260500-H: SUPPLEMENTAL COMMON WORK RESULTS FOR ELECTRICAL (16010-H)

Related Sections

Basis Guideline: 260500 - “Common Work Results for Electrical”
For an explanation of the use of these guidelines, see “Design Guidelines for UMHHC Facilities”

Standards: - Items below have been rearranged for clarity

General Requirements

1. Circuits from the following classes of power systems and auxiliary systems are only to be grouped in raceways with other circuits of the same class and voltage only; and/or as noted here:
   a. Normal power
   b. Life Safety Power
   c. Critical Power
   d. Essential Power (Also referred to as Equipment System in NEC Article 517)
   e. X-ray, MRI, CT and PET scanners wiring
   f. Medium Voltage 5 and 15 kV class cables
   g. Fire alarm wiring. (Note: Fire alarm wiring shall preferably be installed in dedicated conduits only. In areas of the corridors, as noted in 283100, the wiring may be installed using dedicated J-Hooks.)
   h. Security wires may be installed in cable tray or in dedicated J-Hooks.
   i. Other systems requiring dedicated raceways per manufacturer requirements.

2. Whenever possible, sources of Normal, Life Safety, Critical, and Equipment power are to be available within a reasonable distance from any location in the building. I.e., do not provide one Essential Service power panel in the far corner of the lowest level.

3. If a service or equipment is no longer required, it is to be removed and all associated wiring is to be removed back to the sources noted below, or equivalent.
   a. Power: Back to panel or first junction box where circuit continues on to other, existing, active loads.
   b. Telephone and Data wiring: MCIT to disconnect wiring at board in communication room and at outlet. Contractor to carefully remove cable.
   c. Security, fire alarm, A/V and other low voltage and/or special wiring: Remove wiring back to communication room or other source.
   d. Conduit in walls where walls are not otherwise being opened: Abandon in place. Install blank cover plates at outlet boxes, cut off conduit above ceiling or where otherwise accessible, and plug or cap end. If conduit in wall is flex, it shall be removed.
   e. Conduit, accessible above ceilings or other locations: Remove conduit, plug open ends at panel.

4. Fire stop all holes and openings in floor and at fire or smoke partitions.

5. Renovation projects shall include needed work to extend/add services, risers, panels, etc., as needed to serve new functions. If existing services are utilized, the need to maintain the space capacity as noted above will not apply. If any new extensions are required, those extensions shall comply with the space capacity requirements noted above.

New Equipment Naming

1. New Panels, services, equipment, etc., shall be labeled, as noted, in Section 16195 for new buildings. Building expansions and renovations shall utilize any naming scheme already in place in that building. A/E shall confirm with UMHS Electrical Engineering the appropriate next sequential name for devices and services in those buildings.

Equipment Color Codes and Labeling
New wiring, conduits, panels and other electrical equipment shall be color coded and labeled in accordance with Section 260553-H.

**Fire Alarm, Security, Communications**
1. Existing fire alarm, security, intercom, nurse call, BMS, master clock and other similar non-power systems shall be extended unless otherwise noted in program statement. A/E shall confirm capacity of those systems to handle new work and include upgrades if needed.
2. Some older buildings on campus still contain obsolete data outlets and wiring. As noted in the program statement or by UMHHC MCIT engineer, update these older outlets. Buildings containing older outlets include, but are not limited to: UH, Mott, Towsley, Women’s Hospital and MPB.
3. New buildings (unless noted otherwise in program statement) shall have fire alarm, security, intercom, nurse call, BMS, master clock and other similar "non-power" systems that are compatible with those already being monitored, maintained, operated and/or listed in these guidelines.

**Operational sequences**
1. Sequences of operation and manufacturer’s Operating Instruction Manual are to be provided for new or extended systems.
2. Engineer will prepare and review operating and maintenance procedures for the Maintenance Department to review. These procedures shall be noted in the contract documents when bid prices would be affected.
3. Electrical or Communications Closets can not be used for staging or storage during construction.

