



## Addendum Number Two

**Date of Issue:** 07/27/16

**Project:** FY16 – E&GMR Capstone Lobby – ADA Restroom  
Project Number: H27-Z289 CP50003071

### **TO: ALL BIDDERS OF RECORD**

This addendum modifies the Contract documents only in the manner and to the extent stated herein and shown on any accompanying drawings and will become part of the Contract Documents. Except as specified or otherwise indicated by this Addendum, all work shall be in accordance with the basic requirements of the Contract Documents.

**BIDDERS SHALL ACKNOWLEDGE RECEIPT OF ADDENDUM IN THE SPACE PROVIDED ON THE BID FORM. FAILURE TO DO SO MAY CONSTITUTE A REASON TO REJECT THE BID.**

This Addendum consists of eight (8) pages including this document and the following:

#### **I. Enclosures:**

1. Specification Section 078110 Sprayed Fire Resistive Materials

#### **II. General Information**

The pre-bid discussion items and subsequent questions were reviewed. The following points for clarification are clarified:

1. **SPRAY FIREPROOFING OF EXISTING BEAM:** Approximately 75 square feet of spray fireproofing shall be provided where USC has abated an existing steel beam in the project area.
2. **20 MIL FIRE RETARDANT POLY BARRIER:** Contractor shall provide and continuously maintain a 20 mil fire retardant poly barrier to contain the perimeter of the project area.

**III. Changes to the Specifications:**

1. Add the following specification section: **SECTION 078110 – SPRAYED FIRE RESISTIVE MATERIALS**

**IV. Changes to the Drawings:**

NOT USED.

2.

**V. Prior Approvals**

NOT USED.

END OF ADDENDUM TWO

## SECTION 07811

### SPRAYED FIRE-RESISTIVE MATERIALS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Work under this section consists of the furnishing of all labor, materials, equipment, and services necessary for, and incidental to, the complete and proper installation of all cementitious aggregate slurry fireproofing for patching of existing fireproofing systems and spray fireproofing for newly uncovered or installed structural steel assemblies and related work as shown on the drawings or specified herein, and in accordance with all applicable requirements of the contract documents.
- B. Conform to all applicable building code requirements of all authorities having jurisdiction.

##### 1.02 RELATED SECTIONS

- A. Section 01731: Cutting and Patching

##### 1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM E84 Surface Burning Characteristics
  - 2. ASTM E119 Standard Methods of Fire Tests of Building Construction and Materials
  - 3. ASTM E605 Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material Applied to Structural Members
  - 4. ASTM E736 Cohesion/Adhesion of Sprayed Fire-Resistive Material Applied to Structural Members
  - 5. ASTM E759 Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members
  - 6. ASTM E760 Effect of Impact on Bonding of Sprayed Fire-Resistive Material Applied to Structural Members
  - 7. ASTM E761 Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members
  - 8. ASTM E859 Air Erosion of Sprayed Fire-Resistive Material Applied to Structural Members
  - 9. ASTM E937 Corrosion of Steel by Sprayed Fire-Resistive Material Applied to Structural Members
  - 10. ASTM E1354 Cone Calorimeter
  - 11. ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
- B. Bureau of Building Inspection: City of San Francisco
  - 1. Abrasion Resistance Test Method
  - 2. Impact Penetration Test Method
- C. Underwriters Laboratories Inc. (UL) Fire Resistance Directory (Latest Edition)
  - 1. UL/ANSI 263 Fire Tests of Building Construction Materials
- D. Uniform Building Code (UBC)
  - 1. UBC Standard No. 7-6 – Thickness and Density Determination for Spray Applied

- Fireproofing
- 2. UBC Standard No. 7-7 – Methods for Calculating Fire Resistance of Steel, Concrete and Wood Construction
- E. Association of the Wall and Ceiling Industry (AWCI)
  - 1. AWCI Technical Manual 12-A: Standard Practice for the Testing and Inspection of Spray Applied Fire-Resistive Materials
  - 2. AWCI Technical Manual 12: Design Selection Utilizing Spray Applied Fire-Resistive Materials
- F. International Building Code (IBC) 2006

#### 1.04 DEFINITIONS

- A. Cementitious aggregate slurry Fireproofing as defined by Underwriters Laboratories Inc. (CHPX) in the latest edition of the UL Fire Resistance Directory.

