PROJECT DATA

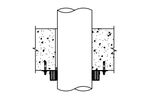
FIRESTOP PENETRATOR GUIDE:

SCHEDULES OF HILTI THROUGH PENETRATION FIRESTOP SYSTEMS

CONCRETE FLOORS			CONCRETE OR BLOCK WALLS			GYPSUM WALLBOARD ASSEMBLIES		
TYPE OF PENETRANT	F-RATING (HR)	UL-CLASSIFIED SYSTEM	TYPE OF PENETRANT	F-RATING (HR)	UL-CLASSIFIED SYSTEM	TYPE OF PENETRANT	F-RATING (HR)	UL-CLASSIFIED SYSTEM
CIRCULAR BLANK OPENINGS	1	F-A-0006, C-AJ-0055, C-AJ-0070	CIRCULAR BLANK OPENINGS	1	C-AJ-0055, C-AJ-0070	METAL PIPES OR CONDUIT	1	W-L-1054, W-L-1058, W-L-1164
	2	F-A-0006, C-AJ-0055, C-AJ-0070		2	C-AJ-0055, C-AJ-0070		2	W-L-1054, W-L-1058, W-L-1164
	3	F-A-0006, C-AJ-0055		3	C-AJ-0055		4	W-L-1110, W-L-1111
SINGLE METAL PIPES OR CONDUIT	1	C-AJ-1226, F-A0117	SINGLE METAL PIPES OR CONDUIT	1	C-AJ-1226, W-J-1021	NON-METALLIC PIPE OR CONDUIT	1	W-L-2078, W-L-2075, W-L-2128
	2	C-AJ-1226, F-A0117, C-BJ-1045, C-BJ-1046		2	C-AJ-1226, W-J-1021		2	W-L-2078, W-L-2075, W-L-2128
	3	C-AJ-1226, F-A0117		3	C-AJ-1226, C-AJ-1041, W-J-1042		4	W-L-2184
	4	C-BJ-1037, C-BJ-1034		4	C-BJ-1034, C-BJ-1037 W-J-1041, W-J-1042	SINGLE OR BUNDLED CABLES	1	W-L-3065, W-L-3111, W-L-3112
SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, FRP, ENT)	1	F-A-2053, F-A-2025, C-AJ-2109 C-AJ-2098, C-AJ-2141, C-AJ-2167 C-BJ-2021	SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, FRP, ENT)	1	C-AJ-2109, C-AJ-2098, C-AJ-2167		2	W-L-3065, W-L-3111, W-L-3112
	2	F-A-2053, F-A-2025, C-AJ-2109 C-AJ-2098, C-AJ-2141, C-AJ-2167 C-BJ-2021, C-BJ-2031, C-BJ-2012 C-BJ-2013, C-BJ-2014		2	C-AJ-2109, C-AJ-2098, C-AJ-2167		4	W-L-3139
				3	C-AJ-2109, C-AJ-2098	CABLE TRAY	1	W-L-4011, W-L-4019
	3	C-AJ-2109, C-AJ-2098		4	W-J-2057		2	W-L-4011, W-L-4019
SINGLE OR BUNDLED CABLES	1	F-A-3007, C-AJ-3095, C-AJ-3096	SINGLE OR BUNDLED CABLES	1	C-AJ-3036, C-AJ-3095, C-AJ-3096		3	W-L-8014
	2	F-A-3007, C-AJ-3095, C-AJ-3096		2	C-AJ-3036, C-AJ-3095, C-AJ-3096	INSULATED PIPES	1	W-L-5028, W-L-5029, W-L-5047
	3	F-A-3007, C-AJ-3095, C-AJ-3096		3	C-AJ-3095, C-AJ-3096		2	W-L-5028, W-L-5029, W-L-5047
				4	W-J-3050		3	W-L-5073
CABLE TRAY	1	C-AJ-4034, C-AJ-4035	CABLE TRAY	1	W-J-4016, C-AJ-4034, C-AJ-4035	NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	W-L-7017, W-L-7048, W-L-7042
	2	C-AJ-4034, C-AJ-4035		2	W-J-4016, C-AJ-4034, C-AJ-4035		2	W-L-7040, W-L-7042
	3	C-AJ-4034, C-AJ-4035		3	C-AJ-4034, C-AJ-4035	MIXED PENETRANTS	1	W-L-1095, W-L-8013
				4	W-J-8007		2	W-L-1095, W-L-8013
SINGLE INSULATED PIPES	1	F-A-5015, F-A-5016, C-AJ-5090, C-AJ-5091, C-AJ-5098	SINGLE INSULATED PIPES	1	C-AJ-5090, C-AJ-5091, C-AJ-5061		4	W-L-8014
	2	F-A-5015, F-A-5016, C-AJ-5090, C-AJ-5091, C-AJ-5098		2	C-AJ-5090, C-AJ-5091, C-AJ-5061			
	3	F-A-5016, C-AJ-5090		3	C-AJ-5090, C-AJ-5061			
	4	C-BJ-5006		4	C-BJ-5006, W-J-5028			
ELECTRICAL BUSWAY	1	C-AJ-6006, C-AJ-6017	ELECTRICAL BUSWAY	1	C-AJ-6006, C-AJ-6017			
	2	C-AJ-6006, C-AJ-6017		2	C-AJ-6006, C-AJ-6017			
	3	C-AJ-6006, C-AJ-6017		3	C-AJ-6006, C-AJ-6017			
NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	C-AJ-7046, C-AJ-7051	NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	C-AJ-7046, C-AJ-7051, W-J-7021, W-J-7022			
	2	C-AJ-7046, C-AJ-7051		2	C-AJ-7046, C-AJ-7051, W-J-7021, W-J-7022			
	3	C-AJ-7046, C-AJ-7051		3	C-AJ-7046, C-AJ-7051			
MIXED PENETRANTS	1	C-AJ-8041, C-AJ-8056	MIXED PENETRANTS	1	C-AJ-8041, C-AJ-8056, W-J-8007			
	2	C-AJ-8041, C-AJ-8056		2	C-AJ-8041, C-AJ-8056, W-J-8007			
	3	C-AJ-8041, C-AJ-8056		3	C-AJ-8041, C-AJ-8056, W-J-8007			
	4	C-BJ-8010		4	C-BJ-8010, W-J-8007			

