

SECTION 07 84 13 – PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes furnishing and installing fire stop systems in the following construction, but does not include load-bearing repairs to concrete floor slab penetration holes.
 - 1. Penetrations of fire rated floor and wall constructions both empty and those penetrated by cables, conduits, pipes, ducts and similar construction.
 - 2. Openings between structurally separate sections of fire rated floors, walls, and expansion joints.
 - 3. Gaps between top of fire rated walls and fire rated structural floor or roof construction.
 - 4. Openings in fire rated walls and floors penetrated by structural members.
 - 5. Safing slot gaps between edge of floor and curtain wall construction.
 - 6. Other locations where specifically shown on the Drawings.

1.3 RELATED WORK

- A. Related Work of Other Sections:
 - 1. Section 07 92 00 – Joint Sealants.
 - 2. Section 09 21 16 – Gypsum Board Assemblies.
 - 3. Division 21, 22, 23, and 26 Sections: Coordinate size of cored holes to accommodate through penetrating items and fire stopping designs provided.

1.4 DESIGN/PERFORMANCE REQUIREMENTS

- A. General: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.
- B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814, UL 1479, or UL 2079:
 - 1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.
 - 2. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:
 - a. Penetrations located outside wall cavities.

- b. Penetrations located outside fire-resistance-rated shaft enclosures.
 - c. L-Rated Systems: Where through-penetration firestop systems are indicated in smoke barriers, provide through-penetration firestop systems with L-ratings of not more than 3.0 cfm/sq. ft (0.01524cu. m/s x sq. m) at both ambient temperatures and 400 deg F (204 deg C).
- C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.
- 1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
 - 2. For floor penetrations with annular spaces exceeding 4 inches (100 mm) in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.
 - 3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.
- D. For those firestop applications that exist for which no UL tested system is available through a manufacturer, an engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgment drawings must follow requirements set forth by the International Firestop Council.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each through-penetration firestop system, show each type of construction condition penetrated, relationships to adjoining construction, and type of penetrating item. Include firestop design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.
- 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.
 - 2. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular through-penetration firestop condition, submit illustration, with modifications marked, approved by through-penetration firestop system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.
- C. Through-Penetration Firestop System Schedule: Indicate locations of each through-penetration firestop system, along with the following information:
- 1. Types of penetrating items.
 - 2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.
 - 3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.
- D. Qualification Data: For Installer.

- E. Product Certificates: For through-penetration firestop system products, signed by product manufacturer.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A firm experienced in installing through-penetration firestop systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its through-penetration firestop system products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.
 - 1. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.
 - 2. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.
 - 3. Manufacturer's Project Site Representative: Arrange to have manufacturer's direct representative (not distributor or agent) on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures per manufacturer's written recommendations and instructions applicable to penetration designs used.
- B. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:
 - 1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
 - 2. Through-penetration firestop systems are identical to those tested per testing standard referenced in "Part 1 Performance Requirements" Article. Provide rated systems complying with the following requirements:
 - a. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
 - b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by UL in its "Fire Resistance Directory."
- C. Mock-Up: Prepare Jobsite mock-ups of each different type of firestopping and smoke seal design required at locations selected by Architect. Approved mock-ups may be left in place as part of the Work and constitute the standard for remaining work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multicomponent materials.

- B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.9 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.
- C. Notify City of Houston's inspecting agency at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.
- D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by building inspector, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide complete fire stop systems that use only products listed in one of the rated designs scheduled in Part 3 of this Section, that are produced by one of the following manufacturers, and that do not require material changes in details and construction of related work:
 - 1. Hilti, Inc. (Hilti), (Tel) 800-879-8000 or www.us.hilti.com
 - 2. 3M Fire Protection Products (3M), St. Paul, MN, www.3m.com/firestop, distributed by SSI, Inc., Houston, TX, (Tel) 713-862-3900
 - 3. Specified Technologies, Inc. (STI), www.stifirestop.com, distributed by D-F-W Supply Co., Inc., Houston, TX (Tel) 713-943-3643.
 - 4. Rectorseal, Inc., Katy, TX, (REC) www.rectorseal.com (Tel) 281-797-1129.
 - 5. Tremco, Inc., Beachwood, OH (TRE) 800-321-7906 or www.tremcosealants.com.
- B. Firestopping Material: Provide the following asbestos free materials arranged in designs which produce Flame (F) and Temperature (T) ratings of not less than one hour but not less than the fire resistance rating of the assembly being penetrated, as tested per ASTM E 814.

1. Intumescent Putty: One part hand moldable 100% solids intumescent putty, UL listed for both Flame (F) and Temperature (T) ratings, and designed to restrict transmission of temperature as well as passage of flame, smoke and water; Hilti CP 618 Firestop Putty Stick or Hilti CP 617 or CP 617L Firestop Putty Pads, 3M Fire Barrier Moldable Putty, STI Spec Seal Firestop Putty, Rectorseal Metacaulk Fire Rated Putty, or Tremco Tremstop putty, as appropriate for designs required.
2. Intumescent Firestop Sealant: One part sealant, providing an airtight, waterproof seal that bonds to most building materials, available in a gun grade for wall and overhead applications and self leveling for floor applications, UL listed for both Flame (F) and Temperature (T) ratings, and designed to restrict transmission of temperature as well as passage of flame, smoke and water; Hilti FS One, Hilti CP 606, Hilti CP 601S, 3M Fire Barrier CP 25 WS+, Rectorseal Metacaulk 1000 Firestopping Sealant, or STI Spec Seal SSS100 sealant, or Tremco Tremstop IA sealant, as appropriate for designs required.
3. Firestop Device: Prefabricated device designed for use around plastic pipe penetrations of fire-rated walls and floors, made from a steel collar with intumescent material, UL listed for both Flame (F) and Temperature (T) ratings; Hilti CP 644 or CP 643 Firestop Collars, 3M Fire Barrier Plastic Pipe Device, or STI Firestop Collars, or STI SpecSeal Pillows, Rectorseal Metacaulk Firestopping Pillows or Pipe Collar, or Tremco Tremstop D collar, as appropriate for designs required.
4. Cast-in Place Firestop Devices: for use with non-combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors, the following products are acceptable; Hilti CP 680, or CP 681, or CP 682, Hilti Cast-In Firestop Devices, Tremco Firecan.
5. Intumescent Sheet/Trowelable Compound: Composite sheet of intumescent material or trowelable intumescent compound used to seal large openings and seal penetrations against flame spread, smoke and toxic fumes, UL listed for both Flame (F) and Temperature (T) ratings; Hilti FS 637 Firestop Mortar, Hilti 675T Firestop Board, 3M Fire Barrier CS 195 Composite Sheet, or Rectorseal Metacaulk Fire rated Putty, or STI SpecSeal SSM Mortar, or Tremco Tremstop M mortar, as appropriate for designs required.
6. Firestop Blocks, Foam or Pillows: Materials used for complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable; Hilti CP 657 Fire Block, Hilti CP658T Firestop Plug, Hilti CP 620 Firefoam.
7. Silicone Sealant: One part, gun-grade, ready to use, moisture curing, silicone sealant; Hilti CP 601S, 3M Fire Barrier 2000 Sealant, or STI SpecSeal Pen 300 Sealant, or Tremco Fyre-Sil gunnable or self-leveling sealant, as appropriate for designs required.
8. Elastomeric Spray: Sprayable elastomeric firestop sealant for construction joints; Hilti CP 672 Speed Spray, STI SpecSeal AS105, or 3M Fire Dam 150 Spray, or Rectorseal Metacaulk 1200 Spray Applied Mastic, or Tremco Tremstop Acrylic gunnable sealant or spray, as appropriate for designs required.
9. Damming Insulation: ASTM C 612, Class 1 and 2, spun mineral wool non-combustible felts with UL Fire Hazard Classification (ASTM E 84) of 15 Flame Spread, 0 Fuel Contributed, and 0 Smoke Developed; United States Gypsum Company "Thermafiber" Fire Safing Insulation, Hilti CP 777 Speed Plugs, Hilti CP 767 Speed Strips, or Tremco CeraBlanket mineral wool, or equivalent.

- C. Miscellaneous Materials: Provide anchoring devices, restricting collars, backup materials, clips, sleeves, supports and other miscellaneous materials used in actual fire tests, compatible with firestopping products and substrates, approved for use as indicated by firestopping products manufacturer, and which have been approved by UL or other acceptable testing and inspecting agency for use in fire-resistance rated designs indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Require installer to examine substrates to determine if they are in satisfactory condition and do not have defects that would interfere with the satisfactory installation of firestopping materials.

