



Retail Interior Finish Code Compliance

Brickell City Centre



SLS CONSULTING, INC.
1825 PONCE DE LEON BLVD #565
CORAL GABLES, FL 33134
TEL: 786-528-7611
FAX: 305-441-6622

www.slsfire.com

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VIA EMAIL

Ms. Garciela Escalante
Project Manager
Swire Properties
1779 Brickell Plz., Suite 802
Miami, Florida 33131

INTERIOR FINISH CODE COMPLIANCE REQUIREMENTS BRICKELL CITYCENTRE - MIAMI, FLORIDA

Dear Grace:

SLS Consulting, Inc. (SLS) has prepared this letter for Swire Properties and the Brickell CityCentre project team in order to outline the required fire testing requirements associated with furniture, fabrics, equipment and interior finishes within the three (3) Brickell CityCentre blocks currently under construction (i.e. BCCW, BCCE and BCCN). The intent of this letter is to assist the project team in proactively identifying the minimum performance criteria and associated testing that will need to be either demonstrated or completed as part of the project's certificate of occupancy process.

The interior finishes are required to comply with the requirements outlined in the 2007 *Florida Prevention Code* (FFPC), which is an amended version of the 2006 Edition of NFPA 1, *Uniform Fire Code* and 101, *Life Safety Code* (FFPC).

This letter has been structured to outline the applicable interior finish code compliance requirements and to summarize the associated testing required in order to determine the fire performance of interior finished (e.g. flame spread, smoke developed ratings, heat release rates, specimens sizes, etc.). It is recommended that SLS Consulting, Inc. serve a third-party fire protection engineer responsible for reviewing all submittals of the FF&E book(s) for the project.



SUMMARY OF MINIMUM CODE COMPLIANCE REQUIREMENTS

NON-UPHOLSTERED INTERIOR WALL FINISH REQUIREMENTS

Interior wall and ceiling finishes classified in accordance with Section 10.2 of the FFPC will be required within the Brickell CityCentre project:

Use Group A-1, <i>Assembly</i> occupancies (FBC §303.1)	<i>Assembly</i> (Chapter 12 - LSC)	<ul style="list-style-type: none"> o Exit Enclosure: Class B o Corridors: Class B o Rooms & Enclosed Spaces: Class C
Use Group A-2, <i>Assembly</i> occupancies (FBC §303.1)	<i>Assembly</i> (Chapter 12 - LSC)	<ul style="list-style-type: none"> o Exit Enclosure: Class B o Corridors: Class B o Rooms & Enclosed Spaces: Class C
Use Group A-3, <i>Assembly</i> occupancies (FBC §303.1)	<i>Assembly</i> (Chapter 12 - LSC)	<ul style="list-style-type: none"> o Exit Enclosure: Class B o Corridors: Class B o Rooms & Enclosed Spaces: Class C
Use Group A-4, <i>Assembly</i> occupancies (FBC §303.1)	<i>Assembly</i> (Chapter 12 - LSC)	<ul style="list-style-type: none"> o Exit Enclosure: Class B o Corridors: Class B o Rooms & Enclosed Spaces: Class C
Use Group B, <i>Business</i> occupancies (FBC §304.1)	<i>Business</i> (Chapter 38 - LSC)	<ul style="list-style-type: none"> o Exit Enclosure: Class B o Corridors: Class C o Rooms & Enclosed Spaces: Class C
Use Group H-3, <i>High Hazard</i> occupancies (FBC §307.5)	<u>None Provided within any of the BCC blocks.</u>	
Use Group M, <i>Mercantile</i> occupancies (FBC §309/§402)	<i>Mercantile</i> (Chapter 36 -LSC)	<ul style="list-style-type: none"> o Exit Enclosure: Class B o Corridors: Class C o Rooms & Enclosed Spaces: Class C
Use Group R <i>Residential</i> occupancies (FBC §310.1)	<i>Hotel</i> (Chapter 28 – LSC) & <i>Apartment</i> (Chapter 30 - LSC)	<ul style="list-style-type: none"> o Exit Enclosure: Class B o Corridors: Class C o Rooms & Enclosed Spaces: Class C
Use Group S-1, <i>Moderate Hazard Storage</i> occupancies (FBC §311.2)	<i>Storage</i> (Chapter 42 - LSC)	<ul style="list-style-type: none"> o Exit Enclosure: Class C o Corridors: Class C o Rooms & Enclosed Spaces: Class C
Use Group S-2, <i>Low Hazard Storage</i> occupancies (FBC §311.3)	<i>Storage</i> (Chapter 42 - LSC)	<ul style="list-style-type: none"> o Exit Enclosure: Class C o Corridors: Class C o Rooms & Enclosed Spaces: Class C

Section 10.2.3 of the FFPC requires materials for interior wall or ceiling to be tested and classified in accordance with:

- NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Material*
- ASTM E 84, *Stand Test Method Surface Burning Characteristics of Building Materials*
- UL 723, *Standard for Test of Surface Burning Characteristics of Building Materials.*

Additionally, Section 10.2.3.2 allows material to be tested in accordance with NFPA 286, *Standards of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*, and meet the requirements of Section 10.2.3.7.2 of the FFPC when finish is required to be a Class A rating – It is understood that this will not be applicable based on discussions with Swire Properties and the understood proposed finishes within the Ritz South Beac. Interior finishes tested in accordance

with NFPA 255, NFPA 286, ASTM E 84, and UL 723 are classified in accordance with flame spread and smoke development as indicated below:

- **Class A**
 - Flame Spread, 0-25
 - Smoke Development, 0-450
 - No continued propagation of fire in any element thereof when so tested
- **Class B**
 - Flame Spread, 26-75
 - Smoke Development, 0-450
- **Class C**
 - Flame Spread, 76-200
 - Smoke Development, 0-450

It is noted that as the proposed interior finishes will be new, the use of field applied fire retardant coatings to any interior finish material is not permitted as prohibited by Section 10.2.6.1 of the *Florida Fire Prevention Code*.

Test Specimen Sizes: As required by Section 4.2.1 of NFPA 255, “The test specimen shall be at least 2 inches wider [nominally 20.25-inches +/- 0.75-inches] than the interior width of the tunnel and a total of 24-feet +/-0.5-inches in length.” It is recommended that prior to sending test specimens to a nationally recognized testing laboratories that Swire Properties confirm the testing laboratories preferred sample sizes and what preparation if any will be required to be provided.

Special Issue Discussion: It is recommended that special attention be paid to all wood interior finishes (e.g. ceiling assembly of the esplanade, wood veneers, etc.) and that testing of finishes assemblies be completed. It is noted that while most woods inherently are considered to be Class B or Class C finishes, the City of Miami Fire Department will likely require that all woods which are finished beyond their natural state to be tested and demonstrate positive results.

UPHOLSTERED/TEXTILE WALL INTERIOR FINISHES

Upholstered / textile wall interior finishes are required by Section 10.2.4.1 of the *Florida Fire Prevention Code* and Section 803.6 of the *Florida Building Code* (FBC) to comply with one of the following testing criteria:

- *Option #1 Testing Requirement & Minimum Performance:* Textile wall and ceiling coverings are required to meet a Class A flame spread index when tested in accordance with ASTM E84/NFPA 255/UL 723 with test specimens prepared and mounted in accordance with ASTM E2404.
- *Option #2 Testing Requirement & Minimum Performance:* Testing in accordance with the requirements of NFPA 286, *Standard Method of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth* with minimum performance complying with the following:

- During 40 kW exposure, flames should not spread to the ceiling.
- During 160 kW exposure, the interior finish should not have flames that spread to the outer extremity of the sample of any wall or ceiling and flashover as defined by NFPA 286 should not occur.
- The peak heat release rate throughout the NFPA 286 test should not exceed 800 kW.
- The total smoke released throughout the NFPA 286 test should not exceed 1,000 m².
- *Option #3 Testing Requirement & Minimum Performance:* Testing in accordance with Method B of NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls* with minimum performance criteria complying with the following:
 - During 40 kW exposure flames should not spread to the ceiling.
 - During 150 kW exposure, the interior finish should not have flames that spread to the outer extremities of the samples on the 8-foot by 12-foot wall and flashover as described in NFPA 265 should not occur.
 - The total smoke released throughout the NFPA 265 test should not exceed 1,000 m².

At this time it is unclear what the proposed configuration to what extent upholstered finishes are proposed to be provided. It is recommended that each assembly be reviewed and where possible testing in accordance with *Option #1* should be considered as a preference due to consideration that this testing represents the least restrictive requirements.

INTERIOR FLOOR FINISHES REQUIREMENTS

The FFPC requires that new assembly occupancy interior floor finished be in accordance with Section 12.3.3.3 interior floor finishes classified in accordance with Section 10.2 are not permitted to be less than a Class II interior floor finish. The FFPC Section 10.2.7.1 requires that carpet and carpet-like interior floor finishes comply with ASTM D 2859, *Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials*. All other interior floor finishes are required by FFPC, Section 10.2.7.3 to be tested in accordance with NFPA 253, *Standard Method of Test for Critical Radiant Flux of Floor Covering Systems using a Radiant Heat Energy Source*¹. Interior floor finishes tested in accordance with NFPA 253 must be classified as in accordance with FFPC, Section 10.2.7.4 as indicated below:

- **Class I Interior Floor Finish**
 - Ignition by a radiant flux not less than 0.45 W / sq.cm
- **Class II Interior Floor Finish**
 - Ignition by a radiant flux not less than 0.22 W / sq.cm but less than 0.45 W/sq.cm.

