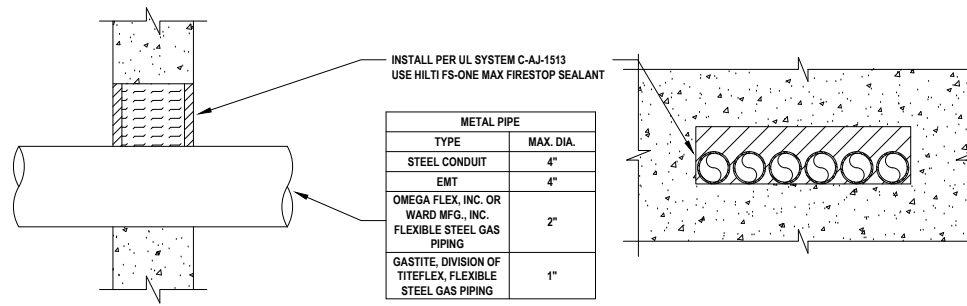


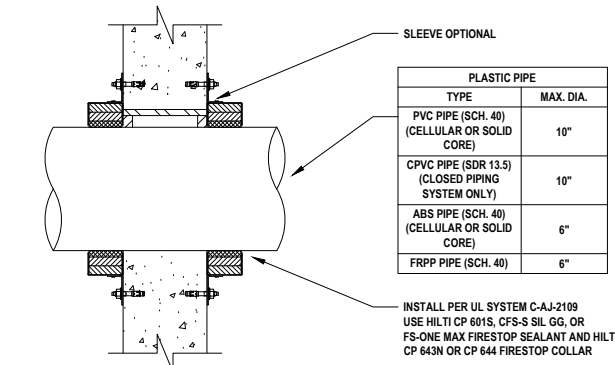
| METAL PIPE                      |           |
|---------------------------------|-----------|
| TYPE                            | MAX. DIA. |
| STEEL PIPE (SCH. 10 OR HEAVIER) | 30"       |
| CAST IRON PIPE                  | 30"       |
| COPPER PIPE                     | 6"        |
| STEEL CONDUIT                   | 6"        |
| EMT                             | 4"        |

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



| METAL PIPE  |           |
|---|-----------|
| TYPE  | MAX. DIA. |
| STEEL CONDUIT   | 4"        |
| EMT   | 4"        |
| OMEGA FLEX, INC. OR WARD MFG., INC. FLEXIBLE STEEL GAS PIPING | 2"        |
| GASTITE, DIVISION OF TITFLEX, FLEXIBLE STEEL GAS PIPING       | 1"        |

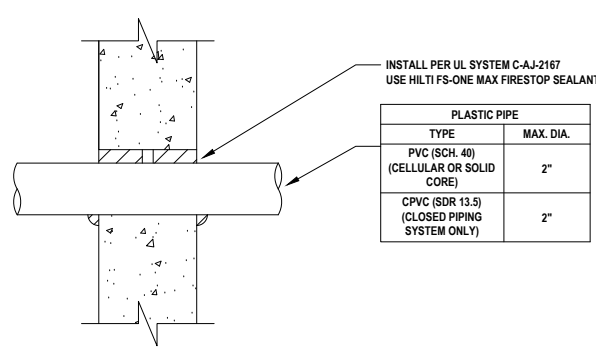
2 MULTIPLE METAL PIPES THROUGH CONCRETE WALL (2-HR.)  
M.2.1 NOT TO SCALE



| PLASTIC PIPE                                     |           |
|--|-----------|
| TYPE   | MAX. DIA. |
| PVC PIPE (SCH. 40) (CELLULAR OR SOLID CORE)      | 10"       |
| CPVC PIPE (SDR 13.5) (CLOSED PIPING SYSTEM ONLY) | 10"       |
| ABS PIPE (SCH. 40) (CELLULAR OR SOLID CORE)      | 6"        |
| FRPP PIPE (SCH. 40)                              | 6"        |

INSTALL PER UL SYSTEM C-AJ-2109  
USE HILTI CP 601S, CFS-S SIL GG, OR FS-ONE MAX FIRESTOP SEALANT AND HILTI CP 643N OR CP 644 FIRESTOP COLLAR