NOTES:
1. JOBSITE CONDITIONS OF EACH THROUGH-PENETRATION FIRESTOP SYSTEM MUST MEET ALL DETAILS OF THE UL-CLASSIFIED SYSTEM SELECTED.
2. IF JOBSITE CONDITIONS DO NOT MATCH ANY UL-CLASSIFIED SYSTEMS IN THE SCHEDULES ABOVE, CONTACT HILTI FOR ALTERNATIVE SYSTEMS OR ENGINEER JUDGEMENT DRAWINGS - 800-879-8000.
3. WHERE MORE THAN ONE APPLICABLE UL-CLASSIFIED SYSTEM IS LISTED IN THE SCHEDULES, CHOOSE THE UL SYSTEM WHICH IS MOST ECONOMICAL FOR EACH THROUGH-PENETRATION FIRESTOP SYSTEM.
4. COORDINATE WORK WITH OTHER TRADES TO ASSURE THE PENETRATION OPENING SIZES ARE APPROPRIATE FOR PENETRANT LOCATIONS, AND VICE VERSA.
5. FOR 3-HOUR RATED GYPSUM WALLS, CONTACT HILTI FOR A UL-CLASSIFIED SYSTEM OR ENGINEER JUDGEMENT DRAWING - 800-879-8000.

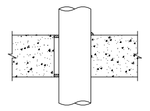
CAST-IN-PLACE CONCRETE



System No.
C-BJ-2021

March 23, 2004

F Rating - 2 Hr
T Rating - 2 Hr



System No. C-BJ-1045
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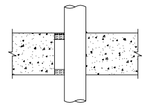
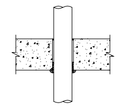
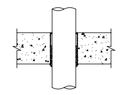
T RATING - 1/4 Hr



System No. C-BJ-1046
F RATING - 2 Hr
T RATING - 1/4 Hr



System No. C-BJ-2011
F RATING - 2 Hr
T RATING - 1-1/2 Hr



System No. C-BJ-2012
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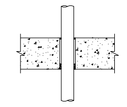
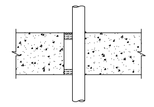
T RATING - 2 Hr



System No. C-BJ-2013
F RATING - 2 Hr
T RATING - 2 Hr



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F RATING - 2 Hr
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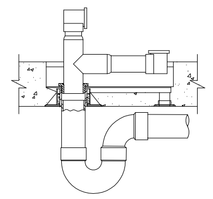
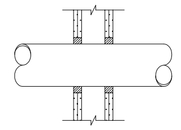
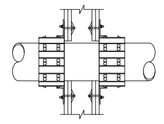


System No. F-A-1037
F RATING - 3 Hr
T RATING - 0 Hr

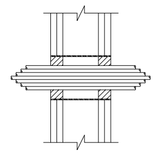
GYPSUM WALLBOARD ASSEMBLIES



System No. W-L-1054
F Ratings - 1 and 2 Hr (See Items 1 and 3)
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/Sq Ft
L Rating At 400 F - 4 CFM/Sq Ft



System No. W-L-2078
F Ratings - 1 & 2 Hr (See Item 1)
T Ratings - 1 & 2 Hr (see Item 1)

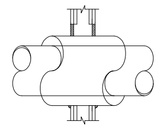


System No. W-L-3065
F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr

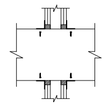
System No. W-L-4019

November 12, 1998

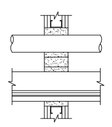
F Ratings - 1 and 2 Hr
(See Item 1)
T Rating - 0 Hr



System No. W-L-5029
F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1/2, 3/4, 1 and 1-3/4 Hr (See Item 3)
L Rating At Ambient - 4 CFM/Sq Ft
L Rating At 400 F - Less Than 1 CFM/Sq Ft



System No. W-L-7040
F Ratings - 1 and 2 Hr (See Items 1 and 3)
T Rating - 0 Hr



System No. W-L-8013
F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr
L Rating At Ambient - 5 CFM/Sq Ft
L Rating At 400 F - 2 CFM/Sq Ft

GENERAL FIRE PROTECTION NOTES:

1. ALL PENETRATION OF FIRE-RESISTIVE FLOORS OR SHAFT WALLS SHALL BE PROTECTED BY MATERIALS AND INSTALLATION DETAILS THAT CONFORM TO UNDERWRITERS LABORATORIES LISTINGS FOR "THROUGH-PENETRATION FIRE STOP SYSTEMS." THE CONTRACTOR SHALL SUBMIT SHOP DRAWING DETAILS, FURNISHED BY THE MANUFACTURER OF THE FIRE STOP MATERIAL, WHICH SHOW COMPLETE CONFORMANCE TO THE UL LISTING TO THE ARCHITECT, AND SUCH DRAWINGS SHALL BE AVAILABLE TO THE CITY INSPECTORS. THE DRAWING SHALL BE SPECIFIC FOR EACH PENETRATION WITH ALL VARIABLES DEFINED.

2. FIRE RATED WALLS SHALL HAVE STEEL ELECTRICAL OUTLET BOXES NOT EXCEEDING 16 SQUARE INCHES ON AREA, PROVIDED THE AREA OF SUCH OPENINGS IS NOT MORE THAN 100 SQUARE INCHES FOR ANY 100 SQUARE FEET OF WALL. OUTLET BOXES ON OPPOSITE SIDES OF WALLS AND PARTITIONS SHALL NOT BE IN THE SAME STUD CAVITY, UNLESS APPROVED FIRE RATED PADS ARE INSTALLED.

