AT&T Practices
Raised Floor Design Standards for NSD Equipment Locations

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Purpose

This document is intended to describe AT&T Seismic Access Floor Systems. It provides a system summary and design criteria and requirements. Issues addressed in this document include seismic and load capacity calculations, equipment configurations, floor anchoring, fire and electrical static resistance, and grounding.

About This Document

Overview

This document describes the standards for the design and installation of a SAF System. The information is organized as follows:

- Section 1 provides general information concerning AT&T Seismic Access Floor Systems.
- Section 2 provides references to construction technologies not covered by this document.
- Section 3 provides a summary of installation and materials requirements.
- Section 4 describes design requirements.
- Section 5 summarizes the design criteria for a complete SAF System.
- Section 6 provides a form for installation certification.

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Indianapolis, IN 46219

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Related Documentation

The following AT&T Practices are referenced in this document.

760-200-020	Telephone Buildings - Design Loads
760-200-026	Seismic Zone Classification
760-200-120	Appendix 1 Procurement Requirements for Raised Floor Seismic Access Floor (SAF) Systems
760-250-150	Building Planning for Electronic Data Processing Systems
760-610-305	Fire Safety Interior Finishes, Furnishings, and Decorations
760-630-410	Fire Stopping Considerations for Floor and Wall Penetrations and Protection of Cable Runs
801-900-160	AT&T Network Equipment Development Standards (Generic) Requirements

802-001-196 Protective Grounding Systems - General Grounding Requirements for Data Processing Computer System Installations

1. General

1.01 This section describes the AT&T raised Seismic Access Floor (SAF) System. These standards apply to new raised floor installations and shall serve as a guide for updating existing raised floor areas.

1.02 This section is reissued to:

- Change the title
- Delete commercial computer floor systems as previously described
- Clarify use, design summary, and layout of the AT&T raised SAF System
- Replace AT&T Practice 760-200-120, Issue 1. Dated August 1993.

1.03 This system was developed by AT&T/Bell Laboratories for use within the central office. Seismic and load capacity calculations, equipment configurations, floor anchoring, fire and electrical static resistance, grounding, quality and reliability issues are all addressed.

1.04 AT&T's Environmental Design Standards Manager shall be contacted for resolutions regarding project layout, materials, equipment, and occupancies issues.

2. References

2.01 For construction terminologies defined or not defined herein, and/or as made reference to in other standards, refer to AT&T Practice 760-200-120, Appendix 1, “Procurement Requirements for Raised Seismic Access Floor (SAF) Systems,” and the appropriate nationally recognized construction industry associations and societies. For design, testing, and installation methods and standards for the SAF System, refer to the manufacturer.

3. Summary

3.01 The AT&T raised Seismic Access Floor (SAF) System shall replace the use of commercially available computer floor systems within AT&T NSD space. Areas of installation shall include all administrative supportive areas (i.e., MMOC, NOC, TCC), network equipment areas (i.e., DACs,

4ESS, 5ESS), Point of Presence (POPs) locations, and rental/vacant spaces that eventually will handle network equipment.

3.02 AT&T Practice 801-900-160, “AT&T Network Equipment Development Standards (Generic) Requirements,” is the Central Office of the Future (COOTF) standard for both new and renovation work. This criteria shall also include whether the total area of the room or floor can be outfitted or built-out with the SAF System. The process of up-grading equipment areas will be on-going as existing equipment is retired and new network equipment is installed.

3.03 Where special conditions, situations, or the budget may place restrictions on the complete SAF System usage (i.e., supportive and rental areas), the SAF stringers and gravity-held floor panels shall be the minimum components installed as replacement components of the standard manufactured computer floor. In this situation, future network deployment affords AT&T the ability of material redemption and/or supplementation to a complete SAF System. It shall also be noted that the SAF System's standard seismic Pedestal “A” is comparable in cost to commercial units and, therefore, shall be strongly considered for use.

3.03.1 Carpet tiles with AT&T's Environmental Design Standards Manager’s approval may be used outside of network equipment areas (i.e., rental space). Refer to paragraph 5.06.3.

3.04 The numerical combination of pedestal types used per square foot is determined by the geographical seismic area or zone per AT&T Practice 760-200-026, “Seismic Zone Classifications.” This document is based on the latest Uniform Building Code (UBC) issue, establishing AT&T's seismic construction classification.

