

MULTIPLE PENETRATIONS THROUGH CONCRETE WALL OR BLOCK WALL ASSEMBLY

F-RATING = 2-HR.

T-RATING = 0-HR.

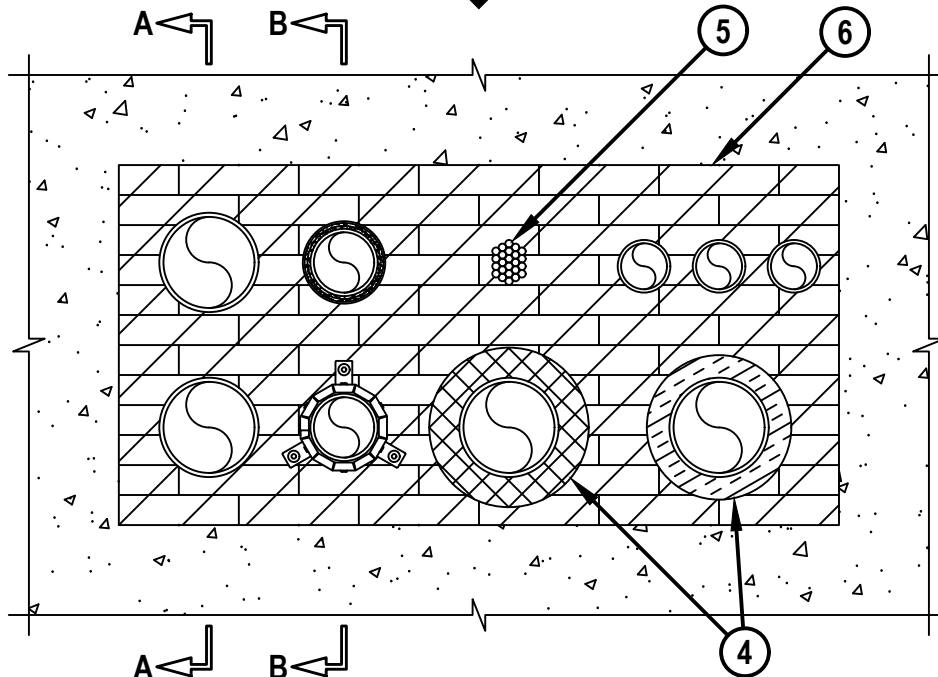
L-RATING AT AMBIENT = 5 CFM / SQ FT

L-RATING AT 400°F = 2 CFM / SQ FT

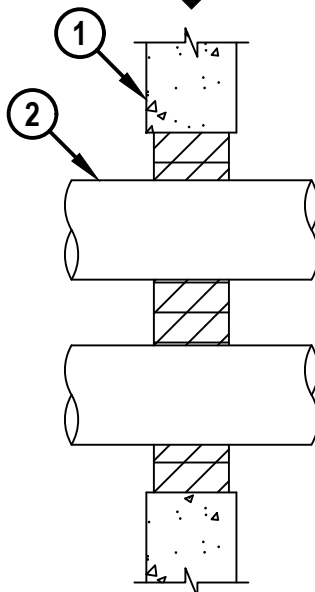
NOTE : TESTED WITH A 2.5 Pa PRESSURE DIFFERENTIAL

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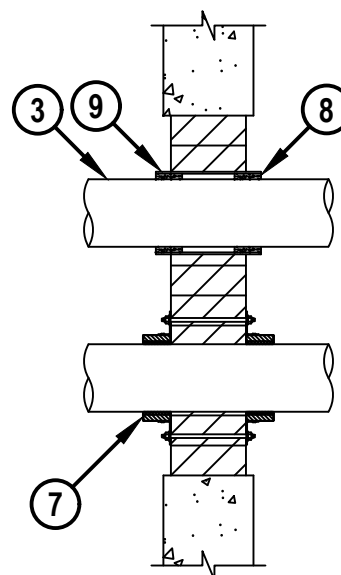
FRONT VIEW