3. ALL INSULATION MATERIALS INCLUDING FACINGS, SUCH AS VAPOR BARRIERS OR BREATHER PAPERS INSTALLED WITHIN FLOOR/CEILING ASSEMBLIES, ROOF/CEILING ASSEMBLIES, WALLS, CRAWL SPACES OR ATTICS, SHALL HAVE A FLAME-SPREAD RATING NOT TO EXCEED 25 AND A SMOKE DENSITY NOT TO EXCEED 450 WHEN TESTED IN ACCORDANCE WITH IBC 2003 EDITION.

4. IN SOUND INSULATED ASSEMBLIES, COVER THE EXTERIOR OF OUTLET BOXES WITH AN APPROVED RESILIENT TAPE PRIOR TO MOUNTING. PLACE RESILIENT PAD (MINIMUM OF 1/8" THICK) BETWEEN MOUNTING BRACKET AND THE STRUCTURAL SUPPORT. TAPE CABLE OR CONDUIT CONNECTION TO BOX UNTIL AIRTIGHT. FLEXIBLE CONDUIT AND CABLE NEED NO ISOLATION EXCEPT AT THE POINT OF PENETRATION WHERE AN AIRTIGHT SEAL MUST BE MADE. RIGID NMT AND EMT CONDUIT AND BOXES SHALL BE INSTALLED WITH APPROVED RESILIENT MATERIALS AND FASTENERS AT SUPPORTS AND SEALED AIRTIGHT AT PENETRATIONS. OUTLET BOXES SHALL BE LIMITED TO A MAXIMUM DIMENSION OF 6"x9 AND, IF LOCATED ON OPPOSITE SURFACES, MUST OFFSET 24" OR MORE AND BE SEALED AS IN ABOVE DIRECTIONS. OUTLET BOXES IN FLOOR/CEILING ASSEMBLIES ARE PERMITTED IF TREATED AS REQUIRED FOR BOXES IN WALL ASSEMBLIES.

5. ALL WATER LINES IN SOUND INSULATED ASSEMBLIES SHALL BE RESILIENTLY SUPPORTED (ISOLATED FROM THE STRUCTURE) WITH PENETRATIONS SEALED AIRTIGHT. DRAIN, WASTE AND VENT PIPE AND FITTINGS SHALL BE RESILIENTLY SUPPORTED WITH PENETRATIONS SEALED AIRTIGHT. TOILETS SHALL BE SET ON PERMANENTLY RESILIENT MOUNTING. TOILET WASTE LINES MAY BE RIGIDLY ATTACHED WHERE THEY PENETRATE THE FLOOR.

ABBREVIATIONS:

ACOUS	ACOUSTIC(AL)
ADD'L	ADDITIONAL
ADH	ADHESIVE
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AL	ALUMINUM
APPROX	APPROXIMATE
ARCH	ARCHITECT(URAL)
ATC	ACOUSTICAL TILE CEILING
AV	AUDIO VISUAL
BD	BOARD
BLDG	BUILDING
BLK	BLOCK(ING)
CAB	CABINET
CL	CENTER LINE
CLG	CEILING
CLO	CLOSET
CLR	CLEARANCE
CMU	CONCRETE MASONRY UNIT
CO	CASED OPENING
COL	COLUMN
CONC	CONCRETE
CONF	CONFERENCE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CORR	CORRIDOR
CPT	CARPET
CT	CERAMIC TILE
CTR	CENTER
DBL	DOUBLE
DED	DEDICATED OUTLET
DEMO	DEMOLISH, DEMOLITION
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DISP	DISPENSER
DIV	DIVISION
DN	DOWN
DR	DOOR
DWG	DRAWING
DWR	DRAWER
EA	EACH
EF	EXHAUST FAN
EJ	EXPANSION JOINT
ELEC	ELECTRIC(AL)
ELEV	ELEVATOR
EMERG	EMERGENCY
ENCL	ENCLOSE(URE)
ENG	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EX(IST)	EXISTING
EXT	EXTERIOR
FA	FIRE ALARM
FAX	FACSIMILE
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FINISHED FLOOR
FHC	FIRE HOSE CABINET
FIN	FINISH(ED)
FL	FLOORING/FLOOR
FLUOR	FLUORESCENT
FT	FEET (FOOT)
FTC	FOOTCANDLE
FURN	FURNITURE
FUT	FUTURE
FWC	FABRIC WALLCOVERING
GA	GAUGE
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GL	GLASS
GWB	GYPSUM WALL BOARD
HDWR	HARDWARE
HORIZ	HORIZONTAL
HR	HOUR
HT	HEIGHT
HVAC	HEATING, VENTILATION & AC
HZ	HERTZ
ID	INSIDE DIAMETER
IN	INCH, INCHES
INCAND	INCANDESCENT
INCL	INCLUDE(D)(ING)
INSUL	INSULATE(D)(ING)
INT	INTERIOR
JC	JANITORS CLOSET
JCT	JUNCTION
JT	JOINT
KIT	KITCHEN
LAM	LAMINATE(D)
LAT	LATERAL
LAV	LAVATORY
LH	LEFT HAND
LIN	LINEAR
LT	LIGHT
LVR	LOUVER
MAX	MAXIMUM
MECH	MECHANICAL
MEZZ	MEZZANINE
MFG	MANUFACTURER
MGR	MANAGER
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTD	MOUNTED
MTL	METAL
MTRL	MATERIAL(S)
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OPNG	OPENING
OPP	OPPOSITE
ORIG	ORIGINAL
PARTN	PARTITION
PBD	PARTICLE BOARD
PED	PEDESTAL
PERP	PERPENDICULAR
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLWD	PLYWOOD
POL	POLISHED
PR	PAIR
PREP	PREPARATION
PROJ	PROJECTED (ION)
PTD	PAINTED
QT	QUARRY TILE
QTY	QUANTITY
R	RISER
RA	RADIUS
RAG	RETURN AIR GRILLE
RECEPT	RECEPTACLE
REF	REFERENCE
REFL	REFLECTED
REFR	REFRIGERATOR
REINF	REINFORCE(D)(ING)
REQ'D, REQ	REQUIRED
RES	RESILENT
REV	REVISION
RH	RIGHT HAND
RM	ROOM
RO	ROUGH OPENING
SC	SOLID CORE
SCHED	SCHEDULE
SECT	SECTION
SIM	SIMILAR
SND	SANITARY NAPKIN DISPENSER
SNR	SANITARY NAPKIN RECEPTACLE
SPEC	SPECIFICATION (SPECIFIED)
SPKR	SPEAKER
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUC	STRUCTURAL
SUSP	SUSPENDED
SYST	SYSTEM
T	TREAD
T&G	TONGUE AND GROOVE
TEL	TELEPHONE
TEMP	TEMPERED
THK	THICKNESS)
THRESH	THRESHOLD
TOIL	TOILET
TPD	TOILET PAPER DISPENSER
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
UTIL	UTILITY
VAR	VARIABLE, VARIES
VAV	VARIABLE AIR VOLUME
VB	VINYL BASE
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VT	VINYL TILE
VWC	VINYL WALLCOVERING
W/	WITH
W/O	WITHOUT
WC	WALLCOVERING
WD	WOOD
WH	WATER HEATER
WMP	WOOD MOLDED PANEL
WT	WEIGHT
YD	YARD

LLW ARCHITECTS

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NO.	ISSUED	DATE
1	ISSUED	10/26/07

NO.	REVISIONS	DATE

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ELECTRICAL:
CHS ENGINEERING
726 S. MT. MORIAH
MEMPHIS, TN 38117
(901) 767-2557

SEAL

Holiday Inn MILLENNIUM
BOSSIER CITY, LOUISIANA

SHEET NAME
PROJECT DATA

DATE 10/26/07
DRAWN BY JW
CHECKED BY PEL
FILE NAME 1507-A002
SCALE NONE
PROJECT NO. 1507
DRAWING

A0.2