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AUTH.NAME AUTHOR AFFILIATION
ROOT,L.D. Iowa Electric Light & Power Co.
RECIP.NAME RECIPIENT AFFILIATION
DENTON,H.R. Office of Nuclear Reactor Regulation

SUBJECT: Forwards responses to questions raised re fire protection analysis.Diesel generator room drawings encl.

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	12 AUXIL SYS BR	2	2	14 PLANT SYS BR	5	5
	19 WAMBACH	1	1	20 MURANAKA,R	1	1
	OELD	1	0			
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Iowa Electric Light and Power Company

November 29, 1979
LDR-79-326

LARRY D. ROOT
ASSISTANT VICE PRESIDENT
NUCLEAR GENERATION

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

On several occasions members of the Iowa Electric Light and Power Company Engineering staff had telephone conversations with Messrs. T. Kevern and L. Derderian of your staff concerning NRC questions about fire protection at the Duane Arnold Energy Center. As a result of these conversations it was requested by your staff that we provide written responses to the questions. Enclosed you will find our responses. If more clarification is needed, we will be pleased to discuss it with you further.

Very truly yours,

Larry D. Root
Assistant Vice President
Nuclear Generation

LDR/RFS/mz
Attachments
cc: R. Salmon
D. Arnold
S. Tuthill
L. Liu
E. Hammond
K. Meyer
D. Wilson
T. Kevern (NRC)
L. Derderian (NRC)
M. Antonetti (Gage Babcock)
J. Boccio (Brookhaven)
File: P-72a

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QUESTIONS AND ANSWERS CONCERNING
THE
DUANE ARNOLD ENERGY CENTER
FIRE HAZARD ANALYSIS

1. Page III-10 states that tray 1K5A supplies power to one pump and a conduit supplies power to the other, implying that a fire involving tray 1K5A will not affect the conduit. What is the vertical and horizontal distance between 1K5A and the conduit? Are both 1K5a and the conduit in the same fire area (RCIC room)?

   The cable tray is separated from the conduit by 10 ft. vertically upward and 4 ft. horizontally.

2. Page III-40 states that installation of ionization detectors will provide early warning of fire conditions. Has our design criteria included the fact that the high velocity of air in the MG Set Room may result in the detectors being ineffective?

   Line detectors (not ionization detectors) are being installed on the cable trays.

3. The zone descriptions concerning the diesel fire pump room and the diesel fire pump day tank room appear to be inconsistent with the agreements that were made. In particular, the analysis implies that all steel surfaces in the pump room are fireproofed and that we are apparently depending upon floor drains to mitigate consequences of an oil spill fire in the day tank room.

   We plan to coat the exposed steel and to add a curbing in the day tank room which would contain an oil spill.

4. There apparently is still some problem with the sprinkler system coverage at elevation 716' of the Turbine Building. Refer to Drawing M-373. The sprinkler discharge should cover the entire curbed area.

   This is a concern over the lack of sprinkler coverage over the oil sump area near the Reactor Feedwater Pumps. As a result of our inspection we have found that an extension of the RFP deluge system presently exists over the area in question.

5. Drawings that we provided for the Emergency Diesel Generator Room were only plan views. They would like to see sprinkler layout drawings and would like information on system coverage densities, type of detection, and system trip points.

   Attached is a preliminary sketch of the proposed sprinkler layout. This sketch is only a guide used for design calculations. The contractor will be required to finalize the design. A coverage density of 0.30 gpm/ft^2 is required. The system will have a rate of rise release to put water into the sytem prior to fusing of the sprinkler. It is estimated that 8 additional 1/2" upright spray sprinklers will be added to each room but actual numbers will be dependent upon contractors final design.

6. A question remains concerning our analysis and design modifications for air intake into the Emergency Diesel Generator rooms.

   Please see the attached drawings which show how we intend to take intake suction from above the Turbine Building roof.

7. Page III-29 discusses a gradual increase of radioactive release to the environs. What level of release is expected?

   The release is monitored, and if it approaches the tech spec limit the system will isolate and shutdown causing no significant hazard to the public.

8. Page III-40 also discusses a smoke release to the atmosphere with no significant radioactive release to the environs.

   The release is only due to combustion of oil in the room, not due to radioactivity from the reactor system.

9. With reference to Zones 7B and 8B, are there fire dampers in all penetrations (4 each) between the two switchgear rooms?

   There are fire dampers in all HVAC penetrations in the switchgear rooms with the exception of the two communicating penetrations. Dampers will be installed in these penetrations during the 1980 outage.

10. Between Zone 8B and external to the TB (east) there is a transformer next to the outside of the wall. With regard to the insulation, how is it secured, and what is its quality and thickness?

    For the turbine building column insulation, refer to attached drawings A8-1(1), A8-1(2), A8-1(3).

11. Lube Oil is stored in Zone 8D near the EDG rooms, but we did not address oil in the area for the case of a pipe rupture. The DBF indicates a possiblility of the event but it is not included in the combustible loading description. Please explain.

    The lube oil in Zone 8D is not listed in the combustible loading table because it is enclosed in piping. Drums and the H_2 seal unit are listed. In addition the amount of turbine lube oil piping in this zone is quite small compared to the H_2 seal unit.

12. In Zone 8D, the TB RR entry area, it is concluded that no sprinkler system is necessary. The NRC believes there should be sprinklers. Please provide further justification or provide sprinklers. New information that should be considered is that the NRC no longer gives credit for drains and they feel that the presence of lube oil, oil storage, the diesel locomotive, etc. require a sprinkler system.

