



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MEMORANDUM FOR: TERA Corp.

FROM: US NRC/TIDC/Distribution Services Branch

SUBJECT: Special Document Handling Requirements

☐ 1. Please use the following special distribution list for the attached document.

☐ 2. The attached document requires the following special considerations:

☒ Do not send oversize enclosure to the NRC PDR.

☐ Only one oversize enclosure was received - please return for Regulatory File storage.

☐ Proprietary information - send affidavit only to the NRC PDR

☒ Other: (specify)

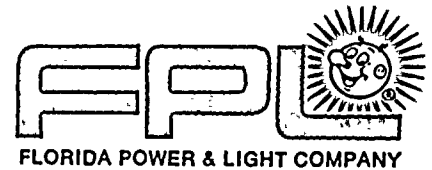
ATTN:
DAVE BOUVE

- see notes

Mike

cc: DSB Files

TIDC/DSB Authorized Signature



December 20, 1979
L-79-355

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

Dear Mr. Schwencer:

Re: Turkey Point Units 3 & 4
Docket Nos. 50-250 & 50-251
Fire Protection

The attached information is submitted in accordance with our letter of October 8, 1979 (L-79-285) and is applicable to asterisked items 3.1.1(4) and 3.1.1(5) in the Safety Evaluation for Amendments 45 and 37 to Operating Licenses DPR-31 and DPR-41, respectively. The information, which is in the form of drawings and equipment descriptions, addresses the switchgear room and diesel generator room fire detection systems. It is marked "preliminary" because the modification package is being reviewed in-house, and minor revisions may be made during the course of the review.

Very truly yours,

Robert E. Uhrig
Vice President
Advanced Systems & Technology

REU/MAS/ms

Attachment

cc: J. P. O'Reilly, Region II (w/o drawings)
Harold Reis, Esquire (w/o drawings)

Acob
5/3
Draws:
FILES
PLANTSYS
TERA (RETURN
TO IE
AFTER
FILM)

ALL OTHERS
RECEIVE LTR &
REPROducible
ENCL

7912270 429

F

Pyr-A-Larm®

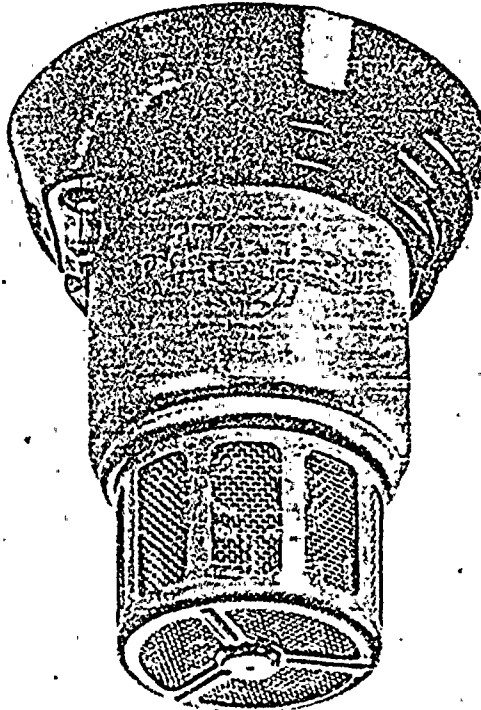
Early Warning Fire Detection and Alarm Systems

Engineer and Architect Specifications

PRELIMINARY

Ionization Fire Detector

MODELS DIS-5B & DIS-5B4

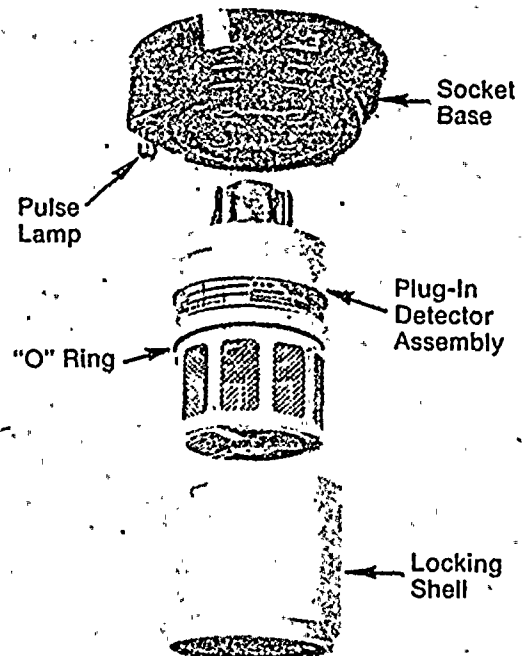


PRELIMINARY

INTRODUCTION

The PYR-A-LARM Model DIS-5B fire detector operates on a patented ionization principle. It reacts to the first traces of fire. Invisible combustion products entering the detector's outer chamber disturb the balance between two ionization chambers and trigger a highly sensitive cold cathode tube. The firing of the tube transmits a signal to the control panel which in turn activates the alarm devices. Neither visible smoke, heat nor flame is required to activate the detector. A detailed technical description of the operation of the detector is available upon request.

The Pyr-A-Larm Model DIS-5B detector is listed by Underwriters Laboratories Inc., and although U.L. gives no specific spacing recommendation, the test spacings of 30 ft. (900 sq. ft.) may be used, if practicable, but only as a guide or starting point in a detector installation layout. The test fires conducted by U.L. were based on only one set of conditions, namely, a 15 ft. 9 in. high smooth ceiling, no air movement, and no physical obstructions between the fire source and detector. It should be realized that these are fairly ideal conditions for a symmetrical detector layout. For conditions other than the above, it is mandatory that engineering judgement be applied regarding detector location and spacing.



Pyrotronics

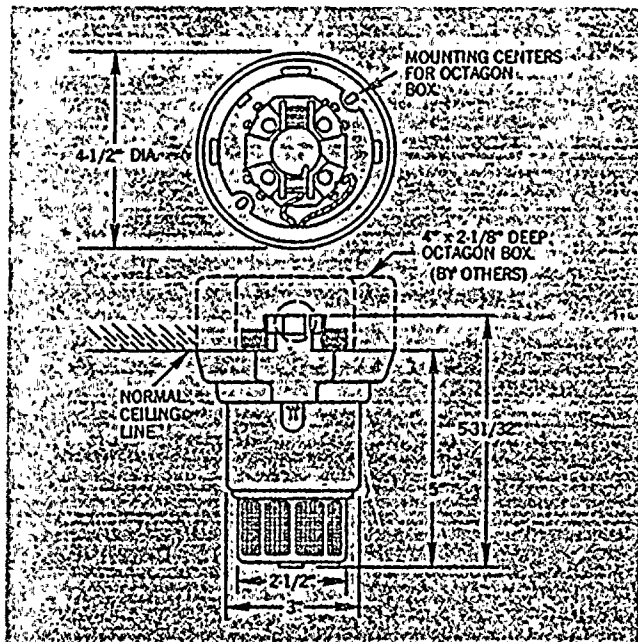
A Baker Industries Company

8 Ridgedale Avenue, Cedar Knolls, New Jersey 07927

February, 1977

Supersedes Sheet dated 6/73

MOUNTING DATA



ARCHITECT'S SPECIFICATIONS

The fire detector shall be a Pyr-A-Larm Model DIS-5B or equivalent. It shall operate on the ionization principle and shall be activated by the presence of invisible combustion products. The detector shall be approved by Underwriters Laboratories Inc., Factory Mutual, Canadian Standards Association and Underwriters' Laboratories of Canada.

The detector head shall be a plug-in unit containing a cold cathode tube and the two ionization chambers. One chamber shall be for fire detection and the second chamber shall function as a reference, to stabilize the detector for changes in environmental temperature, humidity and pressure. It shall be possible to electrically check the detector's sensitivity, using a Pyr-A-Larm Sensitivity Test Set, or equivalent, and readjust the detector's sensitivity, as required. The measurement of detector sensitivity shall provide a precise electrical value as

read on the Test Set meter. Approximate "trial and error" methods of sensitivity determination cannot be considered as equal.

The unit shall contain no moving parts. It shall require no replacements or adjustments after fire alarm has been given, to restore it to normal operation.

The base shall have screw terminals for making all connections; no soldering shall be required. It shall also incorporate a neon indicator which shall provide visual indication of the detector initiating the alarm. It shall contain the receptacle for the plug-in detector head.

The locking shell shall act as a protective cover which twist-locks into place. A socket-head set screw shall secure shell to base, to prevent removal of detector head without prior loosening of screw. All components shall be rust and corrosion resistant, and vibration shall have no appreciable effect on detector operation.

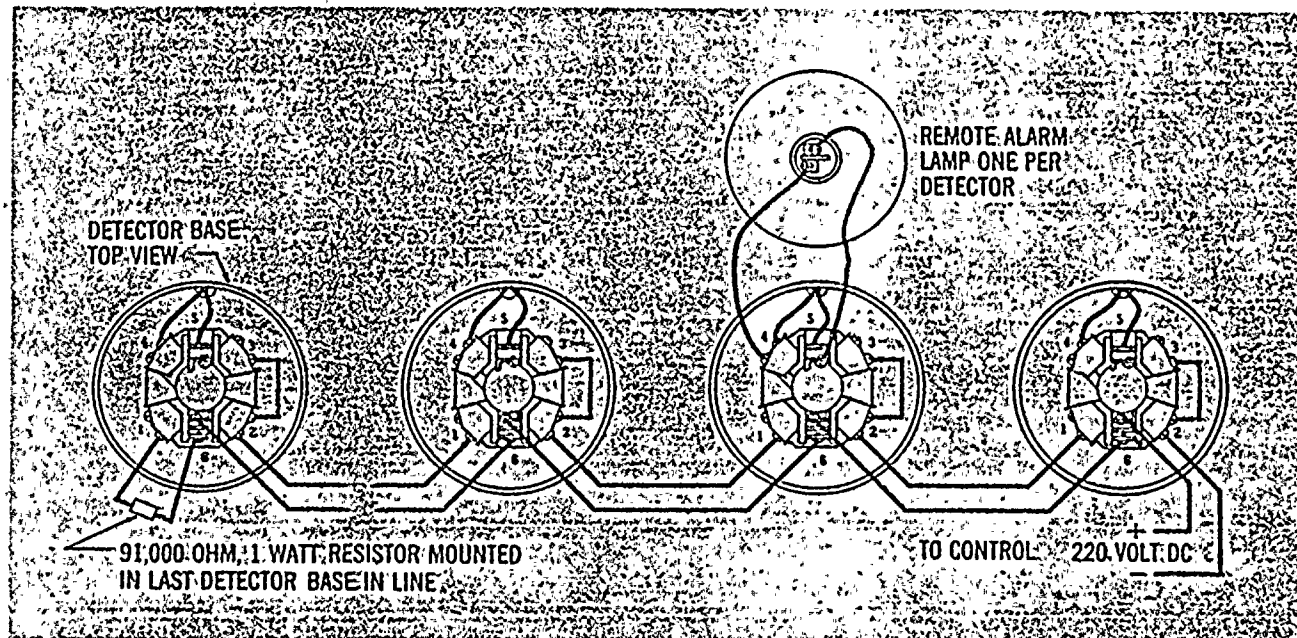
It shall be possible to install any number of detectors on one circuit (however, the number should be limited by sound fire protection practice). Each detector, or group of detectors, shall require a 2-wire circuit of #18 AWG, 600 Volt thermoplastic fixture wire, enclosed in conduit, or #18 AWG limited-energy shielded cable, without conduit if permitted by local building codes.

