SECTION F -- FIRE STOPPING

CONTENTS

1. GENERAL............................................................................................................. F-2
   1.1. Introduction ........................................................................................................... F-2

2. REQUIREMENTS .................................................................................................. F-2
   2.1. General................................................................................................................. F-2
   2.2. Cabling and cable capacity requirements ......................................................... F-4

3. SMOKE STOPPING ............................................................................................... F-4
   3.1. Smoke Stoppage Associated with Cable Installation ............................................ F-4
   3.2. Smoke Stopping For Cable Holes Closed With Hilti Products ............................... F-5

4. FIRE STOPPING ................................................................................................... F-6
   4.1. General................................................................................................................. F-6
   4.2. Continuous Slots Under Office Distributing Frames ............................................. F-6
   4.3. Partially Occupied Cable Slots and Large Floor Openings ................................. F-6
   4.4. Fire Stopping Small Rectangular Floor Openings Under Office Distributing Frames F-7
   4.5. Fire Stopping Using Hilti Products ..................................................................... F-7
   4.6. Fire Stopping Circular Openings Using Hilti Products ....................................... F-10
   4.7. Replacement of Hilti Fire Stop Blocks ................................................................. F-10
   4.8. Fire Stopping Large Wall Openings with Hilti Board ......................................... F-10
   4.9. Fiber Optic Cable Troughs Using Hilti Products ................................................ F-11
   4.10. Optional Quick-Release Top Cover Floor Openings ......................................... F-11

5. FIRE STOP LABEL REQUIREMENTS ..................................................................... F-12
   5.1. Fire Stop Labels ................................................................................................ F-12

6. CORPORATE REAL ESTATE / REAL ESTATE OPERATION – BUILDING INFRASTRUCTURE / CONSTRUCTION FIRE STOPPING AND SMOKE CONTAINMENT .............................................. F-13
   6.1. Scope................................................................................................................. F-13

TABLE F-1 – SUMMARY OF CHANGES IN SECTION F

<table>
<thead>
<tr>
<th>Revision Date</th>
<th>Item Description</th>
<th>Action</th>
<th>Requirements Change Notification</th>
</tr>
</thead>
<tbody>
<tr>
<td>04/02/2015</td>
<td>Contact Information (pg. F-23)</td>
<td>Modification</td>
<td>N/A</td>
</tr>
<tr>
<td>01/16/2018</td>
<td>Entire Document</td>
<td>Modification</td>
<td>N/A; Section Rewrite</td>
</tr>
<tr>
<td>03/04/2019</td>
<td>Entire Document</td>
<td>Modification</td>
<td>N/A; Section Rewrite</td>
</tr>
</tbody>
</table>
1. GENERAL

1.1. Introduction

1.1.1 The Installation Supplier shall ensure, as part of the evaluation of the installation, that all equipment added, rearranged or modified is properly installed and in conformance with AT&T installation specifications.

1.1.2 The Installation Supplier shall ensure, as part of the evaluation of the installation, that all work has been done in accordance with the detail specifications or approved changes to the detail specifications.

1.1.3 This section covers the general requirements for opening and closing through-penetrations in floors and fire rated walls and protection of cable runs.

1.1.4 3M fire and smoke stopping procedures in this document describe previously used methods. Paragraphs are presented solely for purposes of assuring those remaining openings are in compliances to those methods. No new applications of 3M fire stopping systems shall be applied.

1.1.5 All fire stopping installed in AT&T equipment buildings shall be with UL Listed Systems installed in strict accordance to the manufacturer's installation instructions.

1.1.6 Changes in this issue of Section F are summarized in Table F-1.

2. REQUIREMENTS

2.1. General

2.1.1 Smoke and fire stopping is required at all through-penetrations in floors and fire rated walls.

A: Through-penetrations in non-fire rated walls shall not be fire stopped.

B: The Installation Supplier shall contact the AT&T Equipment Engineer for questions regarding the fire rating of a specific wall. This information shall be documented on a JIM and a copy left in the job folder or job folder on site.

2.1.2 Fire-stopping products made by different manufacturers shall not be used in the same cable hole or through-penetration. The exception to this requirement applies to smoke stopping at the interior of cable bundles. Existing fire stopping putty between cable layers that are not accessible and where new putty pads cannot be applied may remain in place even though the product is of another manufacturer.

2.1.3 When the Installation Supplier opens a cable hole, the Installation Supplier shall close, and fire stop the cable hole in accordance with this section and in accordance to UL certified fire stop system drawings.

2.1.4 The Installation Supplier shall comply with the following fire stop management considerations:

a) The Installation Supplier shall permanently close through penetrations at the end of each workday or at the completion of an installation or removal operation, whichever occurs first.
b) The Installation Supplier shall update the Cable Penetration Reporting Log (see Section E).

c) The installation Supplier shall not leave the premises while a through-penetration is open.

d) Unframed cable holes in hollow walls shall be referred to the AT&T Equipment Engineer for upgrading so holes are framed on all four sides. Any supporting documentation regarding this issue shall be left in the job folder.

2.1.5 All penetrations shall be closed with Hilti fire stop materials and smoke stop putty in accordance to Hilti and UL Listed Fire Stop systems. Exceptions to this policy will be limited to the following:

a) Existing penetrations with other manufacturers’ UL certified fire stopping systems may continue to be fire and smoke stopped with existing systems until those penetrations are opened in the future.

b) Cable penetration opened for inspection and immediately closed with no cable add or removal.

c) Closure of penetration during course of project when work in a penetration has not been completed. Final closure of penetration will be fire and smoke stopped with Hilti fire stop system.

d) Cable penetrations previously closed using other fire stopping system shall have all existing materials removed and replaced with Hilti materials. Smoke stop putty of another manufacturer that is not accessible internal to the opening or between cable bundles may be left in place.

2.1.6 If technical assistance is required for Non-Standard cable hole penetrations, the installation supplier shall complete the Request for Technical Assistance form at the end of this Section and forward as indicated on the form. When this form is used, a copy of the response from ATT or Hilti, Inc. shall be left in job folder at job completion. Additionally, the cable hole shall be stenciled or labeled with the following information beneath the face of cable hole:

FIRESTOPPED PER HILTI UL-WXYZ OR HILTI DRAWING NUMBER 1234567x DATED 00/00/0000

2.1.7 Conduits and pipes shall not be added to through-penetrations containing network interconnection cables. Conduit and pipes shall be run through a separate opening, which shall be fire stopped with approved intumescent products. Refer to paragraphs 4.7 to 4.10 of this section for more information.

2.1.8 Through-penetration covers shall be removed before installing new cable and removing dead cable. Cable(s) and conduit shall not be pushed or pulled through an opening without the removal of the cable hole covers.

2.1.9 The Installation Supplier shall provide adequate protection for open cable holes to protect personnel and equipment where there is danger of material or personnel falling through the cable opening. This may include barricades, warning signs and mechanical protection.

2.1.10 The Installation Supplier shall ensure that all surfaces are clean and free of dust, grease, oil, loose materials, rust, or other substances, prior to applying intumescent putty or caulk.
2.1.11 The Installation Supplier shall ensure that fire stopping products are prepared and used in accordance with the manufacturer's documentation before installation.

2.1.12 The edges of cut intumescent composite sheets and cable hole cover plates shall be deburred and free of sharp corners.

   a) The corners of composite sheets and cable hole covers shall be rounded to an 1/8-inch minimum radius.

2.1.13 The cover plate and intumescent composite sheets shall not extend beyond the edge of the corners of the cable hole sheathings at floor openings.

2.1.14 Multipiece cable hole covers shall be spliced together in the following manner:

   a) A 2-inch-wide 28-gauge galvanized steel splice strip shall be used to join the two pieces together. A splice strip shall not be multi-piece. It shall be of one continuous length.

   b) The splice strips shall be secured with ¼ inch by ½ inch sheet metal screws spaced at a maximum of 3 inches apart starting from each end.

   c) 1-¼ inch fender washers shall be used under the screw heads located on the outer edge of the cable hole perimeter.

   d) Intumescent putty shall be placed under the splice strip filling the seam between adjacent pieces of composite sheets and adjacent pieces of covers at floor openings.

   e) Multiple small pieces shall not be spliced together to form one large piece.

2.1.15 Refer to figure F-50 for general guidelines for fire stopping adjacent wall building constructions.

2.1.16 Cable rack pans shall not be installed on internal cable rack sections running through fire rated surfaces such as walls. The cable rack pans shall end just at the opening of the penetration and continue on the other side where cable leaves the penetration. Cables shall be secured with cord to the cable rack at nearest external cross straps to penetration opening where cable enters and exits.

2.2. Cabling and cable capacity requirements

2.2.1 The general requirements for cables, cable routing, cable diversity, cable protection, cable pileup, and cable rack loading, etc. are set in section J of TP76300.

3. SMOKE STOPPING

3.1. Smoke Stoppage Associated with Cable Installation

3.1.1 During cable installation, smoke stopping shall be achieved by filling the interior voids between the cables being installed with approved non-hardening intumescent putty as described below and shown in the appropriate figures in this section to the point of not permitting air flow to be detected through penetration.

   a) Smoke stopping is required on both sides of hollow wall penetrations that are not equipped with metallic sleeves or are not framed on all four sides.
b) Smoke stopping for solid wall and four sided framed hollow wall applications shall be applied on the side of the wall providing the greatest ease of installation, preferably the network equipment side.

c) The ends of all conduits, pipes, tubing, etc. used for routing cable and wire through fire rated walls and floors that do not terminate in an enclosure on one side of the assembly, shall be sealed with a minimum of 1/4" depth of intumescent putty or 1" minimum depth of Hilti fire block material.

d) Smoke stopping shall be applied to all cables restored to cable racks after cable removal/mining activity.

e) To limit the air flow from between cable bundles and around cable racks, putty shall be applied as well as possible around these areas.

