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.)"

Notes:

1. Refer to the following specifications for firestopping:
   a. 07 84 00 Firestopping
   b. 07 84 15 Penetration Firestopping
   c. 07 84 43 Joints Firestopping
   d. 22 00 00 Plumbing
   e. 23 00 00 HVAC
   f. 26 00 00 Electrical
   g. 27 05 37 Communication Systems

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

2. Details shown are typical details. Always refer to the listed 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)
   - Aisle Spacing
   - 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 subject to approval by the Authority Having Jurisdiction (AHJ). Contact Hilti Inc. for alternative systems or Engineering Judgments (800-879-8000). Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:
   - 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 or greater 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
   - Firestop System Name
   - Hourly Rating (F-Rating)
   - Water Rating (W-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 3).

Current as of November 29, 2017. System details subject to change without notice.
For Quality control requirements, refer to the Quality Control portion of the specification.

2. Details shown are typical details. Always refer to the listed 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 UL 1479 and CAN/ULC-S115. Details shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

3. All rated through-penetration assemblies shall be permanently labeled with a QR code with the following information:
   * Warning! - Do Not Disturb
   * Through Penetration Firestop System
   * UL System # Product used
   * Hourly Rating (F-Rating)
   * Installation Date
   * Contractor's Name


For more information, please refer to the specifications for firestopping:

* 07 84 00 Firestopping
* 07 84 13 Penetration Firestopping
* 07 84 14 Penetration Firestopping
* 07 84 16 Penetration Firestopping

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

Details shown are typical details. Always refer to the listed 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 to comply with the details provided 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 subject to approval by the Authority Having Jurisdiction (AHJ). Contact Hilti Inc. for alternative systems or Engineering Judgments (EIJ). Details shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

1. Wall Assembly — The 1, 2 or 3 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in Items 1, 2, 3 and 4.

2. Through Penetrants — One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and periphery of opening shall be min 2 in. (51 mm) wide.

3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, twisted inner wire with a max diam of 1 in. (25 mm).

Design requirements, field conditions and dimensions need to be verified to comply with the details provided but not limited to the following:

- Ambient CFM/sq ft
- System CFM/sq ft
- Temp CFM/sq ft
- Critical CFM/sq ft
- HRR CFM/sq ft
- Max CFM/sq ft

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

1. FT Ratings — 0, 1/2, 1 and 1-1/4 Hr (See Item 1)

2. FT Ratings — 1 and 2 Hr (See Item 1)

3. FT Ratings — 3 and 4 Hr (See Item 1)

4. FT Ratings — 5, 6 and 10 Hr (See Item 1)

5. FT Ratings — 15 and 20 Hr

6. FT Ratings — 25 and 30 Hr

7. FT Ratings — 35 and 40 Hr

8. FT Ratings — 45 and 50 Hr

9. FT Ratings — 55 and 60 Hr

10. FT Ratings — 65 and 70 Hr

11. FT Ratings — 75 and 80 Hr

12. FT Ratings — 85 and 90 Hr

13. FT Ratings — 95 and 100 Hr

14. FT Ratings — 105 and 110 Hr

15. FT Ratings — 115 and 120 Hr

16. FT Ratings — 125 and 130 Hr

17. FT Ratings — 135 and 140 Hr

18. FT Ratings — 145 and 150 Hr

19. FT Ratings — 155 and 160 Hr

20. FT Ratings — 165 and 170 Hr

21. FT Ratings — 175 and 180 Hr

22. FT Ratings — 185 and 190 Hr

23. FT Ratings — 195 and 200 Hr

24. FT Ratings — 205 and 210 Hr

25. FT Ratings — 215 and 220 Hr

26. FT Ratings — 225 and 230 Hr

27. FT Ratings — 235 and 240 Hr

28. FT Ratings — 245 and 250 Hr

29. FT Ratings — 255 and 260 Hr

30. FT Ratings — 265 and 270 Hr

31. FT Ratings — 275 and 280 Hr

32. FT Ratings — 285 and 290 Hr

33. FT Ratings — 295 and 300 Hr

34. FT Ratings — 305 and 310 Hr

35. FT Ratings — 315 and 320 Hr

36. FT Ratings — 325 and 330 Hr

37. FT Ratings — 335 and 340 Hr

38. FT Ratings — 345 and 350 Hr

39. FT Ratings — 355 and 360 Hr

40. FT Ratings — 365 and 370 Hr

41. FT Ratings — 375 and 380 Hr

42. FT Ratings — 385 and 390 Hr

43. FT Ratings — 395 and 400 Hr
1. Wall Assembly — Min 6 in. (152 mm) thick lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Opening may be round, rectangular or irregular with a max diam or dimension of 1 in. (25 mm).

