

## BOABC – 2024 BCBC Lunch and Learn Interconnected Floor Spaces

November 21, 2024

Hosted by: Ken Kunka, AScT BCQ



### Overview

Information presented today does not directly represent the opinions of the Building Officials Association of BC.

This presentation is conceptual and for informal educational purposes only. The presenters and association takes no responsibility for application of any concepts or interpretations in this presentation to specific projects.

#### I have some questions.

The slides must not be considered complete or exhaustive. Code provisions have been generally represented and may not reflect all exceptions.



## Rules of the Room



- Registration will be tracked
- Presentation is not recorded but PowerPoint will be posted
- Please use raise hand icon if you have a question or comment
- PUT IT in the CHAT
- Please mute your microphone
- You may need to turn off your camera
- Please follow up by email if you have specific question or example to share with the membership.
  - kkunka@boabc.org



## Poll Questions

#### **Poll Question #1**

## What is your level of BOABC Qualification?

- Level 01 Building = 17%
- Level 02 Building = 11%
- Level 03 Building = 54%
- Level 01 Plumbing = 2%
- Level 02 Plumbing = 9%
- Other = 7%
  - Retired, architect,

## Poll Question #2

#### What region are you from?

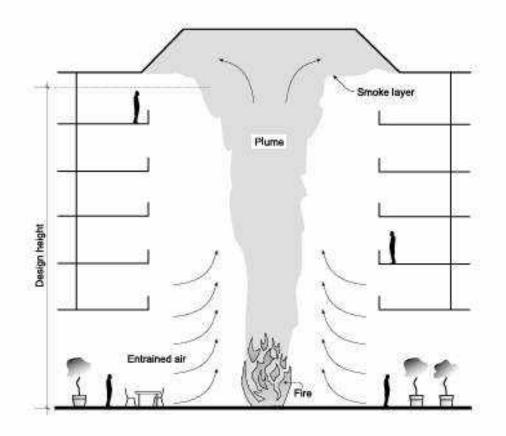
- Lower Mainland = 50%
- South Central Interior = 22%
- Kootenay = 4%
- Northwest = 0%
- Central North Interior = 2%
- Vancouver Island North = 11%
- Vancouver Island South = 11%



## Nov 21 – Interconnected Floor space

#### **Today's Session**

- What's New Update and Training
- Appeals and Interpretations
- Interconnected Floor Space
  - Background
  - Reference Info
  - Basic Code requirements
  - Case Study example
- Q&A





## October – Single Egress Stairs 02

#### Recap – Oct 17

- What is a hazard
- Background Recap Post Occupancy challenges
- 3.2.10
  - Size height occupant loads
  - NFPA 13 required
  - Hold opens for suite doors
  - Exit Facility 2hour (non-combustible)
  - Limits to Smoke 6 Storey Vestibule allowance
  - Case Study example

#### **Lunch and Learns**

CPD Eligibility: 1
point/presentation (Category
A4). You will need to self
report this point. Initial next to
the presentation and then save
it as a pdf to upload as proof.
Previous Lunch and Learns can
be found:

<a href="https://boabc.org/lunch-learn-webinars/">https://boabc.org/lunch-learn-webinars/</a>



# What is a Hazard? - Risk Assessment Appeal Board Decision #1928 — Accessory Bldg.

What is considered a hazard? There is no definition in the Code for the term <u>hazard</u> although the word is used over 280 times.

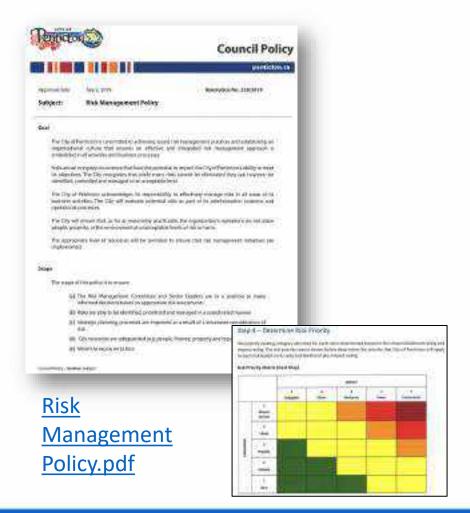
 Left to each local government to determine

# Does your department have a policy to determine the potential severity of Risks/Hazards?

- Yes Dept. centric = 13%
- Yes LG policy = 11%
- No = 37%
- Unknown = 37%

#### **Potential Hazards**

- Occupant safety
- Fire Hazard
- Structural Issues
- Electrical, Gas,
   Plumbing Hazards
- Zoning Violations
- Flood Risk
- Geotechnical
- Wildfire Interface
- Hazardous
   Materials
- Others?





