# GENERAL

## RELATED DOCUMENTS

### Drawings and general provisions of the Contract including General and Supplementary Conditions and Division 1 specification sections, apply to the work of this Section.

### This Section is a Division 26 "Basic Materials and Methods" section, and is a part of each Division 26 section making reference to panelboards specified herein.

### Division 26 “Surge Protection”.

## DESCRIPTION OF WORK

### Extent of panelboard and enclosure work, including cabinets and cutout boxes is indicated on the drawings and by schedules.

### **NOTE TO SPECIFIER: REVISE LIST BELOW ACCORDING TO PROJECT REQUIREMENTS.**

### Types of panelboards and enclosures in this Section include the following:

#### Distribution Panels

#### Power Panels

#### Lighting and Appliance Panels

#### Surge Protection Devices (SPDs) Refer to other Division 26 sections for cable/wire, connectors and electric raceway work required in conjunction with panelboards and enclosures; not work of this Section.

## QUALITY ASSURANCE

### Manufacturers: Firms regularly engaged in the manufacture of panelboards and enclosures, of types, size and ratings required, whose products have been in satisfactory use in similar service for not less than five (5) years.

### Installer: A firm of at least three (3) years of successful installation experience on projects with electrical installation work similar to that required for this project.

## REFERENCES

### Special Use Markings: Provide panelboards, constructed for special use, with UL markings indicating that special type usage. Panels identified or shown on the drawings for use as main service entrance equipment shall be labeled at the factory with "SERVICE ENTRANCE" type UL label.

### UL Compliance: Comply with applicable UL safety standards pertaining to panelboards, accessories, and enclosures. Provide units which have been UL listed and labeled. UL standards are as follows:

#### Panelboards - UL67

#### Enclosures for Electrical Equipment - UL50

### NEC Compliance: Comply with the NEC as applicable to the installation of panelboards, cabinets, and cutout boxes.

### NEMA Compliance: Comply with NEMA Stds. Pub. No. 250 "Enclosures for Electrical Equipment (1000 volt maximum)", Pub. No. 1 "Panelboards" and Pub. No. PB1.1, "Instruction for Safe Installation, Operation, and Maintenance of Panelboards Rates 600 Volts and Less".

### NECA Compliance: Comply with NECA's "Standard of Installation".

## SUBMITTALS

### Product Data: Submit manufacturer's data including specifications, installation instructions and general recommendations for each panelboard required. Include data substantiating that units comply with specified requirements.

### Shop Drawings: Submit dimensioned drawings of panelboards and enclosures showing accurately scaled layouts of enclosures and required individual panelboard devices, including but not limited to circuit breakers, fusible switches, fuses, ground fault circuit interrupters, and accessories.

# PRODUCTS

**NOTE TO SPECIFIER: REVISE LIST OF MANUFACTURERS ACCORDING TO PROJECT REQUIREMENTS.**

## Acceptable Manufacturers: Subject to compliance with requirements provide products of one of the following:

### Eaton Corporation

### General Electric Corp.

### Square D Company

### Siemens

## GENERAL

### Except as otherwise indicated, provide panelboards, enclosures and ancillary components, of types, sizes, and ratings indicated, which comply with manufacturer's standard materials, and which are designed and constructed in accordance with published product information. Provide solderless lugs, or connectors, in the correct number and size for conductors on mains, on the load side of each branch, circuit, and on ground and neutral bars. Provide tin plated copper busses. Provide an insulated neutral bus (equal in size to the phase bussing) and a bonded equipment ground bus mounted at the opposite end of the structure from the mains, and having numbered screw or lug terminals for connection of wires. Equip panels with the number of unit devices as required for a complete installation. Where more than one type of component meets the indicated requirements, selection is installer's option. Where types, sizes or ratings are not indicated, comply with NEC, UL and established industry standards for applications indicated.

### Provide ground fault circuit interrupting type circuit breakers for all devices noted with a "GFI" subscript on the panelboard schedules for this project.

### Provide UL listed HACR or approved equal type circuit breakers for all devices which serve heating, ventilating, or air conditioning equipment.

### Panelboards shall be provided with covers for surface or flush mounting as shown on the drawings, or as required for actual project conditions.

### Panelboards shall be constructed for top or bottom feeder service, as required by actual project conditions.

### All panels shall be marked with PPE level per NEC where fault current calculations have been done – refer to switchboard section.

## LIGHTING AND APPLIANCE PANELS

### Lighting and appliance panelboards shall be General Electric A Series (or equal) for 277/480 volt or 120/208 volt applications. All branch circuit breakers are to be quick-make, quick-break, trip indicating and common trip on all multi-pole breakers, and shall be bolt-on type. Trip indication shall be clearly shown by breaker handle located between the "ON" and the "OFF" positions. Panelboards shall have distributed phase copper bussing throughout.