3.1.2 Mini-coax cables shall be bundled together and treated as a single cable. They shall be fire stopped as follows:

a) Each individual coax cable shall not be individually wrapped with an intumescent putty pad.

b) Intumescent putty or caulk shall be placed into the middle of the cable bundle to fill all the void space between the coax cables.

c) The banded mini-coax bundle shall be treated as a single cable and fire stopped per requirements found in the rest of Section F.

3.1.3 After installing cables and applying smoke stopping material between the cables, the Installation Supplier shall tightly band cables together to compress the cable bundle and effectively join smoke stopping material to form an airtight seal. (See Figure F-2).

a) Cable bands shall be a 1/4-inch or larger nylon cable tie (preferred) or a minimum of 4 strands of 9-ply wax fiber cord.

b) Cable bands shall be placed 1 ½ to 2 inches above the top cable hole cover and shall be visible for inspection when the last securing strap is more than six inches from the cable hole cover.

1. Cable bands shall be placed 1 ½ to 2 inches below the bottom side cable hole opening and shall be visible for inspection when the first securing strap is more than six inches from the cable hole opening

2. The locking head of the cable tie shall be positioned at the side or rear of the cable rack.

3. Cable protection practices may require wrapping some cable types with protective sheeting such as fiber paper before they are banded together. Refer to Section J of this document.

3.2. Smoke Stopping For Cable Holes Closed With Hilti Products

3.2.1 Cable openings and cable bundles shall be smoke stopped as follows;

a) A single layer of minimum 1-inch wide putty pad material shall be firmly applied across the face of opening where cables will rest against the building surface. This layer of material
shall be minimally as wide as the opening’s cable rack(s) and extend 1 inch above/from the
building surface. The portion of material extending above/from the building surface shall be
pressed into the cable curvatures as cable is placed across the face of the opening in their
final installed position.

b) A single layer of minimum 1-inch wide putty pad material shall be firmly applied across
each layer of cable in a manner that fills the voids between the cables to form an air tight
seal.

c) All layered smoke stopping material shall extend a minimum of 1 inch into floor and wall
openings. Adjacent segments of layered material shall overlap a minimum of ¼ inch

4. FIRE STOPPING

4.1. General

4.1.1 Non-metallic pipe and tubing installed with cables shall be wrapped with a layer of intumescent
wrap strip that is a minimum of 1-3/4 inches wide. Wrap strips to be located where pipe/tubing
exits holes through floors and on both sides of walls.

4.1.2 Wrap strips shall be held in place using two strands of 9 ply cord, or aluminum tape unless
otherwise specified herein.

4.2. Continuous Slots Under Office Distributing Frames

4.2.1 The closing of continuous slots under office distributing frames, regardless of depth, may be
accomplished in the following manner. See Figure F-9.

a) Work from below with covers in place. Use mineral wool batting of 3 or 4 inches thickness
and cut 2 inches oversized to ensure a tight fit. Force mineral wool batting into the slot and
press up against the covers to tightly pack all voids between vertical bundles of stub
cables.

b) Insert mineral wool batting so that there are no vertical joints except at the stub cable. No
bottom plates are required with this method.

c) Mineral wool batting installed over an equipment area shall be wrapped in aluminum foil to
minimize dusting problems. Cutting and wrapping should be done in an area other than the
telephone equipment area.

d) Smoke stop all spaces between the cable and cover plate with intumescent putty.

e) Eye protection and dust masks shall be worn by the installer for this operation.

4.3. Partially Occupied Cable Slots and Large Floor Openings

4.3.1 The occupied portion of cable slots shall be isolated from unoccupied portions and from
portions fire stopped with another media by installing a steel partition between the ceiling and
floor surfaces similar to the one as shown in Figure F-6A. Partitions are not required if the
occupied and unoccupied portion(s) of a slot are fire stopped in the same manner with the
same fire stopping products.

a) Partitions shall be made from a minimum of 16-gauge painted or galvanized sheet metal.
b) There shall be zero to 1/4 inch of clearance between the partition and the sides of the cable hole for ease of installation. The partition shall be fastened to ceiling cover plates or to the building surface at a minimum of two locations at the lower end and shall be fastened at a minimum of one location at the upper end. The use of multi-piece partitions is acceptable. Multi-piece partitions shall be fastened together with a minimum of two fasteners in a manner that assures the pieces will react as a single rigid piece when subjected to pressure.

c) A ½ inch bead of intumescent putty shall be installed around the perimeter of partitions at their interface with building surfaces, slot covers and cable hole sheathings to form an airtight seal.

d) Partitions shall also be used to segment cable holes when opening is fire stopped with different technologies (mineral wool, blocks, composite sheets, etc).

4.3.2 Figure F-6B shall be used as a reference when it is necessary to segment large openings into smaller openings to enable more affective cable management and/or fire stopping. In such cases partitions shall be fabricated from a minimum of 16 gauge (0.06) painted or galvanized steel and a minimum of 11 gauge steel shall be used for hole covers. The actual partitioning configuration used is dependant on floor/wall location and hole usage.

a) At this time, the 15-inch front-to-back maximum size of a cable opening shown in Figure F-6B is applicable to holes fire stopped with Hilti fire blocks. It is relative to cable pileup allowances on miscellaneous cable racks.

b) Wall cable holes greater than 2,496 square inches (17.3 sq. ft.) in size require partitioning into smaller openings when fire stopped with Hilti Fire Blocks. The longest allowable dimension comprising the 2,496 square inches is 52 inches. Reference UL Design WL-8014. An RFTA may also be requested.

4.4. Fire Stopping Small Rectangular Floor Openings Under Office Distributing Frames

4.4.1 The closing of occupied small rectangular openings up to 4 x 10-inches in size shall be accomplished in the following manner. Refer to Figure F-10.

a) Provide a temporary method of containment on one side (top or bottom, preferably the bottom) so that material can be packed against it.

b) Pack all voids around the cables at the perimeter of the cable bundle to the full depth of the opening with mineral wool batting.

c) Install a layer of intumescent putty over the mineral wool batting at the top of the hole to a minimum depth of 1 inch.

4.5. Fire Stopping Using Hilti Products

4.5.1 The fire stopping of large through penetrations using Hilti FS-657 or CFS-BL Fire Blocks shall be in accordance with Figures F-30 to F-33 and F-45 to F-47 as covered below and in 4.14.2. Putty pads may/should be applied to building surfaces to assist with fire block installation when necessary or desirable.
a) A single layer of minimum 1-inch wide putty pad material shall be firmly applied around the perimeter of the cable bundle and pressed into the curvatures formed by adjacent cables. Adjacent segments of layered material shall overlap a minimum of ¼ inch.

b) Layered putty material shall extend a minimum of 1 inch into cable openings. This layer of fire protection material becomes the smoke stopping element of subsequent cable layers.

c) **Note:** The Hilti FS657 or CFS-BL Fire Block may be used for this application. The existing FS657 has a clear plastic sheet for shipping purposes that must be removed before installation. The CFS-BL Block has a branded color label with product name and UL designation on the 8" x 5" surface. This label does not have to be removed prior to installation. The installer has the option of removing the CFS-BL label depending on preference. Fire blocks shall be cut to the cable bundle’s shape and to minimize the potential for air gaps. The blocks shall be installed in an overlapping (staggered) fashion to completely fill the remaining interior void of the through penetration. Blocks shall overlap a minimum of 1/4".

d) Fire blocks shall be installed flush with the top of floor/wall building surface and extend 5-inches into the opening for miscellaneous holes and 8-inches into the opening for power and fiber cable only holes. On a single cable rack with mixed cabling (secondary power and switchboard cabling), the blocks shall extend 5-inches into the opening. Fire block installation shall equal wall thickness for power and fiber only holes in walls measuring 5 to 8-inches thick. Blocks may extend below the ceiling in the floor applications and beyond wall surfaces when covers are not required. Exception: When Fire Blocks are installed in conjunction with the Z-frame per section 4.18, Fire Blocks installed 5" deep regardless of cable type.

e) Air leaks in the fire block installation shall be sealed at the top by wedging CP-617 putty pad or CP-618 putty stick material into detected air passages. There shall be no spaces between fire blocks.

f) A ½-inch (min.) dome or minimum 1-inch wide layer of putty shall be applied around the cable bundle and other penetrating items at their interface with the fire blocks. This perimeter of putty material is required at both sides of wall openings.

g) A 1-inch wide strip of putty pad or a 1/4-inch bead of putty material shall be applied around the top perimeter of the cable hole sheathings at floor openings as indicated in Figure F-30.

h) Large floor openings shall be covered with a minimum 11 gauge steel cover that is cut to approximate the shape of the installed cable bundle. The gap between the installed cable and the steel cable hole cover shall be 1/2-inch ± 1/4-inch.

i) In some AT&T offices, optional quick-release fasteners for floor top cover will require a thinner steel sheet to be used. The cover for these floor penetrations shall be 20 gauge steel. Only penetrations equipped with quick-release fasteners shall use the thinner covers.

j) A 1-inch minimum dome of putty shall be applied around the entire perimeter of the cable bundle at its interface with the steel cover plate, cable rack and cable hole sheathing. This dome of putty shall overlap onto the steel cable hole surfaces a minimum of 1/2-inch.
k) Fasteners shall be located within 2-inches of cable hole corners and spaced no more than 8-inches apart.

