GENERAL:

- 1. The scope of this document is to provide requirements for switchboards.
- 2. For these guidelines, Switchboard design is defined as individually mounted bolt-on breakers in floor mounted, front or rear accessible enclosures.
- 3. See section 26 2116 Electrical Service Entrance for guidelines governing design of building low voltage service entrance.
- 4. The use of draw out breakers shall be switchgear design. See 26 2300 Low Voltage Switchgear.

DESIGN GUIDELINES:

- 1. Switchboards shall be designed, to provide ease of maintenance and testing without service interruption.
- 2. The assembly and location shall allow for future additions and modifications.
- 3. All switchboards shall be located in a dedicated, lockable electrical room.
- 4. Enclosure
 - 4.1. It shall be a vertical free standing rigid metal enclosure with "compartments" used for additions and removal of circuit breakers and other equipment devices.
 - 4.2. Shall be floor mounted with front & rear or front only access.
 - 4.3. Entire assembly shall have barriers between each vertical section.
 - 4.4. Assembly temperature ratings
 - 4.4.1. Ambient: -30°C minimum, 40°C maximum
 - 4.4.2. Full load rise of 65°C maximum above ambient.
 - 4.4.3. Full assembly shall achieve rated capabilities without the use of forced air ventilation.
 - 4.5. Each device shall be capable of being operated without opening any door.
 - 4.6. All trip indications, trip resets and metered values shall be displayed on the front of the assemblies without removal of any covers.
 - 4.7. All settable relays or other devices mounted inside the assemblies shall be installed in compartments with a hinged cover.
 - 4.8. Infrared inspection windows shall be provided to allow energized inspection of all connections

5. Electrical

- 5.1. All bus bar (phase, neutral, and ground) shall be 98% conductivity copper.
- 5.2. Bus bar connections shall be tin or silver plated and bolted.
- 5.3. Copper bus current density shall not exceed 1,000 amperes per square inch.
- 5.4. Main/Source busing shall be fully insulated or have barriers to prevent inadvertent contact.
- 5.5. Neutral bus bar shall be fully rated (100% of phase bus bars).

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- 5.6. All power and ground lugs shall be compression-type, long-barrel double –hole, copper type lugs.
- 5.7. Assemblies shall be provided with local instrumentation and control system for automatic and manual operation of the system and for monitoring and control during operation.
- 5.8. Assemblies shall be equipped with appropriate devices for local testing, monitoring and lock-out tag-out.
- 5.9. Each assembly shall include digital metering and local display of voltage, power quality and event logging.
- 6. Switchboards shall have a minimum of 20% spare capacity for future loads. Spare Capacity is defined as additional continuous load and space for installing future circuit breakers or fused switches within the panel.
- 7. Provide permanently attached nameplate displaying, at a minimum, the name, voltage, phase and supply circuit origin. Label each overcurrent protection device to show the load it supplies.
- 8. Include permanent one-line diagram mimic bus.
- 9. Main-Tie-Main assemblies shall have interlocks to prevent a condition of all three breakers closed at the same time.