

U.S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C. 20250

DEPARTMENTAL REGULATION		Number: 3902-001
SUBJECT: Service Center Technology Modernization Project (SCTMP) Wiring/Cabling Specifications for Service Center Agencies' (SCA) Computer Rooms	DATE: June 30, 2009 OPI: The Office of the Chief Information Officer (OCIO) International Technology Services (ITS) – Infrastructure Definition Division (IDD), Architecture Definition Branch (ADB)	

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1. PURPOSE

This Regulation provides the wiring and cabling requirements to be incorporated when renovating or constructing new computer rooms for all Service Center Agencies (SCA): Farm Service Agency (FSA), Natural Resources Conservation Service (NRCS), the Rural Development (RD) mission area, and the Office of the Chief Information Officer (OCIO) International Technology Services (ITS).

2. SPECIAL INSTRUCTIONS/CANCELLATIONS

- a. Effective Date. The Wiring/Cabling Specifications will become effective immediately upon issuance of this Regulation.
- b. Series Replaced. Not applicable.
- c. Directives Rescinded. Not applicable.

3. AUTHORITY/REFERENCES

- a. National Communications System (NCS) Federal Telecommunications Recommendation (FTR), FTR1090-1997: Commercial Building Telecommunications Cabling Standard.
- b. American National Standards Institute (ANSI)/Telecommunications Industry Association (TIA)/Electronic Industries Alliance (EIA)-568: Commercial Building Telecommunications Wiring Standard.
- c. ANSI/TIA/EIA-569: Commercial Building Standard for Telecommunications Pathways and Spaces.
- d. ANSI/TIA/EIA-570: Residential and Light Commercial Telecommunications Wiring Standard.
- e. ANSI/TIA/EIA-606: Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.

- f. ANSI/TIA/EIA-607: Commercial Building Grounding and Bonding Requirements for Telecommunications.
- g. ANSI/TIS/EIA-942: Telecommunications Infrastructure Standard for Data Centers.

4. SCOPE

The specifications in this regulation shall be used for all OCIO-ITS and SCA space planning. The Automated Data Processing (ADP) room standards will be applied to all offices receiving ITS services, including those offices where no ITS staff is co-located.

These specifications define a baseline primarily for SCA field service centers. The requirements for state, regional, national offices and other organizational units may be unique and may require higher performance or additional space and power. Deviations from this baseline will be decided on a case by case basis at the time of a major renovation or solicitation of new space.

5. RESPONSIBILITIES

- a. The Technical Support Division (TSD) Group Manager will:
 - (1) Provide oversight for all ADP room cabling and/or wiring installation.
 - (2) Verify that all required certifications are received.
- b. The Service Center Leasing Agent will:
 - (1) Ensure that the specifications in this Regulation are included in solicitations for offers or lease amendments, as appropriate.
 - (2) Keep all certifications as part of the official lease file.
- c. Clearing and Approving Officials:
 - (1) The TSD Group Manager will approve all final wiring cable plants before installation begins.

d. The Infrastructure Operations Division (IOD) Telecommunications Operations Branch (TOB) will:

- (1) Provide the Group Manager with any needed technical assistance.

6. COMPUTER ROOM PHYSICAL AND SECURITY REQUIREMENTS

Refer to Departmental Regulation (DR) 3901-001, ITS Space Standards for the physical and security requirements for the computer room.

7. COMPUTER ROOM ENVIRONMENTAL REQUIRMENTS

When cable consists of multiple runs, the Lessor shall provide cable trays or J-hooks to insure that the cable does not come into contact with the suspended ceiling.

8. DEDICATED ELECTRICAL CIRCUITS AND OUTLETS FOR ADP EQUIPMENT

- a. Computer Room Circuits. Provide and install dedicated electrical circuits with isolated grounds in the Computer Room. Dedicated circuits must be 110 volt, 20-ampere standard three-prong circuits with true earth ground terminated into orange or other uniquely marked (“computer use only”) duplex outlets. Provide and install duplex outlets for each dedicated electrical circuit in the Computer room. Dedicated electrical circuits will be used for the telephone systems. The main electrical panel for the computer/voice (if computer/voice is available) equipment will be properly grounded to meet TIA/EIA and Federal Information Processing Standards (FIPS).
- b. General Office Space Circuits. Provide dedicated electrical circuits with multiple outlets at designated locations throughout the service center with multiple outlets to accommodate the peripheral equipment (i.e. computer workstations, printers).
- c. Electrical Requirements for Uninterruptible Power Supply (UPS) Circuit. Critical servers are required to be connected to the UPS.
 - (1) Uninterruptible Power Supply (UPS). Dedicated Circuits will be required for use by UPS.
 - (2) Number and Type of Circuits. There will be a minimum of 2 (two) 120 volt, 30 amp minimum with true ground, terminated into a twisting-lock receptacle. Each dedicated circuit must have insulated, isolated earth ground; conduit ground is not acceptable.

