Technical Specification
Power Equipment Center (PEC)

PART 1 – GENERAL

SCOPE

The specification covers requirements applicable to the provision of power equipment centers (PEC). The PEC shall be environmentally controlled, and shall consist of a coordinated grouping of electrical power and control equipment as indicated on any accompanying data sheets and/or drawings. Any data sheets, drawings, or any other related documents accompanying this specification should be considered a part of this specification.

The supplier shall furnish, install, interconnect and test the equipment and materials specified herein, as well as any equipment specified in any related documents.

Site conditions shall be shown on the data sheet(s). These conditions shall be considered when sizing and designing equipment.

Any exceptions to the specification shall be noted in the supplier's quotation, under a separate heading. For any portions of the specification, which have not been accepted or clarified, the customer shall construe complete compliance by the supplier.

Any exceptions to entire portions of the specification, and any notations of exception to anything, which is not in the supplier's quotation, shall be deemed non-responsive and shall be rejected.

STATUTES, CODES AND STANDARDS

All materials, equipment and labor supplied by the supplier shall be in strict compliance with the statutes, codes and standards listed herein. Where conflicts exist between statutes, codes and standards, the more stringent requirement shall prevail. Applicable statutes, codes and standards are as listed below:

1. American Institute of Steel Construction (AISC)
2. American National Standard Institute (ANSI)
3. American Society of Testing and Materials (ASTM)
4. American Welding Society (AWS)
    a. AWSD1.1, Structural Welding Code – Steel
5. National Fire Protection Association (NFPA)

6. National Electric Code (NEC)

7. National Electrical Manufacturers Association (NEMA)

8. Underwriters' Laboratories (UL)

9. Uniform Building Code (UBC)

QUALITY REQUIREMENTS

The PEC shall be manufactured under an established autonomous quality assurance program. The supplier shall have a designated quality assurance (QA) manager. The supplier must be ISO 9002 certified, or have a quality system in place, which corresponds with the requirements of ISO 9002.

The successful bidder shall be prepared to submit for customer approval, any and/or all quality plans, forms, and procedures applicable to the manufacture of the PEC.

PART II – PRODUCTS

POWER EQUIPMENT CENTER (PEC)

The PEC shall be designed and constructed for outdoor use under wind and seismic load conditions per the UBC guidelines for the jobsite.

The building and all components mounted thereon shall be designed for and anchored sufficiently for transportation to the jobsite.

The skid shall be of all welded, seamless construction utilizing ASTM-A36 structural steel members, sized and arranged for proper strength, and able to withstand the stress and loads which will result when lifting the complete factory fabricated and equipped assemblies. Welding shall be in accordance with the requirements of AWSD1.1. Welders certified through the 4G positions shall perform all welding. Suppliers shall be prepared to show welders' certificates.

Deflection shall be L/240. The building shall be suitable for installation on a concrete pad or on piers.

The skid shall be equipped with two (2) stainless steel ground pads located at opposite corners of the skid.

The skid shall be provided with 8-10 mil coverage of bituminous mastic undercoating.

The floor shall be a minimum of ¼" H.R. ASTM-A36 smooth steel plate welded to the perimeter and longitudinal and/or transverse structural members of the skid. The floor loading shall be not less than 250 PSF.

The floor shall be provided with floor cutouts where required for power and control cable entry/exit from the equipment. The cutouts shall be provided with 12 gauge galvanized cover plates.

BUILDING CONSTRUCTION

Building walls, roof and ceiling shall be fabricated from G90 galvanized steel. Exterior walls, exterior roof and interior ceiling shall be of self-framing, interlocking design, with maximum panel width of 16". Buildings of framed construction are not acceptable.

Exterior walls shall be minimum of 18-gauge thickness, but rated to withstand the loading requirements of the jobsite.

Interior walls shall be minimum of 18-gauge thickness, but rated to withstand the loading requirements of the jobsite.

Exterior roof shall be minimum of 18-gauge thickness, but rated to withstand the loading requirements of the jobsite. The roof shall be sloped at ¼" per linear foot, and shall be sloped away from the personnel doors.

Interior ceiling shall be minimum of 18-gauge thickness, but rated to withstand the loading requirements of the jobsite.

For buildings which must be shipped in multiple shipping sections, miscellaneous NEMA 1 junction boxes will be provided at the shipping splits for easy breakdown of the building wiring for shipment and reconnecting at the jobsite.

Prior to shipment the open end/sides of each shipping section will be crated (weatherproofed) for transit to the jobsite. A company recognized and experienced in the trade must perform the crating.

Where wall bulkhead penetrations are required, the cutouts shall be completely framed with ¼" aluminum cover plates with neoprene gasket. All wall penetrations shall be made in the walls prior to bending with the appropriate machinery. No manual cutting of wall penetrations via jigsaw, plasma torch, etc., shall be permitted.

All fastening hardware shall be zinc plated. Welding of galvanized steel and rivets shall not be an acceptable method of exterior fastening.

