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## SECTION D5000

## ELECTRICAL SYSTEMS

04/09/02

**PART 1 GENERAL****1.1 SYSTEM DESCRIPTION**

Provide complete interior power distribution and lighting systems. Provide complete interior telecommunications including voice, data, public address, music, intercom, intrusion detection, CATV, and CCTV systems.

**1.2 SYSTEM REQUIREMENTS**

- a. The electrical system design shall be designed after a thorough site investigation and meetings with [Public Works Office/Department] [Facilities Maintenance Department (FMD)], Resident Officer in Charge of Construction (ROICC), and end users. Arrange systems logically for easy maintenance. Specify extremely durable components for a quality, low-maintenance installation.
- b. Electrical systems shall comply with SWDIV-TG-1004, "Technical Guidance For Electrical Design" Adhere to the design guide preference where applicable and as modified by this document.

**1.3 CRITERIA**

Technical Guides (TG's) and other SWDIV Criteria can be found on SWDIV' Internet. The address is

[SWDIV Technical Guides](#)

NAVFAC criteria can be found on NAVFAC's Internet. The address is

<http://www.efdlant.navy.mil/criteria>

NAVFAC guide specifications (UFGS) can be located at

<http://www.ccb.org/ufgs/ufgs.htm>

**1.4 COMPLIANCE VERIFICATION**

Compliance with the requirements will be determined by a review of the design and construction submittals and by field inspection. See Document 00911, Design Requirements, for submittal requirements. See Section 01330, Submittal Procedures, for Submittal Descriptions (SD-xx) and requirements.

Verification of satisfactory electrical system performance shall be via Performance Verification Testing, as detailed in this section of the RFP.

## **1.5 DESIGN SUBMITTALS**

Provide a complete submittal package for review and approval prior to ordering materials, fabrication, or installation.

### **1.5.1 Design Analyses and Drawings**

Provide the following drawings and any other drawings and documents necessary to construct the project:

a. Electrical plans (Power and Lighting)

Show equipment, wiring including loads and devices, and critical sectional views.

b. Power Single Line Diagram (not a riser) for Demo/Repair and New Installations

Show major electrical equipment down to the sub-panel level such as source of power, transformers, meters, circuit protection relay, etc. Include the grounding plan and control schematic diagrams.

c. Communications plans

Provide registered communications distribution designer (RCDD) approved drawings complete with wiring diagrams and details showing the system shall properly support connectivity from telecommunications equipment room to workstation outlets. Show all components of the system.

d. Demolition Plans

e. Equipment details

f. Riser diagrams

g. Enlarged floor plans and elevations of electrical rooms and vaults

h. Equipment and panelboard schedules

i. Manhole Foldout Details

j. Lightning Protection Plan

k. Design Analysis:

Submit design analysis as required in SWDIV-TG-1004.

### **1.5.2 Design Specifications**

a. Submit manufacturer's data sheets per Document 00911, "Project Kickoff and Design Completion" for all items if available. If manufacturer's data is unavailable, submit prescriptive construction specifications per Document 00911 to specify the quality, characteristics, performance factors, efficiency, installation procedures, and testing and certification requirements.

b. Provide the following sections using NAVFAC guide specifications. Edit only the bracketed portions.

UFGS-16268N, "400-Hertz (HZ) Solid State Frequency Converter"

#### SD-07 Certificates

##### Year 2000 (Y2K) Compliance Warranty

For each product, component, and system, specified in this section as a "computer controlled facility component," provide a statement of Y2K compliance warranty for the specific equipment. If the specific listed equipments must perform as a system to exchange date and time data, then that warranty shall apply to those specific equipments as a system.

### 1.6 CONSTRUCTION SUBMITTALS

See Section 01330, Submittal Procedures, for Submittal Descriptions (SD-xx) and requirements. The following items shall be submitted to the Contracting Officer for approval.

#### SD-03 Product Data

Frequency Converter

TVSS

Switchboards

Motor Control Centers

Panelboards

Circuit Breakers

Telephone System

[Others as deemed necessary]

#### SD-06 Test Reports

Submit electrical test plan that conforms to the NETA Acceptance Testing Specifications for Electrical Distribution Equipment and Systems.

