

UL/cUL SYSTEM NO. C-AJ-8177

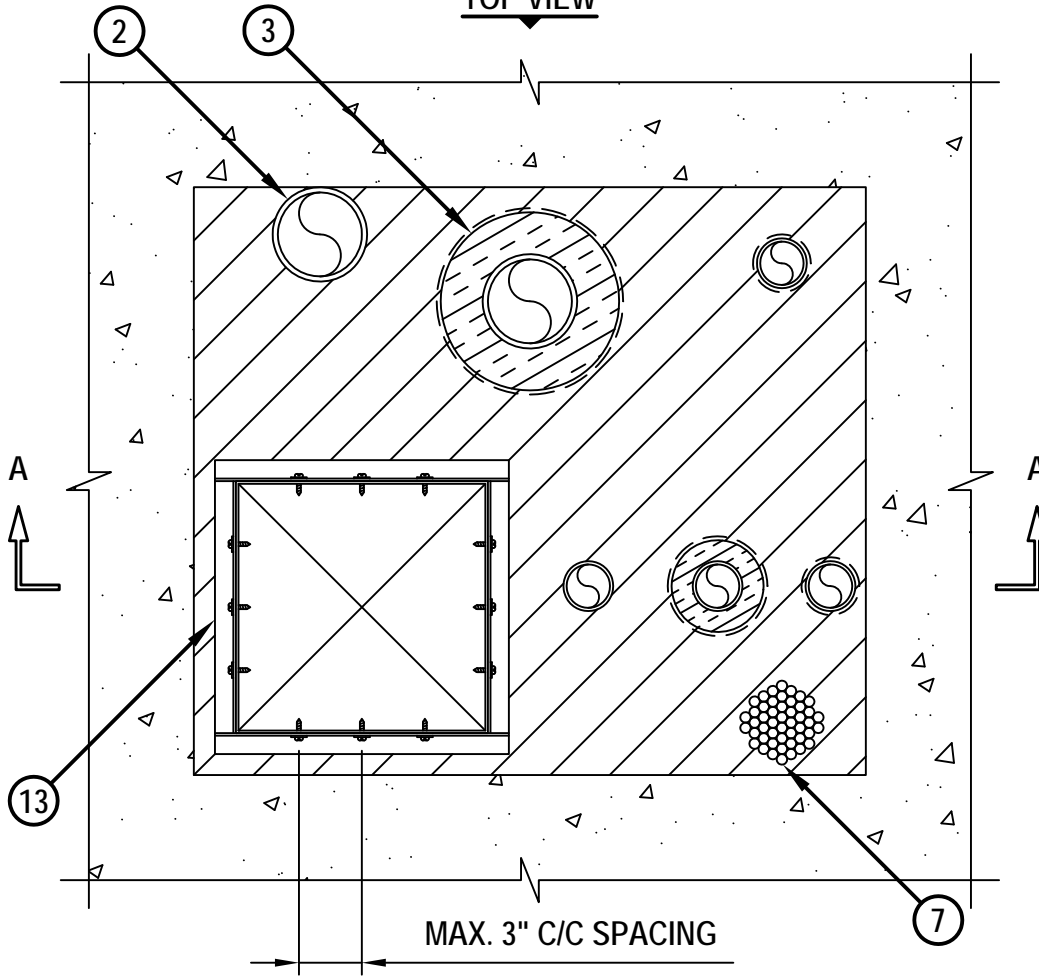
MULTIPLE PENETRANTS THROUGH CONCRETE FLOOR/WALL OR BLOCK WALL

F-RATING = 2-HR.

T-RATING = 0-HR., 1/4-HR., 1-1/2-HR. OR 2-HR.

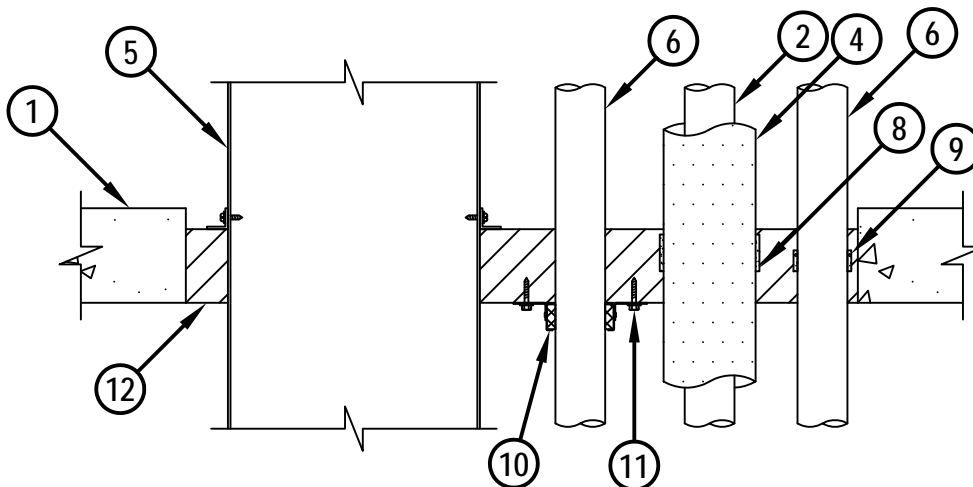
CAJ8177c.082813

TOP VIEW



MAX. 3" C/C SPACING

SECTION A-A



HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

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Scale	7/64" = 1"
Date	Aug. 28, 2013

Drawing No.

**CAJ
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Saving Lives through Innovation and Education

MULTIPLE PENETRANTS THROUGH CONCRETE FLOOR/WALL OR BLOCK WALL

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1. CONCRETE FLOOR OR WALL ASSEMBLY (2-HR. FIRE-RATING) :
 - A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR OR WALL (MINIMUM 4-1/2" THICK).
 - B. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL.
2. ONE OR MORE OF THE FOLLOWING METALLIC PIPES MAY BE USED :
 - 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 4" NOMINAL DIAMETER STEEL CONDUIT OR EMT.
3. [OPTIONAL] ANY OR ALL PIPES (2A, 2B OR 2C) MAY BE INSULATED WITH NOMINAL 2" THICK GLASS-FIBER PIPE INSULATION.
4. [OPTIONAL] ANY OR ALL PIPES (2" OR SMALLER) (2A, 2B OR 2C) MAY BE INSULATED WITH NOMINAL 1" THICK AB/PVC PIPE INSULATION.
5. MAXIMUM 12" x 12" RECTANGULAR SHEET METAL DUCT (MIN. 26 GA.).
6. ONE OR MORE OF THE FOLLOWING NON-METALLIC PIPES MAY BE USED (SEE TABLE) :
 - A. MAXIMUM 4" NOMINAL DIAMETER PVC PLASTIC PIPE (CELLULAR OR SOLID CORE).
 - B. MAXIMUM 4" NOMINAL DIAMETER CPVC PLASTIC PIPE (CLOSED PIPING SYSTEM ONLY).
 - C. MAXIMUM 4" NOMINAL DIAMETER PVC PLASTIC CONDUIT (RNC).
 - D. MAXIMUM 4" NOMINAL DIAMETER ABS PLASTIC PIPE (CELLULAR OR SOLID CORE).
 - E. MAXIMUM 4" NOMINAL DIAMETER FRPP PLASTIC PIPE.
7. MAXIMUM 4" DIAMETER CABLE BUNDLE TO CONSIST OF ANY OF THE FOLLOWING :
 - A. MAXIMUM 300 PAIR NO. 24 AWG COPPER CONDUCTOR TELEPHONE CABLE WITH PVC JACKET.
 - B. MAXIMUM 500 KCMIL COPPER CONDUCTOR POWER CABLE WITH PVC JACKET.
 - C. MAXIMUM 3/C NO. 12 AWG STEEL CLAD CABLE WITH PVC JACKET.
 - D. MAXIMUM 3/C NO. 2/0 AWG ALUMINUM CONDUCTOR SER CABLE WITH PVC JACKET.
 - E. MAXIMUM RG/U COAXIAL CABLE WITH FLUORINATED ETHYLENE JACKET.
8. HILTI CP 648E WRAP STRIP (NOMINAL 3/16" THICK x 1-3/4" WIDE) CONTINUOUSLY WRAPPED ONE TIME AROUND EACH INSULATED PIPE WITH ENDS BUTTED AND HELD IN PLACE WITH TAPE. WRAP STRIP TO BE RECESSED 1-1/2" FROM BOTTOM SURFACE OF FLOOR OR BOTH SURFACES OF A WALL.
9. HILTI CP 648S WRAP STRIP (SIZE OF WRAP TO MATCH SIZE OF PIPE) CONTINUOUSLY WRAPPED AROUND THE OUTER CIRCUMFERENCE OF EACH NON-METALLIC PIPE (SEE TABLE BELOW FOR TYPE AND SIZE OF PIPE) AND HELD IN PLACE WITH INTEGRATED TAPE. WRAP STRIP TO BE RECESSED 1-1/2" FROM BOTTOM SURFACE OF FLOOR OR BOTH SIDES OF A WALL.
10. HILTI CP 643N FIRESTOP COLLAR WITH FASTENING HOOKS (SEE TABLE).
11. FASTENING HOOKS TO BE SECURED TO HILTI CP 637 FIRESTOP MORTAR WITH MINIMUM 1/4" DIAMETER BY MINIMUM 1-1/4" LONG CONCRETE SCREWS OR HILTI 1/4" DIAMETER BY 1-1/4" LONG KWIK-CON II+ CONCRETE SCREW ANCHORS. FASTENING HOOKS TO BE SECURED TO CONCRETE FLOOR OR WALL WITH MINIMUM 1/4" DIAMETER BY MINIMUM 1-1/4" LONG STEEL EXPANSION BOLTS, MINIMUM 0.145" DIAMETER BY 1-1/4" LONG POWDER ACTUATED FASTENERS UTILIZING A 1-7/16" DIAMETER BY 1/16" THICK STEEL WASHER, HILTI 1/4" DIAMETER BY 1-1/4" LONG KWIK-CON II+ CONCRETE SCREW ANCHOR, OR HILTI 1/4" DIAMETER BY 1-3/4" LONG KWIK-BOLT 3 STEEL EXPANSION ANCHOR, OR HILTI X-DNI 27 P8 S15 POWDER ACTUATED FASTENER WITH INTEGRAL 9/16" DIAMETER WASHER.



