FIRE STOPPING OF PENETRATIONS

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1. Overview

1.01 This practice establishes AT&T requirements for fire stopping of fire-rated walls, floors, ceilings and partitions penetrated by cables, cable trays, piping, and other conduit. The information presented is based on the use of a two-component fire stop system manufactured by the 3M Corporation and consisting of composite sheet and moldable putty intumescent products. The primary use of this system is for firestopping applications in telecommunication central office facilities such as those containing 4ESS\324, 5ESS\322, digital access cross-connect, fiber optic, and other telecommunications equipment and related utilities. Individual users may select alternative approved systems for other (non-telecommunications) applications. This practice also provides information on procedures to be undertaken when the presence of asbestos is suspected. All fire stopping performed in telecommunications central office facilities (owned and leased) worldwide shall comply with this practice. Where any national, federal, state, or local codes, laws, rules, or regulations of the public authorities having jurisdiction at the location impose more stringent requirements than those cited in this practice, those codes, laws, rules, or regulations shall be followed. Where the requirements contained in this practice cannot be met, the location shall notify the Corporate Fire Protection Engineering Organization (see AT&T 770-350-100, Appendix 1).

1.02 This practice replaces AT&T 760-630-410, General Firestopping Considerations for Floor and Wall Penetrations and Protection of Cable Runs and all previous documents issued on this subject. Whenever this practice is reissued, the reason(s) for reissue will be listed in this paragraph.

1.03 This practice contains safety labels in the form of DANGER and CAUTION.

- o DANGER indicates the presence of a hazard that will cause death or severe personal injury if the hazard is not avoided.

- o CAUTION indicates the presence of a hazard that will or can cause minor personal injury or property damage if the hazard is not avoided.

1.04 AT&T welcomes your comments on this practice.
Your comments will aid us in improving the quality and usefulness of AT&T documentation. Please use the Feedback Form provided in this practice.

1.05 Additional copies of this practice and any associated appendixes may be ordered from the AT&T Customer Information Center as follows:

- o Call 1-800-432-6600
  or
- o Complete Form IND1-80.80 and mail to:
  AT&T Customer Information Center
  Attention: Order Entry Department
  2855 N. Franklin Road
  P.O. Box 19901
  Indianapolis, IN 46219-1999

1.06 This practice does not contain a disclaimer notice.

1.07 This practice does not contain an FCC Warning.

1.08 This practice does not contain a security statement.

1.09 This practice is issued by the AT&T Corporate Environment and Safety Engineering organization under AT&T Action Information Letter AI-93-05-007. Questions concerning its content may be referred to Corporate Fire Protection Engineering. See AT&T 770-350-100, Appendix 1 for specific contact information.

2. General Information

2.01 The materials and application methods presented below are endorsed based on the long-term testing of 3M fire barrier products which have proven to be compatible with AT&T telecommunication cable systems (see paragraphs 3.01 through 3.04 for properties of the 3M products). These procedures shall be used any time opening and resealing of penetrations is conducted. Existing penetrations using formerly approved firestopping methods are not subject to retrofit. All new penetrations and existing reopened penetrations shall use the procedures described herein. Other systems exist, but have not been proven to be compatible: One such system has been withdrawn because of incompatibilities identified after a period of exposure that was causing damage to cable.

2.02 The Network Services Division has specified the use of a single method of fire stopping that is effective, commonly available, and price competitive. The recommended method meets that criteria and is the single method accepted for telecommunication cable firestopping applications. This does not preclude the future acceptance of similar materials as they are proven to be both compatible and effective, but the basic process of

installation is expected to remain as specified herein. This specified method is to be used to the exclusion of the ``blue bag'' method described in AT&T 760-630-410, General Firestopping Considerations for Floor and Wall Penetrations and Protection of Cable Runs which this document replaces.

2.03 This practice provides general installation procedures and related diagrams. All inclusive application information may be found in 3M's Fire Protection Products Applications and Specifier's Guide for Through-Penetration Protection Systems. This guide should be made available for each job. Training programs are also available through 3M. Questions on obtaining the 3M Guide, sample products, or training may be directed to 3M by dialing 1-800-328-1687. Other questions should be addressed to the Corporate Fire Protection Engineering organization (see AT&T 770-350-100, Appendix 1).