PYROTRONICS shall provide system design layout drawings, indicating location of detectors, other components and interconnecting wiring. The system shall be installed and checked by installing electrical contractor, in accordance with applicable Pyr-A-Larm system manual.

ORDERING INFORMATION

Model No.	Description	Shipping Weight
DIS-5B	Detector, Ionization, Normal Sensitivity	1 lb.
DIS-5B4	Detector, Ionization, High Sensitivity, w/Shell To Accommodate Removal Tool	1 lb.

TYPICAL WIRING



Pyr-A-Larm[®]

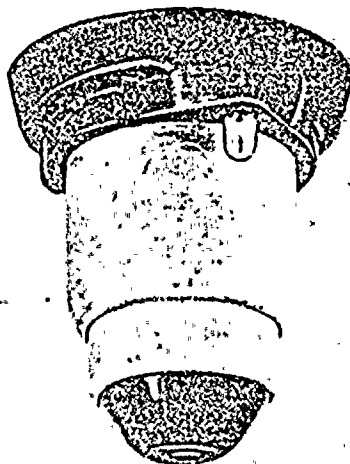
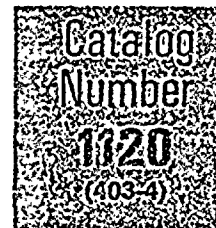
Early Warning Fire Detection and Alarm Systems

Engineer and Architect Specifications

PRELIMINARY

Flame Detectors

MODELS DFS-3, DFS-10, DFS-30



PRELIMINARY

Description—The Pyr-A-Larm flame detectors respond directly to the presence of flame. They sense the infrared radiation emanating from flames, which must be modulated (flickering of the flame) and must be sustained for at least 3, 10, or 30 seconds (depending on detector selected). Response to constant infrared radiation or to short flickering phenomena is, therefore, excluded.

The flame detector is intended to protect hazards where the anticipated fires will develop quickly with little or no incipient or smoldering stages; where ignition is almost instantaneous (e.g. flammable liquids, combustible gases, loose cotton fibre, etc.). The flame detector is not recommended for protection against incipient

and smoldering stage fires. This is better protected by the ionization detector. The Model DFS detectors are Factory Mutual approved.

The flame detector is best suited for direct equipment or process protection and for use on high ceilings. It should be used in combination with ionization detectors.

For detailed information refer to manual on "Application Data, Flame Detectors" (form B-188).

Principles of Operation—The detector consists of a silicon solar cell (photo-electric) located behind a convex infrared filter lens. In response to a flame, a voltage is generated by the cell and amplified by a 5 stage transistor amplifier-rectifier-integrator circuit. The integrator output voltage is used to activate a cold cathode tube which locks in the alarm in a similar manner to that of the ionization detector.

In contrast to the ionization detector, the flame detector draws a small operating current (45 microamperes) and thus a maximum of 5 flame detectors may be used per zone.

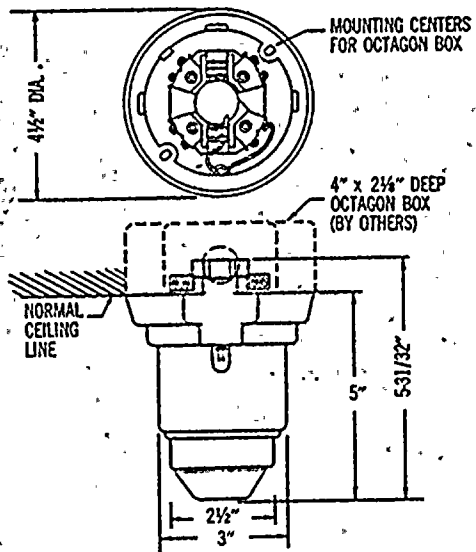
The detector operates in conjunction with the standard neon alarm indicator, located in the detector base. It may be installed in a standard ionization detector base or in a Pyr-A-Larm recessed ceiling fixture.

DETECTOR MOUNTING HEIGHT—When used for area protection, the following general rules apply. The optimum ceiling height is 30-50 feet. The detector may be used on ceilings as high as 85 feet.

At low ceiling heights, the 30 or 10 second detectors should be used to minimize the possibility of unwanted alarms. On high ceilings the 10 or 3 second detectors should be used to increase detector sensitivity.

The detector sensitivity is inversely proportional to the square of the distance from the fire source. Therefore, doubling the distance requires a four times larger fire for detection.

MOUNTING DATA



Pyrotronics

A Baker Industries Company

8 Ridgedale Avenue, Cedar Knolls, New Jersey 07927

May, 1973

Supersedes Sheet dated 4/72

Protected Area—The detector can protect an area of up to 7,500 square feet per detector depending upon ceiling height. The diameter of the protected area is 3 times the detector height from the floor. For example, when used on a 20 foot high ceiling, the diameter would be 60 feet with an overall protected area of 2,800 square feet; a 30 foot ceiling would have a 90 foot diameter and a 6,400 square foot protection area. Where there are obstructions or earlier detection is desired, the square foot coverage should be reduced.

Installation — The flame detectors are directly interchangeable with ionization detectors and plug into the standard Pyr-A-Larm base.

The detectors should be installed at a point which provides the largest area coverage. On a flat ceiling, this will be the ceiling itself. However, on sawtooth or other uneven ceilings, or when there are ceiling obstructions (e.g. beams), this would be a point below the peak. This installation procedure will provide the greatest coverage, since the detector has an angular coverage of 170 degrees.

ENVIRONMENTAL SPECIFICATIONS

The detector may be used within the following range of environmental conditions:

Temperature: -20°F to $+175^{\circ}\text{F}$.

Relative Humidity: Up to 80% continuous; 90% intermittent (condensation inside detector may cause

temporary trouble).

Corrosive Atmospheres: Designed to withstand influence of acids, alkalines or similar corrosive agents.
Vibration: Designed to be relatively free from the effects of shock and vibration normally encountered in service. However, if vibrations are of a frequency which simulate the flicker of a flame (5-30 c.p.s.), the detector should not be directly attached to the vibrating surface. Shock absorbers with a resonant frequency of more than 2 c.p.s. should not be used.

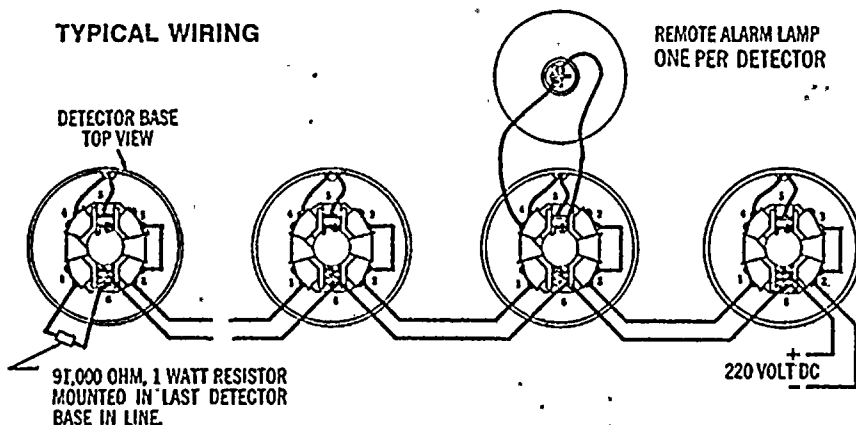
ARCHITECT'S SPECIFICATIONS

The flame fire detector(s) shall be Pyr-A-Larm Model DFS-____ (specify 3, 10 or 30). It shall operate on the infrared principle and have a ____ (specify 3, 10 or 30) second time delay. The detector shall plug into its base and have a visual indicator, in its base, to indicate initiation of an alarm. It shall be directly interchangeable with Pyr-A-Larm detectors, without requiring any wiring changes.

