM



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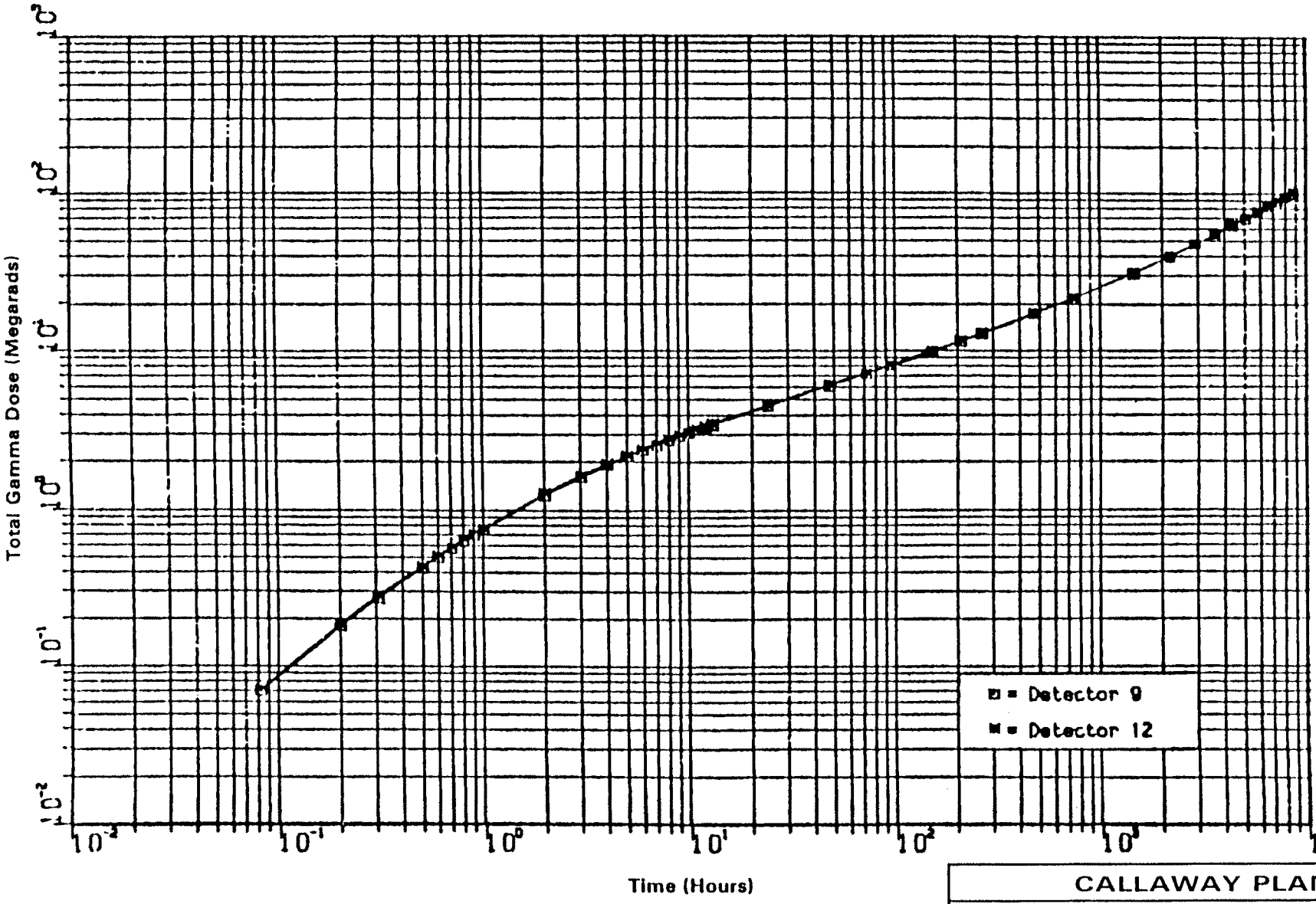
CALLAWAY PLANT
FIGURE 3.11(B)-56 GAMMA DOSE 50% Cs DETECTOR 11,SUBM



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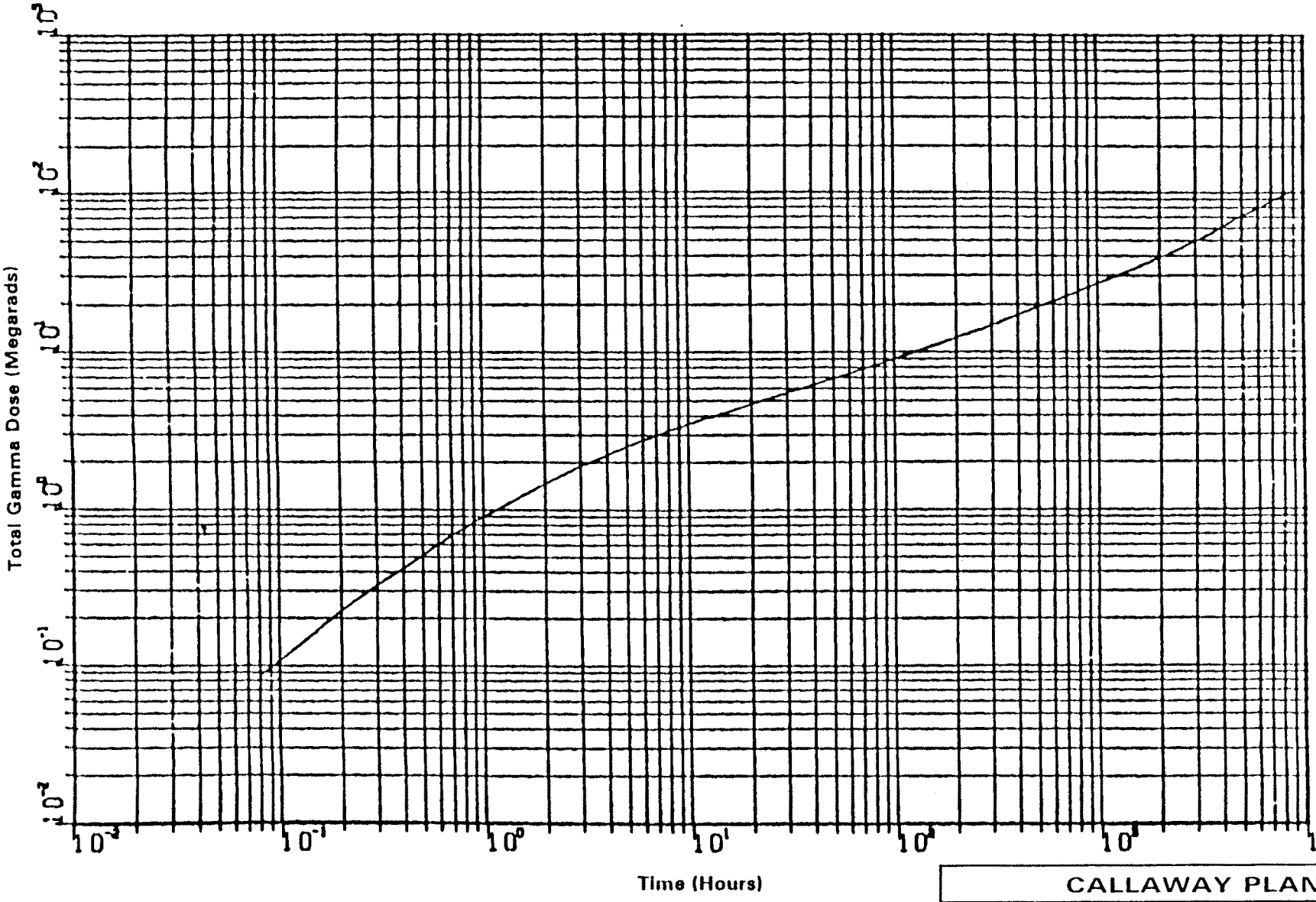
CALLAWAY PLANT

FIGURE 3.11(B)-57

GAMMA DOSE 50% Cs
DETECTORS 9&12,SUR



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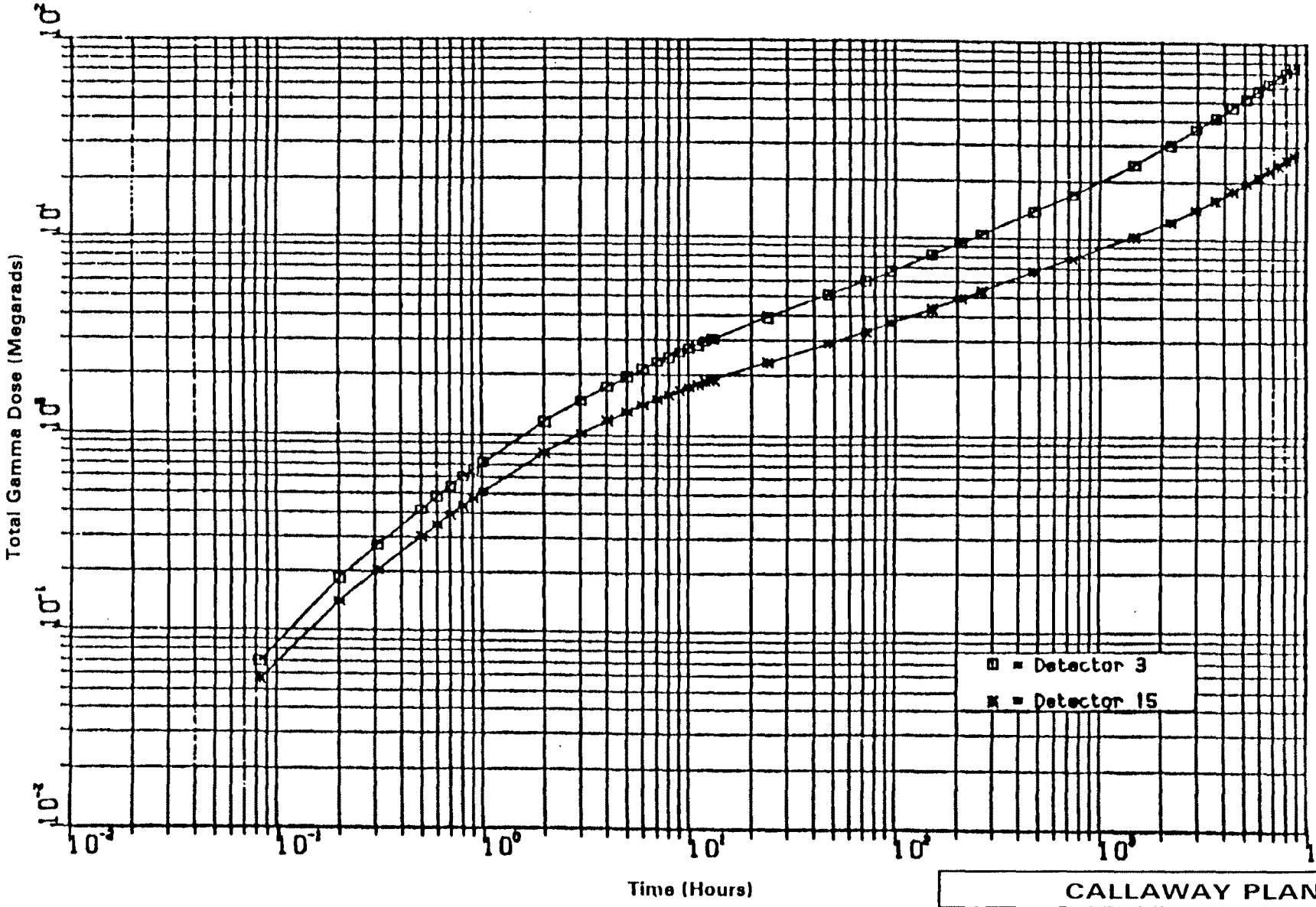
CALLAWAY PLANT
FIGURE 3.11(B)-58 GAMMA DOSE 50% Cs DETECTOR 11,SUR



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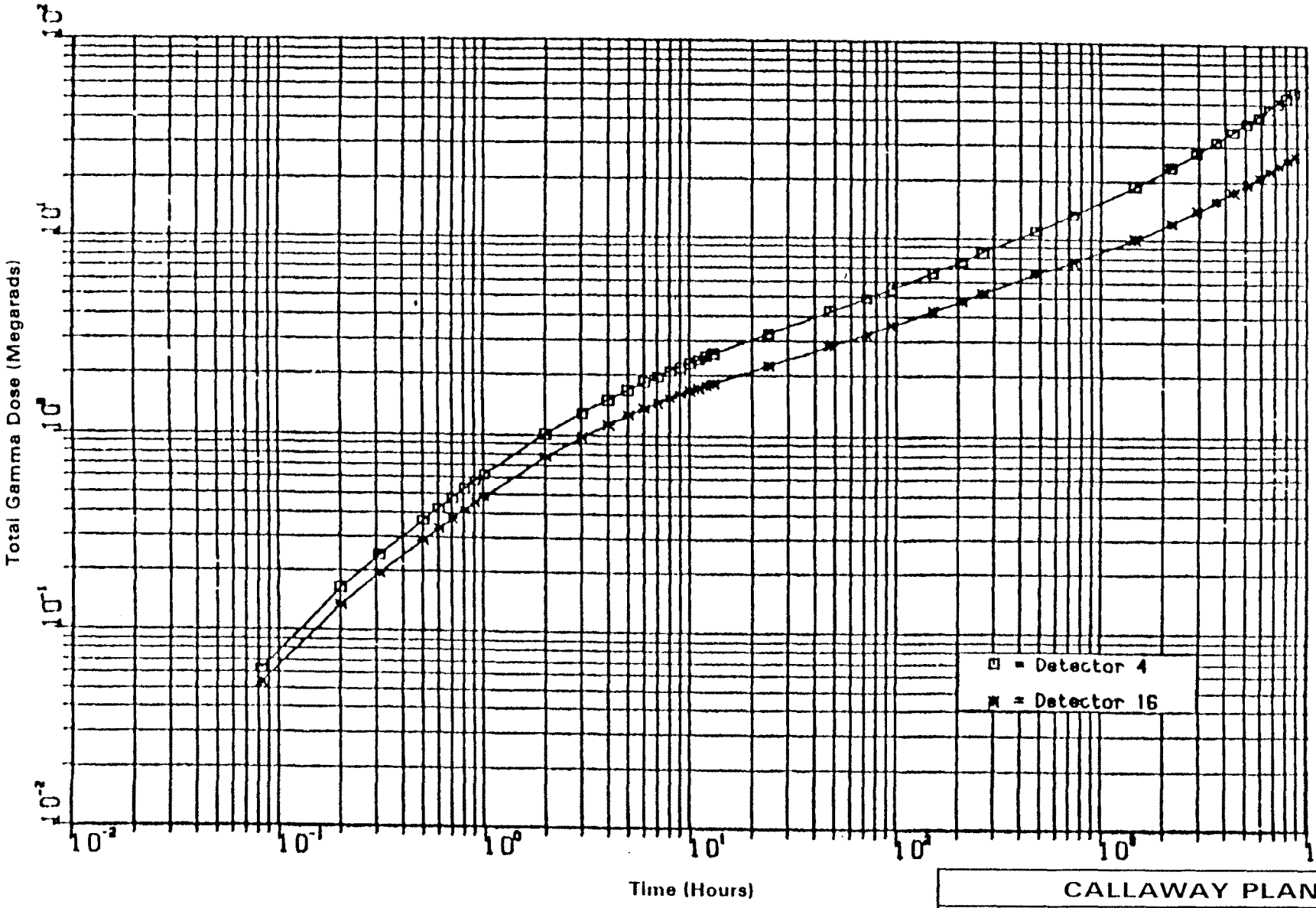
CALLAWAY PLANT
FIGURE 3.11(B)-59 GAMMA DOSE 50% Cs DETECTORS 3&15



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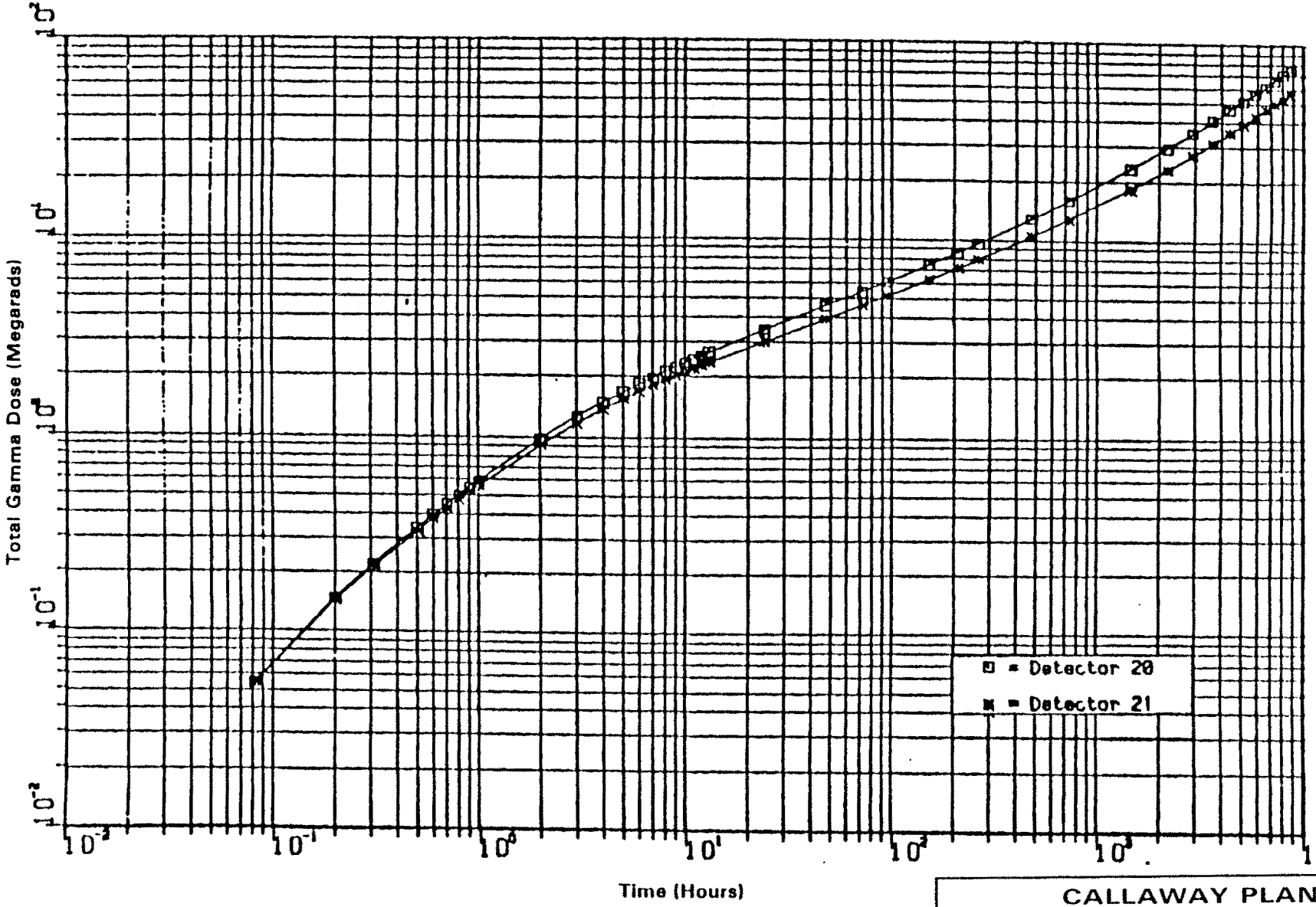
CALLAWAY PLANT

FIGURE 3.11(B)-60

GAMMA DOSE 50% Cs
DETECTORS 4&16



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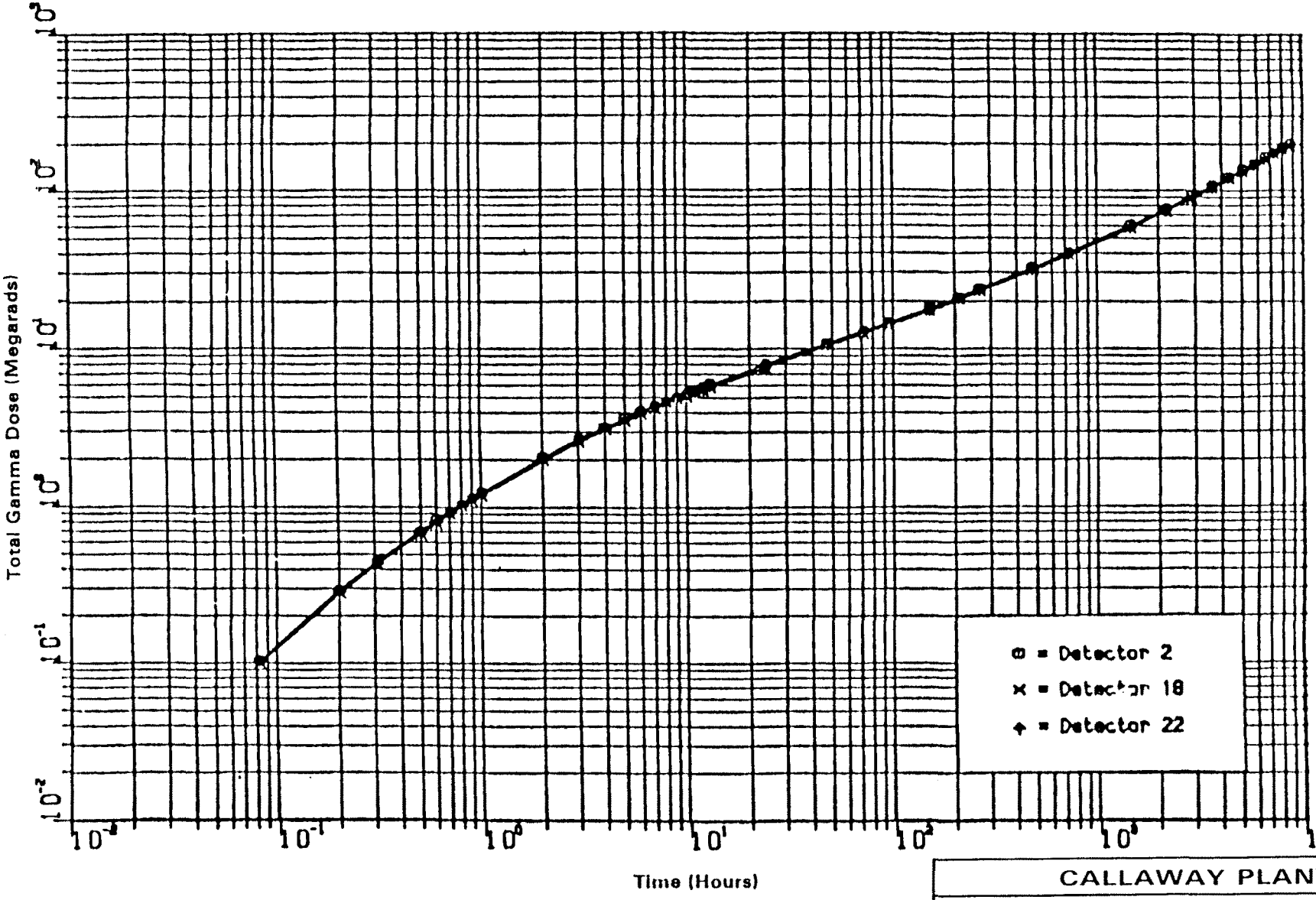
CALLAWAY PLANT

FIGURE 3.11(B)-61

GAMMA DOSE 50% Cs
DETECTORS 20&21



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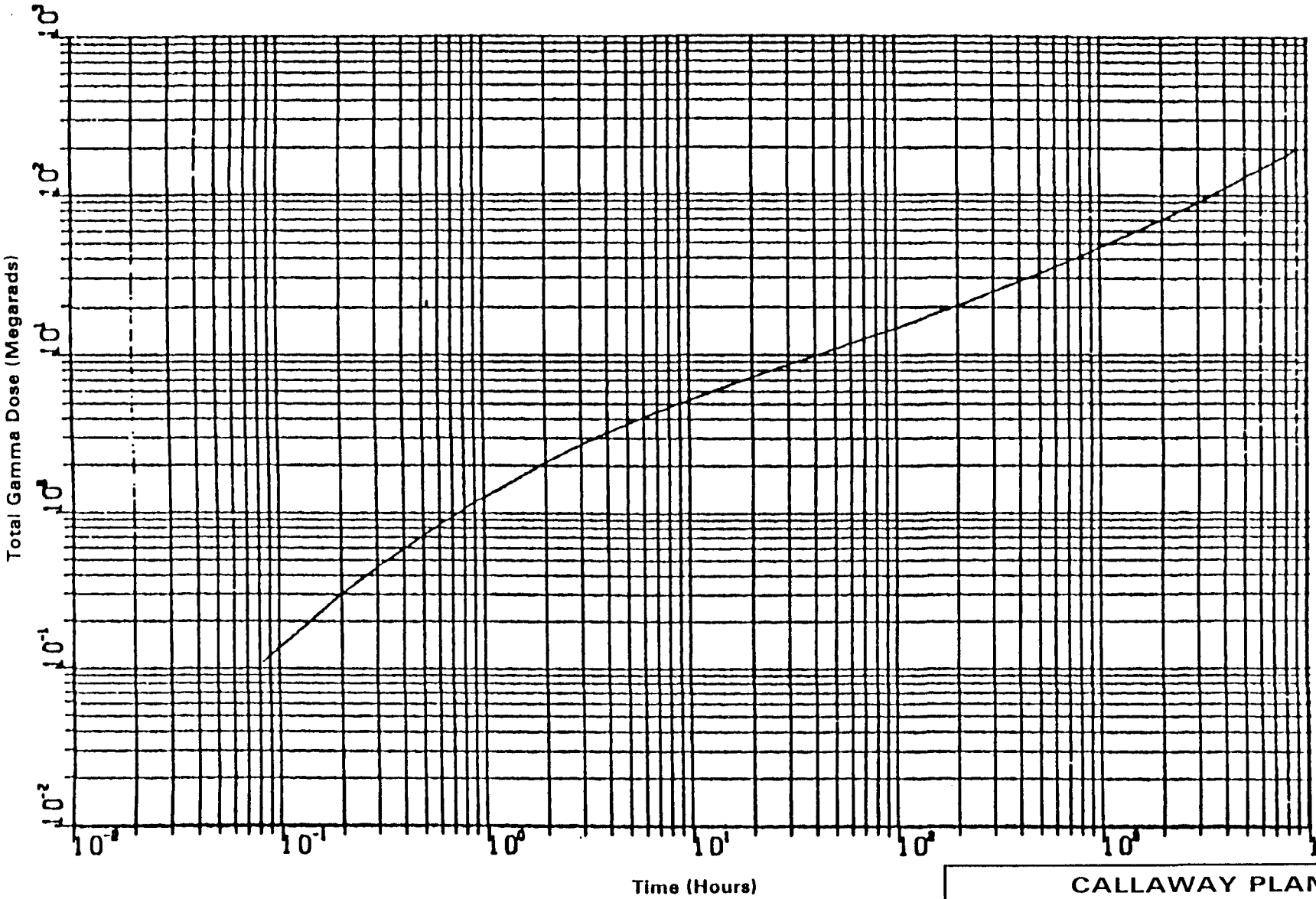
CALLAWAY PLANT

FIGURE 3.11(B)-62

GAMMA DOSE 50% Cs
DETECTORS 2,18&22SUB



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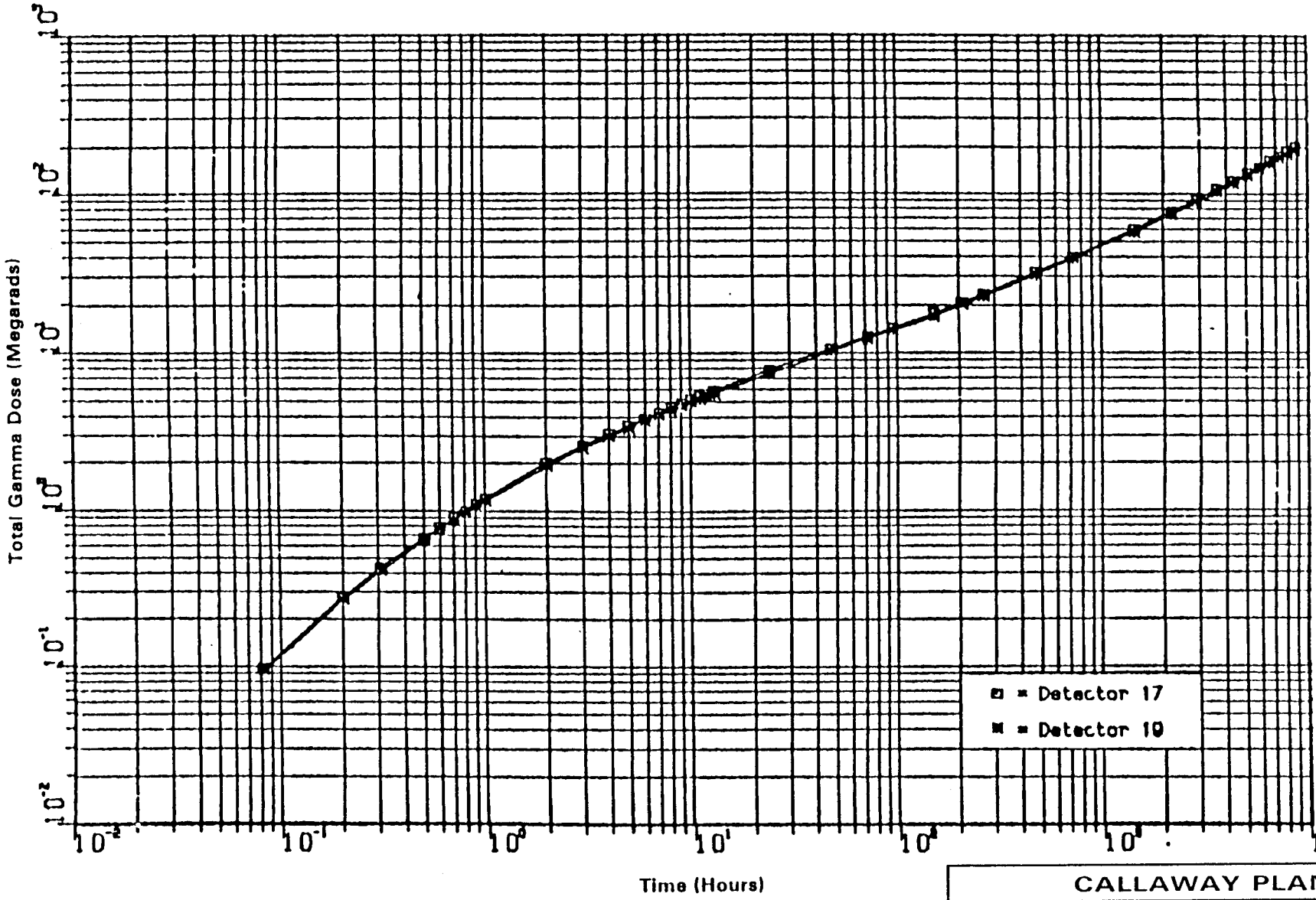
CALLAWAY PLANT
FIGURE 3.11(B)-63 GAMMA DOSE 50% Cs DETECTOR 5,SUBM



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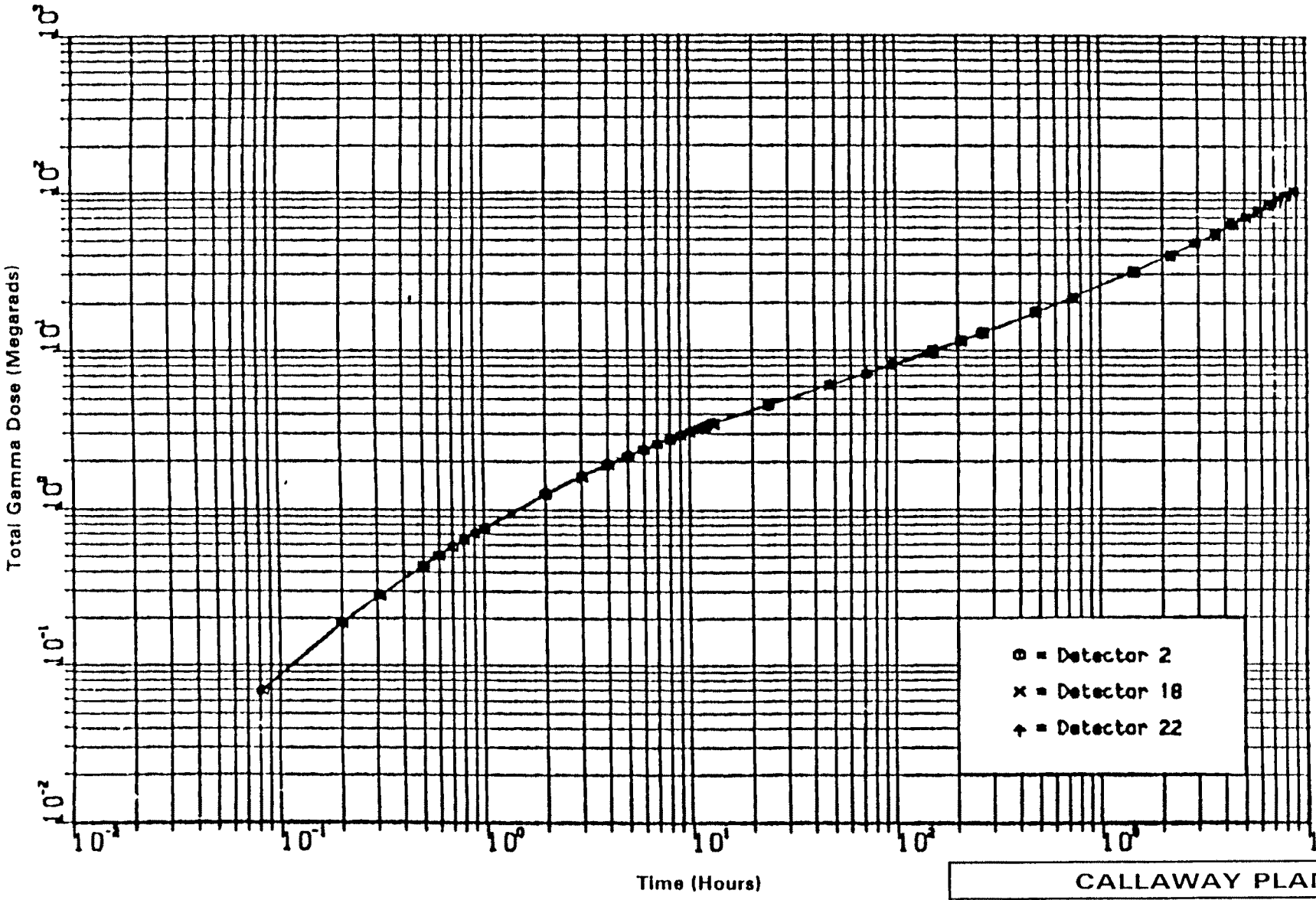
CALLAWAY PLANT

FIGURE 3.11(B)-64

GAMMA DOSE 50% Cs
DETECTOR 17&19,SUBM



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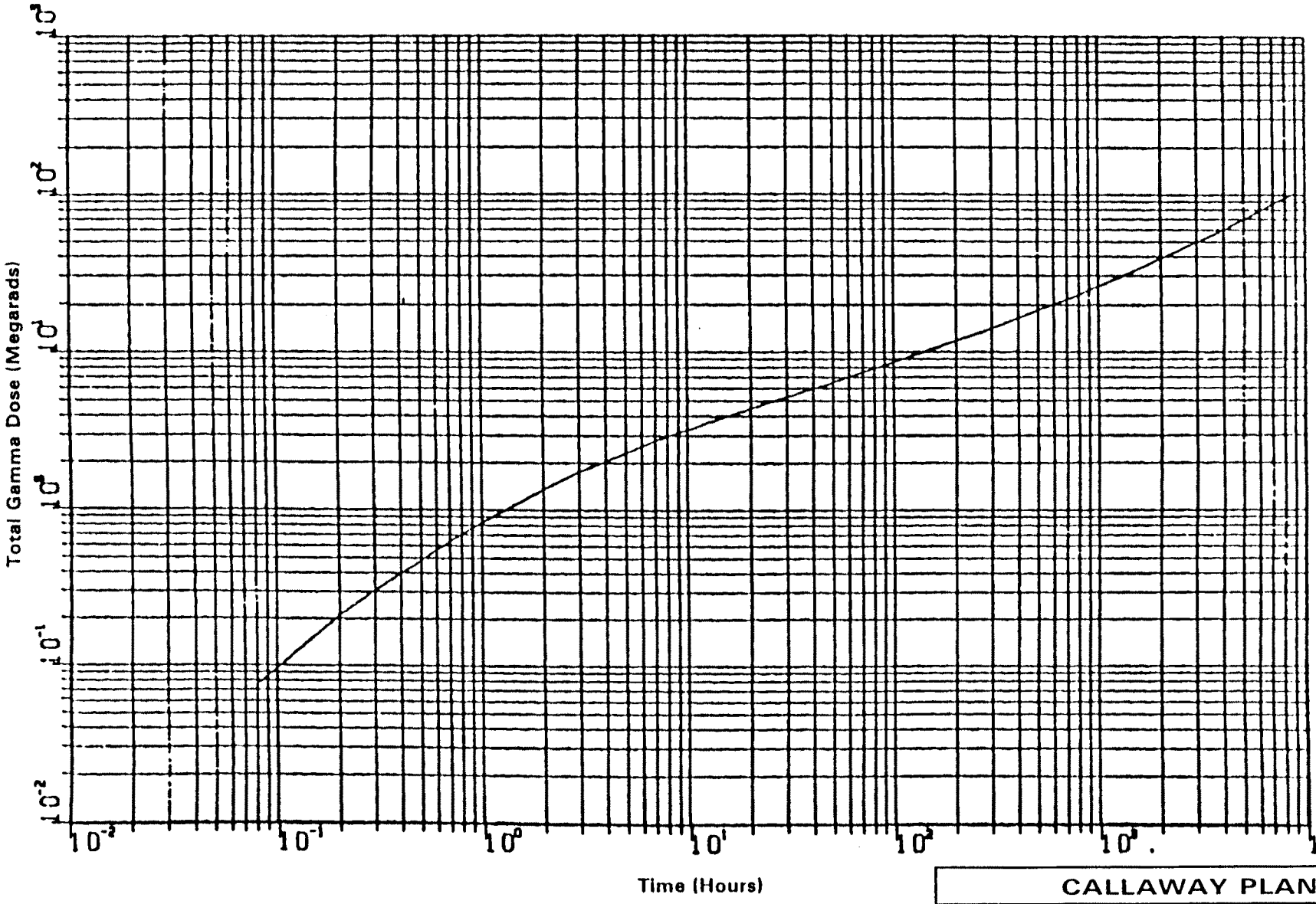
CALLAWAY PLANT

FIGURE 3.11(B)-65

GAMMA DOSE 50% Cs
DETECTORS 2,18&22SUR



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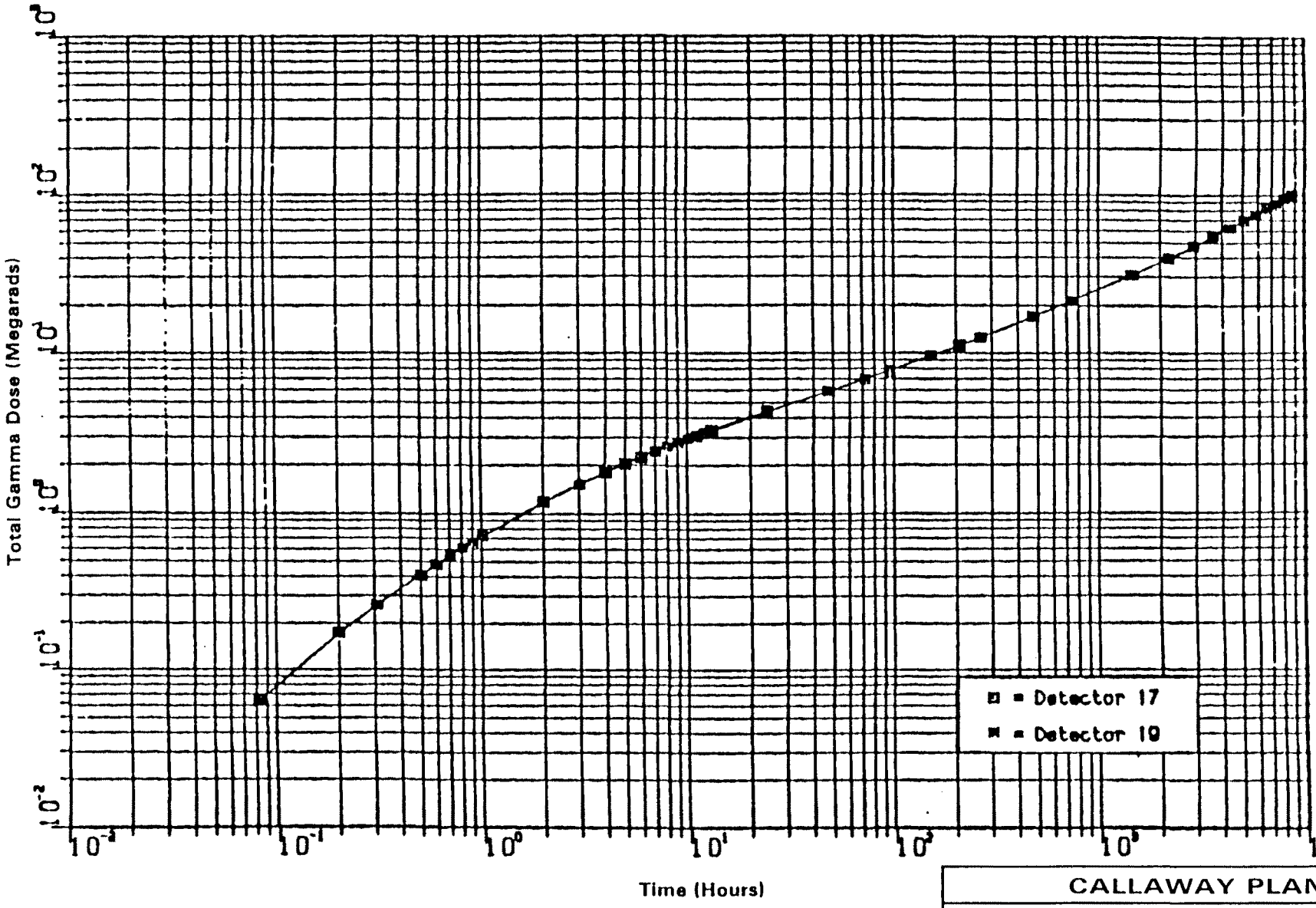
CALLAWAY PLANT
FIGURE 3.11(B)-66 GAMMA DOSE 50% Cs DETECTOR 5,SUR



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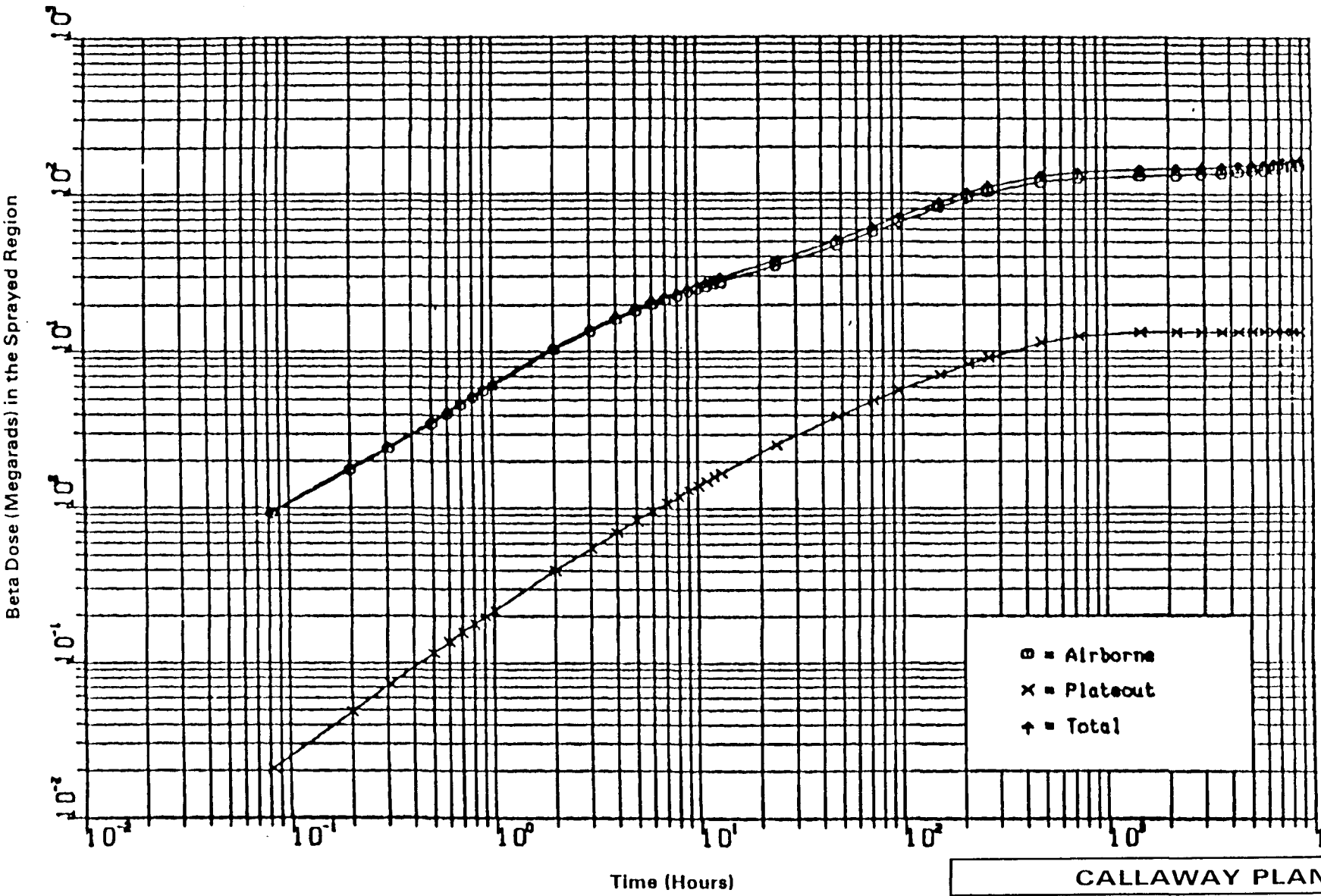
CALLAWAY PLANT

FIGURE 3.11(B)-67

GAMMA DOSE 50% Cs
DETECTORS 17&19,SUR



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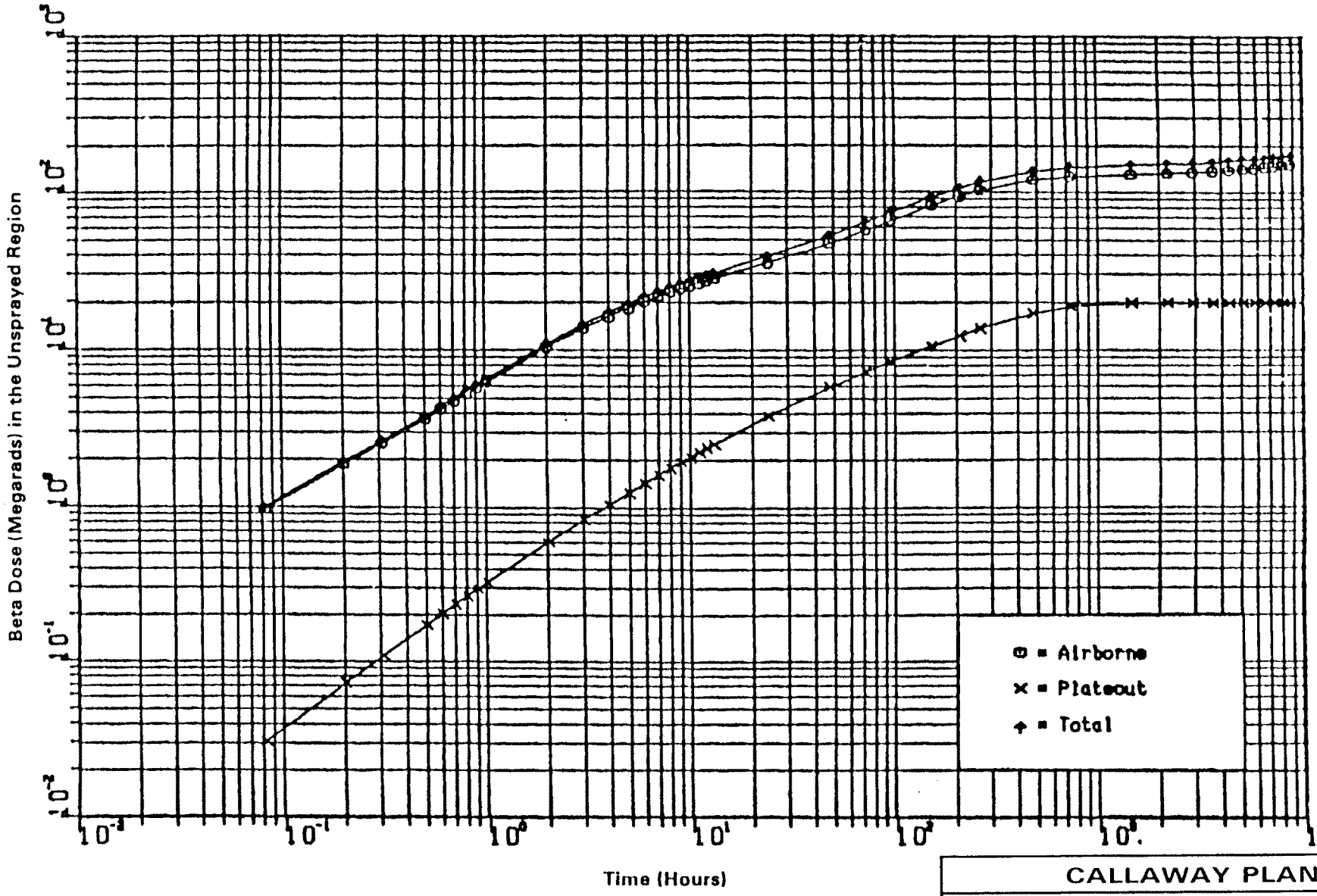
CALLAWAY PLANT
FIGURE 3.11(B)-68 BETA DOSE 50% Cs DETECTORS 1,6-14,& 23-26



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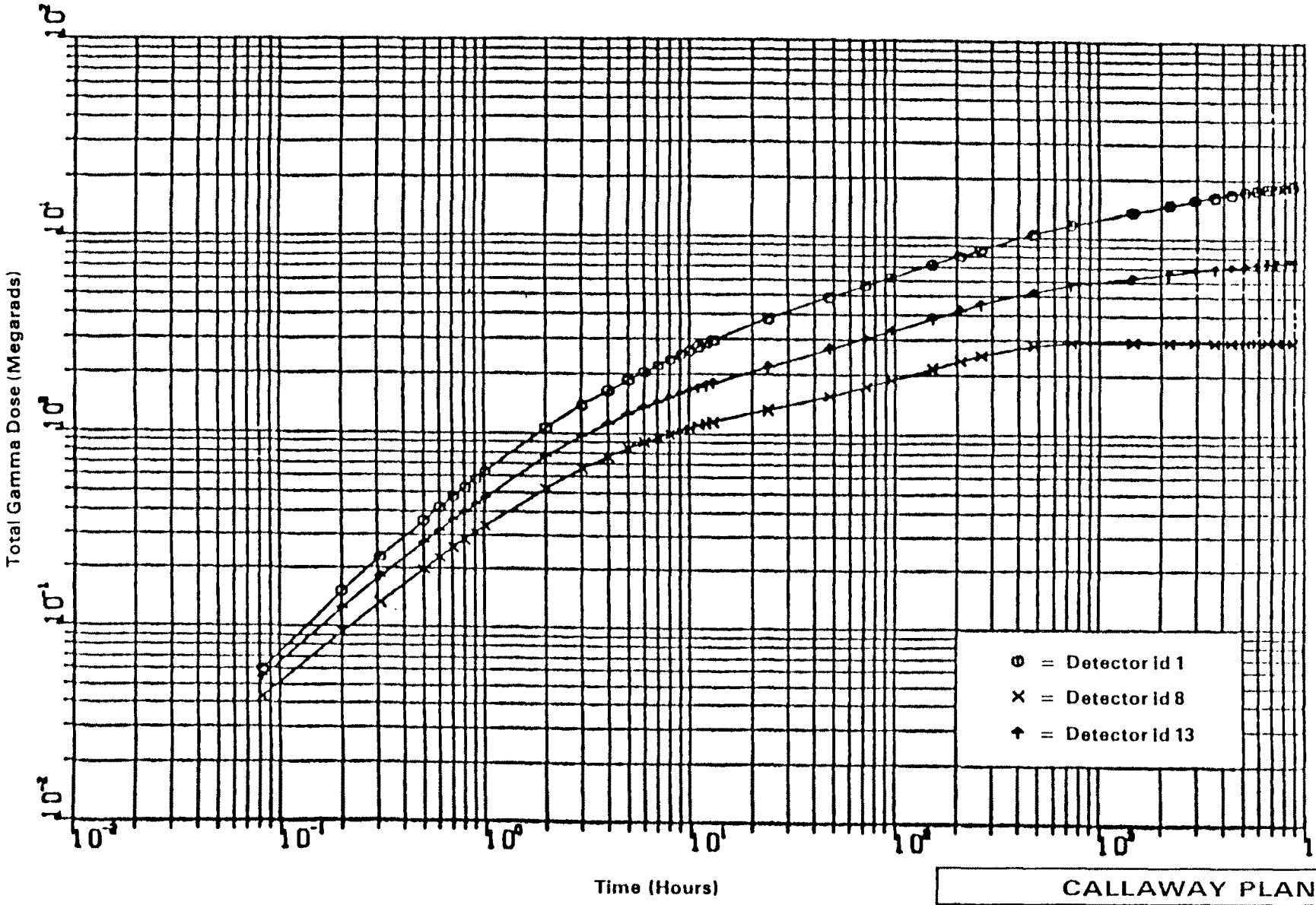
CALLAWAY PLANT
FIGURE 3.11(B)-69 BETA DOSE 50% Cs DETECTORS 2-5,& 15-22



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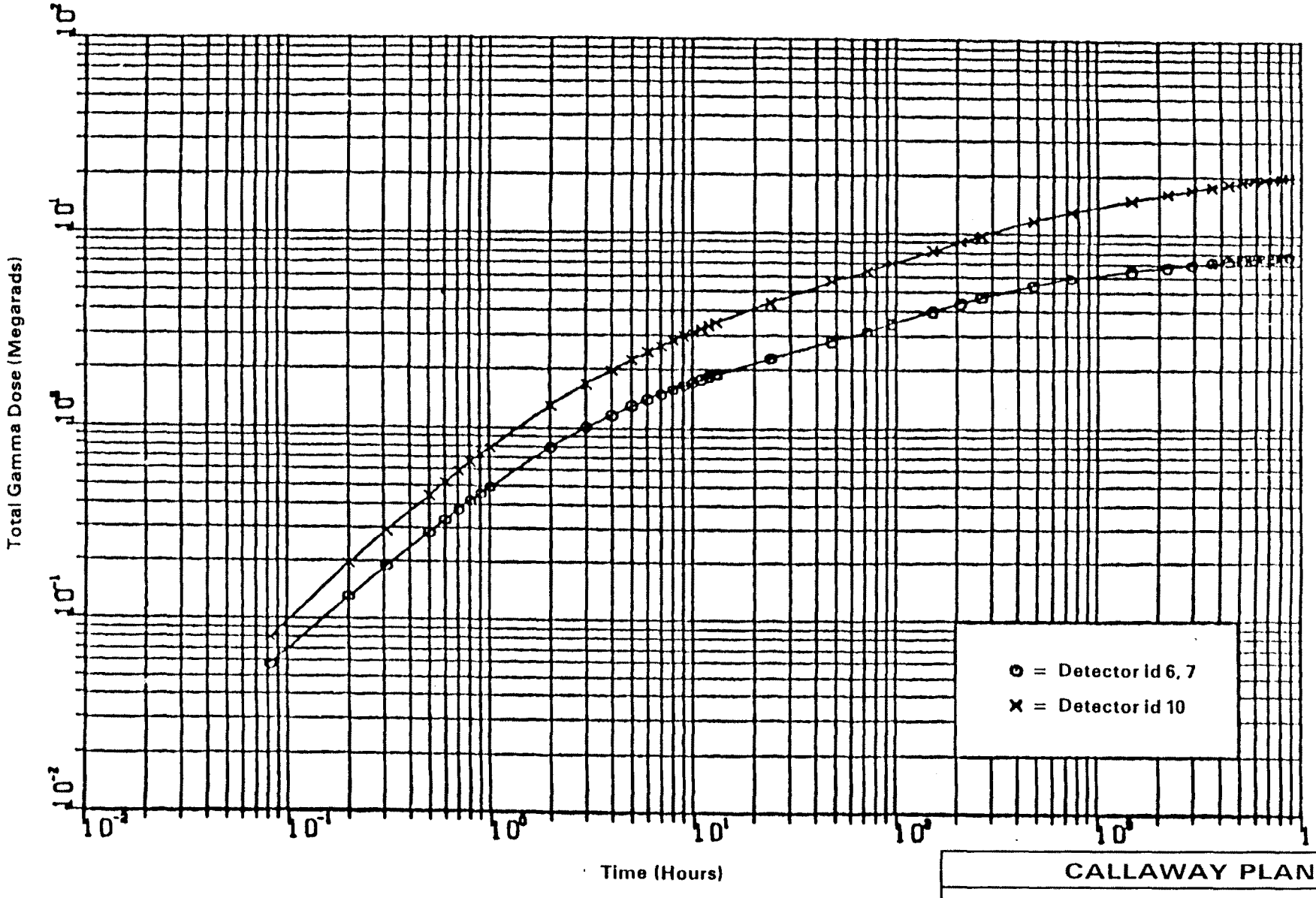
CALLAWAY PLANT

FIGURE 3.11(B)-70

GAMMA DOSE 1.0% Cs
DETECTORS 1,8&13



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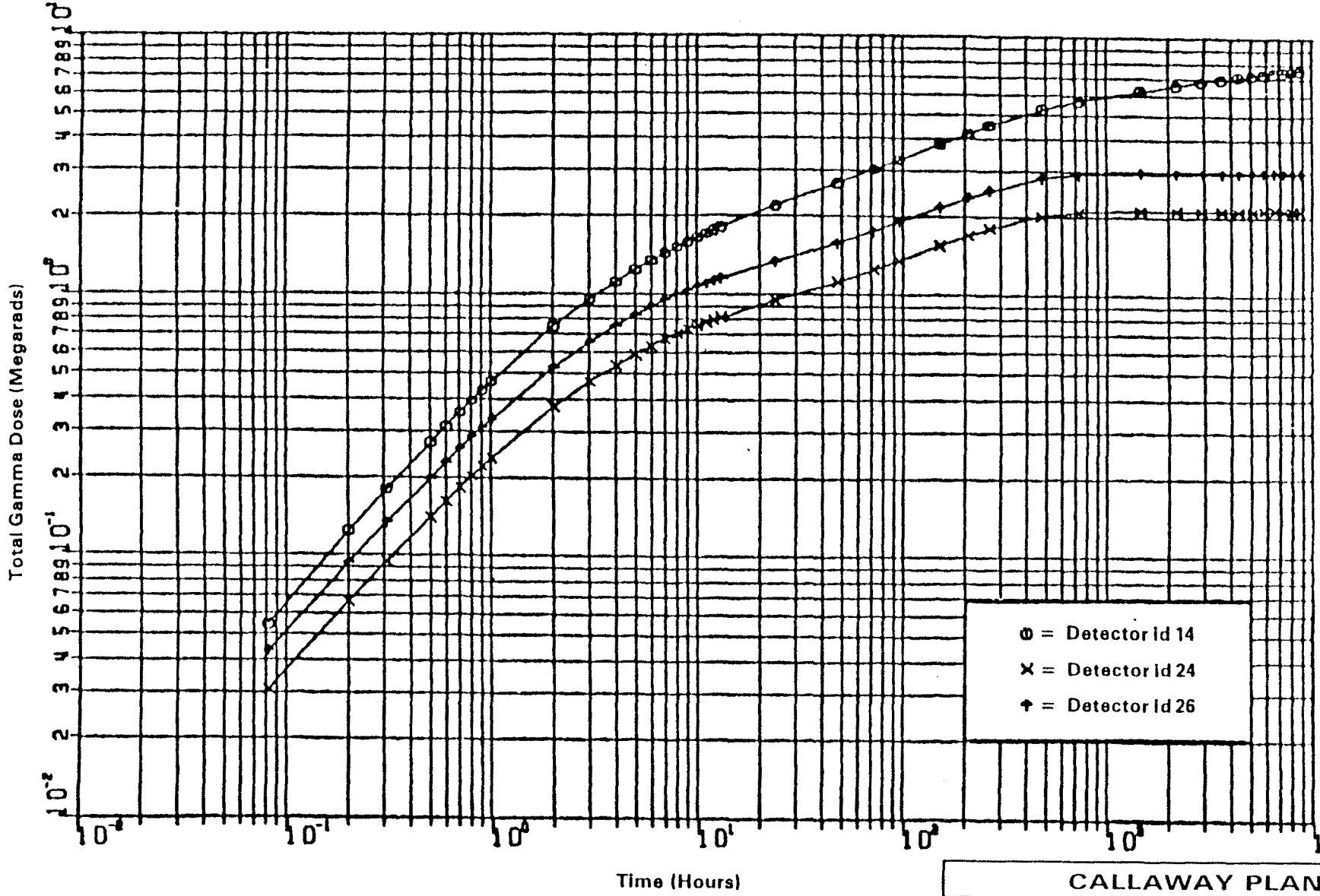
CALLAWAY PLANT

FIGURE 3.11(B)-71

GAMMA DOSE 1.0% Cs
DETECTORS 6,7&10



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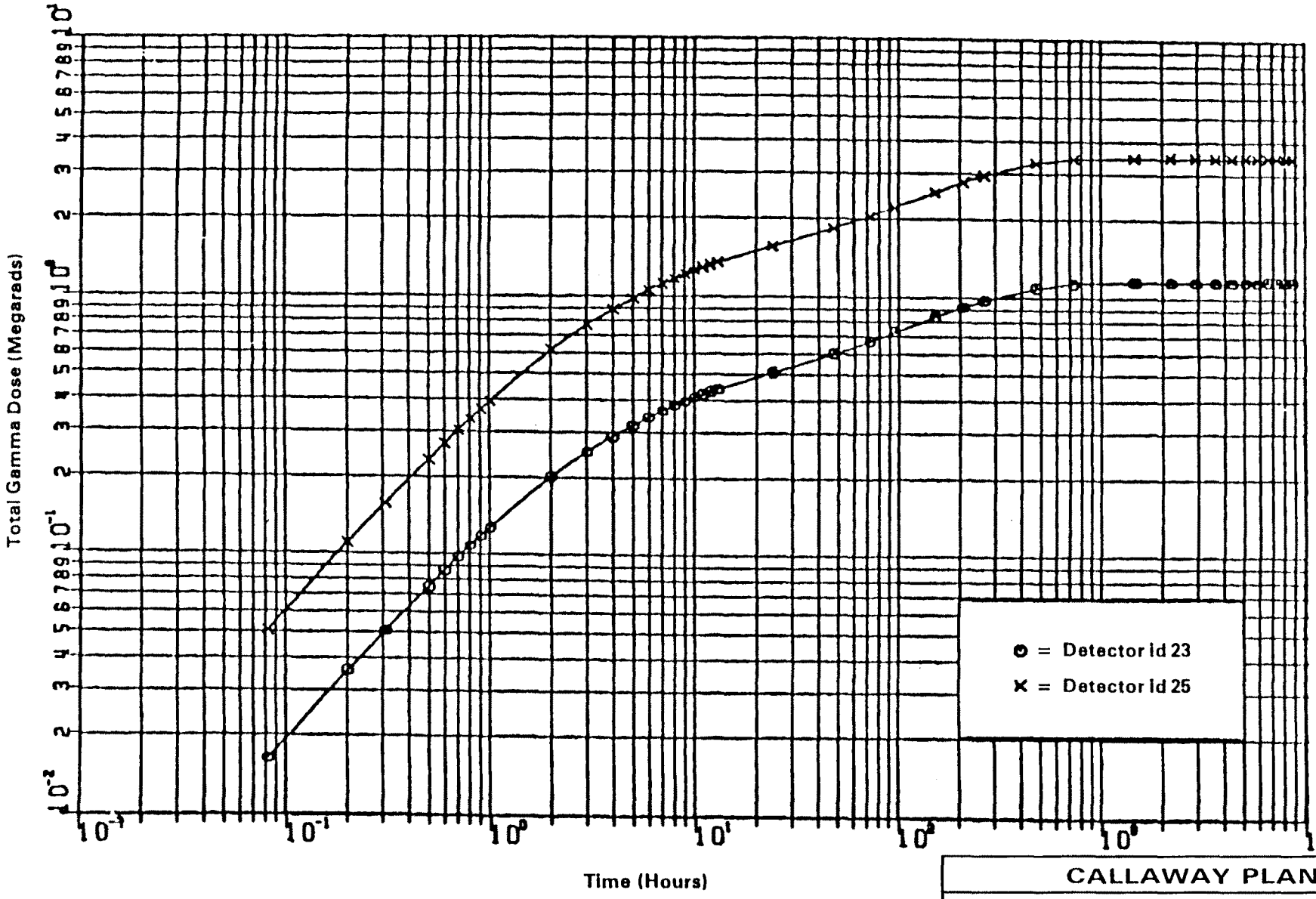
CALLAWAY PLANT

FIGURE 3.11(B)-72

GAMMA DOSE 1.0% Cs
DETECTORS 14,24&26



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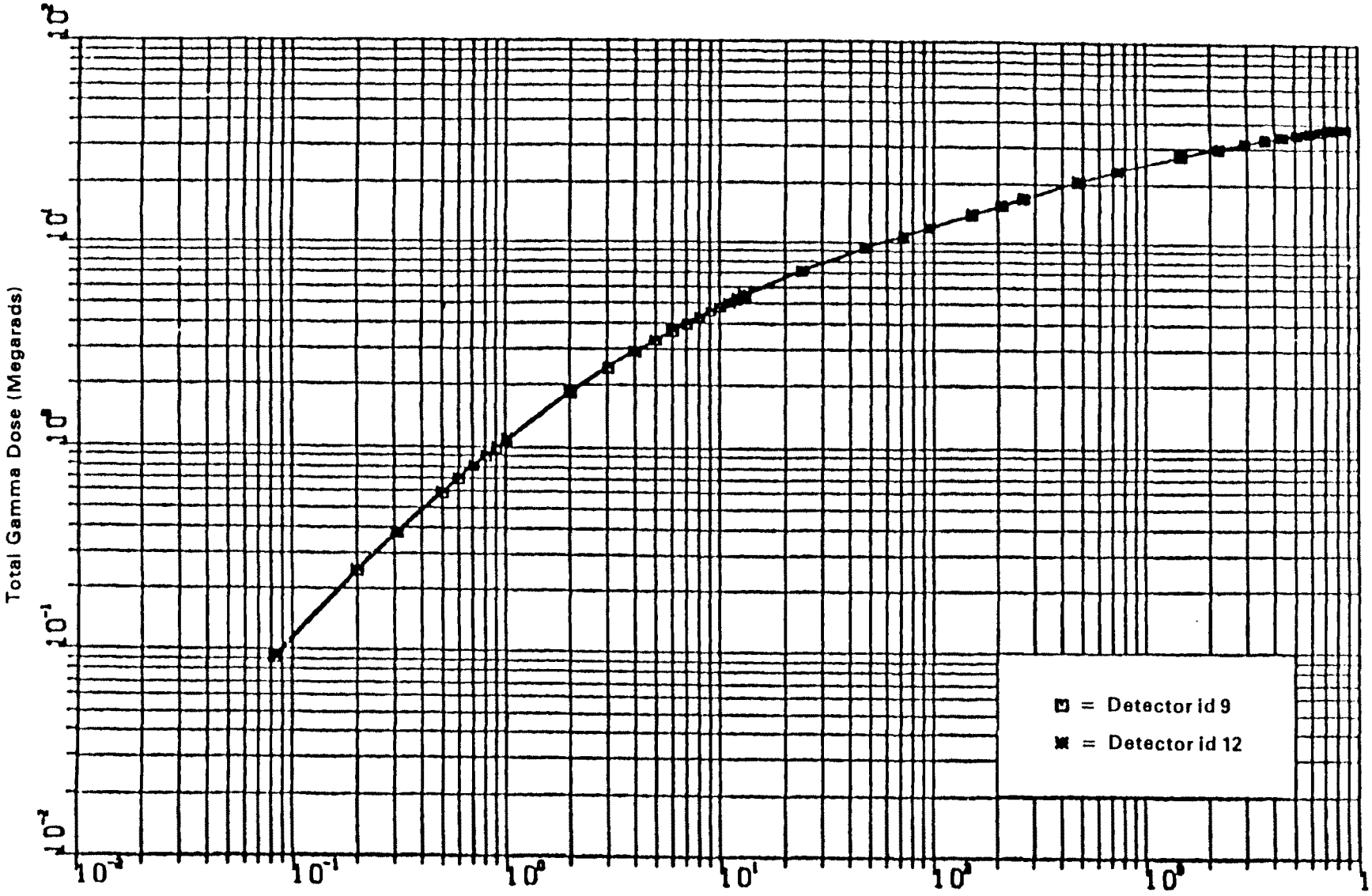
CALLAWAY PLANT

FIGURE 3.11(B)-73

GAMMA DOSE 1.0% Cs
DETECTORS 23&25



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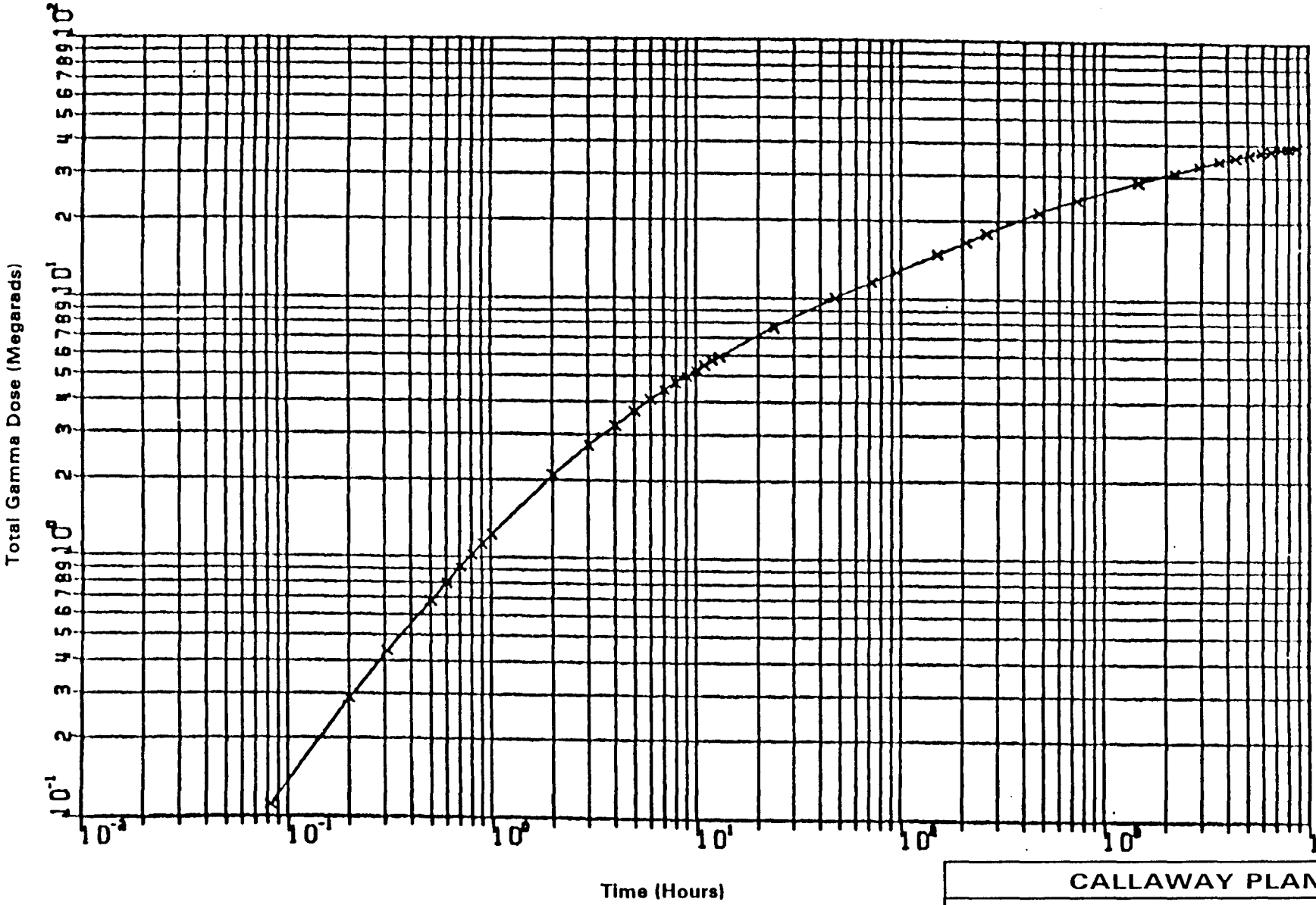
CALLAWAY PLANT

FIGURE 3.11(B)-74

GAMMA DOSE 1.0% Cs
DETECTORS 9&12 SUBM



REV. OL-6
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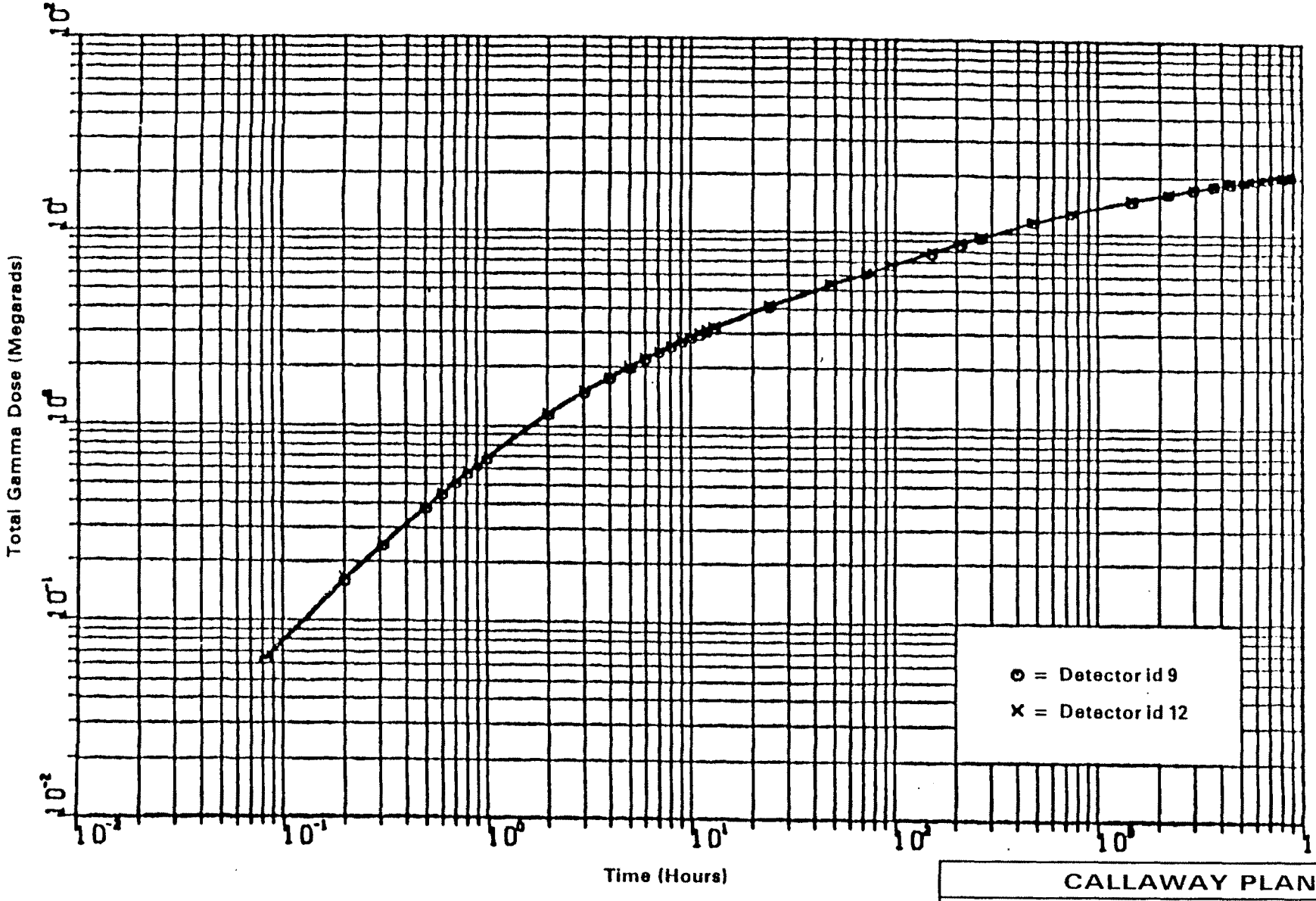
CALLAWAY PLANT

FIGURE 3.11(B)-75

GAMMA DOSE 1.0% Cs
DETECTOR 11 SUBM



REV. OL-6
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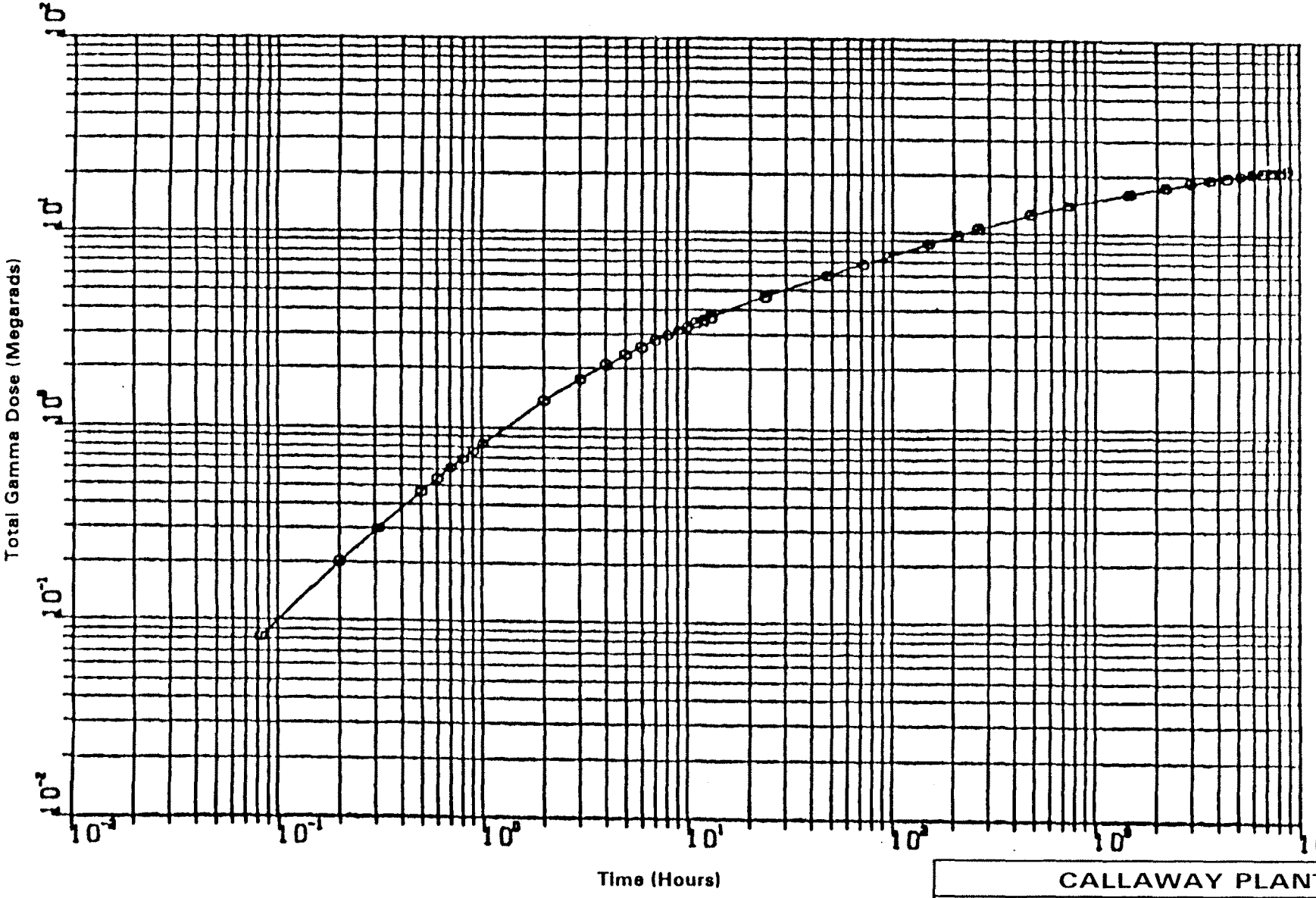
CALLAWAY PLANT
FIGURE 3.11(B)-76 GAMMA DOSE 1.0% Cs DETECTORS 9&12 SUR



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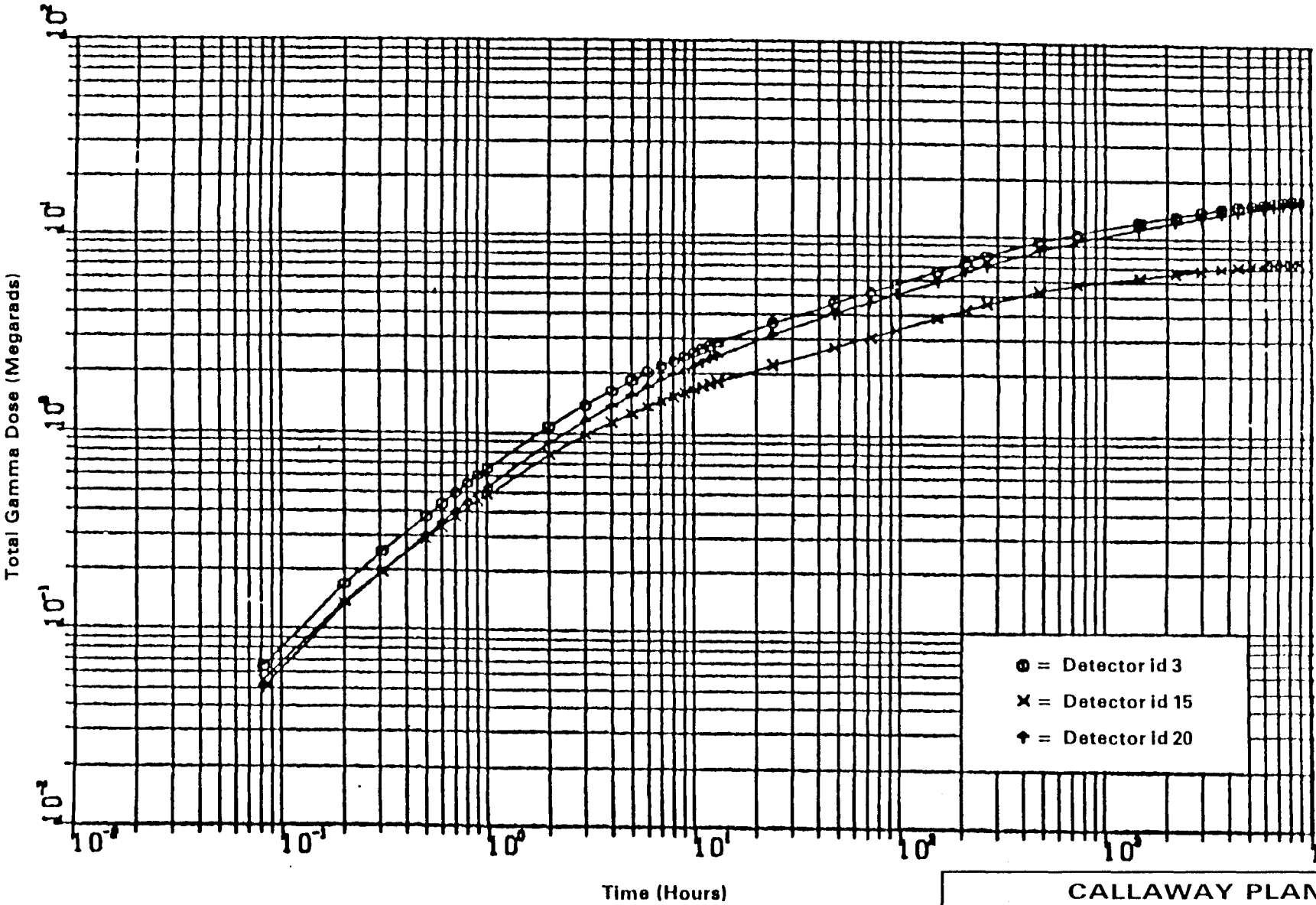
CALLAWAY PLANT
FIGURE 3.11(B)-77 GAMMA DOSE 1.0% Cs DETECTOR 11, SUR



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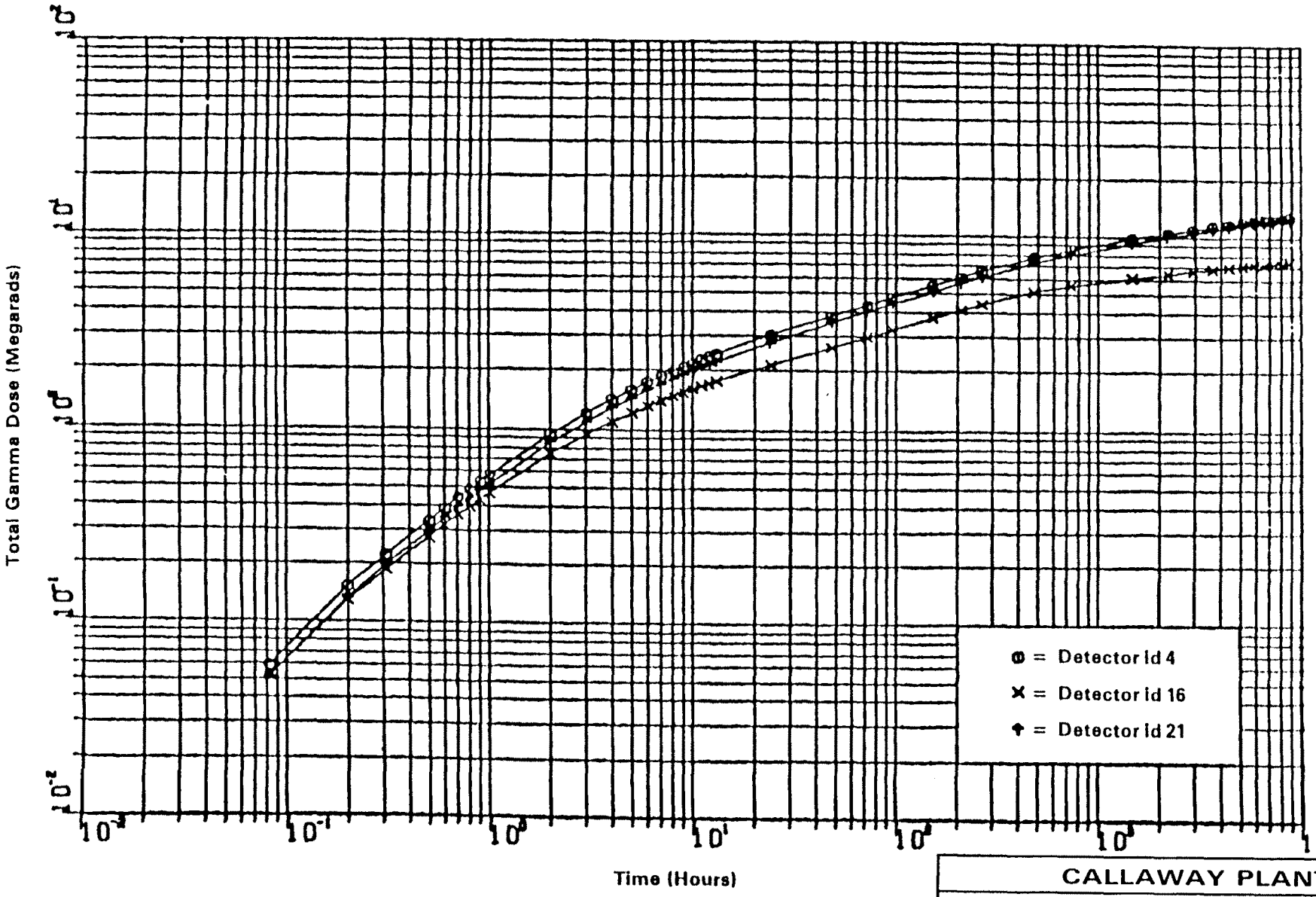
CALLAWAY PLANT

FIGURE 3.11(B)-78

GAMMA DOSE 1.0% Cs
DETECTORS 3,15&20



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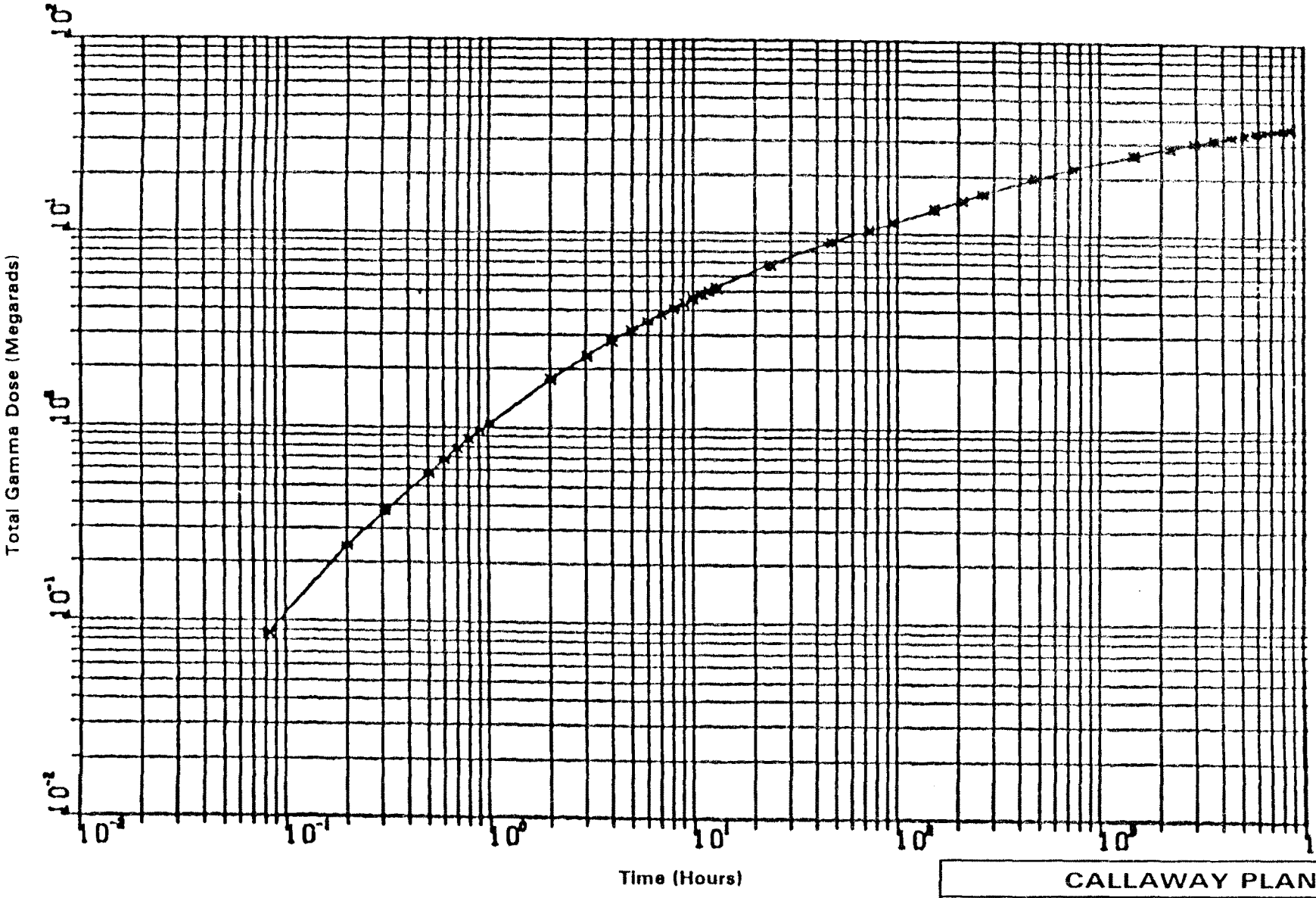
CALLAWAY PLANT

