

## SECTION 01 45 24

### TESTING PROGRAM REQUIREMENTS

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Data to be recorded.
- B. Tests.
- C. Certified Test Reports.

##### 1.02 RELATED SECTIONS

- A. General requirements for training of BART personnel in the operation and maintenance of the various project electrical systems are specified in Section 01 79 00, Demonstration and Training.
- B. Section 01 33 00, Submittal Procedures.
- C. Section 01 33 23, Shop Drawings, Product Data and Samples.
- D. Section 01 43 00, Quality Assurance.
- E. Section 01 45 00, Quality Control.

##### 1.03 MEASUREMENT AND PAYMENT

- A. Separate measurement or payment will not be made for work required under this Section. All costs in connection with the work specified herein will be considered to be included with the related item of work in the Bid Schedule of the Bid Form, or incidental to the Work.

##### 1.04 COORDINATION

- A. Submit written notice as to when the installed equipment and systems will be tested so that the Engineer can be present to witness the tests. Give a minimum of 15 calendar Days notice before performing the proposed tests.
- B. Where specialized or heavy electrical equipment is involved, a representative of the manufacturer will be required to be present to witness the tests and verify the results.

##### 1.05 SUBMITTALS

- A. In addition to the Test Program Plan required in Section 01 43 00, Quality Assurance and the Quality Control Testing required in Section 01 45 00, Quality Control, specific equipment and/or systems require individual testing in accordance with the

Contract specification or the specific code requirements. These specific Contract and code required tests shall be performed as follows:

Testing Program: Submit overall test schedule and test procedures for review before beginning the testing of the equipment or systems. Each procedure shall, as a minimum include the following:

1. Statement of procedure objective and scope;
  2. List of equipment required to set up and perform the procedure;
  3. List of equipment or services required from areas outside the Contractor's authority;
  4. List of prerequisite tests that need to be completed before the procedure can be performed;
  5. Description of the required procedure setup, including diagrams illustrating test equipment connections and identifying test points, where applicable;
  6. Step-by-step instructions for performing the procedure identifying the points where data is to be recorded and the limits for acceptable data;
  7. Provisions for recording pertinent test conditions and environment at time of test; and
  8. Instructions for recording data on data sheets and verifying that procedure steps have been completed.
- B. Test Reports: Submit certified test reports of the results of tests performed on installed equipment or systems.
- C. Instruments: Submit list of instruments and certification indicating that the instruments that will be used for testing have been calibrated and their accuracy certified within a previous period of not more than six months. List types of instruments to be used, manufacturer, serial number, latest date of calibration, and calibration organization.

**1.06 GUARANTY**

- A. Tests shall not alter the Contractor's guaranty of the equipment. Replace and retest work and materials found to be in noncompliance with these Specifications at no additional cost to the District.

**1.07 DATA TO BE RECORDED**

- A. Maintain reproducible test data sheets showing results of tests specified in the accepted test procedures. Provide reproducible data sheets, listing acceptable or specified test limits and values actually measured. Furnish one copy to the Engineer. Retain one copy.

- B. Provide data sheets showing test set-up, equipment used, names of persons performing test, names of witnesses, date, location, and serial number of equipment under test, time of the test, test connection diagrams, clearly identified pass or fail criteria, expected and actual observed data and conditions, comment fields, test personnel including name, company, and contact information, and a section for signature approvals by the Contractor testing personnel and the Engineer witness from the District. Test data sheets shall be reviewed by the Engineer, and the Engineer may accept the test data sheets as submitted, or additional tests may be required. If additional tests are required because initial test results do not comply with these Specifications, the re-testing shall be documented and submitted as before at no additional cost to the District.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS, EQUIPMENT, AND SERVICES**

- A. Provide test procedures, qualified technical personnel, tools, equipment, test instruments, facilities, and services as required to perform the testing. The Engineer will have qualified witnesses present at each test to observe the test results.
- B. For the extended coverage test, (long duration and/or extensive area) provide qualified technical support personnel, tools, test instruments, and services on demand when given at least 24 hours notice.
- C. The Contractor shall be present at all tests performed by others.
  - 1. Verify that the interface parameters sought are in compliance with the test data sheets accepted by the Engineer; or
  - 2. Perform work as necessary to ensure that the accepted interface parameters are met.

## **PART 3 – EXECUTION**

### **3.01 TESTS**

- A. Verify that all required tests have been performed for the applicable specification for each installed equipment or system including all operating and testing requirements. This shall include all electrical, mechanical, plumbing, fire protection, communication and other equipment and /or system.

**END OF SECTION 01 45 24**