

DIVISION 16 - ELECTRICAL

SECTION 16010 – BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

UNH incoming electric service facilities to be included under building contract.

1. Overhead Supply to Outdoor Substation:
 - a. Secondaries
 - b. Metering Space
 - 1) Instruments
 - 2) Meters
 - c. Yard Grading
 - d. Fence
 - e. Foundations
 - f. Trench for grounding
 - h. Conduit for control cable
 - i. Auxiliary power and batteries
 - h. Space for relay panels
 - j. Transformer

2. Underground Supply to a Vault:
 - a. Secondaries
 - b. Metering space
 - 1) Instruments
 - 2) Meters
 - c. Conduit on private property
 - d. Vault structure
 - e. Passageway
 - f. Floor drain* (no floor drains if oil filled transformer)
 - g. Two (2) doors
 - h. Vault lighting
 - i. Ventilation
 - j. Ground rods
 - k. Grounding grid
 - l. Transformer

*Floor drains shall not be used if transformers contain oil. Provide sump for pumping.

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3. Supply to Pad-Mounted Transformer:

- a. Secondaries
- b. Metering
 - 1) Instruments
 - 2) Metering
- c. Foundations
- d. Conduit on private property
- e. Ground rods and grid

4. Secondary Campus Voltages

120/240V, 1-phase, 3W (pwr & ltg) 440V, 3-phase, 3W (power).
240V, 3-phase, 3W (pwr) 480/460V, 3-phase, 3W (power).
110/220V, 1-phase, 3W (pwr & ltg) 480Y/227V, 3-phase, 4W (pwr & ltg).
208Y/120V, 3-phase, 4W (pwr & ltg)

5. Primary Distribution System

The campus has a 4160GY/2400 2400/4160 (Y) volt loop primary distribution system. And a 34,500GY/19,900 volt radial primary distribution system. The primary voltage employed for the project shall be verified with Facilities Design & Construction before wiring design is established.

6. Secondary Distribution System

The secondary voltage employed for the project shall be verified with Facilities Design & Construction before wiring design is established.

7. Motors

Motors 1/2 horse power and larger shall be wired for 208 volts, 3-phase or 480 volts, 3-phase. All motors shall be of the energy efficient type and be designed to operate within the close tolerances of the selected loads. Where starters are required, they shall be in combination with fused (fusetrans) disconnect switches. Final connections to the motors shall be Sealtite.

Electric motors, including OEM motors installed as an integral part of equipment specified in other divisions, shall be premium efficiency with the following minimum NEMA nominal efficiencies:

| <u>HP</u> | <u>Efficiency</u> |
|-----------|-------------------|
| 1 | 82.5% |
| 1/5 & 2 | 86.5% |
| 3 | 88.5% |
| 5 | 89.5% |
| 7.5 & 10 | 91.7% |

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| | |
|-----------|-------|
| 15 | 93.0% |
| 20 | 93.6% |
| 25 & 30 | 94.1% |
| 40 & 50 | 94.5% |
| 60 & 75 | 95.0% |
| 100 – 125 | 95.8% |

8 Lighting

A. Related Requirements Specified Elsewhere

- a. Section 16500 INTERIOR LUMINARIES
- b. Section 16613 EMERGENCY POWER SUPPLIED SYSTEMS

B. Definitions

- a. **Normal Lighting:** A building’s normal lighting system necessary to provide lighting for the intended occupation and use of the facility under normal operating conditions.
- b. **Emergency Lighting:** Code required lighting to support the evacuation and egress of a building during an emergency which results in the loss of normal power.
- c. **Standby Lighting: (and power):** Lighting that may or may not be required by code as emergency lighting but provides continued use and operation of a building or protects facilities and assets against loss during an extended power outage or other emergency.
- d. **Night Lighting:** Lighting meant to remain on at all times to produce a reduced light level varying by occupancy and ranging from minimum illumination for security patrols to periods of reduced building activity.

C. Applicability

- a. Designs for all new construction and complete-building renovations of University buildings, “Primary Facilities” or “Secondary Support Facilities”, **shall** be equipped with an emergency power system capable of providing power for code required emergency and exit lighting systems.

In “Primary Facilities”, except in utility spaces such as mechanical room’s, etc., emergency lighting shall be incorporated into the building’s normal use lighting system, a separate emergency lighting system shall be prohibited

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unless specifically approved. Separate emergency lighting systems are permissible in “Secondary Support Facilities”.

As an energy conscious institution, UNH is seeking every opportunity to save energy through shutting off lighting when not needed. Also, it must be recognized that there are various rooms and functions which require room darkening to take place.

(Note: emergency light systems and night light systems do **not** provide the same functions, and will not usually be the same system.)

- b. Designs for all new construction and complete-building renovations of University buildings defined as either “Primary Facilities” or “Secondary Support Facilities”, **may** be additionally equipped or expanded to provide a standby power system to enable either continued operations and/or protection of goods and property where programmed to occur or warranted for consideration. There may be rare occasions where a standby power system may be requirement of code because of the facility, occupancy, or use.
- c. Designs for other renovations or alterations **shall** include emergency power systems as required by code, and **may** include standby power systems if programmed or warranted for consideration.
- d. All new construction or complete-building renovations should be designed with either a night light system or the ability to turn lights off as applicable to the particular occupancy.

END OF SECTION