Infrastructure Operations Division
U.S. DEPARTMENT OF AGRICULTURE

ADP and Wiring Guidelines

Version 3.0

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Introduction

Updates to two Department Regulations (DRs), DR 3300-001-G and 3300-001-K, supersede the outdated guidance in DR 3902-001, "Service Center Technology Modernization Project (SCTMP) Wiring/Cabling Specifications for Service Center Agencies' (SCA) Computer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 canceled and should no longer be used. Though it is canceled, 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

DR 3300-001-G, "Sharing of Telecommunications Resources"

DR 3300-001-K, "Installation of Telecommunications Cables in Federal Buildings"

Departmental Manual (DM) 3510-001, "Physical Security Standards for Information Technology (IT) Restricted Space"

"CEC Space and ADP Room Guidelines" Available from the OCIO-CEC-Business Services Division (BSD)

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, there will be more 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 offices.

Responsibilities

The OCIO-CEC 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 the OCIO-CEC.

Dedicated Electrical Circuits and Outlets for ADP Equipment

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.

General Office Space Circuits: Provide enough dedicated electrical circuits and multiple outlets at designated locations throughout the service center to accommodate workstations, copiers, etc.

Electrical Requirements for Uninterruptible Power Supply (UPS) Circuit: All CEC network equipment in the computer room is required to be connected to a UPS.

a) CEC or the CEC contracted installer is responsible for the installation of and engineering the load on the UPS.

b) The agency will be responsible for funding UPS.

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.

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 three 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)

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 responsibly sourced and funded.

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.

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 one shown to the right.

Distribution Closets and Cable Pathways

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 OCIO-CEC.

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.

When multiple buildings are to be connected as part of one cable plant, the connection is to be run via fiber optic cable.

When cable consists of multiple runs, the facility owner shall provide cable trays or J-hooks to ensure that the cable does not come in contact with the suspended ceiling.

Data Cabling/Telecommunications

All new installations will use Category 6 (CAT6) ethernet cabling or higher and will meet local building codes. Exceptions: Minor renovations to buildings that currently contain CAT5 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.

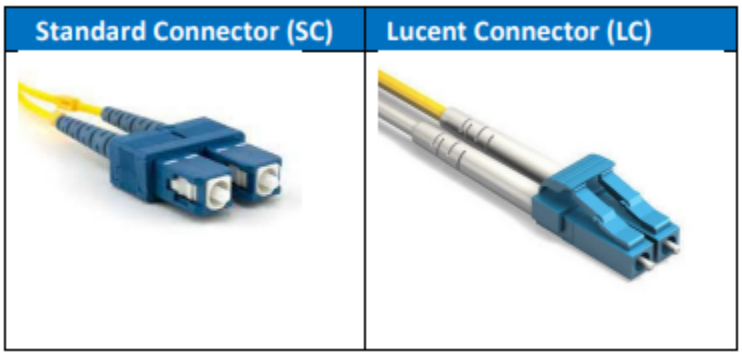
CAT5 cabling is unsuitable for ethernet speeds above 100 Mb/sec and for office Wireless Access Points (WAPs). Therefore, all cabling specifically for WAPs must use CAT6. In addition, when a move or renovation leads to an upgrade of an office to CAT6, the patch cables in the ADP room must be replaced with CAT6-compliant cables as well.

