

winter wind chill shelter. Xeriscaping is used to reduce or eliminate the need for energy-and-water-intensive irrigation.

Brief Summary of the Electrical Design Process

Many electrical design requirements are determined based on other other building systems, not directly from the owner's requirements. Consider the following examples:

- The capacity of boilers and air conditioning equipment is directly determined from the heating and cooling needs of the building. On the other hand, the corresponding electrical installation is determined by the load of motor-driven equipment such as fans and compressors.
- A similar concept applies for lighting design: Fixtures are selected based area and illuminance requirements, while electrical systems depend on their power consumption.

Design engineers must analyze the power requirements of equipment in the building before specifying the electrical installation that will supply that power at the correct voltage. Keep in mind that designers may suggest energy efficiency measures to reduce total electrical load, and the following are some examples:

- NEMA Premium Efficiency motors with speed controls (VFD) for equipment above 1 hp.
- Brushless DC motors for fractional horsepower equipment.
- LED lighting, as previously mentioned.
- ENERGY STAR appliances.
- Air conditioning equipment with smart compressors.

Efficient electrical equipment draws less current, reducing the capacity of the electrical system. Significant cost reductions are possible by optimizing the capacity of wiring, load centers, switchgear and transformers.

Reference Standards:

1. NFPA 70
2. NEMA
3. NEC