## My Questions - Division B -3.2.10.2.(3)

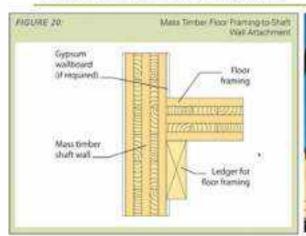
- 3) The exit facility shall be constructed either of noncombustible construction or, potwithstanding the application of Article 3.1.13.7., with finishes that do not exceed the maximum flame-spread rating and maximum smoke developed classification for exit stairways in Table 3.1.13.7., and shall
  - a) be separated from all other spaces in the building by a fire separation having a fire-resistance rating not less than 2 h,

#### **Concrete or concrete masonry units (CMU) – 2hr rating (& sound rating)**

3.1.13.7. High Buildings

CAREFUL WITH CONTINUITY OF FIRE SEP! Note sound ratings 50STC & 55STC (elevators)

#### Floor to Shaft Wall Detailing





**CLT Mass Timber?** 

Photo: Wex Schreyer



**Conventional framing** 

SHAFTS AND ELEV - https://www.youtube.com/watch?v=3TfMfbR53bE

- 3) Pressurization of the stair shaft described in Sentence (1) is not required if each doorway from the public corridor serving the exit facility is protected with a vestibule on the public corridor side of the doorway
  - a) consisting of a closure in the public corridor
    - i) equipped with electromagnetic hold-open devices that release upon activation of the fire alarm system, and
    - ii) that has a fire-protection rating not less than a 45 min, and
  - b) that forms a space that is separated from the remainder of the building by a fire separation with a fire-resistance rating not less than 45 min
    - i) that contains no suite entry doors, and
    - ii) with the distance from doorway to the exit facility and the closure not less than I 800 mm long and a width of the path between doorways not less than I 500 mm.

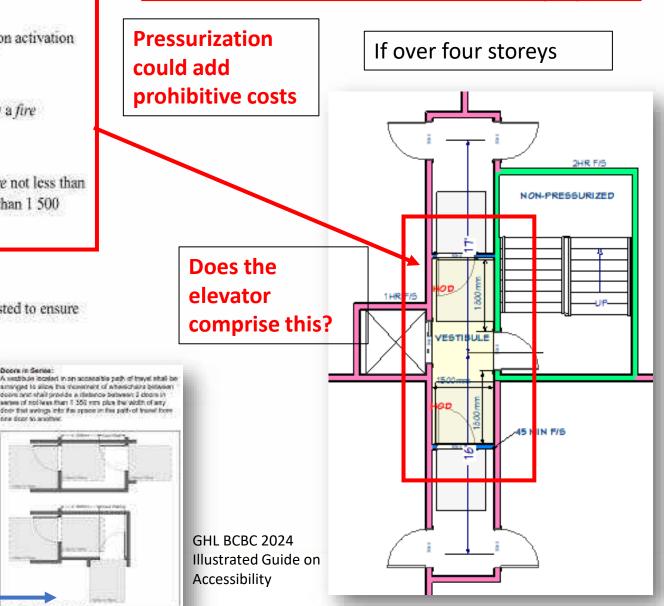
3.8.1 6 (12) Doors in Series

- 4) Elevator hoistways shall not be designed as a means of venting.
- 5) The systems for control of smoke movement required by Sentence (1) shall be tested to ensure satisfactory operation. (See Sentence 3.2.6.9.(1) and Note A-3.2.6.9.(1).)

Specific smoke control performance requirements in Article 3.2.6.2. are applied to five and six storey single exit stair residential buildings. Fans will not always be required, but when they are, there are existing requirements for emergency power. Smoke vestibules are offered as an alternative to pressurization. An example of a smoke vestibule would be a portion of the public corridor adjacent the doorway to the exit facility becomes portioned off upon release of closures should the fire alarm system be activated. This smoke vestibule acts as a sacrificial buffer should smoke compromise the remainder of the public corridor or the exit facility itself.

