The Light company Houston Lighting & Power P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

October 31, 1985
ST-HL-AE-1449
File No.: G9.17

Mr. George W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Responses to DSER/FSAR Items Regarding
Fire Protection for Concentrated Cable Areas

Dear Mr. Knighton:

The attachments enclosed provide additional information on Draft Safety Evaluation Report (DSER) or Final Safety Analysis Report (FSAR) items.

The item number listed below corresponds to those assigned on STP's internal list of items for completion which includes open and confirmatory DSER items, STP FSAR open items and open NRC questions. This list was given to your Mr. N. Prasad Kadambi on October 8, 1985 by our Mr. M. E. Powell.

The items which are attacned to this letter are:

Attachment	Item No.*	Subject
1	D 9.5-6	Description and drawings of areas of concentrated cables. Includes description of the project evaluation of needed fire protection and the results.

HL&P committed to provide this information in a meeting with the Staff on September 17, 1985.

*Legend
D - DSER Open Item
C - DSER Confirmatory Item
F - FSAR Open Item
Q - FSAR Question Response Item

L1/NRC/Z

A0012
1/1

Drawings to: Reg Files

If you should have any questions on this matter, please contact Mr. M. E. Powell at (713) 993-1328.

Very truly yours,

M. R. Wisenburg
Manager, Nuclear Licensing

CAA/yd

Attachments: See above

L1/NRC/Z

Houston Lighting & Power Company
cc:

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San Antonio, TX 78296

Note: The above copies without drawing
except as noted (*).

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Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555
(3 Copies)

*Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
1717 H Street
Washington, DC 20555

Revised 9/25/85

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Evaluation of Concentrated Cables at STP

Objective

To evaluate areas of the plant, outside the Reactor Containment Building (RCB), to determine if cable tray configurations are "concentrated" and to determine if manual fire suppression features are adequate or if fixed automatic fire suppression protection is required.

Findings

A set of drawings extracted from the FHAR, Amendment 1 are attached indicating the following:

1. Specific areas of Unit 1 containing cable tray configurations considered to be "concentrated", based on the guidelines below,

2. The specific areas of Unit 1 containing cable tray configurations considered to be "concentrated", based on the guidelines below, and manual fire suppression features are considered adequate, based on the logic shown on Figure 1-2, and

3. The specific areas of Unit 1 where cable tray configurations, ducting, or equipment form physical barriers to make fire suppression efforts somewhat more difficult, automatic wet pipe sprinkler protection is provided.

Methodology

The scale model of STP was reviewed on October 14, 1985 and a walkdown of the entire plant was made on October 15, 1985. The team described below reviewed areas, previously identified by Engineering as "concentrated" in accordance with the guidelines of Figures 1-1 and 1-2, to determine if manual suppression was adequate.

With regard to adequacy of manual suppression the evaluation looked at whether or not early warning automatic fire detection was in the area, availability of hose stations, the accessibility to all parts of the room, the effective reach of a hose stream to all areas, and the extent of combustible loading with the fire area/zone. With regard to the latter item an analysis was made as to the amount of combustibles in the area and the specific configuration (i.e., number of cable trays, how they are grouped, height of tray stacks, and separation distance between trays). Figure 1-3 illustrates the logic flowpath used in this evaluation.

Review/Walkdown Team

The team performing this evaluation and the review of the model consisted of the following the following personnel:

- o John Echternacht - Impell (Registered P.E. - Fire Protection)
- o Cal Lewis - Impell
- o Wayne Varnell - Bechtel (partial)

The walkdown team consisted of the following personnel:

- o Carl Turner - HL&P, Engineering
- o John Echternacht - Impell (Registered P.E. - Fire Protection)
- o Cal Lewis - Impell

The following personnel from Nuclear Plant Operations Department (NPOD) - Technical Support staff assisted the walkdown team:

- o Carl Wren - HL&P NPOD, Technical Support
- o Jon Kerin - HL&P NPOD, Technical Support
- o Mark Forsythe - HL&P NPOD, Technical Support

Assumptions and Conditions for Performing This Evaluation

1. Installation of raceways (e.g., cable trays) is essentially complete.

2. All areas of the model and of the plant were not accessible at the time of this evaluation.

3. IEEE 383 cables will be installed in the raceways.

4. Specific areas will be provided with fixed automatic fire suppression protection, if required, due to the inaccessibility for manual fire suppression efforts.

5. Manual fire suppression efforts are considered adequate for the specific areas of Unit 1 containing cable tray configurations classified to be "concentrated", based on the guidelines below, and where the walkdown team successfully applied the logic shown on Figure 1-3. Credit is taken for the use of portable extension ladders and 10 ft. extended applicators in some cases to reach within approximately 10 feet of the fire.

Guidelines

I. A review was performed with a Registered Fire Protection Engineer during the walkdown. The review utilized previously established classifications of concentrated cable areas as developed by American Nuclear Insurers (ANI) and then added item A.5, B.1. and B.2 below to

include even more configurations as concentrated. We have defined "concentrated" cable tray configurations (both horizontal and vertical) as meeting one of the following criteria:

A. "Concentrated" Cable Trays - Horizontal Configuration (See Figure 1-1)

1. A single stack of cable trays more than four (4) trays high; or

2. Adjacent horizontal with separation of five (5) feet or less, with more than three (3) trays in each vertical stack; or

3. A stack that is more than three (3) trays high that is less than five (5) feet apart horizontally from a stack of three (3) or more trays which fall within a 30 degree angle from the vertical, starting at the closest edge of the bottom tray; or

4. A stack that is more than three (3) trays high that is three (3) feet or less horizontally from an adjacent stack of three (3) trays, or

5. Six (6) trays or more in close proximity:

   a) Two (2) trays high with horizontal separation between each stack of two (2) feet or less.

   b) Adjacent horizontal trays with separation between each tray of one (1) foot or less.

B. "Concentrated" Cable Trays - Vertical Configuration (See Figure 1-2 for plan view of defined criteria).

1. Six (6) or more adjacent trays with separation between each tray of one (1) foot or less; or

2. Two (2) adjacent stacks with separation of three (3) feet or less, each stack with two (2) or more trays (back to back).

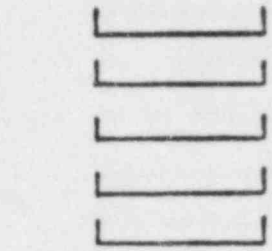
Vertical cable tray configurations at STP can be found along walls within an open room or in dedicated cable chases. Within open rooms all configurations are readily accessible for manual fire suppression and have 3 hour rated penetration seals in both the ceiling and/or the floor when the cable trays are both open and penetrate both floor and/or ceiling. Dedicated cable chases are constructed of heavy concrete walls, rated fire doors at each level, and good accessibility at each level for manual fire suppression.

II. The logic used for determining the adequacy of manual fire suppression features versus the requirements for providing fixed automatic fire suppression protection is shown in Figure 1-3. The walkdown team evaluated these areas visually using the guidance of Figure 1-3.

Figure 1-1

Examples of Concentrated Cable Trays - Horizontal Configuration

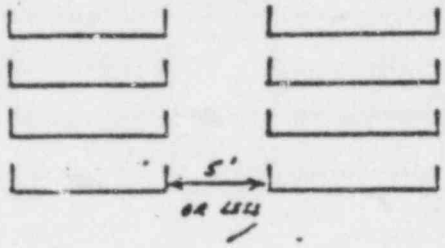
1.



MORE THAN 4 TRAYS

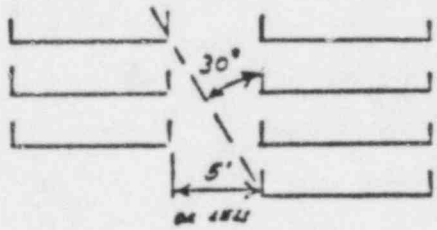
A single stack of cable trays more than four (4) trays high

2.



Adjacent horizontal runs located five (5) feet or less separation, with more than three (3) trays in each vertical stack

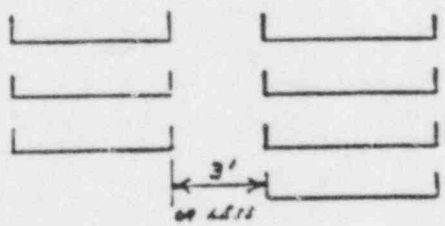
3.



WITHIN 5' HORIZONTALLY AND 30°

A stack that is more than three (3) trays high that is less than five (5) feet apart horizontally from a a stack of three (3) or more trays which fall within a 30 degree angle from the vertical, starting at the closest edge of the bottom tray

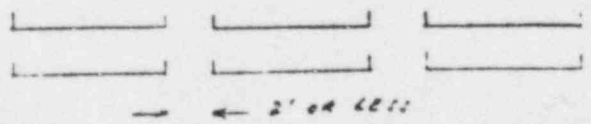
4.



A stack that is more than three(3) trays high that is three (3) feet or less horizontally from an adjacent stack of three (3) trays.

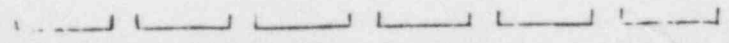
5.

a)



Two (2) trays high with horizontal separation two (2) feet or less

b)

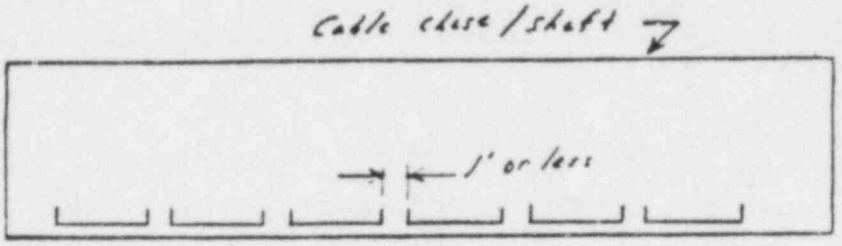


Six (6) trays adjacent with

Figure 1-2

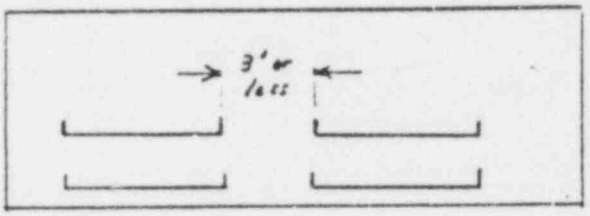
Examples of Concentrated Cable Trays - Vertical Configuration

1.



