BASIS OF DESIGN

This section applies to the general requirements for all electrical work.

Design Criteria

The majority of University construction is for permanent installation. Design all electrical systems to have an anticipated 30- to 40-year life span before requiring major repairs or replacements. Exceptions to this requirement shall be discussed and agreed upon with the University Architect during the programming phase. Such agreed-upon exceptions shall be clearly stated in the Technical Program.

Facility design standards can vary for branch campus and off-site facilities. Review these projects with the Project Manager and Construction Management to determine modifications to the standards discussed and agreed upon with the University Architect. State these approved modifications in the Technical Program.

Where a detailed analysis of the program reveals an inadequate budget to provide the appropriate system design, notify the Project Manager and Construction Management, in writing, of the budget deficiency, the recommended system and its cost, and the alternatives if a budget revision is not provided.

The impact of long equipment delivery time shall be factored into the project cost estimate and schedule.

The location of equipment that produces noise, vibrations, and exhaust and the use of products or processes that create hazardous or offensive noise or fumes may be restricted.

Coordinate with Construction Management the design of special systems (unique shielded rooms, research and diagnostic equipment, and other equipment and designs not specifically covered by the these standards).

Interdisciplinary Coordination

The Electrical Engineer shall work closely with other design team members to coordinate the design and to ensure that space planning adequately accommodates the building electrical infrastructure. The electrical, mechanical, and structural space requirements will necessitate changes to the floor plans, building sections, and exterior elevations if not properly taken into consideration from the onset of design.

Intersystem connection and wiring requirements must be carefully coordinated between the various disciplines. Special attention must be given to the various life safety system components.
Coordinate with the Structural Engineer for the design of reinforced concrete housekeeping pad. Secure to structural slab.

Reference Plans and Specifications

Extensive operational drawings of the primary electrical system, fire alarm, clock, and bell systems are available. The latest versions of these drawings can be obtained from Construction Management.

These standards include several specifications with specific language about UC CM requirements. Spare parts inventories, prior experiences of UC CM, and staff training on the operation and maintenance of sophisticated equipment may restrict the list of suppliers to three or fewer, even though more suppliers with similar equipment may exist. Therefore, the Engineer’s standard practices on approved manufacturers, suppliers, systems, and equipment may not be appropriate for use on University projects.

Operational Constraints

In remodeling and renovation projects and for taps into existing feeders, shutdown of feeders and services may be necessary. These shutdowns may have to occur after normal working hours to prevent interruption of critical operations. All shutdowns must be carefully coordinated with the University and can take several weeks of planning so that all affected departments can plan operations around the outage. Temporary power may be necessary to maintain service to critical loads in hospital, health care, and laboratory areas and to refrigeration equipment. Delays in the construction schedule due to outage coordination shall be accounted for in the construction estimate and noted in specifications or drawings.

General-use buildings are operated to match occupancy and are normally shut down during nights, weekends, and holidays. Libraries usually have extended schedules. Health Science and laboratory buildings usually run continuously to maintain a safe working environment.

Construction Power

The point of service for construction power can be limited, especially where bulk power is required. The Engineer shall determine the construction power requirements and work with Construction Management to identify the anticipated point of service. The Engineer shall specify that the Contractor provide and maintain an electrical construction power system for all needs, including power for the construction trailers. The Contractor shall provide metering for all construction power tap points. The Contractor shall be responsible for the connection to and removal of its equipment from the University’s system.

Renovation and Demolition

Renovation projects must include the evaluation of the existing systems, including variances from current codes, system deficiencies, space limitations, and available
spare capacity. All design team disciplines shall participate in this evaluation to develop innovative remodeling concepts and solutions.

In general, remove abandoned equipment, raceways, and conductors. Electrical design shall address correction of existing electrical problems and removal of abandoned equipment, while maintaining the operation of the building. Define the reuse of equipment where appropriate.

Identify the cost and scope for the removal, remediation, and disposal of hazardous materials (polychlorinated biphenyl [PCB] ballasts, PCB transformers, PCB floor contamination, lead-containing materials, asbestos, etc.).

Design Evaluation

The following information is required to evaluate the design:

- **Programming Phase**
  - Scope of work for electrical systems
  - Description of hazardous material removal and remediation
  - Description of exceptions to these standards
  - Preliminary construction cost and schedule

- **Schematic Design Phase**
  - Description of electrical design requirements
  - Construction power point of service
  - Updated construction cost and schedule
  - Outline specifications

- **Design Development Phase**
  - Preliminary electrical design drawings
  - Identification of equipment that produces noise, vibrations, and exhaust and products or processes that create hazardous or offensive noise or fumes, and the respective mitigating solutions
  - Identification of systems, feeders, and services that will require a shutdown and/or a temporary service during the construction period
  - Identification of items having long equipment delivery times
  - One-line diagram of the construction power service
  - Draft specifications

- **Construction Documents Phase**
  - Complete electrical design drawings
  - Complete specifications
Submittals
Refer to the requirements specified in the individual Electrical sections.

Products, Materials, and Equipment
Refer to the requirements specified in the individual Electrical sections.

Installation, Fabrication, and Construction
Refer to the requirements specified in the individual Electrical sections.