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- 12. MINIMUM 3-1/2" DEPTH HILTI CP 637 FIRESTOP MORTAR, FLUSH WITH BOTTOM SURFACE OF FLOOR OR BOTH SIDES OF A WALL.
- 13. NOMINAL 1" x 1" (MIN. 18 GA.) STEEL ANGLES ATTACHED TO ALL FOUR SIDES OF DUCT, FLUSH WITH FIRESTOP MORTAR. FASTEN ANGLES TO DUCT WITH NO. 8 (OR LARGER) STEEL SHEET METAL SCREWS, SPACED MAXIMUM 2" FROM EACH END AND MAXIMUM 3" C/C.

PENETRANT TYPE (ITEM 6)	NOMINAL DIAMETER OF PENETRANT	WRAP STRIP (ITEM 8) REQUIRED	FIRESTOP COLLAR (ITEM 10) REQUIRED
PVC, CPVC, RNC	1-1/2" AND 2"	YES	MAY BE USED AS ALTERNATE TO WRAP STRIP
PVC, CPVC, RNC	3" AND 4"	NO	YES
ABS, FRPP	1-1/2", 2", 3", AND 4"	NO	YES

ANNULAR SPACE	MINIMUM
BETWEEN METALLIC PIPES AND PERIPHERY OF OPENING	0"
BETWEEN METALLIC PIPES	1"
BETWEEN INSULATED METALLIC PIPES	4"
BETWEEN INSULATED METALLIC PIPES AND PERIPHERY OF OPENING	1/2"
BETWEEN DUCT AND METALLIC PIPES (INSULATED OR NON-INSULATED)	4-1/2"
BETWEEN DUCT AND NON-METALLIC PIPES AND CABLE BUNDLE	10"
BETWEEN DUCT AND PERIPHERY OF OPENING	2"
BETWEEN NON-METALLIC PIPES AND PERIPHERY OF OPENING	1"
BETWEEN NON-METALLIC PIPES AND METALLIC PIPES	8"
BETWEEN CABLE BUNDLE AND PERIPHERY OF OPENING	1/2"
BETWEEN CABLE BUNDLE AND METALLIC PIPES	8"
BETWEEN CABLE BUNDLE AND INSULATED PIPES AND NON-METALLIC PIPES	4"

- NOTES : 1. MAXIMUM AREA OF OPENING = 896 SQ. IN. WITH A MAXIMUM DIMENSION OF 32".
 2. [FORMING NOT SHOWN] USE A RIGID BOARD MATERIAL TO SUPPORT HILTI CP 637 FIRESTOP MORTAR DURING ITS INITIAL CURE (MINIMUM 24 HOURS.).
 3. CLOSED OR VENTED PIPING SYSTEM (PVC, RNC, ABS, FRPP = SCHEDULE 40; CPVC = SDR 13.5).



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