

SECTION 16442 - PANELBOARDS

1.0 GENERAL

- 1.1 DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION-1 SPECIFICATION SECTIONS, APPLY TO WORK OF THIS SECTION.
- 1.2 DIVISION-16 BASIC ELECTRICAL MATERIALS AND METHODS SECTIONS APPLY TO WORK OF THIS SECTION.
- 1.3 SUBMITTALS: SUBMIT THE PRODUCER'S STANDARD DESCRIPTIVE DATA SHEETS FOR EACH TYPE OF PRODUCT BEING PROVIDED. MARK THE DATA SHEET FOR THE PRODUCT BEING PROVIDED WITH AN IDENTIFYING MARK OR ARROW.
- 1.3.1 PANELBOARD SUBMITTAL SHALL BE ARRANGED TO REFLECT THE PANELBOARD SCHEDULES ON THE DRAWINGS.
- 1.3.2 ALL FEATURES SPECIFICALLY CALLED FOR WITHIN THESE SPECIFICATIONS SHALL BE CLEARLY IDENTIFIED.
- 1.4 SUBSTITUTIONS - PRIOR APPROVAL REQUIRED.

2.0 PRODUCTS

- 2.1 ACCEPTABLE PRODUCERS: CUTLER-HAMMER, GENERAL ELECTRIC CO., AND SQUARE D. PRODUCTS SHALL BE FURNISHED BY ONE PRODUCER.
- 2.2 GENERAL: PANELBOARDS SHALL BE CIRCUIT BREAKER TYPE. SEE PANEL SCHEDULES ON DRAWINGS FOR ELECTRICAL CHARACTERISTICS. ALL PANELBOARDS SHALL BE RATED FOR THE INTENDED VOLTAGE AND SHALL INCORPORATE SWITCHING AND PROTECTIVE DEVICES OF THE NUMBER, RATING, AND TYPE NOTED ON THE DRAWING OR SPECIFIED HEREIN. WHERE PANELBOARDS ARE TO BE USED AS SERVICE ENTRANCE EQUIPMENT, THEY SHALL BE SO LABELED. PANELBOARDS SHALL BE LISTED AND LABELED BY UNDERWRITERS' LABORATORIES, INC. IN ACCORDANCE WITH UL STANDARD 67, AND SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE AND NEMA.
- 2.3 BUS ASSEMBLY AND TEMPERATURE RISE: PANELBOARD BUS STRUCTURE AND MAIN LUGS OR MAIN BREAKER SHALL HAVE CURRENT RATINGS AS SHOWN ON THE PANELBOARD SCHEDULE. BUS BARS SHALL BE SIZED IN ACCORDANCE WITH UL STANDARDS TO LIMIT TEMPERATURE RISE ON ANY CURRENT CARRYING PART TO A MAXIMUM OF 65 DEGREES C ABOVE AN AMBIENT OF 40 DEGREES C MAXIMUM. BUS BARS SHALL BE RIGIDLY SUPPORTED TO PREVENT DAMAGE WHEN SUBJECTED TO STRESS, VIBRATION OR SHORT CIRCUIT CURRENT. RATINGS SHALL BE ESTABLISHED BY HEAT RISE TESTS IN ACCORDANCE WITH UNDERWRITERS LABORATORIES STANDARD UL 67. PROVIDE COPPER BUS ASSEMBLY AND COPPER ONLY LUGS FOR COPPER CONDUCTORS. BUS BARS SHALL BE COPPER.
- 2.4 CIRCUIT BREAKERS: CIRCUIT BREAKERS SHALL BE MOLDED CASE WITH THERMAL MAGNETIC OR SOLID STATE TRIP UNITS OF SIZE, TYPE AND QUANTITY SHOWN ON THE DRAWINGS. THE CIRCUIT BREAKERS SHALL BE BOLT-ON TYPE, EQUIPPED WITH

INDIVIDUALLY INSULATED, BRACED AND PROTECTED CONNECTORS. THE FRONT FACES OF ALL CIRCUIT BREAKERS SHALL BE FLUSH WITH EACH OTHER. LARGE PERMANENT, INDIVIDUAL CIRCUIT NUMBERS SHALL BE AFFIXED TO EACH BREAKER IN A UNIFORM POSITION. CIRCUIT BREAKER NUMBERS SHALL BE PERMANENTLY FASTENED AND PROVIDED BY FACTORY (STICK-ON LABELS ARE PROHIBITED). TRIP INDICATION SHALL BE CLEARLY SHOWN BY THE BREAKER HANDLE. PROVISIONS FOR ADDITIONAL BREAKERS SHALL BE SUCH THAT NO ADDITIONAL CONNECTORS WILL BE REQUIRED TO ADD CIRCUIT BREAKERS. BREAKER TERMINALS SHALL BE UL LISTED AS SUITABLE FOR TYPE AND SIZE OF CONDUCTOR PROVIDED.