4.5.2 **Note:** Hilti now offers the CFS-BL Fire Block which allows for extended spaces before supporting wire mesh or metal cover plates are required. Please note the separate spacing limitations of the FS657 vs CFS-BL Fire Blocks. Wall openings completely or partially filled with the Hilti FS 657 Fire Block having more than 4-inches of space between the penetrants, such as cable, cable racking, raceways and conduits, and the wall opening shall be equipped with wire mesh or sheet metal retention covers on both sides of the opening. Wall openings filled entirely with the Hilti CFS-BL Fire Block may have up to 12” of space between penetrants and wall opening before supporting wire mesh or metal cover plates are required. Wire mesh shall be used when the distance (depth) between the wall surface and installed fire blocks does not exceed 1/2” on either side of the opening. Sheet metal covers shall be used when the distance (depth) between the wall surface and installed fire blocks exceeds 1/2-inch on either side of the opening. For walls 8-inches or less thick, wire mesh covers may be used if the fire blocks are installed in the 8-inch direction.

a) Installed wall hole covers shall be no closer than 1 inch or more than 2-1/2 inches away from the hole penetrants.

b) Mesh covers shall be fabricated from #16 gauge galvanized 2-inch square (max.) wire mesh.

c) Sheet metal covers for wall openings shall be fabricated from #20 gauge (min.) galvanized steel.

d) Wall covers shall be fastened to the building surface with 1/4-inch fasteners with 1-1/2” fender washers installed under the fasteners head. Cover fasteners shall be appropriate for the building surface they are installed in.

e) Fasteners shall be located within 2-inches of cable hole corners and spaced no more than 8-inches apart.

f) Cable hole covers shall extend a minimum of 3” beyond the opening of cable holes in walls.

g) Wall holes shall be closed with one type of cable hole cover. Wall holes shall not have wire mesh on one side and a steel cover plate on the other side.

**Note:** Hilti’s strut system for supporting solid covers at wall openings may be used where space permits. Refer to figure F-49 for general strut system application guidelines.

4.5.3 Wire mesh or cover plate over Hilti FS657 Fire Blocks will not be required in max. 24” x 12” wall openings when T-Separator bar and Z-frame system is used as shown in Figure 33. The T-bar will provide the necessary resistance for fire hose stream requirement when fire block height does not exceed 6 inches above or below T-bar and wall opening height does not exceed 12 inches. Hilti Z-frame shall be secured around perimeter of wall penetration and T-bar secured with two rotating latches over face of the T-bar. T-bar may be screw fastened to Z-frame but makes future movement of T-bar more difficult when adding or removing cables.

**Note:** When max 12” x 24” opening is filled entirely with new Hilti CFS-BL Fire Block, a T-Separator Bar is not required.
4.6. Fire Stopping Circular Openings Using Hilti Products

4.6.1 Circular openings shall be fire stopped in accordance with Figures F-34 to F-44, F-51, F-58, and F-59.
   a) Mineral wool batting shall be tightly packed into the opening at the required minimum depth.
   b) Fire blocks, caulk and putty shall be installed at the required locations and minimum depth.
   c) Plastic pipe and sleeves shall be equipped with the required number of wrap strip layers or proper size of collar assembly.
   d) Steel sleeves installed in hollow walls shall comply with the construction elements indicated in the relevant Figure reference.
   e) Speed Sleeves installed in walls/floors shall comply with the accompanying installation instructions and as indicated in the relevant Figure reference (Figure F-58 and F-59)
   f) Fire stop plugs (figure F-51) shall not be used in void openings unless the opening is equipped with a metallic sleeve.
   g) Fire stop plugs (figure F-51) shall be sealed with a 1/2” minimum dome of CP-618 putty stick.
   h) Fire stop drop-in device installed in floors shall comply with the accompanying installation instructions and as indicated in the relevant Figure reference (Figure F-61)

4.7. Replacement of Hilti Fire Stop Blocks

4.7.1 Hilti FS-657 and CFS-BL Fire Blocks shall be examined for suitability of reuse whenever cable penetrations in walls and floors are opened. The blocks shall be in one piece, compressible and pliable without tears, breaks, cracks, flaking, powdering, or signs of wear. Fire blocks showing any unacceptable conditions stated shall be removed and replaced with new block. Blocks cut to fit openings are not considered unacceptable blocks.

4.7.2 Hilti FS-657 and CFS-BL Fire Blocks have a usable life expectancy of 25 years. After 25 years in service the old blocks shall be removed and replaced with new blocks. The examination and replacement of blocks should only occur when cable penetration is opened as a part of a cable project in the office. Blocks with fewer than 5 years of life remaining shall be replaced. Any block that is not dated shall be assumed to have been placed into service January 2005.

4.7.3 The Installation Supplier shall hand mark any new installed block with the month and year of installation with a black permanent marker pen.
   a) Blocks shall be installed so the markings are clearly visible.

4.7.4 Cable penetrations may have fire blocks of different installation dates.

4.7.5 Fire blocks in penetrations of buildings that have been through a fire event shall be examined for damage, discoloration, charring, burns, intumescent expansion and replaced if any of these signs are discovered.

4.8. Fire Stopping Large Wall Openings with Hilti Board
4.8.1 Alternative method to fire stopping large through penetrations in walls using a combination of Hilti CFS-BL Fire Blocks and Hilti CP 675T fire stop boards shall be in accordance with Figure F-31(b) or Figure F-31(c). The alternative method reduces the number of fire stop blocks required for fire stopping large penetrations by replacing fire stop blocks with fire stop boards.

a) Hilti CFS-BL Fire Blocks will be applied to areas of penetration where cables and cable rack pass through wall. Procedures for fire stopping using Hilti CFS-BL fire blocks shall be in accordance to paragraph 4.14. Limit fire blocks above cables to no more than three rows to avoid wire mesh requirement. Fire Blocks can be installed 5 inches deep regardless of cable type when Fire Block/ CP675T method is used.

b) Hilti CP 675T fire stop boards shall be applied to areas of penetration away from cable and cable rack area.

c) The area between fire stop blocks and fire stop board shall be separated horizontally by a Hilti CP 675 T-Separator Bar fastened to the back lip of Hilti CP 675 Z-Frame. The Hilti Z-frame lengths are installed to two vertical sides and top edge of the penetration secured to studs or directly to wall if concrete or masonry. Hilti CP 619T putty, 1” wide by 1/8” thick, shall be applied to inside of Z-frame between the wall and Z-frame.

d) One Hilti CP 675T fire stop board shall be cut to fit opening (within ¼”) and inserted into opening until flush with back lip of Z-Frame. Hilti CP 619T putty is applied to inside perimeter of Z-frame edge prior to inserting interior board. An additional Hilti CP 675T board cut to fit opening (within ¼”) is inserted flush with wall assembly over the previous interior board. Distance holders attached to interior board keeps outside board flush with wall.

e) Rotate latches across board placed on Z-frame to secure board and slide T-bar latches up to secure board. Finish by applying Hilti CP 619T putty to perimeter of board for smoke stop.

4.8.2 Wall openings 24” x 12” or smaller may also be fire stopped in accordance to Figure F-33 with Hilti FS-675 Fire Block and Hilti T-Separator Bar. This system will be a fire block only application. Fire stopping to this system does not require outer wire mesh if installed in accordance to Figure F-33. The installation requires Z-frame secured around perimeter of wall opening and Hilti T-Separator Bar secured to Z-Frame.

4.8.3 Note: When max 12” x 24” opening is filled entirely with new Hilti CFS-BL Fire Block, a T-Separator Bar is not required.

4.9. Fiber Optic Cable Troughs Using Hilti Products

4.9.1 Fiber optic cable troughs shall not be run through floor penetrations. Where they presently exist, the installation supplier shall complete the Request for Technical Assistance form at the end of this section on the form.

4.10. Optional Quick-Release Top Cover Floor Openings

4.10.1 Quick-release hardware used to secure top covers to floor penetration sheathing may be substituted for cap-screws where required by the AT&T Equipment Engineer and the penetration has been identified for high activity. Because of the greater cost for installing the
hardware, only authorized penetrations shall be equipped with quick-release feature. Quick-release feature allows cover to be removed and replaced without tools. Kits are available from Hilti.

a) Quick-release feature is not recommended for general applications because of higher initial cost for materials and labor and the risks for metal shavings being introduced into the equipment space. The shavings are generated from the drilling of sheathing to install inserts.

b) Where quick-release feature is required, every precaution shall be taken to avoid metal shavings from falling down cable hole or to embed into cable bundle. The area directly under sheathing shall be sealed with flame resistant plastic sheet taped to side of opening and around cables. The plastic sheet shall be formed to capture all shavings. A ball of clay or tacky putty shall be placed directly under top of sheathing in the area to be drilled to capture metal chips and shavings.

