

**ADDENDUM ONE**  
**Bid Number 33-15MAY03**  
**Phase II Interior Renovations for the South Facility Maintenance Building**  
Boone County, Missouri

The attached pages reflects changes regarding this bid request and should be integrated into the bid response. Vendors shall make the following changes to the original bid specifications:

Submit the Acknowledgement of Addendum One with your response to the above referenced bid or in a separate envelope clearly marked **Bid Number – 33-15MAY03– Phase II Interior Renovations for the South Facility Maintenance Building**, if your response has already been returned. Additional copies of the bid documents may be obtained from the Purchasing Office, 601 E. Walnut, Room 209, Columbia, MO 65201, (573) 886-4392. **Bid responses must be sent to the Boone County Purchasing Department, Boone County Johnson Building, 601 E. Walnut, Room 209, Columbia, MO 65201.** Responses are due in the Purchasing Department no later than 1:25 p.m. on February 25, 2003.

By: \_\_\_\_\_  
Marlene Ridgway  
Buyer

ACKNOWLEDGEMENT ADDENDUM ONE  
Bid Number 33-15MAY03  
Phase II Interior Renovations for the South Facility Maintenance Building  
Boone County, Missouri

I acknowledge that I received Addendum One to Bid Number 33-15MAY03

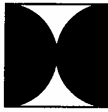
\_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name of Authorized Representative

\_\_\_\_\_  
Company Name

Submit this acknowledgment of addendum receipt with the bid reply sheet or in an envelope clearly marked with the bid number if the bid reply sheet has already been returned.



**mitzel + scroggs** ARCHITECTS INC.  
23 SOUTH 4TH STREET • COLUMBIA, MISSOURI 65201 • TEL (573) 449-0951 •

DONALD C. MITZEL A.I.A. PRES. •  
STUART S. SCROGGS A.I.A. V.P. •

May 9, 2003

**ADDENDUM NO. ONE**

Phase II Interior Renovations  
Boone County Public Works  
South Facility Maintenance Building  
5551 Highway 63 South  
Columbia, MO 65201  
Bid Number 33-15MAY03

Bidders are hereby informed of the following clarifications and/or modifications to be made in the plans and project manual for the above referenced project.

1. Project Manual, Bid Response, Section I - Unit Prices.  
Clarification: **"Outlets may be added by unit price if the new or existing circuit has additional capacity and if the outlet is approved before or during rough-in of adjacent outlets on the same circuit."**
2. Project Manual, Bid Response, Section II.  
Substitution: **"Subcontracted work will be allowed...."** instead of "No subcontracted work will be allowed...."
3. Project Manual, Section 1.02 Invitation for Bids by General Contractors.  
Clarification: The Boone County Commission will receive sealed bids for the construction of all work incidental **"for Phase II Interior Renovations. Boone County Public Works South County Facility Maintenance Building, Bid Number 33-15MAY03"** instead of "to the erection of Regrading and Paving Reality House."
4. Project Manual, Section 7.04 Firestopping.  
Add: **"Add the enclosed Firestopping Section 7.04 and U.L. assemblies catalog cuts."**
5. Project Manual, Section 10.03 Specialties and Miscellaneous Items, Item 10.03.A.4  
Clarification: **"Contractor shall furnish and install four (4) fire extinguishers as directed by Architect and Owner's Representative."**
6. Project Manual, Section 10.03 Specialties and Miscellaneous Items, Item 10.03.A.6.  
Clarification: **"Contractor shall furnish and install ten (10) 8"x6" interior signs."**
7. Drawings, Photograph Sheet P1, Photos A/P1 through I/P1..  
Clarification: **"Contractor shall remove metal wall siding panels on both sides of the existing wall to be removed and salvage wall panels in good condition to the Owner."**

8. Drawings, Main Level Plumbing Plan, Detail A/M1 and C/M1.  
Substitution: **Note: Trench drain work is included in "Alternate No. 3" instead of "in Base Bid." Section reference for trench drain work shall be "C/M1" instead of D/M1." Trench drain detail C/M1 shall say "Alternate No. 3" instead of "Base Bid."**
9. Drawings, Main Level Lighting Plan, Detail A/EZ.  
Add: **"Waste Oil Room 110 – Furnish and install one exit light type 'F' above door #11 and one emergency light type 'G' on the south wall at 8'0" A.F. Circuit both lights to circuit No. F-28. Relocate and re-install two (2) existing high-bay lights in Waste Oil Room 110."**
10. Drawings, Sheets E1 and E2, Main Level Power and Lighting Plans.  
Clarification: **"Install ¾" conduit from the ceiling mounted intercoms in Parts Room 108 and Training/Conference Room #100 to a junction splice box and 2" empty conduit home run. (Intercom system is part of the telephone system). Install a junction splice box and 2" empty conduit drop to the telephone system in Room 119."**
11. Drawings, Sheets E1 and E2, Main Level Lighting Plan.  
Clarification: **"Terminate ¾" empty conduit from the new keypad and two new motion sensors to the existing alarm panel located in the west wall of Room 124, approximately 6' north of Restroom 127."**

