

**PART 1 - GENERAL****1.1 RELATED REQUIREMENTS**

- .1 Section 01 74 19 – Waste Management and Disposal.

**1.2 REFERENCE STANDARDS**

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .2 Underwriter's Laboratories of Canada (ULC)
  - .1 CAN-ULC-S101-04, Standard Methods of fire Endurance Tests of Building Construction and Materials.
  - .2 CAN-ULC-S102-03, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.
- .3 Samples: submit duplicate 300 x 300 mm size sample of exposed fireproofing for approval of texture and colour.
- .4 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
  - .1 Test Reports:
    - .1 Submit product data including certified copies of test reports verifying fireproofing applied to substrate as constructed on project will meet or exceed requirements of Specification.
    - .2 Submit test results in accordance with CAN-ULC-S101 for fire endurance and CAN-ULC-S102 for surface burning characteristics.
    - .3 For assemblies not tested and rated, submit proposals based on related designs using accepted fireproofing design criteria.
  - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures and surface preparation.
  - .4 Manufacturer's Field Reports: submit to manufacturer's written reports within [3] days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

**1.4 QUALITY ASSURANCE**

- .1 Qualifications:
    - .1 Installer: company specializing in sprayed-on fireproofing.
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- .2 Site Meetings:
  - .1 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installations, with contractor's representative and Departmental Representative accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Charts to:
    - .1 Verify Project requirements.
    - .2 Review installation and substrate conditions.
    - .3 Co-ordination with other building subtrades.
    - .4 Review [manufacturer's] installation instructions and warranty requirements.
  - .2 Prior to start of Work arrange for site visit with Departmental Representative to examine existing site conditions adjacent to demolition work.
  - .3 Hold project meetings every week.
  - .4 Ensure key personnel, site supervisor and project manager attend.
  - .5 Departmental Representative will provide written notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.
- .3 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.
  - .1 After delivery and storage of products, and when preparatory Work is complete but before installation begins.
  - .2 Upon completion of Work, after cleaning is carried out.

## 1.5 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
  - .3 Deliver packaged materials in original unopened containers, marked to indicate brand name, manufacturer and ULC markings.
- .2 Storage and Protection:
  - .1 Store materials indoors, in dry location.
  - .2 Store and protect materials from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.
  - .3 Damaged or opened containers will be rejected.
  - .4 Packaging to indicate shelf-life and materials to be applied prior to expiration of shelf-life.
  - .5 Provide temporary enclosures to prevent spray from contaminating air beyond application area.
  - .6 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of fireproofing materials.
- .3 Waste Management and Disposal:
  - .1 Waste Management and Disposal:
    - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
  - .2 Package Waste Management: recover packaging waste for reuse and manufacturer reuse of packaging materials such as pallets, crates, boards and other packaging material, in accordance with Section 01 74 19 – WASTE MANAGEMENT AND DISPOSAL.

## 1.6 AMBIENT CONDITIONS

- .1 At temperatures less than 5 degrees C, ensure that 5 degrees C air and substrate temperature is maintained during and for 24 hours after application. Ensure that natural ventilation to properly dry the fireproofing during and subsequent to its application is provided. In enclosed areas lacking openings for natural ventilation, ensure that interior air is circulated and exhausted to the outside.
- .2 Maintain relative humidity within limits recommended fireproofing manufacturer.
- .3 Ensure that natural ventilation to properly dry fireproofing during and subsequent to its application is provided.
- .4 If application is executed in enclosed areas lacking openings for natural ventilation, ensure that interior air is circulated and exhausted to the outside. Provide at least four (4) air renewals per hour by forced-air circulation.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Sprayed fireproofing: ULC certified plaste and/or Portland cement based, ULC markings, qualified for use in ULC Designs specified and fungus resistant for 28 days.
- .2 Primers: type recommended by fireproofing manufacturer and approved for use of specified ULC models.
- .3 Curing compound: type recommended by fireproofing manufacturer, qualified for use in ULC Designs specified.
- .4 Sealer: type recommended by fireproofing manufacturer, qualified for use in ULC Design specified.
  - .1 Colour: green.
- .5 Fireproofing: minimum dry density and cohesion/adhesion properties as follows:
  - .1 Fireproofing for concealed structural components above ceiling or inside walls, openings or between furrings: minimum applied dry density of 240 kg per cubic meter and cohesion/adhesion strength of 9.57 kPa.
  - .2 Fireproofing for exposed structural components unless otherwise specified: minimum applied dry density of 350 kg per cubic meter and cohesion/adhesion strength of 20.83 kPa.
  - .3 Fireproofing for structural components located in mechanical rooms and storage rooms: minimum applied dry density of 640 kg per cubic meter and cohesion/adhesion strength of 350 kPa.
  - .4 Ensure spray-applied fireproofing: does not crack, spall or delaminate under downward deflection conditions over 3 m clear span.
  - .5 Spray-Applied fireproofing material: not contribute to corrosion of test panels.
  - .6 Dust removal: not exceed 0.0025 gram per square meter.
- .6 Portland cement-based fireproofing (minimum 65 % per density), sprayable and with ULC label, approved for use as specified, formulated without commercial asbestos or mineral fiber, with a minimum average dry density of 350 kg/m<sup>3</sup> (22 lb/pi<sup>3</sup>).

- .7 The fireproofing will have to meet requirements indicated in drawings, technical specifications and the following performance test criteria:
  - .1 The fireproofing must have a mould inhibitor. Tested in accordance with ASTM G21, the fireproofing will demonstrate resistance to mould spread for a period of 21 days for general use and 60 days for materials installed in plenums.
  - .2 Fireproofing will have the following surface combustion characteristics, in accordance with ASTM E84 :
    - .1 Flame spread : 10
    - .2 Smoke developed : 0
  - .3 Water: Water used for mixing shall be clean, fresh, potable and exempt of mineral salts or other organic substances in quantities that will not affect fireproofing application.
  - .4 Primers: in accordance to manufacturer recommendations.
  - .5 Equipment: Spraying equipment must comply to manufacturer requirements and recommendations.

### **PART 3 - EXECUTION**

#### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- .2 Following demolition and construction work, repair existing fireproof cladding at the deck level by applying new fireproof cladding to ensure a new total ULC index of 2 h for existing concrete floor. Take note that existing floor offers a 1.5 h ULC index only.

#### **3.2 PREPARATION**

- .1 Substrate: free of material, which would impair bond.
  - .2 Verify that painted substrates are compatible and have suitable bonding characteristics to receive fireproofing.
  - .3 Remove incompatible materials.
  - .4 Ensure that items required to penetrate fireproofing are placed before installation of fireproofing.
  - .5 Ensure that ducts, piping, equipment, or other items which would interfere with application of fireproofing are not positioned until fireproofing work is completed.
  - .6 Verify if completed work is able to receive described works in this Section. Report any anomaly or non-concordance. Do not undertake work until corrections have been made.
  - .7 Application of the fireproofing will not begin until General Contractor and fireproofing applicator have examined surfaces to determine if they are suitable for receiving fireproofing.
  - .8 Confirm compatibility of substrates with fireproofing.
  - .9 In special conditions, follow manufacturer's recommendations.
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.10 Provide covers for work, tarps/sheeting and other satisfactory protections to protect surfaces from applied fireproofing.

.11 Adequately protect the top of elevator cab, rails and components before applying fireproofing.

### 3.3 APPLICATION

.1 Apply bonding adhesive or primer to substrate if recommended by manufacturer.

.2 Apply fireproofing to correspond with tested assemblies, or acceptable calculation procedures to provide following fire resistance ratings.

.3 Apply fireproofing over substrate, building up to required thickness to cover substrate with monolithic blanket of uniform density and texture.

.4 Tamp smooth, surfaces visible in finished work.

.5 Apply curing compound to surface of cementitious fireproofing as required by manufacturer.

.6 Apply sealer to surface of mineral fibre fireproofing as required by manufacturer where fireproofing is to be painted and as indicated.

.7 Keep fireproofing product in a dry location until time of use. Cover and elevate from ground all bags containing material and removed from moist surfaces. Throw any bag that has been exposed to water. Use material before expiry date.

.8 Applied Fireproofing must be done in accordance with manufacturer's instructions.

.9 Apply fireproofing on surface, in as many successive layers or steps to achieve a monolithic layer of required thickness and desired uniform texture, with a minimum average dry density of 350 kg/m<sup>3</sup> (22 lb/pi<sup>3</sup>).

.10 Never deviate from applicable fire rating description.

.11 Work within temperature, moisture and other special condition limits specified by manufacturer.

.12 Maintain substrate and ambient air temperature of at least 4.5°C, preceding, during and following fireproof application. If necessary, General Contractor will heat work area to maintain specified temperatures.

### 3.4 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.

.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

.2 Inspection and Site Tests:

.1 Inspection and testing of fireproofing will be carried out by Testing Laboratory designated by Departmental Representative.

**3.5 PATCHING**

- .1 Patch damage to fireproofing caused by testing or by other trades before fireproofing is concealed, or if exposed, before final inspection.

**3.6 CLEANING**

- .1 Proceed in accordance with Section 01 74 00 – Cleaning.
- .2 Final Cleaning : upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 – Cleaning.
  - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Waste Management : separate waste materials for reuse and recycling in accordance with Section 01 74 19 – Waste Management and Recycling and 01 35 21 – LEED Requirements.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**

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