Basis of Design

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

Design Criteria

- The majority of University construction is for permanent installation. Design electrical systems for a minimum anticipated 30 to 40-year life span before requiring major repairs or replacements. Exceptions to this requirement shall be discussed and agreed upon with Engineering Services 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 Engineering Services to determine modifications to the Facilities Services Design Guide as appropriate. State these approved modifications in the Technical Program.

- It is the intent of the University of Washington to minimize construction cost by fostering competitive bidding. If the designer feels that one or more of the provisions of this design guide arbitrarily eliminate an otherwise qualified manufacturer from bidding the project, suggest and review changes to the appropriate sections with Engineering Services. This may result in a one-time change or in a permanent revision to the design guide.

- Where a detailed analysis of the program reveals an inadequate budget to provide the appropriate system design, notify the Project Manager and Engineering Services, 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 and the advantages of obtaining a locally manufactured product 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 Engineering Services the design of special systems (unique shielded rooms, research and diagnostic equipment, and other equipment and designs not specifically covered by the design guide.)

Interdiscipline Coordination

- The Electrical Engineer shall work closely with other design team members to coordinate the design and to insure that the 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 need to be carefully coordinated between the various disciplines. Special attention needs to be given to the various life safety system components.

- Coordinate with 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. Unlike other record drawings, these drawings are not available from the Records Vault since they are being updated on a continuing basis by Campus Operations. The latest version of these drawings can be obtained from Engineering Services.

- Several standard type specifications with specific language about the University requirements are included in the design guide. Spare parts inventories, prior experiences of the University, and staff training on the operation and maintenance of sophisticated equipment may restrict the list of suppliers to three or less, even though more suppliers with similar equipment may exist. Therefore, the consultant’s standard practices on approved manufacturers, suppliers, systems and equipment may not be appropriate for use on University projects.

Operational Constraints

- In remodel 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 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 (10pm to 6am), 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 Engineering Services to identify the anticipated point of service. The Consultant 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 their 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 jointly to develop innovative remodel concepts and solutions.

- In general, remove abandoned equipment, raceways and conductors. Electrical design shall address correction of existing electrical problems and removing 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 (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. Describe exceptions to the Facilities Services Design Guide. Preliminary construction cost and schedule. Identify sustainable goals and targets and proposed strategies to meet those targets.

- **Schematic Design Phase:** Description of electrical design requirements. Construction power point of service. Updated construction cost and schedule. Outline specifications. Identify equipment that is to be re-used or recycled. Provide an update on sustainable goals and targets and proposed strategies to meet those targets.

- **Design Development Phase:** Preliminary electrical design drawings. Identify equipment that produces noise, vibrations and exhaust and the use of products or processes that create hazardous or offensive noise or fumes and the respective mitigating solutions. Identify systems, feeders and services that will require a shutdown and/or a temporary service during the construction period. Identify long equipment delivery time items. One-line diagram of the construction power service. Draft specifications. Provide an update on sustainable goals and targets and proposed strategies to meet those targets.

- **Construction Document Phase:** Complete electrical design drawings. Complete specifications.

Submittals

- Refer to requirements specified in individual Electrical sections.

Products, Materials and Equipment

- Refer to requirements specified in individual Electrical sections.

Installation, Fabrication and Construction

- Refer to requirements specified in individual Electrical sections.

END OF DESIGN GUIDE SECTION