#### 1.05 SUBMITTALS

- A. Manufacturer's Data: Submit manufacturer's instructions for proper application of aggregate slurry fireproofing.
- B. Fire Testing:
  - a. Submit evidence that the aggregate slurry fireproofing has been subjected to full-scale UL 263/ASTM E119 fire testing at Underwriters Laboratories Inc. by the manufacturer.
- C. Thickness Schedule: Provide schedule indicating material to be used, structural elements to be protected with spray applied fireproofing, hourly rating and material thickness provided and appropriate references.
- D. Test Data: Upon request, submit copies of ASTM E 119 full-scale fire test reports demonstrating performance of manufacturers' products in the specified and/or submitted UL Fire Resistant Designs:
  - 1. Bond Strength per ASTM E736
  - 2. Compressive Strength per ASTM E761
  - 3. Deflection per ASTM E759
  - 4. Bond Impact per ASTM E760
  - 5. Air Erosion per ASTM E859
  - 6. Corrosion Resistance per ASTM E937
  - 7. Abrasion Resistance Impact Penetration
  - 8. High Speed Air Erosion per ASTM E859
  - 9. Surface Burning Characteristics per ASTM E84
  - 10. Combustibility per ASTM E1354 Cone Calorimeter
  - 11. Mold Resistance per ASTM G21

#### 1.06 QUALITY ASSURANCE

- A. Fireproofing work shall be performed by a firm acceptable to the aggregate slurry fireproofing material manufacturer.
- B. Products, execution, and fireproofing thicknesses shall conform to the applicable code requirements for the required fire-resistance ratings.
- C. Contractor, fireproofing subcontractor and independent testing laboratory shall attend a pre-installation conference to review the substrates for acceptability, method of application, applied thicknesses, inspection procedures and other issues.

### 1.07 DELIVERY, STORAGE AND HANDLING

- A. Material shall be delivered in original unopened packages, fully identified as to manufacturer, brand or other identifying data and bearing the proper independent testing laboratory labels for Surface Burning Characteristic and Fire Resistance Classification.
- B. Material shall be stored off the ground, under cover, and in a dry location until ready for use. All bags that have been exposed to water before use shall be found unsuitable and discarded. Stock of material is to be rotated and used prior to its expiration date.

### 1.08 PROJECT/SITE CONDITIONS

- A. A minimum air and substrate temperature of 4.4°C (40°F) shall be present before application of spray applied fireproofing. A minimum air and substrate temperature of 4.4°C (40°F) must be maintained during and for 24 hours after application of the spray applied fireproofing. Provide enclosures with heat to maintain temperature.
- B. Provide ventilation in poorly ventilated areas to achieve a minimum total fresh air exchange rate of 4 times per hour until the material is substantially dry.

### 1.09 SEQUENCING AND SCHEDULING

- A. Sequence and coordinate application of aggregate slurry fireproofing with work in other sections which would interfere with efficient fireproofing application.

## PART 2 PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURER

- A. Subject to compliance with requirements, provide one of the products specified.

### 2.02 MATERIALS

- A. Patching of Existing Installation: Products: W.R. Grace & Co. “Monokote MK-6”, Retro-Guard<sup>®</sup> RG factory-blended aggregate slurry fireproofing . Mineral fiber type products are not acceptable.
- B. Antibacterial Admix. Provide manufacturer’s standard antibacterial admixture factory blended into packaged fireproofing materials.
- C. Physical Performance Characteristics: Fireproofing material shall meet the following physical performance standards:
  1. Dry Density: The field density shall be measured in accordance with ASTM Standard E605. Minimum average density shall be that required by the manufacturer, or as listed in the UL Fire Resistance Directory for each rating indicated, or as required by the authority having jurisdiction, or a minimum average 240 kg/m<sup>3</sup> (15 pcf) whichever is greater.
  2. Deflection: Material shall not crack or delaminate from the surface to which it is applied when tested in accordance with ASTM E759.
  3. Bond Impact: Material subject to impact tests in accordance with ASTM E760 shall not crack or delaminate from the surface to which it is applied.
  4. Bond Strength: Fireproofing, when tested in accordance with ASTM E736, shall have a minimum average bond strength of 9.6 kN/m<sup>2</sup> (200 psf) and a minimum individual bond strength of 7.2 kN/m<sup>2</sup> (150 psf).
  5. Air Erosion: Maximum allowable total weight loss of the fireproofing material shall be 0.00 g/m<sup>2</sup> (0.00 g/ft<sup>2</sup>) when tested in accordance with ASTM E859.

Sample surface shall be “as applied” (not pre-purged) and the total reported weight loss shall be the total weight loss over a 24 hour period from the beginning of the test.

6. High Speed Air Erosion: Materials to be used in plenums or ducts shall exhibit no continued erosion after 4 hours at an air speed of 12.7 m/s (47 km/h) [2500 ft/min (29 mph)] when tested per ASTM E859.
  7. Compressive Strength: The fireproofing shall not deform more than 10% when subjected to compressive forces of 68.9 kPa (1,440 psf) when tested in accordance with ASTM E761.
  8. Corrosion Resistance: Fireproofing applied to steel shall be tested in accordance with ASTM E937 and shall not promote corrosion of steel.
  9. Abrasion Resistance: No more than 15 cm<sup>3</sup> shall be abraded or removed from the fireproofing substrate when tested in accordance with the test methods developed by the City of San Francisco, Bureau of Building Inspection
  10. Impact Penetration: The fireproofing material shall not show a loss of more than 6 cm<sup>3</sup> when subjected to impact penetration tests in accordance with the test methods developed by the City of San Francisco, Bureau of Building Inspection.
  11. Surface Burning Characteristics: Material shall exhibit the following surface burning characteristics when tested in accordance with ASTM E84:  
Flame Spread 0  
Smoke Development 0
  12. Resistance to Mold: The fireproofing material shall be formulated at the time of manufacturing with a mold inhibitor. Fireproofing material shall be tested in accordance with ASTM G21 and shall show resistance to mold growth for a period of 28 days for general use.
  13. Combustibility: Material shall have a maximum total heat release of 20 MJ/m<sup>2</sup> and a maximum 125 kw/m<sup>2</sup> peak rate of heat release 600 seconds after insertion when tested in accordance with ASTM E1354 at a radiant heat flux of 75 kw/m<sup>2</sup> with the use of electric spark ignition. The sample shall be tested in the horizontal orientation.
- D. Fire Resistance Classification: The spray applied fireproofing material shall have been tested and reported by Underwriters Laboratories Inc., or an other accredited laboratory, in accordance with the procedures of ANSI/ASTM E119 and shall be listed in the Underwriters Laboratories Fire Resistance.
- E. Mixing water shall be clean, fresh, and suitable for domestic consumption and free from such amounts of mineral or organic substances as would affect the set of the fireproofing material. Provide water with sufficient pressure and volume to meet the fireproofing application schedule.

#### 2.03 ACCESSORIES

- A. Provide accessories to comply with manufacturer’s recommendations and to meet fire resistance design and code requirements. Such accessories include, but are not limited to, any required or optional items such as Spatterkote SK-3; bonding agents, mechanical attachments; application aids such as metal lath, scrim, or netting; and Monokote Accelerator.

#### 2.04 SOURCE QUALITY CONTROL

- A. Submit evidence that the aggregate slurry fireproofing has been tested per ASTM

E119 by Underwriters Laboratories Inc. Include evidence that the fire testing was sponsored by the manufacturer and that the material tested was produced at the manufacturer's facility under the supervision of laboratory personnel.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. All surfaces to receive spray applied fireproofing shall be provided free of oil, grease, loose mill scale, dirt or other foreign substances which may impair proper adhesion of the fireproofing to the substrate. Where necessary, cleaning or other corrections of surfaces to receive fireproofing shall be the responsibility of the supplier of the incompatible surface.
- B. Interior structural steel to receive application of spray applied fireproofing shall be free of primer and paint coatings.
- C. Fireproofing shall be applied to painted surfaces and surfaces coated with lock down agents in accordance with ambient bond and mechanical attachment requirements set forth in the Underwriters Laboratories, Inc. Fire Resistance Directory, current edition.
- D. Application of the fireproofing shall not begin until the contractor, applicator and fireproofing testing laboratory (inspector) have examined surfaces to receive fireproofing and determined that the surfaces are acceptable to receive the fireproofing material.