2.04 This practice is based on AT&T requirements, AT&T accepted standards, the National Fire Codes of the National Fire Protection Association (NFPA), various model and building codes, United States Occupational Safety and Health Administration (OSHA) regulations, and requirements of AT&T corporate insurance carriers. Consult them or your own national, state, or local requirements for additional information if required.

NOTE:

Equivalent national or local standards can be substituted for NFPA standards where the standards specified in this practice are not commonly used. However, equivalent protection must be provided. The objective is to avoid imposing unfamiliar standards unless they result in increased safety.

2.05 Conflicting Requirements: Where national, state, or local codes, laws, or regulations of the "Authority Having Jurisdiction" (AHJ) at the location impose more stringent requirements than those cited in this practice, those codes, laws, rules, or regulations shall be followed. Where local codes, laws, rules, or regulations are less stringent than the requirements cited in this practice, the AT&T requirements of this practice shall be followed.

Exception:

Where a legally authorized variance has been granted by the AHJ, in writing, to specific requirements of this practice, the AT&T Corporate Fire Protection Engineering Manager (see AT&T 770-350-100, Appendix 1 for contact) shall be consulted for guidance in achieving equivalent levels of protection by alternate means.

3. Tools/Materials

3M Fire Barrier Products

3.01 The firestopping requirements listed in this practice are based on use of 3M fire barrier products. As applied, these products provide a cold smoke and water seal. When exposed to temperatures exceeding 250\260F (121\260C), these products rapidly expand up to ten times the original volume to seal any cavities in a penetration or opening. This rapid expansion is called intumescence.

3.02 This intumescent action of the material also fills any voids left by items consumed by fire, such as plastic pipe, pipe insulation, or

electrical, communications, or signal cable. Once all the voids are filled, the integrity of the fire-rated wall or floor is fully restored.

3.03 Under continuous exposure to high heat, the intumescent materials convert to a high-strength insulating char that seals out fire, toxic fumes, smoke and water for up to 3 hours. The char also can withstand the thermal and mechanical shock of high-powered water streams.

3.04 This system utilizes two 3M components:

- An organic/inorganic fire resistive elastomeric sheet which provides a basic fire-resistant barrier. The elastomeric material of this sheet is factory-bonded on one side to a layer of 29-gauge galvanized steel, reinforced on the other side with a hexagonal steel wire mesh, and then covered with aluminum foil. It is readily cut using nippers, a hack saw, a saber saw, nibblers, or other cutters commonly used for light metal or plastic materials. When properly installed, the steel wire mesh (foil side) should face into the hole - never out. This sheet may be ordered in various sizes.

- A reusable moldable putty (MPP-1) which is used to seal the sheet to the sides of the hole. This putty is provided in 5-lb. (2.2 kg) packages containing approximately 20 pads of materials each measuring approximately 4 inch by 8 inch by 1/8 inch (10 cm by 20 cm by 3 cm). Approximately one package is required to seal one cable hole that is 1 foot by 2 feet (30 cm by 61 cm). If a cable hole is to be reopened for installation of more cables, an additional 2.5 lbs. (1.1 kg) is required to reseal the hole.

Locally Available Products

3.05 The following locally available tools and materials are required for the operations covered in this section:

- C-clamp, 6 inch (15 cm)
- Contour gauge
- Electric drill, 3/8 inch (9 mm)
- Electric nibbler
- Latex gloves
- Metal file
- Nylon straps
- Perforating punch, 7/16 inch (11 mm)
- Rachet box wrench, 9/16 (14 mm) or equivalent
- Saber saw or equivalent
- Safety glasses
- Work gloves (leather, cotton, etc.)
- #10 sheet metal screws
- 1/4 -20 by 1 inch H.H. cap screws.

4. Precautions

Falling Objects

4.01 Due to the possibility of tools or material dropping through cable hole openings, adequate protection must be provided for personnel and equipment that may be present on the floor below locations where cable hole work is being performed.

Asbestos

A. Possibility of Exposure

4.02 Personnel shall not perform work operations which would entail the exposure to or the handling of asbestos material. This material may be located in areas such as cable slots/holes, engine exhaust piping, cable rack support clamps or ceiling beams. Personnel should be aware of the possibility that asbestos might be present at these locations. In cases where asbestos material or dust is present, it is the customer's responsibility to remove any loose asbestos fibers or dust in the work area prior to the start of any firestopping installation work operations. In any event, if asbestos was previously found at the work site, the Regional Environment and Safety Organization (RESO) should be contacted for assistance prior to the start of work.