FIGURE 3.11(B)-79

GAMMA DOSE 1.0% Cs
DETECTORS 4,16&21



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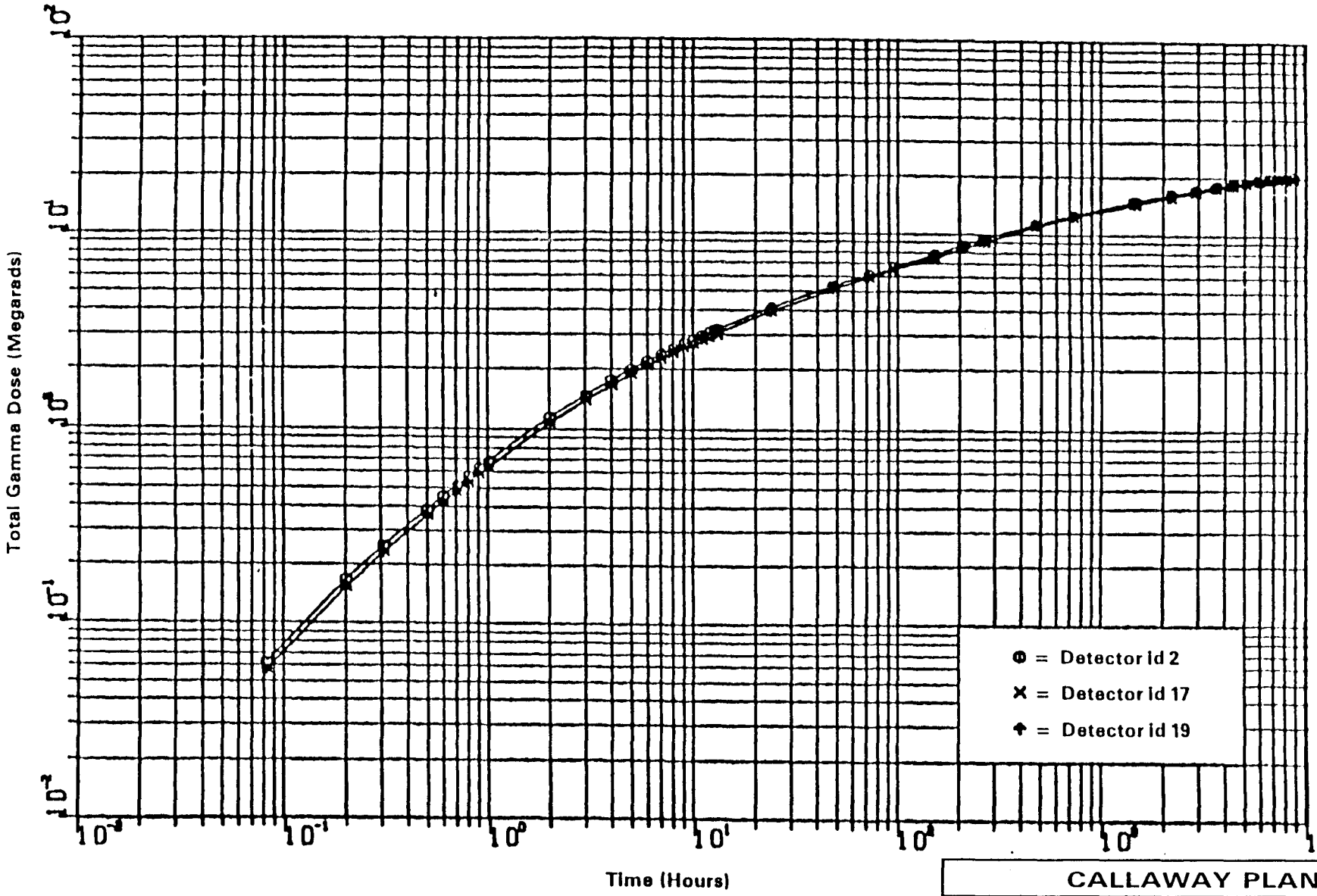
CALLAWAY PLANT

FIGURE 3.11(B)-80

GAMMA DOSE 1.0% Cs
DETECTORS 2,5,17,
18,19&22 SUBM



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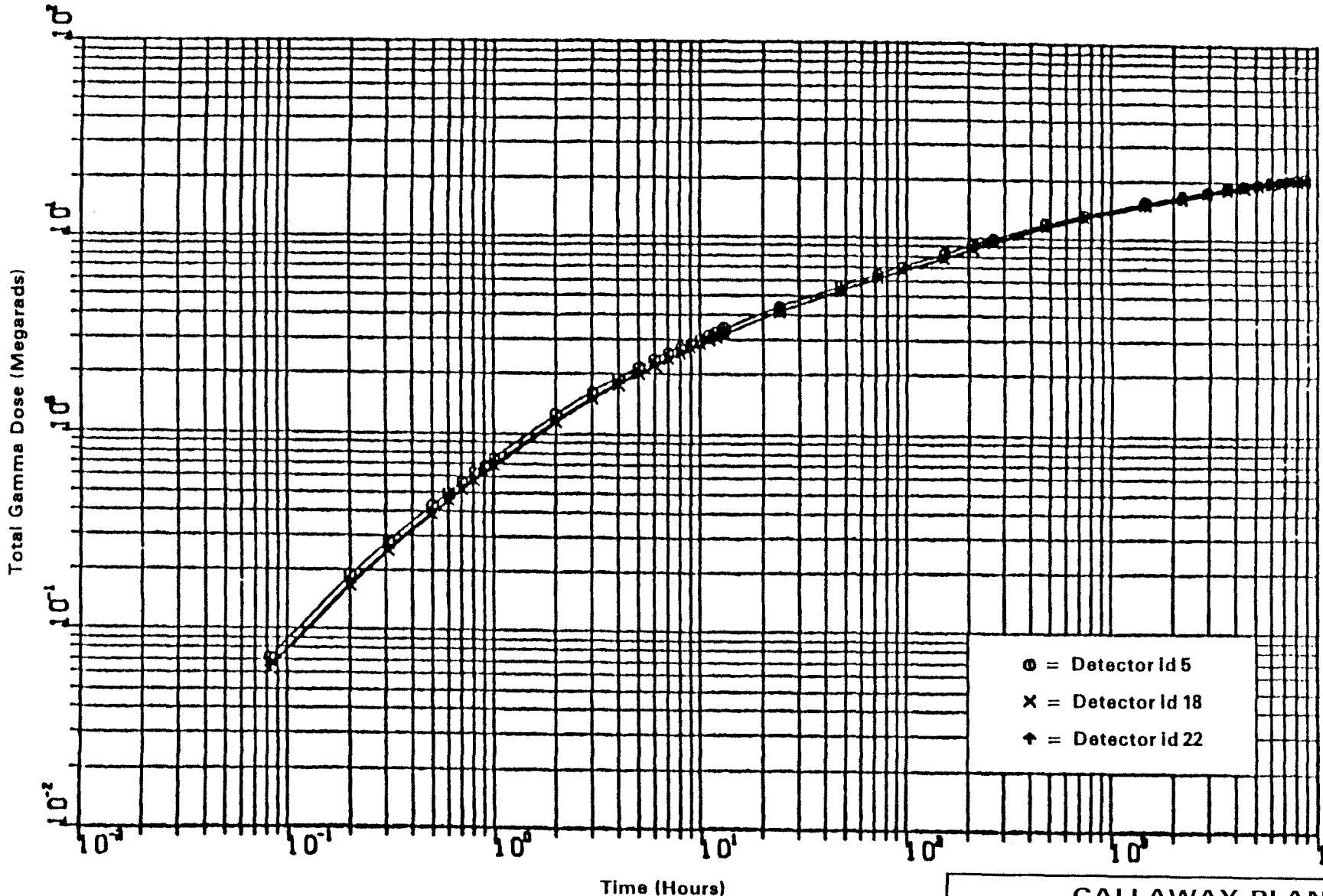
CALLAWAY PLANT
FIGURE 3.11(B)-81 GAMMA DOSE 1.0% Cs DETECTORS 2,17,&19SUR



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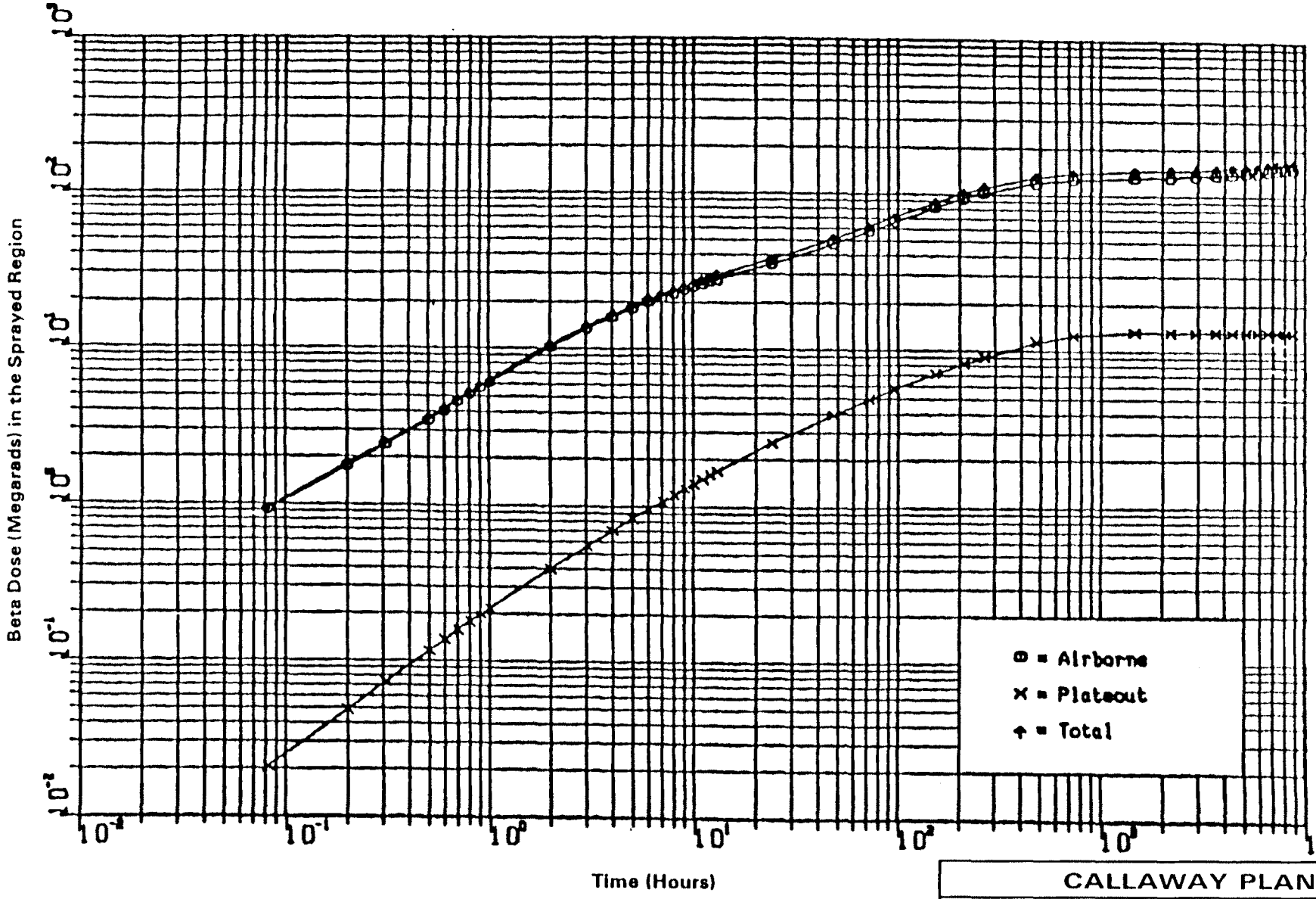
CALLAWAY PLANT

FIGURE 3.11(B)-82

GAMMA DOSE 1.0% Cs
DETECTORS 5,18&22SUR



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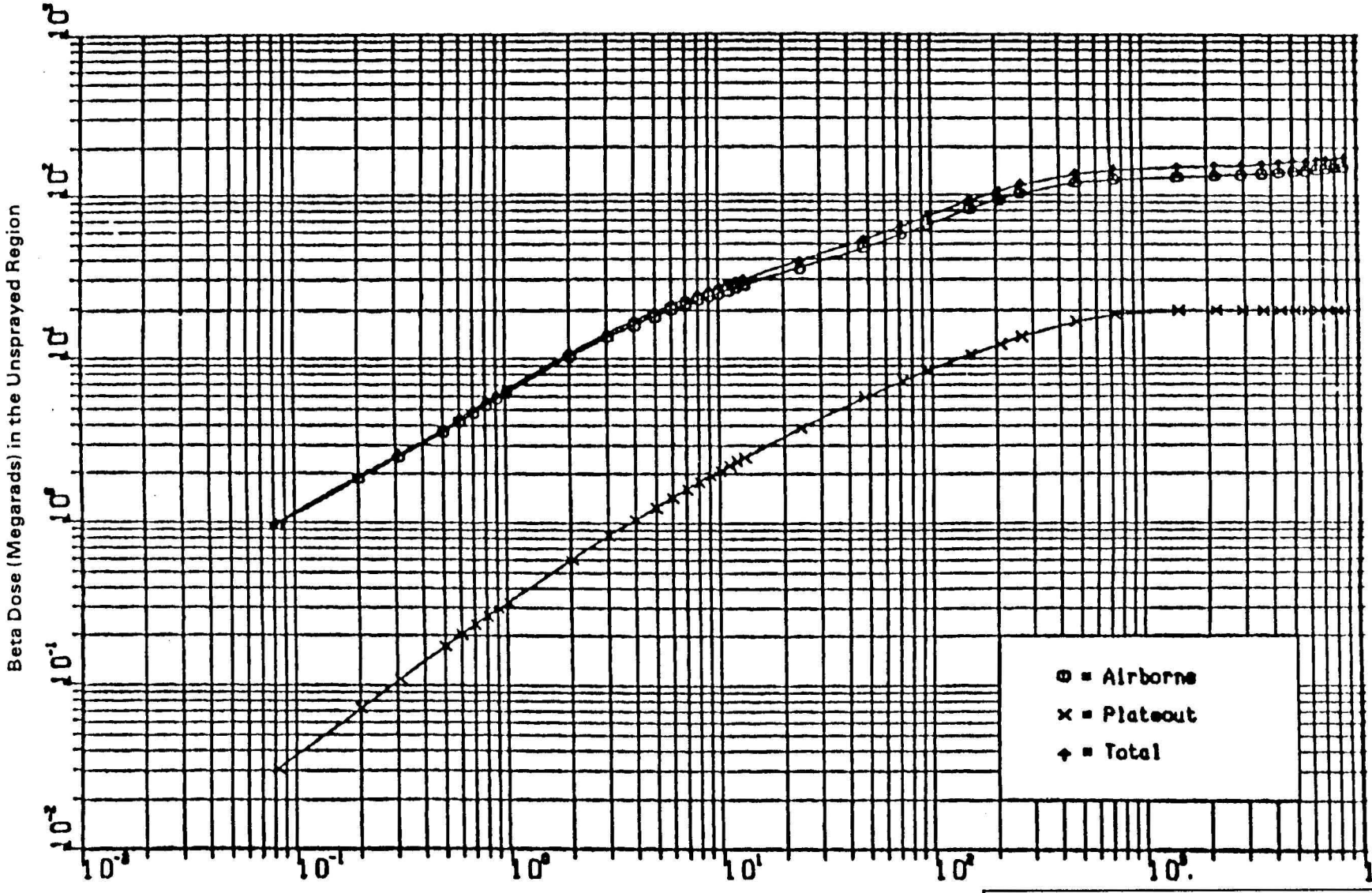
CALLAWAY PLANT
FIGURE 3.11(B)-83 BETA DOSE 1.0% Cs DETECTORS 1,6-14& 23-26



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CALLAWAY PLANT
FIGURE 3.11(B)-84 BETA DOSE 1.0% Cs DETECTORS 2-5&15-22

FSAR Figure 3.11(B)-85 withheld per RIS 2015-17

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CALLAWAY PLANT

FIGURE 3.11(B)-85

DETECTOR LOCATIONS

ELEVATION 2000'-0"

FSAR Figure 3.11(B)-85 withheld per RIS 2015-17

FSAR Figure 3.11(B)-86 withheld per RIS 2015-17

M-0G023

H G F E D C

8 7 6 5 4 3

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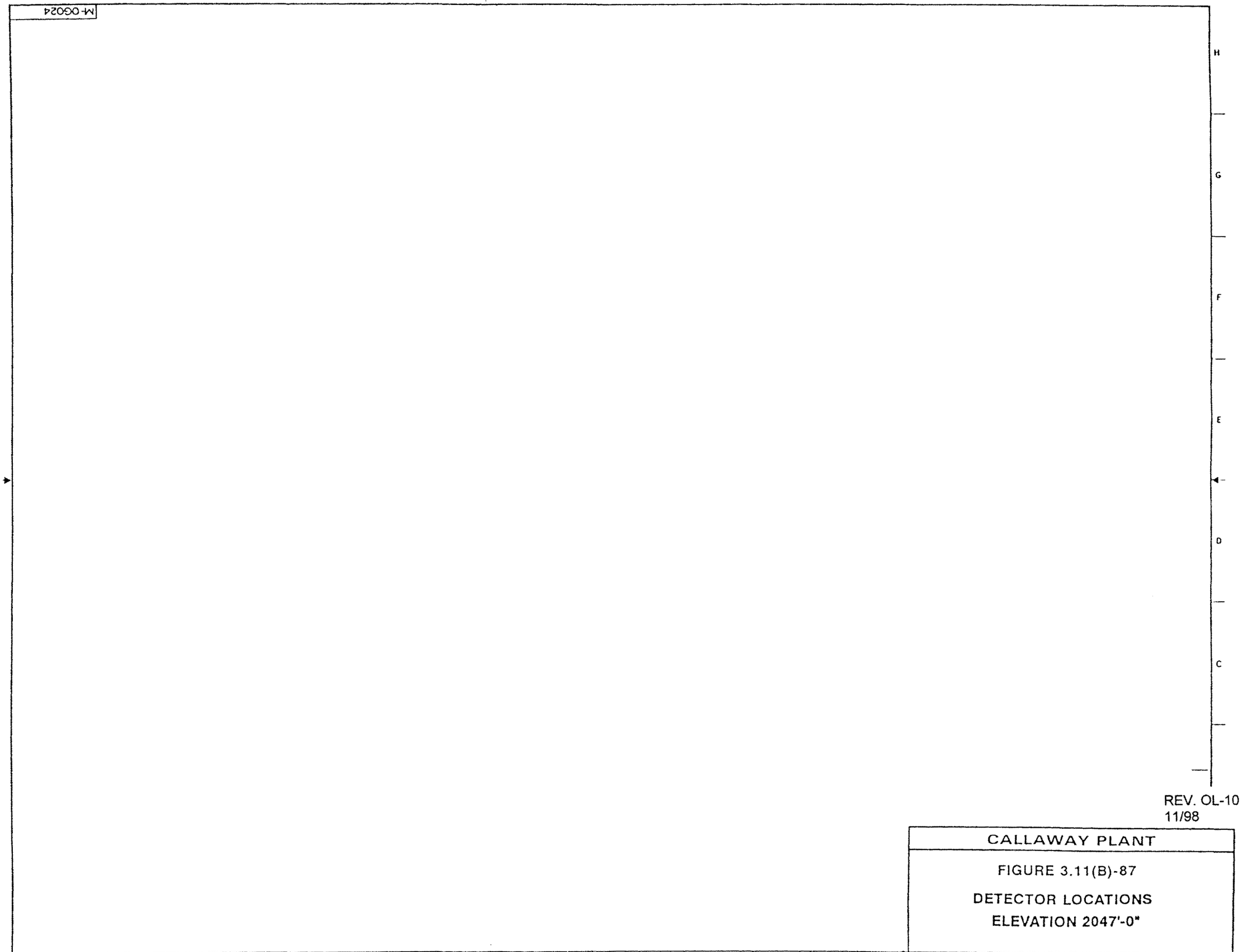
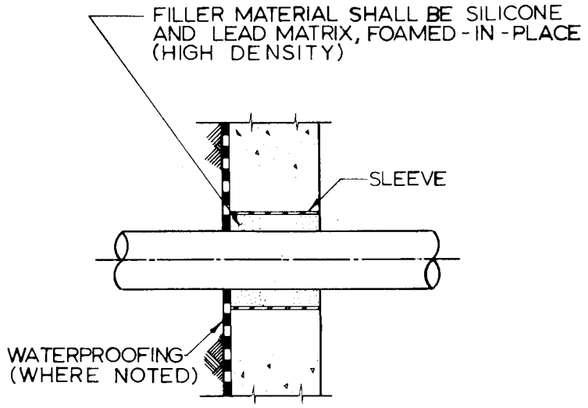
FIGURE 3.11(B)-86
DETECTOR LOCATIONS ELEVATION 2026'-0"

FSAR Figure 3.11(B)-86 withheld per RIS 2015-17

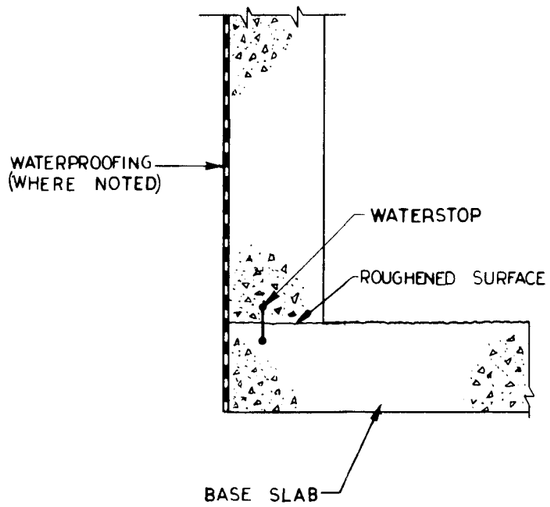
FSAR Figure 3.11(B)-87 withheld per RIS 2015-17



FSAR Figure 3.11(B)-87 withheld per RIS 2015-17



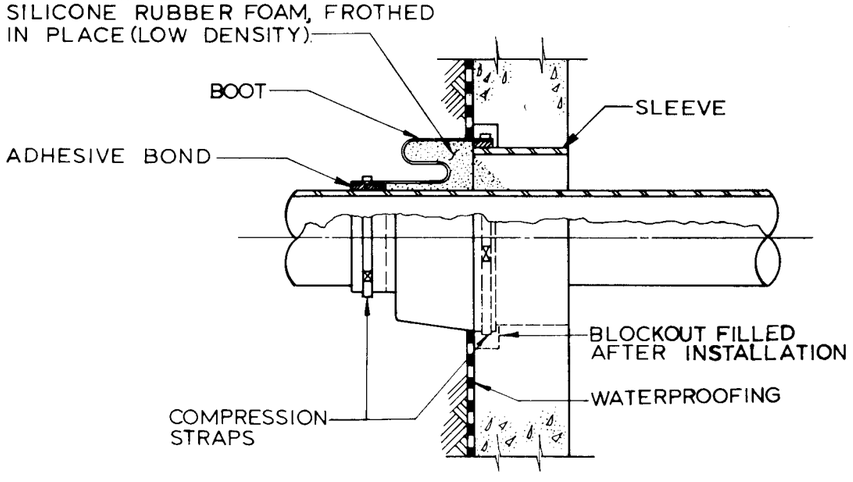
TYPICAL PENETRATION IN WALLS



NOTE

ALL WATERPROOFING WILL BE CARRIED TO GRADE ELEVATION.

TYPICAL WATERPROOFING APPLICATION



ALTERNATE PENETRATION IN WALLS
WHEN FLEXIBILITY OF PIPING IS REQUIRED

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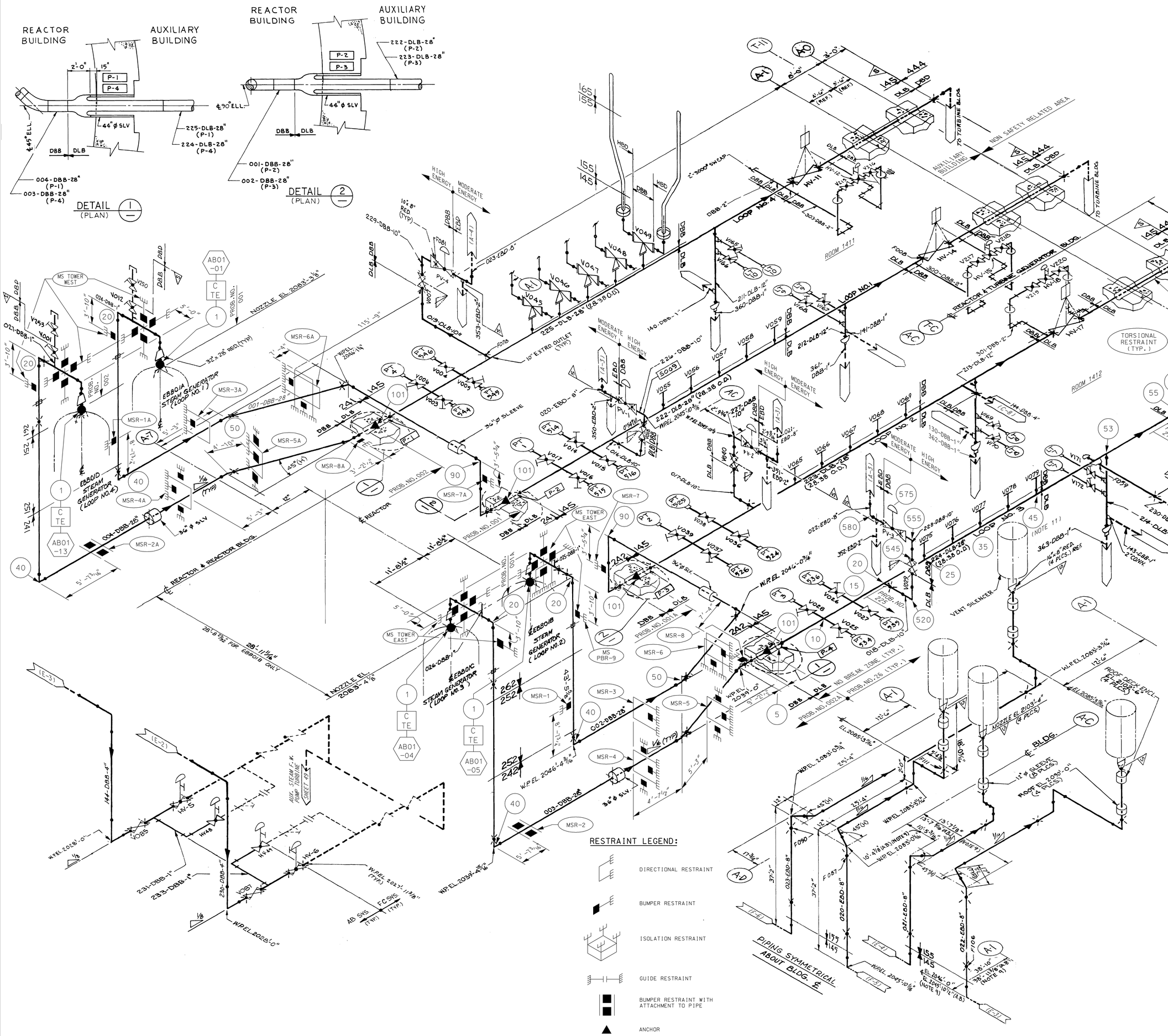
CALLAWAY PLANT

FIGURE 3.4-1
TYPICAL WATERPROOFING DETAILS

NOTES TO FIGURE 3.6-1

SHEETS (1-51)

Table 3.6-4, High Energy Pipe Break Effects Analysis Results, list the sheet of Figure 3.6-1 showing the high energy piping in the indicated room. Figure 3.6-1 sheets also indicate which sheet of Table 3.6-4 is applicable for effect analysis. In some cases the Table 3.6-4 sheet associated with the indicated Room No. shown on Figure 3.6-1 (sheet 1-51) is incorrect and should not be used. Refer to Table 3.6-4 to find the correct sheet of Figure 3.6-1 for the indicated Room No.



NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L IBP – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6.3 SHEETS 1-4, 10, 11 & 38 CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4 SHEET
1411	33
1412	40
2000 (AB01)	41

11. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS. (SG)	(TURB)
AB01-01	304.000	290.000
AB01-05	304.000	290.000
AB01-09	304.000	290.000
AB01-13	304.000	290.000

12. FOR PIPING OUTSIDE CONTAINMENT, STRESS NODES FOR LOOP NO. 3 ARE TYPICAL FOR LOOPS 1, 2 AND 4.

CALLAWAY PLANT

FIGURE 3.6-1

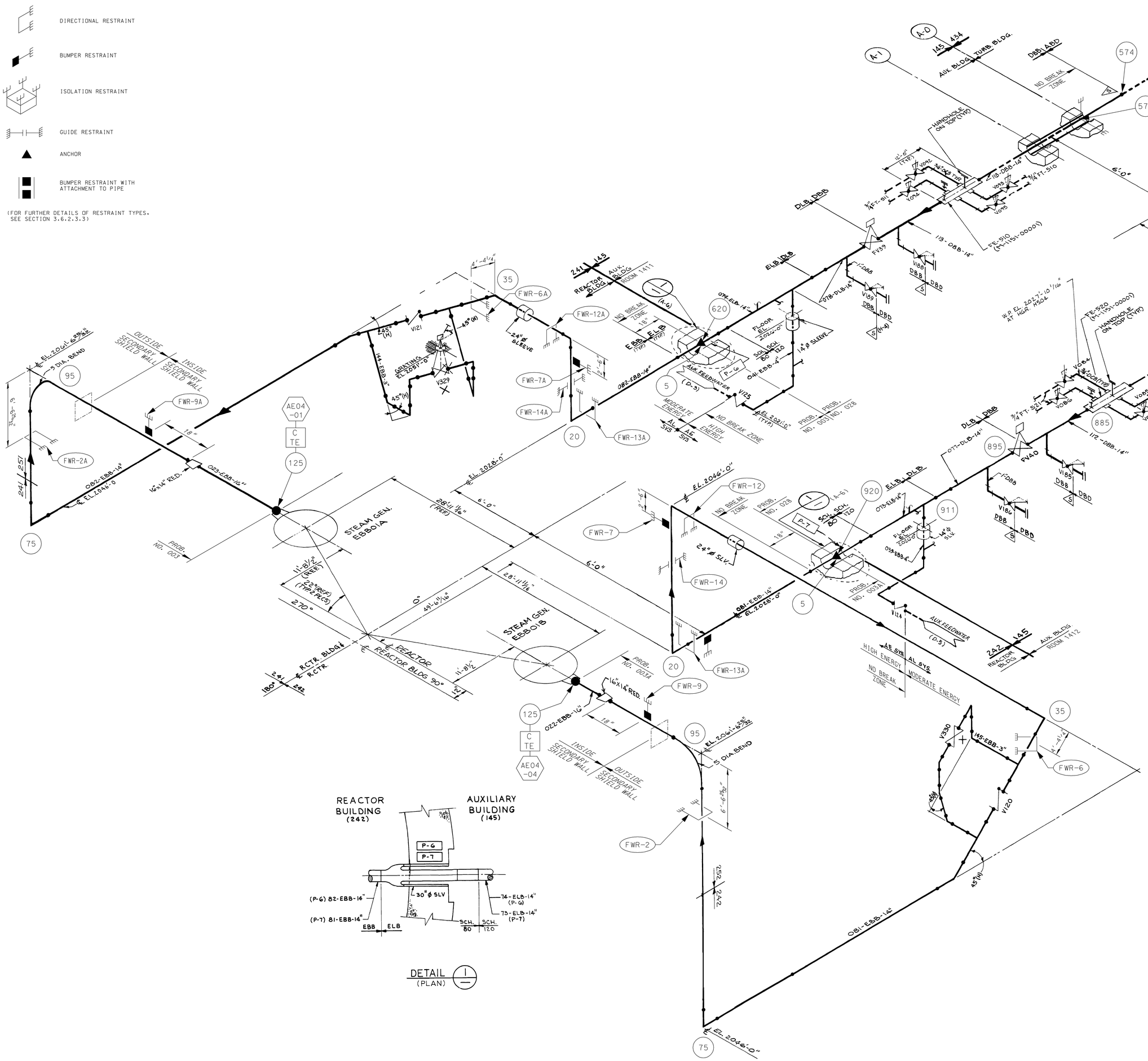
HIGH ENERGY
PIPE BREAK ISOMETRIC
MAIN STEAM SYSTEM
INSIDE CONTAINMENT
(AB01)

REV. OL-15 5/06 (SHEET 1)

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- ANCHOR
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)



REACTOR BUILDING (242)

AUXILIARY BUILDING (145)

DETAIL 1 (PLAN)

NOTES:

1. ● - INDICATES TERMINAL END BREAK POINT
2. ■ - INDICATES INTERMEDIATE BREAK POINT
3. ○ - INDICATES STRESS NODE
4. C IBP - INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L IBP - INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. C TE - INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ - INDICATES BREAK POINT NUMBER
8. ⬭ - INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6-3, SHEETS 5, 6, 12, 20, 24 & 24A CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
AE04-01	321,780
AE04-04	321,780

11. DELETED.
12. EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

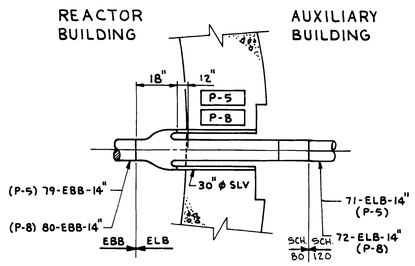
ROOM (ISO)	TABLE 3.6-4 SHEET
2000 (AE04)	44
1411	39
1412	40

CALLAWAY PLANT

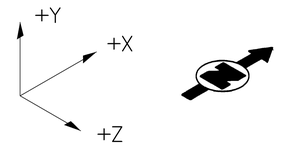
FIGURE 3.6-1

HIGH ENERGY
PIPE BREAK ISOMETRIC
MAIN FEEDWATER SYSTEM
INSIDE CONTAINMENT
(AE04)

REV. OL-15 5/06 (SHEET 2)



DETAIL 1 (PLAN)



NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ◯ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L IBP – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6-3, SHEETS 7, 8, 12, 20, 24 & 24A CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM #	TABLE 3.6-4 SHEET
1411	39
1412	40
2000 (AE05)	45, 46

11. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
AE05-01	321,780
AE05-04	321,780

12. DELETED.

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- ANCHOR
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

DETAIL 6

CALLAWAY PLANT

FIGURE 3.6-1

HIGH ENERGY
PIPE BREAK ISOMETRIC
MAIN FEEDWATER SYSTEM
INSIDE CONTAINMENT
(AE05)

REV. OL-15 5/06 (SHEET 3)

Figure 3.6-1 (Sheets 4 through 7)

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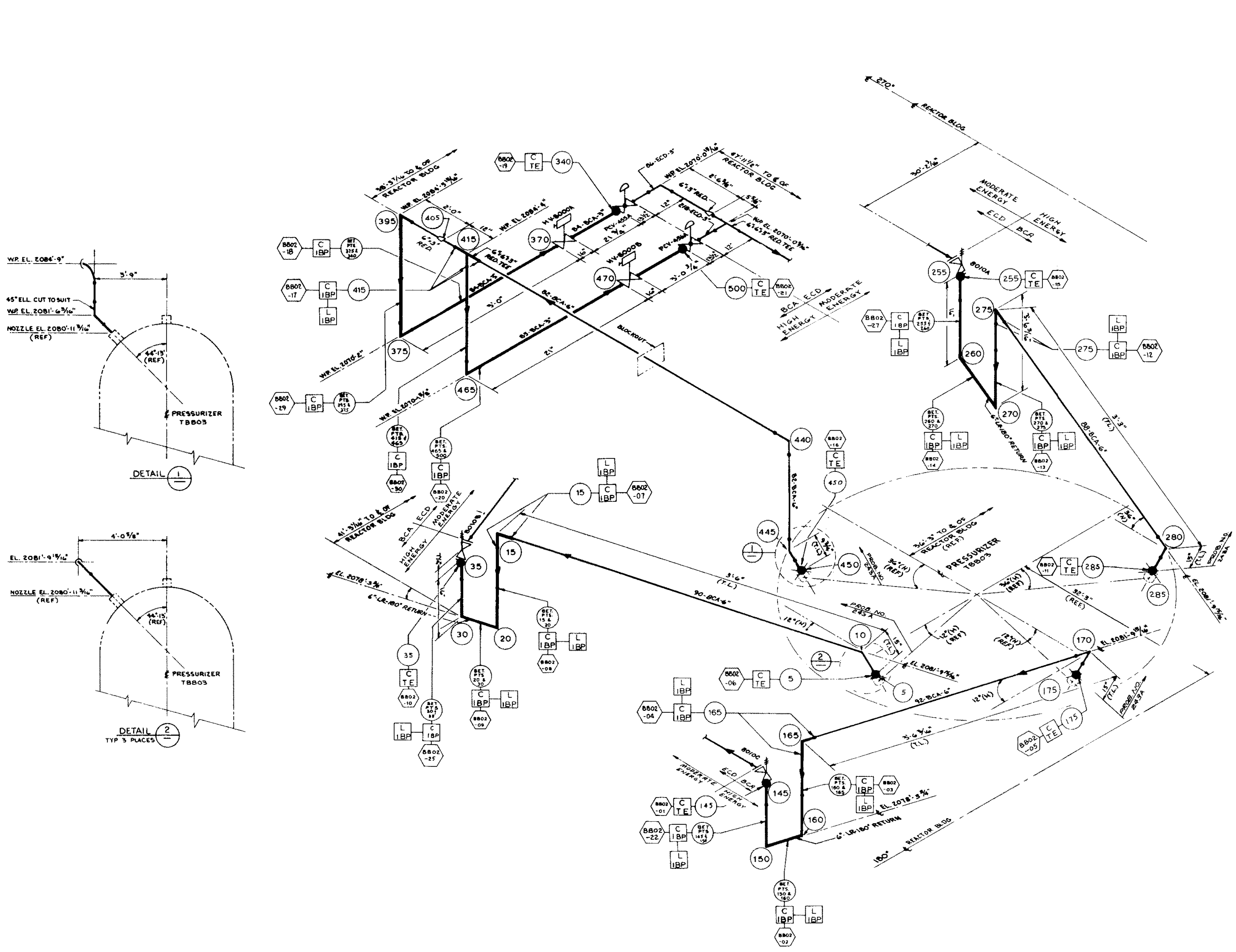

NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C/IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L/IBP – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT.
6. C/TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. – STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6.3, SHEET 52 CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE
10. – STEADY-STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW

BREAK POINT	THRUST FORCE, LBS
BB02-01 through -16	64,304
-17	64,304
-18	16,437
-19 through -21	16,437
-22 through -27	64,304
BB02-29	16,437
BB02-30	16,437

11. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4.

ROOM*(150)	TABLE 3.6-4 SHEET
2000 (BB02)	~~44~~ 47

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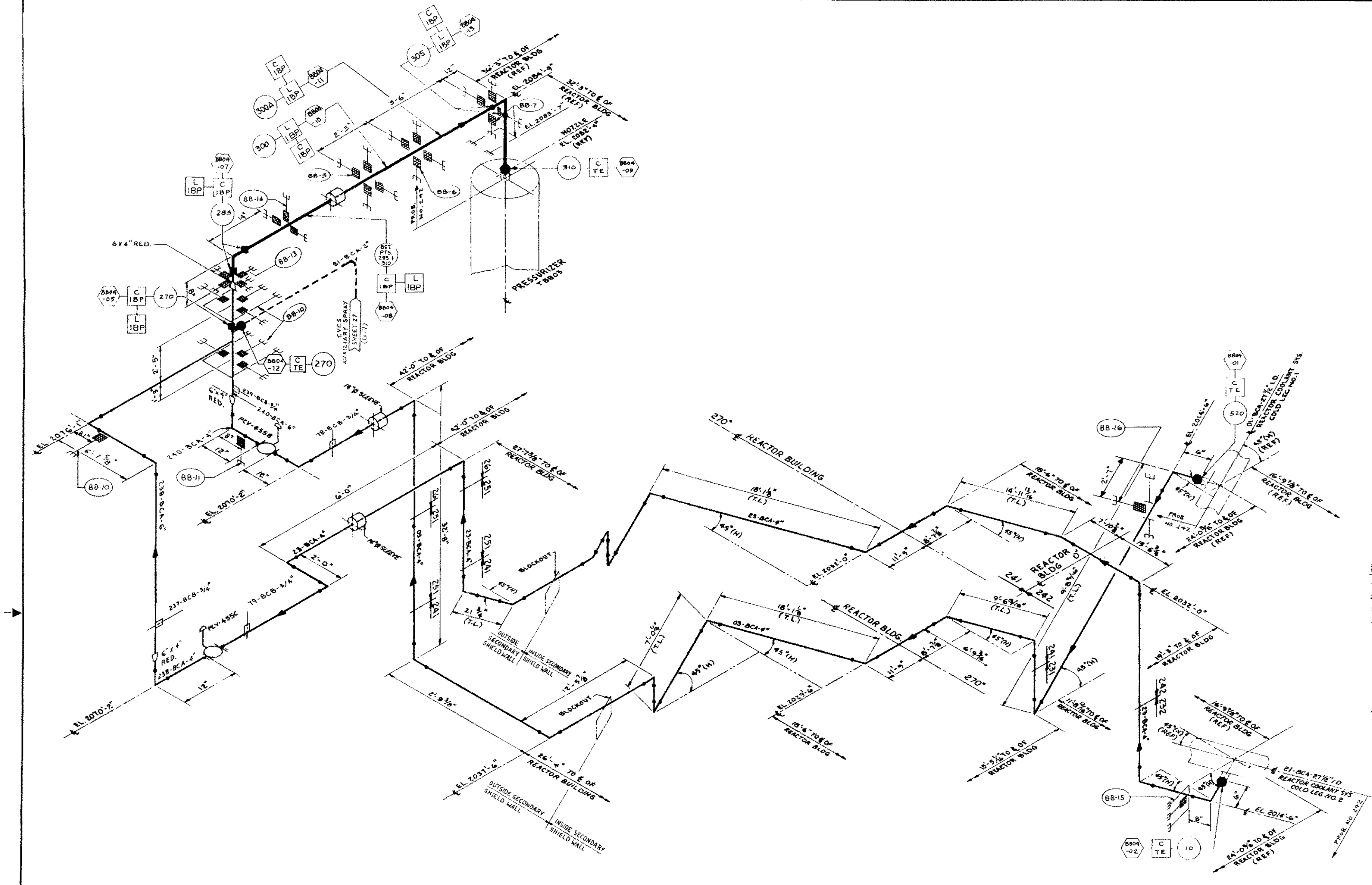
6/86

CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
REACTOR COOLANT SYSTEM
PRESSURIZER RELIEF
(BB02)
(SHEET 8)



RESTRAINT LEGEND

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES SEE SECTION 3.6.2.3.3)

▲ ANCHOR

NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. [C/IBP] – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. [L/IBP] – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT.
6. [C/TE] – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. – INDICATES PIPE BREAK RESTRAINT
9. – STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6.3, SHEET 51 CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE
10. – STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW

BREAK POINT	THRUST FORCE, LBS
BB04 -01	33,747
-02	33,747
-05	76,811
-07	33,747
-08	
BB04 - 09	
BB04-10	
BB04-11	33,747
BB04-12	8127
BB04-13	33,747

11. – EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM* (150)	TABLE 3.6-4 SHEET
2000 (BB04)	~~45~~ 48

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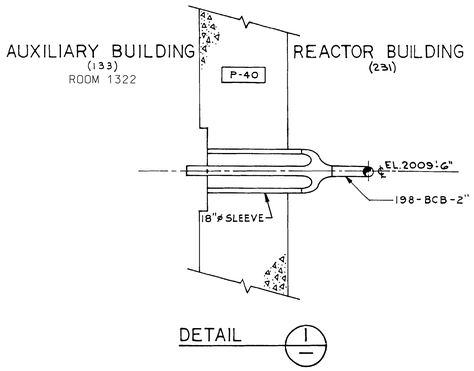
6/86

CALLAWAY PLANT

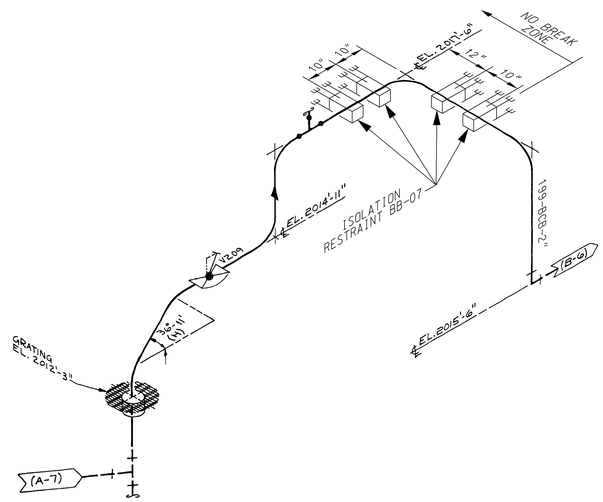
FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
REACTOR COOLANT SYSTEM
PRESSURIZER SPRAY
(BB04)
(SHEET 9)

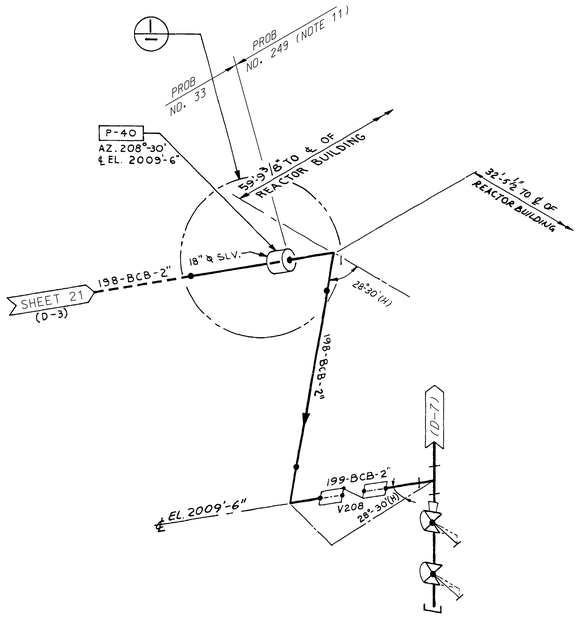
Figure 3.6-1 Sheet 10 has been deleted.

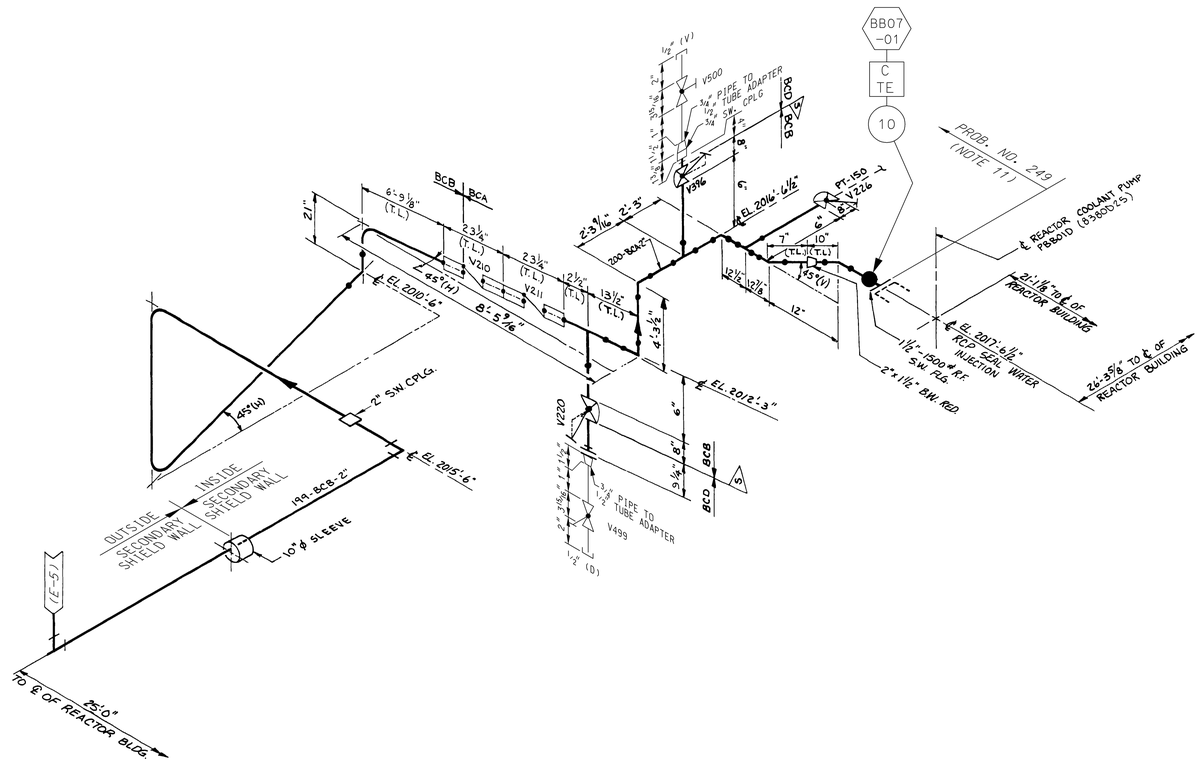
Figure 3.6-1 Sheet 11 has been deleted.



DETAIL 1







NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. [C IBP] – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. [L IBP] – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. [C TE] – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3. SHEET 58 CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
BB07-01 (LOOP)	4968
BB07-01 (CVCS)	132

11. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4 SHEET
2000 (BB07)	52

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- ANCHOR
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

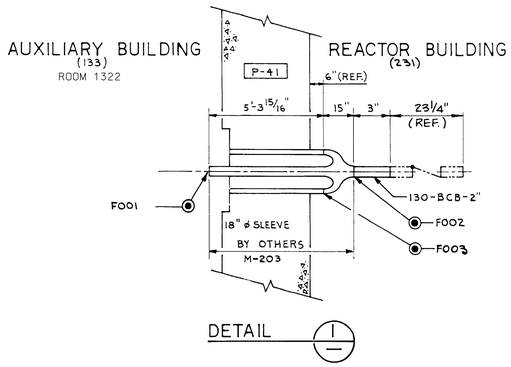
(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

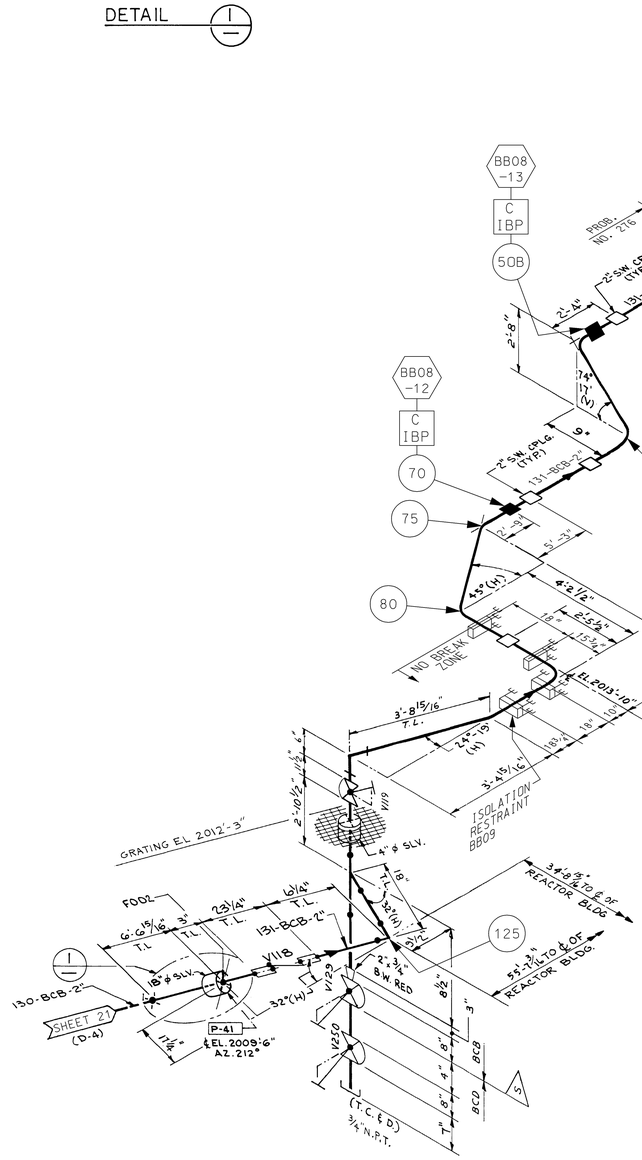
FIGURE 3.6-1

HIGH ENERGY
PIPE BREAK ISOMETRIC
REACTOR COOLANT PUMP D
SEAL WATER INJECTION
INSIDE CONTAINMENT
(BB07)

REV. OL-15 5/06 (SHEET 12)



DETAIL (1)



NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
6. ⬡ – INDICATES BREAK POINT NUMBER
7. ⬭ – INDICATES PIPE BREAK RESTRAINT
8. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3, CORRESPONDING TO THE NUMERICAL NODAL POINTS SHOWN HERE.
9. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
BM08-03 (CVCS)	132
BM08-04 (CVCS)	132
BM08-09 (LOOP)	4968
BM08-09 (CVCS)	132
BM08-12 (CVCS)	132
BM08-13 (CVCS)	132

10. EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM #	TABLE 3.6-4 SHEET
2000	53

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- ANCHOR
- RIGID HANGER
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

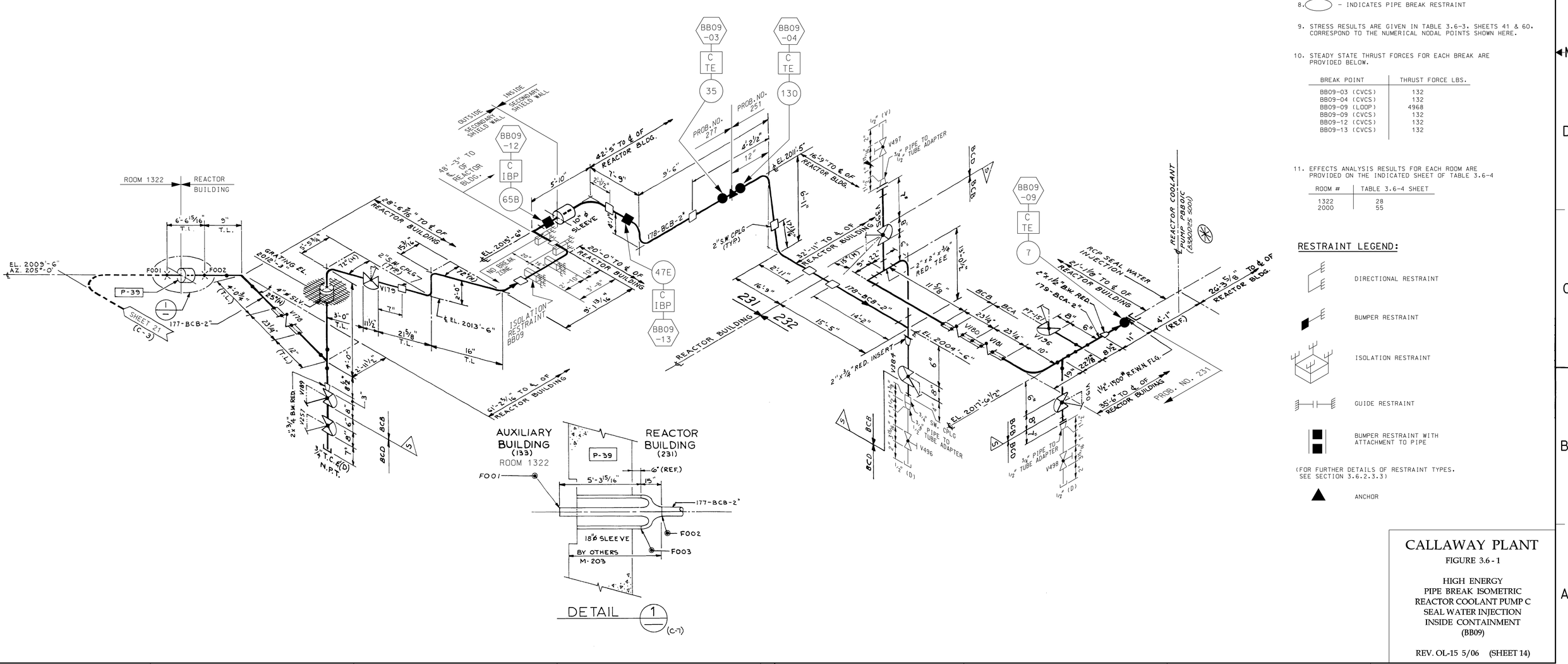
(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

FIGURE 3.6-1

HIGH ENERGY
PIPE BREAK ISOMETRIC
REACTOR COOLANT PUMP A
SEAL WATER INJECTION
INSIDE CONTAINMENT
(BB08)

REV. OL-15 5/06 (SHEET 13)



NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L IBP – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3, SHEETS 41 & 60. CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
BB09-03 (CVCS)	132
BB09-04 (CVCS)	132
BB09-09 (LOOP)	4968
BB09-09 (CVCS)	132
BB09-12 (CVCS)	132
BB09-13 (CVCS)	132

11. EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM #	TABLE 3.6-4 SHEET
1322	28
2000	55

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

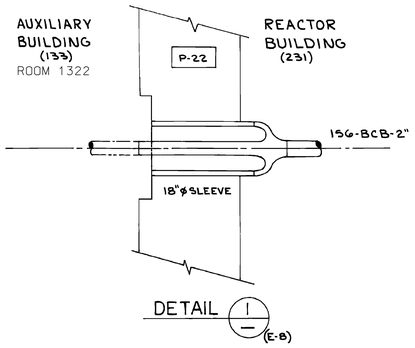
▲ ANCHOR

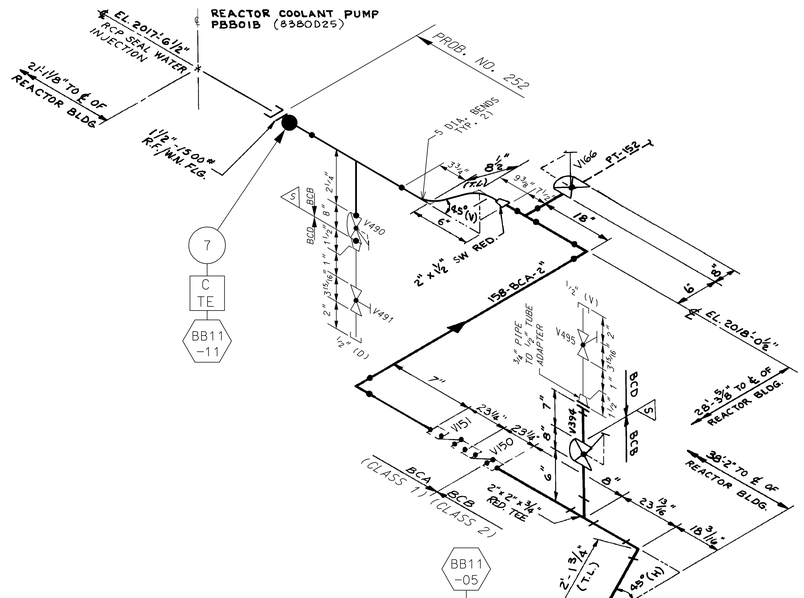
CALLAWAY PLANT

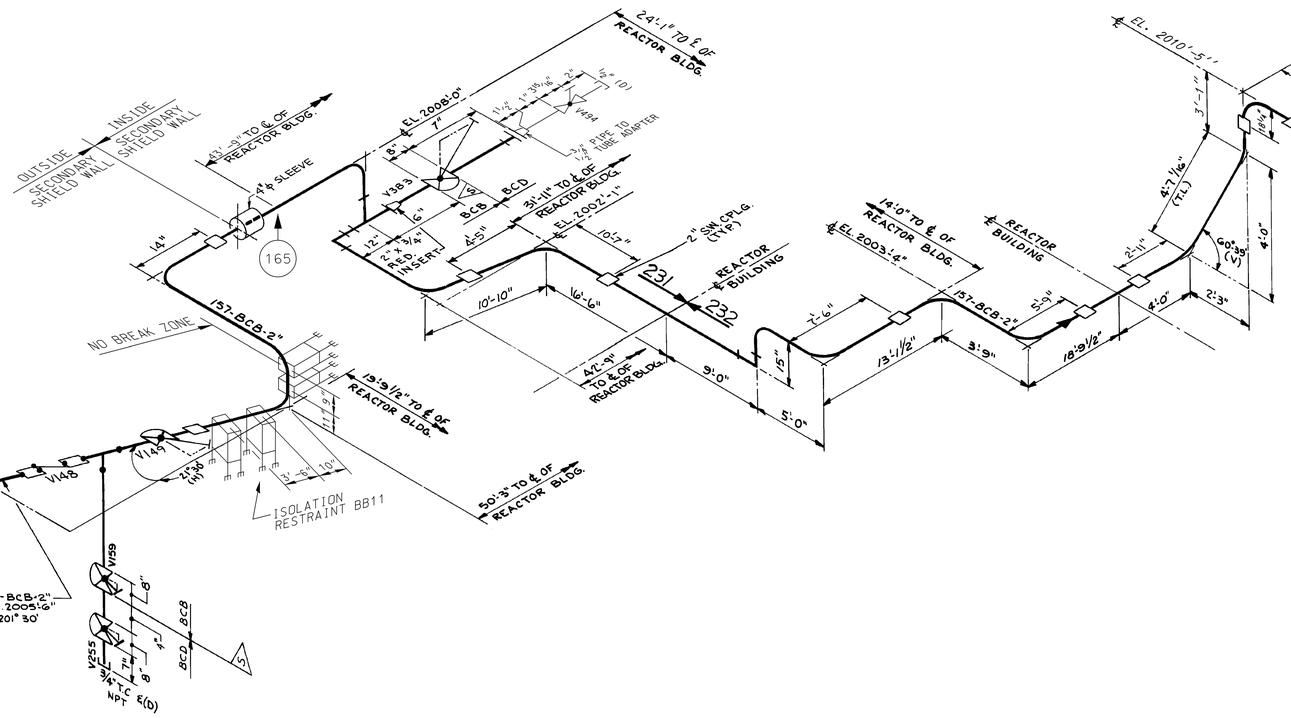
FIGURE 3.6-1

HIGH ENERGY
PIPE BREAK ISOMETRIC
REACTOR COOLANT PUMP C
SEAL WATER INJECTION
INSIDE CONTAINMENT
(BB09)

REV. OL-15 5/06 (SHEET 14)







NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L IBP – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3. SHEETS 42 & 61 CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. FOR PROB. NO. 278. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
BB11-04	132
BB11-05	132
BB11-11 (LOOP)	4968
BB11-11 (CVCS)	132

11. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4 SHEET
2000 (BB11)	51

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- ANCHOR
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES. SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

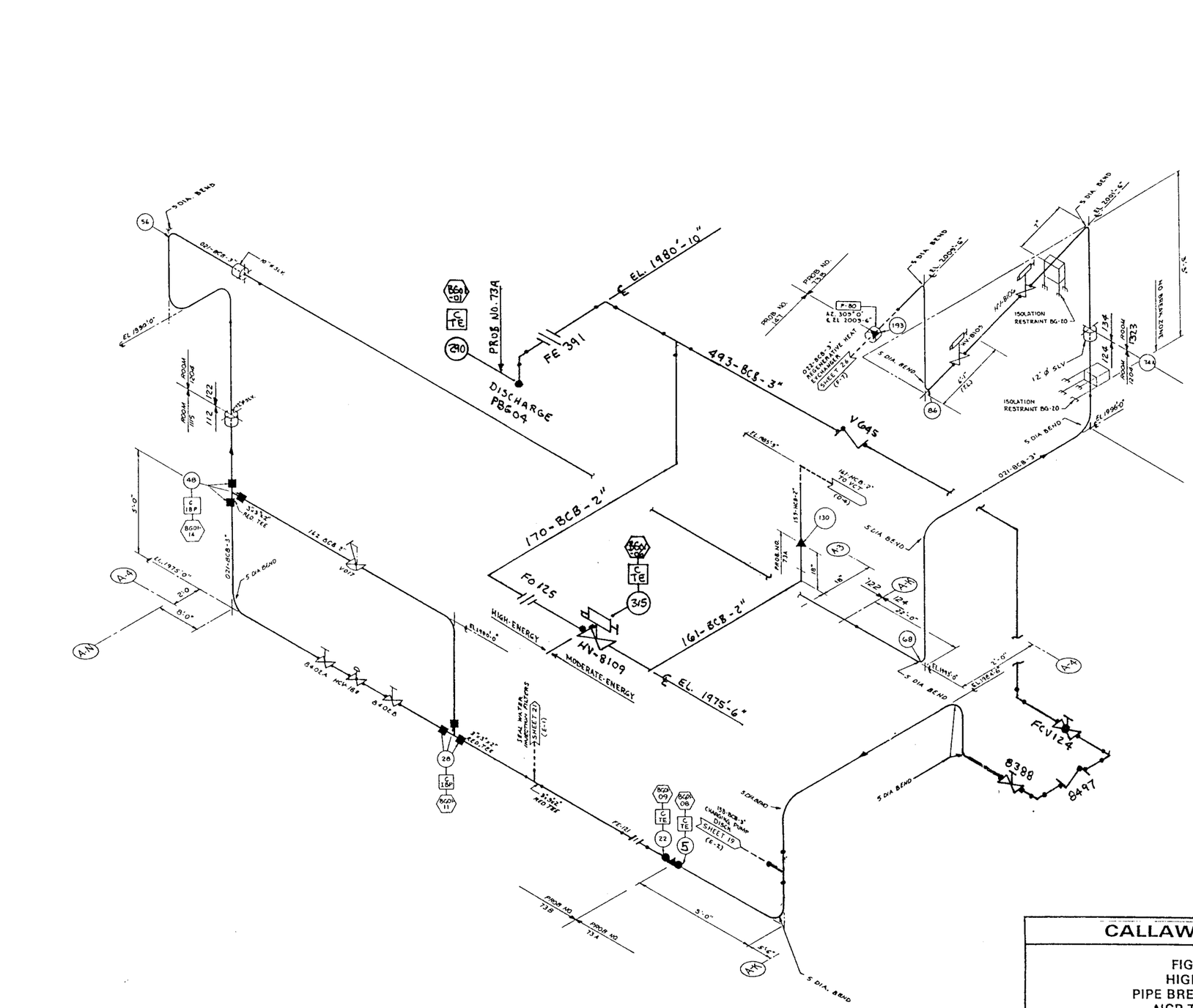
FIGURE 3.6-1

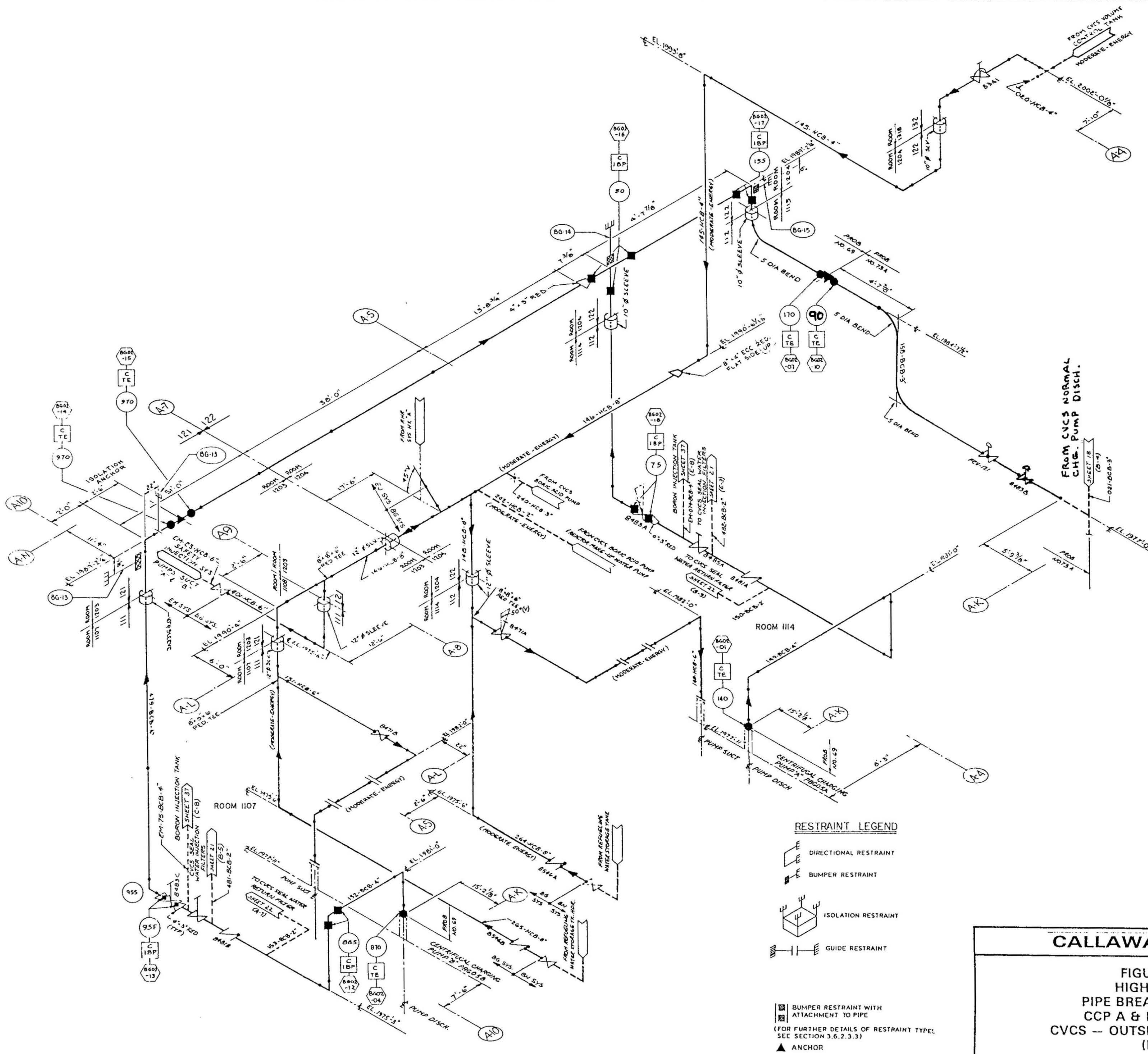
HIGH ENERGY
PIPE BREAK ISOMETRIC
REACTOR COOLANT PUMP B
SEAL WATER INJECTION
INSIDE CONTAINMENT
(BB11)

REV. OL-15 5/06 (SHEET 15)

Figure 3.6-1 Sheet 16 has been deleted.

Figure 3.6-1 Sheet 17 has been deleted.


+Y
+X
+Z
NOTES:
1 ● – INDICATES TERMINAL END BREAK POINT
2 ■ – INDICATES INTERMEDIATE BREAK POINT
3 ○ – INDICATES STRESS NODE
4 – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5 – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT.
6 – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7 – INDICATES BREAK POINT NUMBER
8 – INDICATES PIPE BREAK RESTRAINT
9 – STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6.3 SHEETS 15 & 16 CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE
10 – STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW
BREAK POINT | THRUST FORCE, LBS
BG01-01 | 0
BG01-06 | 0
BG01-08 | 33,000
BG01-09 | 33,000
BG01-11(1.5") | 33,000
BG01-11(2") | 14,000
BG01-14 (3") | 33,000
BG01-14 (2") | 14,000
RESTRAINT LEGEND
DIRECTIONAL RESTRAINT
BUMPER RESTRAINT
ISOLATION RESTRAINT
GUIDE RESTRAINT
BUMPER RESTRAINT WITH ATTACHMENT TO PIPE
(FOR FURTHER DETAILS OF RESTRAINT TYPES SEE SECTION 3.6.2.3.3)
ANCHOR
IL EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4
ROOM # | TABLE 3.6-4 SHEET
1204 | 29
1323 | 29
1115 | 7
493-BCB-3"
170-BCB-2"
161-BCB-2"
FE 391
PROB NO. 73A
PROB NO. 73B
PROB NO. 138
DISCHARGE PB604
V645
HV-8109
HIGH-ENERGY
MODERATE-ENERGY
EL. 1980'-10"
EL. 1975'-6"
ISOLATION RESTRAINT BG-20
NO BREAK ZONE
FCV124
8388
8497
REV OL-8
11/95
CALLAWAY PLANT
FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
NCP TO REGEN HX
CVCS – OUTSIDE CONTAINMENT
(BG01)
(SHEET 18)



NOTES:

1. ● - INDICATES TERMINAL END BREAK POINT
2. ■ - INDICATES INTERMEDIATE BREAK POINT
3. ○ - INDICATES STRESS NODE
4. [C/IBP] - INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. [L/IBP] - INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. [C/TE] - INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ - INDICATES BREAK POINT NUMBER
8. (PBR) - INDICATES PIPE BREAK RESTRAINT
9. - STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6.3 SHEETS [illegible] CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE
10. - EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6.4.

ROOM #	TABLE 3.6.4 SHEET
1107	5
1114	6
1115	7
1203	19
1204	20

- STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE, LBS
BGO2-01	49,575
BGO2-04	49,575
BGO2-07	11,216
BGO2-10	11,216
BGO2-12	49,575
BGO2-13	18,170
BGO2-14	49,575
BGO2-15	49,575
BGO2-16	11,216
BGO2-17	11,216
BGO2-18	18,170

RESTRAINT LEGEND

DIRECTIONAL RESTRAINT

BUMPER RESTRAINT

ISOLATION RESTRAINT

GUIDE RESTRAINT

BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES SEE SECTION 3.6.2.3.3)

▲ ANCHOR

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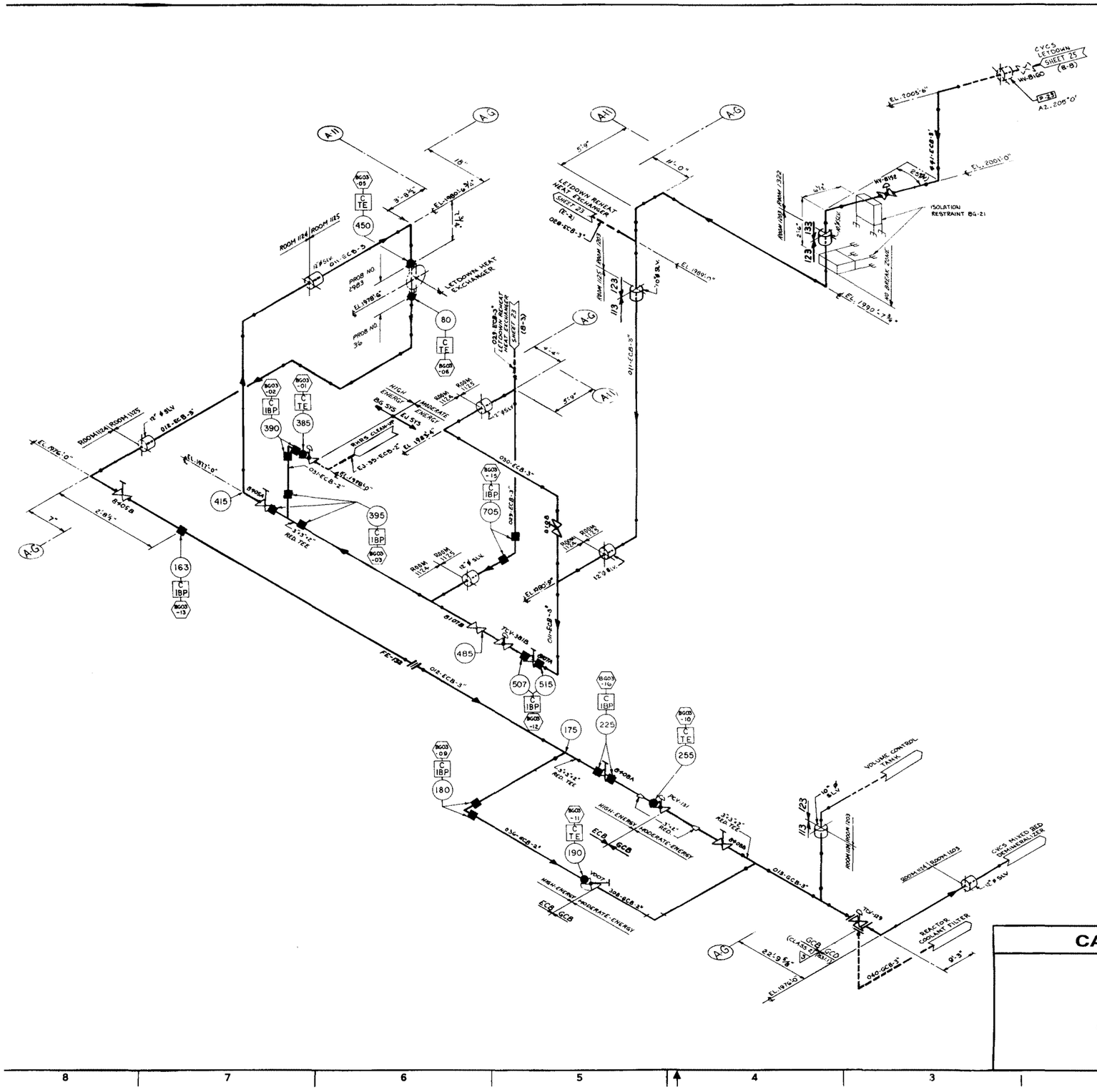
11/95

CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
CCP A & B DISCHARGE
CVCS – OUTSIDE CONTAINMENT
(BG02)
(SHEET 19)



NOTES:

1. ● - INDICATES TERMINAL END BREAK POINT
2. ■ - INDICATES INTERMEDIATE BREAK POINT
3. ○ - INDICATES STRESS NODE
4. ⊞ - INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. ⊞ - INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. ⊞ - INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ - INDICATES BREAK POINT NUMBER
8. ⬭ - INDICATES PIPE BREAK RESTRAINT
9. - STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6.3 SHEETS 15 & 19 CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE
10. - STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW

BREAK POINT	THRUST FORCE, LBS
BG03-01	4,026
BG03-02	4,026
BG03-03	4,026 (2" BREAK)
BG03-03	8,872 (3" BREAK) LETDOWN HX SOURCE
BG03-03	8,587 (CVCS LETDOWN ORIFICE SOURCE)
BG03-05	8,872
BG03-06	8,872
BG03-09	7,088
BG03-10	2,705
BG03-11	1,088
BG03-12	8,587 CVCS LETDOWN ORIFICE
BG03-12	8,872 LETDOWN HX SOURCE
BG03-13	2,705
BG03-15	8,872 LETDOWN HX SOURCE
BG03-15	8,587 CVCS LETDOWN ORIFICE
BG03-16	2,705

RESTRAINT LEGEND

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES SEE SECTION 3.6.2.3.3)

▲ ANCHOR

11 EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM*	TABLE 3.6-4 SHEET
1322	29
1203	19
1125	12
1124	11

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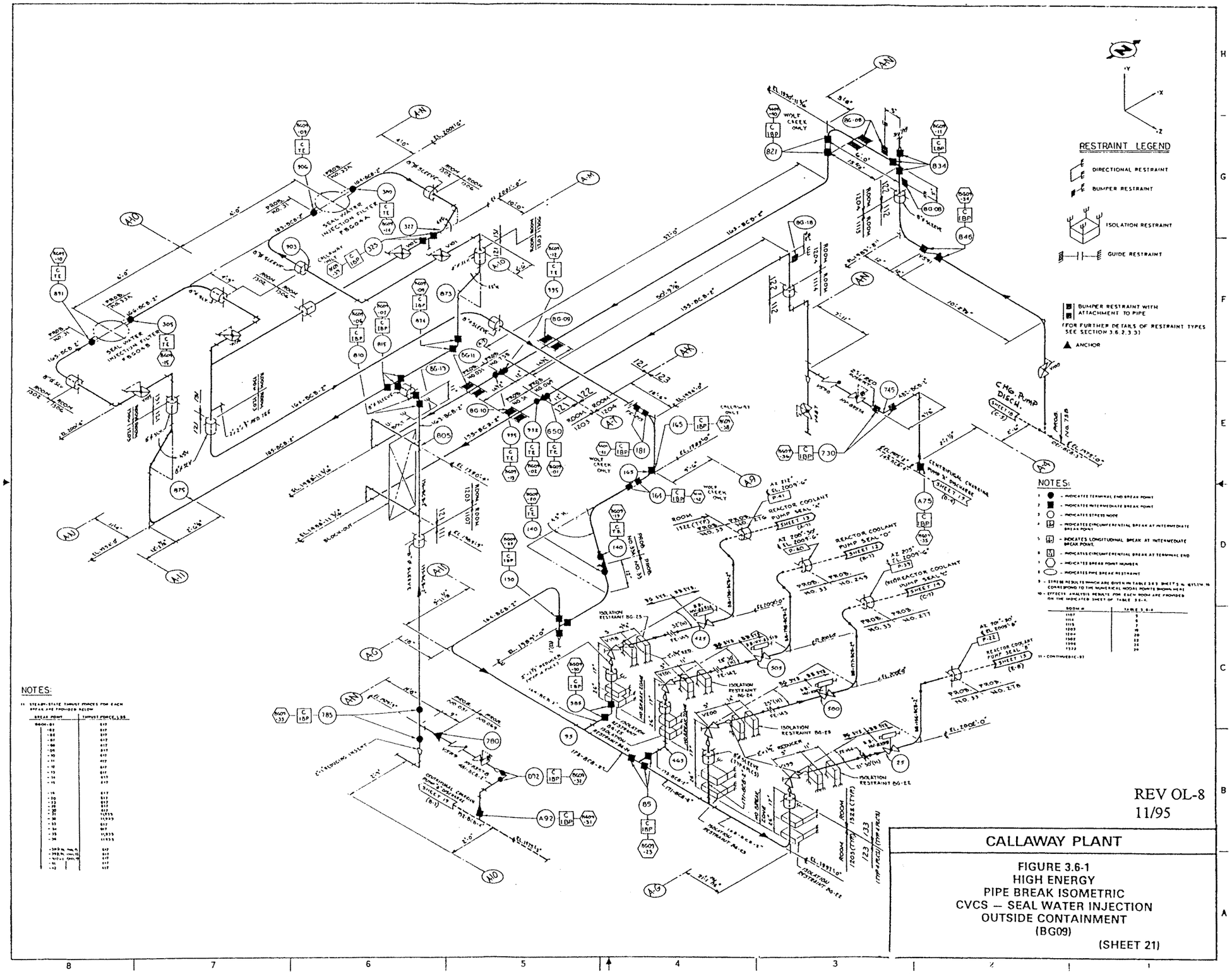
CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
CVCS — LETDOWN
OUTSIDE CONTAINMENT
(BG03)

(SHEET 20)



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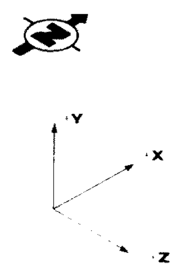
11/95

CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
CVCS — SEAL WATER INJECTION
OUTSIDE CONTAINMENT
(BG09)

(SHEET 21)



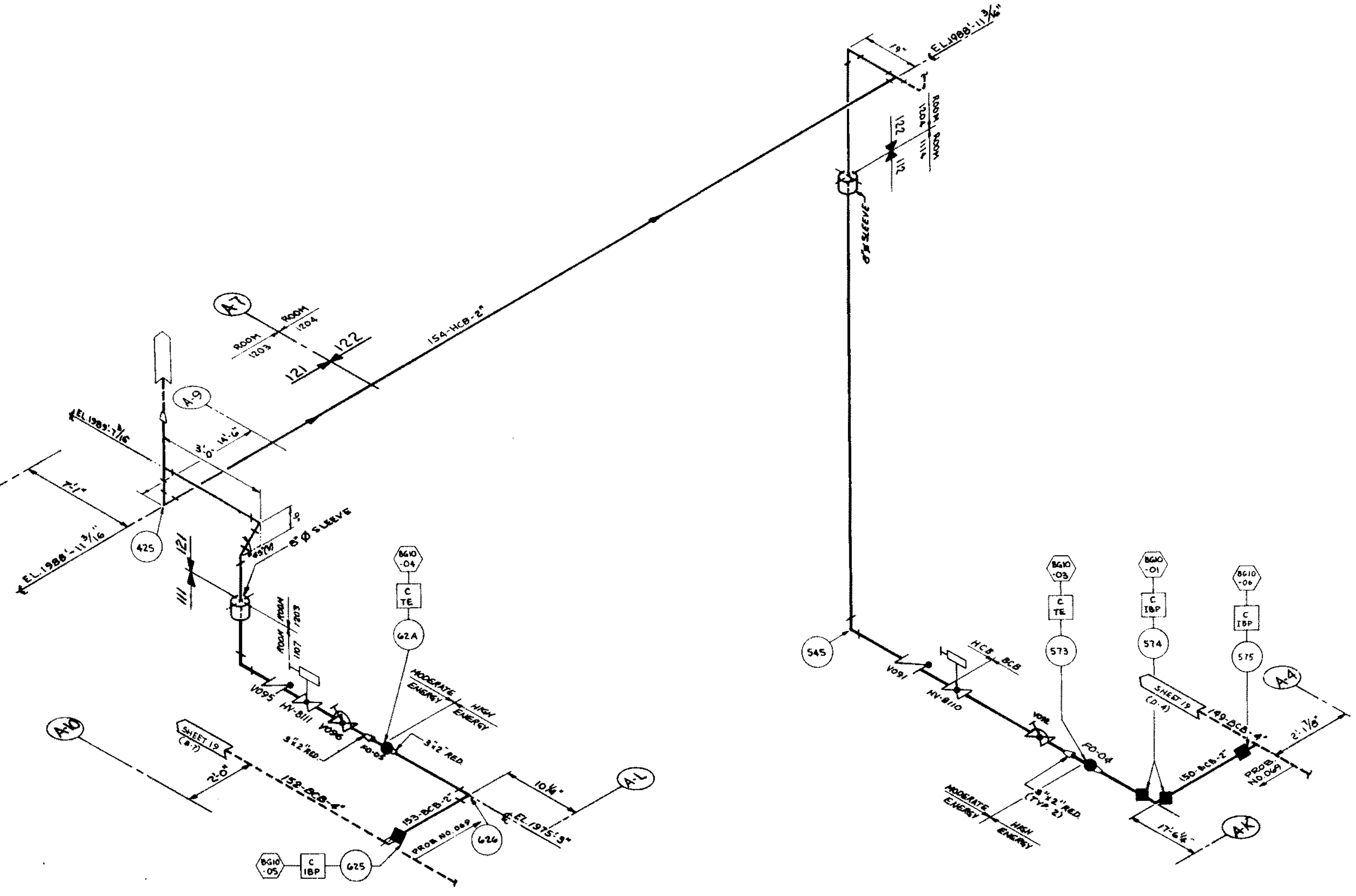
NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. INDICATES CIRCUMFERENTIAL BREAK AT INTERM. BREAK POINT
5. – INDICATES LONGITUDINAL BREAK AT INTERM. BREAK POINT
6. INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6.3, SHEET [illegible] CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE
10. EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6.4.

