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February 23, 2018

Brad Finlay, Vice President
Monaghan Woodworks, Inc.
100 Commercial Street, Suite 212
Portland, Maine 04101

Re: Tess' Designer Yarns
424 Fore Street- 2nd Floor
Portland, Maine 04101

Mr. Finlay,

We have reviewed your project at the second floor of 424 Fore Street in Portland (Tess' Designer Yarns), documents submitted to the City of Portland & comments returned from the local code official. It is our understanding that a 'Change of Use' permit is required at this tenant space as the use has previously been a business office and is currently a retail store. This change of use thus requires the space to become code compliant as required by the current additions of IEBC & NFPA 101.

The building is currently un-sprinklered (lower level restaurant space only is sprinklered) however has an early response fire alarm life safety system that is monitored by a third party. The second floor use at this tenant is classified as a mercantile space with a business use space directly above at the third floor while the tenant spaces at the ground level below are classified as mercantile. The exit travel distance of 28' meets the maximum requirement of 75' for a single exit per IBC 1021.2.

Upon conclusion of our research, site visit & discussion with the local code official we recommend the following actions be taken to ensure most efficient code compliance possible for this space and construction constraints given the existing field conditions.

1. Fire Rated Wall: The existing wall assembly between the tenant space and egress stairs appear to be of a one our fire rated construction however the existing door does not maintain the same required rating. Install a 60 minute half lite fire rated wood door with 'Fire Lite' glazing along with a hollow metal frame. This door would also require a closer and 'ADA' lever hardware. All penetrations in to, out of or through this wall would require a fire rate penetration sealant as well.

2. Floor/ Ceiling Assembly: The existing floor/ ceiling assembly between the 2nd & 3rd floors are currently consisted of exposed heavy timber floor joists of approximately 4"x10" in size spaced roughly 16-24" O.C. with rough sawn 1" thick lap floor boards of varying widths. Finish floor atop at the 3rd floor is typically carpet atop plywood sheathing in most areas.

100 Commercial St
Suite 205
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Phone: 207.774.9057
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E-Mail:
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Member AIA

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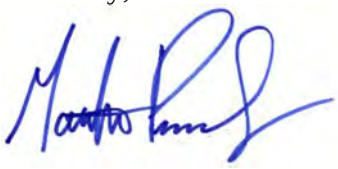
a. Install 'FX Lumber Guard' coating by Fire Retardant Coatings of Texas as required per manufacturers recommendations to achieve a one hour fire rating on all timber joists & floor boards, cover all members in their entirety. See figure A.1 thru A.3 for all information and specifications.
b. Install mineral wool fire stopping at all floor/ masonry wall intersections per code and manufacture requirements (see figure B.1).
c. Install fire blocking and fire caulking at all tops of walls along tenant wall/ egress stair wall (see figure C.1).
d. All areas of damaged floor boards shall be repaired with a similar material along with filling all gaps larger than 1/8" at boards with fire caulking leaving a 'tooled' finish (see figure D.1 & D.2).

If you have any additional questions, comments or concerns please do not hesitate to contact our office for clarification.

Sincerely,



Matt Provencal, Assoc. AIA
Architectural Designer
Mark Mueller Architects

CC: Todd Dominski, Buildings Manager (East Brown Cow)
Peter Harrington, Broker (Malone Commercial Brokers)
Tess' Designer Yarns (Tenant)

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INSTALL 'FX LUMBER GUARD' COATING BY FIRE RETARDANT COATINGS OF TEXAS AS REQUIRED PER MANUFACTURERS RECOMMENDATIONS TO ACHIEVE AN ONE HOUR FIRE

FIGURE A.1

FIGURE A.2

Fire Retardant Coatings of Texas®, LLC
1150 Blue Mound Rd West #403
Haslet, Texas 76052
Off. (817) 710-5233 Fax (817) 439-8385
www.frctexas.com

FX LUMBER GUARD®

TECHNICAL DATA SUBMITTAL SHEET

Technical Information			
FSI <25 SGI / SDI <200	Mold Inhibitor & Insect Resistant		DON'T LET FREEZE DON'T DILUTE
Apply 45-95°F Store >45°F	Non Corrosive	Non Toxic	ENVIRONMENT SAFE
1 COAT APPLICATION	Transparent	STAINABLE / PAINTABLE	
Shelf Life: 3yrs	9.8 lbs per gallon		PH Range: 4.5-5%

A colorant can be added for validation of treatment.

Certified Listed to ASTM E84 & ASTM E2768 *Class A rated*
SYP, SPF, Hem Fir & Doug Fir Lumber, SPF / SYP Plywood & OSB
CSI Div. 06 05 73.13 Fire Retardant Wood Treatment & CSI Div. 09 96 43 Fire Retardant Coatings

Additional Testing

ASTM E119 1 hour rated (commercial)
ASTM E119/ULC S101 17 minute rated (residential)
CAN/ULC S102 Class A
NFPA 255/703 ANSI/UL723 UBC 42.1

Additional Applications: **I-Joist, PSL, LVL, LSL's, Glulam's, Cedar, Redwood, OSB, MDF, Particle Board and other porous softwoods / hardwoods & Sheathings.**

FX LumberGuard: Fire Retardancy is indefinite if protected from excessive exposure to high humidity of >80% constantly or wet locations.

FX LumberGuard: is rated one of the top fire retardant coatings for application process, performance, stability, testing & certifications.

FX LumberGuard: treated dimensional lumber will not require retreating for straight or cross cuts, if ripping, the board will need re-treating, plywood can be straight, cross cut or ripped and will not require re-treatment.

FX LumberGuard: can be used over stain, provided the stain doesn't have any wood protectant (wax, paraffin or latex) in it.

Application Process:

Material to be treated must be clean & dry before treating. Agitate FX Lumber Guard before and throughout application. Apply as it's received by spraying with a hand pump sprayer, a high volume low pressure system, rolled or brushed on at a rate of 300-350 sf per gallon depending on material being treated. (Vertical spraying) Start from the bottom and work up as there is less run off this way, drying time will vary from 8-32hrs depending on temp & humidity. The maximum moisture content for the substrate to be treated is 15 percent for dimensional lumber, 19 percent for plywood, and 16 percent for oriented strand board (OSB).

Field Testing:

When the observation of the treatment and/or field testing is required, field testing must be conducted as follows: The treated substrate will not have distinctive observable features. To ensure the substrate has been treated properly, the treated substrate must be field tested, the flame from a small fire source (propane torch) is applied to a treated and untreated sample of substrate for a period of not less than 15 seconds. The presence of the treatment must be observable through the comparison of the reactions of the substrates to the flame. Presence of the coating can be observed when the coatings begin to form a black char layer.

Meets 16 CFR 1500.3 FHSA of the Consumer Product Safety Commission (CPSC) as Non-Hazardous / Non-Toxic

NOTE: Degradation: Design Values *of lumber or plywood are not affected by the application of FX Lumber Guard due to the less evasive application then impregnation and/or kiln drying.*

WARNING: KEEP THIS AND ALL CHEMICALS OUT OF CHILDRENS REACH - AS WITH ANY PRODUCT, THIS PRODUCT MAY CAUSE EYE AND/OR SKIN IRRITAION - ALWAYS WEAR PERSONAL PROTECTION EQUIPMENT WHEN HANDLING THIS OR ANY CHEMICALS.

Certified & Tested Intertek CCRR-1044 — Intertek W/N 21094 — ESR-3872 — ESL-1087 — ESL-1064 PMG — ER-478 IAPMO ES — Committed to Quality, Committed to You

FIGURE A.3

TEST REPORT

Intertek

REPORT NUMBER: 101183276SAT-001
ORIGINAL ISSUE DATE: August 29, 2013
REVISED DATE: N/A

EVALUATION CENTER
16015 Shady Falls Road
Elmendorf, TX 78112
Phone: (210) 635-8100
Fax: (210) 635-8101
www.intertek.com

RENDERED TO

Fire Retardant Coatings of Texas
1150 Blue Mound Rd. West
Haslet, TX 76052

PRODUCT EVALUATED: 7'X7' Floor/Ceiling Assembly
EVALUATION PROPERTY: Fire Resistance

