Special Provisions changes:

Revise the Special Provisions, Section 10-3.17 "ELECTRICAL EQUIPMENT", as follows:

10-3.17 ELECTRICAL EQUIPMENT

UTILITY AND LIGHTING PANELS
The utility and lighting panels shall conform to UL 67 and the following requirements and as shown on the plans:

A. The bus shall be copper.
B. Boxes shall be made from code gage galvanized steel.
C. The trim shall be made ~~form~~ from code gage steel and painted ~~ANSI 61 gray~~ in conformance with the provisions in "Clean and Paint Structural Steel" of these special provisions, or stainless steel as indicated.
D. Doors 1200 mm or less shall have a single point lock. Doors over 1200 mm shall have a three point catch and lock.
E. The ground bar and neutral bar shall be standard, bolted in box.
F. The enclosure shall be NEMA Type 12 or 4X as indicated. ~~The top and bottom gutters shall be minimum 139 mm and the side gutters shall be 152 mm.~~

The Contractor shall install three-phase general purpose individually mounted panels, self-cooled, as specified herein and as shown on the plans. The panels and all components shall be designed, manufactured and tested in accordance with the latest applicable standards of ANSI and NEMA.

Submittals
Submittal package shall consist of six copies. Submittals shall be delivered to the Engineer at least 180 days prior to the start of the installation. The Engineer shall be allowed 90 days for review of the submittals. The following information shall be submitted to the Engineer:

A. Dimension drawing and weight.
B. Technical certification sheet.
C. Transformer ratings.
D. Component ratings.

Qualifications
For the equipment specified herein, the manufacturer shall be ISO 9000, 9001 or 9002 certified. The manufacturer of this equipment shall have produced similar electrical equipment. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided.

Ratings
Voltage ratings shall be as shown on the plans. Units shall be designed for continuous operation at rated kVA, for 24 hours a day, 365 days a year operation, with normal life expectancy as defined in ANSI C57.96. Where applicable, transformer sound levels shall not exceed 45 dB for a 10 to 50 kVA rated self-cooled transformer as defined by ANSI and NEMA.

Construction
~~Each single-phase panel shall include a main primary breaker. Main primary and feeder breakers shall be enclosed with a padlock lockable hinged door.~~
Each three-phase ~~to single-phase~~ panel shall include a main breaker~~, step-down transformer~~ or a separate main breaker as indicated. Main primary, secondary and feeder breakers shall be enclosed with a padlock lockable hinged door.

~~Transformer~~

~~Transformers for the three-phase panels shall be insulated with a 185°C insulation system. Required performance shall be obtained without exceeding the above-indicated temperature rise in a 40°C maximum ambient, with a 30°C average over 24 hours. All insulation materials shall be flame-retardant and shall not support combustion in conformance with the requirements in ASTM Designation D 635.~~

~~Transformer core shall be constructed with high-grade, non-aging, grain-oriented silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10 percent above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical grade aluminum with continuous wound construction. The core and coil assembly shall be completely encapsulated in a proportioned mixture of resin and aggregate to provide a moisture-proof, shock-resistant seal. The core and coil encapsulation system shall minimize the sound level. The core of the transformer shall be grounded to the enclosure. The transformer shall include two 5 percent taps below nominal voltage.~~

Lighting Panel Enclosure

The enclosure shall conform to UL 50, and be made of heavy-gage steel and the maximum temperature of the enclosure shall not exceed 90°C. The enclosure for indoor installation shall be totally enclosed, non-ventilated, NEMA ~~3R~~ 12~~, with lifting eyes~~. ~~Panels shall be mounted in additional fiberglass enclosures as shown on the plans.~~ Each panel to be mounted outside on the platforms shall be installed in a NEMA 4X, ~~fiberglass or~~ 316 stainless steel enclosure.

CIRCUIT BREAKER ~~Type B~~

The circuit breaker ~~Type B~~ shall be a molded case circuit breaker providing complete circuit overcurrent protection by having inverse time and instantaneous tripping characteristics and shall be designed, manufactured, assembled and tested in accordance with UL 489 and NEMA AB-1 Standards. The frame rating and settings shall be as specified on the plans.

The molded case circuit breakers shall be operated by a toggle-type handle and shall have a quick-make, quick-break over-center switching mechanism that is mechanically trip free from the toggle handle so that the contacts cannot be held closed against short circuits and abnormal currents. All poles shall be so constructed that contacts open, close and trip simultaneously in the either ON or OFF position. All breaker covers shall have molded-in "ON" and "OFF" position.

The circuit breaker frames shall employ high strength, molded-polyester, glass-reinforced cases and covers. The breaker frame shall have legible, tamper-proof nameplates containing maximum frame ampere ratings, maximum voltage ratings and interrupting ratings in accordance with UL standards. All breaker frames sizes shall have external means for manually tripping the breaker and exercising the mechanism and trip latch member.

~~The molded case circuit breakers shall have inverse time and instantaneous tripping characteristics.~~ Automatic tripping of the breaker shall be clearly indicated by the handle position. Contacts shall be non-welding silver alloy and arc extinction shall be accomplished by means of arc chutes.