    In the area of the RR entry, the DBF does not take any credit for floor drainage other than for disposing of fire protection water. Therefore, because of the fact that the area is bounded by fire resistive walls and that administrative controls are provided to control comubstibles in the area, it is still concluded, as was found in the fire hazard analysis, that suppression in the area is neither practical nor necessary.

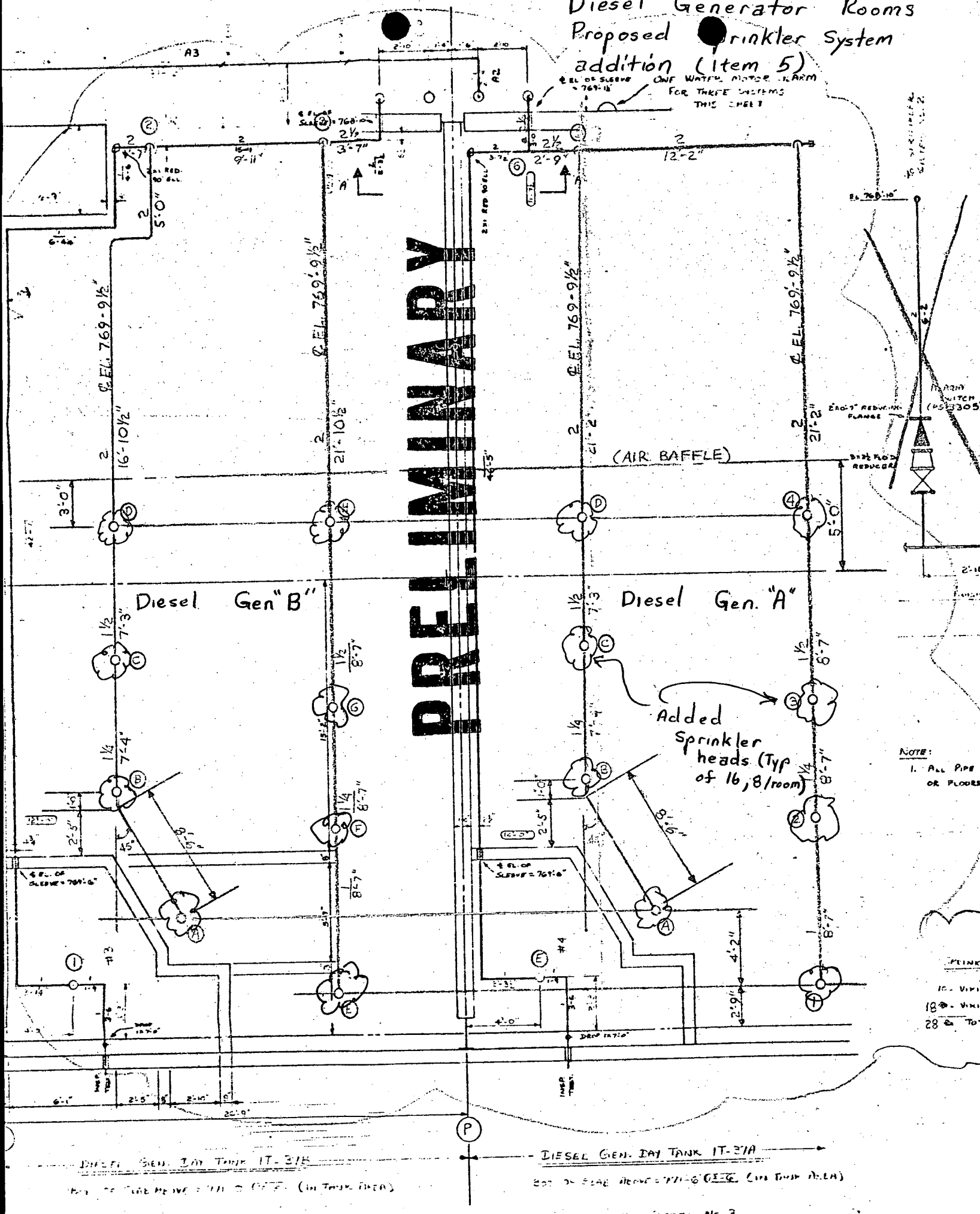
13. With reference to drawing FHA-M-1, the NRC wanted a curb at column row 10, whereas we stated we would put one in at 11. There is a concern about lube oil piping which may not be included by the curb in that area. Please confirm that is not true or provide a curb which will include all piping.

    The curb will be moved to column 10 to include all piping.

