
SECTION 078100

APPLIED FIREPROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Patching and replacement of existing fireproofing materials that are disturbed, remove or damaged during construction activities.
 2. Preparation of substrates.
 3. Wet-mix sprayed fireproofing (FP).
 4. Patching and repairs.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Framing plans or schedules, or both, indicating the following:
1. Extent of fireproofing for each construction and fire-resistance rating.
 2. Applicable fire-resistance design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
 3. Minimum fireproofing thicknesses needed to achieve required fire-resistance rating of each structural component and assembly.
 4. Treatment of fireproofing after application.
- C. Samples: For each exposed product and for each color and texture specified, **4 inches** square in size.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and testing agency.
- B. Product Certificates: For each type of fireproofing.
- C. Evaluation Reports: For fireproofing, from ICC-ES.
- D. Preconstruction Test Reports: For fireproofing.
- E. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by fireproofing manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.
- B. Mockups: Build mockups [to verify selections made under Sample submittals and to demonstrate aesthetic effects] [to set quality standards for materials and execution] [and] [for preconstruction testing].

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1. Build mockup of [each type of fireproofing and different substrate] [and] [each required finish] as shown on Drawings.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test for compliance with requirements for specified performance and test methods.
1. Bond Strength: Test for cohesive and adhesive strength according to ASTM E 736. Provide bond strength indicated in referenced fire-resistance design, but not less than minimum specified in Part 2.
 2. Density: Test for density according to ASTM E 605. Provide density indicated in referenced fire-resistance design, but not less than minimum specified in Part 2.
 3. Verify that manufacturer, through its own laboratory testing or field experience, attests that primers or coatings are compatible with fireproofing.
 4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 5. For materials failing tests, obtain applied-fireproofing manufacturer's written instructions for corrective measures including the use of specially formulated bonding agents or primers.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply fireproofing when ambient or substrate temperature is **44 deg F** or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.
- B. Ventilation: Ventilate building spaces during and after application of fireproofing, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fireproofing dries thoroughly.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.
- B. Source Limitations: Obtain fireproofing for each fire-resistance design from single source.
- C. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E 119 or UL 263 testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Steel members are to be considered unrestrained unless specifically noted otherwise.
- D. Asbestos: Provide products containing no detectable asbestos.

2.2 SPRAY-APPLIED FIRE-RESISTIVE MATERIALS

- A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.

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- B. Sprayed-on Fire-resistant Coating: Cementitious fireproofing, Wet-mix setting based type as defined by Underwriters Laboratories and free from asbestos, actinolite, amosite, anthophyllite, chrysotile and tremolite. No mineral fiber fireproofing allowed.
1. Cementitious Wet Mix Admixtures: Materials (with and without aggregate) which, when mixed in accordance with accompanying instructions forms a slurry or mortar providing properties necessary for conveyance and application to building structures.
 2. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E 119 or UL 263 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Steel members are to be considered unrestrained unless specifically noted otherwise.
 - b. UL design listings must state that the loading was determined by Allowable Stress Design Method or Load and Resistance Factor Design Method. UL design listings requiring a load restriction factor are not allowed.
 3. VOC Content: Products shall comply with VOC
- C. (FP-1) Standard Density: Meeting or exceeding 15 pounds per cubic foot per ASTM E605, no fungal growth per ASTM G21. For concealed locations and in plenum ceilings and above suspended ceilings.
1. Products and Manufacturers:
 - a. Monokote MK-6 by Grace Construction Products.
 - b. Pyrolite 15 by Carbolite Fireproof Products Division.
 - c. Cafco-300 by Isolotek.
 - d. Southwest Fireproofing Type 5GP by AD Fire Protection Systems.
- D. (FP-2): Provide medium density material meeting or exceeding 22 pounds per cubic foot per ASTM E605, no fungal growth per ASTM G21 and also containing 50 percent cement content by weight minimum. For exterior concealed areas, exposed locations on columns, beams, and roof deck in mechanical and electrical rooms, penthouses, data rooms, elevator rooms and shafts, non-ducted air shafts, equipment rooms, and other service type rooms and where indicated.
1. Grace Construction Products, Monokote Z-106.
 2. Pyrolite 22 by Carbolite Co., Fireproofing Products Division.
 3. Carbolite Co., Fireproofing Products Div.; Pyrocrete 239.
 4. Isolatek International Corp.; Cafco 400.
 5. Pyrok-MD by Pyrok, Inc.
 6. Southwest Fireproofing Type 5MD by AD Fire Protection Systems.
- E. (FP-3): Provide high density material meeting or exceeding 40 pounds per cubic foot per ASTM E605, no fungal growth per ASTM G21 and also containing 50 percent cement content by weight minimum. For exterior locations, new and existing canopy structure, including columns, high impact resistance locations, high humidity areas, including swimming pool areas, and where indicated.
1. Grace Construction Products, Monokote Z-146.
 2. Fendolite M-II by Isolotek.
 3. Pyrocrete 40 by Carbolite Co., Fireproofing Products Division.
 4. Pyrok, Inc.; Pyrok-HD.
 5. Southwest Fireproofing Type 1XR by AD Fire Protection Systems.
- F. Mixing: Perform mixing and preparation of materials at project using mechanical equipment, in accordance with manufacturer's printed directions to achieve performance criteria specified herein.

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2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- B. Substrate Primers: Primers approved by fireproofing manufacturer and complying with one or both of the following requirements:
 - 1. Primer and substrate are identical to those tested in required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Primer's bond strength in required fire-resistance design complies with specified bond strength for fireproofing and with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction, based on a series of bond tests according to ASTM E 736.
- C. Bonding Agent: Product approved by fireproofing manufacturer and complying with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction.
- D. Metal Lath: Expanded metal lath fabricated from material of weight, configuration, and finish required, according to fire-resistance designs indicated and fireproofing manufacturer's written instructions. Include clips, lathing accessories, corner beads, and other anchorage devices required to attach lath to substrates and to receive fireproofing.
- E. Reinforcing Fabric: Glass- or carbon-fiber fabric of type, weight, and form required to comply with fire-resistance designs indicated; approved and provided by fireproofing manufacturer.
- F. Reinforcing Mesh: Metallic mesh reinforcement of type, weight, and form required to comply with fire-resistance design indicated; approved and provided by fireproofing manufacturer. Include pins and attachment.
- G. Sealer: Transparent-drying, water-dispersible, tinted protective coating recommended in writing by fireproofing manufacturer for each fire-resistance design.
- H. Topcoat: Suitable for application over applied fireproofing; of type recommended in writing by fireproofing manufacturer for each fire-resistance design.
 - 1. Cement-Based Topcoat: Factory-mixed, cementitious hard-coat formulation for trowel or spray application over SFRM.
 - 2. Water-Based Permeable Topcoat: Factory-mixed formulation for brush, roller, or spray application over applied SFRM. Provide application at a rate of 60 sq. ft./gal. .
- I. Water: Potable, fresh and free from organic and mineral impurities which would affect set of sprayed fireproofing materials.
- J. (FP-___) Thermal Barrier: Portland cement-based dry-mix material for installation over spray polyurethane foam insulation, engineered to provide 15-minute thermal barrier per ASTM E119 - Unexposed Surface Test.
 - 1. Product and Manufacturer: CAFCO Blaze-Shield II by Isolotek.
 - 2. Minimum Applied Thickness: 1-inch.
- K. Adhesive for Bonding Fireproofing: Type recommended by manufacturer of sprayed-on fireproofing manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to which this work is to be attached or applied and notify Architect if conditions exist which are detrimental to proper and expeditious installation of work. Starting of work shall imply acceptance of substrate for adhesion and performance of work as specified. Substrate is in satisfactory condition if it complies with following :
 - 1. Substrate complies with requirements of section in which substrate and related work is specified and is free of oil, grease, rolling compounds, incomplete primers, loose mill scale, dirt or other foreign substances capable of impairing bond of fireproofing with substrate under conditions of normal use or fire exposure.
 - 2. Objects which will penetrate fireproofing, including clips, hangers, support sleeves and similar items have been securely attached to substrates.
 - 3. Substrates are not obstructed by ducts, piping, equipment and other suspended construction that could interfere with application of fireproofing and until it has dried.
- B. Cooperate with coordination and scheduling of work of this section with work of other sections so not to delay job progress.
- C. Clips, hangers, supports, sleeves and other attachments to fireproofing bases, as covered under other sections of specifications, are to be placed by other trades prior to application of fireproofing material, where these materials can be anticipated in advance.
- D. Ducts, piping or conduit or other suspended equipment that could interfere with uniform application of fireproofing material are to be positioned after application of sprayed fireproofing, unless fireproofing applicator agrees to their installation prior to fireproofing.
- E. Prior to application of fireproofing material, ascertain that steel is acceptable to receive fireproofing. Steel shall be free of oil, grease, loose mill scale, or other substance that may impair proper adhesion.

3.2 SURFACE PREPARATION

- A. Clean surface to receive sprayed fireproofing to remove mill scale, dirt, grime, oil, grease, dust, loose rust, rolling compounds, incompatible primers and other foreign material which will impair satisfactory bonding of fireproofing to substrate.
- B. Cover other work which might be damaged by fallout or overspray of fireproofing materials during application. Provide temporary enclosure as may be required to confine operations, protect environment, and to ensure adequate ambient conditions for temperature and ventilation.
- C. Notify Contractor of surface condition which cannot be corrected by normal cleaning methods and requires correction of conditions prior to application of sprayed fireproofing.
- D. Prime substrates where included in fire-resistance design and where recommended in writing by fireproofing manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fireproofing.
- E. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fireproofing. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

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3.3 APPLICATION

- A. Commencement of application of fireproofing shall be deemed as acceptance by applicator of suitability of surface to receive work and acceptance of responsibility for failure of bond between fireproofing and substrate.
- B. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fireproofing work.
- C. Apply spray fireproofing using manufacturer's authorized installer in accordance with manufacturer's directions and instructions and in conformance with city and state codes, regulations and requirements having jurisdiction. Qualified manufacturer's representative shall be present for initial application to guide and assist applicator's personnel.
- D. Sprayed Fireproofing: Apply to areas and surfaces which are scheduled to be fireproofed and to proper thicknesses to achieve fireproofing hours.
 - 1. Control thickness of fireproofing by utilizing workable depth gauge to assure that minimum thickness has been applied.
- E. Ventilation: Make provisions to properly dry fireproofing after application. In enclosed areas lacking natural ventilation, provide mechanical air circulation and ventilation.
- F. Equipment, Mixing and Application: In accordance with manufacturer's written specification and application instructions. Mechanically control material and water ratio on project site.
- G. Qualified Personnel: Provide to supervise application.
- H. Bonding Adhesive: Apply to underside of steel roof deck units which do not have concrete topping and where required by appropriate UL Design. Bonding adhesive is optional in other conditions unless recommended by manufacturer of sprayed fire protection material (SFRM). Apply bonding adhesives in accordance with manufacturer's written application instructions.
- I. Do not install fireproofing prior to completion of concrete work on steel pan stairs. Apply to underside of roof deck assemblies only after roofing system is complete and roof traffic has ceased.
- J. Cracking: No cracking of fireproofing material allowed per UL requirements. Repair cracks at no additional cost to Owner by removing existing fireproofing and reapplying

3.4 PATCHING, REPAIRING, CLEANING AND PROTECTION

- A. Perform patching and repairing of sprayed fireproofing, due to cutting by other trades, by fireproofing applicator. Work shall be paid for by trades that performed cutting, as directed and at no additional cost.
 - 1. Coordinate installation of fireproofing with other work in order to minimize need for other trades to cut or remove fireproofing. As other trades successively complete installations of their work, maintain protection of structure's fireproofing by patching areas which have been removed or damaged prior to concealment of fireproofing by other work.
- B. After completion of fireproofing work, remove equipment and clean walls, floors, equipment, pipes and conduit of over sprayed fireproofing materials.

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- C. Cleaning: Immediately upon completion of sprayed operations in each containable area, remove over-spray and fall-out materials from surfaces of other work and clean exposed surfaces to remove evidence of soiling.
- D. Cure exposed wet-mix fireproofing materials in compliance with fireproofing manufacturer's recommendations to prevent premature drying.
- E. Protect fireproofing according to advice of fireproofing manufacturer and installer from damage resulting from construction operations or other causes so that fireproofing will be without damage or deterioration at time of Substantial Completion.

3.5 FIELD QUALITY CONTROL

- A. At Owner's option Architect may select, and Owner will pay, independent testing laboratory to sample and verify thickness and density of fireproofing in accordance with provisions of ASTM E605, and cohesion/adhesion as per ASTM E736.
 - 1. Minimum testing as follows:
 - a. Randomly Selected Bay: Test each fireproofed element for thickness and density as per ASTM E605 and displacement method per AWCI Tech Manual 12-A, 5.4.5.
 - b. Randomly Selected Typical Structural Elements: Test for cohesion/adhesion as per E736.
 - c. Perform minimum of 5 tests of each kind.
- B. Contractor and sub-contractor for this Section shall cooperate with testing agency in furnishing samples for testing, and other testing agency procedures.
 - 1. Should tested fireproofing fail to meet performance criteria, remove fireproofing, reinstall and retest at no additional cost to Owner.
 - 2. Correct unacceptable work and pay for further testing required to prove acceptability of installation.
 - 3. Patch test areas as required to re-establish fireproofing integrity.

3.6 INSTALLED WORK

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.
- B. Protect fireproofing, according to advice of manufacturer and Installer, from damage resulting from construction operations or other causes, so fireproofing is without damage or deterioration at time of Substantial Completion.
- C. As installation of other construction proceeds, inspect fireproofing and repair damaged areas and fireproofing removed due to work of other trades.
- D. Repair fireproofing damaged by other work before concealing it with other construction.
- E. Repair fireproofing by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION