

## **Section 34 – Information Technology Infrastructure Hardware**

- I. Introduction – This section serves to provide information and standards pertaining to the hardware installation and/or upgrade of HRSD’s Information Technology assets to include new construction and renovation efforts, and to ensure consistency with HRSD’s internal policy related to IT infrastructure hardware and conform to BICSI standards as closely as possible.
- II. General – The objectives are to standardize HRSD’s server and network infrastructure designs to:
  - A. Maximize functionality and performance.
  - B. Minimize time-to-resolution during troubleshooting efforts.
  - C. Facilitate the installation or upgrade process by clearly defining expectations so that re-work is minimized.
- III. Specific Requirements
  - A. Fiber infrastructure shall be OM4, 50µm multimode unless otherwise specified.
  - B. All fiber terminations shall be of the LC type unless otherwise specified and approved by HRSD. All ends shall be terminated and landed in an industry standard closet connector housing such as Corning LANscape CCH-01U, or HRSD approved equivalent. Such housing must be capable of being fully extended to make any needed repairs. No fiber ends shall be left un-terminated. Protective dust caps shall remain in place on all unused connectors.
  - C. Copper infrastructure shall consist of CAT 6 cabling with matching patch panels, such as Leviton CAT6 eXtreme, or HRSD approved equivalent.
  - D. In the case of control network devices, copper patch cables shall be green and yellow to denote the primary and secondary network connections, if employed. Business network patch cables shall be blue, management network patch cables shall be white. Patch cables shall be of the snagless type and manufactured by Tripp-Lite or other HRSD approved equivalent.
  - E. With either connectivity type (fiber or copper), wire management devices shall be utilized in such a manner as to afford the cleanest and most organized appearance.

- F. All network cables including fiber and copper shall be labeled to identify source switch port, switch name, destination port, and destination name. Due to the dependency of labeling nomenclature with respect to data centers, treatment plants, pump stations, and other field cabling, IT should be consulted once all network drops are patched down and the patch panel is ready to accept network equipment.
- G. Servers, switches, and routers shall employ dual power supplies, where available, and connected to separate dedicated UPS' fed by separate circuits.
- H. If dual power supplies are not available, automatic transfer switches (ATS) fed by separate dedicated circuits shall be utilized.
- I. Servers shall be manufactured by Hewlett-Packard (HP) unless an issue is identified that can only be resolved by selecting another HRSD approved vendor.
- J. Switches, routers, and other active components making up the network infrastructure shall be manufactured by Cisco, be no less than five (5) years to end of life (EOL) and be capable of remote management. Under no circumstances shall a non-Cisco device or otherwise unmanageable network device be employed for any purpose.
- K. All server and network hardware shall be rack mounted and securely fastened using the hardware recommended by the manufacturer, including the quantity (all mounting provisions within reason shall be utilized). All systems shall have a 1U space between them.
- L. For telco. rooms requiring one or more network equipment racks, such racks shall be the four-post tapped rail type, black in color, measure 84" H x 36" D, and accept standard 19" wide equipment . An example of such a rack would be the Chatsworth Products #15218-703. A minimum 3' perimeter is required around the rack for access. The rack shall be fastened to the floor using Tapcon® concrete anchors, or equivalent. The equipment rack shall be bonded to the building ground bus bar.
- M. For server closets or small server rooms, the equipment cabinet shall be fully enclosed on two sides with lockable doors front and back, black in color, measure 44U x 30" W x 45" D, and utilize a square punched hole rail system capable of accepting standard

cage nut hardware kits and standard 19" wide equipment. An example of such a cabinet would be the Eaton Paramount #JW843045. A minimum 3' perimeter is required around the cabinet for access. Single, standalone, cabinets shall be fastened to the floor using Tapcon® concrete anchors, or equivalent. Two or more cabinets side-by-side can be ganged together if anchoring to the floor is not feasible or practical. The equipment cabinet shall be bonded to the building ground bus bar.

- N. Power for either racks or cabinets shall be provided via PDU's made by the manufacturer of the cabinet, if possible, and neatly and securely integrated within the rack/cabinet.
- O. Servers shall employ wire managers or other equivalent hardware to allow for their full extension away from the rack on their rails so that maintenance can be performed when needed without disconnecting power, network, etc.
- P. All server and network hardware shall be labeled to clearly identify its purpose. Due to the dependency of labeling nomenclature with respect to data centers, treatment plants, pump stations, and other field cabling, IT should be consulted once all network drops are punched down and the patch panel is ready to accept network equipment.
- Q. All active components (servers, switches, routers, etc.) shall be left de-energized until the space they occupy is reasonably clean and free of construction activity.
- R. The use of media converters and other extraneous hardware shall be kept to the absolute minimum required to complete the design. In cases where media converters must be used, they shall be mounted in a dedicated powered rack supplied by the manufacturer. If this arrangement is not practical, they shall be securely and neatly fastened to a rigid shelf mounted in the equipment cabinet. Wiring for the media converter shall be routed and secured to afford the cleanest and most organized appearance. Like other network devices, the media converters shall be labeled to indicate their intended purpose.

### **End of Section**