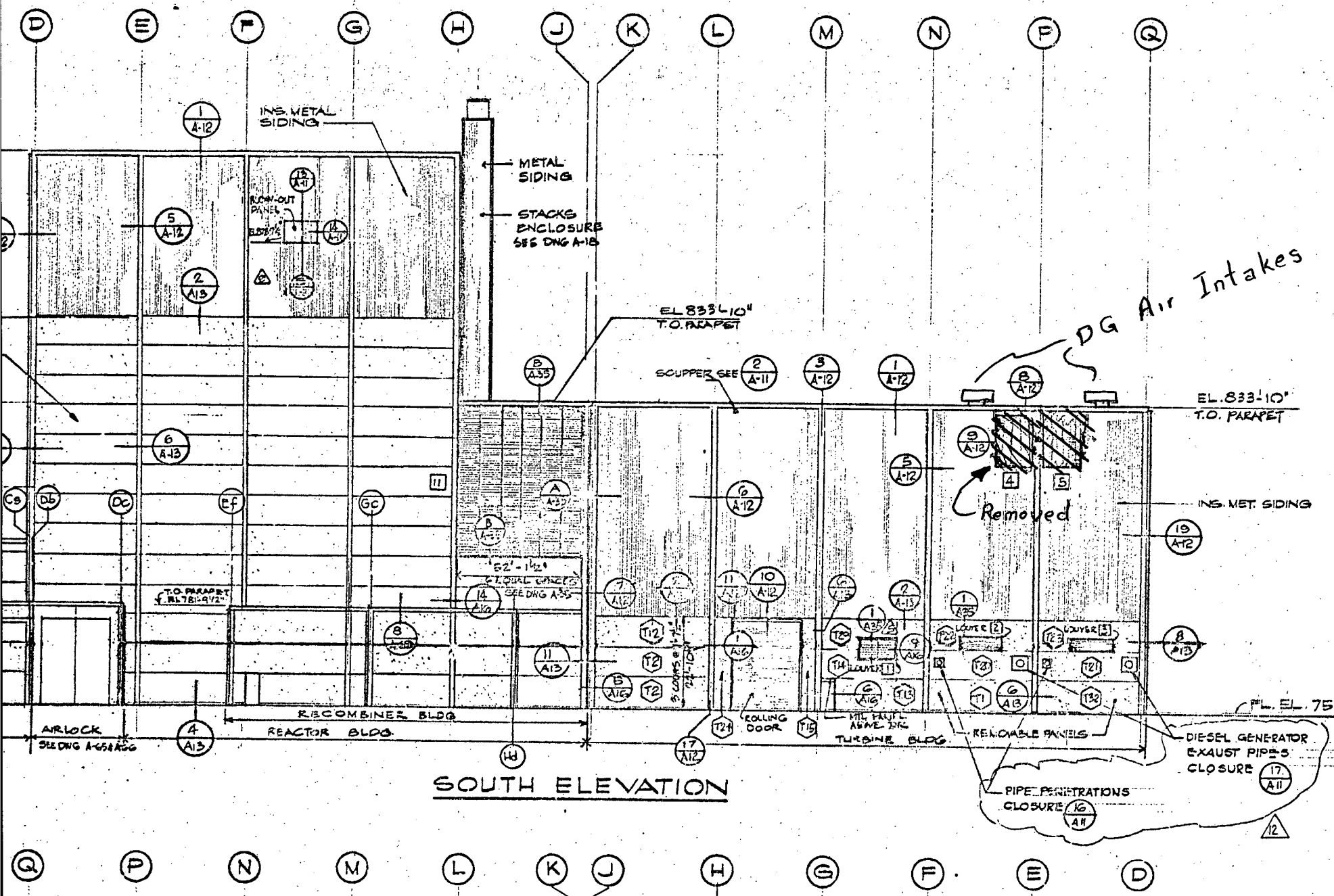
14. Does the fire protection program conform with the administrative controls and quality assurance guidelines of the NRC.

    Please refer to our answer to Question 1 of the enclosure to our April 19, 1978 letter from Mr. L. Liu to Mr. E. Case which states that our program complies with the guidelines.

Diesel Generator Rooms
Proposed Sprinkler System
addition (Item 5)

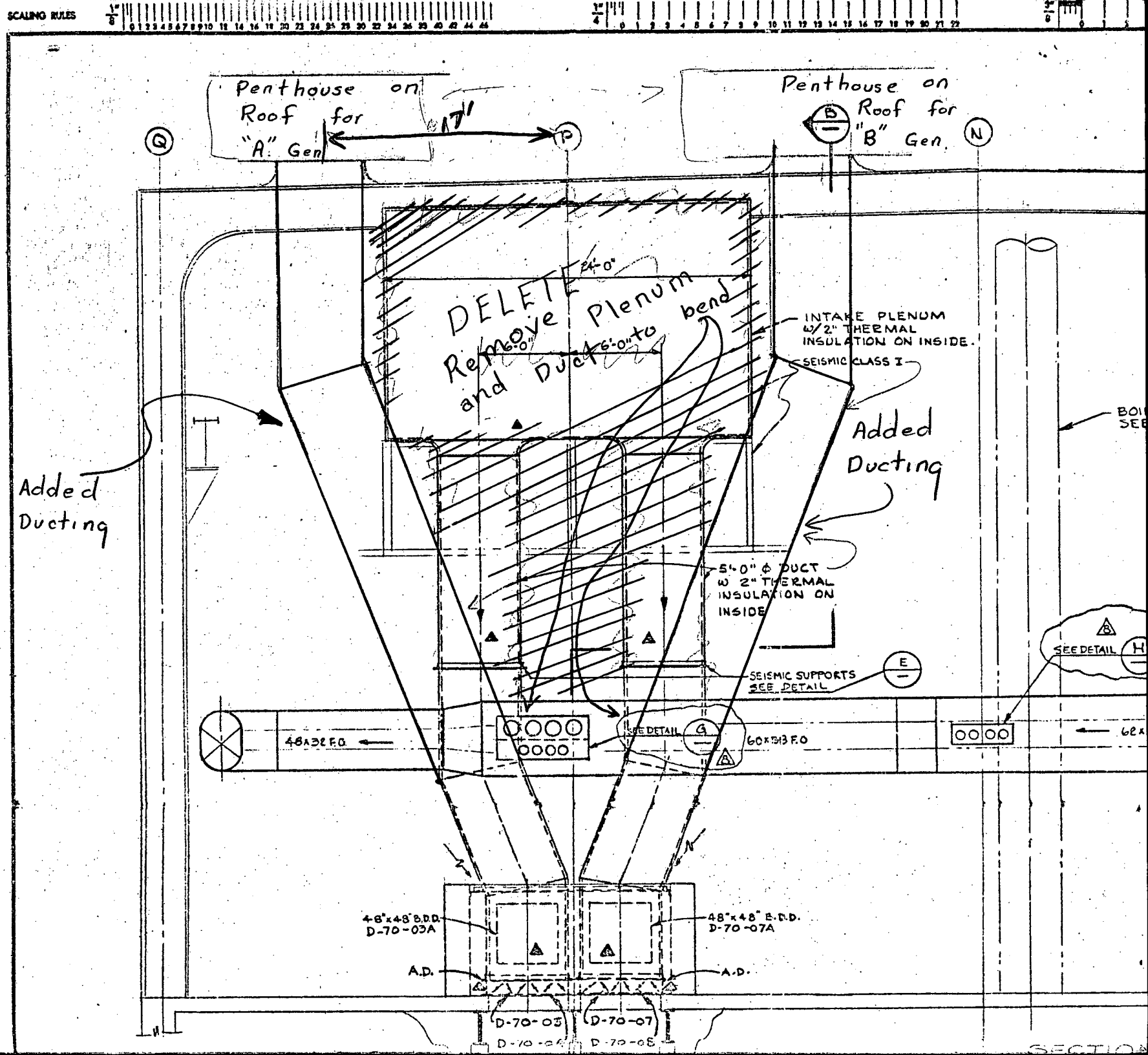


Diesel Generator Duct Revision (Item 6)



SOUTH ELEVATION

Diesel Generator Duct Revision (Item 6)



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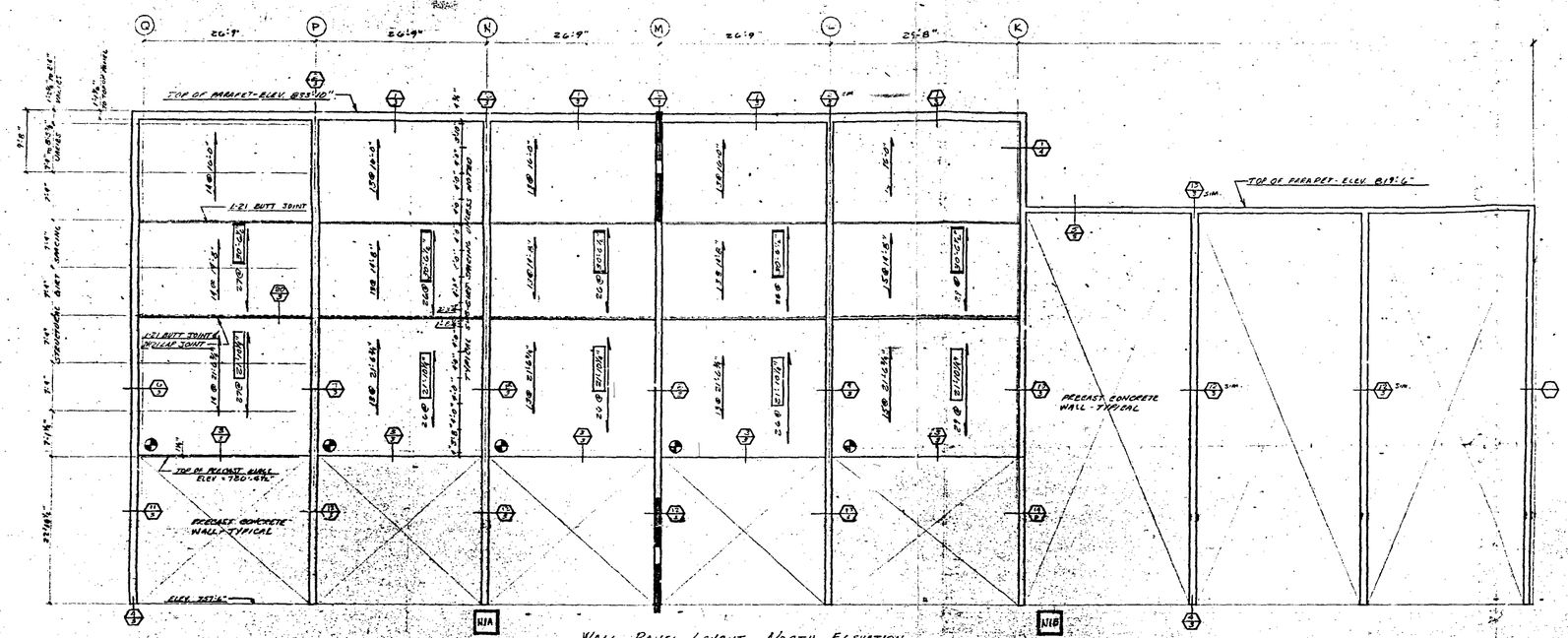

WALL PANEL LAYOUT - NORTH ELEVATION
(TAKEN ALONG COL. LINE M)

THE FOLLOWING MATERIAL IS FURNISHED FOR FIELD USE AND IS MARKED "EXTRA"

2 @ 21'-10¼"
2 @ 30'-6½"
2 @ 30'-6½"

SYMBOLS

- ERECTION STARTING POINT
- SECTION MARK-UPPER NO. INDICATES THE DETAIL NO. LOWER NO. INDICATES THE SHEET THE DETAIL IS LOCATED ON
- INDICATES THE DIRECTION THE PANEL RUNS
- INDICATES HORIZONTAL LAP JOINT-USED FOR EXTERIOR PANELS
- INDICATES HORIZONTAL BUTT JOINT-USED FOR LINER PANELS
- (T) DESIGNATES COLOR #580 "TWINE"
- (PB) DESIGNATES COLOR #84 "PATRICIAN BRONZE"
- LENGTH — L21-24" 24 GAUGE GALVANIZED DUO PRIME DUO PRIME WALL PANEL - 4224-002
- LENGTH — TW21-12" 22 GAUGE GALVANIZED DUO PRIMED DUO FINISHED 500 WALL PANEL COLOR #580 TWINE 4224-027
- LENGTH — TW21-12" 20 GAUGE GALVANIZED DUO PRIMED DUO FINISHED 500 WALL PANEL COLOR #580 TWINE 4224-028
- N1A — INRYCO PALLETIZING AREA; AREA OF PLANE; PLANE OF ELEVATION; ELEVATION
- LENGTH — L21-24" 20 GAUGE GALVANIZED DUO PRIMED DUO PRIMED WALL PANEL 4224-004
- LENGTH — TW21A-12" 22 GAUGE GALVANIZED DUO PRIMED DUO FINISHED 500 WALL PANEL COLOR #580 TWINE 4241-027
- LENGTH — TW21A-12" 20 GAUGE GALVANIZED DUO PRIMED DUO FINISHED 500 WALL PANEL COLOR #580 TWINE PANEL 4241-028

WALL PANEL GENERAL NOTES

1. WALL PANEL TO BE IDEAL TYPES:
   INSULATED WALL
   A. L21 24 GAUGE GALVANIZED DUO PRIMED DUO PRIMED WALL PANEL MK.4224-002
   B. TW21 22 GAUGE GALVANIZED DUO PRIMED DUO FINISHED "500" WALL PANEL MK 4224-027 COLOR #580 "TWINE"
   C. TW21 20 GAUGE GALVANIZED DUO PRIMED DUO FINISHED "500" WALL PANEL MK 4224-028 COLOR #580 "TWINE"
   FIREWALL
   D. L21 20 GAUGE GALVANIZED DUO PRIMED DUO PRIMED WALL PANEL MK 4224-004
   E. TW21A 22 GAUGE GALVANIZED DUO PRIMED DUO FINISHED "500" WALL PANEL MK 4241-027 COLOR #580 "TWINE"
   F. TW21A 20 GAUGE GALVANIZED DUO PRIMED DUO FINISHED "500" WALL PANEL MK 4241-028 COLOR #580 "TWINE"
   SEE COLOR SCHEDULE THIS SHEET.
2. ALL EXTERIOR L-21 LINER PANELS (TYPES A & D) TO BE 2'-0" WIDE WITH INTERLOCKING SIDE SEAM & FLUSH JOINTS, BOOP GALVAND. PANELS TO BE SCREWED TO THE STRUCTURAL GIRTS USING #14 X 3 3/4" TYPE "B" R.S. HEX HEAD SCREWS W/EPDM WASHERS (MK 4290-100) 3 SCREWS PER PANEL PER GIRT. [illegible] TYPE #14 X 1" HEX TEKS #10 HEX HEAD SCREWS WITH EPDM WASHER (MK 4209-051) PLACED AT MID POINTS BETWEEN SUB GIRTS.
3. EXTERIOR TYPE [illegible] PANELS (TYPES B & C) TO BE 1'-0" WIDE WITH INTERLOCKING [illegible] SEAM. PANELS TO BE CLIPPED TO THE [illegible] WALL PANEL CLIPS (MK 4209-941) ONE PER PANEL PER SUPPORT REQUIRED.
4. EXTERIOR [illegible] PANELS (TYPES B & D) TO BE 1'-0" WIDE WITH INTERLOCKING [illegible] & 3 LAYERS OF [illegible] PANELS TO BE ATTACHED TO THE FIREWALL [illegible] & 3 LAYERS OF [illegible] WITH
   △ #14x2" TYPE "A" SCREW MK 4290-118 1 PER PANEL PER SUBGIRT.
5. HAT SECTION SUBGIRTS (MK 4290-810) ARE FURNISHED IN 10'-0" LENGTHS AND SHALL BE ATTACHED TO THE INTERIOR SIDE OF [illegible] (TYPES A & D) WITH #12-14 [illegible] 410 [illegible] 1 PER [illegible] 21 & 2
   △ [illegible]
5A. FIREWALL SUBGIRTS MK (4290-080) ARE FURNISHED IN 21'0" LENGTHS AND HAT SECTION FIREWALL SUBGIRTS MK 4290-811 ARE FURNISHED IN 10'-0" LENGTHS. BOTH SUBGIRTS ARE TO BE PLACED AT THE SAME SPACING AS THE STANDARD SUBGIRTS - SEE ELEVATIONS.
6. [illegible]
   △ [illegible]
   △ COMPRESSED TO ½" IN ASSEMBLY.
8. [illegible] FIELD CUTOUTS AT [illegible], EXHAUST, FLUES, CORNERS, ETC.,
   A. [illegible]
   C. [illegible]
9. ERECTOR [illegible] CAULK AS [illegible] AND SEE DETAIL
   △ ON SH[illegible]
10. ERECTOR [illegible] AS SPECIFIED AT THE FI[illegible]
11. ERECTOR IS TO LAP ALL CORNER [illegible], CORNER SIDES, FASCIAS, PARAPET CAPS, ETC. A MINIMUM OF [illegible]
12. ERECTOR TO TOUCH UP ALL [illegible] AND WELDS OF DUO PRIME OR DUO FINISH [illegible]
13. [illegible] IN THE FIELD TO FIT PANELS AND [illegible] AND ENGINEERING, IN A NEAT AND [illegible]
14. WALL PANEL INSTALLATION BY INRYCO