- 2.5 PROVIDE SHUNT TRIP FEATURE WHEN INDICATED ON THE DRAWINGS.
- 2.6 INTEGRATED EQUIPMENT SHORT CIRCUIT RATING: EACH PANELBOARD, AS A COMPLETE UNIT, SHALL HAVE A UL SHORT CIRCUIT CURRENT LABEL EQUAL TO OR GREATER THAN THE EQUIPMENT RATING SHOWN ON THE PANELBOARD SCHEDULE ON THE DRAWINGS. METHOD OF TESTING SHALL BE PER UNDERWRITERS LABORATORIES STANDARD UL 67. PANELBOARDS SHALL BE MARKED WITH THEIR MAXIMUM SHORT-CIRCUIT CURRENT RATING AT THE SUPPLY VOLTAGE AND SHALL BE UL LISTED. PANELBOARDS RATED 240 VOLTS OR LESS SHALL HAVE SHORT CIRCUIT CURRENT RATINGS NOT LESS THAN 10,000 AMPERES RMS SYMMETRICAL OR AS SHOWN ON THE DRAWINGS. PANELBOARDS RATED 480 VOLTS OF LESS SHALL HAVE SHORT CIRCUIT CURRENT RATINGS NOT LESS THAN 14,000 AMPERES RMS SYMMETRICAL OR AS SHOWN ON THE DRAWINGS. ALL PANELBOARDS SHALL BE FULLY RATED. SERIES RATING IS NOT ALLOWED.
- 2.7 GROUNDING TERMINALS: PROVIDE EACH PANELBOARD UNIT WITH A GROUND TERMINAL BAR AND WITH LUGS FOR EQUIPMENT GROUND WIRES. AMPACITY SHALL BE THE SAME AS THE FULL CAPACITY OF THE MAIN BUS. GROUND BAR OR LUGS SHALL BE COPPER.
- 2.8 NEUTRAL TERMINALS: PROVIDE EACH PANELBOARD UNIT WITH AN INSULATED NEUTRAL TERMINAL BAR. AMPACITY OF NEUTRAL BAR SHALL BE THE SAME AS THE FULL CAPACITY OF THE MAIN BUS BARS. NEUTRAL BUSHING SHALL GAVE A SUITABLE LUG FOR EACH OUTGOING FEEDER REQUIRING A NEUTRAL CONNECTION. NEUTRAL BAR SHALL BE COPPER.
- 2.9 CABINET: PANELBOARD ASSEMBLY SHALL BE ENCLOSED IN A GALVANIZED STEEL CABINET. THE RIGIDITY AND GAUGE OF STEEL SHALL BE AS SPECIFIED IN UL STANDARD 50 FOR CABINETS. THE SIZE OF WIRING GUTTERS SHALL BE IN ACCORDANCE WITH UL STANDARD 67. CABINETS SHALL BE EQUIPPED WITH LATCH AND TUMBLER LOCK ON DOOR. DOORS OVER 48" HIGH SHALL BE EQUIPPED WITH THREE POINT LATCH AND VAULT LOCK. ALL LOCKS SHALL BE KEYED ALIKE. MINIMUM DEPTH OF CABINETS SHALL BE 5-3/4" AND MINIMUM WIDTH SHALL BE 20". CABINET SHALL NOT HAVE VENTILATING OPENINGS. ALL CABINETS ON PANELBOARDS OF SHALL HAVE DOOR-IN-DOOR CONSTRUCTION.
- 2.10 SAFETY BARRIERS: THE PANELBOARD INTERIOR ASSEMBLY SHALL BE DEAD FRONT WITH PANELBOARD FRONT REMOVED. MAIN LUGS OR MAIN BREAKERS SHALL BE BARRIERED.
- 2.11 UL LISTING: PANELBOARDS SHALL BE LISTED BY UNDERWRITERS LABORATORIES AND SHALL BEAR THE UL LABEL. WHEN INDICATED, PANELBOARDS SHALL BE SUITABLE FOR USE AS SERVICE EQUIPMENT.

