



## **Design Guidelines for Facilities Construction:**

### **DESIGN GUIDELINE DG26-08 Commissioning of Electrical**

#### **Part 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section includes commissioning process requirements for electrical systems, assemblies, and equipment.
- B. Related Sections:
  - 1. Division 01 Section “General Commissioning Requirements” for general commissioning process requirements.
  - 2. Division 21 Section “Commissioning of Fire Suppression System” for commissioning process activities for Fire Suppression systems, assemblies, equipment, and components.
  - 3. Division 22 Section “Commissioning of Plumbing” for commissioning process activities for plumbing systems, assemblies, equipment, and components.
  - 4. Division 23 Section “Commissioning of HVAC” for commissioning process activities for HVAC systems, assemblies, equipment, and components.
  - 5. Division 28 Section “Commissioning of Fire Alarm” for commissioning process activities for Fire Alarm systems, assemblies, equipment, and components.

##### **1.2 DEFINITIONS**

- A. Commissioning Plan: A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the commissioning process.
- B. CxA: Commissioning Authority.
- C. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean “as-built” systems, subsystems, equipment, and components.

##### **1.3 CONTRACTOR’S RESPONSIBILITIES**

- A. Perform commissioning tests at the direction of the CxA as defined in the Commissioning Plan.

- B. Complete project-specific construction checklists and commissioning process test procedures for actual plumbing systems, assemblies, equipment, and components to be furnished and installed as part of the construction contract.
- C. Attend construction phase commissioning coordination meeting.
- D. Participate in electrical systems, assemblies, equipment, and component maintenance orientation and inspection as directed by the CxA.
- E. Provide information requested by the CxA for final commissioning documentation.
- F. Provide measuring instruments and logging devices to record test data, and provide data acquisition equipment to record data for the complete range of testing for the required test period.
- G. Provide training to Owner's personnel on system operations, preventative maintenance, sequence of operations, and general function on systems.

#### 1.4 CxA's RESPONSIBILITIES

- A. Prepare project-specific construction checklists and commissioning process test procedures for actual electrical systems, assemblies, equipment, and components to be furnished and installed as part of the construction contract.
- B. Direct commissioning testing.
- C. Verifying testing, adjusting, and balancing of Work are complete.
- D. Provide test data, inspection reports, and certificates in Systems Manual.

#### 1.5 COMMISSIONING DOCUMENTATION

- A. Provide the following information to the CxA for inclusion in the commissioning plan:
  1. Plan for delivery and review of submittals, systems manuals, and other documents and reports.
  2. Identification of installed systems, assemblies, equipment, and components including design changes that occurred during the construction phase.
  3. Process and schedule for completing construction checklists and manufacturer's prestart and startup checklists for electrical systems, assemblies, equipment, and components to be verified and tested.
  4. Certificate of completion certifying that installation, prestart checks, and startup procedures have been completed.
  5. Certificate of readiness certifying that electrical systems, subsystems, equipment, and associated controls are ready for testing.
  6. Test and inspection reports and certificates.
  7. Corrective action documents.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Certificates of readiness.

- B. Certificates of completion of installation, prestart, and startup activities.

## **Part 2 – PRODUCTS (Not Used)**

## **Part 3 - EXECUTION**

### **3.1 TESTING PREPARATION**

- A. Certify that plumbing systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.
- B. Set systems, subsystems, and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).
- C. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

### **3.2 TESTING VERIFICATION**

- A. Notify the CxA at least 10 days in advance of testing Work, and provide access for the CxA to witness testing Work.
- B. Provide technicians, instrumentation, and tools to verify testing of plumbing systems at the direction of the CxA.

### **3.3 GENERAL TESTING REQUIREMENTS**

- A. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.
- B. Testing shall include measuring capacities and effectiveness of operational and control functions.
- C. Test all operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.
- D. Test will be performed using design conditions whenever possible.
- E. Simulated conditions may need to be imposed using an artificial load when it is not practical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate loads. Set simulated conditions as directed by the CxA and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.
- F. If tests cannot be completed because of a deficiency outside the scope of the electrical system, document the deficiency and report it to the Construction Manager, CxA, and Owner. After deficiencies are resolved, reschedule tests.
- G. If the testing plan indicates specific seasonal testing, complete appropriate initial performance tests and documentation and schedule seasonal tests.

### 3.4 ELECTRICAL SYSTEMS, SUBSYSTEMS, AND EQUIPMENT TESTING PROCEDURES

- A. Electrical Testing and Acceptance Procedures: Testing requirements are specified in Division 26 – Electrical Sections. Provide submittals, test data, inspection record, and electrical certification to the CxA.

**END OF SECTION 26 0800**