The building shall be provided with a minimum of two (2) entrance doors. The doors shall be double wall construction, with brushed aluminum panic with cylinder lock and thumb latch, brushed aluminum automatic closure with built-in hold open device, prime

coat hinges, threshold built into the door frame, neoprene gasket, drip shields/water flashing, **"DANGER, HIGH VOLTAGE, KEEP OUT"** sign, and a 12" removable transom above the equipment door only. The personnel door shall be 36" x 84". The equipment door shall be 48" x 84".

When specified, the supplier shall provide landings and stairs for the building. The stairs shall be built in compliance with the UBC code, and shall be hot-dipped galvanized after fabrication.

For equipment requiring rear access, the supplier shall provide 14 gauge-galvanized steel, gasketed and hinged equipment rear access doors, with 3-point latching system with galvanized padlockable handles, **"DANGER HIGH VOLTAGE"** sign, and drip shields/water flashing.

The walls, roof and floor shall be fully insulated, with a minimum of R-11 insulation. The walls and roof shall be provided with fiberglass batt type insulation. The floor shall be provided with polyurethane spray foam insulation.

The building shall be provided with a paint system per the following.

The skid shall be sandblasted to remove rust and scale prior to painting. A 2-3 mil application of epoxy iron oxide primer shall be provided.

The floor shall be provided with a 2-3-mil application of "Red" epoxy iron oxide primer, followed by a 2-3-mil application of ANSI-61 gray epoxy, with a non-skid finish.

The exterior and interior of the building shall be provided with a 0.3 – 0.6 mil application of a vinyl wash primer, followed by a 2-3- mil application of white epoxy paint.

The building shall be provided with an HVAC system, sized and provided by the supplier, considering the ambient site conditions, the dimensions of the building, the solar heat generated within the building, and the heat generated by the equipment within the building. The system shall be designed such that the sensible cooling capacity, NOT the total cooling capacity, will maintain an ambient temperature within the building of between 55F winter and 80F summer at design conditions. The system shall be provided with an electronic, automatic changeover thermostat.

When the building is specified to be located in a classified environment, the supplier shall provide an HVAC/Pressurization system in strict compliance with NFPA 496 requirements. In the event of a classified installation, the supplier shall also provide all exterior electrical apparatuses and proper seals, which are rated for, use in the environment in which the building shall be installed.

The supplier shall furnish all electrical distribution equipment necessary for the proper operation of building services within and without the building. The operating voltage of

all distribution equipment shall be 120/208, three phases. The primary side of any distribution transformers shall be 480V, three phase.

The buildings shall be provided with twin tube, rapid start, fluorescent lighting fixtures, controlled via three-way wall switches to be located at each entry door.

The buildings shall be provided with 125V, 20A, and duplex receptacles at each entry door.

The building shall be provided with 70-watt high-pressure sodium exterior lights at each entry door, controlled via photocell and H-O-A switch.

All wiring shall be type THWN, #12 AWG minimum for power circuits, minimum #14 AWG for control circuits.

For all control interconnection wiring, both ends of the wire shall be provided with polyolefin sleeve type wire markers.

EMT conduit shall be utilized for interior applications. RGS conduit shall be utilized for outdoor applications.

Any cable tray necessary shall be aluminum 6" high with 9" rung spacing. All fittings shall have a minimum of 12" radius. Buildings having cable tray systems shall be provided with structural steel channel supports embedded in the ceiling. The use of unistrut fastened directly to the ceiling for cable tray support shall not be permitted. The support from the channel supports shall be via all thread and unistrut hangers.

¼" x 2" copper ground bar running the length of the building shall be provided, mounted approximately 6" above floor and connected to each end of the equipment ground bar. A #4/0 green insulated copper ground cable shall be provided from the ground bar to the exterior ground pads. A green insulated copper ground wire/cable will be provided from the ground bar to all auxiliary electrical equipment per NEC Table 250-95.

PART III – TESTING AND INSPECTION

The following testing and inspection shall be performed on the building.

Continuity checks of all wiring installed by the supplier.

Operational check of all suppliers furnished and installed electrical apparatuses.

Switchgear and Motor Control Center shipping sections' bus shall be respliced, torqued and meggered.

The supplier's Quality Assurance Manager shall provide a certified test report.

If necessary, secondary control power shall be provided for customer use. Available control power voltages shall be 480/3/60, 120-208/3/60 and 120-240/1/60.

PART IV – SUBMITTALS

The supplier shall provide the following submittals:

Any quality plans, forms, or procedures deemed necessary by the customer.

Structural drawings including:

General notes.

Building plan view.

Building base skid detail.

Building elevations.

Stairs and landings details (if applicable).

Certified structural calculations (if applicable).

