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REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
OFFICE OF THE SECRETARY
MANILA

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DEPARTMENT ORDER
No. 30
Series of 2016 02.01.16

SUBJECT: DPWH Standard Specification for Item 1044 – Interior Cementitious Fireproofing

In line with the mandate of the Department in providing effective standard specifications in the implementation of various infrastructure projects and in view of the need of setting a standard specification for interior cementitious fireproofing, the attached **DPWH Standard Specification for Item 1044 – Interior Cementitious Fireproofing** is hereby prescribed, for the guidance and compliance of all concerned.

This specification shall form part of the on-going revision of the DPWH Standard Specifications for Public Works Structures (Buildings, Ports and Harbors, Flood Control and Drainage Structures and Water Supply Systems), Volume III, 1995 Edition.

This Order shall take effect immediately.

ROGELIO L. SINGSON
Secretary

Department of Public Works and Highways
Office of the Secretary
WIN6U01214

DPWH Standard Specification for ITEM 1044 – INTERIOR CEMENTITIOUS FIREPROOFING

1044.1 Description

This item shall consist of furnishing all materials, tools, and equipment including labor required in undertaking the proper installation of cementitious fire protection for application to steel structures and supports as shown on the Plans and in accordance with this Specification.

1044.2 Materials Requirements

All materials shall be cementitious fireproofing materials. It shall be a proprietary mixture of gypsum and/or Portland cement, with lightweight aggregates, mixed with water to form a slurry for conveyance and application. Mineral fiber based products shall not be permitted.

1044.2.1 Cementitious Fireproofing

This work is intended for interior concealed locations or interior exposed but out of reach locations, and therefore not subjected to physical contact and abuse.

Physical properties of standard density fireproofing materials shall be in accordance with the properties and recommended specifications listed in Table 1044.1.

Table 1044.1 - Physical Properties and Recommended Specifications

Physical Properties	Recommended Specifications	Test Method
1. Dry Density, Minimum Average	240 kg/m^3	ASTM E 605
2. Bond Strength	7.2 kPa min	ASTM E 736
3. Compression, 10% Deformation	112 kPa	ASTM E 761
4. Air Erosion	Max. 0.05 g/m^2	ASTM E 859
5. Corrosion	No evidence of corrosion	ASTM E 937
6. Deflection	No cracking, spalling or delamination	ASTM E 759
7. Bond Impact	No cracking, spalling or delamination	ASTM E 760
8. Flame Spread	0	ASTM E 84
9. Smoke Development	0	ASTM E 84
10. Noncombustibility	Non-combustible	ASTM E 136
11. Mold Resistance	No evidence of growth	ASTM G 21

Structural members not meeting minimum size requirements specified in a design shall receive a thickness of fireproofing consistent with the member's mass over density ratio.

Exposed fire protection shall include, but are not limited to, stairwell columns and beams, elevator shafts structural steel and mechanical room columns.

1044.2.2 Miscellaneous Materials

Items enumerated below shall be provided as recommended by the manufacturer.

1. Primers
   For surfaces where primer is necessary, fireproofing application may still take place as long as the adhesion property requirement on the manufacturer's recommendation is obtained.

2. Adhesives
   Adhesive shall be provided when necessary and must be in accordance with manufacturer's recommendation together with the fire test design requirements. Acceptable adhesives shall be: 1. Water-based acrylic adhesive, for general applications and, 2. Cementitious spatter coat, for all steel roof decks.

3. Lath
   Expanded metal lath shall be provided in areas where adhesion to substrate is questionable. It shall conform to the applicable requirements of Item 1040, Metal Lath and Accessories.

4. Reinforcements
   Fiberglass mesh or wire lath shall be provided in steel joists and in areas where adhesion is not compatible.

5. Mold Inhibitor
   Factory added mold inhibitor tested in accordance with ASTM G 21 shall be provided for areas such as hospitals, testing laboratories, health facilities and other areas with high consideration on hygienic requirements.

6. Top Coats
   Top coat shall be used as required and recommended by fireproofing manufacturer or compatible products. In corrosive environment, an appropriate topcoat shall be used. If seal coat is used, application may be done 24 hours after final application of fireproofing. Minimum and maximum cure times shall be based on product's data sheet.

7. Asbestos
   The product supplied shall be certified 100% asbestos-free.

1044.2.3 Miscellaneous Surface

1. Steel Surfaces
   All structural steel and steel decking surfaces for fireproofing shall be unprimed.

2. Painted/Primed Steel Surfaces
   For steel surfaces with existing paint covers or primers for fireproofing, considerations such as adhesion compatibility must be verified first, prior to the application, otherwise existing coating shall be removed.

3. Galvanized Surfaces
   All coatings, paint, or oil shall be removed from galvanized metal.

4. Non-Ferrous Surfaces
   Exposed surfaces for Aluminum, Copper and other non-Ferrous metals shall be primed.

1044.3 Construction and Installation

1044.3.1 Pre-installation Examination

The Applicator and the Contractor shall examine the surfaces to be fire protected and determine if the surfaces are satisfactory. Substrate conditions shall comply with the following conditions:

1. Substrates shall be free of grease, oil, rolling compounds, incompatible primers or paint, loose mill scale, dirt or any other foreign matter which would prevent proper bonding of fireproofing material. For painted or primed substrate, refer to Section 1044.2.3. Steel roofs and floor decks shall be galvanized.

2. Suspended objects such as hangers, piping attachments, and other related devices shall be properly secured.

3. Ducts, piping, and other equipment shall be taken from suspension or placed with a distance from the activity until after application.

4. Do not apply fireproofing to metal roof decking until roofing is complete. Prohibit all roof traffic until application of fireproofing is completed and dry.

5. The fireproofing should not be considered as part of the corrosion protection system.

1044.3.2 Preparation

Any substrate shall be cleaned prior to fireproofing application.

All work subjected to potential overspray during application shall be masked. Temporary enclosure shall be provided when necessary to temporarily confine fireproofing and protect the environment.

Ambient temperatures, and/or heat ventilation shall be maintained when required.

Water-based or cementitious adhesive shall be sprayed when necessary.

1044.3.3 Application Parameters

The fireproofing Contractor shall be allowed to move freely to apply products as necessary. Materials stored on the floor shall be protected by the Contractor or relocated if these materials prevent the proper application of fireproofing.

Patching, repairing and cleaning of fireproofing material residue from other damages shall be performed by the fireproofing Applicator.

After the completion of fireproofing, the Applicator shall remove all equipment and broom sweep all floor areas of overspray materials.

Application of fireproofing shall not commence until the project is at a stage to allow the applicator to apply product continuously and efficiently, without undue interference and delay by other trades.

1044.3.4 Sprayed Fireproofing Construction

Sprayed Fireproofing Construction shall comply with the manufacturers written application instructions and procedures for mixing, conveying and applying products, in accordance with the types of recommended equipment and specific procedures regarding the particular jobsite conditions.

For steel or concrete substrates with coated water-based adhesive, sprayed fireproofing shall be applied while the adhesive is still tacky.

Fireproofing materials shall be applied to required thickness per approved fire test design information. Multiple-layer may require two or more passes, depending on necessity allowing each coat to set between coats.

It shall provide a uniform surface. Product shall be applied at the minimum density required by the fire test design, or greater.

Fireproofing shall be cured to prevent premature drying if such site conditions apply.

The application of cementitious fireproofing of all steel members shall be carried out in accordance with the approved marked up drawings and thickness schedule issued for this job.

The final surface pattern and finish determined prior to installation shall be troweled. Its thickness shall be within tolerances of 3mm and the edges of termination shall be masked to achieve neat and sharp edges.

1044.3.5 Cleaning and Repair

After completion of each day's work, the Applicator shall broom clean the fireproofed area. Finished surfaces that are not intended to receive fireproofing shall be masked.

All patching of damaged fireproofing shall be accomplished by the Fireproofing Trade Contractor.

Hand patches may be tolerated for very small-sized patches. Every patch over a square meter of area should be managed with spray equipment.

1044.4 Manufacturer's Requirements

Manufacturer's product data, installation instructions, use and limitations for each material used, and applicable fire test designs, as listed by approved fire testing organization shall be submitted prior to application of sprayed fireproofing.

The Contractor or the Installer shall also submit tested designs which apply to the project construction assemblies or details. The design selection priority are as follows:

1. Tested design shall be in accordance with ASTM E 119.

2. If the project assembly or detail cannot be supported by any ASTM tested design source, a technical proposal that best matches the project situations shall be provided instead.

3. Any alternate proposal shall come from or be assisted by the Fireproofing manufacturer.

4. Any structure system or element which does not meet the dimension requirements stated in the tested design shall be protected by a thickness based upon its particular mass over density ratio.

1044.5 Packaging, Handling and Storing Material

All material to be used shall be delivered in original unopened packages bearing the name of the manufacturer, the brand and proper labels for fire hazard and fire resistance classifications.

The materials shall be kept dry until ready for use. Packages of material shall be kept off the ground, under cover and away from sweating walls and other damp surfaces. All bags that have been exposed to water before use shall be discarded. All materials shall be stored at a temperature above four degrees Centigrade (4°C) in a dry location, protected from weather. Stock material is to be rotated and used before its expiration date.

1044.6 Warranty

The Contractor shall furnish the DPWH/Owner a written guaranty stating that the sprayed cementitious fireproofing materials are free from defects. The guaranty shall be for the period of one (1) year from the date of the final acceptance of the work. Any part of the sprayed cementitious fireproofing surface that becomes defective during the term of the guaranty shall be replaced and made good by the Contractor at his own expense a manner satisfactory to the DPWH/Owner.

1044.7 Acceptance

a. Testing shall be done in accordance with the applicable building code and ASTM E 605.

b. Field Tests shall be done for thickness and density.

c. Variances shall be corrected with the testing agency present or implementing agency, and while the Applicator is performing work in the same area, to permit expedient corrections.

d. A schedule of tests to be performed shall be agreed upon by the Contractor and the Engineer.

e. Sprayed Fireproofing Products shall be tested and listed in compliance with the following ASTM Testing Standards:

1. ASTM E 119, Fire Test of Building Construction and Materials.
2. ASTM E 84, Test for Surface Burning Characteristics of Building Materials.

1044.8 Method of Measurement

The area to be paid for under this Item shall be the number of surface square meters (m^2) of sprayed fireproofing placed and accepted in the sprayed area. In computing the quantity, the dimensions shall be those as measured in place and completed based on the preceding requirements.

1044.9 Basis of Payment

The accepted quantity, measured as prescribed in Section 1044.8, shall be paid for at the Contract Unit Price for Interior Cementitious Spray-Applied Fireproofing which price and payment shall be full compensation for furnishing and placing all materials, including all labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item.

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
1044	Sprayed Cementitious Fireproofing	Square meter

References:

1. *Southwest Product S Specification*
2. *American Society for Testing and Materials (ASTM)*
3 *National Fireproofing Contractors Association*
4. *Carboline Company*
5. *Fireproofing Products. Grace Construction Products*