16950-H: ELECTRICAL ACCEPTANCE TESTS

Applicability:

The information expressed herein is unique to UMHHC owned, operated, and leased facilities, and are intended to supplement the University of Michigan’s Architecture, Engineering, and Construction (UMAEC), design guidelines 16950. Those UMAEC design guidelines are located on website http://www.plantext.bf.umich.edu/forarchs/index.html. All information presented in the referenced UMAEC guideline applies to UMHHC facilities, unless explicitly stated otherwise below. Where differences and/or conflicts exist between the supplemental information noted below, and the information in the UMAEC guideline, this supplementary information shall take precedence.

The Design Professional (A/E) shall adhere to UMHHC Design Guidelines for all work at UMHHC facilities. Any requested deviations from these guidelines, shall be sent, in writing, to UMHHC’s Facilities Planning and Development (FP&D). Address the correspondence to the assigned FP&D engineer for the given project. The deviation shall not be incorporated into the construction documents until written approval of the deviation is received by the Design Professional.

The Design Professional is fully responsible for the professional quality, technical accuracy, code compliance, and overall coordination of the contract documents. Compliance with these guidelines shall not be construed so as to relieve the Design Professional of any of that responsibility.

Isolated Power Systems (IPS)

1. Test all branch circuit wiring for leakage currents to ground using a 500-volt megger. Replace the wiring on any circuit exceeding IPS manufacture’s recommendations.
2. Verify accuracy of leakage current meter, and proper alarming when leakage current on panel exceeds manufacturer’s recommendations.
3. New isolated power systems shall be certified by a qualified agency.
4. Existing isolated power system shall also be re-certified.

Engine-Generators, Automatic Transfer Switches and Paralleling Gear

The following additional tests, to engine generator, and automatic transfer switches shall be performed beyond what is in 16950. These are especially important on any installation with more than one generator installed.

1. Affirm that all generators start and synchronize upon loss of power.
2. That all priority one loads (Life Safety and Critical) are powered within 10-seconds.
3. That loads are added in priority order as more capacity becomes available.
4. That the loss of a generator automatically sheds sufficient lower priority loads so insure remaining generators do not become overloaded.
5. That a ‘failing’ generator is dropped, and load is shed to within limits of remaining generators, to maintain Priority 1 loads and other loads within capability of remaining generators.
6. That all Life Safety and Critical transfer switches can transfer during tests and on restoration of power so the loads are not disturbed (closed transition). Do like test on any other ATS’s having closed transitioning.
7. On ATS’s not having closed-transition switches, affirm that ‘in-phase’ controls only transfer when the two sources are within specified phase angle.
8. Test for smooth operation of maintenance bypasses, to affirm loads are not interrupted during operation in ‘either direction’.
Security Systems

1. Proper operation of all electronic access control (EAC) doors are tested, both in non-secured, and secured states, under the following conditions. [If 50% of the doors (minimum of one), of each configuration, pass then the testing of the remaining doors in that grouping may be waived by the commissioner].
   a. Normal power available, no fire alarm.
   b. Normal power available, with fire alarm
   c. Normal power not available, no fire alarm.
   d. Normal power not available, with fire alarm.
   e. Affirm that all interfaces to other doors, and/or other devices are working properly.
   f. Affirm that sequence of operation for each location is followed by installed systems.

2. Proper operation or CCTV cameras, switchers, monitors and recorders.
   a. Test for proper operation of all cameras, and PTZ controls from Facilities Control Center.
   b. On fixed cameras affirm proper targeting of camera
   c. Test cameras under normal lighting and emergency level lighting to affirm clear images
   d. Test that programmed initiating events (alarms) brings camera up on alarm monitor, and that real time recording begins on DVR.
   e. Affirm another operational sequences noted in contract documents.

3. Other security systems such as Infant Monitoring, Equipment tracking, and other ‘special’ systems are testing in normal and abnormal circumstances (as noted under EAC above), to affirm noted operational sequences given in contract documents are met.

Audio Visual Systems

Test all components of audio visual systems to affirm design criteria is being met for all modes of operation – standard audio/visual presentation, video conferencing, interaction with ‘other end of line’ for OR integration projects, etc.. Also test operator interface, with user to affirm they can understand and use the system properly

Project Commissioning

The below noted systems shall be commissioned, following all of the requirements, procedures, submittal, training and other activities as defined on Campus web-page

Systems to be Commissioned

The systems and equipment will be commissioned include, but are not limited to the following:

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<td>Air Handling Unit</td>
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<td>Clock</td>
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<td>Card Reader</td>
<td>Building Automation System</td>
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<td>CCTV camera</td>
<td>Chiller</td>
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<td>Fire Alarm</td>
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