**Future Capacity and Loading Limits for I-2, Critical Facilities, and Other Facilities as Noted in the Program Statement**

*Please note: All noted spare capacities shall be those at the end of construction. For this reason, designed spare capacity may need to be at least 5-10% more than what is noted below.*

1. For the services noted below the power source, grounding systems, main switch gear, switchboards, panel boards, transformers and feeders shall all have a minimum: 20% spare kVA (or ampere as appropriate) capacity at the end of construction. [The design loading limit shall be 80% of the nameplate rating – except as noted below.]
   a. Normal power switchboards, panels, MCC’s
   b. Life Safety Power switchboards, panels
   c. Essential Power (Equipment System in NEC 517.30) switchboards, panels, MCC’s
   d. X-ray, MRI, CT Power Conditioner and UPS power systems.
   e. 100% rated Substation mains shall not exceed 85% when substation is single-ended.
   f. 100% rated substation feeder breakers shall not exceed 80%

2. For Critical Power services the power source, grounding systems, main switch gear, switchboards, panel boards, transformers and feeders shall all have a minimum: 35% spare kVA (or ampere as appropriate) capacity at the end of construction. Said another way, the loading limit is 65% of nameplate rating. The 35% value is selected to allow for all normal power clinical loads to be plugged into the Critical Power receptacles when normal power is lost.
3. Panelboards, switchboards, motor control centers, and switchgear all shall have at the end of construction a minimum:
   a. 20% spare poles, 6 poles minimum for panels
   b. One spare breaker, and space for one 3-pole breaker in substations
   c. 20% spare mounting inches in switchboards and the equivalent in motor control centers

**Note:** If multiple panels or sections make up an overall unit, the noted spares and spaces may be placed in any of those sections.

4. Generators are to be sized in kVA, for 20% growth in load beyond the additional spare capacity needed to start and operate the largest projected motors with no more than a 10% voltage drop upon start of largest motor, or 2% voltage drop with running or steady-state load. Loading limit on generators shall be 80% of the standby rating.
5. Communication raceways systems, risers, cable trays, communication closets, will allow for 100% growth in number of conductors installed, in watts of installed equipment in communication rooms, and number of drops installed on the system.
6. **Future Capacity and Loading Limits for Offsite, and Other non-I-2 Facilities**

Please note: All noted spare capacities shall be those at the end of construction. For this reason, designed spare capacity may need to be at least 20% more than what is noted below.

1. For the services noted below the power source, grounding systems, main switch gear, switchboards, panel boards, transformers and feeders shall all have a minimum: 20% spare kVA (or ampere as appropriate) capacity at the end of construction. [The design loading limit shall be 80% of the nameplate rating.]
   - Normal power switchboards, panels, MCC’s
   - Life Safety Power switchboards, panels
   - Essential Power (Equipment System in NEC 517.30) switchboards, panels, MCC’s
   - X-ray, MRI, CT Power Conditioner and UPS power systems.

2. For Critical Power services the power source, grounding systems, main switch gear, switchboards, panel boards, transformers and feeders shall all have a minimum: 25% spare kVA (or ampere as appropriate) capacity at the end of construction. Said another way, the loading limit is 75% of nameplate rating. The 25% value is selected in part to allow for all normal power clinical loads to be plugged into the Critical Power receptacles when normal power is lost.

3. Panelboards, switchboards, motor control centers, and switchgear all shall have at the end of construction a minimum:
   - 20% spare poles, 6 poles minimum
   - One spare breaker and space for one 3-pole breaker in substations.
   - 20% spare mounting inches in switchboards and the equivalent in motor control centers
   **Note:** If multiple panels or sections make up an overall unit, the noted spares and spaces may be placed in any of those sections.

4. Generators are to be sized in kVA, for 20% growth in load beyond the additional spare capacity needed to start and operate the largest projected motors with no more than a 20% voltage drop upon start of largest motor, or 2% voltage drop with running or steady-state load.

5. Interrupting duties and bus ratings are to be based upon maximum future available fault projected by Detroit Edison or Campus Utilities Services. Fault studies shall be performed by A/E before bidding, to confirm adequacy of specified equipment. Review interrupting duties and bus ratings whenever services are upgraded.

6. Communication raceways systems, risers, cable trays, communication closets, will allow for 50% growth in number of conductors installed, in watts of installed equipment in communication rooms, and number of drops installed on the system.