Office of Information and Technology DESIGN AND CONSTRUCTION GUIDANCE
(revised 3/8/11)

1. General VA Palo Alto Health Care System

1.1 Codes of Practice
Adherence to the VA Network Cable Specifications by cabling installation contractors is a condition of contract. In the event the cabling installation is sub-contracted by the prime contractor, the prime contractor will supply a copy of these specifications to the sub-contractor. This requirement shall cover all levels of sub-contracting.

Any variations to the issued job specification shall be referred for approval to the Contracting Officer Representative (COR).

Contractors shall install all cable and cabling products with a proven track record for data network cabling installations. Such installations shall also meet all requirements as set out in this specification.

Un-terminated "future capacity" cables are not permitted. All installed cables shall be terminated at each end and documentation, labeling and (where applicable) test results provided. This applies to all permanently installed cable types.

1.2 Documentation
At least two copies of documents describing the data cable installation shall be provided. A copy to be supplied to the COR for approval

1.3 Network Equipment

COR must approve the installation or removal of network hardware equipment. Non-VA staff shall carry out such work only with prior approval from the COR.

2. Unshielded Twisted Pair (UTP) Category 6 *Contractor shall use a Cable color other than White*

IEEE 802.3 100BaseT UTP Level 6, 24 AWG plenum rated cable.
Insulation – high-speed data grade.
Sheath – high temperature UL data grade.

2.1 Network Configuration Constraints *Contractor shall use a Cable color other than White *
Each segment comprises a four pair Category 6 cable.
Pin all 8 conductors.
Maximum link length – 90 meters
Maximum channel length – 100 meters
Maximum number of stations per segment – 1.

2.2 Installation Constraints

2.2.1 Installation Standards
Cable and connecting hardware meeting or exceeding the Category 6 specifications shall be used throughout, with pairs terminated according to the T568B wiring scheme.

2.2.2 General Requirements
The cabling system shall include all patch panels, horizontal cables, transition blocks, vertical cabling, modular jacks, system cables, patch cables, cable management, and a comprehensive labeling system. Cable trays shall be installed in main hallways in the place of j-hooks.

2.2.3 Data Outlets
The following information represents a minimum requirement for the number of UTP outlets that shall be installed in each type of workspace.

If the construction at the location of the voice/data outlet is drywall, provide flush-mounted single-gang outlet boxes with six-port base plates and applicable wall device faceplates (cable to be installed behind drywall).

If the construction at the location of the voice/data outlet is a solid wall, provide surface-mounted single-gang outlet boxes with six-port base plates and applicable wall device faceplates (cable to be installed in plastic wall mold equipped with protective insulator or sleeve).

Where modular furniture is used, the location of the voice/data outlet will be in the baseboard of the furniture, where the networked equipment (computers, printers, etc) will be located. Provide flush-mounted single gang outlet boxes with six-port base plates and applicable wall device faceplates. If flush-mounted single-gang outlet boxes cannot be used, then modular surface mount boxes will be used with six-port inserts. All cable runs in modular furniture will be through furniture wire baseboard ducts/conduit.

2.2.4 Horizontal Cabling
The horizontal wiring shall be a star topology connecting each network outlet jack to a jack on a patch panel rack in a communications enclosure/room.

The cable used shall be 4-pair 100-ohm high performance, 24 AWG solid conductor, and unshielded twisted pair cable, meeting or exceeding the Category 6 specification.

2.2.5 Network Outlet and Labeling
*ETHERNET 568B .5 RJ 45 shall be blue and .6 RJ 45 shall be yellow *
*VOICE Pair one in insert one shall be white and Pair two in insert two shall be white
Each network outlet faceplate shall incorporate one or more modular, universal RJ45 IDC jack sockets meeting or exceeding the Category 6 specification. Label each jack at this wall device faceplate to correspond with the label on the patch panel jack (N1, N2, etc.). All numbering should be readily visible.

2.2.6 Cable Installation

The cable interconnecting a network outlet to the patch panel shall be one continuous length with no intermediate joins, splices or taps. Each cable runs shall be no longer than 300 feet total in length, from start to finish.