### **NOTE TO SPECIFIER: PERFORM A SHORT CIRCUIT ANALYSIS FOR EACH PROJECT. SERIES RATING IS NOT APPROPRIATE FOR ALL APPLICATIONS SEE THE SPEC NOTES FOR FURTHER INFORMATION. USE FULLY RATED PANELS WHERE REQUIRED.**

### Provide fully rated main circuit breaker type panelboards, where the short circuit rating of the complete panelboard assembly is determined by the lowest rated branch device. Provide panelboard interrupting ratings as noted on the drawings. The Contractor may, at his option, (if acceptable to the local Code Authority) provide main circuit breaker type panelboards where the short circuit rating of the complete panelboard is determined by the use of UL approved combinations of main and branch circuit breaker devices, and the rating of the complete panelboard assembly is as shown on the drawings.

### Provide fully rated main lug only type panelboards where the short circuit rating of the complete panelboard assembly is determined by the lowest rated branch device. Provide panelboard interrupting ratings as noted on the drawings. The Contractor may, at his option, (if acceptable to the local Code Authority) provide main lug only type panelboards where the short circuit rating of the complete panelboard assembly is determined by the use of UL approved combinations of upstream devices and branch circuit breaker devices, and the rating of the complete panelboard assembly is as shown on the drawings.

### Panelboard boxes shall have 6-inch minimum gutters. Fronts are to be complete with door and cylinder lock, with all locks keyed alike. Fronts shall have adjustable trim clamps, directory frames, and shall be equipped with a typewritten directory that identifies each circuit breaker by number and the equipment that the breaker serves. One additional blank directory card for each panel shall be furnished to the Owner.

### Two section panels shall be equipped with boxes of equal dimensions

### Panelboards shall be Underwriters' Laboratory listed and shall bear the UL label. The size of the panelboard main disconnect device or main lugs, the rating and number of branch circuits, and the type of mounting shall be as shown on the drawings.

### All factory installed devices shall be re-torqued prior to energizing.

## DISTRIBUTION PANELS

### Generally, the University prefers circuit breaker based distribution panels over fused disconnect type panels. However, fused disconnect type panels will be considered on a project by project basis. Distribution panels shall be General Electric A Series or Spectra Series (or equal) panels as indicated on the plans. Provide appropriate type of panels to meet specific project requirements. Panelboards shall have distributed phase copper bussing throughout.

### Circuit breakers shall be as specified for lighting panels unless indicated otherwise. Power panels shall have combination card holder and name-plate and shall be equipped with typewritten directories that identify all loads served and all spare circuits. Provide a copper ground bus in all power panels.

### Power panels shall be Underwriters' Laboratory approved and shall bear the UL label. Main lugs and gutters shall be suitable for copper and aluminum wire. The size of the panelboard main protective device or main lugs, the size, type and the number of branch circuits and the type of mounting shall be as shown on the drawings.

### Where required, provide fully rated main circuit breaker type panelboards, where the short circuit rating of the complete panelboard assembly is determined by the lowest rated branch device. Provide panelboard interrupting ratings as noted on the drawings. The Contractor may, at his option, (if acceptable to the local Code Authority) provide main circuit breaker type panelboards where the short circuit rating of the complete panelboard is determined by the use of UL approved combinations of main and branch circuit breaker devices, and the rating of the complete panelboard assembly is as shown on the drawings.

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**NOTE TO SPECIFIER: INCLUDE THE SECION ON TVSS PANELS WHERE PANELBOARDS WITH INTEGRAL TVSS ARE INDICATED ON THE DRAWINGS. PANELBOARDS WITH INTEGRAL TVSS NEED TO BE CLEARLY IDENTIFIED ON THE DRAWINGS.**

## SURGE PROTECTION DEVICES (SPD)

### Surge protection devices (SPD) shall be provided at panelboards on most projects. Typically, a minimum of one SPD per distribution ‘level’ or voltage within a given system. SPDs provided for panel boards shall adhere to requirements found within Division 26 “Surge Protection” specification. ~~s (~~

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# EXECUTION

## INSTALLATION

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

### Any and all overcurrent protection device settings or setting adjustments required by the project or project’s coordination study shall be included within the scope of work. Documentation of the settings and settings adjustments shall be provided to the UNL Project Manager.

### Coordinate the installation of panelboards and enclosures with cable and raceway installation work.

### Provide all required electrical connections within the enclosure.

### Fill out typewritten panelboard circuit directory cards upon completion of the installation work.

END OF SECTION 262416