GENERAL NOTES

1. MATERIAL: EXTERIOR WALL – 16 GAUGE GALVANIZED STEEL INTERLOCKING PANELS
   EXTERIOR ROOF – 16 GAUGE GALVANIZED STEEL INTERLOCKING PANELS
   INTERIOR WALL – 18 GAUGE GALVANIZED STEEL OVERLAPPING SHEETS
   INTERIOR ROOF – 16 GAUGE GALVANIZED STEEL INTERLOCKING PANELS
   FLOOR – 1/4" SMOOTH H.R. ASTM A-36 STEEL
   BASE – AS SHOWN ON DRAWING D-BROCHURE-400

2. PAINT: BASE – COMMERCIAL SANDBLAST PRIOR TO PRIMER
   PRIMER, MOBILE #40-AR-18 IRON OXIDE, EPOXY, 2-3 MILS DRY
   UNDERCOAT, QUAKER KOTE #68109, 8-10 MILS
   FLOOR – PRIMER, MOBILE #40-AR-18 IRON OXIDE EPOXY, 2-3 MILS DRY
   FINISH, MOBILE #40-AH-82, (ANSI-61) GRAY EPOXY, 2-3 MILS DRY, NON-SKID
   EXTERIOR – PRIMER, MOBILE #50W8, VINYL WASH, .3-.4 MIL DRY
   CAULK, SIKAFLEX-1A, POLYURETHANE AT ALL EXTERIOR SEAMS
   FINISH, MOBILE #40-AW-34, WHITE EPOXY, 2-3 MILS DRY
   INTERIOR – PRIMER, MOBILE #50W8, VINYL WASH, .3-.6 MIL DRY
   FINISH, MOBILE #40-AW-34, WHITE EPOXY, 2-3 MILS DRY
   GUTTERS & DOWNSPOUTS – SAME AS EXTERIOR

3. INSULATION: WALLS – 3 1/2" OWENS CORNING FIBERGLASS, R-11
   ROOF – 3 1/2" OWENS CORNING FIBERGLASS, R-11
   FLOOR – 2" SPRAY ON POLYURETHANE, R-14

4. DOORS: ONE (1), #PC43070, RH, TYPE "F", 18 GAUGE GALVANIZED STEEL
   ONE (1), #PC43060, LH, TYPE "F", 18 GAUGE GALVANIZED STEEL
   SUPPLIED WITH THE FOLLOWING HARDWARE:
   KEYED CYLINDER LOCK – AMERICAN #8300
   PANIC – MARCHBROW #H1550-S-32-0T531C-32, BRUSHED ALUMINUM, US 32
   AUTOMATIC DOOR CLOSER – INTERNATIONAL #1985P, WITH BUILT-IN HOLD OPEN DEVICE
   HINGES – STANLEY #BB1278, STEEL, PRIME COAT
   FRAME – 14 GAUGE GALVANIZED STEEL
   THRESHOLD – INTEGRAL WITH DOOR FRAME
   GASKET – CLOSED CELL NEOPRENE

5. FLOOR CUTOUTS: AS SHOWN ON DRAWING D-BROCHURE-300, (18-REQUIRED)

6. COVERPLATES: 12 GAUGE GALVANIZED STEEL WITH NEOPRENE GASKET, (18-REQUIRED)

7. WALL CUTOUTS: AS SHOWN ON DRAWING D-BROCHURE-500, (5-REQUIRED)

8. GROUND PADS: STAINLESS STEEL, 3" X 5" X 1/8", MOUNTED ON EXTERIOR, ONE (1) AT EACH END OF BUILDING, WITH #4/0 COMPRESSION LUG, (2-REQUIRED)

9. FASTENERS: EXTERIOR SCREWS, SECURING WALLS AND ROOF WILL BE ZINC PLATED

10. ACCESS DOORS: 14 GAUGE GALVANIZED STEEL, HINGED, GASKETED, DOORSTOPS, PADLOCKABLE VAULT HANDLE, 3-POINT LATCH WITH "DANGER HIGH VOLTAGE" SIGNS, (5-REQUIRED)

11. GUTTERS AND DOWNSPOUTS: AS SHOWN ON DRAWING D-BROCHURE-500

12. PLATFORMS AND STAIRS: AS SHOWN ON DRAWING D-BROCHURE-1000

13. EYE WASH: BRADLEY #S19-650A (2P331), SELF CONTAINED EMERGENCY EYEWASH STATION, WALL MOUNT, 13.4 GALLON CAPACITY, 0.4 GALLONS PER MINUTE FOR 15 MINUTES, WITH #S19-350 (ST910) CONCENTRATE OF BUFFERED ISOTONIC SALINE SOLUTION, (1-REQUIRED)

14. FIRE EXTINGUISHER MOUNTING PLATES: 12 GAUGE GALVANIZED STEEL, (2-REQUIRED)

15. ESTIMATED WEIGHTS:

LIVE LOAD	11,150	POUNDS
DEAD LOAD	12,480	POUNDS
TOTAL LOAD	23,630	POUNDS

ELECTRICAL NOTES

1. ELECTRICAL CLASSIFICATION: INTERIOR & EXTERIOR – GENERAL PURPOSE

2. WIRE: #12AWG, 600V, "THWN", 90°C, (BLACK-WHITE-GREEN), UNLESS OTHERWISE NOTED WITH BRADY #HCPS.8-500BW HEAT SHRINKABLE SLEEVE TYPE MARKERS