The circuit breaker rating shall be as specified on the plans and as required by the load and coordination studies. Ground fault protection shall be provided where indicated. Shunt trips, bell alarms and auxiliary switches shall be provided where indicated.

Circuit Breaker Enclosure

The enclosure shall conform to UL 50, and be made of heavy-gage steel and the maximum temperature of the enclosure shall not exceed 90°C. The enclosure for indoor installation shall be totally enclosed, non-ventilated, NEMA 12. Each enclosure to be mounted outside on the platforms shall be installed in a NEMA 4X, 316 stainless steel enclosure.

DRY TYPE TRANSFORMER

The Contractor shall install three-phase general purpose individually mounted dry-type transformers of the two-winding type, self-cooled as specified herein, and as shown on the contract plans. The transformers and all

components shall be designed, manufactured and tested in accordance with the latest ~~applicable standards of ANSI and~~ NEMA ST20 and UL 1561.

Submittals
Submittal package shall consist of six copies. Submittals shall be delivered to the Engineer at least 180 days prior to the start of the installation. The Engineer shall be allowed 90 days for review of the submittals. The following information shall be submitted to the Engineer for review and approval:

A. Dimension drawing and weight.
B. Technical certification sheet.
C. Conduit entry and exit locations.

Qualifications
For the equipment specified herein, the manufacturer shall be ISO 9000, 9001 or 9002 certified. The manufacturer of this equipment shall have produced similar electrical equipment. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided. The transformers shall be suitable for and certified to meet all applicable seismic requirements of the California Building Code (CBC) for Zone 4 application.

Ratings
The transformer's kVA and voltage ratings shall be as shown on the plans.
Transformers shall be designed for continuous operation at rated kVA, for 24 hours a day, 365 days a year operation, with normal life expectancy as defined in ANSI C57.96. Transformer sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings:

A. Up to 9 kVA less than 40 dB.
B. 10 to 50 kVA less than 45 dB.

Construction
Transformers shall be insulated as follows:

A. Rated 2 kVA and below: 150°C insulation system based upon 80°C rise.
B. Rated 3 to ~~15~~ 30 kVA: 185°C insulation system based upon 115°C rise.
~~C. Rated 15 kVA and above: 220°C insulation system based upon 150°C rise.~~ Required performance shall be obtained without exceeding the above indicated temperature rise in a 40°C maximum ambient, with a 30°C average over 24 hours. All insulation materials shall be flame-retardant and shall not support combustion in conformance with the requirements in ASTM Designation D 635. Transformer core shall be constructed with high-grade, non-aging, grain-oriented silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10 percent above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of ~~electrical-grade aluminum~~ copper ~~with continuous wound construction~~. On units rated ~~15~~ 30 kVA and below the core and coil assembly shall be completely encapsulated in a proportioned mixture of resin and aggregate to provide a moisture-proof, shock-resistant seal. The core and coil encapsulation system shall minimize the sound level. The transformer shall include two 5 percent taps below nominal voltage.

Dry Type Transformer Enclosure
The enclosure shall conform to UL 50, and be made of heavy-gage steel. All transformers shall be equipped with a wiring compartment suitable for conduit entry and large enough to allow convenient wiring. The maximum temperature of the enclosure shall not exceed 90°C. The core of the transformer shall be grounded to the enclosure. The transformer enclosures shall be ~~general purpose~~ non-ventilated ~~type,~~ NEMA type 12 suitable for indoor service only and NEMA 4X, 316 stainless steel if mounted outdoors. ~~Enclosures shall be finished with ANSI 61 color.~~

SAFETY SWITCH

Submittal package shall consist of six copies. Submittals shall be delivered to the Engineer at least 180 days prior to the start of the installation. The Engineer shall be allowed 90 days for review of the submittals. The following information shall be submitted to the Engineer for review and approval:

A. Dimension drawing and weight.
B. Technical certification sheet.
C. Conduit entry and exit locations.

The safety switch shall be a heavy-duty low-voltage safety switch with the following requirements:

A. Rated for 600 VAC.
B. Terminals be copper-aluminum.
C. The enclosure shall be NEMA Type 4 enclosure.
D. A metal nameplate shall be mounted on the front cover that contains switch information (type, catalog number, electrical ratings V, A, and horsepower).
E. Handle whose position is easily recognizable and padlockable in the "Off" position.
F. Visible blades.
G. Reinforced fuse clips.
H. Nonteasible, positive, quick-make quick-break mechanisms.
I. Switch assembly plus operating handle as an integral part of the enclosure.
J. Switch shall be UL listed, horsepower rated, meet Federal Specification WS-885c, and NEMA Specifications KSI-1990.
K. Switch shall have defeatable door interlocks that prevent the door from opening when the operating handle is in the "ON" position.
L. Switch shall have line terminal shields.

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Exp. 12/31/09
ELECTRICAL
STATE OF CALIFORNIA