3.05 AT&T Practice 760-200-120, Appendix 1, “Procurement Requirements for Raised Seismic Access Floor (SAF) Systems,” shall be used for procurement and installation. This document, as edited for optional features by the Architect/Engineer of Record's drawings, shall remain un-edited and placed within the project bid package per the AT&T/Manufacturer Agreement (as in effect).

3.05.1 Only at the AT&T Representative's discretion shall SAF material from within company stock be reused, provided that this material was properly removed, stored, and retains all applicable identifying certification.

3.06 The SAF System, similar to commercial computer raised floor systems, can be erected on a portion of or on an entire building floor in new and existing facilities that may have already established raised floor systems. Stairs, ramps, and railings can be eliminated where the use of a depressed floor slab for raised floor areas can be economically incorporated within the new construction.

4. Design Requirements

4.01 The SAF System is AT&T's standard for all installations. By design the system withstands stress from overturning moments, shear loads, and compressive loads induced by the floor's response to earthquake loadings. Raised floor design loads are generally specified for uniform and concentrated loadings. Typical uniform floor loadings for telephone buildings are listed in AT&T Practice 760-200-020, “Design Loads for Telephone Buildings”. Concentrated floor loadings and transient floor loads shall be verified per location by the Architect/Engineer of Record.

4.02 In seismic zones 2 through 4, electronic data processing and network equipment shall be secured directly through the raised floor to the subfloor to prevent the equipment from undergoing excessive displacement or overturning. For seismic zones 0 and 1, this equipment will be fastened to the SAF System.

Drawings ED-97956 (Sheets 1, 2, and 3) and L-525235 (Sheets 1 and 2) and ED 4A306-70 outline equipment anchoring. Such base cabinet attachments may also be considered for critical equipment in regions of relatively low seismic threat. Refer to AT&T Practice 760-250-150, “Electronic Data Processing Center - Building Design Criteria”.

4.03 The equipment engineer for AT&T Network equipment areas must provide electrical grounding of the SAF System which connects the raised floor system to the building ground. Grounding is discussed in AT&T Practice 802-001-196, “Protective Grounding Systems-General Grounding Requirements for Data Processing Computer System Installations”, and ED 4A308-10, Figure 22. Where no network equipment is deployed, the project Building Engineer shall coordinate special grounding considerations for administrative areas (i.e., MMOC).

4.04 Do not use the SAF System cavity as an air plenum. Underfloor supply air signifies increased regulations on the total floor cavity environment and equipment cabling. Central Office underfloor environment is classified as “Dead Space,” not a crawl space or a confined space.

4.0.4.1 All subfloor cable penetrations shall be fire rated per AT&T Practice 760-630-410, “Fire Stopping Considerations for Floor and Wall Penetrations and Protection of Cable Runs”.

4.05 Existing subfloor finishes shall be removed, sealed, and/or encapsulated (i.e., vinyl-asbestos floor tile) prior to drilling and mechanically anchoring the raised floor pedestals. This will prevent excessive dust from developing within the work area while ensuring proper set of pedestal bases. Mastic or any type of adhesive is prohibited for pedestal anchoring or temporary placement.

4.06 When the subfloor is subject to potential water leakage (i.e., when water or other liquid is piped through this area), the subfloor surface will be waterproofed to prevent leakage into lower areas within the facility. Floor drains, drip pans, and water detection alarms will be also installed.

4.07 The SAF System installation is based on a 2 foot by 2 foot grid pattern as coordinated with network equipment arrangements. All floor panels in the maintenance aisles shall be completely removable using the manufacturer's appropriate panel lifting device. In so doing, total access to the cable pathways is rendered without disturbing the access floor's supportive sub-structure. Refer to the Central Office Layout Designers (COLD) drawings for the floor's “reference or starting point” and equipment layouts.

4.07.1 Unlike commercially available raised floor systems, greater accessibility is provided with the deletion of field-applied diagonal seismic bracing on the pedestals. Routing of cable paths shall be designated under equipment lineups, and the open aisles shall generally be designated as maintenance or service aisles.

4.08 In non-telecommunication facilities, the higher initial cost of raised floor systems as compared with conventional construction, must be evaluated. Alternative solutions such as under carpet flat conductor power and communication wiring, power poles, or wall mounted raceways should be considered.

