United States Department of Agriculture

Wiring and Cabling: Guidelines for FPAC and RD Offices

Version 0.5

Note: Computer Room Requirements and Specifications included on page 6.

Introduction

Recent updates to two Department Regulations (DRs), DR 3300-001-G and 3300-001-K, supersede the outdated guidance in DR 3902-001, "Service Center Technology Modernization Project (SCTMP) Wiring/Cabling Specifications for Service Center Agencies' (SCA) Computer Rooms." As a result, 3902-001 has been cancelled and should no longer be used. Though it is cancelled, it did have some information that was still useful and applicable. Therefore, the Office of the Chief Information Officer's Client Experience Center (OCIO-CEC) has taken that information and documented it in these guidelines to help supplement the references below.

References

1. DR 3300-001-G, "Sharing of Telecommunications Resources"
2. DR 3300-001-K, "Installation of Telecommunications Cables in Federal Buildings"
3. Departmental Manual (DM) 3410-001, "Physical Security Standards for Information Technology (IT) Restricted Space"
4. (In DRAFT), "CEC Space and ADP Room Guidelines" Available from OCIO-CEC-Business Services Division. (BSD)
5. Technical Support Division (TSD) Site Moves Standard Operating Procedure. (SOP)

Scope

It is expected that with End User Consolidation (EUC) and the award of the new Enterprise Infrastructure Solutions (EIS) contract that there will be more opportunity and formal guidance forthcoming on facility and information technology services consolidation. However, until then, these guidelines should be used to assist with the wiring/cabling needs for only Farm Production and Conservation (FPAC) & Rural Development offices. (RD)

Responsibilities

The TSD Group Manager (GM) has the authority and responsibility for oversight of the office Automated Data Processing (ADP) rooms and cabling. They are responsible for providing approval of all cabling plans. The Mission Area leasing agent is responsible for including all applicable requirements and standards in solicitations.

Questions on these guidelines can be directed to OCIO-CEC's Infrastructure Operations Division, Telecommunications Administration Services Branch (OCIO-CEC-IOD-TASB).

Computer Room Physical and Security Requirements

Refer to Departmental Manual (DM 3510-001) "Physical Security Standards for Information Technology (IT) Restricted Space" and the "CEC Space and ADP Room Guidelines". **REF Pg 6, ADDENDUM, ADP Room Specs.**

Dedicated Electrical Circuits and Outlets for ADP Equipment

1. ADP Room and Demarcation Point Circuits: Provide and install dedicated electrical circuits with isolated grounds in the computer room. Dedicated circuits must be 110 volt, 20-amp 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 and any distribution closets. One dedicated outlet for the explicit use of USDA/OCIO/CEC should also be provided at the demarcation point. The main electrical panel for the computer/voice equipment will be properly grounded.
2. General Office Space Circuits: Provide enough dedicated electrical circuits and multiple outlets at designated locations throughout the service center to accommodate workstations, copiers, etc.
3. Electrical Requirements for Uninterruptible Power Supply (UPS) Circuit: All CEC network equipment in the computer room is required to be connected to a UPS.
4. Number and Type of Circuits: There will be a minimum of one 120 volt, 30-amp minimum with true ground, terminated into a twisting-lock NEMA L5-30R receptacle. Each dedicated circuit must have insulated, isolated earth ground; conduit ground is not acceptable.
5. Location of the UPS receptacle: The receptacle will be located within a maximum of 4.5 feet from the back of the computer room wiring cabinet.

Plywood Wall Mounting

One sheet of ¾ inch 4 x 4-foot plywood or equivalent open space on an existing backboard, shall be vertically mounted on the wall at the internal demarcation point within 3-feet of an electrical outlet. 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.

Demarcation Point (D-Mark)

1. When possible, all telecommunication company demarcation points should be internal to the building. The lessor is responsible for ensuring there is a route available for any extended demark need from the building demark to the USDA ADP room. Any demarcation extension should be coordinated with TSD and the sponsoring agency to ensure the work is properly sourced and funded.
2. A 4-inch conduit with pull cable for the explicit use of USDA should be installed from the demarcation point to the USDA ADP (Computer) Room.
3. For any analog Plain Old Telephone Service (POTS) lines delivered to the office, extend them from the demark to the extended demark at the computer room and utilize 6P4C surface mount jacks to accommodate RJ11 cables, such as the following:

Distribution Closets and Cable Pathways

1. For the standard service center, data cabling may traverse non-USDA space (for example, in the space above a drop ceiling) without any special protection (conduit, etc.). Any exceptions to this will be identified site-specifically by the TSD GM.
2. Data cabling may terminate in USDA or USDA partner space. If any space changes definition (for example, a USDA office is discontinued without the entire location being closed, and the abandoned space is leased to a non-USDA tenant), the USDA cable terminations must be removed from the now, non-USDA space.
3. When multiple buildings are to be connected as part of one cable plant, the connection is to be run via fiber optic cable.
4. When cable consists of multiple runs, the facility owner shall provide cable trays or J-hooks to ensure that the cable does not come into contact with the suspended ceiling.

Data Cabling/Telecommunications

1. All new installations will use Category (Cat) 6 Ethernet cabling or higher and will meet local building codes. Exceptions: Minor renovations to buildings that currently contain Cat 5 cable and terminations may continue to do so. However, all substantial additions to or replacements of existing wiring should be replaced with Cat 6 where possible.
2. Cat 5 cabling is unsuitable for Ethernet speeds above 100 Mb/sec and for office Wireless Access Points (WAPs). So, all cabling specifically for WAPs must use Cat 6. In addition, when a move or renovation leads to an upgrade of an office to Cat 6, the patch cables in the ADP room must be replaced with Cat 6 compliant cables as well.
3. Copper Cable Installation: All data cable and voice cables shall be terminated with Cat 6 compliant terminations (patch panels, wall outlets, etc.). Upon completion, it shall be tested and certified by the installer to ensure it is operational and within compliance of the reference documents. Finally, if occupying space with existing cabling, it should still be tested and certified to comply with the reference documents as well.
4. Data Fiber Cable Installation: 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.

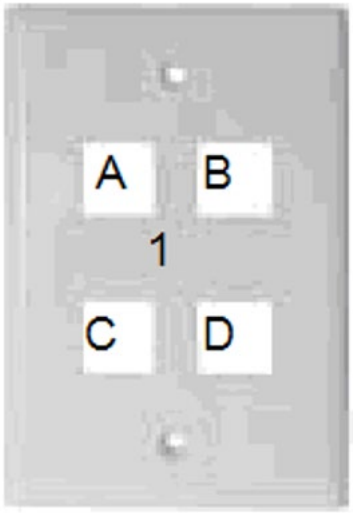
SC Connector

ST Connector

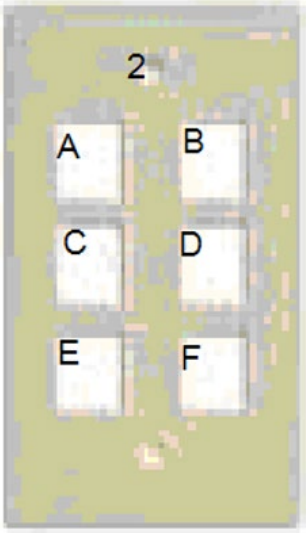
Note: Supply several sets of fiber patch cords that should not only serve immediate switch connection concerns but allow for possible switch update connections in the future. The unused fiber patch cables will be kept in reserve at this site.

5. Wall Input/Output (I/O) Face Plates for Work Areas: Work areas will have a dual, quad, or hex outlet plate with corresponding RJ-45 connectors (see diagram below) or integrated into modular furniture. 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. The other end will be punched down on an RJ-45/110-type patch panel in the ADP room wiring cabinet. Each dual, quad, or hex plate must be labeled with the workstation 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.

Quad Plate



Hex Plate



Local Area Network (LAN) / Wide Area Network (WAN) / Voice Cabinet

1. 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 GM. Patch panels will be RJ-45/110 type and appropriately sized, based upon the number of 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 GM.

   Note: Though not recommended, the patch panels may be installed on the plywood board and the cabling terminated into them only if required by the lessor.

2. Where patch panel size and equipment requirements have grown beyond the capacity of a single cabinet, racks or additional cabinets may be used. However, any additional racks or cabinets need to follow similar specifications as that original equipment.

3. Distribution points that have smaller equipment requirements (for example, a single 24-port switch) can utilize half-height or wall mounted racks, rather than full, floor standing cabinets. However, this equipment still should be secured and protected in some sort of cabinet.

Direct all questions to OCIO-CEC-IOD-TASB.