INTERIOR CONTENTS AND FURNISHING REQUIREMENTS

Use Group A-1, <i>Assembly</i> occupancies (FBC §303.1)	<i>Assembly</i> (Chapter 12 - LSC)	No requirements. Section 12.7.4.5 of the <i>Florida Fire Prevention Code</i> (FFPC) indicates that the provisions of Section 10.3.2 do not apply. No requirements.
Use Group A-2, <i>Assembly</i> occupancies (FBC §303.1)	<i>Assembly</i> (Chapter 12 - LSC)	
Use Group A-3, <i>Assembly</i> occupancies (FBC §303.1)	<i>Assembly</i> (Chapter 12 - LSC)	
Use Group A-4, <i>Assembly</i> occupancies (FBC §303.1)	<i>Assembly</i> (Chapter 12 - LSC)	
Use Group B, <i>Business</i> occupancies (FBC §304.1)	<i>Business</i> (Chapter 38 - LSC)	No requirements. Section 38.7.4 of the <i>Florida Fire Prevention Code</i> (FFPC) indicates that the provisions of Section 10.3.2 do not apply. No requirements.
Use Group H-3, <i>High Hazard</i> occupancies (FBC §307.5)	<u>None Provided within any of the BCC blocks.</u>	
Use Group M, <i>Mercantile</i> occupancies (FBC §309/§402)	<i>Mercantile</i> (Chapter 36 -LSC)	No requirements. Section 38.7.4 of the <i>Florida Fire Prevention Code</i> (FFPC) indicates that the provisions of Section 10.3.2 do not apply. No requirements.
Use Group R-1, <i>Residential</i> occupancies (FBC §310.1)	<i>Hotel</i> (Chapter 28 – LSC)	No requirements. Section 28.3.3.4.1 of the <i>Florida Fire Prevention Code</i> (FFPC) indicates that the provisions of Section 10.3.2 do not apply. No requirements.
Use Group R-2, <i>Residential</i> occupancies (FBC §310.1)	<i>Hotel (Apartment)</i> (Chapter 30 - LSC)	No requirements. Section 30.3.3.4 of the <i>Florida Fire Prevention Code</i> (FFPC) indicates that the provisions of Section 10.3 do not apply. No requirements.
Use Group S-1, <i>Moderate Hazard Storage</i> occupancies (FBC §311.2)	<i>Storage</i> (Chapter 42 - LSC)	No requirements. The provisions of Section 10.3 do not apply. No requirements.
Use Group S-2, <i>Low Hazard Storage</i> occupancies (FBC §311.3)	<i>Storage</i> (Chapter 42 - LSC)	

¹ ASTM E-648, *Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Sources*.

None of the occupancies within Brickell CityCentre, as per the 2007 Edition of the *Florida Fire Prevention Code* (FFPC) are required to comply with Section 10.3.2.1 of the FFPC requires that newly introduced upholstered components to meet the requirements for Class I when tested in Accordance with NFPA 260, *Standard Methods of Test and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture*, or with ASTM E 1353, *Standard Test Methods for Cigarette Ignition Resistance of Components of Upholstered Furniture*.

It is noted that most upholstered furniture fabrics within assembly and hotels are inherently meet the NFPA 260 Class I criteria and have supporting documentation from manufacturers. As such, it is recommended that Swire Properties consider making this a requirement for the Brickell CityCentre project. It is noted that future editions of the *Florida Fire Prevention Code* (FFPC) require this minimum criteria within assembly and hotel occupancies.

It is noted that California Technical Bulletin 117, *Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture* and California Technical Bulletin 133, *Flammability Test Procedure for Seating Furniture for Use in Public Occupancies* are often referenced as required testing procedures; however neither are required by the minimum requirements of the *Florida Building Code* (FBC) or the *Florida Fire Prevention Code* (FFPC). It is noted that CA TB 133 is a complete burn test.

DRAPERIES, CURTAINS AND OTHER LOOSELY HANGING FURNISHING

New draperies, curtains and other similarly loosely hanging furnishing and decorations be flame resistance as demonstrated by testing in accordance with NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*.

Depending on the type of drapery or hanging, there are two (2) different test methods contained within NFPA 701 which are conceptually summarized in the following:

- *Test Method #1 Applicability:* Test method #1 is intended to apply to fabrics or other materials used in curtains, draperies, or other window treatments having an areal density not greater than 21 oz/yd².

Sample Size: As required by Section 7.1.1 of NFPA 701, ten (10) individual test specimens should be cut from a single piece of the material to be evaluated to a size of 6.1-inches by 16-inches with the length parallel to the lengthwise direction of the materials.

- *Test Method #2 Applicability:* Test method #2 is intended to apply to vinyl coated blackout linings, multi-layered fabrics with or without backings.