4.03 Exercise caution when opening cable holes or slots.
Loose packing materials containing asbestos have

been found in some cable slots used to run cable to the main distributing frame. If loose packing material is found upon opening a cable hole/slot, samples shall be placed in approved plastic bags for identification by an approved testing laboratory.

Exception:

This requirement does not apply to loose filling from punctured or torn mineral wool or fiberglass-filled bags previously used for fire stopping.

DANGER:

Samples shall not be taken by unauthorized personnel. Contact the RESO for assistance in collecting samples and locating an approved laboratory. The sample(s) shall be forwarded to the laboratory to determine if any asbestos is present.

B. Removal

4.04 If the laboratory results do establish the presence of asbestos, the installer shall inform the customer that the asbestos material handling, cleanup, and disposal must be subcontracted to an outside company who can perform the required services in accordance with applicable state and federally legislated requirements. The Chemicals and Environmental Management Services (CHEMS) group in Greensboro, North Carolina (919-279-6990) has a listing of asbestos removal contractors and consultants approved to perform asbestos-related work activities in company premises. See AT&T 010-160-151, Procedures for Asbestos Abatement and Control for further information.

4.05 When an outside contractor performs work operations which cause asbestos fibers to become airborne, a qualified industrial hygienist should be available to take air samples for record purposes. Personnel must mark off the work area to restrict all nonessential personnel from entering. Personnel shall not be positioned in the asbestos removal area until a safety zone has been established by the industrial hygienist. It may be necessary to relocate installation and maintenance personnel to an adjoining room or different floor level.

NOTE:
Generally, an independent industrial hygiene monitoring firm is retained to oversee removal operations for AT&T. The CHEMS group maintains a list of approved industrial hygiene consultants. Additionally, they have developed AT&T Master Specifications for asbestos removal projects. See AT&T Practice 010-160-153, Asbestos Removal Specification Information for further information.

4.06 When existing floor, wall, and partition cable holes are opened and the present covers are of an asbestos material, the installer shall replace them with 3M fire barrier composite sheet. A steel plate should then be placed over the composite sheet on all affected floor and ceiling cable holes. (See Figures 1 and 2.)

DANGER:
The replaced asbestos material covers are not to be cut or reduced in size prior to disposal. Such covers shall be placed into double-bagged, 6-mil polyethylene bags and disposed of via an approved asbestos removal service company. Label all bags in accordance with AT&T 015-200-020, Product Safety Labeling or ANSI Z535.4-1991.

5. Fire Stopping Floor/Ceiling Penetrations

Basic Method

5.01 The following procedure outlines the basic method of fire stopping floor/ceiling cable holes. (See Figures 1 and 2.)

For specific details and fabrication methods, refer to job specifications and drawings provided in the 3M Fire Protection Products Applications and Specifier's Guide for Through-Penetration Protection Systems. Also, see Section 9 for additional information on joining 3M composite sheets.

1. Take precautions detailed in Section 4.

2. Remove the existing top steel plate. It will be reused as a cover over the cable penetration to prevent someone falling through the penetration.

3. Remove the ``blue'' (mineral wool) bags and discard.

4. Mark the interior outline of the hole onto the bottom steel plate.

5. Remove the bottom steel plate.

6. Draw a second line on the bottom plate, 3/4 inch (19 mm) inside the first line.

7. Cut the bottom plate along the inside line and discard the inside piece.

8. Mark and cut the 3M composite sheet to match the outside line drawn on the bottom plate.

9. Compress the cable bundle above and below the cable hole with nylon ties.

10. Reinstall the bottom steel plate.

11. Install the lower 3M composite sheet (supported by the ledge formed by the bottom steel plate).
    CAUTION:
    In order to provide an effective fire barrier, place the 3M composite sheet so that the wire mesh side faces into the cable hole.

12. Fill the void between the cables and the cover with 3M putty (MPP-1).
    CAUTION:
    Tests have indicated that putty installed between layers of cables in cable bundles significantly reduces smoke penetration. To obtain a smokeless cable hole, apply putty strips around each cable and press the bundle tightly to fill all voids between cables with putty. Repeat process as new cables are added.

13. Using the top steel plate as a guide, mark and cut a second 3M composite sheet to match the contour of the steel plate.

14. Install the top 3M composite sheet.

    CAUTION:
    In order to provide an effective fire barrier, place the 3M composite sheet so that the wire mesh side faces into the cable hole.