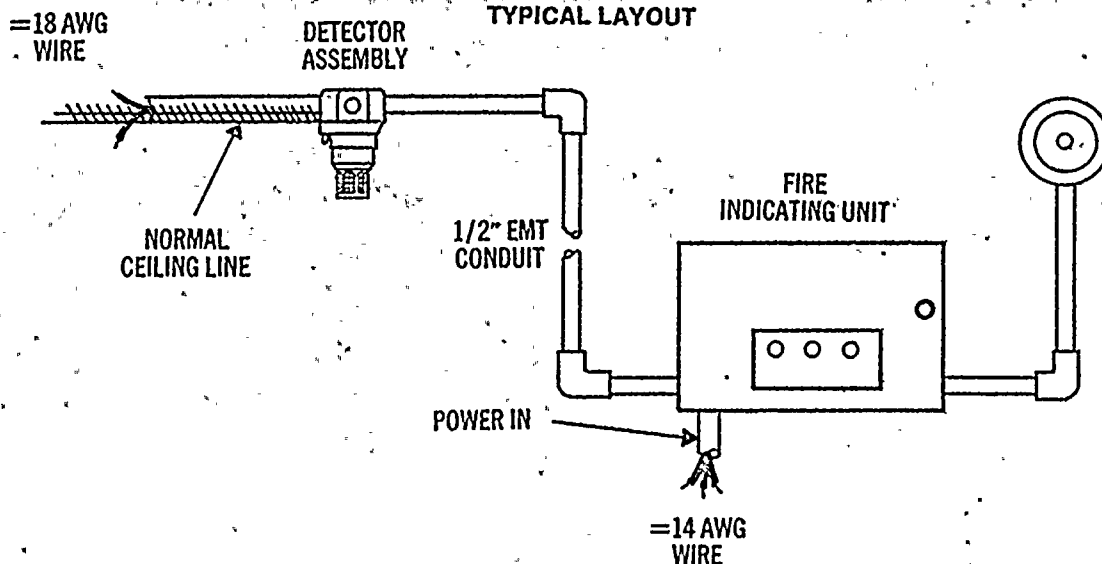
ORDERING INFORMATION

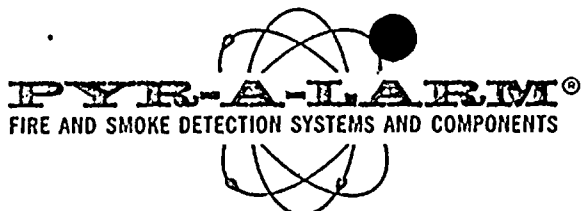
Model	Description	Shipping Wt.
DFS-3	Flame Detector, 3 sec. delay	1 lb.
DFS-10	Flame Detector, 10 sec. delay	1 lb.
DFS-30	Flame Detector, 30 sec. delay	1 lb.

TYPICAL WIRING



TYPICAL LAYOUT

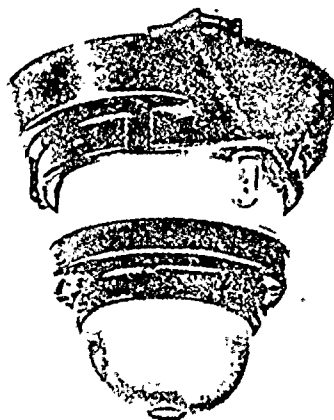
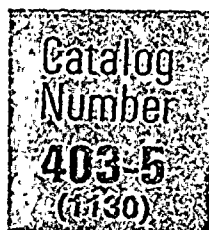




Engineer and Architect Specifications

Thermal Plug-In Fire Detectors

MODELS DTF-136P, DTF-190P,
DTR-136P, DTR-190P



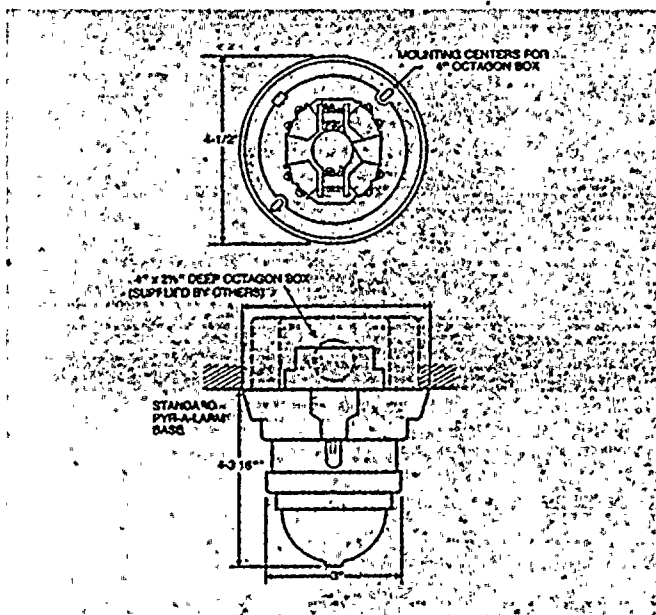
PRELIMINARY

INTRODUCTION

The Pyr-A-Larm Plug-In Thermal Fire detectors are of the fixed temperature or combination fixed temperature/rate-of-rise type. The combination detectors consist of two independently operated thermal elements. The rate-of-rise element is self-restoring. The fixed temperature element is of the non-restoring type. The plug-in thermal detectors are designed for use with the standard Pyr-A-Larm Detector base. Located on the base is a lamp which visually indicates the initiation of an alarm.

Underwriters' Laboratories, Inc., recommends the combination type thermal detector be used to protect a maximum of 2,500 square feet, and the fixed temperature type be used to protect a maximum of 225 square feet. Job conditions and engineering judgment, however, often dictate closer spacing to provide faster detection.

MOUNTING DATA



RATE-OF-RISE PRINCIPLE OF OPERATION

Basically, the rate-of-rise element consists of an air chamber, a flexible diaphragm, and a carefully calibrated vent.

It is well known that air expands as it is heated, and contracts as it is cooled. For normal daily fluctuations of temperature, the natural expansion and contractions of the air in the chamber is automatically compensated by the "breathing" action of the vent. However, when a fire occurs, air temperatures rise very rapidly and the air in the chamber expands faster than it can be vented. This creates a pressure which distends the diaphragm and closes electrical contacts.

The rate-of-rise action is not related to any fixed temperature level, but responds promptly when the rate exceeds 15° per minute. When the heat is removed, the air within the chamber contracts, relieving the pressure and restoring the electrical contacts to a normally open circuit position.

FIXED TEMPERATURE OF OPERATION

The fixed temperature element is entirely independent of the rate-of-rise element and is the non-restorable type. In a slow developing fire, the temperature may not increase rapidly enough to operate the rate-of-rise element. However, when the fixed temperature element is heated to its rated temperature, its operation is as follows:

A fusible alloy, melted by the heat, releases a spring to close the electrical contacts. A "tell-tale" hole appears in the detector shell and indicates the fired detector. The detector cannot be reset after operation and must be replaced.

These thermal detectors respond only to heat, so they are suitable for use in areas where normal conditions would prohibit the use of Pyr-A-Larm ionization detectors.

When connected to Pyr-A-Larm control equipment, the detectors are fully compatible with Pyr-A-Larm ionization detectors, flame detectors, and manual stations. Electrically, any number of thermal detectors can be used in a circuit. The limit is only subject to the practical considerations of job conditions and engineering judgement.



Pyrotronics

A Division of Baker Industries, Inc.

8 Ridgedale Avenue, Cedar Knolls, New Jersey 07927

June, 1973

Supersedes Sheet dated 5/72

The Underwriters' Laboratories rates the combination detectors to protect an area of 2500 square feet and the fixed temperature detectors to protect 225 sq. feet. This coverage provides detection that is equivalent to sprinkler devices protecting a 100 sq. ft. area.

ARCHITECT'S SPECIFICATIONS

The thermal fire detector shall be a Pyr-A-Larm Model _____ (insert number). It shall operate at a temperature of _____ degrees F. (Insert temp.). The detector shall plug into its base and have a lamp in its base to indicate the initiation of an alarm. The detector shall be listed by Underwriters' Laboratories, Inc. and Factory Mutual.

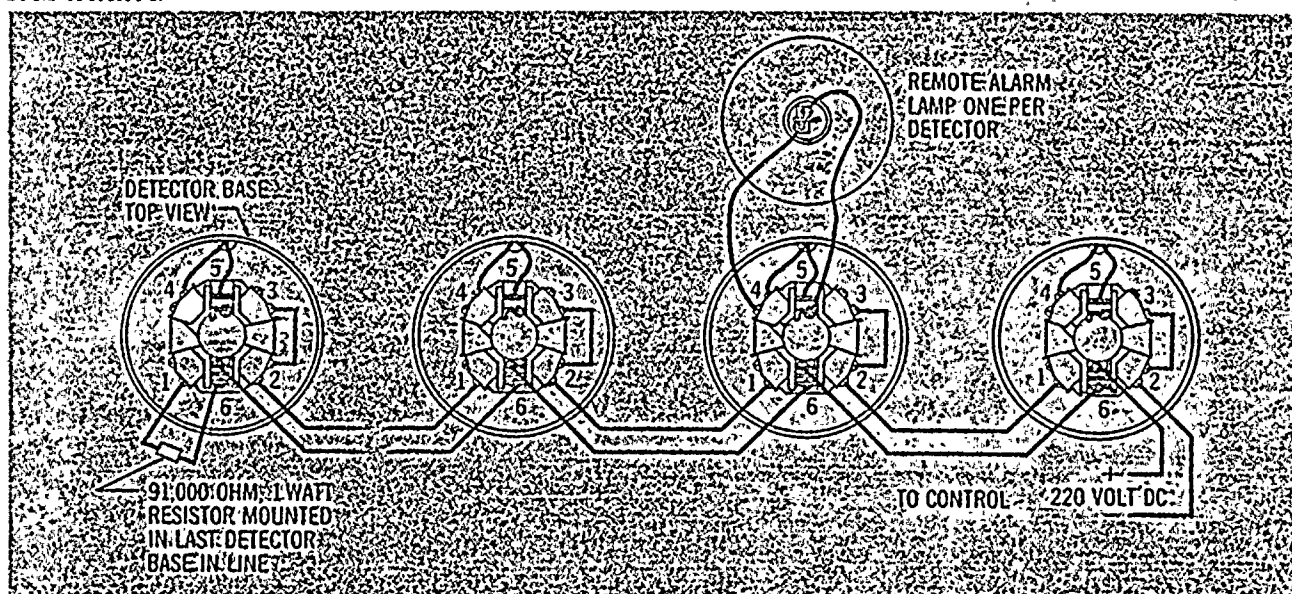
The detector shall be compatible with Pyr-A-Larm Ionization detectors, flame detectors, and manual stations. There shall be no theoretical limit, other than practical consideration, to the number of detectors which may be installed in any one circuit.