Report of Testing 7'X7' Floor/Ceiling Assembly for compliance with the applicable requirements of the following criteria: Modified *ASTM E119–12a Standard Test Methods for Fire Tests of Building Construction and Materials, 2012 Edition.*

1 Table of Contents

2 Introduction

Intertek Testing Services NA, Inc. (Intertek) has conducted testing for Fire Retardant Coatings of Texas, on their 7'X7' Floor/Ceiling Assembly, to evaluate its fire resistance. Testing was conducted in accordance with the applicable requirements of, and following the standard methods of, Modified **ASTM E119–12a Standard Test Methods for Fire Tests of Building Construction and Materials, 2012 Edition**. This evaluation took place on August 21, 2013.

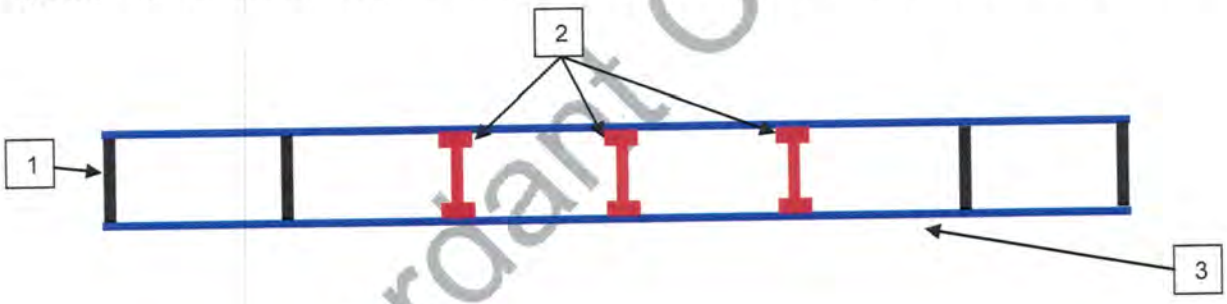
3 Test Samples

3.1. SAMPLE SELECTION

Samples were submitted to Intertek directly from the client. Samples were not independently selected for testing. Samples (Intertek I.D. Nos. SAT1308061725-001 through -003) were received at the Evaluation Center on August 6, 2013.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

A symmetrical, 7' x 7', non-load bearing floor/ceiling was constructed of lumber framing, wood joists, intumescent caulking, and magnesium-oxide board cladding (see Appendix A).



1. Framing – nominal 2 x 9-1/2" wood members were installed around the perimeter and attached with three 3-1/2" long Deck Mate screws at each location.

2. Joists – 7' x 9-1/2" TJI Trus Joists spaced 16" o.c., attached to the perimeter board using four 3-1/2" long Deck Mate screws; two screws at each cord (top and bottom) at each location. Two joists were installed using the same wood members as the framing between the I-joists and the perimeter framing, spaced 16" o.c. from the I-joists.

3. Cladding – 4' x 8' x 1/2" thick MagBoard™ (Fiber-Reinforced Magnesium-Oxide-Based Sheet); installed with the long edge perpendicular to the joists and secured using #8 x 1-1/4" long, coarse thread screws spaced nominally 8" o.c. A nominal 1/4" bead of 3M™ Fire Barrier Sealant CP 25WB+ (intumescent) caulking was applied at the butt joints of the MagBoard™. The joints of the cladding were staggered 24" o.c. from the exposed to the unexposed side of the assembly.

4 Testing and Evaluation Methods

4.1. INSTRUMENTATION

The unexposed surface of the assembly was instrumented with a total of six (6), 24 GA, Type K, fiberglass jacketed thermocouples, located on the unexposed side (see Appendix A). The output of the thermocouples and the furnace probes were monitored by a 300-channel Yokogawa, Inc., Darwin Data Acquisition Unit. The computer was programmed to scan data every 6 seconds and save data every 30 seconds. Following the test, the files were imported into MS Excel for tabular and graphical display (presented in Appendix B).

4.2. TEST STANDARD

Testing was conducted in accordance with the applicable requirements of, and following the standard methods of a Modified **ASTM E119–12a Standard Test Methods for Fire Tests of Building Construction and Materials, 2012 Edition.**

4.2.1. Deviation From Standard Method

R & D testing on a 7'x7' floor/ceiling assembly. Sample does not meet the minimum size requirements per the standard and due to the size only 6 unexposed thermocouples were installed.

The assembly was secured to the small scale horizontal furnace and was tested to the standard time-temperature curve described in the E119 standard.

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

The test was initiated on August 21, 2013. The ambient temperature at the time of the test was 82 °F and the relative humidity was 71 % R.H.

Observations made during the test are listed below:

Time (min:sec)	Observations
0:00	The test was initiated at 9:15 A.M.
3:00	The exposed MagBoard™ darkened in color
5:00	There was intumescent char along the center of the exposed joint
10:00	There was steaming around the perimeter of the sample
18:00	There was a small amount of buckling of the MagBoard™ at the joint between the joists on the exposed side
33:00	The steaming ceased from around the perimeter

39:00	There was hairline cracking on the exposed side MagBoard™ with buckling at the joint
48:00	There was flaming at the joint on exposed side
56:00	There was a popping sound from the sample
58:00	There was increased flaming on the exposed side of the sample
60:00	The MagBoard™ was still attached on the exposed side with visual buckling at the center
61:00	The sample exceeded the average failing point
64:00	The test was terminated

The assembly withstood the effects of the fire test without passage of flame or gasses hot enough to ignite cotton waste. The heat conducted through the assembly did cause the temperatures measured by the thermocouples to exceed the 250°F rise in average temperature at 61 minutes and exceed the 325°F rise limit at 63 minutes for an individual thermocouple.

5.2. EXAMINATION OF RESULTS

5.2.1. Correction Factor for the Fire Endurance Test

In accordance with the E119 test standard, a calculation for any correction to the indicated fire resistance period was done. The correction factor was then mathematically added to the indicated fire resistance period, yielding the fire resistance period achieved by this specimen:

Correction Factor for the Fire Endurance Test

ITEM	DESCRIPTION	TEST VALUE
C	correction factor	-0.04
I	indicated fire-resistance period	61 minutes
A	area under the curve of indicated average furnace temperature for the first three fourths of the indicated period	59794 (°F•min)
As	area under the standard furnace curve for the same part of the indicated period	59863 (°F•min)
ITEM	**DESCRIPTION**	**TEST VALUE**
L	lag correction	3240
	FIRE RESISTANCE PERIOD ACHIEVED BY THIS SPECIMEN ==>	61 minutes

Note: Note: The standard specifies that the fire resistance be determined to the nearest integral minute. Consequently, if the correction factor is less than 30 seconds, and the test specimen met the criteria for the full indicated fire resistance period, no correction is deemed necessary.

6 Conclusion

Intertek Testing Services NA, Inc. (Intertek) has conducted testing for Fire Retardant Coatings of Texas, on their 7'X7' Floor/Ceiling Assembly, to evaluate its fire resistance. Testing was conducted in accordance with the applicable requirements of, and following the standard methods of, Modified **ASTM E119–12a Standard Test Methods for Fire Tests of Building Construction and Materials, 2012 Edition**. This evaluation took place on August 21, 2013.

Based on the results of this test, the non-load-bearing 7'X7' Floor/Ceiling Assembly achieved a fire resistance rating of 61 minutes.

The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

INTERTEK TESTING SERVICES NA, INC.

Tested by: _____
Joseph Zatopek
Engineering Team Leader, Fire Resistance

Reviewed by: _____
Victor M. Burgos
Project Engineer, Fire Resistance


INSTALL MINERAL WOOL FIRE STOPPING AT ALL FLOOR/ MASONRY WALL INTERSECTIONS PER CODE & MANUFACTURER REQUIREMENTS

FIGURE B.1


INSTALL FIRE BLOCKING
& FIRE CAULKING AT ALL
TOPS OF WALLS ALONG
TENANT WALL/ EGRESS
STAIR WALL

FIGURE C.1


FIRE CAULKING AT ALL GAPS LARGER THAN 1/8" WIDE, PROVIDED 'TOOLED' FINISH APPEARANCE
REPAIR DAMAGED BOARD WITH SIMILAR MATERIAL

FIGURE D.2