15. Reinstall the top steel plate.

16. Fill the void between the cables and the cover with 3M putty (MPP-1).

Temporary Method

5.02 At the end of each working day, all active cable holes shall be closed as follows:

1. Place the 3M composite sheet plate over the cable hole metal frame.

2. Place the steel cover over the composite sheet plate and secure with two screws to the metal frame.

NOTE:
Do not apply additional moldable putty if a sufficient amount is already on the cable bundle. However, if this is a new cable slot or additional cables are added to an existing one, then apply putty to the bundle.

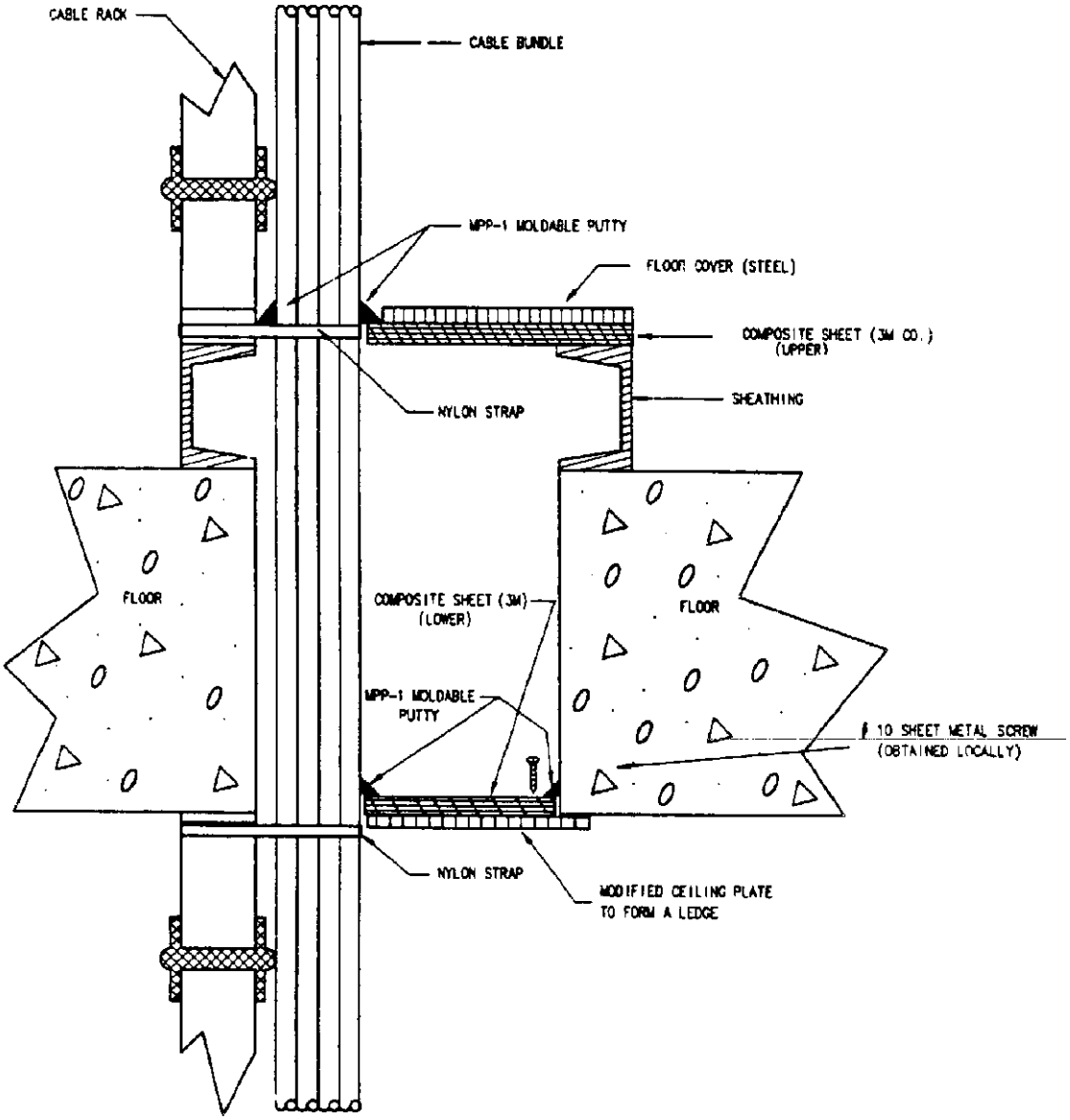

Figure 1. Cable Opening - Floor/Ceiling

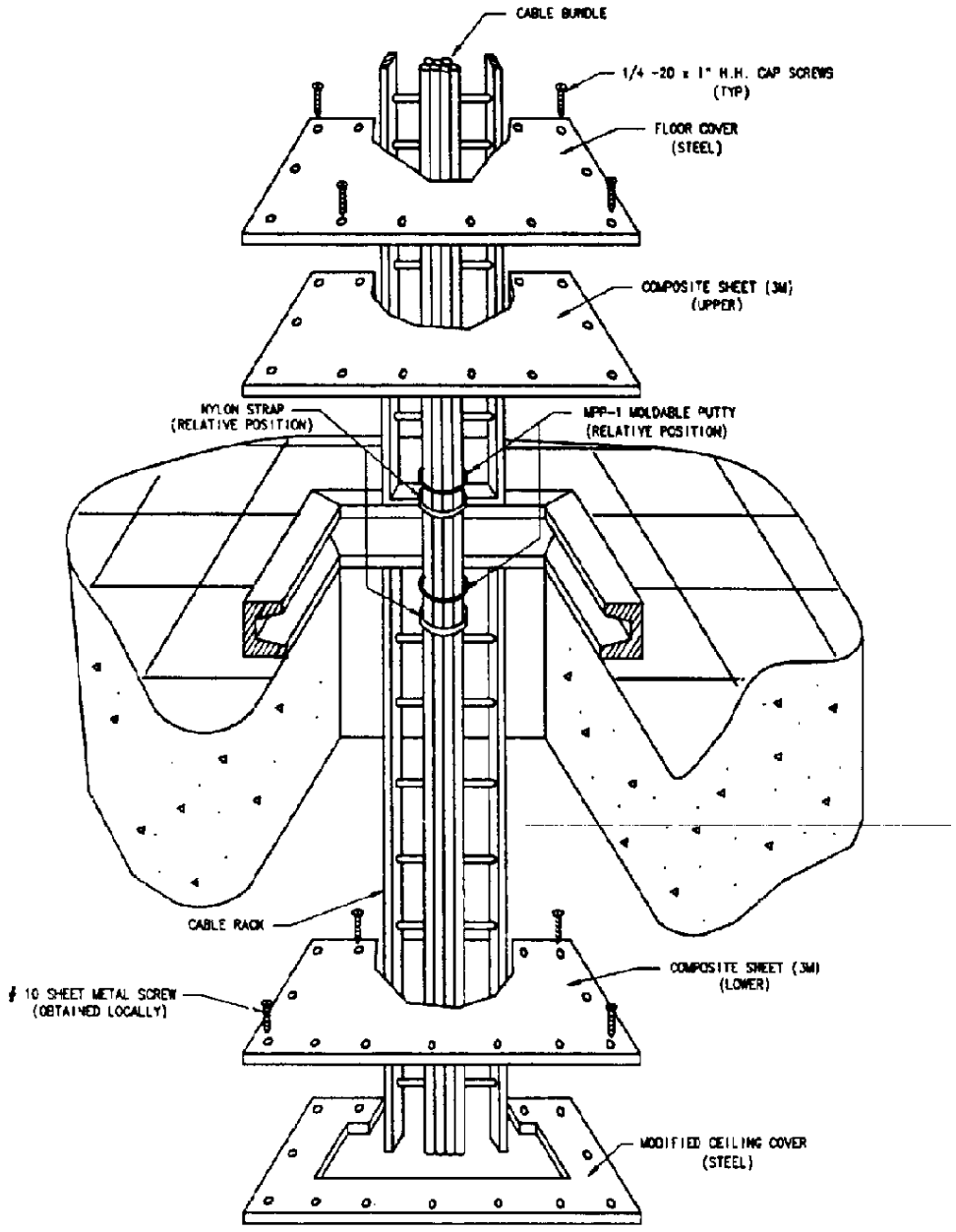

Figure 2. Exploded View of Cable Opening - Floor/Ceiling

6. Fire Stopping Wall and Partition Penetrations

6.01 The following procedure briefly outlines the method of fire stopping walls and partitions. (See Figures 3 and 4.)

For specific details and fabrication methods, refer to job specifications and drawings provided in the 3M Fire Protection Products Applications and Specifier's Guide for Through-Penetration Protection Systems. Also, see Section 9 for additional information on joining 3M composite sheets.

