SECTION 26 08 10

ELECTRICAL SYSTEMS PREVENTATIVE MAINTENANCE TESTING

PART 1 - GENERAL

1.1 GENERAL

A. This purpose of this section is to describe the general requirements for electrical preventative maintenance testing as part of the Stanford University Electrical Code Safety Program. The Stanford medium voltage equipment (e.g. pad mounted transformers, 15KV cables, etc.) is not in this Scope of Work.

B. This work shall be performed by qualified contractor(s) with certified membership of the National Electrical Testing Association (NETA). The lead on-site technical person for the NETA contractor shall be a NETA Certified Technician/ Level 3 (or higher) in accordance with ANSI/ NETA ETT-2015, Standard for Certification of Electrical Testing Personnel.

C. Tests described in Parts 4 and 5 below may be witnessed by Stanford’s representative upon timely notification.

PART 2 - CODES & STANDARDS

2.1 GENERAL

A. All preventative maintenance testing requirements and procedures shall comply with the following latest edition of codes and standards wherever applicable:

3. Institute of Electrical & Electronics Engineering (IEEE).
5. American National Standards Institute (ANSI)

PART 3 - DATA REQUIRED FOR PREVENTATIVE MAINTENANCE TESTING

3.1 GENERAL

A. The following project data are required for the successful completion of this work:

2. Power system study (e.g. short circuit study, coordination study, arc flash study, etc.) for the applicable power system of the project complete with approved protective device settings.
3. Any pertinent drawings/data if the power system to be tested is electrically connected with other building systems (examples: lab exhaust fans connected to the emergency power system, circuit breakers with shunt trips, etc.).

PART 4 - SCOPE OF WORK

4.1 GENERAL

A. The following electrical equipment shall be individually inspected and tested per NETA maintenance testing procedures and standards where applicable:

1. Main switchboards (MSB), normal distribution switchboards 400 amps and larger, and emergency/standby distribution switchboards 400 amps and larger. (Note: all breakers in the building shall be manually opened/tripped and re-closed (3) times to prove their operational integrity.)

2. Circuit breakers with 400-amp frame sizes and larger in the MSB, normal distribution switchboards, and emergency/standby distribution switchboards 400 amps and larger.

3. Ground fault protection systems (GFP).

4. Emergency power gen-sets (circuit breaker only) and associated automatic transfer switches (ATS).

PART 5 - PREVENTATIVE MAINTENANCE TESTING

5.1 GENERAL

A. Coordinate an outage and lockout/tagout procedure for the building with Stanford and Stanford’s electrical contractor, so that all electrical sources are securely de-energized with safety grounding. Contractor shall have all necessary tools, test power, temporary lighting, and materials in place, and appropriate staff assigned to perform all the de-energized preventative maintenance work within one consecutive ten-hour outage window.

B. Perform the following typical (but not limited to) preventative maintenance testing for the building electrical systems:

1. Switchgear and Switchboard Assemblies
   a. Main switchboard (MSB), normal distribution switchboards 400 amps and larger, and emergency/standby distribution switchboards 400 amps and larger: Perform all tests, excluding optional tests, electrical tests of control transformer/instrument transformers/meters, and the thermographic survey, listed in Section 7.1 of NETA MTS- 2019.
   b. Normal distribution switchboards less than 400 amps and panelboards: Provide testing criteria and test forms for Stanford’s electrical contractor to perform all visual and mechanical inspections listed in Section 7.1 of NETA MTS- 2019, excluding
2. Transformers, Dry-Type, Air Cooled, Low Voltage
   a. Provide testing criteria and test forms for Stanford’s electrical contractor to perform all visual and mechanical inspections listed in Section 7.2.1.1 of NETA MTS-2019, excluding the thermographic survey. Review contractor test results and perform final visual inspection.

3. Metal-Enclosed Busways
   a. Provide testing criteria and test forms for Stanford’s electrical contractor to perform all visual and mechanical inspections listed in Section 7.4 of NETA MTS-2019, excluding optional tests and the thermographic survey. Also include busway plug-in devices in the testing criteria and test forms as part of the busway system. Review contractor test results and perform final visual inspection.

4. Circuit Breakers, Air, Insulated Case/Molded Case
   a. Frame size 400 amps and larger in the MSB, normal distribution switchboards 400 amps and larger, and emergency/standby distribution switchboards 400 amps and larger: Perform all tests, excluding optional tests and the thermographic survey, listed in Section 7.6.1.1 of NETA MTS-2019.
   b. Normal distribution switchboards less than 400 amps and panelboards: Provide testing criteria and test forms for Stanford’s electrical contractor to perform all visual and mechanical inspections listed in Section 7.6.1.1 of NETA MTS-2019 plus manually opened/tripped and re-closed (3) times to prove their operational integrity. Review contractor test results and perform final visual inspection.
   c. Emergency/standby distribution switchboards less than 400 amps and panelboards: Provide testing criteria and test forms for Stanford’s electrical contractor to perform all visual and mechanical inspections listed in Section 7.6.1.1 of NETA MTS-2019 plus manually opened/tripped and re-closed (3) times to prove their operational integrity. Review contractor test results and perform final visual inspection.

5. Circuit Breakers, Low-Voltage, Power
   a. Perform all tests, excluding optional tests and the thermographic survey, listed in Section 7.6.1.2 of NETA MTS-2019.
6. **Grounding Systems**  
a. Perform all tests, excluding the fall-of-potential test, listed in Section 7.13 of NETA MTS-2019.

7. **Ground Fault Protection Systems**  

8. **Emergency Systems, Engine Generator**  

9. **Emergency Systems, Automatic Transfer Switches**  
a. Perform all tests, excluding optional tests and the thermographic survey, listed in Section 7.22.3 of NETA MTS-2019.

**PART 6 -FINAL TEST REPORT**

6.1 **GENERAL**

A. Three (3) copies of the completed preventative maintenance test reports (including Stanford’s electrical contractor test results) shall be submitted to the Stanford Project Manager. The contractor shall engage the services of a California Registered Professional Electrical Engineer with a minimum of 5-years experience evaluating power system electrical equipment preventative maintenance testing results to review and stamp the completed test reports prior to submission to Stanford. This professional electrical engineer may be an employee of the contractor.

B. Any recommendations or improvements to the system that are deemed appropriate for future implementation shall be described in these reports.

END OF SECTION