SECTION A-A



SECTION B-B



MULTIPLE PENETRATIONS THROUGH CONCRETE WALL OR BLOCK WALL ASSEMBLY

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1. CONCRETE WALL ASSEMBLY (2-HR. FIRE-RATING) :
 - A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE WALL (MINIMUM 6" THICK).
 - B. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL.
2. ONE OR MORE OF THE FOLLOWING PIPES, CONDUITS, OR TUBING (IN ANY COMBINATION) MAY BE INSTALLED WITHIN OPENING :
 - A. MAXIMUM 6" NOMINAL DIAMETER STEEL PIPE (SCH 5 OR HEAVIER).
 - B. MAXIMUM 6" NOMINAL DIAMETER CAST OR DUCTILE IRON PIPE.
 - C. MAXIMUM 6" NOMINAL DIAMETER STEEL CONDUIT.
 - D. MAXIMUM 4" NOMINAL DIAMETER STEEL EMT.
 - E. MAXIMUM 4" NOMINAL DIAMETER COPPER PIPE OR TUBING.
 - F. MAXIMUM 1" NOMINAL DIAMETER FLEXIBLE STEEL CONDUIT.
 - G. MAXIMUM 4" NOMINAL DIAMETER ALUMINUM PIPE (SCH 10 OR HEAVIER) (CLOSED PIPING SYSTEM).
 - H. MAXIMUM 4" NOMINAL DIAMETER RIGID ALUMINUM CONDUIT (CLOSED PIPING SYSTEM).
 - I. MAXIMUM 2" NOMINAL DIAMETER ALUMINUM PIPE (SCH 10 OR HEAVIER) (CLOSED OR VENTED PIPING SYSTEM).
 - J. MAXIMUM 2" NOMINAL DIAMETER RIGID ALUMINUM CONDUIT (CLOSED OR VENTED PIPING SYSTEM).
3. ONE OR MORE OF THE FOLLOWING NON-METALLIC PIPES MAY BE INSTALLED WITHIN THE OPENING :
 - A. MAXIMUM 4" NOMINAL DIAMETER CPVC PLASTIC PIPE (SDR 13.5) (CLOSED PIPING SYSTEM).
(NOTE : FOR PENETRANTS LARGER THAN 2", PIPE MUST BE INSTALLED WITH ITEMS 7 OR 8 AND 9)
 - B. MAXIMUM 4" NOMINAL DIAMETER RIGID NON-METALLIC CONDUIT (RNC) (SCH 40).
(NOTE : FOR PENETRANTS LARGER THAN 2", PIPE MUST BE INSTALLED WITH ITEMS 7 OR 8 AND 9)
 - C. MAXIMUM 2" NOMINAL DIAMETER FIBER OPTIC RACEWAY (PVC).
 - D. MAXIMUM 4" NOMINAL DIAMETER FRPP PLASTIC PIPE (SCH 40) (CLOSED OR VENTED PIPING SYSTEM).
(NOTE : PIPE MUST BE INSTALLED WITH ITEMS 7 OR 8 AND 9)
 - E. MAXIMUM 4" NOMINAL DIAMETER PVC PLASTIC PIPE (SCH 40) (CLOSED OR VENTED PIPING SYSTEM).
(NOTE : PIPE MUST BE INSTALLED WITH ITEMS 7 OR 8 AND 9)
 - F. MAXIMUM 4" NOMINAL DIAMETER ABS PLASTIC PIPE (SCH 40) (CLOSED OR VENTED PIPING SYSTEM).
(NOTE : PIPE MUST BE INSTALLED WITH ITEMS 7 OR 8 AND 9)

**Hilti Firestop Systems**

HILTI, Inc.
Plano, Texas USA (800) 879-8000

Sheet	2 of 4
Scale	1/16" = 1"
Date	May 21, 2024

Drawing No.

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4. ONE OR MORE METALLIC PENETRANTS (ITEMS 2A, 2B, AND 2E) MAY BE INSTALLED WITH THE FOLLOWING TYPES OF INSULATION :
- A. MAXIMUM 1-1/2" THICK GLASS-FIBER PIPE INSULATION (MIN. 3.5 PCF DENSITY).
 - B. MAXIMUM 2" THICK CALCIUM SILICATE PIPE INSULATION (SEE NOTE NO. 5 BELOW).
 - C. MAXIMUM 3/4" THICK AB/PVC PIPE INSULATION (MAY BE INSTALLED ON 2" AND SMALLER PIPES).
5. MAXIMUM 3" DIAMETER CABLE BUNDLE TO CONSIST OF ANY OF THE FOLLOWING (MAX. QTY. = 8) :
- A. MAXIMUM 750 KCMIL POWER CABLE WITH PVC JACKET.
 - B. MAXIMUM 300 PAIR NO. 24 AWG TELEPHONE CABLE WITH PVC JACKET.
 - C. MAXIMUM 24 FIBER OPTIC CABLE WITH PVC JACKET.
 - D. MAXIMUM 3/C NO. 12 AWG METAL CLAD CABLE.
 - E. MAXIMUM 7/C NO. 12 POWER CABLE WITH PVC JACKET.
 - F. RGU/59 COAXIAL CABLE WITH PVC JACKET.
 - G. MAXIMUM 4 PAIR NO. 22 AWG CAT 5 OR CAT 6 DATA CABLE.
 - H. MAXIMUM 3/C NO. 2/0 AWG COPPER CONDUCTOR PVC JACKETED ALUMINUM CLAD OR STEEL CLAD TECK 90 CABLE.
 - I. ANY CABLES, METAL-CLAD CABLES, OR ARMORED CABLES CURRENTLY LISTED UNDER THE THROUGH PENETRATING PRODUCTS CATEGORY.
 - J. MAXIMUM 500 KCMIL SINGLE COPPER OR ALUMINUM CONDUCTOR POWER CABLE WITH THERMOPLASTIC INSULATION AND PVC JACKET.
 - K. MAXIMUM 1/2" DIAMETER MULTIPLE FIBER OPTICAL COMMUNICATION CABLES WITH PVC JACKET.
 - L. MAXIMUM 3/C NO. 12 AWG STEEL CLAD CABLE WITH COPPER CONDUCTORS AND PVC INSULATED JACKET.
 - M. MAXIMUM 4C/750 KCMIL ALUMINUM OR COPPER CONDUCTOR METAL CLAD CABLE WITH ALUMINUM OR STEEL ARMOR, WITH OR WITHOUT PVC JACKET.
6. HILTI CFS-BL FIRESTOP BLOCK (2" THICK x 8" WIDE x 5" DEEP, REFERENCE : FRONT VIEW) FIRMLY PACKED AND CENTERED WITHIN WALL ASSEMBLY (SEE NOTE NO. 2 BELOW).
7. HILTI CP 643N FIRESTOP COLLAR INSTALLED PER ACCOMPANYING INSTALLATION INSTRUCTIONS ON BOTH SIDES OF WALL. COLLARS ARE TO BE SECURED TOGETHER THROUGH THE OPENING WITH 1/4" DIAMETER THREADED STEEL ROD WITH WASHERS/BOLTS.
8. HILTI CP 648E WRAP STRIP (NOMINAL 3/16" THICK x 1-3/4" WIDE) CONTINUOUSLY WRAPPED AROUND THE OUTER CIRCUMFERENCE OF THE PIPE, COVERING TWO TIMES, WITH ENDS BUTTED AND HELD IN PLACE WITH TAPE. WRAP STRIP INSTALLED FLUSH WITH BOTH ENDS OF SHEET METAL SLEEVE (ITEM 9).
9. SHEET METAL SLEEVE (MIN. 30 GA.) HAVING A MINIMUM 2" LAP ALONG THE LONGITUDINAL SEAM. SLEEVE TO EXTEND 2" BEYOND EACH SURFACE OF WALL. THE SLEEVE SHALL BE COMPRESSED AROUND PIPE AND WRAP STRIP (ITEM 8) AND SECURED TOGETHER WITH TWO NO. 8 SHEET METAL SCREWS ON EACH END OF SLEEVE.

