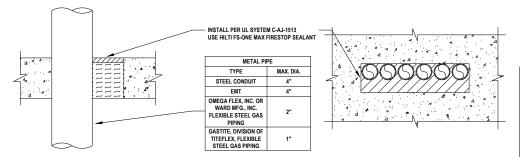
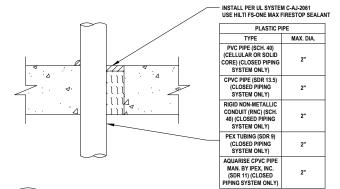


METAL PIPE THROUGH CONCRETE FLOOR (2-HR.) 2 E.1.1

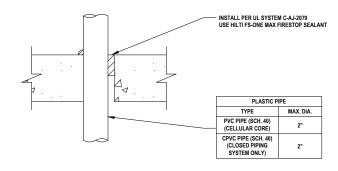


\MULTIPLE METAL PIPE THROUGH CONCRETE FLOOR (2-HR.) NOT TO SCALE

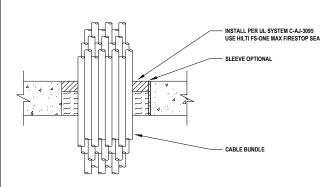


\PLASTIC PIPE THROUGH CONCRETE FLOOR (2-HR.) E.1.1 NOT TO SCALE

E.1.1



PLASTIC PIPE THROUGH CONCRETE FLOOR (2-HR.) E.1.1 NOT TO SCALE



	CABLE BUNDLE CONSISTS OF:				
	TYPE	MAX.	TYPE	MAX.	
LAN1	TELEPHONE CABLE WITH PVC JACKET	300 PAIR NO. 24 AWG	METAL-CLAD CABLE	3/C NO. 12 AWG	
	POWER CABLE WITH PVC JACKET (COPPER CONDUCTOR)	500 KCMIL	COPPER CONDUCTOR SER CABLE WITH PVC JACKET	3/C (+GROUND) 2/0 AWG	
	POWER CABLE WITH PVC JACKET (ALUMINUM OR COPPER CONDUCTOR)	350 KCMIL	COAXIAL CABLE WITH FLUORINATED ETHYLENE JACKET	RG/U	
	POWER CABLE WITH PVC JACKET	7/C NO. 12 AWG	CABLE WITH PVC JACKET	3/C NO. 6 AWG	
	FIBER OPTIC CABLE (24 FIBER)	1/2" DIA.	SINGLE OR MULTIPLE CONDUCTOR TYPE MI CABLE (MIN. 1/8" SEPERATION BETWEEN MI CABLES AND ANY OTHER TYPES OF CABLE)	1-1/4" DIA.	

INSTALL PER UL SYSTEM C-AJ-3216 USE HILTI CFS-PL FIRESTOP PLUG SLEEVE OPTIONAL - CABLE BUNDLE

	WITH PVC INSULATION AND JACKET	300 PAIR NO. 24 AWG	METAL-CLAD CABLE WITH PVC JACKET	3/C NO. 1 AWG
	POWER CABLE WITH THERMOPLASTIC INSULATION AND PVC JACKET	750 KCMIL	METAL-CLAD TEK CABLE WITH PVC JACKET	1" DIA.
	POWER CABLE WITH PVC OR XLPE INSULATION AND PVC JACKET	7/C NO. 12 AWG	ALUMINUM SER CABLE	2/0
	FIBER OPTIC CABLE (MAX. 24 FIBER)	1/2" DIA.	COAXIAL CABLE WITH PE INSULATION AND PVC JACKET	RG 59

CABLE BUNDLE CONSISTS OF

CABLE BUNDLE THROUGH CONCRETE FLOOR (2-HR.) NOT TO SCALE E.1.1

> NSTALL PER UL SYSTEM C-AJ-3283 ISE HILTI CP 653 SPEED SLEEVE - CABLE BUNDLE

CABLE BUNDLE CONSISTS OF:				
	TYPE	MAX.	TYPE	MAX.
	TELEPHONE CABLE WITH PVC JACKET	100 PAIR NO. 24 AWG	FIBER OPTIC CABLE (24 FIBER) WITH PVC OR PE JACKET AND INSULATION	1/2" DIA.
	COPPER CONDUCTOR CONTROL CABLE WITH PVC OR XLPE JACKET AND INSULATION	7/C NO. 12 AWG	SHIELDED PRINTER CABLE WITH PVC JACKET	20/C NO. 22 AWG
	SHIELDED PRINTER CABLE WITH PVC JACKET	4/0 AWG	POWER OR NON-POWER LIMITED FIRE ALARM CABLE WITH OR WITHOUT METAL JACKET (MAN. BY AFC CABLE SYSTEMS, INC.)	2/C NO. 18 AWG
	COMPUTER CABLE	4 PAIR NO. 22 AWG CAT 6	S-VIDEO CABLE CONSISTING OF MAX. 24 AWG 75 OHM COAX OR TWISTED PAIR CABLE WITH PE INSULATION AND PVC JACKET	1/4" DIA.
	COAXIAL CABLE	RG 6/U		

6 NOT TO SCALE

CABLE BUNDLE THROUGH CONCRETE FLOOR (2-HR.) E.1.1

- 1. Refer to the following specifications for firestopping.
 - a. 07 84 00 Firestopping
 - b. 07 84 13 Penetration Firestopping
 - c. 22 00 00 Plumbing d. 23 00 00 HVAC
 - e. 26 00 00 Electrical
 - f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

- 2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
 - * Fire Rating (F-Rating)
 - * Temperature Rating (T-Rating)
 - * Leakage Rating (L-Rating)
 - * Water Rating (W-Rating)
 - * Annular Space
 - * Percent Fill
 - * Movement
 - * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available. manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes 5. Firestop System installation must meet requirements of ASTM
- E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated. 6. All rated through-penetration assemblies shall be prominently
- labeled with a Hilti Firestop Label equipped with a QR code with the following information:
- *Warning! Do Not Disturb
- *Through Penetration Firestop System
- * UL System # * Product(s) used
- * Hourly Rating (F-Rating)
- * Installation Date *Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

JOB NUMBER:

most current "Underwriter's

e with title block inforr application/system ne ature or fire ratings.

to designer (delete this note after i 1. Any modification to these details. UL or Intertek Classification or tf 2. Details shown are up to date as 3. For additional information on the Laboratories Fire Resistance Dir

2. ε.

CHECKED:

ISSUE DATE:

REVISIONS:

CONTENTS:

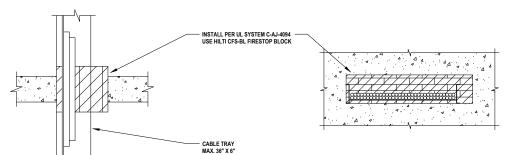
ELECTRICAL PENETRATIONS FLAT CONCRETE FLOOR 2 HR.

SHEET NAME:

SHEET NUMBER:

CABLE BUNDLE THROUGH CONCRETE FLOOR (2-HR.)

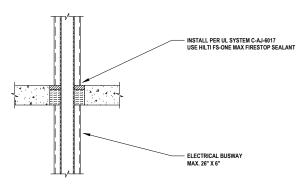
NOT TO SCALE E.1.1

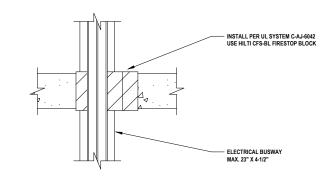


CABLE BUNDLE CONSISTS OF:			
TYPE	MAX.	TYPE	MAX.
TELEPHONE CABLE WITH PVC JACKET	300 PAIR NO. 24 AWG	METAL-CLAD CABLE	3/C NO. 12 AWG
SINGLE CONDUCTOR POWER CABLE WITH PVC JACKET	750 KCMIL	POWER CABLE WITH PVC JACKET	7/C NO. 12 AWG
FIBER OPTIC CABLE (24 FIBER) WITH PVC JACKET	1/2" DIA.		

CABLE TRAY THROUGH CONCRETE FLOOR (2-HR.)

E.1.2





\ELECTRICAL BUSWAY THROUGH CONCRETE FLOOR (2-HR.) E.1.2

ELECTRICAL BUSWAY THROUGH CONCRETE FLOOR (2-HR.) E.1.2 NOT TO SCALE



\MULTIPLE PENETRATIONS THROUGH CONCRETE FLOOR (2-HR.) E.1.2

NOT TO SCALE

Notes:

- 1. Refer to the following specifications for firestopping.
 - a. 07 84 00 Firestopping b. 07 84 13 Penetration Firestopping

 - c. 22 00 00 Plumbing
 - d. 23 00 00 HVAC
 - e. 26 00 00 Electrical
 - f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

- 2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
 - * Fire Rating (F-Rating)
 - * Temperature Rating (T-Rating)
 - * Leakage Rating (L-Rating)
 - * Water Rating (W-Rating) * Annular Space
 - * Percent Fill
 - * Movement
 - * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated.
- 6. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information:
 - *Warning! Do Not Disturb
 - *Through Penetration Firestop System * UL System # * Product(s) used

 - * Hourly Rating (F-Rating) * Installation Date
 - *Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

e with title block inforr application/system ne ature or fire ratings. te this note after ron to these details.
Classification or to note are up to date an all information on the consistence L

most current "Underwriter's

2. ε.

JOB	NUMBER

CHECKED:

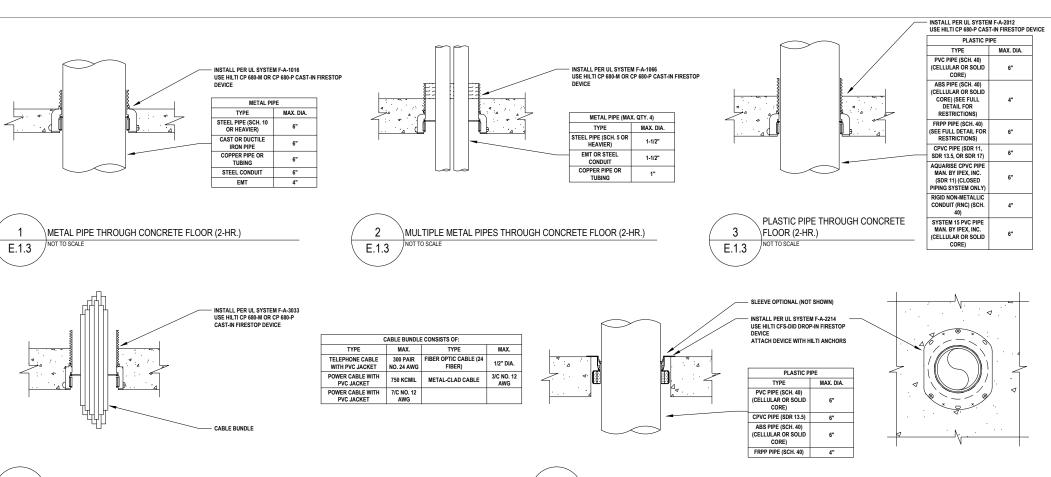
ISSUE DATE:

REVISIONS:

CONTENTS:

ELECTRICAL PENETRATIONS FLAT CONCRETE FLOOR 2 HR.

