PART 1 - GENERAL

1.01 DESCRIPTION

A. The purpose of this section is to specify Division 26 and 27 responsibilities in the commissioning process which are being directed by the commissioning agent. (Other electrical systems testing not part of the commissioning scope is required under other sections).

B. The following electrical systems will be commissioned in this project:
   1. Lighting controls.
   2. Emergency generator and ATS.
   3. Telecom (review test results)

C. Commissioning requires the participation of Division 26 and 27 to ensure that all systems are operating in a manner consistent with the Contract Documents. The general commissioning requirements and coordination are detailed in Division 1 and Division 26. The contractor shall be familiar with all parts of Division 1 and Division 26 and the commissioning plan issued by the commissioning agent and shall execute all commissioning responsibilities assigned to them in the Contract Documents.

1.02 RESPONSIBILITIES

A. Electrical Contractors. The commissioning responsibilities applicable to the electrical contractor are as follows (all references apply to commissioned equipment only):
   1. Construction and Acceptance Phases
      a. Attend a commissioning scoping meeting and other necessary meetings scheduled by the commissioning agent to facilitate the Cx process.
      b. Contractors shall provide normal cut sheets and shop drawing submittals to the commissioning agent of commissioned equipment.
      c. Provide additional requested documentation, prior to normal O&M manual submittals, to the commissioning agent for development of start-up and functional testing procedures.
      d. Provide a copy of the O&M manuals submittals of commissioned equipment, through normal channels, to the commissioning agent for review and approval.
      e. Contractors shall assist (along with the design engineers) in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.
      f. Provide assistance to the commissioning agent in preparation of the specific functional performance test procedures. Subs shall review test procedures to ensure feasibility, safety and equipment protection and provide necessary written alarm limits to be used during the tests.
      g. During the startup and initial checkout process, execute and document the electrical-related portions of the prefunctional checklists provided by the commissioning agent for all commissioned equipment.
      h. Address current A/E punch list items before functional testing.
      i. Provide skilled technicians to execute starting of equipment and to execute the functional performance tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.
      j. Perform functional performance testing under the direction of the commissioning agent for specified equipment.

k. Correct deficiencies identified by the commissioning agent, CM and A/E and retest the equipment.
l. Prepare O&M manuals according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.
m. Provide training of the Owner's operating personnel as specified.
n. Coordinate with equipment manufacturers to determine specific requirements to maintain the validity of the warranty.

2. Warranty Period
   a. Correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

B. Telecom Contractors. The commissioning responsibilities applicable to the telecom contractor are as follows (all references apply to commissioned equipment only):
1. Construction and Acceptance Phases
   a. Attend a commissioning scoping meeting and other necessary meetings scheduled by the commissioning agent to facilitate the Cx process.
   b. Contractors shall provide normal cut sheets and shop drawing submittals to the commissioning agent of commissioned equipment.
   c. Provide test reports for review by commissioning agent.
2. Warranty Period
   a. Correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

PART 2 - PRODUCTS

2.01 TEST EQUIPMENT

A. Division 26 and 27 shall provide all test equipment necessary to fulfill the testing requirements of this Division.

PART 3 - EXECUTION

3.01 SUBMITTALS

A. Divisions 26 and 27 shall provide submittal documentation relative to commissioning to the commissioning agent as requested by the commissioning agent.

3.02 STARTUP

A. The contractor has start-up responsibility and is required to complete systems and sub-systems so they are fully functional, meeting the design objectives of the Contract Documents.

B. Functional testing is intended to begin upon completion of a system.

3.03 FUNCTIONAL PERFORMANCE TESTS

A. Testing and Acceptance criteria: Test functionality of this piece of the system or systems in all control strategies with which it is associated.

3.04 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. Divisions 26 and 27 shall compile and prepare applicable documentation for all equipment and systems covered in Division 26 and 27 and deliver to the GC for inclusion in the O&M manuals.

B. The commissioning agent shall receive a copy of the O&M manuals for review.

3.05 TRAINING OF OWNER PERSONNEL

A. Electrical Contractor. The electrical contractor shall have the following training responsibilities:
1. Provide the commissioning agent with a training plan two weeks before the planned training.
2. Provide designated Owner personnel with comprehensive training in the understanding of the systems and the operation and maintenance of each major piece of commissioned electrical equipment or system.
3. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
4. The appropriate trade or manufacturer's representative shall provide the instructions on each major piece of equipment. This person may be the start-up technician for the piece of equipment, the installing contractor or manufacturer’s representative. Practical building operating expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment are required. More than one party may be required to execute the training.
5. The training sessions shall follow the outline in the Table of Contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.
6. Training shall include use of the printed installation, operation and maintenance instruction material included in the O&M manuals.
7. Hands-on training shall include start-up, and operation in all modes possible.
8. Training shall occur after functional testing is complete, unless approved otherwise by the Project Manager.
9. Duration of Training. The electrical contractor shall provide training on each piece of equipment according to the training schedule shall be agreed upon between the Sub-contractor and the General Contractor and as specified.
10. The electrical contractor shall arrange for the training of the telecom backbone system.

3.06 WRITTEN WORK PRODUCTS

A. Written work products of Contractors will consist of the filled out startup, initial checkout and prefunctional checklists.

END OF SECTION