- (3) Receptacle. The receptacle will be a NEMA L5-30R twist-locking receptacle.
- (4) Location of the UPS receptacle. The UPS receptacle will be located in the ADP/Computer room where the Local Area Network (LAN)/Wide Area Network (WAN)/Voice (LWV) cabinet is installed. The receptacle will be located within a maximum of 4.5 feet from the back of the United States Department of Agriculture (USDA) wiring cabinet.

9. PLYWOOD

One sheet of $\frac{3}{4}$ inch 4 x 8 foot plywood shall be vertically mounted on the wall in the Computer Room within 3 feet of an electrical outlet and the wiring cabinet. The backboard should be attached to the wall using correct mounting hardware and procedures. If the wall is sheet-rocked, attach the backboard to the studs. If the wall is concrete, attach the backboard using anchors. The backboard should be painted with fire retardant paint the same color as the interior walls of the building. This will be the extended demarcation point and for the installation of phone equipment.

10. TELEPHONE SYSTEM

A telephone demarcation point (D-mark) must be provided on a type 66S block on the backboard for all telephone lines prior to the move date. The telephone system will be moved by USDA to a new office and will be installed by USDA technicians during move-in.

11. DISTRIBUTION CLOSETS AND CABLE PATHWAYS

Facilities requiring multiple distribution points within the building or on multiple floors will comply with ANSI/TIA/EIA-569-B standards.

12. DATA CABLING/TELECOMMUNICATIONS

- a. General Specifications. All premise data/telecommunications cabling will comply with TIA/EIA-568-B. All new installations will use Category 6 cabling, as specified in TIA/EIA-568-B.2-1, or higher. All cabling will meet local building codes.
- b. Exceptions. Renovations to buildings which currently comply with TIA/EIA-568-A and contain Category 5 cable and terminations may continue to use Category 5 wiring and terminations as specified in TIA/EIA-568-A.

All substantial additions to, or replacements of, existing wiring should comply with the specifications in 12(a) where possible.

NOTE. Category 5 wiring is unsuitable for Ethernet speeds above 100 Mb/sec.

c. Copper Cable Installation.

- (1) Provide, place, terminate and test Cat-6 certified 100-ohm Balanced Twisted Pair cables according to applicable standards.
- (2) Data cable and voice cables shall be terminated with Cat-6 compliant terminations (patch panels, wall outlets, etc.).
- (3) All Balanced Twisted Pair cables shall be terminated using the T568A pin/pair assignments as specified in TIA/EIA-568-B and per FTR 1090-1997.

d. Copper Cable Specification. All cable equipment and materials must be manufactured by facilities that are International Organization for Standardization (ISO) 9001 registered and certified as follows:

- (1) Shall be Cat-6 or Cat-6a rated in accordance with ANSI/TIA/EIA-568-B.
- (2) Shall be four-pair, balanced, 100-Ohm, 24 American Wire Gage (AWG).
- (3) The selected cable must have contiguous, two-foot segment-length markers printed on the cable jacket. The markings must also show cable manufacturer, cable model number or name, cable part number, Cat-6 or Cat-6a designation, a UL or ETL verification designation, a CMP type, and a “tested to 350 MHz” or above designation.
- (4) Shall be tested and certified by the installer to comply with the previous requirements.

e. Data Fiber Cable Installation.

- (1) Fiber optic cable shall be used for all links in excess of 90 meters and where appropriate. There shall be no 90° bends in any fiber cables with a radius of less than three (3) inches.
- (2) All fiber cable links less than 500 meters shall be 6-strands, multimode optical fiber cable.
- (3) All Optical Fiber, Conductive, Plenum (OFCP) or Optical Fiber Conductive Riser (OFCR) rated fiber cable shall be properly grounded at both ends and may not be installed in the same cable tray or conduit as power cables.
- (4) All ANSI/TIA/EIA-568-B requirements for fiber cable installation, testing, and termination will be observed.
- (5) All strands of each fiber cable shall be terminated at each end of the cable, with either Straight Tip (ST) or Standard Connector (SC) connectors, as appropriate to the related equipment interface connector, and will be conveyed to the selected cable contractor upon request.