## **SECTION 7.04 - FIRESTOP SYSTEMS**

### **A. GENERAL**

1. The Scope of the Work includes:
  - a. Firestop systems shall be required in all the following locations:
    - 1) 3 Hour Rated Concrete Block Walls Through Wall Penetration Items:
      - (a) Conduit (metallic and non-metallic), new and existing.
      - (b) Pipes (metallic and non-metallic), new and existing.
      - (c) Exposed Cabling (including Communication/Data/Alarm), new and existing.
    - 2) Top of 3 Hour Rated Concrete Block Walls to Underside of Existing Standing Seam Metal Roof.
    - 3) Electrical junction and switch boxes in 3 Hour Rated Concrete Block Walls.
  - b. Firestop systems for all fire-resistance-rated through-wall penetrations, including both empty openings, openings containing penetrating items and electrical junction boxes:
    - 1) Listed and labeled by a nationally recognized testing laboratory.
    - 2) Fire tested according to ASTM E814 (ANSI/UL1479).
    - 3) Flame spread index of <25 and Smoke spread of < 400 according to ASTM E84.
    - 4) L-rating of <20 CFM/F<sup>2</sup> for non-egress fire construction and <5 CFM/F<sup>2</sup> for egress fire construction according to UL 1479 air leakage testing.
    - 5) Volatile Condensable (VOC) <1 according to ASTM E 595.
    - 6) Fire stop products shall not contain asbestos according to ASTM D 6620.
  - c. Firestop systems for joints/gaps occurring between the top of fire-resistance-rated concrete block walls and the underside of the existing standing seam metal roof:
    - 2) Fire tested according to ASTM E 1966 (UL 2079)
    - 3) Cycled according to ASTM E 1399
    - 4) Listed and Labeled by a nationally recognized testing laboratory.
    - 5) Flame spread index of < 25 and Smoke spread of < 400 according to ASTM E84.
    - 6) L-rating of < 20 CFM/L.F. for non-egress fire construction and < 5 CFM/L.F. for egress fire construction according to UL 2079 air leakage testing.
    - 7) Fire stop products shall have a minimum expected service life of 40 years according to ASTM E 632, D 3045, D 5510 and/or IEC 216.
    - 8) Volatile Condensable (VOC) <1 according to ASTM E 595
    - 9) Fire stop systems designed to have Sound Transmission Coefficient (STC) of 40 minimum according to ASTM E 413.
    - 10) Fire stop products shall not contain asbestos according to ASTM D 6620.
2. Related sections include the following:
  - a. Division 4 Masonry.
  - b. Division 16 Electrical.
3. References:
  - a. American Society for Testing and Materials Standards (ASTM):
    - 1) ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials.
    - 2) ASTM E814: Standard Test Methods for Fire Tests of Through-Penetration Firestops.
    - 3) ASTM E119: Standard Test Methods for Fire Tests of Building Construction Materials.
    - 4) ASTM E1399: Standard Test Methods for Cyclic Movement and Measuring of Joint Systems.
    - 5) ASTM E1725: Standard Test Methods for Fire Tests of Fire-Resistive Barrier Systems of Electrical Systems Components.
    - 6) ASTM E1966: Standard Test Methods for Fire Tests of Joints.
  - b. Underwriters Laboratories, Inc. (UL):
    - 1) UL 723 Surface Burning Characteristics of Building Materials.
    - 2) UL 1479 Fire Tests of Through-Penetration Firestops, including optional air leak test.
    - 3) UL 2079 Fire Test of Building Joint Firestop Systems.
    - 4) UL Fire Resistance Directory.
  - c. National Fire Protection Agency (NFPA)
    - 1) NFPA 80 Standard Fire Door and Window Assembly Tolerances.
    - 2) NFPA 252 Standard Fire Test for Fire Rated Doors (not specified for positive or negative furnace test pressure).
    - 3) NFPA 257 Standard Fire Test for Fire Rated Windows (not specified for positive or negative furnace test pressure).
  - e. NFPA 101 Life Safety Code.
  - f. NEC 70 National Electrical Code.
4. Definitions:
  - a. Assembly: Particular arrangement of materials specific to a given type of construction described or defined in referenced documents.
  - b. Barrier: Any bearing or non-bearing floor, wall, or ceiling assembly that has an hourly fire or smoke rating.
  - c. Construction Gap: Any joint or opening, whether static or dynamic, within or between adjacent sections of interior or exterior walls, floors, ceilings or roof decks.
  - d. Engineering Judgment: Evaluations that are developed by a manufacturer for a new firestop system that complies with similar UL approved designs or tests that are acceptable to the code enforcing authorities.