The installing contractor shall install the detectors with #18 AWG thermo-plastic wire with a 600 volt insulation rating, housed in conduit or limited energy cable where permitted by local codes. The system shall be installed and checked in accordance with a Pyr-A-Larm Specification Sheet No. 419-1..

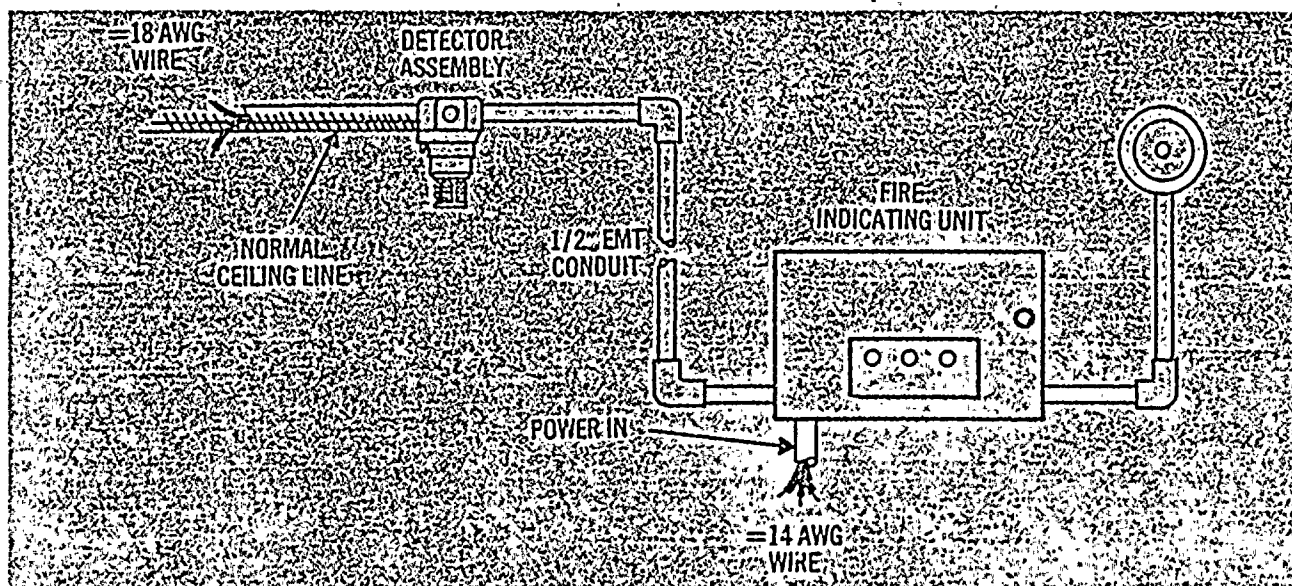
ORDERING INFORMATION

Model Number	Description	Shipping Weight
DTF-136P	136° Fixed Temperature, non-restoring, plug-in	1 lb.
DTF-190P	190° Fixed Temperature, non-restoring, plug-in	1 lb.
DTR-136P	136° Comb. Fixed Temperature (non-restoring) & 15° Rate-of-Rise, plug-in	1 lb.
DTR-190P	190° Comb. Fixed Temperature (non-restoring) & 15° Rate-of-Rise, plug-in	1 lb.

TYPICAL WIRING



TYPICAL LAYOUT



Pyr-A-Larm®

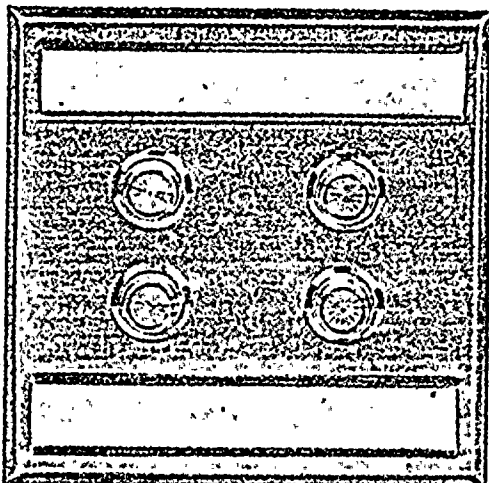
Early Warning Fire Detection and Alarm Systems

Engineer and Architect Specifications

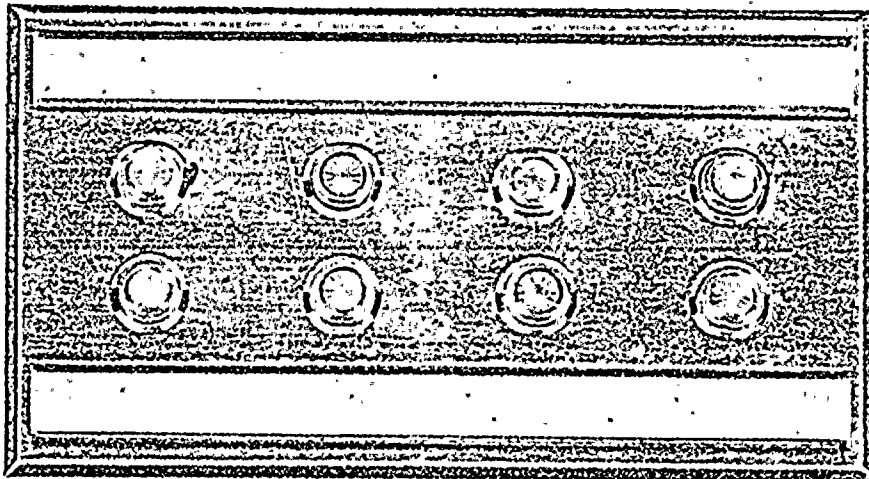
PRELIMINARY Remote Lamp Panels

MODELS RLP-4, RLP-8 & RLP-12

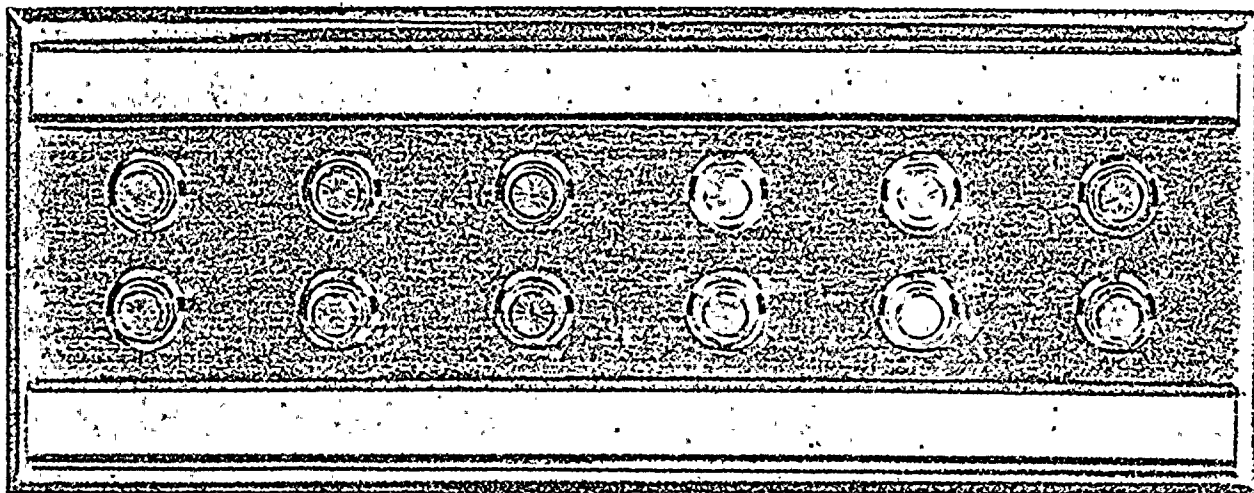
Catalog
Number
2305
(411-5)



MODEL RLP-4



MODEL RLP-8



MODEL RLP-12

INTRODUCTION

The Pyr-A-Larm Remote Lamp Panels, RLP-4, RLP-8, and RLP-12 are designed for use with all Pyr-A-Larm systems where remote lamp annunciation of the detection system activity is desired. This activity could be detector operation, zone indication, power failure, trouble, etc.

The RLP Panels are normally fitted with neon lamps to duplicate the high voltage detector pulse lamp operation. However, 6-volt, 12-volt, 24-volt, 48-volt and 120-volt lamps are

available as optional items to match the electrical characteristics of any desired system.

The RLP-4 Remote Lamp Panel is equipped with 4 lamps beneath clear lenses and is designed for 2-gang switch box mounting. The RLP-8 has 8 lamps and requires 4-gang switch box mounting, while the RLP-12 has 12 lamps and requires 6-gang switch box mounting. The panels are equally attractive whether mounted vertically or horizontally.

Each panel has an upper and lower bracket to accommodate plastic nameplate strip for lamp identification.



Pyrotronics

A Baker Industries Company

8 Ridgedale Avenue, Cedar Knolls, New Jersey 07927

March, 1972

NEW ISSUE

MOUNTING DATA

The RLP Panel is completely assembled with screw type terminals on its printed wiring board to facilitate wiring connections. The panel is then connected to the switch box with upper and lower fastening screws. The plate mounting screws are in such a position that they are hidden by the nameplate strip after installation.