Sample Size: As required by Section 11.1 of NFPA 701, the minimum specimen size for *Test Method #2* is 4.9-inches by 47.25-inches.

CLIMATE RIBBON FLAME SPREAD AND COMBUSTIBILITY CRITERIA

As outlined in the project's *Fire Protection/Life Safety Narrative* report the climate ribbon, finishes applied to delta beams and blades will be subject to the following minimum criteria.

- Flame Propagation: The membrane structure (i.e. fabric) should meet the flame propagation criteria contained in NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films* (LSC §11.9.1.6.1 & FBC §3105.3.1). Flame spread characteristics will be included in the *Construction Documents* submittal.
- Combustibility: The climate ribbon should be *noncombustible* or *limited combustible*.
 - Limited Combustible Definition: A building construction material that does not comply with the definition of noncombustible materials, in the form in which it is used, has a potential heat value not exceeding 3,500 Btu per lb and complies with either of the following:
 - Materials having a structural base of noncombustible material, with a surfacing not exceeding 1/8-inch that has a flame spread rating of not greater than 50.
 - Materials, in the form and thickness used having a flame spread rating not greater than 25 nor having evidence of continued progressive combustion and of such composition that surfaces that would be exposed by cutting through the material on any plane would have neither a flame spread rating greater than 25 nor evidence of continued progressive combustion.
- Preservation: Materials subject to increase in combustibility or flame spread rating beyond the limits established above through the effects of age, moisture, or other atmospheric condition should be considered combustible (NFPA §3.3.14).

NFPA 705 FIELD TESTING

NFPA 705, *Recommended Practice for a Field Flame Test for Textiles and Films*² is a recommended guideline, not formally adopted by the State of Florida or the City of Miami which calls for field testing of all textiles and films which are not provided with fire resistance ratings. The City of Miami Fire Department has not historically implemented field testing and it is not anticipated that a practice of field testing will be implemented in the future; however it is noted that neighboring jurisdictions have implemented field testing of all films and fabrics which are not provided with any fire test performance data.

² As per Section 1.1.1 of NFPA 705, "This recommended practice provides guidance to enforcement officials for the field application of an open flame to textiles and films that have been in use in the field or for which reliable laboratory data is not available."

INTERIOR FINISHES & CONTENTS TESTING REQUIREMENTS SUMMARY

INTERIOR FINISH TYPE		TEST REQUIREMENTS
Interior Wall or Ceiling Finish		NFPA 255, <i>Standard Method of Test of Surface Burning Characteristics of Building Materials</i> ; or ASTM E 84, <i>Stand Test Method of Surface Burning Characteristics of Building Material</i> ; or UL 723, <i>Standard for Test of Surface Burning Characteristics of Building Materials</i>
Interior Floor Finish		NFPA 253, <i>Standard Method of Test of Critical Radiant Flux of Floor Covering Systems using a Radiant Heat Energy Source</i> (ASTM E648); or ASTM D 2859, <i>Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials</i> .
Interior Contents and Furnishing	Upholstered Furniture	The requirements of FFPC §10.3.2 do not technically apply (i.e. ASTM E 1353 and NFPA 260).
	Draperies, Curtains and other similar loosely hanging furnishings	NFPA 701, <i>Standard Methods of Fire Tests for Flame Propagation of Textiles and Films</i> .

Table 1 – Summary of Testing Requirements

RECOMMENDATIONS

1. It is recommended that the project team begin assembling a complete FF&E binder, one for each block broken into three (3) sections (i.e. podium, office towers and residential towers) that includes all information associated with interior finishes, floor finishes, upholstered wall finishes and draperies. It is recommended that consideration be given to having SLS Consulting, Inc. provide a review of the complete FF&E binder and complete a code compliance analysis of all of the interior finishes proposed to be provided and all of the accompanying fire testing certificates.
2. It is recommended that the project team evaluate all the locations where wood and/or wood veneers will be utilized in the building and determine prior to ordering whether these finishes have been tested with associated finishes (e.g. lacquers, varnishes, etc.) as an assembly so as to determine to what extent testing will be required to be completed.
3. It is recommended that the project team make it clear to all providers of interior finishes that actual testing certificates, not manufacturer produced certificates reflecting fire testing performance will be required to be provided.
4. It is recommended that the project team make it clear to all providers of interior finishes that testing as an assembly will be required to be provided.

If you have any questions or would like to discuss the review comments identified above, please do not hesitate to contact us at (786) 352-7377.

Sincerely,
SLS CONSULTING, INC



Michael P. Sheehan, P.E.

10/29/2013

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APPENDIX: INTERIOR FINISH REVIEW ASSESSMENT

*(TO BE COMPLETED UPON SELECTION OF FF&E AND RECEIPT OF FIRE TEST
DATA IF REQUESTED BY SWIRE PROPERTIES)*