2. Cables — Single or tight bundle of cables to be installed within the opening. Aggregate cross-sectional area of cables in opening to have a visual fill of min 0% to max 100%. The annular space between the cable bundle and the periphery of the opening to be min 0 in. (point contact).

3. Fill, Void or Cavity Material* — Nom 60 mm diam by 3 mm thick putty disc with one seam at radius. Paper-backer of disc to be removed and openings with no penetrant, the F, FT, FH and FTH Ratings are 2 hr.

4. Firestop Systems provided must be UL Listed and classified for the particular construction penetrations and field conditions. The firestop system for the cable assembly must be an approved system for the building code jurisdiction. The firestop system shall follow the International Firestop System Code (IFSC) and meet the requirements of the particular building code.

5. Firestop Systems installation must be completed by a qualified installer for the International Firestop System Code (IFSC) and meet the requirements of the particular building code.

6. All through penetrations must be closed with the firestop system in accordance with the International Firestop System Code (IFSC) and meet the requirements of the particular building code.

7. For additional information on the details, refer to the most current "Underwriter’s Laboratories Fire Resistance Directory (volume 2.)" and the "Firestop Systems Engineering Judgments (800-879-8000)." Drawings are acceptable subject to manufacturer’s engineering judgment if alternate details matching the construction being penetrated.

8. Reference: "Firestop Systems Engineering Judgments (800-879-8000)."

9. All rated through-penetration firestop systems being installed shall be prominently labeled as assemblies shall be termed with a Hilti Firestop Label equipped with the UL System # and Product(s) used.

10. System installation must be completed by a qualified installer for the International Firestop System Code (IFSC) and meet the requirements of the particular building code.

11. If alternate details matching the construction being penetrated, alternate details shall be utilized. Details shown are up to date as of February 2015.

12. For Quality Control requirements, refer to the Quality Control portion of the Underwriter’s Laboratories, Inc. if alternate details are not available.

13. For Quality Control requirements, refer to the Quality Control portion of the Underwriter’s Laboratories, Inc. if alternate details are not available.

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81. For Quality Control requirements, refer to the Quality Control portion of the Underwriter’s Laboratories, Inc. if alternate details are not available.
1. Any modification to these details could result in an application/system not meeting the requirements of UL System # ___

2. Details shown are typical details. Always refer to the listed 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 of material for fire-rated construction.

3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable subject to approval by the Authority Having Jurisdiction (AHJ). Contact Hilti Inc. for information on alternative systems or Engineering Judgment (EJHD). Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:
   - 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 or greater 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 3).

Current as of November 29, 2017. System details subject to change without notice.
1. Refer to section 07840 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.
2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
   * Minimum and maximum Width of joints
   * Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.
3. If alternate details matching the field conditions are not available, manufacturer’s engineering judgment drawings are acceptable. Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.
4. References:
   * 2017 Underwriter’s Laboratories Firestop Directory, Volume 2
   * Intertek Directory of Building Products
   * All governing local and regional building codes

Current as of November 19, 2017. System details subject to change without notice.
1. Refer to section 07840 of the specifications. For Quality Control requirements, refer to the Quality Control portion of the specification.

2. Details shown are typical details. If field conditions do not match requirements of typical details, approved alternate details shall be utilized. Field conditions and dimensions need to be verified for compliance with the details, including but not limited to the following:
   * Minimum and maximum Width of joints
   * Type and thickness of fire-rated construction. The minimum assembly rating of the firestop assembly shall meet or exceed the highest rating of the adjacent construction.

3. If alternate details matching the field conditions are not available, manufacturer's engineering judgment drawings are acceptable. Drawings shall follow the International Firestop Council (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments.

4. References:
   * 2017 Underwriter's Laboratories Fire Resistance Directory, Volume 2
   * Intertek Directory of Building Products
   * All governing local and regional building codes

Current as of November 19, 2017. System details subject to change without notice.