FOR INFORMATION ONLY
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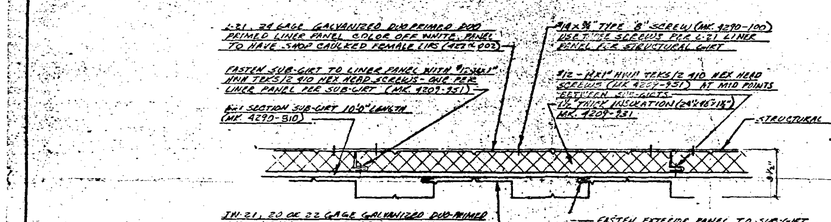
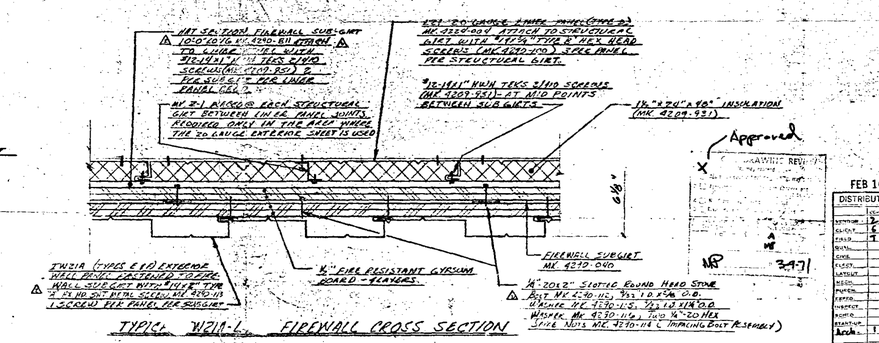


TYPICAL TW21-L21 WALL PANEL CROSS SECTION



TYPICAL TW21-L FIREWALL CROSS SECTION

Approved

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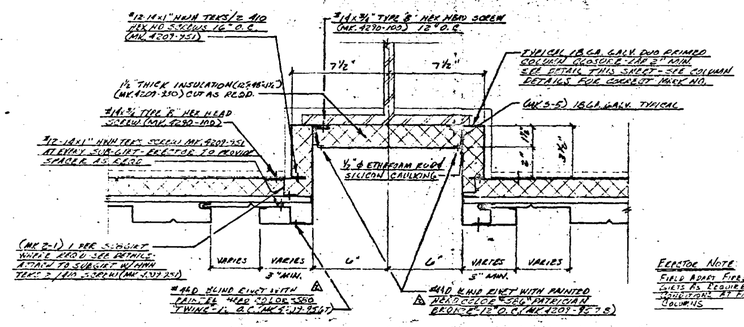
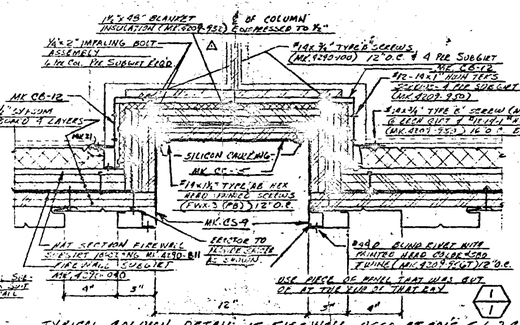


TYPICAL COLUMN COVER DETAIL

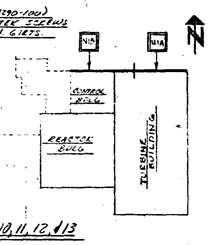
ERECTOR NOTE:
FIELD ADJUST FIREWALL SUB-GIRTS AS REQUIRED TO AVOID INTERFERENCE WITH COLUMNS



TYPICAL COLUMN DETAIL AT FIREWALL - USED AT COLS. 5, 6, 7, 8, 9, 10, 11, 12, & 13

△ GENERAL NOTES CONTD.

15. PARAPET FLASHING AND COLUMN COVERS TO BE 18 GAUGE DUO PRIMED DUO FINISH COLOR #586 PATRICIAN BRONZE. ALL OTHER FLASHINGS TO BE COLOR #580 TWINE.