ROOM #	TABLE 3.6.4 SHEET
1107	5
1114	6
1203	19
1204	~~20~~ 21

11. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW

BREAK POINT	THRUST FORCE, LBS
BG10-01	5,272
BG10-03	5,272
BG10-04	5,272
BG10-05	5,272
BG10-06	5,272



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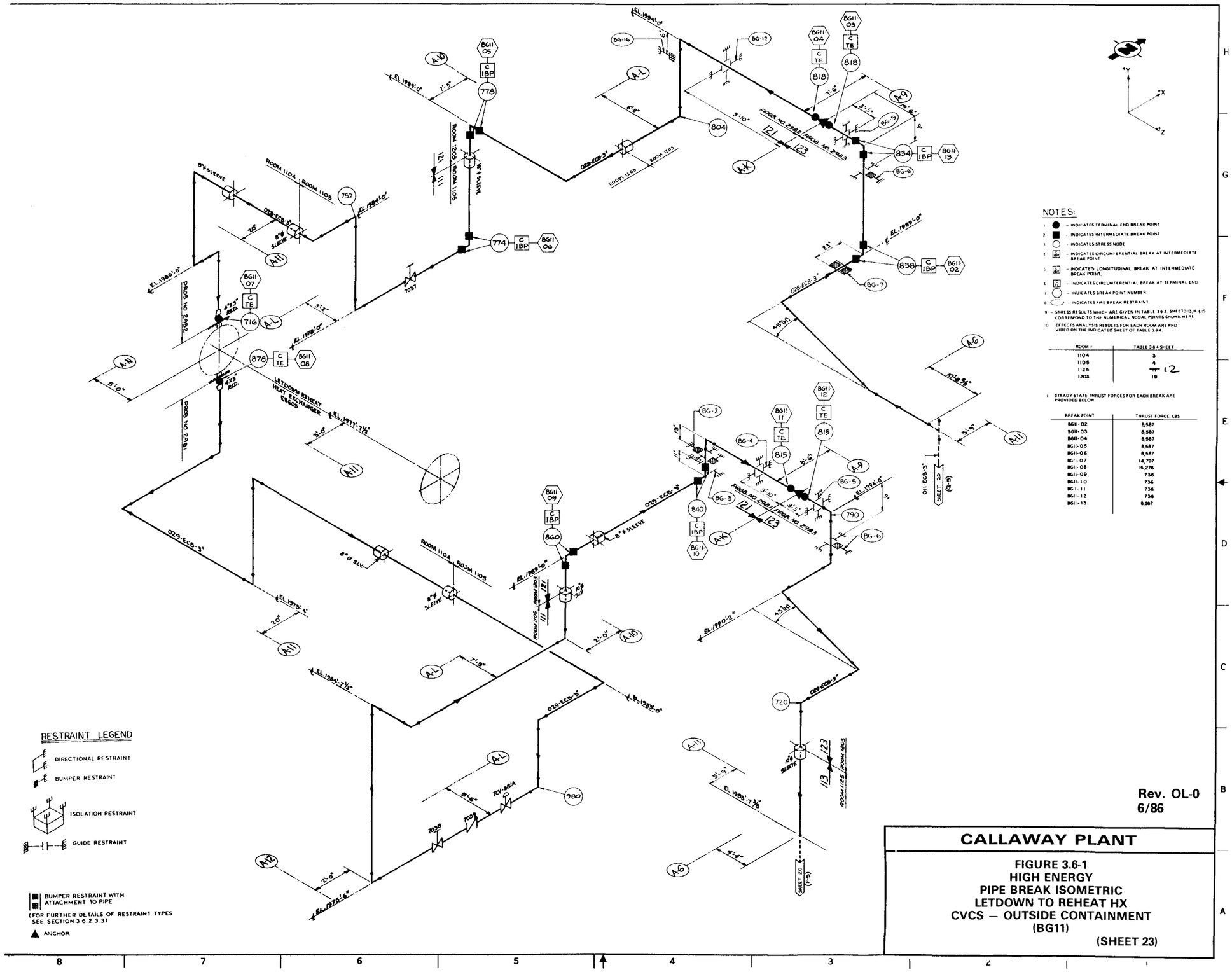
CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
CCP A & B MINIFLOW
CVCS – OUTSIDE CONTAINMENT
(BG10)
(SHEET 22)



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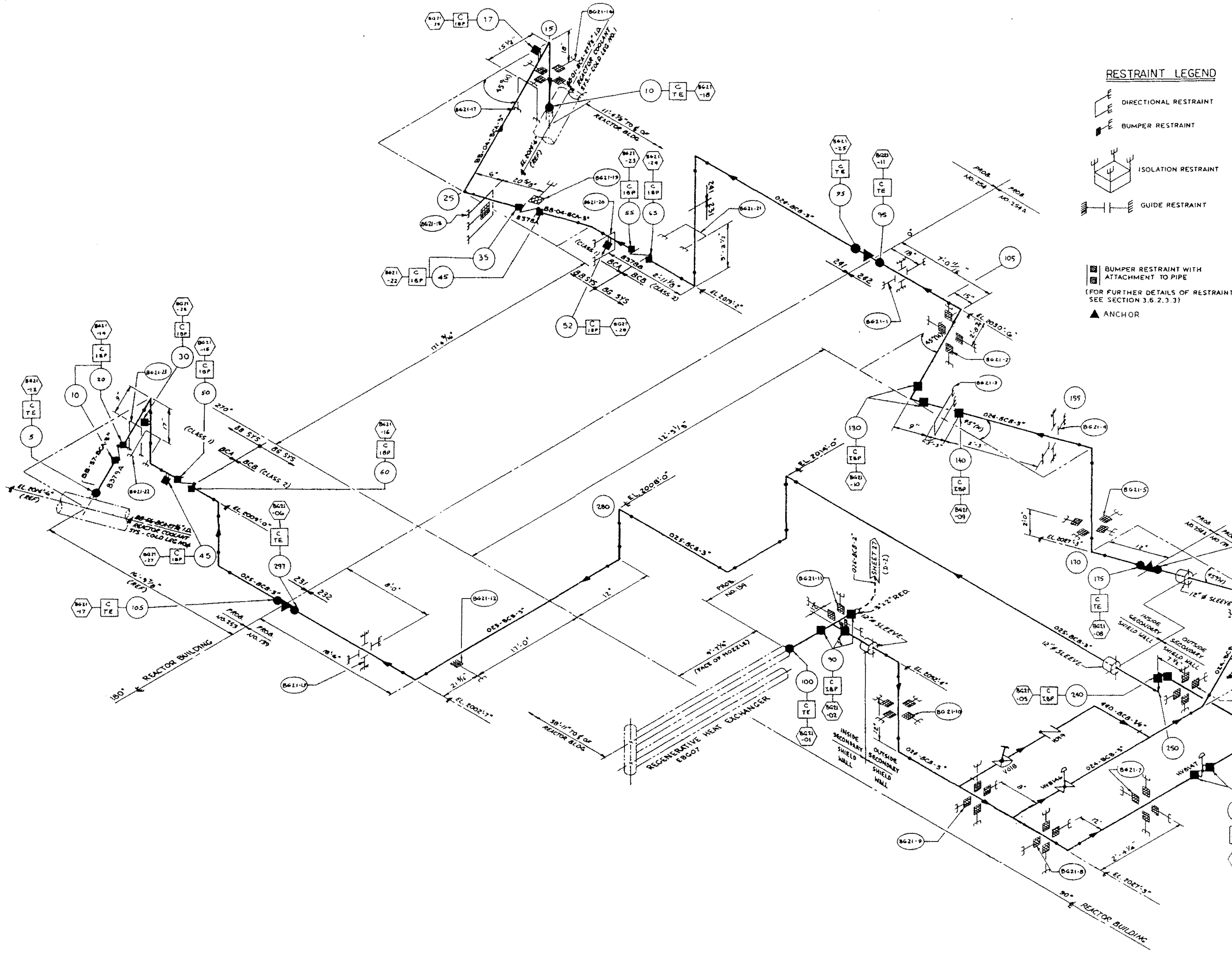
CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
LETDOWN TO REHEAT HX
CVCS – OUTSIDE CONTAINMENT
(BG11)

(SHEET 23)



NOTES:

1. ● - INDICATES TERMINAL END BREAK POINT
2. ■ - INDICATES INTERMEDIATE BREAK POINT
3. ○ - INDICATES STRESS NODE
4. C/IBP - INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L/IBP - INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT.
6. C/TE - INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ - INDICATES BREAK POINT NUMBER
8. ⬭ - INDICATES PIPE BREAK RESTRAINT
9. - STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6-3, SHEETS 29, 29A, & 39 CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. - STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE, LBS
BG21-01	23,373
-02	23,373
-04	19,277
-05	19,277
-06	19,277
-07	23,210
-08	23,210
-09	23,210
-10	23,210
-11	23,210
-12 LOOP	19,656
-12 CVCS	19,277
-14 LOOP	19,656
-14 CVCS	19,277
-15 LOOP	19,656
-15 CVCS	19,277
-16	19,277
-17	19,277
-18 LOOP	19,656
-18 CVCS	23,210
-26, 27	19,656
-28, 29	23,210
-22 LOOP	19,656
-22 CVCS	23,210
-23 LOOP	19,656
-23 CVCS	23,210
-24	23,210
BG21-25	23,210

11. - EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM #(150)	TABLE 3.6-4 SHEET
2000 (BG21)	54

REV OL-11
5/00

CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
NORMAL & ALTERNATE CHARGING
CVCS – INSIDE CONTAINMENT
(BG21)
(SHEET 24)

NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
6. ⬡ – INDICATES BREAK POINT NUMBER
7. ⬭ – INDICATES PIPE BREAK RESTRAINT
8. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3. SHEETS 28, 31, 32 & 54, CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
9. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
BG22-01	21,839
BG22-02	21,839
BG22-03	21,839
BG22-04	21,839
BG22-05	26,900 (BOTH SOURCES)
BG22-06	3,900 (BOTH SOURCES)
BG22-07 (2")	3,900 (BOTH SOURCES)
BG22-07 (3")	8,594 (BOTH SOURCES)
BG22-08	3,900 (BOTH SOURCES)
BG22-09	8,594 (BOTH SOURCES)
BG22-10	8,594 (BOTH SOURCES)
BG22-12	8,594 (BOTH SOURCES)
BG22-13 (2")	3,900 (BOTH SOURCES)
BG22-13 (3")	8,594 (BOTH SOURCES)
BG22-14	8,594 (BOTH SOURCES)
BG22-18	21,839
BG22-24 (CVCS)	21,839
BG22-24 (LOOP)	19,115
BG22-26 (CVCS)	21,839
BG22-26 (LOOP)	19,115
BG22-27 (CVCS)	21,839
BG22-27 (LOOP)	19,115
BG22-28	7,921

10. ▲ – INDICATES ANCHOR POINT.
11. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4 SHEET
2000 (BG22)	65

AUXILIARY BUILDING (133) ROOM 1322

REACTOR BUILDING (231)

DETAIL 1

ROOM 1322 | REACTOR BUILDING

DETAIL 5

REGENERATIVE HEAT EXCHANGER EBG07

REGENERATIVE HEAT EXCHANGER EBG01

LETDOWN DELAY PIPE

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

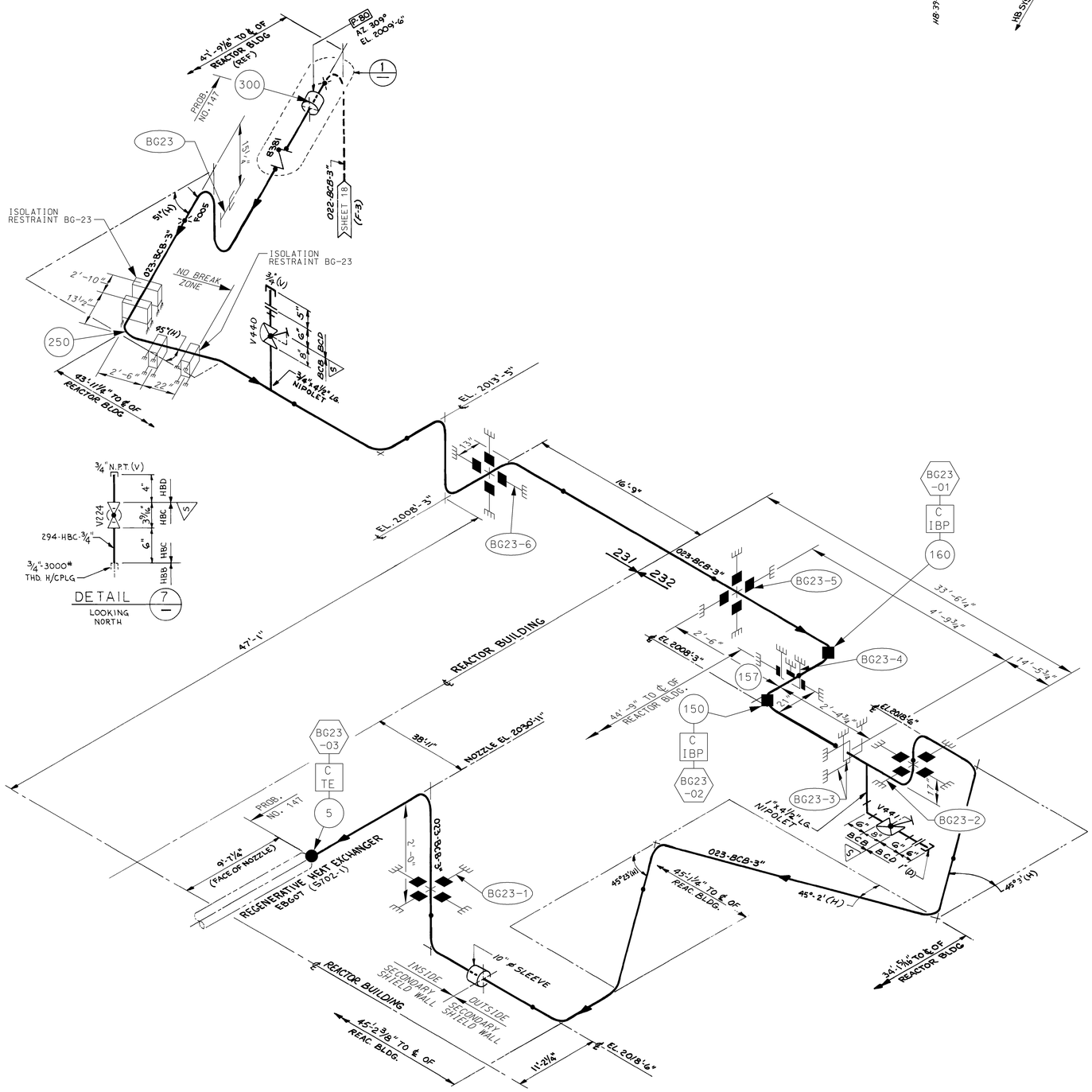
(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

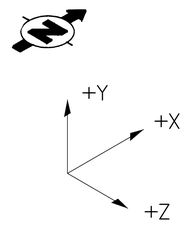
CALLAWAY PLANT

FIGURE 3.6-1

HIGH ENERGY PIPE BREAK ISOMETRIC CVCS - LETDOWN INSIDE CONTAINMENT (BG22)

REV. OL-23 5/18 (SHEET 25)





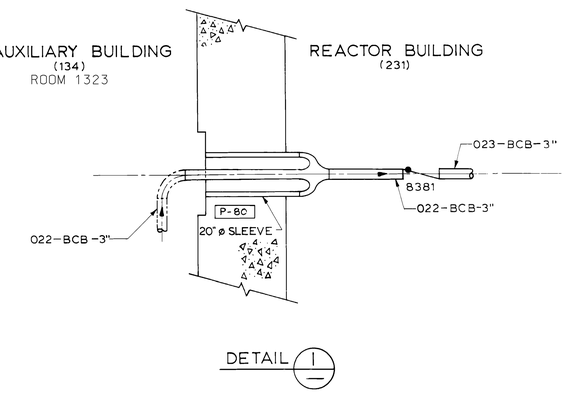
NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L IBP – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3. SHEETS 33 & 53 CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
BG23-01	1.285 (BOTH SOURCES)
BG23-02	1.285 (BOTH SOURCES)
BG23-03	1.285 (BOTH SOURCES)
BG23-04	7.921
BG23-06	7.921
BG23-07	7.921
BG23-11	7.921

11. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4 SHEET
2000 (BG23)	68



RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- ANCHOR
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

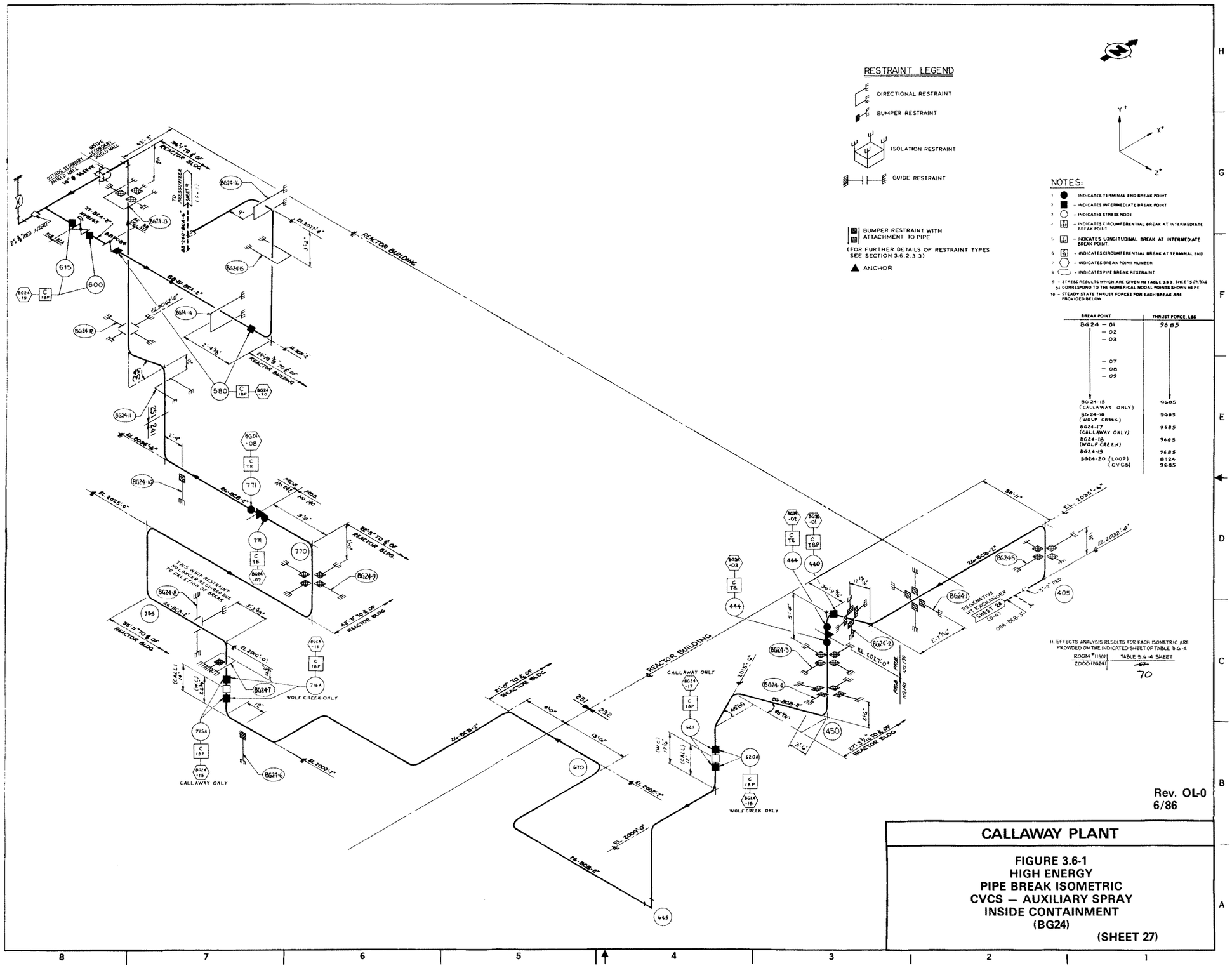
(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

FIGURE 3.6 - 1

HIGH ENERGY
PIPE BREAK ISOMETRIC
CHARGING & EXCESS LETDOWN
CVCS - INSIDE CONTAINMENT
(BG23)

REV. OL-15 5/06 (SHEET 26)



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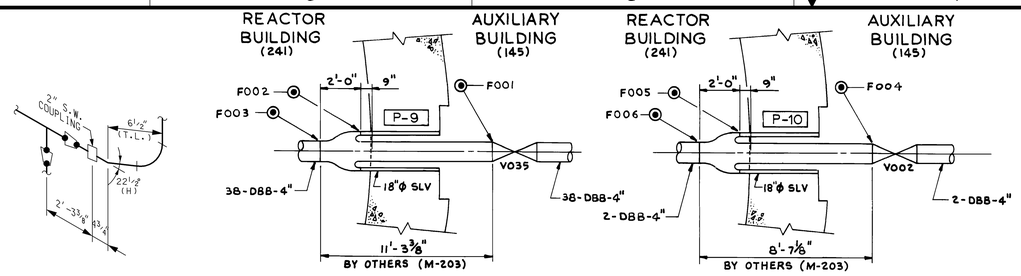
CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
CVCS – AUXILIARY SPRAY
INSIDE CONTAINMENT
(BG24)

(SHEET 27)

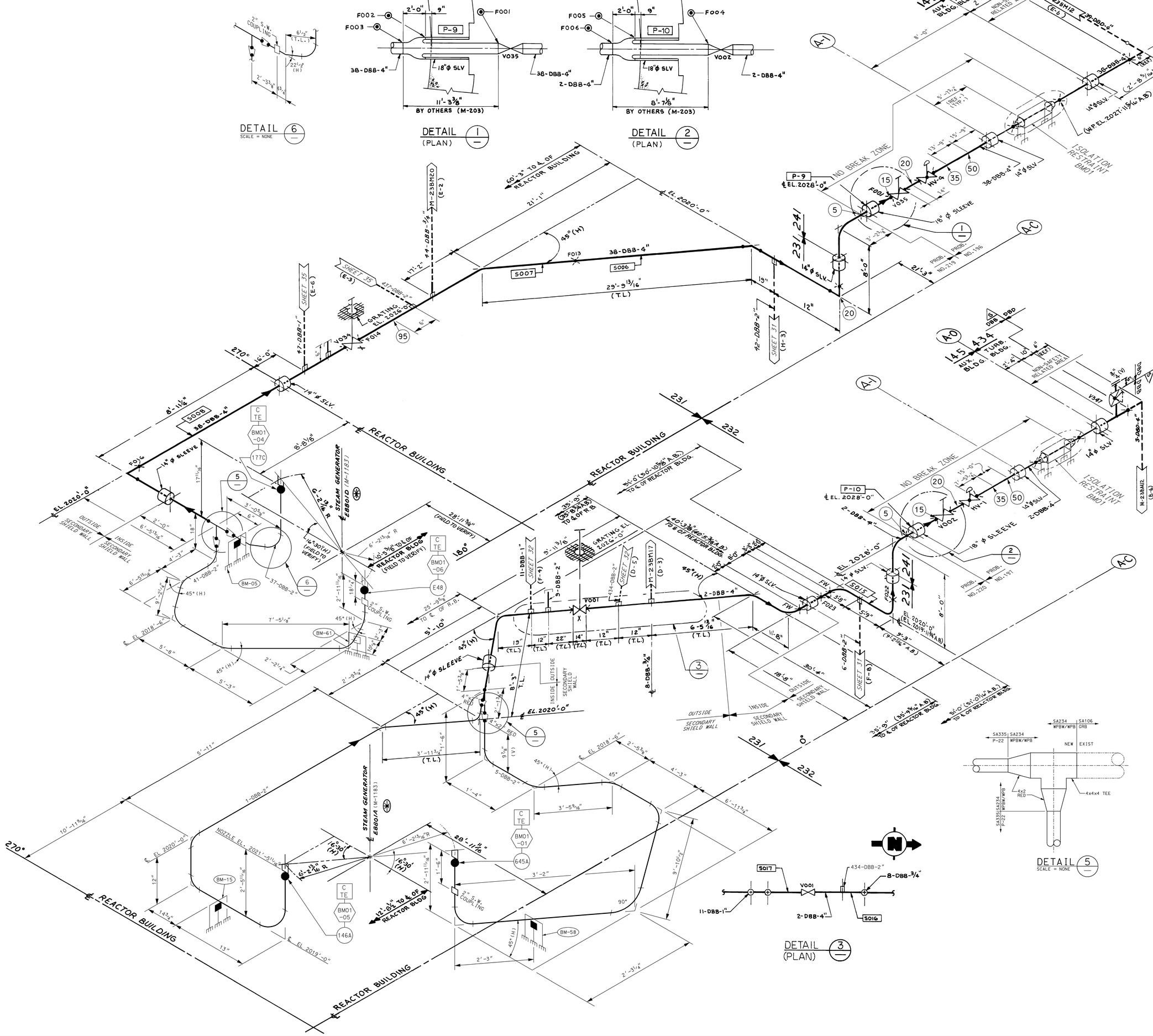
FIGURE 3.6-1 (SHEET 28) HAS BEEN DELETED



DETAIL 6 (SCALE = NONE)

DETAIL 1 (PLAN)

DETAIL 2 (PLAN)



NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
6. ⬡ – INDICATES BREAK POINT NUMBER
7. ⬭ – INDICATES PIPE BREAK RESTRAINT
8. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3, CORRESPONDING TO THE NUMERICAL NODAL POINTS SHOWN HERE.
9. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
BM01-01	5.300 (BOTH SOURCES)
BM01-04	5.300 (BOTH SOURCES)
BM01-05	5.300 (BOTH SOURCES)
BM01-06	5.300 (BOTH SOURCES)

10. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4
2000 (BM01)	65

11. WHIP RESTRAINT NO LONGER REQUIRED DUE TO DELETION OF BREAKS.
12. DIMENSIONS, OTHER THAN THOSE ASSOCIATED WITH WHIP RESTRAINT LOCATIONS, ARE HISTORICAL. SEE LATEST PLANT DRAWING REVISION FOR DIMENSIONS.

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

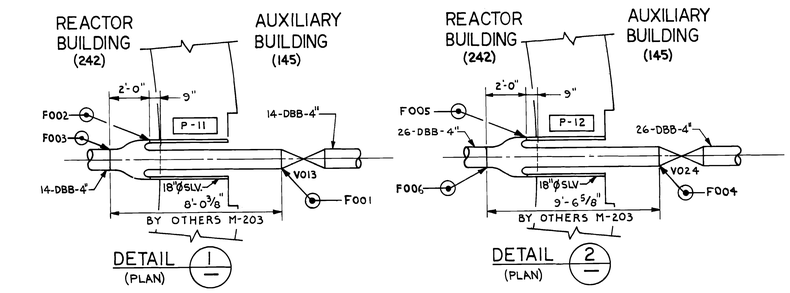
(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

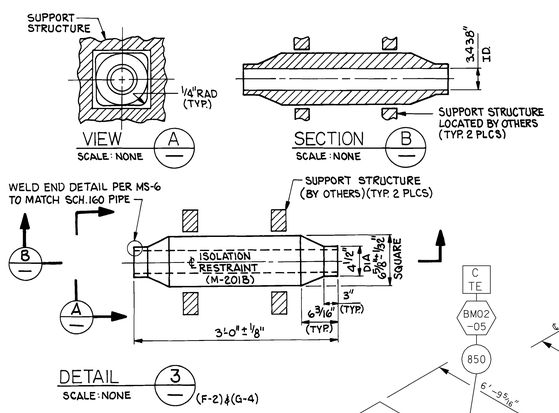
CALLAWAY PLANT

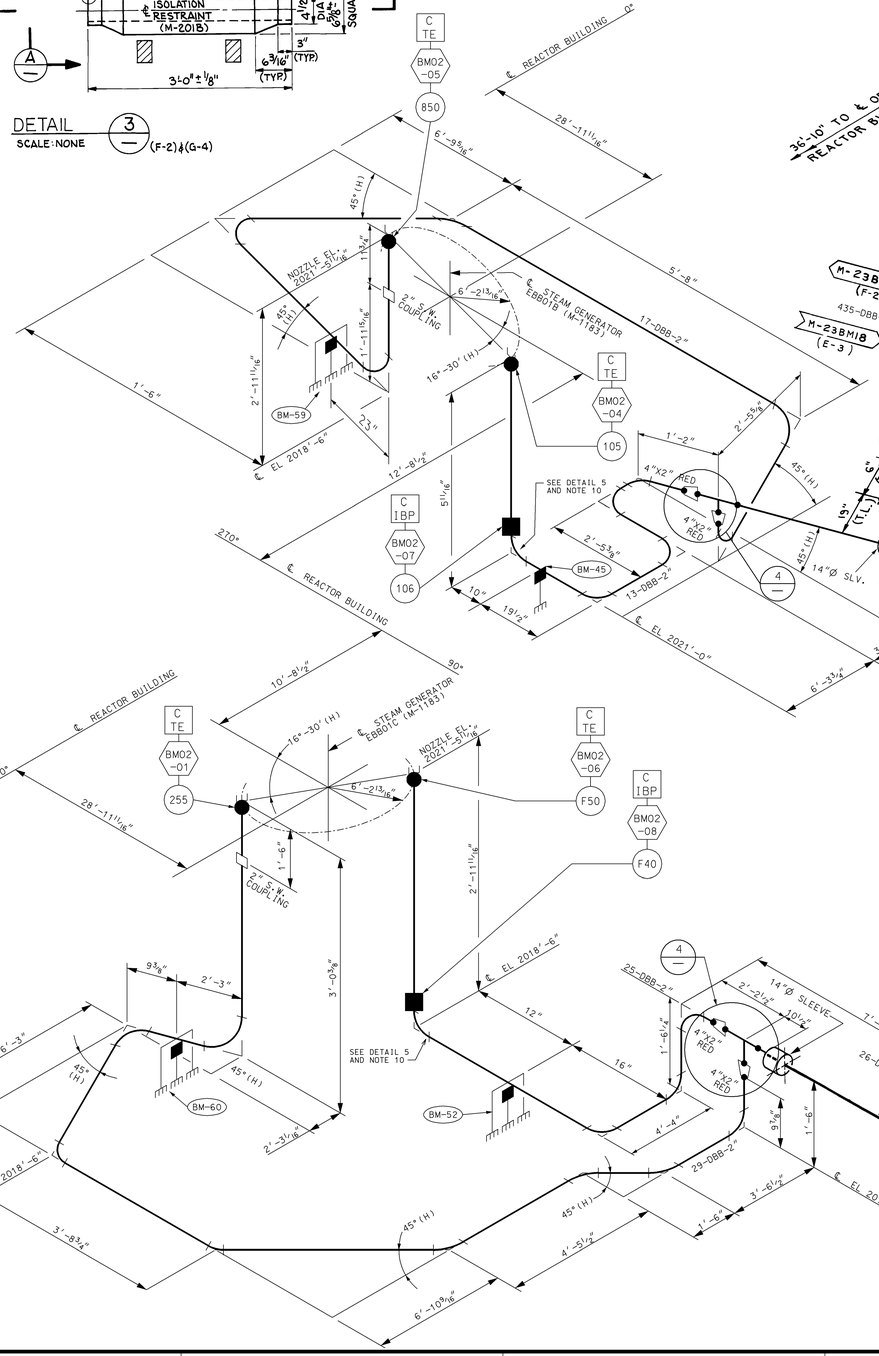
FIGURE 3.6 - 1

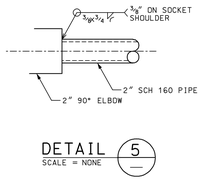
HIGH ENERGY
PIPE BREAK ISOMETRIC
STM GEN A & D BLOWDOWN
INSIDE CONTAINMENT
(BM01)

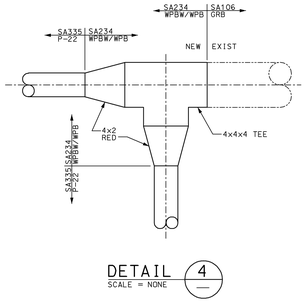
REV. OL-15 5/06 (SHEET 29)











NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
6. ⬡ – INDICATES BREAK POINT NUMBER
7. ⬭ – INDICATES PIPE BREAK RESTRAINT
8. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3, CORRESPONDING TO THE NUMERICAL NODAL POINTS SHOWN HERE.
9. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
BM02-01	5,300 (BOTH SOURCES)
BM02-04	5,300 (BOTH SOURCES)
BM02-05	5,300 (BOTH SOURCES)
BM02-06	5,300 (BOTH SOURCES)
BM02-07	5,300 (BOTH SOURCES)
BM02-08	5,300 (BOTH SOURCES)

10. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4
2000	67
1412	39

11. WHIP RESTRAINT NO LONGER REQUIRED DUE TO DELETION OF BREAKS.
12. DIMENSIONS, OTHER THAN THOSE ASSOCIATED WITH WHIP RESTRAINT LOCATIONS, ARE HISTORICAL. SEE LATEST PLANT DRAWING REVISION FOR DIMENSIONS.

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

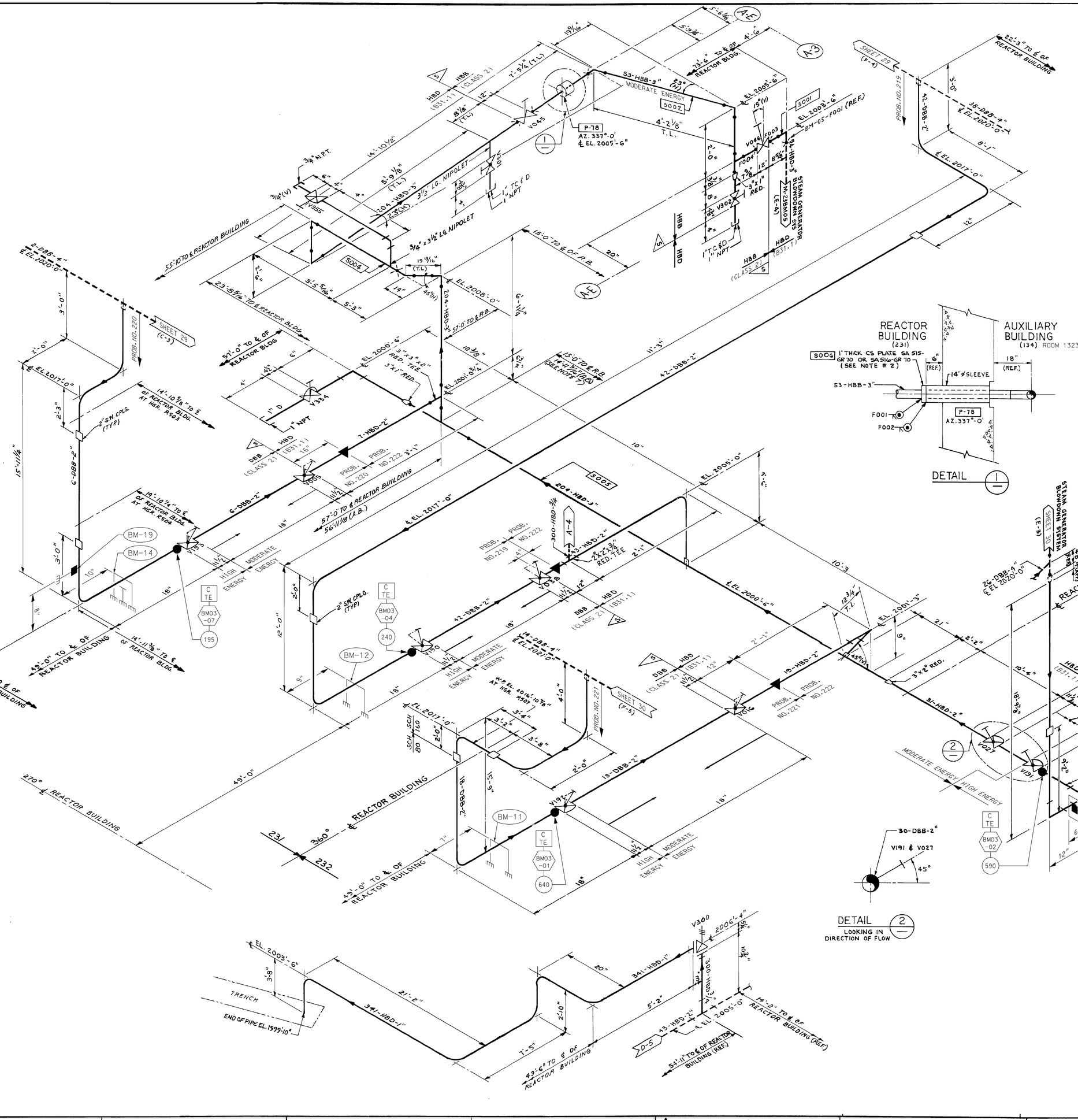
(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

FIGURE 3.6 - 1

HIGH ENERGY
PIPE BREAK ISOMETRIC
STM GEN B & C BLOWDOWN
INSIDE CONTAINMENT
(BM02)

REV. OL-15 5/06 (SHEET 30)

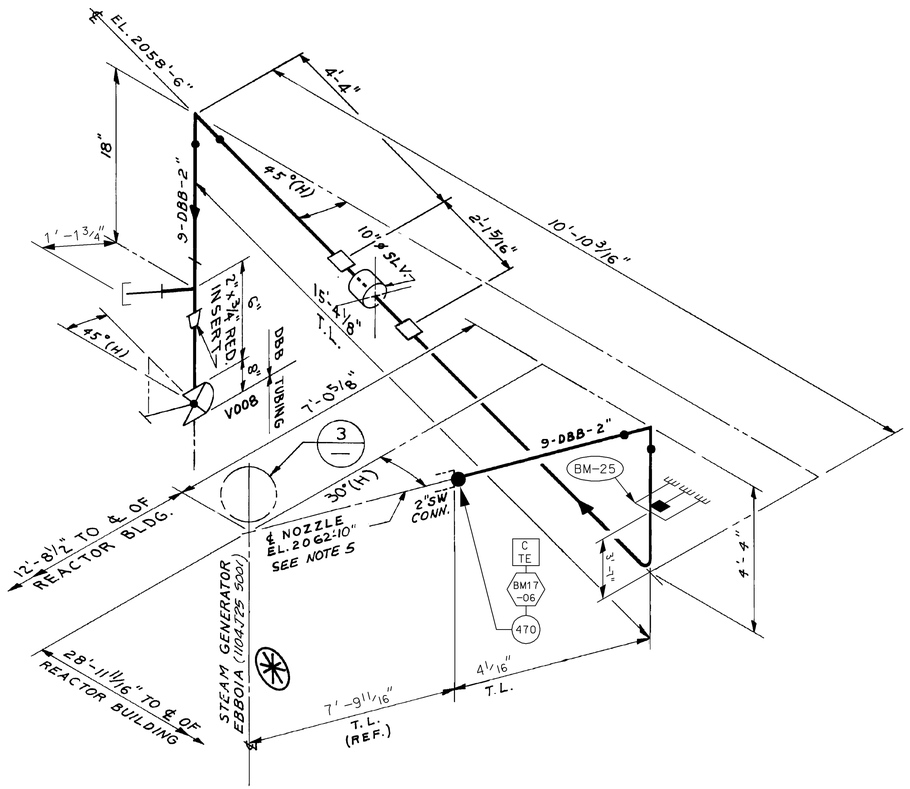


CALLAWAY PLANT

FIGURE 3.6 - 1

HIGH ENERGY
PIPE BREAK ISOMETRIC
STM GEN A, B, C, & D BLOWDOWN
INSIDE CONTAINMENT
(BM03)

REV. OL-15 5/06 (SHEET 31)



NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. [C IBP] – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. [C TE] – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
6. ⬡ – INDICATES BREAK POINT NUMBER
7. ⬭ – INDICATES PIPE BREAK RESTRAINT
8. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3, CORRESPONDING TO THE NUMERICAL NODAL POINTS SHOWN HERE.
9. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
BM17-06	5,300

10. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4
2000 (BM17)	71

11. WHIP RESTRAINT NO LONGER REQUIRED DUE TO DELETION OF BREAKS.
12. DIMENSIONS, OTHER THAN THOSE ASSOCIATED WITH WHIP RESTRAINT LOCATIONS, ARE HISTORICAL. SEE LATEST PLANT DRAWING REVISION FOR DIMENSIONS.

RESTRAINT LEGEND:

DIRECTIONAL RESTRAINT

BUMPER RESTRAINT

ISOLATION RESTRAINT

GUIDE RESTRAINT

BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

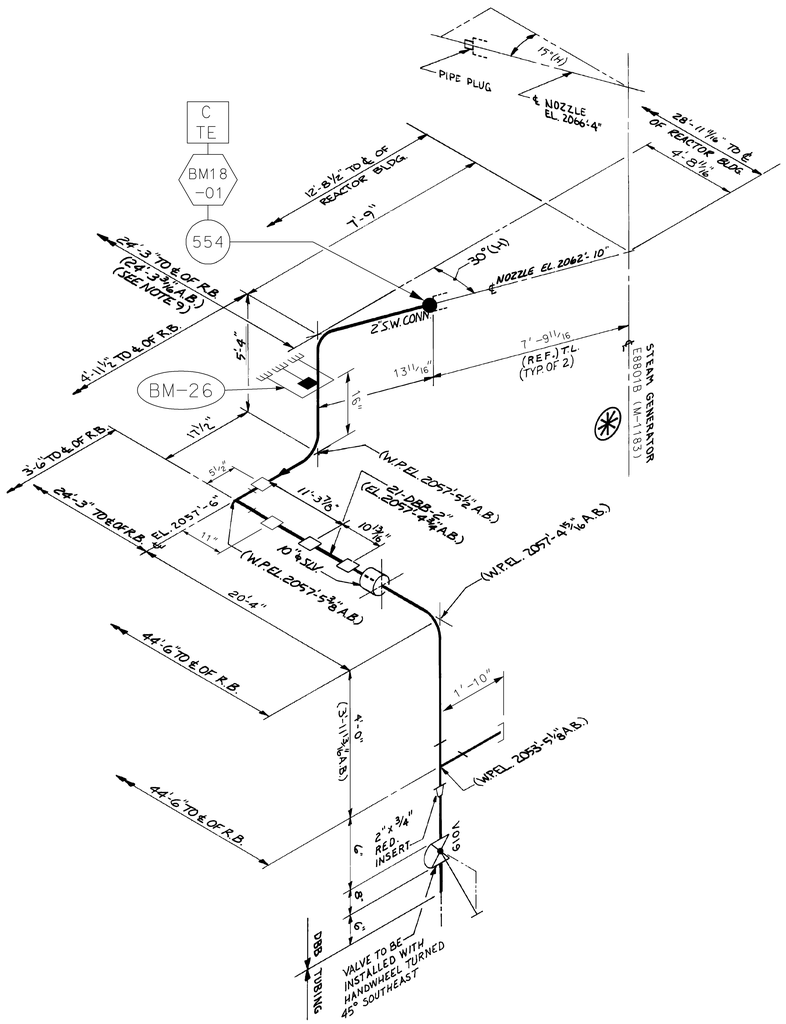
(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

FIGURE 3.6 - 1

HIGH ENERGY
PIPE BREAK ISOMETRIC
STM GEN A SAMPLE
AND TUBE SHEET DRAIN
INSIDE CONTAINMENT
(BM17)

REV. OL-15 5/06 (SHEET 32)



NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
6. ⬡ – INDICATES BREAK POINT NUMBER
7. ⬭ – INDICATES PIPE BREAK RESTRAINT
8. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3. CORRESPONDING TO THE NUMERICAL NODAL POINTS SHOWN HERE.
9. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

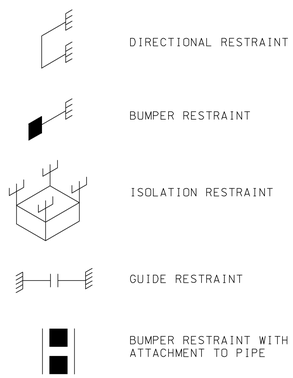
BREAK POINT	THRUST FORCE LBS.
BM18-01	5,300

10. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4
2000 (BM18)	72

11. WHIP RESTRAINT NO LONGER REQUIRED DUE TO DELETION OF BREAKS.
12. DIMENSIONS, OTHER THAN THOSE ASSOCIATED WITH WHIP RESTRAINT LOCATIONS, ARE HISTORICAL. SEE LATEST PLANT DRAWING REVISION FOR DIMENSIONS.

RESTRAINT LEGEND:



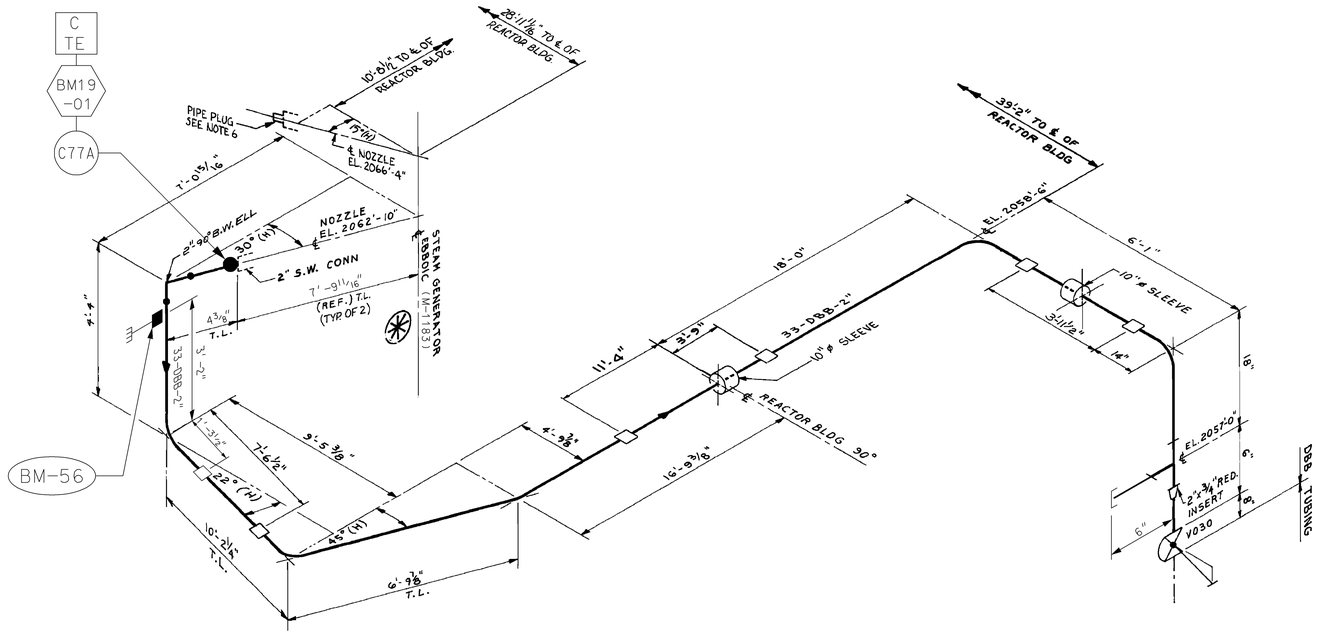
(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

FIGURE 3.6-1

HIGH ENERGY
PIPE BREAK ISOMETRIC
STM GEN B SAMPLE
AND TUBE SHEET DRAIN
INSIDE CONTAINMENT
(BM18)

REV. OL-15 5/06 (SHEET 33)



NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
6. ⬡ – INDICATES BREAK POINT NUMBER
7. ⬭ – INDICATES PIPE BREAK RESTRAINT
8. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3. CORRESPONDING TO THE NUMERICAL NODAL POINTS SHOWN HERE.
9. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
BM19-01	5,300

10. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4
2000 (BM19)	73

11. WHIP RESTRAINT NO LONGER REQUIRED DUE TO DELETION OF BREAKS.
12. DIMENSIONS. OTHER THAN THOSE ASSOCIATED WITH WHIP RESTRAINT LOCATIONS. ARE HISTORICAL. SEE LATEST PLANT DRAWING REVISION FOR DIMENSIONS.

RESTRAINT LEGEND:

DIRECTIONAL RESTRAINT

BUMPER RESTRAINT

ISOLATION RESTRAINT

GUIDE RESTRAINT

BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

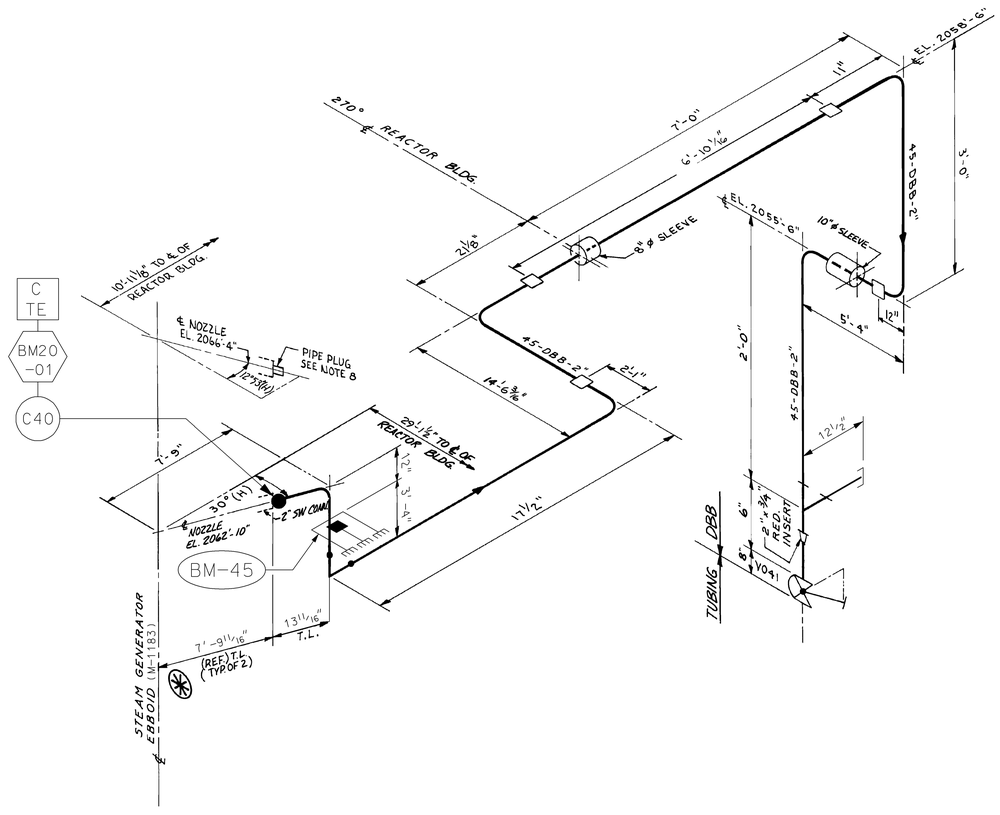
(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

FIGURE 3.6 - 1

HIGH ENERGY
PIPE BREAK ISOMETRIC
STM GEN C SAMPLE
AND TUBE SHEET DRAIN
INSIDE CONTAINMENT
(BM19)

REV. OL-15 5/06 (SHEET 34)



NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
6. ⬡ – INDICATES BREAK POINT NUMBER
7. ⬭ – INDICATES PIPE BREAK RESTRAINT
8. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3. CORRESPONDING TO THE NUMERICAL NODAL POINTS SHOWN HERE.
9. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
BM20-01	5,300

10. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4
2000 (BM20)	74

11. WHIP RESTRAINT NO LONGER REQUIRED DUE TO DELETION OF BREAKS.
12. DIMENSIONS, OTHER THAN THOSE ASSOCIATED WITH WHIP RESTRAINT LOCATIONS, ARE HISTORICAL. SEE LATEST PLANT DRAWING REVISION FOR DIMENSIONS.

RESTRAINT LEGEND:

DIRECTIONAL RESTRAINT

BUMPER RESTRAINT

ISOLATION RESTRAINT

GUIDE RESTRAINT

BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

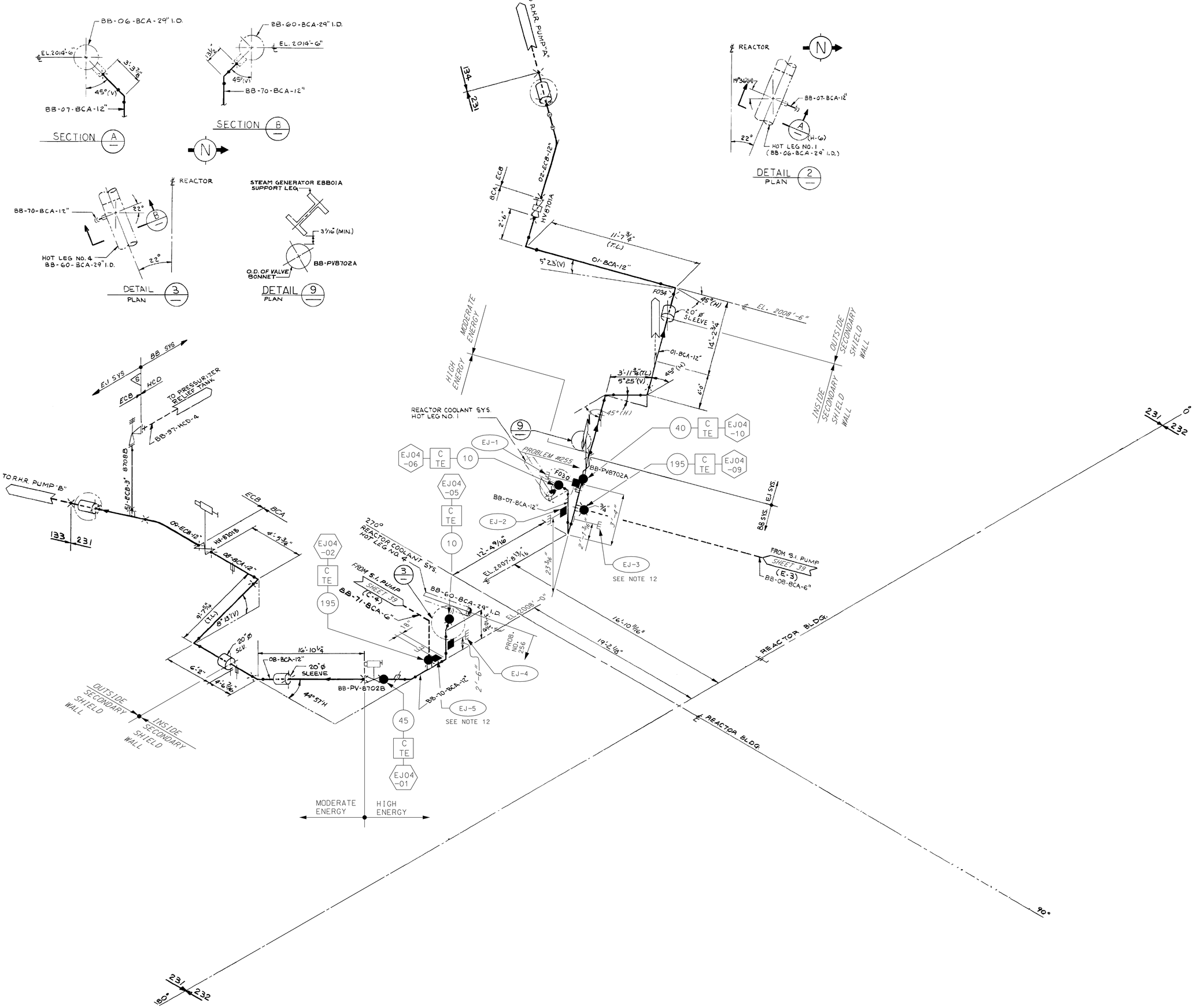
(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

FIGURE 3.6-1

HIGH ENERGY
PIPE BREAK ISOMETRIC
STM GEN D SAMPLE
AND TUBE SHEET DRAIN
INSIDE CONTAINMENT
(BM20)

REV. OL-15 5/06 (SHEET 35)



NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L IBP – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6-3. SHEETS 64 & 65. CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
EJ04-01	270,690
EJ04-02	66,111
EJ04-05	↓
EJ04-06	↓
EJ04-09	66,111
EJ04-10	270,690

11. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4
2000 (EJ04)	83

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE
- ▲ ANCHOR

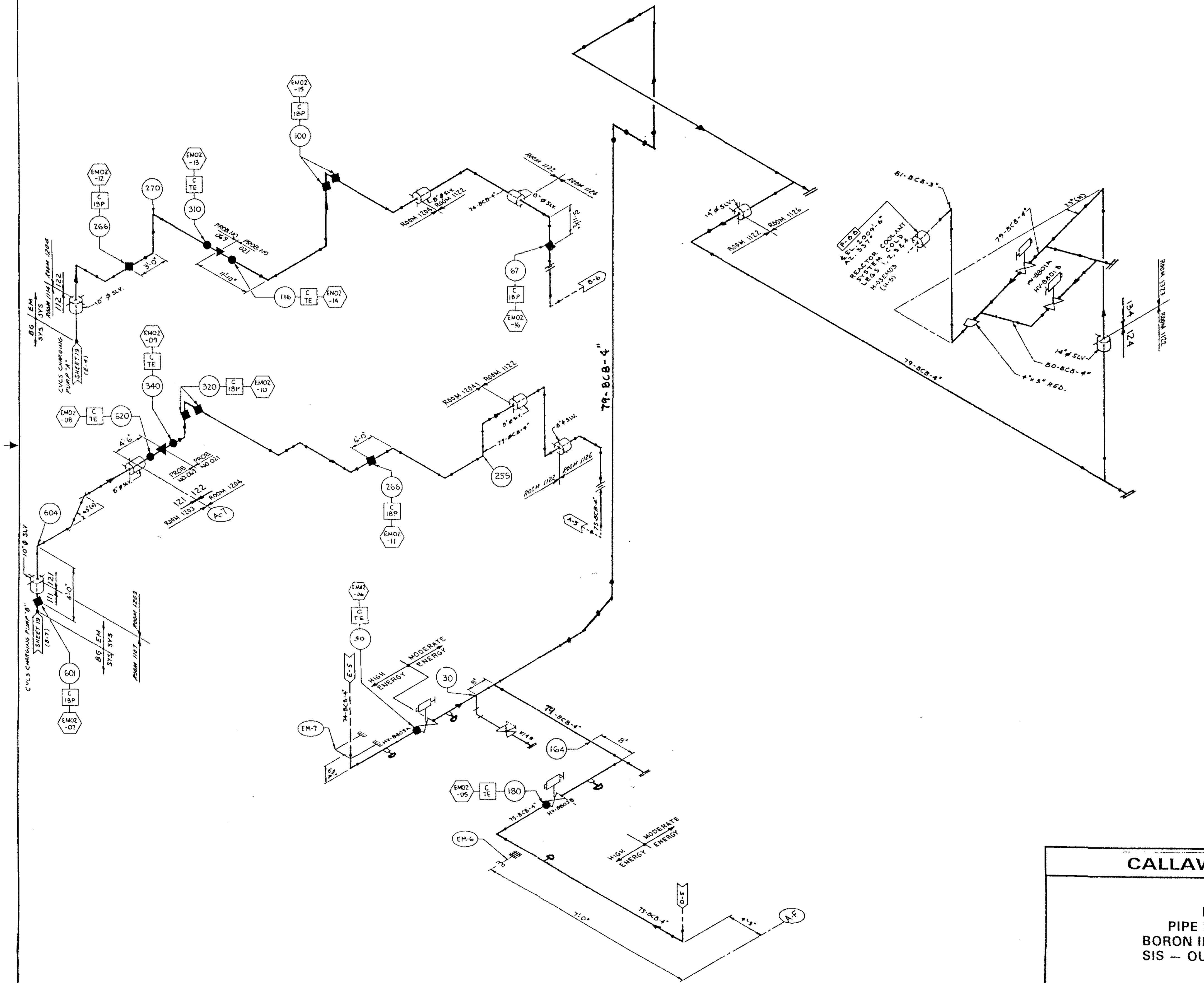
(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

FIGURE 3.6 - 1

HIGH ENERGY
PIPE BREAK ISOMETRIC
RHR SUCTION - LOOPS 1 & 4
INSIDE CONTAINMENT
(EJ04)

REV. OL-15 5/06 (SHEET 36)



NOTES:

1 ● – INDICATES TERMINAL END BREAK POINT
2 ■ – INDICATES INTERMEDIATE BREAK POINT
3 ○ – INDICATES STRESS NODE
4 – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5 – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT.
6 – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7 ⬡ – INDICATES BREAK POINT NUMBER
8 – INDICATES PIPE BREAK RESTRAINT
9 – STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6.3, SHEETS 9, 23, 23A CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE
10 – STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW

BREAK POINT	THRUST FORCE, LBS
EM02-05	6962
06	
07	
08	
09	
10	
11	
12	
13	
14	
15	
EM02-16	6962

11. ▲ INDICATES ANCHOR POINT

RESTRAINT LEGEND

DIRECTIONAL RESTRAINT

BUMPER RESTRAINT

ISOLATION RESTRAINT

GUIDE RESTRAINT

BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES SEE SECTION 3.6.2.3.3)

12. EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4.

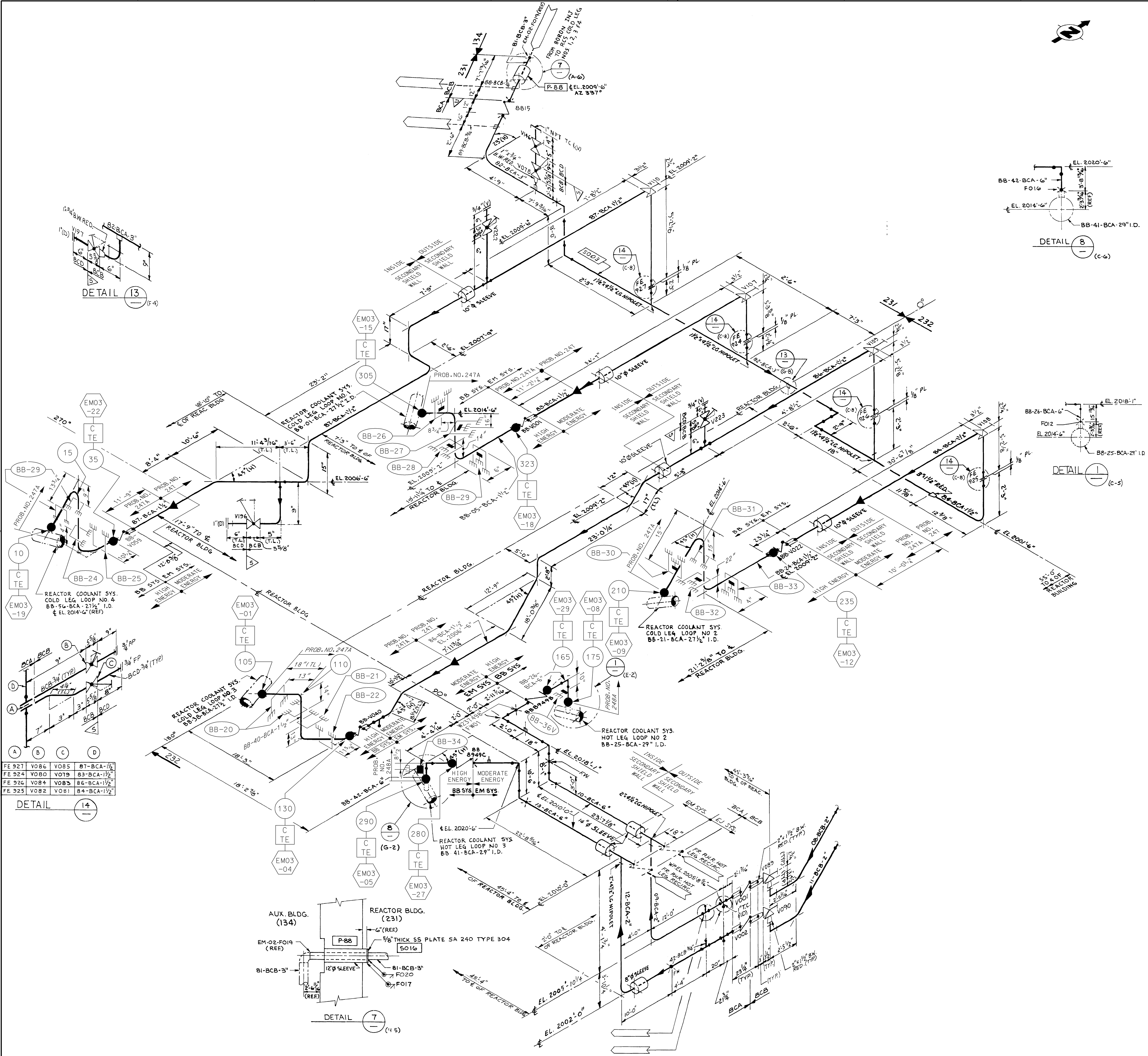
ROOM*	TABLE 3.6-4 SHEET
1323	29
1122	9
1126	13
1204	20
1114	6
1203	19
1107	5

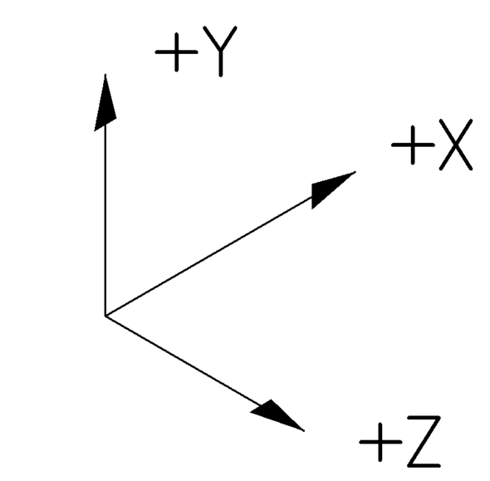
REV OL-8
11/95

CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
BORON INJECTION TANK INLET
SIS – OUTSIDE CONTAINMENT
(EM02)

(SHEET 37)





NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. [C / IBP] – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. [L / IBP] – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. [C / TE] – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3, SHEETS 55, 56 & 57, CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
EM03-01	5,109
EM03-04	5,109
EM03-05	66,110
EM03-08	66,110
EM03-09	5,109
EM03-12	5,109
EM03-15	5,109
EM03-18	5,109
EM03-19	5,109
EM03-22	5,109
EM03-27	66,110
EM03-29	66,110

11. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4 SHEET
2000 (EM03)	66

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE
- ▲ ANCHOR

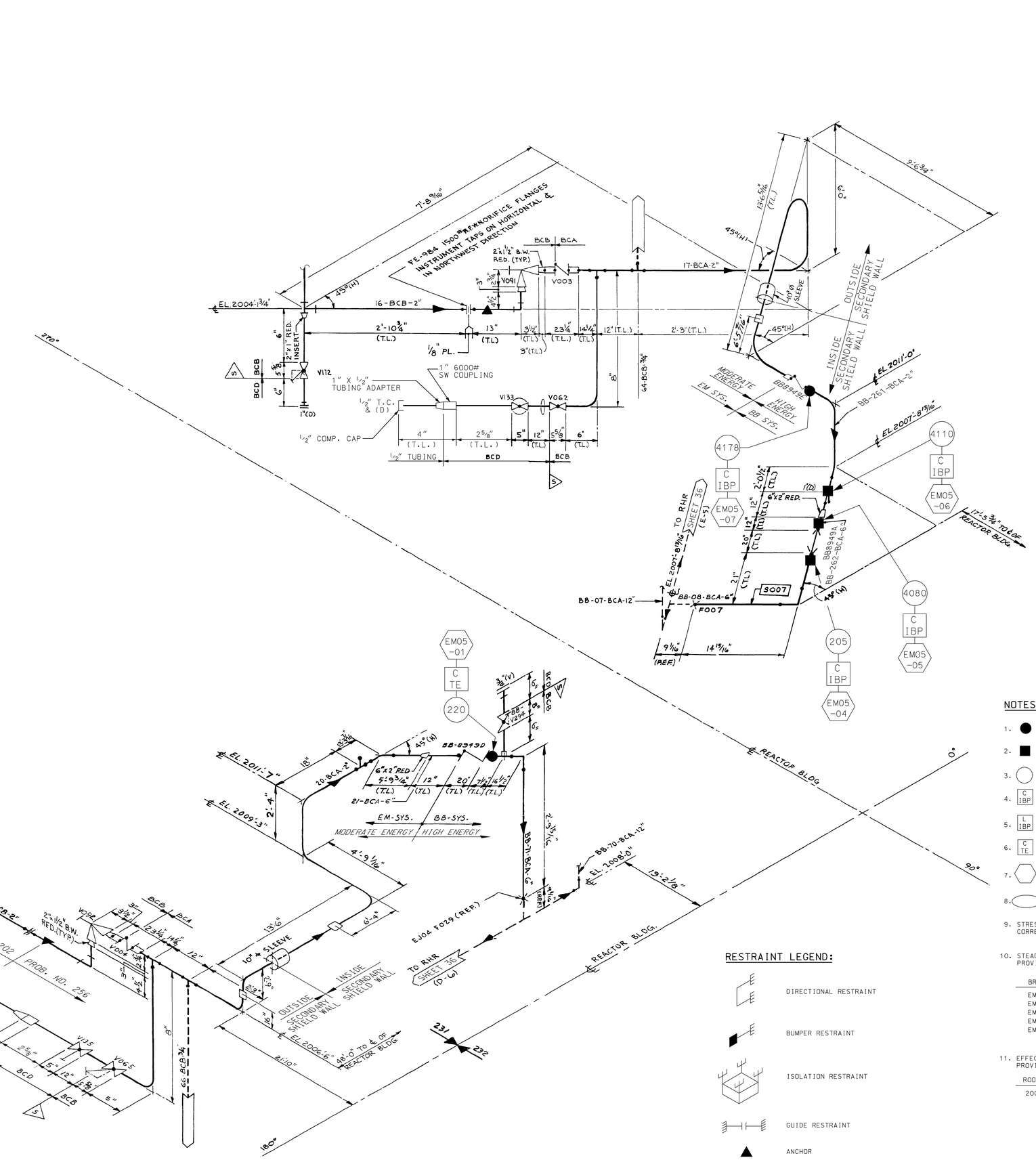
(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

FIGURE 3.6-1

HIGH ENERGY
PIPE BREAK ISOMETRIC
BI AND SI & RHR RECIRC.
SIS - INSIDE CONTAINMENT
(EM03)

REV. OL-15 5/06 (SHEET 38)



RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- ANCHOR
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L IBP – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3. SHEETS 64 & 65 CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
EMO5-01	66.111
EMO5-04	66.111
EMO5-05	66.111
EMO5-06	7.004
EMO5-07	7.004

11. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

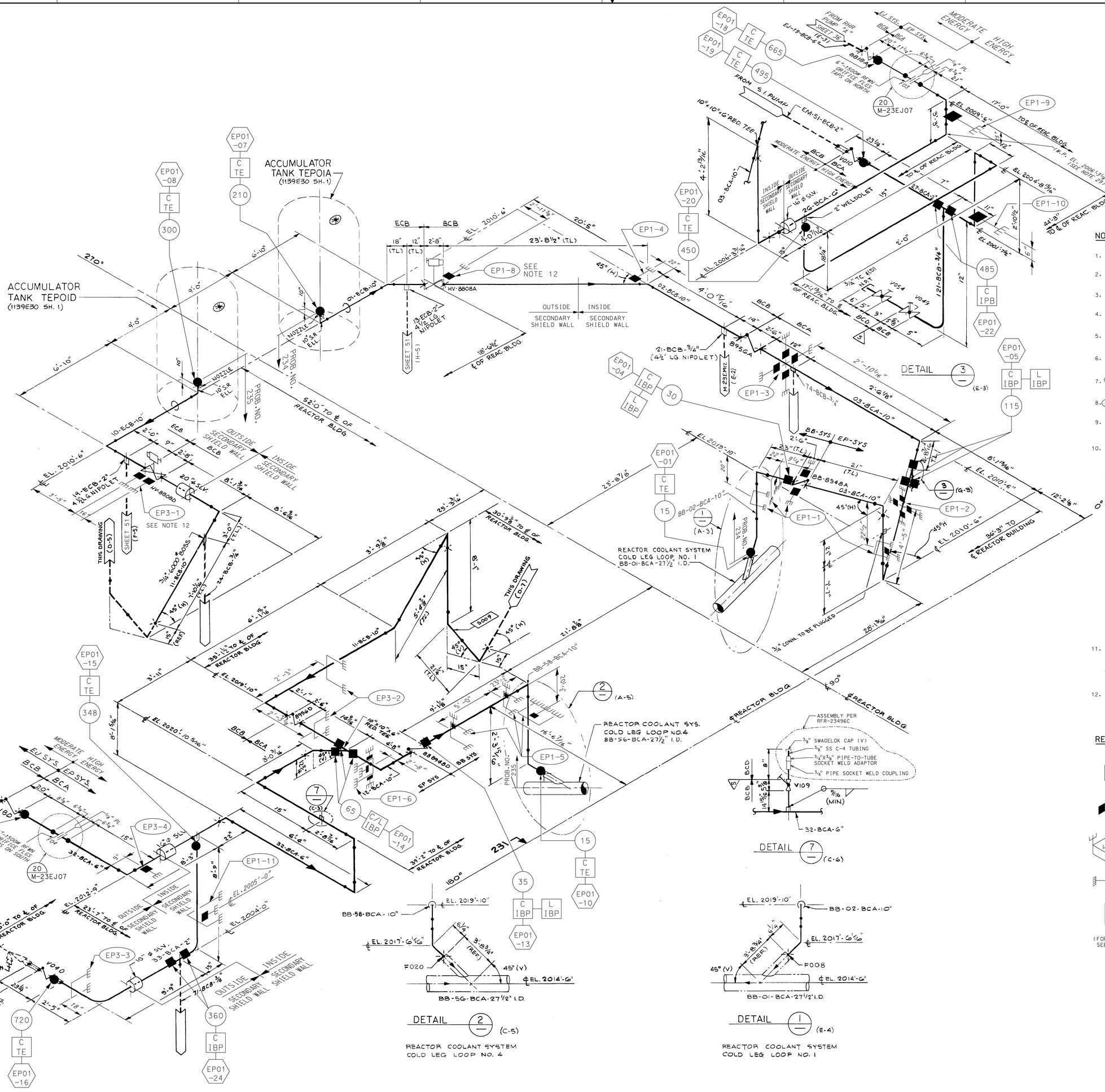
ROOM # (ISO)	TABLE 3.6-4 SHEET
2000 (EMO5)	67

CALLAWAY PLANT

FIGURE 3.6 - 1

HIGH ENERGY
PIPE BREAK ISOMETRIC
SI DISCHARGE - LOOPS 1 & 4
SIS - INSIDE CONTAINMENT
(EM05)

REV. OL-15 5/06 (SHEET 39)



NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L IBP – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3, CORRESPONDING TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
EP01-01 (LOOP)	218.580
EP01-01 (TANK)	29.927
EP01-04 (LOOP)	218.580
EP01-04 (TANK)	29.927
EP01-05 (10")	29.927
EP01-05 (6")	12.857
EP01-07	110.396
EP01-08	110.396
EP01-10 (LOOP)	218.580
EP01-10 (TANK)	29.927
EP01-13 (LOOP)	218.580
EP01-13 (TANK)	29.927
EP01-14 (10")	29.927
EP01-14 (6")	12.857
EP01-15	3.129
EP01-16	3.129
EP01-17	12.857
EP01-18	12.857
EP01-19	3.129
EP01-20	3.129
EP01-24	3.129
EP01-22	3.129

11. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4
2000 (EP01)	68

12. WHIP RESTRAINT NO LONGER REQUIRED DUE TO DELETION OF BREAKS.

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

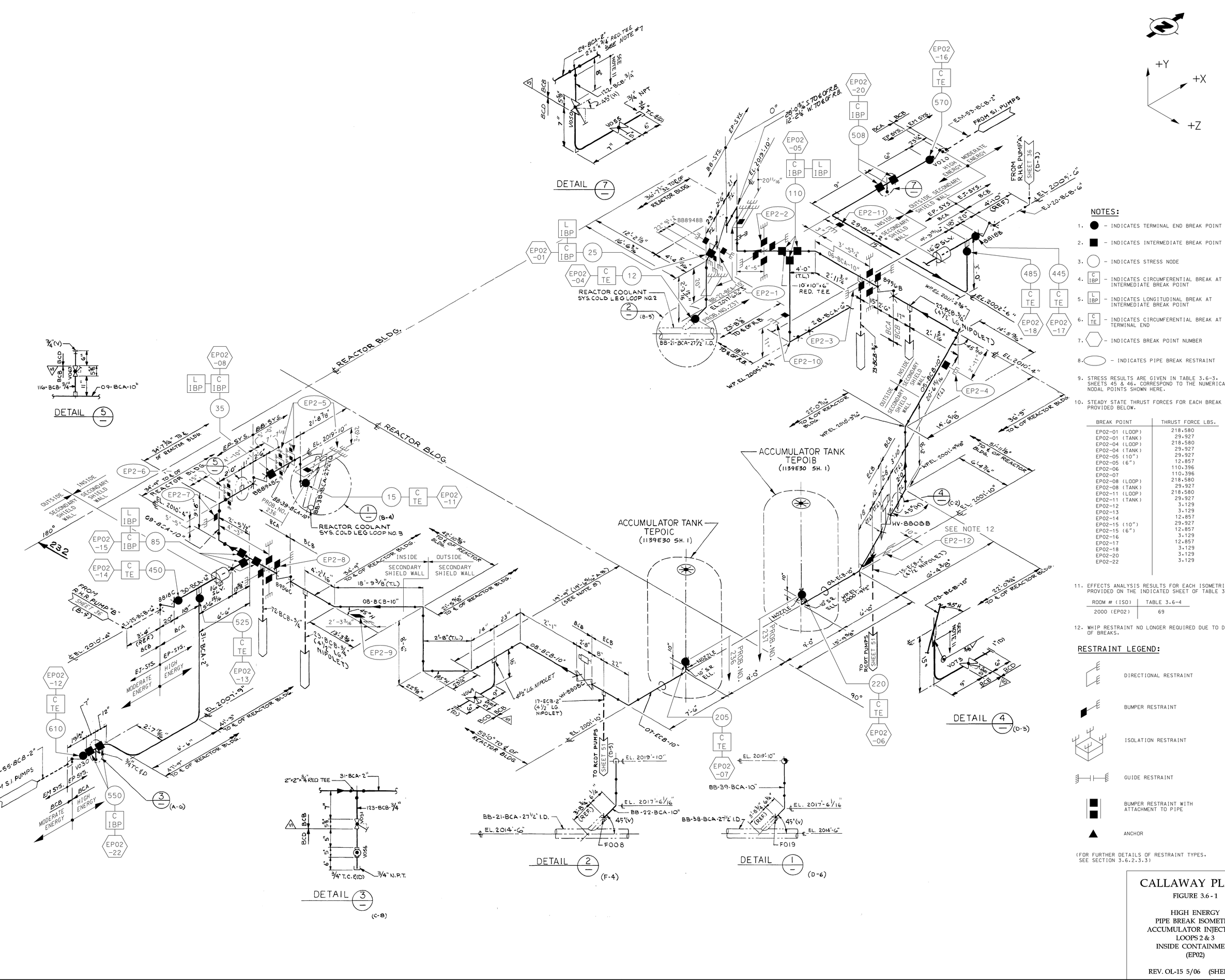
(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

FIGURE 3.6-1

HIGH ENERGY
PIPE BREAK ISOMETRIC
ACCUMULATOR INJECTION - LOOPS 1 & 4
INSIDE CONTAINMENT
(EP01)

REV. OL-15 5/06 (SHEET 40)



NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L IBP – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS ARE GIVEN IN TABLE 3.6-3. SHEETS 45 & 46. CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
EP02-01 (LOOP)	218,580
EP02-01 (TANK)	29,927
EP02-04 (LOOP)	218,580
EP02-04 (TANK)	29,927
EP02-05 (10")	29,927
EP02-05 (6")	12,857
EP02-06	110,396
EP02-07	218,580
EP02-08 (LOOP)	29,927
EP02-08 (TANK)	218,580
EP02-11 (LOOP)	29,927
EP02-11 (TANK)	3,129
EP02-12	3,129
EP02-13	12,857
EP02-14	29,927
EP02-15 (10")	12,857
EP02-15 (6")	3,129
EP02-16	12,857
EP02-17	3,129
EP02-18	3,129
EP02-20	3,129
EP02-22	

11. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4
2000 (EP02)	69

12. WHIP RESTRAINT NO LONGER REQUIRED DUE TO DELETION OF BREAKS.

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE
- ANCHOR

(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

FIGURE 3.6-1

HIGH ENERGY
PIPE BREAK ISOMETRIC
ACCUMULATOR INJECTION - LOOPS 2 & 3
INSIDE CONTAINMENT
(EP02)

REV. OL-15 5/06 (SHEET 41)

Figure 3.6-1 (Sheet 42)

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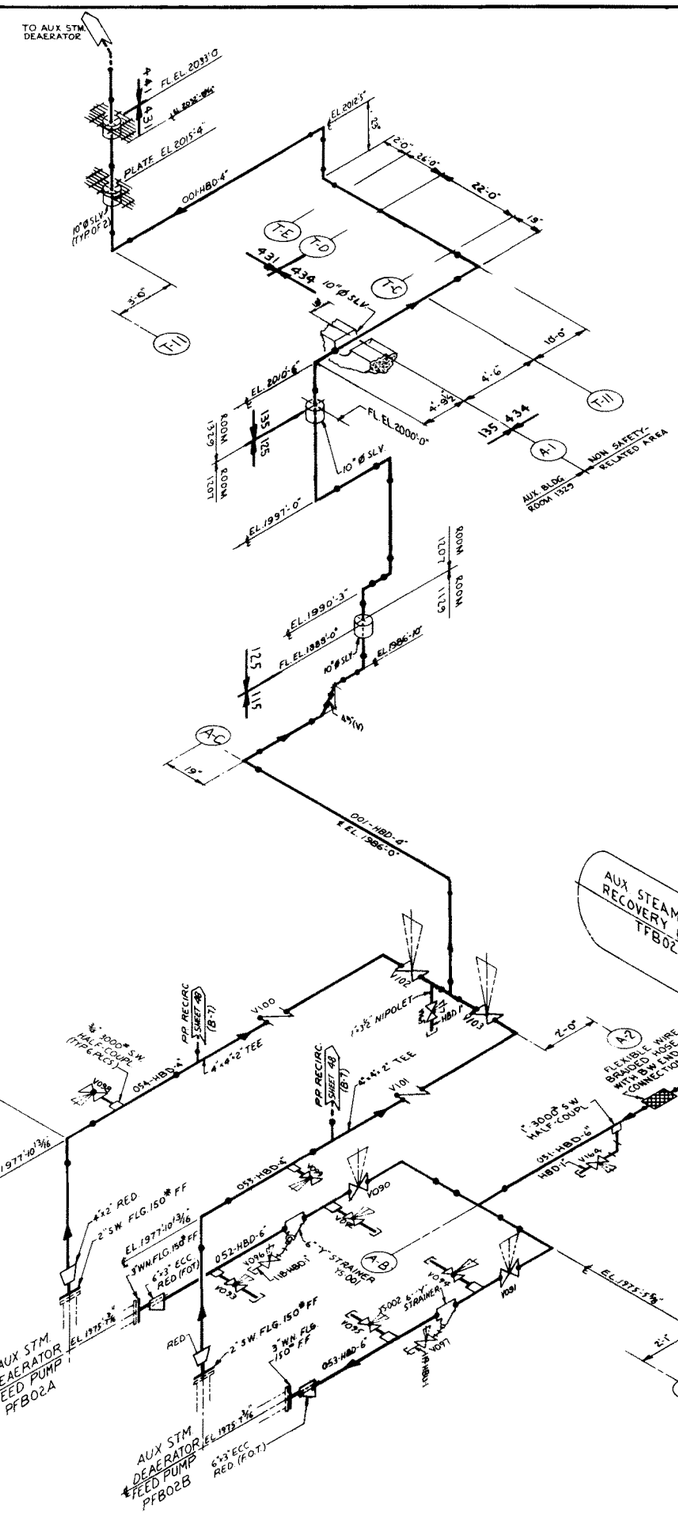

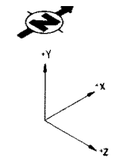

RESTRAINT LEGEND

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES SEE SECTION 3.6.2.3.3)

▲ ANCHOR

NOTES:

1. BREAK LOCATIONS FOR THIS PIPING ARE DEFINED IN SECTION 3.6.2.1.1d. BREAK TYPES ARE DEFINED IN SECTION 3.6.2.1.2.3.
2. EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4.

ROOM #	TABLE 3.6-4 SHEET
1129	15
1207	~~31~~ 22
1329	35

3. STEADY-STATE THRUST FORCES FOR EACH LINE ARE PROVIDED BELOW.

LINE #	THRUST FORCE, LBF
051-HBD-6"	173
052-HBD-6"	
053-HBD-6"	
001-HBD-4"	2000
054-HBD-4"	
055-HBD-4"	

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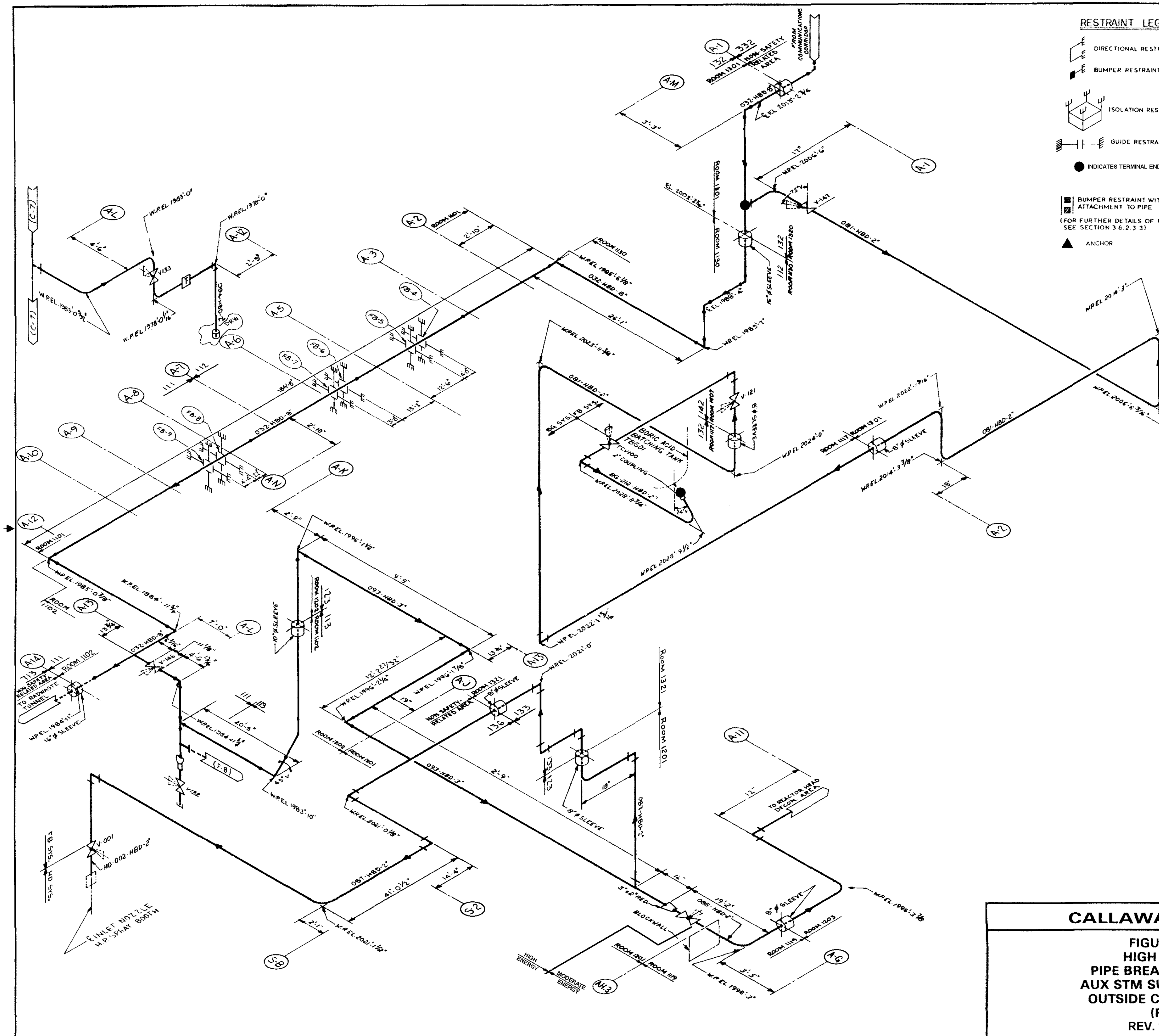
CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
AUX STM DEAERATOR FEED PUMP
DISCHARGE
OUTSIDE CONTAINMENT
(FB04)

(SHEET 43)



RESTRAINT LEGEND

DIRECTIONAL RESTRAINT

BUMPER RESTRAINT

ISOLATION RESTRAINT

GUIDE RESTRAINT

INDICATES TERMINAL END BREAK POINT

BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES SEE SECTION 3.6.2.3.3)

ANCHOR

NOTES:

1. BREAK LOCATIONS. FOR THIS PIPING ARE PROVIDED IN SECTION 3.6.2.1.16. BREAK TYPES ARE DEFINED IN SECTION 3.6.2.1.2.3.

2. EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4.

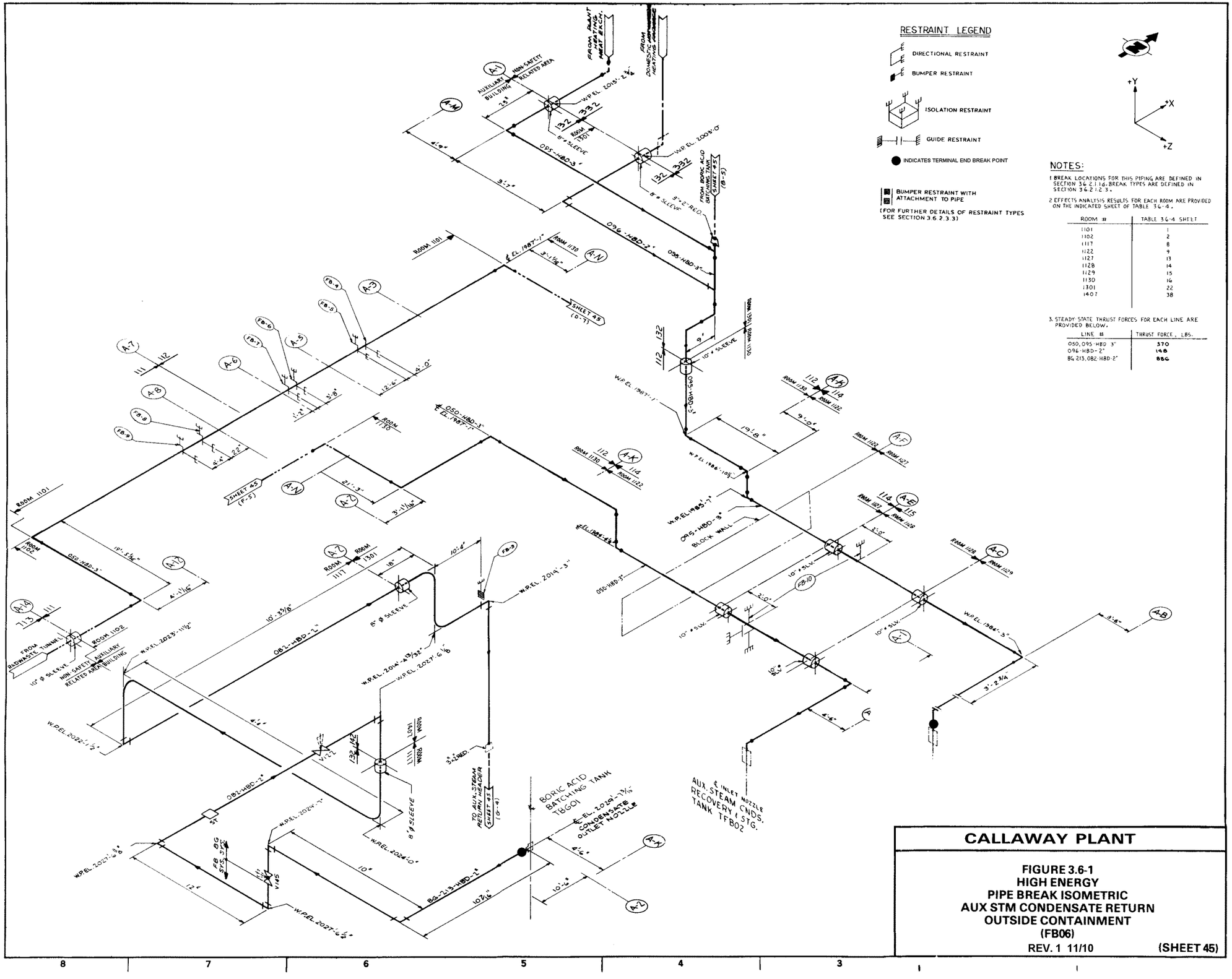
ROOM #	TABLE 3.6-4 SHEET
1101	1
1102	2
1130	16
1301	22

3. STEADY-STATE THRUST FORCES FOR EACH LINE ARE PROVIDED BELOW.

LINE #	THRUST FORCE, LBF
032-HBD-8"	6,000

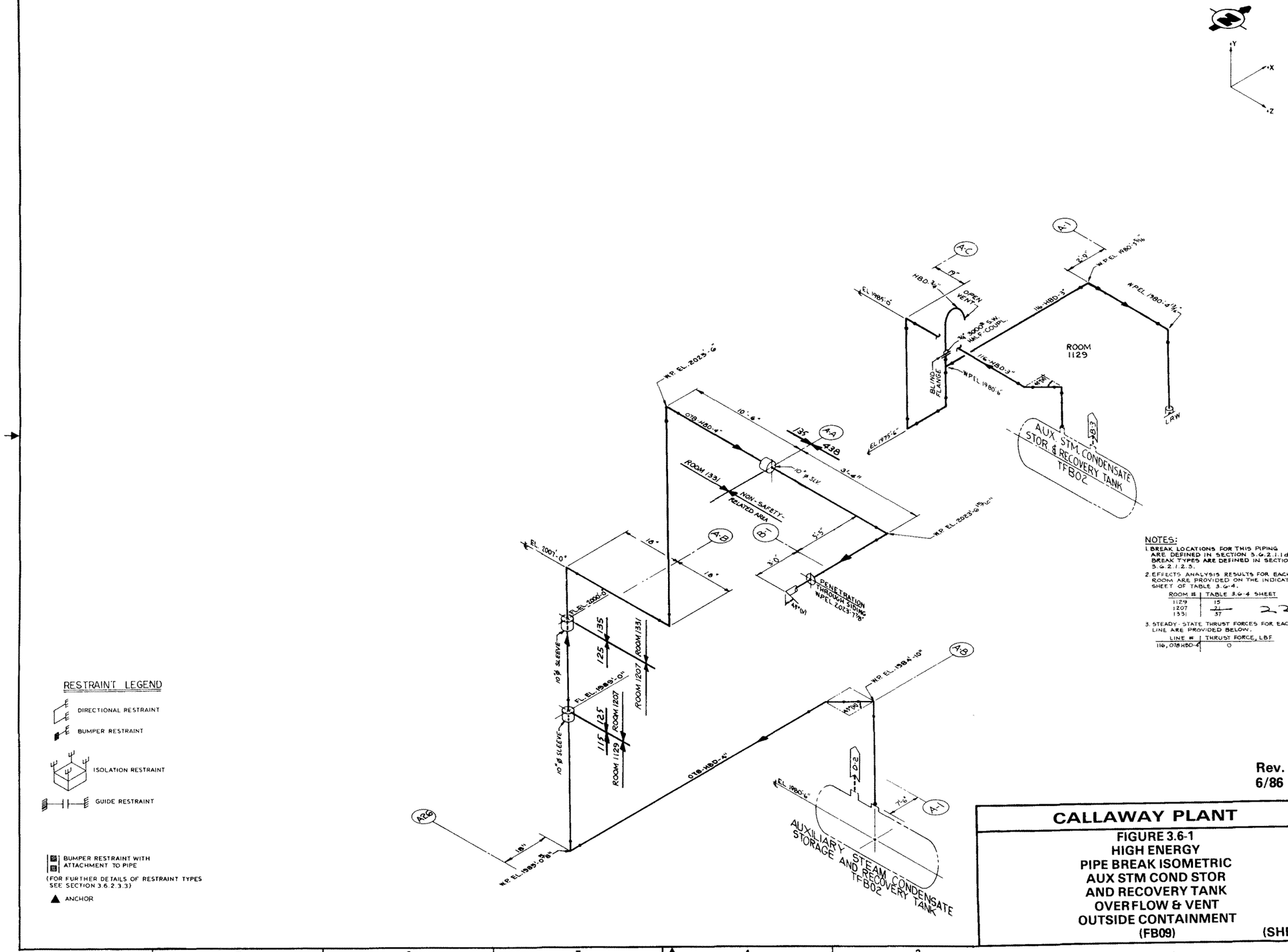
CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
AUX STM SUPPLY HEADER
OUTSIDE CONTAINMENT
(FB05)
REV. 1 11/10 (SHEET 44)



CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
AUX STM CONDENSATE RETURN
OUTSIDE CONTAINMENT
(FB06)
REV. 1 11/10 **(SHEET 45)**



RESTRAINT LEGEND

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES SEE SECTION 3.6.2.3.3)

▲ ANCHOR

NOTES:

1. BREAK LOCATIONS FOR THIS PIPING ARE DEFINED IN SECTION 3.6.2.1.1.d. BREAK TYPES ARE DEFINED IN SECTION 3.6.2.1.2.5.
2. EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4.

