**Sheet Number:** M.3.1  
**Sheet Name:** 2 HR. CONCRETE OVER METAL DECK MECHANICAL PENETRATIONS

**Contents:**
- Use Hilti FS-One Max Firestop Sealant
- Install per UL System C-AJ-8099

**Revisions:**
- Issue Date:
- Checked:
- Drawn:
- Job Number:

**Notes:**
- Refer to the following specifications for firestopping:
  - A. 07 #420 Firestopping
  - B. 07 #123 Penetration Firestopping
  - C. 22 00 10 Penetrating

- Metal Decking (2-HR.)
- Concrete Over Metal Deck (2-HR.)
- Metal Pipe Through Concrete Over Metal Decking (2-HR.)
- Plastic Pipe Through Concrete Over Metal Decking (2-HR.)
- Plastic Pipe Through Concrete Over Metal Decking (2-HR.)
- Metal Pipe With Glass-Fiber Or Calcium Slicate Insulation Through Concrete Over Metal Decking (2-HR.)
- Metal Pipe With Ab/Pvc Insulation Through Concrete Over Metal Decking (2-HR.)
- Round Sheet Metal Duct Through Concrete Over Metal Decking (2-HR.)
- Sheet Metal Duct With Glass Fiber Insulation Through Concrete Over Metal Decking (2-HR.)
- Multiple Penetrations Through Concrete Over Metal Decking (2-HR.)

**Dimensions:**
- Min. 2-1/2"
- Max. 30" X 30"
- Max. 60" X 36"

**Materials:**
- Steel Duct
- Sheet Metal Duct
- Glass Fiber Insulation

**Firestopping Systems:**
- USE HILTI FS-ONE MAX FIRESTOP SEALANT
- INSTALL PER UL SYSTEM C-AJ-8099
- INSTALL PER UL SYSTEM C-AJ-7111
- INSTALL PER UL SYSTEM F-A-2025
- INSTALL PER UL SYSTEM C-AJ-5090
- INSTALL PER UL SYSTEM C-AJ-5091
- INSTALL PER UL SYSTEM C-AJ-1291

**Penetrations:**
- Use Hilti Firestop Label equipped with a QR code with
- Equal to that of construction being penetrated.

**References:**
- Laboratories, Fire Resistance Directory (Volume 1.)
- Protective Materials, category CLIV as classified by Underwriter’s Laboratories, Fire Resistance Directory (Volume 2.)
- Systems Engineering Judgments.
- Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments (800-879-8000)
- UL or Intertek Classification or the intended temperature or fire ratings.

**Design Requirements:**
- All governed local and regional building codes
- All governing local and regional building codes
- Building Code Requirements for Acceptance of Firestop Systems and Assemblies
- ANSI/A1349-2004
- E-814 (UL 1479) tested assemblies that provide a fire rating not limited to the following:
  - Fire Rating (F-Rating)
  - Temperature Rating (T-Rating)
  - Leakage Rating (L-Rating)
  - Water Rating (W-Rating)
  - Acoustic Space
  - Pressure Flange
  - Micropipet
  - Type and finish of fire-resistive construction.

**Additional Information:**
- For Quality Control requirements, refer to the Quality Control portion of the specification.
- Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - GfA.
  - GfB.
  - GfC.
  - GfD.
  - GfE.
  - GfF.
  - GfG.
  - GfH.

**Drawings:**
- Drawing no. 701/3/13, Drawing no. 701/3/19, Drawing no. 701/3/20, Drawing no. 701/3/21

**Job Number:** [Contractor’s Name]  
**Installation Date:** [Installation Date]  
**Hourly Rating (F-Rating):** [Hourly Rating (F-Rating)]  
**All governing local and regional building codes:** [All governing local and regional building codes]

**Disclaimer:**
- The information provided is intended for general guidance and may not be suitable for all applications. It is recommended to consult with a professional for specific requirements.

**Communication:**
- 26 00 00 Electrical  
- 22 00 00 Plumbing  
- 23 00 00 HVAC  
- 24 00 00 Mechanical  
- 27 06 37 Penetration Firestopping  
- 07 84 00 Firestopping  
- 07 84 13 Communication  
- 26 00 00 Electrical  
- 22 00 00 Plumbing  
- 23 00 00 HVAC  
- 24 00 00 Mechanical  
- 27 06 37 Penetration Firestopping  
- 07 84 00 Firestopping  
- 07 84 13 Communication

**Materials:**
- Steel Duct
- Sheet Metal Duct
- Glass Fiber Insulation

**System Requirements:**
- The system requirements are to be used as a guide for installation.
- The manufacturer’s engineering judgment drawings are acceptable. Design requirements, field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
  - GfA.
  - GfB.
  - GfC.
  - GfD.
  - GfE.
  - GfF.
  - GfG.
  - GfH.

**Special Considerations:**
- For additional information on the details, refer to the most current "Underwriter's Laboratories Fire Resistance Directory (Volume 2.)"
1. Metal Pipe with Glass Fiber Insulation Through Concrete Over Metal Decking (2-Hr.)

2. Plastic Pipe Through Concrete Over Metal Decking (2-Hr.)

3. Plastic Pipe Through Concrete Over Metal Decking (2-Hr.)

4. Metal Pipe with AB/PVC Insulation Through Concrete Over Metal Decking (2-Hr.)

5. Metal Pipe with Glass Fiber Insulation Through Concrete Over Metal Decking (2-Hr.)

6. Plastic Pipe Through Concrete Over Metal Decking (2-Hr.)

7. Metal Pipe with AB/PVC or Glass Fiber Insulation Through Concrete Over Metal Decking (2-Hr.)

**Notes:**
1. Refer to the following specifications for firestopping:
   a. *UL System Details* for complete system requirements.
   b. Refer to the Quality Control portion of the specification.
2. Details shown are up to date as of February 2015.
3. For outlet boxes requiring protection, use only Wall Opening Protective Modules or equivalent. Refer to the most current Underwriter's Laboratories Fire Resistance Directory (Volumes 1 & 2) for additional information on the details. Always refer to the full UL system detail for complete system requirements.
4. Refer to the following specifications for firestopping:
   a. NFPA 70 - National Electric Code
   c. NFPA 210: Glossary of Fire Protection Terms
   d. NFPA 251: Fire Tests of Building Components and Structures
   e. NFPA 252: Combustion Efficiency of Commercial Combustion Systems
   f. NFPA 220: Combustibility of Interior Materials
   g. NFPA 230: Fire Protection of Buildings

5. Firestopping System installation must meet requirements of ASTMA E1434 (UL 1652) tested assembly that provides a fire rating of 2 hours of construction being penetrated.

6. Refer to the following specifications for firestopping:

7. Refer to the following specifications for firestopping:

8. Refer to the following specifications for firestopping:
   c. *Laboratories Fire Resistance Directory (Volume 1.)*
   d. *Laboratories Fire Resistance Directory (Volume 2.)*
   e. *FIRESTOP SYSTEMS ENGINEERING JUDGMENTS (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

9. Refer to the following specifications for firestopping:

10. Refer to the following specifications for firestopping:
    c. *Laboratories Fire Resistance Directory (Volume 1.)*
    d. *Laboratories Fire Resistance Directory (Volume 2.)*
    e. *FIRESTOP SYSTEMS ENGINEERING JUDGMENTS (800-879-8000) Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.*