5. The SAF System

5.01 This section summarizes the design criteria of a complete, portable, raised SAF System which incorporates modular gravity-held formed steel panels on an elevated, mechanically anchored seismic pedestal system and supports screwed box stringers with optional metal railings, ramps, and stairs assemblies, thus creating a floor system with an accessible, non-confining underfloor cavity for telecommunication network and facility support services. Refer to the attached “System Details” in AT&T Practice 760-200-120, Appendix 1, “Procurement Requirements for Raised Seismic Access Floor (SAF) Systems,” for component illustrations.

5.02 Pedestals

The SAF System's supporting columns which create the underfloor cavity are available in both the standard seismic Pedestal “A” unit and the reinforced or heavy-duty seismic Pedestal “B” unit which incorporates the diagonal bracing for any seismic zone installation. Although the company

standard is the 24 inch assembly per AT&T Practice 801-900-160, both pedestal units can be installed in either a 24 or 36 inch finished floor height configuration. The Pedestal “B” is always positioned at mid-span or center point of the four foot long panel support box stringer.

5.02.1 To maintain the System's structural integrity while achieving the greatest underfloor cavity height, the dimensional length of the anchored pedestal assemblies must be verified for the maximum finished floor height allowed per seismic zone (Table 1). Final adjustment is provided within each pedestal head assembly for overall floor leveling and alignment to adjoining floor surfaces.

Table 1. **Finished Floor Height**

Seismic Zone	Pedestal Height	Designed Floor Height
0 (zero)	Pedestal A	36 inches (three feet)
1 (one)	Pedestal A	36 inches (three feet)
2A (two)A	Pedestal A and B	36 inches (three feet)
2B (two)B	Pedestal A and B	36 inches (three feet)
3 (three)	Pedestal A and B	36 inches (three feet)
4 (four)	Pedestal A and B	24 inches (two feet)

5.02.2 The vertical center line of each pedestal shall be set at the intersections of the AT&T Central Office Layout Designer's (COLD) twenty-four (24) inch square grid layout, as dimensioned from the reference or starting point for equipment placement. Refer to the attached “Typical Pedestal “B” Layout Drawing/Details” in AT&T Practice 760-200-120, Appendix 1, “Procurement Requirements for Raised Seismic Access Floor (SAF) Systems”. Any additional pedestals at cutouts, cut panels at columns or along the perimeter, or per floor loading requirements shall be placed to maintain structural integrity.

a. Seismic bracing (if required) is only placed using the manufacturer's standard diagonal braces per the Architect/Engineer of Record drawings/calculations on the last row of perimeter pedestals supporting full panels.

b. Perimeter Pedestal “A” units supporting cut floor panels and cantileving box stringers need only one (1) anchor, provided that each unit is placed within twelve (12) inches from the perimeter.

Table 2 coordinates the pedestal assembly types per square foot for each seismic zone.

Table 2. **Pedestal Location**

Seismic Zone	Pedestal Type Used	Square Footage
0 (zero)	Pedestal “A”	Used singularly throughout
1 (one)	Pedestal “A”	Used singularly throughout
2A (two)A	Pedestal “A”, “B”	“A”=std., “B”=1/64 sq. ft.
2B (two)B	Pedestal “A”, “B”	“A”=std., “B”=1/64 sq. ft.
3 (three)	Pedestal “A”, “B”	“A”=std., “B”=1/64 sq. ft.
4 (four)	Pedestal “A”, “B”	“A”=std., “B”=1/64 sq. ft.

5.03 Pedestal Anchors

For approved anchor manufacturers, refer to AT&T Practice 760-200-120, Appendix 1, “Procurement Requirements for Raised Seismic Access Floor (SAF) Systems”. All anchor types shall be approved for use within the jurisdiction holding code enforcement, for example; International Conference of Building Officials (ICBO) Evaluation Report, Southern Building Code Congress International, Inc. (SBCCI), City of Los Angeles (COLA) Research, etc. No mastic or adhesive is permitted during construction, for each pedestal shall only be mechanically fastened for all seismic zones.

a. Pedestal “A” (the standard seismic pedestal unit) anchor is a concrete screw type, 3/8 inch diameter with an embedded drilled hole depth of 3.0 inches or an approved equal pending site particulars.

b. Pedestal “B” (the heavy duty seismic pedestal unit) anchor is a heavy-duty expansion/sleeve type with torque value of sixty foot-pounds (60 ft.lb.) and an embedment depth of 80 millimeters (mm) minimum, set within a drilled hole depth of 100 mm maximum.

