SECTION 16470

PANELBOARDS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The work of this section consists of providing labor, materials, tools, appliances and miscellaneous accessories associated with panelboard work indicated herein and on the Drawings and schedules.

B. Types of panelboards and enclosures required for this project include the following:

1. Power-distribution panelboards.
2. Lighting and appliance panelboards.

C. Fuses required in connection with installation of panelboards and enclosures are specified in section 16472.

1.2 RELATED DOCUMENTS

A. Drawings.

B. General provisions of Contract, including General and Supplementary Conditions.

C. Division 01 - Specification Sections.

D. Section 16010 - Basic Electrical Requirements.

E. Extent of panelboard work is indicated by drawings and schedules.

PART 2 - PRODUCTS

2.1 PANELBOARDS

A. General:

1. Except as otherwise indicated, provide panelboards, enclosures and ancillary components, of types, sizes, and ratings indicated, which comply with manufacturer's standard materials, design and construction in accordance with published product information; equip with number of unit panelboard devices as required for complete installation. Where types, sizes, or ratings are not

indicated, comply with NEC, UL and established industry standards for applications indicated.

2. Main lugs or main overcurrent units shall be furnished for panelboards as indicated on the Drawings. The number of branches in each panel shall be as indicated on the Drawings.
3. Panelboards shall be mounted in code gauge galvanized sheet steel cabinets with corners lapped and riveted or fastened by other approved methods. Cabinets shall be of such size as to allow a wiring gutter space of at least 6" all around for power panels, and 4" all around for lighting panels. Extra large gutter spaces shall be provided if specifically called for.
4. Panelboards shall be flush or surface mounted as indicated on the Drawings. Trim for each panel shall be suitable for the type of mounting. Each trim shall be complete with suitable hinged door having chrome plated flush type combination lock and catch, except that for doors over 48" in height a chrome plated vault handle and 3 point catch shall be provided with built-in lock arranged to fasten door at top, bottom and center. Two keys shall be provided for each lock and each key shall open all panelboards furnished. All trims shall be of a type that is self-supporting on the box after the trim holding screws have been removed. All free-standing cabinets shall be secured to floors, walls, and columns with approved angle iron or unistrut framework. Framework shall be painted as cabinets.
5. Each panelboard shall be complete with main copper bus run up the center and neutral bars where required and all properly sequenced phase connections. Polarized panelboards will not be accepted. Capacities of copper busses and connections shall be based on a maximum density of 1000 amps per sq. in. Spacing of busses shall not be less than code requirements. Busses shall be arranged for single or 3-phase, 3- or 4-wire supply as indicated on the Drawings. Busses shall be provided with suitable phase identification.
6. Provide split bus panelboards where noted in panel schedule.
7. Directory holder with metal frame shall be furnished and installed upon of door of each cabinet, with complete typewritten circuit schedule inserted.
8. The inside and outside of panelboard boxes, doors and trims shall be furnished with at least two coats of manufacturer's standard finish paint over a baked-on prime cost.
9. Provide ground bus.

B. Power and Distribution Panels:

1. Service Equipment Label: Main Distribution Panel MDP shall be UL labeled for use as service equipment
2. Power and distribution panels shall be the dead-front type, without hinged doors, with fusible switches or circuit breakers in the branches as indicated on the Drawings. The panels shall be suitable for 480 volt, 3 phase, 3 wire or 480/277 volt, 3-phase, 4-wire supply as shown. Fused switches or circuit breakers shall be quick-make, quick-break with provision for "lock-out" in the open position and provided with circuit designation.

3. Provide distribution panel circuit breakers with conventional interrupting capacity otherwise shown, but in no case less that the following symmetrical amperes RMS:

CONVENTIONAL FRAME SIZE/ VOLTAGE	INTERRUPTING CAPACITY
100A/240V	10,000 AIC
225A/240V	10,000 AIC
400A/240V	22,000 AIC
600A/240V	42,000 AIC
800A/240V	42,000 AIC
1000A/240V	42,000 AIC
1200A/240V	42,000 AIC
100A/480V	14,000 AIC
225A/480V	22,000 AIC
400A/480V	30,000 AIC
800A/480V	30,000 AIC
1000A/480V	30,000 AIC
1200A/480V	30,000 AIC

4. Series rated circuit breaker panels shall not be accepted.

C. Lighting and Appliance Panels:

1. Lighting and appliance panelboards shall be dead front safety-type equipped with molded case circuit breakers as shown and scheduled.
2. Except where otherwise indicated, panels shall be for use on 208/120 volt, 3 phase, 4-wire, 60 cycle, solid neutral service, with number and size of bolt-on type circuit breaker branches as shown on the Drawings. Circuit breaker's interrupting capacity shall be 10,000 RMS symmetrical amperes unless otherwise noted.
3. Fluorescent & Hid Lighting Panels: Shall be 480/277 volt, 3 phase, 4-wire, solid neutral service, with number and size of bolt-on type circuit breaker branches as indicated. Circuit breaker's interrupting capacity shall be 14,000 RMS symmetrical amperes minimum.
4. Where shown and scheduled on the Drawings, provide split bus, contactor controlled lighting and appliance panelboards. Contactor shall have same rating as bus with 120-volt coil. Contactor shall be of same manufacturer as panelboard and shall be mounted in panelboard enclosure. Contacts shall be silver alloy type. Contacts shall have same withstand rating as panelboard.

PART 3 - EXECUTION

3.1 INSTALLATION OF PANELBOARDS

A. General: Install panelboards and enclosures where indicated, in accordance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.

B. Coordinate installation of panelboards and enclosures with cable and raceway installation work.

C. Anchor panelboard assemblies firmly to walls and structural surfaces, ensuring that they are permanently and mechanically secure.

D. Provide properly wired electrical connections for panelboards within enclosures.

E. Fill out (typewritten) panelboard's circuit directory card upon completion of installation work.

F. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Stds 486A and B.

G. Insert fuses, if any, of ratings indicated, within installed panelboards.

3.2 GROUNDING: Provide equipment-grounding connections for panelboard enclosures as indicated. Tighten connections to comply with UL tightening torques to assure permanent and effective grounds.

3.3 FIELD QUALITY CONTROL

A. Prior to energization of panelboards, check with ground resistance tester phase-to-phase and phase-to-ground insulation resistance levels to ensure manufacturer's tolerances are fulfilled.

B. Prior to energization, check panelboards for electrical continuity of circuits, and for short-circuits.

3.4 ADJUSTING AND CLEANING

A. Adjust operating mechanisms for free mechanical movement.

B. Touch-up scratched or marred surfaces to match original finishes.

3.5 DEMONSTRATION

A. Subsequent to wire and cable hook-ups, energize panelboards and demonstrate functioning in accordance with requirements. Where necessary, correct malfunctioning units, and then retest to demonstrate compliance.

B. Label panelboards in accordance with SECTION 16195.

END OF SECTION