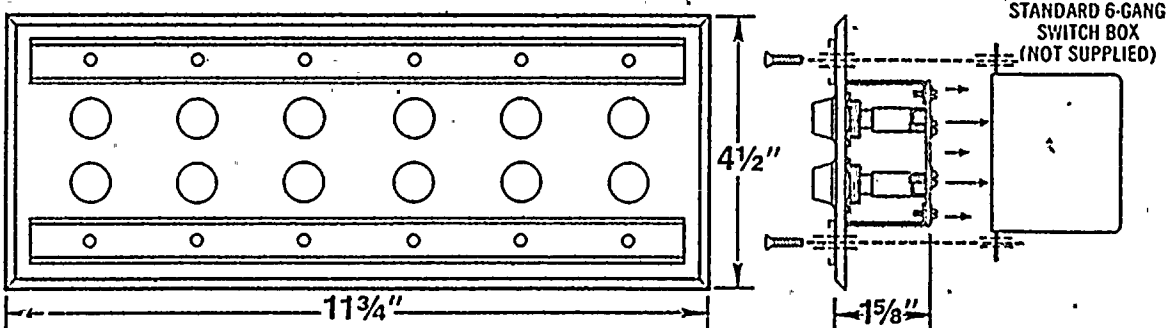
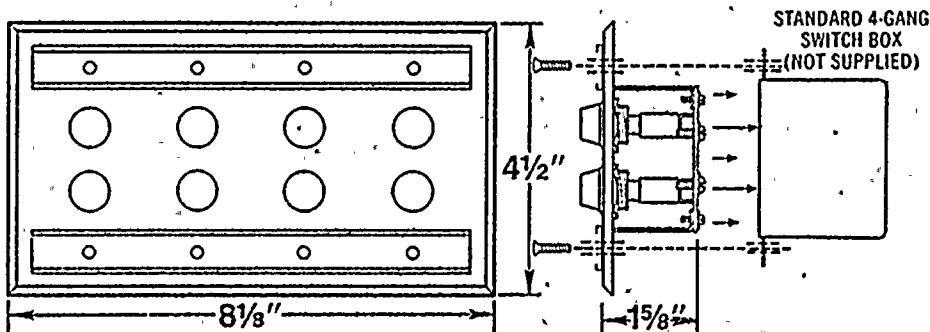
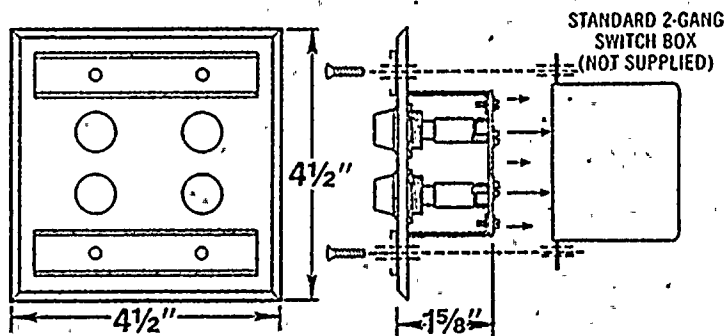
ARCHITECT'S SPECIFICATIONS

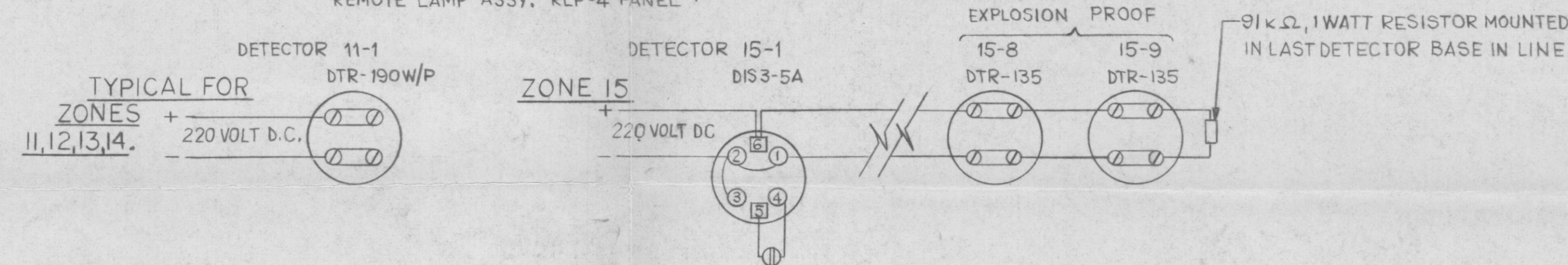
The Remote Lamp Panel for the Pyr-A-Larm system shall be a Pyr-A-Larm RLP _____ (insert 4, 8 or 12). The panel shall be capable of monitoring the condition of the Pyr-A-Larm system (fire pulse, zone indication, power failure, trouble, etc.). The RLP panel shall be Underwriters' Laboratories, Inc. listed.

The electrical contractor shall mount the RLP-4 Panel on a 2-gang switch box; the RLP-8 Panel on a 4-gang switch box; and the RLP-12 on a 6-gang switch box. The wiring between the panel and the system components shall be #18 AWG thermoplastic fixture wire enclosed in conduit or #18 AWG limited-energy shielded cable without conduit, if permitted by local building codes. Installation wiring shall be performed as indicated in system drawings supplied by Pyrontronics.

ORDERING INFORMATION

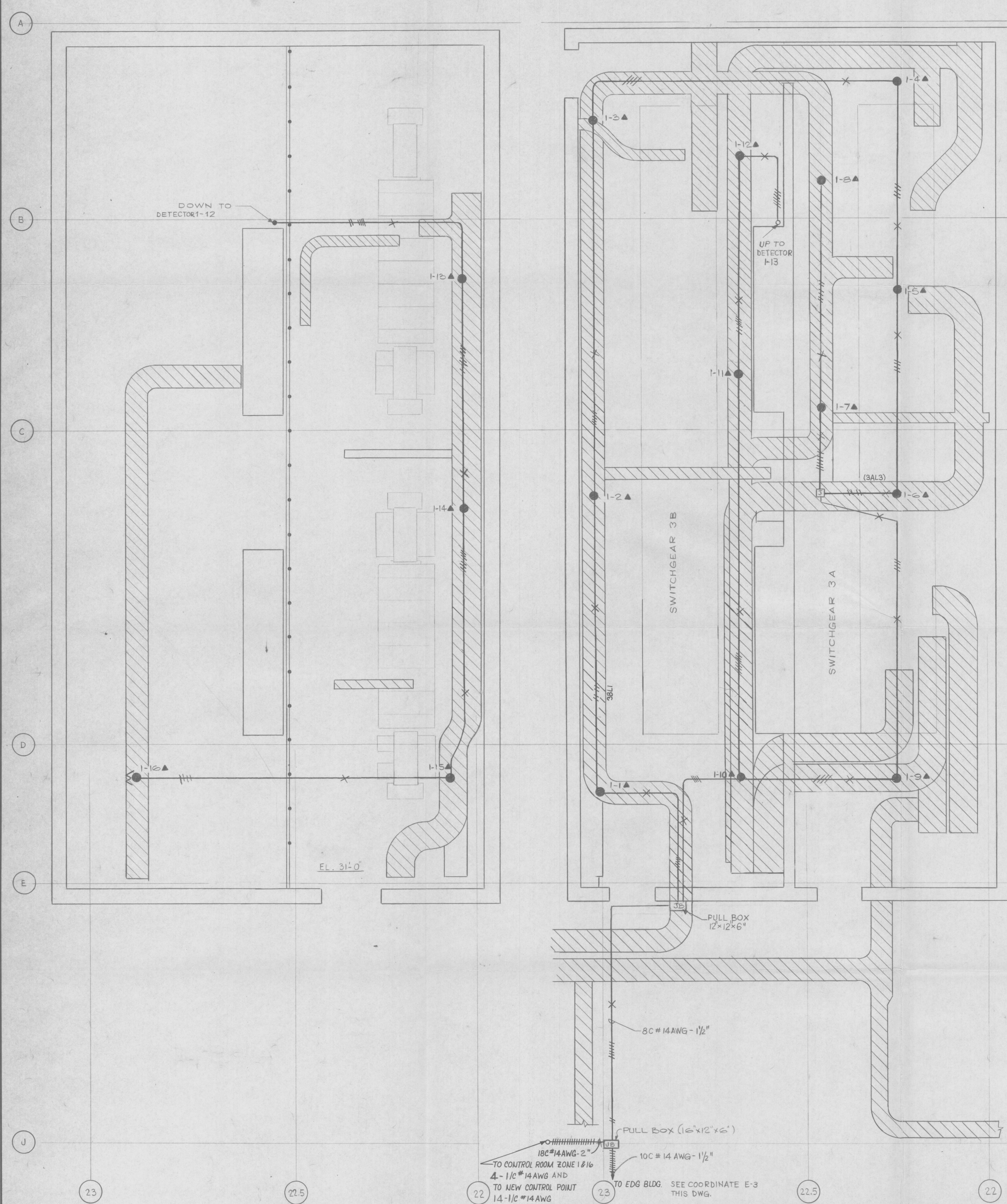
Model No.	Description	Shipping Weight
RLP-4	Remote Lamp Panel, 4-position	1 lb.
RLP-8	Remote Lamp Panel, 8-position	1½ lbs.
RLP-12	Remote Lamp Panel, 12-position	2 lbs.
Optional Lamps (order total quantity needed)		
Part No.	Description	
125-216152	6-volt lamp	
125-216153	12-volt lamp	
125-216154	24-volt lamp	
125-216155	48-volt lamp	
125-216156	120-volt lamp	