5. FIRE STOP LABEL REQUIREMENTS

5.1. Fire Stop Labels

5.1.1 The AT&T approved cable hole labels (Figure F-7) shall be completed and affixed to an opening’s cover plate and cable hole sheathing, building surface or cables upon completion of the fire stopping activity in a manner that will cause the label(s) to tear when the cable hole cover is removed. The label is not required when drop in ceiling plates are utilized.

a) On wall openings closed with Hilti products, two labelsshall be applied across the fire stop board, or when fire stop blocks are installed, two labels across wire mesh or solid cover plate. The labels shall be affixed to the building surface and fire stop material/cover on front and rear of the cable opening (a total of 4 labels per opening). The labels shall be placed one on right and the other on left side of the fire stop board, wire mesh or solid cover plate of front and rear opening locations. For applications with fire blocks and Hilti Z-Frame or fire stop board/block combination with Hilti Z-Frame, labels shall be applied on the working side only of the cable hole closure across a rotating Z-frame latch retaining block, board or T-bar. One label on right side and another label on left side of opening are required. The label shall be applied so a latch, fire stop material and Z-frame surface are all contacted.

b) At floor openings closed with Hilti products, a label shall be applied on each side of the steel cover plate (sides paralleling cable growth).

c) All existing closed and/or open cable hole labels (as shown in Figure F-7 or similar) shall be removed in their entirety before affixing new labels.

d) While a cable hole is open, the AT&T approved open cable hole label, (Figure F-7A), shall be completed and affixed to the cable hole opening. This label shall remain in plain view until such time the hole is permanently fire stopped.

e) For any situations where the cable hole label requirements cannot be met as noted in the above paragraphs, then the fire stop labels shall be placed across and affixed to the cables as shown in Figure F-8.
f) When a cable penetration is opened for inspection or survey reasons, duplicates of the original labels shall be affixed over the top originals and a single additional label with the inspection date and company shall be applied to the fire stopping cover. The intent of this procedure is to maintain an audit trail of the last installation effort while documenting the inspection effort.

6. CORPORATE REAL ESTATE / REAL ESTATE OPERATION – BUILDING INFRASTRUCTURE / CONSTRUCTION FIRE STOPPING AND SMOKE CONTAINMENT

6.1. Scope

6.1.1 AT&T Practice Fire and Smoke Containment System AT&T Practice CRE-07-84-13-ATP-001 shall be implemented for all building infrastructure and construction fire stopping and smoke containment. This Practice provides requirements for the selection, installation and maintenance of through-penetration, membrane-penetration, and building joint/top-of-wall firestop and smoke containment systems in fire-resistance-rated assemblies where Corporate Real Estate (CRE) Real Estate Operations (REO) manages building penetrations.

6.1.2 This Practice applies to all new and existing AT&T Enterprise (Domestic, International) owned, operated, or leased telecommunications equipment buildings and non-telecommunications equipment buildings.

6.1.3 Any variances, exceptions, and technical questions to the Practice must be submitted to and approved by REO Programs and Standards Fire Protection and Life Safety Fire2@att.com.

6.1.4 To obtain a copy of the Practice contact the CRE/REO Project Manager.
REQUEST FOR TECHNICAL ASSISTANCE RESPONSE
FIRE STOPPING NON-STANDARD THROUGH-PENETRATION ASSEMBLY
TELECOMMUNICATIONS FACILITIES

<table>
<thead>
<tr>
<th>Author's RFTA Ref. No.</th>
<th>Date _______ Telco Job Ref. No. _______ Office CLLI _______ Floor _____</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office Address _______</td>
<td>Cable Hole Desig. _______</td>
</tr>
<tr>
<td>AT&amp;T LEC Eqpt. Engr.</td>
<td>Phone ______________________</td>
</tr>
<tr>
<td>Submitted By: _________</td>
<td>Company: ______________________</td>
</tr>
<tr>
<td>Phone: ________________</td>
<td>FAX: ________________</td>
</tr>
<tr>
<td></td>
<td>Response Needed By: _______</td>
</tr>
</tbody>
</table>

**Building Surface Construction:**
- Floor ___ Wall ___ Thickness ______ F Rating (if known) ___ hr.
- Framed/Hollow Wall _____ Concrete/Block Wall _______
- Size of Opening ______ Describe Hole Lining/Sheathing If Any: ______________________

**Use of Space on Both Sides Of Opening:**
- Side A: ______________ Side B: ______________

**Penetrating Apparatus** (include cable bundle size if applicable): __________________

**Function of Fire Stop:**
- Permanent Closing _____ Re-enterable Closing _____

**The problem/situation (By Installation Contractor):**

**Proposed resolution (By Hilti/AT&T Approval Team):**

**Send Request To:**
Hilti Fire Protection Engineering Team
Ph: 1-800-886-8915   FAX: 918-254-1679   E-mail: gary.mason@hilti.com

