

SECTION 28 08 00

COMMISSIONING OF ELECTRONIC SECURITY

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section covers security systems performance verification, as required to demonstrate that the Electronic Security Systems are ready for safe and satisfactory operation.
- B. Performance verification is an ongoing process and shall be performed throughout construction. Performance verification verifies that systems operate consistent with the Construction Documents.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Additional related specification sections include:
 - 1. Section 28 05 00, Common Work Results for Electronic Security
 - 2. Section 28 05 13, Conductors and Cables for Electronic Security.
 - 3. Section 28 05 28, Pathways for Electronic Security.
 - 4. Section 28 10 00, Access Control.
 - 5. Section 28 20 00, Video Surveillance
 - 6. Section 28 31 00, Intrusion Detection
- C. Performance verification shall include, but shall not be limited to, identification of security system devices, cabling and equipment, cleaning, check-out, testing and adjusting of systems, preparation of equipment and systems documentation and of maintenance and operation manuals, Owner training, and preparation of record drawings.
- D. Performance verification shall conclude with the completion of required testing, training, and system documentation as specified herein and required to demonstrate the proper operation of the security equipment and systems.

1.3 QUALITY ASSURANCE

- A. Provide a Security Systems Performance Verification Supervisor for the security systems. The Security Systems Performance Verification Supervisor shall have 10 years of experience in security systems contracting. The Security Systems Performance Verification Supervisor shall become familiar with the Owner's project requirements and the requirements of the performance verification process as defined in this Section. The Security Systems Performance Verification Supervisor shall coordinate and execute the required performance verification activities.
- B. The Security Systems Performance Verification Supervisor shall review submittal data for conformance with the requirements of the Project, shall monitor compliance with the

requirements specified herein for storage and protection of equipment during construction, shall oversee testing, and shall document that the scheduled and specified performance requirements of each system have been accomplished.

1.4 CLOSEOUT SUBMITTALS - OPERATION AND MAINTENANCE DOCUMENTATION PACKAGE

- A. The Security Systems Performance Verification Supervisor shall compile and prepare documentation for equipment and systems covered in these Security Specifications and deliver this documentation for inclusion in the operation and maintenance manuals prior to the training of the Owner's personnel. The Owner shall receive a copy of the operation and maintenance manuals for review.

1.5 PERFORMANCE VERIFICATION

- A. The Security Systems Performance Verification Supervisor shall be responsible for scheduling, supervising, coordinating, and executing the testing and performance verification activities as specified herein.
- B. Security systems performance verification shall take place in three phases. Performance verification requirements for each phase are as follows:
 - 1. Construction Phase:
 - a) Provide documentation of installed systems and equipment and develop functional testing procedures, prior to normal operation and maintenance manual submittals. This documentation shall include detailed manufacturer installation, operating, troubleshooting and maintenance procedures; full factory testing reports, if any; and full warranty information, including responsibilities of the Owner to keep the warranty in force. In addition, the installation, check-out materials that are shipped inside the equipment, and the actual field check-out sheet forms to be used by the factory or field technicians shall be submitted to the Owner.
 - b) Develop and submit to the Owner for review and comment, prior to system functional testing, a complete functional testing plan using manufacturer's testing procedures and functional testing checklists for the performance of the equipment to be verified.
 - c) Assist in clarifying the proposed operation and control of equipment in areas where the specifications, drawings or equipment documentation is not sufficient for writing detailed testing procedures.
 - d) Review the proposed functional test procedures to ensure feasibility, safety, and equipment protection. Obtain approval from the Owner for proposed functional test procedures.
 - e) Prepare a preliminary schedule for performance verification activities, including equipment testing and adjusting from start to completion, and update the schedule during the construction period, as appropriate. Notify the Owner immediately when performance verification activities not yet performed, or not yet scheduled, will delay construction.
 - f) Provide functional testing for equipment and execute the security systems related portions of the functional checklists for the verification of the performance of all the equipment during the testing process.