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- e. Firestopping: Methods and materials applied in penetrations and unprotected openings to limit the spread of heat, fire, gasses and smoke.
  - f. Firestop System: The use of a specific firestop material or combination of materials in conjunction with a specific wall or ceiling construction type and a specific penetrating material(s) to achieve a rated fire barrier.
  - g. Intumescent: Materials that expand with heat to seal around objects threatened by fire.
  - h. Penetration: Opening or foreign material passing through a floor, wall or ceiling barrier such that the full thickness of the rated material(s) is breached either in total or in-part.
  - i. Sleeve: Metal fabrication or pipe section that is part of a system that extends through a barrier.
5. Performance Requirements:
- a. General: Provide firestop systems that are produced and installed to resist the spread of fire according to requirements indicated, resist passage of smoke and other gasses, and maintain original fire-resistance rating of construction assembly.
  - b. F-Rated Systems: Provide firestop systems with F-ratings indicated, as determined per ASTM E814, but not less than that equaling or exceeding fire-resistance ratings of the construction assembly.
  - c. T-Rated Systems: Provide firestop systems with T-ratings indicated, as determined per ASTM E814 and ASTM E119, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas.
  - d. L-Rated Systems: Provide firestop systems with L-ratings indicated, as determined per ASTM E814, where systems maintain a barrier to cold smoke at all: penetrations, connections with other surfaces, separations required to permit building movement, sound or vibration absorption, and other construction gaps.
  - e. For 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.
  - f. For firestop systems exposed to view, provide products with flame-spread ratings of less than 25 and smoke-developed ratings of less than 450, as determined per ASTM E84.
  - g. Construction joint/gap firestop systems must be tested for cyclic movement, according to ASTM E1399 standard test methods, to meet or exceed 500 cycles at 10 cycles per minute.
6. Submittals:
- a. Product Data: Manufacturer's product literature for each type of firestop material as follows:
    - 1) Product characteristics, typical uses, installation procedures, performance and limitation criteria
  - b. Shop Drawings: For each firestop system show construction conditions, relationships to adjoining construction, dimensions, description of materials and finishes, component connections, anchorage methods, hardware and installation procedures, plus the following:
    - 1) Firestop design designation of testing and inspecting agency acceptable to authorities having jurisdiction that confirms compliance with requirements for each condition indicated.
    - 2) Documentation, including illustrations, from a qualified testing and inspection agency that is applicable to each firestop system configuration for construction and penetrating items. Factory 2nd/or manufacturer furnished installation details are not acceptable in lieu of published documents by approved testing agencies (UL, OPL, Warnock Hersey, etc).
    - 3) Where Project conditions require modification of a qualified testing and inspecting agency's illustration to suit a particular firestop condition, submit illustration, with modifications marked, approved by firestop system manufacturer's fire-protection engineer.
  - c. Qualification Data: For firms and persons specified in "Quality Assurance" Article 1.07, to demonstrate their capabilities and experience, include a list of names and addresses of completed projects, architects and owners, and other information specified.
  - d. Product Certificates: Signed by manufacturers of firestop system products certifying that products furnished, comply with requirements.
  - e. Substitutions. Firestop systems are identical to those tested per ASTM E814 or UL 1479 and comply with the following requirements:
    - a) Firestop system products bear classification marking of qualified testing and inspecting agency.
    - b) Firestop systems correspond to those indicated by reference to firestop system designations listed by the following:
      - 1) UL in "Fire Resistance Directory."
      - 2) ITS (Warnock Hersey) in "Directory of Listed Products."
      - 3) Omega Point Laboratories.
      - 4) Factory Mutual.
7. Delivery, Storage, And Handling:
- a. Deliver 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, qualified testing and inspection agency's classification marking, curing time, and mixing instructions.
  - b. Store and handle materials for firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes. Follow manufacturer's instructions.
8. Project Conditions:
- a. Existing Conditions: Verify the condition of the substrates and correct unsatisfactory conditions before installing firestop system products; follow manufacturer's instructions.

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- b. Environmental Limitations: Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestop systems.
  - c. Ventilation: Ventilate firestop systems during installation per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.
  - d. Protection: Provide masking and drop clothes to prevent contamination of surfaces by firestop system materials.
9. Coordination:
- a. Coordinate construction and sizing of sleeves, openings, core-drilled holes, cut openings and penetrating items to ensure that firestop systems are installed according to specified requirements.
  - b. Notify owner's inspecting agency in advance of firestop system installations.
  - c. Do not cover-up or conceal firestop system installations behind other construction until owner's inspecting agency and building inspector has examined each installation.

**B. MATERIALS**

1. General:
- a. Compatibility: Provide firestop systems that are compatible with one another, with the substrates forming openings, and with the items penetrating through the firestop system, under conditions of service and application, as demonstrated by the firestop system manufacturer based on testing and field experience.
  - b. Provide components for each firestop system specified by firestop systems manufacturer and approved by the qualified testing and inspecting agency for firestop systems indicated. Components include, but are not limited to, the following items:
    - 1) Permanent forming/damming/backing materials:
      - a) Slag/rock-wool-fiber insulation.
      - b) Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
      - c) Fillers for sealants.
      - d) Temporary forming materials.
      - e) Substrate primers.
      - f) Collars and steel sleeves.
2. Through-Penetration Firestop Systems For Fire-Rated Assemblies:
- a. Latex firestop sealant, non-sag, non-halogen formula, fast drying, paintable for metallic & non-metallic pipe, conduit, communication cabling, and plastic pipe penetrations:
    - 1) Specified Technologies, Inc. (STI) SpecSeal Series SSS Intumescent sealant.
    - 2) 3M Fire Barrier CP25WB+ caulking.
    - 3) W.R. Grace & Co. FlameSafe FS 1900 sealant.
    - 4) Nelson LBS sealant.
    - 5) Or approved equal.
  - b. Factory-assembled, one-piece steel collars lined with intumescent material, with locking latch and bendable tabs, for Plastic Pipe:
    - 1) Specified Technologies, Inc. (STI) SpecSeal Series SSC Firestop Collars.
    - 2) 3M Ultra PPD Plastic Pipe Device.
    - 3) W.R. Grace & Co. FlameSafe Intumescent Sleeve (FSIS).
    - 4) Nelson PCS Collar.
    - 5) Or approved equal.
3. Construction Joint/Gap Firestop Systems at top of Fire Rated Wall Assemblies/Underside of Roof:
- a. Packing Material, min. 4 pcf mineral wool batt insulation.
    - 1) Owens Corning Paroc Safing Insulation.
    - 2) Fibrex Insulations Inc. FBX safing insulation.
    - 3) Roxul Inc. Safe.
    - 4) Thermafiber L.L.C. SAF.
    - 5) Or approved equal.
  - b. Water based, capable of drying to tough, elastomeric coating:
    - 1) Specified Technologies, Inc. (STI) SpecSeal Series AS200 Elastomeric Spray.
    - 2) 3M FireDam Spray 100.
    - 3) W.R. Grace & Co. FlameSafe FS 3000.
    - 4) Nelson FSC3.
    - 5) Or approved equal.
4. Intumescent, non-hardening putty pads to be installed on all metallic and nonmetallic electrical switch and receptacle junction boxes in Fire Rated Wall Assemblies:
- 1) Specified Technologies, Inc. (STI) SpecSeal Series SSP Firestop Putty Pads or approved equal.
  - 2) 3M Fire Barrier Moldable Putty+.
  - 3) W.R. Grace & Co. FlameSafe FSP1077 Putty Pads.
  - 4) Nelson FSP.
  - 5) Or approved equal.

SECTION 07841 - FIRESTOP SYSTEMS

C. EXECUTION

1. Examination:
  - a. Examine substrates to determine they are satisfactory to receive firestop system materials.
    - 1) Verify that firestop systems substrates are free of oil, grease, rolling compounds, incompatible primers, loose mill scale, dirt or other foreign substances capable of impairing bond of fire-resistant materials as per manufacturer's written recommendations.
    - 2) Verify objects penetrating firestop materials, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
    - 3) Coordinate with other trades that substrates are not obstructed by ducts, piping, equipment, and other suspended construction, which would interfere with applying fire-resistant materials.
  - c. Verify that environmental conditions are safe and suitable for installation of firestop materials.
  - d. Do not proceed with installation of firestop system until unsatisfactory conditions have been corrected by the contractor in a manner acceptable to the Owner's Representative.
2. Preparation:
  - a. Clean and repair substrates that could impair the adhesion or proper fitting of firestop materials, including oil, grease, rolling compounds, incompatible primers, and loose mill scale.
  - b. Secure all pipe, conduit, cable and other items which penetrate firestop materials.
  - c. Provide masking and temporary covering, as required, to prevent contamination of adjacent surfaces by firestop materials.
3. Installation – General:
  - a. Installation of firestop systems shall be performed in strict accordance with manufacturer's detailed installation instructions, procedures and U.L. system test.
  - b. Extend firestop material in full thickness over entire area of each substrate or opening to be protected.
  - c. Protect firestop material from damage on surfaces subject to traffic.
  - d. Install fill materials for firestop systems by proven techniques to produce the following results:
    - 1) Fill voids and cavities formed by openings, forming materials, accessories and penetrating items as required to achieve fire-resistance ratings indicated.
    - 2) Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
    - 3) For fill materials that will remain exposed after completing work, finish to produce smooth, uniform surfaces that are flush with adjoining surfaces.
  - e. Install forming/damming/backing materials and other accessories of types required to support fill material during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
    - 1) After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop system.
  - e. Proceed with enclosing through-penetration firestop systems with other construction only after inspection and approval by code authorities.
4. Installation Of Firestop Systems:
  - a. Through-Penetration Firestop Systems for conduits, metallic & non-metallic pipes, communication cabling, etc.:
    - 1) Install in accordance with U.L. System No. W-J-1070 or W-J-1072 depending on conduit or pipe size.
    - 2) Firmly pack mineral wool batt insulation into the opening.
    - 3) Install a continuous bead of latex firestop sealant to a minimum 1" depth of the opening on both sides of the wall.
  - b. Through-Penetration Firestop Systems for plastic pipe:
    - 1) Install in accordance with U.L. System No. W-J-2061.
    - 2) Firmly pack mineral wool batt insulation into the opening.
    - 3) Install a continuous bead of latex firestop sealant to a minimum 1" depth on both sides of the wall.
    - 4) Install firestop collar around pipe.
    - 5) Flex intumescent insert, followed by outer steel shell around pipe.
    - 6) Close steel shell around insert and fasten by crimping tab closure or by bolting by using supplied fasteners.
    - 7) Slide collar to wall, mark mounting holes, drill holes and install fasteners.
    - 8) Place fender washers over fastener at collar mounting tabs and tighten anchors fully.
  - d. Firestop Systems at top of Fire Rated Wall Assemblies to Underside of Roof:
    - 1) Install in accordance with U.L. System No. HW-D-0086.
    - 2) Cut existing pre-faced roof insulation, protect and fold out of way on both sides of wall.
    - 3) Firmly pack mineral wool batt insulation cut to the width of the wall into the opening and valleys of the existing standing seam metal roofing.
    - 4) Install additional mineral wool batt insulation cut to the shape of the metal roofing, stacked to a thickness approx. 1" greater than the overall thickness of the wall and installed in the flutes above the wall. Compress mineral wool in flutes such that it is flush with each surface of the wall.
    - 5) Install a minimum 1/8" spray coating of elastomeric coating applied to each side of the wall in the flutes of the existing standing seam metal roofing and overlap minimum 1/2" on the top of wall.

SECTION 07841 - FIRESTOP SYSTEMS

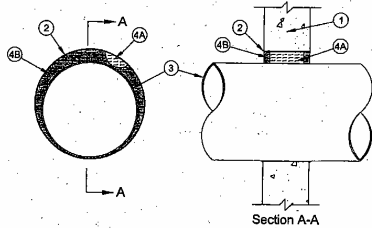
- 6) Spray a second coating of elastomeric coating applied to each side of the wall in the flutes of the existing standing seam metal roofing and overlap minimum ½" on the top of wall.
- 7) Install a 3"x3" light gauge angle over pre-faced roof insulation on both sides of wall, compress into place and fasten angles to the concrete block wall.
- e. Electrical junction and switch boxes in 3 Hour Fire Rated Wall Assemblies:
  - 1) Remove poly liner from one side of Putty Pad.
  - 2) Align Putty Pad and adhere to top, bottom and sides of box.
  - 3) Overlap Putty Pads along any joints for continuity.
  - 4) Cut slits in Putty Pads to fit around conduits.
  - 5) Repeat the above and install a SECOND layer of Putty Pads.
5. Field Quality Control
  - a. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.
6. Cleaning And Protection
  - a. Clean off excess fill materials adjacent to openings as work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop systems manufacturer and that do not damage materials in which openings occur.
  - b. Provide final protection and maintain conditions during and after installation that ensure through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce through-penetration firestop systems complying with specified requirements.



THROUGH-PENETRATION FIRESTOP SYSTEMS (XHEZ)

**System No. W-J-1070**

F Rating — 4 Hr  
 T Rating — 0 Hr  
 L Rating At Ambient — Less than 1 CFM/sq ft  
 L Rating At 400 F — Less than 1 CFM/sq ft



1. **Wall Assembly** — Min 7-5/8 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks\*. Max diam of opening is 26 in.  
 See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Steel Sleeve** — Cylindrical sleeve fabricated from min 0.031 in. thick (No. 22 MSG) galv sheet steel and having a min 2 in. lap along the longitudinal seam. The ends of the steel sleeve shall be installed flush with each face of the wall or extend a max 1/4 in. beyond each surface of the wall.

3. **Through Penetrants** — One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe, conduit or tubing and the periphery of the opening shall be min 0 in. (point contact) to max 2 in. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:

- ✓ A. **Steel Pipe** — Nom 24 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
- ✓ B. **Iron Pipe** — Nom 24 in. diam (or smaller) cast or ductile iron pipe.
- ✓ C. **Conduit** — Nom 6 in. diam (or smaller) rigid steel conduit, nom 4 in. diam (or smaller) electrical metallic tubing or nom 1 in. diam (or smaller) flexible steel conduit.
- ✓ D. **Copper Tubing** — Nom 6 in. diam (or smaller) Type M (or heavier) copper tubing.
- ✓ E. **Copper Pipe** — Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe.

4. **Firestop System** — The firestop system shall consist of the following:

A. **Packing Material** — Min 5-5/8 in. thickness of 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from each edge of sleeve to accommodate the required thickness of fill material.

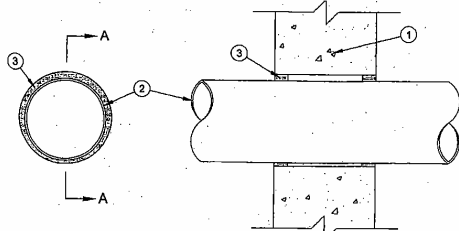
B. **Fill, Void or Cavity Material\*** — **Caulk** — Min 1 in. thickness of fill material applied within the annulus, flush with both ends of steel sleeve. A min 1/4 in. thick bead of fill material shall be applied at the point contact location on both surfaces of wall. When sleeve projects beyond surface of wall, a min 1/4 in. thick bead of caulk shall be applied to outer perimeter of sleeve at interface with wall surfaces.

SPECIFIED TECHNOLOGIES INC — SpecSeal 100, 101, 102, 129, 105 Sealant

\*Bearing the UL Classification Mark

**System No. W-J-1071**

F Rating — 4 Hr  
 T Rating — 0 Hr  
 L Rating At Ambient — Less than 1 CFM/sq ft  
 L Rating At 400 F — Less than 1 CFM/sq ft



1. **Wall Assembly** — Min 7-5/8 in. thick reinforced lightweight or normal

THROUGH-PENETRATION FIRESTOP SYSTEMS (XHEZ) 2261

weight (100-150 pcf) concrete wall assembly. Wall may also be constructed of any UL Classified Concrete Blocks\*. Max diam of opening is 13-1/2 in.

See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Through Penetrants** — One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe, conduit or tubing and the periphery of the opening shall be min 1/4 in. to max 1/2 in. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:

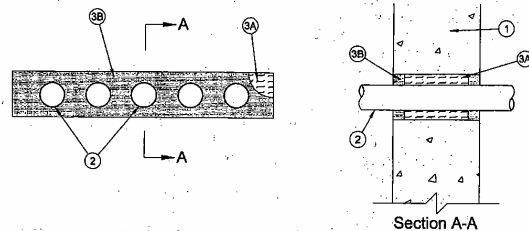
- A. **Steel Pipe** — Nom 12 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
- B. **Iron Pipe** — Nom 12 in. diam (or smaller) cast or ductile iron pipe.
- C. **Conduit** — Nom 6 in. diam (or smaller) rigid steel conduit, nom 4 in. diam (or smaller) electrical metallic tubing or nom 1 in. diam (or smaller) flexible steel conduit.
- D. **Copper Tubing** — Nom 6 in. diam (or smaller) Type M (or heavier) copper tubing.
- E. **Copper Pipe** — Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe.

3. **Fill, Void or Cavity Material\*** — **Sealant** — Min 1 in. thickness of fill material applied within the annulus, flush with both surfaces of wall.  
 SPECIFIED TECHNOLOGIES INC — SpecSeal 100, 101, 102, 129, 105 Sealant

\*Bearing the UL Classification Mark

**System No. W-J-1072**

F Rating — 4 Hr  
 T Rating — 1 Hr  
 L Rating At Ambient — Less Than 1 CFM/sq ft  
 L Rating At 400 F — Less Than 1 CFM/sq ft



1. **Wall Assembly** — Min 7-5/8 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete wall assembly. Wall may also be constructed of any UL Classified Concrete Blocks\*. Max diam of opening is 24 in.

See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Through Penetrants** — One or more pipes, conduits or tubing to be installed within the opening. The space between the pipes, conduits or tubing shall be min 1/2 in. The annular space between the pipes, conduits or tubing and the edges of the opening shall be min 1/4 in. to max 1-3/8 in. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of pipes, conduits or tubing may be used:

- ✓ A. **Steel Pipe** — Nom 2 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
- ✓ B. **Iron Pipe** — Nom 2 in. diam (or smaller) cast or ductile iron pipe.
- ✓ C. **Conduit** — Nom 2 in. diam (or smaller) galv steel conduit or electrical metallic tubing (EMT) or nom 1 in. diam (or smaller) flexible steel conduit.

3. **Firestop System** — The firestop system shall consist of the following:

A. **Packing Material** — Min 5-5/8 in. thickness of min 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from both surfaces of wall as required to accommodate the required thickness of fill material.

B. **Fill Void or Cavity Materials\*** — **Sealant** — Min 1/1 in. thickness of fill material applied within the annulus, flush with both surfaces of wall.

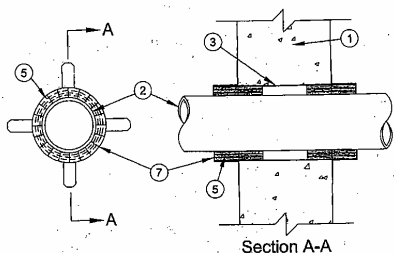
SPECIFIED TECHNOLOGIES INC — SpecSeal 100, 101, 102, 129, 105 Sealant

\*Bearing the UL Classification Mark

LOOK FOR THE UL MARK ON PRODUCT

2294 THROUGH-PENETRATION FIRESTOP SYSTEMS (XHEZ)

System No. **W-J-2061**  
 F Rating — 4 Hr  
 T Rating — 4 Hr



1. Wall Assembly — Min 7-5/8 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete wall assembly. Wall may also be constructed of any UL Classified Concrete Blocks\*. Max diam of opening is 6-1/8 in.

See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Through Penetrant — One nonmetallic pipe or conduit to be centered within the firestop system. A nom annular space of 13/16 in. is required within the firestop system. Pipe or conduit to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipe or conduit may be used:

- ✓ A. Polyvinyl Chloride (PVC) Pipe — Nom 4 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
- ✓ B. Rigid Nonmetallic Conduit — Nom 4 in. (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NEPA No. 70).
- C. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 4 in. diam (or smaller) SDR17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
- D. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 4 in. diam (or smaller) Schedule 40 solid or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
- E. Fire Retardant Polypropylene (FRPP) Pipe — Nom 4 in. (or smaller) Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

3. Metallic Sleeve — Cylindrical sleeve fabricated from 0.031 in. thick (No. 22 MSG) galv sheet steel and having a 2 in. lap along the longitudinal seam. Length of steel sleeve to be 3-1/2 in. to 4 in. greater than the thickness of the wall. Sleeve installed by coiling the sheet steel to a diam smaller than the through opening, inserting the coil through the openings and releasing the coil to let it uncoil against through opening. The ends of the sleeve shall extend 1-3/4 in. to 3 in. beyond each surface of the wall.

4. Aluminum Foil Tape — (Not Shown) Nom 3 mil thick pressure sensitive aluminum foil tape wrapped around the circumference of the pipe with a min 1 in. wide overlap along its perimeter joint. Foil tape shall begin at edge of wall and extend 3 in. beyond surface of the wall on both sides of the wall.