#### SD-09 Manufacturer's Field Reports

##### Y2K Demonstration

For each product, component, and system, specified in this section as a "computer controlled facility component," provide a field test to demonstrate Y2K compliance.

**PART 2 SYSTEM COMPONENTS****2.1 ELECTRICAL POWER - SERVICE AND DISTRIBUTION (D5010)****[2.1.a. Main Switchboard/Main Distribution Panel]**

1. Provide service entrance equipment with a main circuit breaker, motor control centers as necessary, and a system of panelboards and feeders to power the facility.
2. Size neutral bus at [100] [ ] percent of full load rating.
3. Main protective device shall be an [individually mounted] [drawout] [air power circuit breaker] [insulated-case circuit breaker] [molded-case circuit breaker]. [Provide adjustable solid-state tripping device integral to the breaker frame.] [Provide solid-state ground fault protection.]

**[2.1.b. Conduit and Wiring From Transformer to Switchboard/Main Distribution Panel.]**

1. [Conduits shall be concrete encased when routed underground.]
2. [Minimum duct size shall be [4 in] [103mm]] [ in][ mm]]

**[2.1.c. Interior Distribution Transformers]**

[Windings shall be copper.]

**[2.1.d. Branch Circuit Panels]**

[Panelboards shall be provided with [copper bus] and [main circuit breakers].

**[2.1.e. Enclosed Circuit Breakers]**

[Text to be developed]

**[2.1.f. Motor Control Centers/Controller]**

Main Protective device shall be [molded case circuit breaker][low voltage power circuit breaker].

**[2.1.g. Conduit and Wiring to Circuit Panels]**

[Text to be developed]

**[2.2 LIGHTING AND BRANCH WIRING (D5020)]****[2.2.a. Branch Wiring and Devices for Lighting Fixtures]**

[Text to be developed]

**[2.2.b. Lighting Fixtures]**

[Text to be developed]

**[2.2.c. Branch Wiring For Devices and Equipment Connections ]**

[Text to be developed]

**[2.2.d. Devices]**

1. Provide each workstation with a minimum of [2] [ ] duplex 120-volt outlets.
2. Device plates shall be [white][the same color as the switch/outlet with which they are mounted]. [Plates shall be unbreakable thermoplastic.] [Device plates shall be stainless steel.]
3. [Define additional receptacle requirements.]
4. [Define other special power requirements.]

**[2.2.e. Exterior Building Lighting]**

All building attached exterior lighting fixtures shall be [time switched], [photocell switched] and [manually switched] controlled.

**[2.3 COMMUNICATION AND SECURITY (D5030)]****[2.3.a Fire Alarm Systems]**

Refer to Section D4000

**[2.3.b Call Systems]**

[Text to be developed]

**[2.3.c Telephone Systems]****a. Data Circuits:**

[Text to be developed]

**b. Voice Circuits:**

[Text to be developed]

**c. Workstation Outlets:**

[Text to be developed]

**[2.3.d. Local Area Networks]**

[Text to be developed]

**[2.3.e. Public Address and Music Systems]**

[Text to be developed]

**[2.3.f. Intercommunication Systems and Paging]**

[Text to be developed]

**[2.3.g. Clock and Program Systems]**

[Text to be developed]

**[2.3.h. Television Systems]**

[Text to be developed]

**[2.3.i. Security Systems]**

[Text to be developed]

**2.4 OTHER ELECTRICAL SYSTEMS (D5090)****[2.4.a. Emergency Generators]**

[Text to be developed]

**[2.4.b. Uninterruptible Power Supply (UPS) Systems]**

[Text to be developed]

**[2.4.c. Transient Voltage Surge Suppression (TVSS)]**

[Text to be developed]

**[2.4.d. Lightning Protection]**

[Text to be developed]

**[2.4.e. Frequency Converters]**

[Text to be developed]

END OF SECTION