



To: *Kulomack@henweberegeddy.com*

*Dave W ①
Jerry ②*

BLAZE-SHIELD® II

Spray-Applied Fire Resistive Material

2

CAFCO® BLAZE-SHIELD® II is a portland cement based spray-applied fire resistive material (SFRM) designed to provide fire resistive ratings for structural steel and concrete in commercial construction.

Applied directly to deck, steel beams, columns or concrete surfaces, the outstanding value and proven fire resistive performance of BLAZE-SHIELD II make it an excellent choice for concealed commercial environments.

BLAZE-SHIELD II is applied exclusively by CAFCO licensed and trained contractors. Our technical staff works closely with building team members to meet all fire protection needs.

Code Compliances

CAFCO BLAZE-SHIELD II satisfies the requirements of the following:

- IBC—International Building Code
- SBCCI—Southern Building Code Congress International (Report No. 9423E)
- ICBO—International Conference of Building Officials (Report No. 1244)
- BOCA—Building Officials and Code Administrators International
- New York City—MEA
- NBC—National Building Code of Canada, Sections 2.5, 3.1.5, and 3.1.7

Major Specifications

BLAZE-SHIELD II complies with the requirements of the following specifications:

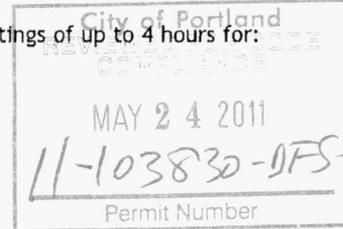
- General Services Administration (GSA): AIA/SC/GSA: 07811
- Department of the Navy NAVFACENCOM Guide Specification NFGS 07810, Sprayed-On Fireproofing
- Veterans Administration (VA): H-08-1
- U.S. ARMY Corps of Engineers. CEGS-07811
- U.S. Environmental Protection Agency (EPA): Regulation 40
- Construction Specification Canada (CSC) TEK-AID

Fire Test Performance

CAFCO BLAZE-SHIELD II has been extensively tested for fire endurance by Underwriters Laboratories, Inc. (UL) and Underwriters Laboratories of Canada (ULC) in accordance with ASTM E119 (UL 263, CAN/ULC-S101).

These tests have resulted in ratings of up to 4 hours for:

- Floor Assemblies
- Beams
- Joists
- Columns
- Roof Assemblies
- Walls and Partitions



BLAZE-SHIELD II has also been tested in accordance with ASTM E84 and CAN/ULC-S102 and has the following Surface Burning Characteristics:

Flame Spread.....0
Smoke Developed.....0

Thermal Properties

The unique formulation of CAFCO® BLAZE-SHIELD® II makes it a very effective thermal insulator. This benefit is important in reducing heat loss, particularly when applied to the underside of a roof deck. The R-value added by BLAZE-SHIELD II may allow a reduction in roof insulation.

Product	Conductivity (k)*	Resistance (R/inch)
BLAZE-SHIELD II	0.30 BTU in/hr ft² °F @ 75°F (0.043 W/mK @ 24°C)	3.33

*When tested in accordance with ASTM C518

Acoustical Properties

As an efficient sound-absorbing material, BLAZE-SHIELD II adds value to the fire protection application in areas where high-noise levels are anticipated. Typical acoustical performance is as follows:

Product	Thickness	Base	NRC Rating*
BLAZE-SHIELD II	1/2 inch (13 mm)	Deck & Beam	0.75
BLAZE-SHIELD II	1 inch (25 mm)	Solid	0.75

*When tested in accordance with ASTM C423

Physical Performance

Characteristic	ASTM Method	Standard Performance*	Tested Performance**
Density	E605	15 pcf (240 kg/m³)	16 pcf (256 kg/m³)
Combustibility	E136	Noncombustible	Noncombustible
Cohesion/Adhesion	E736	150 psf (7.2 kPa)	360 psf (17.2 kPa)
Deflection	E759	No Cracks or Delaminations	No Cracks or Delaminations
Bond Impact	E760	No Cracks or Delaminations	No Cracks or Delaminations
Compressive Strength	E761	750 psf (35.9 kPa)	2,380 psf (114 kPa)
Air Erosion Resistance	E859	Less than 0.025 g/ft² (0.27 g/m²)	0.000 g/ft² (0.000 g/m²)
Corrosion Resistance	E937, Mil. Std. 810	Does Not Promote Corrosion of Steel	Does Not Promote Corrosion of Steel
Sound Absorption	C423		0.75 NRC, 1/2" (13mm) onto deck and beam

* Standard performance based on General Services Administration AIA/SC/GSA/07811 except for density, which is based on UL. Refer to UL design for density requirement.