ROOM #	TABLE 3.6-4 SHEET
1129	15
1207	~~21~~ 22
1331	37

3. STEADY-STATE THRUST FORCES FOR EACH LINE ARE PROVIDED BELOW.

LINE #	THRUST FORCE, LBF
116, 078-HBD-4	0

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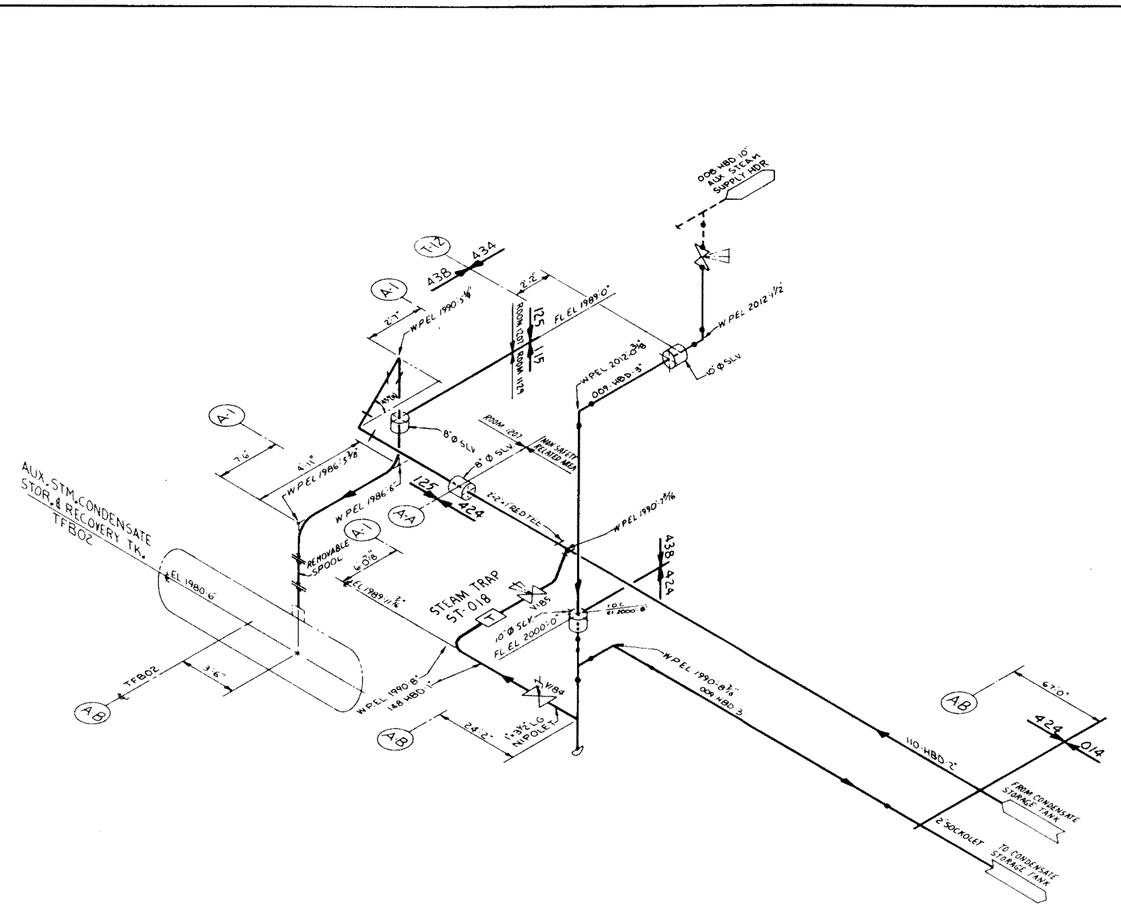
CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
AUX STM COND STOR
AND RECOVERY TANK
OVERFLOW & VENT
OUTSIDE CONTAINMENT
(FB09)

(SHEET 46)

8 7 6 5 4 3



NOTES:

1. BREAK LOCATIONS FOR THIS PIPING ARE DEFINED IN SECTION 3.6.2.1.1.d. BREAK TYPES ARE DEFINED IN SECTION 3.6.2.1.2.

2. EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4.

ROOM #	TABLE 3.6-4 SHEET
1129	15
1207	~~15~~ 22

3. STEADY-STATE THRUST FORCES FOR EACH LINE ARE PROVIDED BELOW.

LINE #	THRUST FORCE, LBS.
110 HBD 3"	475

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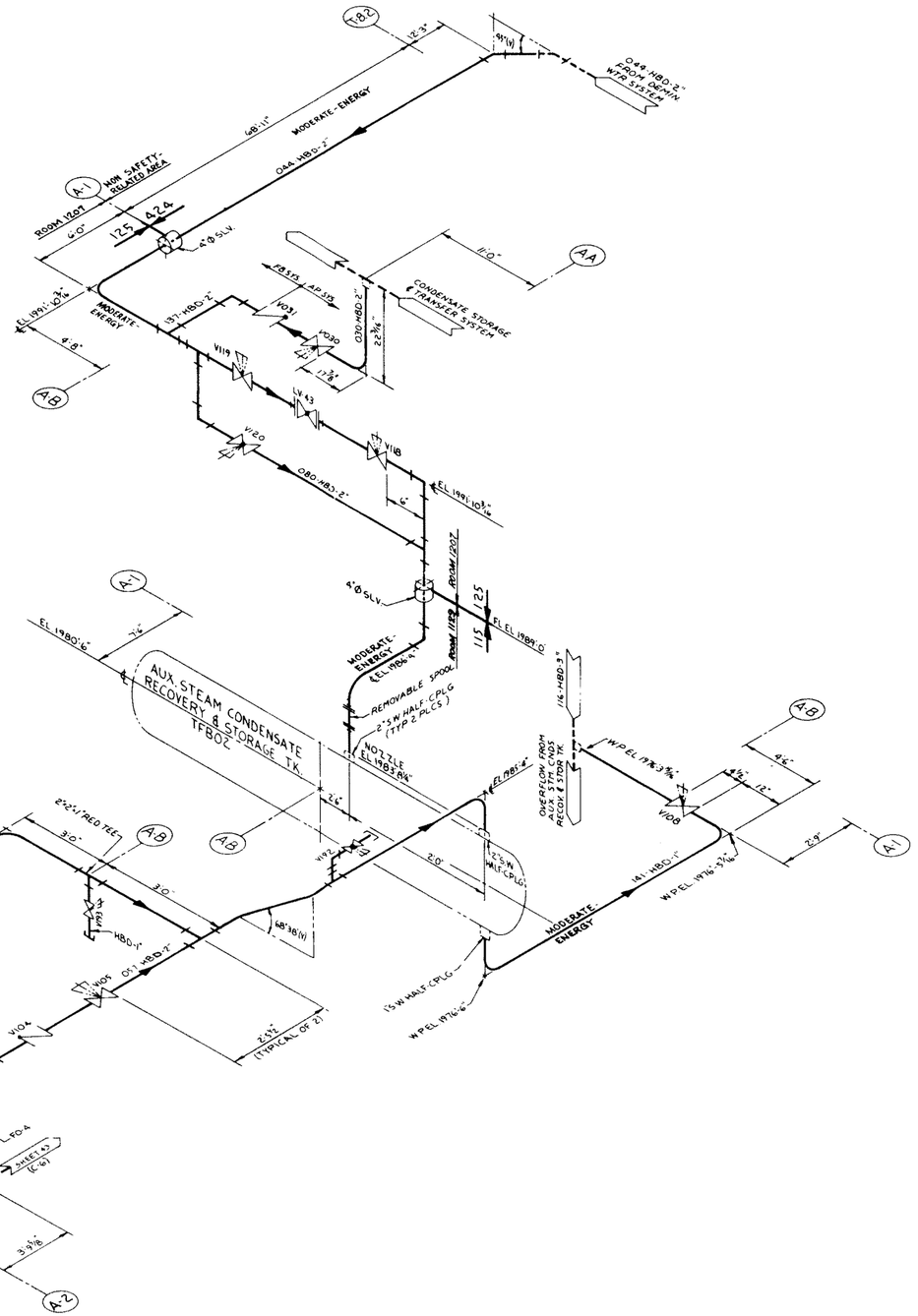
CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
AUX STM COND TRANSFER PUMP
DISCHARGE
OUTSIDE CONTAINMENT
(FB10)

(SHEET 47)



NOTES:

1. BREAK LOCATIONS FOR THIS PIPING ARE DEFINED IN SECTION 3.6.2.1.1d. BREAK TYPES ARE DEFINED IN SECTION 3.6.2.1.2.3.
2. EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM #	TABLE 3.6-4 SHEET
1129	15

3. STEADY-STATE THRUST FORCES FOR EACH LINE ARE PROVIDED BELOW.

LINE #	THRUST FORCE, LBS
056, 057-HBD-2"	475

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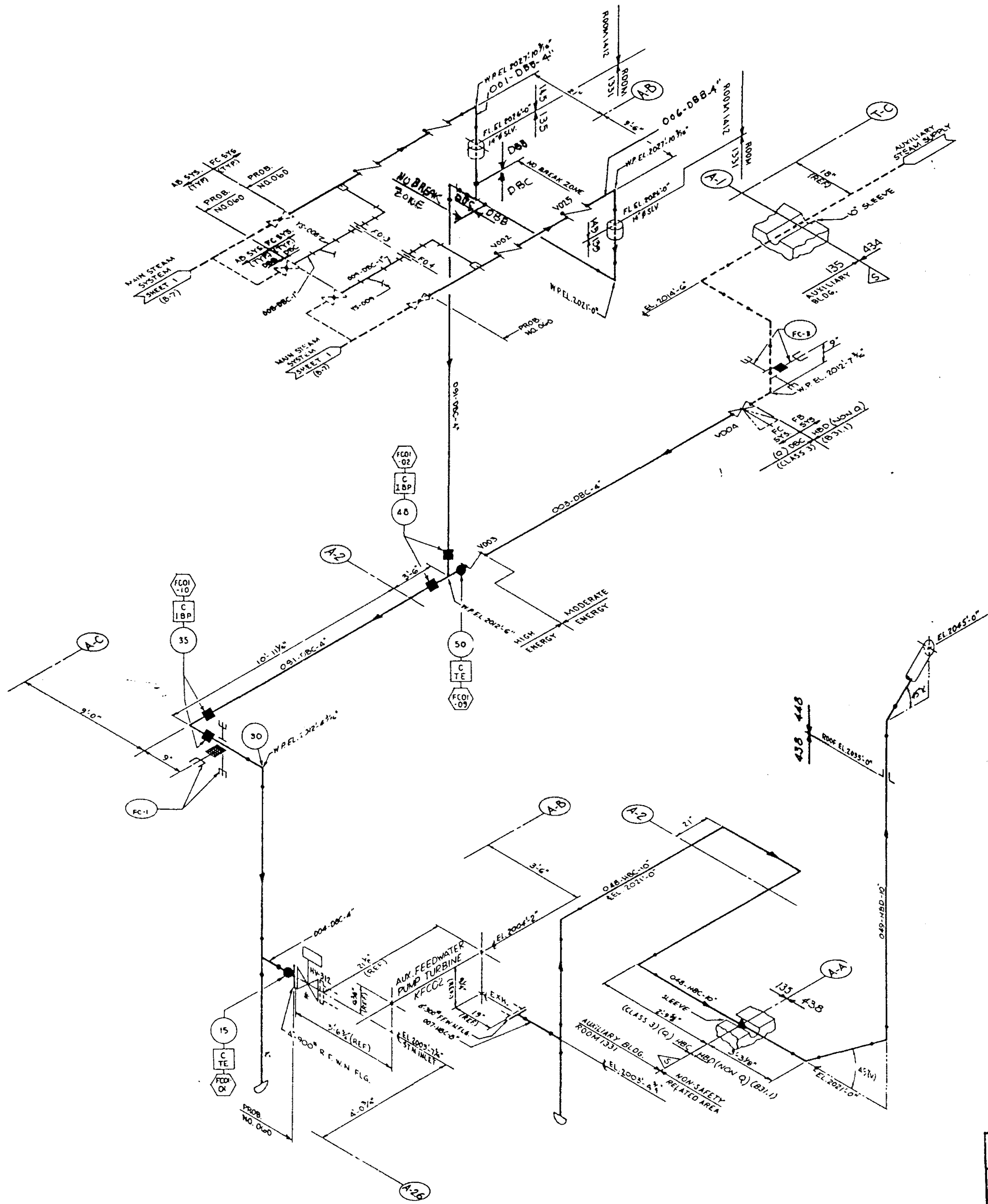
CALLAWAY PLANT

FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
AUX STM DEAREATOR FEED PUMP
RECIRC
OUTSIDE CONTAINMENT
(FB13)

(SHEET 48)



RESTRAINT LEGEND

DIRECTIONAL RESTRAINT

BUMPER RESTRAINT

ISOLATION RESTRAINT

GUIDE RESTRAINT

BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES SEE SECTION 3.6.2.3.3)

▲ ANCHOR

NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ○ – INDICATES STRESS NODE
4. [C/IBP] – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. [C/TE] – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
6. ⬡ – INDICATES BREAK POINT NUMBER
7. (PBR) – INDICATES PIPE BREAK RESTRAINT
8. STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6-3, SHEETS 21 & 22 CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
9. EFFECTS ANALYSIS RESULTS FOR EACH ROOM ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4.

ROOM #	TABLE 3.6-4 SHEET
1331	37
1412 (NO BREAK ZONE)	40

10. STEADY-STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE, LBS
FC01-01	2216
FC01-02	↓
FC01-05	
FC01-10	

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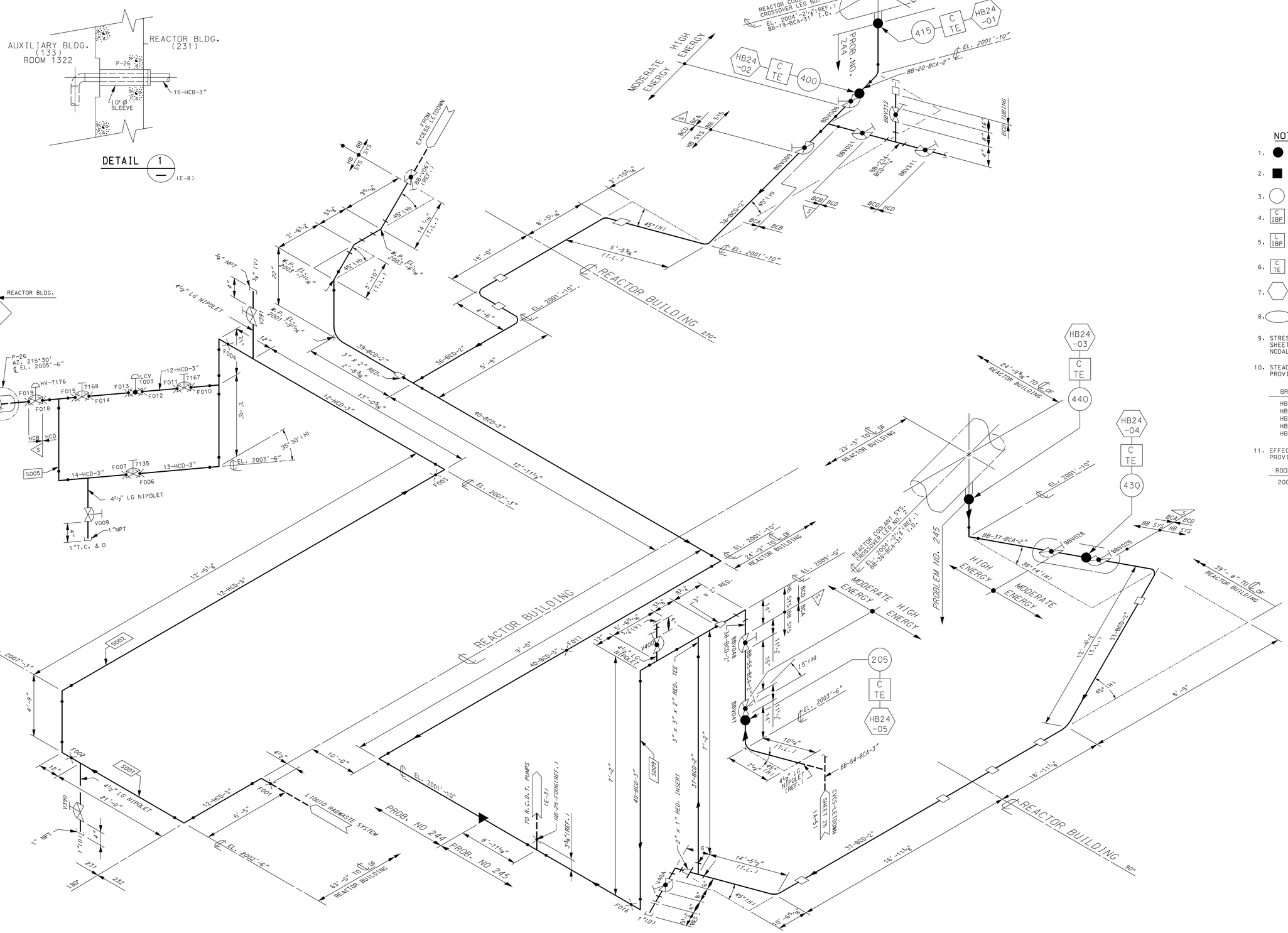
FIGURE 3.6-1
HIGH ENERGY
PIPE BREAK ISOMETRIC
MAIN STM SUPPLY TO TURB AFP
OUTSIDE CONTAINMENT
(FC01)
(SHEET 49)



NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ◯ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L IBP – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6-3. SHEETS 53 & 54. CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
HB24-01	7.921
HB24-02	7.921
HB24-03	7.921
HB24-04	7.921
HB24-05	7.921

11. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4
2000 (HB24)	70

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

▲ ANCHOR

CALLAWAY PLANT

FIGURE 3.6-1

HIGH ENERGY
PIPE BREAK ISOMETRIC
REACTOR COOLANT -
LOOP DRAINS
INSIDE CONTAINMENT
(HB24)

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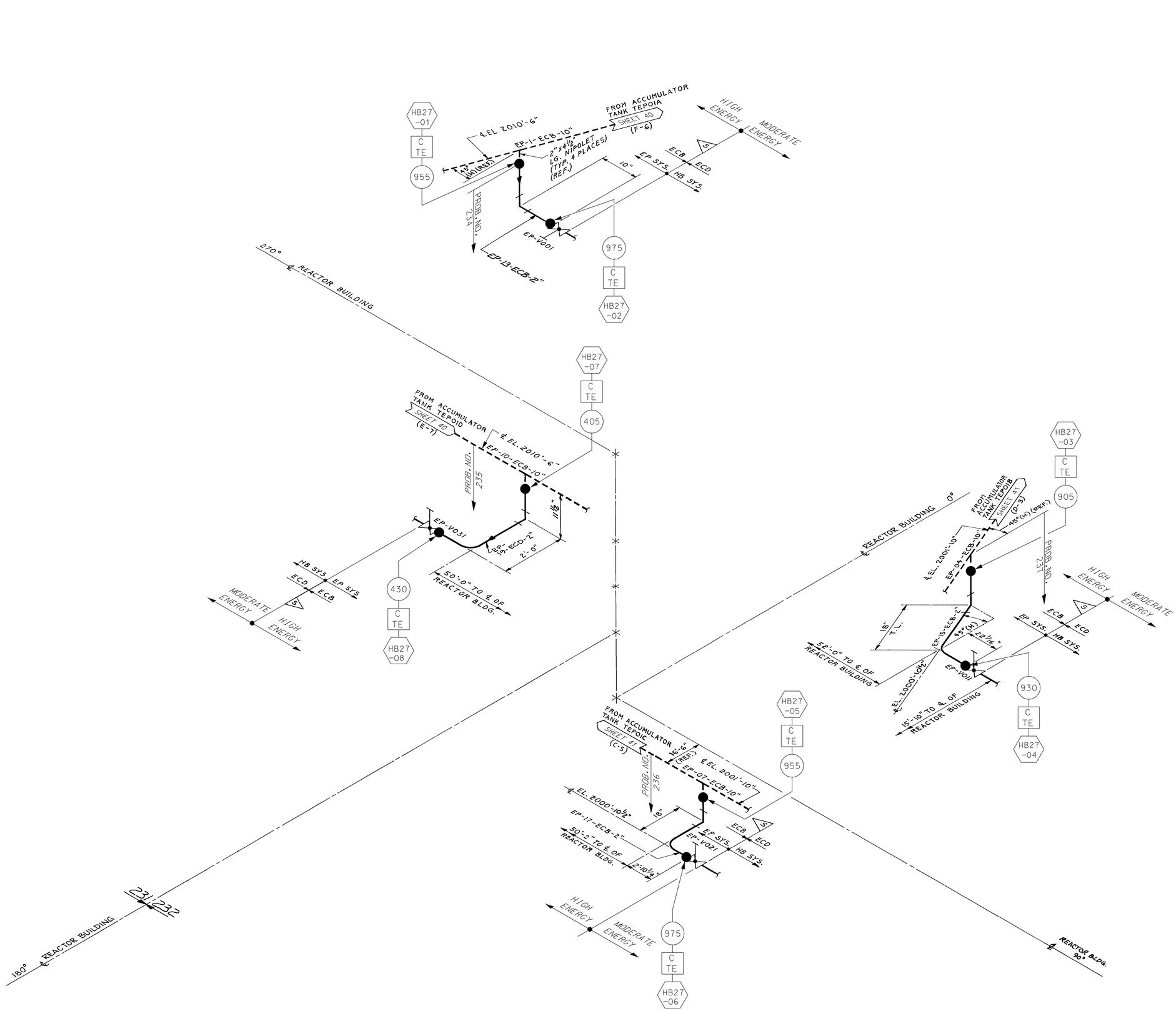

NOTES:

1. ● – INDICATES TERMINAL END BREAK POINT
2. ■ – INDICATES INTERMEDIATE BREAK POINT
3. ◯ – INDICATES STRESS NODE
4. C IBP – INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. L IBP – INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT
6. C TE – INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ – INDICATES BREAK POINT NUMBER
8. ⬭ – INDICATES PIPE BREAK RESTRAINT
9. STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6-3, SHEETS 43-46, CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE.
10. STEADY STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED BELOW.

BREAK POINT	THRUST FORCE LBS.
HB27-01	4,697
HB27-02	
HB27-04	
HB27-05	
HB27-06	
HB27-07	
HB27-08	
HB27-09	4,697

11. EFFECTS ANALYSIS RESULTS FOR EACH ISOMETRIC ARE PROVIDED ON THE INDICATED SHEET OF TABLE 3.6-4

ROOM # (ISO)	TABLE 3.6-4
2000 (HB27)	71

RESTRAINT LEGEND:

- DIRECTIONAL RESTRAINT
- BUMPER RESTRAINT
- ISOLATION RESTRAINT
- GUIDE RESTRAINT
- BUMPER RESTRAINT WITH ATTACHMENT TO PIPE

(FOR FURTHER DETAILS OF RESTRAINT TYPES, SEE SECTION 3.6.2.3.3)

CALLAWAY PLANT

FIGURE 3.6 - 1

HIGH ENERGY
PIPE BREAK ISOMETRIC
ACCUMULATOR TANK DRAINS
INSIDE CONTAINMENT
(HB27)

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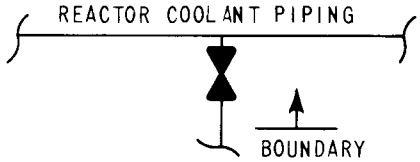
CASE I

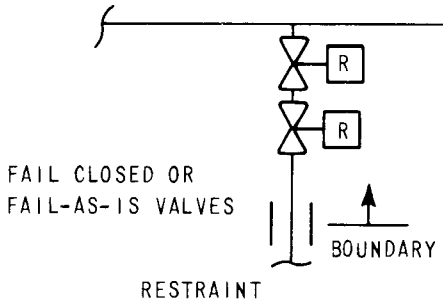
OUTGOING LINES WITH NORMALLY CLOSED VALVE



NOTE: PRESSURIZER SAFETY VALVES ARE INCLUDED UNDER THIS CASE.

CASE II

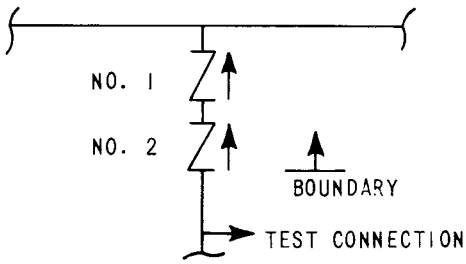
OUTGOING LINES WITH NORMALLY OPEN VALVES



NOTE: THE REACTOR COOLANT PUMP NO. 1 SEAL IS ASSUMED TO BE EQUIVALENT TO FIRST VALVE

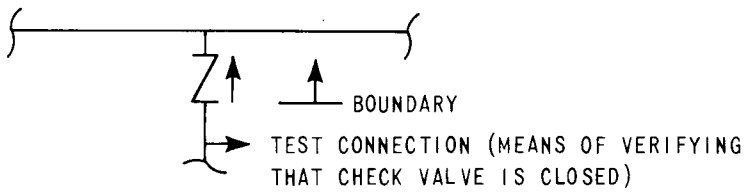
CASE III

INCOMING LINES NORMALLY WITH FLOW



CASE IV

INCOMING LINES NORMALLY WITHOUT FLOW



CASE V

ALL INSTRUMENTATION TUBING AND INSTRUMENTS CONNECTED DIRECTLY TO THE REACTOR COOLANT SYSTEM IS CONSIDERED AS A BOUNDARY. HOWEVER. A BREAK WITHIN THIS BOUNDARY RESULTS IN A RELATIVELY SMALL FLOW WHICH CAN NORMALLY BE MADE UP WITH THE CHARGING SYSTEM.

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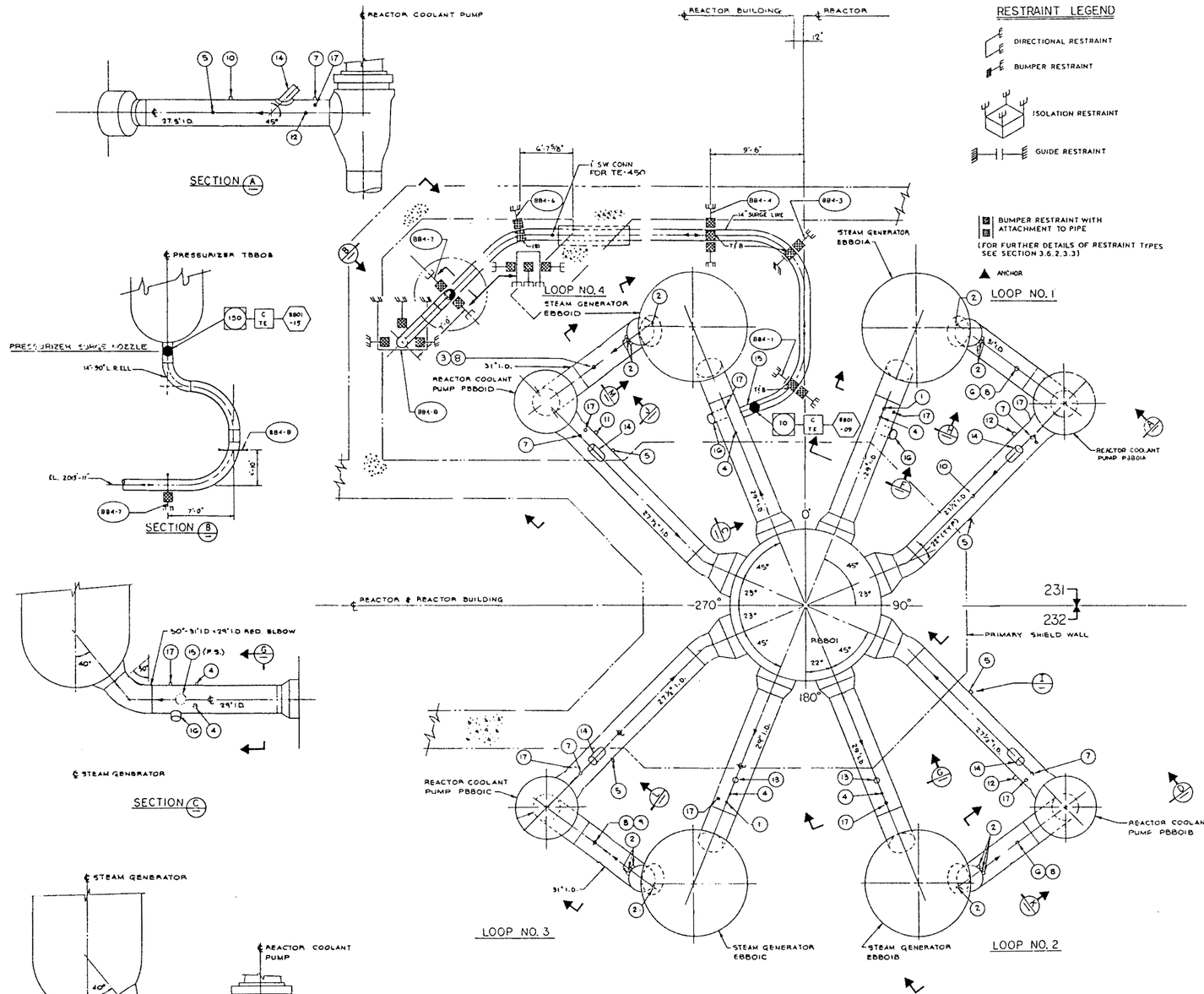
FIGURE 3.6-2

LOSS OF REACTOR COOLANT ACCIDENT BOUNDARY LIMITS



REACTOR COOLANT LOOP AND SURGE LINE PIPE BREAKS

BREAK NO.	DESCRIPTION	TYPE	BREAK OPENING AREA	THRUST FORCE LBS.
BB01-09	PRESSURIZER SURGE (PS) LINE / PRIMARY LOOP CONN.	GUILLOTINE	CROSS SECTIONAL FLOW AREA OF PS LINE	307,330
BB01-15	PRESSURIZER NOZZLE BUTT WELD	GUILLOTINE	CROSS SECTIONAL FLOW AREA OF PS LINE	307,330

NOTE PS LINE THRUST FORCE SHOWN IS APPLICABLE TO GUILLOTINE AND LONGITUDINAL BREAKS.

BRANCH NOZZLES

IDENT NO.	NOZZ SIZE	SERVICE DESCRIPTION
1	3/4"	SAMPLE CONNECTION
2	3/4"	LOOP FLOW INSTRUMENTATION
3	2"	LOOP DRAIN WITH 1" CVCS EXCESS LETDOWN
4	1"	RTD Thermowell-Hot leg
5	1 1/8"	SIS FROM BORON INJECTION
G	2"	LOOP DRAIN TO REACTOR COOLANT DRAIN TANK - WPS-L
7	2"	RTD Thermowell-cold leg
8	3"	Capped RTD Bypass line
9	3"	TO CVCS LETDOWN
10	3"	FROM CVCS NORMAL CHARGING LINE
11	3"	FROM CVCS ALTERNATE CHARGING LINE
12	4"	TO RCS PRESSURIZER SPRAY HEADER
13	6"	FROM SIS AND RHR PUMP
14	10"	SIS FROM ACCUMULATOR TANK
15	14"	PRESSURIZER SURGE LINE
16	12"	TO RHR PUMP - SUCTION
17	~	THERMOWELL

NOTES:

1. ● - INDICATES TERMINAL END BREAK POINT
2. ■ - INDICATES INTERMEDIATE BREAK POINT
3. ○ - INDICATES STRESS NODE BY WESTINGHOUSE (LATER)
4. ⊕ - INDICATES CIRCUMFERENTIAL BREAK AT INTERMEDIATE BREAK POINT
5. ⊕ - INDICATES LONGITUDINAL BREAK AT INTERMEDIATE BREAK POINT.
6. ⊕ - INDICATES CIRCUMFERENTIAL BREAK AT TERMINAL END
7. ⬡ - INDICATES BREAK POINT NUMBER
8. ⬭ - INDICATES PIPE BREAK RESTRAINT
9. - STRESS RESULTS WHICH ARE GIVEN IN TABLE 3.6.2, SHEET 66 CORRESPOND TO THE NUMERICAL NODAL POINTS SHOWN HERE
10. - STEADY-STATE THRUST FORCES FOR EACH BREAK ARE PROVIDED ABOVE
11. ○ - DENOTES BRANCH NOZZLE NUMBER DEFINED IN BRANCH NOZZLE TABLE
12. ⬬ - INDICATES TERMINAL END LIMITED AREA CIRCUMFERENTIAL BREAK POINT.
13. ⬬ - INDICATES INTERMEDIATE LIMITED AREA CIRCUMFERENTIAL BREAK POINT.
14. - EFFECTS ANALYSIS RESULTS FOR REACTOR COOLANT LOOP AND SURGE LINE PIPE BREAKS ARE PROVIDED ON Sheets 101, 102, 103 and 104 of Table 3.6-4.

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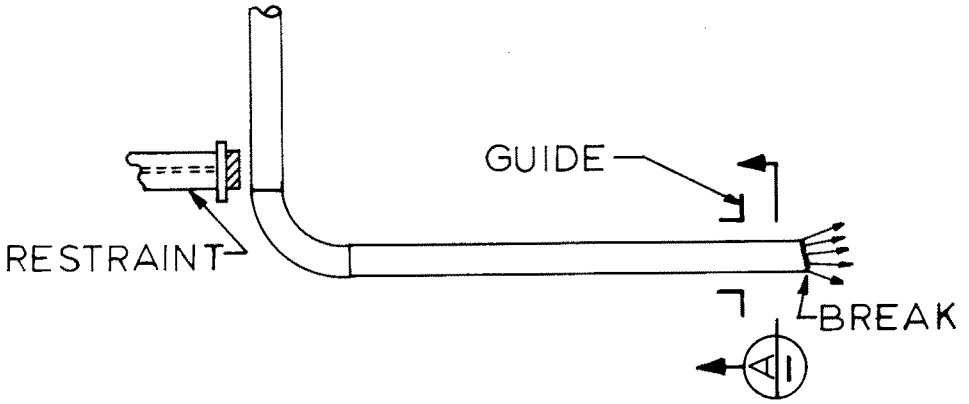
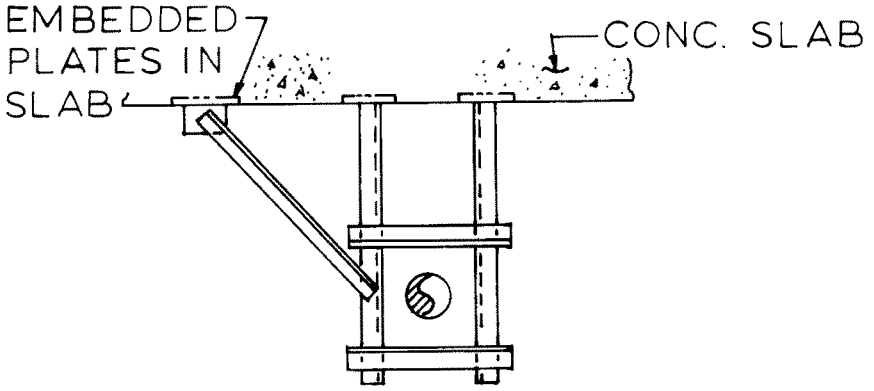
FIGURE 3.6-3

LOCATION OF POSTULATED BREAKS IN REACTOR COOLANT (INCLUDING PRESSURIZER SURGE LINE)



PLAN



SECTION A

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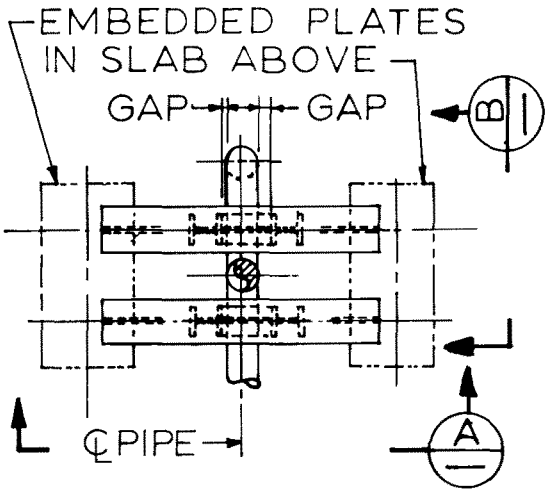
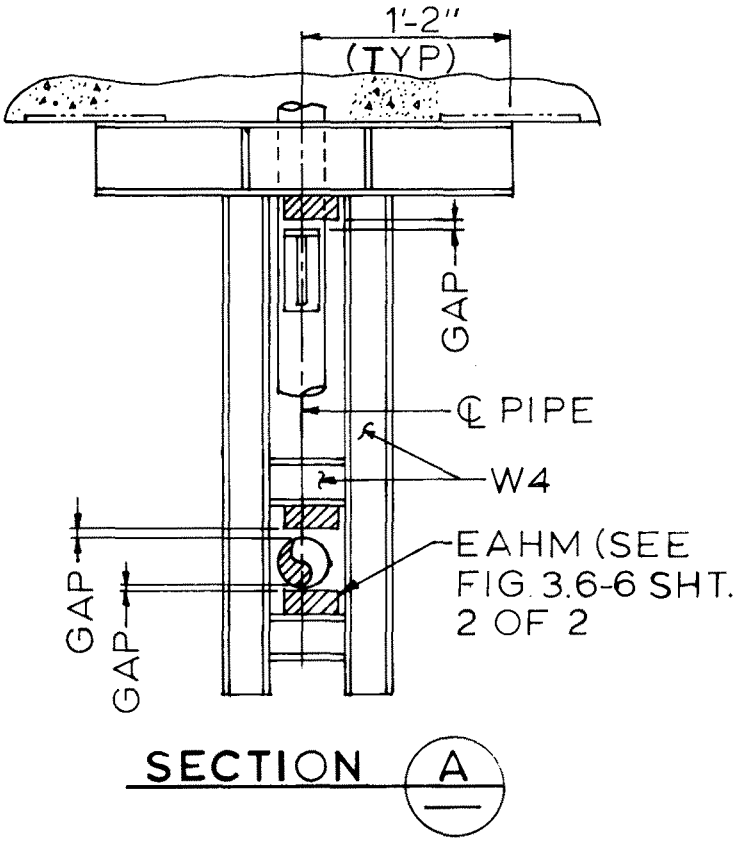
CALLAWAY PLANT

FIGURE 3.6-4

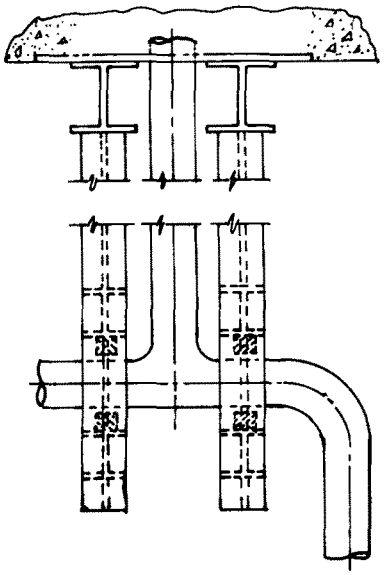
TYPICAL PIPING GUIDE INSTALLATION



PLAN



SECTION A



SECTION B

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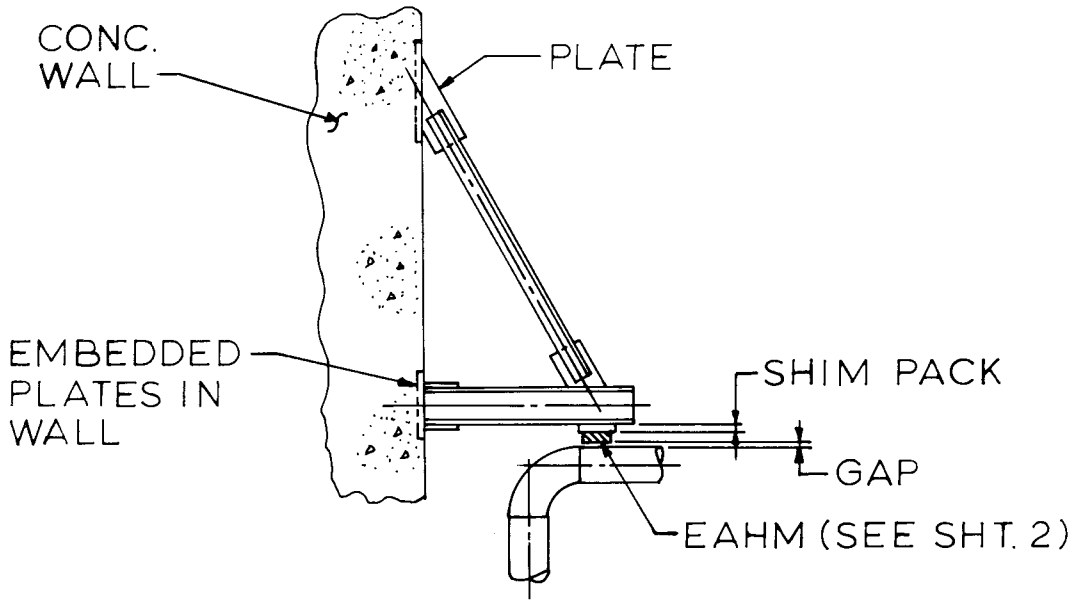
CALLAWAY PLANT
FIGURE 3.6-5
TYPICAL ISOLATION RESTRAINT



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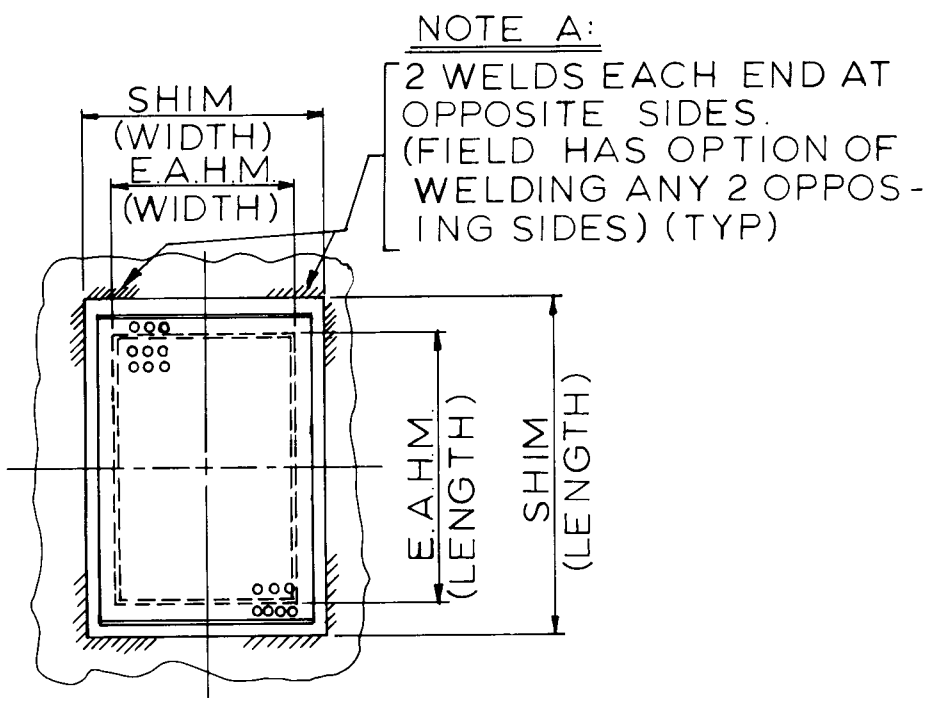
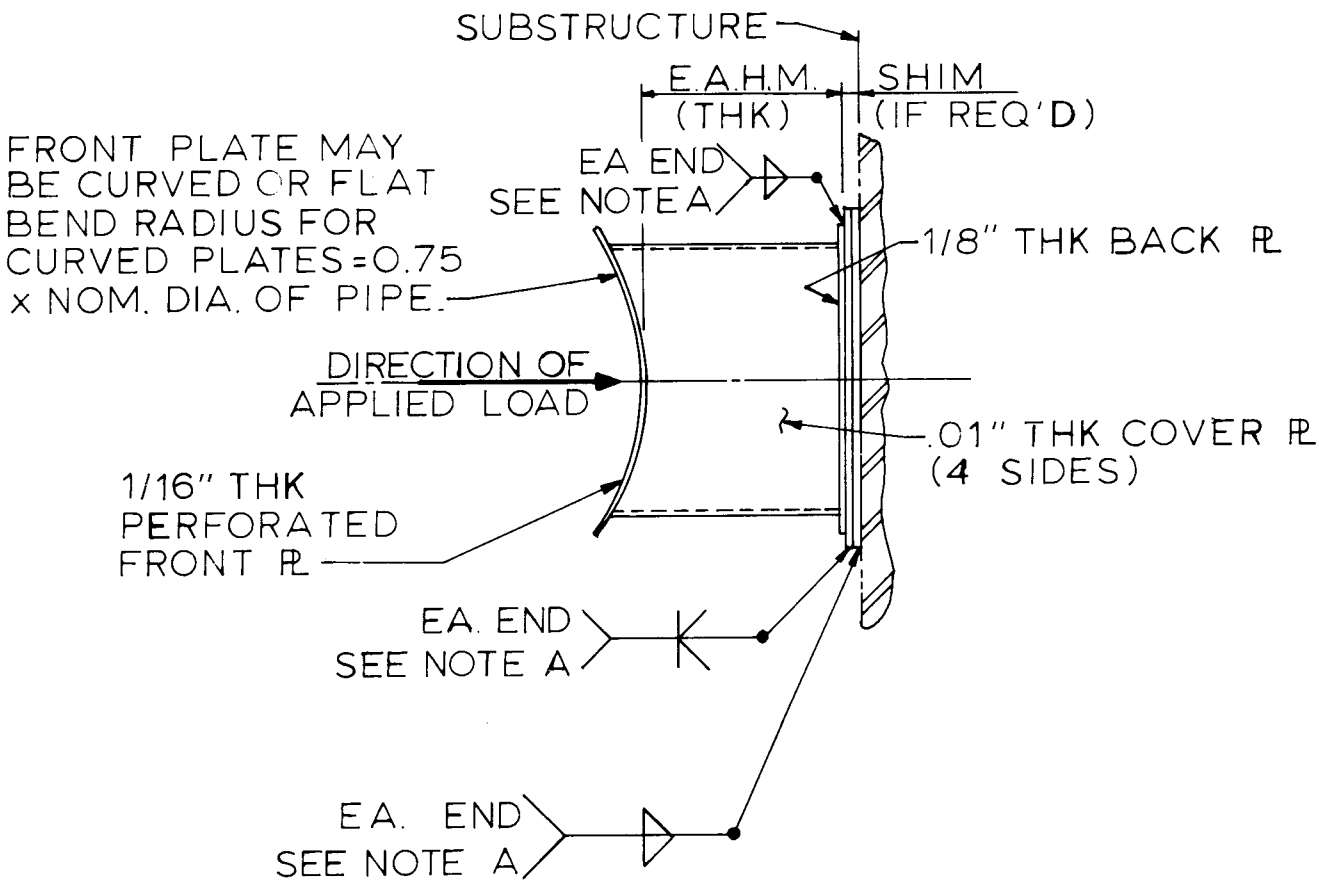
CALLAWAY PLANT

FIGURE 3.6-6
SHEET 1

ENERGY ABSORBING HONEYCOMB MATERIAL - LARGE GAP RESTRAINT





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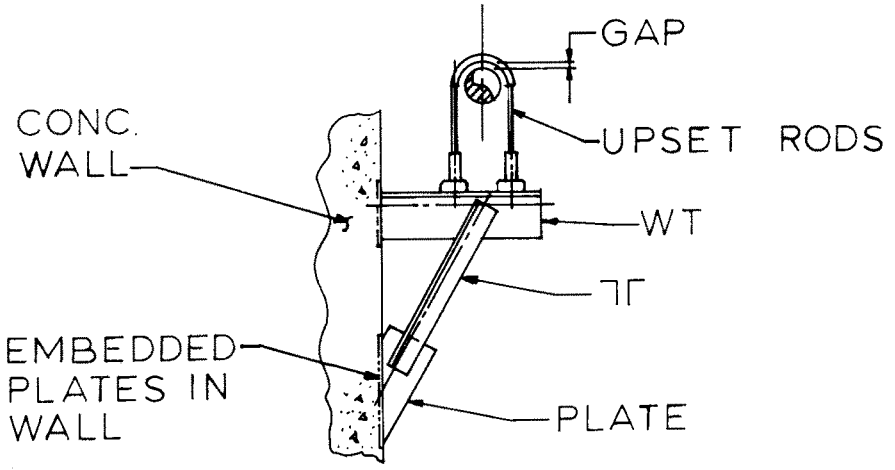
CALLAWAY PLANT

FIGURE 3.6-6
SHEET 2
TYPICAL PREFABRICATED ENERGY ABSORBING HONEYCOMB MATERIAL INSTALLATION



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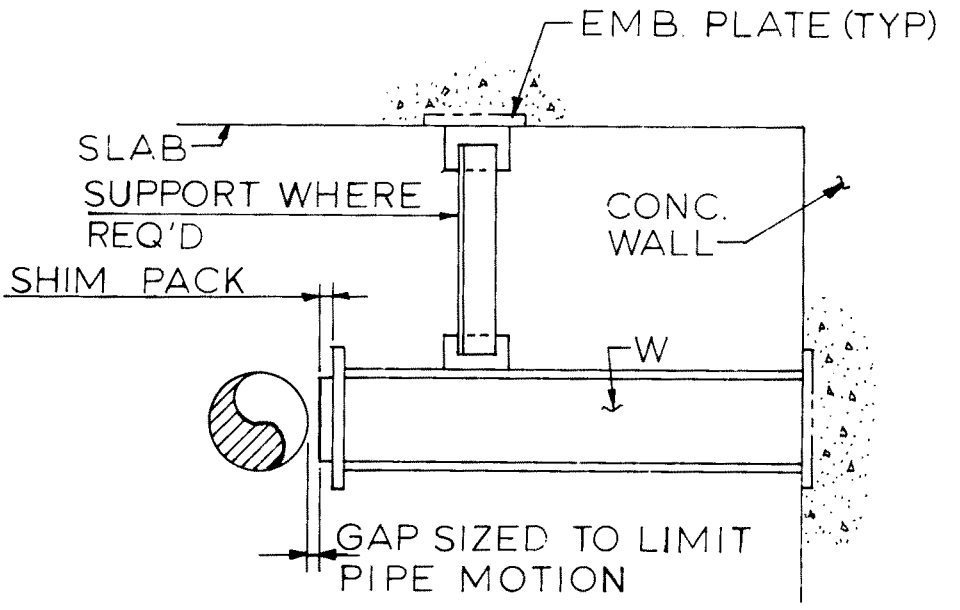
CALLAWAY PLANT

FIGURE 3.6-7

**TYPICAL UPSET ROD
LARGE GAP RESTRAINT**



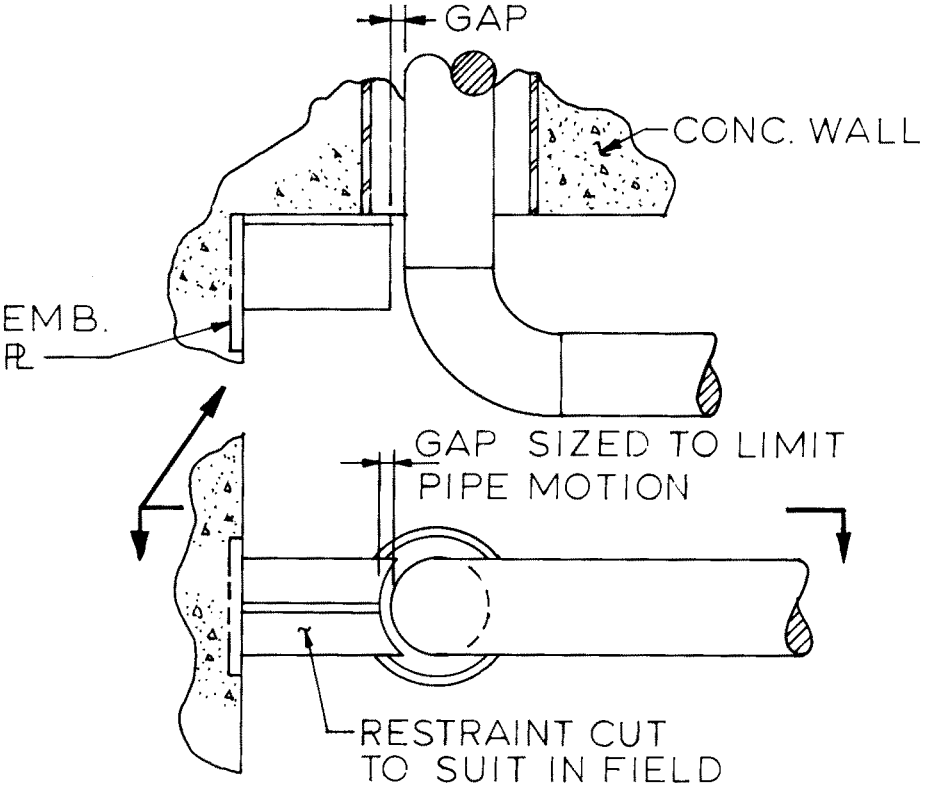


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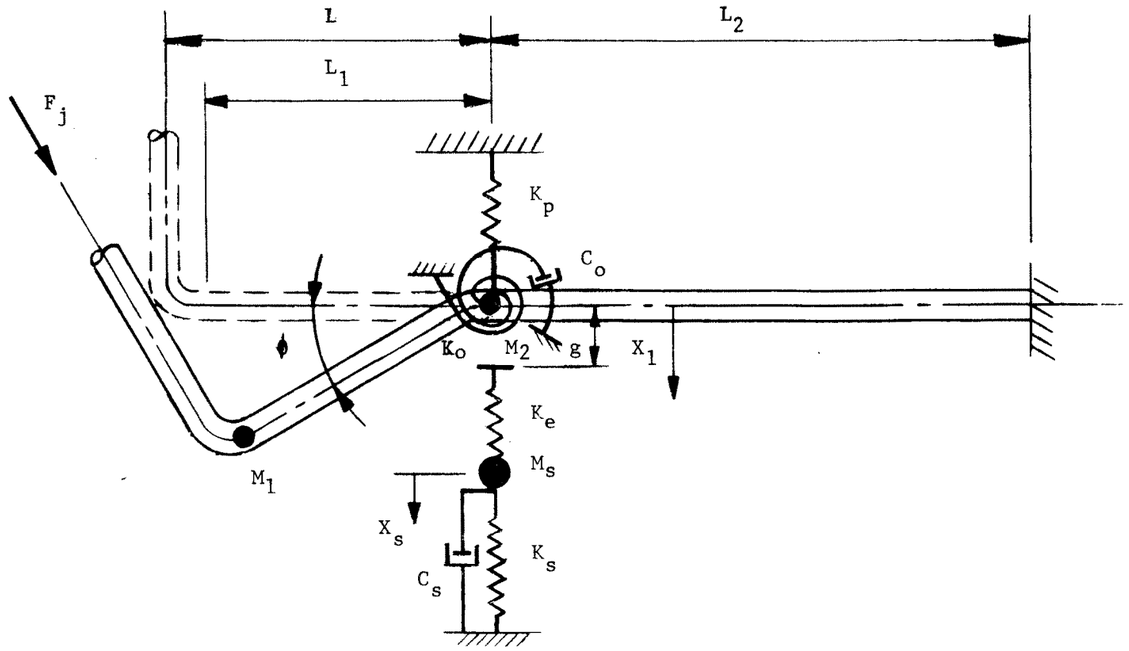
FIGURE 3.6-8

TYPICAL CLOSE GAP RESTRAINT



F_j = Jet thrust reaction force (See Reference 5)

M_1 = Effective mass of rotating pipe (between broken end of pipe and restraint)

M_2 = Effective mass of rotating portion of pipe between fixity and restraint

M_s = Effective mass of restraint substructure

K_o = Elastic-plastic clock spring representing stiffness of pipe at a restraint due to deflection/rotation caused by F_j (plastic hinge determined by equations in Section 3.6.2.3.4(a))

K_p = Elastic spring representing stiffness of pipe between point of fixity and restraint

K_e = Elastic-plastic spring representing energy dissipating device. (Active only in compression - provides rebound capability.)

K_s = Elastic-plastic spring representing stiffness of restraint substructure.

C_o = Effective damping of pipe (effective translational damping)

C_s = Effective damping of substructure

L = Distance from elbow to restraint

L_1 = Distance from elbow to restraint to effective mass of rotating pipe

L_2 = Distance from restraint to point of fixity

g = Initial gap between pipe and restraint

ϕ = Degree of freedom representing rotation of the elbow at the restraint

X_1 = Degree of freedom representing translational motion of pipe at the restraint

X_s = Degree of freedom representing the motion of the restraint substructure

Note: The coupled second order differential equations developed using Lagrangian dynamics representing the model, are solved by a time step integration procedure via computer to yield the time history acceleration velocities and displacements of the defined masses.

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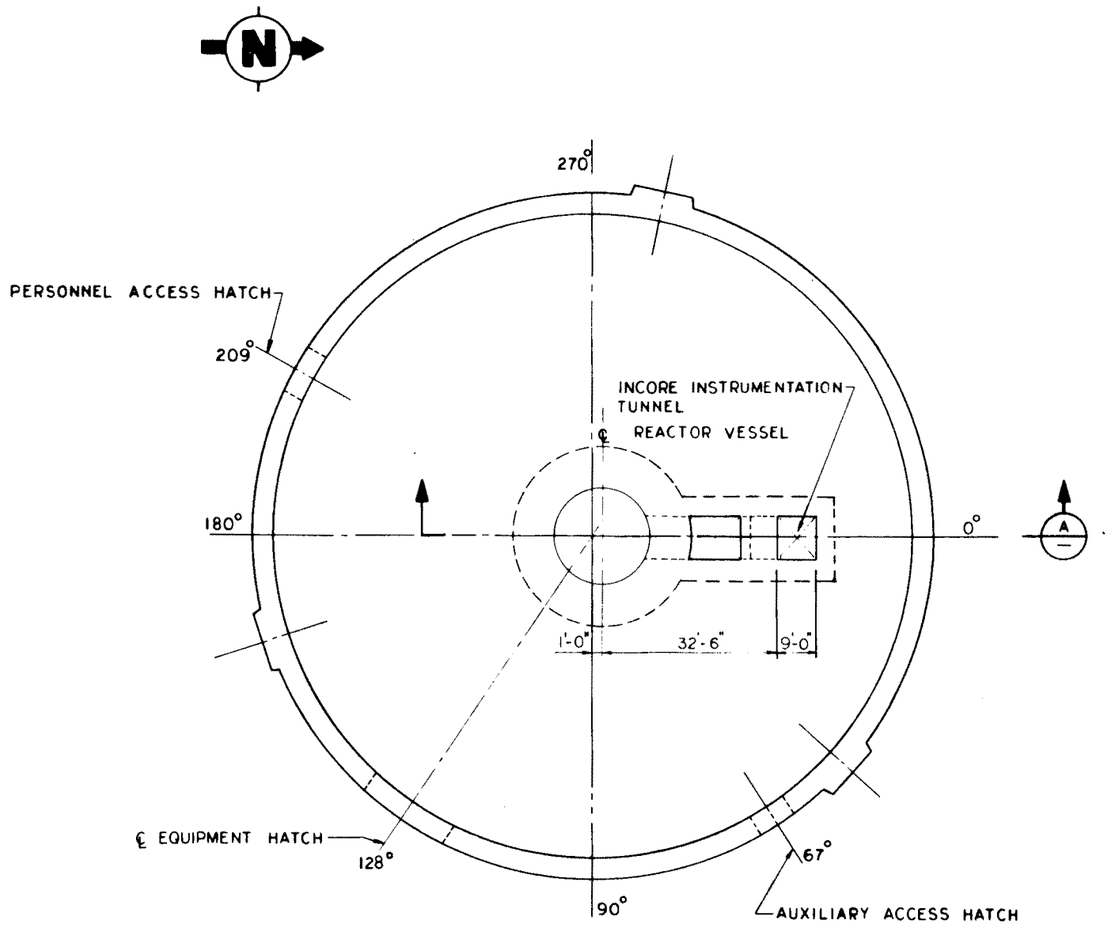
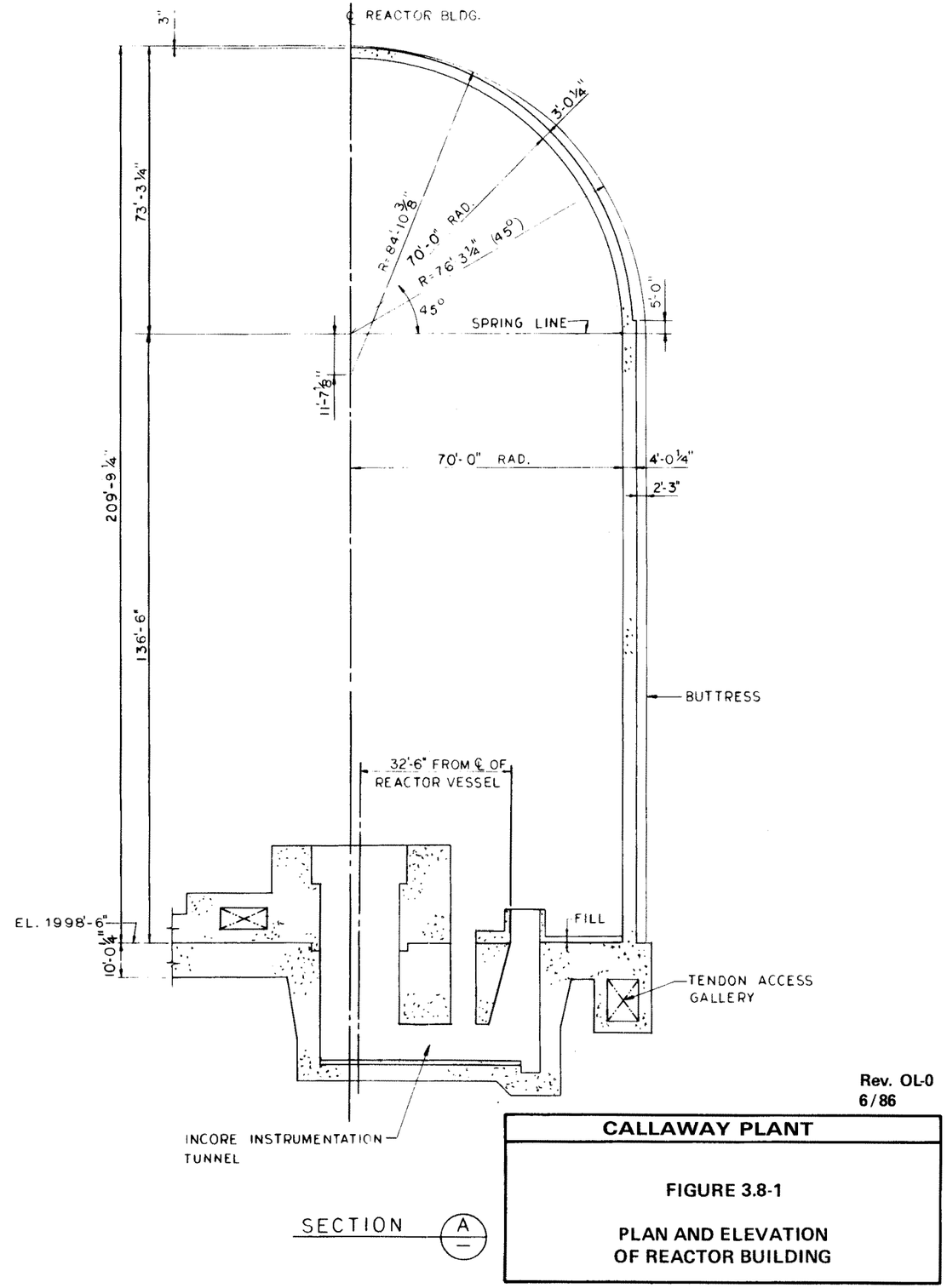
FIGURE 3.6 -9

LUMPED-PARAMETER MODEL

PIPE-RESTRAINT SYSTEM



PLAN



SECTION A

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CALLAWAY PLANT

FIGURE 3.8-1

PLAN AND ELEVATION OF REACTOR BUILDING

FSAR Figure 3.8-2 is withheld per RIS 2015-17

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5/00

CALLAWAY PLANT
FIGURE 3.8-2 REACTOR BUILDING GROUND FLOOR PLAN – ELEV 2000'-0" AND 2001'-4'

FSAR Figure 3.8-2 is withheld per RIS 2015-17

FSAR Figure 3.8-3 is withheld per RIS 2015-17

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FIGURE 3.8-3

REACTOR BUILDING INTERMEDIATE
FLOOR PLAN – ELEV 2026'-0"

FSAR Figure 3.8-3 is withheld per RIS 2015-17

FSAR Figure 3.8-4 is withheld per RIS 2015-17

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FIGURE 3.8-4

REACTOR BUILDING OPERATING FLOOR
PLAN – ELEV 2047'-6" AND 2051'-0"

FSAR Figure 3.8-4 is withheld per RIS 2015-17

FSAR Figure 3.8-5 is withheld per RIS 2015-17

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CALLAWAY PLANT

FIGURE 3.8-5

REACTOR BUILDING PLAN –
ELEV 2068'-0"

FSAR Figure 3.8-5 is withheld per RIS 2015-17

FSAR Figure 3.8-6 is withheld per RIS 2015-17

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FIGURE 3.8-6

REACTOR BUILDING
EAST-WEST CROSS SECTION

FSAR Figure 3.8-6 is withheld per RIS 2015-17

FSAR Figure 3.8-7 is withheld per RIS 2015-17

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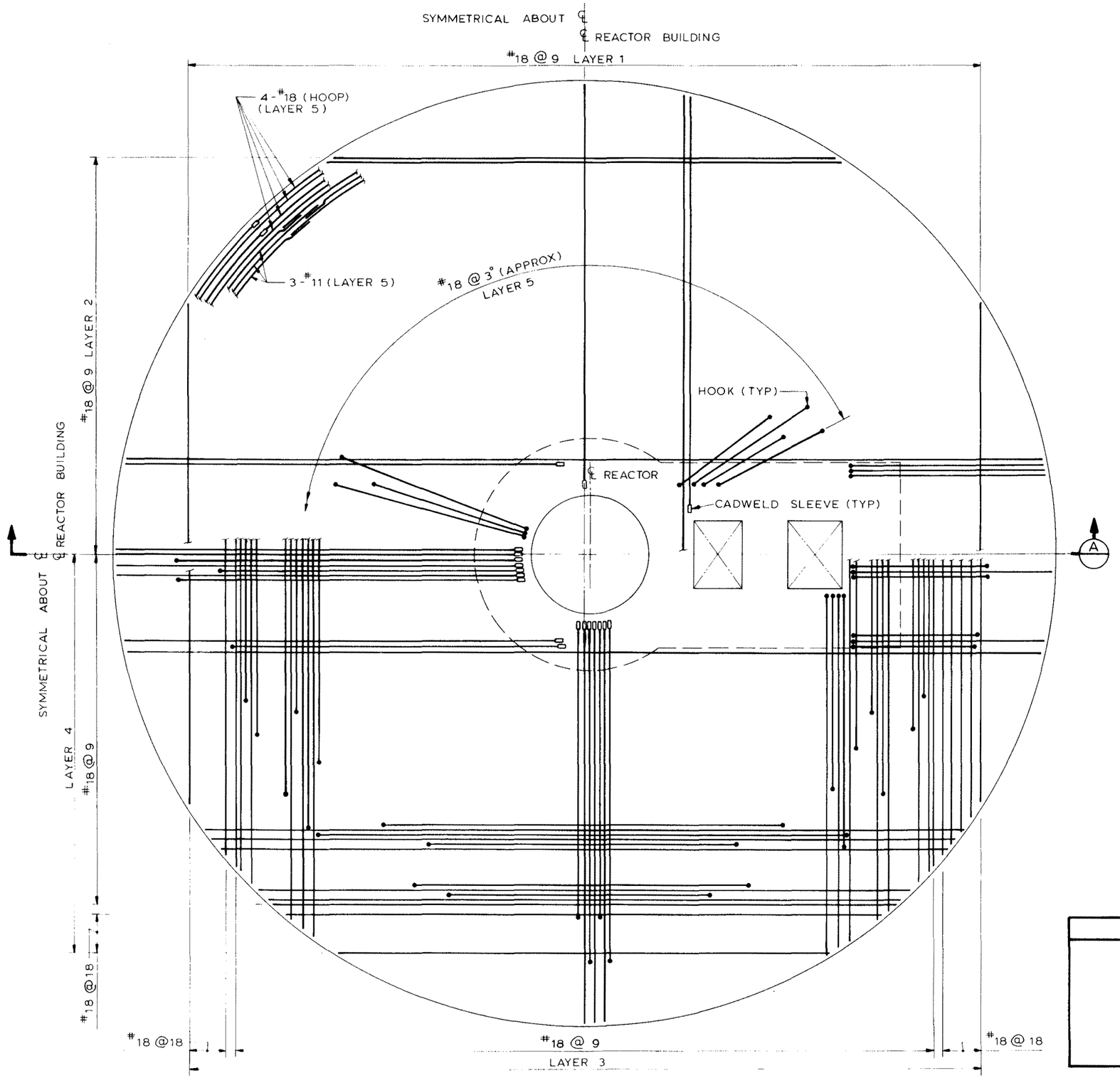
CALLAWAY PLANT

FIGURE 3.8-7

REACTOR BUILDING
NORTH-SOUTH CROSS SECTION

FSAR Figure 3.8-7 is withheld per RIS 2015-17



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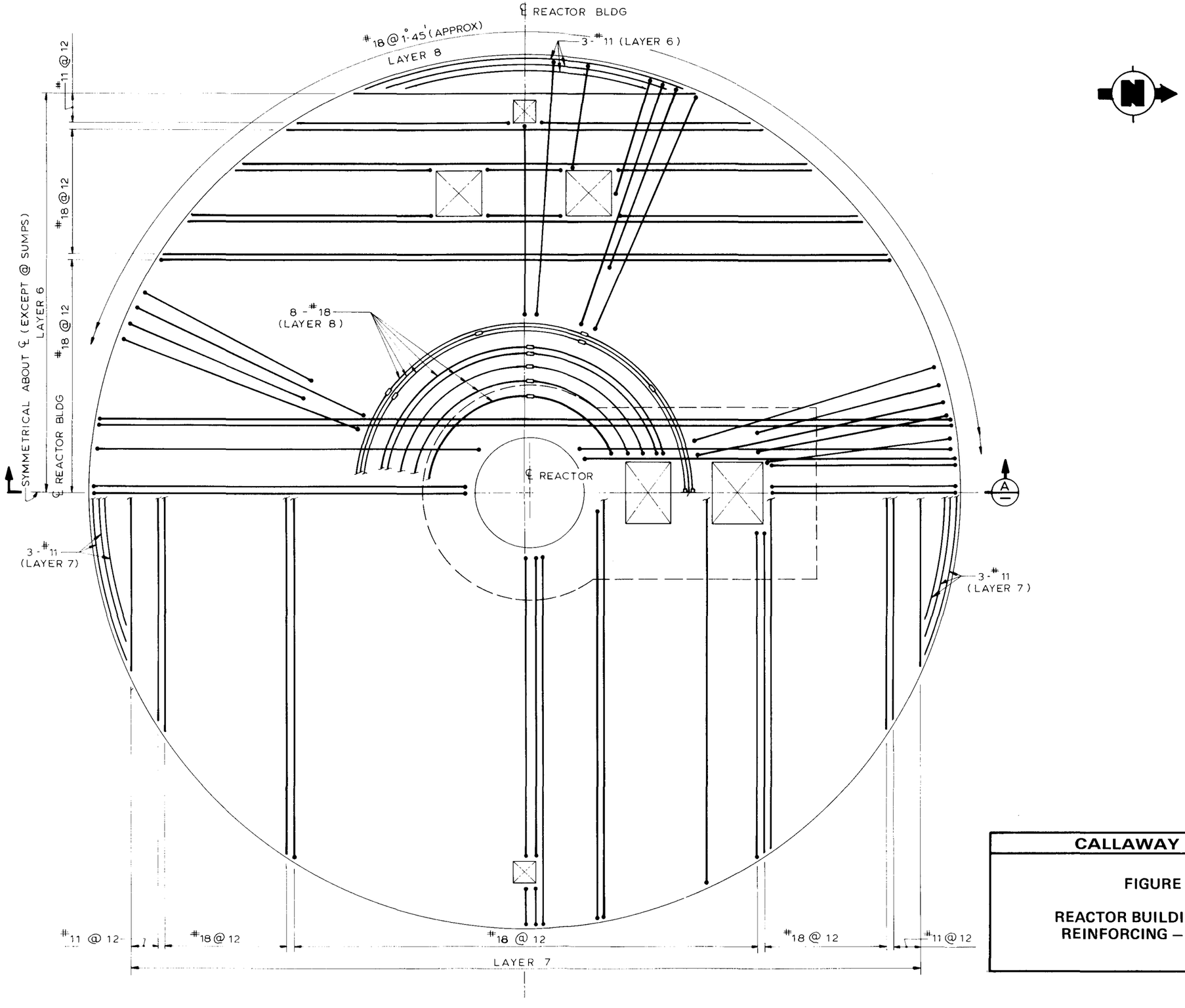
CALLAWAY PLANT

FIGURE 3.8-8

REACTOR BUILDING BASE MAT REINFORCING – BOTTOM LAYERS



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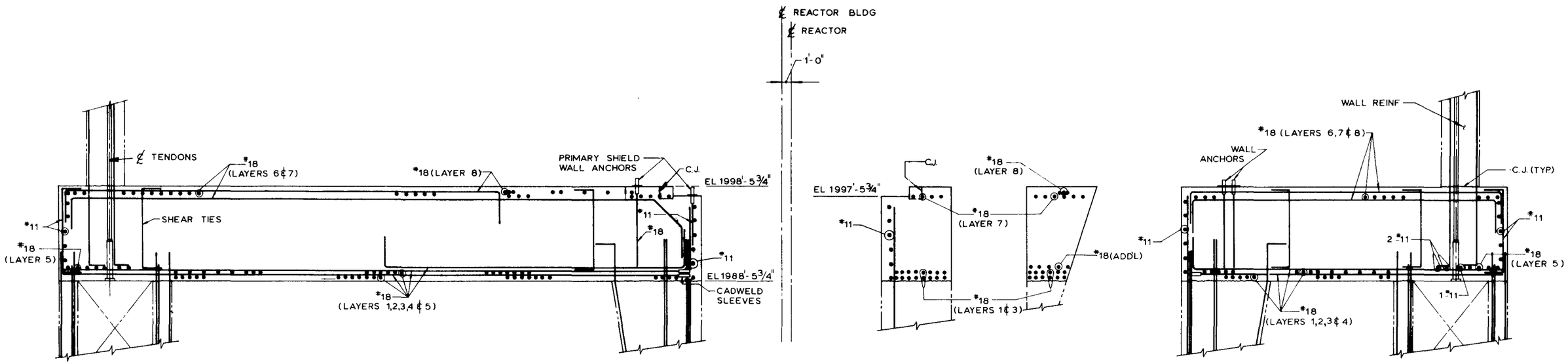
CALLAWAY PLANT

FIGURE 3.8-9

REACTOR BUILDING BASE MAT REINFORCING – TOP LAYERS



SECTION Ⓐ

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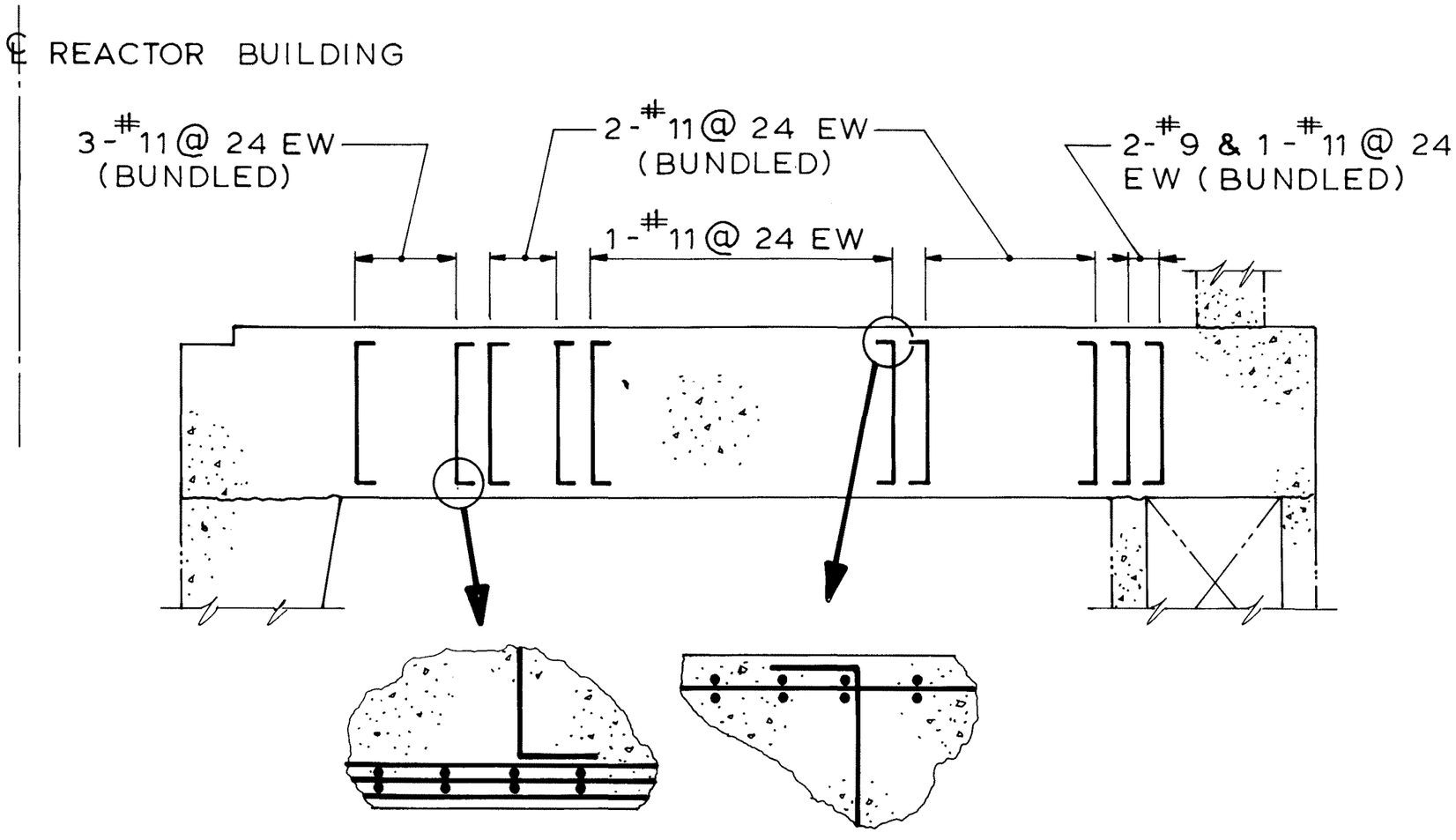
FIGURE 3.8-10

REACTOR BUILDING BASE MAT
REINFORCING – CROSS SECTION



TYPICAL SECTION SHOWING SHEAR REINFORCING

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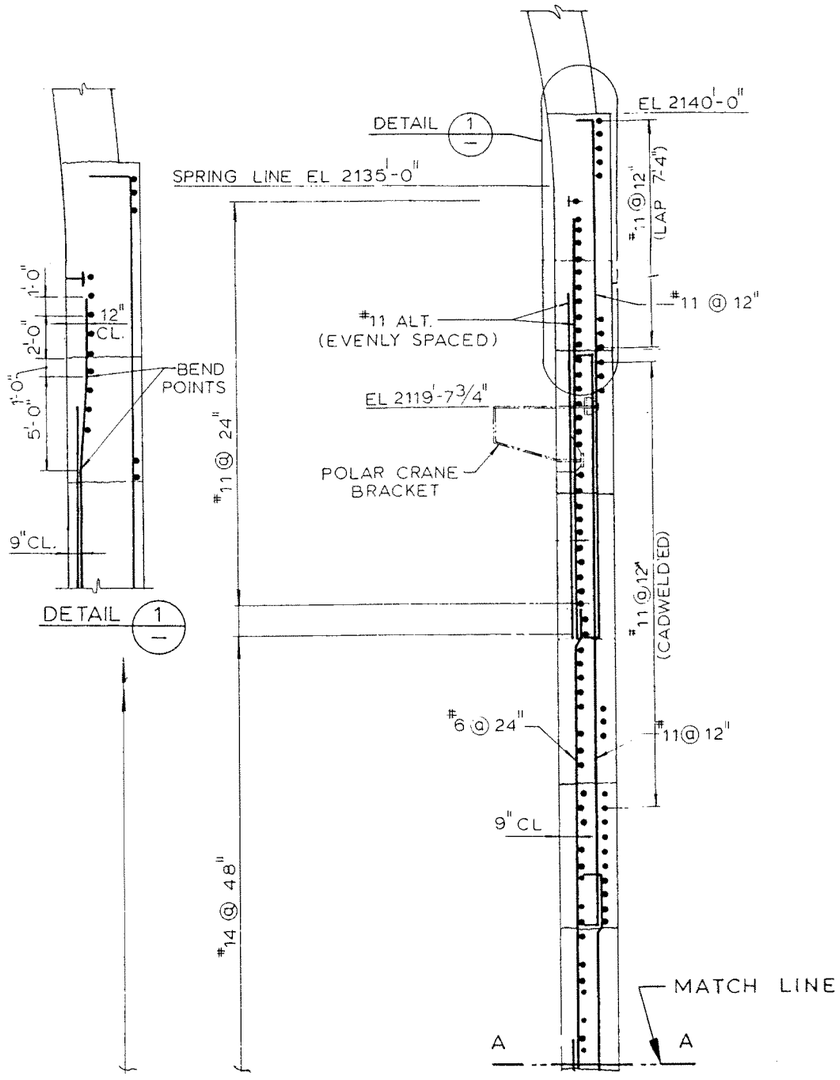
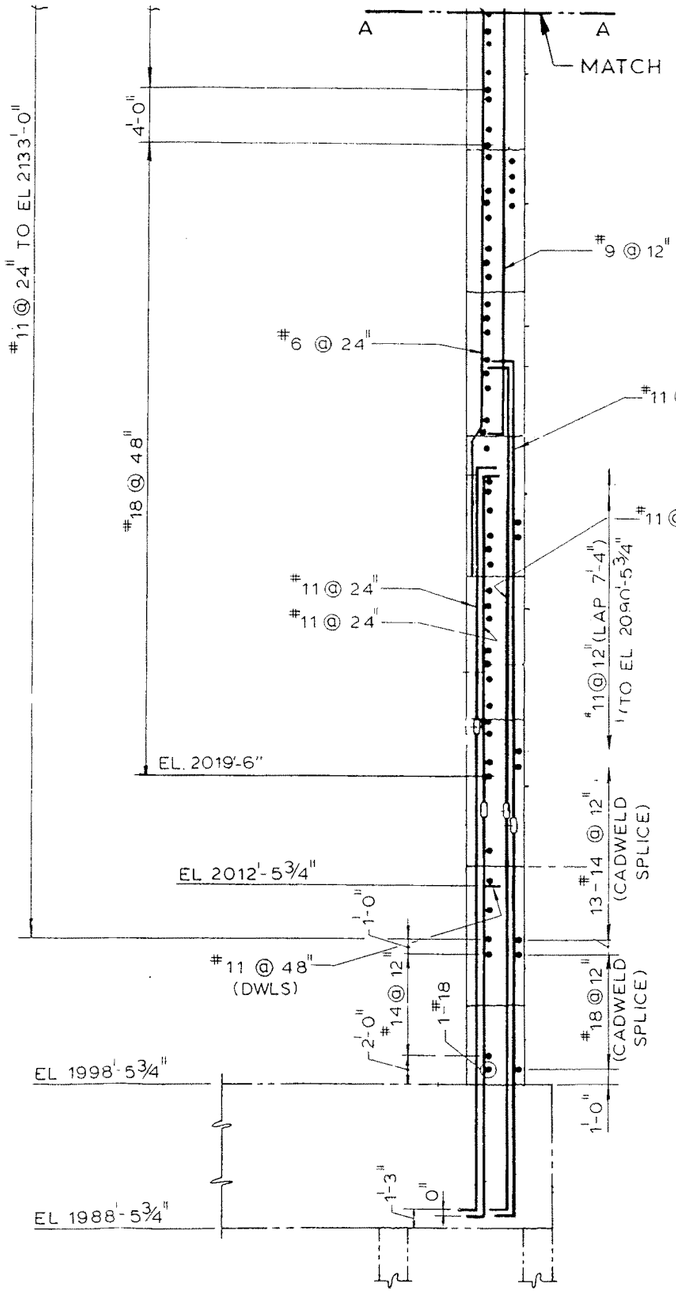
FIGURE 3.8-11

REACTOR BUILDING BASE MAT REINFORCING – SHEAR TIE





TYPICAL WALL ELEVATION

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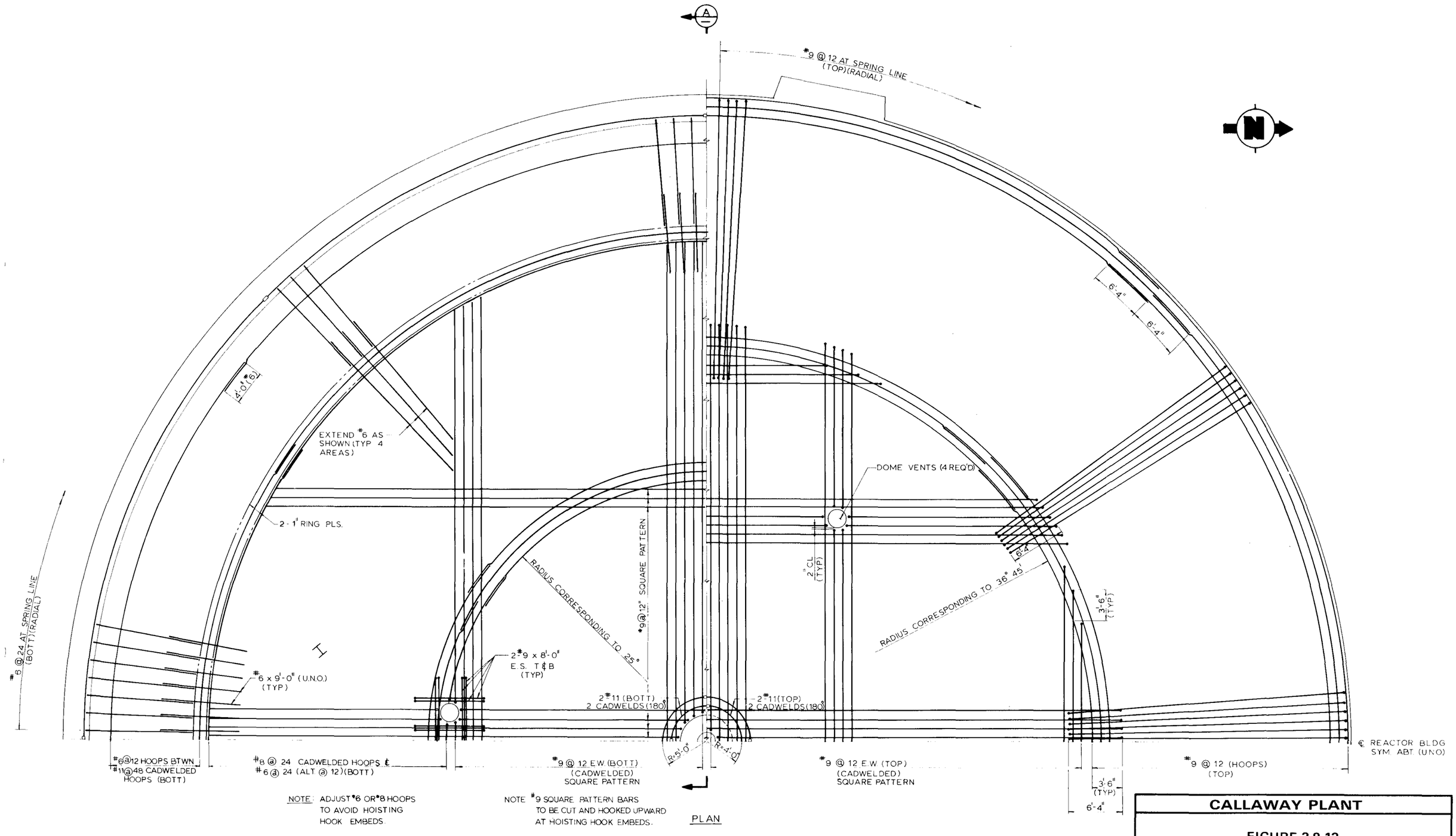
FIGURE 3.8-12

REACTOR BUILDING
SHELL REINFORCING

Standard Plant



NOTE: ADJUST #6 OR #8 HOOPS TO AVOID HOISTING HOOK EMBEDS.

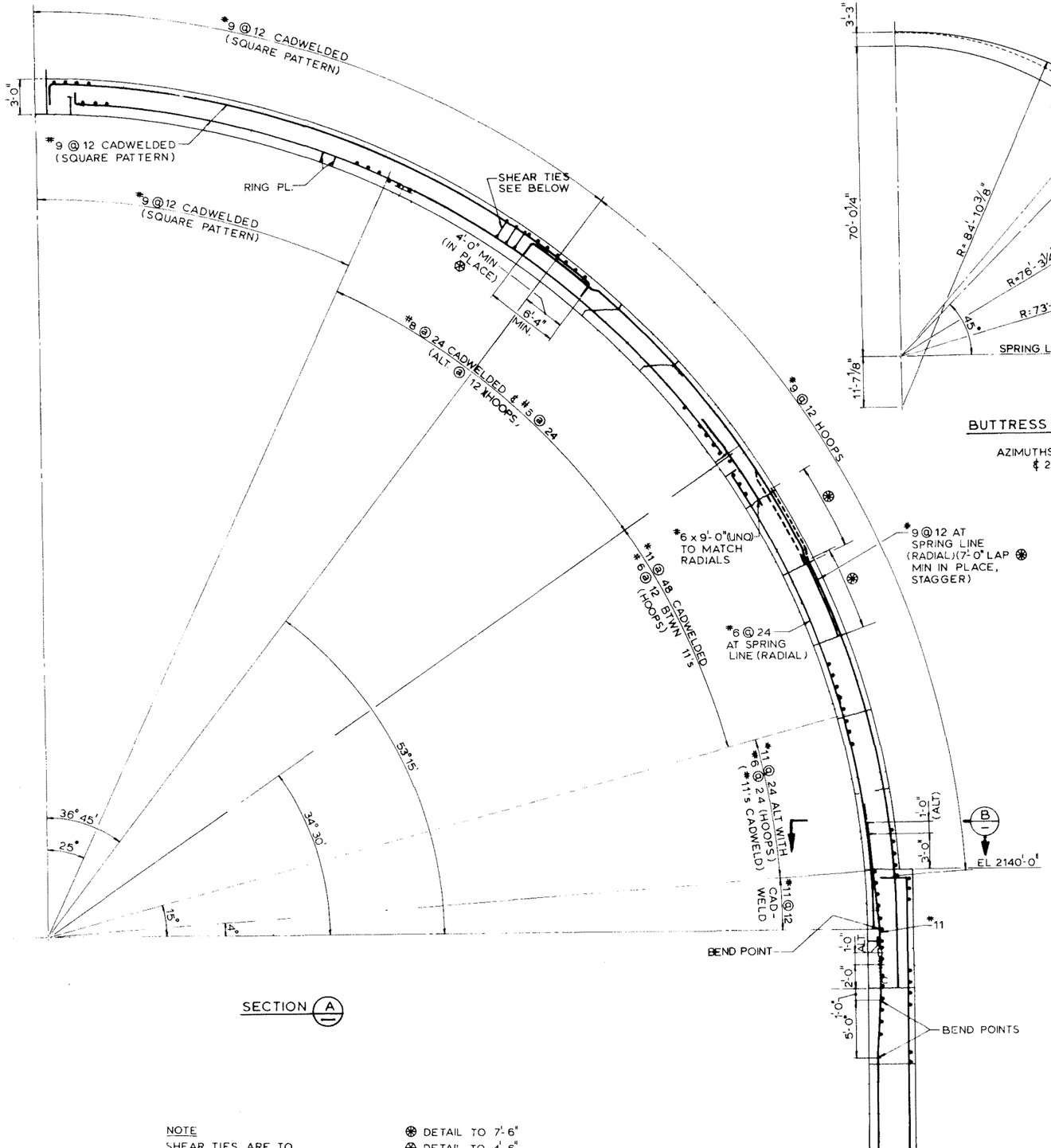
NOTE #9 SQUARE PATTERN BARS TO BE CUT AND HOOKED UPWARD AT HOISTING HOOK EMBEDS.