SHEET NAME:



CABLE BUNDLE THROUGH CONCRETE FLOOR (2-HR.)

E.1.3

NOT TO SCALE

5 \PLASTIC PIPE THROUGH CONCRETE FLOOR (2-HR.) E.1.3 NOT TO SCALE

Notes:

- 1. Refer to the following specifications for firestopping.
 - a. 07 84 00 Firestopping b. 07 84 13 Penetration Firestopping
 - c. 22 00 00 Plumbing
 - d. 23 00 00 HVAC
 - e. 26 00 00 Electrical
 - f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:

* Fire Rating (F-Rating)

- * Temperature Rating (T-Rating)
- * Leakage Rating (L-Rating) * Water Rating (W-Rating)
- * Annular Space
- * Percent Fill
- * Movement
- * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated.
- 6. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information:

*Warning! - Do Not Disturb

- *Through Penetration Firestop System
- * UL System # * Product(s) used
- * Hourly Rating (F-Rating)
- * Installation Date
- *Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

e with title block informat application/system not n rature or fire ratings. to designer (delete this note after i 1. Any modification to these details. UL or Intertek Classification or tf 2. Details shown are up to date as 3. For additional information on the Laboratories Fire Resistance Dir 2. ε.

most current "Underwriter's

JOB NUMBER:

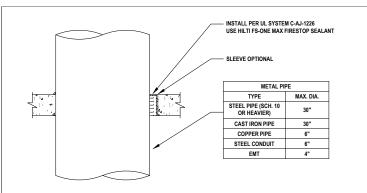
CHECKED:

ISSUE DATE: REVISIONS:

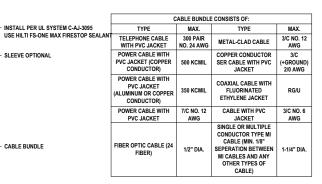
CONTENTS:

ELECTRICAL PENETRATIONS FLAT CONCRETE FLOOR 2 HR.

SHEET NAME:

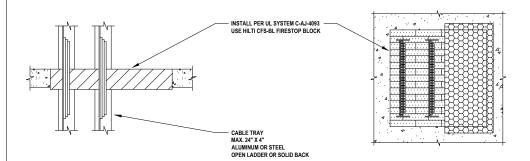


METAL PIPE THROUGH CONCRETE FLOOR (3-HR.) E.1.4



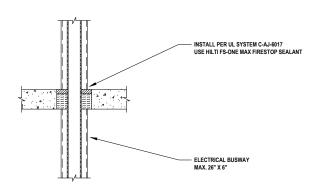
CABLE BUNDLE THROUGH CONCRETE FLOOR (3-HR.)

E.1.4

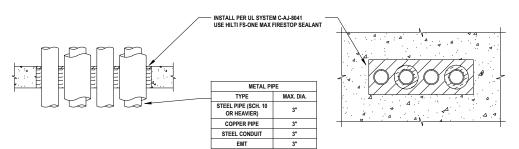


CABLE BUNDLE

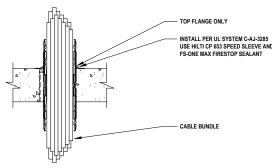
\MULTIPLE CABLE TRAYS THROUGH CONCRETE FLOOR (3-HR.) NOT TO SCALE E.1.4



\ELECTRICAL BUSWAY THROUGH CONCRETE FLOOR (3-HR.) NOT TO SCALE E.1.4



2 \MULTIPLE METAL PIPES THROUGH CONCRETE FLOOR (3-HR.) NOT TO SCALE E.1.4



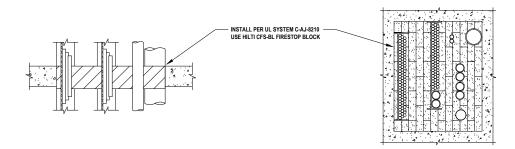
TELEPHONE CABLE WITH PVC JACKET	100 PAIR NO. 24 AWG	FIBER OPTIC CABLE (24 FIBER) WITH PVC OR PE JACKET AND INSULATION	1/2" DIA.
COPPER CONDUCTOR CONTROL CABLE WITH PVC OR XLPE JACKET AND INSULATION	7/C NO. 12 AWG	SHIELDED PRINTER CABLE WITH PVC JACKET	20/C NO. 22 AWG
TYPE RHH GROUND CABLE	4/0 AWG	POWER OR NON-POWER LIMITED FIRE ALARM CABLE WITH OR WITHOUT METAL JACKET (MAN. BY AFC CABLE SYSTEMS, INC.)	2/C NO. 18 AWG
COMPUTER CABLE	4 PAIR NO. 22 AWG CAT 6	S-VIDEO CABLE CONSISTING OF TWO MAX. 24 AWG 75 OHM COAX OR TWISTED PAIR CABLE WITH PE INSULATION AND PVC JACKET	1/4" DIA.
COAXIAL CABLE	RG 6/U		

CABLE BUNDLE CONSISTS OF:

MAX.

CABLE BUNDLE THROUGH CONCRETE FLOOR (3-HR.) E.1.4 NOT TO SCALE

CABLE BUNDLE CONSISTS OF:				
TYPE	MAX.	TYPE	MAX.	
COPPER CONDUCTOR CABLE WITH PVC JACKET	7/C NO. 12 AWG	SINGLE CONDUCTOR POWER CABLE WITH PVC JACKET	500 KCMIL	
TELEPHONE CABLE WITH PVC JACKET	300 PAIR NO. 24 AWG	FIBER OPTIC CABLE WITH PVC JACKET	24	
SINGLE CONDUCTOR POWER CABLE WITH	350 KCMIL			



\MULTIPLE PENETRATIONS THROUGH CONCRETE FLOOR (3-HR.) NOT TO SCALE E.1.4

- 1. Refer to the following specifications for firestopping.
 - a. 07 84 00 Firestopping
 - b. 07 84 13 Penetration Firestopping
 - c. 22 00 00 Plumbing d. 23 00 00 HVAC
 - e. 26 00 00 Electrical
 - f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

- ude block inform application/system novrature or fire ra*** 2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
 - * Fire Rating (F-Rating)
 - * Temperature Rating (T-Rating)
 - * Leakage Rating (L-Rating) * Water Rating (W-Rating)
 - * Annular Space
- * Percent Fill
- * Movement
- * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated.
- All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information:
 - *Warning! Do Not Disturb
 - *Through Penetration Firestop System
 - * UL System # * Product(s) used
 - * Hourly Rating (F-Rating)
 - * Installation Date
 - *Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

JOB NUMBER:

most current "Under

te this note after ron to these details.
Classification or to note to date a suit information on the consistence I

2. ε.

CHECKED:

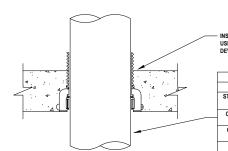
ISSUE DATE:

REVISIONS:

CONTENTS:

ELECTRICAL PENETRATIONS FLAT CONCRETE FLOOR 3 HR.

SHEET NAME:



INSTALL PER UL SYSTEM F-A-1017 USE HILTI CP 680-M OR CP 680-P FIRESTOP

METAL PI	PE
TYPE	MAX. DIA.
STEEL PIPE (SCH. 10 OR HEAVIER)	6"
CAST OR DUCTILE IRON PIPE	6"
COPPER PIPE OR TUBING	6"
STEEL CONDUIT	6"
EMT	4"

E		- INSTALL PER UL SYSTE USE HILTI CP 680-M OR DEVICE	
4 4		METAL PIPE (MA	X. QTY. 4)
		TYPE	MAX. DIA.

STEEL PIPE (SCH. 5 OR HEAVIER)

EMT OR STEEL

CONDUIT

COPPER PIPE OR TUBING

1-1/2"

1-1/2"

1"

PVC PIPE (SCH. 40) (CELLULAR OR SOLID

CORE) (SEE FULL DETAIL FOR FRPP PIPE (SCH. 40) (SEE FULL DETAIL FOR RESTRICTIONS) CPVC PIPE (SDR 11 SDR 13.5. OR SDR 17 CONDUIT (RNC) (SCH. 40)

INSTALL PER UL SYSTEM F-A-2012 USE HILTI CP 680-P CAST-IN FIRESTOP DEVICE PLASTIC PIPE

MAX. DIA

6"

AQUARISE CPVC PIPE MAN. BY IPEX, INC. (SDR 11) (CLOSED PIPING SYSTEM ONLY) RIGID NON-METALLIC SYSTEM 15 PVC PIPE MAN. BY IPEX, INC. (CELLULAR OR SOLID CORE)

CORF) ABS PIPE (SCH. 40) (CELLULAR OR SOLID

METAL PIPE THROUGH CONCRETE FLOOR (3-HR.)

E.1.5

MULTIPLE METAL PIPES THROUGH CONCRETE FLOOR (3-HR.) NOT TO SCALE E.1.5

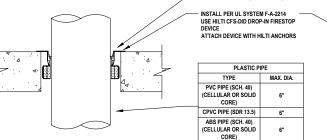
5

PLASTIC PIPE THROUGH CONCRETE 3 \FLOOR (3-HR.) NOT TO SCALE E.1.5

FRPP PIPE (SCH. 40)

INSTALL PER UL SYSTEM F-A-3033 USE HILTI CP 680-M OR CP 680-P

(CABLE BUNDLE	E CONSISTS OF:	
TYPE	MAX.	TYPE	MAX.
TELEPHONE CABLE WITH PVC JACKET	300 PAIR NO. 24 AWG	FIBER OPTIC CABLE (24 FIBER)	1/2" DIA.
POWER CABLE WITH PVC JACKET	750 KCMIL	METAL-CLAD CABLE	3/C NO. 12 AWG
POWER CABLE WITH PVC JACKET	7/C NO. 12 AWG		



CABLE BUNDLE THROUGH CONCRETE FLOOR (3-HR.) E.1.5

\PLASTIC PIPE THROUGH CONCRETE FLOOR (3-HR.) E.1.5 NOT TO SCALE

- 1. Refer to the following specifications for firestopping.
 - a. 07 84 00 Firestopping b. 07 84 13 Penetration Firestopping
 - c. 22 00 00 Plumbing
 - d. 23 00 00 HVAC
 - e. 26 00 00 Electrical
- f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

- 2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
 - * Fire Rating (F-Rating)
 - * Temperature Rating (T-Rating) * Leakage Rating (L-Rating)
 - * Water Rating (W-Rating)
 - * Annular Space
 - * Percent Fill
- * Movement
- * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating
- equal to that of construction being penetrated. 6. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with
- the following information: *Warning! Do Not Disturb
- *Through Penetration Firestop System
- * UL System # * Product(s) used
- * Hourly Rating (F-Rating)
- * Installation Date
- *Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter. Laboratories, Fire Resistance Directory (Volume 1.)