Category 5, 5e, 6, 6a & 7 Cable Comparison					
	CAT5	CAT5e	CAT6	CAT6a	CAT7 (Proposed)
Frequency	100 MHz	100 MHz	250 MHz	500 MHz	600 MHz
Attenuation (min. at 100MHz)	22 dB	22 dB	19.8 dB	--	20.8 dB
Characteristic Impedance	100 ohms = 15%	100 ohms = 15%	100 ohms = 15%	--	100 ohms = 15%
NEXT (min. at 100MHz)	32.3 dB	35.3 dB	44.3 dB	27.9 dB	62.1 dB
PS-NEXT (min. at 100 MHz)	N/A	32.3 dB	42.3 dB	--	59.1 dB
EL-FEXT (min. at 100 MHz)	N/A	23.8 dB	27.8 dB	9.3 dB	Not yet specified
PS-ELFEXT (min. at 100 MHz)	N/A	20.8 dB	24.8 dB	--	Not yet specified
PS-ANEXT (min. at 500 MHz)	--	--	--	49.5 dB	--
PS-AELFEXT (min. at 500 MHz)	16.0 dB	20.1 dB	20.1 dB	23.0 dB	14.1 dB
Return Loss (min. at 100 MHz)	16.0 dB	20.1 dB	20.1 dB	8.0 dB	14.1 dB
Delay Skew (max. per 100m)	N/A	45 ns	45 ns	--	20 ns
Networks Supported	100BASE-T	1000BASE-T	1000BASE-TX	10GBASE	Not yet specified

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 evaluated and certified by the installer to ensure it is operational and within compliance with the reference documents. Finally, if occupying space with existing cabling, it should still be evaluated and certified to comply with the reference documents as well.

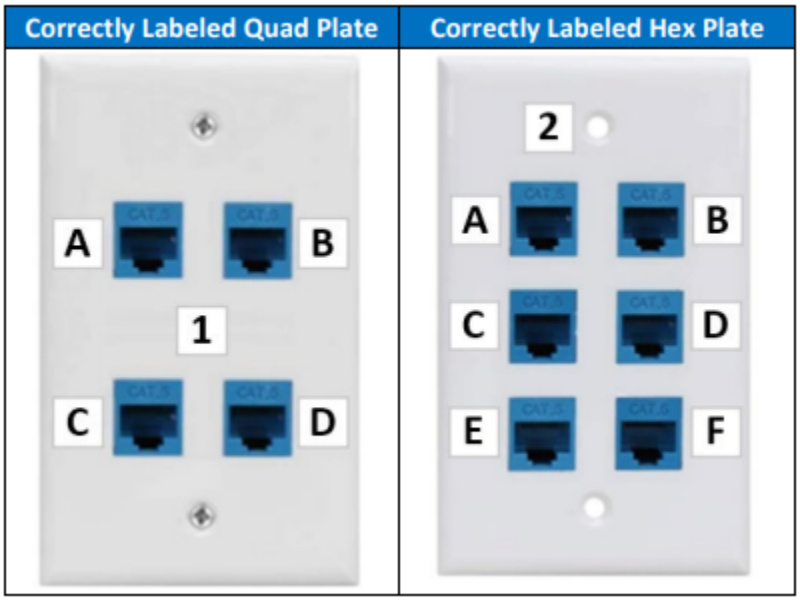
Data Fiber Cable Installation: All strands of each fiber cable shall be terminated at each end of the cable, with either Lucent Connector (LC) or Standard Connector (SC) connectors, as

appropriate to the related equipment interface connector, and will be conveyed to the selected cable contractor upon request.



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.

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 diagrams to right) 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.



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

The Lessor or Government contracted installers will provide and install the LAN/WAN/Voice cabinet, wiring, cabling, and patch panels in the cabinet as specified by OCIO-CEC. 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 OCIO-CEC.

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.

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.

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.

CEC Space Guidelines

It is USDA policy to manage occupied space efficiently and effectively to achieve the most customer-friendly facilities, while ensuring effective and efficient coordination of resource sharing. To accomplish this, the Guide ensures that space is provided to allow CEC employees to efficiently perform their duties, complies with DRs, and keeps space costs to a minimum.

Offices – The same square footage as comparable grade level offices of the customer in the building, not to exceed 150 square feet. Supervisory personnel will be given priority for private offices over non-supervisory personnel.

OCIO-CEC Space – When CEC staff is present a cubicle or office, storage and work/setup space is needed. It is preferred that the CEC staff cubicles, storage, and set-up space are all located in a suite with a lockable door. If this is not possible it is preferred that all CEC rooms are adjoining. If they are adjoining rooms, the storage and set-up space must have a lockable door. The IT specialist can sit in a cubicle outside of this area. Square footage for the storage and work/setup space should be allotted as follows:

0-3 CEC Staff – 50 square feet for storage and 50 square feet for work/set up space 4-6 CEC Staff – 100 square feet for storage and 100 square feet for work/set up space 7-9 CEC Staff – 150 square feet for storage and 150 square feet for work/set up space.

