NETWORK EQUIPMENT BUILDING SYSTEM (NEBS) IN EXISTING BUILDINGS

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1. GENERAL

1.01 This section provides general building planning guidelines for use in existing buildings intended to house telephone equipment that meets the requirements of Section 800-610-164, "NEBS—General Equipment Requirements." The information provided by this section revises and supersedes that information originally provided in Section 760-100-032. This section contains information on building planning only and excludes equipment space planning standards. This exclusion of equipment space planning standards follows the organizational separation of these functions.

1.02 Whenever this section is reissued, the reason(s) for reissue will be listed in this paragraph.

1.03 The NEBS standards effectively integrate the building design and the physical requirements of modern electronic switching equipment. A summary of NEBS building standards is outlined in Section 760-100-016, "NEBS in New Buildings." The NEBS standards are presently applied to all new buildings that will be used as local central offices, toll terminal centers, or transmission stations. The NEBS standards are also extensively applied to existing buildings due to the replacement of electromechanical switching equipment with newer electronic switching equipment.

1.04 For specific information concerning NEBS building design standards, refer to the appropriate 760-2XX-XXX section. A list of sections discussing NEBS standards is included in Section 760-200-015, "NEBS Standards—Building Design—General."

2. ADAPTING NEBS TO EXISTING BUILDINGS

2.01 Environmental requirements for older electromechanical switching systems differ from those of the newer electronic switching systems (ESSs). Two primary differences are the vertical space requirements and the air cooling requirements.

VERTICAL SPACE REQUIREMENTS

2.02 Buildings designed for electromechanical switching systems usually have a clear ceiling height of 13 feet. Additional older space engineered for 4A Toll Crossbar and toll terminal equipment, including broadband carrier, generally have a clear ceiling height of 13 feet 6 inches. Typically, 1 or 2 feet above these levels are occupied by the air distribution ducts that serve these relatively low heat dissipating older equipment systems; thus, the vertical space is allocated as follows:

Equipment frames	0 to 11-1/2 feet above finished floor (AFF)
Cabling	11-1/2 to 13 feet AFF
Toll terminal	11-1/2 to 13-1/2 feet AFF
Air ducts	13 to 15 feet AFF

2.03 The vertical space requirements of the newer ESSs are discussed in Section 760-210-150, "Ceiling Heights for Equipment Buildings." A brief outline follows:

Equipment frames	0 to 7 feet AFF
Cabling (including lighting)	7 to 10 feet AFF
Air ducts and diffusers	Over 10 feet AFF

2.04 Considering these vertical space requirements, the NEBS system can be installed in existing space with existing racking in place or after removing all older ceiling-supported racking and ductwork. Figure 1 gives general representations of vertical space allocations where NEBS systems are applied to existing buildings.

COOLING REQUIREMENTS

2.05 When reusing existing space, equipment cooling can be implemented by either modifying an existing Conventional Cooling System (CCS) or installing the Modular Cooling System (MCS). These two options are shown in Fig. 1. Discussion of CCS design is described in Sections 760-550-208, 760-550-212, 760-230-100, and 760-230-101. A complete description and associated planning guidelines for the MCS are found in Section 760-550-300, "Modular Cooling System, Planning and Engineering Guidelines."

2.06 Typical specific heat release data for the newer equipments are given in the Floor Plan Data sheets. For long-range planning, a minimum vertical space of 2 feet 6 inches is recommended for duct space to allow for cooling all future NEBS 7-foot equipment systems. Such 7-foot systems now range in heat dissipation from 10 to 60 watts/square foot of occupied area with some small areas at loads up to 100 watts/square foot.

2.07 When a CCS either exists or is chosen as the means for cooling a NEBS equipment addition in existing space, it is important that a Cable Pathways Plan be prepared before designing or modifying the cooling system ductwork. This plan provides standardized locations with respect to cable racks and lights and for cooling air supply diffusers at the 10-foot level. This insures unobstructed openings throughout the life of the installation for the free flow of air down to the equipment. The Cable Pathways Plan is part of the Common Systems Planning and Engineering Center Comprehensive Plan. It is prepared by Common Systems and concurred in Building Planning.

2.08 As shown in Fig. 1, the air diffusers (eg, KS-21344) can be connected to existing ductwork by flexible ducts, allowing flexibility in diffuser locations. The diffusers are supported on a ceiling-hung auxiliary framing grid. A space of approximately 18 inches is usually available between the tops of the NEBS equipment and cabling systems (10 feet AFF) and the bottoms of any existing racking. This space can be used for additional ductwork to handle extra heat load or for mounting the diffusers and supporting hardware.