JOB NUMBER:

most current "Underwriter's

e with title block informat application/system not n rature or fire ratings.

to designer (delete this note after reading and rep.

1. Any modification to these details could result in
UL or Intertek Classification or the intended ten.

2. Details shown are up to date as of February 20.

3. For additional information on the details, refer the taboratories Fire Resistance Directory (volume).

2. ε.

CHECKED:

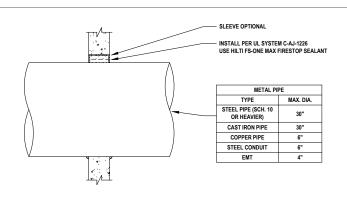
ISSUE DATE:

REVISIONS:

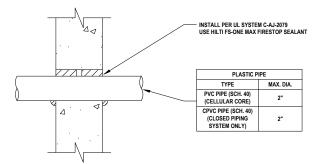
CONTENTS:

ELECTRICAL PENETRATIONS FLAT CONCRETE FLOOR 3 HR.

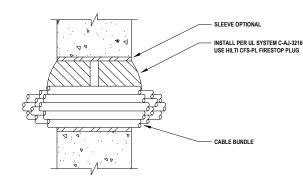
SHEET NAME:



METAL PIPE THROUGH CONCRETE WALL (2-HR.) NOT TO SCALE E.2.1



PLASTIC PIPE THROUGH CONCRETE WALL (2-HR.) E.2.1 NOT TO SCALE



CABLE BUNDLE THROUGH CONCRETE WALL (2-HR.)

CABLE BUNDLE CONSISTS OF:				
	TYPE	MAX.	TYPE	MAX.
	TELEPHONE CABLE WITH PVC INSULATION AND JACKET	300 PAIR NO. 24 AWG	METAL-CLAD CABLE WITH PVC JACKET	3/C NO. 12 AWG
	POWER CABLE WITH THERMOPLASTIC INSULATION AND PVC JACKET	750 KCMIL	METAL-CLAD TEK CABLE WITH PVC JACKET	1" DIA.
	POWER CABLE WITH PVC OR XLPE INSULATION AND PVC JACKET	7/C NO. 12 AWG	ALUMINUM SER CABLE	2/0
	FIBER OPTIC CABLE (MAX. 24 FIBER)	1/2" DIA.	COAXIAL CABLE WITH PE INSULATION AND PVC JACKET	RG 59

HR.)

INSTALL PER UL SYSTEM C-AJ-3283 USE HILTI CP 653 SPEED SLEEVE CABLE BUNDLE

6	CABLE BUNDLE THROUGH CONCRETE WALL (2-H
E.2.1	NOT TO SCALE

TYPE

METAL-CLAD CABLE

POWER CARLE WITH

MAX.

3/C NO. 12 AWG

7/C NO. 12 AWG

CABLE BUNDLE CONSISTS OF

MAX.

NO. 24 AWG

750 KCMIL

1/2" DIA.

TYPE

TELEPHONE CABLE WITH PVC JACKET

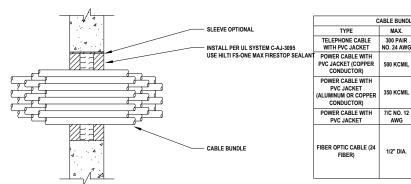
SINGLE CONDUCTOR POWER CABLE WITH PVC JACKET

FIBER OPTIC CABLE (24

FIBER) WITH PVC JÁCKET

INSTALL PER III SYSTEM C-A.I-1513 METAL PIPE TYPE MAX. DIA. 4" STEEL CONDUIT OMEGA FLEX, INC. OR WARD MFG., INC. FLEXIBLE STEEL GAS PIPING GASTITE, DIVISION OF TITEFI EX EL EXIBLE

2 MULTIPLE METAL PIPES THROUGH CONCRETE WALL (2-HR.) NOT TO SCALE E.2.1



CABLE BUNDLE THROUGH CONCRETE WALL (2-HR.) E.2.1 NOT TO SCALE

CABLE BUNDLE CONSISTS OF:				
TYPE	MAX.	TYPE	MAX.	
TELEPHONE CABLE WITH PVC JACKET	100 PAIR NO. 24 AWG	FIBER OPTIC CABLE (24 FIBER) WITH PVC OR PE JACKET AND INSULATION	1/2" DIA.	
COPPER CONDUCTOR CONTROL CABLE WITH PVC OR XLPE JACKET AND INSULATION	7/C NO. 12 AWG	SHIELDED PRINTER CABLE WITH PVC JACKET	20/C NO. 22 AWG	
SHIELDED PRINTER CABLE WITH PVC JACKET	4/0 AWG	POWER OR NON-POWER LIMITED FIRE ALARM CABLE WITH OR WITHOUT METAL JACKET (MAN. BY AFC CABLE SYSTEMS, INC.)	2/C NO. 18 AWG	
COMPUTER CABLE	4 PAIR NO. 22 AWG CAT 6	S-VIDEO CABLE CONSISTING OF MAX. 24 AWG 75 OHM COAX OR TWISTED PAIR CABLE WITH PE INSULATION AND PVC JACKET	1/4" DIA.	
COAXIAL CABLE	RG 6/U			

CABLE BUNDLE CONSISTS OF

TYPE

METAL-CLAD CABLE

COPPER CONDUCTOR

COAXIAL CABLE WITH FLUORINATED ETHYLENE JACKET

CARLE WITH PVC

JACKET SINGLE OR MULTIPLE

CONDUCTOR TYPE MI CABLE (MIN. 1/8"

MI CABLES AND ANY OTHER TYPES OF CABLE)

SEPERATION BETWEEN 1-1/4" DIA

MAX.

300 PAIR NO. 24 AWG

1/2" DIA.

- 1. Refer to the following specifications for firestopping. a. 07 84 00 Firestopping
 - b. 07 84 13 Penetration Firestopping
 - c. 22 00 00 Plumbing
 - d. 23 00 00 HVAC
 - e. 26 00 00 Electrical
 - f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

- 2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
 - * Fire Rating (F-Rating)
 - * Temperature Rating (T-Rating) * Leakage Rating (L-Rating)
 - * Water Rating (W-Rating)
 - * Annular Space
 - * Percent Fill
 - * Movement
 - * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated.
- 6. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information:
 - *Warning! Do Not Disturb
 - *Through Penetration Firestop System
- * UL System # * Product(s) used
- * Hourly Rating (F-Rating)
- * Installation Date
- *Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

e with title block inforr application/system ne ature or fire ratings. to designer (delete this note after i 1. Any modification to these details. UL or Intertek Classification or tf 2. Details shown are up to date as 3. For additional information on the Laboratories Fire Resistance Dir

most current "Under

2. ε.

JOB NUMBER:

CHECKED:

ISSUE DATE:

REVISIONS:

CONTENTS:

ELECTRICAL PENETRATIONS CONCRETE/BLOCK WALL 2 HR.

SHEET NAME:

E.2.1

SHEET NUMBER:

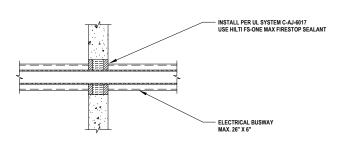
	- INSTALL PER UL SYSTEM C-AJ-4094 USE HILTI CFS-BL FIRESTOP BLOCK	
<u> </u>	- CABLE TRAY MAX. 36" X 6" ALUMINUM OR STEEL OPEN LADDER	

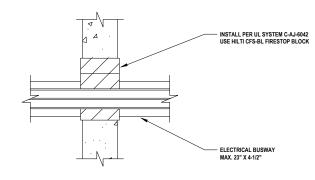
CABLE TRAY THROUGH CONCRETE WALL (2-HR.) E.2.1

NOT TO SCALE

NOT TO SCALE

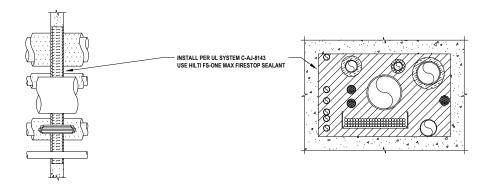
E.2.1





\ELECTRICAL BUSWAY THROUGH CONCRETE WALL (2-HR.) NOT TO SCALE E.2.2

\ELECTRICAL BUSWAY THROUGH CONCRETE WALL (2-HR.) NOT TO SCALE E.2.2



\MULTIPLE PENETRATIONS THROUGH CONCRETE WALL (2-HR.) E.2.2

- Refer to the following specifications for firestopping.
 - a. 07 84 00 Firestopping b. 07 84 13 Penetration Firestopping

 - c. 22 00 00 Plumbing d. 23 00 00 HVAC
 - e. 26 00 00 Electrical
 - f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

- 2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
- * Fire Rating (F-Rating)
- * Temperature Rating (T-Rating) * Leakage Rating (L-Rating)
- * Water Rating (W-Rating)
- * Annular Space
- * Percent Fill
- * Movement
- * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes 5. Firestop System installation must meet requirements of ASTM
- E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated.
- All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information: *Warning! - Do Not Disturb

- *Through Penetration Firestop System
- * UL System # * Product(s) used
- * Hourly Rating (F-Rating)
- * Installation Date
- *Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

e with title block inforn application/system nc ature or fire ratings. te this note after ron to these details.
Classification or to note to date a suit information on the consistence I

most current "Underwriter's

2. ε.

JOB	NUMBER:	
		Ī

CHECKED:

ISSUE DATE:

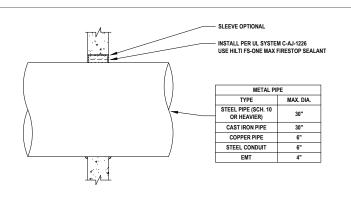
REVISIONS:

CONTENTS:

ELECTRICAL PENETRATIONS CONCRETE/BLOCK WALL 2 HR.

SHEET NAME:

E.2.2



METAL PIPE THROUGH CONCRETE WALL (3-HR.) NOT TO SCALE

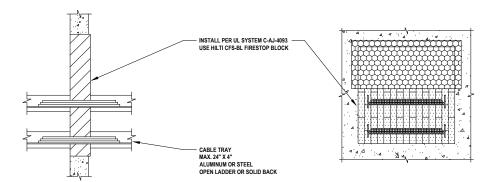
E.2.3

E.2.3

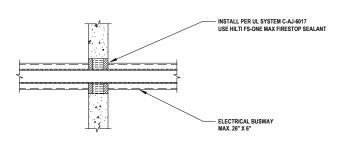
INSTALL PER UL SYSTEM C-AJ-3095 USE HILTI FS-ONE MAX FIRESTOP SEALA CABLE BUNDLE

	CABLE BUNDLE CONSISTS OF:				
	TYPE	MAX.	TYPE	MAX.	
	TELEPHONE CABLE WITH PVC JACKET	300 PAIR NO. 24 AWG	METAL-CLAD CABLE	3/C NO. 12 AWG	
LAN	POWER CABLE WITH PVC JACKET (COPPER CONDUCTOR)	500 KCMIL	COPPER CONDUCTOR SER CABLE WITH PVC JACKET	3/C (+GROUND) 2/0 AWG	
	POWER CABLE WITH PVC JACKET (ALUMINUM OR COPPER CONDUCTOR)	350 KCMIL	COAXIAL CABLE WITH FLUORINATED ETHYLENE JACKET	RG/U	
	POWER CABLE WITH PVC JACKET	7/C NO. 12 AWG	CABLE WITH PVC JACKET	3/C NO. 6 AWG	
	FIBER OPTIC CABLE (24 FIBER)	1/2" DIA.	SINGLE OR MULTIPLE CONDUCTOR TYPE MI CABLE (MIN. 1/8" SEPERATION BETWEEN MI CABLES AND ANY OTHER TYPES OF CABLE)	1-1/4" DIA.	

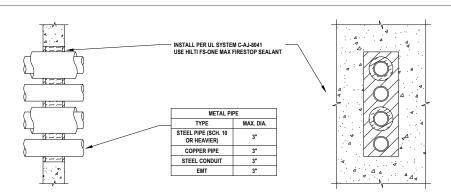
CABLE BUNDLE THROUGH CONCRETE WALL (3-HR.)



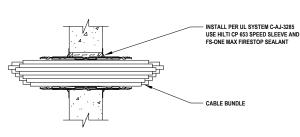
\MULTIPLE CABLE TRAYS THROUGH CONCRETE WALL (3-HR.) E.2.3



\ELECTRICAL BUSWAY THROUGH CONCRETE WALL (3-HR.) NOT TO SCALE E.2.3



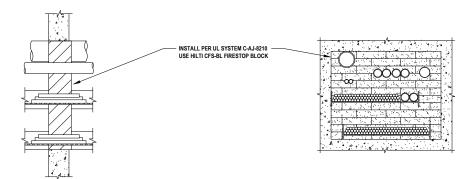
2 \MULTIPLE METAL PIPES THROUGH CONCRETE WALL (3-HR.) NOT TO SCALE E.2.3



CABLE BUNDLE CONSISTS OF:			
TYPE	MAX.	TYPE	MAX.
TELEPHONE CABLE WITH PVC JACKET	100 PAIR NO. 24 AWG	FIBER OPTIC CABLE (24 FIBER) WITH PVC OR PE JACKET AND INSULATION	1/2" DIA.
COPPER CONDUCTOR CONTROL CABLE WITH PVC OR XLPE JACKET AND INSULATION	7/C NO. 12 AWG	SHIELDED PRINTER CABLE WITH PVC JACKET	20/C NO. 22 AWG
TYPE RHH GROUND CABLE	4/0 AWG	POWER OR NON-POWER LIMITED FIRE ALARM CABLE WITH OR WITHOUT METAL JACKET (MAN. BY AFC CABLE SYSTEMS, INC.)	2/C NO. 18 AWG
COMPUTER CABLE	4 PAIR NO. 22 AWG CAT 6	S-VIDEO CABLE CONSISTING OF TWO MAX. 24 AWG 75 OHM COAX OR TWISTED PAIR CABLE WITH PE INSULATION AND PVC JACKET	1/4" DIA.
COAXIAL CABLE	RG 6/U		
	TYPE TELEPHONE CABLE WITH PVC JACKET COPPER CONDUCTOR CONTROL CABLE WITH PVC OR XLPE JACKET AND INSULATION TYPE RHH GROUND CABLE COMPUTER CABLE	TYPE MAX. TELEPHONE CABLE WITH PVC JACKET NO. 24 AWG COPPER CONDUCTOR CONTROL CABLE WITH PVC OR XLPE JACKET AWD INSULATION TYPE RHH GROUND CABLE WAS AWG COMPUTER CABLE 4/0 AWG 4/0 AWG 4 PAIR NO. 22 AWG CAT 6	TYPE MAX. TYPE TELEPHONE CABLE WITH PVC JACKET NO. 24 AWG COPPER CONDUCTOR CONTROL CABLE WITH PVC OR LPE JACKET AND INSULATION TYPE RIH GROUND CABLE COMPUTER CABLE COMPUTER CABLE 4/0 AWG ANG 4/0 AWG ANG 4/0 AWG COMPUTER CABLE 4/0 AWG ANG 4/0 AWG ANG 4/0 AWG COMPUTER CABLE 4/0 AWG ANG 4/0 AWG ANG ANG ANG ANG ANG ANG ANG

CABLE BUNDLE THROUGH CONCRETE WALL (3-HR.) E.2.3 NOT TO SCALE

CABLE BUNDLE CONSISTS OF:				
TYPE	MAX.	TYPE	MAX.	
COPPER CONDUCTOR CABLE WITH PVC JACKET	7/C NO. 12 AWG	SINGLE CONDUCTOR POWER CABLE WITH PVC JACKET	500 KCMIL	
TELEPHONE CABLE WITH PVC JACKET	300 PAIR NO. 24 AWG	FIBER OPTIC CABLE WITH PVC JACKET	24	
SINGLE CONDUCTOR POWER CABLE WITH PVC.IACKET	350 KCMIL			



\MULTIPLE PENETRATIONS THROUGH CONCRETE WALL (3-HR.) NOT TO SCALE

E.2.3

- Refer to the following specifications for firestopping.
 - a. 07 84 00 Firestopping
 - b. 07 84 13 Penetration Firestopping
 - c. 22 00 00 Plumbing d. 23 00 00 HVAC
 - e. 26 00 00 Electrical
 - f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

- ude block inform application/system novrature or fire ratir 2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
 - * Fire Rating (F-Rating)
 - * Temperature Rating (T-Rating)
 - * Leakage Rating (L-Rating)
 - * Water Rating (W-Rating) * Annular Space
- * Percent Fill
- * Movement
- * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated.
- All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information:
 - *Warning! Do Not Disturb
 - *Through Penetration Firestop System * UL System # * Product(s) used
 - * Hourly Rating (F-Rating)
 - * Installation Date
 - *Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

JOB NUMBER:

most current "Unde

te this note after ron to these details.
Classification or to nare up to date an information on the consistence.

CHECKED:

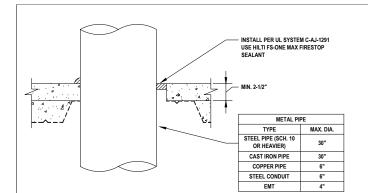
ISSUE DATE:

REVISIONS:

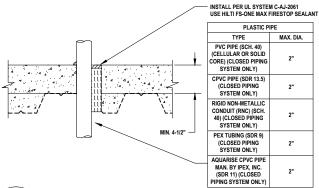
CONTENTS:

ELECTRICAL PENETRATIONS CONCRETE/BLOCK WALL 3 HR.

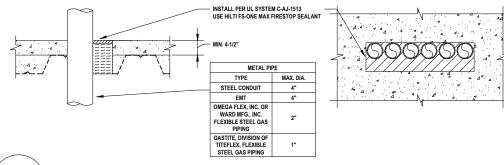
SHEET NAME:



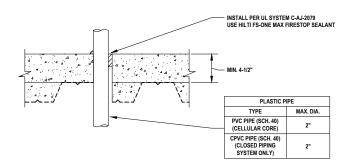
METAL PIPE THROUGH CONCRETE OVER METAL DECKING \(2-HR.) NOT TO SCALE E.3.1



PLASTIC PIPE THROUGH CONCRETE OVER METAL DECKING 3 \(2-HR.) NOT TO SCALE E.3.1



2 \MULTIPLE METAL PIPE THROUGH CONCRETE OVER METAL DECKING (2-HR.) NOT TO SCALE E.3.1



PLASTIC PIPE THROUGH CONCRETE OVER METAL DECKING \(2-HR.) E.3.1 NOT TO SCALE

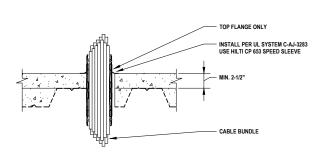
	SLEEVE O	
นนน.	CABLE BL	NDLE

CABLE BUNDLE CONSISTS OF:				
TYPE	MAX.	TYPE	MAX.	
TELEPHONE CABLE WITH PVC JACKET	300 PAIR NO. 24 AWG	METAL-CLAD CABLE	3/C NO. 12 AWG	
POWER CABLE WITH PVC JACKET (COPPER CONDUCTOR)	500 KCMIL	COPPER CONDUCTOR SER CABLE WITH PVC JACKET	3/C (+GROUND) 2/0 AWG	
POWER CABLE WITH PVC JACKET (ALUMINUM OR COPPER CONDUCTOR)	350 KCMIL	COAXIAL CABLE WITH FLUORINATED ETHYLENE JACKET	RG/U	
POWER CABLE WITH PVC JACKET	7/C NO. 12 AWG	CABLE WITH PVC JACKET	3/C NO. 6 AWG	
FIBER OPTIC CABLE (24 FIBER)	1/2" DIA.	SINGLE OR MULTIPLE CONDUCTOR TYPE MI CABLE (MIN. 1/8" SEPERATION BETWEEN MI CABLES AND ANY OTHER TYPES OF CABLE)	1-1/4" DIA.	
	TYPE TELEPHONE CABLE WITH PVC JACKET POWER CABLE WITH PVC JACKET (COPPER CONDUCTOR) POWER CABLE WITH PVC JACKET (ALUMINUM OR COPPER CONDUCTOR) POWER CABLE WITH PVC JACKET FIBER OPTIC CABLE (24	TYPE MAX. TELEPHONE CABLE 300 PAIR WITH PVC JACKET NO. 24 AWG POWER CABLE WITH PVC JACKET (COPPER CONDUCTOR) POWER CABLE WITH PVC JACKET (ALUMINUM OR COPPER CONDUCTOR) POWER CABLE WITH PVC JACKET AWG FIBER OPTIC CABLE (24 1/2" DIA	TYPE MAX. TYPE TELEPHONE CABLE 300 PAIR WITH PVC JACKET NO. 24 AWG POWER CABLE WITH PVC JACKET S00 KCMIL CONDUCTOR) POWER CABLE WITH PVC JACKET (ALUMINUM OR COPPER CONDUCTOR) POWER CABLE WITH PVC JACKET (ALUMINUM OR COPPER CONDUCTOR) POWER CABLE WITH PVC JACKET AWG STORE JACKET S00 KCMIL CABLE WITH PVC JACKET AWG FIBER OPTIC CABLE (24 FIBER) FIBER OPTIC ACBLE (24 FIBER) FIBER OPTIC ACBLE (24 FIBER) FIBER OPTIC ACBLE (24 FIBER) FIBER OPTIC AC	

INSTALL PER UL SYSTEM C-AJ-3216 USE HILTI CFS-PL FIRESTOP PLUG SLEEVE OPTIONAL - CABLE BUNDLE

6 CABLE BUNDLE THROUGH CONCRETE OVER METAL DECKING (2-HR.) NOT TO SCALE E.3.1

CABLE BUNDLE THROUGH CONCRETE OVER METAL DECKING (2-HR.) NOT TO SCALE E.3.1



TYPE	MAX.	TYPE	MAX.
TELEPHONE CABLE WITH PVC JACKET	100 PAIR NO. 24 AWG	FIBER OPTIC CABLE (24 FIBER) WITH PVC OR PE JACKET AND INSULATION	1/2" DIA.
COPPER CONDUCTOR CONTROL CABLE WITH PVC OR XLPE JACKET AND INSULATION	7/C NO. 12 AWG	SHIELDED PRINTER CABLE WITH PVC JACKET	20/C NO. 22 AWG
SHIELDED PRINTER CABLE WITH PVC JACKET	4/0 AWG	POWER OR NON-POWER LIMITED FIRE ALARM CABLE WITH OR WITHOUT METAL JACKET (MAN. BY AFC CABLE SYSTEMS, INC.)	2/C NO. 18 AWG
COMPUTER CABLE	4 PAIR NO. 22 AWG CAT 6	S-VIDEO CABLE CONSISTING OF MAX. 24 AWG 75 OHM COAX OR TWISTED PAIR CABLE WITH PE INSULATION AND PVC JACKET	1/4" DIA.
COAXIAL CABLE	RG 6/U		

CABLE BUNDLE CONSISTS OF

1. Refer to the following specifications for firestopping. a. 07 84 00 Firestopping

b. 07 84 13 Penetration Firestopping

c. 22 00 00 Plumbing

d. 23 00 00 HVAC

e. 26 00 00 Electrical

f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

ude block inform application/system novrature or fire ra*** 2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:

* Fire Rating (F-Rating)

* Temperature Rating (T-Rating)

* Leakage Rating (L-Rating)

* Water Rating (W-Rating) * Annular Space

* Percent Fill

* Movement

* Type and thickness of fire-rated construction.

3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

CABLE BUNDLE CONSISTS OF:

METAL-CLAD CABLE WITH PVC JACKET

METAL-CLAD TEK

CABLE WITH PVC JACKET

LUMINUM SER CABLE

COAXIAL CABLE WITH PE INSULATION AND

3/C NO. 12 AWG

1" DIA

MAX.

300 PAIR

750 KCMIL

7/C NO. 12

1/2" DIA.

TELEPHONE CARLE

WITH PVC INSULATION AND JACKET

POWER CABLE WITH

THERMOPLASTIC INSULATION AND PVC

JACKET

POWER CABLE WITH

PVC OR XLPE

INSULATION AND PVC

JACKET

* 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2

* NFPA 101 Life Safety Code

* NFPA 70 - National Electric Code

* All governing local and regional building codes 5. Firestop System installation must meet requirements of ASTM

E-814 (UL 1479) tested assemblies that provide a fire rating egual to that of construction being penetrated. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with

the following information: *Warning! - Do Not Disturb

*Through Penetration Firestop System

* UL System # * Product(s) used

* Hourly Rating (F-Rating)

* Installation Date

*Contractor's Name

7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

JOB NUMBER:

most current "Underwriter's

on to urco...
Classification or transe up to date a al information on the all information on the all information or the all information o

2. ε.

CHECKED:

ISSUE DATE:

REVISIONS:

CONTENTS

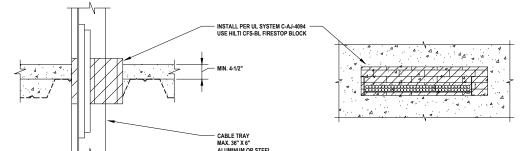
ELECTRICAL PENETRATIONS CONCRETE OVER METAL DECK 2 HR.

SHEET NAME:

SHEET NUMBER:

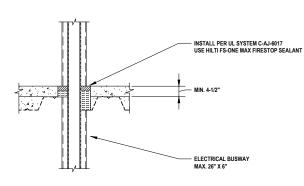
CABLE BUNDLE THROUGH CONCRETE OVER METAL DECKING (2-HR.)

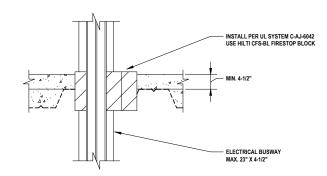
NOT TO SCALE E.3.1



CABLE BUNDLE CONSISTS OF:				
TYPE	MAX.	TYPE	MAX.	
TELEPHONE CABLE WITH PVC JACKET	300 PAIR NO. 24 AWG	METAL-CLAD CABLE	3/C NO. 12 AWG	
SINGLE CONDUCTOR POWER CABLE WITH PVC JACKET	750 KCMIL	POWER CABLE WITH PVC JACKET	7/C NO. 12 AWG	
FIBER OPTIC CABLE (24 FIBER) WITH PVC JACKET	1/2" DIA.			

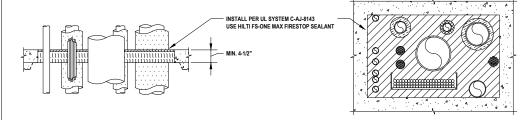
CABLE TRAY THROUGH CONCRETE OVER METAL DECKING (2-HR.) E.3.2





ELECTRICAL BUSWAY THROUGH CONCRETE OVER METAL DECKING (2-HR.) NOT TO SCALE E.3.2

ELECTRICAL BUSWAY THROUGH CONCRETE OVER METAL DECKING (2-HR.) E.3.2 NOT TO SCALE



\MULTIPLE PENETRATIONS THROUGH CONCRETE OVER METAL DECKING (2-HR.)

E.3.2

Notes:

- Refer to the following specifications for firestopping.
 - a. 07 84 00 Firestopping
 - b. 07 84 13 Penetration Firestopping
 - c. 22 00 00 Plumbing
 - d. 23 00 00 HVAC e. 26 00 00 Electrical

 - f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

- 2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
 - * Fire Rating (F-Rating)
 - * Temperature Rating (T-Rating) * Leakage Rating (L-Rating)

 - * Water Rating (W-Rating) * Annular Space
 - * Percent Fill
 - * Movement
 - * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated.
- 6. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information:
 - *Warning! Do Not Disturb
 - *Through Penetration Firestop System * UL System # * Product(s) used

 - * Hourly Rating (F-Rating) * Installation Date

 - *Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

ייטג inform. אטוומאר... rature or fire ratio...

most current "Underwriter's

2. ε.

JOB NUMBER:

CHECKED:

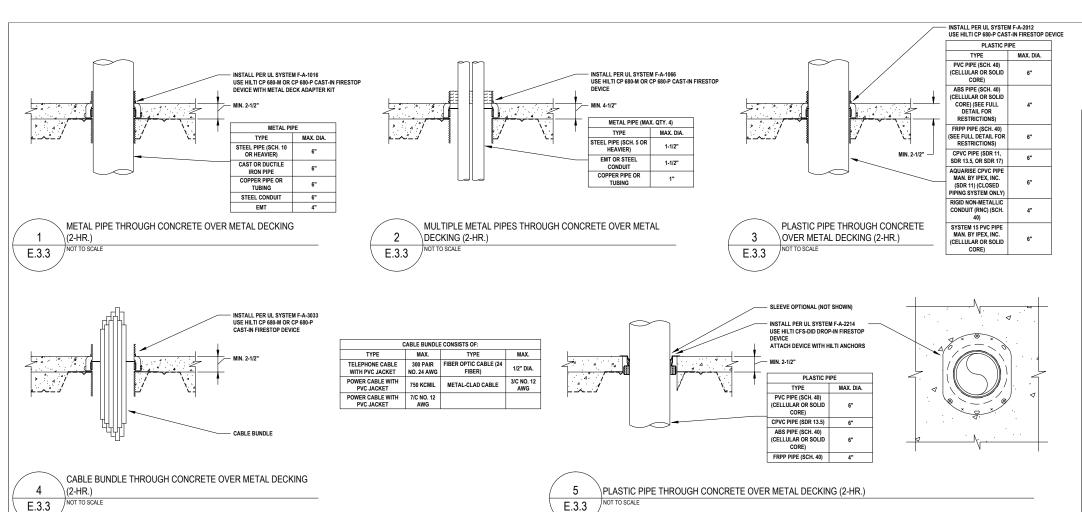
ISSUE DATE:

REVISIONS:

CONTENTS:

ELECTRICAL PENETRATIONS CONCRETE OVER METAL DECK 2 HR.

SHEET NAME:



Notes:

1. Refer to the following specifications for firestopping.

a. 07 84 00 Firestopping

b. 07 84 13 Penetration Firestopping

c. 22 00 00 Plumbing d. 23 00 00 HVAC

e. 26 00 00 Electrical

f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification

2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:

* Fire Rating (F-Rating)

* Temperature Rating (T-Rating)

* Leakage Rating (L-Rating)

* Water Rating (W-Rating)

* Annular Space * Percent Fill

* Movement

* Type and thickness of fire-rated construction.

3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

* 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2

* NFPA 101 Life Safety Code

* NFPA 70 - National Electric Code

* All governing local and regional building codes

5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated.

6. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information:

*Warning! - Do Not Disturb

*Through Penetration Firestop System

* UL System # * Product(s) used

* Hourly Rating (F-Rating)

* Installation Date

*Contractor's Name

7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

most current "Underwriter's e with title block inforr application/system ne ature or fire ratings. te this note after ron to these details.
Classification or to note to date a suit information on the consistence I 2. ε.

JOB NUMBER:

CHECKED:

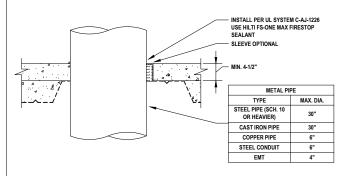
ISSUE DATE:

REVISIONS:

CONTENTS:

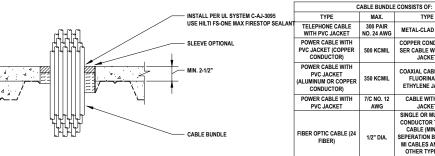
ELECTRICAL PENETRATIONS CONCRETE OVER METAL DECK 2 HR.

SHEET NAME:



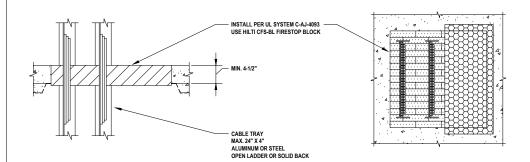
METAL PIPE THROUGH CONCRETE OVER METAL DECKING \(3-HR.) NOT TO SCALE E.3.4

E.3.4

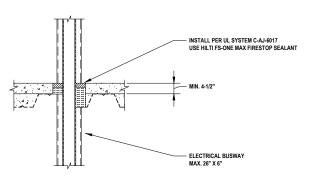


3/C NO. 12 AWG METAL-CLAD CABLE 3/C (+GROUNE 2/0 AWG COPPER CONDUCTOR COAXIAL CABLE WITH FLUORINATED ETHYLENE JACKET 3/C NO. 6 AWG CARLE WITH PVC JACKET
SINGLE OR MULTIPLE CONDUCTOR TYPE MI CABLE (MIN. 1/8" SEPERATION BETWEEN 1-1/4" DIA MI CABLES AND ANY OTHER TYPES OF CABLE)

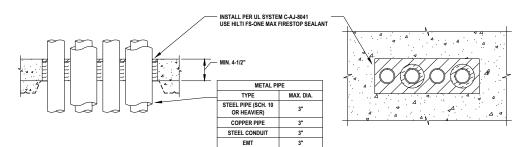
CABLE BUNDLE THROUGH CONCRETE OVER METAL DECKING (3-HR.) NOT TO SCALE



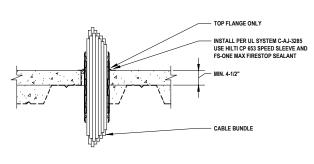
\MULTIPLE CABLE TRAYS THROUGH CONCRETE OVER METAL DECKING (3-HR.) NOT TO SCALE E.3.4



ELECTRICAL BUSWAY THROUGH CONCRETE OVER METAL DECKING (3-HR.) NOT TO SCALE E.3.4



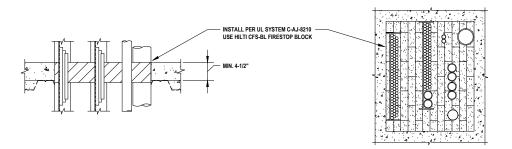
2 \MULTIPLE METAL PIPES THROUGH CONCRETE OVER METAL DECKING (3-HR.) NOT TO SCALE E.3.4



CABLE BUNDLE CONSISTS OF:				
TYPE	MAX.	TYPE	MAX.	
TELEPHONE CABLE WITH PVC JACKET	100 PAIR NO. 24 AWG	FIBER OPTIC CABLE (24 FIBER) WITH PVC OR PE JACKET AND INSULATION	1/2" DIA.	
COPPER CONDUCTOR CONTROL CABLE WITH PVC OR XLPE JACKET AND INSULATION	7/C NO. 12 AWG	SHIELDED PRINTER CABLE WITH PVC JACKET	20/C NO. 22 AWG	
TYPE RHH GROUND CABLE	4/0 AWG	POWER OR NON-POWER LIMITED FIRE ALARM CABLE WITH OR WITHOUT METAL JACKET (MAN. BY AFC CABLE SYSTEMS, INC.)	2/C NO. 18 AWG	
COMPUTER CABLE	4 PAIR NO. 22 AWG CAT 6	S-VIDEO CABLE CONSISTING OF TWO MAX. 24 AWG 75 OHM COAX OR TWISTED PAIR CABLE WITH PE INSULATION AND PVC JACKET	1/4" DIA.	
COAXIAL CABLE	RG 6/U			

\CABLE BUNDLE THROUGH CONCRETE OVER METAL DECKING (3-HR.) E.3.4 NOT TO SCALE

(ABLE BUNDLE	CONSISTS OF:	
TYPE	MAX.	TYPE	MAX.
COPPER CONDUCTOR CABLE WITH PVC JACKET	7/C NO. 12 AWG	SINGLE CONDUCTOR POWER CABLE WITH PVC JACKET	500 KCMIL
TELEPHONE CABLE WITH PVC JACKET	300 PAIR NO. 24 AWG	FIBER OPTIC CABLE WITH PVC JACKET	24
SINGLE CONDUCTOR POWER CABLE WITH PVC.IACKET	350 KCMIL		



MULTIPLE PENETRATIONS THROUGH CONCRETE OVER METAL DECKING (3-HR.) NOT TO SCALE E.3.4

Refer to the following specifications for firestopping.

a. 07 84 00 Firestopping b. 07 84 13 Penetration Firestopping

c. 22 00 00 Plumbing

d. 23 00 00 HVAC

e. 26 00 00 Electrical

f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

2. Details shown are typical details, containing general information سا block in. plication/systen rature or fire ra** only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:

* Fire Rating (F-Rating)

* Temperature Rating (T-Rating)

* Leakage Rating (L-Rating)

* Water Rating (W-Rating) * Annular Space

* Percent Fill

* Type and thickness of fire-rated construction.

3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

* 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2

* NFPA 101 Life Safety Code

* NFPA 70 - National Electric Code * All governing local and regional building codes

5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated.

 All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information:

*Warning! - Do Not Disturb

*Through Penetration Firestop System

* UL System # * Product(s) used

* Hourly Rating (F-Rating)

* Installation Date

*Contractor's Name

7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

JOB NUMBER:

most current "Underwriter's

on to urc...
Classification or ti
n are up to date a:
I information on tf

2. ε.

CHECKED:

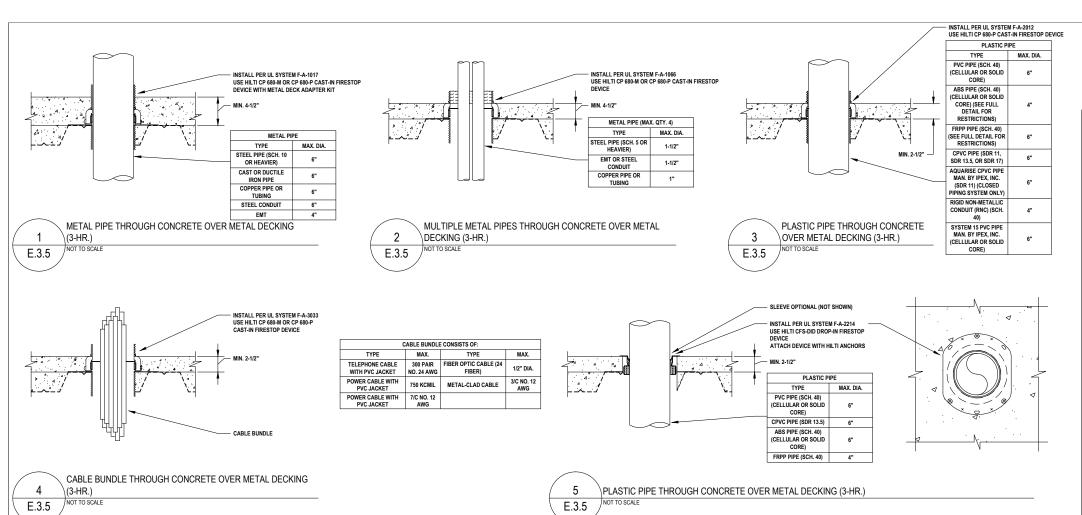
ISSUE DATE:

REVISIONS:

CONTENTS

ELECTRICAL PENETRATIONS CONCRETE OVER METAL DECK 3 HR.

SHEET NAME:



Notes:

- 1. Refer to the following specifications for firestopping.
 - a. 07 84 00 Firestopping b. 07 84 13 Penetration Firestopping

 - c. 22 00 00 Plumbing d. 23 00 00 HVAC
 - e. 26 00 00 Electrical
 - f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification

- 2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
 - * Fire Rating (F-Rating)
 - * Temperature Rating (T-Rating) * Leakage Rating (L-Rating)
 - * Water Rating (W-Rating)
 - * Annular Space
 - * Percent Fill

 - * Movement
- * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated.
- 6. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information:

*Warning! - Do Not Disturb

- *Through Penetration Firestop System
- * UL System # * Product(s) used
- * Hourly Rating (F-Rating)
- * Installation Date
- *Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

e with title block inforr application/system ne ature or fire ratings. elete this note after ation to these detail ek Classification or t wn are up to date av nal information on th s Fire Resistance D 2. ε.

most current "Underwriter's

JOB NUMBER:

CHECKED:

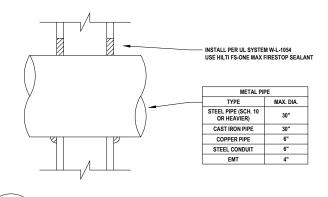
ISSUE DATE:

REVISIONS:

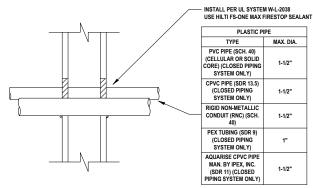
CONTENTS:

ELECTRICAL PENETRATIONS CONCRETE OVER METAL DECK 3 HR.

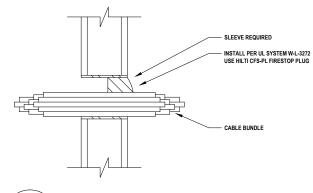
SHEET NAME:



METAL PIPE THROUGH GYPSUM WALL ASSEMBLY (1-HR.) NOT TO SCALE E.4.1



MULTIPLE PLASTIC PIPES THROUGH GYPSUM WALL ASSEMBLY 3 \(1-HR.) E.4.1 NOT TO SCALE

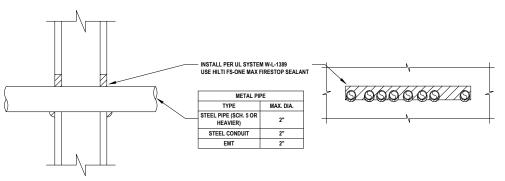


CABLE BUNDLE THROUGH GYPSUM WALL ASSEMBLY (1-HR.)

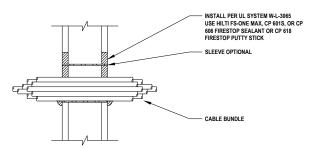
NOT TO SCALE

E.4.1

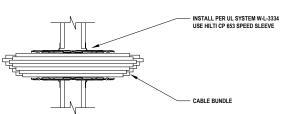
CARLE BUNDLE CONSISTS OF MAX. TYPE MAX. TELEPHONE CABLE 300 PAIR FIBER OPTIC CABLE 1/2" DIA. WITH PVC JACKET NO. 24 AWG (MAX. 24 FIBER) METAL-CLAD CABLE WITH PVC JACKET 3/C NO. 12 AWG 750 KCMIL METAL-CLAD TEK POWER CABLE WITH PVC JACKET 7/C NO. 12 AWG CABLE WITH PVC



2 \MULTIPLE METAL PIPES THROUGH GYPSUM WALL ASSEMBLY (1-HR.) NOT TO SCALE E.4.1



CABLE BUNDLE THROUGH GYPSUM WALL ASSEMBLY (1-HR.) E.4.1 NOT TO SCALE



6 CABLE BUNDLE THROUGH GYPSUM WALL ASSEMBLY (1-HR.) NOT TO SCALE E.4.1

TYPE	MAX.	TYPE	MAX.
POWER CABLE WITH PVC JACKET	7/C NO. 12 AWG	COPPER GROUND CABLE WITH OR WITHOUT PVC JACKET	3/4" DIA.
TELEPHONE CABLE WITH PVC JACKET	25 PAIR NO. 24 AWG	SINGLE OR MULTIPLE CONDUCTOR TYPE MI CABLE (MIN. 1/8" SEPERATION BETWEEN MI CABLES AND ANY OTHER TYPES OF CABLE)	1-1/4" DIA.
COAXIAL CABLE WITH PVC JACKET	1/2" DIA. RG/U	ANY CABLES, METAL-CLAD CABLES, OR ARMORED CABLES CURRENTLY LISTED UNDER THE THROUGH PENETRATING PRODUCTS CATEGORY	-
METAL-CLAD CABLE	3/C NO. 8 AWG	ALUMINUM SER CABLE	4/C (+GROUND) NO. 300 KCMIL
COPPER CONDUCTOR CABLE (ROMEX)	3/C (+GROUND) NO. 8 AWG	CABLE	4 PAIR NO. 22 AWG CAT 5 OR CAT 6
FIBER OPTIC CABLE WITH PVC JACKET	5/8" DIA.	COAXIAL CABLE WITH FLUORINATED ETHYLENE JACKET	RG 6/U

CABLE BUNDLE CONSISTS OF

CABLE BUNDLE CONSISTS OF

TYPE	MAX.	TYPE	MAX.
TELEPHONE CABLE WITH PVC JACKET	100 PAIR NO. 24 AWG	SHIELDED PRINTER CABLE WITH PVC JACKET	20/C NO. 22 AWG
COPPER CONDUCTOR CONTROL CABLE WITH PVC OR XLPE JACKET AND INSULATION	7/C NO. 12 AWG	POWER OR NON-POWER LIMITED FIRE ALARM CABLE WITH OR WITHOUT METAL JACKET (MAN. BY AFC CABLE SYSTEMS, INC.)	2/C NO. 18 AWG
TYPE RHH GROUND Cable	4/0 AWG	S-VIDEO CABLE CONSISTING OF TWO MAX. 24 AWG 75 OHM COAX OR TWISTED PAIR CABLE WITH PE INSULATION AND PVC JACKET	1/4" DIA.
COMPUTER CABLE	4 PAIR NO. 22 AWG CAT 5 OR CAT 6	METAL-CLAD CABLE	3/C NO. 12 AWG
COAXIAL CABLE	RG 6/U	ANY CABLES, METAL-CLAD CABLES, OR ARMORED CABLES CURRENTLY LISTED UNDER THE THROUGH PENETRATING PRODUCTS CATEGORY	'
FIBER OPTIC CABLE (24 FIBER) WITH PVC OR PE JACKET AND INSULATION	1/2" DIA.		

Notes:

- 1. Refer to the following specifications for firestopping. a. 07 84 00 Firestopping
 - b. 07 84 13 Penetration Firestopping
 - c. 22 00 00 Plumbing
 - d. 23 00 00 HVAC
 - e. 26 00 00 Electrical
 - f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification

2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:

- * Fire Rating (F-Rating)
- * Temperature Rating (T-Rating) * Leakage Rating (L-Rating)
- * Water Rating (W-Rating)
- * Annular Space
- * Percent Fill
- * Movement
- * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating

equal to that of construction being penetrated. 6. All rated through-penetration assemblies shall be prominently

labeled with a Hilti Firestop Label equipped with a QR code with the following information:

*Warning! - Do Not Disturb

- *Through Penetration Firestop System
- * UL System # * Product(s) used
- * Hourly Rating (F-Rating)
- * Installation Date
- *Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

e with title block inforn application/system nc ature or fire ratings. to designer (delete this note after i 1. Any modification to these details. UL or Intertek Classification or tf 2. Details shown are up to date as 3. For additional information on the Laboratories Fire Resistance Dir

most current "Under

2. ε.

JOB NUMBER:

CHECKED:

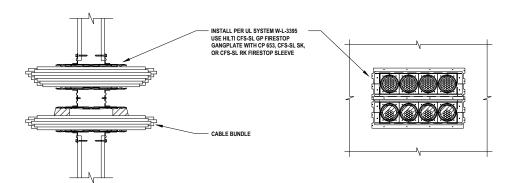
ISSUE DATE:

REVISIONS:

CONTENTS:

ELECTRICAL PENETRATIONS
GYPSUM WALL
1 HR.

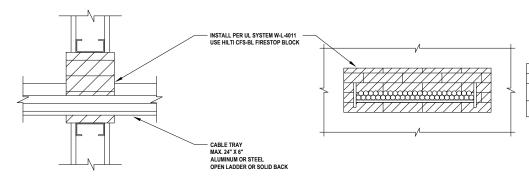
SHEET NAME:



CABLE BUNDLE CONSISTS OF:				
TYPE	MAX.	TYPE	MAX.	
TELEPHONE CABLE WITH PVC JACKET	100 PAIR NO. 24 AWG	COAXIAL CABLE	RG 6/U	
COPPER CONDUCTOR CONTROL CABLE WITH PVC OR XLPE JACKET AND INSULATION	7/C NO. 12 AWG	FIBER OPTIC CABLE (24 FIBER) WITH PVC OR PE JACKET AND INSULATION	1/2" DIA.	
TYPE RHH GROUND CABLE	4/0 AWG	MC CABLE	3/C NO. 12 AWG	
COMPUTER CABLE	4 PAIR NO. 22 AWG CAT 5 OR CAT 6			

MULTIPLE CABLE BUNDLES THROUGH GYPSUM WALL ASSEMBLY (1-HR.)

E.4.2

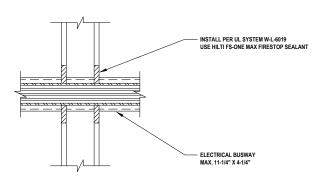


CABLE BUNDLE CONSISTS OF:				
TYPE MAX. TYPE MAX.				
TELEPHONE CABLE	300 PAIR NO. 24 AWG	FIBER OPTIC CABLE (24 FIBER)	1/2" DIA.	
SINGLE CONDUCTOR POWER CABLE	750 KCMIL	METAL-CLAD CABLE	3/C NO. 12 AWG	

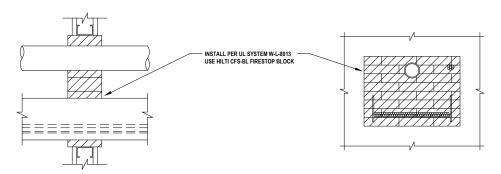
CABLE TRAY THROUGH GYPSUM WALL ASSEMBLY (1-HR.)

E.4.2

E.4.2



ELECTRICAL BUSWAY THROUGH GYPSUM WALL ASSEMBLY \(1-HR.) NOT TO SCALE



MULTIPLE PENETRATIONS THROUGH GYPSUM WALL ASSEMBLY (1-HR.) NOT TO SCALE E.4.2

- Refer to the following specifications for firestopping.
 - a. 07 84 00 Firestopping
 - b. 07 84 13 Penetration Firestopping
 - c. 22 00 00 Plumbing d. 23 00 00 HVAC
 - e. 26 00 00 Electrical
 - f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

- 2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
 - * Fire Rating (F-Rating)
 - * Temperature Rating (T-Rating) * Leakage Rating (L-Rating)
 - * Water Rating (W-Rating)
 - * Annular Space
 - * Percent Fill
 - * Movement
- * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes
- 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated.
- 6. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information: *Warning! - Do Not Disturb

 - *Through Penetration Firestop System
 - * UL System # * Product(s) used
 - * Hourly Rating (F-Rating) * Installation Date
 - *Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

JOB NUMBER:

most current "Underwriter's

e with title block inforn application/system nc ature or fire ratings.

to designer (delete this note after i 1. Any modification to these details. UL or Intertek Classification or tf 2. Details shown are up to date as 3. For additional information on the Laboratories Fire Resistance Dir

2. ε.

CHECKED:

ISSUE DATE:

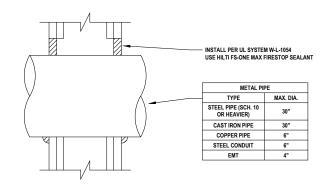
REVISIONS:

CONTENTS:

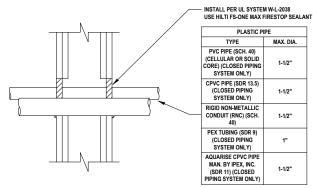
ELECTRICAL PENETRATIONS GYPSUM WALL 1 HR.

SHEET NAME:

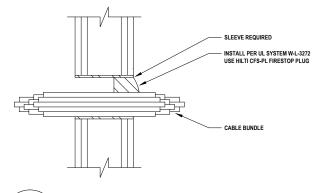
E.4.2



METAL PIPE THROUGH GYPSUM WALL ASSEMBLY (2-HR.) NOT TO SCALE E.4.3



MULTIPLE PLASTIC PIPES THROUGH GYPSUM WALL ASSEMBLY 3 (2-HR.) E.4.3 NOT TO SCALE

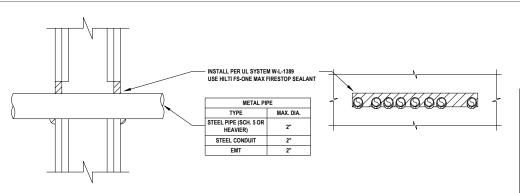


	CABLE BUNDLE	CONSISTS OF:	
TYPE	MAX.	TYPE	MAX.
TELEPHONE CABLE WITH PVC JACKET	300 PAIR NO. 24 AWG	FIBER OPTIC CABLE (MAX. 24 FIBER)	1/2" DIA.
POWER CABLE WITH PVC JACKET	750 KCMIL	METAL-CLAD CABLE WITH PVC JACKET	3/C NO. 1 AWG
POWER CABLE WITH PVC JACKET	7/C NO. 12 AWG	METAL-CLAD TEK CABLE WITH PVC JACKET	1"

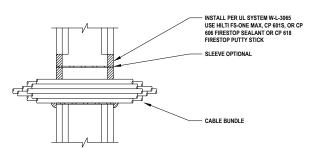
CABLE BUNDLE THROUGH GYPSUM WALL ASSEMBLY (2-HR.)