Space for Managers – CEC Division Directors, Branch Chiefs, and Group Managers. At locations where private offices are allocated to managers, CEC Division Directors, Branch Chiefs, and Group Managers will also be assigned a private office with a lockable door. This office may be within or adjacent to the general CEC room.

ADP Room Guidelines

If all requirements in DM 3510-001, Chapter 2, Part I, Physical Security Standards for Information Technology (IT) Restricted Space and the additional CEC Requests listed below cannot be met, a waiver must be submitted to CEC, Business Services Division, Asset Management Branch, Space Representative through the Group Manager.

In addition, CEC requests the following:

ADP Room Size – 75SF minimum and must be large enough to accommodate all equipment (CEC IT staff should be contacted for information on equipment needed) to support the office. This room is for CEC and customer information technology equipment. The room must be large enough to allow three feet for accessibility around all sides of the equipment. If a determination is made by the Group Manager that the cabling loop will allow the three feet accessibility this is acceptable.

Temperature and Humidity – ADP rooms must always be cooled. The ambient room temperature must be maintained between 65 to 78 degrees Fahrenheit (18 to 26 degrees

Celsius). The ambient relative humidity levels must be maintained between 35 and 55 percent. The temperature and humidity controls must be managed within the room. Temperature readings will be visible within the ADP room. Air conditioning and humidity levels must be maintained at established levels 24 hours a day, 7 days a week.

Emergency Contacts – A list of individuals who can be contacted during an emergency must be posted in the ADP room.

Electrical Power – Whenever possible, new, and refurbished ADP rooms will have the ability to shut off power to a malfunctioning information system component.

Plumbing – Because of the danger of water damage, the ADP room must not be in areas where water-bearing pipes would be overhead.

Flooring – The flooring will be anti-static solid surface. Carpet is not allowed.

Shared Space – ADP rooms must not be designed as multi-use rooms, i.e., storage, etc.

Fire Extinguisher – Each ADP room shall be equipped with a cleaning agent of 5 to 6 pounds fire extinguisher. An annual inspection must be performed on the fire extinguisher.

Wiring/Cabling Requirements – Refer to the Wiring and Cabling Guidelines for Offices Version 2.3. Please contact your Group Manager to obtain a copy.

Computer Room Physical and Security Requirements

Location -

- The IT Space will be located in the interior of the building away from exterior windows, if practical;
- The computer room will be protected by a fire suppressant system in accordance with local fire code, preferably dry pipe;
- Entrances to the IT restricted space will be kept to the minimum required by local fire code;
- Mailrooms will not be located within 50 feet of IT Restricted Space and cannot be placed over or under this space;
- Storage areas and loading docks will not be located within 50 feet of IT Restricted Space and cannot be placed over or under this space;
- Exterior IT Restricted Space doors will have either interior hinges or exterior hinges with non-removable pins.

Security -

- Entrance to the computer room will be via electronic access control with the capability of providing an audit trail, where possible;
- Exterior computer room doors having key access hardware will be removed from the Master Key system of the facility.

Abbreviations / Definitions

Abbreviation	Definition
ADP	Automated Data Processing
BSD	Business Services Division
CAT	Category (e.g., CAT6 cable designations)
CEC	Client Experience Center
DM	Departmental Manual
DR	Departmental Regulation
EIS	Enterprise Infrastructure Solutions
EUC	End User Consolidation
GM	Group Manager
IOD	Infrastructure Operations Division
LAN	Local Area Network
OCIO	Office of the Chief Information Officer
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

Revision History

Version	Date	By	Notes
3.0	November 3, 2023	Anna Risse	Initial draft: combined the CEC Space and ADP Room Checklist Guidelines document and the Wiring Cabling Guidelines Offices document into one – refer to those documents if needed; edited, formatted, and transferred the new ADP and Wiring Guidelines to IOD new template with TOC.