** Values represent independent laboratory tests under controlled conditions

Micra 11-103830-DFS-01

615 SW Alder

11-103830 DFS 01 FA

BLAZE-SHIELD II Guide Specification

PART 1 – GENERAL

1.1 Work Included

- 1.1.1 Provide all labor, materials, equipment and services necessary for, and incidental to, the complete and proper installation of all spray-applied fire resistive material and related work as shown on the drawings or where specified herein, and in accordance with all applicable requirements of the Contract Documents.
- 1.1.2 The material and installation shall conform to the applicable building code requirements and the requirements of all authorities having jurisdiction.
- 1.2 Quality Assurance
- 1.2.1 Work shall be performed by a firm with expertise in the installation of fire protection or similar materials. This firm shall be licensed or otherwise approved by the spray-applied fire resistive material manufacturer.
- 1.2.2 Before proceeding with the fire protection work, approval of the proposed material thicknesses and densities shall be obtained from the architect and other applicable authorities having jurisdiction.

1.3 Related Sections

- 1.3.1 Section 05100 - Structural Steel.
- 1.3.2 Section 05300 - Metal Decking.
- 1.3.3 Section 07200 - Insulation.
- 1.3.4 Section 07270 - Firestopping.
- 1.3.5 Section 07812 - Intumescent Coatings.
- 1.3.6 Section 09200 - Lath and Plaster.
- 1.3.7 Section 09900 - Painting.

1.4 References

- A. ASTM E84 - Surface Burning Characteristics of Building Materials.
- B. ASTM E119 - Fire Tests of Building Construction and Materials.
- C. ASTM E136 - (Noncombustibility) Behavior of Materials in a Vertical Tube Furnace at 750 C.
- D. ASTM E605 - Thickness and Density of Sprayed Fire-Resistive Materials Applied to Structural Members.
- E. ASTM E736 - Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.
- F. ASTM E759 - Effect of Deflection of Sprayed Fire-Resistive Materials Applied to Structural Members.
- G. ASTM E769 - Effect of Impact on Bonding of Sprayed Fire-Resistive Materials Applied to Structural Members.
- H. ASTM E761 - Compressive Strength of Sprayed Fire-Resistive Materials Applied to Structural Members.
- I. ASTM E859 - Air Erosion of Sprayed Fire-Resistive Materials Applied to Structural Members.
- J. ASTM E937 - Corrosion of Steel by Sprayed Fire-Resistive Materials Applied to Structural Members.
- K. CAN/ULC-S101 - Standard Methods of Fire Tests of Building Construction and Materials.
- L. CAN/ULC-S102 Steiner Tunnel Test.
- M. CAN4-S114 Standard Test Method for Determination of Noncombustibility in Building Materials.
- 1.4.1 Underwriters Laboratories, Inc. (UL) Fire Resistance Directory.
- 1.4.2 Underwriters Laboratories of Canada (ULC) List of Equipment and Materials.

- 1.4.3 Uniform Building Code Standard No. 7-6 (current edition): Thickness and Density Determination for Spray-Applied Fire Protection.
- 1.4.4 AWCI Publication: Technical Manual 12-A Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-Resistive Materials; an Annotated Guide.
- 1.5 Submittals
- 1.5.1 Manufacturer's Data: Submit manufacturer's specifications, including certification as may be required to show material compliance with Contract Documents.
- 1.5.2 Test Data: Independent laboratory test results shall be submitted for all specified performance criteria.
- 1.6 Delivery, Storage and Handling
- 1.6.1 Deliver materials to the project in manufacturer's unopened packages, fully identified as to trade name, type and other identifying data. Packaging shall bear the UL and ULC labels for fire hazard and fire-resistance classifications.
- 1.6.2 Store materials above ground, in a dry location, protected from the weather. Damaged packages found unsuitable for use should be rejected and removed from the project.
- 1.7 Project Conditions
- 1.7.1 When the prevailing outdoor temperature at the building is less than 40° F (4° C), a minimum substrate and ambient temperature of 40° F (4° C) shall be maintained prior to, during, and a minimum of 24 hours after application of spray-applied fire resistive material. If necessary for job progress General Contractor shall provide enclosures with heat to maintain temperatures.
- 1.7.2 General Contractor shall provide ventilation to allow proper drying of the spray-applied fire resistive material during and subsequent to its application.
- 1.7.2.1 In enclosed areas ventilation shall not be less than 4 complete air changes per hour.
- 1.8 Sequencing/Scheduling
- 1.8.1 All fire protection work on a floor shall be completed before proceeding to the next floor.
- 1.8.2 The Contractor shall cooperate in the coordination and scheduling of fire protection work to avoid delays in job progress.

PART 2 – PRODUCTS

- 2.1 Acceptable Manufacturers. The spray-applied fire resistive material shall be manufactured under the CAFCO® brand name, by authorized producers.
- 2.2 Materials
- 2.2.1 Materials shall be BLAZE-SHIELD® II, (UL/ULC designation: Type II) applied to conform to the drawings, specifications and following test criteria:
- 2.2.1.1 Deflection: When tested in accordance with ASTM E759, the material shall not crack or delaminate when the non-concrete topped galvanized deck to which it is applied is subjected to a one time vertical centerload resulting in a downward deflection of 1/120th of the span
- 2.2.1.2 Bond Impact: When tested in accordance with ASTM E760, the material shall not crack or delaminate from the concrete topped galvanized deck to which it is applied.

- 2.2.1.3 Cohesion/Adhesion (bond strength): When tested in accordance with ASTM E736, the material applied over uncoated or galvanized steel shall have an average bond strength of 150 psf (7.2 kPa).
- 2.2.1.4 Air Erosion: When tested in accordance with ASTM E859, the material shall not be subject to losses from the finished application greater than 0.025 grams per sq. ft. (0.27 grams per square meter).
- 2.2.1.5 Compressive Strength: When tested in accordance with ASTM E761, the material shall not deform more than 10 percent when subjected to a crushing force of 750 psf (35.9 kPa).
- 2.2.1.6 Corrosion Resistance: When tested in accordance with ASTM E937, the material shall not promote corrosion of steel.
- 2.2.1.7 Noncombustibility: When tested in accordance with ASTM E136 or CAN4-S114, the material shall be noncombustible.
- 2.2.1.8 Surface Burning Characteristics: When tested in accordance with ASTM E84 or CAN/ULC-S102, the material shall exhibit the following surface burning characteristics:
Flame Spread.....0
Smoke Developed.....0
- 2.2.1.9 Density: When tested in accordance with ASTM E605, the material shall meet the minimum individual and average density values as listed in the appropriate UL / ULC design or as required by the authority having jurisdiction.
- 2.2.2 The material shall have been tested and classified by Underwriters Laboratories, Inc. (UL) or Underwriters Laboratories of Canada (ULC) in accordance with the procedures of UL 263 (ASTM E119) or CAN/ULC-S101.
- 2.2.3 Spray-applied fire resistive materials shall be applied at the approved minimum thickness and density to achieve the following ratings:
Floor assemblies ____hr.
Roof assemblies ____hr.
Beams ____hr.
Girders ____hr.
Columns ____hr.
Joists ____hr.
- 2.2.4 Potable water shall be used for the application of spray-applied fire resistive materials.
- 2.2.5 Spray-applied fire resistive materials shall be free of all forms of asbestos, including actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite. Material manufacturer shall provide certification of such upon request.

PART 3 – EXECUTION

3.1 Preparation

- 3.1.1 All surfaces to receive fire protection shall be free of oil, grease, loose mill scale, dirt, paints/primers or other foreign materials which would impair satisfactory bonding to the surface. Manufacturer shall be contacted for procedures on handling primed/painted steel. Any cleaning of surfaces to receive spray-applied fire resistive material shall be the responsibility of the General Contractor or Steel Erector, as outlined in the structural steel or steel deck section.
- 3.1.2 Clips, hangers, supports, sleeves and other attachments to the substrate are to be placed by others prior to the application of spray-applied fire resistive materials.
- 3.1.3 The installation of ducts, piping, conduit or other suspended equipment shall not take place until the application of spray-applied fire resistive material is complete in an area.
- 3.1.4 The spray-applied fire resistive material shall only be applied to steel deck which has been fabricated and erected in accordance with the criteria set by the Steel Deck Institute.

- 3.1.5 When roof traffic is anticipated, as in the case of periodic maintenance, roofing pavers shall be installed as a walkway to distribute loads.
- 3.2 Application
- 3.2.1 Equipment, mixing and application shall be in accordance with the manufacturer's written application instructions.
- 3.2.2 The application of spray-applied fire resistive material shall not commence until certification has been received by the General Contractor that surfaces to receive spray-applied fire resistive material have been inspected by the applicator and are acceptable to receive spray-applied fire resistive material.
- 3.2.3 All unsuitable substrates must be identified and made known to the General Contractor and corrected prior to application of the spray-applied fire resistive material.
- 3.2.4 Spray-applied fire resistive material shall not be applied to steel floor decks prior to the completion of concrete work on that deck.
- 3.2.5 The application of spray-applied fire resistive material to the underside of roof deck shall not commence until the roofing is completely installed and tight, all penthouses are complete, all mechanical units have been placed, and after construction roof traffic has ceased.
- 3.2.6 Proper temperature and ventilation shall be maintained as specified in 1.7.1, 1.7.2 and 1.7.2.1.
- 3.2.7 Provide masking, drop cloths or other suitable coverings to prevent overspray from coming in contact with surfaces not intended to be sprayed.
- 3.2.8 CAFCO® BOND-SEAL (Type EBS) adhesive shall be applied as per the appropriate UL/ULC fire resistance design and manufacturer's written recommendations.

3.3 Repairing and Cleaning

- 3.3.1 All patching of and repair to spray-applied fire resistive material, due to damage by other trades, shall be performed under this section and paid for by the trade responsible for the damage.
- 3.3.2 After the completion of the work in this section, equipment shall be removed and all surfaces not to be sprayed shall be cleaned to the extent previously agreed to by the applicator and General Contractor.

3.4 Inspection and Testing

- 3.4.1 The spray-applied fire resistive material shall be tested for thickness and density in accordance with one of the following procedures: ASTM E605 - Standard Test Method of Sprayed Fire-Resistive Materials Applied to Structural Members. AWCI - Technical Manual 12-A Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-Resistive Materials an Annotated Guide. UBC Standard No. 7-6 - Thickness and Density Determination for Spray-Applied Fire Protection.

Product Availability

CAFCO Spray-Applied Fire Resistive Materials are available to trained, licensed contractors around the world from strategically located production and distribution points in the U.S., Canada, Mexico, Europe and the Pacific Basin.

For Further Information

ISOLATEK INTERNATIONAL is registered with the AIA Continuing Education System (AIA/CES). For further information CAFCO® Technical and Sales Representatives are always available to lend assistance. Additional printed materials, including Material Safety Data Sheets, and other product literature, are available upon request. For more information about our CAFCO® line of sprayed fire protection, thermal and acoustical treatments, SprayFilm™ Intumescent Coatings, and CAFCO-BOARD™ or for the name of the Sales Representative in your area, please contact:

In the United States: Isolatak International, Stanhope, New Jersey Tel: 800.631.9600 Fax: 973.347.9170
In Mexico & Central America: Cafco Mexico S.A. de C.V., Mexico D.F. Tel: 52.55.5254.6683 Fax: 52.55.5531.7826
In Andean Countries: Cafco Andina S.A., Santiago, Chile Tel: 562.378.5120 Fax: 562.378.5121
In Canada: Cafco Industries, Toronto, Ontario Tel: 888.873.0003 Fax: 416.679.2933

For more detailed product information, visit our website at www.cafco.com or contact us at cafco@isolatek.com

ISOLATEK
INTERNATIONAL

The performance data herein reflect our expectations based on tests conducted in accordance with recognized standard methods under controlled conditions. The sale of these products shall be subject to the Terms and Conditions of Sale set forth in the Company's invoices. Isolatak International is not responsible for property damage, bodily injuries, consequential damages or losses of any kind that arise from or are related to the applicator's, general contractor's, or property owner's failure to follow the recommendations set forth in Isolatak International's publications. No agent, employee or representative of the Company, its subsidiary or affiliated companies, is authorized to modify this statement.



Health Hazard	①
Fire Hazard	②
Reactivity	③
Personal Protection	④
HMIS RATING	

MATERIAL SAFETY DATA SHEET (OSHA 29 CFR 1910.1200)



Effective Date: October 29, 2004
Supersedes: November 12, 2001

SECTION I – PRODUCT INFORMATION

1. **MANUFACTURER'S NAME AND ADDRESS:**
United States Mineral Products Company
dba Isolatek International/CAFCO INDUSTRIES
41 Furnace Street
Stanhope, NJ 07874
2. **EMERGENCY TELEPHONE NUMBER:**
973-347-1200
3. **CHEMICAL NAME AND SYNONYMS**
Spray-Applied Fire Resistive Materials (SFRMs).
4. **CHEMICAL FAMILY:**
Silicates and Calcium Sulfates
5. **FORMULA:**
Slag Wool and Inorganic Binders
6. **TRADE NAMES AND SYNONYMS:**
CAFCO® BLAZE-SHIELD®, CAFCO BLAZE-SHIELD WHITE, CAFCO BLAZE-SHIELD CHARCOAL, CAFCO BLAZE-SHIELD II, CAFCO BLAZE-SHIELD II WHITE, CAFCO BLAZE-SHIELD II CHARCOAL, CAFCO BLAZE-SHIELD HP, CAFCO BLAZE-SHIELD HP WHITE, CAFCO BLAZE-SHIELD HP CHARCOAL,

SECTION II – HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

INGREDIENT	CAS NUMBER	OSHA PEL	ACGIH TLV-TWA
Slag Wool	65997-17-3	NE	1 fiber /cc
Powdered Binders & Fillers	N/Ap	Total Dust: 15mg/m ³	10mg/m ³
Nuisance Particulates		Respirable fraction: 5mg/m ³	3mg/m ³

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

- | | | |
|----|--|------------------------------|
| 1. | Boiling Point (°F): | N/Ap |
| 2. | Vapor Pressure (mm Hg): | N/Ap |
| 3. | Vapor Density (Air=1): | N/Ap |
| 4. | Solubility in Water: | Negligible |
| 5. | Specific Gravity (H ₂ O=1): | >1 |
| 6. | Melting Point (°F): | >1800 |
| 7. | Evaporation Rate: | N/Ap |
| 8. | Appearance and Odor: | White to charcoal, low odor. |
| 9. | Physical State: | Solid |

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

- | | | |
|----|-------------------------------------|----------------|
| 1. | Flash Point (Method used): | N/Ap |
| 2. | Flammable Limits: | Noncombustible |
| 3. | Extinguishing Media: | N/Ap |
| 4. | Special Fire Fighting Procedures: | N/Ap |
| 5. | Unusual Fire and Explosion Hazards: | None |

SECTION V - REACTIVITY DATA

- | | | |
|----|---------------------------------------|---------------------------|
| 1. | Stability: | Stable |
| | Conditions to Avoid: | Contact with strong acids |
| 2. | Incompatibility (Materials to Avoid): | Strong Acids |
| 3. | Hazardous Decomposition Products: | CO, CO ₂ |
| 4. | Hazardous Polymerization: | Will not occur |
| | Conditions to Avoid: | N/Ap |

NE = Not Established
N/Ap = Not Applicable

SECTION VI - HEALTH HAZARD DATA

Primary Routes of Entry: Inhalation, Skin and Eye Contact.

Acute: Slag wool and other nuisance particulates may cause transitory skin irritation (itching) and possible irritation of eyes and upper respiratory tract.

Carcinogenicity: NTP - NO OSHA - NO IARC - 3 (Not classifiable as to human carcinogenicity)

Medical Conditions Aggravated by Exposure: Any condition, which may be aggravated by mechanical irritants.

Emergency and First Aid Procedures:

Eye Contact: *Flush with water.
Skin Contact: *Wash with water. Launder clothing separate from other garments.
Inhalation: *Remove to fresh air.

*If irritation persists, seek medical attention.

USE NORMAL PERSONAL HYGIENE AFTER CONTACT TO REMOVE ANY MATERIAL CONTAMINANTS.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

- Steps to be taken in case material is released or spilled:
Sweep up and place in disposal containers. Avoid inhalation of dust.
- Waste Disposal Method: Land Fill - In accordance with local, state, and federal regulations.
- Precautions to be taken in handling and storing:
Avoid inhalation of dust during use. Avoid skin and eye contact. Use normal personal hygiene to remove material contaminants.

SECTION VIII - CONTROL MEASURES

- Respiratory Protection: Use NIOSH approved dust mask or equivalent for nuisance dust.
- Ventilation: Sufficient to maintain dust levels below TLV.
- Protective Gloves: Wear cloth gloves.
- Eye Protection: Wear proper eye protection.
- Other Protective Equipment: Wear Loose fitting long sleeve shirt and pants.

SECTION IX - PREPARATION INFORMATION

Prepared By: Research Department, U.S.A.

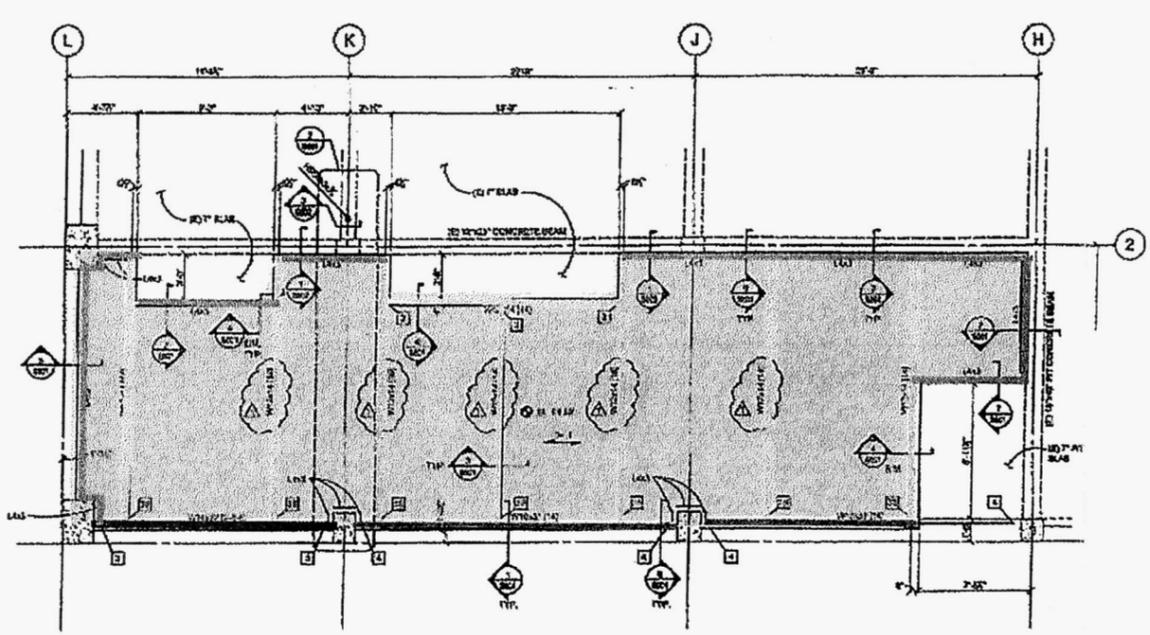
Telephone: (973) 347-1200

Effective Date: October 29, 2004

Supersedes: November 12, 2001

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof. **VENDOR SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** In no event shall the vendor be liable for special, indirect or consequential damages.

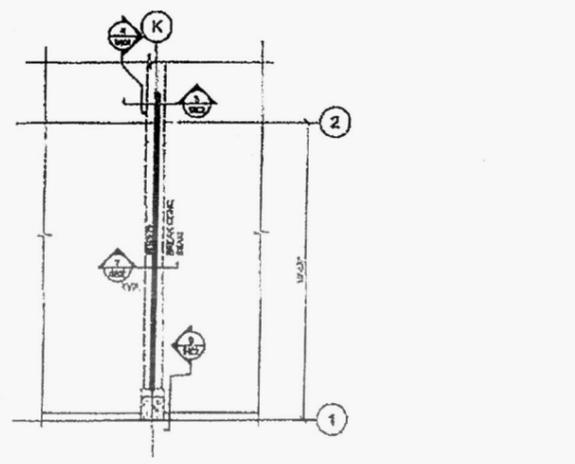
Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in this data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes all risks in his use of the material.



1 SECOND FLOOR FRAMING PLAN
12'-0" x 15'-0"

FIREPROOFING THICKNESS DRAWINGS
 PREPARED BY NORKOTE INC.
 CONTACT: RUSS WILSON
 425 771-1138
 MATERIAL: ISOLATEK, CAFCO BLASE-SHIELD II
 CONTACT: TERRY WILDEBOER, CSI
 206-546-8645

BEAMS: 3 HOUR PER UL DESIGN D858 AS MARKED
 METAL DECK: 3 HOUR PER UL DESIGN D858 1"



2 THIRD FLOOR FRAMING - PARTIAL PLAN
12'-0" x 15'-0"

- MEMBER SIZE / FP THICKNESS
- 3 Hour W12x14 (1-11/16") D858
 - 3 Hour W16x31 (1-3/8") D858
 - 3 Hour W14x22 (1-1/2") D858
 - 3 Hour L4x3x3/8 (2-3/8") D858
 - 3 Hour Decking (1") D858
 - 3 Hour W10x19 (1-7/16") D858

FRAMING PLAN
 SECOND FLOOR
 PERMIT SET
S201