### 3.02 PREPARATION

- A. Prior to application of the fireproofing material, a bonding agent, approved by the fireproofing material manufacturer, shall be applied to all concrete substrates to receive fireproofing.
- B. Other trades shall install clips, hangers, support sleeves and other attachments required to penetrate the fireproofing, prior to application of the fireproofing materials.
- C. Other trades shall not install ducts, piping, equipment or other suspended items until the fireproofing is complete.
- D. Complete placing of concrete on floor and roof decking prior to application of the fireproofing to the underside of steel deck and supporting beams and joists.
- E. On roof decks without a concrete cover, complete all roofing applications and roof mounted equipment installation prior to application of the fireproofing to the underside of roof decking and supporting beams and joists. Prohibit all roof traffic upon commencement of the fireproofing and until the fireproofing material is dry.
- F. Protection of permanently exposed walls or floors, or special surfaces is required to protect existing finishes, materials and installations. These existing surfaces to remain shall be protected with masking, drop cloths or other satisfactory covering.

### 3.03 APPLICATION

- A. Equipment and application procedures shall conform to the material manufacturer's application instructions.
- B. Post appropriate cautionary "Slippery When Wet" signs in all areas in contact with wet fireproofing material. Erect appropriate barriers to prevent entry by

non-fireproofing workers into the fireproofing spray and mixing areas and other areas exposed to wet fireproofing material.

- C. Apply a discontinuous textured spray of Spatterkote SK-3 in accordance with manufacturer’s instructions to all cellular steel floor units with flat plate on the bottom and to roof deck assemblies as required to meet the fire resistance ratings, before application of the Monokote fireproofing to these surfaces

3.04 FIELD QUALITY CONTROL

- A. The architect will select, and the owner will pay an independent testing laboratory to randomly sample and verify the thickness and the density of the fireproofing in accordance with provisions of ASTM E605, or the “Inspection Procedure for Field-applied Sprayed Fire Protection Materials” as published by the Association of Wall and Ceiling Contractors International (AWCI), or the Uniform Building Code Standard No. 7-6. Fireproofing density samples should be tested in accordance with the displacement method in ASTM E605 to determine in-place fireproofing density.
- B. The architect will select, and the owner will pay an independent testing laboratory to randomly sample and verify the bond strength of the fireproofing in accordance with provisions of ASTM E736.
- C. The results of the above tests shall be made available to all parties at the completion of pre-designated areas which shall have been determined during the pre-job conference.

3.05 CLEANING

- A. After the completion of fireproofing work, application equipment shall be removed.
- B. All existing above ceiling conditions shall be cleaned of fire proofing overspray and debris caused as a result of this work.
- C. All finishes and systems shall be returned to their original condition prior to the start of the work.

3.06 PATCHING

- A. All patching and repairing of spray applied fireproofing, due to damage by other trades, shall be performed with same materials under this section, and paid for by the trade(s) responsible for the damage.

3.07 FIRE RATING SCHEDULE

Elements

Fire-Resistance Rating (time in hours) schedule shall be as follows:

Structural Component	Hourly Rating Requirement	Design Reference	Restrained (Check one)	Unrestrained
Columns	3 hr.	match existing	N/A)	(N/A)
Floor Assemblies (Decks)	2 hr.	match existing	( )	( X )
Floor Beams/Joists	2 hr.	match existing	( )	( X )
Roof Assemblies (Decks)	2 hr.	match existing	( )	( X )
Beams/Joists	2 hr.	match existing	( )	( X )

END OF SECTION