SECTION  – applied fireproofing

1. General
   1. summary
      1. Section includes cementitious sprayed fire-resistive materials, having a fire resistance rating of 2 hours applied to underside of steel decking, and supporting structural steel framing and joists.
      2. Work of this Section includes, but is not limited to work required to patch, repair, and make good after installation of adjacent materials that may cause damage to completed work of this Section.
      3. Work includes, but is not limited to:

Spec Note: Edit the following paragraphs below to reflect what is required on the Project. Retain the first paragraph for use on all projects.

* + - 1. Application of applied fireproofing to prepared acceptable substrate.

Spec Note: Edit the following paragraphs to reflect Project requirements.

* + - 1. Application of sealer to applied fireproofing.
      2. Application of spray foam insulation to sealed fireproofing.
      3. Application of thermal barrier to spray foam insulation.
      4. Application of coloured surface coating to sealed fireproofing.
    1. Structural steel elements that are protected by masonry, concrete, or a rated gypsum board assembly do not require protection using materials specified in this Section provided that protection provided meets required fire resistance as determined from the Building Code.
    2. Related Requirements:
       1. Section 07 81 23 – Intumescent Fireproofing.
       2. Section 07 84 13 – Penetration Firestopping.
       3. Section 07 84 43 – Joint Firestopping.
  1. reference standards
     1. American Society for Testing of Materials (ASTM):
        1. ASTM E 119 12, Standard Method of Fire Tests of Building Construction and Materials.
        2. ASTM E 605 93 (2011), Tests for Thickness and Density of Sprayed Fire Resistive Material Applied to Structural Members.
        3. ASTM E 736-00 (2011), Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.
        4. ASTM E 759-92 (2011), Standard Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members.
        5. ASTM E 761-92 (2011), Standard Test Method for Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members.
        6. ASTM E 859-93 (2011), Standard Test Method for Air Erosion of Sprayed Fire-Resistive Materials (SFRMs) Applied to Structural Members.
     2. Underwriters Laboratories of Canada (ULC):
        1. CAN/ULC S101 14, Standard Methods of Fire Endurance Tests of Build Construction and Materials.
        2. CAN/ULC S102 10 Surface Burning Characteristics of Building Materials and Assemblies.
        3. ULC List of Equipment and Materials.
  2. definitions
     1. Sprayed fire-resistive material is applied to surfaces that are concealed from view behind other construction when the Work is completed or that are exposed to view in locations where they will not be physically abused meaning that the materials are not in contact with end user or end user's equipment causing dislocation or reduction in required thickness of material.
  3. PRICE AND PAYMENT PROCEDURES
     1. Allowances: Inspection and testing of fire-resistant material will be performed by an independent testing agency administered by a cash allowance as specified in Section 01 21 00 – Allowances.
  4. COORDINATION
     1. Sequence and coordinate application of sprayed fire-resistive materials with other related work specified in other Sections to comply with the following requirements:
        1. Provide temporary enclosures for interior applications to prevent deterioration of fire-resistive material due to exposure to unfavorable environmental conditions.
        2. Avoid unnecessary exposure of fire-resistive material to abrasion and other damage likely to occur during construction operations subsequent to its application.
        3. Do not apply fire-resistive material to metal roof deck substrates until concrete fill, if any, and roofing has been completed; prohibit roof traffic during application and drying of fire-resistive material.
        4. Do not apply fire-resistive material to metal floor deck substrates until concrete fill has been completed.
        5. Do not begin applying fire-resistive material until clips, hangers, supports, sleeves, and other items penetrating fire protection are in place.
        6. Defer installing ducts, piping, and other items that would interfere with applying fire-resistive material until application of fire protection is completed.
        7. Do not install enclosing or concealing construction until after fire-resistive material has been applied, inspected, tested and corrections have been made to defective applications.
  5. action submittals
     1. Product Data: Submit current edition of manufacturer's application and installation instruction manual and referenced bulletins.
     2. Shop Drawings: Submit a "Fire-Resistive Materials Design Schedule Keyed to the Structural Drawings and Schedules" indicating the following:
        1. Schedule for each building element receiving spray fire-resistive materials showing hourly rating and material thickness and UL, ULC, and/or cUL Design Number.
        2. When applicable, for Projects located within Canadian, provide cUL, or ULC Design numbers which correlate to UL Design Numbers.
        3. When UL Designs are used for beams and columns smaller and larger than those listed in the UL Design, provide explanation of thickness adjustment based on W (weight per lineal foot)/D (perimeter of exposure) formulas for each element.
        4. Locations and types of surface preparations required before applying sprayed fire-resistive material.
        5. Extent of sprayed fire-resistive material for each construction and fire-resistance rating, including a schedule indicating the following:
           1. Applicable fire-resistance design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
           2. Minimum thicknesses needed to achieve required fire-resistance ratings of structural components and assemblies.
  6. INFORMATIONAL SUBMITTALS
     1. Delegated Design: Provide engineered judgements and certification for work performed by this Section in accordance with requirements of Authority Having Jurisdiction.
     2. Qualification Data: For installer.
        1. Applicator: Use applicators that are licensed or approved by manufacturer of fire-resistant material.
        2. Materials: Use materials produced under label service of an agency that has tested material, or assemblies containing material, in accordance with specified test standards.
        3. Air Quality: Provide ventilation in areas receiving fire resistant material during and twenty-four (24) hours after application to dry material; maintain non-toxic, unpolluted working area; provide temporary enclosure to prevent spray from contaminating air.
     3. Product Certificates: For each type of fireproofing.
        1. Certificates: Submit test results in accordance with CAN/ULC S101 for fire endurance and CAN/ULC S102 for surface burning characteristics.
        2. Compliance Certification: Provide certificates from manufacturer indicating tested performance requirements required by Authorities Having Jurisdiction.
     4. Evaluation Reports: For fireproofing, from ICC-ES.

Retain "Preconstruction Test Reports" Paragraph below if specifying preconstruction testing in "Preconstruction Testing" Article as Contractor's responsibility.

* + 1. Preconstruction Test Reports: For fireproofing.

Retain "Field quality-control reports" Paragraph below if Contractor is responsible for field quality-control testing and inspecting.

* + 1. Field quality-control reports.
  1. QUALITY ASSURANCE

Edit the following to reflect the correct Building Code for the Project. Adjust for different Provinces and/or Client requirements.

* + 1. Regulatory Requirements: Use materials and methods required to achieve fire resistance ratings required for the Project to the satisfaction of the Authority Having Jurisdiction, latest edition of the National Building Code (NBC) and Ontario Building Code (OBC) and in accordance with referenced standards.
    2. Installer Qualifications: Engage an experienced installer certified, licensed, or otherwise qualified by sprayed fire-resistive material manufacturer as having the necessary experience staff, and training to install manufacturer's products according to specified requirements. A manufacturer's willingness to sell its sprayed fire-resistive materials to Contractor or to an installer engaged by Contractor does not in itself confer qualification on the buyer.
    3. Fire-Test-Response Characteristics: Provide sprayed fire-resistive materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

Indicate rating, testing agency, and testing agency's design designation on Drawings.

* + - 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency acceptable to authorities having jurisdiction, for sprayed fire-resistive material serving as direct-applied protection tested per CAN/ULC S101, and ASTM E 119.
      2. Surface-Burning Characteristics: CAN/ULC S102.
    1. Engineered Judgements: Provide engineered judgment acceptable to Authority Having Jurisdiction where assembly being protected differs from the tested assembly used to determine thickness.

Delete paragraph and subparagraphs below if not required. If retaining, indicate location, size, and other details of sample installations on Drawings or by inserts.

* + 1. Sample Installations: Prior to installation of sprayed fire-resistive material, apply products specified to demonstrate aesthetic effects, where applicable, adhesion/cohesion, and quality of workmanship. Build sample installations to comply with the following requirements, using materials indicated for completed Work:
       1. Locate sample installations in a location(s) as directed by the Consultant.
       2. Extent of Sample Installations: Include each of the following surfaces for which spray fire-resistive materials are required: 48 inches (1219 mm) linear of column, 48 inches (1219 mm) linear of beam and 4 square feet (0.37 sm) of metal deck. Make areas contiguous. Test installation for adhesion/cohesion in accordance with manufacturer's tested assemblies proposed for the Work and as specified.
       3. Testing: The Owner's Testing and Inspection Agency will perform testing on sample installations in accordance with requirements of Part 3, "Field Quality Control."
       4. Notify Consultant seven (7) days in advance of the dates and times when sample installations will be constructed.
       5. Demonstrate the proposed range of aesthetic effects and workmanship, including patching.
       6. Approved sample installations may become part of the completed Work if undisturbed at time of Substantial Completion.
    2. Pre-Installation Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 – Project Management and Coordination. Contractor, installer, and independent testing agency shall attend a pre-installation conference to review the substrates for acceptability, method of application, applied thicknesses, and testing and inspection procedures.
    3. Regulatory Requirements: Conform to the applicable building code requirements of the authorities having jurisdiction. Products, execution, and the thickness spray fire resistive materials shall conform to the applicable code requirements for the required fire resistance ratings.
  1. STORAGE, DELIVERY, and HANDLING
     1. Deliver products to Project site in original, unopened packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, shelf life if applicable, and fire-resistance ratings applicable to Project.
     2. Use materials with limited shelf life within period indicated. Remove from Project site and discard materials whose shelf life has expired.
     3. Store materials inside, under cover, aboveground, in a dry location, until ready for use. Remove from Project site and discard wet or deteriorated materials.
  2. field conditions

Revise first paragraph below if different temperature limits apply to products selected.

* + 1. Environmental Limitations: Do not apply sprayed fire-resistive material when ambient or substrate temperatures are 40 deg F (4 deg C) or lower. When ambient or substrate temperatures are lower, provide temporary enclosures and heat to maintain temperatures at or above this level for twenty-four (24) hours before and during application, and after application for a minimum of twenty-four (24) hours or more, until the sprayed fire resistive material is cured.
    2. Ventilation: Ventilate spaces during and after application of sprayed fire-resistive material. Provide a minimum of four (4) air changes per hour until fire resistive material cures by the following:
       1. Using natural means.
       2. When natural means are inadequate, provide forced-air circulation at a rate of 4 air exchanges per hour.
  1. WARRANTY
     1. Special Warranty: Submit a written warranty, signed by Contractor and by Installer, agreeing to repair or replace sprayed fire-resistive materials that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
        1. Failures include, but are not limited to, cracking, flaking, or eroding by air or weather, in excess of specified requirements; peeling; and delaminating of sprayed fire-resistive materials from substrates due to defective materials and workmanship.
        2. Not covered under the warranty are failures due to damage by occupants and Owner's maintenance personnel, exposure to environmental conditions other than those investigated and approved during fire-response testing, and other causes not reasonably foreseeable under conditions of normal use.
     2. Warranty Period: Two (2) years from date of Substantial Completion.

1. Products
   1. SPRAYED FIRE-RESISTIVE MATERIALS
      1. General: Provide manufacturer's standard products complying with requirements indicated for material composition and physical properties representative of installed products.

Coordinate paragraph and subparagraphs below with material composition and performance requirements retained.

* + 1. Subject to compliance with requirements, provide products by one of the following:
       1. Cementitious Sprayed Fire-Resistive Material for interior locations, concealed conditions, in buildings less than 75 ft. (22.8 m) tall:
          1. Carboline Co., Fireproofing Products Div.; Pyrolite 15.
          2. GCP Applied Technologies (Grace, W. R. & Co., Construction Products Div.); Monokote Type MK-6.
          3. Isolatek International Corp., Cafco Products; Cafco 300.
          4. Southwest Fireproofing Products Co.; 5GP.
       2. Cementitious Sprayed Fire-Resistive Material for interior locations, concealed conditions, in buildings between 75 ft. and up to 420 feet (22.8 m and up to 128 m) tall:
          1. Carboline Co., Fireproofing Products Div.; Pyrolite 15.
          2. GCP Applied Technologies (Grace, W. R. & Co., Construction Products Div.); Monokote Type MK-10/HB.
          3. Isolatek International Corp., Cafco Products; Cafco 300 HS.
          4. Southwest Fireproofing Products Co.; 5MD.
       3. Cementitious Sprayed Fire-Resistive Material for interior locations, concealed conditions, in buildings greater than 420 feet (128 m) tall:
          1. GCP Applied Technologies (Grace, W. R. & Co., Construction Products Div.); Monokote Type MK-1000/HB.
          2. Isolatek International Corp., Cafco Products; Cafco 3000.
          3. Southwest Fireproofing Products Co.; 5MD.
    2. Material Composition: Cementitious sprayed fire-resistive material consisting of factory-mixed, dry formulation of gypsum or Portland cement binders and lightweight, asbestos free, mineral, or synthetic aggregates mixed with water at Project site to form a slurry or mortar for conveyance and application.
    3. Physical Properties: Minimum values, unless otherwise indicated, or higher values required to attain designated fire-resistance ratings, measured per standard test methods referenced with each property as follows:

See Editing Instruction in the Evaluations for discussion of physical properties.

* + - 1. Dry Density: 15 lbs./cu. ft. (240 kg/cu. m) typically, and for buildings greater than 420 feet (128 m) tall provide 18 lbs./cu. ft. (288 kg/cu. m), for average and individual densities regardless of density indicated in referenced fire-resistance design, or greater if required to attain fire-resistance ratings indicated, per ASTM E 605/E 605M.
      2. Thickness: Provide minimum average thickness required for each fire-resistance design indicated according to ASTM E 605/E 605M.

Values below are minimum bond strengths permitted by the NBC. Verify bond strength requirement with local codes.

Use first option for interior locations, concealed conditions, in buildings less than 75 feet tall.

Use second option for interior locations, concealed conditions, for buildings between 75 and 420 feet tall.

Use third option for interior locations, concealed conditions, for buildings greater than 420 feet tall.

For fireproofing subject to impact resistance (such as car antennae in parking garage, or tugs in airport baggage handling applications) refer to manufacturers literature.

For fireproofing exposed to impact resistance and to exterior environment refer to manufacturer's literature.

* + - 1. Bond Strength: **[200 lbf/sq. ft. (9.5 kPa)] [430 lbf/sq. ft. (20.5 kPa)] [1000 lbf/sq. ft. (47.8 kPa)]** minimum per ASTM E 736/E 736M:
         1. If surfaces of structural steel receiving sprayed fire-resistive material are primed or otherwise painted for coating materials, perform series of bond tests specified in UL's "Fire Resistance Directory." Provide bond strength indicated in referenced UL fire-resistance criteria.
      2. Air Erosion: Maximum weight loss of 0.001 g/sq. ft. (0.01 g/sq. m) in 24 hours per ASTM E 859.
      3. Fire-Test-Response Characteristics: Provide sprayed fire-resistive materials with the following surface-burning characteristics as determined by testing identical products per CAN/ULC S102 or another testing and inspecting agency acceptable to authorities having jurisdiction:
         1. Flame-Spread Index: 10 or less.
         2. Smoke-Developed Index: 0.

Test method below is an example for special environments such as hospitals or where indoor air quality is an issue. Verify, with manufacturer, test method and availability of microbial inhibitors for selected products. Monokote, Southwest Vermiculite and Cafco only.

* + - 1. Fungal Resistance: No observed growth on specimens for a minimum of sixty (60) days per ASTM G 21.
  1. AUXILIARY FIRE-RESISTIVE MATERIALS
     1. General: Provide auxiliary fire-resistive materials that are compatible with sprayed fire-resistive materials 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.

Delete paragraph below if not required. For products listed, verify need for below for each substrate and application, with manufacturer and by reference to UL's "Fire Resistance Directory." Adhesives may be needed with certain formulations applied to metal deck.

* + 1. Adhesive for Bonding Fire-Resistive Material: Product approved by manufacturer of sprayed fire-resistive material.
    2. Metal Lath: Expanded metal lath fabricated from material of weight, configuration, and finish required to comply with fire-resistance designs indicated and fire-resistive material manufacturer's written recommendations. Include clips, lathing accessories, corner beads, and other anchorage devices required to attach lath to substrates and to receive sprayed fire-resistive material.
    3. Water: Potable. Provide water with sufficient pressure and volume to meet the fireproofing application schedule.

Sealer is required if Paint Coatings or Thermal Insulation are applied to the Fireproofing. Delete if not required.

* + 1. Sealer: Water based sealer, as recommended by applied fireproofing manufacturer, allowing installation of approved coloured surface coatings or spray foam insulation to applied fireproofing.

Delete the following 2 paragraphs if spray foam insulation is not required on this Project.

* + 1. Spray Foam Insulation: As indicated in Section 07 21 29 "Sprayed Polyurethane Foam Insulation."
    2. Thermal Barrier: Where indicated on Drawings; manufacturer's recommended thermal barrier for application overtop of spray foam insulation combustible materials, as noted in the ULC listing and outlined in the OBC.
       1. Single component, factory blended fire resistive cementitious coating, tested to ULC/CAN4-S124-M85(R2000), and has the following properties:
          1. Class B.
          2. Thickness: 19 mm (3/4") thick.
          3. Density: 380/370 kg/m3 min. average.
       2. Basis of Design: A/D Cementitious Thermal Barrier by A/D Fire Protection Systems Inc.

Delete the Following paragraph if surface coatings are not required on this project.

* + 1. Surface Coating: As selected by the Consultant from the manufacturer's standard product line, compatible with applied fireproofing manufacturer's sealer, and requiring a flame spread index limited to maximum 200, unless further limited by authority having jurisdiction.

1. Execution
   1. EXAMINATION
      1. Examine substrates, with installer and representative of the testing laboratory present, to determine that they are in satisfactory condition to receive sprayed fire-resistive material. Contractor, Installer, and testing laboratory shall submit written statement of each area’s substrate acceptability to the Consultant prior to beginning application of fire-resistive materials. A substrate is in satisfactory condition if it complies with the following:
         1. Substrates comply with requirements in the Section where the substrate and related materials and construction are specified.
         2. Substrates are free of oil, grease, rolling compounds, incompatible primers, loose mill scale, dirt, and other foreign substances capable of impairing bond of fire-resistive material with substrate under conditions of normal use or fire exposure.
         3. Objects penetrating fire-resistive material, including clips, hangers, support sleeves, and similar items, are securely attached to substrates prior to application.
         4. Substrates are not obstructed by ducts, piping, equipment, and other suspended construction that will interfere with applying fire-resistive material.
      2. Prior to application of fireproofing to steel beams and decks verify that placement of concrete fill on floor and roof decks has been completed.
      3. On roof decks without concrete fill complete all roofing applications and roof mounted equipment installation prior to application of fireproofing to the underside of supporting beams.
      4. Do not proceed with installation of fire resistive materials until unsatisfactory conditions have been corrected.
   2. PREPARATION
      1. Clean substrates of substances that could impair bond of fire-resistive material, including dirt, oil, grease, release agents, rolling compounds, loose mill scale, and incompatible primers, paints, and other foreign substances which may impair proper adhesion of fireproofing to substrate.

If by chance someone on the building team mistakenly uses a painted deck that is either not UL Classified (does not bear the UL Classification marking) or is not listed in the applicable UL design, the deck will need to have metal lath mechanically attached under the entire area to comply with UL requirements. The use of galvanized metal deck takes care of this problem. Check with structural engineer to confirm if galvanized metal deck is specified.

Most of the specified spray on fireproofing products are self adhesive to unprimed and galvanized steel; check specific UL listings to see if lathing is required as normally it is not.

* + 1. Metal Lathing: Where required by rated assembly and bond, install metal lath, as required, to comply with fire-resistance ratings and fire-resistive material manufacturer's written recommendations for conditions of exposure and intended use. Securely attach lath to substrate in position required for support and reinforcement of fire-resistive material. Use anchorage devices of type recommended in writing by sprayed fire-resistive material manufacturer. Attach lathing accessories where indicated or required for secure attachment to substrate.
    2. Cover other work subject to damage from fallout or overspray of fire-resistive materials before application. Provide temporary enclosure as required to confine spraying operations, protect the environment, and ensure maintenance of adequate ambient conditions for temperature and ventilation.
       1. Cover floor slabs scheduled to be exposed with polyethylene sheeting.
  1. INSTALLATION, general
     1. Comply with fire-resistive material manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and spray on fire-resistive material, as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.
     2. Extend fire-resistive material in full thickness over entire area of each substrate to be protected. Unless otherwise recommended in writing by sprayed fire-resistive material manufacturer, install body of fire-resistive covering in a single course.
  2. FIELD QUALITY CONTROL
     1. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to verify the adequacy of the Contractor's quality control of the sprayed-fire resistive materials work.
        1. The independent testing and inspection agency will promptly submit weekly test results to the Contractor and Consultant in the form required under ASTM E 605/E 605M and E 736/E 736M. The reports shall clearly indicate the location of each test, the test result at that location, and whether or not the tested fire resistive materials at each test location complies with the Contract Documents.
     2. Testing and Inspection: Testing and inspection of completed applications of sprayed fire-resistive material shall be conducted as the work progresses. Each thickness, density and bond strength test location shall be selected at random by the testing and inspection agency. Do not proceed with application of sprayed fire-resistive material for the next area until test results for previously completed applications of sprayed fire-resistive material show compliance with requirements.
        1. Testing and inspection of the sprayed fire resistive material shall comply with the statutory requirements of New York City Controlled Inspections Program for Spray-On Fireproofing and for the requirements of the component materials and installation.

Subparagraphs below are examples only; revise to suit products selected and requirements of Project and of authorities having jurisdiction. Delete subparagraphs below and retain paragraph above if project is in NYC. See Evaluations.

* + - 1. Visual Inspection:
         1. Prior to Application: Visually inspect all surfaces intended to receive sprayed fire resistive materials prior to its installation for conformance with the requirements of the Contract Documents.
         2. After Application: Visually inspect all surfaces that received sprayed fire resistive materials, including patched areas, for conformance with the requirements of the Contract Documents. Cracks in the fireproofing which expose the fireproofed substrate will not be permitted.
         3. Final Inspection: After the work of adjacent trades has been completed, but before sprayed structural elements are enclosed, conduct a final visual inspection of sprayed-fire resistive materials work.
      2. Thickness Testing:
         1. Thickness for Floor and Roof Deck Assemblies: For each 1000 sq. ft. (93 sq. m) area, or partial area, on each floor, make four random tests for thickness per ASTM E 605/E 605M. Thickness measurements shall be selected from a square area 12 inches by 12 inches (305 by 305 mm) in size. For fluted decks a minimum of four measurements shall be made, located symmetrically within the square area including one each of the following: valley, crest, and sides. The average of the measurements shall be reported.
         2. Thickness for Beams, Girders, Joists, Trusses, and Columns: One test for beams, girders, joists or trusses, and one test for columns, per 25 percent of structural members per floor per ASTM E 605/E 605M.

At beams and girders thickness measurements shall be made at nine locations around the beam or girder at each end of a 12-inch (305 mm) length.

At joists and trusses, thickness measurements shall be made at seven locations around the joist or truss at each end of a 12-inch (305 mm) length.

At wide flange columns, thickness measurements shall be made at twelve locations around the column at each end of a 12-inch (305 mm) length.

At hollow structural section and pipe columns, thickness measurements shall be made at a minimum of four locations around the column at each end of a 12-inch (305 mm) length.

* + - 1. Density Testing: For each 2,500 sq. ft. (232 sq. m) area, or partial area, on each floor, test one protected beam, one protected girder, one protected truss, one protected column, and one protected deck surface per ASTM E 605/E 605M.
      2. Cohesion-Adhesion (Bond Strength) Testing: For each 2,500 sq. ft. (232 sq. m) area, or partial area, on each floor, test one protected beam, one protected column, and one protected deck surface, for cohesion and adhesion per ASTM E 736/E 736M.

Retain the following paragraph if painted deck is to be fireproofed.

* + - 1. Compatibility and Adhesion Testing: Test primers and other coatings which have been applied to surfaces which are to be protected by sprayed firm resistive materials to confirm that they are compatible with, and can be adhered to by, sprayed fire-resistive material. Determine compatibility and adhesion according to the following requirements:

Authorities having jurisdiction may require testing that differs from ASTM E 736.

* + - * 1. Testing for bond per ASTM E 736/E 736M and requirements in UL's "Fire Resistance Directory" for coating materials. Provide bond strength indicated in referenced fire-resistance design, but not less than minimum specified in Part 2.
        2. Verify that manufacturer, through its own laboratory testing or field experience, has not found primers or coatings to be incompatible with, or incapable of being adhered to by, sprayed fire-resistive material.
      1. Where testing and inspection reveals applications of sprayed fire-resistive material are not in compliance with requirements, testing and inspecting agency will perform additional random testing to determine extent of noncompliance.
    1. Apply additional sprayed fire-resistive material per manufacturer's written instructions where test results indicate that thickness does not comply with specified requirements.
    2. Remove and replace, at Contractor's expense, including costs of delays to the work caused by removal and replacement, sprayed fire-resistive material where test results indicate that they do not comply with specified requirements for both cohesion and adhesion and for density.
    3. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
  1. CLEANING, PROTECTING, AND REPAIR
     1. Cleaning: Immediately after completing spraying operations in each confinable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces.
     2. Cure exposed cementitious-sprayed fire-resistive material according to product manufacturer's written recommendations to prevent premature drying.
     3. Protect sprayed fire-resistive material, according to advice of product manufacturer and Installer, from damage resulting from construction operations or other causes so fire protection will be without damage or deterioration at time of Substantial Completion.
        1. Trades, other than fireproofing installer, who remove fireproofing material will be responsible for replacement of same.
     4. Coordinate application of sprayed fire-resistive material with other construction to minimize need to cut or remove fire protection. As installation of other construction proceeds, inspect sprayed fire-resistive material and patch any damaged or removed areas prior to covering by other construction.

END OF SECTION