UL/cUL SYSTEM NO. C-AJ-8207

MULTIPLE PENETRATIONS THROUGH CONCRETE FLOOR/WALL OR BLOCK WALL

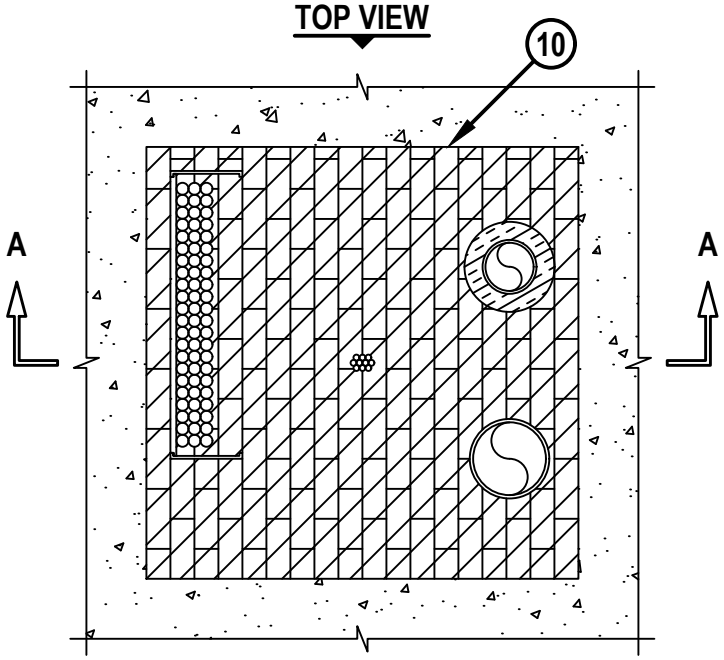
F-RATING = 2-HR. OR 3-HR. (SEE ITEM NO. 10 AND NOTE NO. 3 BELOW)

T-RATING = 0-HR.

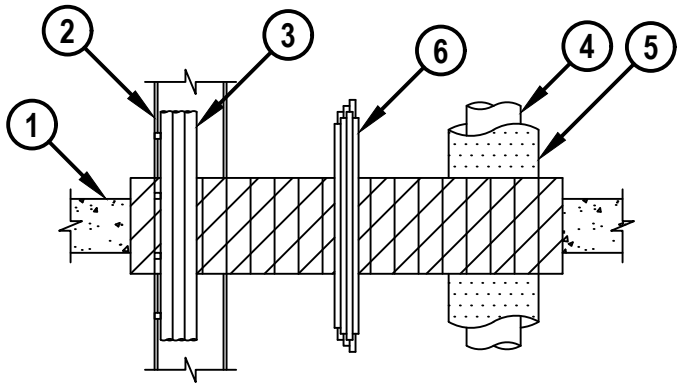
NOTE : TESTED TO A 2.5 Pa PRESSURE DIFFERENTIAL

CAJ8207e.092217

TOP VIEW



SECTION A-A



1. CONCRETE FLOOR OR WALL ASSEMBLY (2-HR. OR 3-HR. FIRE-RATING) :
   - A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR (MINIMUM 4-1/2" THICK).
   - B. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL (SOLID OR FILLED).
2. MAXIMUM 24" x 4" OR MAXIMUM 18" x 6" ALUMINUM OR STEEL OPEN LADDER CABLE TRAY (MAX. QTY. = 2).
3. ANY COMBINATION OF THE FOLLOWING CABLES MAY BE USED WITHIN THE CABLE TRAY(S). CABLES TO FILL MAXIMUM 40% OF THE CROSS-SECTIONAL AREA OF CABLE TRAY (BASED ON A MAXIMUM 3" LOADING DEPTH) :
   - A. MAXIMUM 500 KCMIL SINGLE COPPER CONDUCTOR POWER CABLE WITH PVC JACKET.
   - B. MAXIMUM 300 PAIR NO. 24 AWG TELEPHONE CABLE WITH PVC JACKET.
   - C. MAXIMUM 7/C NO. 12 AWG POWER CABLE WITH PVC JACKET.
   - D. MAXIMUM 1/2" DIAMETER FIBER-OPTIC CABLE WITH PVC JACKET.
   - E. MAXIMUM 3/C NO. 12 AWG METAL CLAD CABLE.
   - F. MAXIMUM 2/C NO. 10 AWG CABLE WITH PVC JACKET.
   - G. MAXIMUM 3/C NO. 8 AWG ALUMINUM CLAD CABLE WITH PVC JACKET.
4. ONE OR MORE OF THE FOLLOWING METALLIC PIPES, CONDUITS, OR TUBING TO BE INSTALLED WITHIN THE OPENING :
   - A. MAXIMUM 8" NOMINAL DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   - B. MAXIMUM 8" NOMINAL DIAMETER CAST OR DUCTILE IRON PIPE.
   - C. MAXIMUM 4" NOMINAL DIAMETER COPPER PIPE OR TUBING.
   - D. MAXIMUM 6" NOMINAL DIAMETER STEEL CONDUIT.
   - E. MAXIMUM 4" NOMINAL DIAMETER EMT.

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T-RATING = 0-HR.
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CAJ8207e.092217

5. [OPTIONAL] METALLIC PIPES OR TUBING MAY BE INSTALLED WITH ONE OF THE FOLLOWING (SEE NOTE NO. 3 BELOW) :
   - A. NOMINAL 1-1/2" OR 2" THICK GLASS-FIBER PIPE INSULATION (MIN. 3.5 PCF DENSITY).
   - B. NOMINAL 1-1/2" OR 2" THICK UNFACED MINERAL FIBER PIPE INSULATION (MIN. 3.5 PCF DENSITY) WITH FOIL-SCRIM-KRAFT OR ALL SERVICE JACKET WITH THE KRAFT SIDE EXPOSED. INSULATION SECURED WITH MIN. 18 SWG STEEL WIRE (SPACED 12" O/C).
   - C. NOMINAL 1" THICK AB/PVC PIPE INSULATION FOR PIPES WITH A NOMINAL 2" DIAMETER OR SMALLER.
   - D. NOMINAL 3/4" THICK AB/PVC PIPE INSULATION FOR PIPES WITH A NOMINAL 4" DIAMETER OR SMALLER.
   - E. NOMINAL 1-1/2", 2", OR 3" THICK CELLULAR GLASS PIPE INSULATION (FOAMGLASS®) WITH A MINIMUM 12" LONG JACKET FORMED OF MINIMUM 0.010" THICK STEEL OR ALUMINUM SHEET AND CUT TO WRAP TIGHTLY AROUND THE PIPE INSULATION. JACKET SECURED WITH A MINIMUM 1/2" WIDE STAINLESS STEEL HOSE CLAMP OR BAND, LOCATED WITHIN 2" OF EACH END OF JACKET, AND SPACED A MAXIMUM OF 10" O/C. JACKET TO HAVE A MINIMUM 2" OVERLAP AT SEAM AND INSTALLED ABUTTING SURFACE OF FIRESTOP BLOCK ON TO TOP SURFACE OF FLOOR, OR BOTH SURFACES OF WALL.
   - F. MAXIMUM 2" THICK CALCIUM SILICATE PIPE INSULATION SECURED WITH A MIN. 18 SWG STEEL WIRE (SPACED 12" O/C).
6. ONE OR MORE MAXIMUM 4" DIAMETER CABLE BUNDLE(S) CONSISTING OF ANY COMBINATION OF THE FOLLOWING :
   - A. MAXIMUM 500 KCMIL SINGLE COPPER CONDUCTOR POWER CABLE WITH PVC JACKET.
   - B. MAXIMUM 300 PAIR NO. 24 AWG TELEPHONE CABLE WITH PVC JACKET.
   - C. MAXIMUM 7/C NO. 12 AWG POWER CABLE WITH PVC JACKET.
   - D. MAXIMUM 1/2" DIAMETER FIBER-OPTIC CABLE WITH PVC JACKET.
   - E. MAXIMUM 3/C NO. 12 AWG METAL CLAD CABLE.
   - F. MAXIMUM 2/C NO. 10 AWG CABLE WITH PVC JACKET.
   - G. MAXIMUM 3/C NO. 8 AWG ALUMINUM CLAD CABLE WITH PVC JACKET.
7. [NOT SHOWN] ONE OR MORE NON-METALLIC PIPES OR CONDUITS (SEE NOTES NO. 2 AND 3 BELOW) :
   - A. MAXIMUM 2" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40) (CLOSED OR VENTED PIPING SYSTEM).
   - B. MAXIMUM 2" NOMINAL DIAMETER CPVC PLASTIC PIPE (SDR 13.5) (CLOSED PIPING SYSTEM).
   - C. MAXIMUM 2" NOMINAL DIAMETER RIGID NON-METALLIC CONDUIT (RNC).
8. [NOT SHOWN] MAXIMUM 2" NOMINAL DIAMETER FIBER-OPTIC RACEWAY (PVC OR PVDF).
9. [NOT SHOWN] ELECTRICAL BUSWAY (NOMINAL 23" WIDE x 4-1/2" DEEP, OR SMALLER) ("I" SHAPED ALUMINUM OR STEEL ENCLOSURE CONTAINING FACTORY MOUNTED COPPER BARS RATED FOR 600V, 5000A OR ALUMINUM BARS RATED FOR 600V, 4000A) (MAX. QTY. = 2) (SEE NOTE NO. 3 BELOW).

UL/cUL SYSTEM NO. C-AJ-8207

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T-RATING = 0-HR.
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CAJ8207e.092217

10. HILTI CFS-BL FIRESTOP BLOCK (8" DEEP) FIRMLY PACKED AND CENTERED WITHIN FLOOR OR WALL. FOR 2-HR. FIRE-RATING WITH A MAXIMUM OPENING DIMENSION OF 36" OR LESS, FIRESTOP BLOCKS MAY BE INSTALLED (5" DEEP) FIRMLY PACKED AND FLUSH WITH TOP SURFACE OF FLOOR OR CENTERED WITHIN WALL.

ANNULAR SPACE	MIN.	MAX.
BETWEEN METALLIC PENETRANTS AND PERIPHERY OF OPENING	0"	-
BETWEEN METALLIC PENETRANTS AND OTHER PENETRANTS	4"	-
BETWEEN METALLIC PENETRANTS	1"	-
BETWEEN INSULATED PENETRANTS AND PERIPHERY OF OPENING	1"	-
BETWEEN INSULATED PENETRANTS	3"	-
BETWEEN INSULATED PENETRANTS AND OTHER PENETRANTS	4"	-
BETWEEN NON-METALLIC PENETRANTS	3"	-
BETWEEN NON-METALLIC PENETRANTS AND PERIPHERY OF OPENING	1"	-
BETWEEN NON-METALLIC PENETRANTS AND OTHER PENETRANTS	4"	-
BETWEEN CABLE BUNDLES	4"	-
BETWEEN CABLE BUNDLES AND PERIPHERY OF OPENING	1"	-
BETWEEN CABLE BUNDLES AND OTHER PENETRANTS	4"	-
BETWEEN CABLE TRAYS	5"	-
BETWEEN CABLE TRAYS AND PERIPHERY OF OPENING	0"	-
BETWEEN BUSWAYS AND PERIPHERY OF OPENING	1/2"	5-3/4"
BETWEEN BUSWAYS AND OTHER PENETRANTS	6"	-

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T-RATING = 0-HR.
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CAJ8207e.092217

NOTES : 1. MAXIMUM AREA OF OPENING = 18 SQ. FT., WITH A MAXIMUM DIMENSION OF 6 FT.

2. ONE OF THE FOLLOWING MUST BE INSTALLED AROUND NON-METALLIC PENETRANTS (ITEM NO. 7 ABOVE) PRIOR TO INSTALLATION OF FIRESTOP BLOCKS :
   A. MINIMUM 4" HIGH x 1/16" THICK LAYER OF HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT INSTALLED AROUND THE CIRCUMFERENCE OF PIPE AND CENTERED WITHIN FIRESTOP BLOCKS.
   B. HILTI CP 648E WRAP STRIP (NOMINAL 3/16" THICK x 1" WIDE) CONTINUOUSLY WRAPPED AROUND THE OUTER CIRCUMFERENCE OF THE PIPE, COVERING ONE TIME, WITH ENDS BUTTED AND HELD IN PLACE WITH TAPE. WRAP STRIP TO BE CENTERED WITHIN FIRESTOP BLOCKS.
3. THE FIRE-RATING OF THE FIRESTOP SYSTEM IS LIMITED TO 2-HR. WHEN NON-METALLIC PENETRANTS, BUSWAYS, OR ANY TYPE OF PIPE INSULATION IS USED.
4. APPLY HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT OR HILTI CP 618 FIRESTOP PUTTY STICK INTO INTERSTICES OF CABLES, BETWEEN CABLES AND CABLE TRAYS, AND INTO VOIDS TO MAXIMUM EXTENT POSSIBLE.
5. WIRE MESH [NOT SHOWN] - WHEN ANY DIMENSION OF THE THROUGH OPENING EXCEEDS 36 IN. (914 MM), WIRE MESH IS REQUIRED ON BOTH SIDES OF THE WALL OR FLOOR OPENING. WHEN MAX DIMENSION OF THE THROUGH OPENING DOES NOT EXCEED 36 IN. (914 MM), WIRE MESH IS REQUIRED ON TOP SIDE OF FLOOR OR BOTH SIDES OF WALL ONLY WHEN THE ANNULAR SPACE EXCEEDS 12 IN. (305 MM). NOM 1" HEXAGONAL WIRE MESH (20 GA. OR HEAVIER) OR NOM 2 IN. x 2 IN. WIRE FENCING FABRICATED FROM MIN NO 16 SWG (0.060 IN. OR 1.5 MM) GALV STEEL WIRE CUT TO FIT THE CONTOURS OF THE PENETRATING ITEMS AND THE OPENING WITH A MIN 3 IN. (76 MM) LAP BEYOND THE PERIPHERY OF THE OPENING. WIRE MESH SECURED TO BOTH SIDES OF FLOOR OR WALL BY MEANS OF 1/4 IN. (6 MM) DIAM BY 1-1/2 IN. (38 MM) LONG STEEL CONCRETE SCREWS IN CONJUNCTION WITH 1-1/2 IN. (38 MM) DIAM STEEL FENDER WASHERS SPACED MAX 6 IN. (152 MM) OC. ANY JOINTS WITHIN WIRE MESH SHALL OVERLAP 2 IN. (51 MM) AND BE SECURED TOGETHER BY MEANS OF NO. 20 SWG STEEL WIRE SPACED 6 IN. (152 MM) OC.