PLAN

CALLAWAY PLANT

FIGURE 3.8-13

REACTOR BUILDING DOME REINFORCING-PLAN



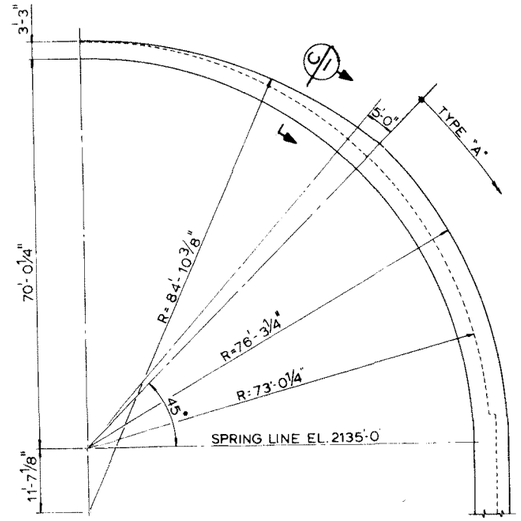
SECTION A

NOTE

SHEAR TIES ARE TO BE *6 @ 12"x12" FROM EL 2135'-0"

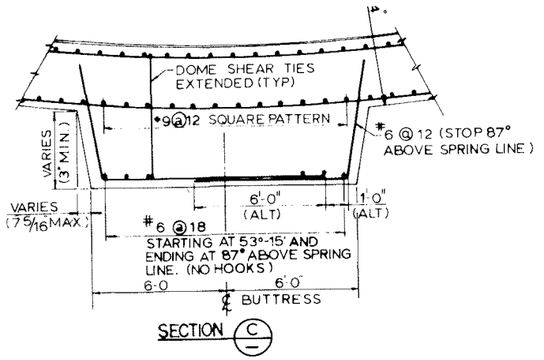
⊛ DETAIL TO 7'-6"
⊛ DETAIL TO 4'-6"

THE DETAILED LENGTH IS PROVIDED FOR CONSTRUCTOR FLEXIBILITY IN RESOLVING INTERFERENCES WITH THE REBAR HOOK AND TENDON SHEATHING

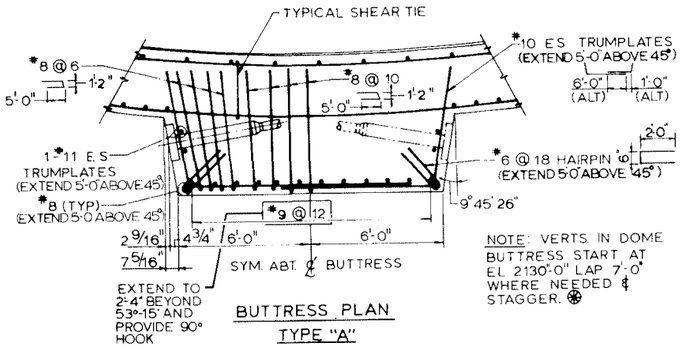


BUTTRESS ELEVATION

AZIMUTHS 41°, 161°
& 281°

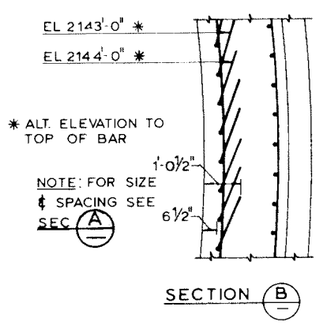


SECTION C



BUTTRESS PLAN
TYPE "A"

NOTE: VERTS. IN DOME BUTTRESS START AT EL. 2130'-0" LAP 7'-0" WHERE NEEDED ℄ STAGGER. ⊛



SECTION B

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CALLAWAY PLANT

FIGURE 3.8-14

REACTOR BUILDING
DOME REINFORCING-ELEVATION

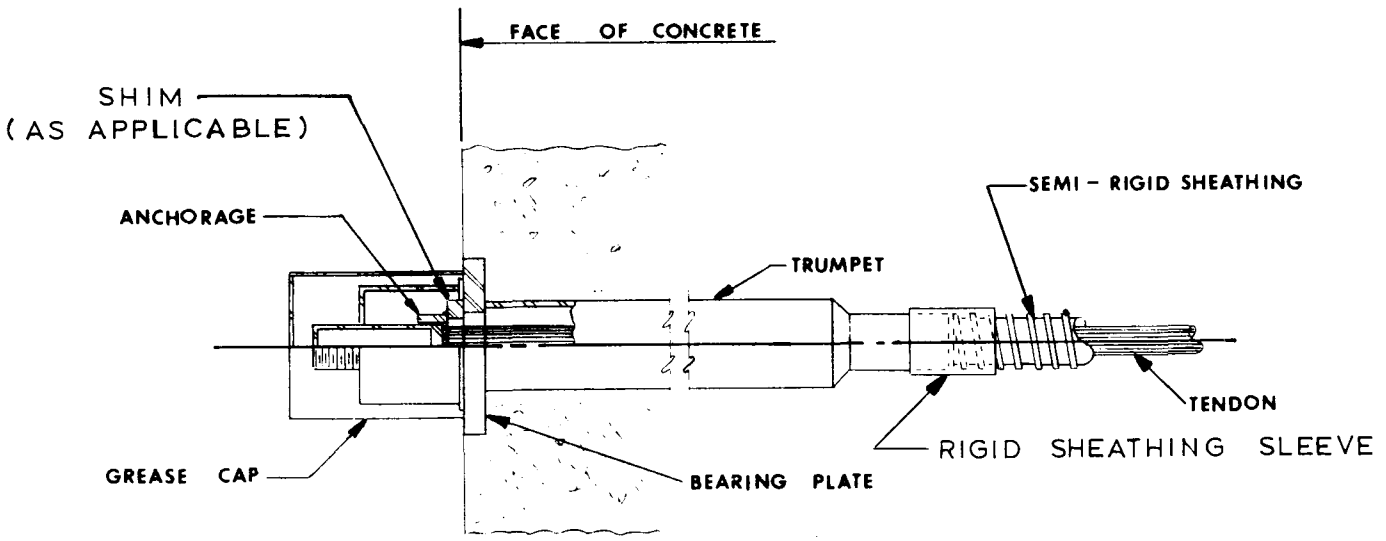

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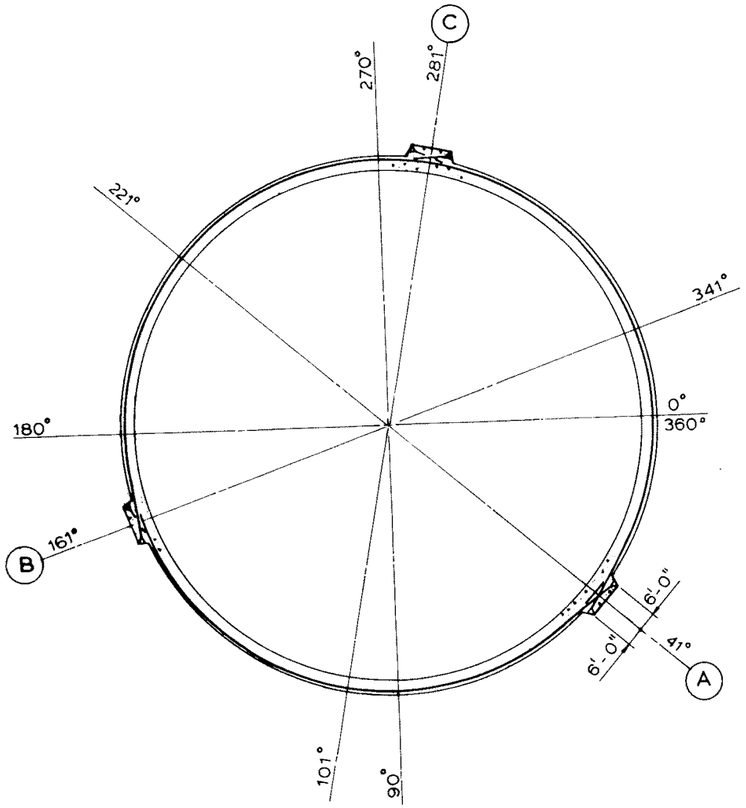
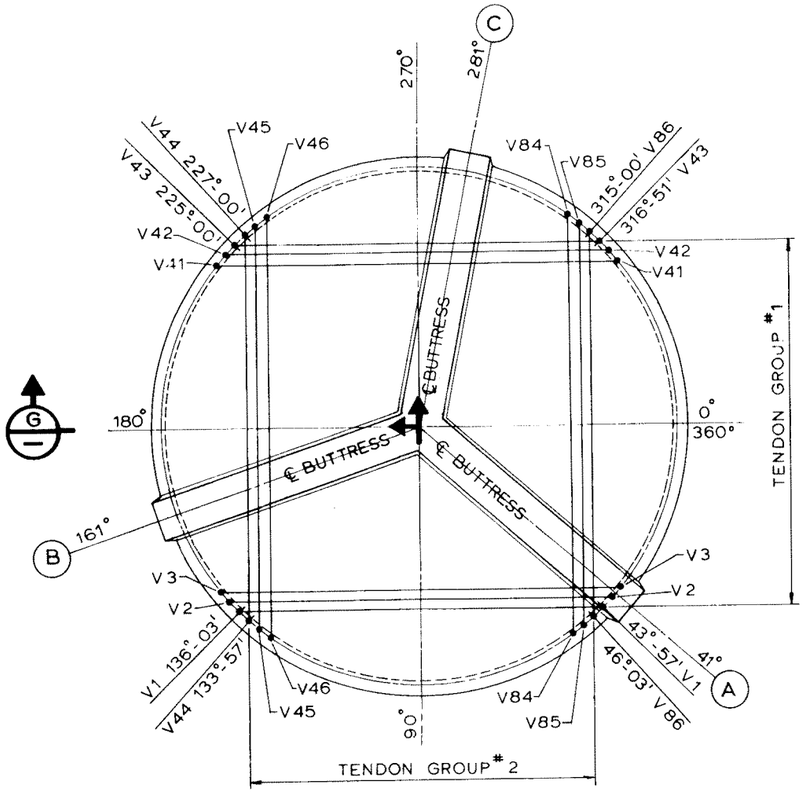
FIGURE 3.8-15

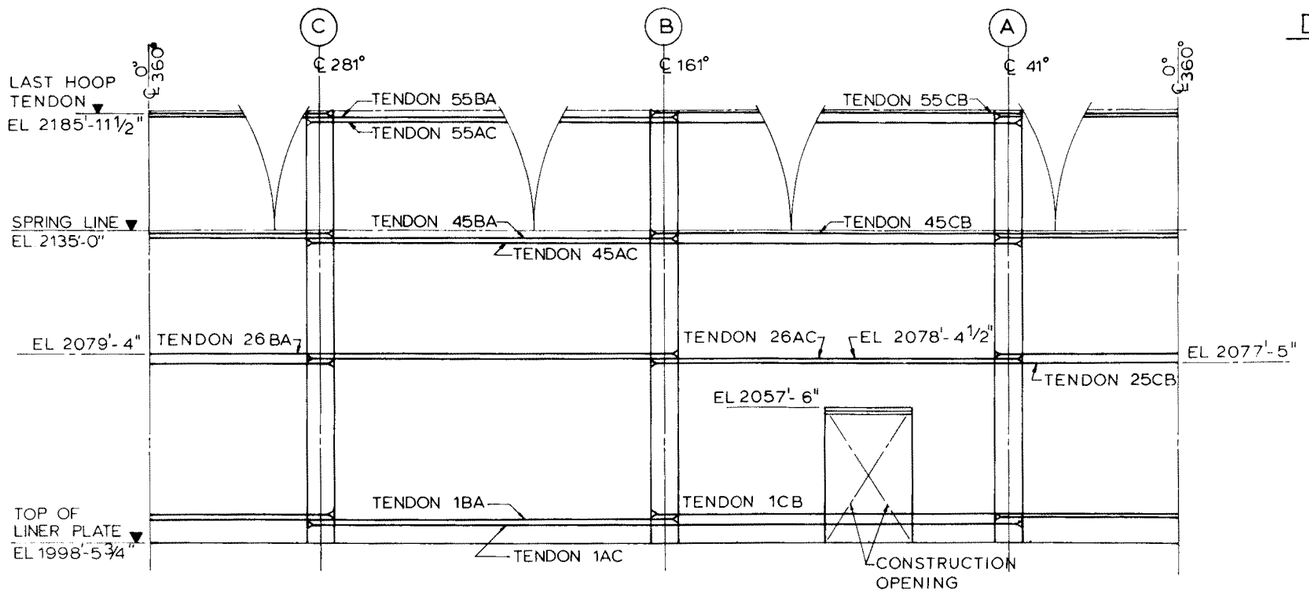
REACTOR BUILDING
TENDON ANCHORAGE SYSTEM



WALL PLAN
(HORIZONTALS)



DOME PLAN
(VERTICALS)



WALL ELEVATION
HORIZONTALS

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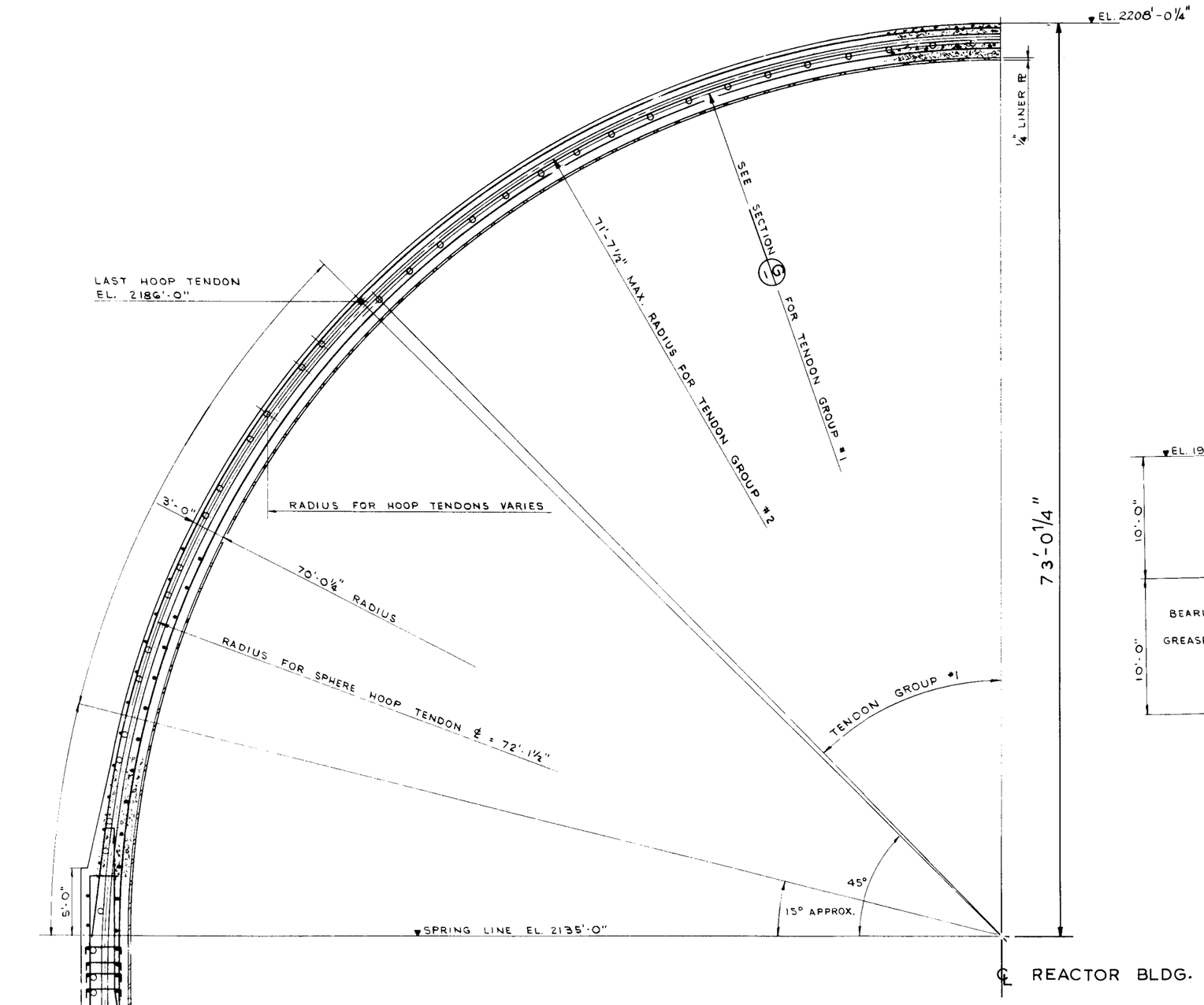
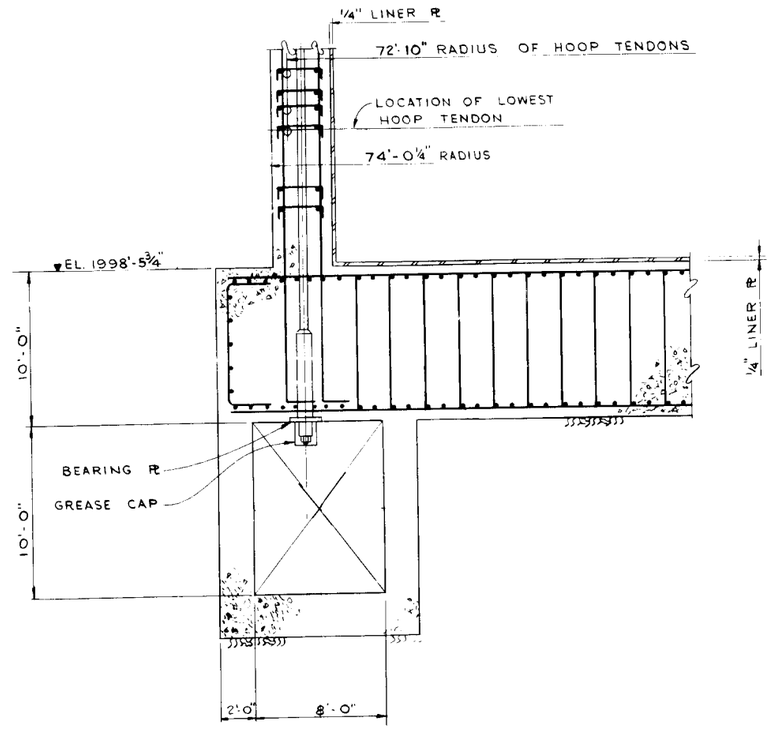
FIGURE 3.8-16

REACTOR BUILDING
TENDON AND BUTTRESS ARRANGEMENT



SECTION F



SECTION F'

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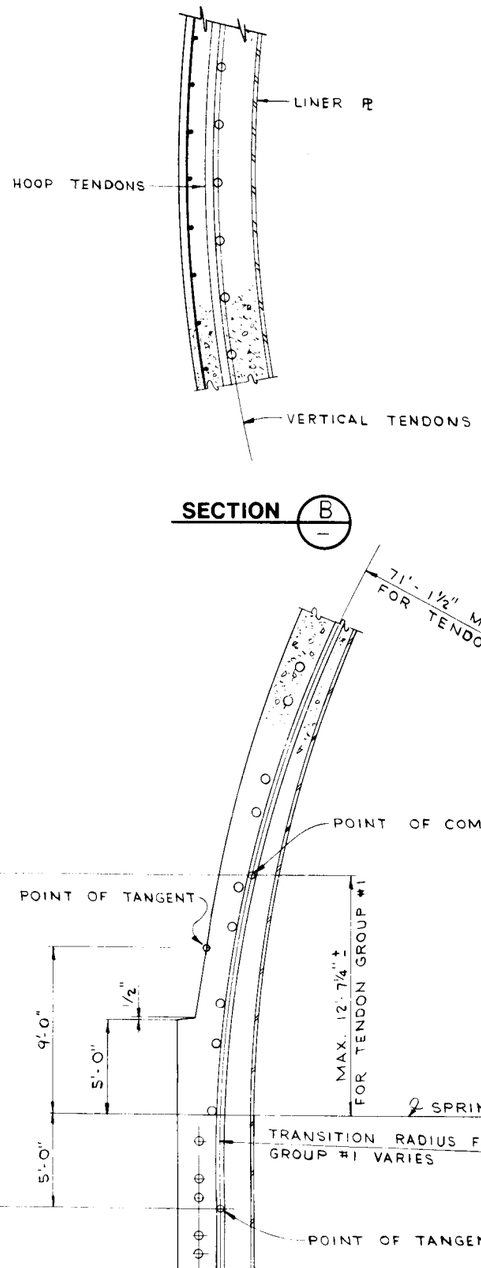
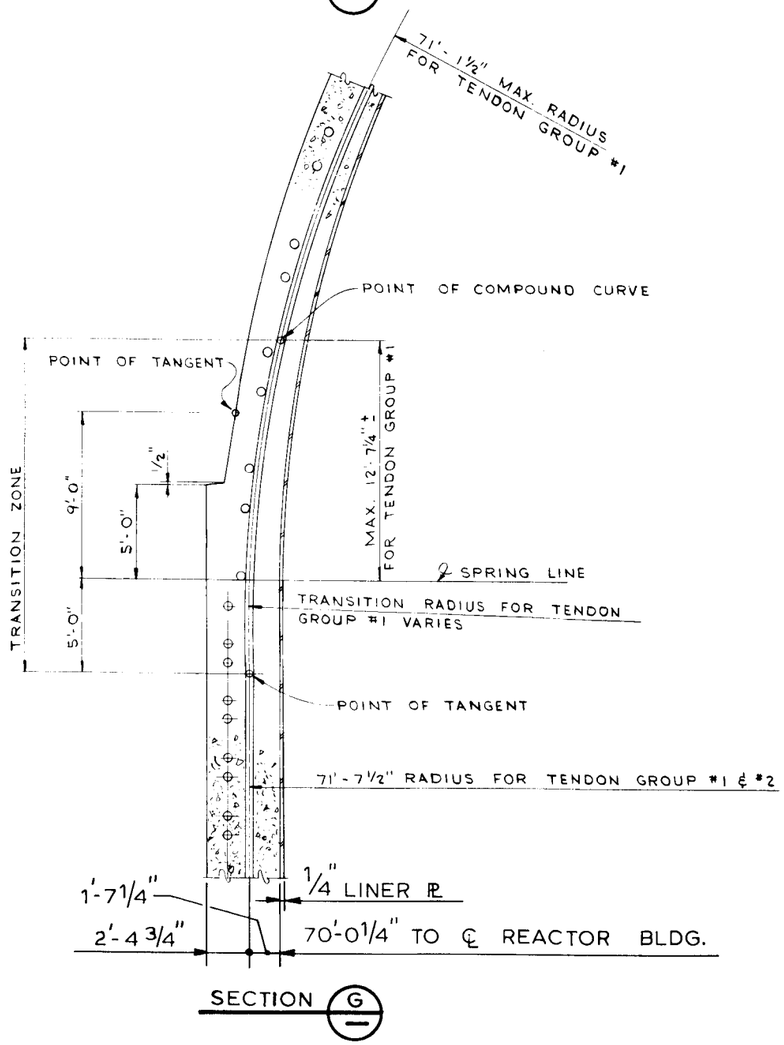
FIGURE 3.8-17

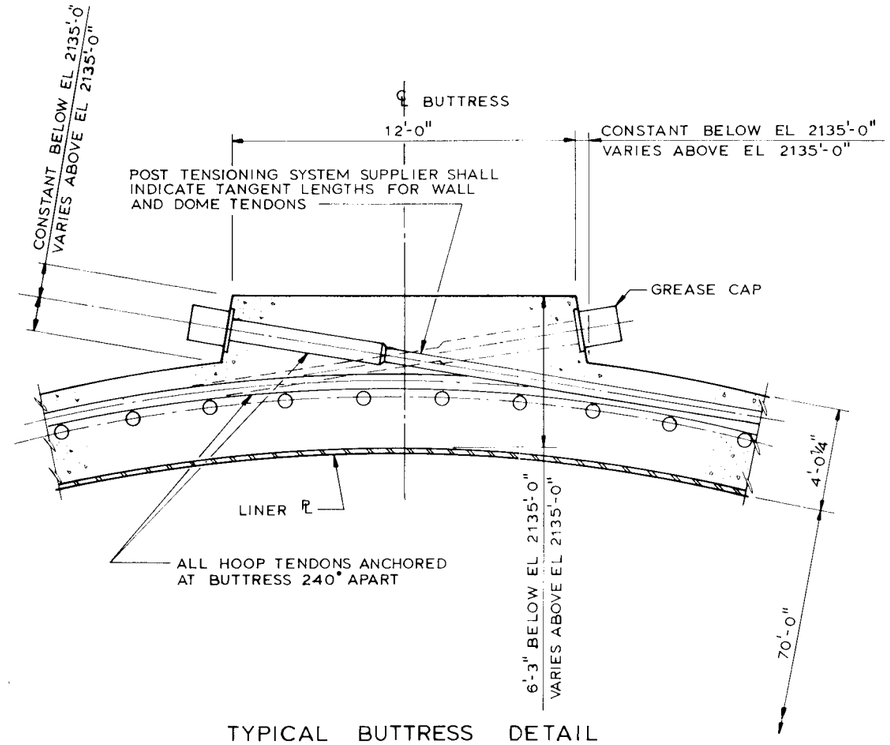
REACTOR BUILDING TENDONS – SECTIONS



SECTION B



SECTION G



TYPICAL BUTTRESS DETAIL

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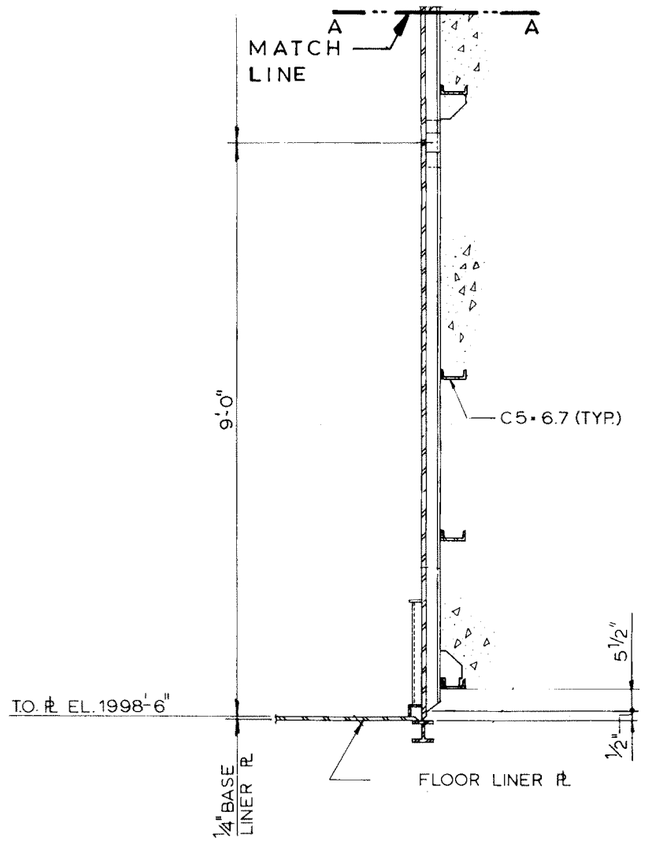
CALLAWAY PLANT

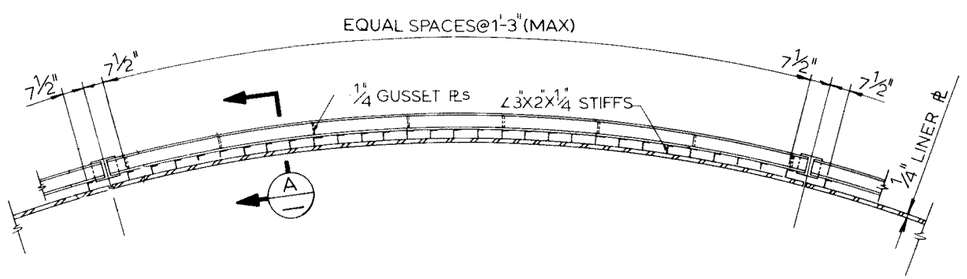
FIGURE 3.8-18

REACTOR BUILDING
TENDONS – ADDITIONAL SECTIONS

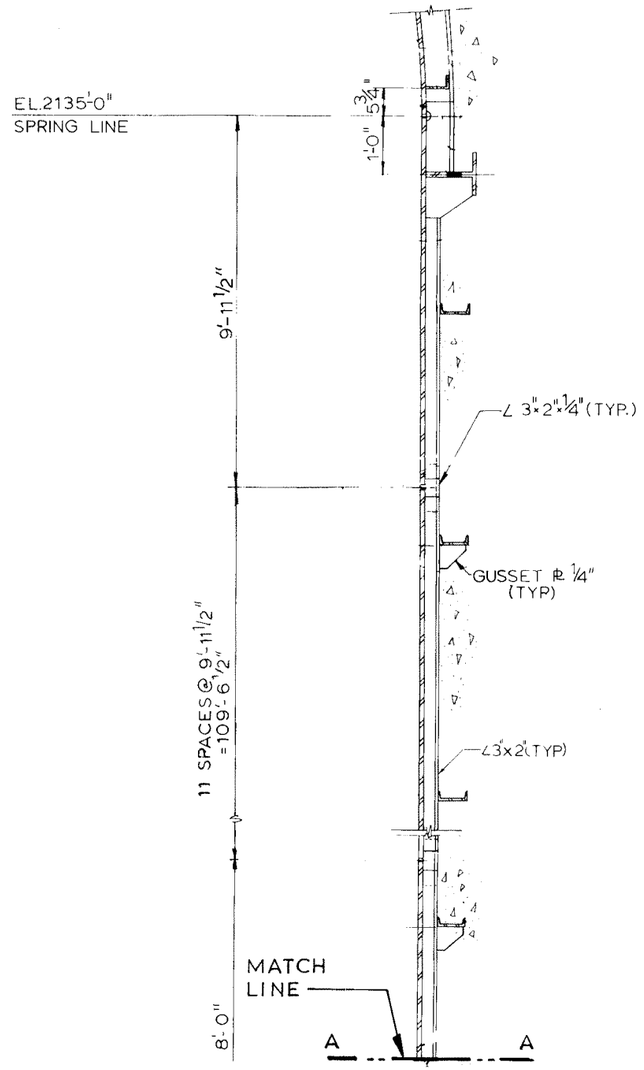


SECTION A

TYPICAL SECTION THRU WALL LINER PLATE



PLAN-TYPICAL SEGMENT OF LINER PLATE



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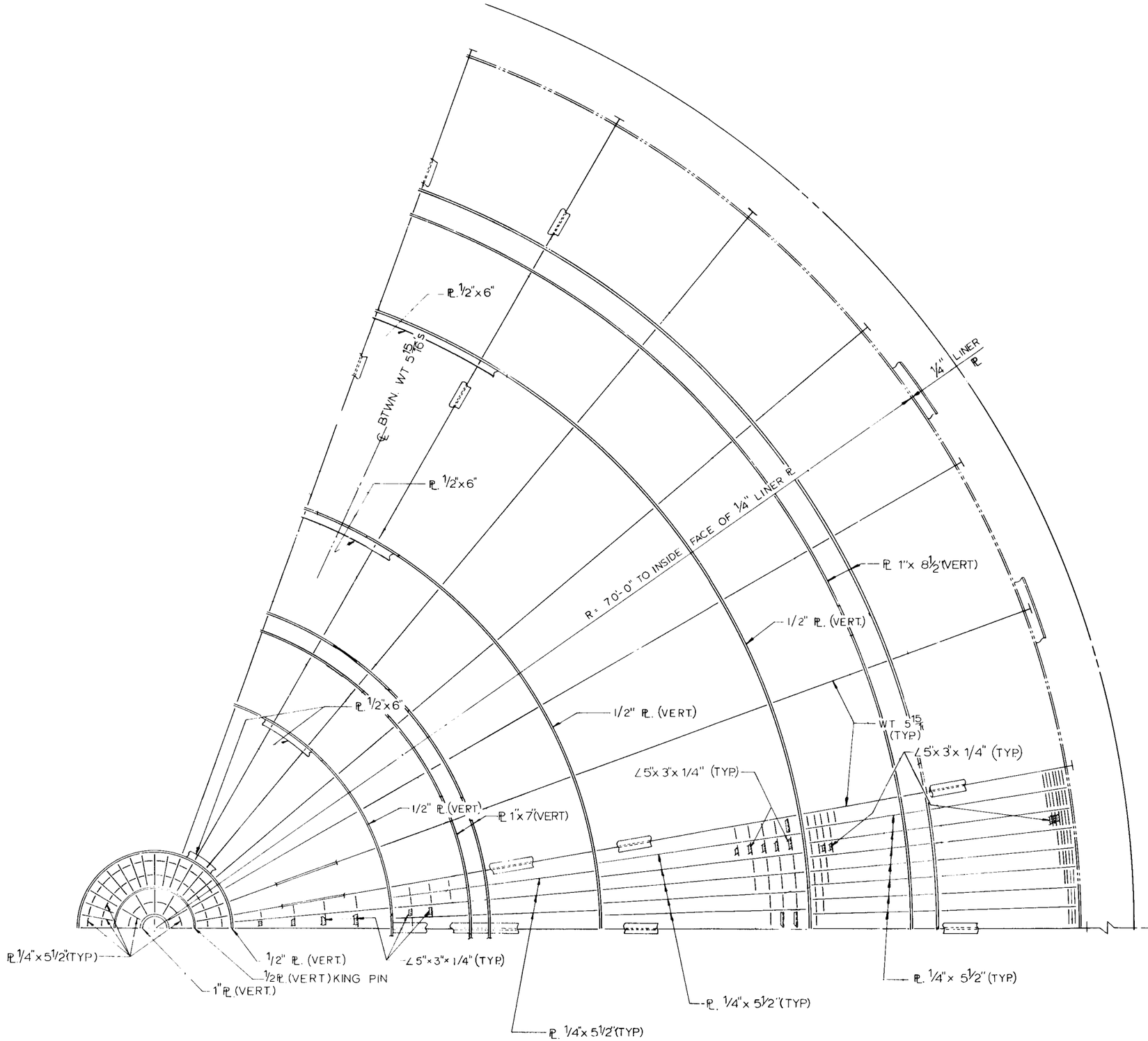
CALLAWAY PLANT

FIGURE 3.8-19

REACTOR BUILDING LINER PLATE – TYPICAL WALL SECTIONS



PLAN

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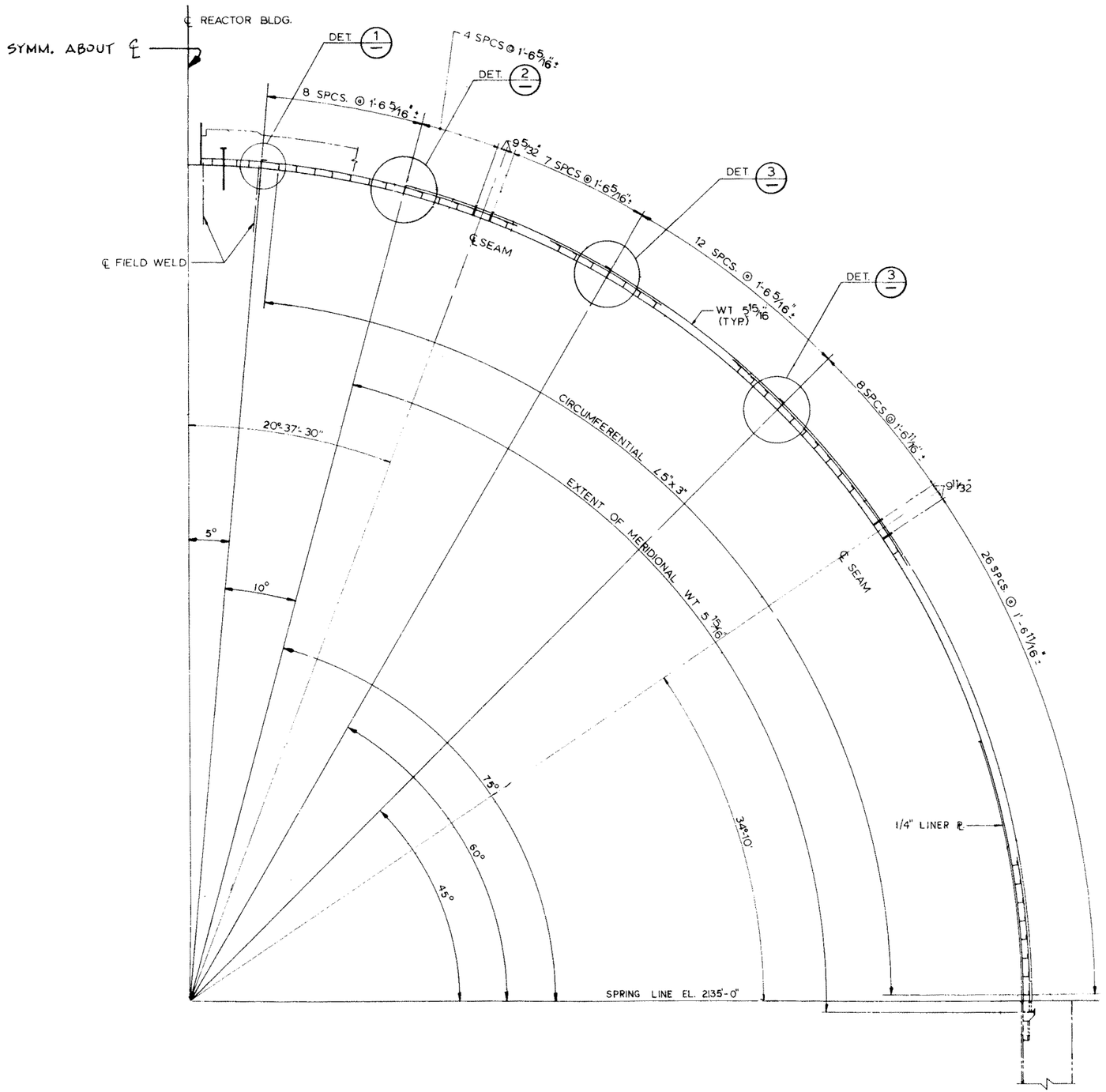
CALLAWAY PLANT

FIGURE 3.8-20

REACTOR BUILDING LINER PLATE – DOME STIFFENER PLAN



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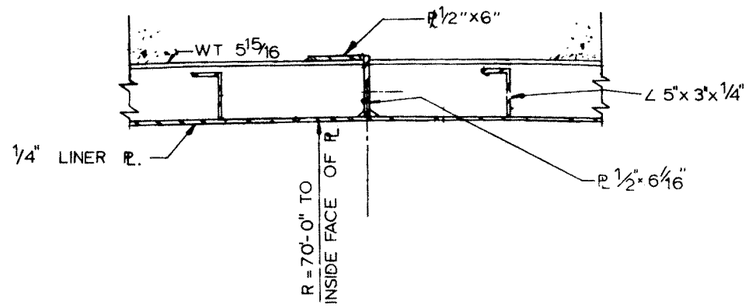
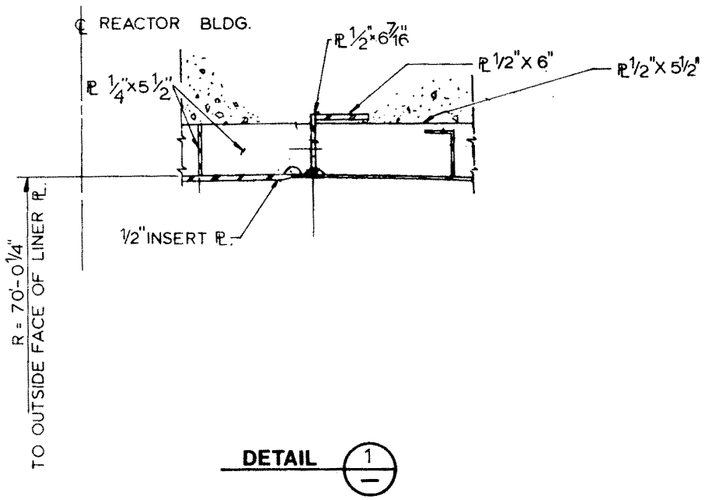
CALLAWAY PLANT

FIGURE 3.8-21

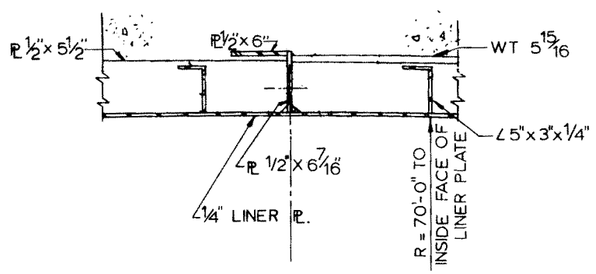
REACTOR BUILDING LINER PLATE – TYPICAL DOME SECTION



DETAIL 3



DETAIL 1



DETAIL 2

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FIGURE 3.8-22

REACTOR BUILDING LINER PLATE – DOME DETAILS

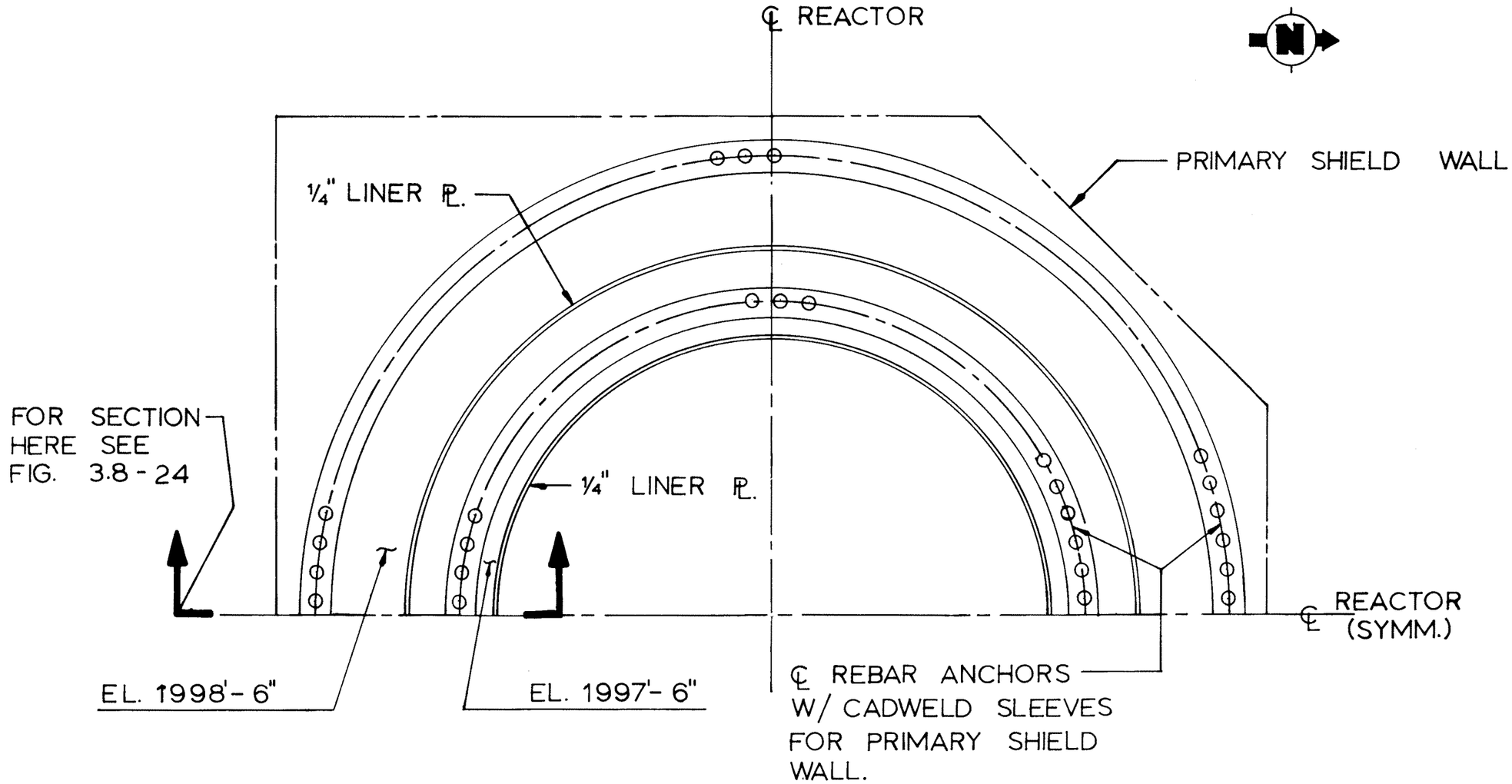

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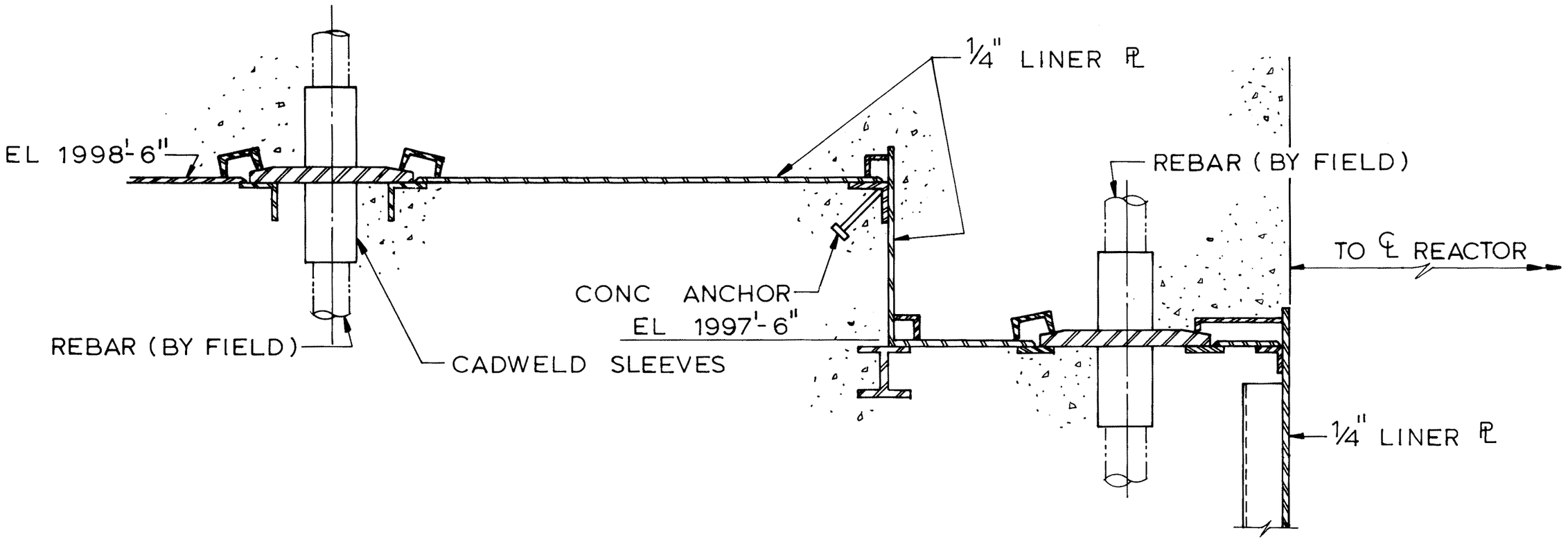
FIGURE 3.8-23

ANCHORAGE AT REACTOR CAVITY – PLAN VIEW



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CALLAWAY PLANT

FIGURE 3.8-24

ANCHORAGE AT REACTOR CAVITY – TYPICAL SECTION

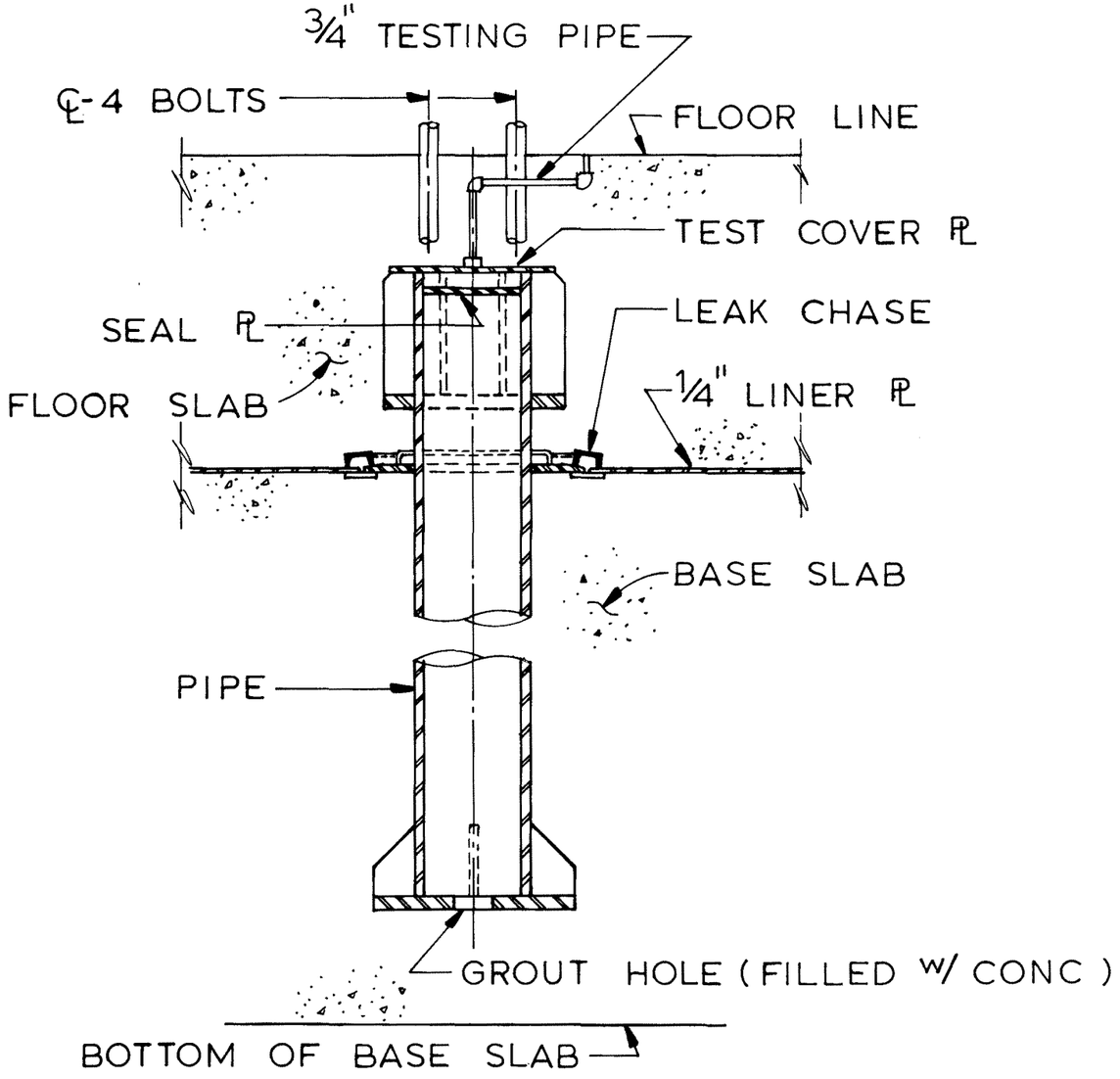

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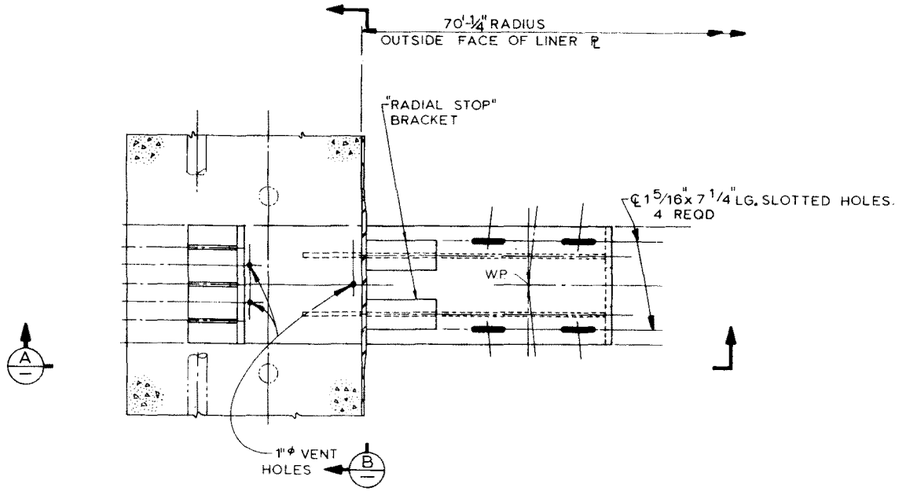
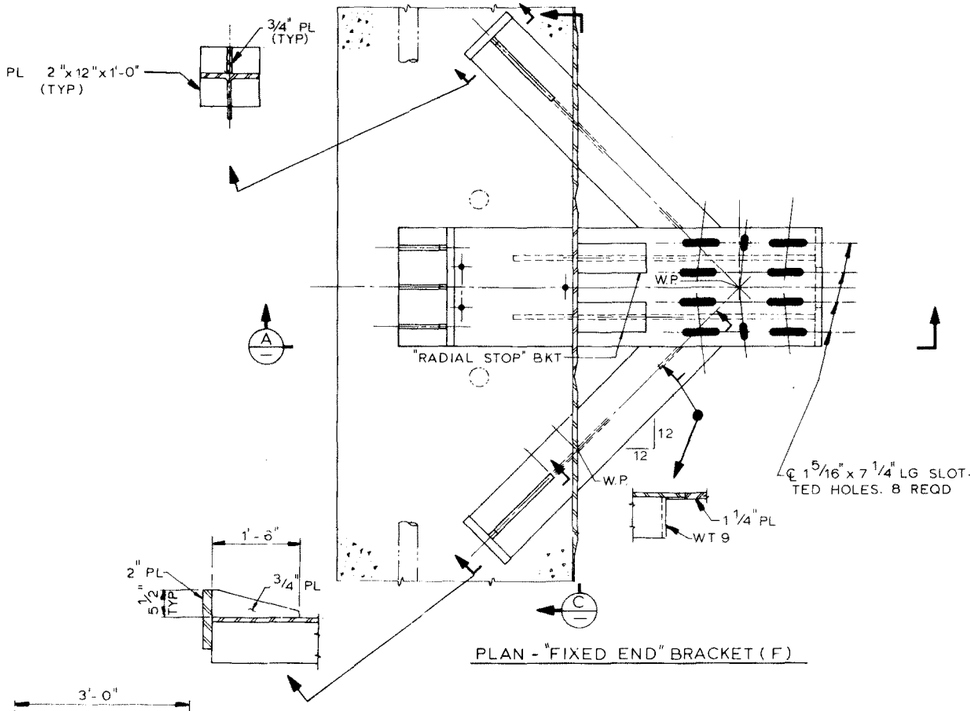
FIGURE 3.8-25

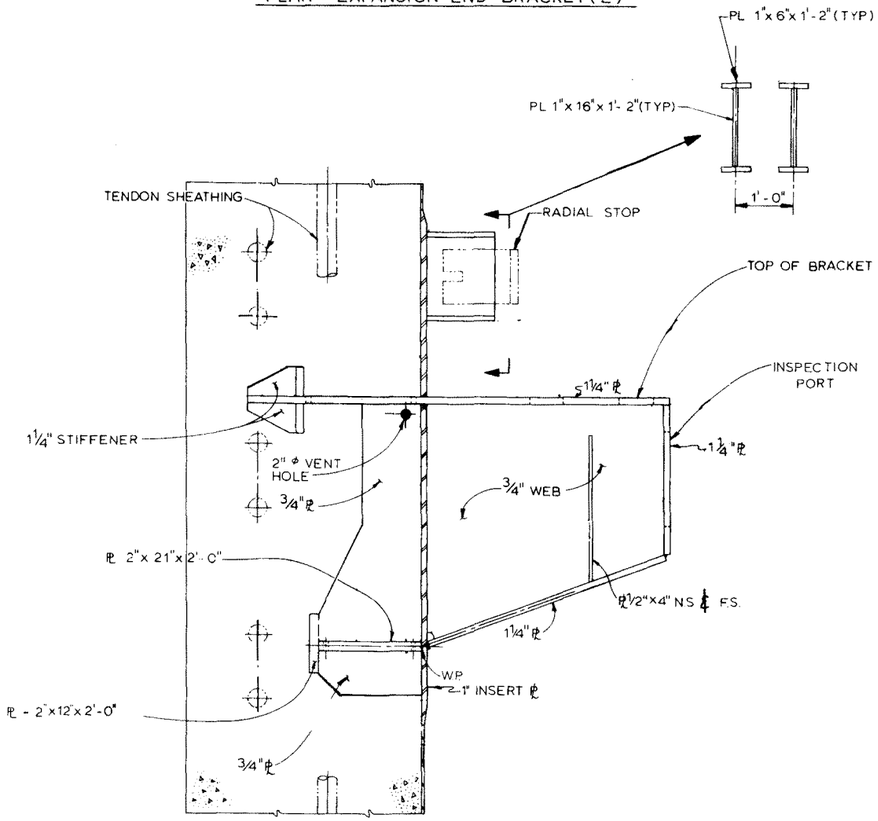
TYPICAL ANCHORAGE THROUGH BASE MAT FOR NSSC EQUIPMENT SUPPORTS



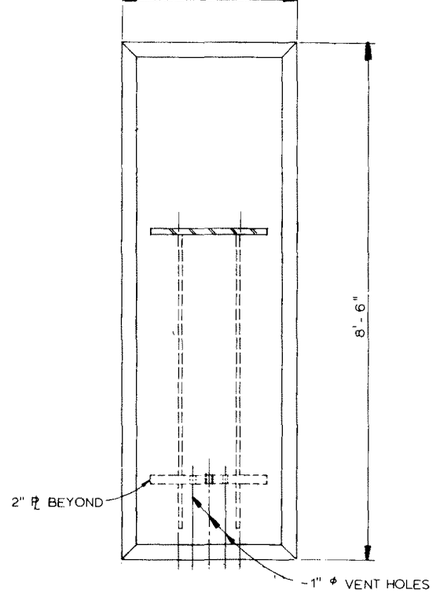
PLAN - "EXPANSION END" BRACKET (E)



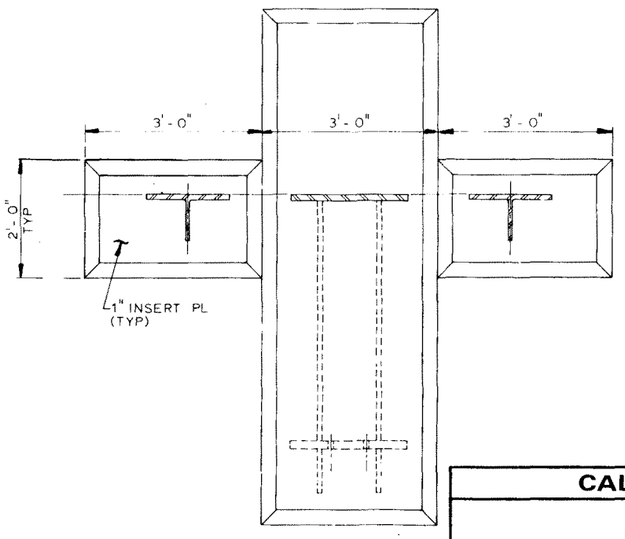
PLAN - "FIXED END" BRACKET (F)



SECTION A



SECTION B



SECTION C

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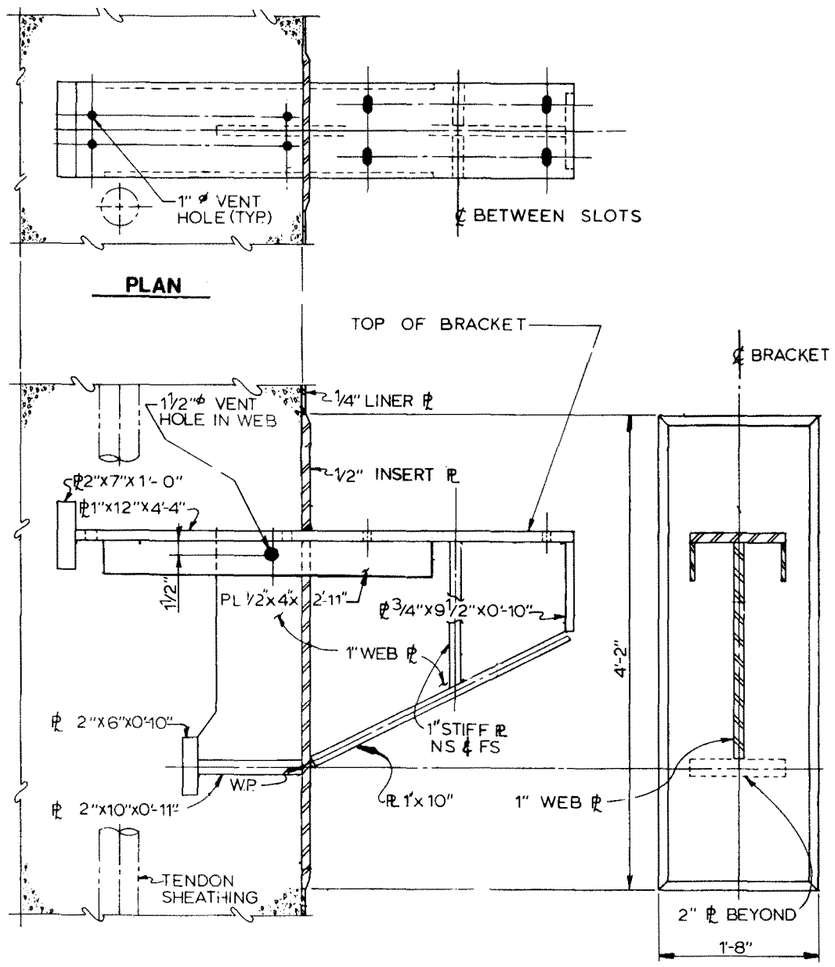
CALLAWAY PLANT

FIGURE 3.8-26

REACTOR BUILDING POLAR CRANE BRACKETS



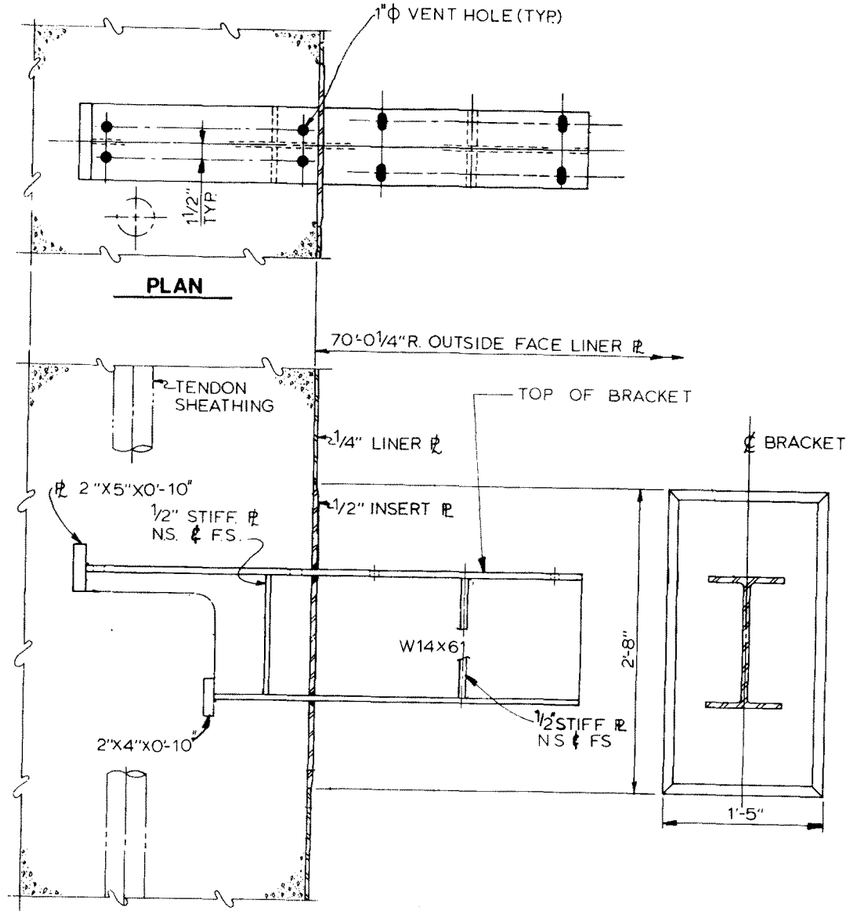


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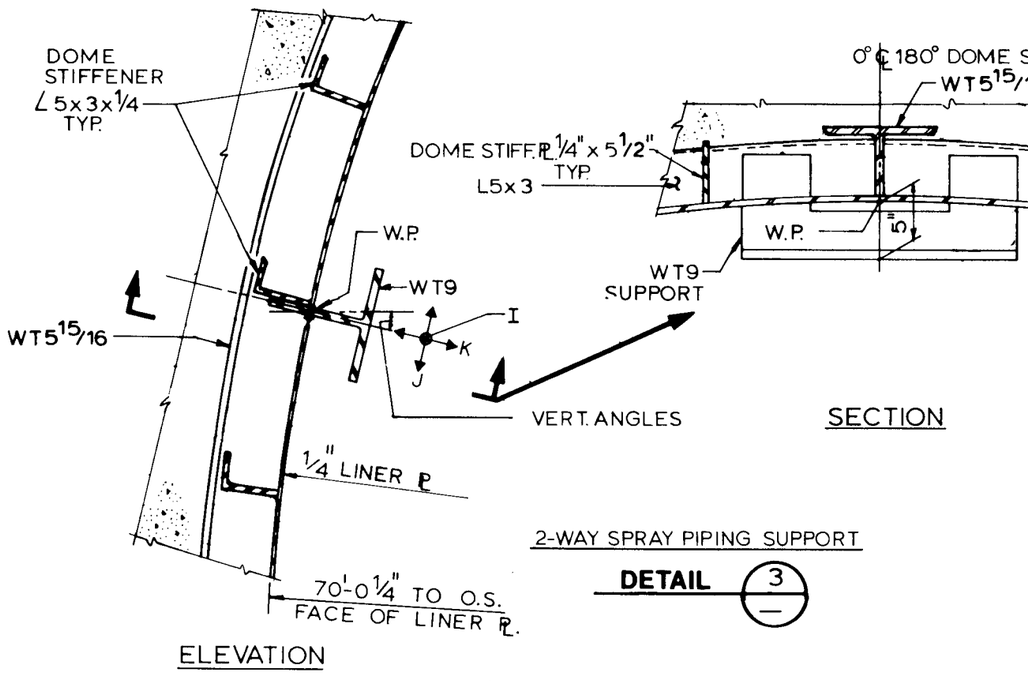
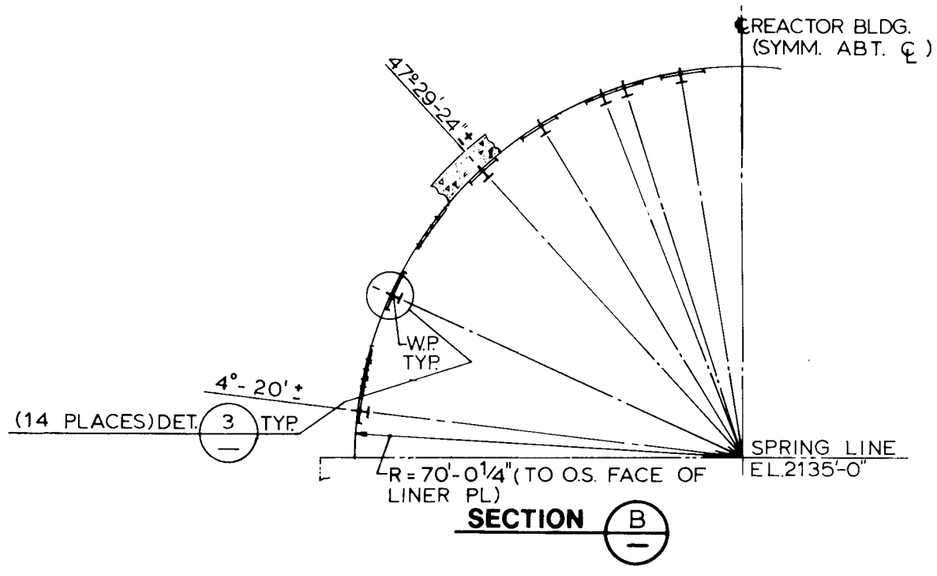
FIGURE 3.8-27

REACTOR BUILDING SHELL
TYPICAL BEAM SUPPORT BRACKETS





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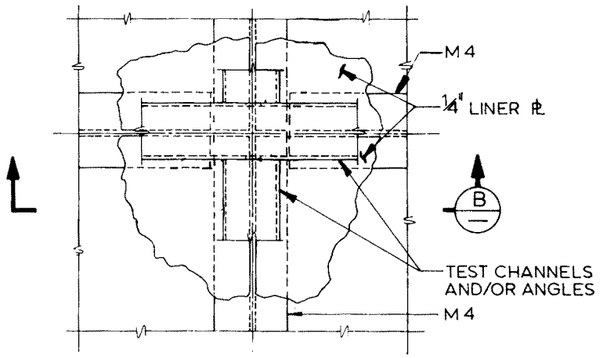
CALLAWAY PLANT

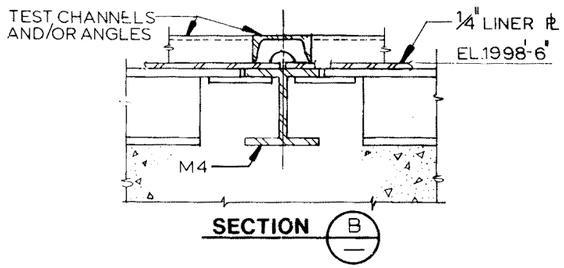
FIGURE 3.8-28

REACTOR BUILDING – TYPICAL PIPE SUPPORT BRACKETS IN DOME

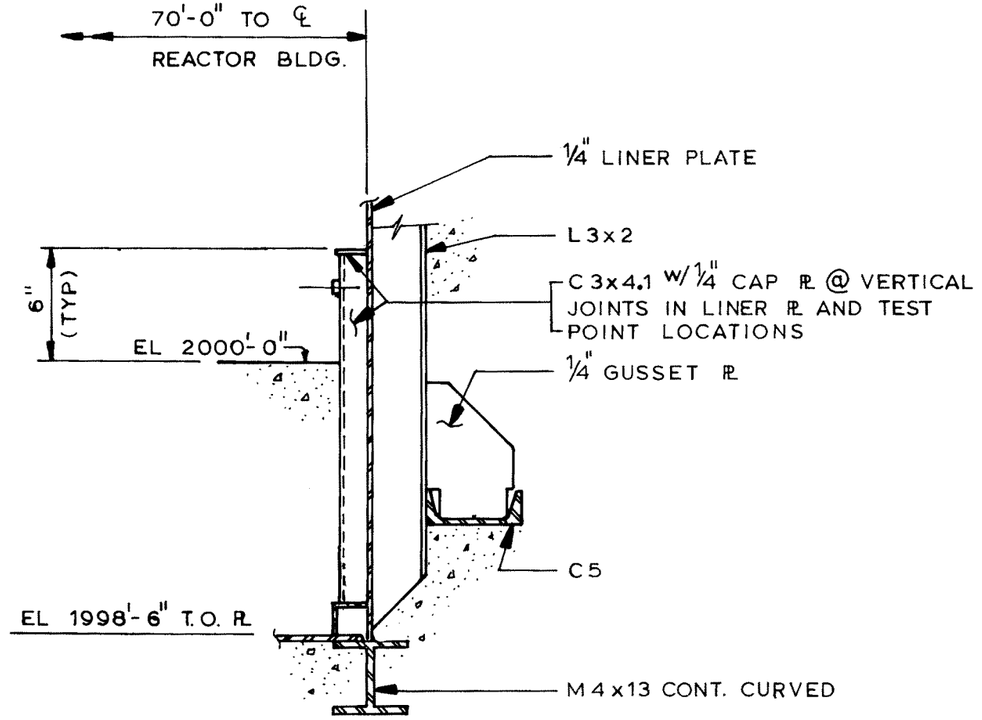


PLAN

TYP AT ALL TEST CHANNEL INTERSECTIONS



SECTION B



TYPICAL LEAK CHASE ADJACENT TO WALL

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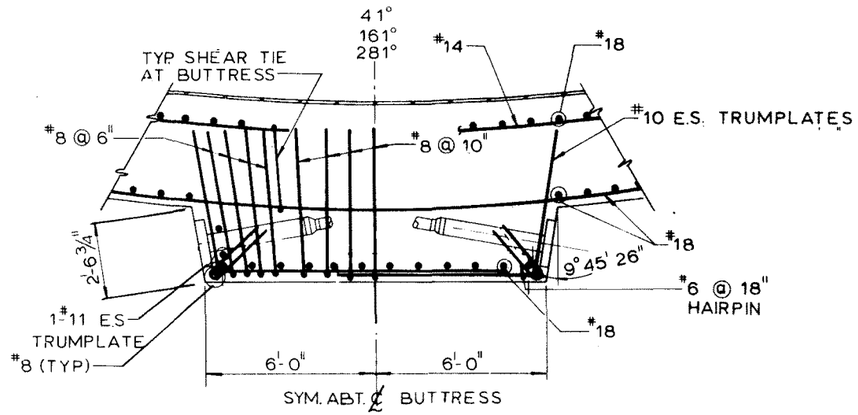
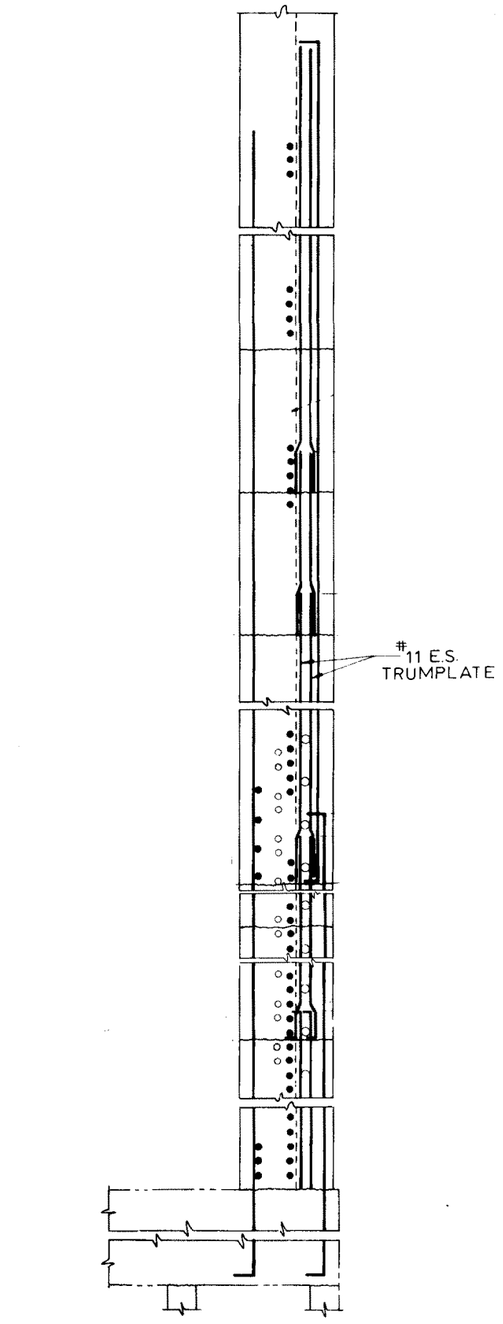
CALLAWAY PLANT

FIGURE 3.8-29

REACTOR BUILDING LINER PLATE LEAK CHASE – TYPICAL DATA



PLAN OF BUTTRESS @ SHELL WALL



TYPICAL BUTTRESS ELEVATION

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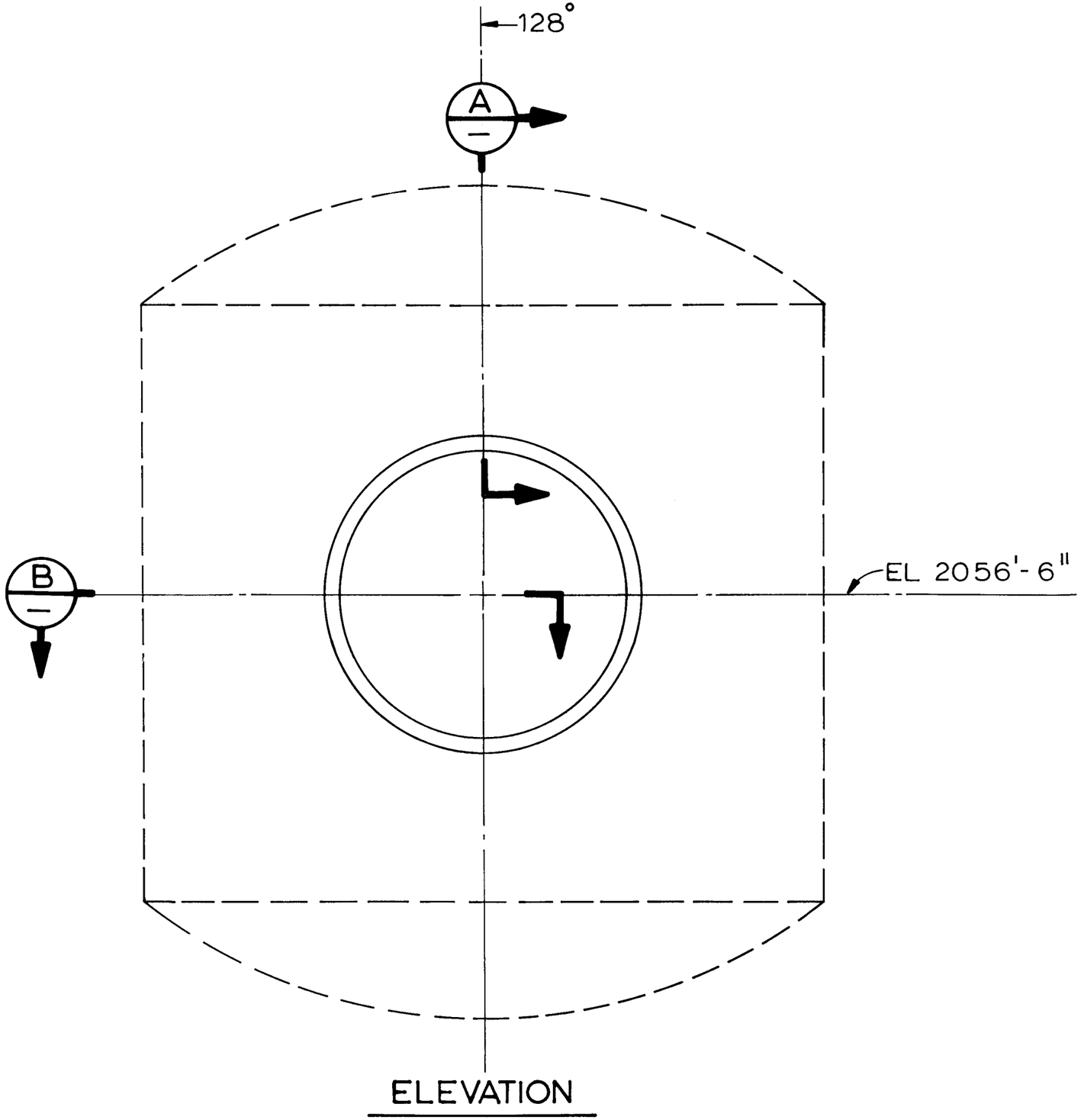
CALLAWAY PLANT

FIGURE 3.8-30

REACTOR BUILDING BUTTRESS DETAILS



ELEVATION

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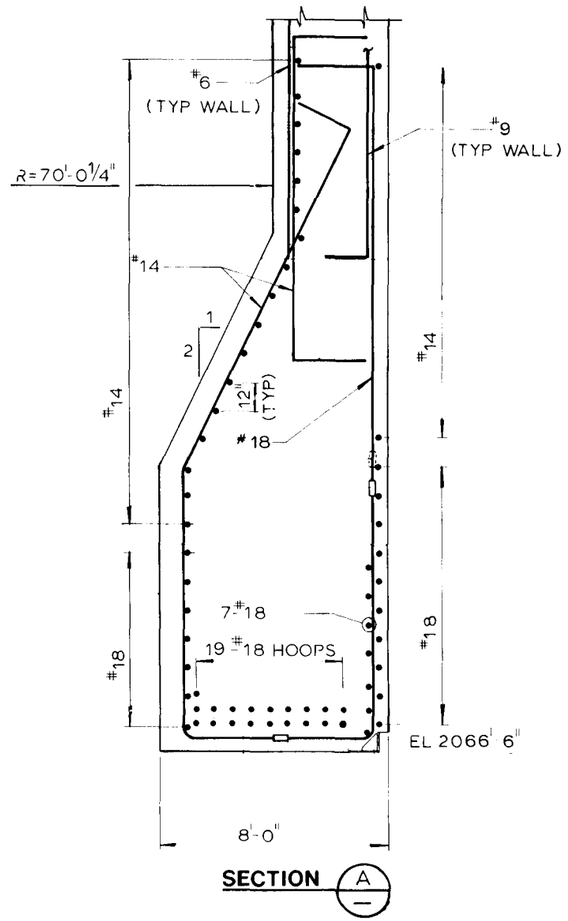
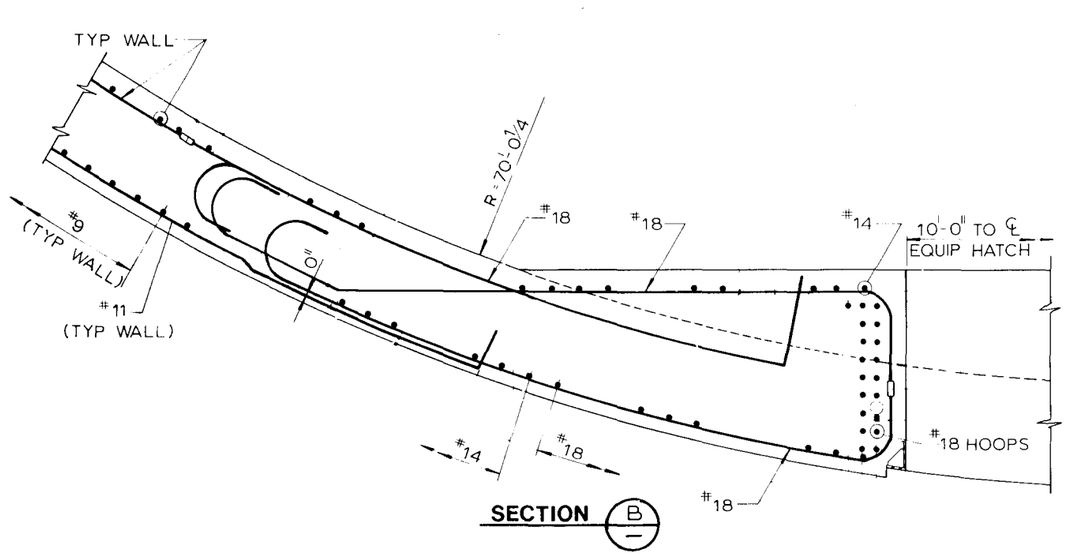
CALLAWAY PLANT

FIGURE 3.8-31

REACTOR BUILDING
EQUIPMENT HATCH OPENING



SECTION A



SECTION B

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CALLAWAY PLANT

FIGURE 3.8-32

REACTOR BUILDING EQUIPMENT HATCH OPENING – TYPICAL SECTION

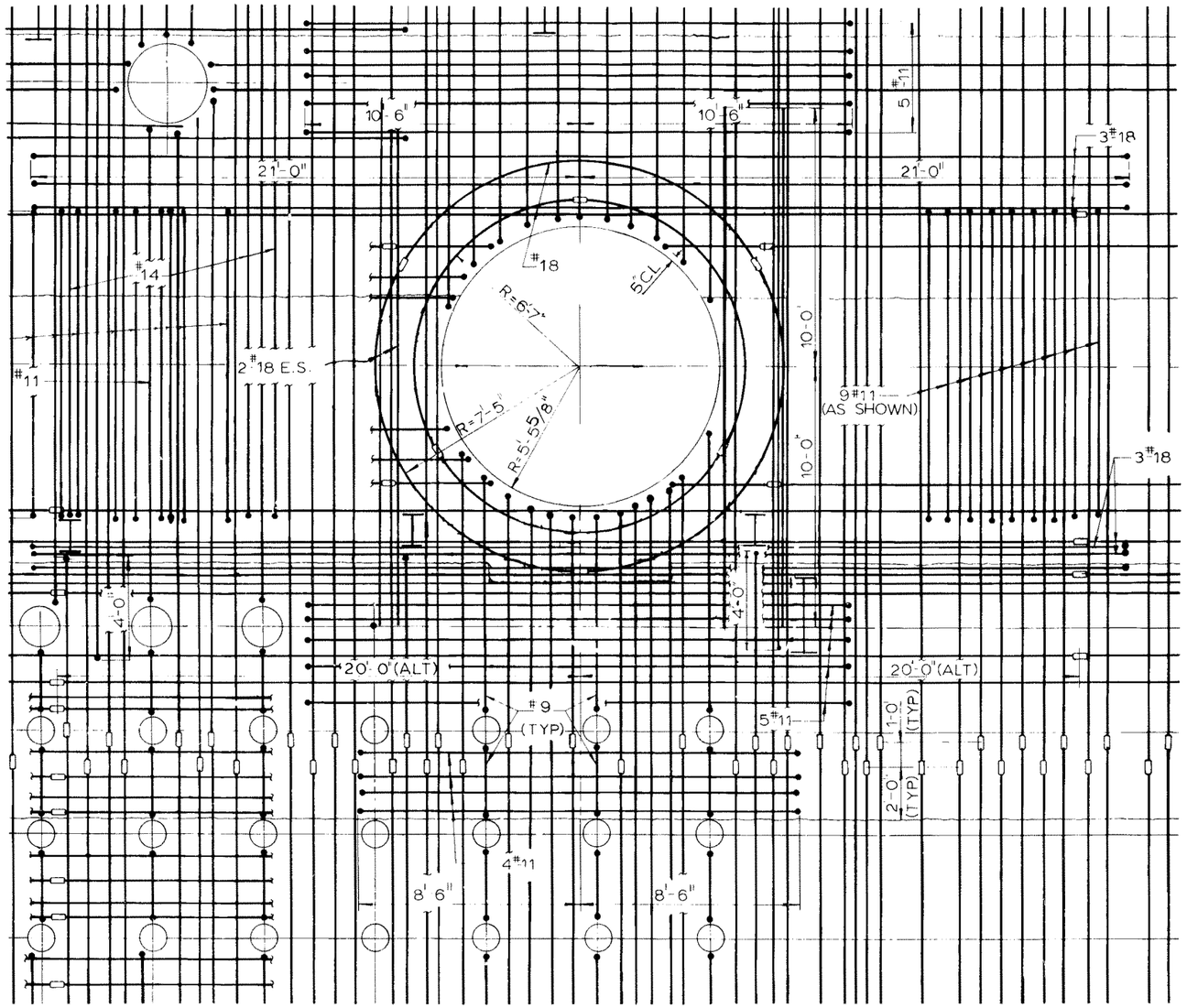

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FIGURE 3.8-33

REACTOR BUILDING PERSONNEL HATCH OPENING – INSIDE FACE. SHEET 1 OF 2

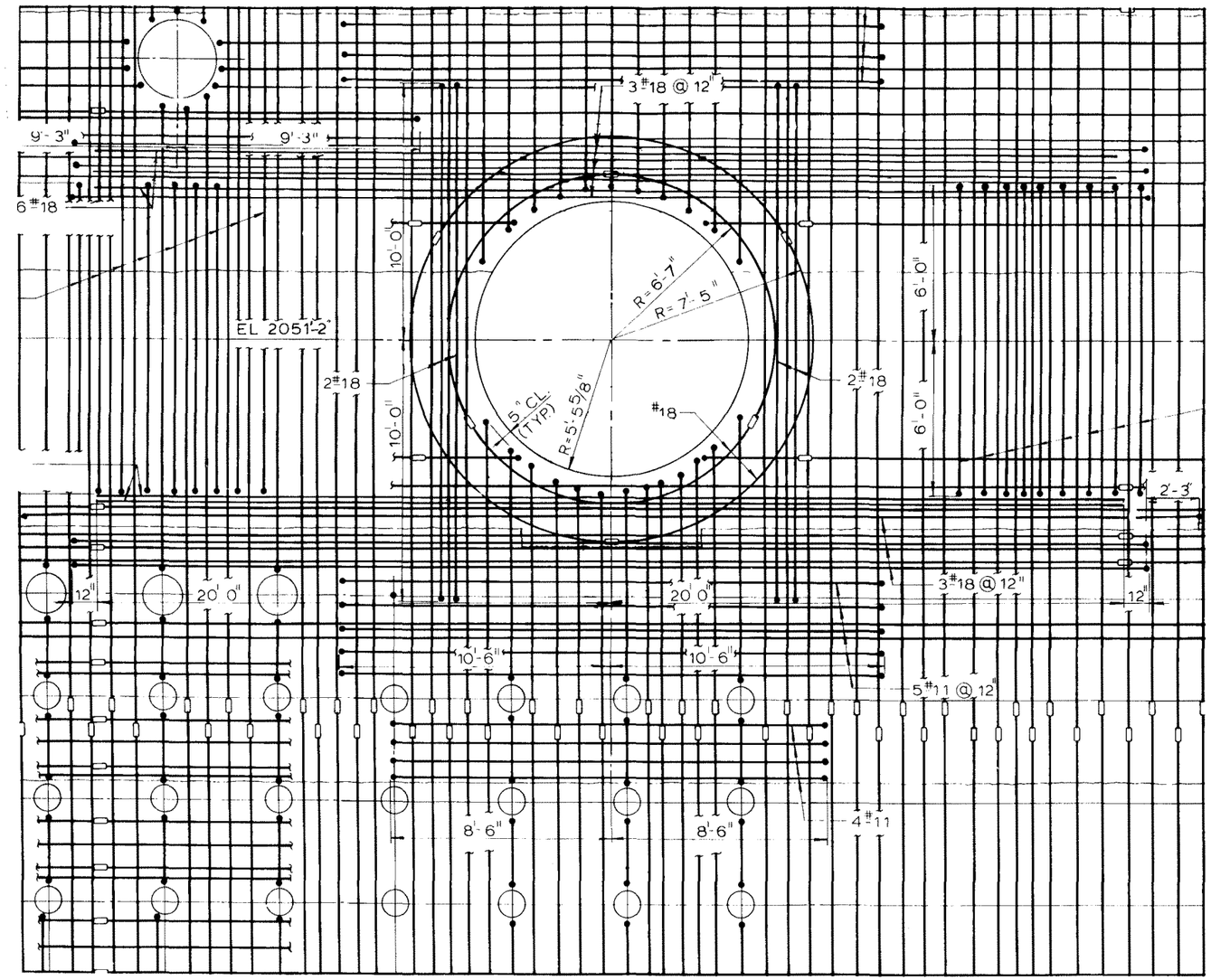

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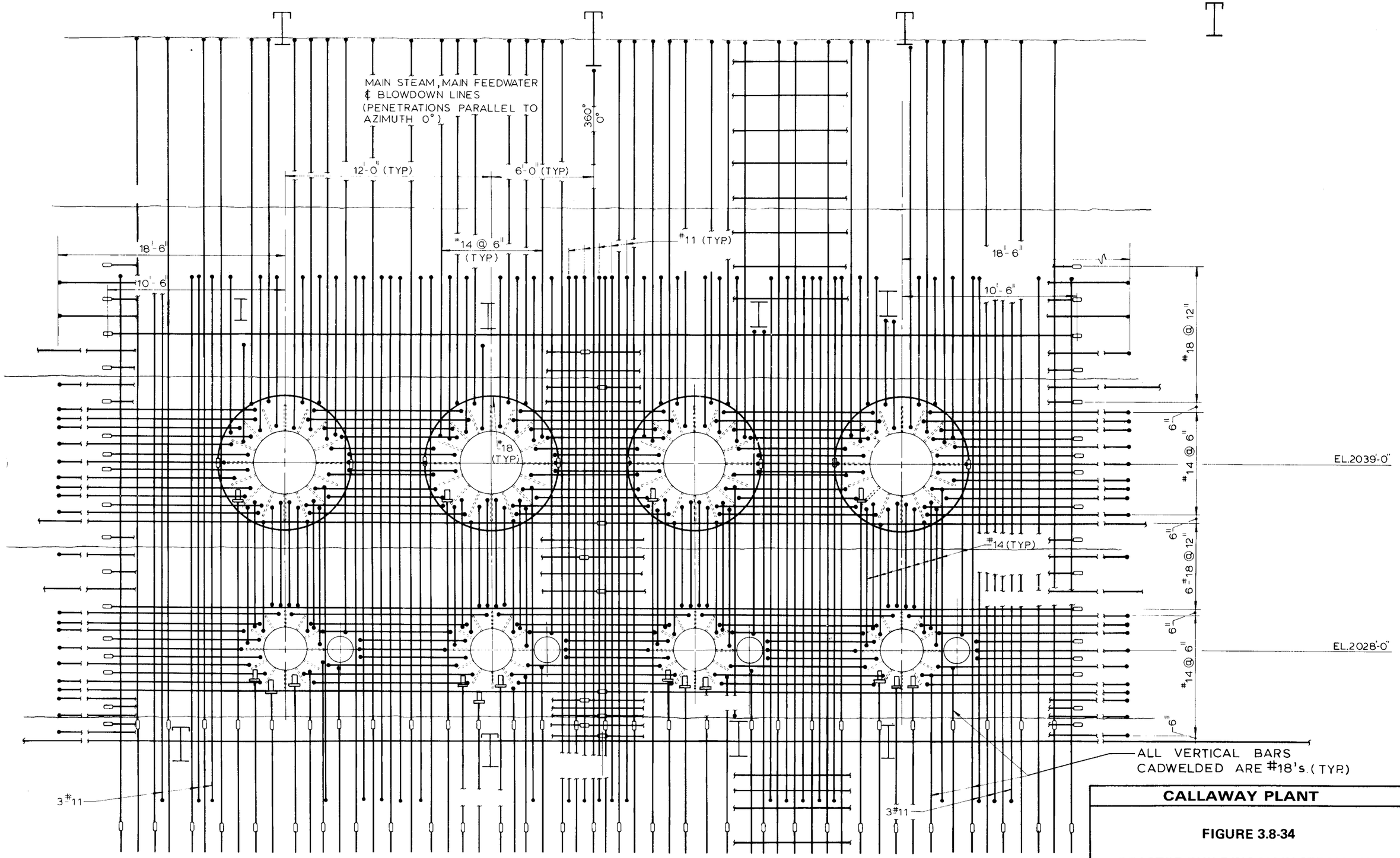
FIGURE 3.8-33

REACTOR BUILDING PERSONNEL HATCH OPENING – OUTSIDE FACE, SHEET 2 OF 2



CALLAWAY PLANT

FIGURE 3.8-34

REACTOR BUILDING MAIN STEAM AND MAIN FEEDWATER OPENINGS – INSIDE FACE

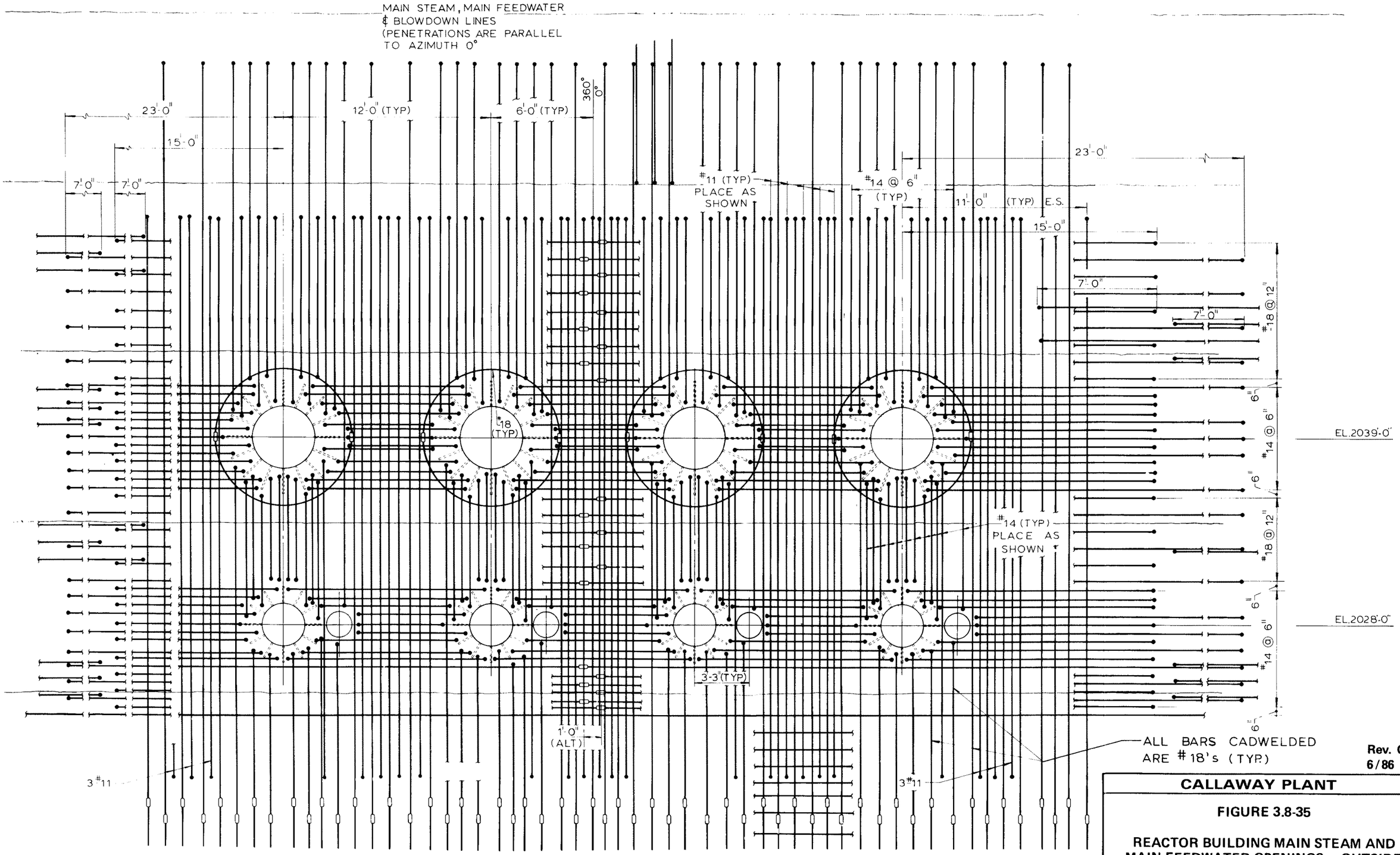


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FIGURE 3.8-35

REACTOR BUILDING MAIN STEAM AND MAIN FEEDWATER OPENINGS – OUTSIDE FACE

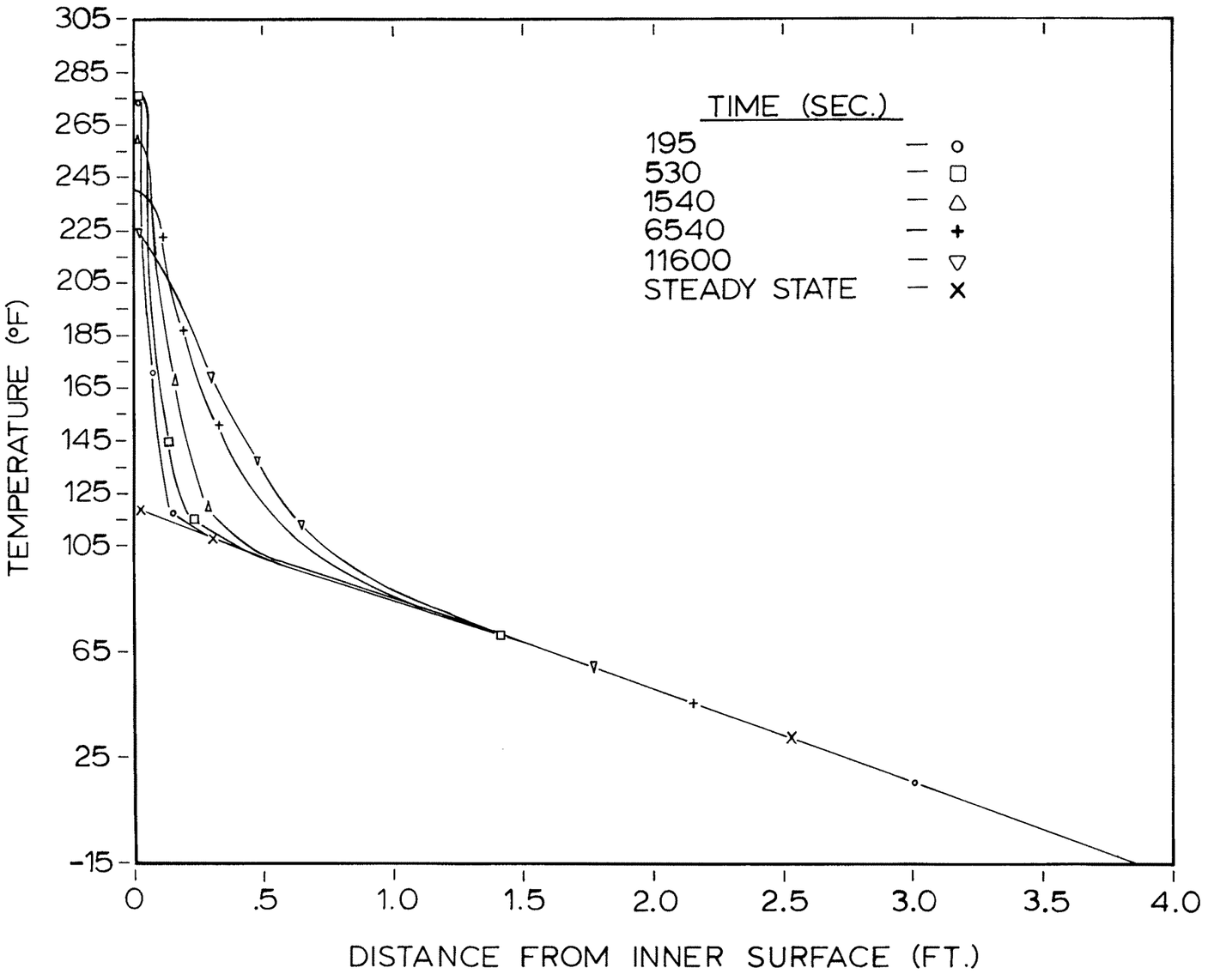

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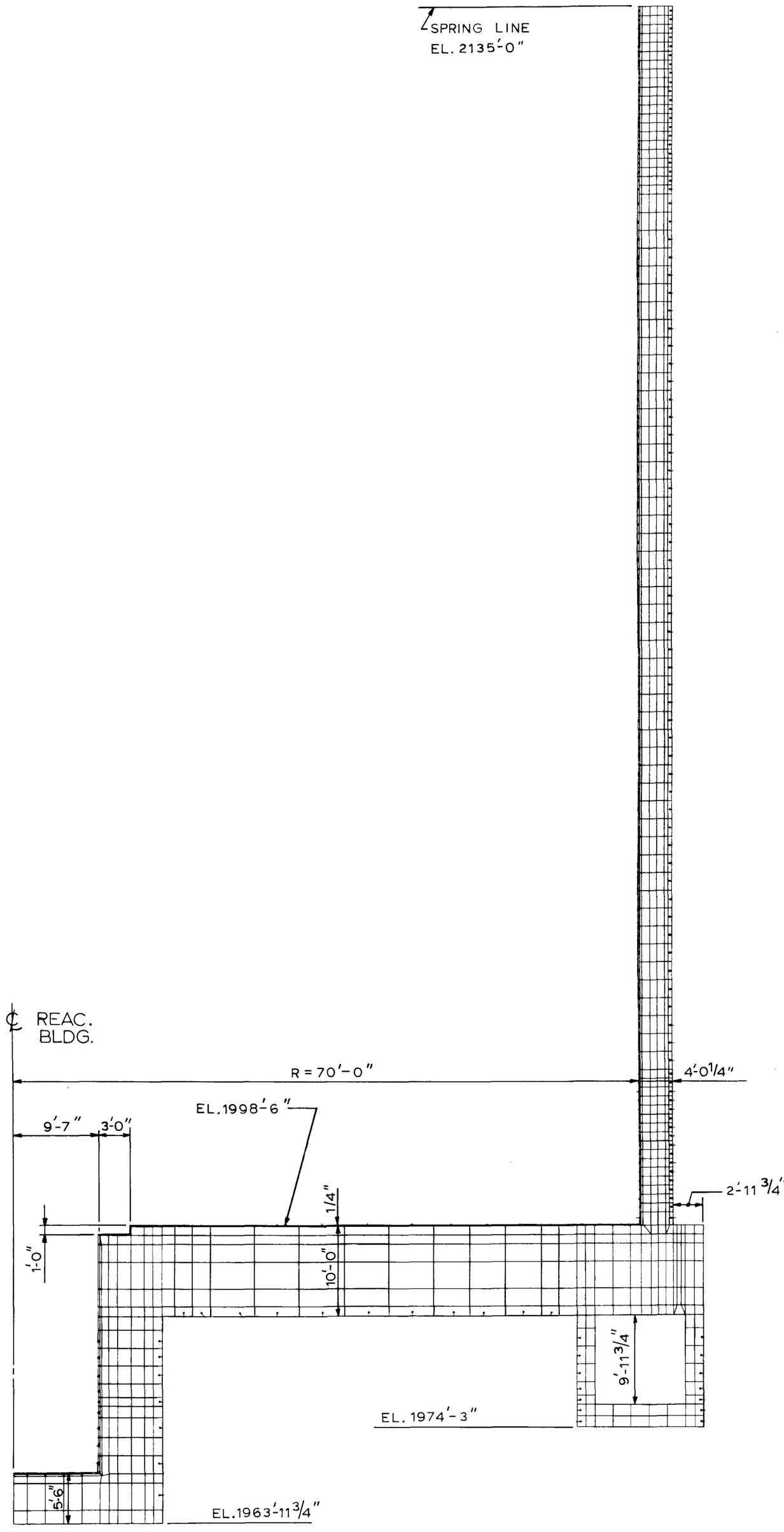
FIGURE 3.8-36

TEMPERATURE GRADIENTS THROUGH REACTOR BUILDING WALL FOR DBA (POSTULATED PRIMARY COOLANT LOOP BREAK)



CALLAWAY PLANT

FIGURE 3.8-37

FINITE ELEMENT MODEL FOR AXISYMMETRIC LOADS – STR.