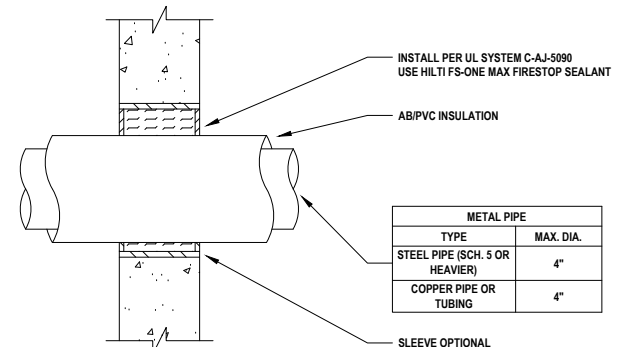
3 PLASTIC PIPE THROUGH CONCRETE WALL (2-HR.)  
M.2.1 NOT TO SCALE



INSTALL PER UL SYSTEM C-AJ-2167  
USE HILTI FS-ONE MAX FIRESTOP SEALANT

| PLASTIC PIPE                                |           |
|---|-----------|
| TYPE  | MAX. DIA. |
| PVC (SCH. 40) (CELLULAR OR SOLID CORE)      | 2"        |
| CPVC (SDR 13.5) (CLOSED PIPING SYSTEM ONLY) | 2"        |

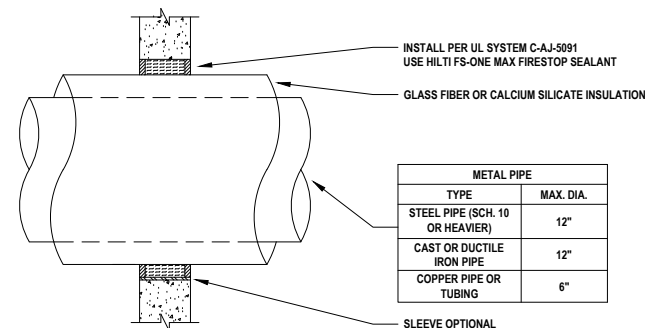
4 PLASTIC PIPE THROUGH CONCRETE WALL (2-HR.)  
M.2.1 NOT TO SCALE



INSTALL PER UL SYSTEM C-AJ-5090  
USE HILTI FS-ONE MAX FIRESTOP SEALANT

| METAL PIPE                     |           |
|--------------------------------|-----------|
| TYPE                           | MAX. DIA. |
| STEEL PIPE (SCH. 5 OR HEAVIER) | 4"        |
| COPPER PIPE OR TUBING          | 4"        |

5 METAL PIPE WITH AB/PVC INSULATION THROUGH CONCRETE WALL (2-HR.)  
M.2.1 NOT TO SCALE

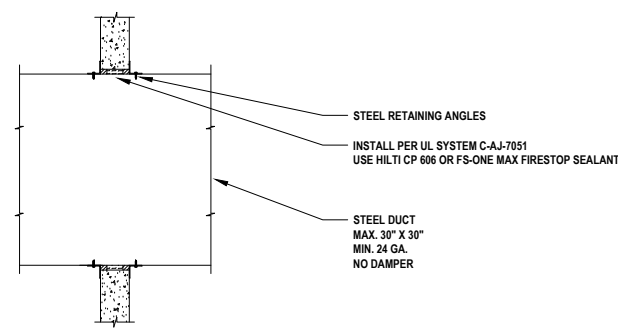


INSTALL PER UL SYSTEM C-AJ-5091  
USE HILTI FS-ONE MAX FIRESTOP SEALANT

| METAL PIPE                      |           |
|---------------------------------|-----------|
| TYPE                            | MAX. DIA. |
| STEEL PIPE (SCH. 10 OR HEAVIER) | 12"       |
| CAST OR DUCTILE IRON PIPE       | 12"       |
| COPPER PIPE OR TUBING           | 6"        |

SLEEVE OPTIONAL

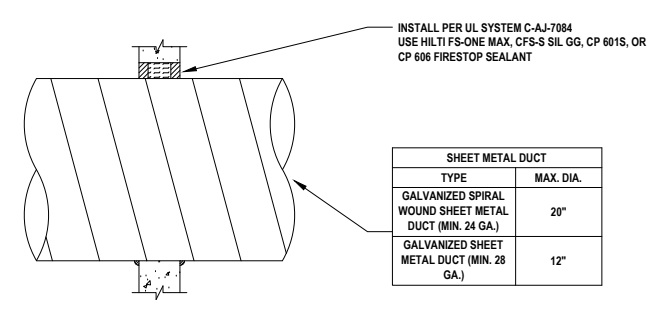
6 METAL PIPE WITH GLASS FIBER OR CALCIUM SILICATE INSULATION THROUGH CONCRETE WALL (2-HR.)  
M.2.1 NOT TO SCALE



INSTALL PER UL SYSTEM C-AJ-7051  
USE HILTI CP 606 OR FS-ONE MAX FIRESTOP SEALANT

STEEL DUCT  
MAX. 30" X 30"  
MIN. 24 GA.  
NO DAMPER

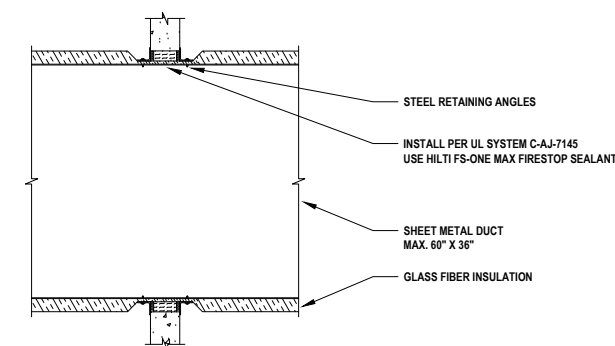
7 METAL DUCT (WITHOUT DAMPER) THROUGH CONCRETE WALL (2-HR.)  
M.2.1 NOT TO SCALE



INSTALL PER UL SYSTEM C-AJ-7084  
USE HILTI FS-ONE MAX, CFS-S SIL GG, CP 601S, OR CP 606 FIRESTOP SEALANT

| SHEET METAL DUCT                                       |           |
|--|-----------|
| TYPE   | MAX. DIA. |
| GALVANIZED SPIRAL WOUND SHEET METAL DUCT (MIN. 24 GA.) | 20"       |
| GALVANIZED SHEET METAL DUCT (MIN. 28 GA.)              | 12"       |

8 ROUND SHEET METAL DUCT THROUGH CONCRETE WALL (2-HR.)  
M.2.1 NOT TO SCALE

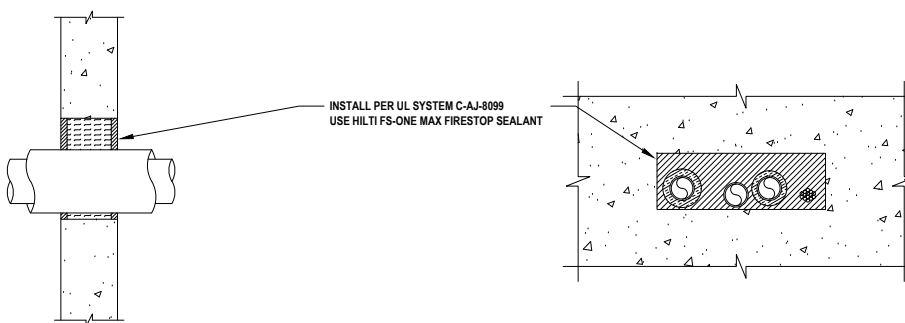


INSTALL PER UL SYSTEM C-AJ-7145  
USE HILTI FS-ONE MAX FIRESTOP SEALANT

SHEET METAL DUCT  
MAX. 60" X 36"

GLASS FIBER INSULATION

9 SHEET METAL DUCT WITH GLASS FIBER INSULATION THROUGH CONCRETE WALL (2-HR.)  
M.2.1 NOT TO SCALE



INSTALL PER UL SYSTEM C-AJ-8099  
USE HILTI FS-ONE MAX FIRESTOP SEALANT

10 MULTIPLE PENETRATIONS THROUGH CONCRETE WALL (2-HR.)  
M.2.1 NOT TO SCALE

Notes:

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

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

- 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.

- 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.

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

- 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

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

<Notes to designer (delete this note after reading and replace with title block information)>  
 1. Any modification to these details could result in an application/system not meeting the UL or Intertek Classification or the intended temperature or fire ratings.  
 2. Details shown are up to date as of February 2015.  
 3. For additional information on the details, refer to the most current "Underwriter's Laboratories Fire Resistance Directory (Volume 2)."

JOB NUMBER: \_\_\_\_\_

DRAWN: \_\_\_\_\_

CHECKED: \_\_\_\_\_

ISSUE DATE: \_\_\_\_\_

REVISIONS: \_\_\_\_\_

CONTENTS: \_\_\_\_\_

MECHANICAL PENETRATIONS  
CONCRETE/BLOCK WALL  
2 HR.

SHEET NAME: \_\_\_\_\_

**M.2.1**

SHEET NUMBER: \_\_\_\_\_