5. Fill, Void or Cavity Materials\* - Wrap Strip — Nom 3/16 in. thick intumescent material faced on both sides with plastic film, supplied in 2 in. wide strips. Two stacks of wrap strips individually wrapped around the through penetrants with ends butted and held in place with tape. Wrap strip stacks slid along through penetrant until edges of second stack are flush with edge of sleeve. The wrap strip stacks are installed on each side of the wall. The number of layers of wrap strips per stack is dependent upon the diam of the through-penetrant as tabulated below:

Diam of Through Penetrant, In.	Layers of Wrap Strip Per Stack
4	3
3	2
2	1

SPECIFIED TECHNOLOGIES INC — SpecSeal BLU Wrap Strip

6. Fill, Void or Cavity Materials\* — Sealant — (Not Shown) Min 1/4 in. diam bead of fill material applied around circumference of steel sleeve at its egress from each side of the wall.

SPECIFIED TECHNOLOGIES INC — SpecSeal 100, 101, 102, 129 or 105 Sealant

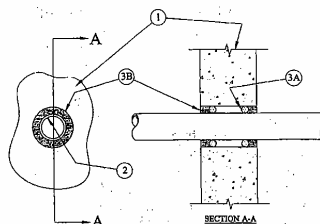
7. Steel Collar — Collar fabricated from coils of precut 0.029 in. thick (No. 22 MSG) galv sheet steel available from wrap strip manufacturer.

THROUGH-PENETRATION FIRESTOP SYSTEMS (XHEZ)

Collar shall be nom 2 in. deep with a min of four 1 in. wide by 2 in. long mounting tabs. Retainer tabs, 3/4 in. wide tapering down to 3/8 in. wide and located opposite the anchor tabs, are bent inward 90 deg to retain the wrap strips. Mounting tabs of steel collar bent outward 90 deg and pressed against wall surface without attachment. Steel collar wrapped around wrap strips and steel sleeve on each side of the wall with a min 1 in. overlap along its perimeter joint. Steel collar tightened around and secures to steel sleeve with four symmetrically located No. 8 sheet metal screws. The length of the steel screws is dependent upon the number of layers of wrap strip used within the steel sleeve and collar. For steel collars incorporating a single layer of wrap strip, the steel screws shall be 1/4 in. long. For steel collars incorporating two or more layers of wrap strip, the steel screws shall be 3/8 in. long.

\*Bearing the UL Classification Mark

System No. **W-J-2062**  
 F Rating — 2 Hr  
 T Rating — 1-1/2 Hr



1. Wall Assembly — Min 5 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks\*. Max diam of opening is 3-5/8 in. See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Through Penetrant — One nonmetallic pipe or tube to be centered within the firestop system with a nom 5/8 in. annular space. Pipe or tube to be rigidly supported on both sides of wall assembly. The following types and sizes of pipes may be used:

- A. Polyvinyl Chloride (PVC) Pipe — Nom 2 in. diam (or smaller) Schedule 40 PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
- B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 2 in. diam (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) piping systems.
- C. Crosslinked Polyethylene (PEX) Tubing — Nom 1 in. diam (or smaller) SDR 9 PEX tube for use in closed (process or supply) piping systems.

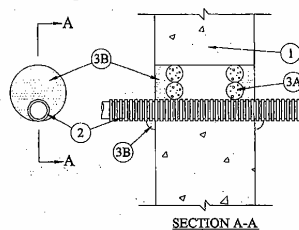
3. Firestop System — The firestop system shall consist of the following:

- A. Packing Material — Foam backer rod firmly packed into opening as a permanent form. Packing material to be recessed from both surfaces of wall as required to accommodate the required thickness of fill material.
- B. Fill, Void or Cavity Material\* — Caulk — Min 3/4 in. thickness of fill material applied within the annulus, flush with both surfaces of wall.

NELSON FIRESTOP PRODUCTS — LBS + Sealant

\*Bearing the UL Classification Mark

System No. **W-J-2063**  
 F Rating — 2 Hr  
 T Ratings — 1-3/4 and 2 Hr (See Item 2)



1. Wall Assembly — Min 6 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks\*. Max diam of opening is 4 in. The T Rating of the firestop system is 1-3/4 hr when the diam of the opening is greater than 2-1/16 in. larger than the outside diam of the penetrant and 2 hr when the diam of the opening is less than or equal to 2-1/16

LOOK FOR THE UL MARK ON PRODUCT