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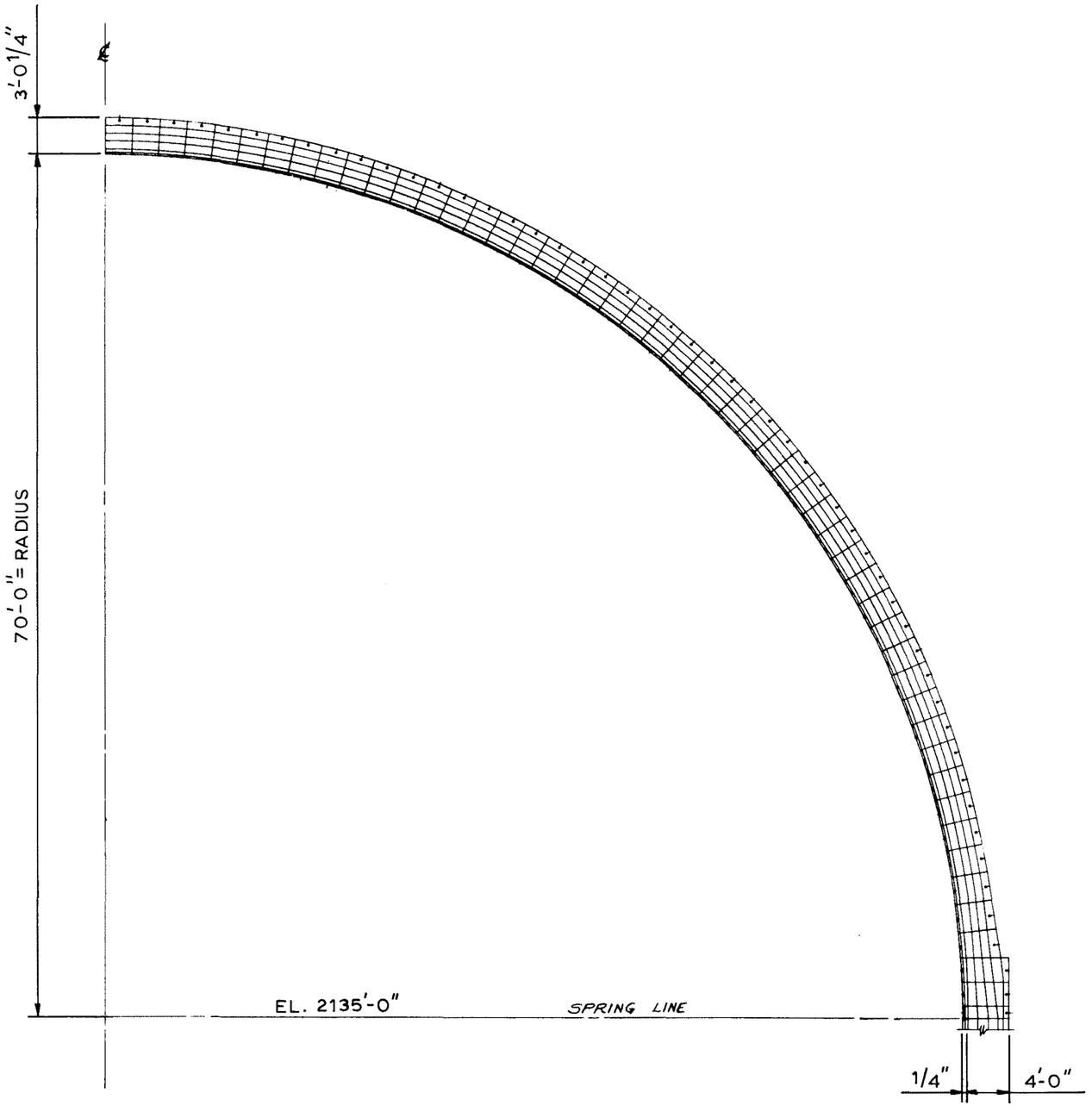

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FIGURE 3.8-38

FINITE ELEMENT MODEL FOR AXISYMMETRIC LOADS – DESIGN

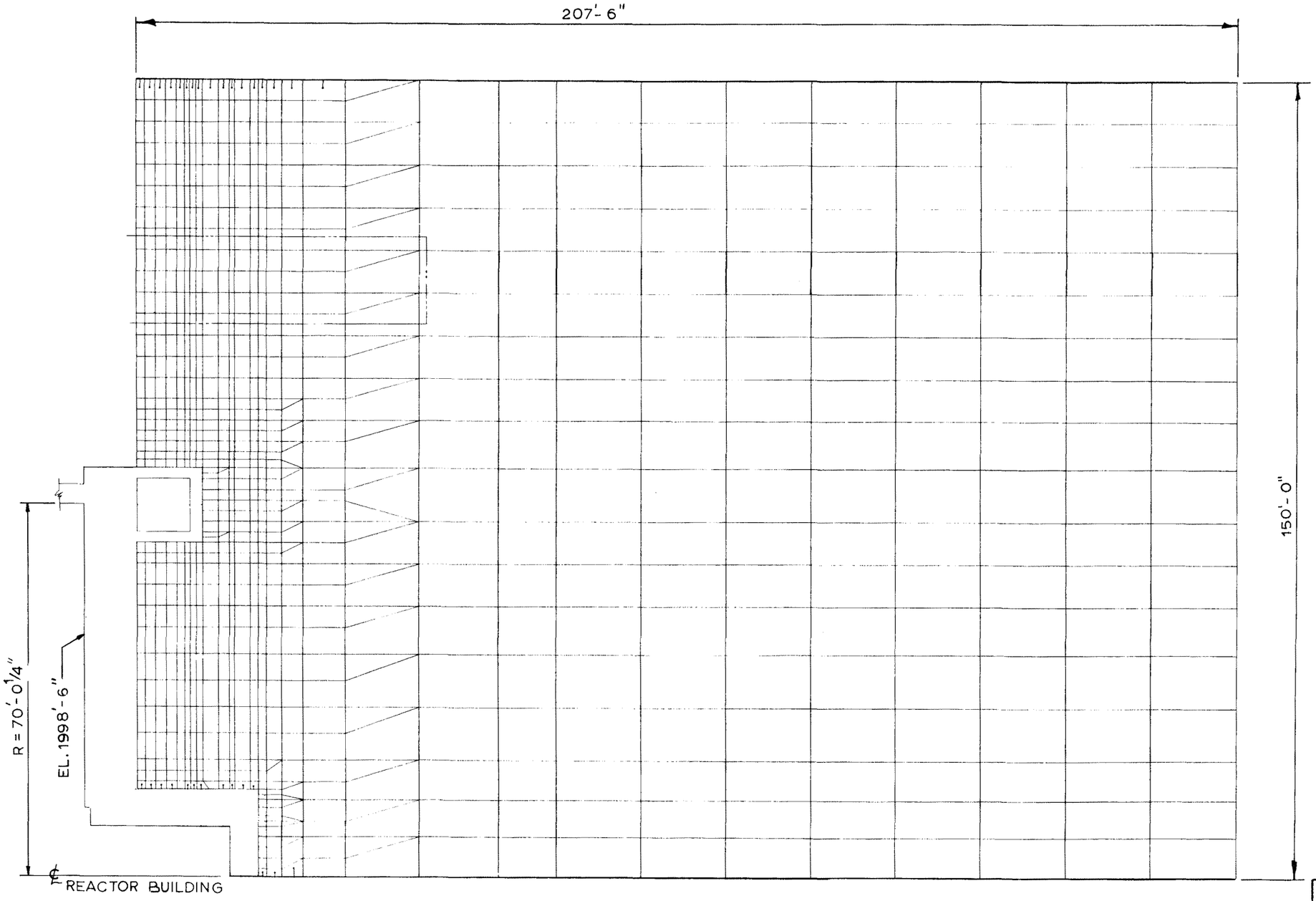

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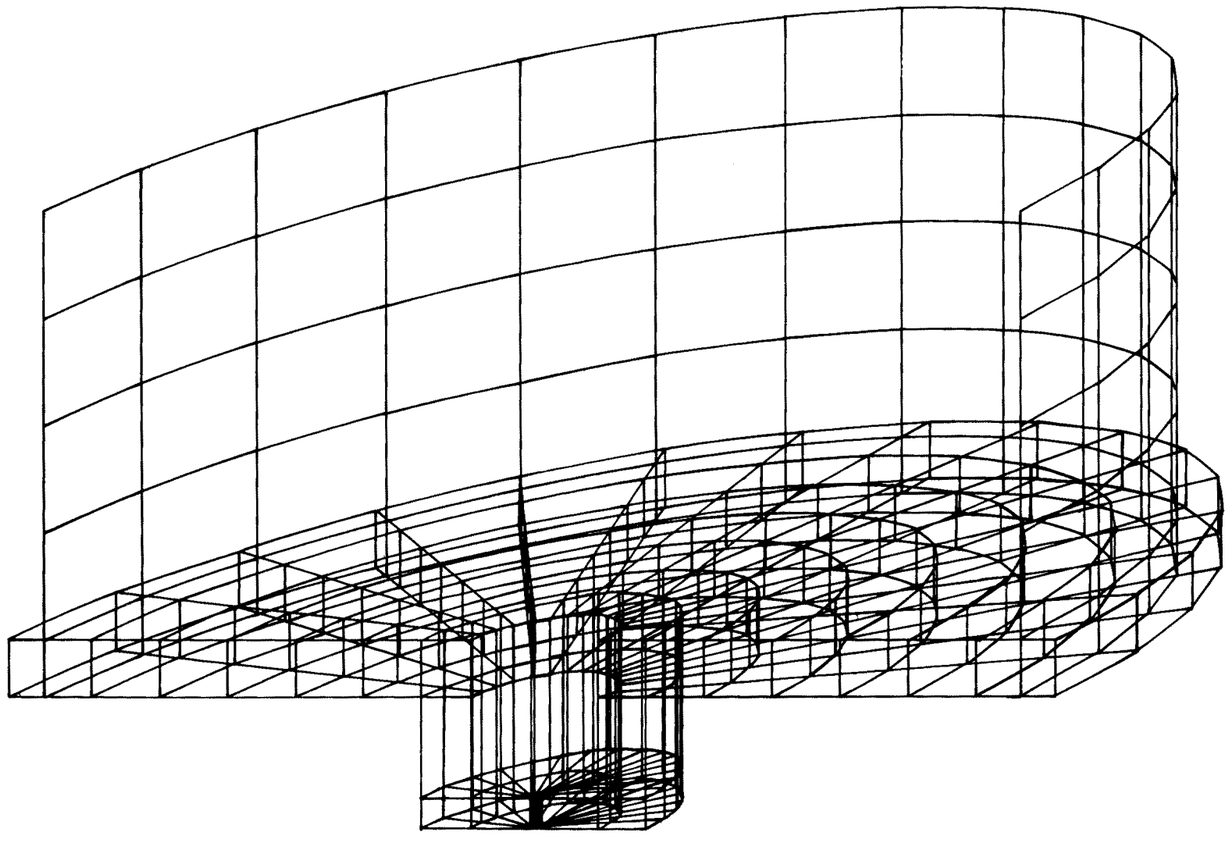
FIGURE 3.8-39

FINITE ELEMENT MODEL FOR AXISYMMETRIC LOADS – FOUNDA. MEDIUM



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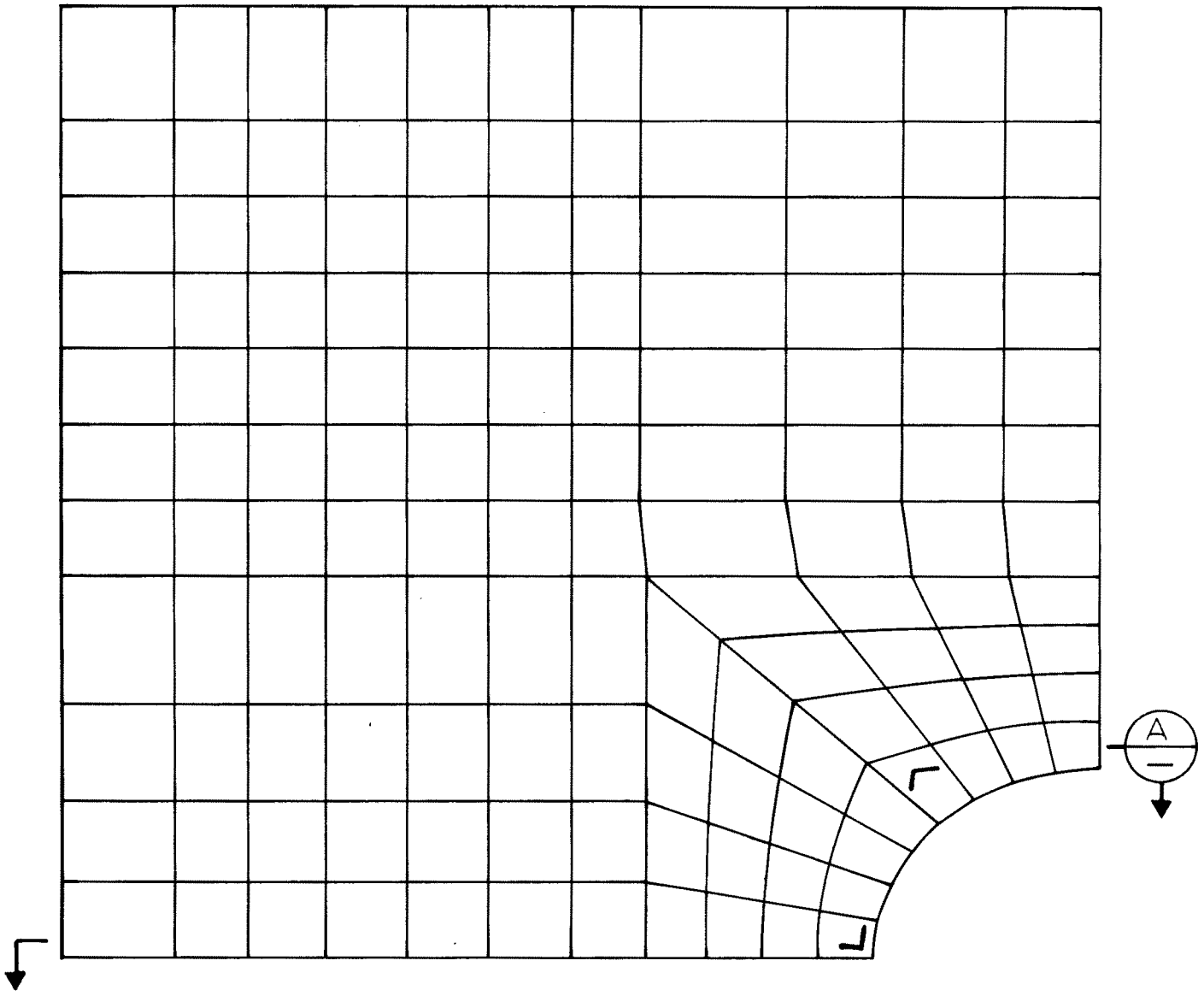
CALLAWAY PLANT

FIGURE 3.8-40

FINITE ELEMENT MODEL FOR
NONAXISYMMETRIC LOADS



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CALLAWAY PLANT

FIGURE 3.8-41

FINITE ELEMENT MODEL FOR
EQUIPMENT HATCH - ELEVATION

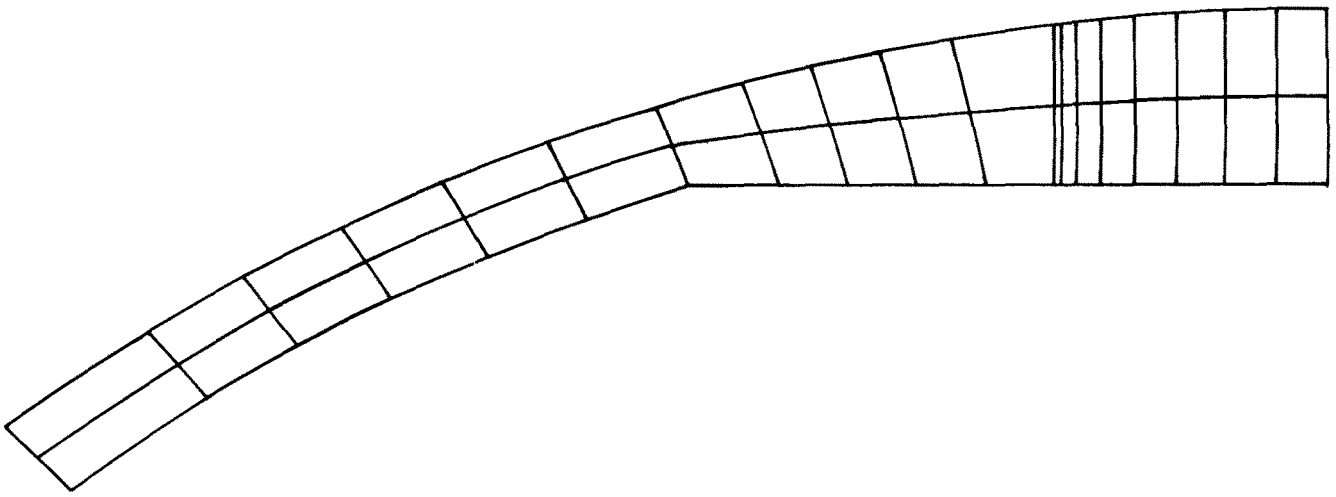

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FIGURE 3.8-42

FINITE ELEMENT MODEL FOR EQUIPMENT HATCH - PLAN

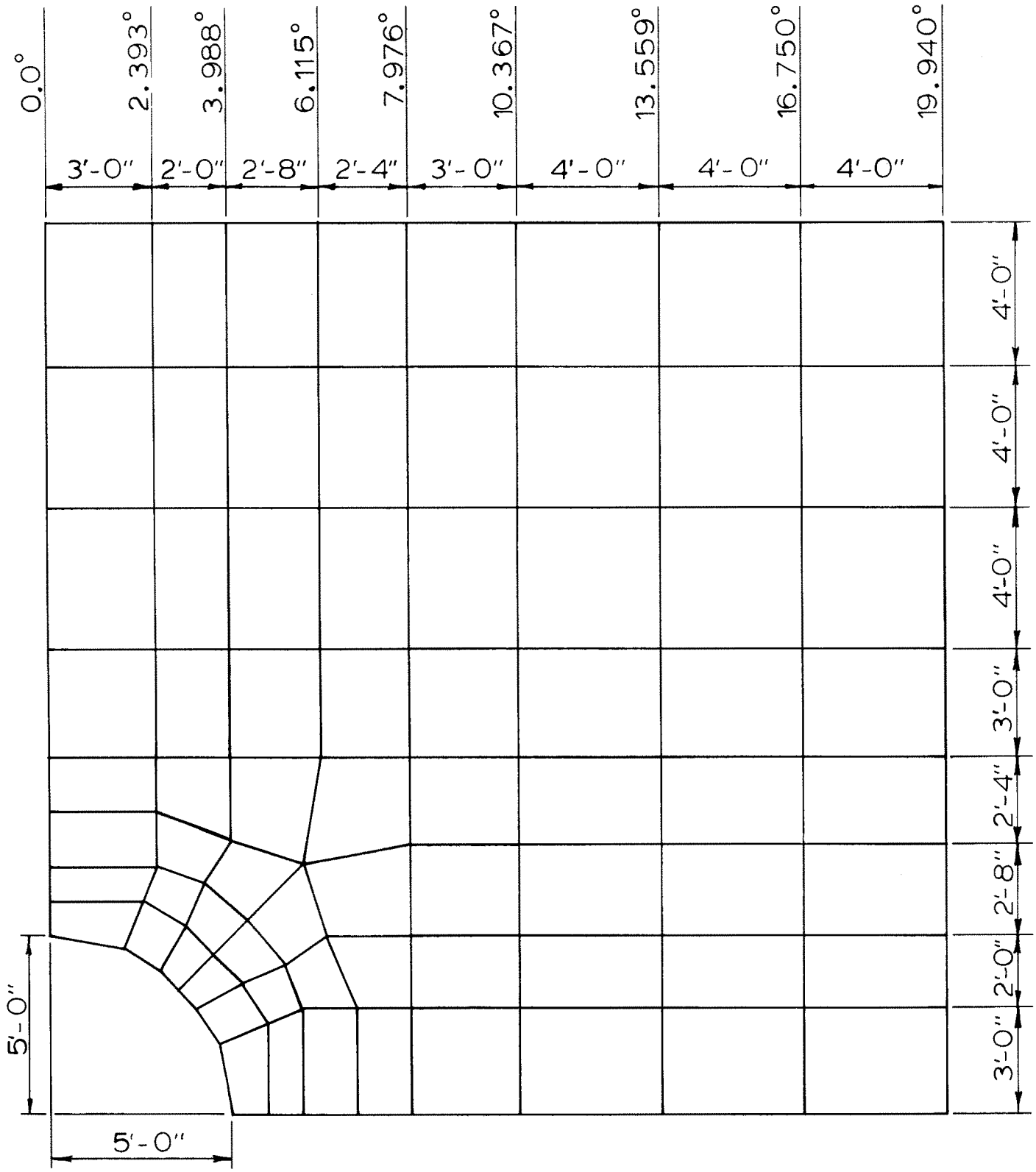

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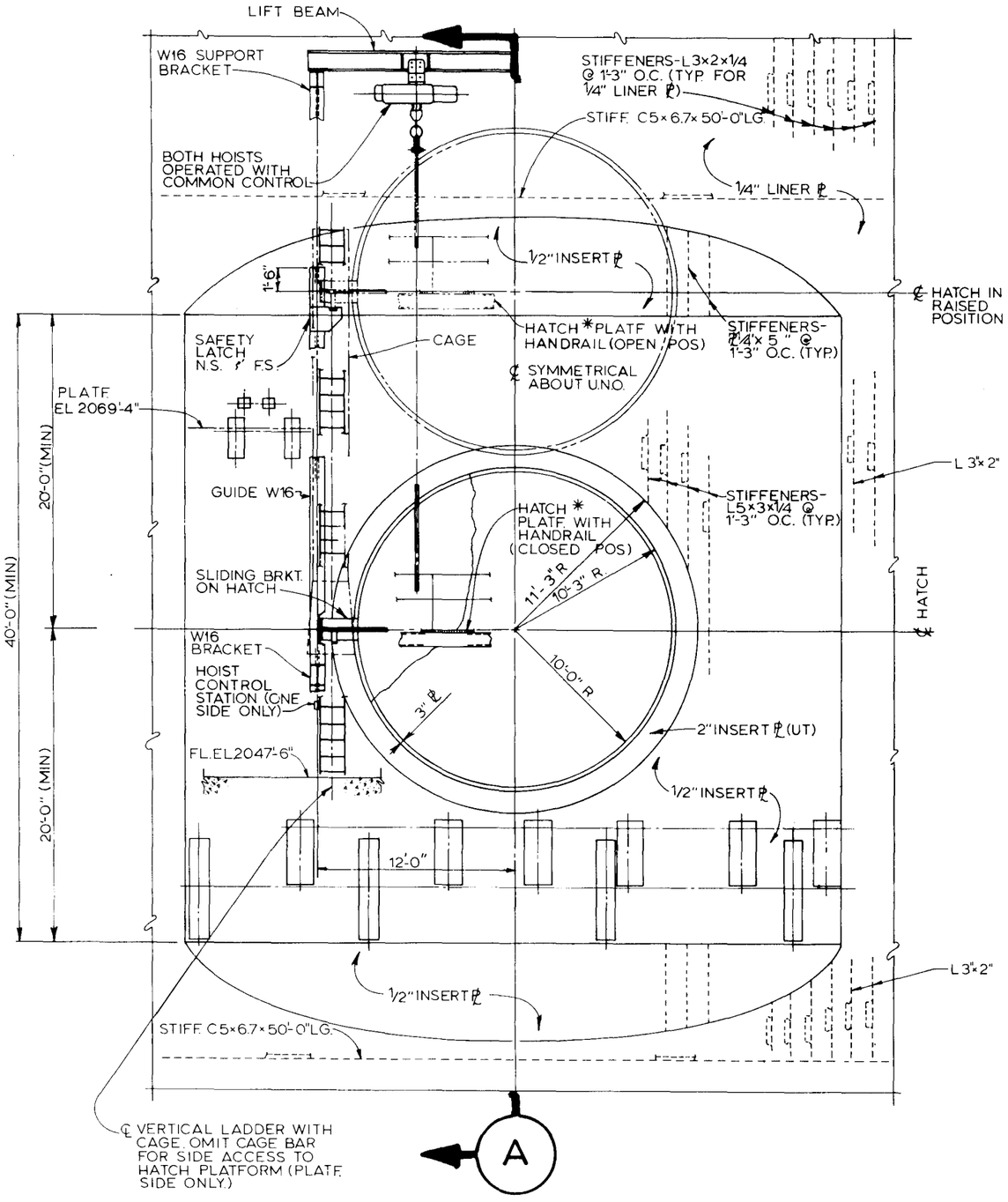
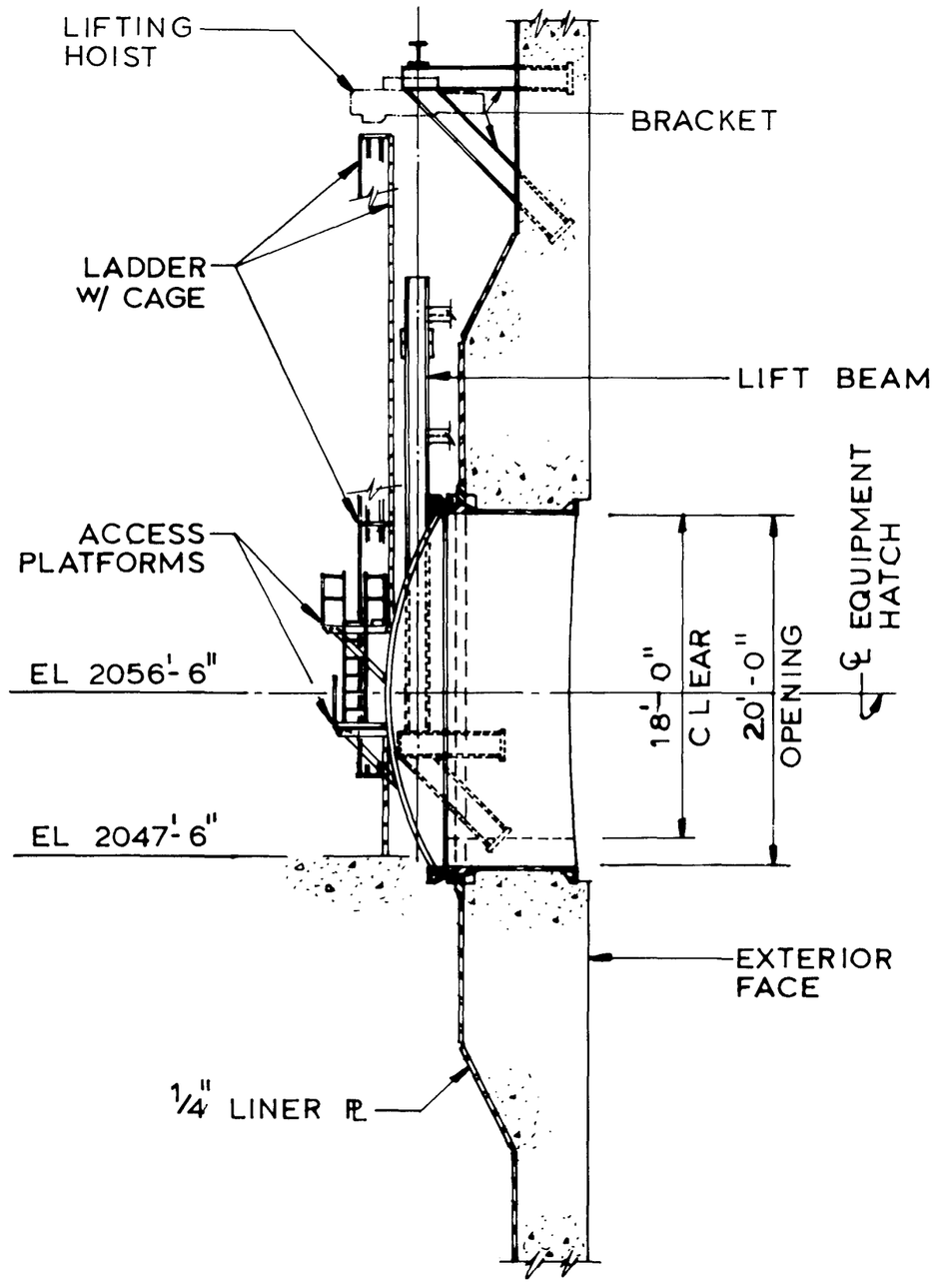
FIGURE 3.8-43

FINITE ELEMENT MODEL FOR PERSONNEL HATCH



ELEVATION

(FROM INSIDE)



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CALLAWAY PLANT

FIGURE 3.8-44

REACTOR BUILDING EQUIPMENT HATCH

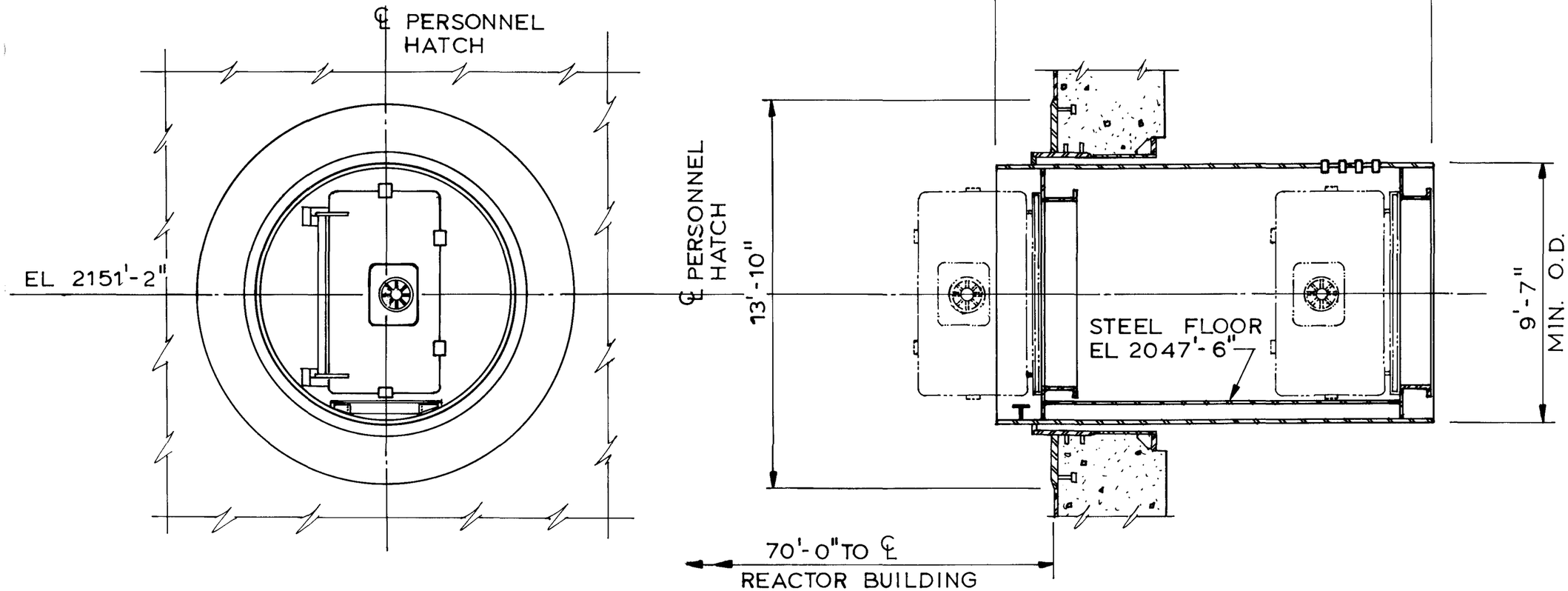

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FIGURE 3.8-45

REACTOR BUILDING PERSONNEL HATCH

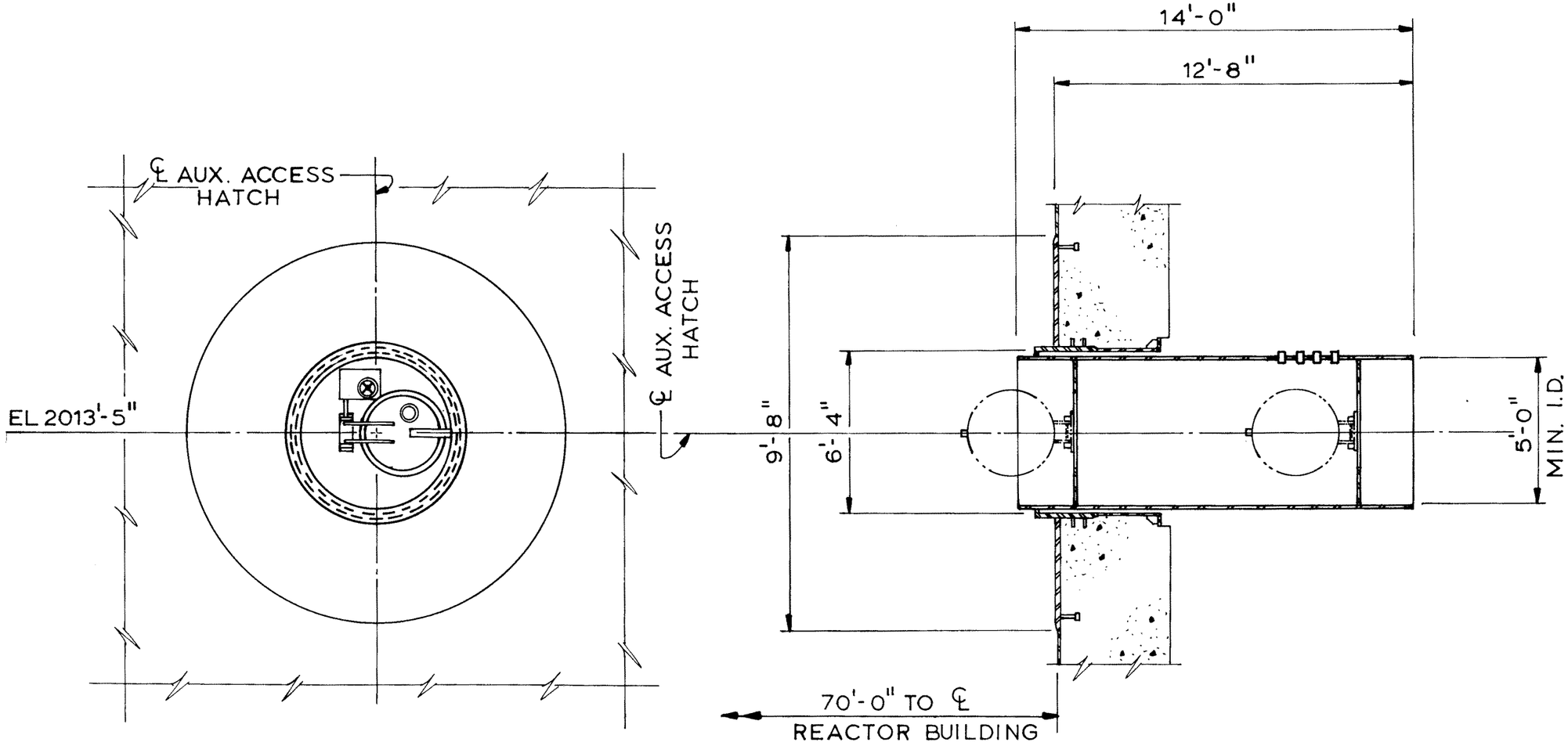

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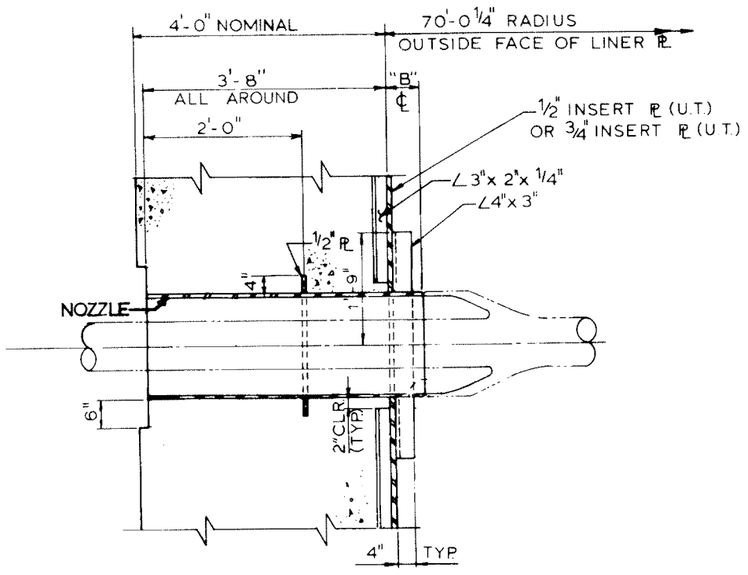
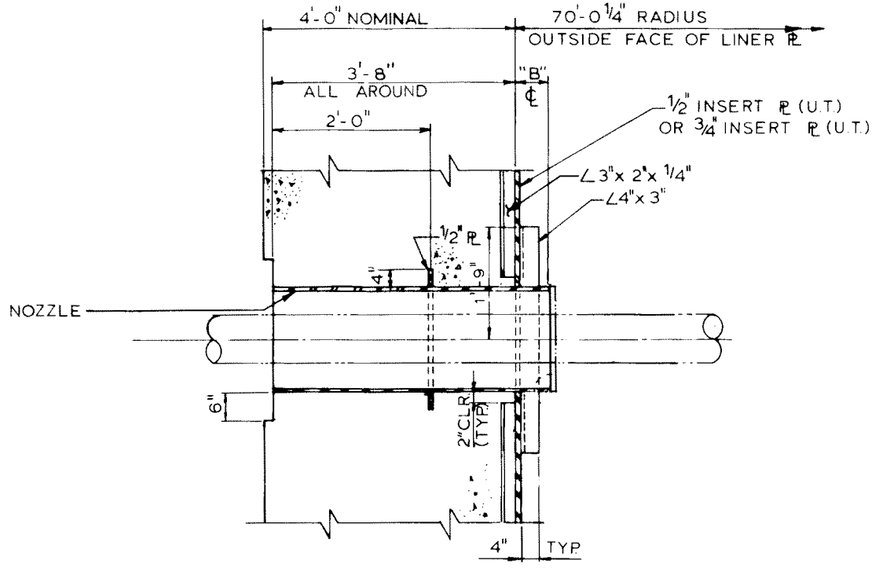
FIGURE 3.8-46

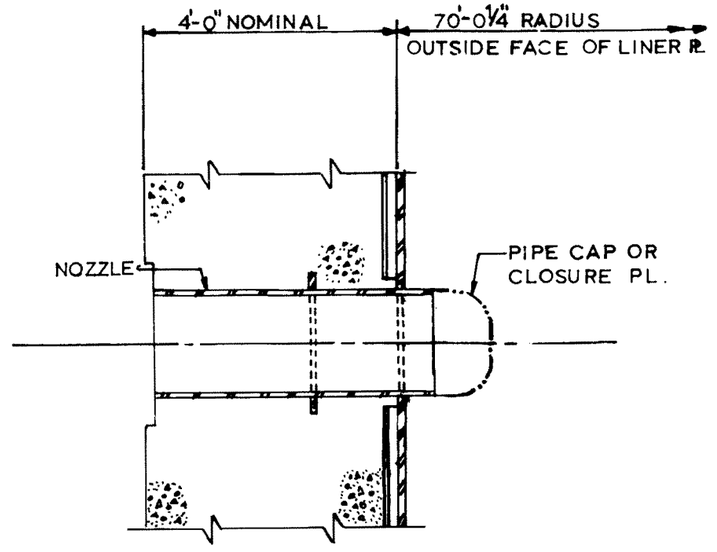
REACTOR BUILDING AUXILIARY ACCESS HATCH



TYPICAL PIPE PENETRATION-TYPE 1
FLUED HEAD PENETRATION



TYPICAL PIPE PENETRATION-TYPE 2
CLOSURE PLATE PENETRATION



TYP PIPE PENETRATION-TYPE 3
PENETRATION SPARE BLANKING

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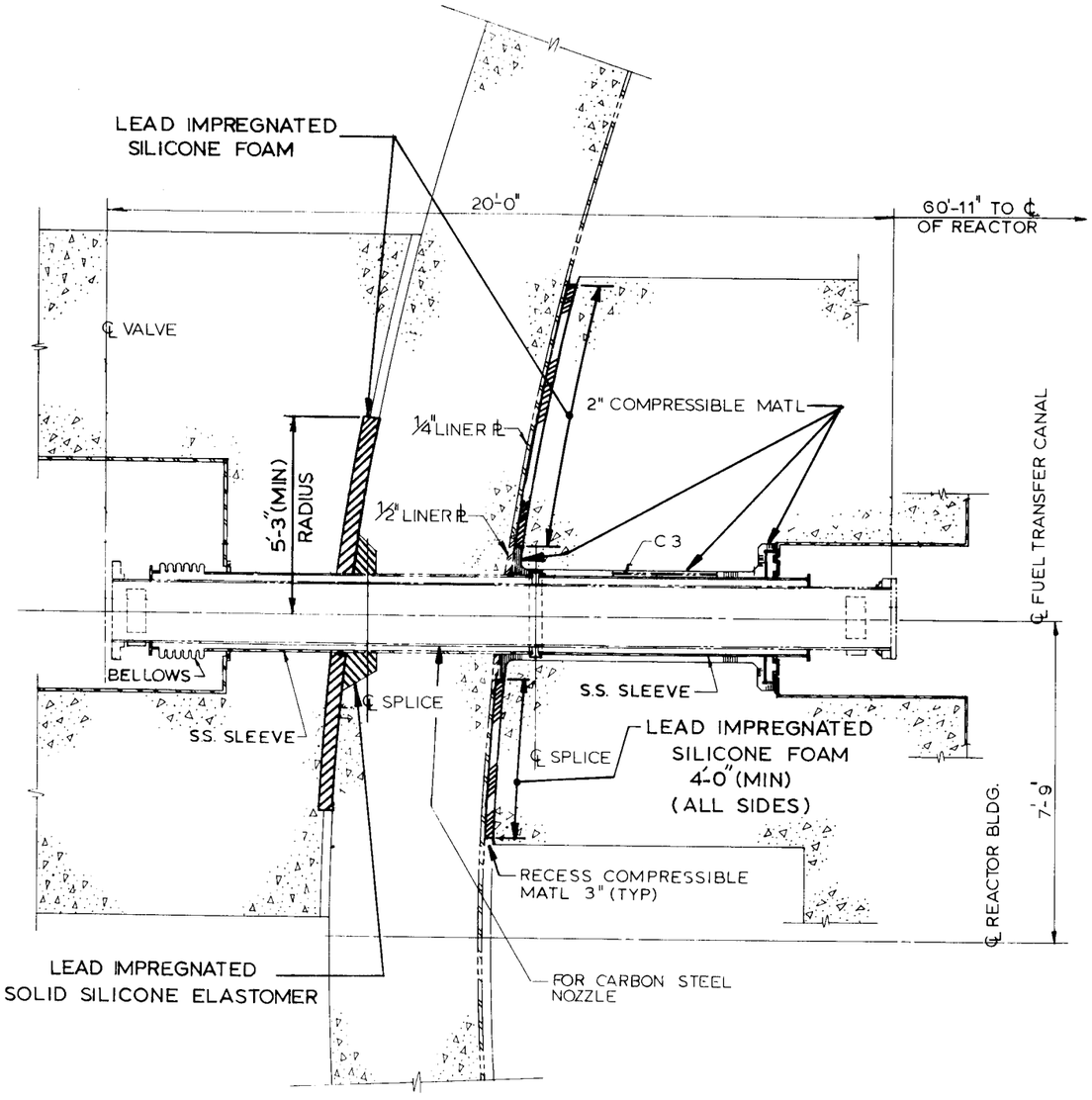
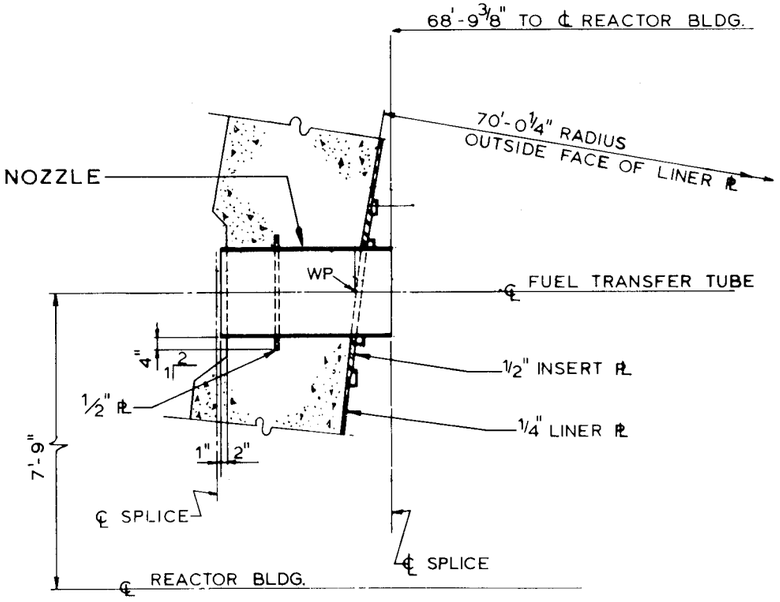
FIGURE 3.8-47

REACTOR BUILDING
TYPICAL PIPE PENETRATION



FUEL TRANSFER TUBE PLAN



PLAN - NOZZLE FOR FUEL TRANSFER TUBE

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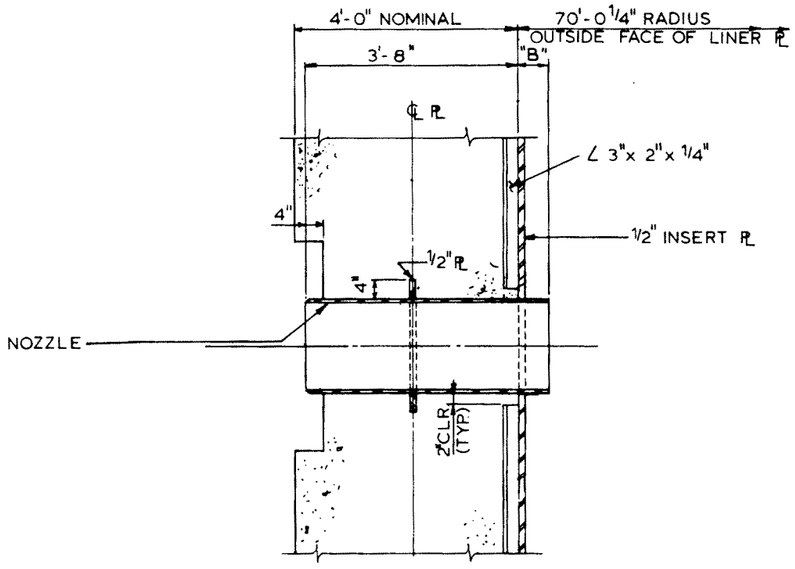
FIGURE 3.8-48

REACTOR BUILDING
FUEL TRANSFER PENETRATION



ELECTRICAL PENETRATION

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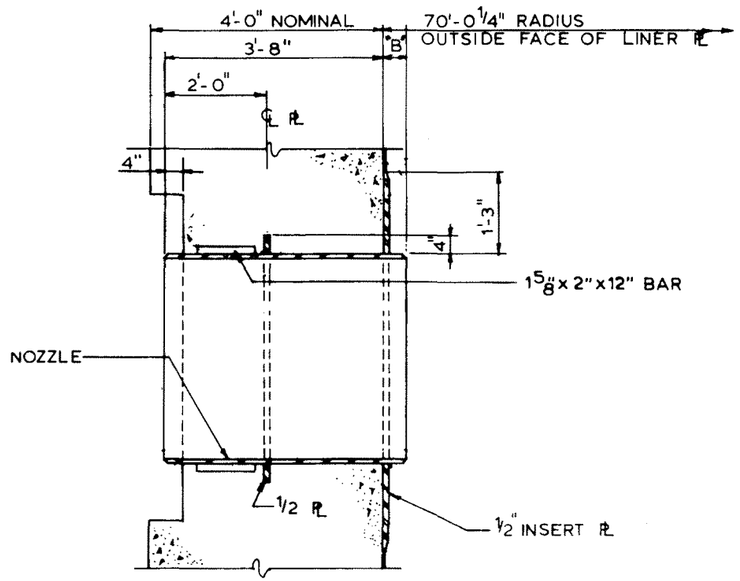
FIGURE 3.8-49

REACTOR BUILDING
ELECTRICAL PENETRATION



PURGE LINE

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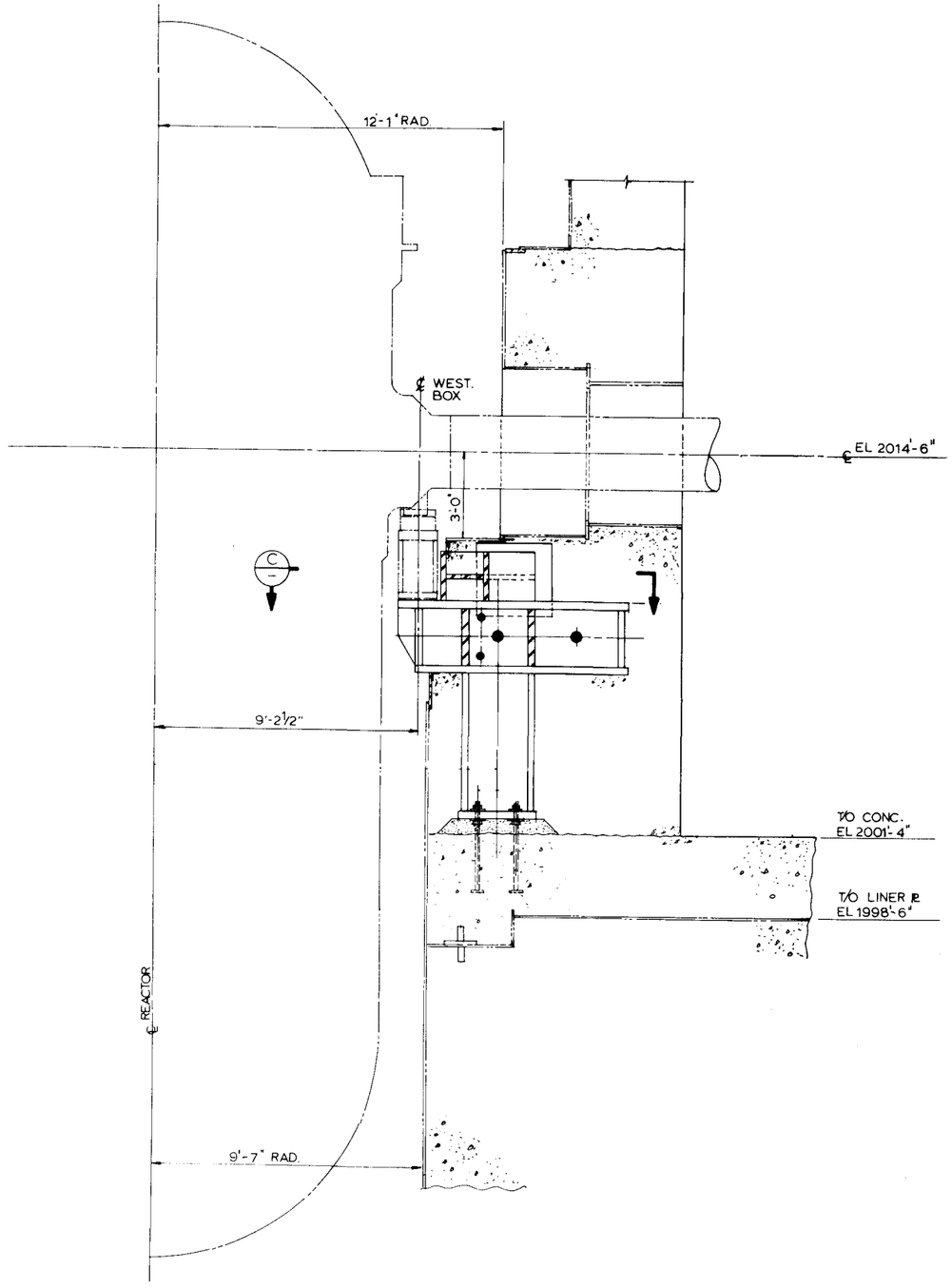
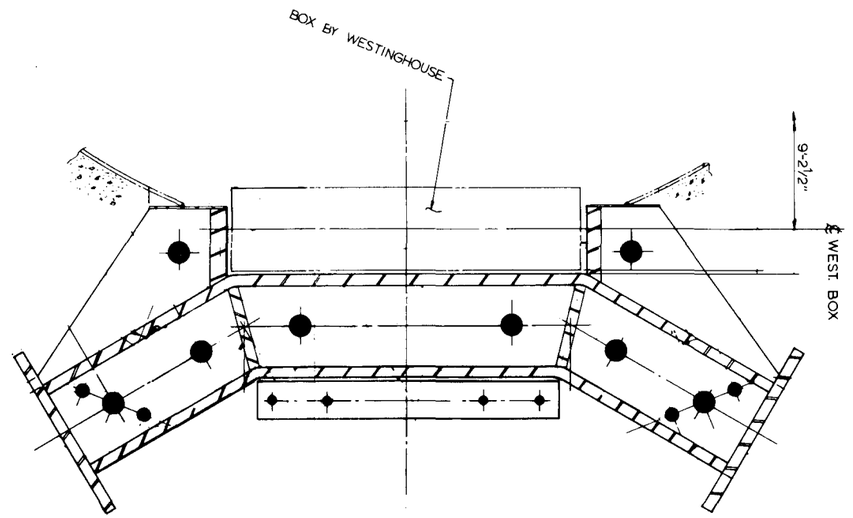
FIGURE 3.8-50

REACTOR BUILDING
PURGE LINE PENETRATIONS





SECTION C

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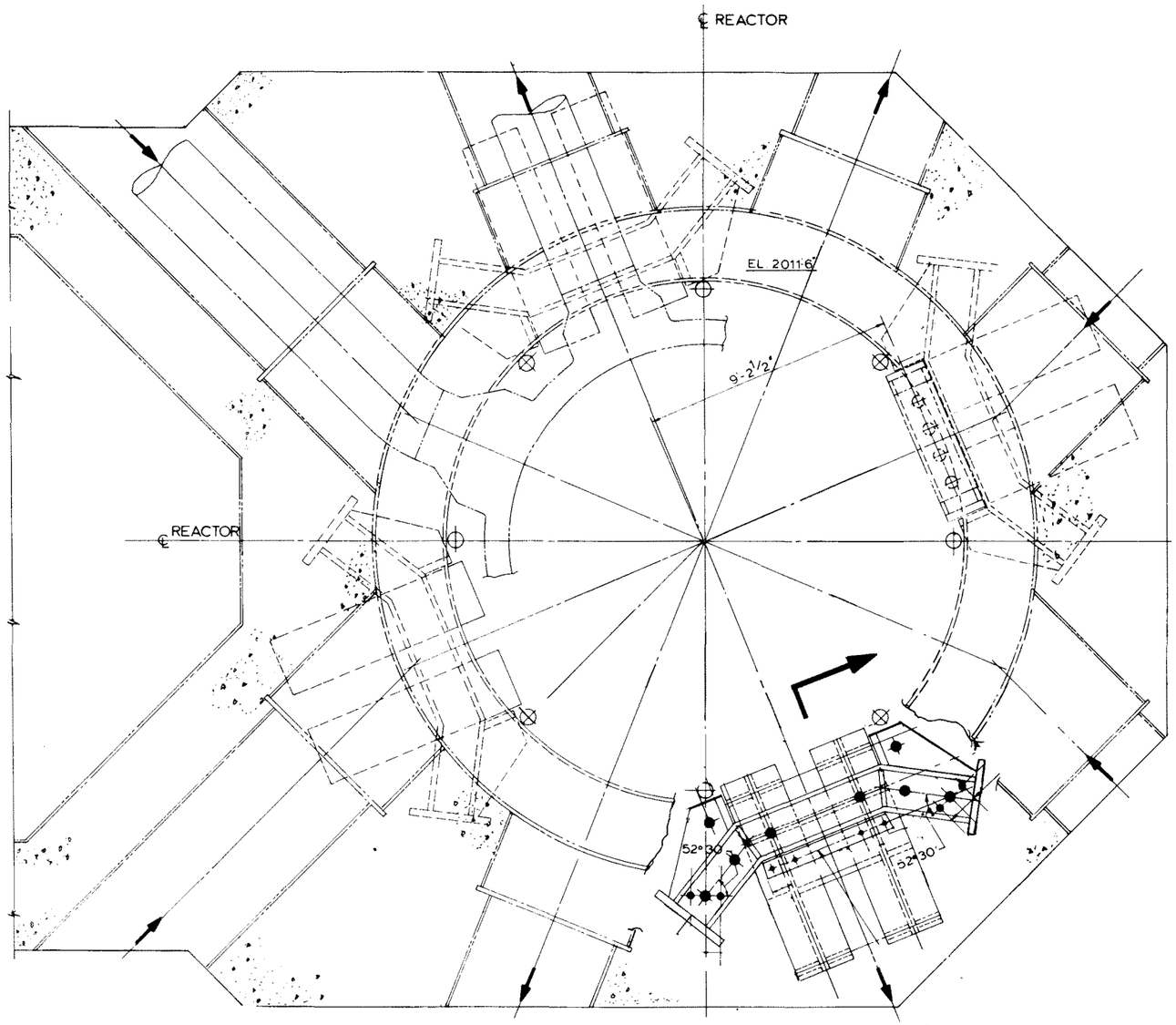
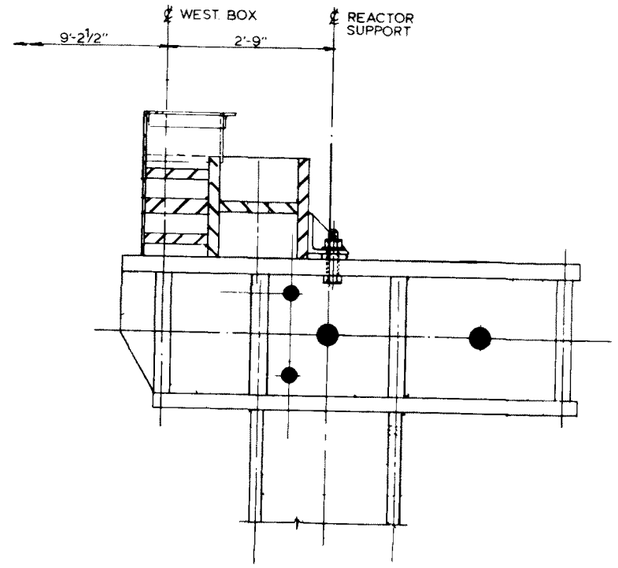
CALLAWAY PLANT

FIGURE 3.8-51

REACTOR VESSEL SUPPORT SYSTEM – ELEVATION



PLAN AT EL 2014'-6"



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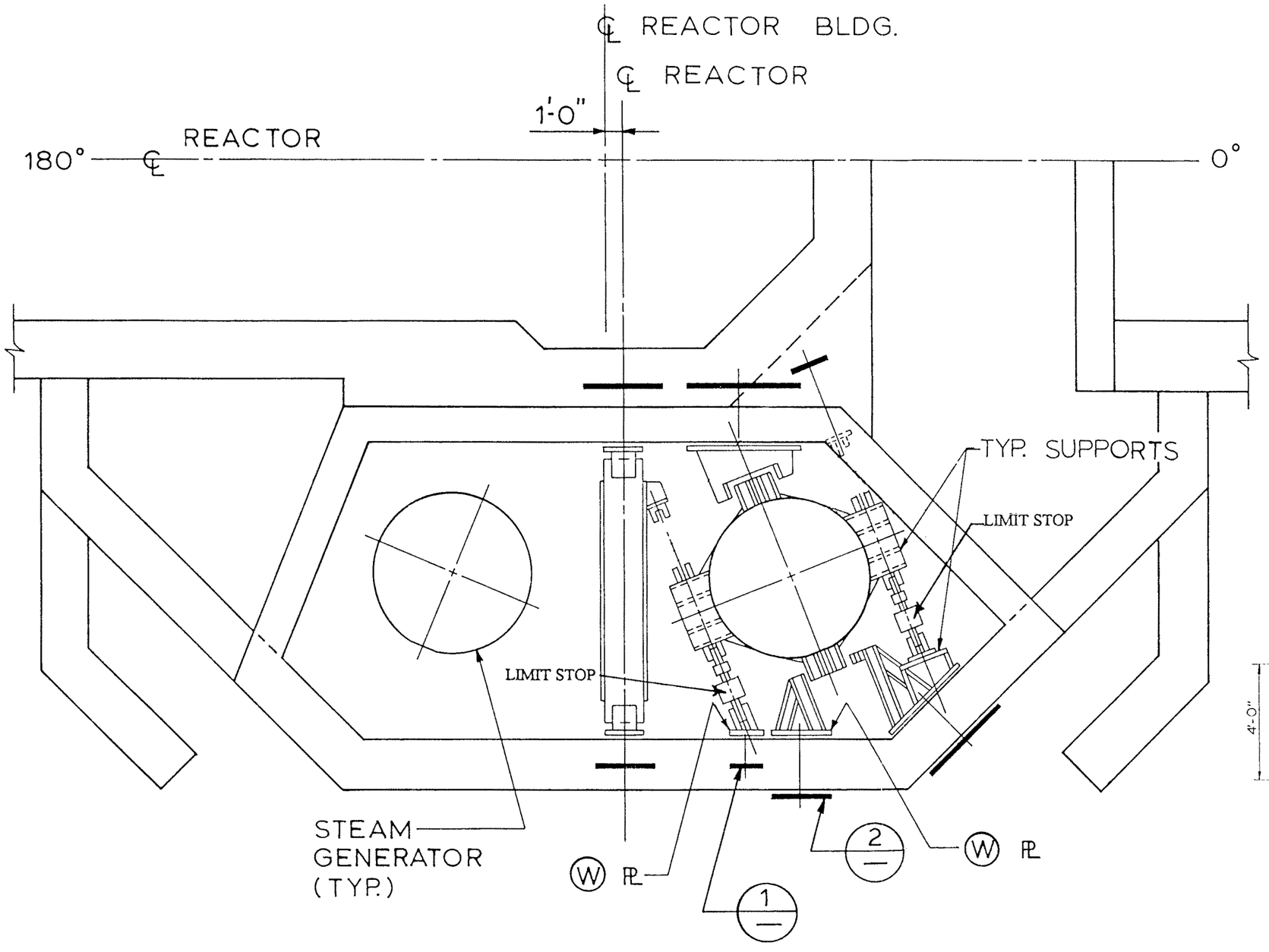
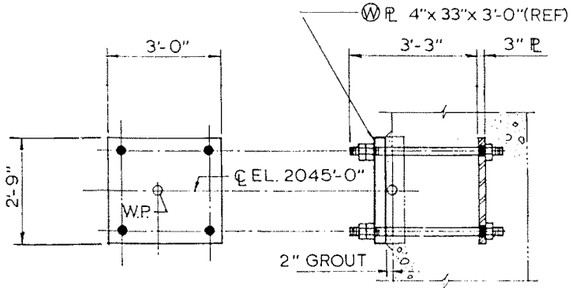
CALLAWAY PLANT

FIGURE 3.8-52

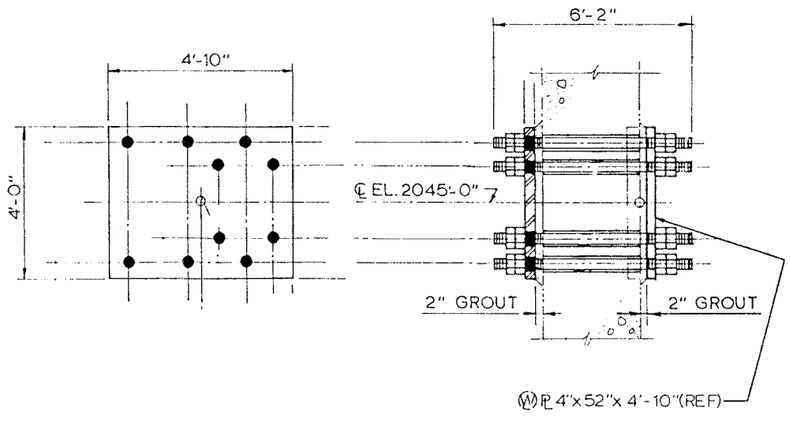
REACTOR VESSEL SUPPORT SYSTEM – PLAN



PLAN - STEAM GENERATOR
UPPER LATERAL SUPPORTS



DETAIL 1



DETAIL 2

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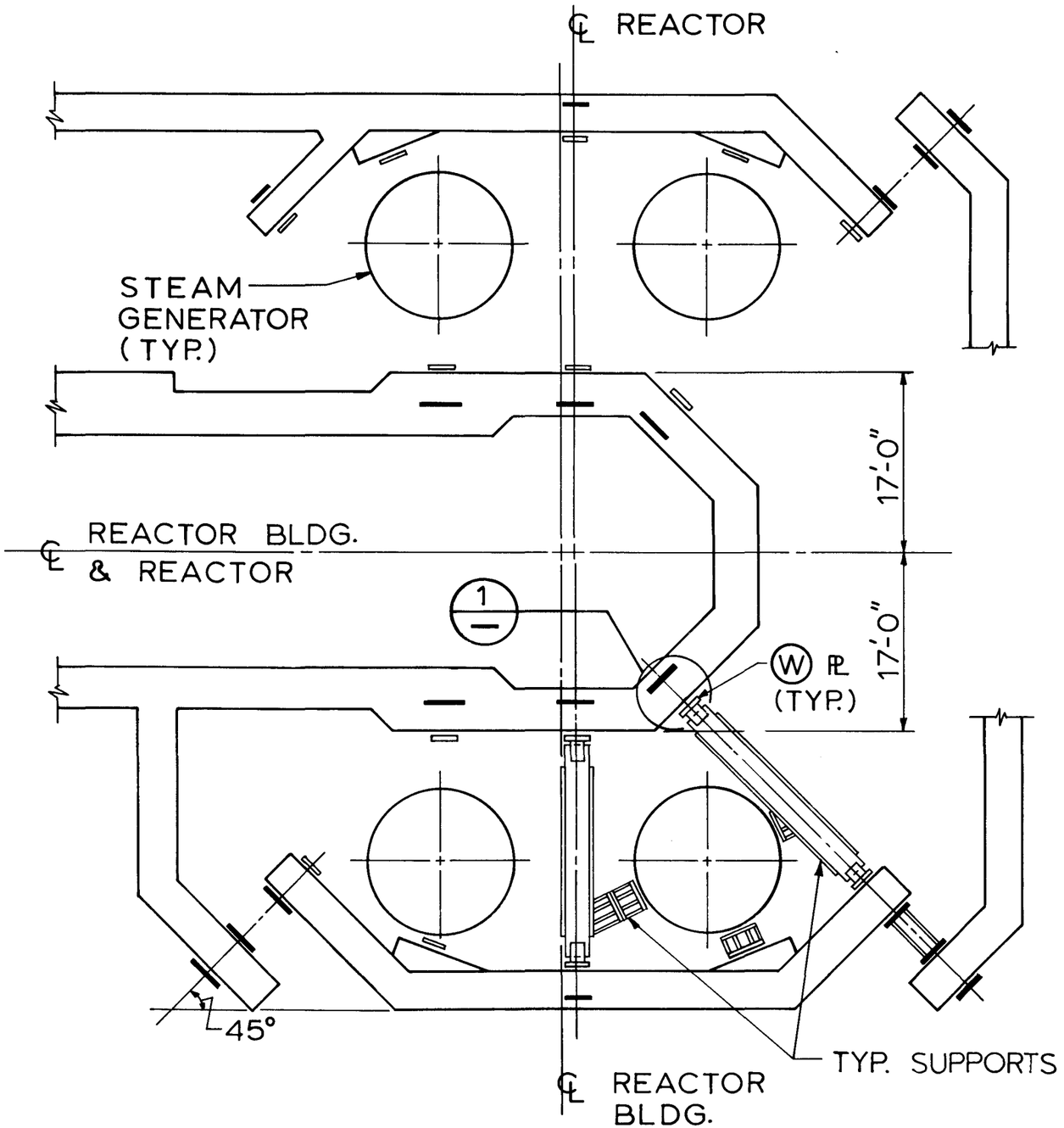
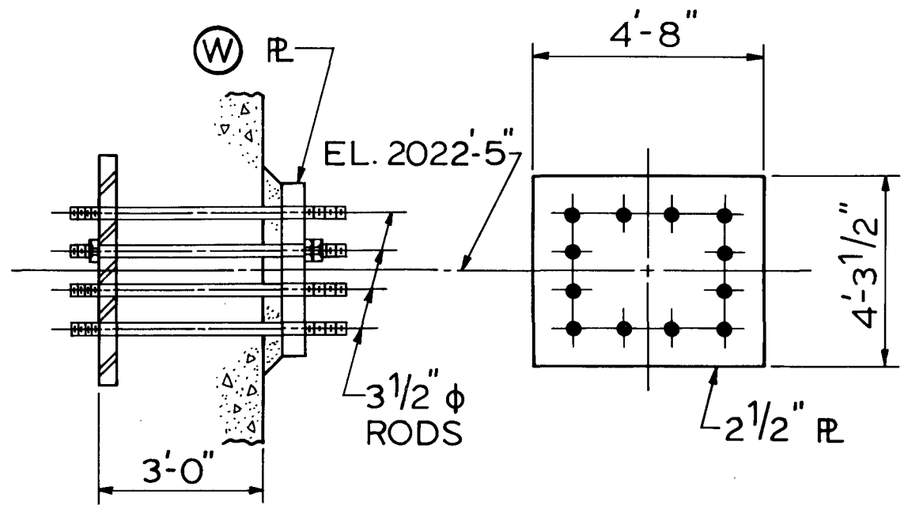
CALLAWAY PLANT

FIGURE 3.8-53

STEAM GENERATOR SUPPORT SYSTEM – UPPER SUPPORTS



PLAN - STEAM GENERATOR LOWER LATERAL SUPPORTS



DETAIL 1/—

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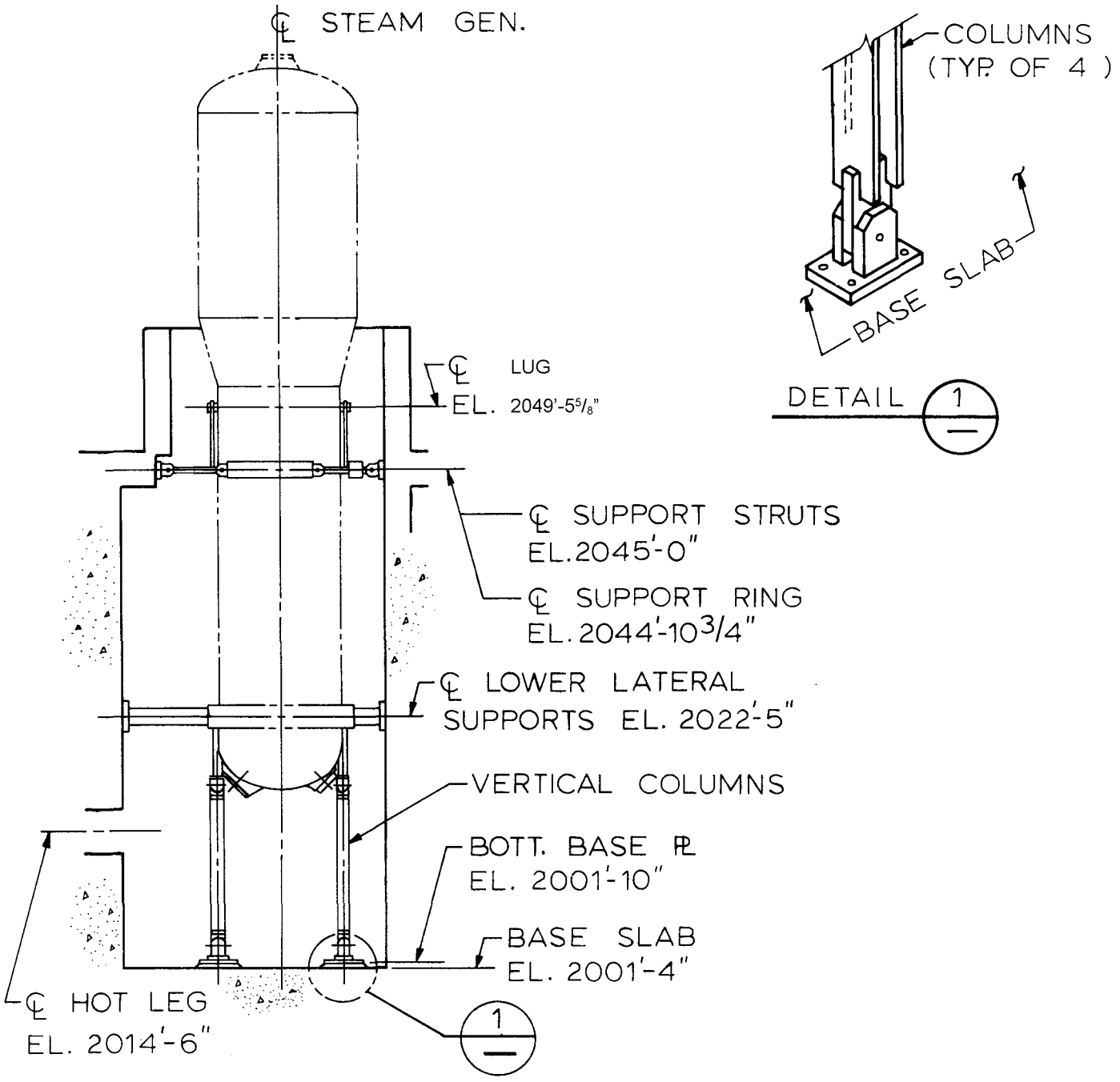
FIGURE 3.8-54

STEAM GENERATOR SUPPORT SYSTEM – LOWER SUPPORTS



STEAM GENERATOR
ELEVATION VIEW

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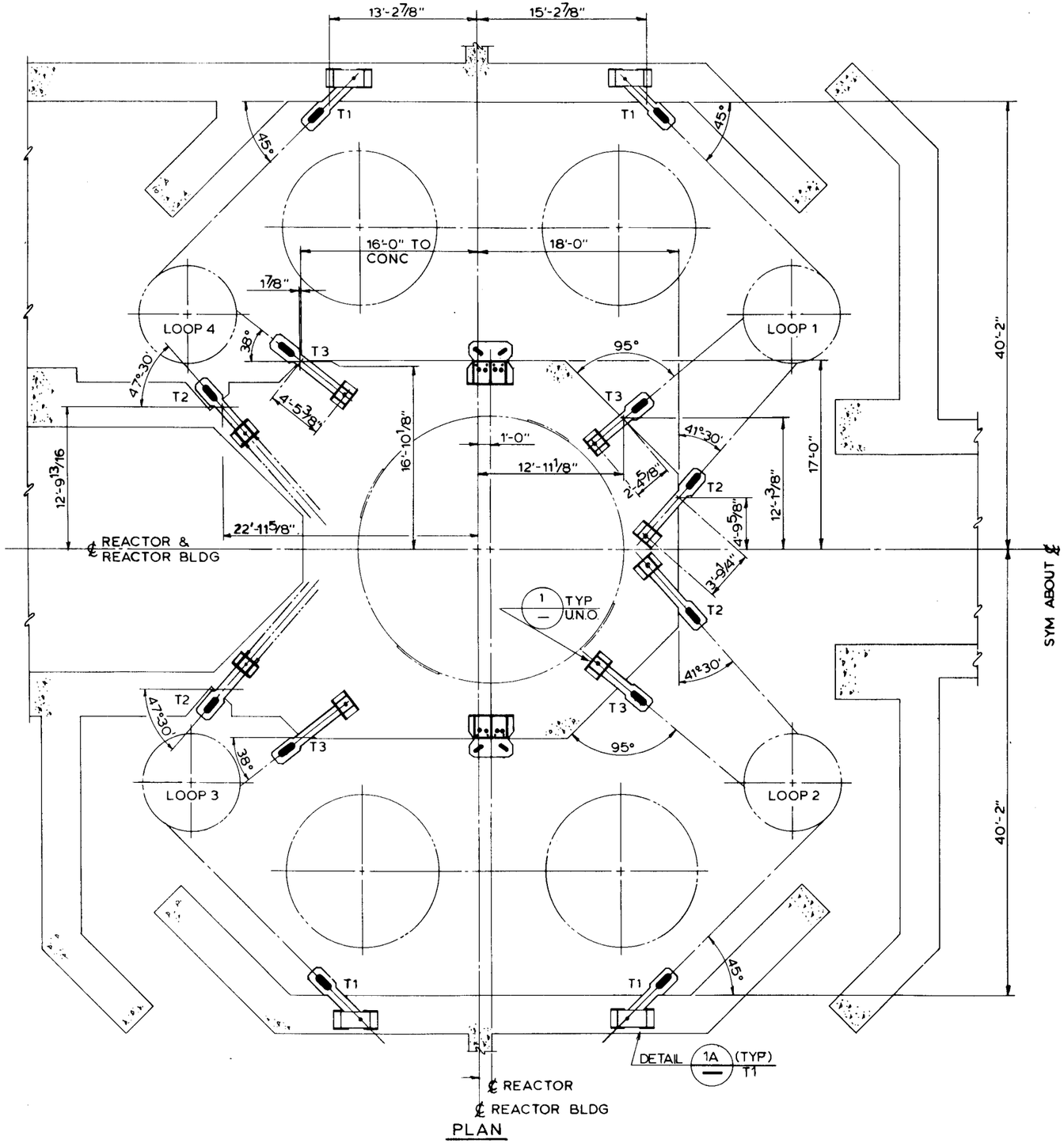
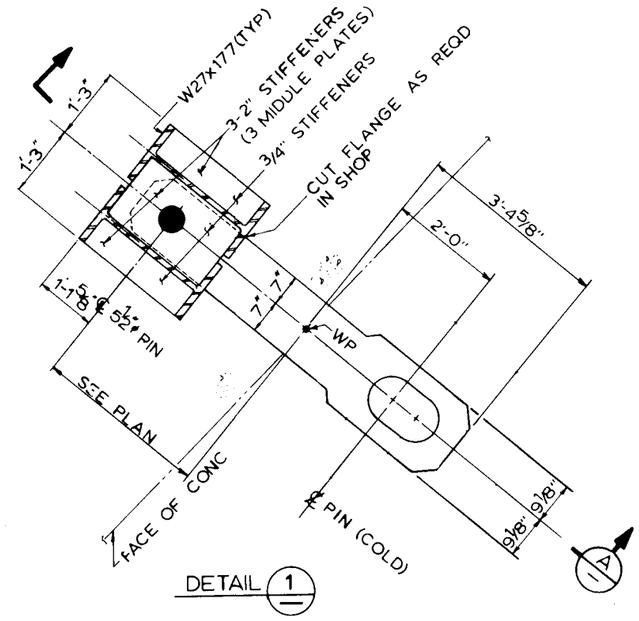
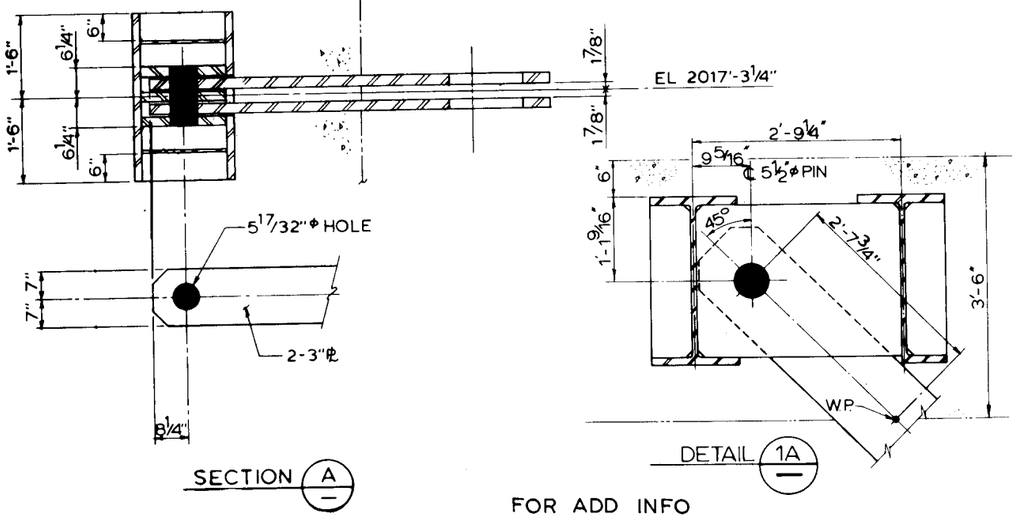
CALLAWAY PLANT

