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## Standards for Data and Telephone Cabling

1. This standard details the contractor responsibilities for installation of the data and telecom wiring at The New School University (TNS). Data wiring plans will be released as available.
2. Unless otherwise specified, all material is to be supplied by the wiring contractor.
3. All work on any project shall be in accordance with the procedures and practices of ANSI/TIA/EIA 568-B-1, ANSI/TIA/EIA 568-B-2 plus addendums, ANSI/TIA/EIA 568-B-3, TIA/EIA 569-A-3, TIA/EIA 606-A, TIA/EIA 607 and TIA/EIA-604-14A.
4. Cable Specifications:
  - a. Horizontal cable cables from the IDF to each work area outlet (WAO) shall be General Cable blue, 4 pair, plenum rated 100Ω Category 6, P/N **7131688** or equivalent.
  - b. Horizontal telephone cables from the IDF to each work area outlet (WAO) shall be General Cable white, 4 pair, plenum rated 100Ω Category 5e, P/N **5131450E**. or equivalent
  - c. Unless otherwise specified, the data backbone between each IDF and the MDF shall either be 24 strand 50/125μm multimode interlocking armored cable and/or, a minimum of six (6) enhanced Cat 6 cables, as specified by The New School.
  - d. The telephone backbone between the IDFs and the MDF shall be multiple 25 or 50 pair plenum rated Cat 5e cables, General Cable **P/N 39419-50WH** or **P/N 30171-100WH** or equivalent. The number and mix of cables is to be determined by the wiring contractor. At least 10% of the pairs shall remain as spares for future growth.
  - e. Cable TV shall be quad shielded plenum rated RG6 coax with F-Type connectors. TV terminations shall be to a dedicated wall plate in the work area and to the cable company point-of-presence on the transmission end.
  - f. All backbone cables shall be supported in the vertical cable duct per TIA/EIA-568-B.
  - g. Horizontal support for both backbone and horizontal work station cables to the IDF will be in The New School supplied ladder racks, trays or conduit for open ceilings.

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In closed ceilings, cabling may be supported from installed “black iron”, wiring contractor supplied “J” rings or in The New School supplied conduit. Where conduit is required, a pull box will be installed at every second ninety degree bend. Pull boxes will be large enough to accommodate a bend radius of at least eight (8) inches.

5. Work Area Outlets:

- a. Horizontal cable distribution from the IDF to the work areas will be via TSU provided overhead ladder racks or raceway unless otherwise specified. Both data and telephone cables shall be installed in these racks or raceway. Where the WAO is in an enclosed office, cables will pass through a drop ceiling and cables shall be ceiling mounting in accordance with current EIA/TIA standards.
- b. TSU electrical contractor will provide single gang wall boxes with  $\frac{3}{4}$ “stubups for the WAO in all enclosed offices. Where more than three cables are to be installed in the WAO, the stubup will be sized in accordance with Table 1.
- c. Where there are open office area spaces with office partitions. Cables to these open offices shall run from the ladder rack through NSU installed vertical conduits and through the partition cableway in the partitions to the work area.
- d. Unless otherwise specified, two data outlets shall be provided for each user. The data jacks shall be Hubbell Xcelerator, blue, Category 6: Hubbell P/N **HXJ6B**. Each data jack shall have one data cable wired in the TIA/EIA 568B configuration.
- e. Unless otherwise specified, two telephone outlets shall be provided for each user. The telephone jacks shall be Hubbell Xcelerator, office white, USOC 6 position: Hubbell P/N **HXJUOW**. Each telephone jack shall have one data cable with two pairs from the Cat5e cable terminated in a USOC RJ14 configuration.
- f. Unless otherwise specified, the closed office jacks will be mounted in a Hubbell 4 Port office white faceplate P/N **IFP14OW**. The two data jacks shall be mounted in the lower two positions and the two telephone jacks in the upper two locations.
- g. Unless otherwise specified, the open office jacks will be mounted in a in a Hubbell furniture plate, P/N **FP4BBK**, which fits the standard ANSI/TIA/EIA furniture opening. The two data jacks shall be mounted on the right side of the furniture plate and the two telephone jacks on the left.
- h. When audio/visual A/V cabinets are to be installed, the contractor will provide a Hubble four (4) port faceplate with four (4) data outlets as noted above.
- i. Outlets noted as WiFi shall be terminated in a single port outlet. The data jack shall be a Hubbell Xcelerator, yellow, Category 6: Hubbell P/N **HXJ6Y** or equivalent. Where the termination is to be in the ceiling or ladder rack, a single jack surface

mount box shall be provided to protect the jack. A service loop of at least fifteen feet shall be provided for each drop. If conditions allow, outlets will be mounted at least eight AFF. WiFi outlets and patch panel shall be labeled with the floor number, prefixed with the letter “W” and a jack number starting with the number “1”. All WiFi terminations in the data closet will grouped in the patch panel.

**Table 1**  
Conduit Capacity

Trade Size	Cable Outside Diameter (inches)						
	0.22	0.24	0.29	0.31	0.37	0.53	0.62
3/4	4	3	2	2	1	0	0
1	7	6	3	3	2	1	0
1 1/4	12	10	6	4	3	1	1
1 1/2	16	15	7	6	4	2	1
2	22	20	14	12	7	4	3
2 1/2	36	30	17	14	12	6	3
3	50	40	20	20	17	7	6
3 1/2	n/a	n/a	n/a	n/a	22	12	7
4	n/a	n/a	n/a	n/a	30	14	12

## 6. Installation

### a. Category 5e and 6 compliant Jacks – UTP

Jacks shall be installed to provide minimal signal impairment by preserving wire pair twists as close as possible to the point of mechanical termination. The amount of untwisting in a pair as a result of termination to the jack shall be no greater than 0.5 inches (13 mm).

Jacks shall be installed according to manufacturer’s instructions and properly mounted in plates, frames, housings or other appropriate mounting device.

Jacks shall be installed such that cables terminated to the jacks maintain a minimum bend radius of at least 4 times the cable diameter into the IDC contacts. Cables shall be terminated on jacks such that there is no tension on the conductors in the termination contacts.

## 7. IDF: All horizontal wiring shall be terminated in an Intermediate Data Frame (IDF) located on the same floor. Fiber backbone and telephone riser cables will be terminated in the IDF to link to the MDF.

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- a. Data cables shall be terminated on one or more Hubbell Category 6e 48 Port Patch Panels P/N **P648U**. All terminations shall be T568B.
  - b. The contractor shall install a fire retardant plywood sheet on the IDF wall for mounting 110 type terminal blocks. All telephone cables shall be terminated on one or more Hubbell 100 or 300 pair 110 blocks, P/N **110BLK100BWL** or **110BLK300BWL**, as required. All 4 pairs will be terminated on the 110 block.
  - c. The telephone riser cables will terminate on a Hubbell 300 pair 110 block. Multiple 50 or 100 pair cables, as required to support the number of users on a floor, shall be provided by the contractor. The wiring contractor shall cross connect the horizontal and riser cables with one cross connect for each active phone pair.
  - d. One 24 strand, inter-locking, armored, 50/125µm, multimode fiber cable will be used to connect each IDF to the MDF. The strands shall be terminated with SC fiber connectors in a 24 port rack mount panel, Hubbell P/N **FPR024SCM**.
  - e. A standard 84 inch high EIA19 inch rack will be installed by the contractor in each IDF. The rack will aluminum and be drilled for #12-24 machine mounting screws. The rack will be solidly affixed to the floor and be bonded to the building ground with a minimum #6 AWG wire in accordance with TIA/EIA-607.
  - f. Data racks shall have contractor supplied horizontal and vertical wire managers. The vertical managers, matching the rack, may be specified by the contractor and the horizontal wire manager shall be Hubbell four ring panel P/N HC119MS3N.
8. MDF: The MDF for any building will be specified by The New School. Dependant on the number of terminations, one or more standard 84 inch high EIA19 inch racks are to be provided, to be specified by The New School. The racks shall be bonded as noted in Para. 7e. A fire retardant plywood sheet shall also be installed for termination of the telephone backbone and horizontal telephone connections for the floor on which the MDF is located.
- a. All the fiber backbone cables will be terminated with SC fiber connectors in a 24 port rack mount panel, Hubbell P/N **PR024SCM**. The panels are to be installed at the top of the rack.
  - b. The horizontal data cables shall be installed as noted in Para. 6a.
  - c. The telephone riser cables from each IDF shall be terminated on 110 blocks on the plywood backboard. A set of 110 blocks shall be dedicated to each floor. NSU will be responsible for cross connecting all active pairs to the telephone switch.

## 9. Roof Riser

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- a. If required in the building, one 24strand, inter-locking, armored, 50/125 $\mu$ m, multimode fiber cable will be used to connect the MDF to the roof. The one side shall be terminated in the MDF with SC fiber connectors in a 24 port rack mount panel, Hubbell P/N **FPR024SCM**.
- b. The roof side shall be terminated in a location specified by the NSU. The terminations shall be SC and housed in a 24 port Hubbell locking FTU wall mount cabinet.

10. Labeling: All cables shall be labeled in accordance with standard TIA/EIA606-A, except as noted herein.

- a. Work Area Outlets shall have a machine printed label permanently attached showing the building letter (D), room number and outlet letter, i.e. D-510A. Data jack numbers shall be separately affixed and noted as D1, D2. The outlets will be lettered sequentially going clockwise around the room (cubical) starting with the first outlet next to the door or cubical entrance.
- b. The patch panels in each IDF shall have machine printed labels permanently attached showing the room number, outlet number and jack number. If there are space restrictions, labels can be printed as D1, Room #, D2.
- c. Horizontal telephone blocks will have a machine printed label for each four pair cable noting the room number and outlet letter. The backbone telephone block shall be labeled with room number, outlet number and pair number.
- d. The backbone telephone blocks in the MDF. Each pair on the block shall be labeled with the room number, outlet number and pair number.
- e. As built drawings shall be supplied by the contractor showing the location and labeling of the telecommunication outlets (see Attachment A).
- f. All cross connect information, including WAO location, horizontal termination positions at both ends and backbone/feeder terminations shall be supplied by the contractor and included with the As Built Drawings (See Attachment B and C).

11. Testing

- a. Category 5e and 6 compliant Jacks - UTP

Jacks shall be tested as part of the channel for Length, DC continuity, NEXT, PSNEXT, Attenuation, Return Loss, ELFEXT, and PSELFEXT using the specified hardware manufacturer's test heads and an industry standard level III tester per ANSI/TIA/EIA-568-B.2 and B2.1 and ISO/IEC 11801, Class E compliance.

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Testers shall be correctly set to test the type and manufacturer of the horizontal cable used in the channel being tested, including the correct NVP.

A "PASS" indication shall be obtained for all channel tests when tested using the appropriate level tester for the appropriate category.

All test data shall be recorded and submitted to TNS before the cabling plant will be accepted.

b. Fiber Backbone

All backbone and horizontal fiber shall be tested as part of the channel in accordance with TIA/EIA-568-B.3 and TIA/EIA-604-14A, Optical Loss Measurements of Installed Multimode Fiber Cable Plant. The data will include the end-to-end attenuation testing (one direction only) at 850nm and 1300nm and connector loss testing at 850nm.

All test data shall be recorded and submitted to NSU before the cabling plant will be accepted.

12. Contractor Certification

- a. The cabling installation is to be preformed by a contractor who is certified by the HUBBELL MISSION CRITICAL ® TRAINING PROGRAM.
- b. Contractors performing the certified installation are to be properly registered in the Hubbell Mission Critical ® warranty program.

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