

Electrical Engineering

Course Number: EE-02-103

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1-2 REFERENCES.

Appendix A contains the list of references used in this document. The publication date of the code or standard is not included in this document.

The design is intended to use the most current version of a publication, standard or code in effect when the design contract is signed unless written direction is provided to the contrary. If dates are not indicated in the contract or in the absence or other direction, the issue/version of publication in effect at the time the design started is to be used. Designs that have been started and then delayed will need to evaluate which version is applicable, and may have to update to the newer version if considerable time has gone by. This may require some redesign.

1-3 DESIGN STANDARDS.

The electrical Designer of Record must complete each of the following for each project:

- a. Apply NFPA 70 and IEEE C2 to electrical designs.
- b. Provide contract documents that fully indicate the scope of work.
- c. Comply with applicable UFCs, codes, regulations, laws, and service-specific requirements.
- d. Provide a completed project within funding limits.
- e. Provide a completed project within scope of work limits.
- f. Provide a completed project of acceptable appearance within design standards.
- g. Provide a completed project with coordinated systems (structural, mechanical, electrical, and other applicable disciplines).
- h. Provide complete, accurate, and coordinated construction documentation for the project.
- i. Provide a completed project considerate of the ecological, physical, and visual features of the site.
- j. Comply with applicable environmental requirements.
- k. Provide a completed project that incorporates sustainable design principles.
- I. Provide a completed project, meeting the Installation Appearance Plan (IAP) or Base Exterior Architectural Plan (BEAP), as applicable.



1-4 CYBERSECURITY.

All control systems (including systems separate from an energy management control system) must be planned, designed, acquired, executed and maintained in accordance with applicable standards.

1-5 PERMITS – CONSTRUCTION, ENVIRONMENTAL, AND OTHER.

Identify the permits and fees necessary for environmental, construction, and operation of facilities.



CHAPTER 2 DESIGN REQUIREMENTS

2-1 GENERAL.

Design electrical systems to meet the needs of the activity and supporting facilities in accordance with this document.

Provide electrical equipment that is the manufacturer's standard catalog products, conforming to the latest published industry and technical society standards at the date of contract award. Underwriters Laboratories (UL) listing or third-party certification is required for all basic equipment. Use of shop or field fabricated electrical equipment assemblies that are not manufacturer's standard catalog products or do not conform to the industry and technical society standards are not acceptable.

2-1.1 Hazardous Materials and Waste, and Controlled Materials.

Demolition or replacement of existing electrical equipment may involve hazardous materials and waste. This equipment includes, but is not necessarily limited to the following:

- Pad mounted transformers dielectric fluid containing PCBs, lead paint on the exterior
- Pad mounted switches dielectric fluid containing PCBs, lead paint on the exterior
- Oil-fused cutout switches dielectric fluid containing PCBs
- Capacitors dielectric fluid containing PCBs
- Pole mounted transformers dielectric fluid containing PCBs
- Fluorescent ballasts dielectric fluid containing PCBs
- Fluorescent and HID lamps mercury
- Self-luminous exit signs tritium
- Lead shielded cables lead
- Manholes, handholes, and ducts
 - Asbestos fireproofing spray on type
 - Asbestos fireproofing tape
 - Cable asbestos fill
- Storage batteries lead, cadmium, lithium, and electrolytes



Demolition or replacement of existing electrical equipment may involve controlled materials, such as SF6 gas.

2-1.2 Removal of Existing Cables and Conductors.

When a project requires disconnection of existing cables and conductors enclosed in either duct or conduit, physically remove the existing cables and conductors. Associated ducts or conduits may be abandoned in place only for the following conditions:

- They are planned for re-use.
- Removal will cause substantial facility damage.
- Conduits are inaccessible.

On duct systems between underground structures (handholes, manholes, and vaults), provide a pull wire (string or rope) for future use, and seal both ends of duct. Apply label to each end of the pull rope noting the location of the other end of the conduit.

2-1.3 Hot Caps and Removal of T-Splices Inside Manholes.

Regardless of voltage, do not hot cap conductors in a manhole or handhole as part of demolition.

If the conductor is part of a T-splice or Y-splice that is being removed, remove the splice and install an in-line splice for the remaining conductors. For the Army and Navy, if the conductor is part of a T-splice or Y-splice that is being re-used, a hot cap is allowed during construction to maintain an energized circuit.

Note: Hot caps are only allowed as a temporary method during construction to maintain an energized circuit.

2-1.4 Modification to Existing Electrical Equipment.

Uniquely identify equipment to be "Modified" or "Added to" and include the manufacturer's name and other pertinent manufacturer's identification (e.g., serial number, model number, style), if such information exists.

2-1.5 Salvaged Materials and Equipment.

Demolition projects may require equipment or material to be salvaged for, or by the Government. Uniquely identify all salvageable equipment or material. Include the manufacturer's name and other pertinent manufacturer's identification including serial number, model number, style, physical dimensions, and weight if such information exists. Indicate who is responsible for removal, storage, and transportation.



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