FIGURE 3.8-55

STEAM GENERATOR SUPPORT SYSTEM – ELEVATION







FOR ADD INFO SEE DET 1

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FIGURE 3.8-56

REACTOR COOLANT PUMP LATERAL SUPPORT EMBEDS

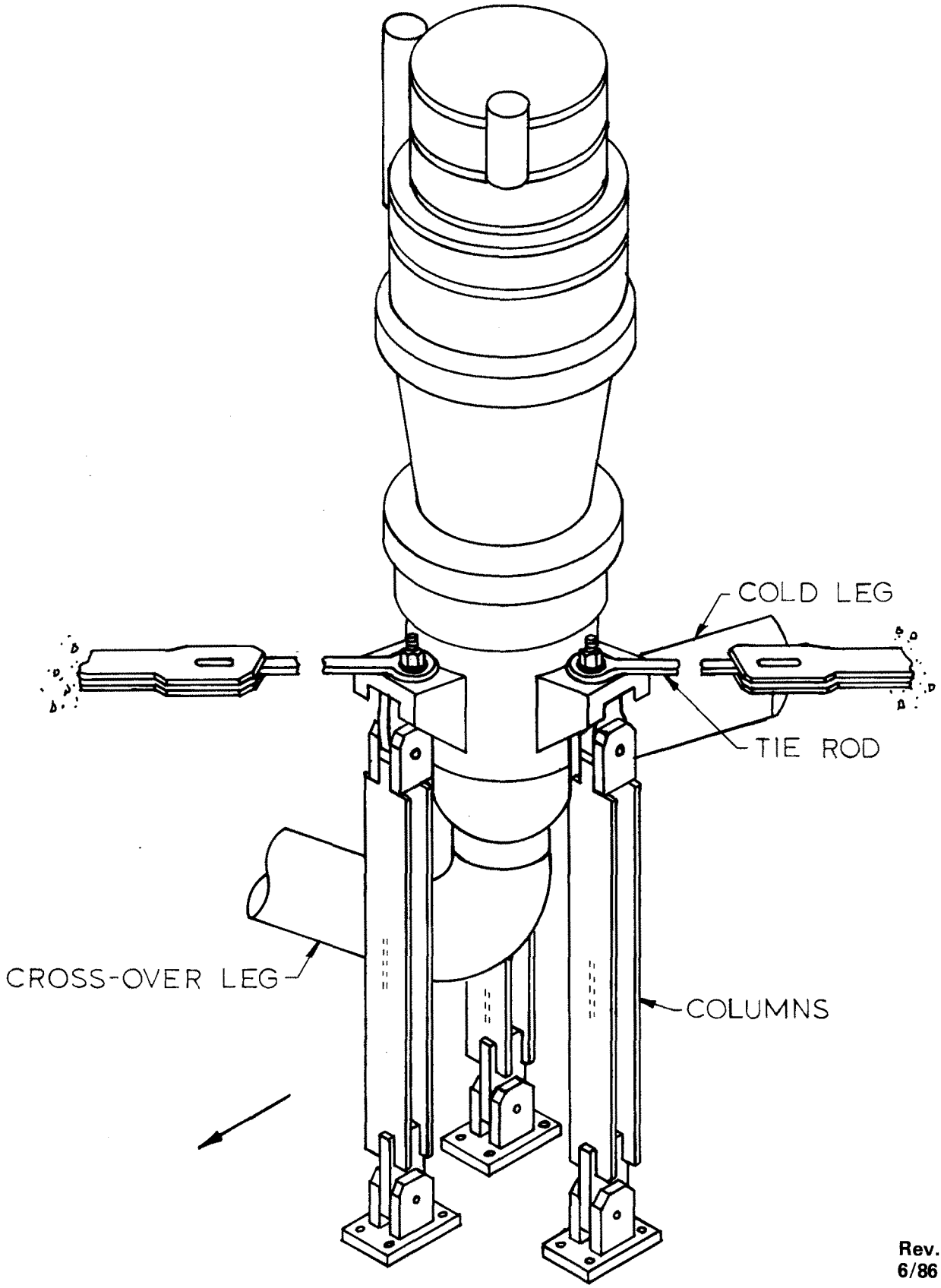

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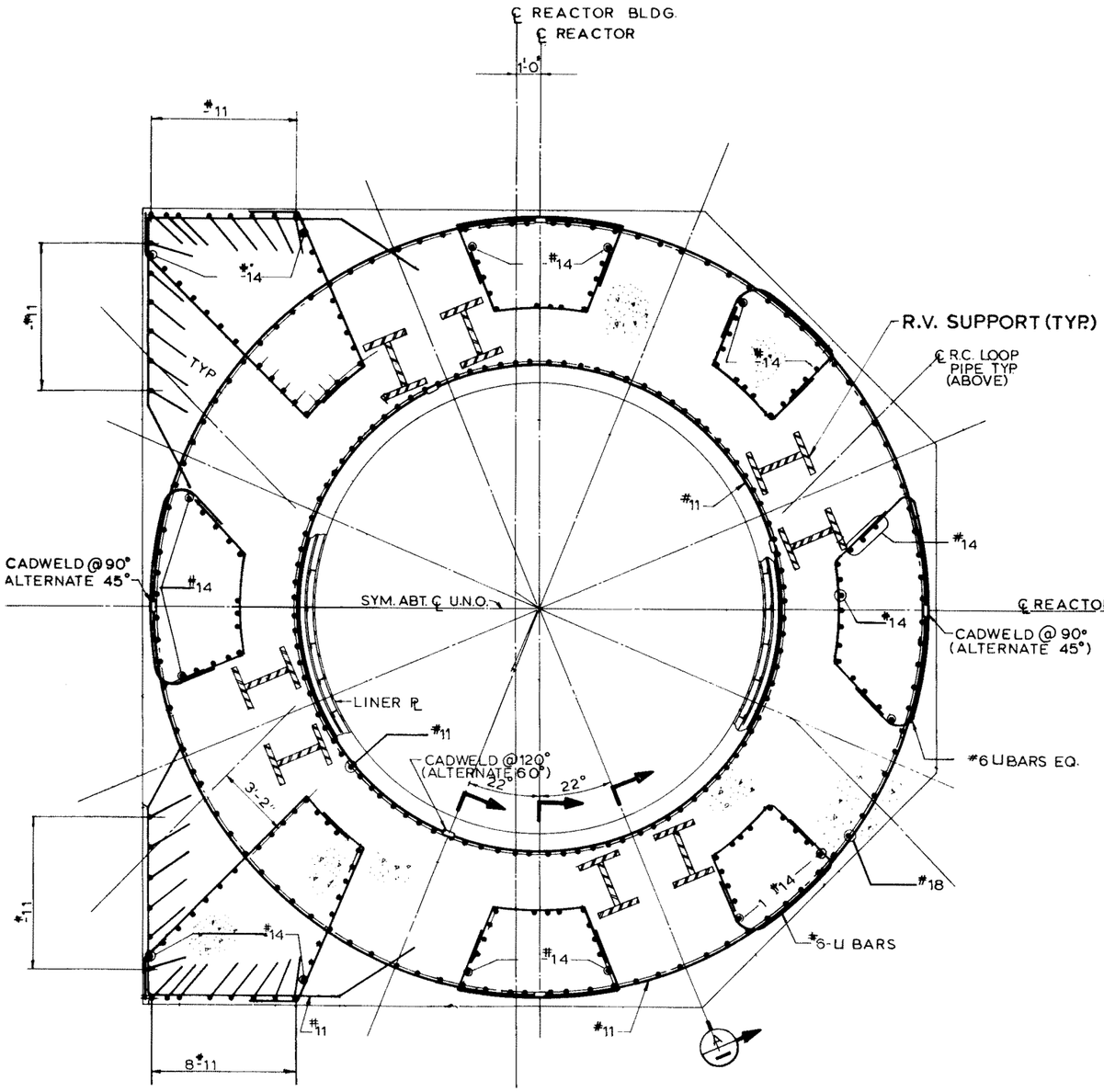
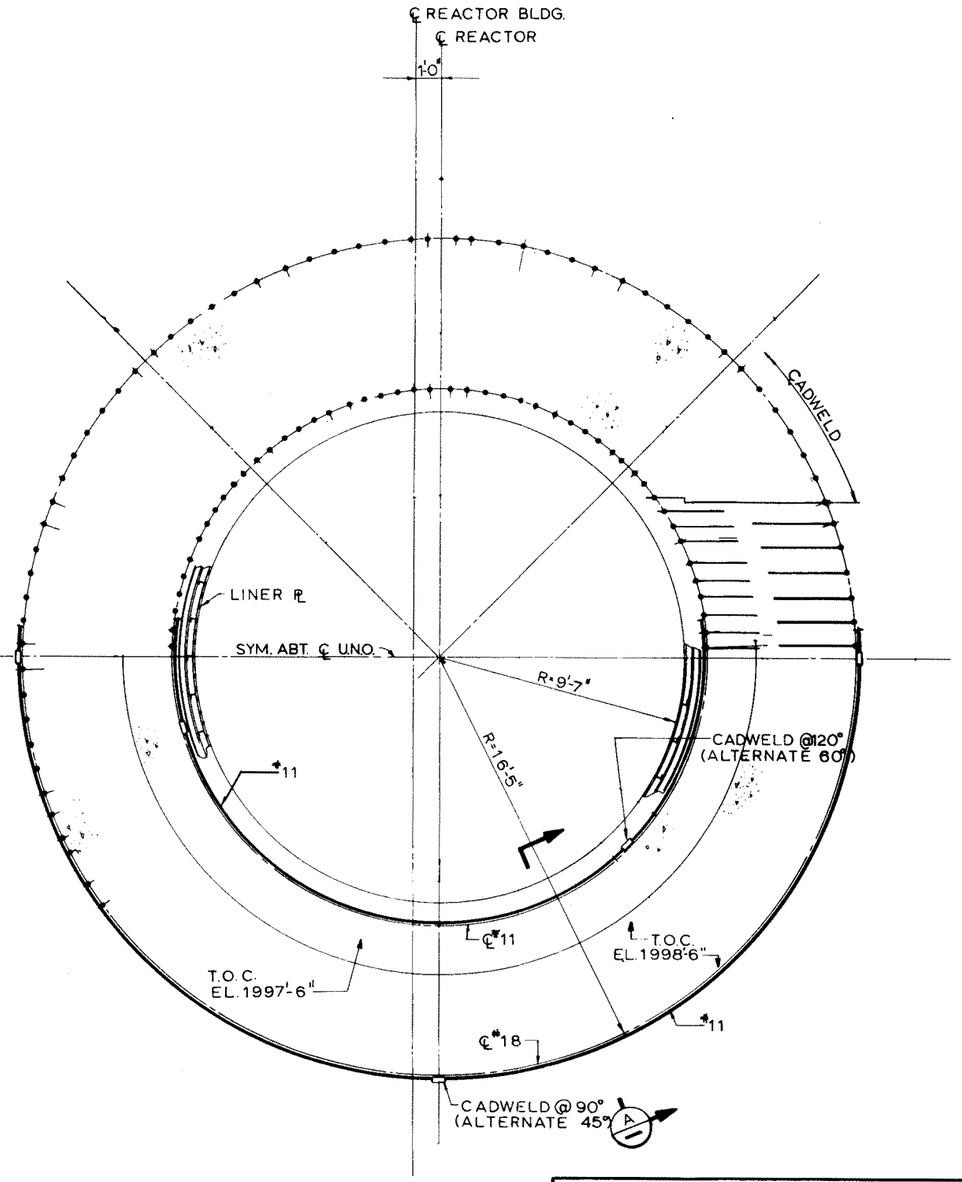
FIGURE 3.8-57

REACTOR COOLANT PUMP SUPPORT DETAILS



PLAN AT EL. 2001'-4" TO EL. 2005'-7"



PLAN AT EL. 1997'-6" TO EL. 2001'-4"

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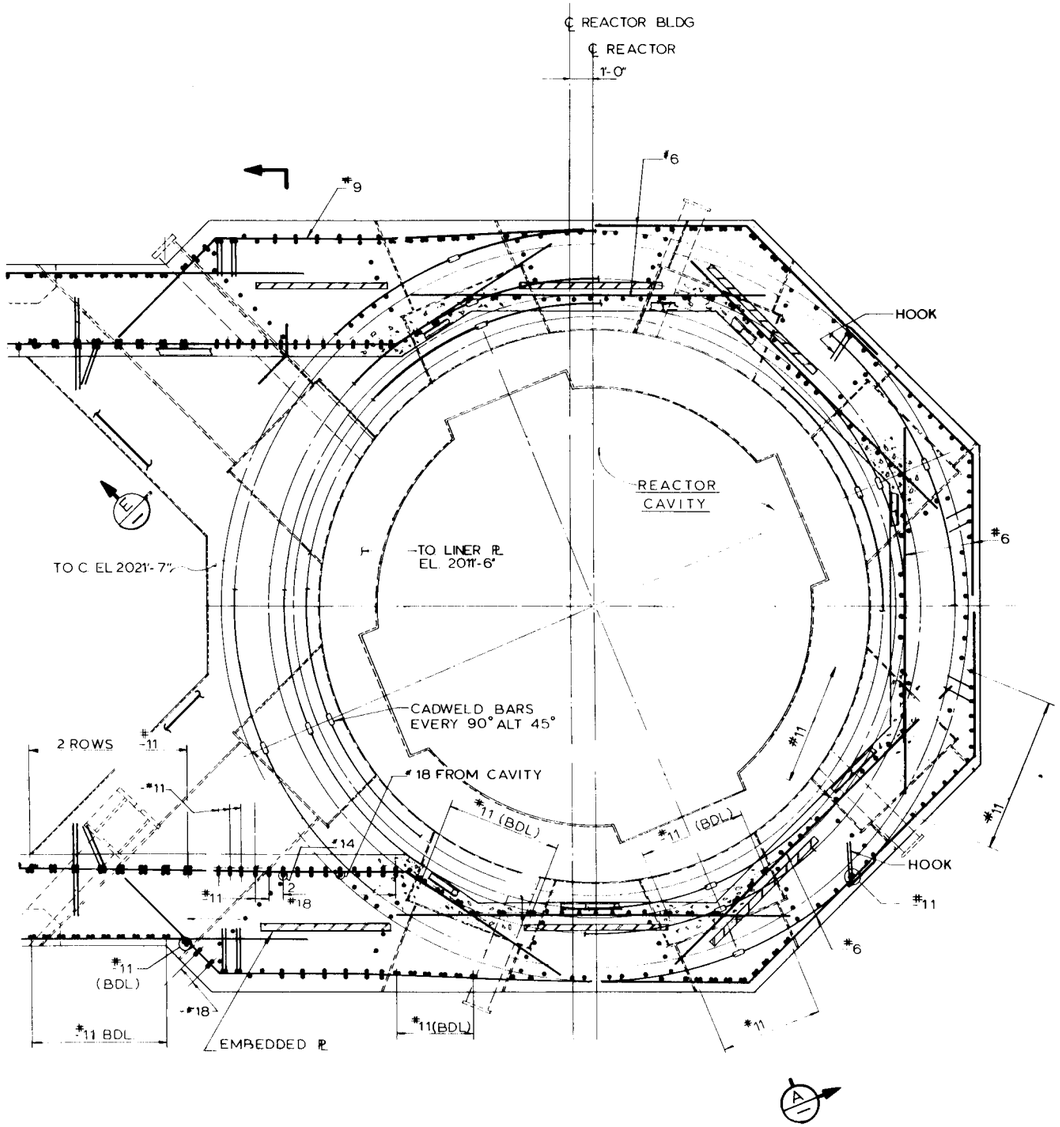
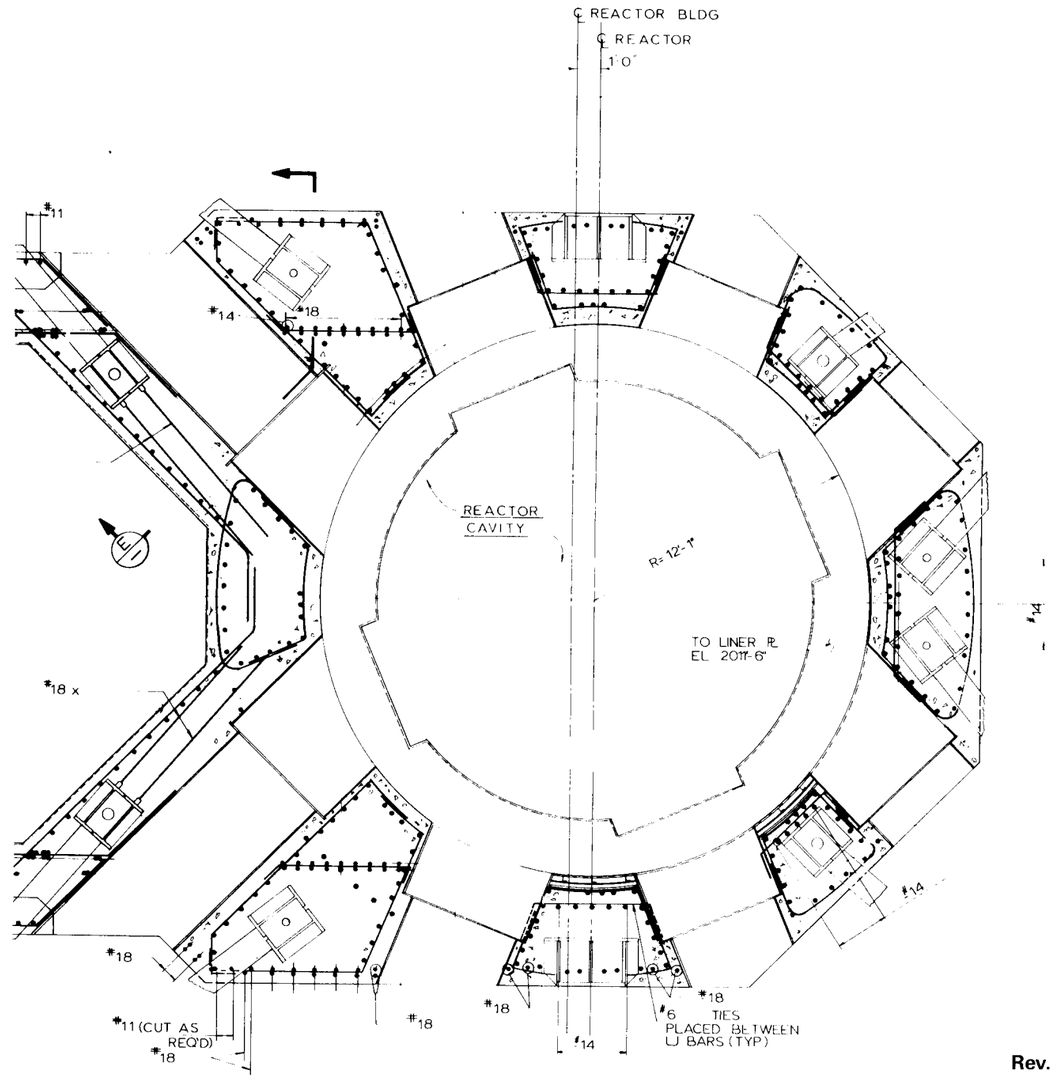
FIGURE 3.8-58

REACTOR CAVITY PLAN – ELEVATION 1997'-6" TO 2005'-7"



PLAN AT EL 2017'-5" TO EL 2021'-7"



PLAN AT EL 2011'-6" TO EL 2017'-5"

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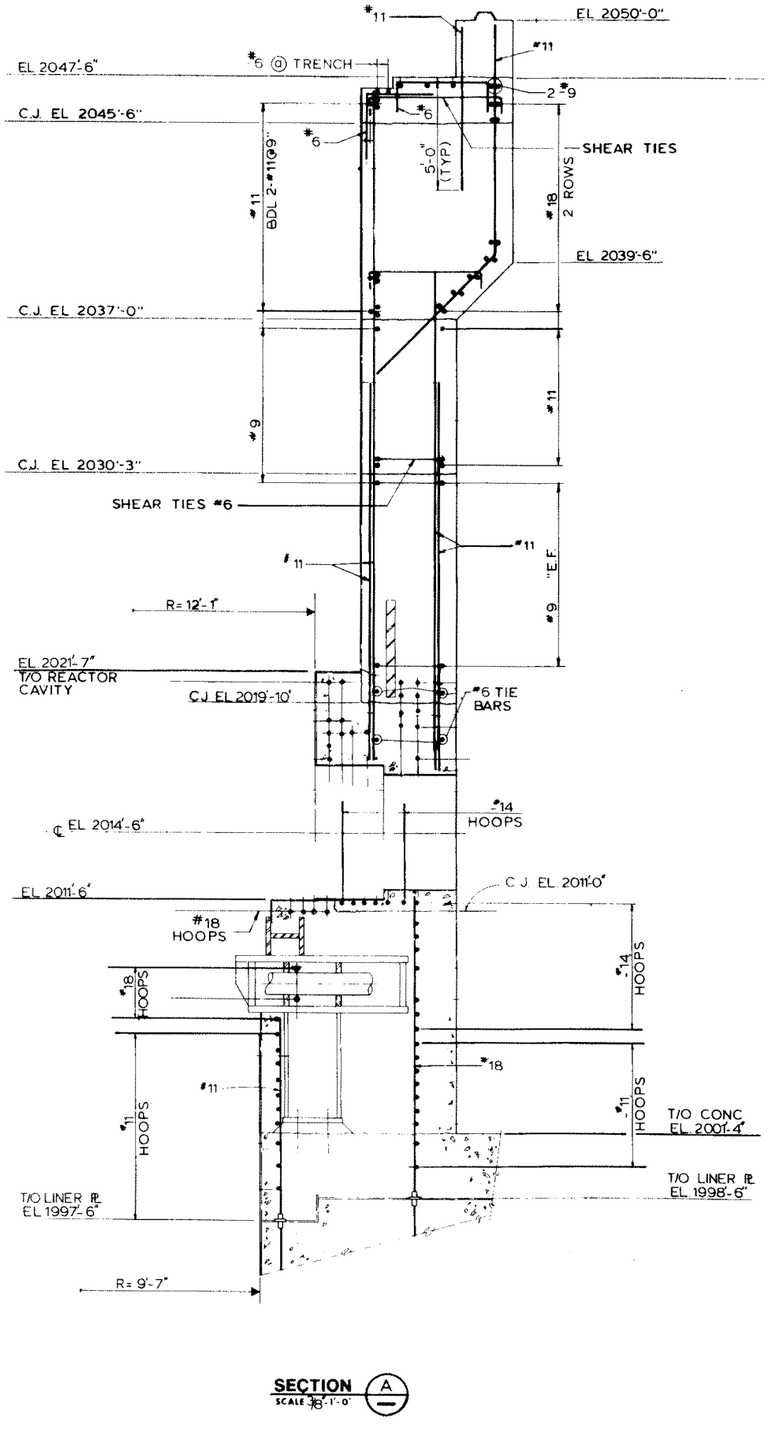
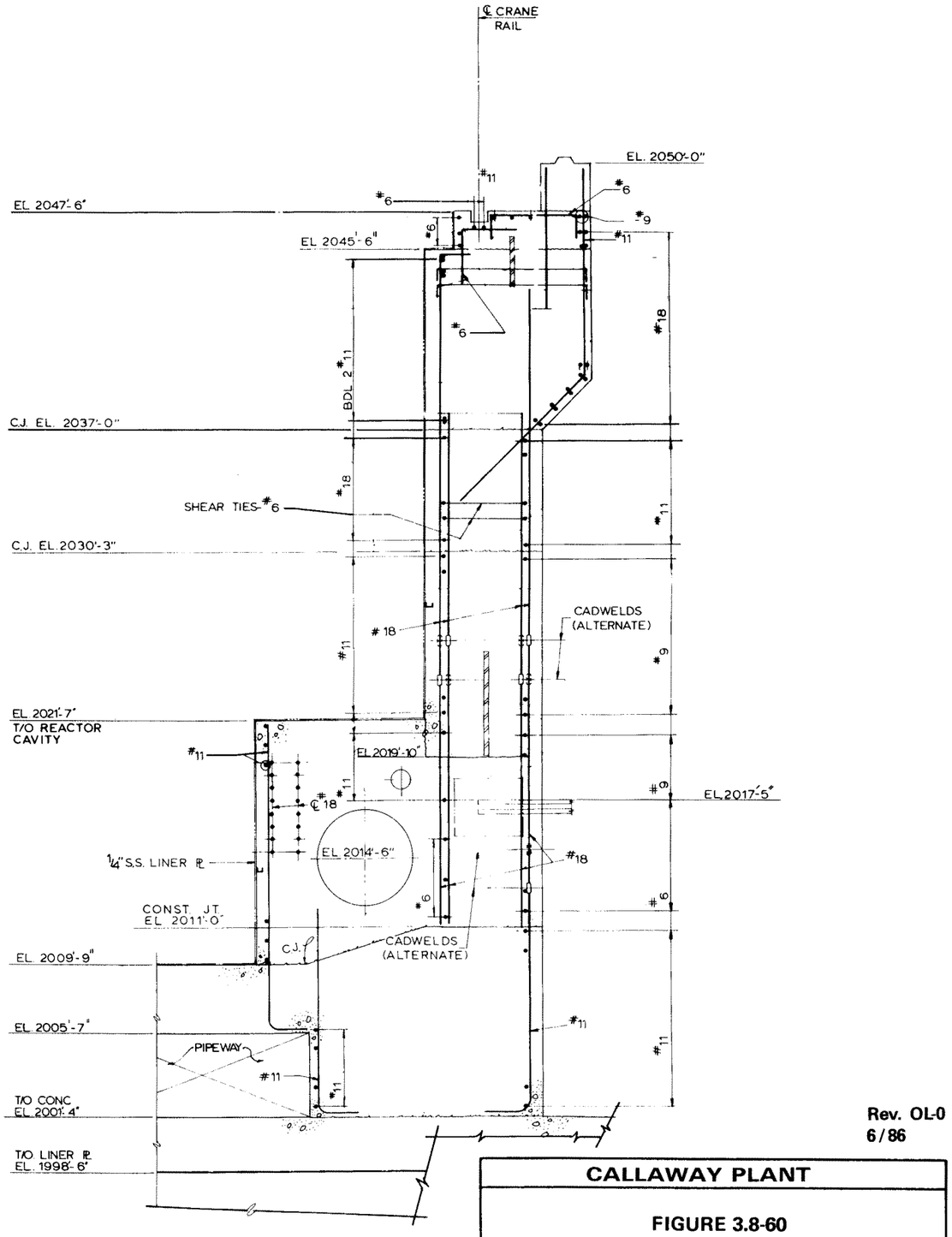
FIGURE 3.8-59

REACTOR CAVITY PLAN – ELEVATION 2011'-6" TO 2021'-7"



SECTION A
SCALE 3/8"-1'-0"



SECTION E

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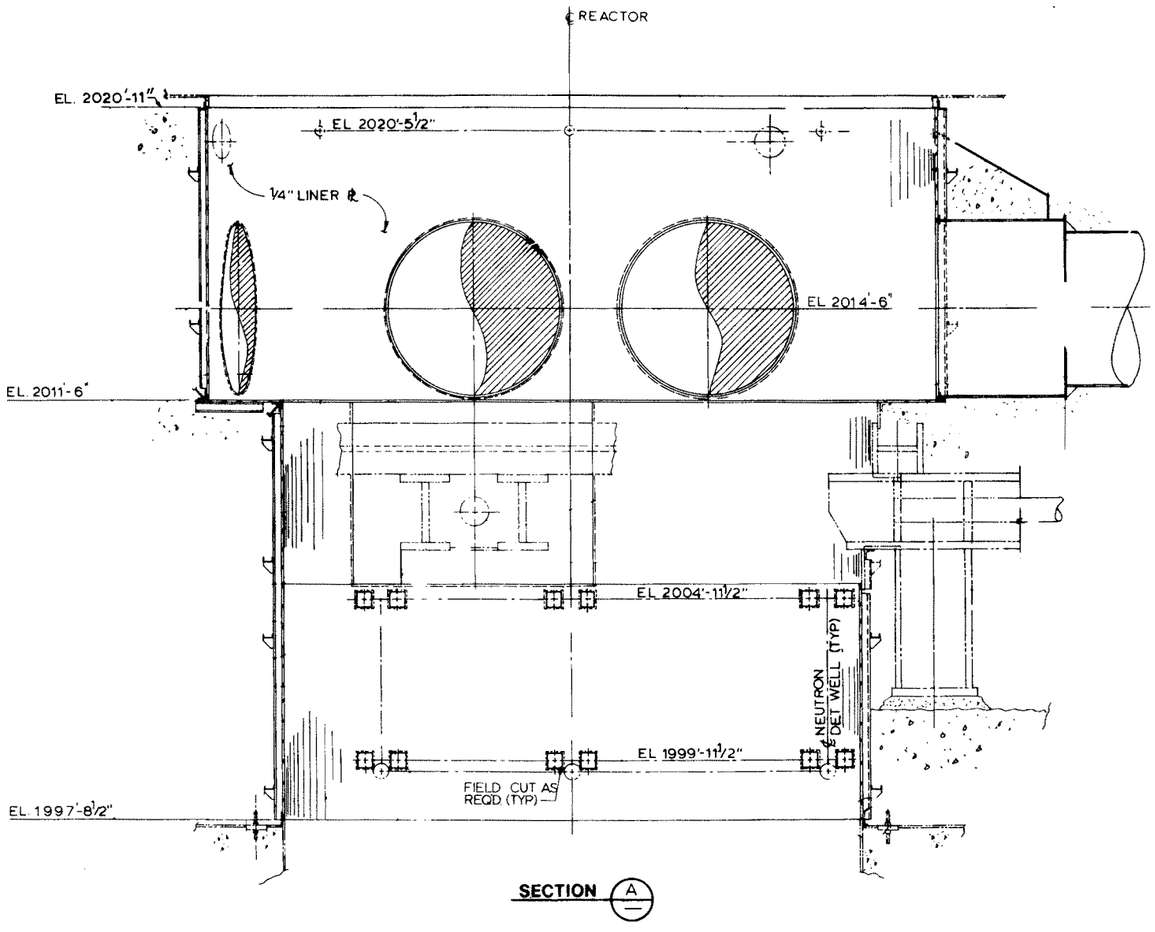
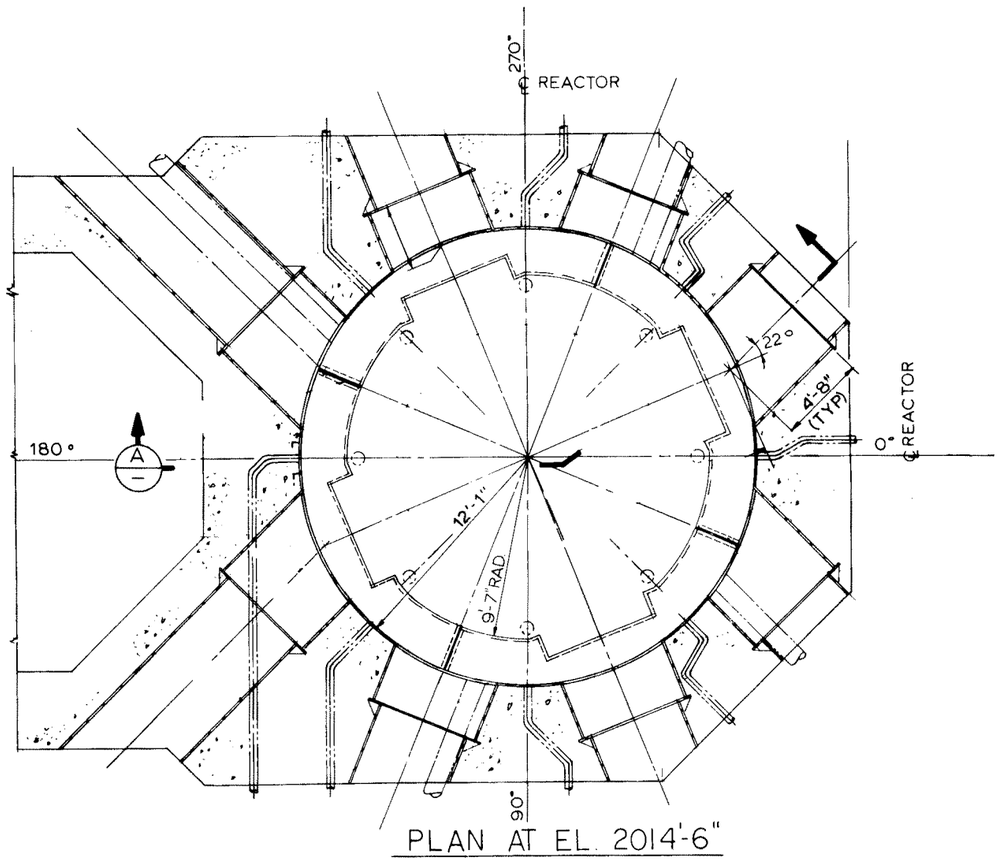
CALLAWAY PLANT

FIGURE 3.8-60

REACTOR CAVITY ELEVATIONS



SECTION A



PLAN AT EL. 2014'-6"

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FIGURE 3.8-61

REACTOR CAVITY NEAT LINE

Figure 3.8-61a has been deleted.

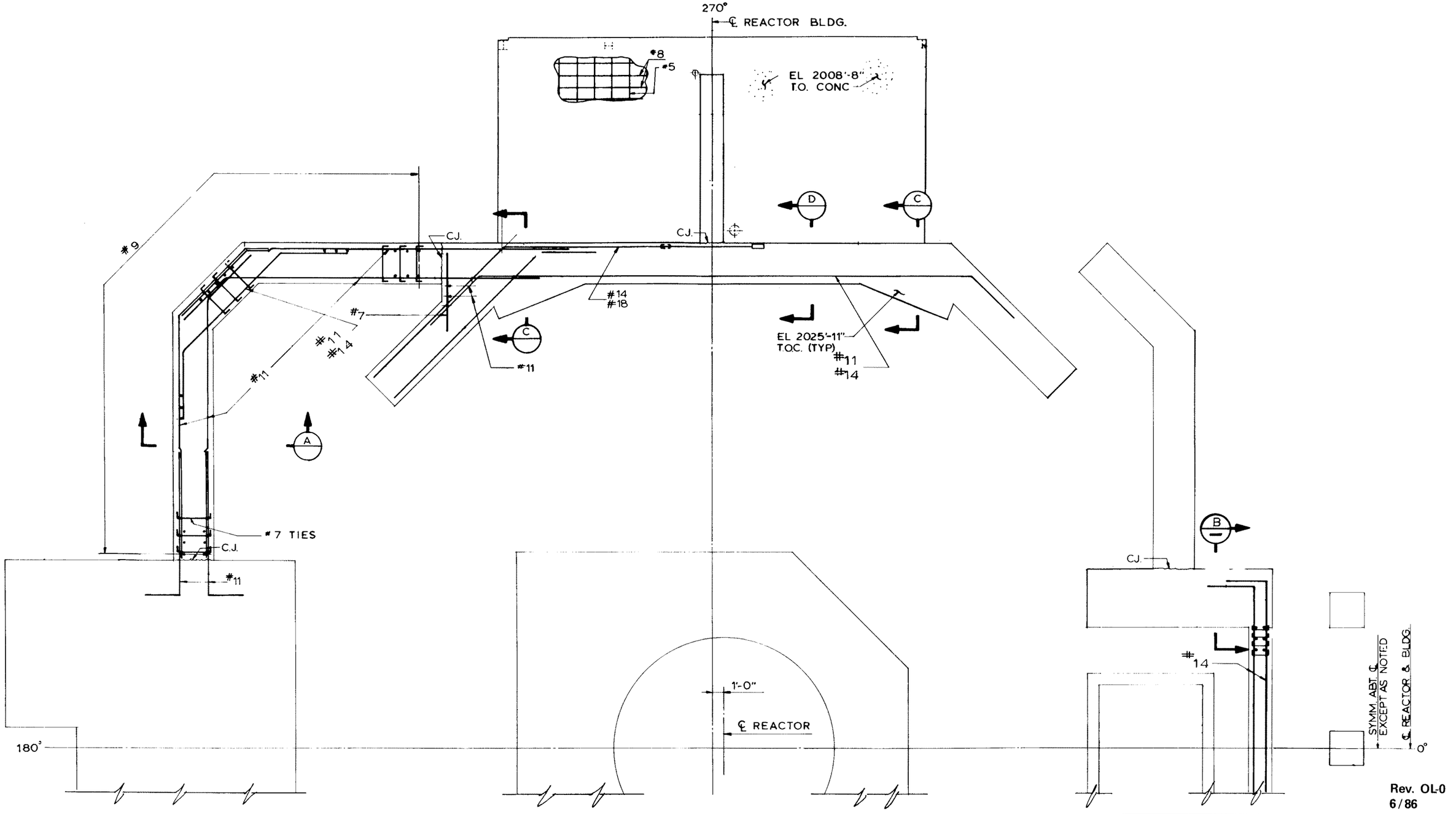

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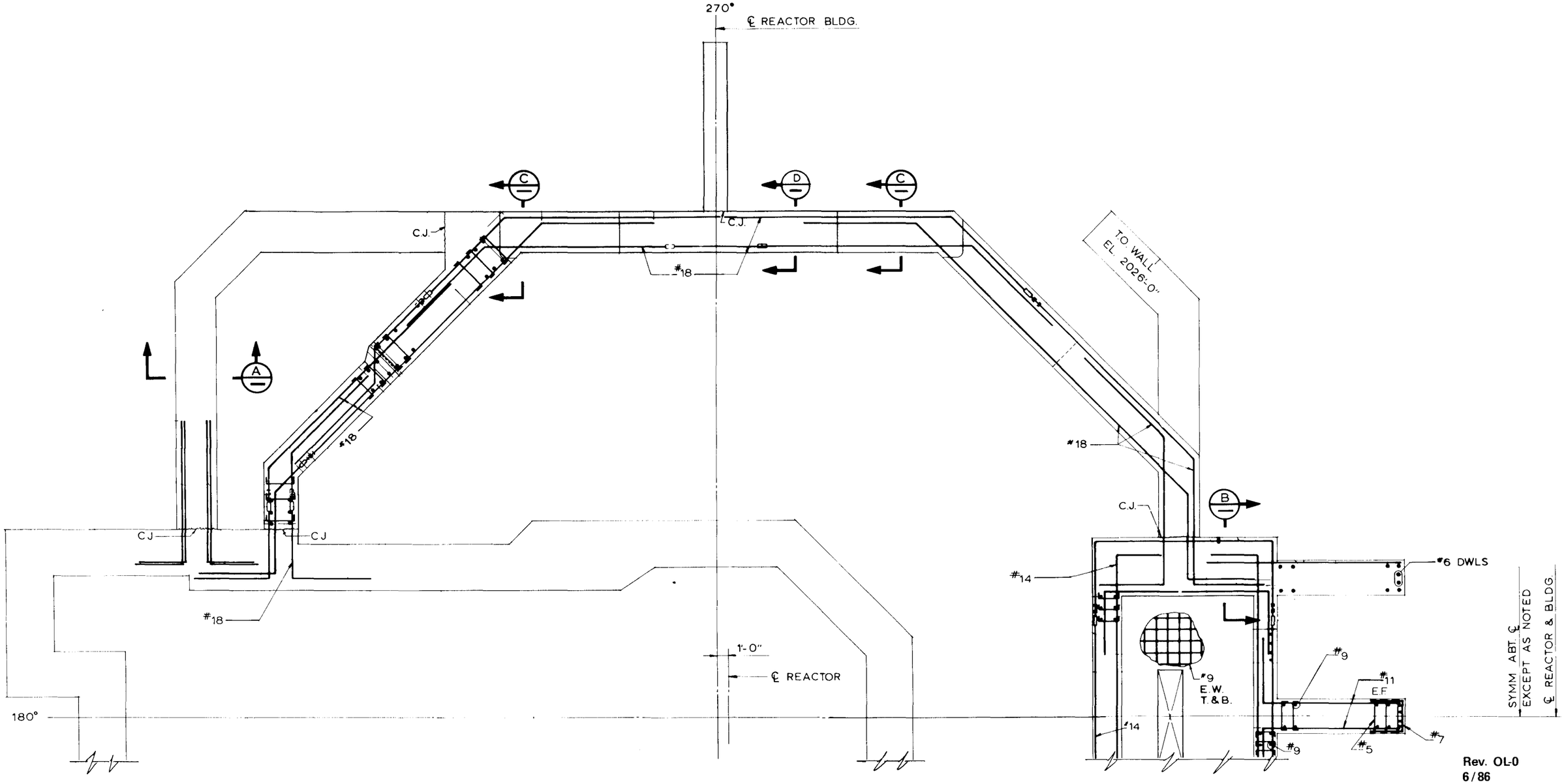
FIGURE 3.8-62

**SECONDARY SHIELD WALLS –
ELEVATION 2000'-0" TO 2025'-0"**



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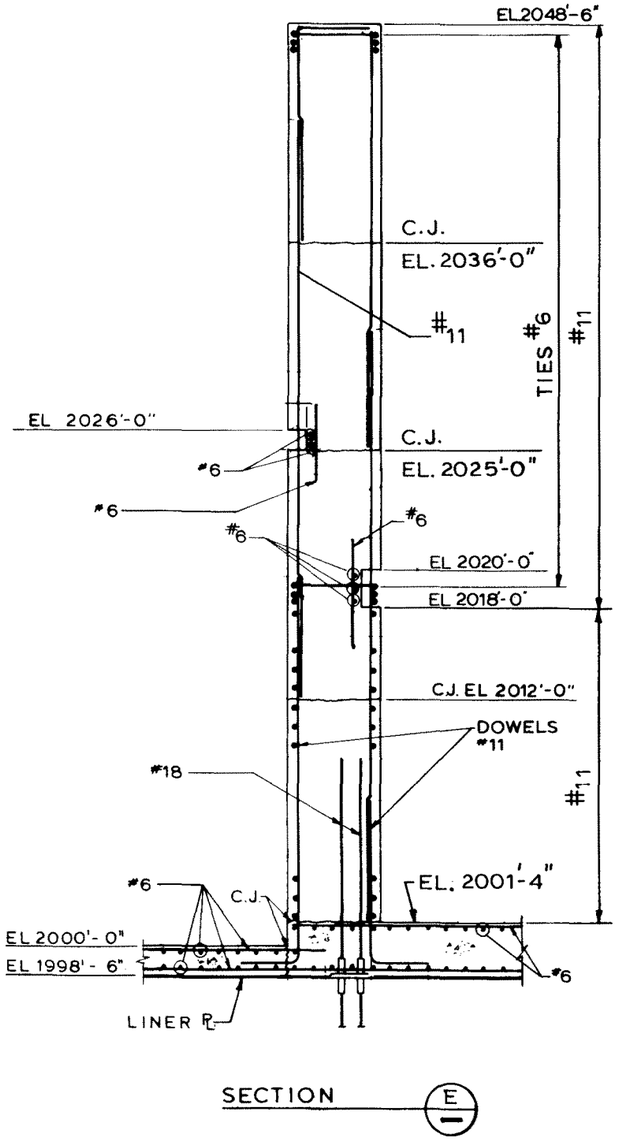
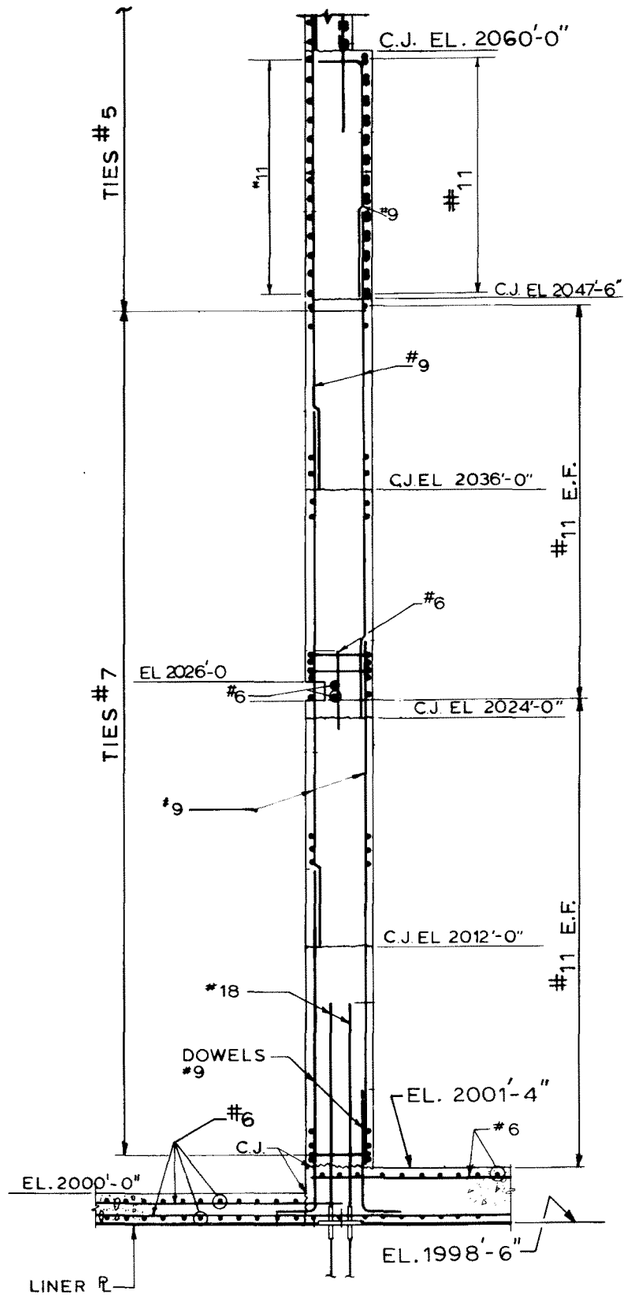
CALLAWAY PLANT

FIGURE 3.8-63

SECONDARY SHIELD WALLS –
ELEVATION 2025'-0" TO 2047'-0"



SECTION E



SECTION A

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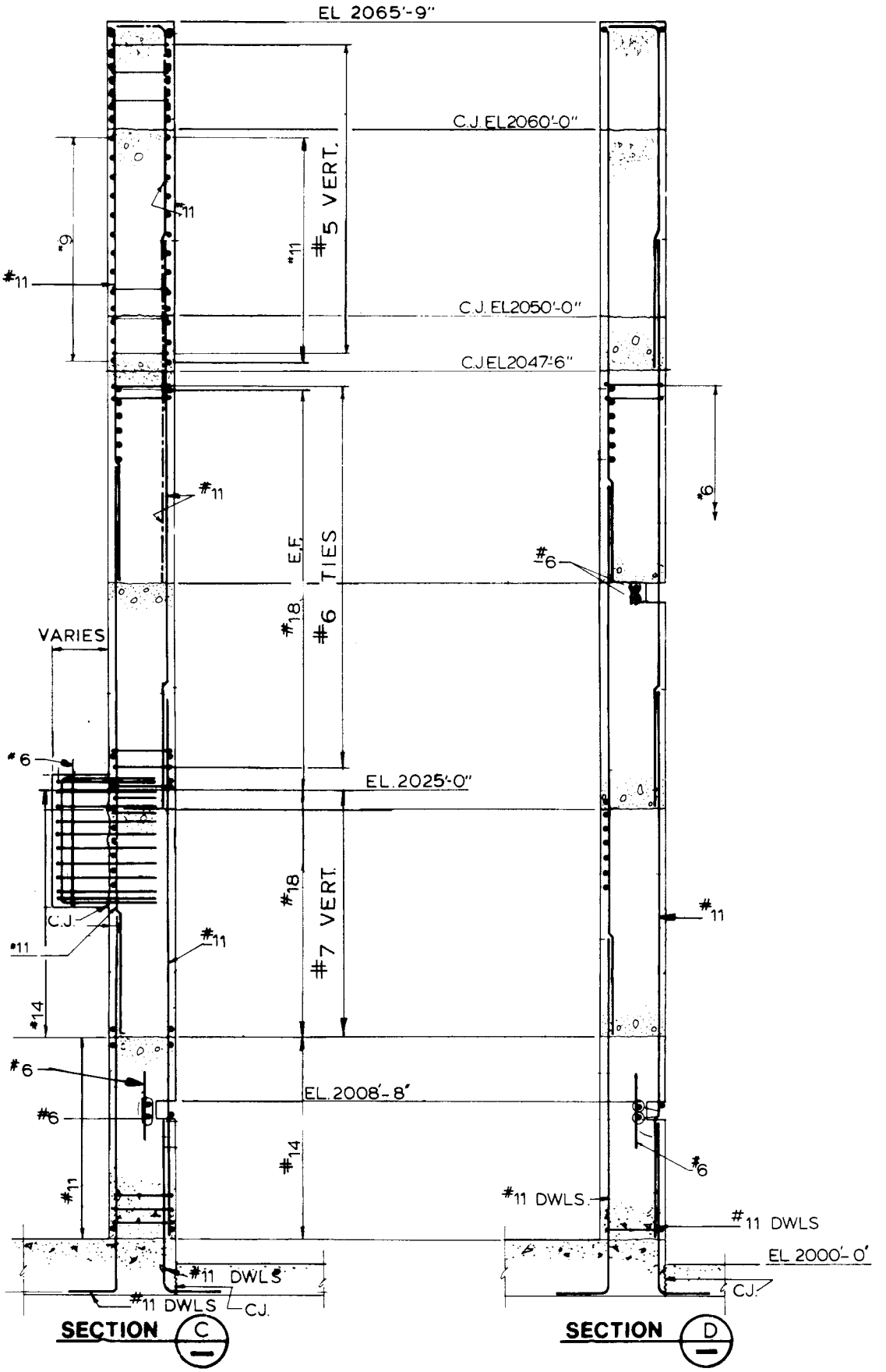
FIGURE 3.8-64

SECONDARY SHIELD WALLS – SECTIONS



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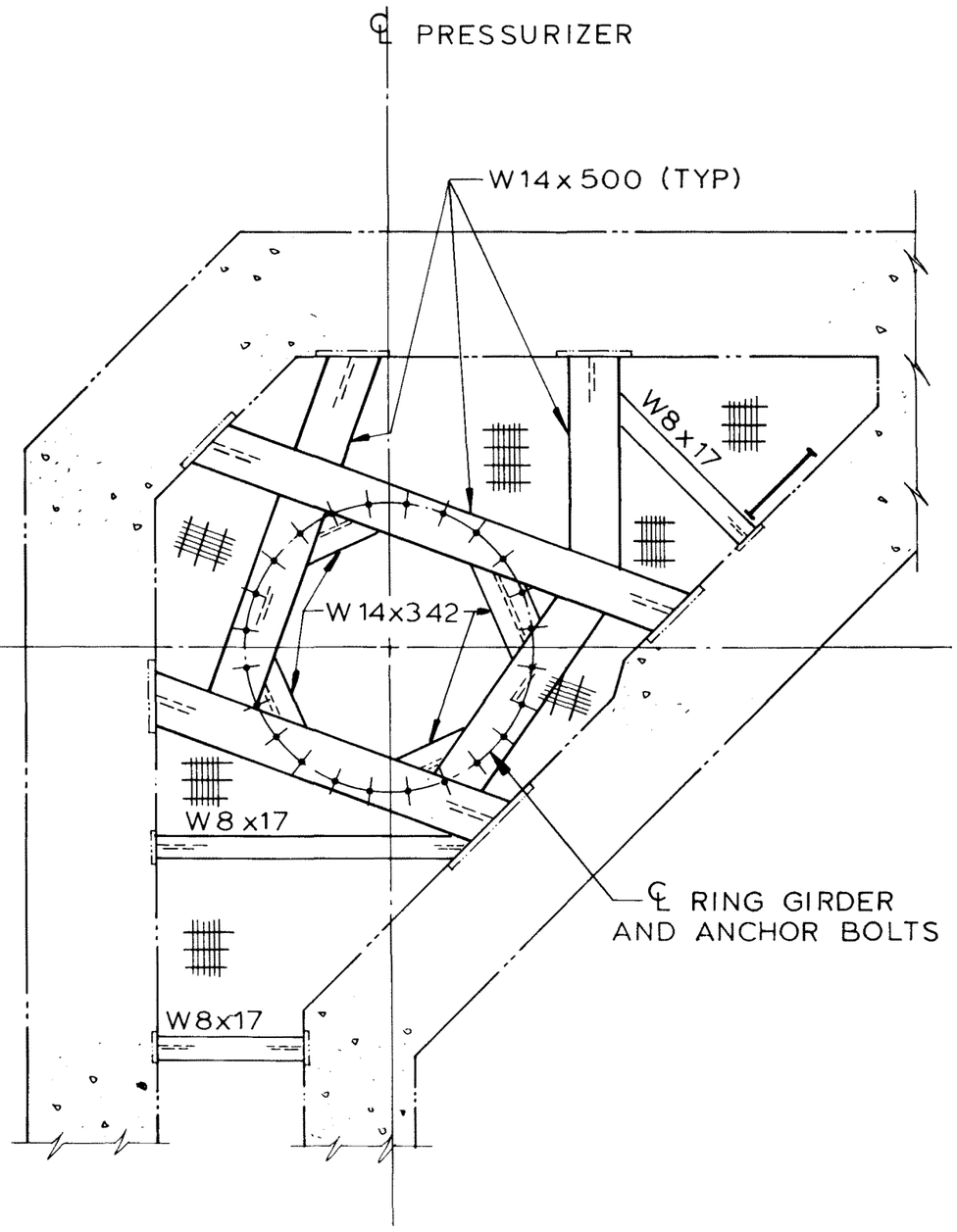
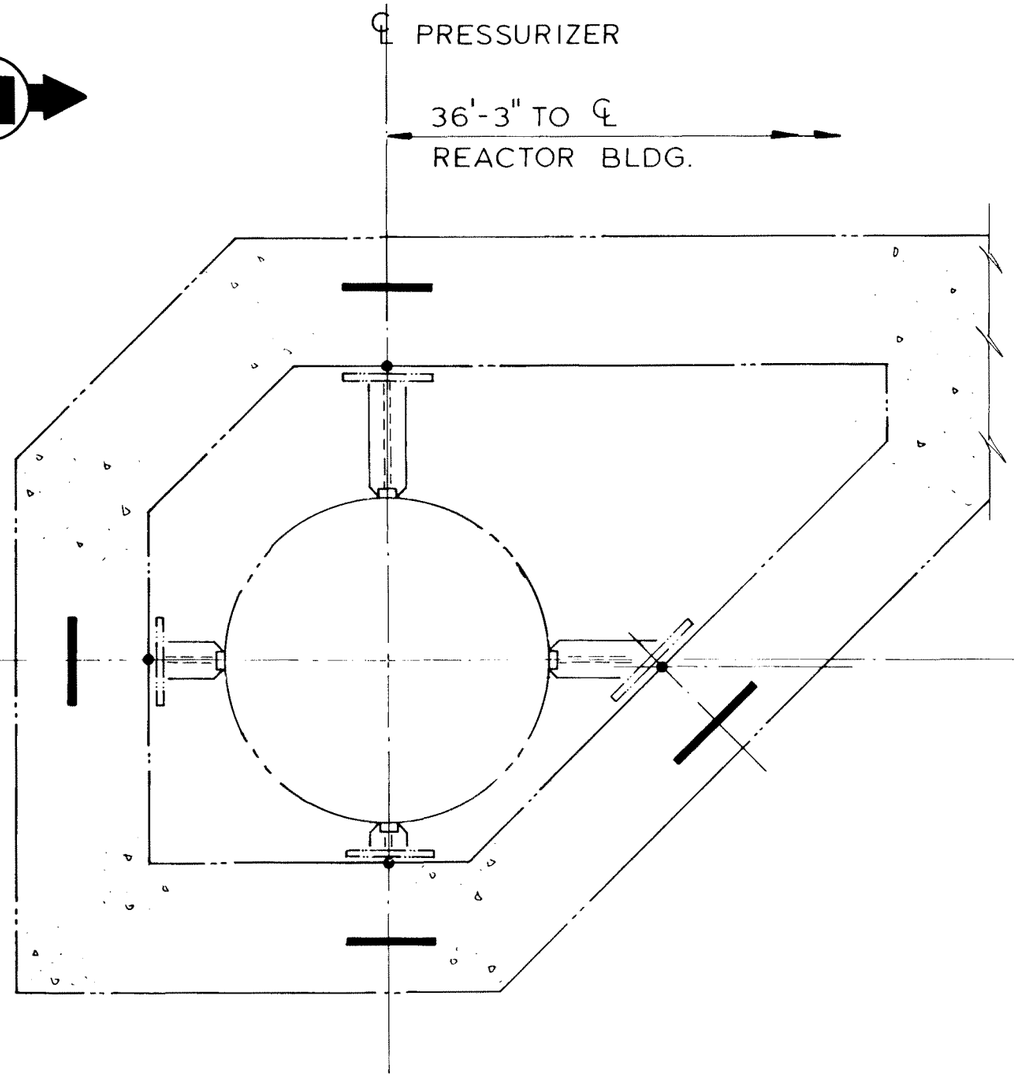
CALLAWAY PLANT

FIGURE 3.8-65

**SECONDARY SHIELD WALLS –
ADDITIONAL SECTIONS**



PRESSURIZER SUPPORT
AT EL 2029'-6"



PRESSURIZER UPPER
LATERAL SUPPORTS

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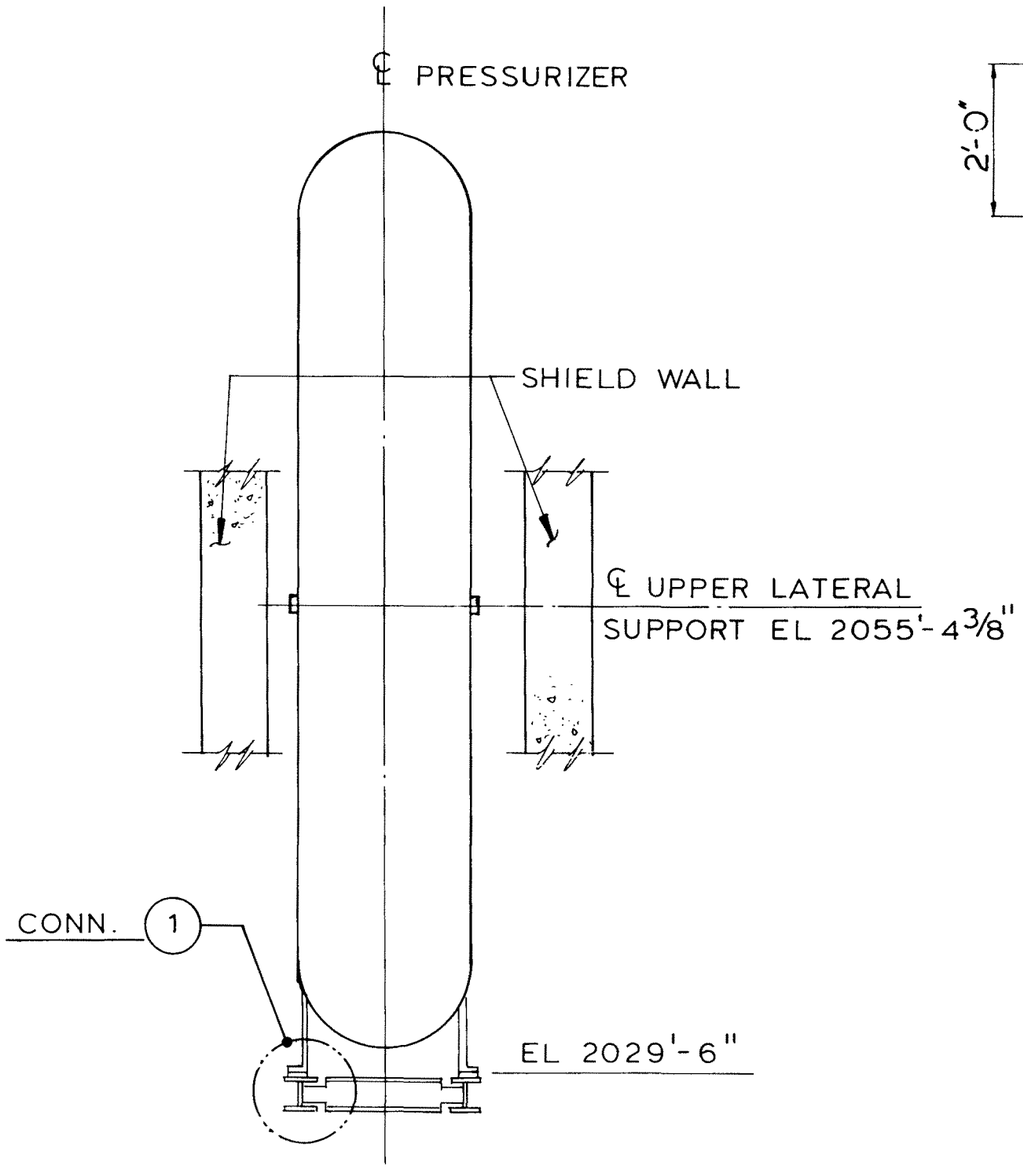
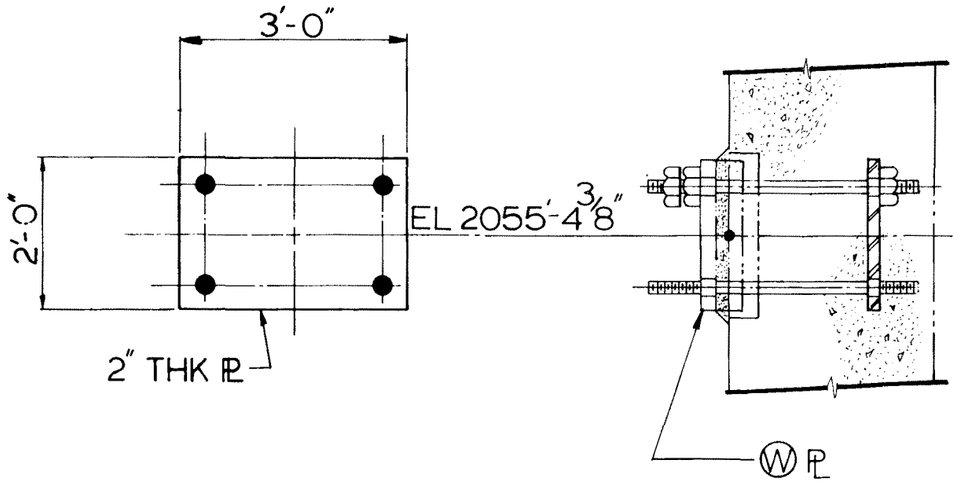
CALLAWAY PLANT

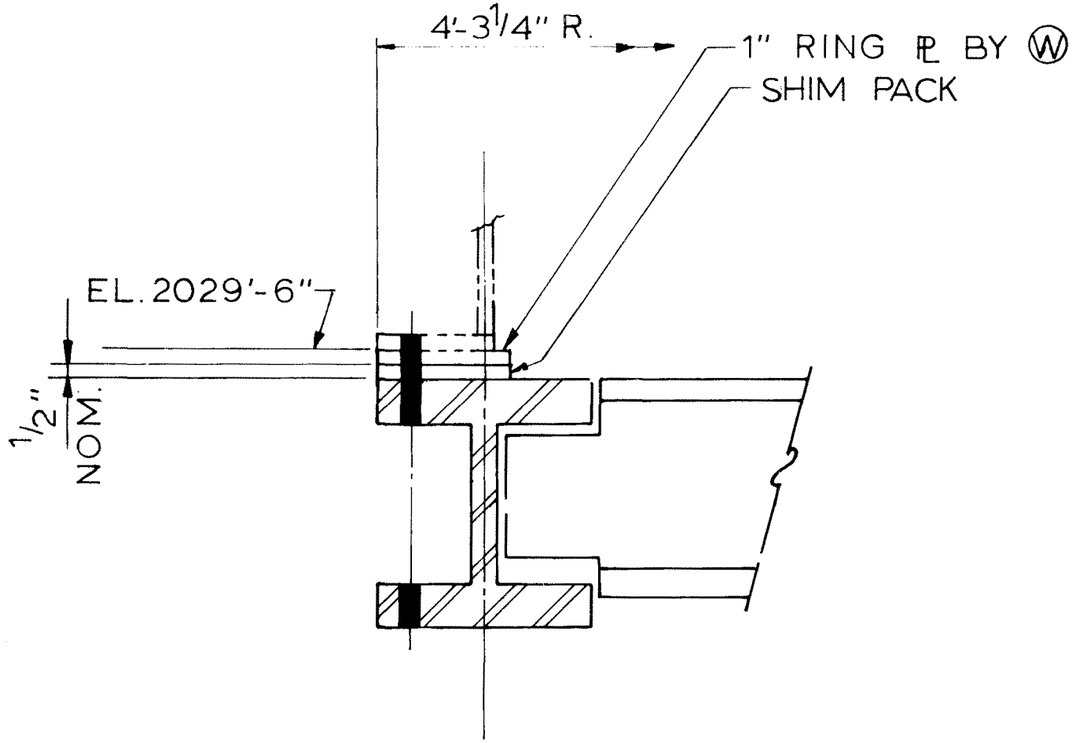
FIGURE 3.8-66

PRESSURIZER SUPPORTS



PRESSURIZER





CONNECTION 1

SCALE: 1" = 1'-0"

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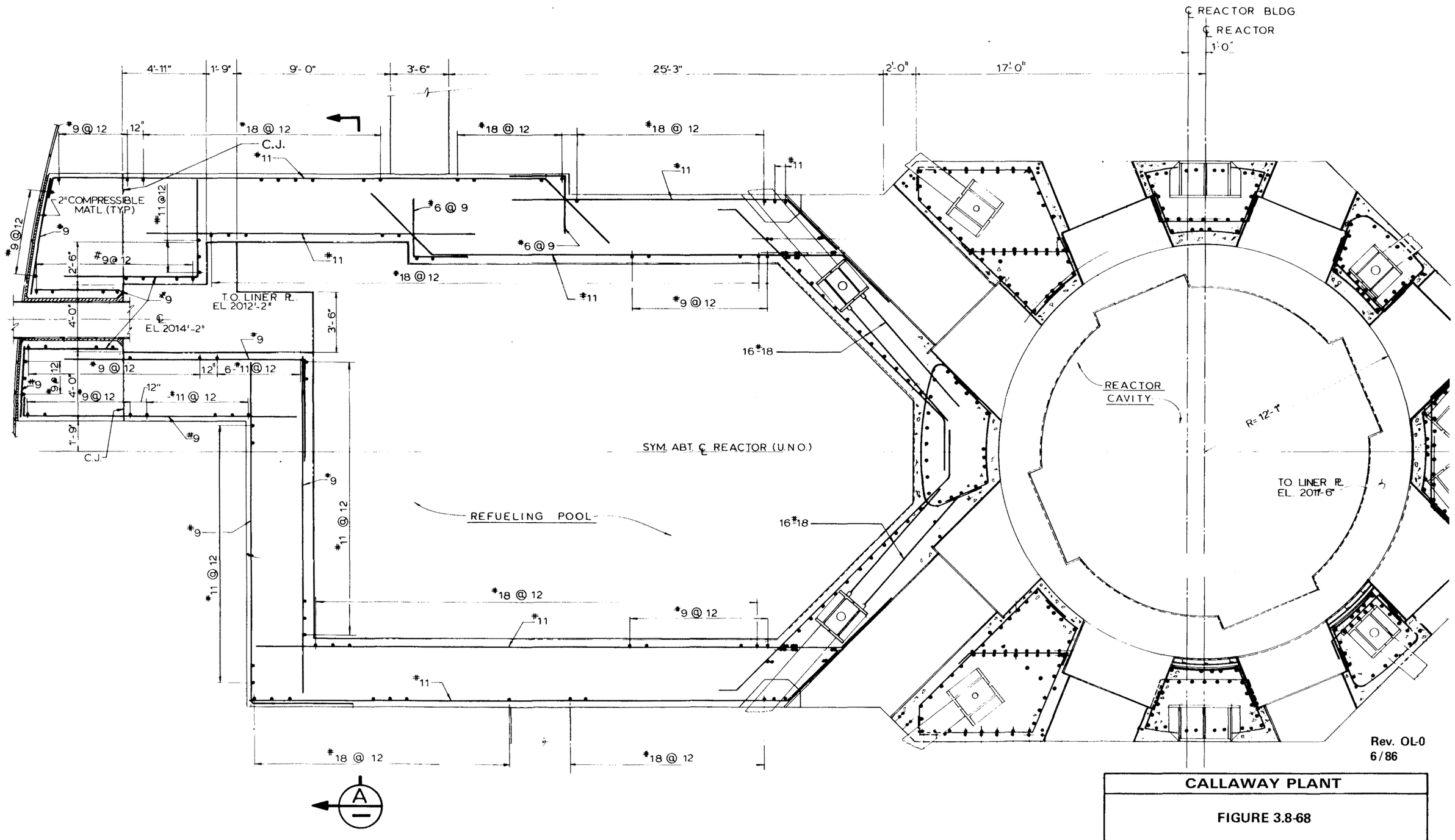
CALLAWAY PLANT

FIGURE 3.8-67

PRESSURIZER SUPPORT DETAILS



PLAN @ EL. 2011'-6" TO EL. 2017'-5"

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CALLAWAY PLANT

FIGURE 3.8-68

REFUELING CANAL – TYPICAL PLAN

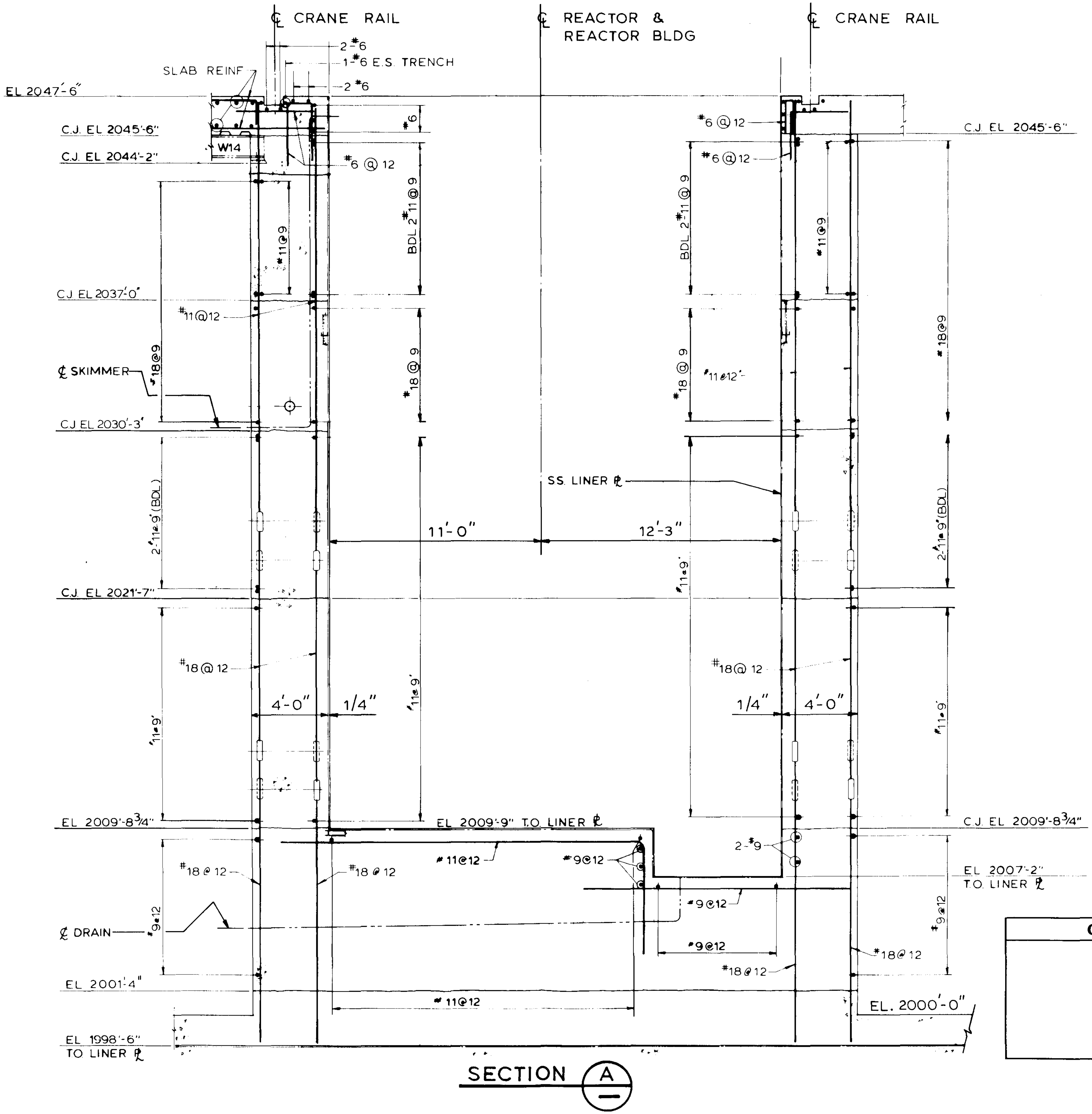

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FIGURE 3.8-69

REFUELING POOL
TYPICAL CROSS SECTION

FSAR Figure 3.8-70 is withheld per RIS 2015-17

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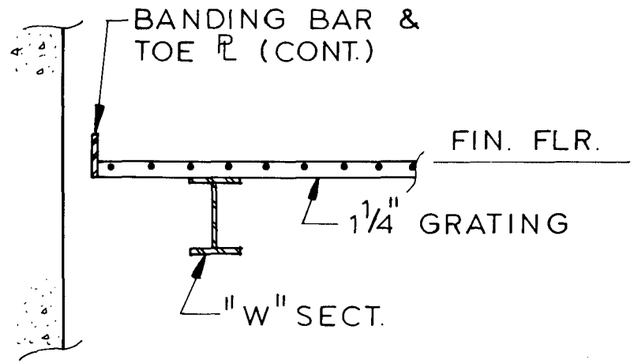
CALLAWAY PLANT

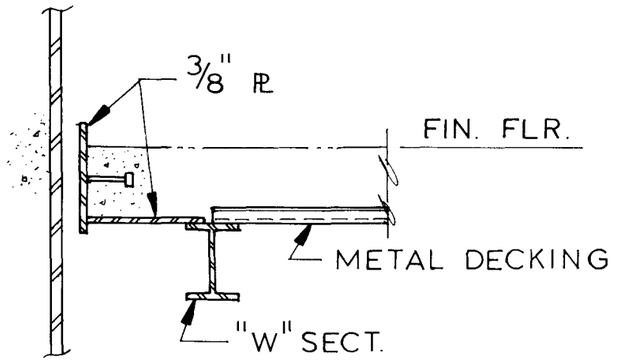
FIGURE 3.8-70

REACTOR BUILDING
OPERATING FLOOR

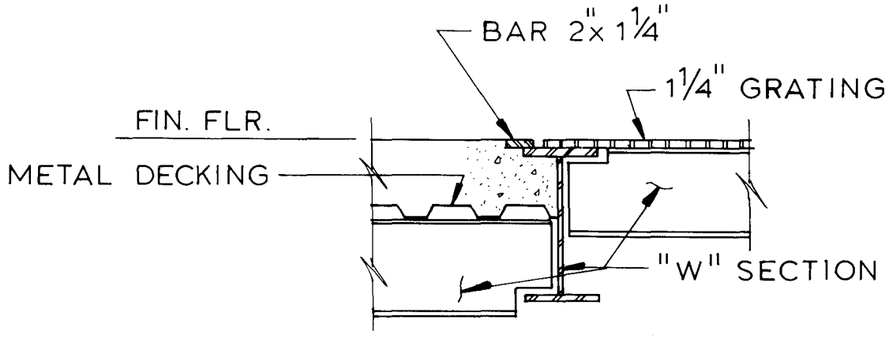
FSAR Figure 3.8-70 is withheld per RIS 2015-17



SECTION B



SECTION A



SECTION C

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CALLAWAY PLANT

FIGURE 3.8-71

REACTOR BUILDING OPERATING FLOOR SUPPORTS AT SHELL

FSAR Figure 3.8-72 is withheld per RIS 2015-17

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CALLAWAY PLANT

FIGURE 3.8-72

REACTOR BUILDING INTERMEDIATE
FLOOR AT ELEVATION 2026'-0"

FSAR Figure 3.8-72 is withheld per RIS 2015-17

FSAR Figure 3.8-73 is withheld per RIS 2015-17

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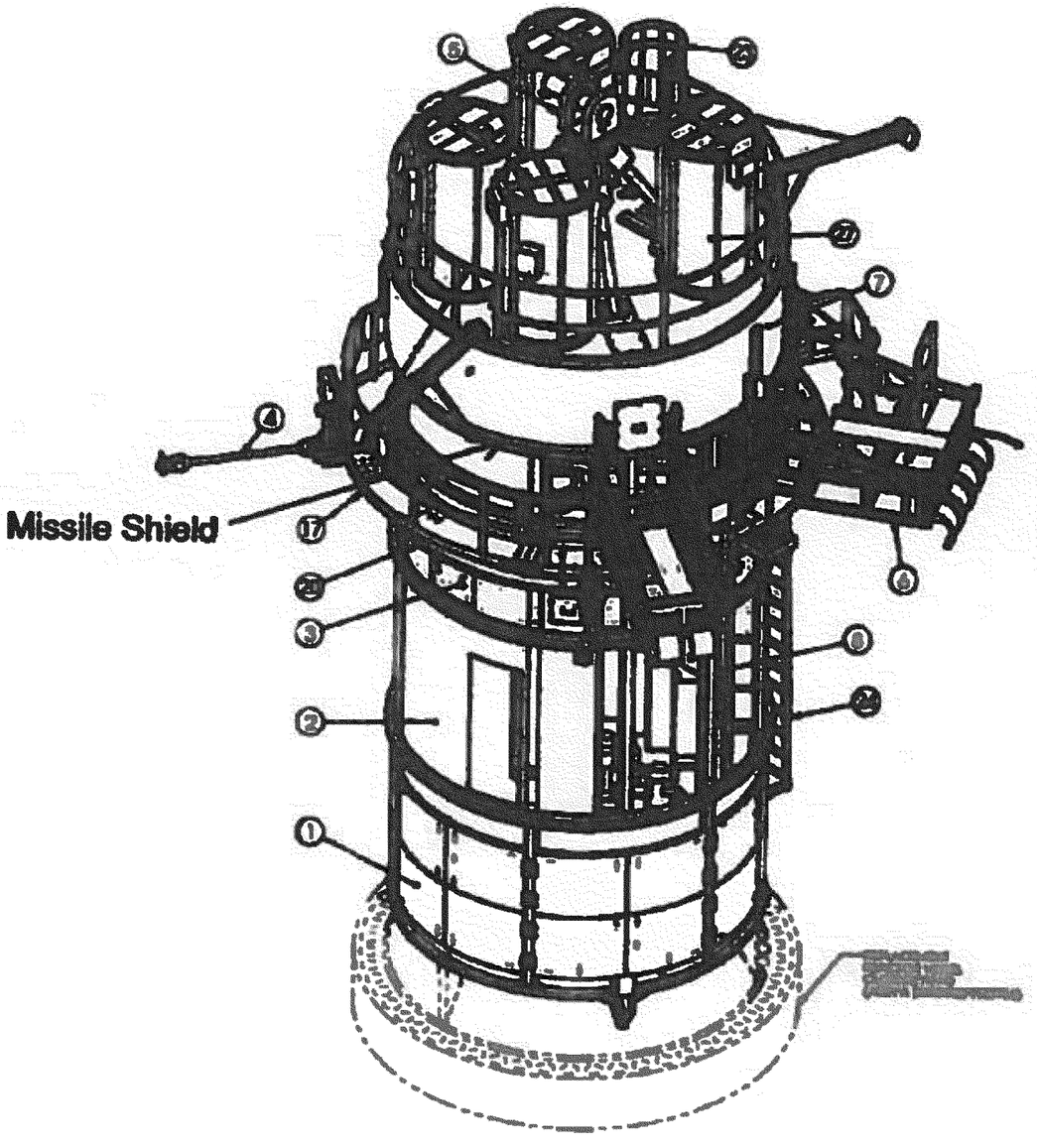
5/06

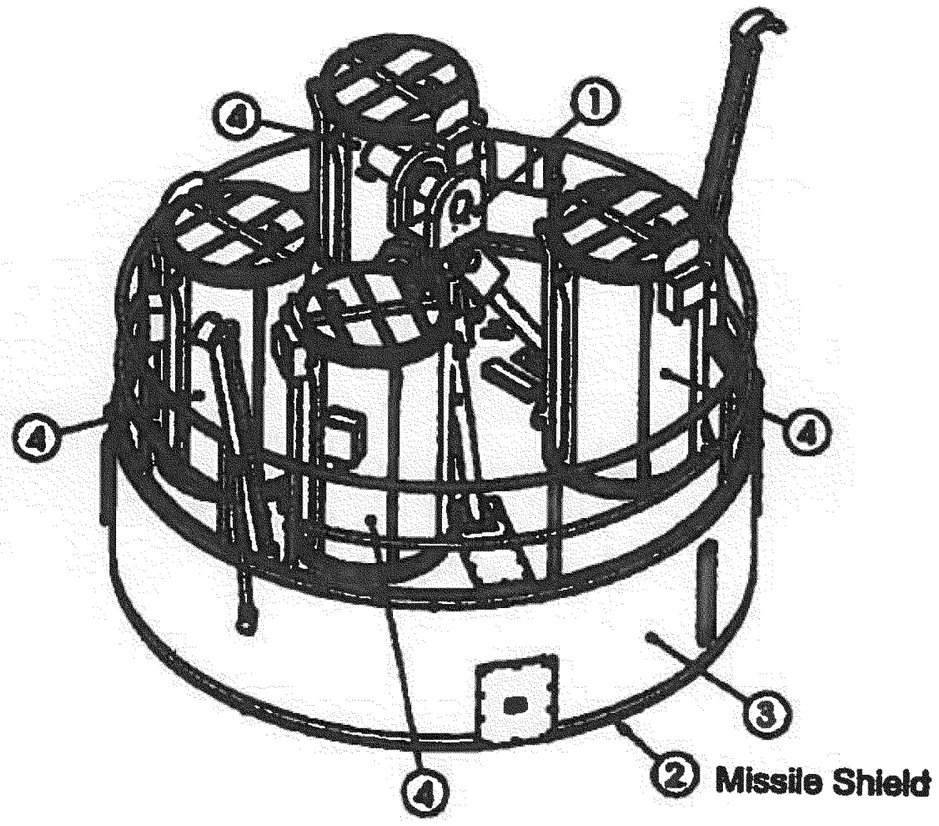
CALLAWAY PLANT

FIGURE 3.8-73

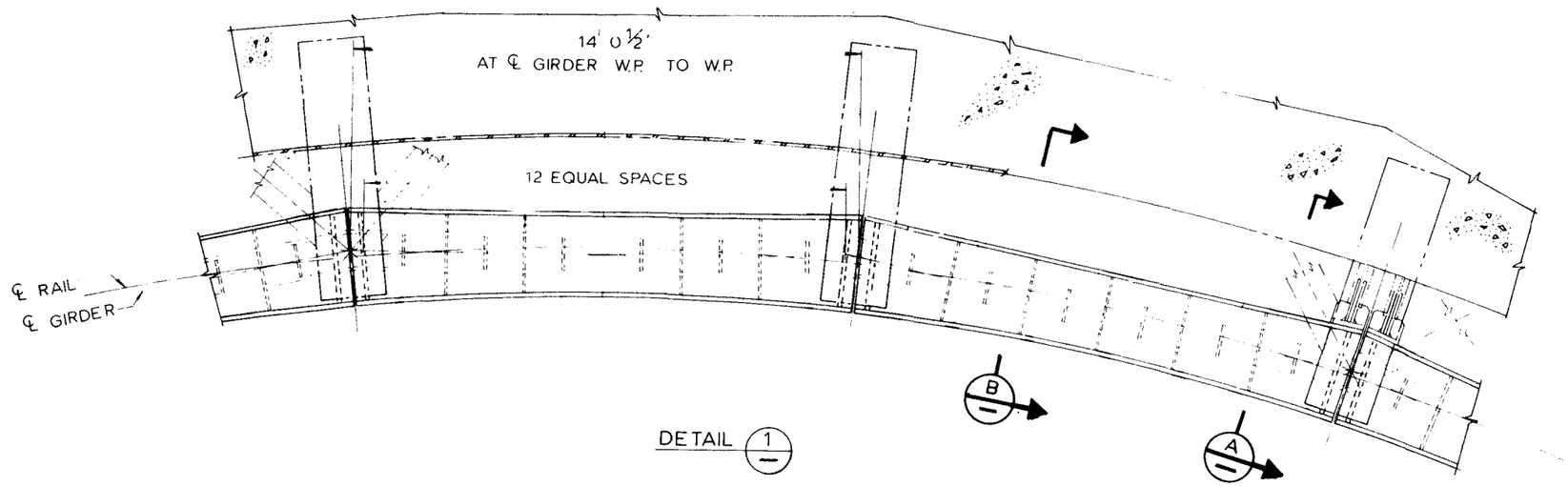
REACTOR BUILDING INTERMEDIATE FLOOR AT ELEVATION 2068'-6"

FSAR Figure 3.8-73 is withheld per RIS 2015-17

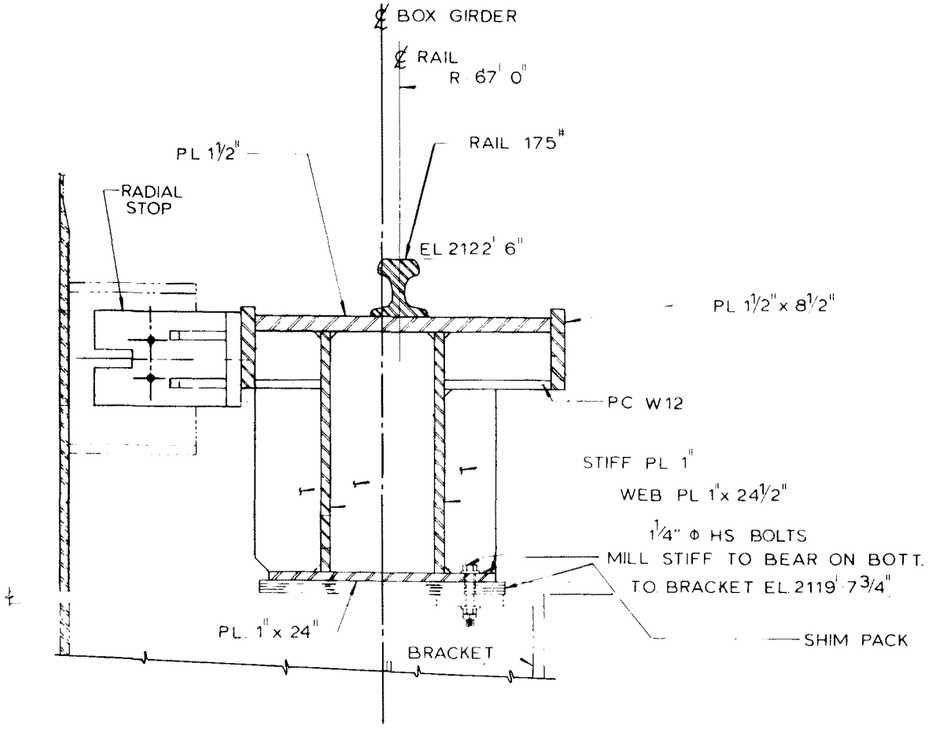




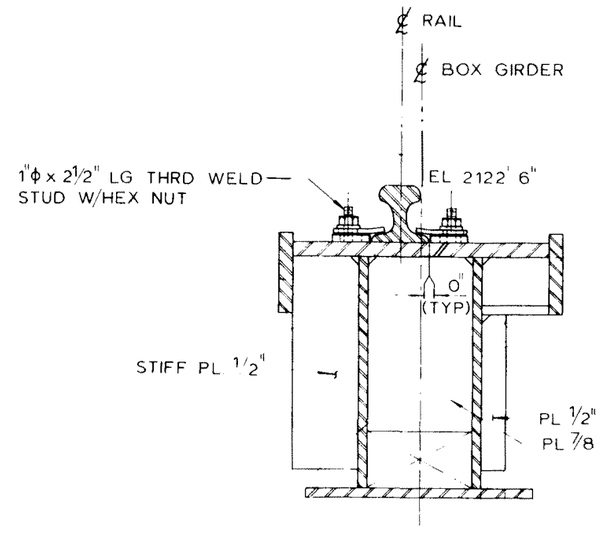
CALLAWAY PLANT
FIGURE 3.8-74 REACTOR MISSILE SHIELD (INTEGRATED INTO THE INTEGRATED HEAD ASSEMBLY) REV. 1 5/15



DETAIL 1



SECTION A



SECTION B

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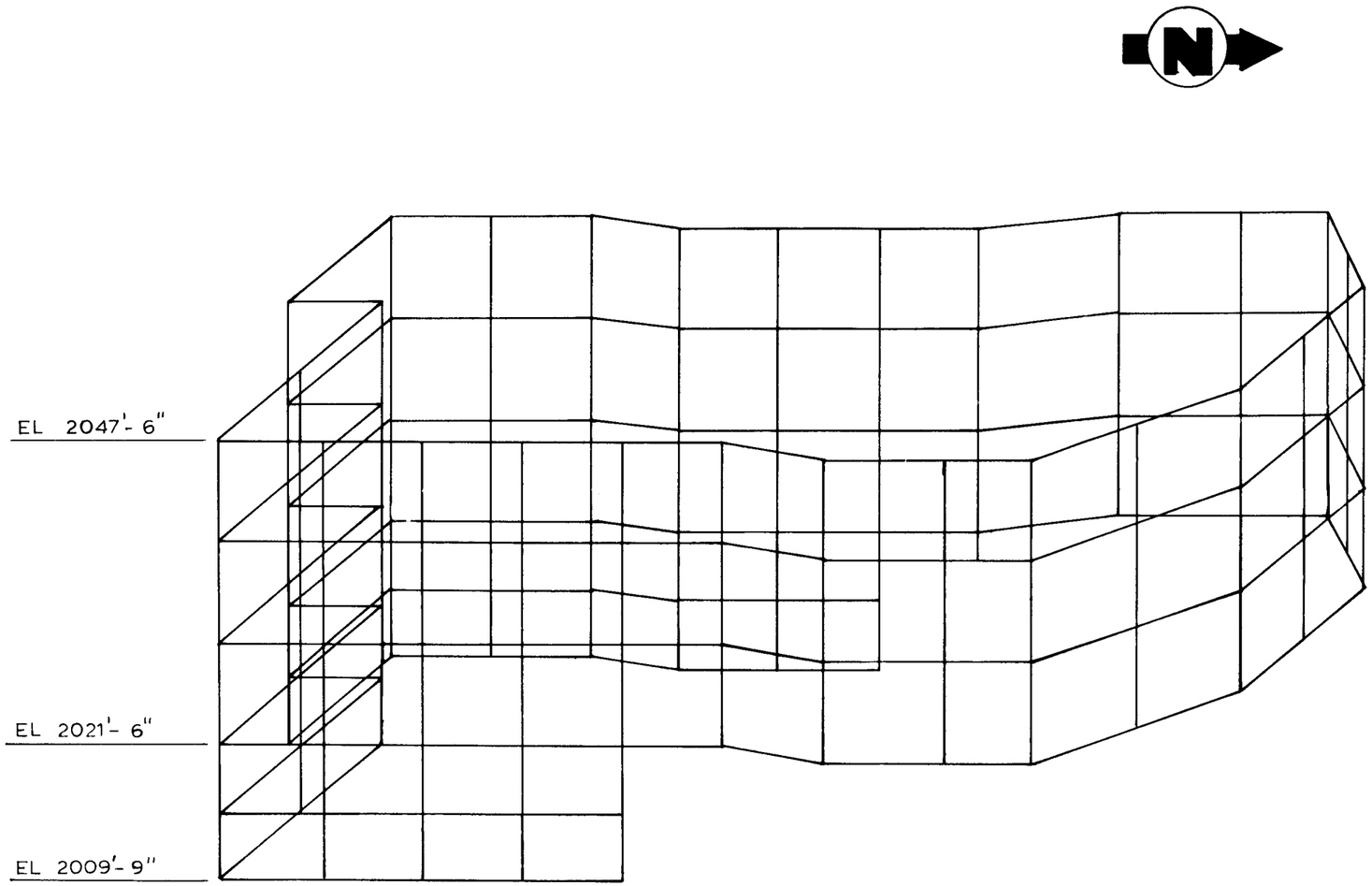
CALLAWAY PLANT

FIGURE 3.8-75

REACTOR BUILDING
POLAR CRANE SUPPORT SYSTEM

Figure 3.8-76 Deleted



NOTE: BOUNDARY ELEMENTS ARE NOT SHOWN FOR CLARITY.
MODEL IS "FIXED" ALONG ENTIRE BOTTOM EDGE.
TOP EDGE IS "FREE", EXCEPT LATERAL RESTRAINT IS
PROVIDED AT NORTHERN PORTION TO ACCOUNT
FOR THE SEAL TABLE.

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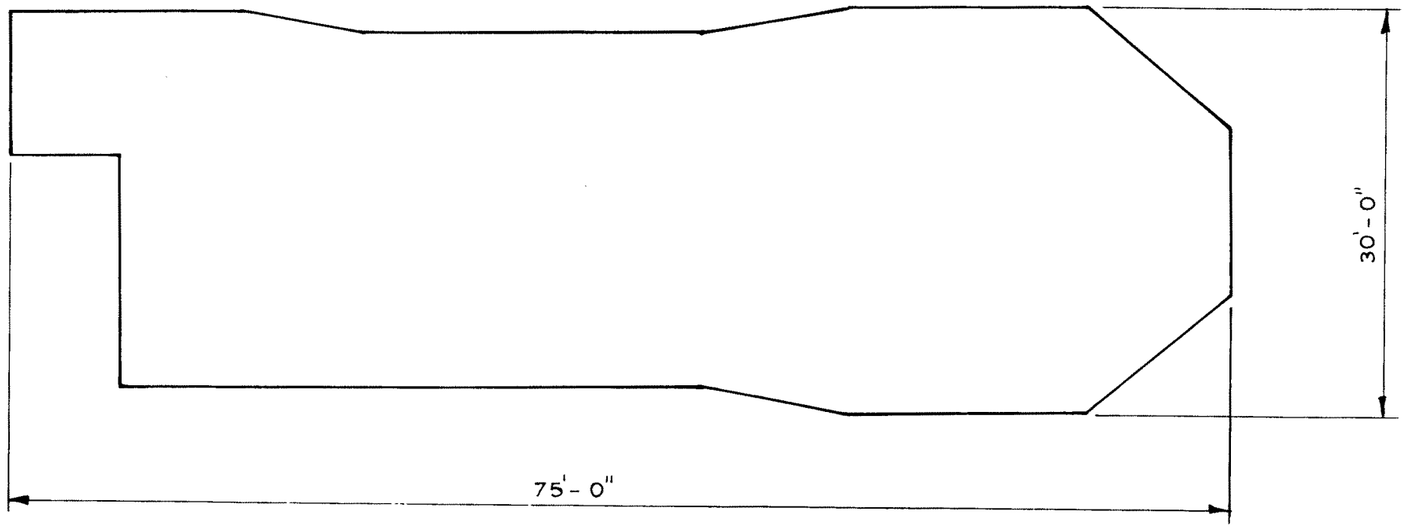
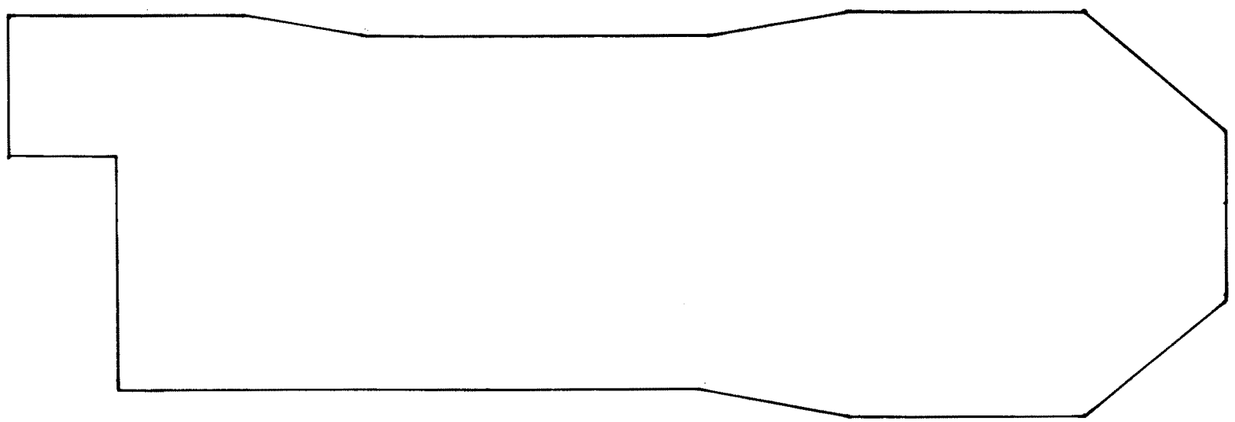
CALLAWAY PLANT

FIGURE 3.8-77

REFUELING POOL FINITE ELEMENT MODEL - ISOMETRIC



PLAN ELEV. 2047'-6"



PLAN ELEV. 2021'-6"

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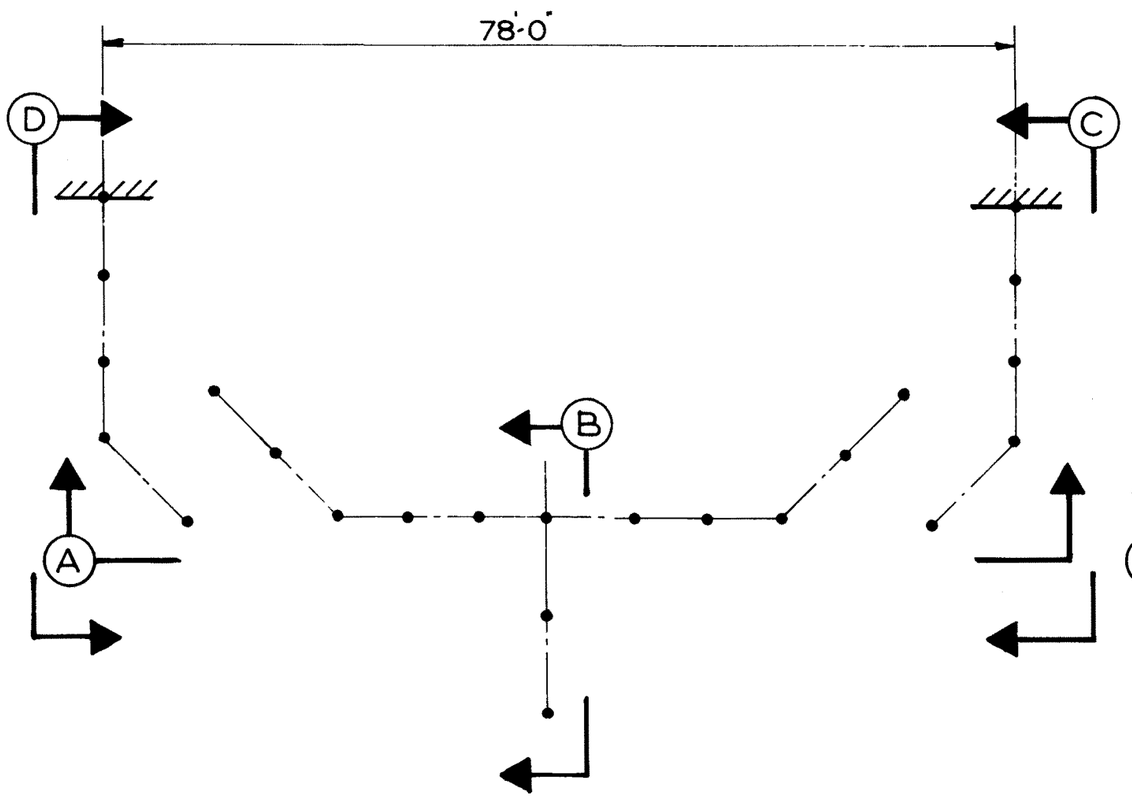
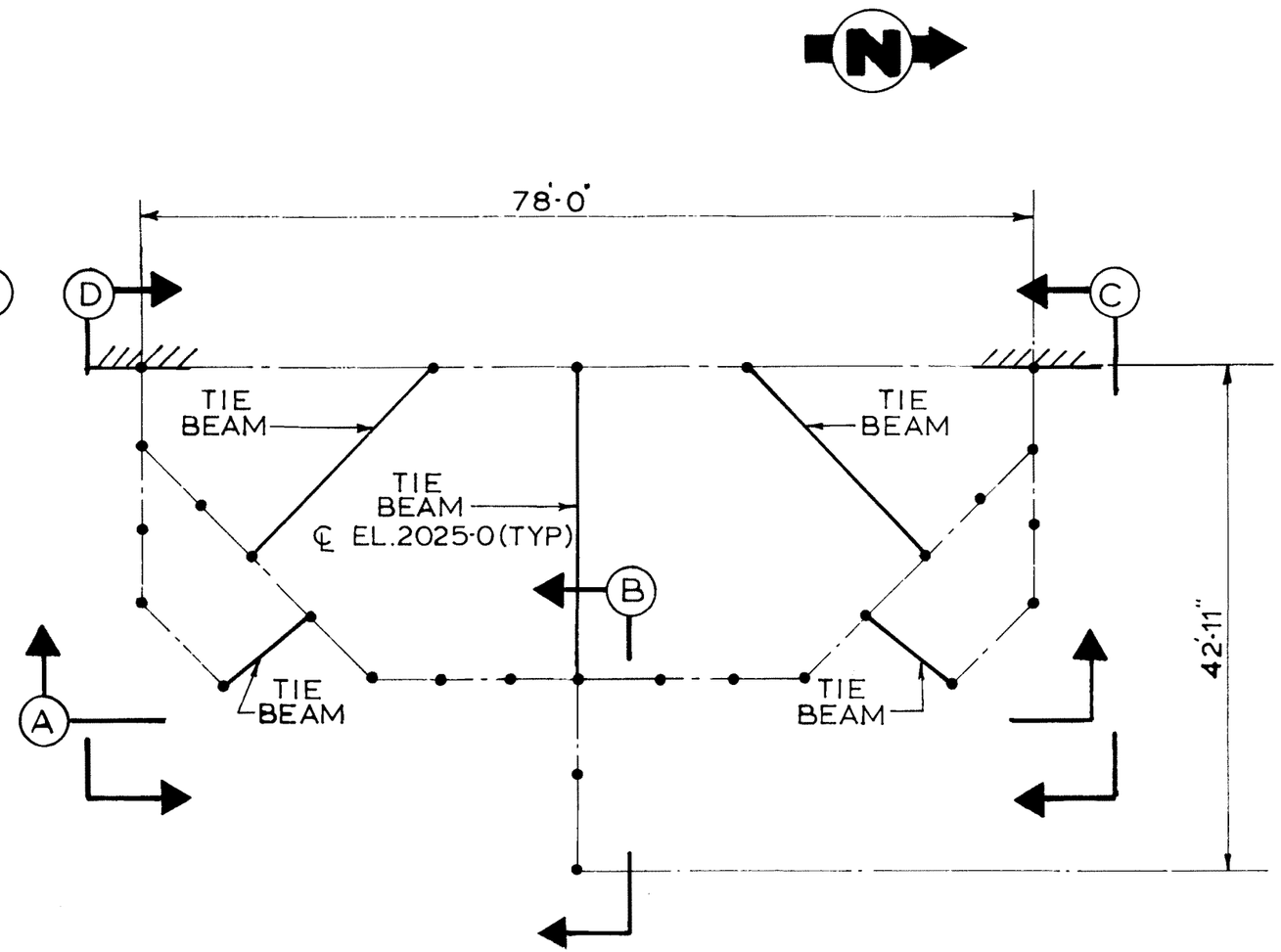
CALLAWAY PLANT

FIGURE 3.8-78

REFUELING POOL FINITE ELEMENT MODEL - PLAN VIEWS



PLAN FROM EL.2000'-0"
TO EL.2025'-0"



PLAN AT EL.2025'-0"

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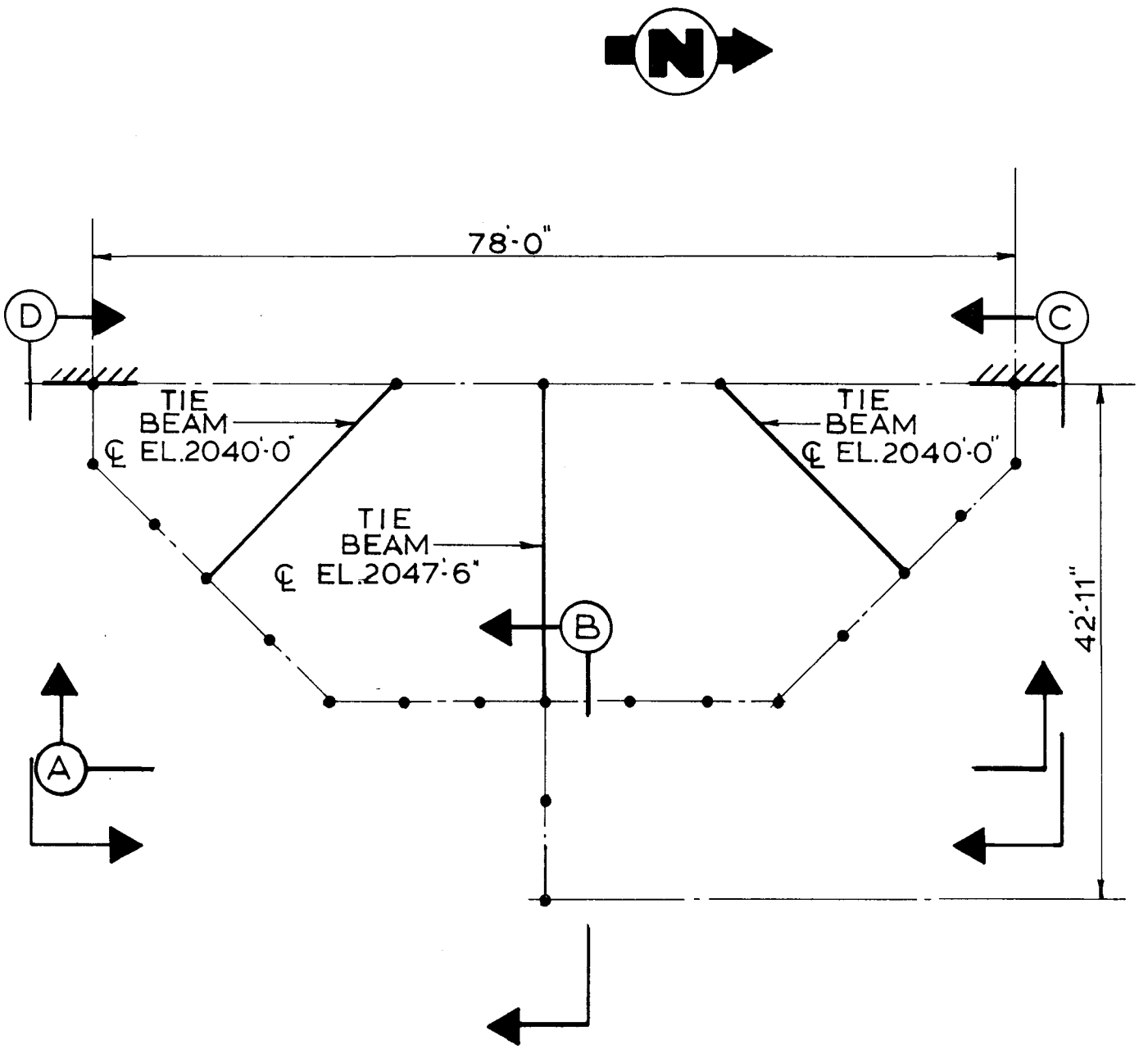
CALLAWAY PLANT

FIGURE 3.8-79

**SECONDARY SHIELD WALL EAST SIDE
FINITE ELEMENT MODEL - PLAN VIEWS**



PLAN FROM EL.2025'-0"
TO EL.2047'-6"

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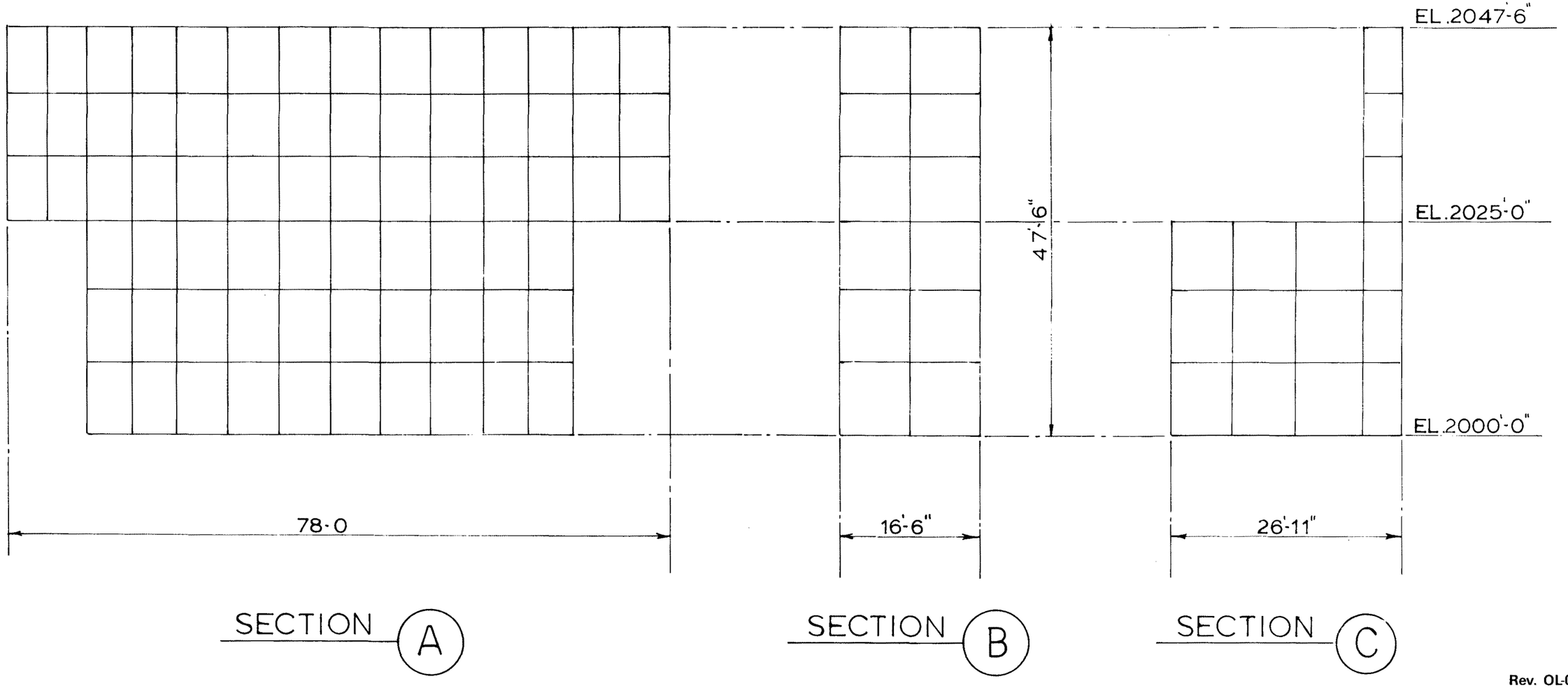
CALLAWAY PLANT

FIGURE 3.8-80

REACTOR BUILDING SECONDARY SHIELD WALL FINITE ELEMENT MODEL - PLAN VIEW



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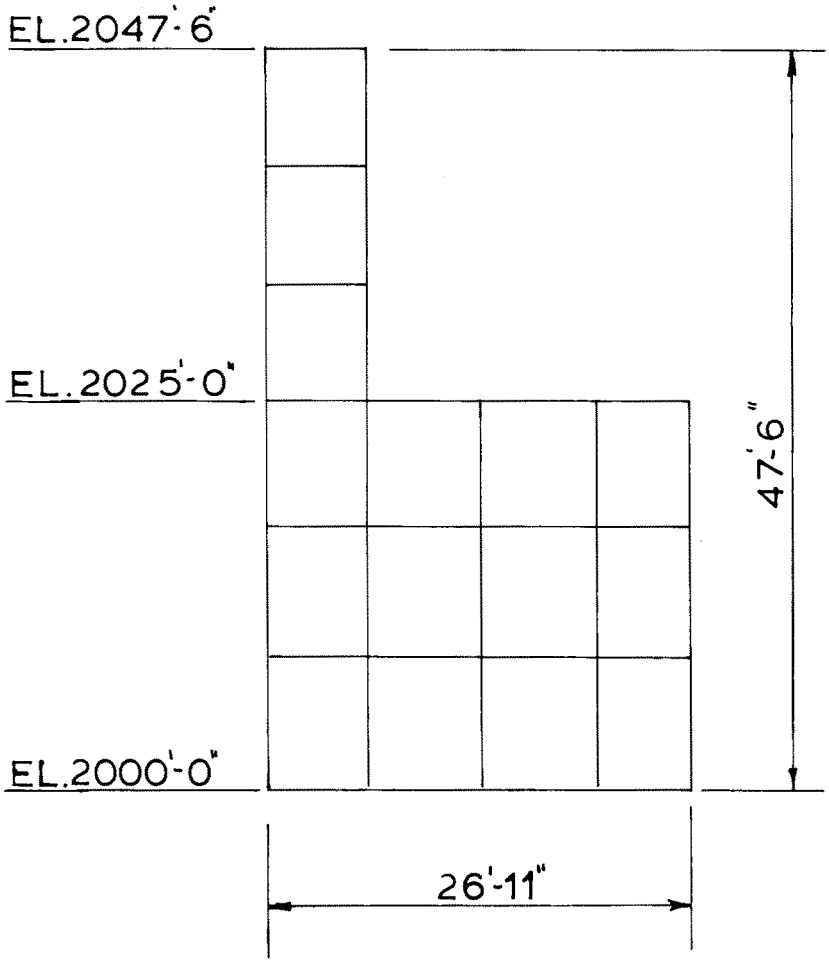
CALLAWAY PLANT

FIGURE 3.8-81

WALL FINITE ELEMENT MODEL - SECTIONS A, B, AND C



SECTION D

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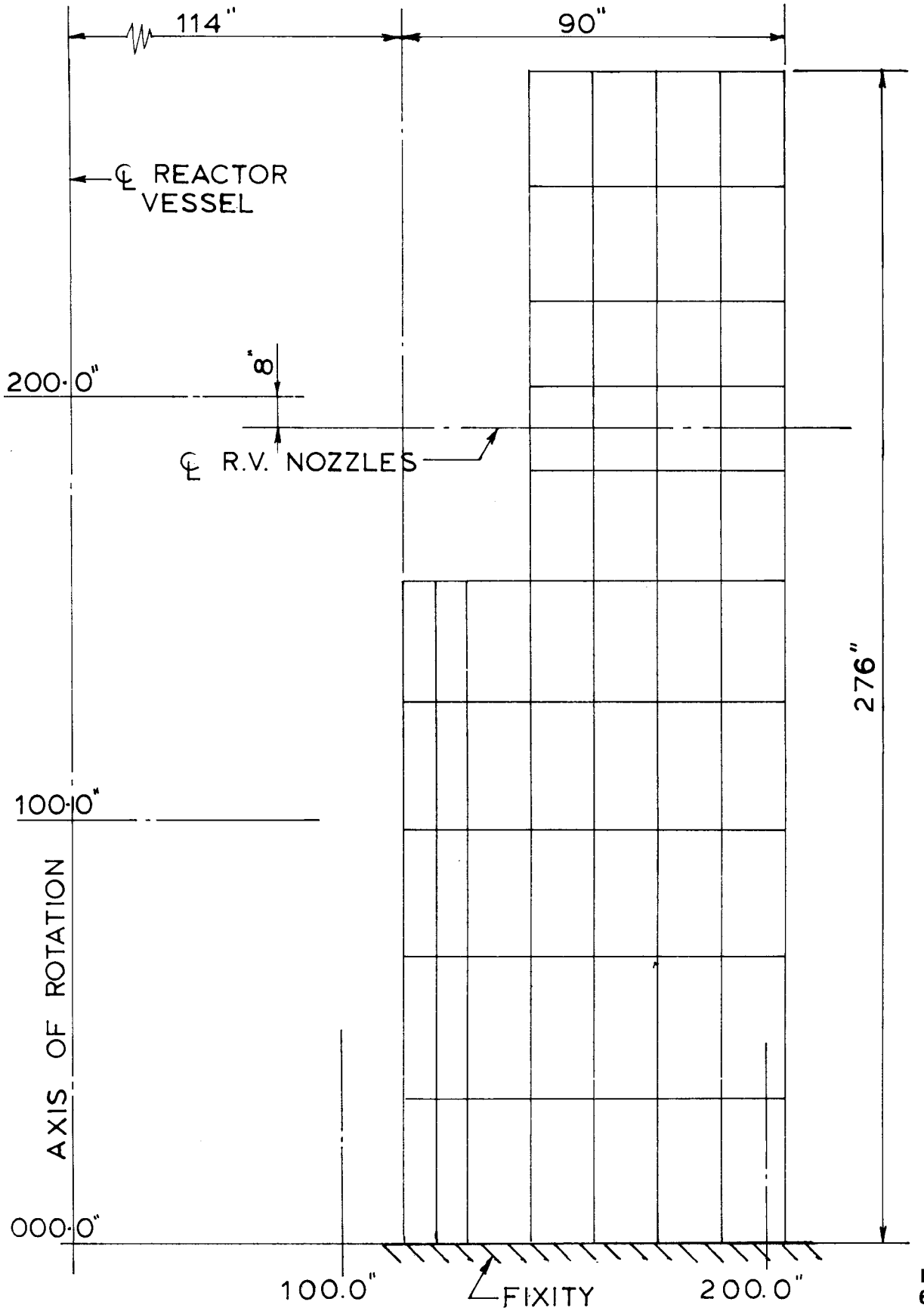
CALLAWAY PLANT

FIGURE 3.8-82

REACTOR BUILDING SECONDARY SHIELD WALL FINITE ELEMENT MODEL - SECTION D



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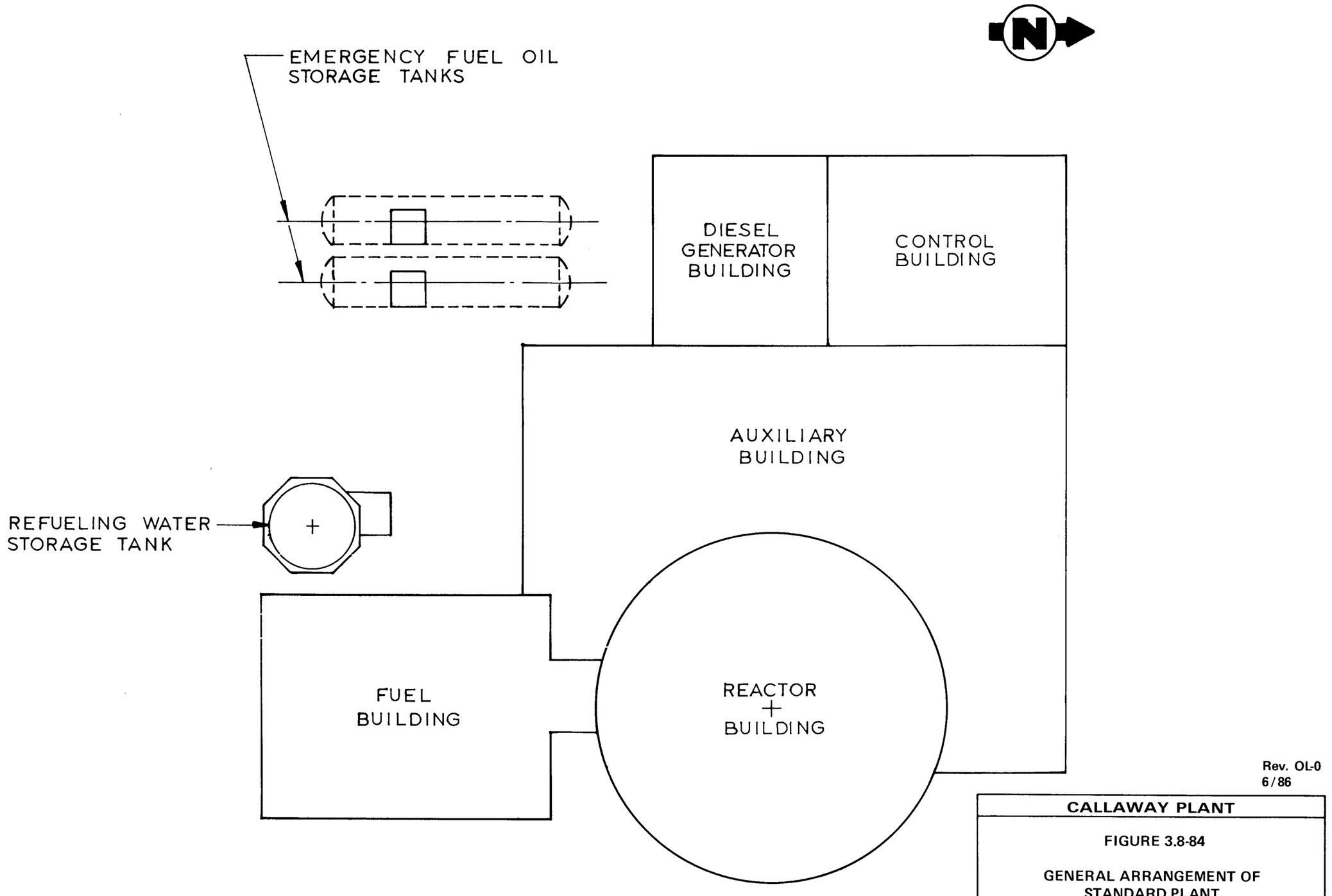
ELEVATION
REACTOR CAVITY

CALLAWAY PLANT

FIGURE 3.8-83

REACTOR CAVITY FINITE ELEMENT MODEL



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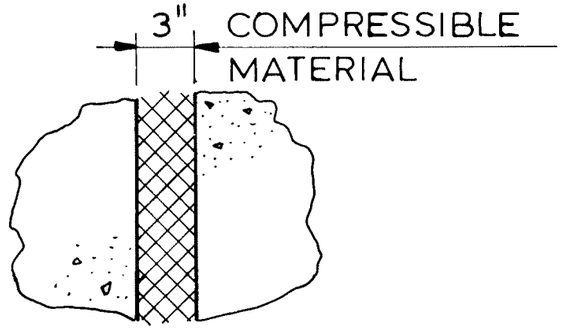
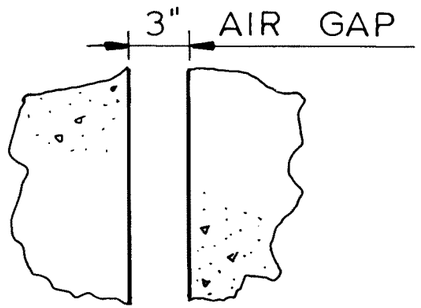
CALLAWAY PLANT

FIGURE 3.8-84

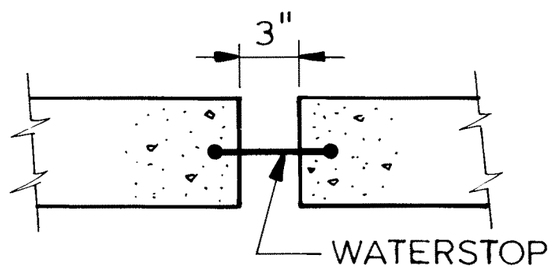
GENERAL ARRANGEMENT OF STANDARD PLANT CATEGORY I STRUCTURES



TYPICAL ISOLATION JOINT
BELOW GRADE



TYPICAL ISOLATION JOINT
ABOVE GRADE



TYPICAL ISOLATION JOINT @ ROOF SLAB
AND EXTERIOR WALLS

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CALLAWAY PLANT

FIGURE 3.8-85

TYPICAL ISOLATION JOINTS
BETWEEN BUILDINGS

FSAR Figure 3.8-86 is withheld per RIS 2015-17

FSAR Figure 3.8-86 is withheld per RIS 2015-17

CALLAWAY PLANT
FIGURE 3.8-86 AUXILIARY BUILDING PLAN – ELEV. 1974'-0" REV. 1 10/08

FSAR Figure 3.8-87 is withheld per RIS 2015-17

FSAR Figure 3.8-87 is withheld per RIS 2015-17

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CALLAWAY PLANT
FIGURE 3.8-87 AUXILIARY BUILDING PLAN – ELEV. 1988'-0" AND 1989'-6"

FSAR Figure 3.8-88 is withheld per RIS 2015-17

FSAR Figure 3.8-88 is withheld per RIS 2015-17

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CALLAWAY PLANT

FIGURE 3.8-88

AUXILIARY BUILDING PLAN –
ELEV. 2000'-0"

FSAR Figure 3.8-89 is withheld per RIS 2015-17

FSAR Figure 3.8-89 is withheld per RIS 2015-17

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CALLAWAY PLANT

FIGURE 3.8-89

AUXILIARY BUILDING PLAN –
ELEV. 2026'-0"

FSAR Figure 3.8-90 is withheld per RIS 2015-17

REV. OL-10
11/98

CALLAWAY PLANT

FIGURE 3.8-90

AUXILIARY BUILDING PLAN –
ELEV. 2047'-6"

FSAR Figure 3.8-90 is withheld per RIS 2015-17

FSAR Figure 3.8-91 is withheld per RIS 2015-17

FSAR Figure 3.8-91 is withheld per RIS 2015-17

REV. OL-10
11/98

CALLAWAY PLANT

FIGURE 3.8-91

AUXILIARY BUILDING PLAN –
NORTH-SOUTH CROSS SECTION

FSAR Figure 3.8-92 is withheld per RIS 2015-17

FSAR Figure 3.8-92 is withheld per RIS 2015-17

REV. OL-10
11/98

CALLAWAY PLANT

FIGURE 3.8-92

AUXILIARY BUILDING PLAN –
EAST-WEST CROSS SECTION

FSAR Figure 3.8-93 is withheld per RIS 2015-17

REV OL-8
11/95

CALLAWAY PLANT

FIGURE 3.8-93

AUXILIARY BUILDING PLAN –
EAST-WEST CROSS SECTION

FSAR Figure 3.8-93 is withheld per RIS 2015-17

FSAR Figure 3.8-94 is withheld per RIS 2015-17

FSAR Figure 3.8-94 is withheld per RIS 2015-17

REV OL-11
5/00

CALLAWAY PLANT

FIGURE 3.8-94

FUEL BUILDING PLAN –
ELEV. 2000'-0" (UN)

FSAR Figure 3.8-95 is withheld per RIS 2015-17

FSAR Figure 3.8-95 is withheld per RIS 2015-17

REV OL-11
5/00

CALLAWAY PLANT
FIGURE 3.8-95 FUEL BUILDING PLAN – ELEV. 2026'-0" (UN)

FSAR Figure 3.8-96 is withheld per RIS 2015-17

FSAR Figure 3.8-96 is withheld per RIS 2015-17

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CALLAWAY PLANT

FIGURE 3.8-96

FUEL BUILDING PLAN –
ELEV. 2047'-6"

FSAR Figure 3.8-97 is withheld per RIS 2015-17

REV. OL-1
11/16

CALLAWAY PLANT

FIGURE 3.8-97

FUEL BUILDING-
NORTH-SOUTH CROSS SECTION

FSAR Figure 3.8-97 is withheld per RIS 2015-17

FSAR Figure 3.8-98 is withheld per RIS 2015-17

REV. OL-1
11/16

CALLAWAY PLANT

FIGURE 3.8-98

FUEL BUILDING
EAST-WEST CROSS SECTION

FSAR Figure 3.8-98 is withheld per RIS 2015-17

FSAR Figure 3.8-99 is withheld per RIS 2015-17

REV OL-12
11/01

CALLAWAY PLANT

FIGURE 3.8-99

CONTROL BUILDING PLAN
ELEV. 1974~0" AND 1984~0"

FSAR Figure 3.8-99 is withheld per RIS 2015-17

FSAR Figure 3.8-100 is withheld per RIS 2015-17

FSAR Figure 3.8-100 is withheld per RIS 2015-17

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CALLAWAY PLANT

FIGURE 3.8-100

CONTROL BUILDING PLAN –
ELEV. 2000'-0" AND 2016'-0"

FSAR Figure 3.8-101 is withheld per RIS 2015-17

FSAR Figure 3.8-101 is withheld per RIS 2015-17

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CALLAWAY PLANT

FIGURE 3.8-101

CONTROL BUILDING PLAN –
ELEV. 2032'-0"

FSAR Figure 3.8-102 is withheld per RIS 2015-17

FSAR Figure 3.8-102 is withheld per RIS 2015-17

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CALLAWAY PLANT

FIGURE 3.8-102

CONTROL BUILDING PLAN –
ELEV. 2047'-6" AND 2073'-6"

FSAR Figure 3.8-103 is withheld per RIS 2015-17

REV OL-12
11/01

CALLAWAY PLANT

FIGURE 3.8-103

CONTROL BUILDING -
NORTH-SOUTH CROSS SECTION

FSAR Figure 3.8-103 is withheld per RIS 2015-17

FSAR Figure 3.8-104 is withheld per RIS 2015-17

REV OL-12
11/01

CALLAWAY PLANT

FIGURE 3.8-104

CONTROL BUILDING-
EAST-WEST CROSS SECTION

FSAR Figure 3.8-104 is withheld per RIS 2015-17

FSAR Figure 3.8-105 is withheld per RIS 2015-17

REV. OL-15
5/06

CALLAWAY PLANT

FIGURE 3.8 - 105

DIESEL GENERATOR BUILDING PLAN
ELEV. 2000' - 0"

FSAR Figure 3.8-105 is withheld per RIS 2015-17

FSAR Figure 3.8-106 is withheld per RIS 2015-17

FSAR Figure 3.8-106 is withheld per RIS 2015-17

REV. OL-15
5/06

CALLAWAY PLANT

FIGURE 3.8 - 106

DIESEL GENERATOR BUILDING PLAN
ELEV. 2019' - 3" AND 2032' - 0"

FSAR Figure 3.8-107 is withheld per RIS 2015-17

FSAR Figure 3.8-107 is withheld per RIS 2015-17

REV. OL-10
11/98

CALLAWAY PLANT

FIGURE 3.8-107

DIESEL-GENERATOR BUILDING PLAN –
ELEV. 2047'-2"

FSAR Figure 3.8-108 is withheld per RIS 2015-17

REV. OL-15
5/06

CALLAWAY PLANT

FIGURE 3.8 - 108

DIESEL GENERATOR BUILDING
EAST - WEST CROSS SECTION

FSAR Figure 3.8-108 is withheld per RIS 2015-17

FSAR Figure 3.8-109 is withheld per RIS 2015-17

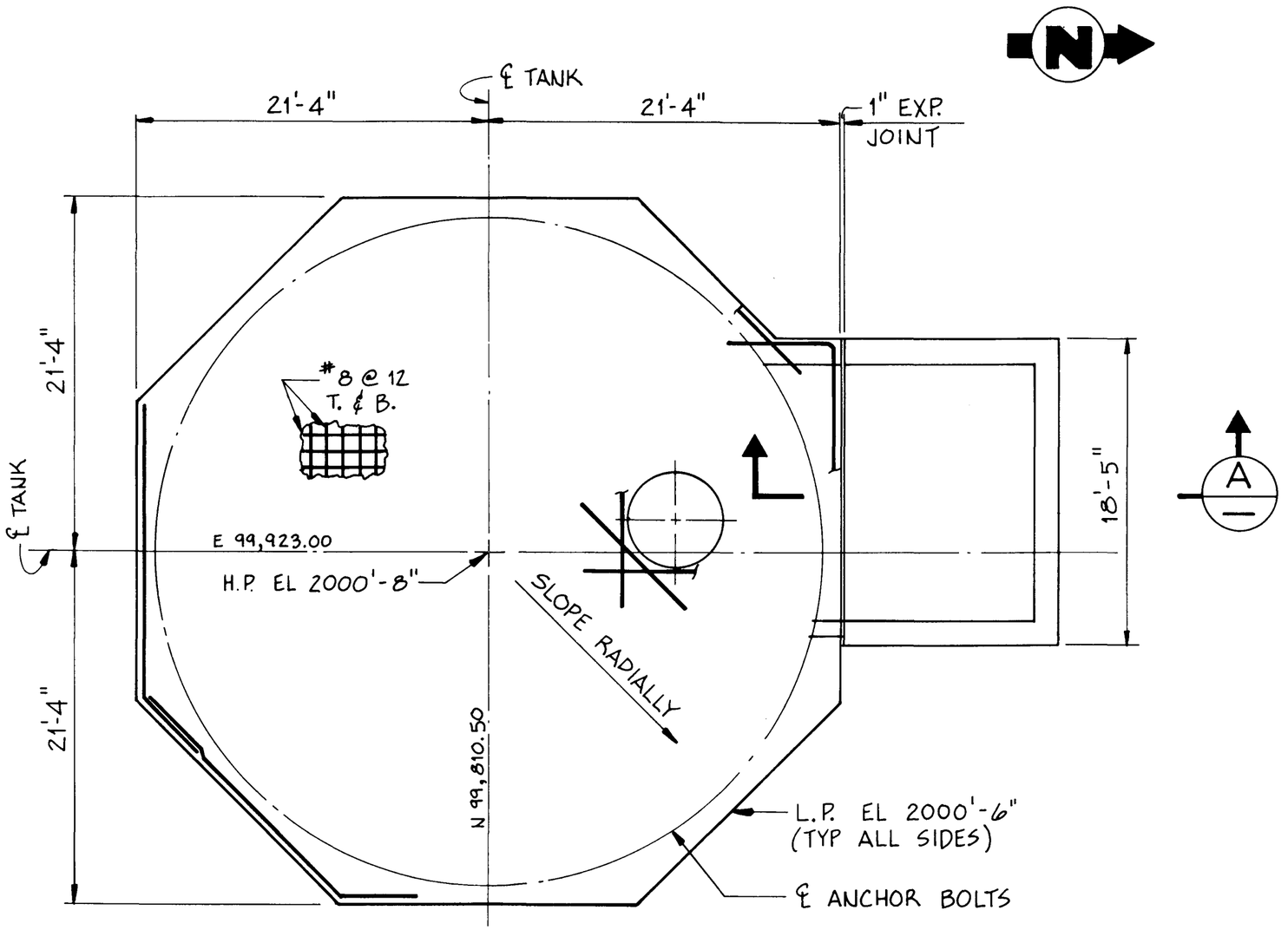
REV. OL-15
5/06

CALLAWAY PLANT

FIGURE 3.8 - 109

DIESEL GENERATOR BUILDING
NORTH - SOUTH CROSS SECTION

FSAR Figure 3.8-109 is withheld per RIS 2015-17



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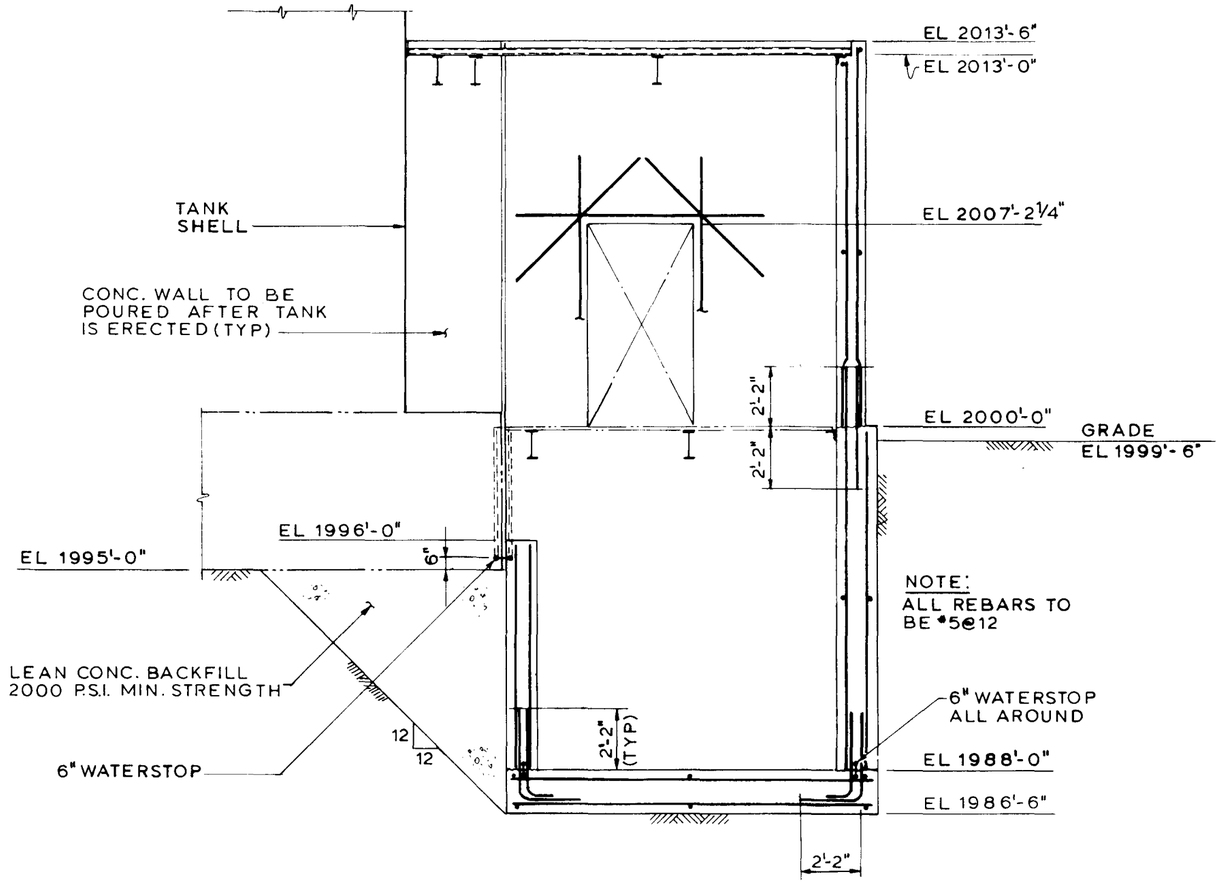
CALLAWAY PLANT

FIGURE 3.8-110

REFUELING WATER STORAGE TANK AND VALVE HOUSE – FOUNDATION PLAN



SECTION A

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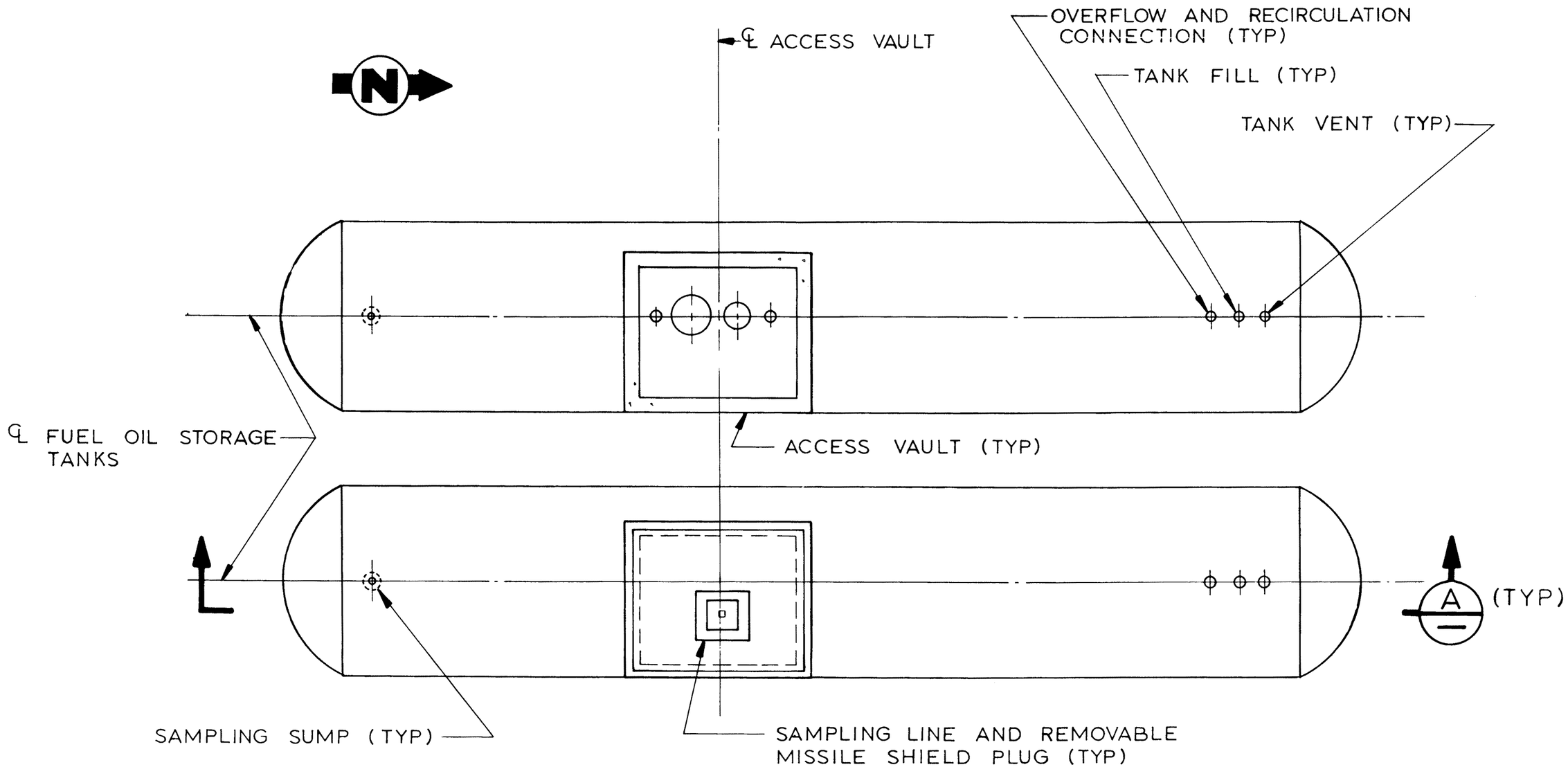
CALLAWAY PLANT

FIGURE 3.8-111

REFUELING WATER STORAGE VALVE HOUSE ELEVATION



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EMERGENCY FUEL OIL STORAGE TANKS

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FIGURE 3.8-112

EMERGENCY OIL STORAGE TANKS AND ACCESS VAULT PLAN

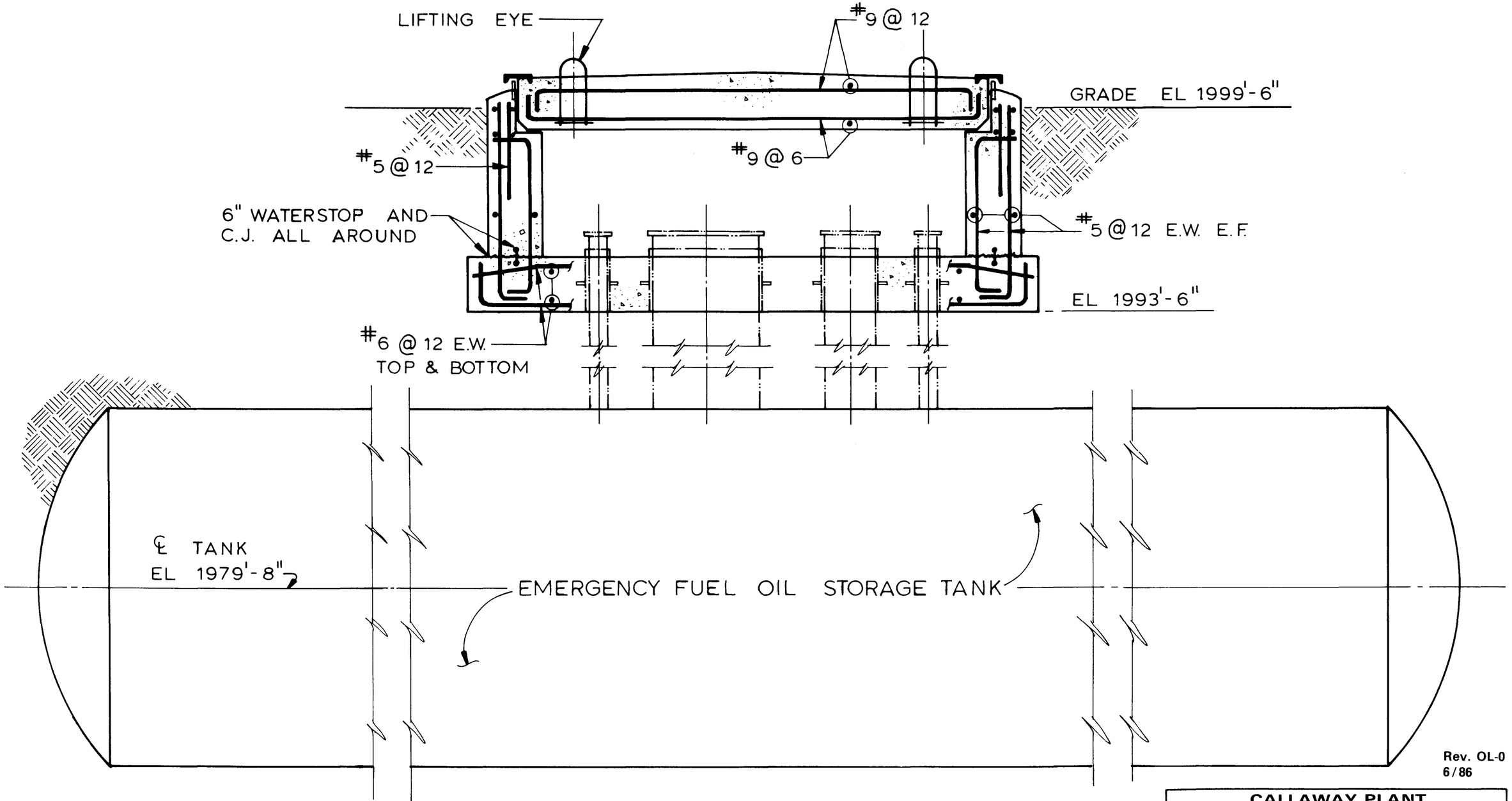

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FIGURE 3.8-113

EMERGENCY OIL STORAGE TANKS AND ACCESS VAULT

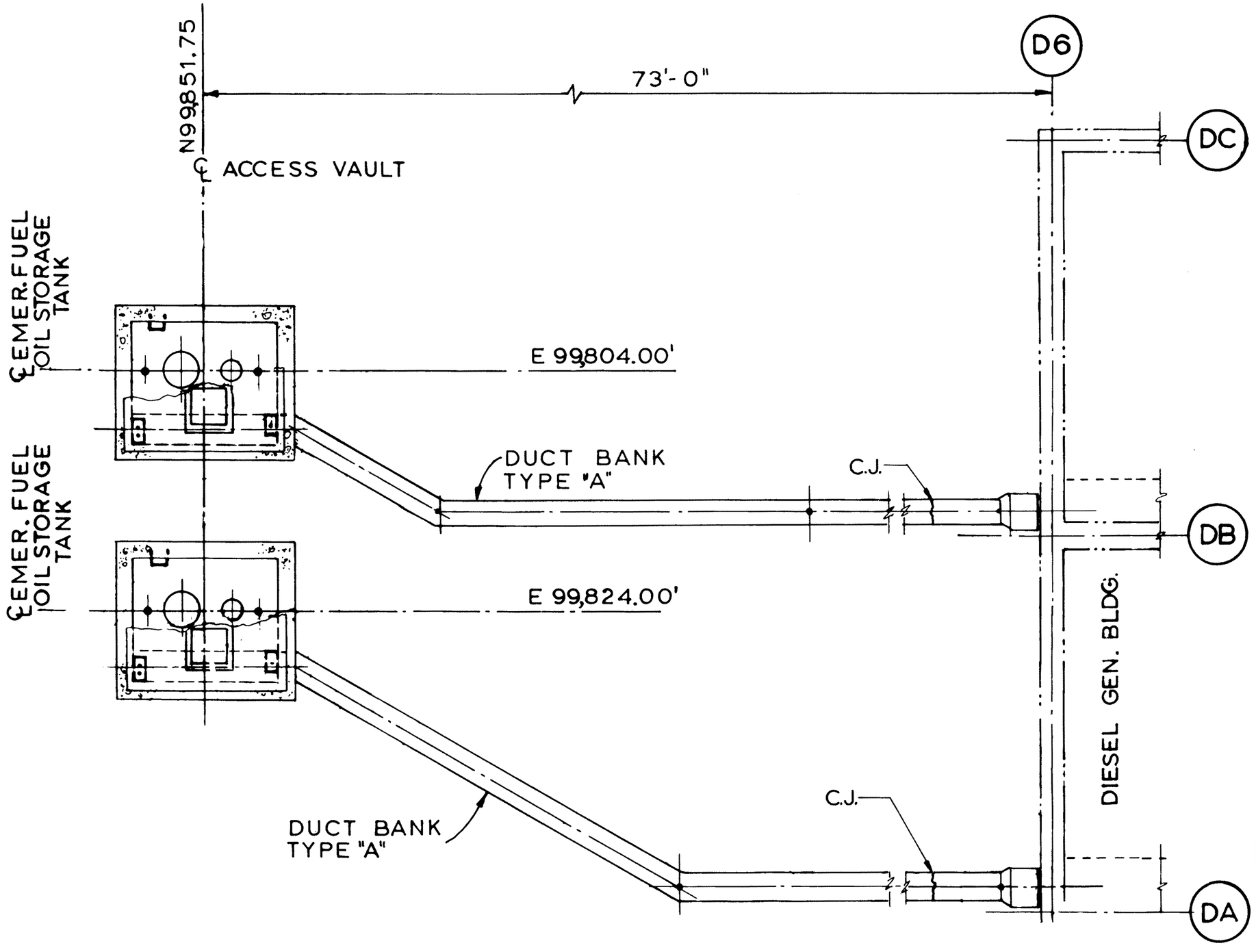

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FIGURE 3.8-114

BURIED DUCT BANKS TO EMER. FUEL OIL STORAGE TANKS

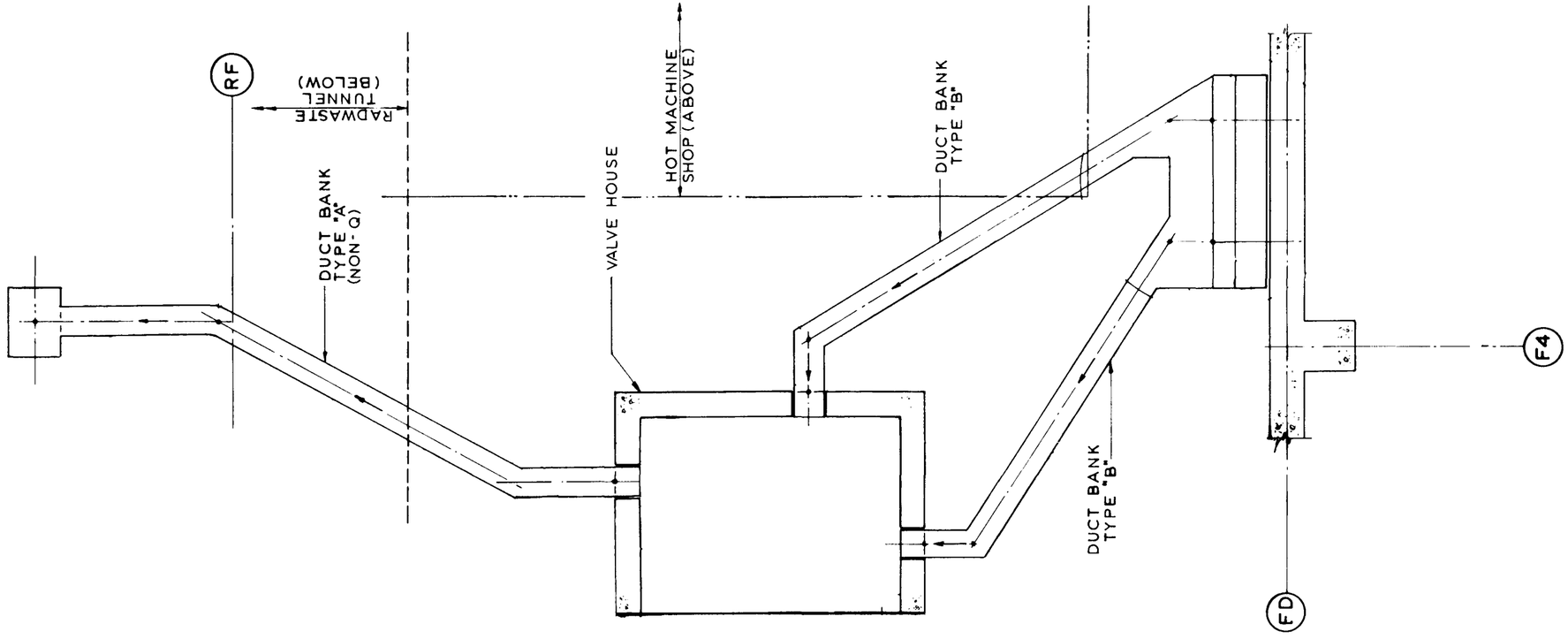

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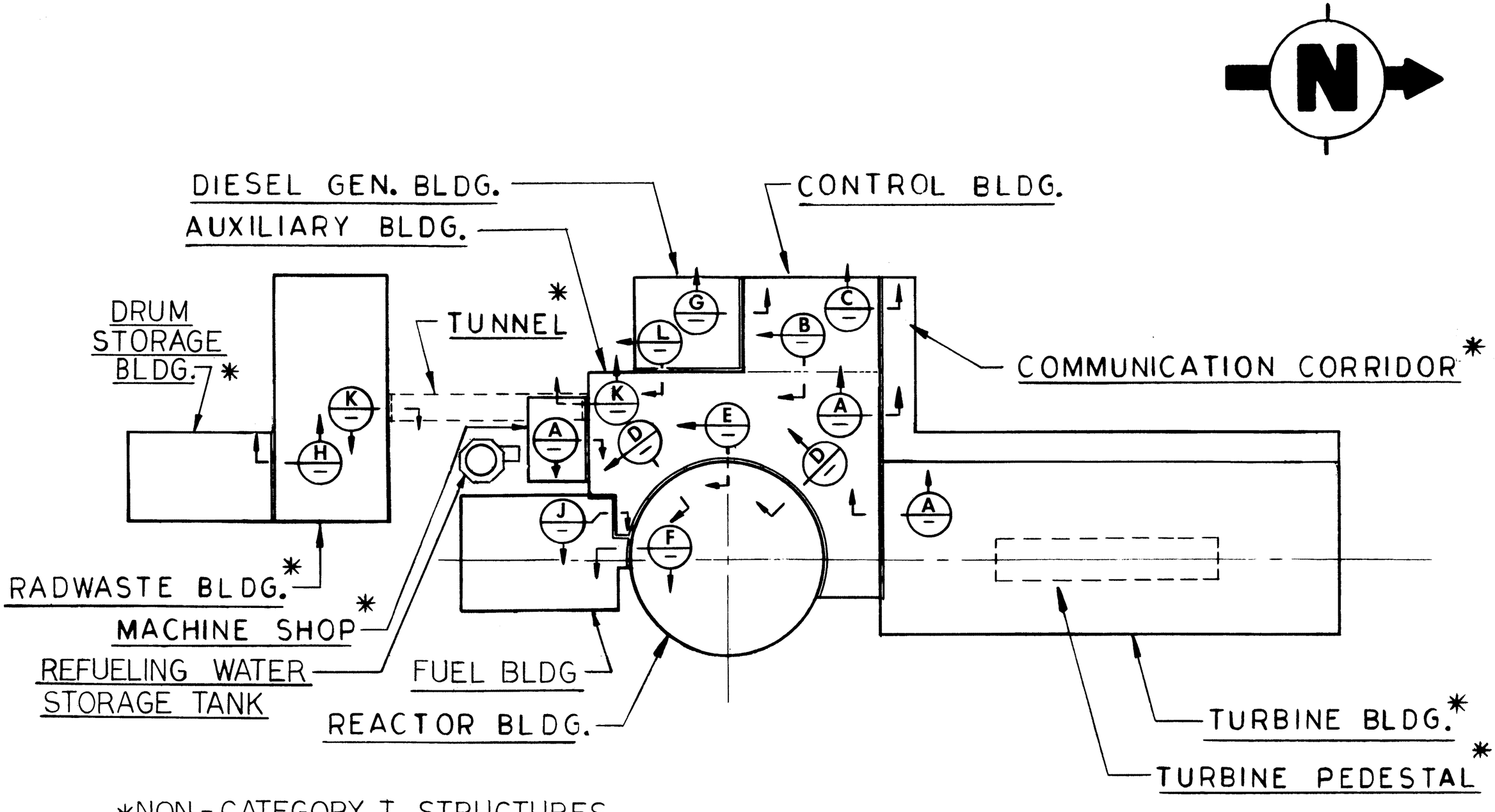
FIGURE 3.8-115

BURIED DUCT BANKS TO REFUELING STORAGE VALVE HOUSE



*NON - CATEGORY I STRUCTURES

PLAN

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FIGURE 3.8-116

ARRANGEMENT OF FOUNDATION – PLAN

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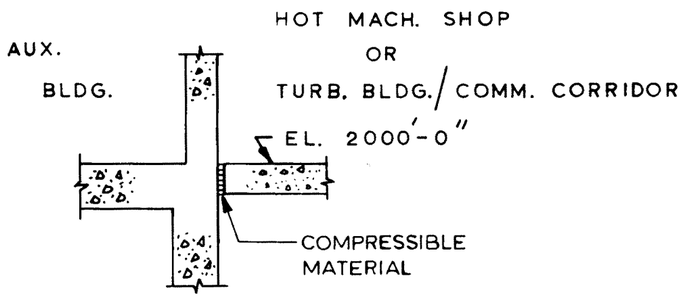
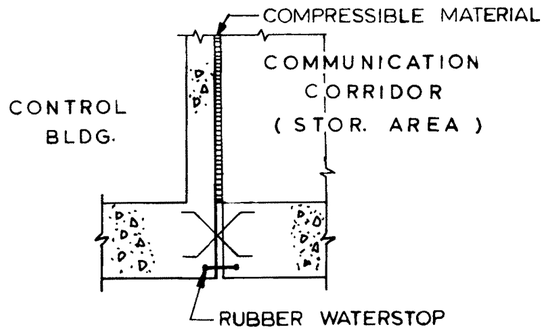
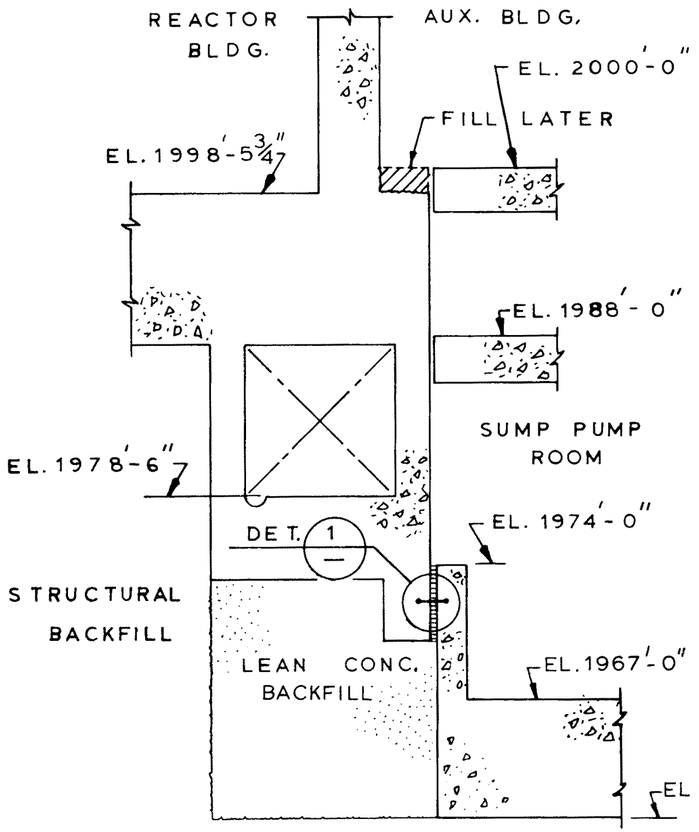


SECTION A



SECTION C



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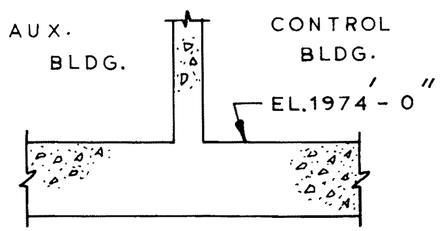

SECTION B

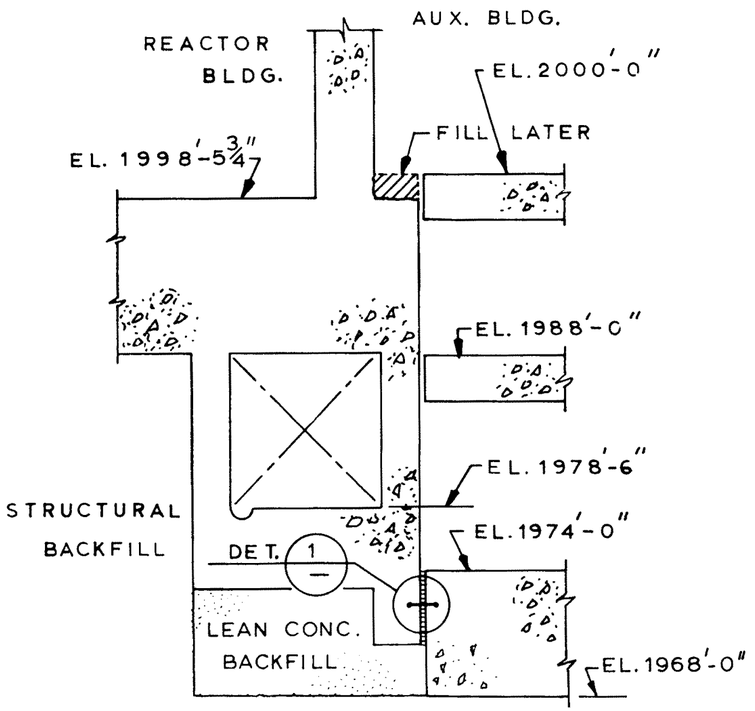

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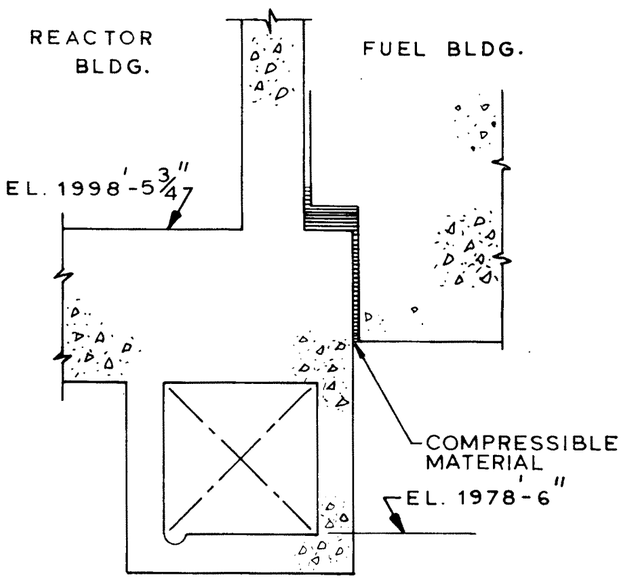
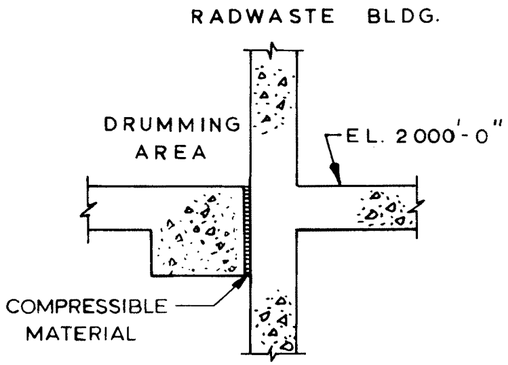
FIGURE 3.8-117

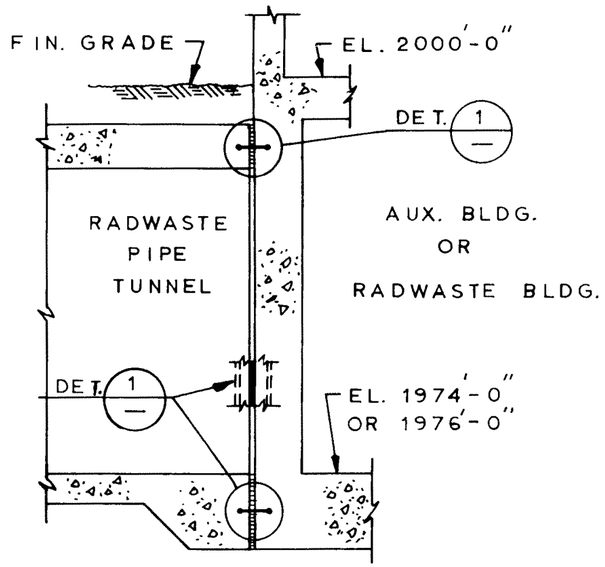
ARRANGEMENT OF FOUNDATION – DETAILS



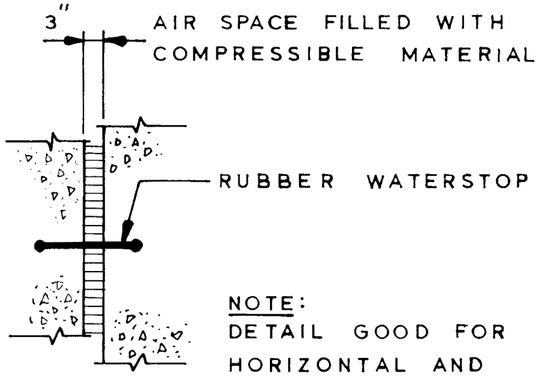
SECTION F



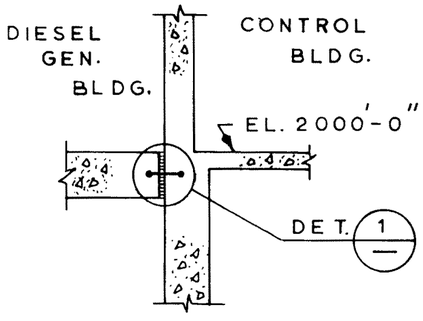
SECTION H



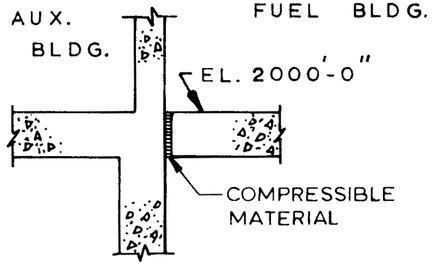
SECTION K



DETAIL 1



SECTION G



SECTION J

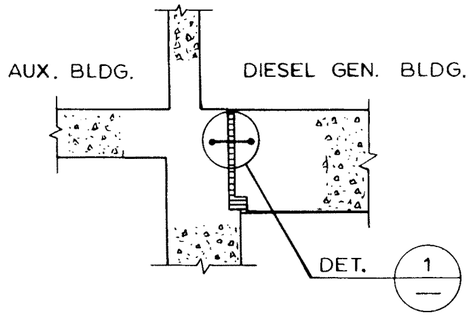


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FIGURE 3.8-118

ARRANGEMENT OF FOUNDATION – ADDITIONAL DETAILS

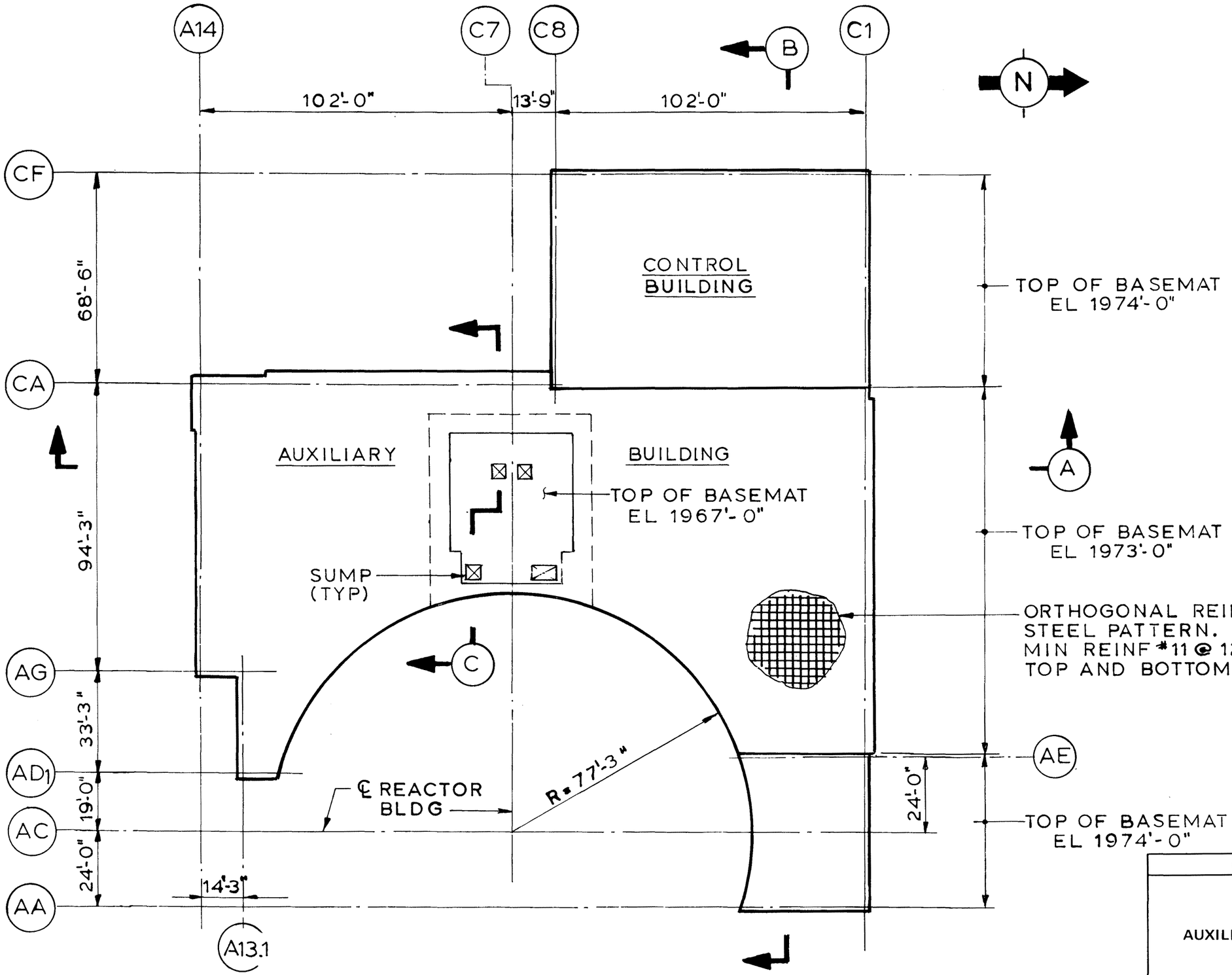

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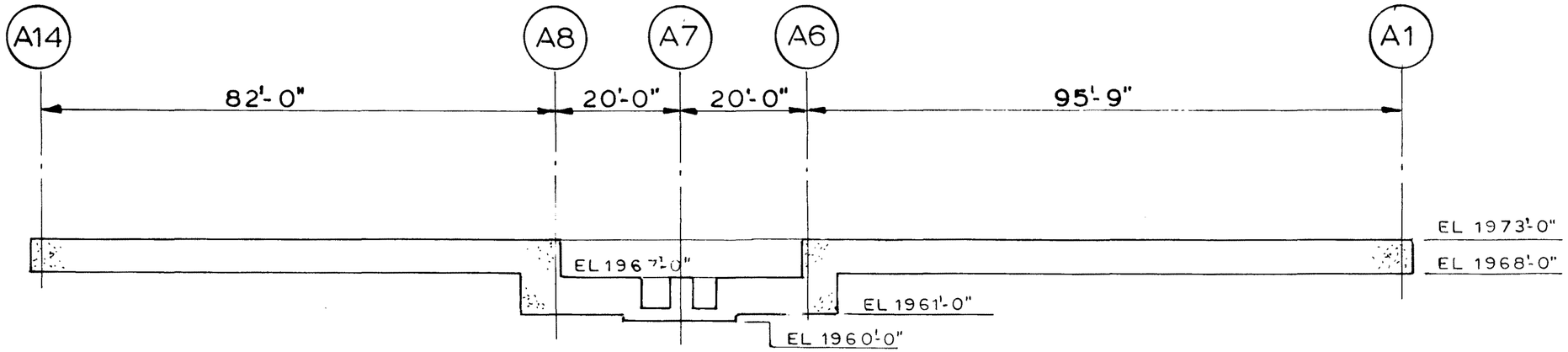
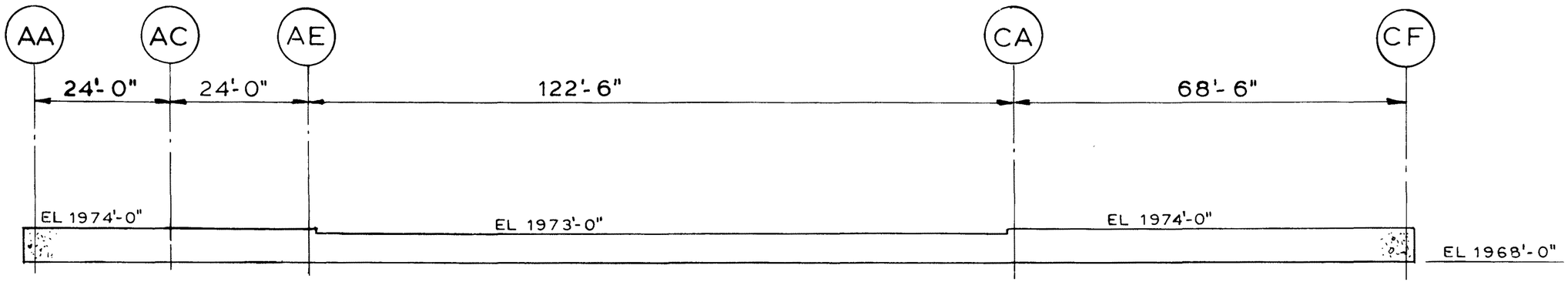
FIGURE 3.8-119

AUXILIARY AND CONTROL BUILDING FOUNDATION PLAN



SECTION A



SECTION B

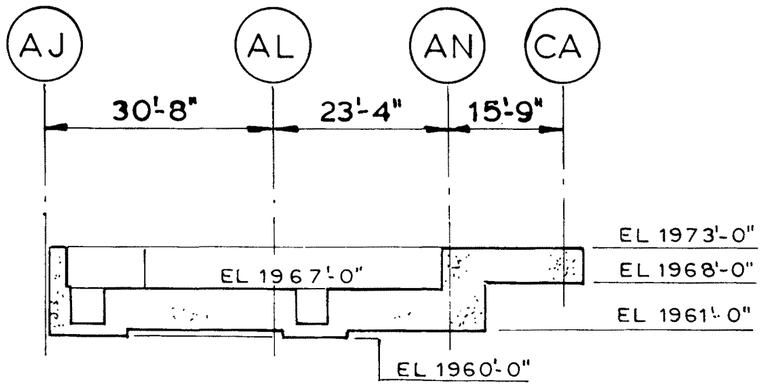


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FIGURE 3.8-120

AUXILIARY AND CONTROL BUILDING FOUNDATION SECTIONS

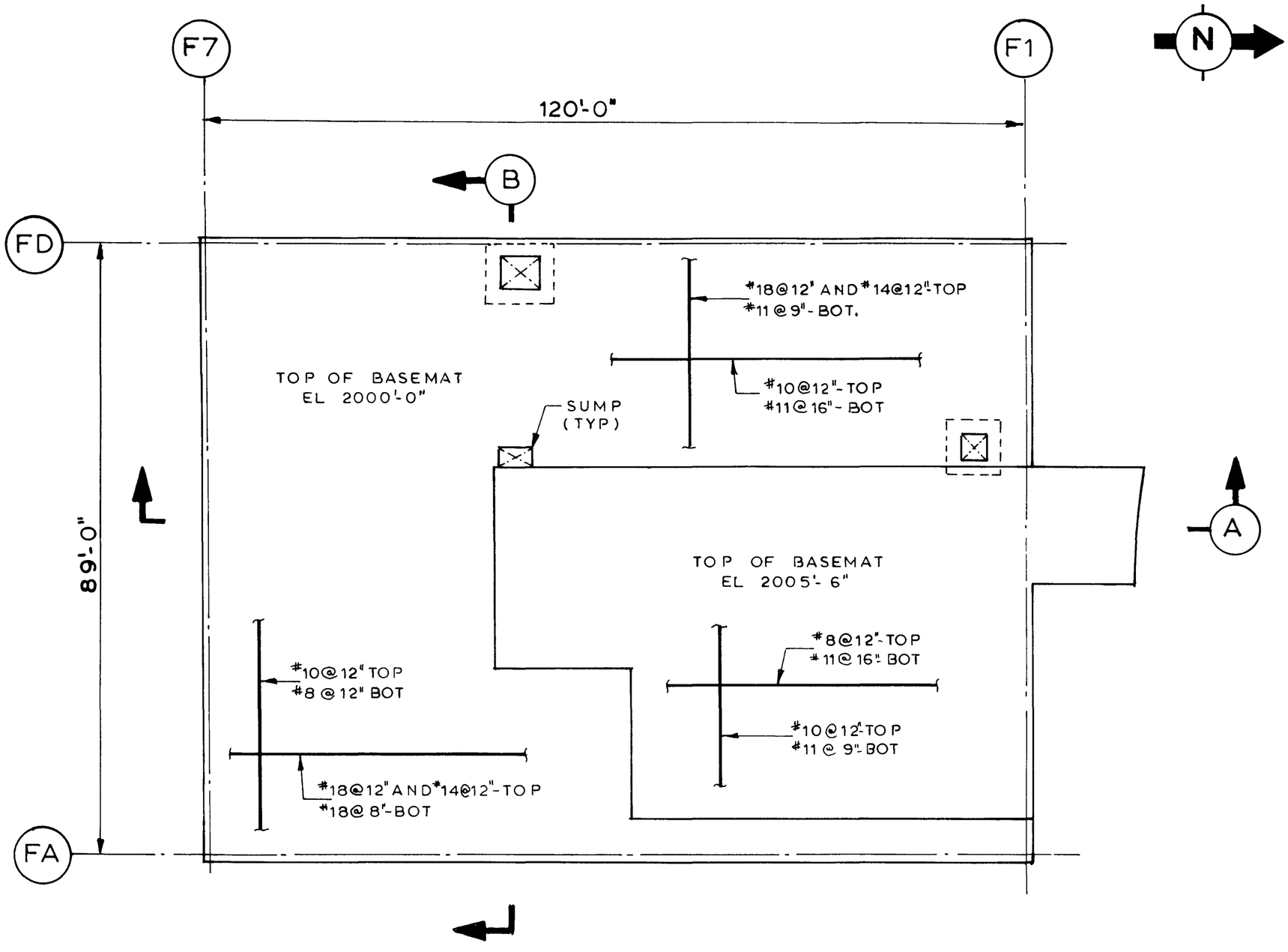

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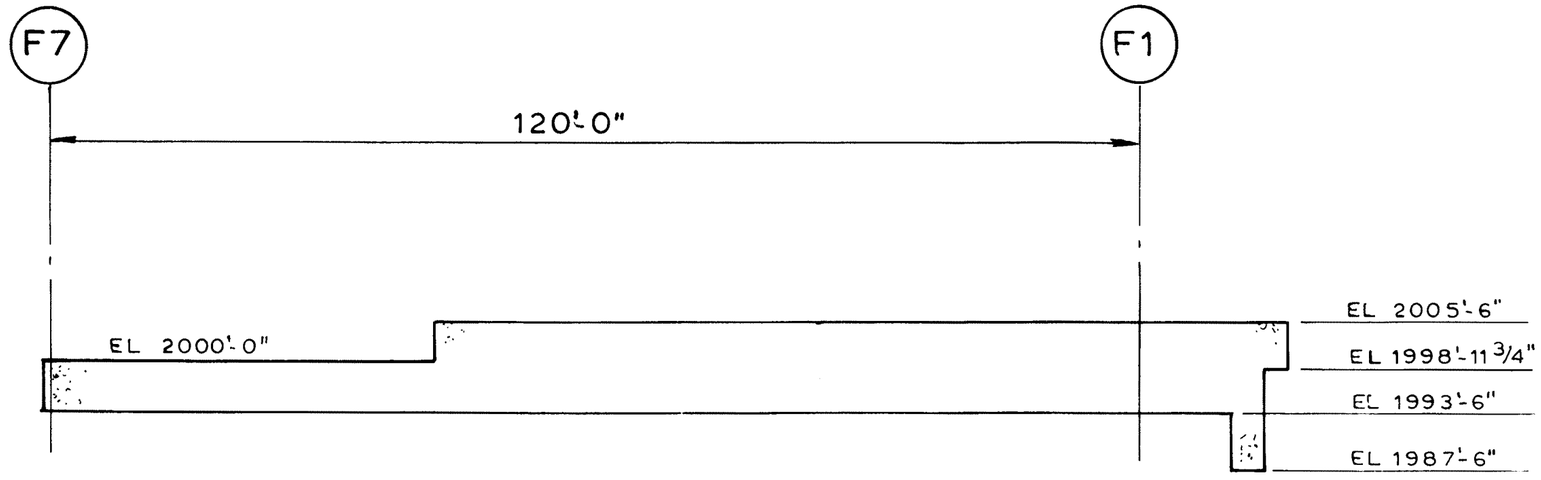
FIGURE 3.8-121

FUEL BUILDING
FOUNDATION PLAN



SECTION A

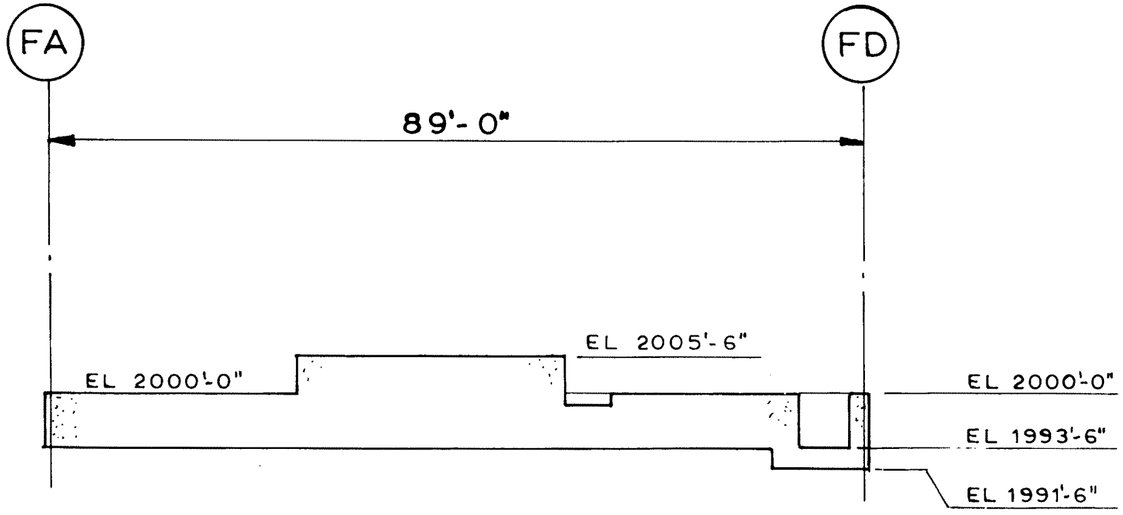


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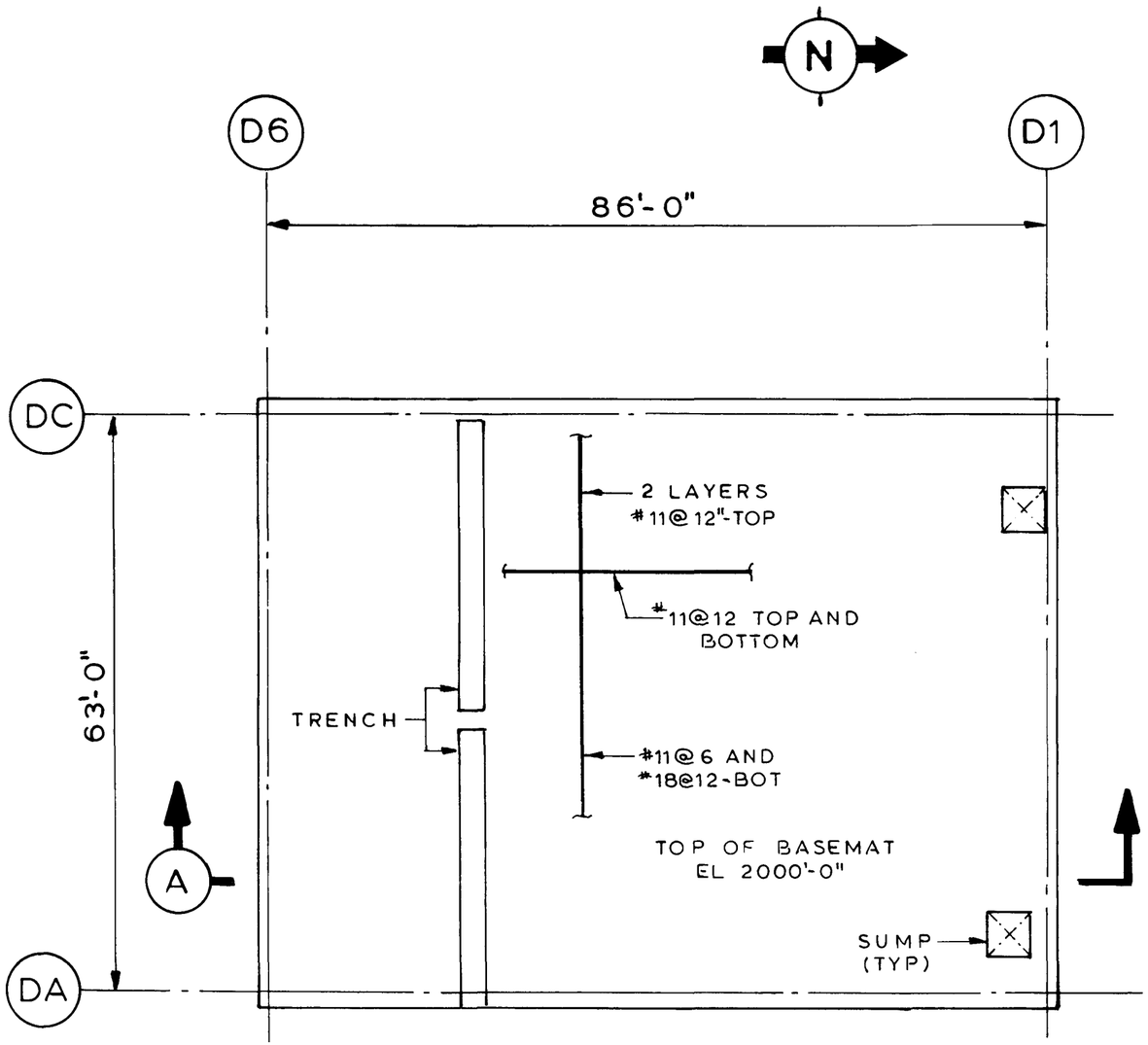
FIGURE 3.8-122

FUEL BUILDING FOUNDATION SECTIONS



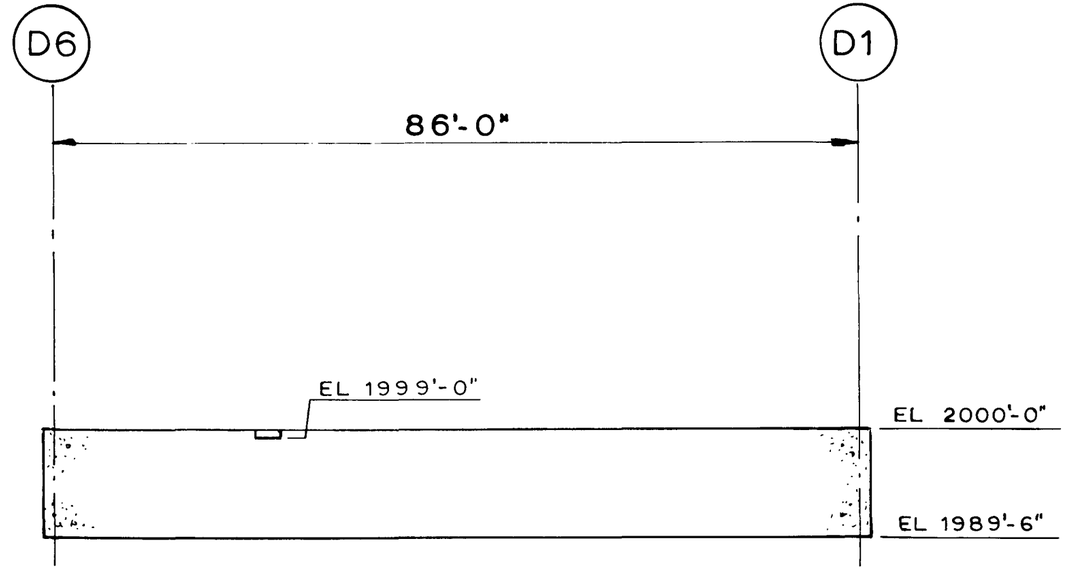


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FIGURE 3.8-123

DIESEL-GENERATOR BUILDING FOUNDATION PLAN

FSAR Figure 3.8-124 is withheld per RIS 2015-17

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FIGURE 3.8-124

RADWASTE BUILDING AND TUNNEL –
PLAN EL. 1974'-0" & EL. 1976'-0"

FSAR Figure 3.8-124 is withheld per RIS 2015-17

FSAR Figure 3.8-125 withheld per RIS 2015-17

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FIGURE 3.8-125

RADWASTE BUILDING –
PLAN EL. 2000'-0"

FSAR Figure 3.8-125 withheld per RIS 2015-17

FSAR Figure 3.8-126 withheld per RIS 2015-17

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FIGURE 3.8-126

RADWASTE BUILDING –
PLAN EL. 2022'-0"

FSAR Figure 3.8-126 withheld per RIS 2015-17

FSAR Figure 3.8-127 withheld per RIS 2015-17

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FIGURE 3.8-127

RADWASTE BUILDING –
EL. 2031'-6"

FSAR Figure 3.8-127 withheld per RIS 2015-17

FSAR Figure 3.8-128 withheld per RIS 2015-17

FSAR Figure 3.8-128 withheld per RIS 2015-17

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FIGURE 3.8-128

RADWASTE BUILDING –
EL. 2040'-6" & EL. 2047'-0"

FSAR Figure 3.8-129 withheld per RIS 2015-17

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FIGURE 3.8-129

RADWASTE BUILDING –
SECTION

FSAR Figure 3.8-129 withheld per RIS 2015-17

FSAR Figure 3.8-130 withheld per RIS 2015-17

FSAR Figure 3.8-130 withheld per RIS 2015-17

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FIGURE 3.8-130

RADWASTE BUILDING –
SECTION