*Email picture of application when submitting RFTA form

Approved ___ Denied ___

Questions to AT&T: Keith Lanning, Ph: (770) 329-7193   E-mail: kl1825@att.com

Comments:
<table>
<thead>
<tr>
<th>Line</th>
<th>Figure</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F-1</td>
<td>WATERPROOFING LARGE HOLES IN FLOORS</td>
</tr>
<tr>
<td></td>
<td>F-2</td>
<td>BANDING CABLES</td>
</tr>
<tr>
<td></td>
<td>F-3</td>
<td>STIRRUPS FOR INTUMESCENT COMPOSITE SHEET SUPPORT (FOR INFO PURPOSES ONLY, NO NEW INSTALLATIONS)</td>
</tr>
<tr>
<td></td>
<td>F-4</td>
<td>MODIFIED CEILING PLATES FOR INTUMESCENT COMPOSITE SHEET SUPPORT (FOR INFO PURPOSES ONLY, NO NEW INSTALLATIONS)</td>
</tr>
<tr>
<td>5</td>
<td>F-5</td>
<td>PROTECTIVE COVERS FOR INTUMESCENT COMPOSITE SHEETS AT FLOORS (FOR INFO PURPOSES ONLY, NO NEW INSTALLATIONS)</td>
</tr>
<tr>
<td></td>
<td>F-6A, B</td>
<td>CABLE SLOT PARTITIONING ARRANGEMENTS</td>
</tr>
<tr>
<td></td>
<td>F-7</td>
<td>CABLE HOLE LABEL DESCRIPTIONS</td>
</tr>
<tr>
<td></td>
<td>F-8</td>
<td>CABLE HOLE LABEL INSTALLATION AT WALL OPENINGS WITHOUT SOLID COVERS</td>
</tr>
<tr>
<td></td>
<td>F-9</td>
<td>CONTINUOUS SLOTS UNDER DISTRIBUTING FRAME</td>
</tr>
<tr>
<td>10</td>
<td>F-10</td>
<td>SMALL RECTANGULAR SLOTS UNDER DISTRIBUTING FRAME</td>
</tr>
<tr>
<td></td>
<td>F-11</td>
<td>FIRE STOPPING LARGE FLOOR OPENINGS USING INTUMESCENT COMPOSITE SHEET PRODUCTS (UL FB-3004)</td>
</tr>
<tr>
<td></td>
<td>F-12</td>
<td>FIRE STOPPING LARGE WALL OPENINGS USING INTUMESCENT COMPOSITE SHEET PRODUCTS (UL CAJ-4003)</td>
</tr>
<tr>
<td></td>
<td>F-13</td>
<td>FIRE STOPPING NON-METALLIC PIPE IN LARGE RECTANGULAR OR CIRCULAR OPENINGS USING INTUMESCENT COMPOSITE SHEETS (OPENINGS UP TO 84 IN.2) (UL CAJ-2003)</td>
</tr>
<tr>
<td></td>
<td>F-14</td>
<td>FIRE STOPPING FLEXIBLE NON-METALLIC TUBING IN LARGE RECTANGULAR OPENINGS USING INTUMESCENT COMPOSITES SHEETS (UL CAJ-2030)</td>
</tr>
<tr>
<td>15</td>
<td>F-15</td>
<td>FIRE STOPPING ADC RACEWAY IN LARGE WALL OPENINGS USING INTUMESCENT COMPOSITE SHEETS (UL WL-6002)</td>
</tr>
<tr>
<td></td>
<td>F-16</td>
<td>FIRE STOPPING CABLE IN CIRCULAR OPENING UP TO 6&quot; DIAMETER IN CONCRETE/MASONRY FLOORS AND WALLS (UL CAJ-3021)</td>
</tr>
<tr>
<td></td>
<td>F-17</td>
<td>FIRE STOPPING CABLE IN CIRCULAR OPENING UP TO 4&quot; DIAMETER IN CONCRETE/MASONRY FLOORS AND WALLS HAVING A NON-METALLIC SLEEVE – SLEEVE EXTENDS 2&quot; OR LESS BEYOND BUILDING SURFACE (UL CAJ-3058 EJ)</td>
</tr>
<tr>
<td></td>
<td>F-18</td>
<td>FIRE STOPPING CABLE IN CIRCULAR OPENING UP TO 4&quot; DIAMETER IN CONCRETE / MASONRY FLOORS AND WALLS HAVING A NON-METALLIC SLEEVE – SLEEVE EXTENDS MORE THAN 2&quot; BEYOND BUILDING SURFACE (UL CAJ-3058 EJ)</td>
</tr>
<tr>
<td></td>
<td>F-19</td>
<td>FIRE STOPPING NON-METALLIC PIPE UP TO 4&quot; DIAMETER IN A 7&quot; MAX DIAMETER CIRCULAR OPENING IN SOLID/HOLLOW FLOORS AND WALLS (UL CAJ-2001, CAJ-2226, WL-2092)</td>
</tr>
<tr>
<td>20</td>
<td>F-20</td>
<td>FIRE STOPPING NON-METALLIC PIPE UP TO 4&quot; DIAMETER IN A 6&quot; MAX DIAMETER CIRCULAR OPENING IN CONCRETE/MASONRY FLOORS AND WALLS (UL CAJ-2002)</td>
</tr>
<tr>
<td></td>
<td>F-21</td>
<td>FIRE STOPPING METALLIC PIPE IN CIRCULAR OPENING OF CONCRETE/MASONRY FLOORS AND WALLS (UL CAJ-1027)</td>
</tr>
<tr>
<td></td>
<td>F-22</td>
<td>FIRE STOPPING FLEXIBLE NON-METALLIC TUBING IN CIRCULAR OPENINGS OF CONCRETE/MASONRY FLOORS AND WALLS (UL CAJ-2028 &amp; CAJ-2029)</td>
</tr>
<tr>
<td></td>
<td>F-23</td>
<td>FIRE STOPPING CABLE IN CIRCULAR OPENINGS OF HOLLOW WALLS (UL WL-3031)</td>
</tr>
<tr>
<td></td>
<td>F-24</td>
<td>FIRE STOPPING 2&quot; MAX DIAMETER NON-METALLIC PIPE IN HOLLOW WALLS (UL WL-2097)</td>
</tr>
<tr>
<td>25</td>
<td>F-25</td>
<td>FIRE STOPPING METALLIC PIPE IN HOLLOW WALLS (UL WL-1001, WL-1032)</td>
</tr>
<tr>
<td></td>
<td>F-26</td>
<td>FIRE STOPPING VOID CIRCULAR OPENINGS IN FLOORS AND WALLS (UL WL-</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>F-27</td>
<td>RESERVED</td>
<td></td>
</tr>
<tr>
<td>F-28</td>
<td>RESERVED</td>
<td></td>
</tr>
<tr>
<td>F-29</td>
<td>RESERVED</td>
<td></td>
</tr>
<tr>
<td>F-30</td>
<td>FIRE STOPPING LARGE FLOOR OPENINGS USING INTUMESCENT FIRE BLOCKS (CBJ-8013)</td>
<td></td>
</tr>
<tr>
<td>F-31A</td>
<td>FIRE STOPPING LARGE WALL OPENINGS USING INTUMESCENT FIRE BLOCKS (CBJ-8013)</td>
<td></td>
</tr>
<tr>
<td>F-31B</td>
<td>FIRE STOPPING LARGE WALL OPENINGS USING HILTI FIRE STOP BOARD AND BLOCKS (UL WJ-4049)</td>
<td></td>
</tr>
<tr>
<td>F-31C</td>
<td>FIRE STOPPING LARGE WALL OPENINGS USING HILTI FIRE STOP BOARD AND BLOCKS (UL WJ-4050)</td>
<td></td>
</tr>
<tr>
<td>F-32</td>
<td>FIRE STOPPING NON-METALLIC PIPE AND TUBING IN RECTANGULAR OPENINGS USING INTUMESCENT FIRE BLOCKS (CBJ-8013)</td>
<td></td>
</tr>
<tr>
<td>F-33</td>
<td>FIRE STOPPING WALL OPENINGS MAX. 12&quot; X 24&quot; WITHOUT MESH OR COVER PLATE WHEN USING T-BAR (HILTI UL SYSTEM W-L-4049 CONFIG. C)</td>
<td></td>
</tr>
<tr>
<td>F-34</td>
<td>FIRE STOPPING CABLE IN 6&quot; MAX. DIA. OPENING IN SOLID FLOORS AND WALLS</td>
<td></td>
</tr>
<tr>
<td>F-35</td>
<td>FIRE STOPPING CABLE IN 4&quot; MAX. DIAMETER OPENING IN SOLID FLOORS AND WALLS EQUIPPED WITH NON-METALLIC SLEEVE (CAJ-3084)</td>
<td></td>
</tr>
<tr>
<td>F-36</td>
<td>FIRE STOPPING CABLE IN 4&quot; MAX. DIA. OPENING IN SOLID FLOORS AND WALLS EQUIPPED WITH NON-METALLIC SLEEVE EXTENDING BEYOND BUILDING SURFACE (CAJ-3084 EJ)</td>
<td></td>
</tr>
<tr>
<td>F-37</td>
<td>FIRE STOPPING NONMETALLIC PIPE 7&quot; MAX. DIA. OPENING IN SOLID FLOORS AND WALLS – SMALL ANNULAR SPACE (CAJ-2109)</td>
<td></td>
</tr>
<tr>
<td>F-38</td>
<td>FIRE STOPPING NON-METALLIC PIPE IN 6&quot; MAX. DIA. OPENING IN SOLID FLOORS AND WALLS – LARGE ANNULAR SPACE (CAJ-2294)</td>
<td></td>
</tr>
<tr>
<td>F-39</td>
<td>FIRE STOPPING METALLIC PIPE IN 6&quot; MAX. DIA OPENING IN SOLID FLOORS AND WALLS – LARGE ANNULAR SPACE (CAJ-1276)</td>
<td></td>
</tr>
<tr>
<td>F-40</td>
<td>FIRE STOPPING ENT IN 4&quot; MAX. DIA. OPENING IN SOLID FLOORS AND WALLS (CAJ-3084 EJ)</td>
<td></td>
</tr>
<tr>
<td>F-41</td>
<td>FIRE STOPPING CABLE IN 4&quot; MAX. DIA. OPENING IN HOLLOW WALLS (WL-3111, WL-3112)</td>
<td></td>
</tr>
<tr>
<td>F-42</td>
<td>FIRE STOPPING NON-METALLIC PIPE IN 4&quot; MAX. DIA. OPENING IN HOLLOW WALLS (WL-2075)</td>
<td></td>
</tr>
<tr>
<td>F-43</td>
<td>FIRE STOPPING METALLIC RACEWAYS IN HOLLOW WALLS (EJ)</td>
<td></td>
</tr>
<tr>
<td>F-44</td>
<td>FIRE STOPPING VOID CIRCULAR OPENINGS IN FLOORS AND WALLS</td>
<td></td>
</tr>
<tr>
<td>F-45</td>
<td>FIRE STOPPING LARGE POWER CABLE ONLY OPENINGS IN FLOORS USING INTUMESCENT FIRE BLOCKS (CBJ-4026)</td>
<td></td>
</tr>
<tr>
<td>F-46</td>
<td>FIRE STOPPING LARGE FIBER CABLE ONLY OPENINGS IN FLOORS USING INTUMESCENT FIRE BLOCKS (CBJ-4026)</td>
<td></td>
</tr>
<tr>
<td>F-47</td>
<td>HILTI FIRE BLOCK ORIENTATION GUIDE</td>
<td></td>
</tr>
<tr>
<td>F-48</td>
<td>COVER JUNCTIONING – LARGE HOLES USING HILTI FIRE STOP BLOCKS</td>
<td></td>
</tr>
<tr>
<td>F-49</td>
<td>HILTI SOLID COVER STRUT KIT GUIDE</td>
<td></td>
</tr>
<tr>
<td>F-50</td>
<td>GENERAL APPLICATION OF FIRE STOPS AT ADJACENT BUILDING WALLS</td>
<td></td>
</tr>
<tr>
<td>F-51</td>
<td>FIRE STOPPING CIRCULAR OPENINGS UP TO 4&quot; IN DIA. IN FLOORS/WALLS USING HILTI CP-658T FIRE STOP PLUGS (CAJ-0097 and CAJ-3216)</td>
<td></td>
</tr>
<tr>
<td>F-52</td>
<td>FIRE STOPPING ADC RACEWAY THROUGH WALLS (UL W-L-6017)</td>
<td></td>
</tr>
<tr>
<td>F-53</td>
<td>FIRE STOPPING METAL PIPE/STEEL CONDUIT THROUGH FLOORS (UL F-A-2213, F-B-1026)</td>
<td></td>
</tr>
<tr>
<td>Line</td>
<td>Figure</td>
<td>Subject</td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hilti Fire Stop Systems</td>
</tr>
<tr>
<td>Hole Type</td>
<td>Size</td>
<td>Construction</td>
</tr>
<tr>
<td>15</td>
<td>Large Rectangular</td>
<td>12” x 24”</td>
</tr>
<tr>
<td></td>
<td>Wall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very Large Rectangular</td>
<td>Greater than 12” x 24”</td>
</tr>
<tr>
<td></td>
<td>Wall</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Small Rectangular</td>
<td>&lt;12” x 24”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Large Rectangular</td>
<td>12” X 24”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Circular</td>
<td>≤ 6”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 4”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 4”</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>≤ 7”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 4”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 6”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 6”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 4”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 4”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 4”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 4”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 3”</td>
</tr>
<tr>
<td>35</td>
<td></td>
<td>≤ 6”</td>
</tr>
</tbody>
</table>
FIGURE F-1 – TYPICAL WATERPROOFING OF LARGE HOLES IN FLOORS

- Intumescent caulk or non-hardening gasket compound such as Permatex No. 2
- Interior face of cable hole
- Sheathing, frame or steel cover anchoring hole
FIGURE F-2 – APPLICATION OF CABLE BANDING FOR SMOKE STOPPING

- MINIMUM CABLE TIE MIN. 1/4" WIDE
- MIN. 4 STRANDS OF WAXED STRINGING CORD
- INITIAL INSTALLATION
- SUBSEQUENT INSTALLATION
- SUBSEQUENT CABLE BAND THROUGH EXISTING CABLE BUNDLE OR TO EXISTING CABLE BAND
- SMOKE STOPPING BUTT AT INTERIOR VOIDS
- ±2" FROM CABLE HOLE COVER
- CABLE BAND – TO CABLE PACK STRINGER OR AROUND ENTIRE BUNDLE WHICH ENSURES NOSE APPROPRIATE AND CONVENIENT FOR PROTECTION OF CABLE INSTALLATION INTEGRITY.
FIGURE F-3 – CABLE HOLE SET-UP FOR COMPOSITE SHEET PRODUCTS USING SUPPORT STIRRUPS (UL FB-3004 METHOD)
FIGURE F-4 – CABLE HOLE SET-UP FOR COMPOSITE SHEET PRODUCTS USING MODIFIED CEILING PLATE SUPPORT (UL FB-3004 EJ)

1/4 x 3/4" SELF-TAPPING SHEET METAL SCREW & FENDER WASHER
INTERMEDIATE DROP-IN COVER PLATE

MODIFIED CEILING COVER PLATE

APPROXIMATELY 2"

VERTICAL CABLE PULL FROM OVERHEAD STRUCTURE
FOR VIVA CABLE CEILINGS

MODIFIED CEILING COVER PLATE AT FLOOR BELOW
FIGURE F-5 – METHOD OF PROTECTING EXPOSED INTUMESCENT COVERS AT FLOOR OPENINGS

1/4-20 HHCS & FENDER WASHER

1/2" MIN
4" MAX.

1/8" STEEL COVER PLATE
FIGURE F-6A – PARTITIONING CABLE SLOT IN FLOOR

- Shown with upper lip folded over lower flange of hole sheathing.
- Shown with upper lip folded under lower flange of hole sheathing.
- Ceiling cover plate.
- Multi-piece/adjustable partition.
- Single piece partition.
- Shown separating adjacent openings, interior firmly packed with mineral wool batting.
FIGURE F-6B – SEGMENTING LARGE FLOOR OPENINGS INTO SMALLER ONES

#11 GA. STEEL COVER
(INITIALLY NOT SHOWN)

HOLE SHEET-THIN-

MINERAL TRAY-

FILE TOP BLOCKS SHOWN

#16 GA. PARTITION TUBE TWO PIECES SHOWN

#11 GA. STEEL COVER

#11 GA. CEILING COVER

#16 GA. PARTITION (MIN.)
TWO PIECES SHOWN

NOTE 1. SINGLE PIECE PARTITION MAY BE USED WITH FLOORS UP TO 12-INCHES DEEP
MIN. 1/4-INCH FASTENERS USED THROUGHOUT ASSEMBLY

NOTE 2. FASTENERS ON TWO PIECE PARTITION TO BE LOCATED BELOW FINEST MELLEN.
AT EACH END OF PARTITION MIN. APPROX. 6 COVERS.
FIGURE F-7 – TYPICAL FIRE STOP LABELS

AT&T EQUIPMENT ENGINEER

THIS CABLE HOLE OPENED BY:

SUPPLIER NAME: ________________________________

TEO #: __________ DATE/TIME OPENED: __________

SUPPLIER CONTACT NUMBER: ____________________

Open Cable Hole Label
(Black Characters on Green Background)
(A)

AT&T EQUIPMENT ENGINEER

THIS CABLE HOLE HAS BEEN PROPERLY FIRE STOPPED IN ACCORDANCE WITH ATT-TP-76300

SUPPLIER'S NAME: ________________________________

TEO #: __________ DATE CLOSED: __________

SUPPLIER CONTACT NUMBER: ____________________

Closed Cable Hole Label
(Black Characters on Orange Background)
(B)
FIGURE F-8– APPLICATION OF FIRE STOP LABELS

LABELS APPLIED ACROSS CABLE BUNDLE PRIOR TO SEALING BLOCK INSTALLATION. CONTRACTOR AND JOB INFORMATION NOT COVERED BY PUTTY.
FIGURE F-9 – FIRE STOPPING CONTINUOUS SLOTS UNDER OFFICE DISTRIBUTING FRAMES
FIGURE F-10 – FIRE STOPPING SMALL RECTANGULAR OPENINGS UNDER OFFICE DISTRIBUTING FRAMES
FIGURE F-11 – FIRE STOPPING LARGE FLOOR OPENINGS USING INTUMESCENT COMPOSITE SHEET PRODUCTS (UL FB-3004)
FIGURE F-12 – FIRE STOPPING LARGE WALL OPENINGS USING INTUMESCENT COMPOSITE SHEET PRODUCTS (UL CAJ-4003)

1. In the middle of intumescent putty and high perimeter of cable bundle at both sides of opening.
2. Cable tie
3. Reference side B
4. Reference side A
5. Stationary composite sheet cover
6. Removable composite sheet cover
7. Apply putty under strip at junction of covers
8. 1/4” wall fasteners and fender washers according to construction of wall
9. 8” max. spacing of fasteners
10. 1/4 gauge galv. steel strip 2” wide
11. 1/4 x 1/2" sheet metal screws (max. 3” spacing)
12. 1/4” head of putty or approved sealant
1. **MPP+ Moldable Putty Pad**
   1A. Interior of raceway lined with single 4" wide strip of MPP+ putty pad. A 4" wide strip to overlap top of raceway sides 1/2" and extend a minimum 1" from the wall surface.
   1B. A single strip of 2" wide MPP+ putty pad formed across top of 1/2" maximum cable pileup. Putty strip to extend a minimum 1" from wall surface.

2. **CS-195+ Composite Sheet**
   Installed per standard fastening and opening overlap requirements. Fixed and removable portion of cable hole cover cut to fit contour of raceway and installed cable. Space between covers and raceway to be +1/2" to allow insertion of FS-195+ Warp/Strip around perimeter of raceway.

3. **FS-195+ Wrap/Strip**
   3A. Apply a single layer of FS-195+ Wrap Strip across the top of cable bundle. This layer of wrap strip to be relocated to top of cable bundle as additional cable is installed.
   3B. Raceway and installed cable enclosed by a single layer of FS-195+ Wrap Strip. Wrap strip to overlap top of either side of raceway and extend a minimum of 1" from wall surface.

4. **MPS-2+ Putty Stix**
   4A. A min. 1/4" bead of bulk putty to be installed around perimeter of FS-195+ Wrap/Strip to seal opening. Putty to be wedged into space between composite sheet and wrap strip so that wrap strip is held against raceway and installed cable. Putty to overlap composite sheet a minimum 1/4".
   4B. Additional putty to be applied around the exposed side of wrap strip to seal all gaps and spaces between wrap strip and raceway and to plug interior of raceway support channels.

5. **3MM Diameter Fiber Optic Cables**
   Maximum of 960 jumper cables per raceway (approximately 3/4 visual fill). Cables to be installed and layered with single layer of 2" wide MPP+ pad for every 1/2" of cable pileup until pileup nears 3/4 visual fill. Install 1 layer of FS-195+ Wrap/Strip at the top of cable pileup.
FIGURE F-16 – FIRE STOPPING CABLE IN CIRCULAR OPENING UP TO 6" DIAMETER IN CONCRETE/MASONRY FLOORS AND WALLS (UL CAJ-3021)

CABLE TIE
SMOKESTOP

1" MIN. DEPTH OF INTUMESCENT PUTTY OVER 1" MIN. DEPTH OF MINERAL WOOL

(THIS ARRANGEMENT FOR BOTH SIDES OF WALL OPENINGS)

OPTIONAL STEEL SLEEVE

FIGURE F-17 – FIRE STOPPING CABLE IN CIRCULAR OPENING UP TO 4" DIAMETER IN CONCRETE/MASONRY FLOORS AND WALLS HAVING A NON-METALLIC SLEEVE – SLEEVE EXTENDS 2" OR LESS BEYOND BUILDING SURFACE (UL CAJ-3058 EJ)

CABLE TIE
SMOKESTOP

1" MINIMUM DEPTH OF INTUMESCENT PUTTY

NON-METALLIC SLEEVE
SEE F-19 FOR SLEEVE EXTENSIONS BEYOND CEILING AND WALLS

1" DEPTH OF INTUMESCENT PUTTY ABOVE 1" DEPTH OF MINERAL WOOL
FIGURE F-18 - FIRE STOPPING CABLE IN CIRCULAR OPENING UP TO 4" DIAMETER IN CONCRETE/MASONRY FLOORS AND WALLS HAVING A NON-METALLIC SLEEVE – SLEEVE EXTENDS MORE THAN 2" BEYOND BUILDING SURFACE (UL CAJ-3058 EJ)

TABLE F-18

<table>
<thead>
<tr>
<th>PVC</th>
<th>ENT</th>
<th>SQ. or Rectangle</th>
<th>No. of Wrap Strip Layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 to 2&quot;</td>
<td>&lt;1-1/2&quot;</td>
<td>&lt;3 Sq. In.</td>
<td>1</td>
</tr>
<tr>
<td>2-1/2 to 3&quot;</td>
<td>1-1/2 to 2&quot;</td>
<td>3 to 7 Sq. In.</td>
<td>2</td>
</tr>
<tr>
<td>3-1/4 to 4&quot;</td>
<td>Bundles of &lt;2&quot;</td>
<td>&gt;7 Sq. to 12-1/2 Sq. In.</td>
<td>3</td>
</tr>
<tr>
<td>6&quot; (7 max.)</td>
<td></td>
<td>13 to 28 Sq. In.</td>
<td>2 Stacks of 3</td>
</tr>
<tr>
<td>8&quot;</td>
<td></td>
<td>&gt;28 Sq. In.</td>
<td>2 Stacks of 4</td>
</tr>
</tbody>
</table>
FIGURE F-19 – FIRE STOPPING NON-METALLIC PIPE UP TO 4" DIAMETER IN A 7" MAX. DIAMETER CIRCULAR OPENING IN SOLID/HOLLOW FLOORS AND WALLS (UL CAJ-2001, CAJ-2226, WL-2092)
FIGURE F-20 - FIRE STOPPING NON-METALLIC PIPE UP TO 4" DIAMETER IN A 6" MAX. DIAMETER CIRCULAR OPENING IN CONCRETE/MASONRY FLOORS AND WALLS (UL CAJ-2002)
FIGURE F-21 – FIRE STOPPING METALLIC PIPE IN CIRCULAR OPENING OF CONCRETE/MASONRY FLOORS AND WALLS (UL CAJ-1027)

MINERAL WOOL BATTING
1" MINIMUM DEPTH TIGHTLY PACKED INTO OPENINGS WITH ANNULAR SPACES GREATER THAN 3/4"

1-1/2" MAX.

METALLIC RACEWAY

INTUMESCENT PUTTY
1" MINIMUM DEPTH AT PERIMETER OF OPENING

(Both Sides Of Walls)
FIGURE F-22 – FIRE STOPPING FLEXIBLE NON-METALLIC TUBING IN CIRCULAR OPENINGS OF CONCRETE/MASONRY FLOORS AND WALLS (UL CAJ-2028 & CAJ-2029)

(A) SINGLE RUN OF TUBING UP TO 2" IN DIAMETER (BOTH SIDES OF WALLS)

(B) MULTIPLE RUNS OF TUBING UP TO 2" IN DIAMETER IN A SINGLE OPENING

(C) ASSEMBLY OF WRAP STRIPS ACCORDING TO NUMBER OF INSTALLED RACEWAYS
FIGURE F-23 – FIRE STOPPING CABLE IN CIRCULAR OPENINGS OF HOLLOW WALLS
(UL WL-3031)

NOTE 1. SLEEVE TO BE 1" MINIMUM DIAMETER BUT NO 28 GAUGE ADVANCED SHEET
STEEL SLEEVE TO EXTEND 1/4" MINIMUM INTO WALL SURFACE
STEEL SLEEVE TO HAVE A MINIMUM 6" RISE INTO WALL MATERIAL LENGTH
AND BE EQUIPPED WITH SLIP FLEXIBLE TIES AT BOTH ENDS.

NOTE 2. MESH TIES MUST BE AT MAXIMUM 6" CENTER AND 3" PERpendicular TO WALL SURFACE

NOTE 3. MINIMUM 1" DIAMETER OF MESH TIES MUST BE IN CONTACT WITH WALL MATERIAL FOR
SUBMISSIONS TO FIRE RATING OF WALL.

5/8" WALLCAP MUST BE 3" PERpendicular TO WALL
FIGURE F-24 – FIRE STOPPING 2" MAX. DIAMETER NON-METALLIC PIPE IN HOLLOW WALLS (UL WL-2097)

NOTE 1: SLEEVE TO BE 7" MAXIMUM DIAMETER EMT OR NO. 28 GAUGE GALVANIZED SHEET STEEL SLEEVE TO EXTEND 1/2" MINIMUM BEYOND WALL SURFACE. SHEET STEEL SLEEVE TO HAVE 2" MINIMUM OVERLAP ALONG ITS LENGTH ALONG LENGTH AND BE ENCRUSTED WITH MINERAL WOOL OR OTHER INERT MATERIAL. FIRE RESISTIVE TIGHT-FITTING LINING MATERIALS TO BE INSTALLED AT BOTH ENDS.

FIGURE F-25 – FIRE STOPPING METALLIC PIPE IN HOLLOW WALLS (UL WL-1001, WL-1032)
FIGURE F-26 – FIRE STOPPING VOID CIRCULAR OPENINGS IN FLOORS AND WALLS (UL WL-3031 EJ)

(A) VOID CIRCULAR OPENING IN CONCRETE/MASSIVE FLOOR AND WALLS

(B) VOID CIRCULAR OPENING IN FRAMED WALLS
F-30 – FIRE STOPPING LARGE FLOOR OPENINGS USING
INTUMESCENT FIRE BLOCKS (CBJ-8013)
F-31A – FIRE STOPPING LARGE WALL OPENINGS USING INTUMESCENT FIRE BLOCKS (CBJ-8013)

- 16 GAUGE x 2" (MIN) GALVANIZED WIRE MESH OR 20 GAUGE (MIN) SHEET STEEL COVER AT ANNULAR SPACES EXCEEDING 4 INCHES
- 1/4" FASTENERS AND FENDER WASHERS SPACED 8" (MAX) ON CENTER
- PUTTY SEALING AIR LEAKS AS REQUIRED
- CP-617 TAPS AT PERIMETER OF CABLE BUNDLE
- 1" MIN 2-1/2" MAX
- 1/2" BROME OF INTUMESCENT PUTTY AT PERIMETER OF CABLE BUNDLE AND CABLE BACK ON BOTH SIDES OF WALL
FIGURE F-31B – FIRE STOPPING LARGE WALL OPENINGS USING HILTI FIRE STOP BOARD AND BLOCKS (UL WJ-4049)

1" WIDE STRIP OF PUTTY AROUND BOARD AND BLOCKS

ROTATING LATCH

HILTI CP 675 Z-FRAME

HILTI CP 675 FIRE STOP BOARD

APPROX. 8" C/C

T SEPARATOR BAR LATCH

INNER CP 675T BOARD

APPROX. 12" C/C

HILTI CP 675 T-SEPARATOR BAR

1" STRIP OF PUTTY BETWEEN BOARD AND Z-FRAME

DISTANCE HOLDER

CP 675T FIRE STOP BOARD (OUTER)

CP 675T FIRE STOP BOARD (INNER)

1" STRIP OF PUTTY AROUND PERIMETER OF BOARD

T-SEPARATOR BAR

MIN. 1" DEEP PUTTY SEAL AROUND CABLE BUNDLE

FS-657 FIRE BLOCKS

CABLE RACK
FIGURE F-31C – FIRE STOPPING LARGE WALL OPENINGS USING
HILTI FIRE STOP BOARD AND BLOCKS
(UL WJ-4050)
FIGURE F-32 – FIRE STOPPING NON-METALLIC PIPE AND TUBING IN RECTANGULAR OPENINGS USING INTUMESCENT FIRE BLOCKS
(CBJ-8013)
FIGURE F-33 – FIRE STOPPING WALL OPENINGS MAX. 12" X 24"
WITHOUT MESH OR COVER PLATE WHEN USING T-BAR
(HILTI UL SYSTEM W-L-4049 CONFIG. C)

T-separator bar installed without screw fastening to Z-frame to accommodate future move. Rotating latches positioned across T-bar face to prevent T-bar dislodging. Wire mesh or cover plate not required on either side of penetration when T-bar is installed. Maximum height of Hilti FS-657 blocks cannot exceed 6 inches above or below T-bar and maximum opening height cannot exceed 12".

APPLIES TO CABLE OPENING
HEIGHT OF 12" MAX. ONLY

HILTI CP 675 T-SEPARATOR BAR

MAX. 6" ABOVE/BELOW T-BAR

CABLE RACK 2" STRINGER

HILTI CP619T PUTTY ALL AROUND

HILTI CP 675 Z-FRAME

ROTATING LATCH POSITIONED ACROSS T-SEPARATOR BAR

FS-657 FIRE BLOCKS
FIGURE F-34 – FIRE STOPPING CABLE IN 6" MAX. DIA. OPENING IN SOLID FLOORS AND WALLS

(A)
(CAJ-3095)

(B)
(CAJ-3152)

(C)
Conduit Dead-Ended Within Equipment Area
FIGURE F-35 – FIRE STOPPING CABLE IN 4" MAX. DIAMETER OPENING IN SOLID FLOORS AND WALLS EQUIPPED WITH NON-METALLIC SLEEVE (CAJ-3084)
FIGURE F-36 – FIRE STOPPING CABLE IN 4" MAX. DIA. OPENING IN SOLID FLOORS AND WALLS EQUIPPED WITH NON-METALLIC SLEEVE EXTENDING BEYOND BUILDING SURFACE (CAJ-3084 EJ)

FIGURE F-37 – FIRE STOPPING NONMETALLIC PIPE 7" MAX. DIA. OPENING IN SOLID FLOORS AND WALLS – SMALL ANNULAR SPACE (CAJ-2109)
FIGURE F-38 – FIRE STOPPING NON-METALLIC PIPE IN 6" MAX. DIA. OPENING IN SOLID FLOORS AND WALLS – LARGE ANNULAR SPACE (CAJ-2294)

4" MAXIMUM DIAMETER NON-METALLIC PIPE

FS-ONE SEALANT (1/2" MINIMUM DEPTH)

1/2" MIN. DEPTH OF FS-ONE SEALANT (BOTH SIDES FLOOR AND WALLS)

1" MIN. DEPTH MINERAL WOOL FOR FLOOR APPLICATIONS

CP-646 WRAP STRIPS (BOTH SIDES OF WALLS)

FIGURE F-39 – FIRE STOPPING METALLIC PIPE IN 6" MAX. DIA OPENING IN SOLID FLOORS AND WALLS – LARGE ANNULAR SPACE (CAJ-1276)

MINERAL WOOL BATTING 1" MINIMUM DEPTH TIGHTLY PACKED INTO OPENINGS

CP-618 PUTTY 1" MINIMUM DEPTH AT PERIMETER OF OPENING

METALLIC PIPE 3/4" MAX.
FIGURE F-40 – FIRE STOPPING ENT IN 4" MAX. DIA. OPENING IN SOLID FLOORS AND WALLS (CAJ-3084 EJ)

ENDS OF TUBING TO BE SEALED WITH 1/4" MINIMUM DEPTH OF PUTTY UNLESS THEY ARE TERMINATED IN A RELATIVELY AIR TIGHT AND NORMALLY CLOSED ENCLOSURE

MINERAL WOOL DAM
FS-ONE SEALANT 2" MINIMUM DEPTH
REQUIRED AT BOTH SIDES OF WALL OPENINGS

FIGURE F-41 – FIRE STOPPING CABLE IN 4" MAX. DIA. OPENING IN HOLLOW WALLS (WL-3111, WL-3112)

NOTE 1. SLEEVE TO BE 1" MINIMUM DIAMETER BUT OR NO. 26 GAUGE GALVANIZED SHEET STEEL AND EXTEND A MINIMUM OF 1/2" BEYOND WALL SURFACE

SHEET STEEL SLEEVE TO HAVE A 2" MINIMUM DEPTH ALONG ITS UNIFORML LENGTH AND BE FITTED WITH CABLE IN NOT MORE THAN 24" IN FLEXIBLE TUBING AT BOTH ENDS

ENT SLEEVE TO BE PERMANENTLY BURIED INTO OPENING ABOUT TO THE SAME THICKNESS OF WALL AND COVERED

METALLIC SLEEVE SEE NOTE 1
INTRODUCTION PUTTY 1/4" MINIMUM DEPTH OF PUTTY AROUND SLEEVE AT INTERFACE WITH BUILDING SURFACE
SMOKESTOP
INTRODUCTION PUTTY MINIMUM DEPTH AT PERIMETER OF CABLE DUCT
5/8" WALLBOARD NUMBER OF LAYERS TO BE任命 OF WALL
FIGURE F-42 – FIRE STOPPING NON-METALLIC PIPE IN 4" MAX. DIA. OPENING IN HOLLOW WALLS (WL-2075)

NOTE 1. SLEEVE TO BE 1" MINIMUM DIAMETER END OR NO. 28 GAUGE SHEET STEEL SLEEVE TO EXTEND A MINIMUM OF 1/2" BEYOND WALL SURFACES.

SHEET STEEL SLEEVE TO HAVE A MINIMUM 2" OVERLAP ALONG ITS UNINTERRUPTED LENGTH AND BE ENCLOSED WITH CABLE PROTECTION SUCH AS SLIT FLEXIBLE TINNED AT BOTH ENDS.

ENT SLEEVE TO BE PENETRANTLY GROUNDED INTO OPENING. GROUT TO BE AT THICK AS WALLBOARD COVERING.

FIGURE F-43 – FIRE STOPPING METALLIC RACEWAYS IN HOLLOW WALLS (EJ)

METALLIC RACEWAY

FS-ONE SEALANT FULL THICKNESS OF WALL COVERING(S)

1/2" MAXIMUM ANGULAR SPACE

5/8" WALLBOARD NUMBER OF LAYERS PER FIRE RATING OF WALL
FIGURE F-44 – FIRE STOPPING VOID CIRCULAR OPENINGS IN FLOORS AND WALLS

(A) 1" MAX. 60" MIN.
SLEEVES OPTIONAL

(B) 1/2" MIN. F.I.S. SEALANT
(both sides of walls)

(C) 3/4" MIN. CF-918 PUTTY
(both sides of walls)

(D) 1" MAX. 60" HOLE

(E) 2" MIN. CF-141
(both sides of walls)

MAX. 4-1/2" HOLE

MINERAL WOOL MATING

FA-0058

E-28529H
NOTE 1. SLEEVE TO BE 1" MINIMUM THICKNESS ON NO. 20 GAUGE SHEET STEEL. SLEEVE TO EXTEND A MINIMUM OF 1/2" BEYOND WALL SURFACE.

SHEET STEEL SLEEVE TO HAVE A MINIMUM 2" OVERLAP ALONG ITS LENGTH.

BRACE SLEEVE TO BE PERMANENTLY SHOT PINNED INTO OPENING, ABOUT TO BE AS THIN AS WALL THICKNESS.

\[ \text{HILTI EJ 28652a} \]

- \(1/4" \) MINIMUM REAR OF FIRE-CORE SLEEVE TO BE AT INTERFACIAL INTERFACE OF FIRE PLUGS WITH SLEEVE.

- \(2" \) DEPTH OF FIRE-CORE SLEEVE PLUS MINIMAL CLEARANCE AT INTERFACIAL INTERFACE.

- FIRE PLUGS TO BE FLUSH WITH WALL SURFACE.

\[ \text{HILTI EJ 28653a} \]

- MINERAL WOOL PLACING 1/4" THICK OVER THE OPENING INTO THE BASE OF WALL.

- \(1/2" \) DEPTH OF FIRE-CORE SLEEVE PLUS MINIMAL CLEARANCE AT INTERFACIAL INTERFACE.

- FIRE PLUGS TO BE FLUSH WITH WALL SURFACE.

- \(1/8" \) WALLBOARD LAYER OF LAYERED AIRE 1-MIN. OF WALL.

\( \text{(E) HOLLOW WALLS} \)
FIGURE F-45 – FIRE STOPPING LARGE POWER CABLE ONLY OPENINGS IN FLOORS USING INTUMESCENT FIRE BLOCKS (CBJ-4026)

1" DOME OF INTUMESCENT PUTTY AT PERIMETER OF CABLE BUNDLE

1/2" MIN. DOME OF INTUMESCENT PUTTY AT PERIMETER OF CABLE BUNDLE

STEEL COVER PLATE

CABLE, HOLE SHEATHING

CABLE TIE

LAYER OF PUTTY PAD

5.00

5.00

FIRE BLOCKS

8" MIN. DEPTH IN FLOORS

+6" THICK 5" MIN. DEPTH IN FLOORS 5" OR LESS THICK.
FIGURE F-46 – FIRE STOPPING LARGE FIBER CABLE ONLY OPENINGS IN FLOORS USING INTUMESCENT FIRE BLOCKS (CBJ-4026)

- Layer of putty pad
- Cable tie
- Smoke stop
- Cable rack

1.00

1/2" min. dome of intumescent putty at perimeter of cable bundle

1.00

Steel cover plate

Cable hole sheathing

FS-657 fire blocks

Min. 8" depth in floors

+5" thick. Min. 5" depth in floors 5" or less thick.
FIGURE F-47 – TYPICAL ORIENTATION OF HILTI FIRE BLOCKS AT VARIOUS WALL CONSTRUCTIONS

(A) Concrete and Solid Filled Block Constructions
FIGURE F-47 – Continued

Any size rectangular opening where annular space exceeds 4 inches

Misc. Cable  Power or fiber cable only  Any Tenement
WIRE MESH COVERS  WIRE MESH COVERS  SHEET STEEL COVERS

(B)
Hollow Wall Constructions
FIGURE F-48 – TYPICAL COVER JUNCTIONING AT LARGE WALL OPENINGS

(A) Solid Covers

(B) Mesh Covers
FIGURE F-49 – GENERAL APPLICATION OF HILTI STRUT COVER SUPPORTS
(SINGLE HOLES ONLY)

(A) Void Cable Holes

(B) Occupied Cable Holes

COVER SIZE = MIN. X+6” & Y+6”

U CHANNEL LENGTH = X x 2 NOMINALLY

1/4” FASTENERS @ MAX. 12” SPACING

13/16”d x 1-5/8”w x #12 GA. U CHANNEL

1/4” FASTENERS @ MAX. 8” SPACING

MIN. #20 GA. COVER
FIGURE F-50 – GENERAL APPLICATION OF FIRE STOPS AT ADJACENT BUILDING WALLS
FIGURE F-51 – FIRE STOPPING CIRCULAR OPENINGS UP TO 4" IN DIA. IN FLOORS/WALLS USING HILTI CP-658T FIRE STOP PLUGS (CAJ-0097 and CAJ-3216)
FIGURE F-52 – FIRE STOPPING ADC RACEWAY THROUGH WALLS
(UL W-L-6017)

FIGURE F-53 – FIRE STOPPING METAL PIPE/STEEL CONDUIT THROUGH FLOORS
(UL F-A-2213, F-B-1026)