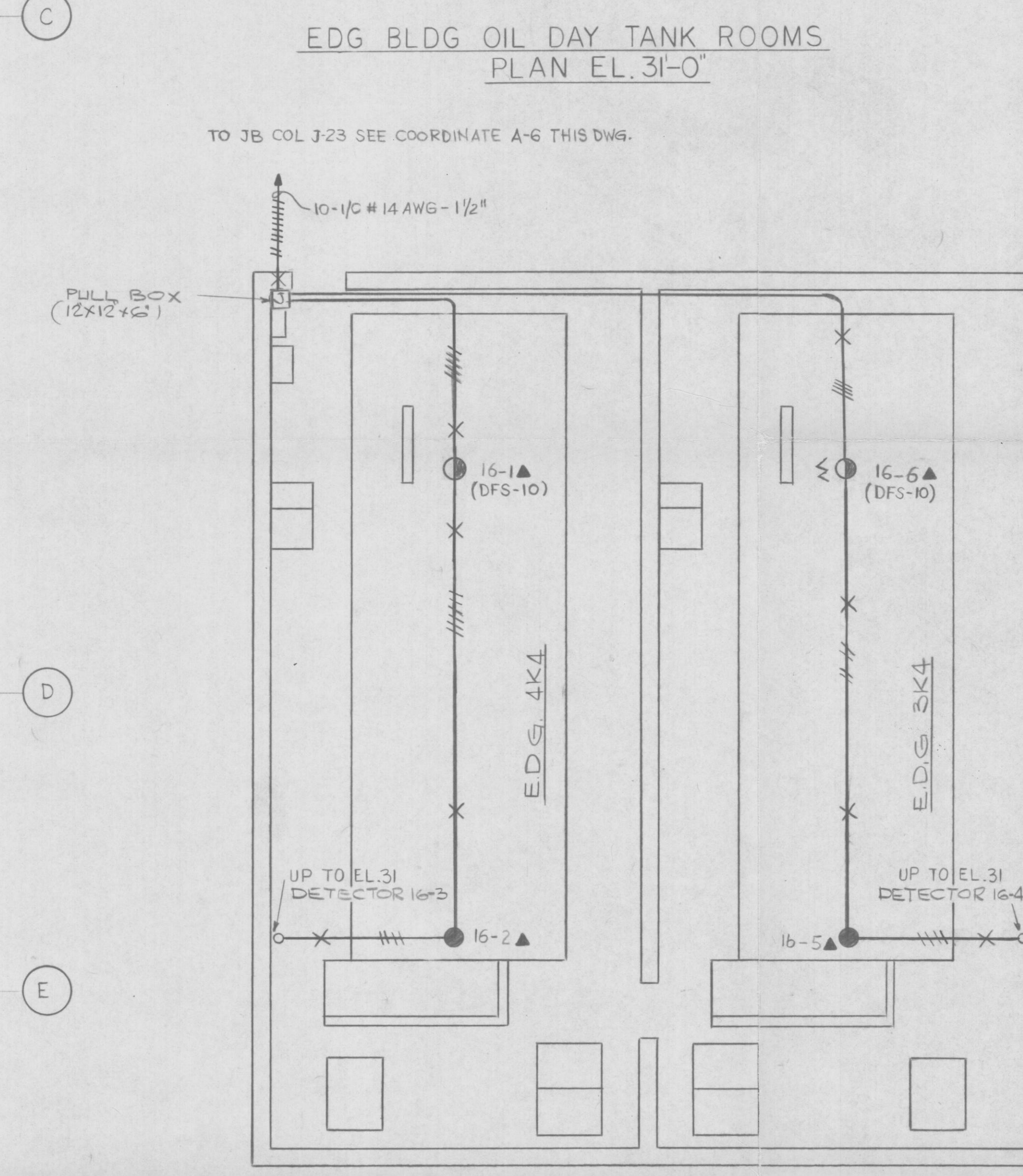
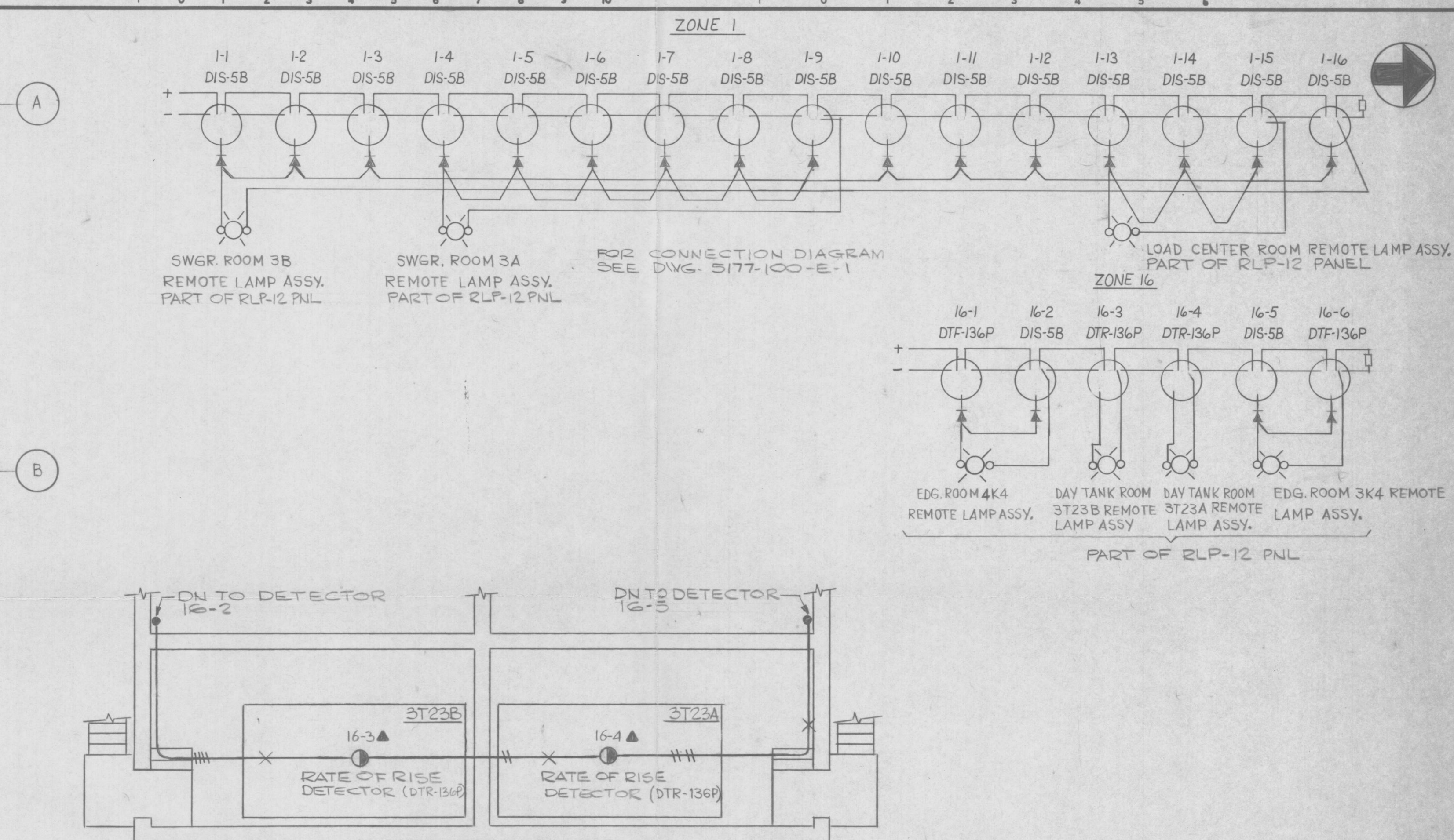
- PRELIMINARY** **E**
Docket # 50-250
Control # 7912270429
Date 12-28-79 of Document:
REGULATORY DOCKET FILE

O <i>10/14</i>		ISSUED FOR CONSTRUCTION		1G. <i>Fed</i>		<i>del</i>		<i>10/14</i>	
NO.	DATE	REVISIONS		BY	CHK.	APPR. SUPERV.	ENGR.	APP.	APP.
<h1>BECHTEL</h1> <h2>GAITHERSBURG, MARYLAND</h2>									
<h1>FLORIDA POWER & LIGHT COMPANY</h1> <p>TURKEY POINT NUCLEAR UNITS</p> <p>UNIT NO. 3 1970-760 MW INSTALLATION</p> <p>UNIT NO. 4 1971-760 MW INSTALLATION</p>									
<h1>FIRE PROTECTION</h1> <h1>WIRING DIAGRAM</h1>									
<h1>PRELIMINARY</h1>									
DRAWN	YAGIN	CHECKED	<i>FL</i>	GRABT'S SUPERV.	—	ENGR.	<i>del</i>	APP.	<i>10/14</i>
DATE		DRAWING NO.				APP.		REV.	
<i>8-21-79</i>		54177-100-E-1						0	
SCALE									
<h1>A FILE NUMBER:</h1>									



480V LOAD CENTERS 3A, 3B, 3C, 3D, ROOMS
PLAN ABOVE EL. 31'-0"

4160V SWGR ROOMS 3A, 3B
PLAN ABOVE EL. 18'-0"



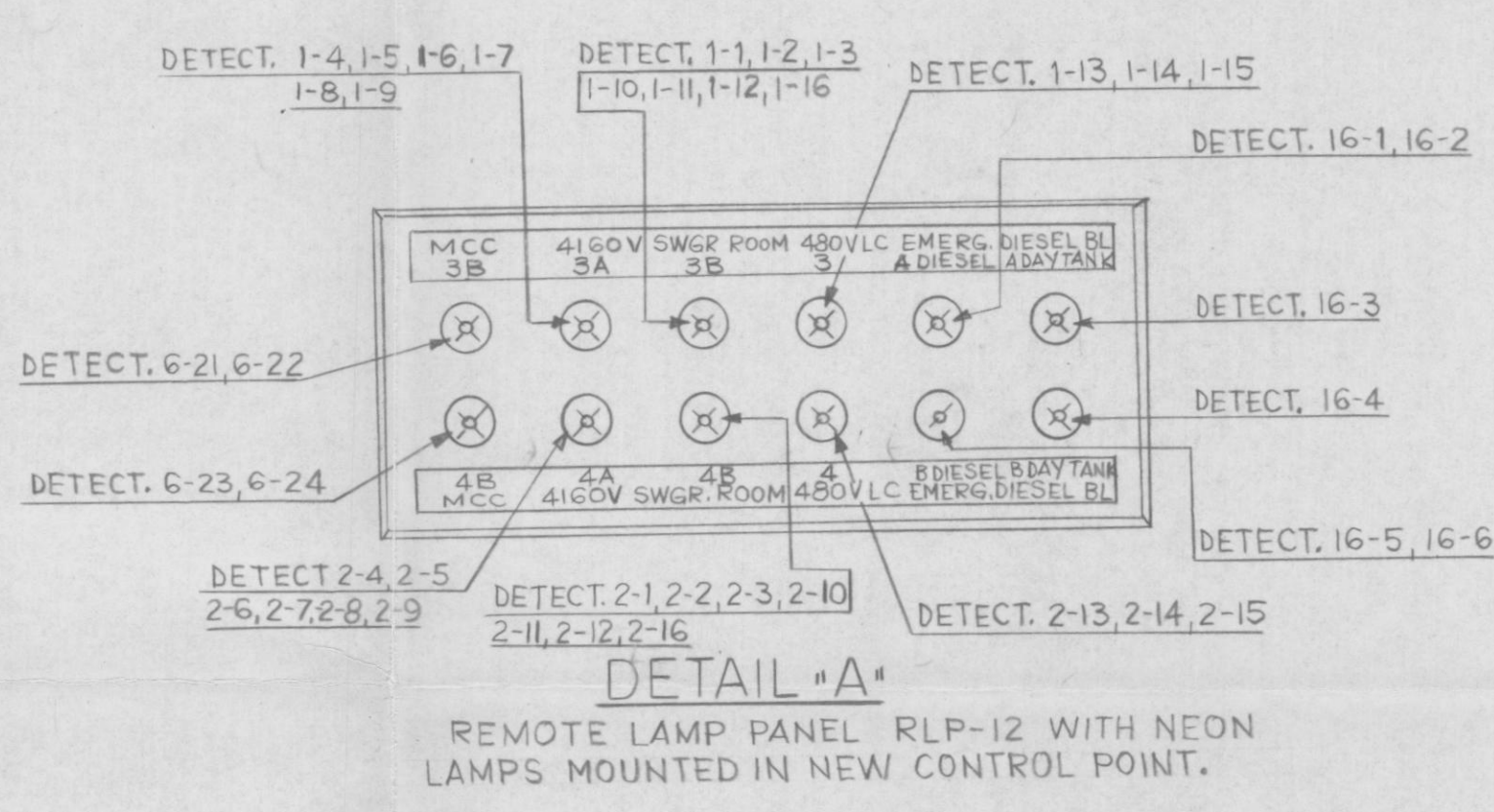
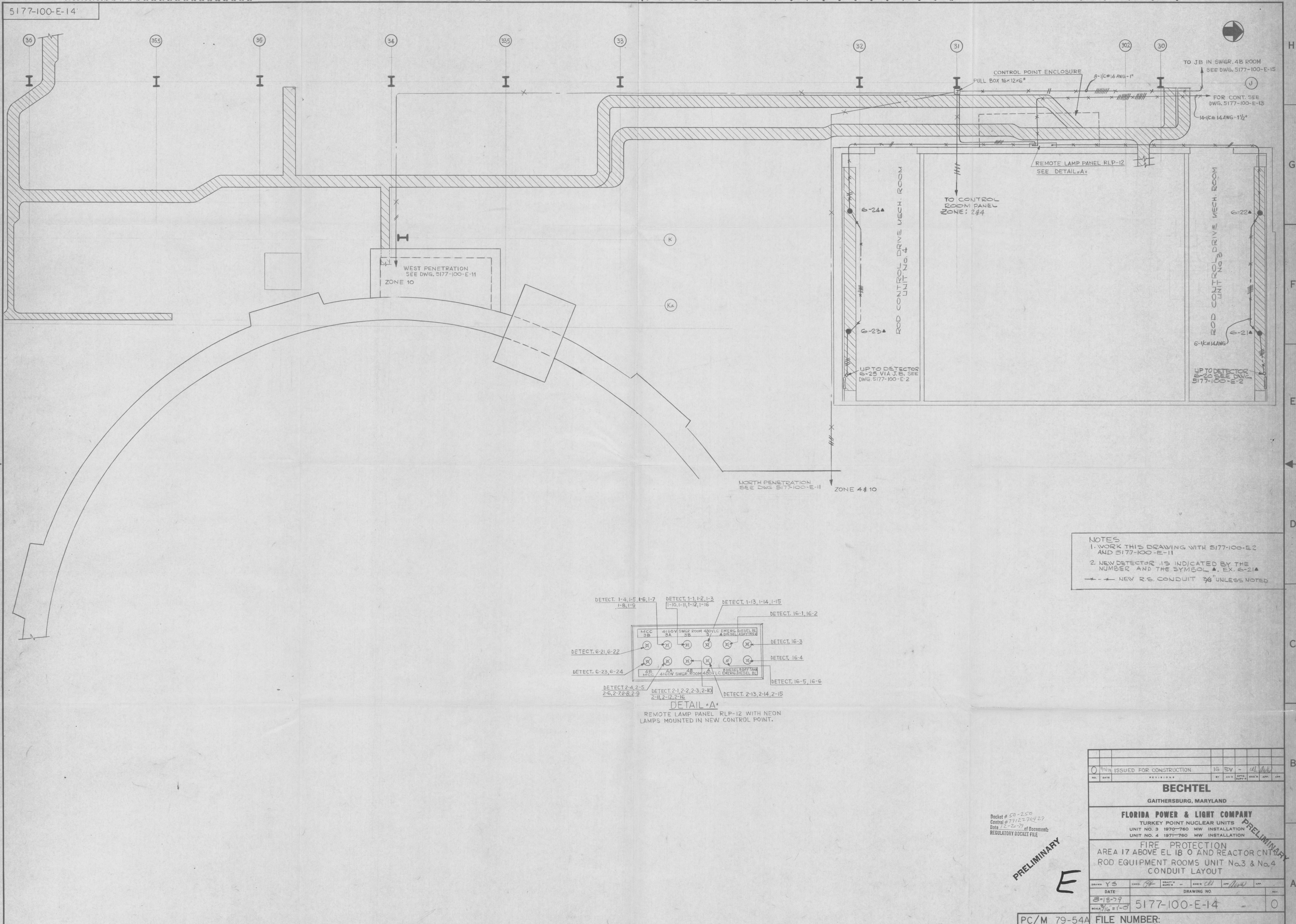
EDG BLDG PLAN VIEW ABOVE EL. 18'-0"

- LEGEND**
- NEW CONDUIT
 - ALL NEW DETECTORS ARE FOLLOWED BY THE SYMBOL ▲. EX. 1-3▲
- NOTES**
- ALL CONDUITS TO BE 3/4" UNLESS OTHERWISE NOTED.
 - IN PULLING LONG RUNS OF SINGLE CONDUCTOR CABLE #14AWG, ADEQUATE CARE SHOULD BE TAKEN TO PREVENT CABLE DAMAGE.

REFERENCE DRAWING
5177-100-E-1 FIRE PROTECTION WIRING DIAGRAM

ISSUED FOR CONSTRUCTION		1G Prt -	
NO.	DATE	BY	CHK
BECHTEL			
GAITHERSBURG, MARYLAND			
FLORIDA POWER & LIGHT COMPANY			
TURKEY POINT NUCLEAR UNITS			
UNIT NO. 3 1970-760 MW INSTALLATION			
UNIT NO. 4 1971-760 MW INSTALLATION			
FIRE PROTECTION			
4160V SWGR ROOMS UNIT NO. 3			
480V LOAD CENTER ROOMS UNIT NO. 3			
EMERGENCY DIESEL GEN. BUILDING CONDUIT LAYOUT			
DRAWN	YASIN	CHKD	PR
DATE	3-21-79	BY	CHK
SCALE	1/8" = 1'-0"	5177-100-E-12	

PC/M 79-54A FILE NUMBER: 791217



NOTES
1. WORK THIS DRAWING WITH 5177-100-E-2 AND 5177-100-E-11
2. NEW DETECTOR IS INDICATED BY THE NUMBER AND THE SYMBOL Δ. EX. 6-21Δ
--- NEW R.G. CONDUIT 3/4" UNLESS NOTED

Docket # 50-250
Control # 7912270429
Date 12-22-79 of Documents
REGULATORY DOCKET FILE