3. CONDUIT: INTERIOR – 3/4" EMT, EXTERIOR – 3/4" RGS, SURFACE MOUNTED, UNLESS OTHERWISE NOTED

4. INTERIOR LIGHTING: METALUX #W-240A, 2 LAMP, 40 WATT, 120V, FLUORESCENT, SURFACE MOUNT, (5-REQUIRED)

5. INTERIOR LIGHT SWITCH: LEVITON #CS320-2L 3 WAY, 20A, 120V, (2-REQUIRED)

6. DUPLEX RECEPTACLE: LEVITON #CR20-L, 20A, 125V, 5-20R, (3-REQUIRED)

7. LIGHTING PANEL: ITE #Q3042M83200CU, 120/208V, 3 PHASE, 4 WIRE, 24 CIRCUIT, 100A MAIN BREAKER, WITH 22/20A/1P & 1/40A/2P BOLT-ON BRANCH BREAKERS, (1-REQUIRED)

8. EMERGENCY LIGHTING: SURE-LITES #EBP-1-40H (EVCR7), 120V, FLUORESCENT EMERGENCY BALLAST WITH MAINTENANCE FREE RECHARGEABLE BATTERY, SOLID STATE CHARGER, TEST SWITCH, 90 MINUTE OPERATION AFTER POWER FAILURE, (5-REQUIRED)

9. TRANSFORMER: ITE #3F3Y015, 15KVA, 3 PHASE, 4 WIRE, 480-208/120V, (1-REQUIRED)

10. HVAC UNIT: BARD #WA602-C15, 480V, 3 PHASE, 28.0A, 87,500BTU'S COOLING, 15KW HEATING, WITH GRILLES, WHITE-ROGERS #1F56-306 (4E028) THERMOSTAT AND MAINTENANCE DISCONNECT CIRCUIT BREAKER, (1-REQUIRED)

11. EXTERIOR LIGHTS: ITT WEAVER #DS010H040-GGL-B2, 120V, 100W HIGH PRESSURE SODIUM, (2-REQUIRED) WITH INTERMATIC #K4141 (SU788) PHOTOCELL, (1-REQUIRED)

12. GROUNDING SYSTEM: AS SHOWN ON DRAWING D-BROCHURE-800

13. BATTERY CHARGER: CONSTANT POWER MANUFACTURING CO. #USG-208V-1"-130VDC-15ADC, (1-REQUIRED)

14. BATTERY: EXIDE TYPE "CA", ANTIMONY FLAT PLATE, 100 AMP HOUR, (1-REQUIRED)

15. CABLE TRAY: AS SHOWN ON DRAWING D-BROCHURE-600

THE FOLLOWING EQUIPMENT IS TO BE FURNISHED BY SIEMENS ENERGY AND AUTOMATION, INC. COMPANY AND INSTALLED BY PROTECT CONTROLS, INC.

1. 480V SWITCHGEAR: 3 VERTICAL SECTIONS

2. 480V MOTOR CONTROL: 10 VERTICAL SECTIONS

3. 480V BUSDUCT: 2 SECTIONS FROM EQUIPMENT THRU WALL

REV	DATE	DESCRIPTION
0	7-12-95	FOR REFERENCE ONLY

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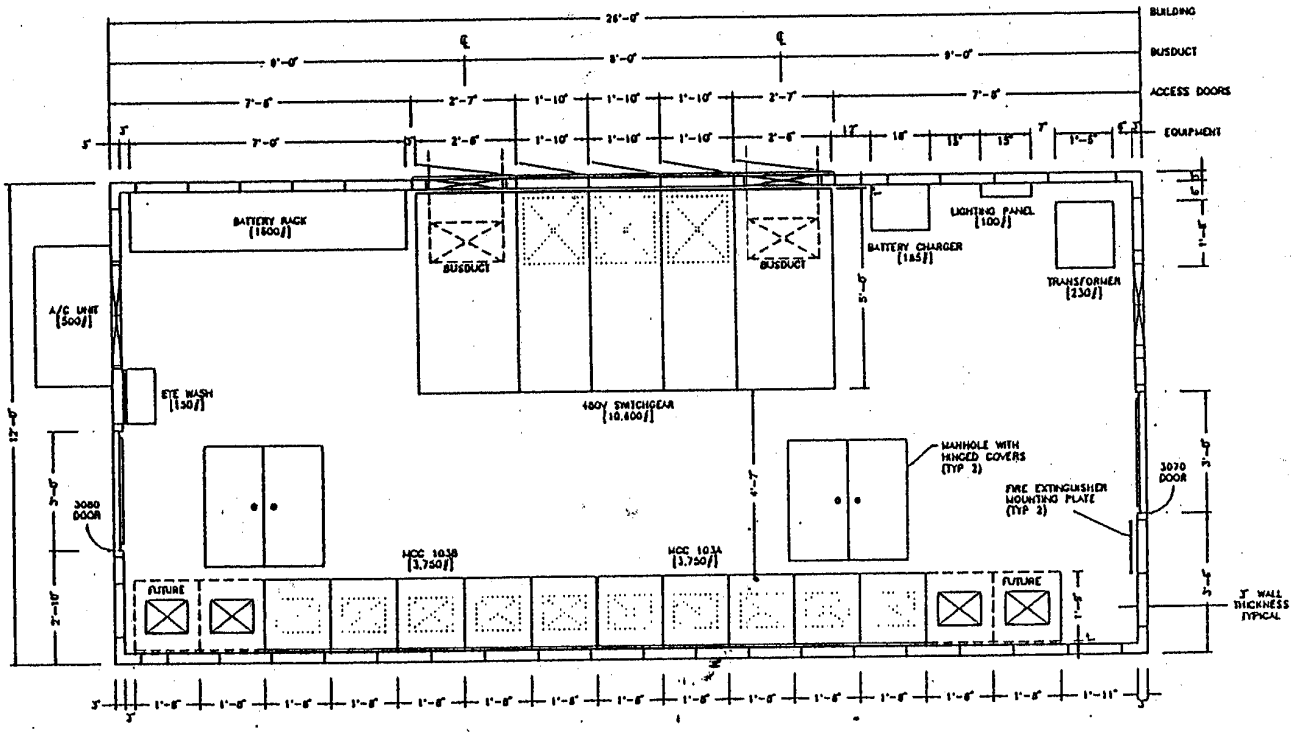
CUSTOMER: YOUR COMPANY NAME HERE
JOB NO.: SA
TITLE: SAMPLE DRAWING
GENERAL & ELECTRICAL NOTES
DRAWN: RODRIGUEZ
DATE: 7-12-95
DRAWING NUMBER



PLAN VIEW

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PLAN VIEW
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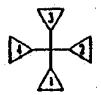
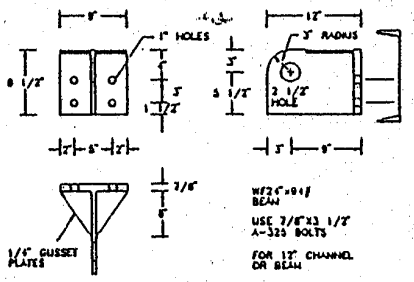
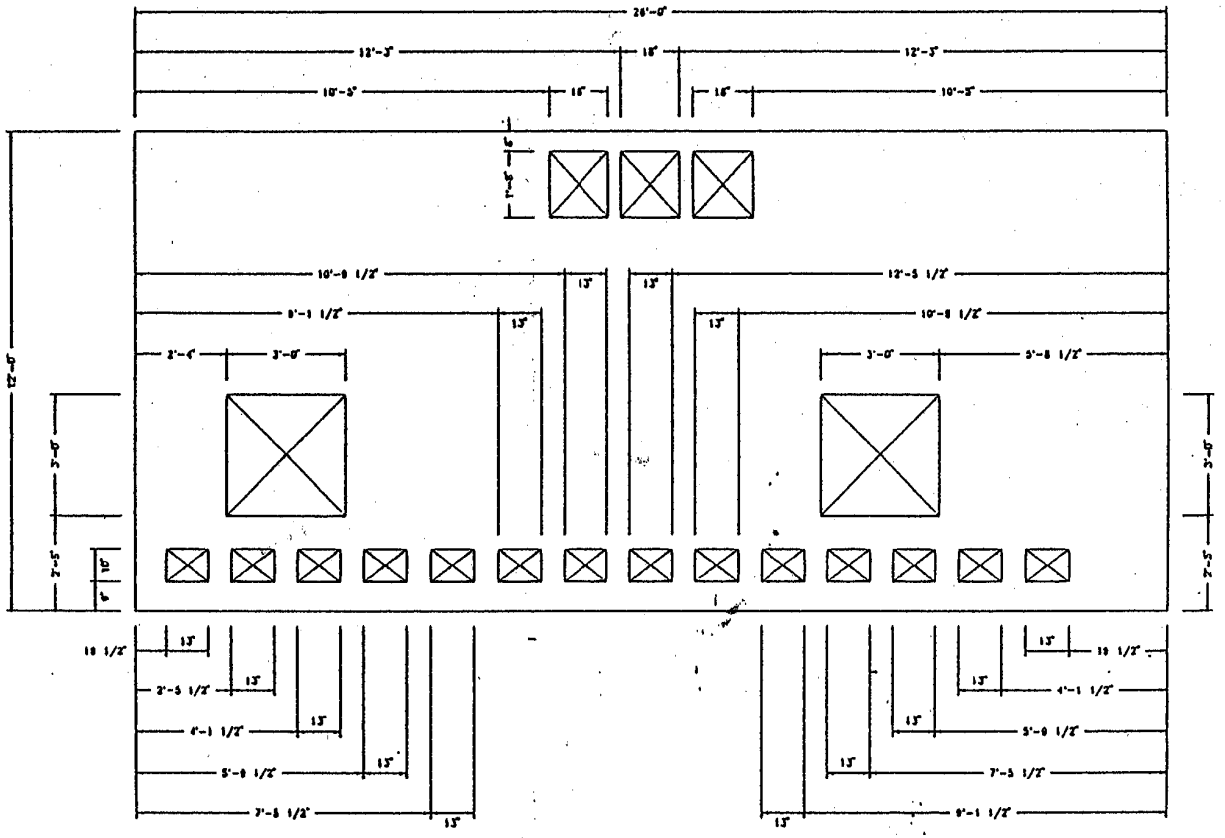




LIFTING LUG DETAIL

N.T.S.



FLOOR CUTOUT PLAN

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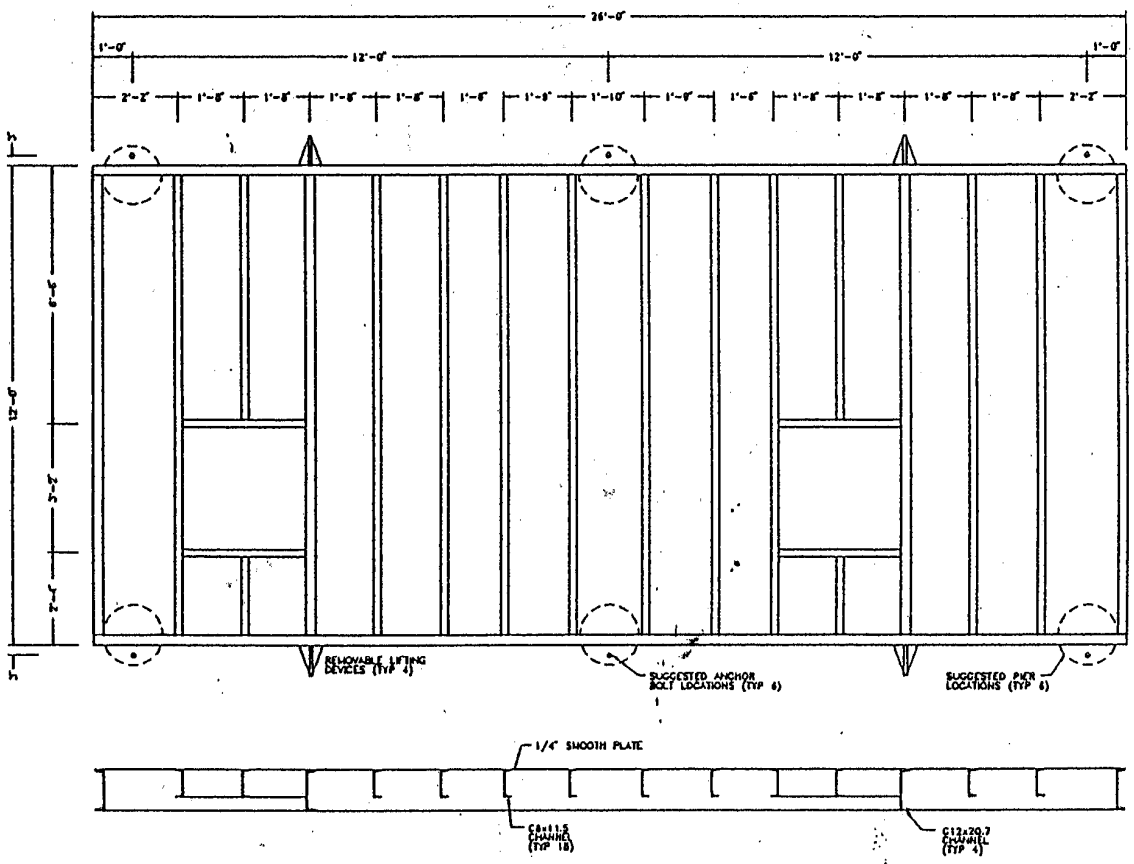
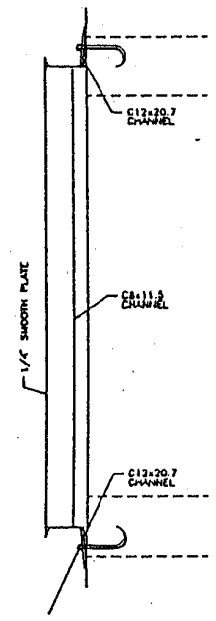
FLOOR CUTOUT PLAN VIEW
DRAWN: FORREST
DATE: 7-12-95
DRAWING NUMBER





NOTE: ANCHOR BOLTS, TIE DOWN CLIPS AND/OR PIERS SHALL BE SIZED, SUPPLIED AND INSTALLED BY OTHERS IN FIELD

BASE DETAIL

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JOB NO: S
TITLE: SAMPLE DRAWING
BASE DETAIL
DRAWN: FORREST
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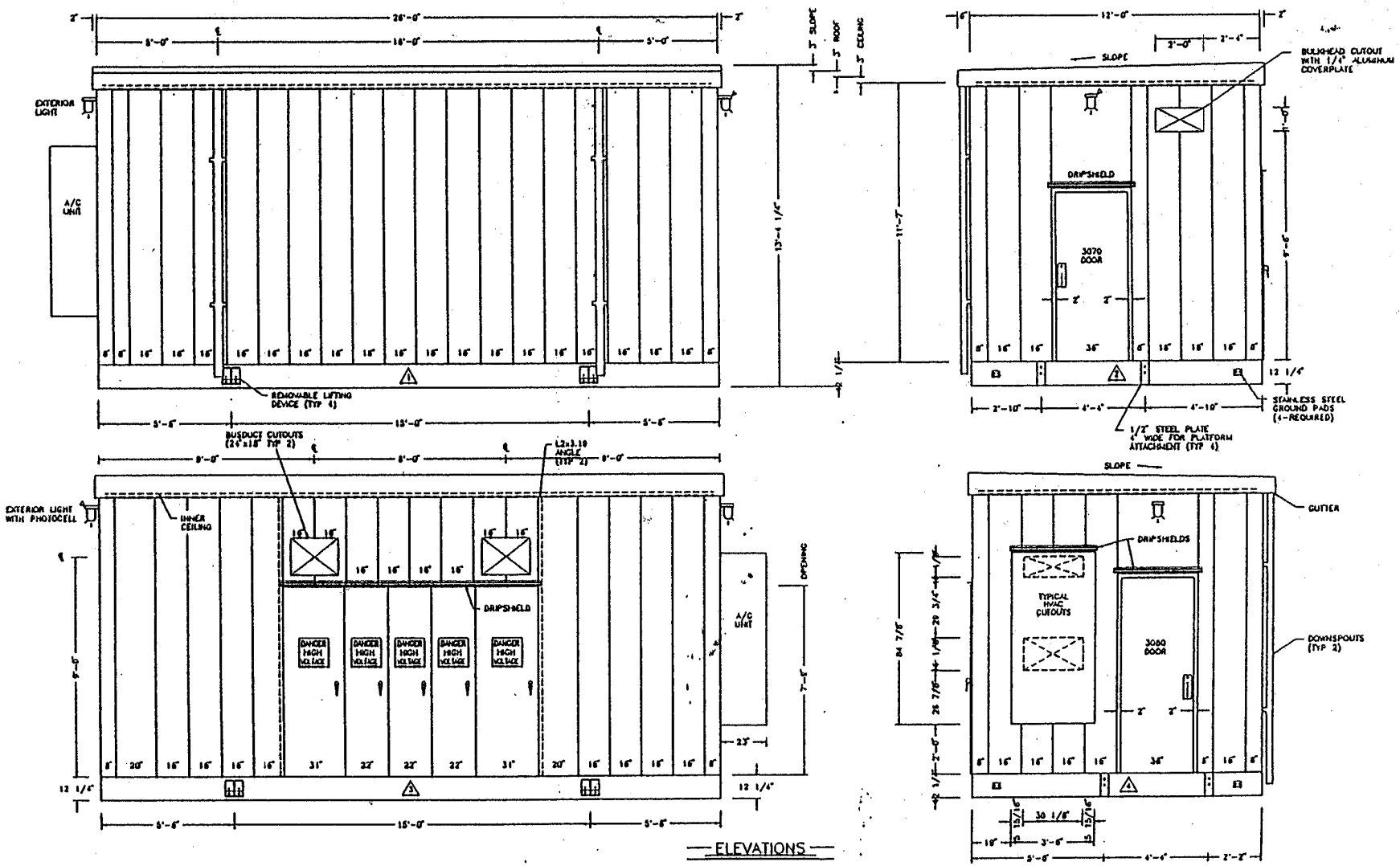

ELEVATIONS

REV	DATE	DESCRIPTION
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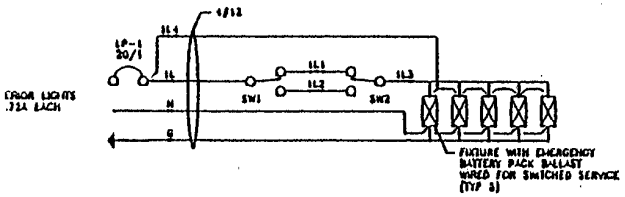
TITLE: SAMPLE DRAWING
ELEVATIONS

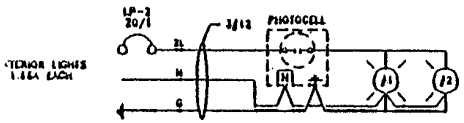
DRAWN BY: FORREST | DATE: 7-12-95

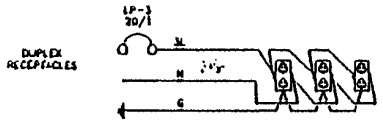
PANEL SCHEDULE

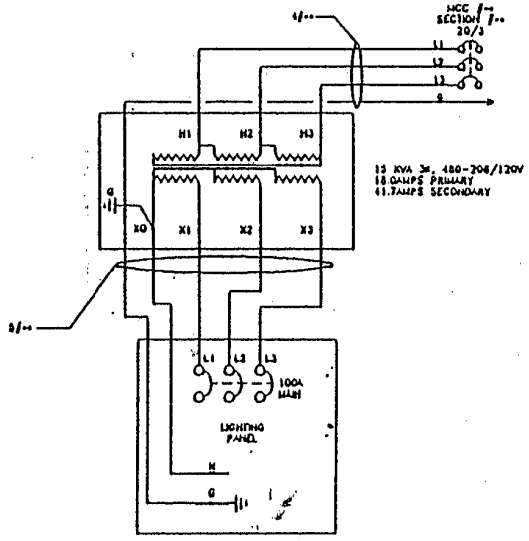
120/208V, 100A MAIN, 3 PHASE, 4 WIRE, 24 CIRCUIT

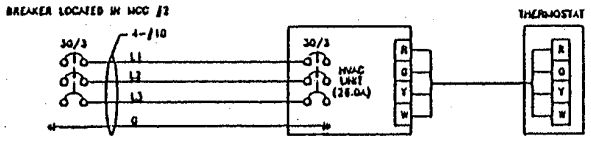
CKT No	AMP	DESIGNATION	LOAD	LOAD	LOAD	DESIGNATION	AMP	CKT No
1	20	INTERIOR LIGHTS (3.8)				EXTERIOR LIGHTS (3.3A)	20	3
3	20	INTERIOR RECEPTACLES						4
5	20					BATTERY CHARGER (30A)	40	6
7	20							8
9	20						20	10
11	20						20	12
13	20						20	14
15	20						20	16
17	20						20	18
19	20						20	20
21	20						20	22
23	20						20	24

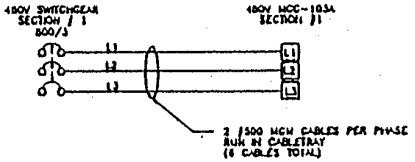


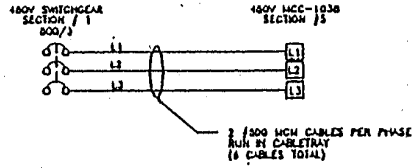


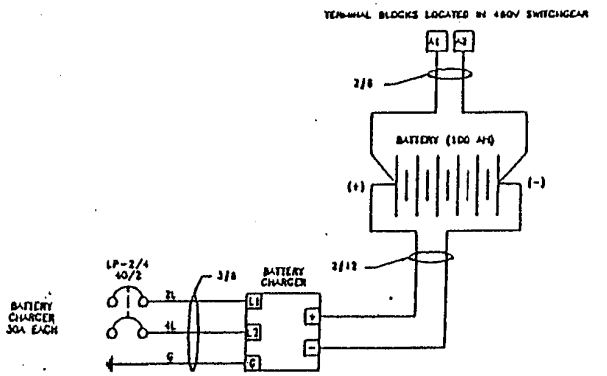












WIRING DIAGRAMS

NO	DATE	DESCRIPTION
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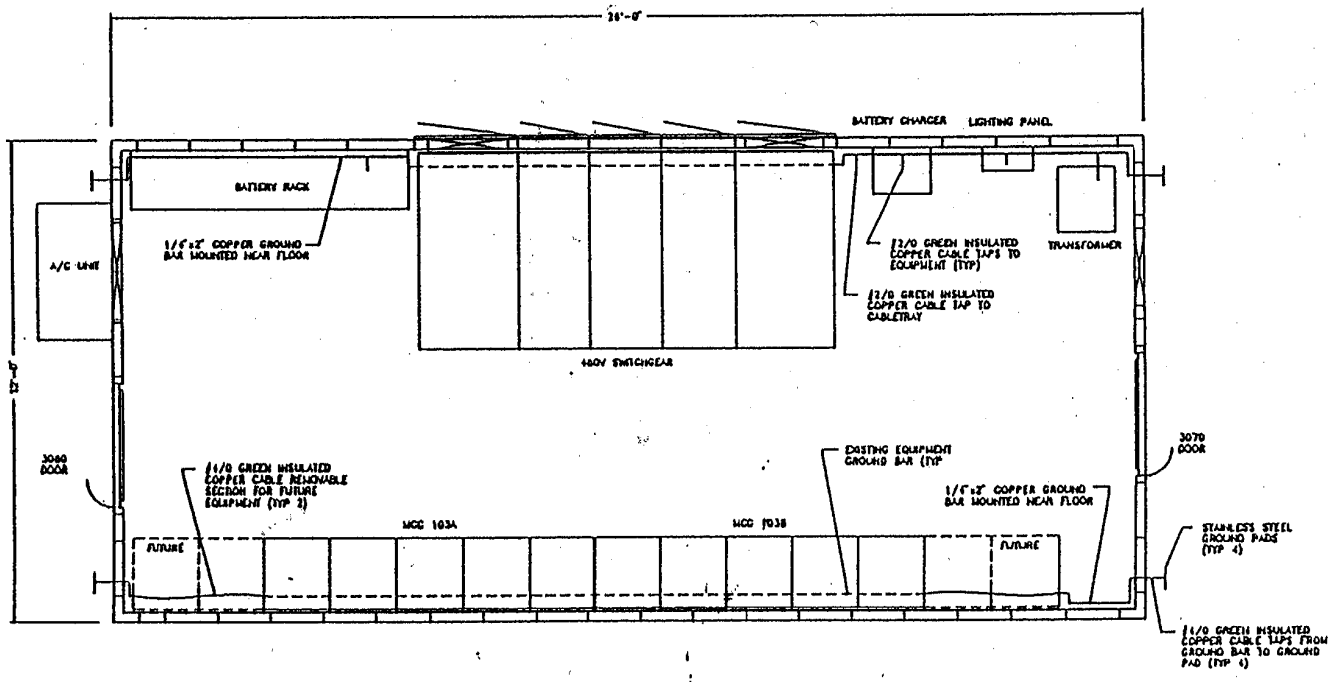
JOB TITLE: SAMPLE DRAWING

WIRING DIAGRAMS



GROUNDING PLAN

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GROUNDING PLAN VIEW