Six (6) trays adjacent with separation one (1) foot or less

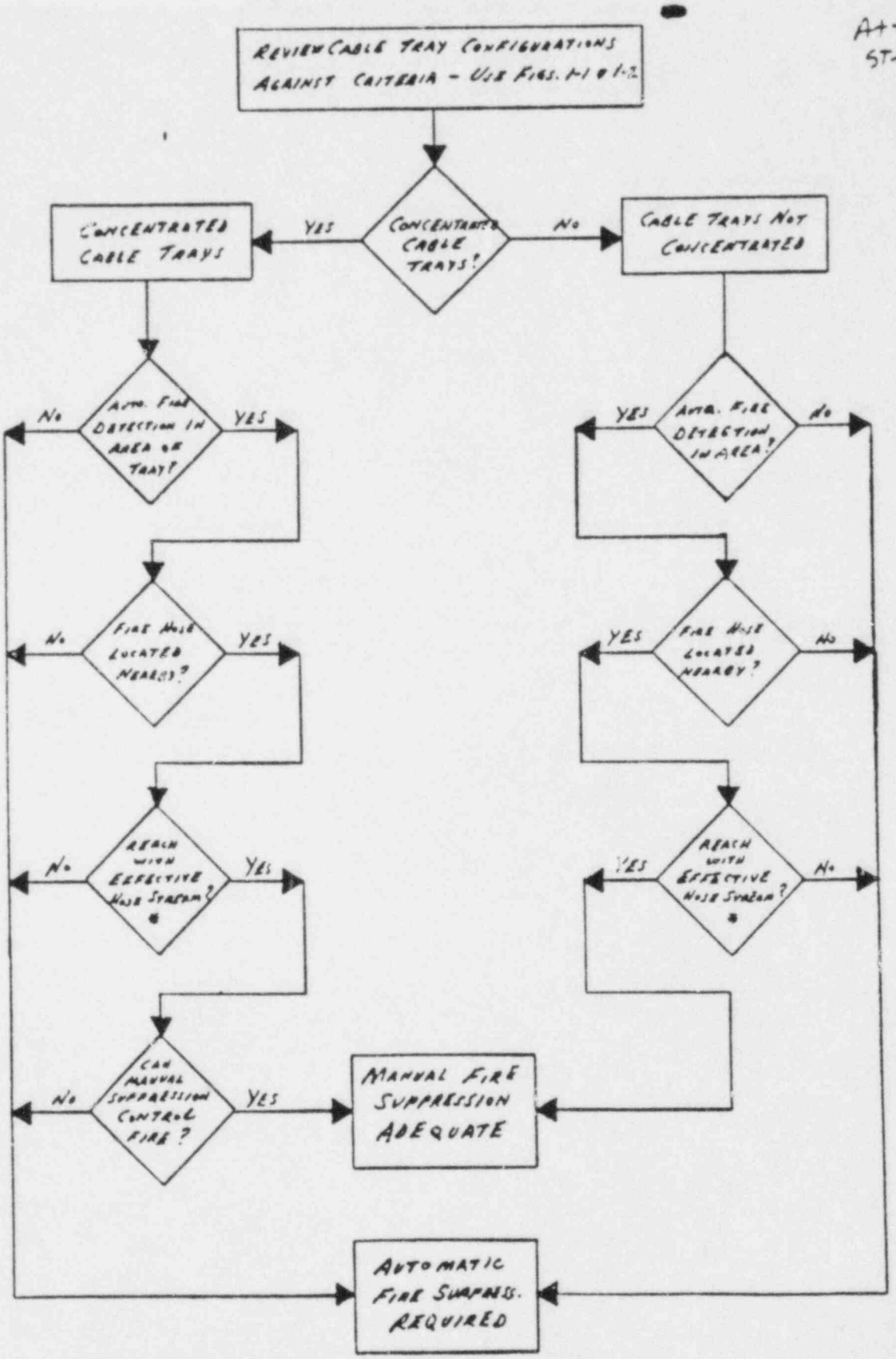
2.



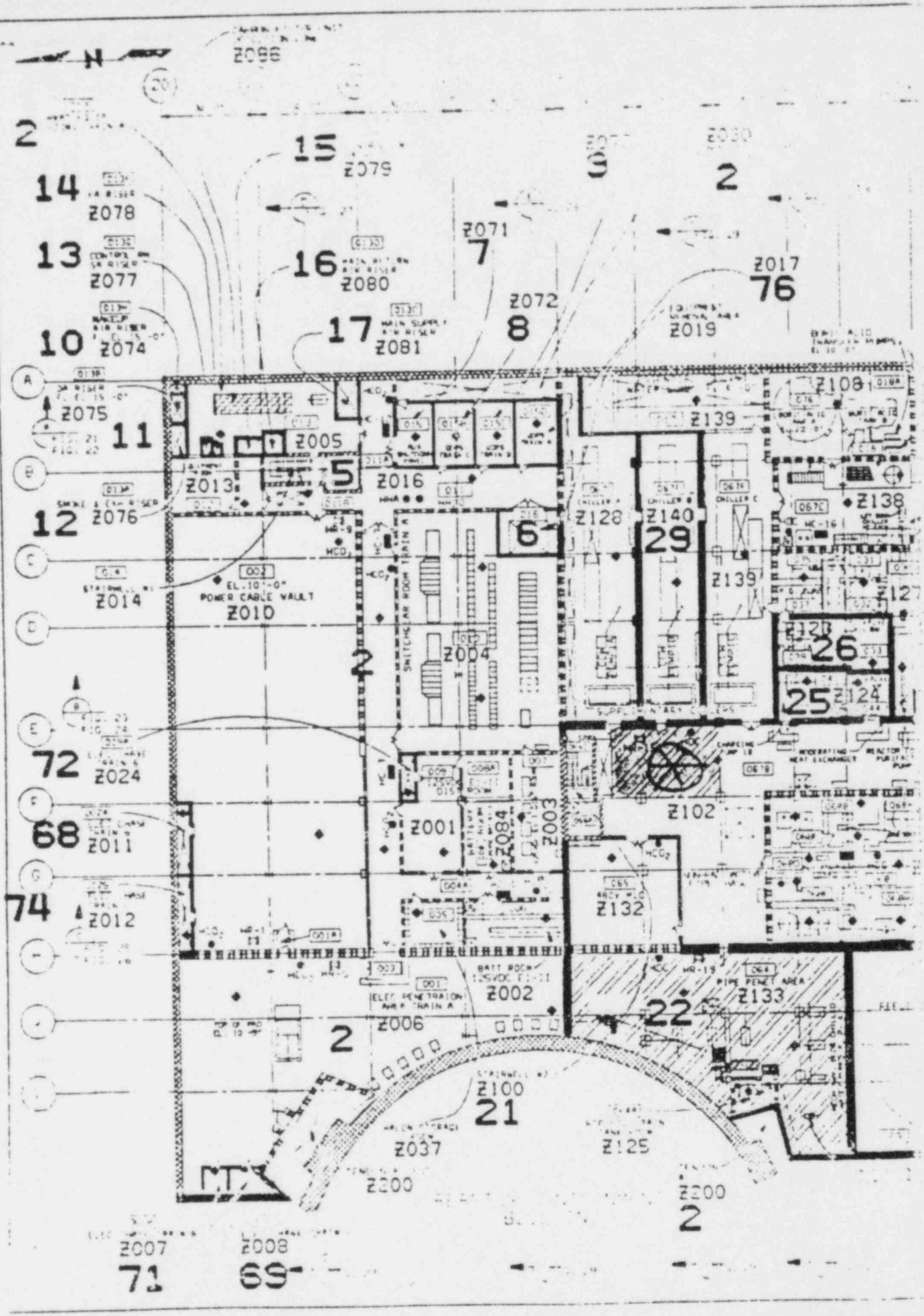
Two (2) adjacent stacks with separation three (3) feet or less, each stack with two (2) or more trays back to back

FIGURE 1-3

LOGIC FOR DETERMINING THE TYPE OF FIRE SUPPRESSION SYSTEM, MANUAL OR AUTOMATIC, FOR ALL CABLE TRAYS OUTSIDE CABLE SPREADING ROOMS/POWER CABLE VAULT



TO ACHIEVE CREDIT MAY BE TAKEN FOR USE OF PORTABLE LADDERS AND ADEQUATE CLEARANCE IN ACCESS PATHS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EL. 101'-0"
POWER CABLE VAULT
Z010
Z004
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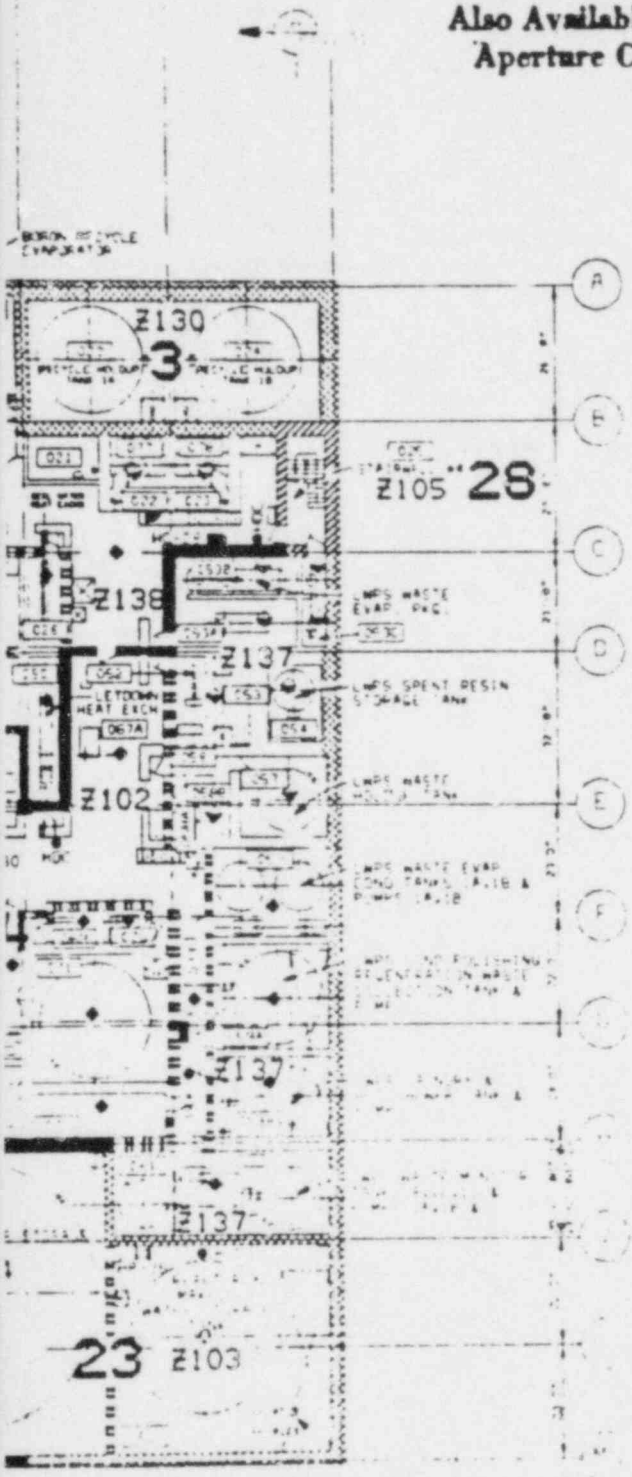


AREAS HAVING CONCENTRATED CABLES AND PROTECTED BY MANUAL FIRE SUPPRESSION

AREAS HAVING CONCENTRATED CABLES AND PROTECTED BY FIXED AUTOMATIC FIRE SUPPRESSION SYSTEMS

FIXED AUTOMATIC FIRE SUPPRESSION PROVIDED FOR DIFFICULT TO ACCESS AREAS ABOVE DUCTING - CABLE TRAYS ARE NOT CONSIDERED "CONCENTRATED"

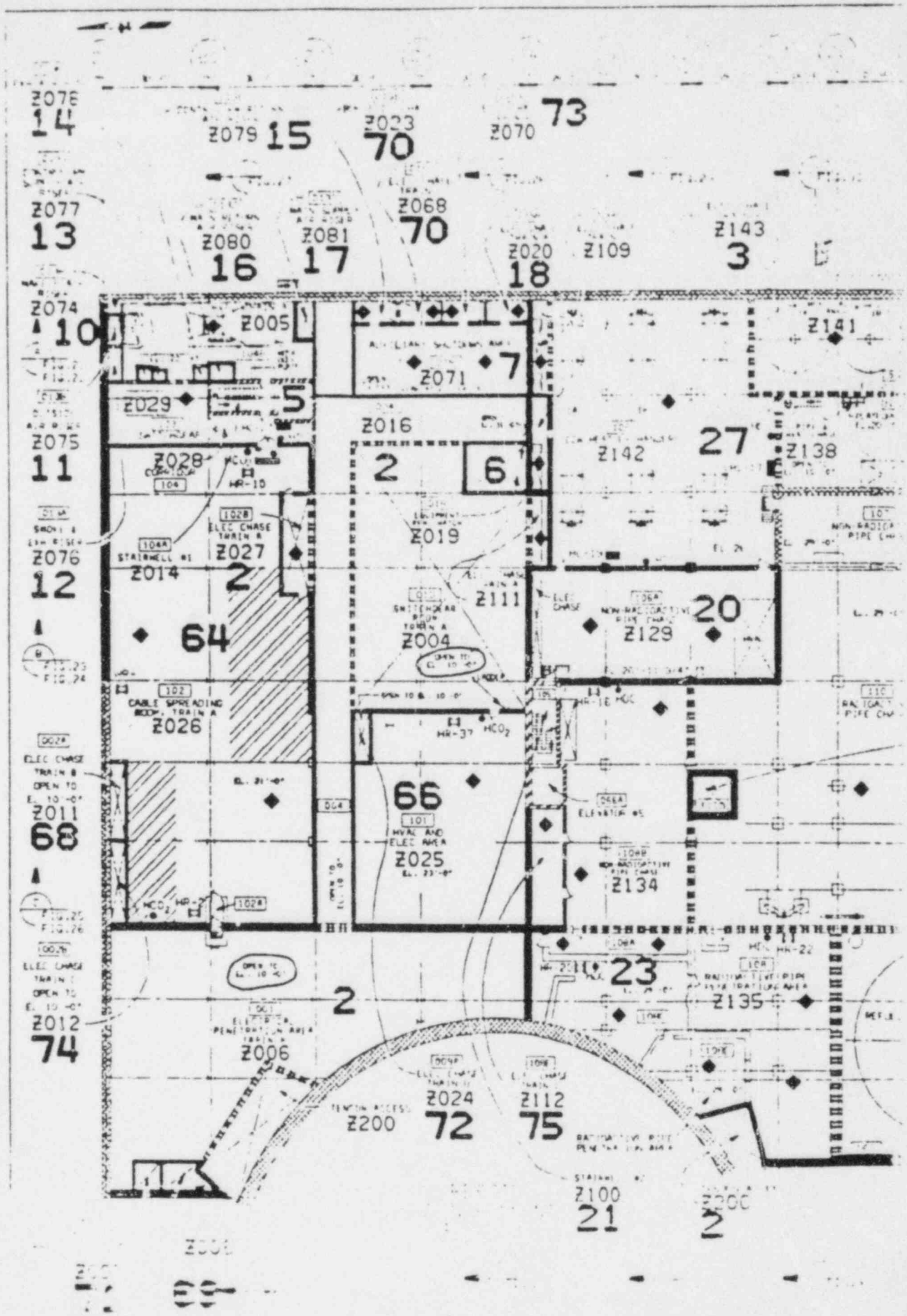
SOUTH TEXAS PROJECT
UNITS 1&2

FIRE AREAS

MECHANICAL & ELECTRICAL
AUXILIARY BUILDING
PLAN AT EL. 10[illegible]

CONCENTRATED CABLE TRAY
EVALUATION

8511050181-01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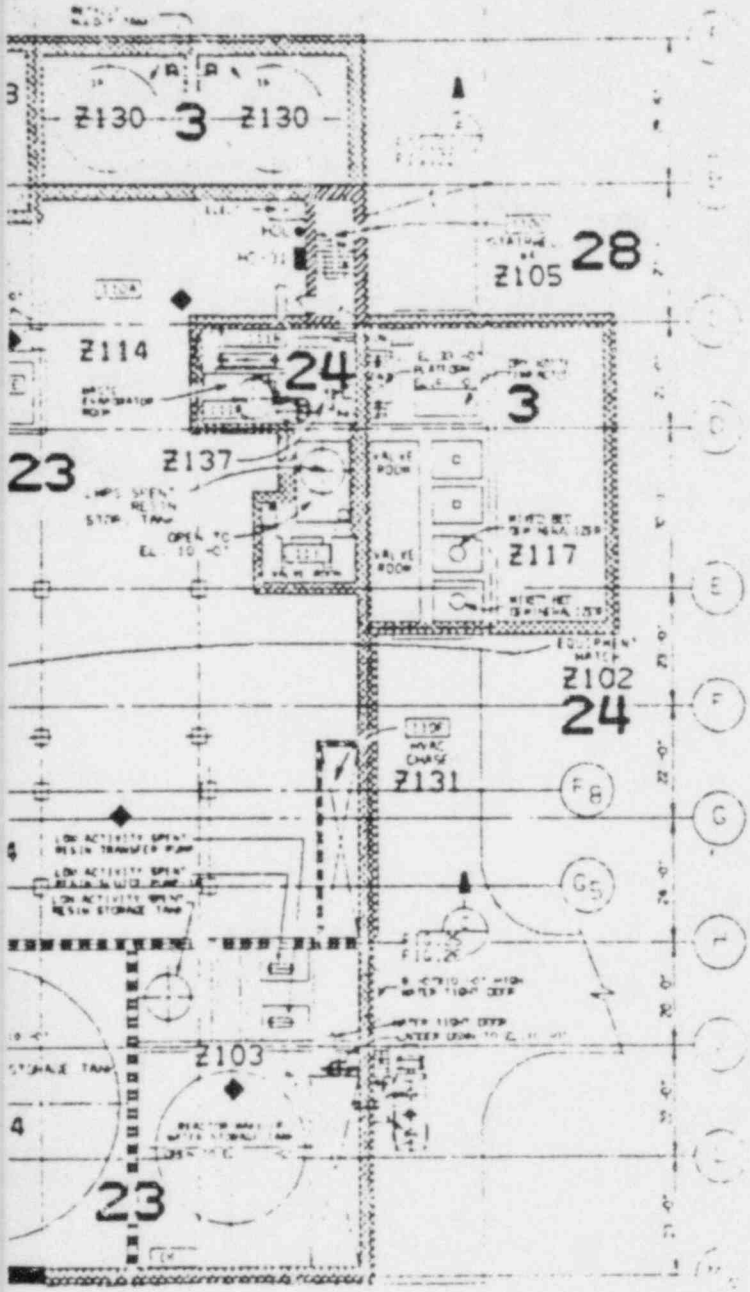

SEE MEAB 10' EL.
FOR LEGEND

SOUTH TEXAS PROJECT
UNITS 1&2

FIRE AREAS

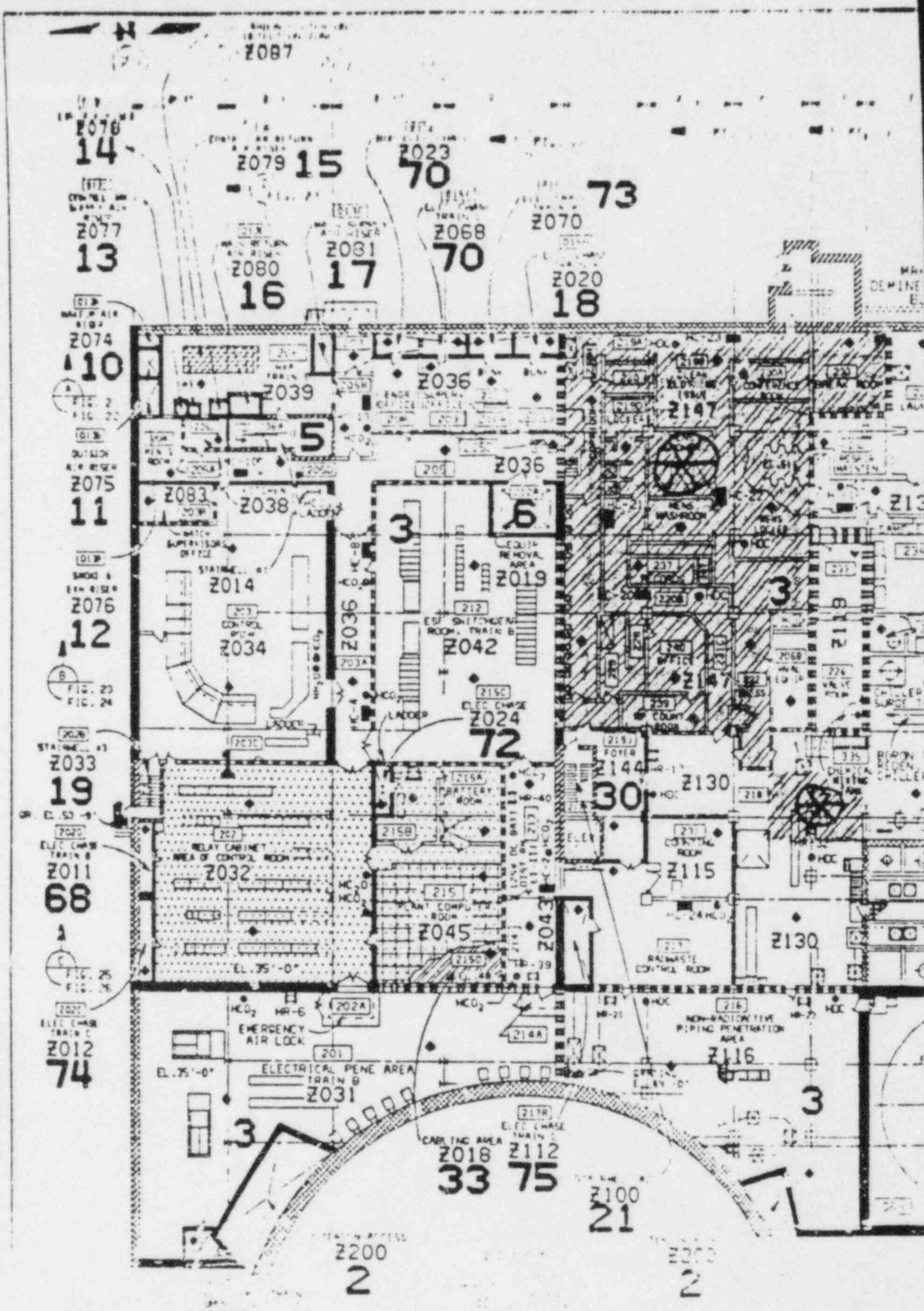

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FIG. 2
FIG. 22
Z039
Z036
5
Z147
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11
Z083
Z038
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6
EQUIP REMOVAL AREA
Z019
MENS WASHROOM
3
WATCH SUPERVISORS OFFICE
STAIRWELL #1
Z014
Z076
12
CONTROL RM
Z034
Z036
ESF SWITCHGEAR ROOM, TRAIN B
Z042
FIG. 23
FIG. 24
ELEC CHASE
Z024
72
CHILLER SURGE TK
STAIRWELL #3
Z033
19
FOYER
Z144
Z130
30
BATTERY ROOM
ELEC CHASE TRAIN B
Z011
68
RELAY CABINET AREA OF CONTROL ROOM
Z032
PLANT COMPUTER ROOM
Z045
CONTROL ROOM
Z115
Z043
Z130
FIG. 25
FIG. 26
EL. 35'-0"
RADWASTE CONTROL ROOM
ELEC CHASE TRAIN C
Z012
74
HR-6
EMERGENCY AIR LOCK
NON-RADIOACTIVE PIPING PENETRATION AREA
Z116
EL. 35'-0"
ELECTRICAL PENE AREA TRAIN B
Z031
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CABLING AREA
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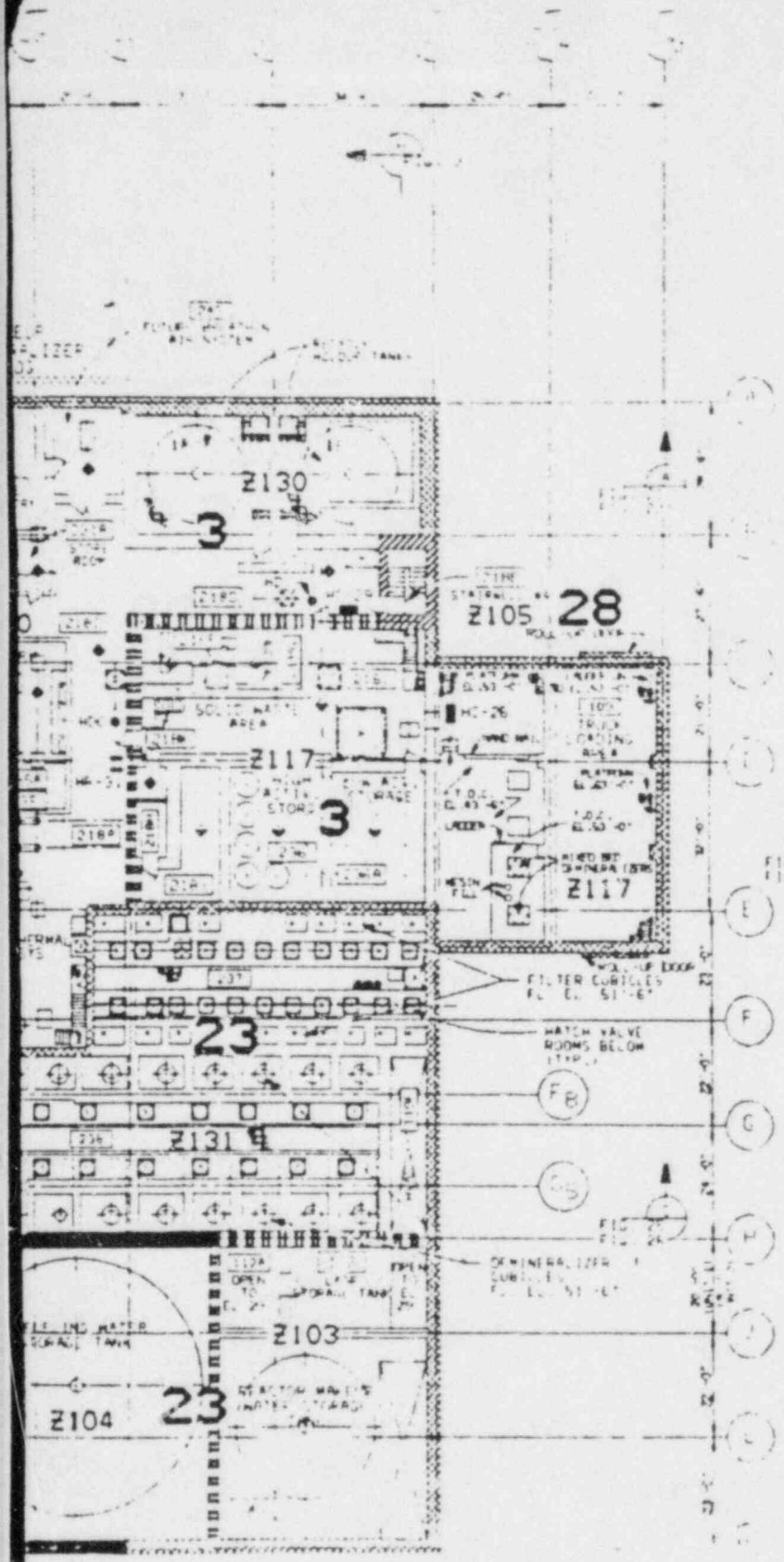


TI APERTURE CARD

Also Available On Aperture Card

SEE MEAB 10' FOR LEGEND

ATTACHMENT 1
ST-HL-AE-1449
PAGE 10 OF 17

⊛ - FIXED AUTOMATIC FIRE SUPPRESSION PROVIDED TO INACCESSIBLE AREAS ABOVE DUCTING OR SUSPENDED CEILINGS. CABLES ARE NOT CONSIDERED "CONCENTRATED".

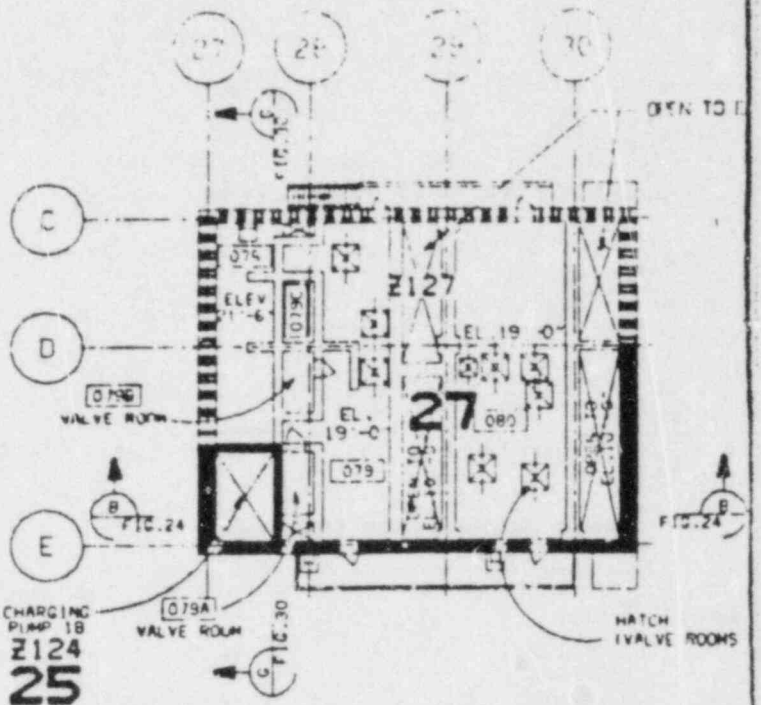
SOUTH TEXAS PROJECT
UNITS 1&2

FIRE AREAS

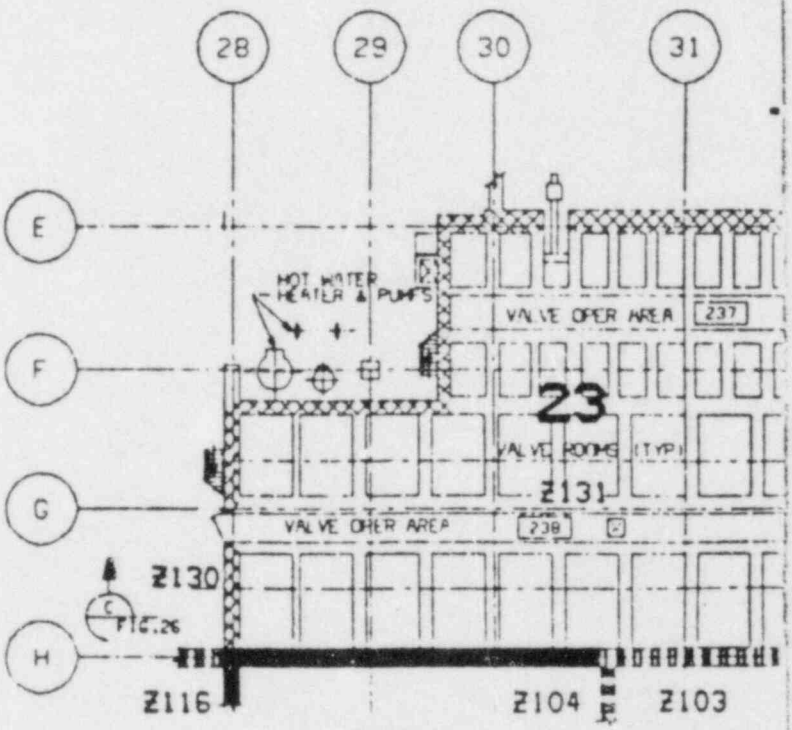
MECHANICAL & ELECTRICAL
AUXILIARY BUILDING
PLAN AT EL. 35'-0", 47'-0" & 59'-0"

10/15/25

8511050181-03



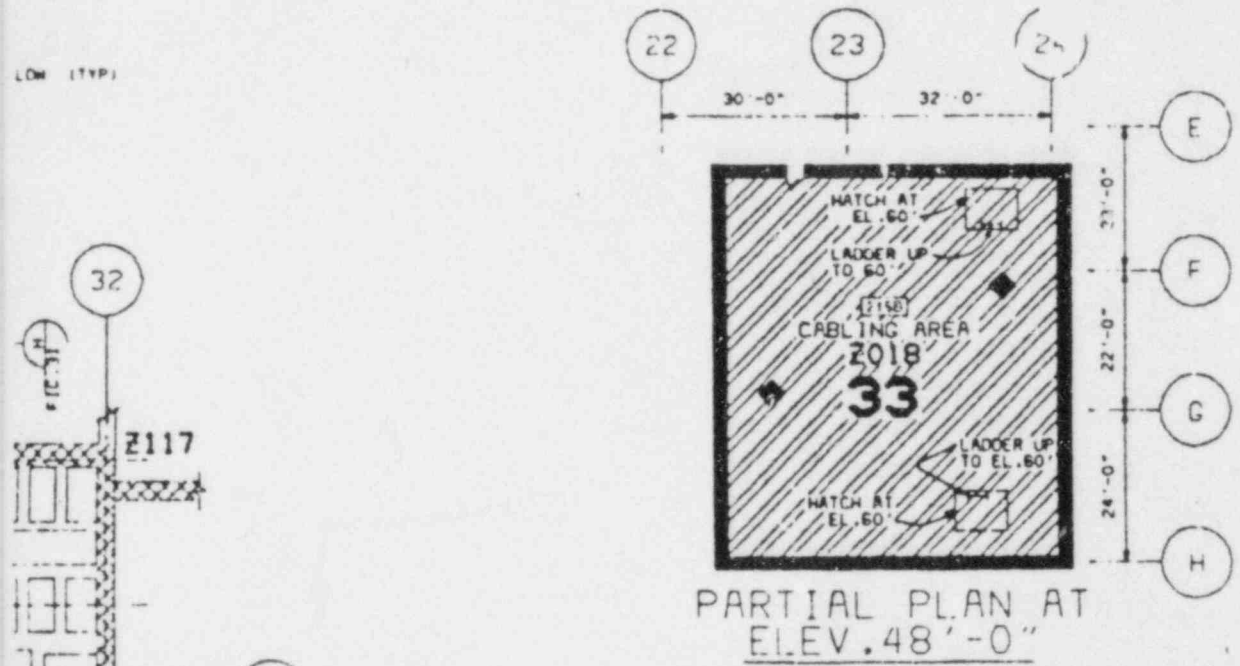
PARTIAL PLAN AT EL. 19'-0"



NOTES:

1. REFER TO FIGURE [illegible] FOR LEGEND AND SYMBOLS.
2. THE FIRE DETECTORS ARE REPRESENTATIVE ONLY. SEE RELATED FIRE DETECTION DRAWINGS FOR THE ACTUAL LOCATION AND NUMBER OF FIRE DETECTORS IN EACH FIRE AREA.
3. PORTABLE FIRE FIGHTING EQUIPMENT AND HOSE STATIONS ARE NOT NECESSARILY SHOWN AT THEIR EXACT INSTALLED LOCATIONS. FOR ACTUAL LOCATIONS, SEE FIRE PROTECTION CONTRACTOR'S DRAWINGS.

SEE MEAB EL. 10' FOR LEGEND



PARTIAL PLAN AT ELEV. 48'-0"

TI APERTURE CARD

Also Available On Aperture Card

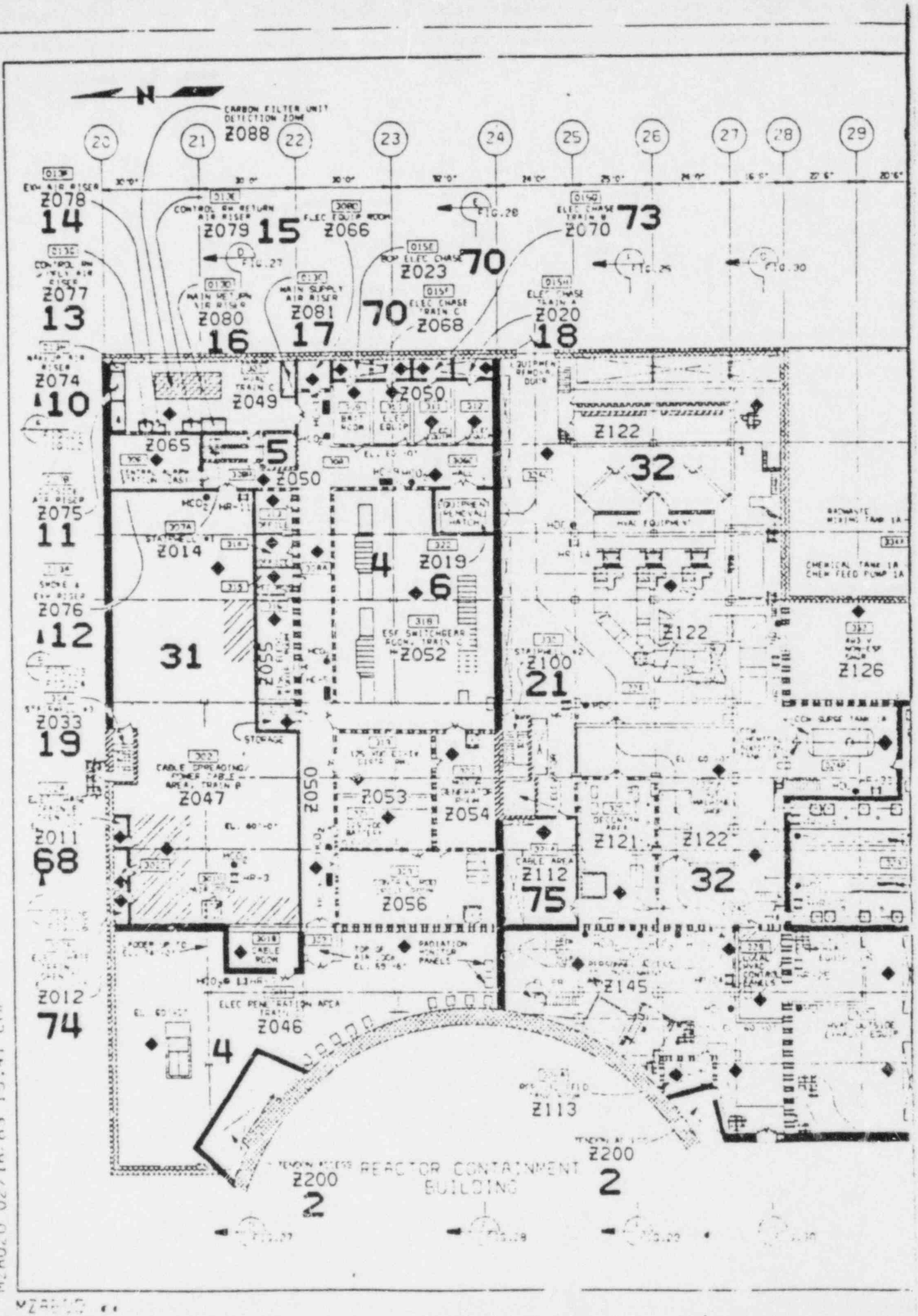
SOUTH TEXAS PROJECT
UNITS 1&2

FIRE AREAS

MECHANICAL & ELECTRICAL AUXILIARY BUILDING
PARTIAL PLAN AT EL. 10' 41' & 48'

10/15/85

8511050181-04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REACTOR CONTAINMENT BUILDING
Z200
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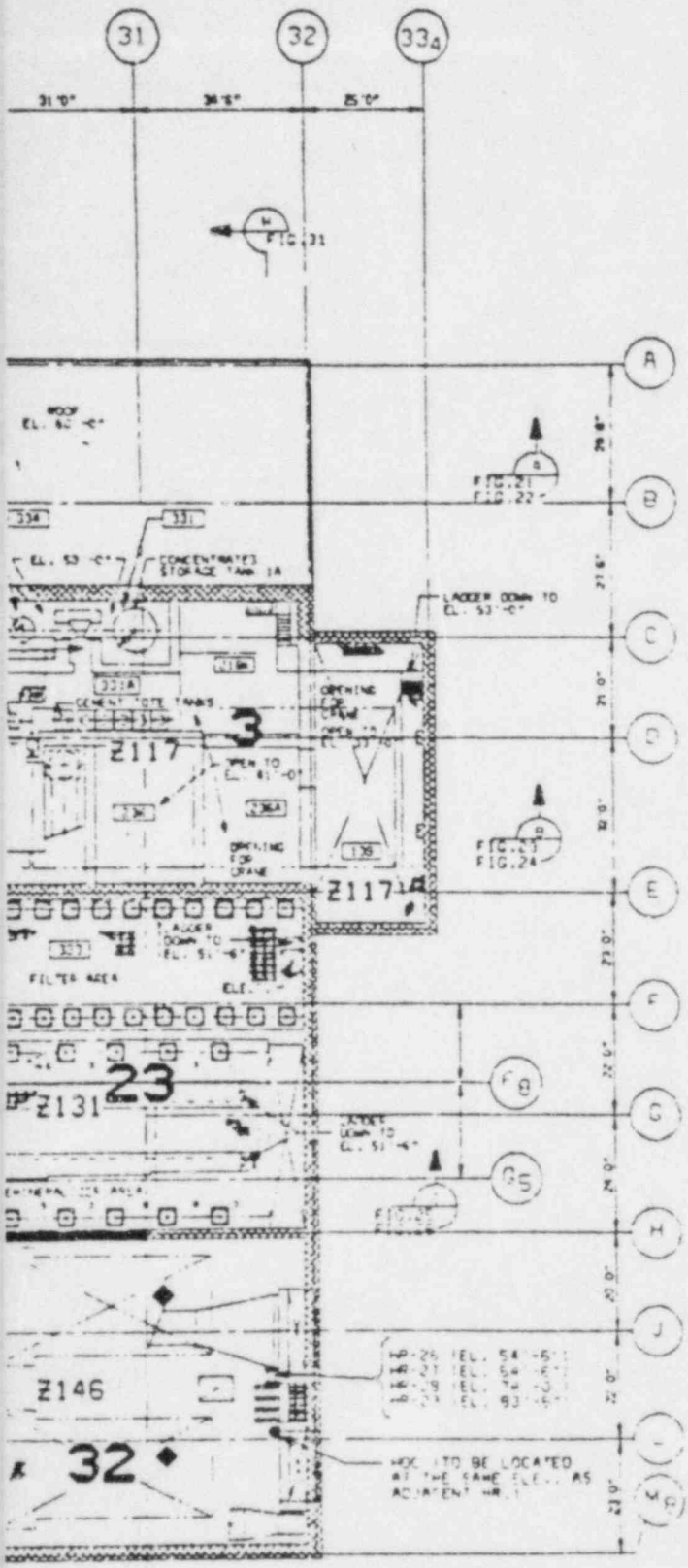


NOTES:

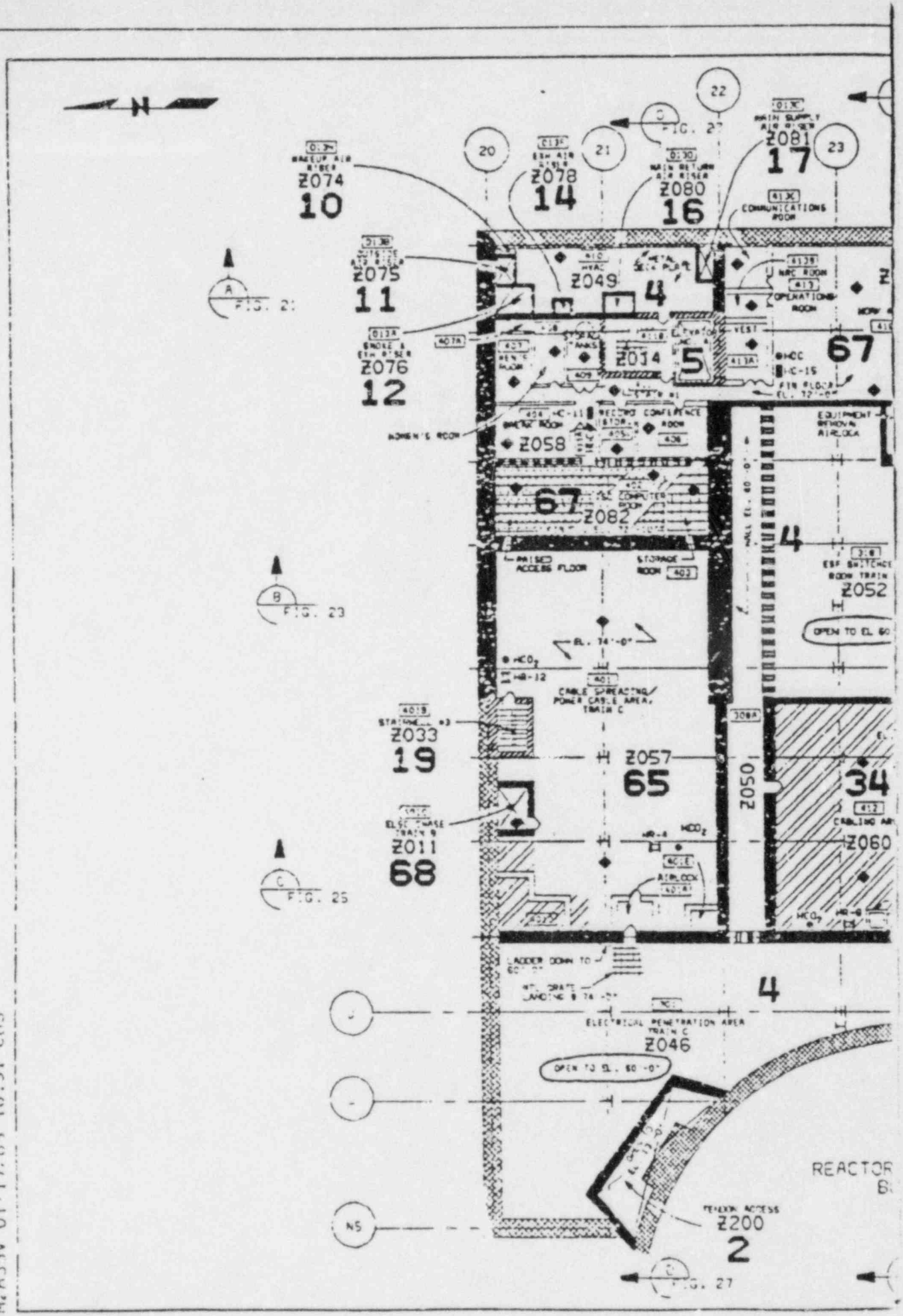
1. REFER TO FIGURE 3-50 FOR LEGEND AND SYMBOLS.
2. THE FIRE DETECTORS ARE REPRESENTATIVE ONLY. SEE BECHTEL FIRE DETECTION DRAWINGS FOR THE ACTUAL LOCATION AND NUMBER OF FIRE DETECTORS IN EACH FIRE AREA.
3. PORTABE FIRE FIGHTING EQUIPMENT AND HOSE STATIONS ARE NOT NECESSARILY SHOWN AT THEIR EXACT INSTALLED LOCATIONS, FOR ACTUAL LOCATIONS, SEE FIRE PROTECTION CONTRACTOR'S DRAWINGS.

SOUTH TEXAS PROJECT
UNITS 1&2

FIRE AREAS

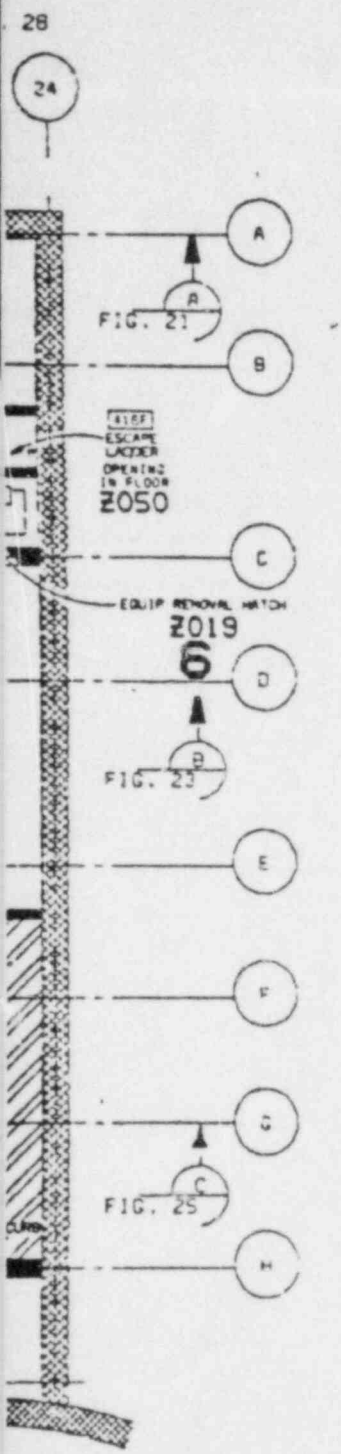
MECHANICAL & ELECTRICAL
AUXILIARY BUILDING
PLAN AT EL. 60'-0"

10/15/85



M/A/SW 01/17/85 18:31 CDS

MZABDD



NOTES:

1. REFER TO FIGURE 3-50 FOR LEGEND AND SYMBOLS.
2. THE FIRE DETECTORS ARE REPRESENTATIVE ONLY; SEE BECHTEL FIRE DETECTION DRAWINGS FOR THE ACTUAL LOCATION AND NUMBER OF FIRE DETECTORS IN EACH FIRE AREA.
3. PORTABLE FIRE FIGHTING EQUIPMENT AND HOSE STATIONS ARE NOT NECESSRILY SHOWN AT THEIR EXACT INSTALLED LOCATIONS; FOR ACTUAL LOCATIONS, SEE FIRE PROTECTION CONTRACTOR'S DRAWINGS.

SEE MEAB 10' EL. FOR LEGEND

SOUTH TEXAS PROJECT
UNITS 1&2

FIRE AREAS

MECHANICAL & ELECTRICAL AUXILIARY BUILDING PLANS AT EL. 72'-0", 74'-0", & 76'-0"

10/15/85

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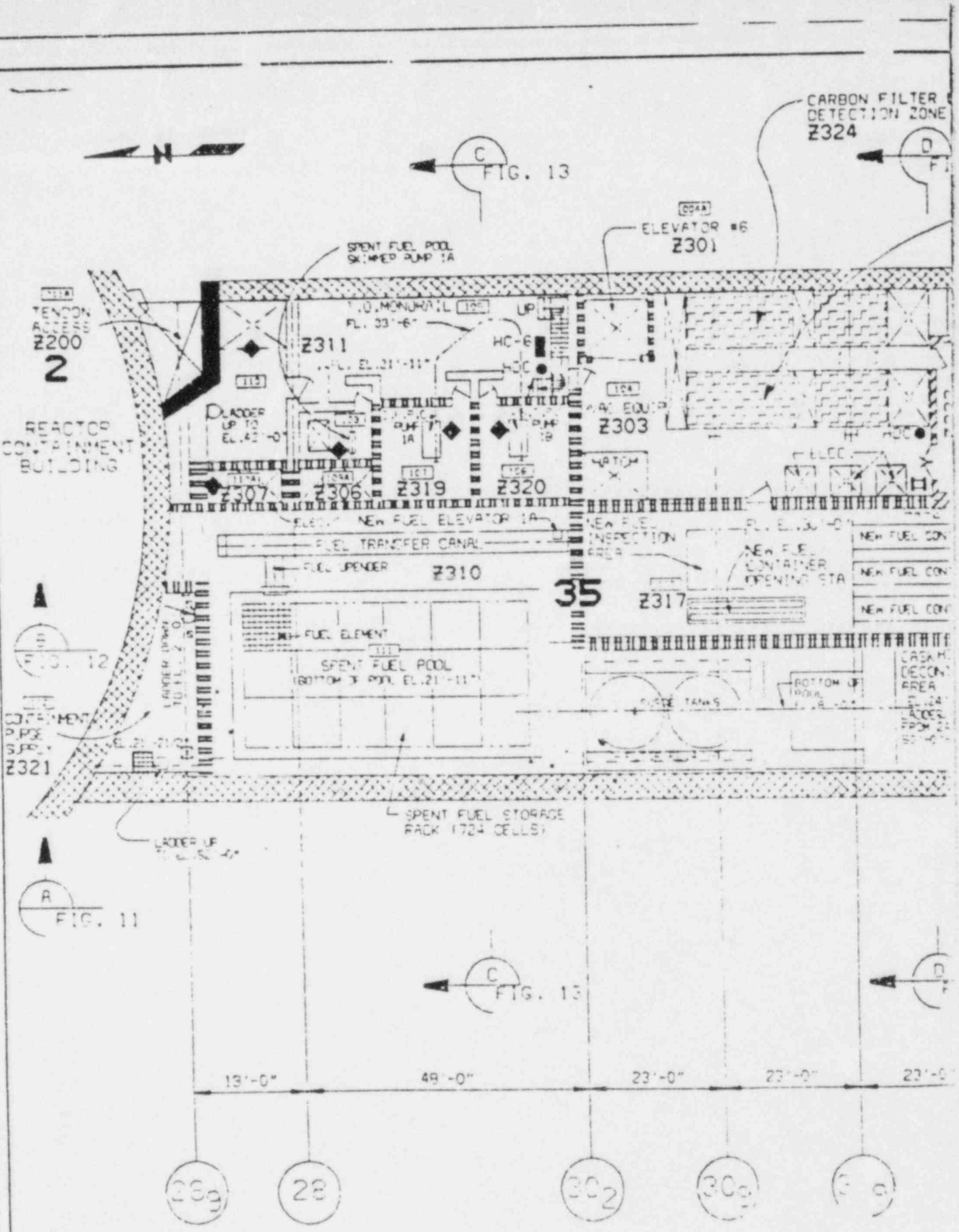
28



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NOTES:

1. REFER TO FIGURE 3-50 FOR LEGEND AND SYMBOLS.
2. THE FIRE DETECTORS ARE REPRESENTATIVE ONLY. SEE BECHTEL FIRE DETECTION DRAWINGS FOR THE ACTUAL LOCATION AND NUMBER OF FIRE DETECTORS IN EACH FIRE AREA.
3. PORTABLE FIRE FIGHTING EQUIPMENT AND HOSE STATIONS ARE NOT NECESSARILY SHOWN AT THEIR EXACT INSTALLED LOCATIONS. FOR FINAL LOCATIONS, SEE FIRE PROTECTION INSTALLATION DRAWINGS.

13

BON FILTER UNIT
ECTION ZONE
25

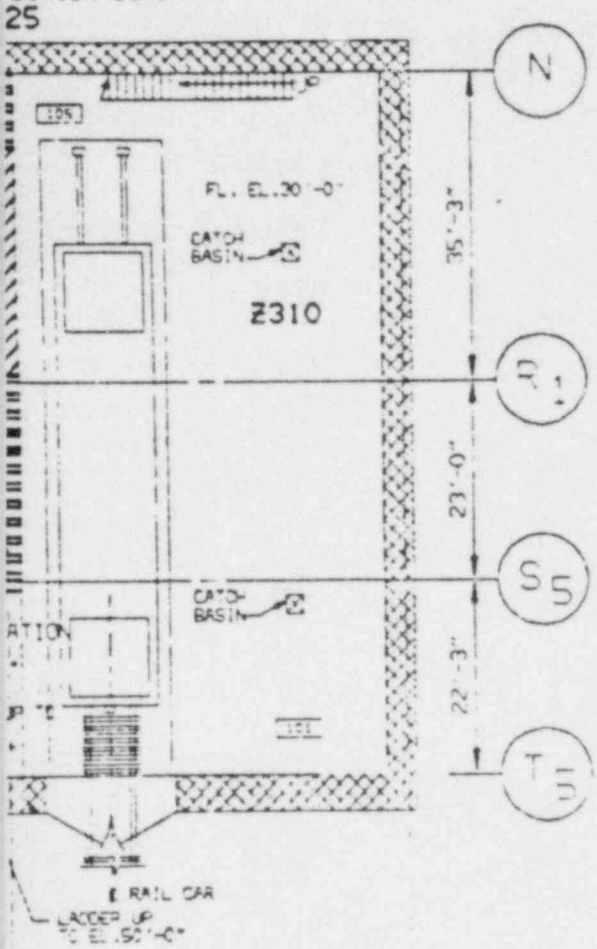


FIG. 12

FIG. 11

See MEAB 10' for legend

13

45'-0"

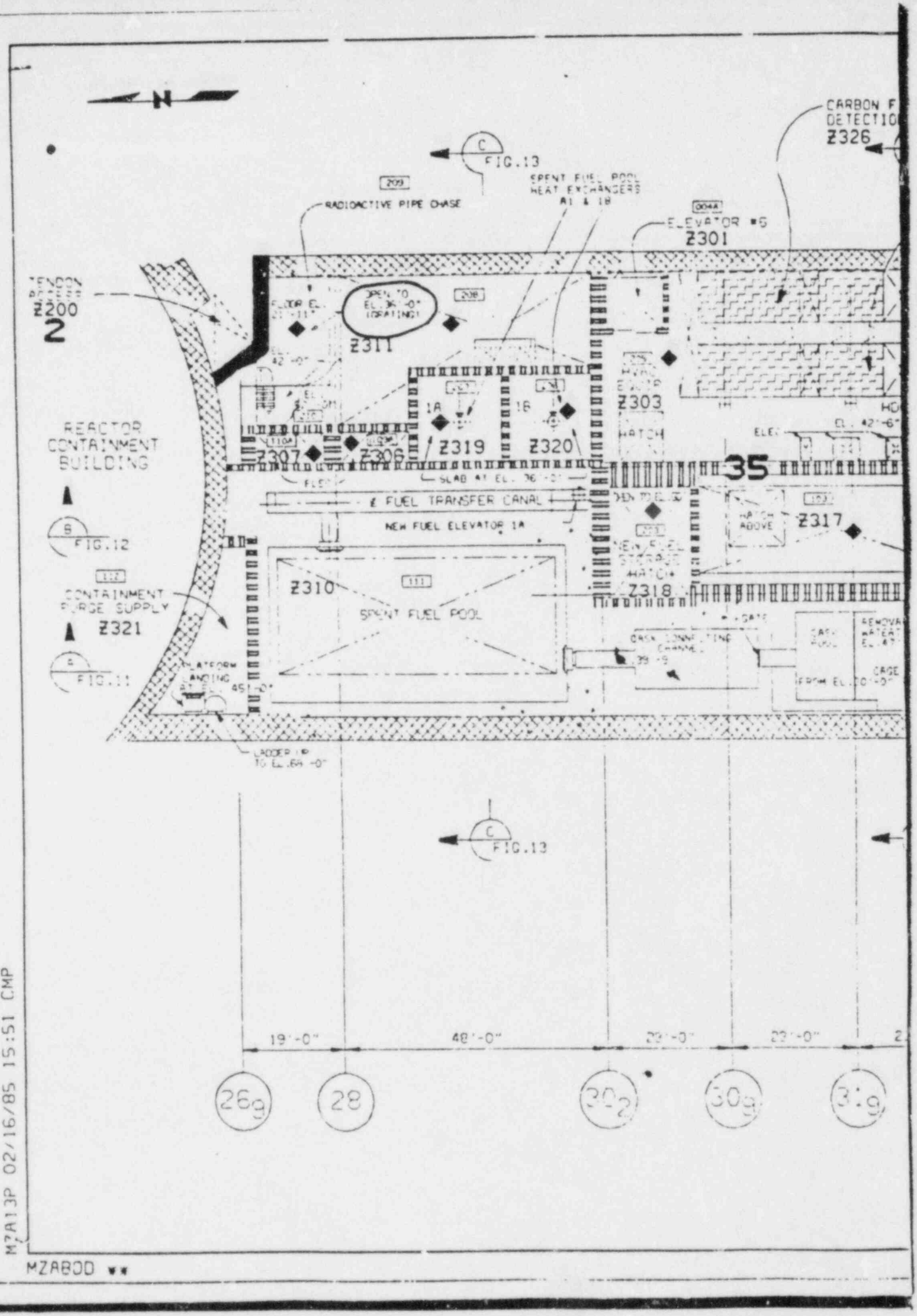
34

SOUTH TEXAS PROJECT
UNITS 1&2

FIRE AREAS

FUEL HANDLING BUILDING
PLAN AT EL. 21'-11"

10/15/85



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CARBON FILTER UNIT
DETECTION ZONE
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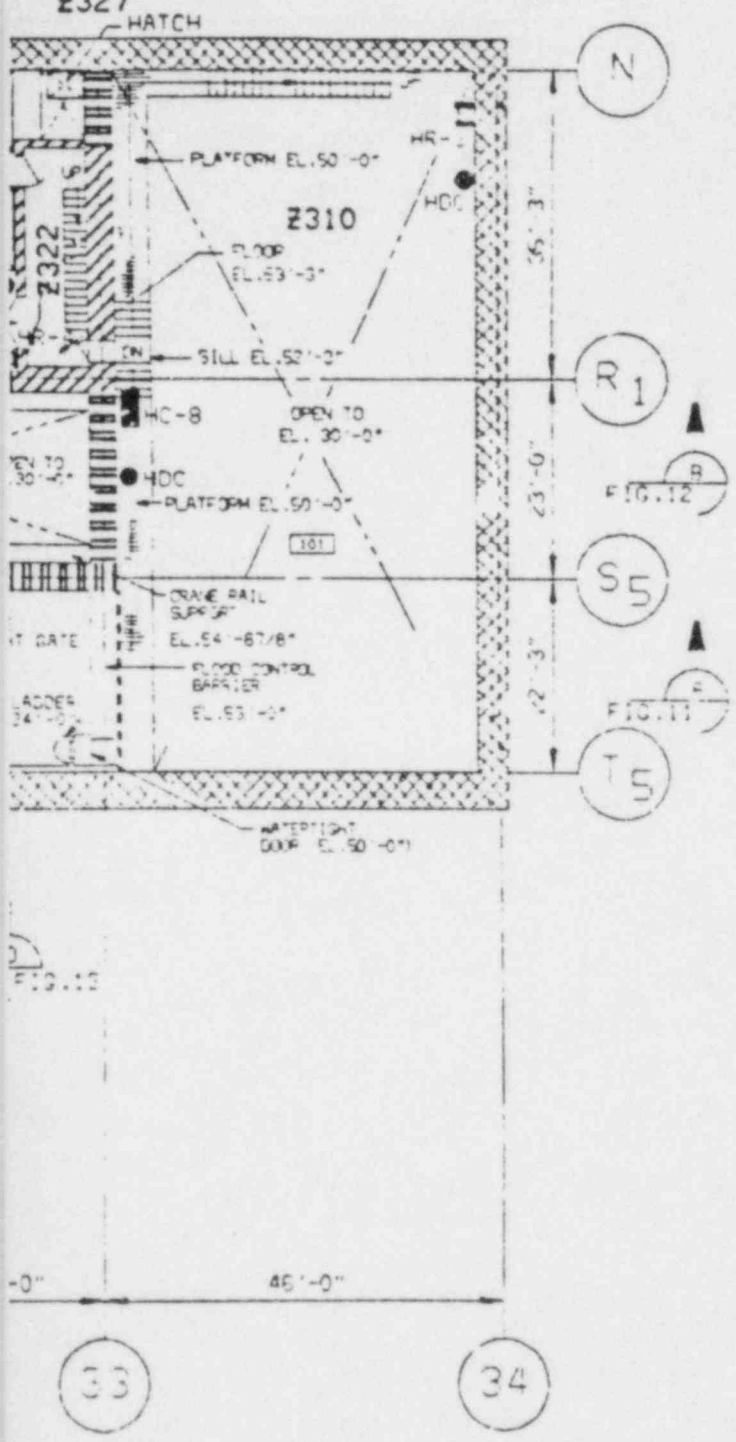

NOTES:

1. REFER TO FIGURE 3-50 FOR LEGEND AND SYMBOLS.
2. THE FIRE DETECTORS ARE REPRESENTATIVE ONLY. SEE BECHTEL FIRE DETECTION DRAWINGS FOR THE ACTUAL LOCATION AND NUMBER OF FIRE DETECTORS IN EACH FIRE AREA.
3. PORTABLE FIRE FIGHTING EQUIPMENT AND HOSE STATIONS ARE NOT NECESSARILY SHOWN AT THEIR EXACT INSTALLED LOCATIONS FOR ACTUAL LOCATIONS, SEE FIRE PROTECTION CONTRACTOR'S DRAWINGS.

SEE MEAB 10' FOR LEGEND

SOUTH TEXAS PROJECT
UNITS 1&2

FIRE AREAS

FUEL HANDLING BUILDING
PLAN AT EL. 42'-6"

10/15/85

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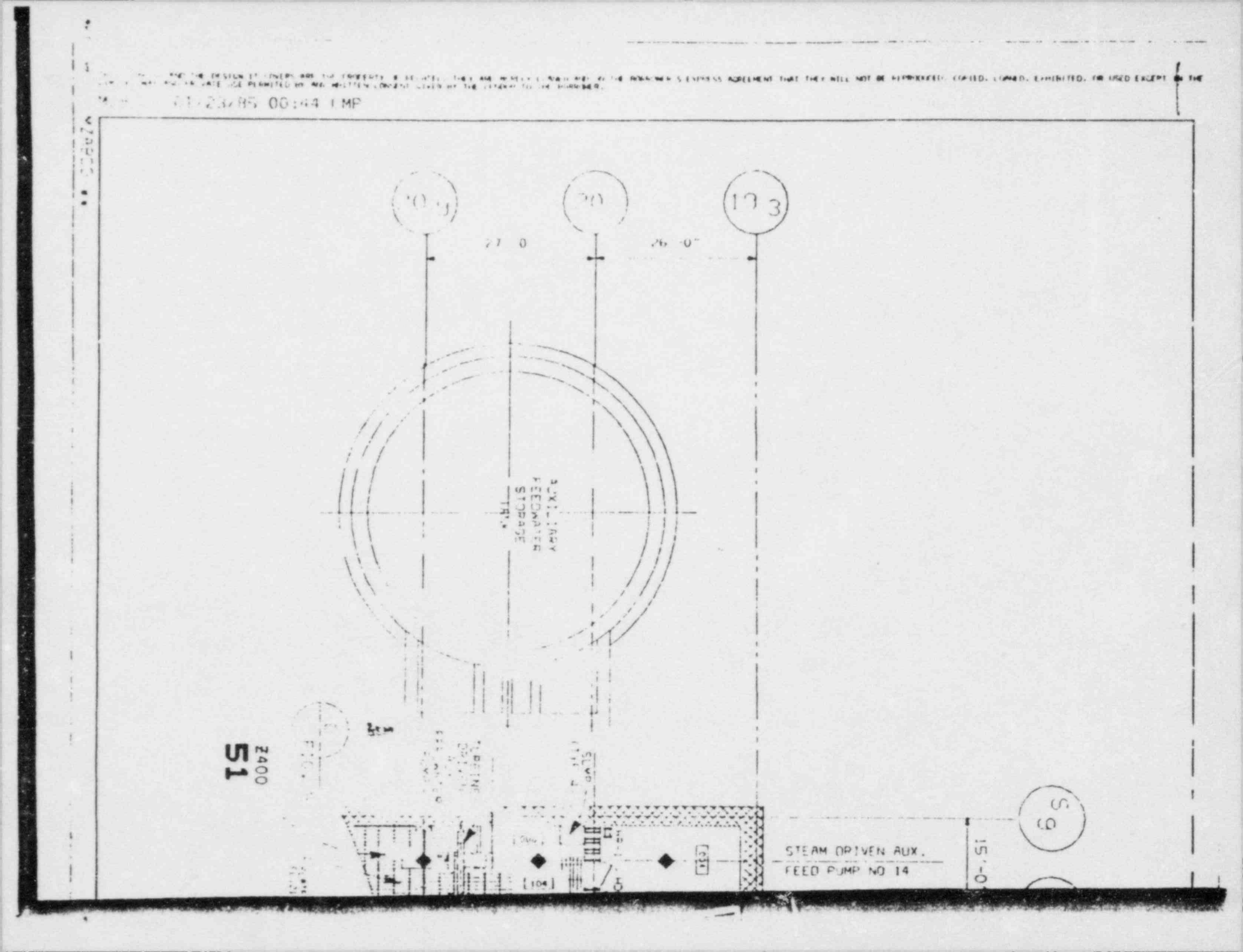

Attachment 1
ST-HL-AE-1449
Page 16 OF 17

NOTES:

1. REFER TO FIGURE 3-50 FOR LEGEND AND SYMBOLS.
2. THE FIRE DETECTORS ARE REPRESENTATIVE ONLY. SEE BECHTEL FIRE DETECTION DRAWINGS FOR THE ACTUAL LOCATION AND NUMBER OF FIRE DETECTORS IN EACH FIRE AREA.
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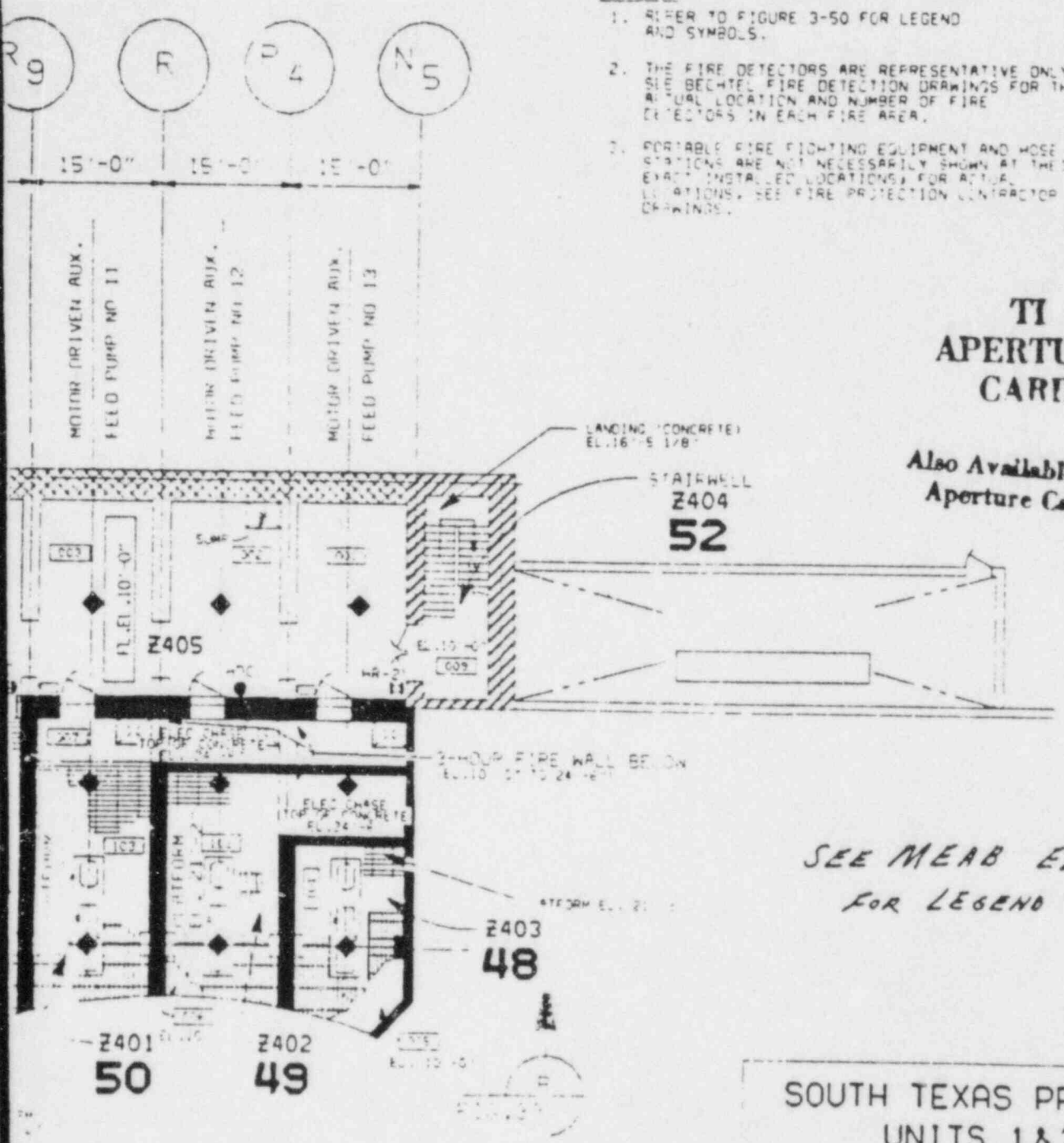

SEE MEAB EL. 10'-0 FOR LEGEND

SOUTH TEXAS PROJECT
UNITS 1&2

FIRE AREAS

ISOLATION VALVES CUBICLE
PLAN AT EL. 10'-0" & 21'-2"

~~FIGURE 3-35~~
10/15/85

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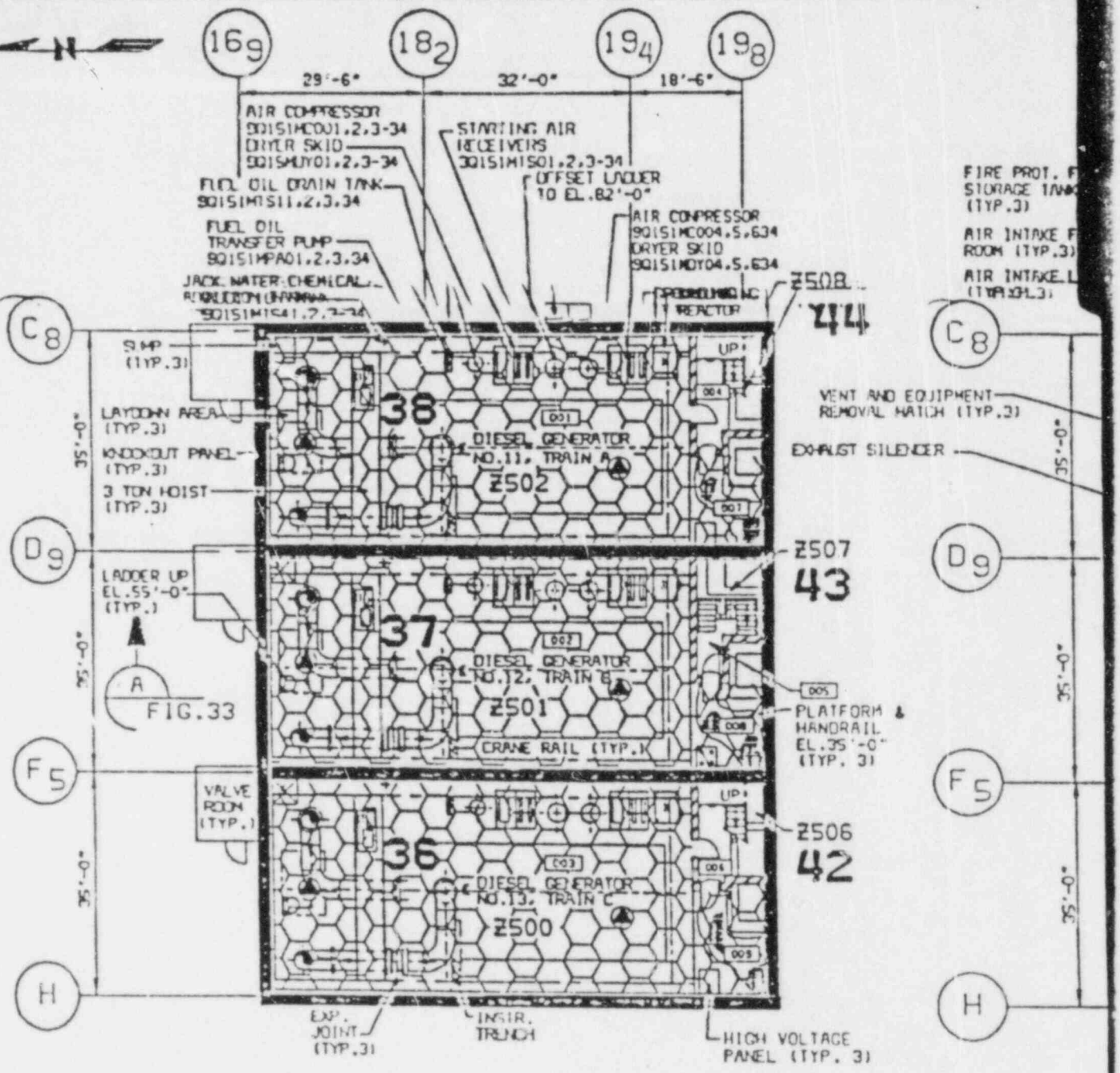
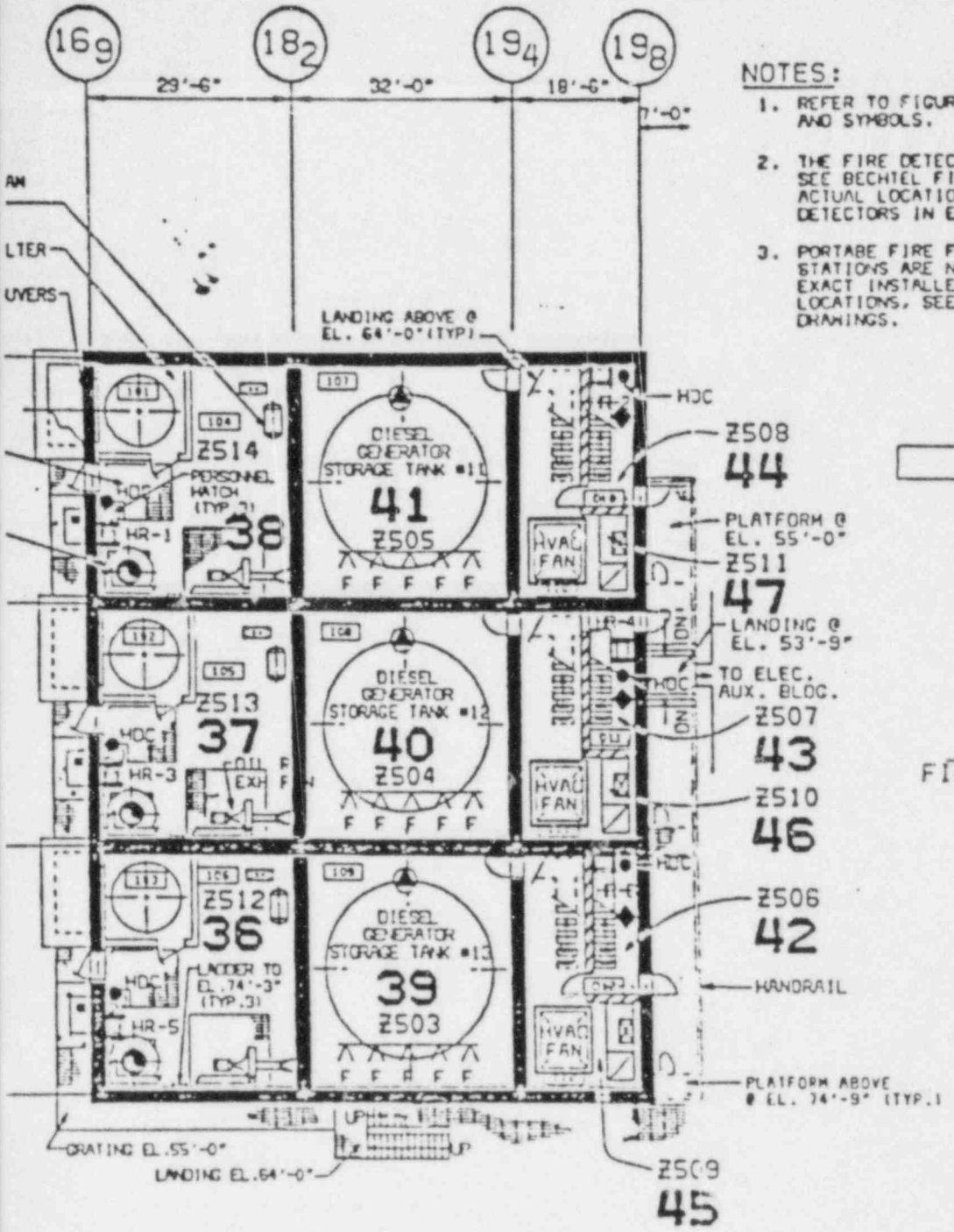


PLAN AT EL. 25'-0"



NOTES:

1. REFER TO FIGURE 3-50 FOR LEGEND AND SYMBOLS.
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AREAS HAVING CONCENTRATED CABLES AND PROTECTED BY FIXED AUTOMATIC FIRE SUPPRESION SYSTEMS.

A
FIG. 33

TI APERTURE CARD

Also Available On Aperture Card

PLAN AT EL. 55'-0"

SOUTH TEXAS PROJECT
UNITS 1&2

FIRE AREAS

DIESEL GENERATOR BUILDING
PLANS AT EL. 25'-0" & 55'-0"

~~FIGURE 3-32~~
10/11/85

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