1. Take precautions detailed in Section 4.

2. Apply a 3M composite sheet on both sides of the wall or partition cable hole.

   CAUTION:

   In order to provide an effective fire barrier, place the 3M composite sheet so that the wire mesh side faces into the cable hole.

3. Apply a bead of molded putty (MPP-1) around the cable bundle to fill the gap between the composite sheet and the cable.

4. Apply a bead of the putty at joints of the composite sheet and cover with metal flashing.

   NOTE:

   Wall and partition cable holes do not require the installation of steel plates over the composite sheets.

7. Fire Stopping Sleeves

7.01 Apply 3M moldable putty (MPP-1) to a minimum depth of 2 inches (51 mm) in the void between the sleeve and wall or floor surface. In addition, work the putty into the voids between cables.

NOTE:

The composition of sleeves may vary. In order to select the most appropriate fire-stopping procedure and depth of putty to fill voids, refer to the 3M Guide.

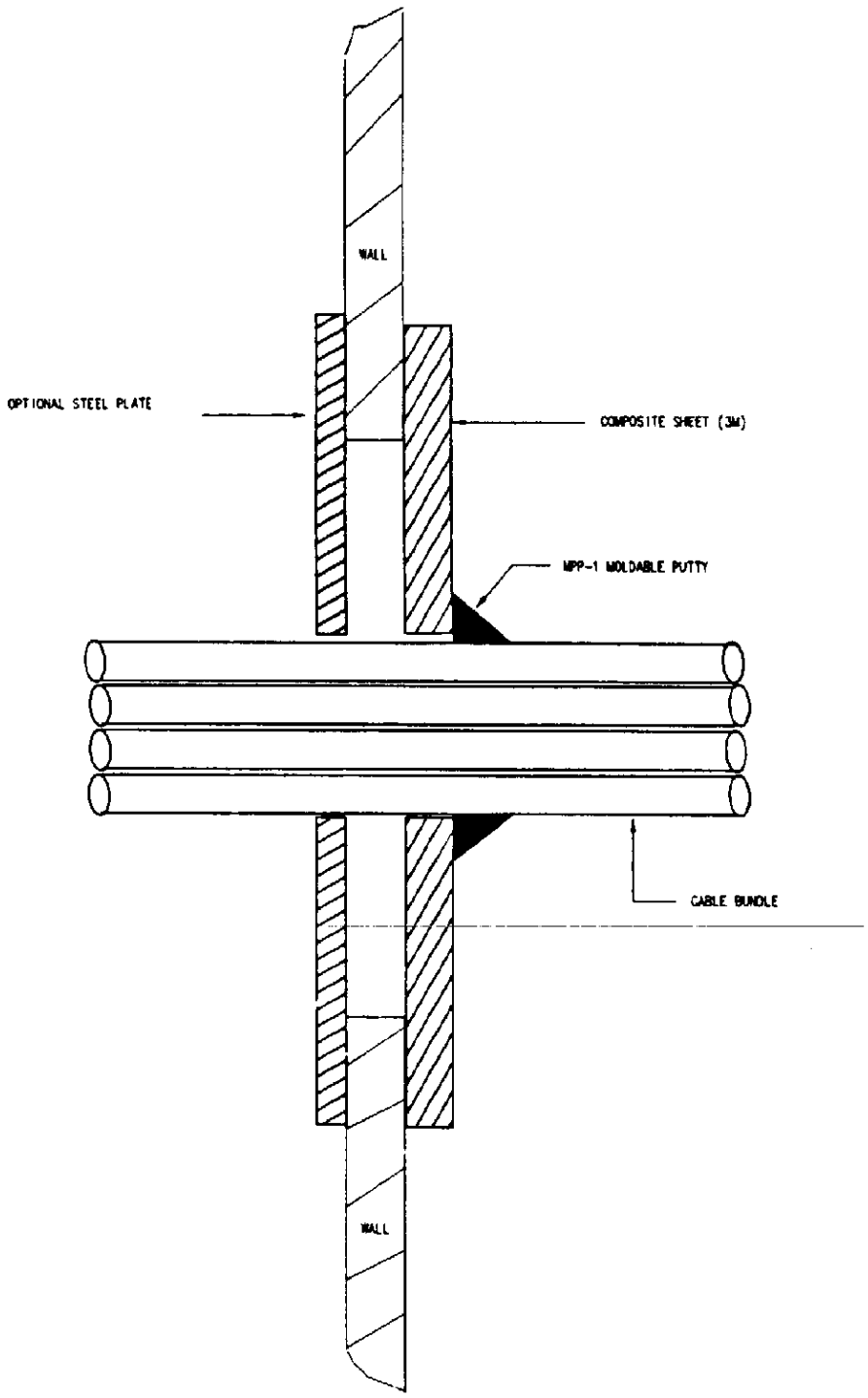

Figure 3. Cable Opening - Partition Wall

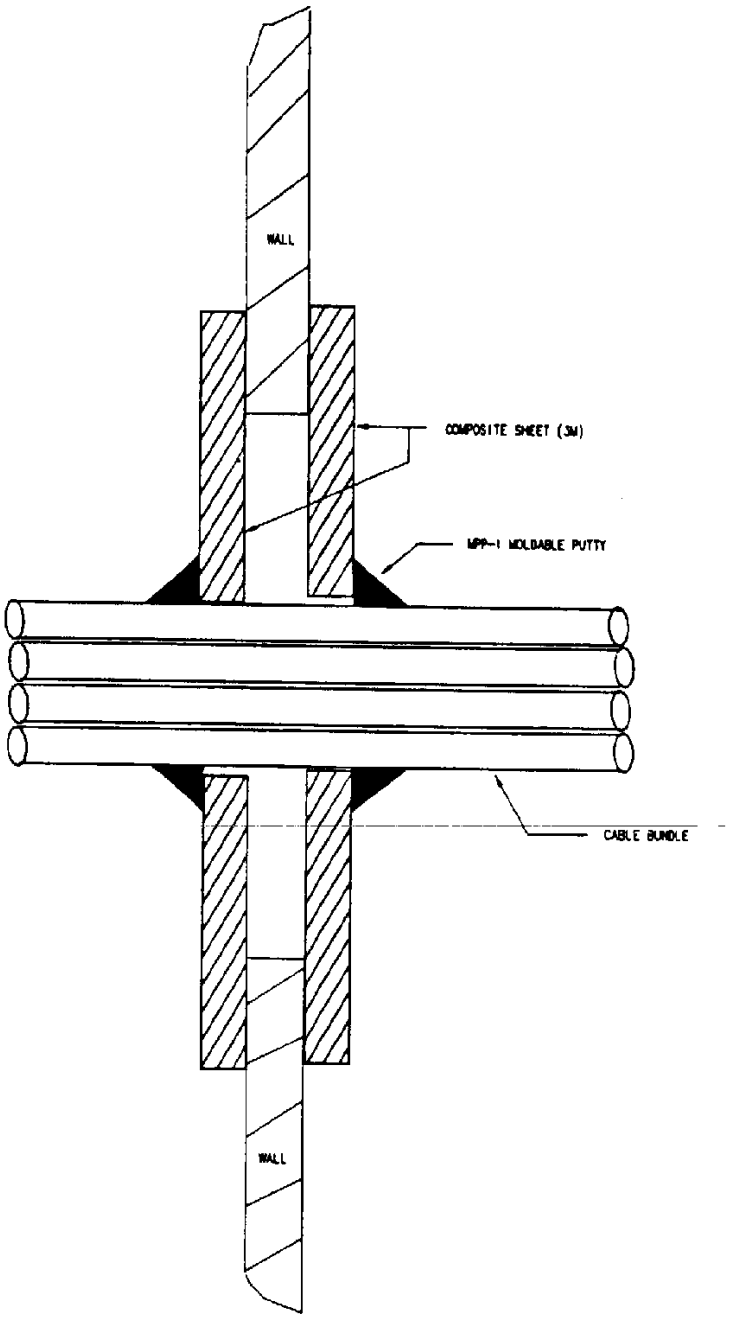

Figure 4. Cable Opening - Fire Wall

8. Fire Stopping Miscellaneous Penetrations

Ventilated Bus Ducts

8.01 Ventilated bus ducts that penetrate fire-rated walls and floors are not recommended. However, where they presently exist, the opening outside the duct shall be sealed as noted in paragraphs 5.01 and 6.01.

Unventilated Bus Duct

8.02 The installation of unventilated bus ducts through fire-rated floors and walls shall be such that no void exists between the bus duct enclosure and the wall or floor opening or penetration. Any void shall be sealed in accordance with the procedures in paragraphs 5.01 and 6.01.