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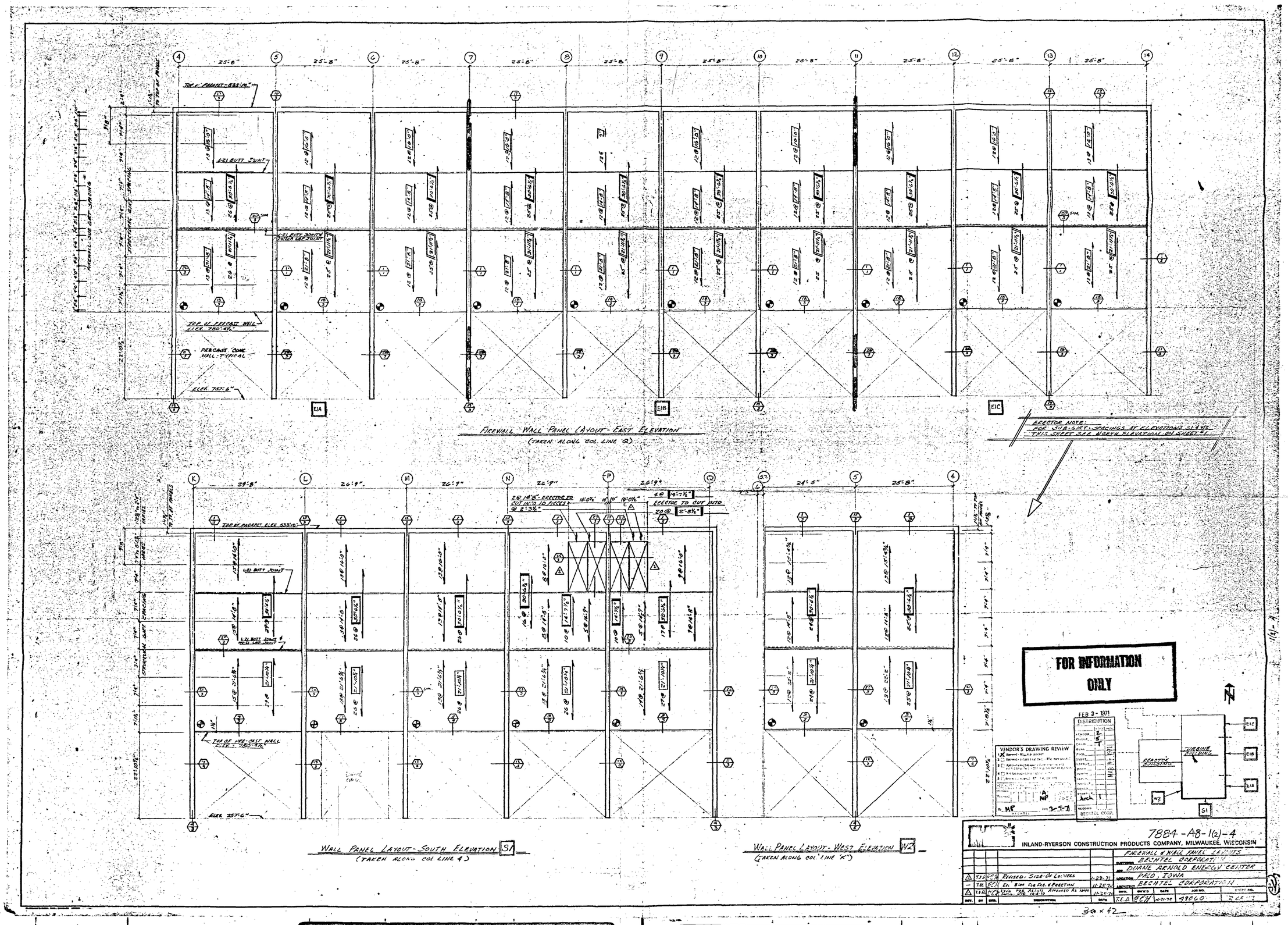
NO.	DATE	DESCRIPTION	DATE	
1	7-10-70	DETAIL CORRECTED, NOTES & DETAILS ADDED, NOTE ADDED, NOTE ADDED	2-11-71	
2	7-10-70	ADDED NOTE NO. 14	12-7-70	
—	7-10-70	ADD SUB GIRT FOR FIRE & REDETAIL	11-25-70	
3	7-10-70	ADDED FOR ACCESSORIES & NOTES ADDED, ADDED NOTE NO. 13	11-25-70	

TITLE	WALL PANEL LAYOUT & SECTIONS
CUSTOMER	BECHTEL CORPORATION
JOB	DOANE ARNOLD ENERGY CENTER
LOCATION	PALO, IOWA
ARCHITECT-ENGINEER	BECHTEL CORPORATION
DWN. T.E.D.	CHK'D. RCB
DATE 10-11-70	JOB NO. 47050
SHEET NO.	1 of 5

30



FIREWALL WALL PANEL LAYOUT - EAST ELEVATION
(TAKEN ALONG COL. LINE Q)
ERECTOR NOTE:
FOR SUB-GIRT SPACINGS AT ELEVATIONS S1 & W2
THIS SHEET SEE NORTH ELEVATION ON SHEET #1
WALL PANEL LAYOUT - SOUTH ELEVATION S1
(TAKEN ALONG COL. LINE 4)
WALL PANEL LAYOUT - WEST ELEVATION W2
(TAKEN ALONG COL. LINE "K")
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REACTOR BUILDING
TURBINE BUILDING
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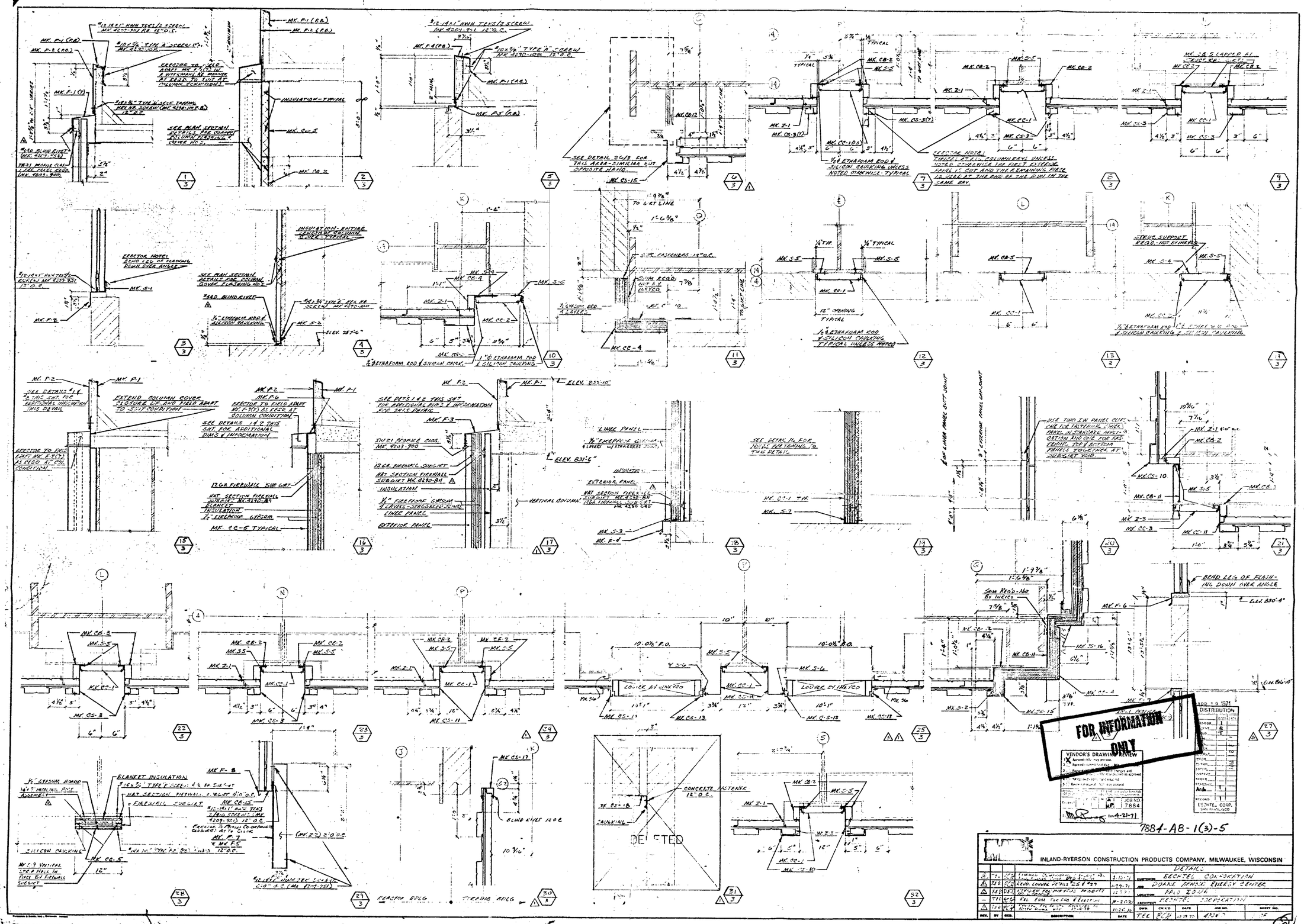
FIREWALL & WALL PANEL LAYOUTS
BECHTEL CORPORATION
DUANE ARNOLD ENERGY CENTER
PALO, IOWA
BECHTEL CORPORATION
REVISED, SIZE OF LOUVERS
1-29-71
11-25-70
11-25-70
T.E.D.
49060
30 x 42


EFFECTOR TO FIELD ADAPT
INSULATION - TYPICAL
SEE PLAN SECTION DETAILS FOR COMPLETE EXTENT OF COLUMN COVER
EFFECTOR NOTE: BEND LEG OF FLASHING DOWN OVER ANGLE
SEE DETAIL 2C/3 FOR THIS AREA - SIMILAR BUT OPPOSITE HAND
1/4" ETHAFOAM ROD & SILICON CAULKING UNLESS NOTED OTHERWISE - TYPICAL
EFFECTOR NOTE: PRIOR TO FINAL COLUMN COVER UNLESS NOTED OTHERWISE THE FIRST ENTERING PANEL IS CUT AND THE REMAINING PANEL IS USED AT THE END OF THE COL IN THE SAME BAY.
STEEL SUPPORT REQ'D - NOT EXISTING
1/4" ETHAFOAM ROD & SILICON CAULKING
EXTEND COLUMN COVER CLOSURE OF AND FIELD ADAPT TO SUIT CONDITION
EFFECTOR TO FIELD ADAPT MK. F-3(?) AS REQ'D AT COLUMN CONDITION
SEE DETAILS 1 & 2 THIS SHT. FOR ADDITIONAL DIMS & INFORMATION
12 GA. FIREWALL SUBGIRT
MAT SECTION FIREWALL SUBGIRT MK. 4230-811
INSULATION
1/4" FIREPROOF GYPSUM & LINERS - STAGGERED JOINTS
LINER PANEL
EXTERIOR PANEL
VERTICAL COLUMN
ELEV. 831'-6"
ELEV. 850'-10"
SEE DETAIL 14 FOR NOTES PERTAINING TO THIS DETAIL
USE TWO 3" W. PANEL CLIP LINE FOR INTERIOR LINER PANEL IN STANDARD APPLICATION AND CLIP FOR GASKETING TOP & BOTTOM PANELS TOGETHER AT SUBGIRT VOID
BEND LEG OF FLASHING DOWN OVER ANGLE
LOUVER BY OWNER
ELANKET INSULATION
1/2" GYPSUM BOARD
MAT SECTION FIREWALL SUBGIRT
FIREWALL SUBGIRT
SILICON CAULKING
CONCRETE FASTENER 12" O.C.
CAULKING
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4-21-71
APR 19 1971
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INLAND-RYERSON CONSTRUCTION PRODUCTS COMPANY, MILWAUKEE, WISCONSIN
DETAILS
CUSTOMER: BECHTEL CORPORATION
JOB: DOANE RANCH ENERGY CENTER
LOCATION: FRO COUNTY
ARCHITECT: BECHTEL CORPORATION
DWN. TEC CK'D BCP DATE 11-19-70 JOB NO. 4328 SHEET NO. 5
REV. BY SCD. DESCRIPTION DATE
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