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ANNULAR SPACE	MINIMUM	MAXIMUM
BETWEEN METALLIC PIPES AND PERIPHERY OF OPENING	0"	26"
BETWEEN METALLIC PIPES	1"	26"
BETWEEN NON-METALLIC PIPES OR RIGID NON-METALLIC CONDUITS	1-1/2"	26"
BETWEEN NON-METALLIC PIPES OR CONDUITS AND PERIPHERY OF OPENING	1-1/2"	26"
BETWEEN FIBER OPTIC RACEWAY AND OTHER PENETRANTS	3-1/2"	-
BETWEEN FIBER OPTIC RACEWAY AND PERIPHERY OF OPENING	2"	26"
BETWEEN INSULATED PIPES	1-1/2"	-
BETWEEN INSULATED PIPES AND PERIPHERY OF OPENING	1"	-
BETWEEN CABLE BUNDLES	1-1/2"	26"
BETWEEN CABLE BUNDLES AND PERIPHERY OF OPENING	1-13/16"	26"

- NOTES : 1. MAXIMUM AREA OF OPENING = 1152 SQ. IN. WITH A MAXIMUM DIMENSION OF 48".
2. APPLY HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT, HILTI CP 618 FIRESTOP PUTTY STICK, HILTI CP 620 FIRE FOAM, OR HILTI CP 660 FIRESTOP FOAM INTO ANY VOID THAT MAY EXIST (AROUND PENETRANTS, INTO INTERSTICES OF CABLES, OR BETWEEN FIRESTOP BLOCKS), TO MAXIMUM EXTENT POSSIBLE. HILTI CP 618, HILTI CP 620, AND HILTI CP 660 ARE NOTE SUITABLE FOR CPVC.
3. L-RATINGS APPLY ONLY WHEN HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT IS USED.
4. IF THE ANNULAR SPACE IS GREATER THAN 12", THEN ATTACH A STEEL WIRE MESH (NOMINAL 1" HEXAGONAL [20 GA. OR HEAVIER] OR NOMINAL 2" SQUARES [NO. 16 SWG]) WITH 1/4" DIAMETER x 1" LONG STEEL CONCRETE ANCHORS AND 1-1/2" DIAMETER FENDER WASHERS (SPACED MAXIMUM 8" C/C) ON BOTH SIDES OF WALL ASSEMBLY. STEEL WIRE MESH CUT TO FIT WITHIN MAXIMUM 2" OF PENETRANT AND OVERLAP MINIMUM 3" BEYOND THE PERIPHERY OF THE OPENING. THE JOINTS WITHIN WIRE MESH SHALL OVERLAP A MINIMUM OF 2" AND BE SECURED TOGETHER BY 16 AWG STEEL WIRE SPACED 8" O.C.
5. CALCIUM SILICATE PIPE INSULATION TO BE SECURED WITH STAINLESS STEEL BANDS OR WITH 18 AWG STAINLESS STEEL WIRE LOCATED MAXIMUM 6" FROM EACH FACE OF WALL AND SPACED 12" O.C.
6. FOR BLOCK WALLS, FIRESTOP BLOCKS TO FILL ENTIRE THICKNESS OF WALL UNLESS WALL IS SOLID FILLED.

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Sheet 4 of 4

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