2.09 The MCS is designed specifically for No. 4 ESS and other high heat transmission systems and is fully compatible with all NEBS standards. Additionally, this system is well suited for cooling analog broadband carrier and digital T-carrier equipment that typically dissipate 25 watts/square foot or more over sizable areas.

2.10 For existing buildings, the MCS without a raised floor may be just as effective as the full system where there is not enough vertical space. This type of arrangement, shown as Type B in Section 760-230-101, "Equipment Room Air Distribution," is especially well suited to handling local "hot spots" by placing one or more process coolers in the high-heat areas and using local ducting to direct the air to the desired equipment.

2.11 Where an MCS option or a combination of MCS elements and an existing CCS seem viable, a complete cost study should be conducted to account for variations in costs resulting from such factors as local labor conditions or special building considerations. It is also important to reiterate that a Cable Pathways Plan be prepared for the entire floor as an early step in the development of the floor plan. This is especially important for MCS options or combinations of MCS and CCS where dropped diffusers are used. Failure to establish the Cable Pathways Plan could result in inefficient air conditioning or misalignment of diffusers with open areas in the cable rack arrangement. The subsequent correction of either condition after construction is extremely expensive.

3. SUMMARY

3.01 In the refurbishing of existing building space for new equipment, the application of NEBS equipment and space concepts has been anticipated. The need for increased cabling space to handle the higher cable densities brought on by circuit compression is in direct conflict with the need for more space to provide higher capacity in the equipment cooling systems originally designed for low electromechanical heat loads. The NEBS concept will eliminate these problems in existing buildings by integrating the equipment cabling and cooling arrangements within 12 feet 6 inches of vertical height. This becomes especially valuable in older electromechanical offices where 13-foot clear ceiling heights were frequently constructed. With the necessary modifications to fit existing building bay dimensions, cable hole locations, and ceiling insert patterns, the use of NEBS standards becomes completely applicable and, in most cases, essential to the reuse of existing building space.

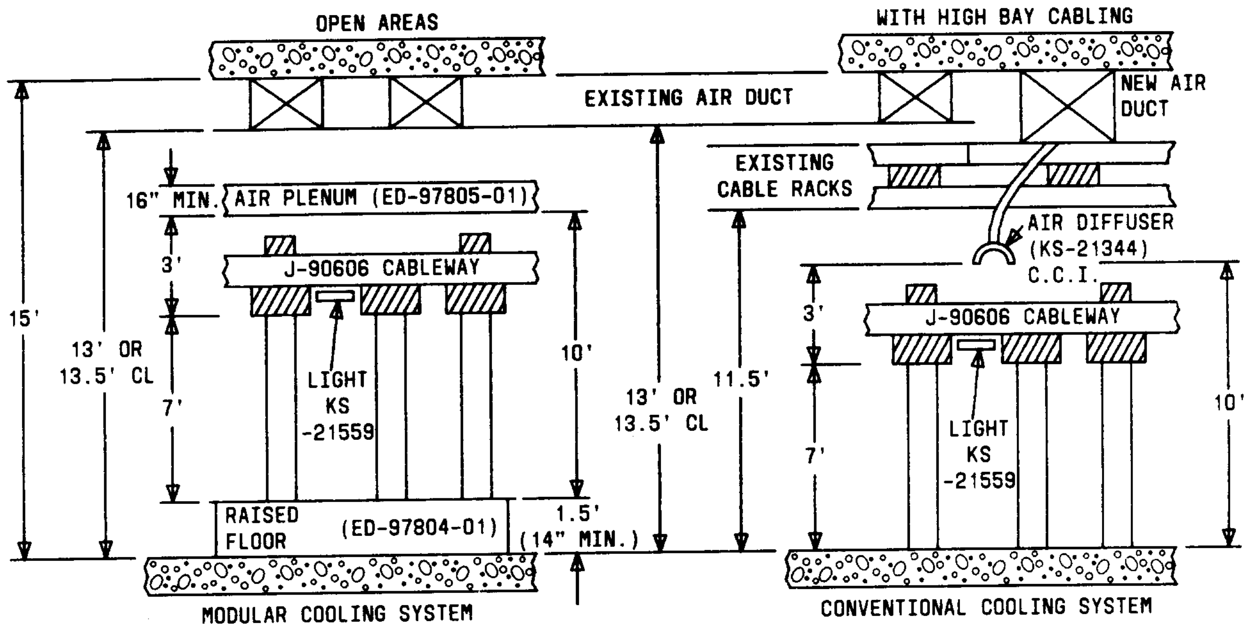

Fig. 1—NEBS Systems Applied to Existing Buildings Showing a Modular Cooling System and a Conventional Cooling System