

271800 – COMMUNICATIONS TESTING

PART 1 GENERAL

1.1 RELATED SECTIONS

- A. Section 27 00 00; Communications General.

1.2 REFERENCES

- A. See Architectural Section - Reference Standards.

1.3 DEFINITIONS

- A. See Section 27 00 00: Communications General.

1.4 SUBMITTALS

- A. The Contractor shall provide the Owner's Representative with printed and electronic forms of all test results. Test results shall be unedited and as presented by the tester software. With the test results, the contractor shall provide software from the tester manufacturer to enable viewing of test results in native format. If software is not available, test results may be provided in comma-delimited text format. This must be pre-approved by JH.

1.5 PROJECT CONDITIONS

- A. The Owner's Representative reserves the right to be present during all testing.
- B. Testing of existing and active connections may be restricted until after normal working hours. The Owner's Personnel shall determine if testing can occur during normal business hours.
- C. Testing shall take place only when the channel is fully installed. If channel components may be moved or re-positioned after testing, the Contractor shall delay testing until cables, faceplates, and other components are in their final positions. This includes any repositioning by other trades prior to occupancy by the owner.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 GENERAL

- A. The Contractor shall perform validation testing on all voice and data communications cable installed as part of any project. This testing shall verify that the cable has been installed properly and has the specific characteristics required by the project.
- B. The Owner's Representative reserves the right to be present during any testing.
- C. The Contractor shall provide all required test equipment and personnel necessary to support the certification and validation tests prescribed in this section.
- D. The Contractor shall provide a listing of the test equipment proposed for use for all

certification testing.

3.2 HIGH PAIR COUNT COPPER CABLES

- A. The Contractor shall provide a continuity test for all voice pairs. All voice grade copper cable shall be tested by toning-out each pair.
- B. The Contractor shall provide the Owner's Representative with printed and electronic forms of all test results. Test results shall be unedited and as presented by the tester software.

3.3 CATEGORY 6A COPPER CABLES

- A. All category 6A field testing shall be performed with an approved level III balanced twisted-pair field test device.
- B. All installed category 6A channels shall perform equal to or better than the minimum requirements as specified by the current ANSI/TIA/EIA standards for Category 6A. If the cable manufacturer has a separate, more stringent set of test standards required to certify the total solution being installed, the Contractor shall use the more stringent requirements.
- C. Category 6A balanced twisted-pair horizontal and backbone cables, whose length does not exceed 90 m (295 ft.) for the basic link, and 100 m (328 ft.) for the channel shall be 100 percent tested according to ANSI/TIA/EIA-568-B.2. Test parameters include wire map plus ScTP shield continuity (when present), length, NEXT loss (pair-to-pair), NEXT loss (power sum), ELFEXT loss (pair-to-pair), ELFEXT loss (power sum), return loss, insertion loss, propagation delay, and delay skew.
- D. The Contractor shall provide the Owner's Representative with printed and electronic forms of all test results. Test results shall be unedited and as presented by the tester software. With the test results, the contractor shall provide software from the tester manufacturer to enable viewing of test results in native format. If software is not available, test results may be provided in comma-delimited text format. This must be pre-approved by Owner.

3.4 COPPER TEST EQUIPMENT

- A. All balanced twisted-pair field testers shall be factory calibrated each calendar year by the field test equipment manufacturer as stipulated by the manuals provided with the field test unit. The calibration certificate shall be provided for review prior to the start of testing.
- B. The Contractor shall set the testers to the correct cable, by manufacturer and name, to ensure correct parameters are used during testing. Test settings selected from options provided in the field testers shall be compatible with the installed cable under test.

3.5 FIBER OPTIC TESTING

- A. The Contractor shall test all optical fiber strands for insertion loss and length. The Contractor shall perform bi-directional OTDR tests on all OSP optical fiber strands.
- B. The Contractor shall test insertion loss at 850 nm and 1300 nm for 50/125m multimode cabling in at least one direction using the Method B (1-jumper) test procedure as specified in ANSI/TIA/EIA-526-14A.
- C. The Contractor shall test insertion loss at 1310 and 1550 for single model cabling in at least one direction using the Method A.1 (1-jumper) test procedure as specified in ANSI/TIA/EIA-526-7.

- D. The Contractor shall determine and record length using an OTDR, optical length test measurement device or sequential cable measurement markings.
- E. The Contractor shall calculate the allowable attenuated loss based on final installed length, attenuation coefficient, and connector loss.
- F. The Contractor shall remediate any strands testing above calculated limit.
- G. The Owner's Representative reserves the right to have third party testing to confirm the test results. The Contractor shall remediate, at their expense, any strands exceeding this limit by third party testing.
- H. The Contractor shall provide the Owner's Representative with electronic forms of all test results. Test results shall be unedited and as presented by the tester software.

3.6 FIBER TEST EQUIPMENT

- A. All optical fiber test equipment shall be factory calibrated as recommended by the field test equipment manufacturer. The calibration certificates shall be provided for review prior to the start of testing.

3.7 BONDING AND GROUNDING

- A. All bonds installed by the contractor shall be tested for impedance with an earth ground resistance test in its two-point setup, such as a LEM Handy GEO tester. The Contractor shall place a QA label (with date and inspector) in proximity to each bond tested.
- B. The Contractor shall test all grounding conductors, once installed, for current. The Contractor shall measure AC and bi-directional DC current. The Contractor shall report any AC current over 1 Amp. The Contractor shall report any DC current, in either direction, over 500milliamps.
- C. Test all bonds for a maximum impedance of 0.1 using a two-point impedance test. Contractors shall remediate any bond above 0.1 impedance.
- D. Test all bonds for a maximum impedance of 0.1 using a two-point impedance test. Contractors shall remediate any bond above 0.1 impedance.

END OF SECTION 271800