FIGURE 1

SC Connector



FIGURE 2

ST Connector



- (6) Supply several sets of fiber patch cords that should not only serve immediate switch connection concerns, but allow for possible switch update connections in the future. The unused fiber patch cables will be kept in reserve at this site, in the event that such switch updates do occur.

f. Data Fiber Cable Specifications.

- (1) All fiber cable shall be 6-strand, multimode, tight buffered, 50 x 125 μm optical fiber, rated OFCP or OFCR as appropriate, and must be clearly marked as such on the cable sheathing.
- (2) All fiber link cable runs, shall be run within orange, plenum rated inter-duct, and appropriately sized according to the number of fiber runs to be contained.
- (3) Both the fiber cable sheathing and the protective inter-duct shall be colored orange to denote multimode fiber.

g. Wall Input/Output (I/O) Face Plates for Work Area I/O Connections. Work areas will have a quad or hex outlet plate connector with four or six RJ-45 connectors (see diagram). Extra outlet plate connectors will also be required in some common areas. All drops will be identified and numbered on the office floor plan prior to installation. Each of the four or six connectors will be cabled with 4-pair balanced twisted-pair cable. The data cables will be category 6 as listed in the cable specification block. These cables will be terminated with RJ-45 connectors at the device end. The other end will be punched down on an RJ-45/110-type patch panel in the LWV wiring cabinet. Each quad plate **MUST** be labeled with the work station number (1, 2, etc.) and the A, B, C etc. format. Each connection **MUST** be identified as (1A, 1B, 2A, 2B, etc.) on the corresponding patch panel location.

FIGURE 3

Quad Plate

Ports A, B, C – Data

Port D – Phone

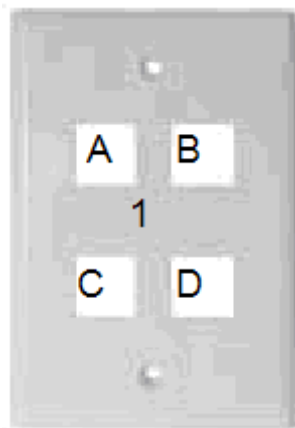
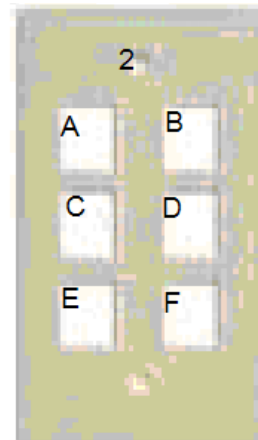


FIGURE 4

Hex Plate

Ports A, B, C, D, E – Data

Port F – Phone



13. LAN/WAN/VOICE CABINET

The Government will provide the LAN/WAN/VOICE cabinet, and a cable installation contractor will provide and install the wiring, cabling, and patch panels in the cabinet as specified by the TSD Group Manager. Patch panels will be RJ-45/110 type and appropriately-sized, based upon the number of quad and/or hex outlet plates. A wire service loop that will allow the cabinet to freely move a minimum of six feet in any direction will be installed by the cable installation contractor as part of the cable installation. The RJ-45/110 type patch panel must be mounted in the cabinet in the place designated by the TSD Group Manager.

14. COPIES OF RELATED DOCUMENTS

- a. Copies of FTRs. Copies of FTRs are available from:

The National Communications System (NCS), Technology and Standards Division
(N6)

701 South Court House Road

Arlington, Virginia 22204-2198

Telephone (703) 607-6204

- b. Copies of the specifications and related documents. Copies of the specifications and related documents can be obtained from:

- (1) Global Engineering Documents

15 Inverness Way East

Englewood, Colorado 80112

Telephone (800) 854-7179 or (303) 397-7956

- (2) National Resource for Global Standards, www.nssn.org.

15. INQUIRIES

Direct all questions concerning this notice to OCIO, ITS, Infrastructure Operations Division (IOD), Telecommunications Operations Branch (TOB).

16. ABBREVIATIONS/DEFINITIONS

ADB	Architecture Definition Branch
ADP	Automated Data Processing
ANSI	American National Standards Institute
EIA	Electronics Industry Association
FIPS	Federal Information Processing Standards
FTR	Federal Telecommunications Recommendations
GWAC	General Services Administration Wiring and Cabling Contract
IDD	Infrastructure Definition Division
IOD	Infrastructure Operations Division
ITS	International Technology Services
LWV	Local Area Network (LAN)/Wide Area Network (WAN)/Voice
NCS	National Communications System
SCA	Service Center Agencies
TIA	Telecommunications Industry Association
TOB	Telecommunications Operation Branch

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