5.04 Box Stringers

The modular steel stringers with a top applied sound proofing strip shall be positioned and mechanically fastened to the pedestal head assemblies in a basketweave configuration to ensure maximum lateral stability. Each stringer, while spanning three pedestal units, must be capable of supporting a concentrated load of 450 lbf. (pounds-force) at mid-span while providing support for all removable panel edges.

5.04.1 Stringers are constructed of boxed cross sectional galvanized steel with an approximate overall dimension of four (4) feet. Each stringer is mechanically fastened to the pedestal heads using four (4) 0.250/20 by 2.0 inch plated screws that are accessible from above and provide a positive electrical contact.

5.05 Floor Panels

All panels shall bear a model identification and a reference number denoting the panel's concentrated load capacity of 1,250 pounds per the Ceiling and Interior Systems Contractors Association (CISA) standard. The standard commercial floor panels of 24 inches square shall be maintained in an all-steel, unitized, welded panel construction with a uniform bottom pan pattern of formed modular pockets to resist deflection. The installed panels shall not extend below the support stringer's bottom edge.

5.06 Panel Covering

5.06.1 Exposed panel covering for use within network equipment areas shall be limited to NEMA LD 3, High Wear (.062) Type-High Pressure Laminate (HPL) and fabricated in one piece to cover each panel face. Panel color and trim shall be per the AT&T/Manufacturer Agreement as in effect or per the Architect's sample.

5.06.2 Carpeting shall not be used in Central Office (CO) equipment areas, computer rooms, or administrative areas containing equipment that is electrically connected to the CO or computer equipment such as the Maintenance Operations Center (MOC) of the 4ESS office.

5.06.3 Provided that this panel covering meets AT&T's Environment and Safety Engineering Center-Corporate Fire Protection Organization requirements as specified in AT&T Practice 760-610-305, “Fire Safety Interior Finishes, Furnishings and Decorations,” carpet tiles with low-static electricity properties and low-lint dispersion may be used in administrative office areas or in computer terminal rooms where service characteristics of the carpeting will not have any detrimental effect on equipment operation. This carpeting shall be applied to the panel over the HPL which allows for removal when the panel may be deployed within network areas.

5.07 Cable Location Stickers

To limit the number of floor panels removed in performing work, all subfloor and through the wall cable penetrations below the raised SAF System shall receive a “CABLE PENETRATION BELOW” identification

sticker. These self-adhesive, orange color stickers with black lettering shall be applied directly to the floor panel above the occurrence or above the base moulding on the wall where a through the wall penetration occurs below.

To order:

Ideal Jacobs Printing Inc.
Attn.: Andrew Jacobs
22 East Willow Street
Milburn, New Jersey 07041
(201) 467-3010

5.08 Accessories

5.08.1 Stairs, ramps, hand, and guard railings can be supplied by the floor manufacturer or an outside vendor provided their design criteria are acceptable to the Architect/Engineer of Record.

5.08.2 The portable floor panel lifting device that is compatible with panel covering shall be kept on a wall mounted holder. Mount the lifter's bracket that includes panel removal and replacement instructions and the lifter, adjacent to each entry/exit door or on a column enclosure opposite of or closest to each point of entry within the area as required by AT&T and/or the code authority holding jurisdiction.

6. AT&T Installation Certification Form

See the following attachment.

AT&T Installation Certification Form

Date: _____

To: TATE ACCESS FLOORS, INC.
7510 Montevideo Road
Jessup, Maryland 20794
1-800-242-4304
Attn: Mr. Roger Picker, Vice President

From: _____
_____
_____
_____

PO No.: _____
Job No.: _____
Project Name: _____
Project Address:
_____
_____

For: Material only: ___ Material and Services: ____

Seismic classification: _____ Floor Height: _____ Project Square Footage: _____
Panel capacity: _____

Sir,

This letter serves as our certification that the SAF System as installed at said location is in accordance with your directives and quality requirements which are pursuant to AT&T Contract No. CH923022AO.

Additionally, the final installation was and accepted by:

_____on_____.
AT&T Representative Date

Thank You,

_____on_____.
TATE Authorized Installer Date

copy to: M. H. Clark - AT&T Environmental Design Standards Manager
Room No. 3C120CPhone: 908-234-3035
900 Route 202/206 North, P.O.Box 752
Bedminster, New Jersey 07921-0752

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