Cable termination onto a horizontal distribution panel or patch panel shall be undertaken in a manner that permits additional cables to be terminated without unduly disturbing previously installed cables.

Each voice/data outlet / device location will have six (6) cable runs. Two (2) will terminate on the AT&T style 110 block for voice requirements and four (4) will terminate on the high density rack mounted patch panel. (1)

No more than 24 cables shall be cable tied in a bunch.

A 2-meter loop of cable shall be left within or on the approach to each communications room/enclosure to facilitate re-termination of the cable in the future, should this be required. Such cable slack shall be coiled and supported in a neat and practical manner.

A 0.5-meter loop of cable shall be left in the trunking on the approach to each network outlet to facilitate re-termination of the cable in the future, should this be required.
The amount of untwisting in a pair as a result of termination to connecting hardware shall be no greater than 13mm, and less than this if possible.

Cable bend radii shall be no less than eight times the cable diameter or as specified by the cable manufacturer; whichever is the greater.
Precautions shall be observed to eliminate cable stress caused by tension in suspended cable runs and tightly strapped bundles.

Cable bundles shall not rub on, or be unduly compressed against any cable tray, equipment racking, or other cable support.
Cable bundles shall not obstruct the installation and removal of equipment in equipment racks.

Where UTP cables are run parallel with electrical cables the following minimum separation rules shall be observed:

Circuit rating	Unshielded power/data	Shielded power/data
≤ 1 KVA	300mm	25mm
≥ 1 < 2 KVA	450mm	50mm
≥ 2 < 5 KVA	600mm	150mm
5 KVA	1500mm	300mm

Where UTP cables are run in the proximity of electrical motors or transformers the minimum separation shall be 1 meter.

In situations where the above minimum distances cannot be applied due to a lack of available space, data cables shall be enclosed in rigid and/or flexible steel conduit. Conduit shall be bonded to a protective ground at one point in the installation. No steel cabling enclosure medium shall be installed without having continuity to a protective ground.

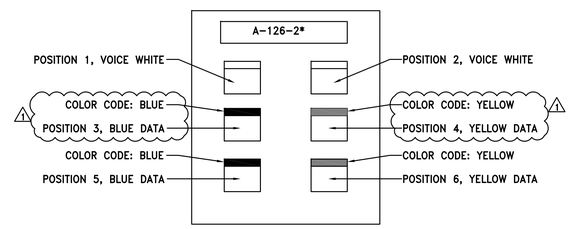
2.4 Testing
Testing shall be carried out with building electrical services operating (lighting, power, air-conditioning plant and lift services where applicable).

Wiring shall be tested to verify the continuity, integrity and polarity of the cable according to the specified pin and pair grouping assignments.

2.5 Documentation

The contractor shall provide installation documentation at the completion of the cabling system installation.

The contractor shall certify that the cabling system meets the UTP cabling system requirements for Category 6 performance levels.



* THE LABEL FOR EACH WALL JACK SHOULD BE THE ROOM NUMBER HYPHEN THE NUMBER OF JACK IN THE ROOM. IN THIS EXAMPLE THE ROOM NUMBER IS A-126, AND THIS IS THE SECOND JACK IN THE ROOM

1 TYPICAL DATA OUTLET
NOT TO SCALE

FULLY SPRINKLERED
CONSTRUCTION DOCUMENTS - BID SET

Revisions:	Date
1 AMENDMENT NO.5	5-29-15

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Drawing Title: **SPECIFICATION**
Approved: Project Director

Project Title: **RENOVATE SLEEP ROOMS FOR CLINICAL SUPPORT SERVICES BUILDING 101**
Location: **VAPAHCS - PALO ALTO**
Date: **SEPTEMBER 30, 2013** | Checked: **SJ/MF** | Drawn: **FWA TEAM**

Project Number: **640-12-117P**
Building Number: **BLDG. 101/3RD FLR.**
Drawing Number: **ES-7.2**
Dwg. -- of --

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