3.2 PREPARATION

- A. Clean surfaces and substrates of dirt, oil, loose materials, and other foreign materials that may affect proper bond or installation of firestops in accordance with manufacturer's written instructions.
 - 1. Provide proper primers as required for conditions and which comply with manufacturer's recommendations for substrates and conditions.
 - 2. Do not apply firestops to surfaces previously painted or treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required to comply with manufacturer's instructions.
 - 3. Mask to protect adjoining surfaces. Remove excess material and stains on surface of materials not indicated to receive firestopping materials.

3.3 INSTALLATION

- A. Install firestopping materials in accordance with manufacturers printed instructions to provide a Flame (F) and Temperature (T) rating of at least one hour but not less than the rating of the assembly being penetrated.
- B. Ensure that anchoring devices, backup materials, clips, sleeves, supports and other materials used in the actual fire test are installed.
- C. Install firestops with sufficient pressure to properly fill and seal openings and to ensure an effective smoke seal.
- D. Tool or trowel exposed surfaces of firestops to eliminate air pockets and to ensure contact and adhesion of firestopping material to substrates. Remove excess firestop material promptly as work progresses and upon completion.

3.4 FIELD QUALITY CONTROL

- A. Promptly notify Architect if specified firestop systems cannot comply with requirements specified.
- B. Installer shall examine firestops for proper installation and compliance with specified requirements.

- C. Maintain accessibility of each installation area until completion of applicable inspections by governing authorities.
- D. Remove and reinstall unacceptable firestops and arrange for reinspection to verify compliance with requirements.

3.5 FIRESTOPPING SYSTEM AND APPLICATION SCHEDULE

- A. Provide one of the following UL listed firestopping designs and associated materials at each of the penetration types indicated or required for the Project.

Penetration Type	3M	Hilti	Rectorseal	STI	Tremco
Metal Pipe Penetration Through Concrete or Masonry	CAJ1001, CAJ1006, CAJ1009, CAJ1014, CAJ1015, CAJ1015, CAJ1015, CAJ1017, CAJ1021, CAJ1027, CAJ1044, CAJ1058, CAJ1060, CAJ1175, CAJ1176, CAJ1091, CAJ1112	CAJ 1149, CAJ 1150, CAJ 1154, CAJ 1155, CAJ 1156, CAJ 1158, CAJ 1172, CAJ 1173, CAJ 1184, CAJ 1226, CAJ 1226, CAJ 1277, CAJ 1278, CAJ1291, FA 1016, FA 1017, FA 1028, FA 1029	CAJ1115, CAJ1186, CAJ1272, CAJ1059, CAJ1036, CAJ1035	CAJ1030, CAJ1213, CAJ1045, CAJ1214, CAJ1048, CAJ1215, CAJ1079, CAJ1217, CAJ1080, CAJ1232, CAJ1089, CAJ1198, CAJ1090, WJ1025, CAJ1142, WJ1033	CAJ1233, CAJ1064, CAJ1288, CAJ1205, CAJ1187, CAJ1145, CAJ1047, CAJ1179, CAJ1113
Metal Pipe or Conduit Through Gypsum	WL1001, WL1010, WL1002, WL1017, WL1003, WL1036, WL1009	WL 1052, WL 1054, WL 1056, WL 1058, WL 5029, WL 1085, WL 1164, WL 1165, WL 1175, WL 1205, WL 1206, WL 1243, WL 1252, WL 1289, WL 1290, WL 1297	WL 1026, WL 1034, WL 1253, WL 1140, WL 1024, WL 5056, WL 1144, WL 5063, WL 5061, WL 5057, WL 5059, WL 1025, WL 1040, WL 5068, WL 1075, WL 1102, WL 1128, WL 1099, WL 1106, WL 1118, WL 1114, WL 1132, WL 1183	WL1028, WL1079, WL1029, WL1088, WL1033, WL1090, WL1049, WL1093, WL1062, WL1101, WL1078	CAJ1233, CAJ1064, CAJ1288, CAJ1205, CAJ1187, CAJ1145, CAJ1047, CAJ1179, CAJ1113
Insulated Metal Pipe Through Concrete or Masonry	CAJ5001, CAJ5030, CAJ5002, CAJ5041, CAJ5003, CAJ5060, CAJ5005, CAJ5004, CAJ5009, CAJ5017, CAJ5024	CAJ 5044, CAJ 5045, CAJ 5046, CAJ 5048, CAJ 5090, CAJ 5091, CAJ 5184, CAJ 5185, CAJ 5198, CAJ 5061, CAJ 5069, CAJ 5096, CAJ 5098, CAJ 5230, FA 5017, FA 5018, FA 5015, FA 5016, CBJ 5006, CBJ 5007, CBJ 5013, WJ 5028, WJ 5003, WJ 5057, WJ 5058, WJ 5041, WJ 5042, WJ 5066, WJ 5067	CAJ5077, CAJ5078, CAJ5110, CAJ1247, CAJ8067, CAJ5134, CAJ5136	CAJ5010, CAJ5005, CAJ5021, CAJ5006, CAJ5029, CAJ5011, CAJ5042, CAJ5051, CAJ5058, CAJ5087	CAJ5067, CAJ5121, CAJ5081, CAJ5005
Insulated Metal Pipe Through Gypsum	WL5001, WL5032, WL5002, WL5038, WL5009, WL5039, WL5010, WL5040, WL5011, WL5023, WL5024	WL 5016, WL 5025, WL 5017, WL 5028, WL 5019, WL 5029, WL 5021, WL 5022, WL 5046, WL 5047, WL 5096, WL 5126, WL 5143, WL 5144, WL 5073, WL 5024, WL 5025, WL 5026, WL 5027	WL5077, WL5075, WL5092, WL8016	WL5014, WL5051, WL5025, WL5054, WL5026, WL5027, WL5028, WL5029, WL5033	WL5082, WL5081, WL5083

Penetration Type	3M	Hilti	Rectorseal	STI	Tremco
Plastic Pipe Through Concrete or Masonry	CAJ2001, CAJ2028, CAJ2002, CAJ2040, CAJ2003, CAJ2090, CAJ2005, FA2011, CAJ2006, FA2016, CAJ2007	CAJ 2062, CAJ 2110, CAJ 2066, CAJ 2091, CAJ 2141, CAJ 2109, CAJ 2118, CAJ 2095, FA 2092, FA 2053, FA 2093, FA 2054, FA 2094, FA 2075, FA 2089, FE 2005, WJ 2057, WJ 2071, WJ 2072, WJ 2091, WJ 2101, WJ 2108	CAJ2134, CAJ2153, FA2051, CAJ2269, CAJ2265, FA2049, CAJ2113, CAJ2119, CAJ2122, CAJ2180, CAJ2112	CAJ2038, CAJ2095, CAJ2039, CAJ2098, CAJ2045, CAJ2105, CAJ2056, CAJ2106, CAJ2063, CAJ2138, CAJ2064, CAJ2139	CAJ2229, CAJ2233, CAJ2184, CAJ2075, CAJ2074, CAJ2116, CAJ2076, CAJ2160B, CAJ2085, CAJ2069, CAJ2073, FA2042
Plastic Pipe Through Gypsum	WL2002, WL2005, WL2003, WL2033, WL2004, WL2073	WL 2051, WL 2098, WL 2052, WL 2078, WL 2053, WL 2075, WL 2217, WL 2128, WL 2235, WL 2165, WL 2236, WL 2184, WL 2244, WL 2186	WL2262, WL2104, WL2121, WL2108, WL2106, WL2014, WL8001, WL2207, WL2199, WL2134, WL2209, WL2240	WL2048, WL2076, WL2059, WL2078, WL2075, WL2093	WL2176, WL2076, WL2177, WL2078, WL2083, WL2093, WL2082, WL2169, WL2061, WL2062, WL2063, WL2125
Jacket Cable Through Concrete or Masonry	CAJ3001, CAJ3031, CAJ3005, CAJ3041, CAJ3009, CAJ3044, CAJ3010, CAJ3058, CAJ3011, CAJ3071, CAJ3014, CAJ3074, CAJ3015, CAJ3080, CAJ3021, FB3004, CAJ3029, WJ3015, CAJ3030	CAJ 3069, CAJ 3070, CAJ 3079, CAJ 2095, CAJ 3139, CAJ 3152, CAJ 3180, CAJ 3181, CAJ 3193, CAJ 3198	CAJ3086, CAJ3101, CAJ3087, CAJ3100, CAJ3086, CAJ4047, CAJ3127, CAJ3122, CAJ3027, CAJ3026, CAJ3134, WJ3058, WJ3056, CAJ8067, CAJ4040	CAJ3042, CAJ3043, CAJ3084, CAJ3095, CAJ3096	CAJ3141, CAJ3144, CAJ3068
Jacket Cable Through Gypsum	WL3001, WL3030, WL3008, WL3031, WL3009, WL3032, WL3015, WL3056, WL3022	WL 3045, WL 3046 WL 3047, WL 3048 WL 3065, WL 3161, WL 3071, WL 3079, WL 3049, WL 3112, WL 3065, WL 3111, WL 3112, WL 3185, WL 3059, WL 3139, WI 3226	WL8001, WL3014, WL3108, WL3013, WL3104, WL3150, WL3028, WL3029, WL3052, WL3055, WL4031	WL3024, WL3065, WL3025, WL3076, WL3049, WL3058, WL3059	WL3131, WL3043
Cable Tray or Electric Busway Through Concrete or Masonry	CAJ4003, CBJ4005, CAJ4006, CBJ4021, CAJ6001, CBJ4022, CAJ6002, FA6001, CBJ4001, WJ4008, CBJ4003	CAJ 4017, CAJ 4035, CAJ 4034, CAJ 4054, CBJ 4025, CBJ 4026, WJ 4016, WJ 4030, WJ 4027, WJ 4029, WJ 6003	CAJ6031, CAJ6025, CAJ4049, CAJ8043	CAJ6006, CAJ8016, CAJ8033, CAJ8035, CAJ8036	WJ4005, WJ4012
Cable Tray or Electric Busway Through Gypsum	WL4004	WL 4011, WL 4034, WL 4019, WL 4006, WL 5016, WL 4035, WL 4038, WL 6017	WL6015, WL6008, WL7012, WL0006	WL4005, WL4008	WL4012

Penetration Type	3M	Hilti	Rectorseal	STI	Tremco
Mixed or Multiple Penetrating Items Through Concrete or Masonry	CAJ1066, CBJ1020, CAJ1092, CBJ1021, CAJ1148, CBJ1031, CAJ2020, CBJ8004, CAJ2030, CBJ8005, CAJ2044, CBJ8008, CAJ3075, FA1002, CAJ8001, FA2002, CAJ8003, FB3001, CAJ8006, FA8001, CAJ8013	CAJ1140, CAJ1172, CAJ1174, CAJ5044, WJ8004, CAJ8056, CAJ8041, CAJ6006	WJ2073, WJ2025, WJ2035, CAJ2151, CAJ2112, CAJ2265, CAJ2269, CAJ2157	CAJ1208, CAJ1209, CAJ8016, CAJ8033, CAJ8035, CAJ8036, CAJ8052, CAJ5042, WJ8006	CAJ3141, CAJ3144, CAJ8034, CAJ8057
Mixed or Multiple Penetrating Items Through Gypsum	WL1016, WL2032, WL1037, WL3051, WL2031, WL3062	WL1057, WL1095, WL8013, WL8004	WL8016, WL1183, WL1122, WL2132, WL2117WL2201, WL2238, WL1074, WL1104, WL1108, WL1120, WL1116, WL1129, WL2135	WL1093, WL8003, WL8011	WL3131, WL3043
Expansion Joint, Curtain Wall, Siding, Slots,, and Construction Gaps	CAJ0004, J900B, CBJ0013, J900C, CBJ0020, U900J, WJ0003, U900L	FF-S-1008, WL1095, WWS-1011, FW-S-1002, FFS-1017		WWS0017, HWD1001, WWS1009, WWD0001, WWS1010, WWD1001, WWS0023, WWD1002, WWS0029, FWD1001	WWJ0024, WWD0009, WWJ0025, WWD0010, CAJ0011, CAJ0026
Wall/Ceiling Interface Between Top of Wall and Roof Deck	N/A	HW-D-0003, HW-D-0010, HW-D-0004, HW-D-0042, HW-D-0005, HW-D-0008	HWD0058, HWD0221, HWD0127, HWD0129, HWD0125, WWD0023, HWD0014, HWD0018, HWS0023, HWS0025, HWD0032, HWD0056, HWD0058, HWD0104, FWD1022, HWD1022, HWD0179, WWD0028, HWD0197, HWD0215, HWS0023,	WWS0017, FWD1001, WWS1009, HWD1001, WWS1010, WWD0001, WWS0023, WWD1001, WWS0029, WWD1002	HWD00016, HWD00017
Applications Not Listed					
	Contact one of the specified manufacturer's technical representatives and request an engineered drawing detail to suit field conditions. Provide manufacturer's written statement describing the basis for the untested designs and the authority of the person making them				

END OF SECTION 07 84 13