

SECTION 16425

SWITCHBOARDS

Part 1 -Design Directives

The engineer shall prepare panel schedules for each switchboard that includes the ampere rating of each breaker, total connected load and diversity factor used in tabulating total switchboard load. These schedules shall be part of the drawing/spec package and available for review by Dartmouth prior to release for construction.

Buildings served by medium voltage transformers rated 300KVA and larger shall be equipped with bus connected freestanding switchboards for the distribution of building feeders.

Switchboards shall be GE Spectra Class 2 or equal supplied by Cutler Hammer or Square D. They shall be equipped with individually mounted main and tie breakers. All feeder breakers shall be compartmentalized with line and load bus connections. Devices shall be front removable and load connections rear accessible.

Switchboards shall be close coupled to the building transformer and securely fastened to a housekeeping pad. The housekeeping pad shall be a minimum of four inches high and eight inches larger in length and width than the assembly footprint. All edges of the housekeeping pad shall be chamfered.

All bus work and conductors inside switchboards shall be hard drawn copper with 98% conductivity.

The switchboard shall be equipped at the factory with a hard drawn copper equipment grounding bus and main bonding jumper.

Pits beneath switchboards will be allowed provided the conduits enter the pit through the bottom and not the sides. Conduit in pits beneath equipment shall be stubbed to a level at least four inches above the elevation of the housekeeping pad. Conduits that protrude through a concrete floor or pad shall be rigid metal.

Main and tie circuit breakers on single and double-ended loadcenter transformer arrangements shall be individually mounted drawout air circuit breakers. The drawout breaker mechanism shall be capable of adjusting the breaker from the disconnected position to an intermediate test position and finally to the fully connected position. Mains and ties shall be equipped with long time, short time and ground fault overcurrent protection only to allow for selective coordination with down stream feeder breakers. Instantaneous overcurrent protection should never be specified for mains and ties. All breakers in the switchboard shall be fully rated with respect to fault current interrupt rating. Series rated equipment shall not be used.

All feeder breakers supplied with the switchboard shall be equipped with time, instantaneous and ground fault over current devices.

The electrical specification shall include a requirement to prepare a coordination study. The facilities engineering department at Dartmouth will provide the available fault current for the point at which the building is connected to the medium voltage system. The design engineer is responsible to review the coordination study and ensure that all adjustable overcurrent devices are properly set in the field. The design engineer will also tabulate the breaker settings and provide them to the architect for inclusion in the O&M manual. A separate copy of the complete coordination study and settings shall be transmitted to the Facilities Engineering Office at Dartmouth for review and approval prior to implementation.

Switchboards shall be specified with a dedicated set of current transformers installed on the main low voltage bus for the owners revenue metering. Each set of current transformers shall be wired through a shorting terminal block and door mounted test device. Potential input to the meter shall be provided by a separate fused disconnect and door mounted test device that is factory installed. The customer revenue metering specified by Dartmouth can accept input voltage up to 600 Vac phase to phase. Consult section 16430 of this document for

the type of meter to be installed. The RFQ for the switchboard should request that the factory install the specified revenue meter.

Part 2 -Products

Cutler Hammer
GE
Square D

Part 3 -Execution

Locate conduit in the bottom or top of the switchboard in a location that will allow for the safe access and replacement of cable in the future while the equipment is energized. To insure this goal is attained the contractor must request a conduit entry drawing at the RFQ phase of the project so that base slab conduits can be installed in the proper location.

All conductors shall be neatly trained and securely supported in the rear of the switchboard. The individual conductors that make up each feeder shall be grouped together into an assembly from the point at which the conductors leave the conduit to within 12 inches of the termination at the supplying breaker. Neutrals and equipment grounds shall be routed together and supported also.

All conduits entering the switchboard shall be equipped with grounding bushings regardless of size.

All feeder breakers shall be molded or insulated case and be removable from the front of the switchboard. Thirty percent spare breaker space shall be provided for each frame size of breaker specified in the switchboard. Spare breaker locations shall be equipped at the factory with all necessary bus work to connect the breaker in the future.

All feeder breakers shall be labeled to indicate the load served.