NOT TO SCALE

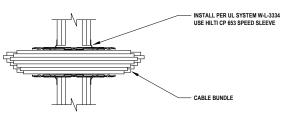
E.4.3



2 MULTIPLE METAL PIPES THROUGH GYPSUM WALL ASSEMBLY (2-HR.) NOT TO SCALE E.4.3



CABLE BUNDLE THROUGH GYPSUM WALL ASSEMBLY (2-HR.) E.4.3 NOT TO SCALE



6 CABLE BUNDLE THROUGH GYPSUM WALL ASSEMBLY (2-HR.) NOT TO SCALE E.4.3

TYPE	MAX.	TYPE	MAX.
POWER CABLE WITH PVC JACKET	7/C NO. 12 AWG	COPPER GROUND CABLE WITH OR WITHOUT PVC JACKET	3/4" DIA.
TELEPHONE CABLE WITH PVC JACKET	25 PAIR NO. 24 AWG	SINGLE OR MULTIPLE CONDUCTOR TYPE MI CABLE (MIN. 1/8" SEPERATION BETWEEN MI CABLES AND ANY OTHER TYPES OF CABLE)	1-1/4" DIA.
COAXIAL CABLE WITH PVC JACKET	1/2" DIA. RG/U	ANY CABLES, METAL-CLAD CABLES, OR ARMORED CABLES CURRENTLY LISTED UNDER THE THROUGH PENETRATING PRODUCTS CATEGORY	-
METAL-CLAD CABLE	3/C NO. 8 AWG	ALUMINUM SER CABLE	4/C (+GROUND) NO. 300 KCMIL
COPPER CONDUCTOR CABLE (ROMEX)	3/C (+GROUND) NO. 8 AWG	CABLE	4 PAIR NO. 22 AWG CAT 5 OR CAT 6
FIBER OPTIC CABLE WITH PVC JACKET	5/8" DIA.	COAXIAL CABLE WITH FLUORINATED ETHYLENE JACKET	RG 6/U

CABLE BUNDLE CONSISTS OF

CABLE BUNDLE CONSISTS OF:

TYPE	MAX.	TYPE	MAX.
TELEPHONE CABLE WITH PVC JACKET	100 PAIR NO. 24 AWG	SHIELDED PRINTER CABLE WITH PVC JACKET	20/C NO. 22 AWG
COPPER CONDUCTOR CONTROL CABLE WITH PVC OR XLPE JACKET AND INSULATION	7/C NO. 12 AWG	POWER OR NON-POWER LIMITED FIRE ALARM CABLE WITH OR WITHOUT METAL JACKET (MAN. BY AFC CABLE SYSTEMS, INC.)	2/C NO. 18 AWG
TYPE RHH GROUND Cable	4/0 AWG	S-VIDEO CABLE CONSISTING OF TWO MAX. 24 AWG 75 OHM COAX OR TWISTED PAIR CABLE WITH PE INSULATION AND PVC JACKET	1/4" DIA.
COMPUTER CABLE	4 PAIR NO. 22 AWG CAT 5 OR CAT 6	METAL-CLAD CABLE	3/C NO. 12 AWG
COAXIAL CABLE	RG 6/U	ANY CABLES, METAL-CLAD CABLES, OR ARMORED CABLES CURRENTLY LISTED UNDER THE THROUGH PENETRATING PRODUCTS CATEGORY	-
FIBER OPTIC CABLE (24 FIBER) WITH PVC OR PE JACKET AND INSULATION	1/2" DIA.		

Notes:

- 1. Refer to the following specifications for firestopping. a. 07 84 00 Firestopping

 - b. 07 84 13 Penetration Firestopping
 - c. 22 00 00 Plumbing d. 23 00 00 HVAC
 - e. 26 00 00 Electrical
 - f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:

- * Fire Rating (F-Rating)
- * Temperature Rating (T-Rating) * Leakage Rating (L-Rating)
- * Water Rating (W-Rating)
- * Annular Space
- * Percent Fill
- * Movement
- * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes 5. Firestop System installation must meet requirements of ASTM E-814 (UL 1479) tested assemblies that provide a fire rating

equal to that of construction being penetrated. 6. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information:

*Warning! - Do Not Disturb

*Through Penetration Firestop System

- * UL System # * Product(s) used
- * Hourly Rating (F-Rating)
- * Installation Date
- *Contractor's Name

7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

ce with ttle block inforn n application/system no grature or fire ratings. to designer (delete this note after i 1. Any modification to these details. UL or Intertek Classification or tf 2. Details shown are up to date as 3. For additional information on the Laboratories Fire Resistance Dir

most current "Under

2. ε.

JOB NUMBER:

CHECKED:

ISSUE DATE:

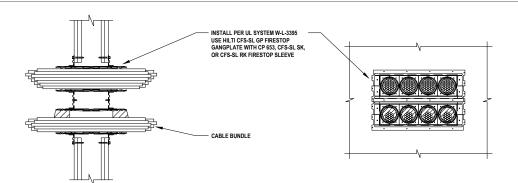
REVISIONS:

CONTENTS:

ELECTRICAL PENETRATIONS GYPSUM WALL 2 HR.

SHEET NAME:

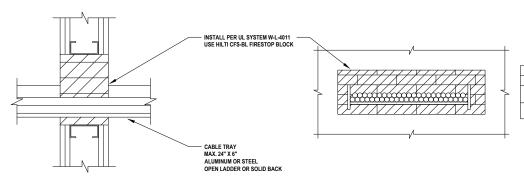
E.4.3



CABLE BUNDLE CONSISTS OF:				
TYPE	MAX.	TYPE	MAX.	
TELEPHONE CABLE WITH PVC JACKET	100 PAIR NO. 24 AWG	COAXIAL CABLE	RG 6/U	
COPPER CONDUCTOR CONTROL CABLE WITH PVC OR XLPE JACKET AND INSULATION	7/C NO. 12 AWG	FIBER OPTIC CABLE (24 FIBER) WITH PVC OR PE JACKET AND INSULATION	1/2" DIA.	
TYPE RHH GROUND CABLE	4/0 AWG	MC CABLE	3/C NO. 12 AWG	
COMPUTER CABLE	4 PAIR NO. 22 AWG CAT 5 OR CAT 6			

MULTIPLE CABLE BUNDLES THROUGH GYPSUM WALL ASSEMBLY (2-HR.)

E.4.4

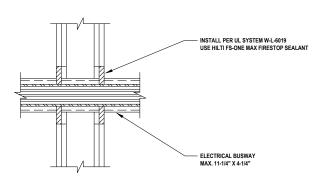


CABLE BUNDLE CONSISTS OF:				
TYPE MAX. TYPE MAX.				
TELEPHONE CABLE	300 PAIR NO. 24 AWG	FIBER OPTIC CABLE (24 FIBER)	1/2" DIA.	
SINGLE CONDUCTOR POWER CABLE	750 KCMIL	METAL-CLAD CABLE	3/C NO. 12 AWG	

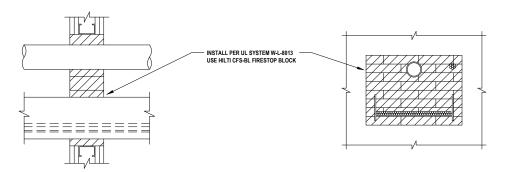
CABLE TRAY THROUGH GYPSUM WALL ASSEMBLY (2-HR.)

E.4.4

E.4.4



ELECTRICAL BUSWAY THROUGH GYPSUM WALL ASSEMBLY (2-HR.) NOT TO SCALE



MULTIPLE PENETRATIONS THROUGH GYPSUM WALL ASSEMBLY (2-HR.) NOT TO SCALE E.4.4

- Refer to the following specifications for firestopping.
 - a. 07 84 00 Firestopping b. 07 84 13 Penetration Firestopping
 - c. 22 00 00 Plumbing
 - d. 23 00 00 HVAC
 - e. 26 00 00 Electrical
 - f. 27 06 37 Communication

For Quality Control requirements, refer to the Quality Control portion of the specification.

- 2. Details shown are typical details, containing general information only. Always refer to the full UL system detail for complete system requirements. If field conditions do not match requirements of details, approved alternate details shall be utilized. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
 - * Fire Rating (F-Rating)
 - * Temperature Rating (T-Rating) * Leakage Rating (L-Rating)
 - * Water Rating (W-Rating)
 - * Annular Space
 - * Percent Fill
- * Movement
- * Type and thickness of fire-rated construction.
- 3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Contact Hilti Inc. for alternative systems or Engineering Judgment (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:

- * 2013 Underwriter's Laboratories Fire Resistance Directory, Volumes 1 & 2
- * NFPA 101 Life Safety Code
- * NFPA 70 National Electric Code
- * All governing local and regional building codes 5. Firestop System installation must meet requirements of ASTM
- E-814 (UL 1479) tested assemblies that provide a fire rating equal to that of construction being penetrated.
- 6. All rated through-penetration assemblies shall be prominently labeled with a Hilti Firestop Label equipped with a QR code with the following information: *Warning! - Do Not Disturb

 - *Through Penetration Firestop System
 - * UL System # * Product(s) used
 - * Hourly Rating (F-Rating)
 - * Installation Date *Contractor's Name
- 7. For outlet boxes requiring protection, use only Wall Opening Protective Materials, category CLIV as classified by Underwriter's Laboratories, Fire Resistance Directory (Volume 1.)

ce with ttle block inforn n application/system no grature or fire ratings. to designer (delete this note after i 1. Any modification to these details. UL or Intertek Classification or tf 2. Details shown are up to date as 3. For additional information on the Laboratories Fire Resistance Dir

most current "Underwriter's

2. ε.

JOB NUMBER:

CHECKED:

ISSUE DATE:

REVISIONS:

CONTENTS:

ELECTRICAL PENETRATIONS GYPSUM WALL 2 HR.

SHEET NAME:

E.4.4