Abbreviations / Definitions

- ADP Automated Data Processing
- BSD Business Services Division
- Cat Category (i.e., Cat 6 cable designations)
- CEC Client Experience Center
- DM Departmental Manual
- DR Departmental Regulation
- EIS Enterprise Infrastructure Solutions
- EUC End User Consolidation
- FPAC Farm Production and Conservation
- GM Group Manager
- IOD Infrastructure Operations Division
- LAN Local Area Network
- OCIO Office of the Chief Information Officer
- RD Rural Development
- SC Standard Connector
- SOP Standard Operating Procedures
- ST Straight Tip
- TASB Telecommunications Administration Services Branch
- TSD Technical Support Division
- UPS Uninterruptible Power Supply
- WAN Wide Area Network
- WAP Wireless Access Point

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Computer Room Physical and Security Requirements (USDA Level 1 Security Sites)

SPECIFICATIONS FOR THE ADP ROOM

1. **Square Footage.** The ADP room shall be a minimum of 75 square feet and a maximum of 100 square feet. The configuration of the room shall allow a three-foot clearance around equipment.
2. **Doors.** The number of entrances to the ADP room will be kept to a minimum as required by local fire code. Every entrance into an ADP room must be a metal clad or solid core, lockable door. A managed process will be utilized to control all access to the room. The process may be electronic or manual. One key or code will be assigned to an individual from each SCA. All computer room doors shall be removed from the master key system of the facility. Exterior doors must have either interior hinges or exterior hinges with non-removable pins.
3. **Windows.** There will be NO WINDOWS in the ADP room, even if a portion of the room has exterior walls.
4. **Flooring.** The flooring will be anti-static hard surface; no carpet.
5. **Walls.** Walls of the ADP room shall extend from the structural floor slab to the structural ceiling slab with sound transmission class 40 or better.
6. **Temperature and Humidity.** The ADP room shall be cooled at all times. The ambient room temperature shall be maintained between 65° to 75°F (18° to 26°C). The ambient relative humidity levels shall be maintained between 35% and 55%. The temperature and humidity controls shall be managed within the room, including points of contacts for emergency situations. The ADP room shall have access to temperature readings within the space. Air conditioning must be controlled on the weekends and holidays as needed to maintain the minimum temperature in the room. Depending on the equipment to be placed in the room, a separate air conditioning unit may be required.
7. **Shared Space.** The ADP room shall NOT be designed as a multi-use room. Only ADP and telephone equipment shall be in this room. Mail machines, printers (unless specifically for the ADP equipment), faxes, file cabinets, shared storage, copiers, plotters, etc. shall be located outside the ADP room. ITS storage will NOT be in the ADP room.
8. **Plumbing.** Because of the danger of water damage, the ADP room shall not be located in areas where water bearing pipes would be overhead. ADP room should be located to avoid walls with plumbing.
9. **Fire Suppressant Systems.** A sprinkler system will be installed when local building codes require it. A dry-pipe system is preferred. Sprinkler heads shall be placed so that they are not directly above any equipment. Each ADP room shall be equipped with any type ***"Clean Agent"*** (at least 5 to 6 lbs) fire extinguishers that are approved/designed to be used for Computer, Telecommunications, Data Storage and Laboratory type rooms, which houses delicate electronic equipment. An annual inspection must be performed on the fire extinguisher.
10. **Design Approval.** In SCA offices, the Group Manager shall review the electrical section of the construction drawings to ensure that the location of the data ports, and electrical outlets will be accessible once systems furniture is installed. In all other offices, the appropriate Division Directors shall review and approve the floor plans. All final floor plans for the ADP room and general space shall be approved by the OCIO-ITS Realty Specialist before construction begins.
11. **Public Areas.** Where possible, the ADP room shall be within the interior of the building and away from public areas. Where possible, ensure that all computer rooms are not located either above or below public areas in multi-story buildings.
12. **Mailrooms and Loading Docks.** Where possible, the ADP room shall not be located in close proximity to mailrooms or loading docks.
13. **Signage.** Ensure that all signs identifying the ADP room are removed from public view. Directories or building maps that identify the location of critical or sensitive asset locations shall not be displayed. Exterior signs are not to identify OCIO/ITS/ADP within the SCA.
14. **Electrical Power.** Where possible, the capability of shutting off power to an information system component that may be malfunctioning or threatened without endangering personnel by requiring them to approach the equipment shall be included in new and refurbished ADP **rooms.**