- g) Perform and document functional tests results, providing a copy to the Owner.
 - h) Correct noncompliance items before beginning acceptance testing. Discrepancies and problems shall be remedied before acceptance testing.
2. Acceptance Phase:
- a) Place equipment and systems into operation and continue their operation during each working day of the acceptance testing and performance verification activities, as required.
 - b) Provide skilled technicians to execute acceptance testing of each system. Technicians shall be available and present during the agreed upon scheduled acceptance tests and for sufficient duration to complete the necessary tests, adjustments and problem-solving.
 - c) Perform acceptance testing for specified systems and equipment as directed by the Owner and interpret the test data, as necessary.
 - d) Correct deficiencies (differences between specified and observed performance) retest the equipment, as required to demonstrate proper operation and performance.
 - e) Prepare operation and maintenance manuals as specified, including clarifying, and updating the original sequences of operation to as-built conditions.
 - f) Maintain marked-up record drawings and produce final record drawings of project drawings and contractor-generated coordination drawings.
 - g) Provide specified training of the Owner's operating personnel.
 - h) Coordinate with equipment manufacturers to determine specific requirements to maintain the validity of the warranty.
3. Warranty Period:
- a) Correct deficiencies and make necessary adjustments to operation and maintenance manuals, and as-built drawings system or equipment modifications made during the warranty period.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. Standard testing equipment required to perform the required testing shall be provided by the Contractor for the equipment or system being tested.
- B. Test equipment shall be of the quality and accuracy required to test and/or measure system performance with the tolerances specified and shall have been calibrated within the last 12 months, or as specified herein. Equipment shall be calibrated according to the manufacturer's recommended intervals and when dropped or damaged. Calibration tags shall be affixed or certificates available on request. Accuracy of sensors shall be at least twice that of the instrumentation being tested.

PART 3 - EXECUTION

3.1 SUBMITTALS

- A. Submit additional documentation as required to support the performance verification process. This extra submittal documentation shall include the proposed functional testing plan and checklists.

3.2 FUNCTIONAL TESTING

- A. General:
 - 1. Functional testing shall be performed as required to ensure that the equipment and systems are correctly installed and ready for operation, so that acceptance testing may proceed without delays. Follow the approved functional testing procedures. Sampling strategies shall not be used for functional testing. The functional testing for equipment and subsystems of a given system shall be successfully completed and documented prior to acceptance testing of the system.
 - 2. Functional testing plan: develop the detailed functional testing plans for equipment and systems to be verified as specified herein. Review the proposed procedures and functional testing documentation to ensure that each manufacturer-recommended procedure has been completed.
 - 3. The functional testing plan shall include the manufacturer's standard written check-out procedures copied from the installation manuals and manufacturer's normally used field check-out sheets. The plan shall include checklists and procedures with specific boxes or lines for recording and documenting the tests recommended by the equipment manufacturer, and as specified herein. Each checklist shall include a summary statement with a signature block at the end of the plan.

3.3 ACCEPTANCE TESTING

- A. Before obtaining permission from the Owner to schedule the acceptance test, provide written certification that each system has been calibrated, tested and is ready to begin the 14-day burn-in period and acceptance testing.
- B. Conduct final acceptance test after at least 14 consecutive normal working days of trouble-free operation.
- C. During this burn-in period, each system shall operate continuously for 24 hours per day. During the acceptance test, demonstrate the correct operation of features and capabilities specified herein.
- D. The Owner reserves the right to witness the acceptance tests. Notify the Owner at least 10 days prior to the date scheduled for the tests.

3.4 RETESTING OF EQUIPMENT AND/OR SYSTEMS

- A. Provide labor and materials required for retesting of any functional test found to be deficient.
- B. Before retesting, submit required data indicating that the deficient items have been completed and/or corrected to the Owner for approval and rescheduling of the functional test. If during the retesting it becomes apparent that the deficient items have not been completed and/or corrected as indicated in the data provided by the Contractor, the

retesting shall be stopped. Costs for the design team to further supervise the retesting of a functional test shall be the responsibility of the Contractor.

3.5 TESTING DOCUMENTATION, NONCONFORMANCE, AND APPROVALS

- A. Functional Test Reports: For each subsystem, provide a spreadsheet with all devices listed in the first column by device designator (name/number) with each test parameter listed by name (or code) in the remaining columns.
- B. Work to repair, replace, or otherwise resolve issues that result in a failed test until all devices pass all test parameters.
- C. Upon the completion of Functional Testing, provide the Owner with the functional test reports. The Owner will then review the Contractor's functional testing reports and submit either a noncompliance report or available dates for the scheduling of the Acceptance Testing. Where items are found to be deficient during the acceptance testing, the Contractor shall correct items promptly and notify the Owner that they have been corrected. Resubmit an updated report and a statement of correction of each non-compliance item. When requirements are completed, the Owner will schedule follow-up acceptance testing or recommend acceptance of the electronic security systems.

END OF SECTION 28 08 00