Blank Openings

8.03 For penetration fire stopping of blank openings, refer to the ``Blank Openings'' section of the 3M Fire Protection Products Applications and Specifier's Guide for Through-Penetration Protection Systems.

Other Penetrations

8.04 All other penetrations of fire-rated barriers such as sleeves, collars, etc., for purposes of sleeving ground conductors, water piping, etc., shall be sealed in accordance with the procedures in paragraphs 5.01, 6.01, and 7.01.

9. Joining 3M Composite Sheets (Seam Fabrication)

9.01 Occasions will arise when a penetration is too large for the available composite sheets or when penetrations previously fire stopped using the recommended methods are opened for removal of cable. Fire stopping in this case will require fitting the composite sheet into a hole larger than the original. In such situations, the composite sheet should be supported every 750 in2 (0.5 m2) with an internal steel support frame or metal stirrups.

9.02 Occasionally during cable mining operations, the void created exceeds the gap parameters (between the cables and composite sheet) of the fire stop system. In this event, the existing composite sheet shall be contoured to fit against the remaining cables. Then, the penetration shall be sealed by adding another piece of composite sheet. For application details, refer to the ``Seaming Details'' section of the 3M Fire Protection Products Applications and Specifier's Guide for Through-Penetration Protection Systems.

10. Verifying Proper Fire Stopping of Penetrations

Inspection

10.01 Visually verify that:

(a) A 3M composite sheet has been placed under the floor steel plates.

(b) The moldable putty (MPP-1) is placed between cables as additional cables are added to a retrofitted cable hole.

(c) The wire mesh side of the composite sheet is not visible at the ceiling.

(d) The moldable putty is visible between the composite sheet and the cable bundle at the ceiling side.

(e) The cable bundle is compressed with nylon ties above and below the cable hole as shown in Figures 1 and 2.

10.02 The same visual inspection method applies to fire-rated walls and partitions.

Labeling

10.03 If management prefers the use of labels as a means of verifying proper fire stopping of cable penetrations, then they may be applied. If selected for use, application of the labels should be consistent throughout the facility. One form of labels may be ordered through Material Distribution Centers per KS22228 L1. Alternatively, local management may require a label designed by others. In any event, the decision to label is left to the customer.

11. Reference Documents

11.01 The following AT&T Practices are associated with this practice.

Number	Title
AT&T 010-160-151	Procedures for Asbestos Abatement and Control
AT&T 010-160-153	Asbestos Removal Specification Information
AT&T 015-200-020	Product Safety Labeling

11.02 The AT&T Practices listed in paragraph 11.01 are stocked in Indianapolis, Indiana, at the AT&T Customer Information Center. To order copies:

- Call 1-800-432-6600

or

- Complete Form IND1-80.80 and mail to:

AT&T Customer Information Center
Attention: Order Entry Department
2855 N. Franklin Road
P.O. Box 19901
Indianapolis, IN 46219-1999

Contacts
Fire Stopping of Penetrations

1. Overview

1.01 This appendix provides the names, addresses, and telephone numbers of current contacts as specified by AT&T 770-350-100, Fire Stopping of Penetrations.

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

2. Contacts Internal to AT&T

2.01 AT&T Corporate Fire Protection Engineering Organization:

131 Morristown Road
Basking Ridge, NJ 07920
908-204-8230

2.02 AT&T Regional Environment and Safety Organization:

Headquarters Region
745 Route 202/206
Bridgewater, NJ 08807
908-231-6427

2.03 AT&T Regional Environment and Safety Organization:

Eastern Region
21 Colonial Drive
Piscataway, NJ 08854
1-800-544-8502
1-800-544-4787

2.04 AT&T Regional Environment and Safety Organization:

Western Region
4430 Rosewood Drive
Pleasanton, CA 94566
510-224-1440

2.05 AT&T Regional Environment and Safety Organization:

Central Region
227 West Monroe St., Suite 1004
Chicago, IL 60606
312-230-5252

2.06 AT&T Regional Environment and Safety Organization:

Southern Region
Promenade II, Floor 05W12
1200 Peachtree Street, NE
Atlanta, GA 30309
404-810-4810

FEEDBACK FORM

Document Title: Firestopping of Penetrations
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Submitted by (optional):
Name:
Company:
Address:
Telephone Number:
Date:
Return to:

AT&T Organization: Corporate Fire Protection Engineering Organization
Address: 131 Morristown Rd., Basking Ridge, NJ 07920