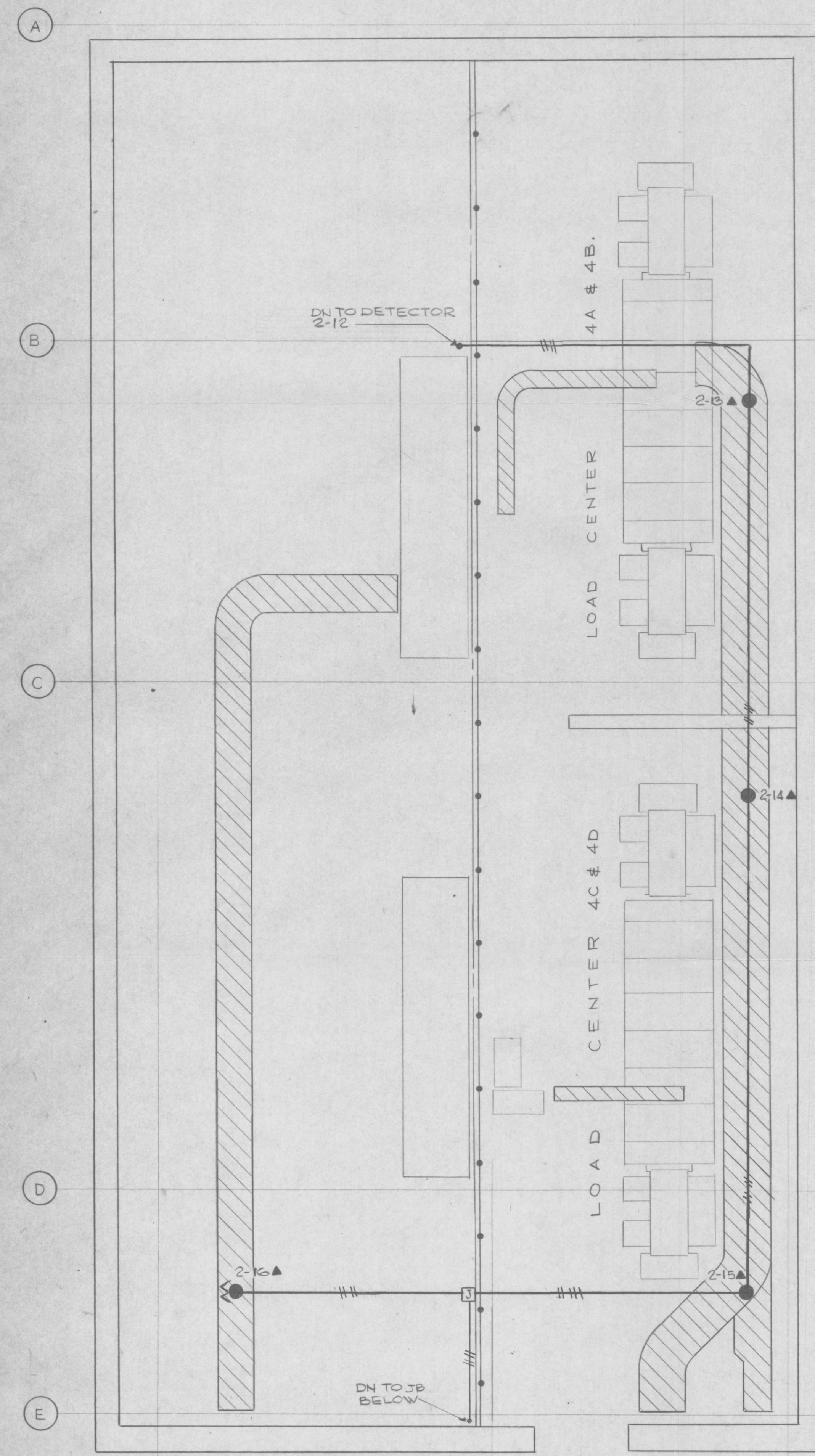
PRELIMINARY
E

ISSUED FOR CONSTRUCTION		IG	BY	DATE	APP.
REVISIONS					
BECHTEL					
GAITHERSBURG, MARYLAND					
FLORIDA POWER & LIGHT COMPANY					
TURKEY POINT NUCLEAR UNITS					
UNIT NO. 3 1970-760 MW INSTALLATION					
UNIT NO. 4 1971-760 MW INSTALLATION					
FIRE PROTECTION					
AREA 17 ABOVE EL 18.0 AND REACTOR CONTAINMENT					
ROD EQUIPMENT ROOMS UNIT No.3 & No.4					
CONDUIT LAYOUT					
DRAWN	Y.S.	CHECK	CH	DATE	12-22-79
DATE		DRAWING NO.		REV.	
8-13-79		5177-100-E-14		0	
SCALE 3/16" = 1'-0"					

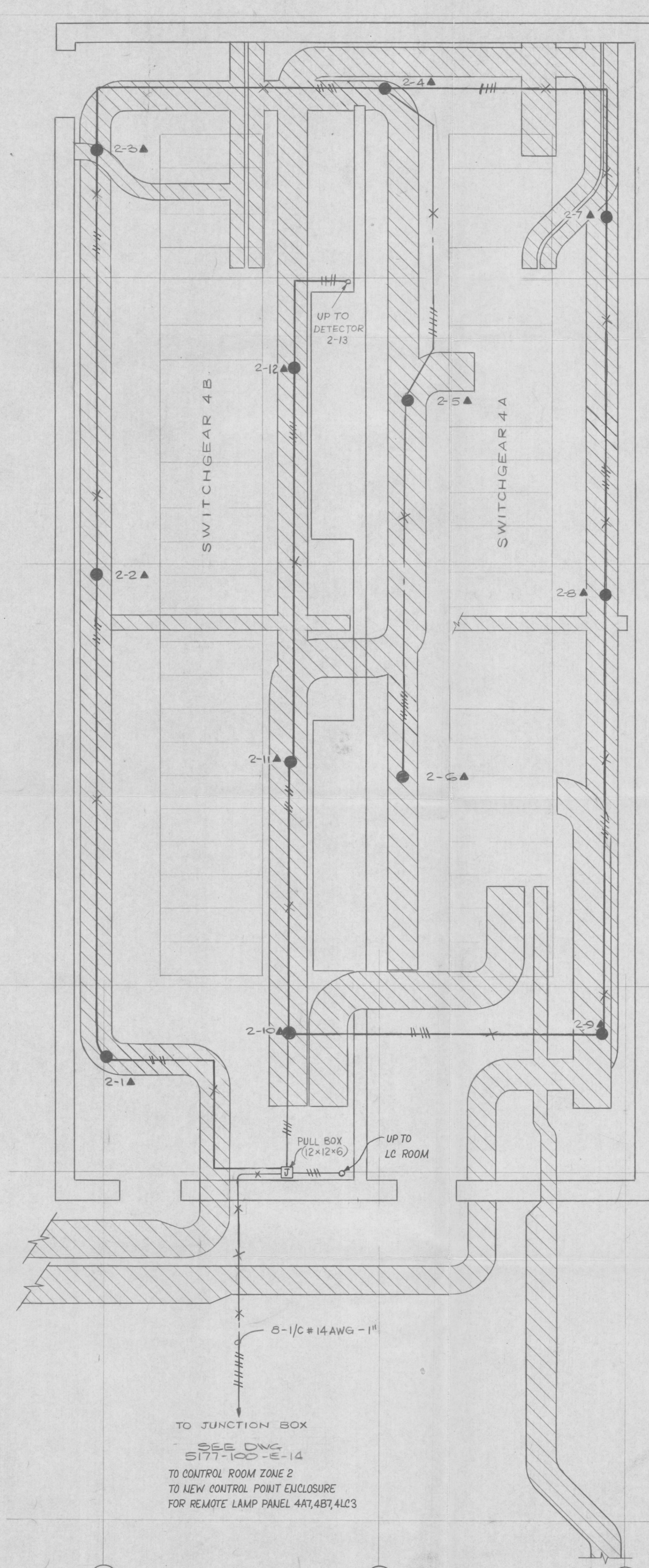
PC/M 79-54A

FILE NUMBER:

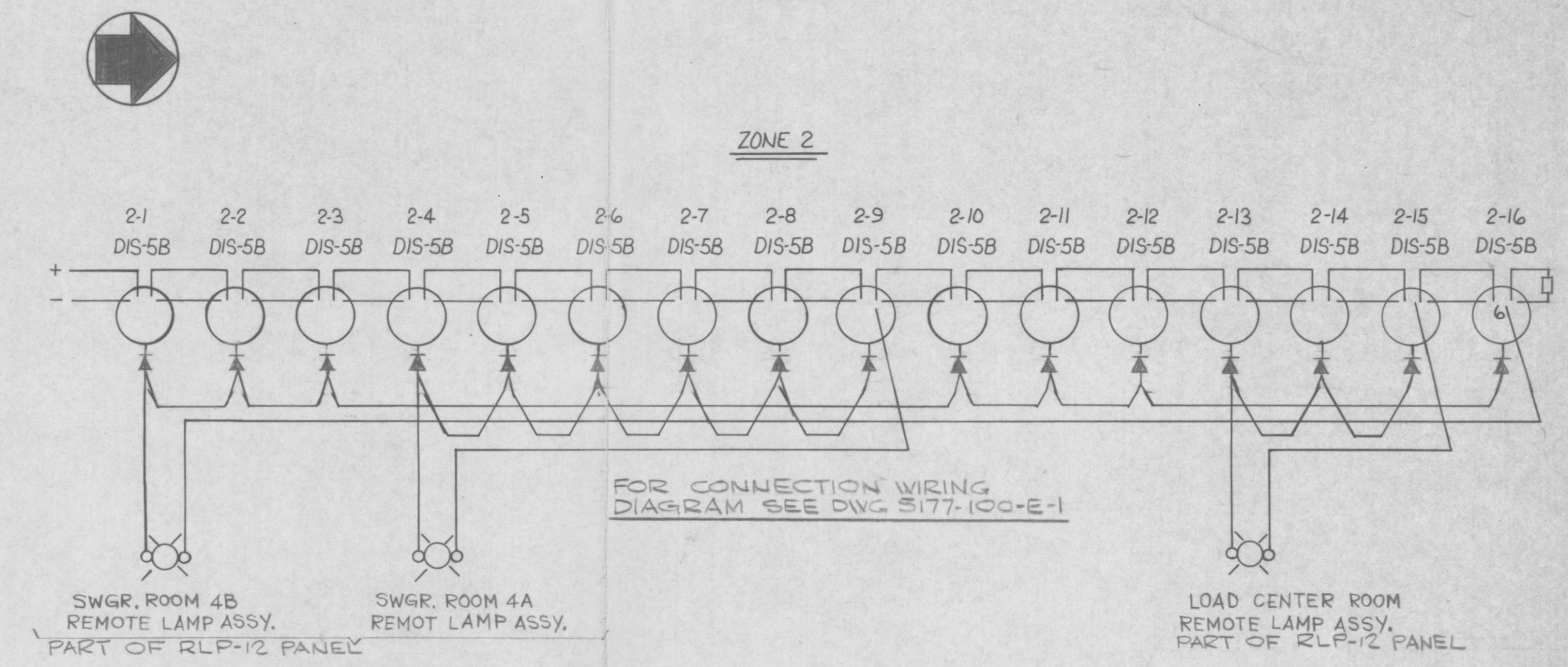
5177-100-E-15



480V LOAD CENTERS 4A, 4B, 4C, 4D ROOMS
PLAN ABOVE EL 31'-0"



4160V SWGR ROOMS 4A, 4B
PLAN ABOVE EL 18'-0"



- NOTES
1. WORK THIS DWG WITH 5177-100-E-2 AND 5177-100-E-14
 2. ALL RACEWAYS TO BE 3/4" R.S. UNLESS NOTED

PRELIMINARY

0		ISSUED FOR CONSTRUCTION		IG		FB		CL		APP	
BECHTEL											
GAITHERSBURG, MARYLAND											
FLORIDA POWER & LIGHT COMPANY											
TURKEY POINT NUCLEAR UNITS											
UNIT NO. 3 1970-760 MW INSTALLATION											
UNIT NO. 4 1971-760 MW INSTALLATION											
FIRE PROTECTION											
4160V SWGR ROOMS UNIT NO. 4											
480V LOAD CENTER ROOMS UNIT NO. 4											
CONDUIT LAYOUT											
DATE	8-20-1979	SCALE	1/8" = 1'-0"	DRAWING NO.	5177-100-E-15	REV.	0				

PC/M 79-54A FILE NUMBER: