

Healthcare developments

Work is underway on an important new standard that will support applications ranging from patient tracking to pharmaceutical inventory.

A new healthcare standard is currently under development in the TIA TR 42.1 subcommittee that addresses the specific needs of healthcare facilities and buildings beyond those currently specified in the TIA 568-C series of standards.

The first draft, which was submitted for committee ballot in late August, will eventually be published as ANSI/TIA-1179 and will be an important addition to the TIA family of structured cabling standards. (For the purposes of this article, the term “healthcare standard” refers to the 1st draft of this standard as described above.)

The draft standard specifies requirements for telecommunications infrastructure for healthcare facilities including cabling types, topologies and distance requirements, outlet requirements as well as cabling design and installation requirements for healthcare facilities.

It is intended to support a wide range of applications including amongst others building automation systems, nurse call, security, patient tracking, pharmaceutical inventory, clinical and non-clinical systems.

Healthcare facilities are different from commercial buildings because they provide essential services that are necessary to ensure life and safety. Many, particularly critical care areas, can be severely impacted by a loss of telecommunications services.

As a result, the standard makes provision for route diversity and redundancy in that a minimum of two diverse pathways shall be provided between the entrance facility and the equipment room and a minimum of two diverse route backbone pathways and cables shall be provided to each telecommunications room or telecommunications enclosure. This could be accomplished by the use of optional cabling between horizontal cross-connects / telecommunications rooms.

The healthcare standard recognizes the same types of cabling for horizontal and backbone as the 568-C series of standards. Whenever possible, it is recommended that the designer consider using the highest performing media to allow for the longest possible lifecycle with the least potential for the need for replacement.

Because of the large number of telecommunications services present in healthcare facilities, it is recommended that the minimum size for the telecommunications room is 12 square meters (130 square feet), considerably larger than for an office-oriented commercial building. The biggest difference in the healthcare standard compared to the commercial building telecommunications cabling standard is the density of drops in the work area.

For healthcare applications, the term “work area” takes on a broader scope depending on the location of application-specific areas and spaces within the healthcare facility. These application-specific areas are classified as follows: a) Patient Services, b) Surgery/Procedure/Operating Rooms, c) Emergency, d) Ambulatory Care, e) Women’s Health, f) Diagnostic and Treatment, g) Caregiver, h) Service/Support, i) Facilities, j) Operations and k) Critical Care.

Each area classification is further subdivided into functional spaces based on the function performed at that location.

The standard includes a Table that specifies the density of work area outlets for each area classification and functional space. The densities are defined within a range as follows: a) L = Low: 2 to 6 outlets in each area, b) M = Medium: 6 to 14 outlets in each area and c) H = High: > 14 outlets in each area.

It recommends that the number of outlets at a given location is between the midpoint and upper end of the range, since adding horizontal cabling or outlets after construction can be very complicated in many areas of a healthcare facility.

To simplify relocations, a single style of outlet/connector is recommended for all work area outlets of the same media type.

As with commercial buildings, each 4-pair balanced twisted pair cable is terminated in an eight-position modular jack at the work area location. Many applications related to healthcare require higher bandwidth at designated stations. The designer should review the desired locations for these higher bandwidth stations with the end user.

The healthcare standard also identifies some important design and installation considerations for healthcare facilities. Some examples are as follows:

- Specific infection control requirements (ICR) could seriously impact the times and conditions for cabling installation, moves, adds and changes as well as restrictions on removing ceiling tiles, wall penetrations and access to unoccupied spaces.
- Telecommunications spaces subject to ICR should be labeled to indicate that ICR measures may be necessary prior to entry.
- Reusing cabling products (e.g. patch cords) from certain areas of healthcare facilities may be restricted due to infection control measures.

Some areas of the healthcare facility may expose the cabling to the detrimental effects of high magnetic fields, radiation, high temperature, chemicals etc. As with the industrial cabling standard, compatibility with the environment can be achieved with enhanced cabling components, or through protection, separation or isolation.

The use of colored cables, colored jacks or keyed connectivity should be considered in order to maintain segregation for certain networks and to assist in the administration.

It is still a standard under development and this is the first draft. The subcommittee working on the standard should be commended for the hard work and dedication in developing this document.

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