SECTION 07253
SPRAYED FIREPROOFING

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes:
   1. Cementitious fireproofing.

B. Related Sections:
   1. Section 05120 - Structural Steel.
   2. Section 05210 - Steel Joists.
   3. Section 05300 - Metal Decking.
   5. Section 09260 - Gypsum Board Systems: Gypsum board fireproofing.

1.2 REFERENCES:

A. Codes/Standards:
   1. NFPA requirements for fire resistance ratings of specified areas.
   3. American Society for Testing and Materials (ASTM) latest editions:
      c. ASTM E605: Thickness and Density of Sprayed Fire-Resistive Material Applied to Structural Members.
      d. ASTM E736: Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.
      e. ASTM E759: Effect of Deflection on Sprayed Fire-Resistive Materials Applied to Structural Members.
      g. ASTM E761: Compressive Strength of Sprayed Fire-Resistive Materials Applied to Structural Members.
      h. ASTM E859: Air Erosion of Sprayed Fire-Resistive Materials Applied to Structural Members.

1.3 SUBMITTALS:
A. Test Reports:

1. Submit manufacturer's laboratory test reports on each required test of in-place fireproofing products with performance requirements indicated, including asbestos content where applicable.

2. Submit test reports for sprayed-on fireproofing from a qualified independent testing agency employed and paid by manufacturer. Provide reports indicating that physical properties of proposed sprayed-on fireproofing products comply with specified requirements based on comprehensive testing of current product formulations according to the following requirements:
   a. Testing is performed on sprayed-on fireproofing materials randomly selected from bags bearing the applicable classification marking of UL or another inspecting and testing agency acceptable to the University of Colorado AHJ.
   b. Testing is performed on specimens of sprayed-on fireproofing materials that comply with laboratory testing requirements specified in Part 2 and are otherwise identical in every respect to installed fireproofing including application of sealers, topcoats, tamping, troweling, rolling, and water overspray, if any of these are used in final application.

3. Qualified independent testing agency shall perform testing on laboratory specimens that it witnessed during preparation and conditioning. Include in test reports a full description of preparation and conditioning of laboratory test specimens.
   a. Test reports without the above information are not acceptable.

B. Field Test Reports:

1. Owner employed testing agency will promptly report field test results and inspections to Architect and Contractor.

1.4 QUALITY ASSURANCE:

A. Installer Qualifications:

1. Licensed by manufacturer of fireproofing materials.

2. Experienced in similar applications of sprayed fireproofing materials on a minimum of 2 projects.

B. Certificates:

1. Manufacturer's certification that materials meet or exceed specification requirements.

2. Applicator's certification that application has been completed as specified to meet fire resistance ratings and thickness requirements.
C. Testing Agency Qualifications:
   1. Testing agency must demonstrate that it has the experience and capability to
      conduct testing indicated based on evaluation of submitted criteria conforming to
      ASTM E699.

D. Single Source Responsibility:
   1. Obtain sprayed-on fireproofing materials from a single manufacturer for each
      different product required.

E. Fire Performance Characteristics:
   1. Provide materials and construction which are identical to those tested for the
      following fire performance characteristics, per test method indicated, by UL or
      other testing and inspecting organizations acceptable to the University of
      Colorado at Boulder Department of Environmental Health and Safety.
      a. Fire Resistance Ratings: As indicated by reference to design designation
         in UL "Fire Resistance Directory" for fire-resistance rated assemblies in
         which sprayed-on fireproofing serves as direct-applied protection, tested
         per ASTM E119.
      b. Surface Burning Characteristics: As indicated for each sprayed-on
         fireproofing product required, tested per ASTM E84 and listed in UL
         "Building Materials Directory".

F. Asbestos Content:
   1. No detectable asbestos fibers are permitted as determined per method specified in
      40 CFR Part 763, Subpart F, Appendix A, Section 1, Polarized Light
      Microscopy.

1.5 SEQUENCING AND SCHEDULING:

A. General:
   1. Schedule and coordinate fireproofing with other work so that it will not be
      exposed to weather or other damaging conditions. Do not expose to abrasion and
      other damage likely to occur during subsequent work or install prior to
      installation of enclosing or concealing work. Provide time for inspection and
      testing and subsequent correction of defective fireproofing.
   2. Do not apply to underside of roof assembly until roofing installation is complete.
      Prohibit roof traffic during application and drying.
   3. Do not apply to metal decking supporting concrete until concrete has been
      placed.
   4. Do not apply to open web members until piping through web openings is
      complete and installed with adequate clearance as required by UL.
5. Do not begin applying fireproofing until clips, hangers, supports, sleeves, and other item penetrating fireproofing are in place.

1.6 WARRANTY:

A. Submit a written warranty, executed by Contractor and cosigned by Installer, agreeing to repair or replace sprayed-on fireproofing that has failed within the specified warranty period. Failures include but are not limited to the following:

1. Cracking, flaking, eroding in excess of specified requirements, peeling, and delaminating of sprayed-on fireproofing from substrates due to defective materials and workmanship.

2. Not covered under the warranty are failures attributable to damage by occupants and Owner's maintenance personnel, exposure to environmental conditions other than those investigated and approved during fire-response testing, and to other causes not reasonably foreseeable under conditions of normal use.

B. Warranty Period: 2 years from date of the Notice of Acceptance.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Cementitious Fireproofing:

1. Monokote as manufactured by W. R. Grace and Co.
2. Cafco 300 as manufactured by Isolatek International Corp.
3. Approved substitute.

2.2 PERFORMANCE CRITERIA:

A. Dry Density: ASTM E605 test method for each performance criterion, 15 pcf average, 14 pcf minimum.

B. Deflection: ASTM E759, test for cracking and delamination showing no cracking, spalling or delamination.

C. Impact Resistance: ASTM E760 to show no cracking, spalling or delamination.

D. Bond Strength: ASTM E736. Minimum bond strength of 150 lbf per sq. ft., 3/4" minimum thickness.

E. Air Erosion: ASTM E859. Maximum allowable weight loss of 0.025 grams per sq. ft. of fireproofing material.

F. Compression: ASTM E761. Not less than 5.21 lbf per sq. in., 3/4" minimum thickness, 15 pcf minimum dry density.

G. Fire Hazard Rating per ASTM E84:
1. Flame Spread: 10 maximum.
2. Fuel Contributed: 5 maximum.
3. Smoke Developed: 0 maximum.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL:

A. Sampling and Testing:

1. The Owner will engage and pay for a qualified Testing Agency to inspect and test the fireproofing installation. Contractor will provide facilities to assist the Testing Agency including hoists, scaffolding, access and information as to times and location of applications.

2. Testing of completed fireproofing will take place in successive stages in areas of extent described below; do not proceed with fireproofing of next area until test results for previously completed fireproofing show compliance with requirements.

   a. Extent of Each Test Area: Each bay, 10,000 sq. ft. of floor area, or total floor area, whichever produces greatest number of test areas.

3. Within each area, testing agency will randomly select one structural member of each type (primary beam, secondary beam, joist, truss, steel deck, and column) and test fireproofing as follows:

      1) Average density in any area must not be less than required density and no individual density less than 90% of that required.

   b. Compressive Strength: ASTM E761, equal or exceed as specified.

   c. Bond Strength: ASTM E736, equal or exceed as specified.

   d. When testing discovers fireproofing not in compliance with requirements, testing agency will perform additional random testing to determine extent of noncompliance.

4. Testing agency will report test results promptly and in writing to Contractor and Architect.

5. Remove and replace fireproofing that does not comply with specified requirements for bond or for density or both.

6. Apply additional fireproofing per manufacturer's directions where thickness does not comply with specified requirements.
7. Where fireproofing is removed and replaced or repaired, additional testing shall be performed to determine compliance with specifications at no additional cost to the Owner.

INCLUDE A SCHEDULE IN THE SPECIFICATIONS OR ON THE DRAWINGS THAT IDENTIFIES EACH ASSEMBLY TYPE OR MEMBER TYPE, THE UL DESIGN NUMBER, AND THE HOUR RATING REQUIRED.

END OF SECTION 07253