WEST NAVARRE INTERMEDIATE SCHOOL
5 CLASSROOM ADDITION

- 2.12 NAMEPLATES: PROVIDE AN ENGRAVED LAMINATED PHENOLIC OR MICARTA NAMEPLATE 1" HIGH BY 3" WIDE WITH MINIMUM 1/4" LETTERS INDICATING THE PANELBOARD IDENTIFICATION. ATTACH NAMEPLATES TO FRONT OF PANEL WITH NON FERROUS POP RIVETS. NAMEPLATE SHALL BE AFFIXED TO THE PANELBOARD WITH THE FOLLOWING INFORMATION STAMPED THEREIN:
- MANUFACTURER, VOLTAGE, AMPACITY, TYPE OF PANELBOARD, MANUFACTURER'S ORDER NO. AND DATE, INTERRUPTING RATING - RMS SYM.
- 2.13 GROUND FAULT PROTECTION: PROVIDE GROUND FAULT PROTECTION AS INDICATED ON THE DRAWINGS. GROUND FAULT PROTECTION PROVISIONS SHALL COMPLY WITH NEC ARTICLE 230-95.
- 2.14 PANELBOARD DIRECTORY: THE DIRECTORY SHALL BE PROTECTED BY A TRANSPARENT PROTECTIVE COVERING INSIDE OF A METAL FRAME ATTACHED TO THE INSIDE THE PANELBOARD DOOR.
- 2.15 INTEGRATED TRANSIENT VOLTAGE SURGE PROTECTION: THE PANELS INDICATED ON THE DRAWINGS (ALL CP PANELS) SHALL HAVE BUS MOUNTED TRANSIENT VOLTAGE SURGE PROTECTION. THE SURGE PROTECTOR SHALL BE HOUSED WITHING THE PANELBOARD ENCLOSURE. THE PERFORMANCE REQUIREMENTS ARE LISTED IN THE SPECIFICATION FOR TRANSIENT VOLTAGE SURGE PROTECTION.
- 3.0 EXECUTION
- 3.1 PROVIDE CIRCUIT BREAKERS WITH I.C. RATINGS, AMPERES AND NUMBER OF POLES AS SPECIFIED IN THE SCHEDULES ON THE DRAWINGS.
- 3.2 CIRCUIT BREAKERS SHALL BE UL LISTED.
- 3.3 SHUNT TRIP DEVICE SHALL OPERATE WITH THE CONTACT CLOSURE OF PUSHBUTTON, GROUND FAULT RELAY OR OTHER PILOT DEVICE TO TRIP OPEN ASSOCIATED CIRCUIT BREAKERS UPON COMMAND.
- 3.4 COILS OF SHUNT TRIP DEVICE SHALL BE RATED CONTINUOUS DUTY AND SHALL INCLUDE INTERLOCK ARRANGEMENT TO CLEAR POWER FROM COIL AFTER OPERATION.
- 3.5 MOUNT ADJACENT PANELBOARDS SO THAT THEY ARE ALIGNED AND DO NOT TOUCH EACH OTHER.
- 3.6 PROVIDE A TYPEWRITTEN CIRCUIT DIRECTORY WITH A PROTECTIVE COVERING IN A FRAME INSIDE THE DOOR. THE DIRECTORY SHALL INDICATE LOAD SERVED BY EACH CIRCUIT. DIRECTORIES SHALL ALSO INDICATE SOURCE OF SERVICE TO PANELBOARDS. EXAMPLE: "PANEL PA SERVED FROM PANEL MDP."
- 3.7 MOUNT PANELBOARDS SO MAXIMUM HEIGHT OF CIRCUIT BREAKERS ABOVE FINISHED FLOOR DOES NOT EXCEED 78 INCHES.
- 3.8 WIRING GUTTERS: FEEDER AND BRANCH CIRCUIT CONDUCTORS ARE SIZED FOR CIRCUIT AMPACITY AND ANTICIPATED VOLTAGE DROP AND MAY BE LARGER THAN THE ALLOWABLE AMPACITIES IN TABLE 310-16 OF THE NEC. CONTRACTOR SHALL PROVIDE CABINETS WITH GUTTERS SIZED TO ACCOMMODATE THE NEC CONDUCTORS AND CONNECTIONS ACTUALLY BEING INSTALLED COMPLYING WITH ARTICLE 373-6 AND ARTICLE 310-4.

WEST NAVARRE INTERMEDIATE SCHOOL
5 CLASSROOM ADDITION

- 3.9 PROVIDE BUS MOUNTED TRANSIENT VOLTAGE SURGE SUPPRESSION FOR ALL
PANELBOARDS SERVING COMPUTER LOADS (ALL CP PANELBOARDS).

END OF SECTION