The minimum dimensions of the smoke vestibule align with the established minimum distance between doors in series and the minimum width for an accessible path of travel to facilitate turning and passing and the operation of doors.

## Division B – 3.2.10.3.(3) ??





## **Pressurized Stair Overview**



**2024 BCBC** 

A-3.2.6.2.(3) Pressurization of Stair Shafts.

12 Pa – pressure differential

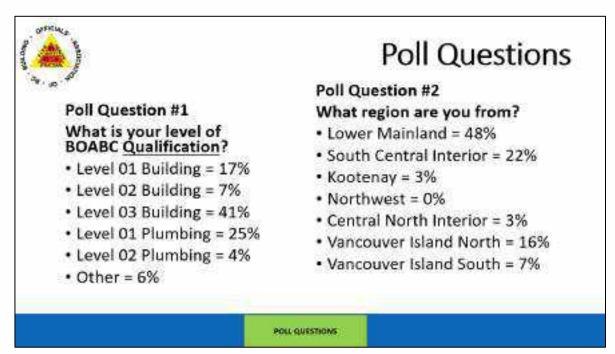
A-3.2.9.1.(1) Testing of Fire Protection and Life Safety Systems.

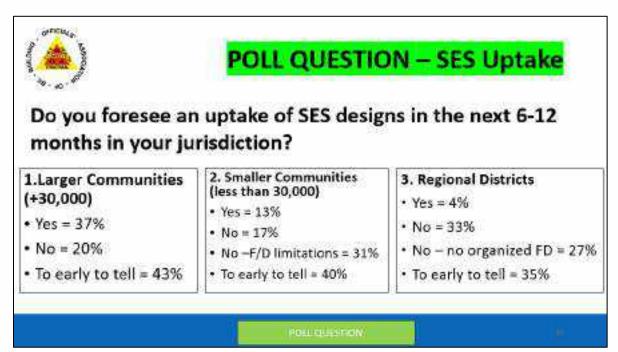


https://youtu.be/UY5m12m1iKc?si=-9U-gr4cCbBpP3g4



## October – Poll Question Results





For Single Egress – it is likely too early to tell if this will make an impact as construction costs for the required safety elements may make the return in investment too low for developers – unless they have secured property already.

**Note** that SES designs are based on the premise that there is an organized and well-equipped fire department, which may limit most Regional Districts and small communities from supporting SES proposals.



## 2024 BC Code Appeals - Interpretations - not binding

BC Code Appeals – binding Interpretations – not binding

Building and Plumbing Code Interpretations 2024

			Search:	
Code Edition(	Interpretation Number	Title	Date Approved \$	File
NEW 2024	24-0055	Curtains for Accessible Showers	15/10/2024	Download
NEW 2024	24-0051	Small Residential Care Home	15/10/2024	Download
NEW 2024	24 0050	Group A Division 2 Occupancy in an Article 9.2.2.40 Suitaing Without Group D Occupancy	15/10/2024	Donnhad
NEW 2024	24-0049	Adaptable Water Closet Encroachments	24/09/2024	Download
NEW 2024	24-0048	Sprinklers on top Floor Residential Balconies	24/09/2024	Download
NEW 2024	24-0046	Opening Restrictor on Bedroom Window	15/10/2024	Download
2024	24-0045	Industrial Mineral Stockpile Cover	13/08/2024	Download
2024	24-0043	Venting Requirements for Floor Drains NPS 3 and Larger	13/08/2024	Download
NEW 2024	24-0042	Camera as a Door Viewer	24/09/2024	Download
2024	24-0038	Separation of Suites in a House having a Suite without a Kitchen	13/08/2024	Download
NEW 2024	24-0037	Fire Dampers in Houses with Secondary Suites	24/09/2024	Download



## Interpretation 24-0051- Care Homes

#### **Question:**

If a residential care facility in a Part 9 building is small enough that it does not require provincial licencing, is it required to comply with the BCBC requirements of Sentence 9.10.2.2.(6) for residential care facilities?

**Sentence 9.10.2.2.(6)** states "A care facility accepted for residential use pursuant to provincial legislation is permitted to be classified as a residential occupancy...". Such a facility is limited to sleeping accommodation for no more than 10 persons who must live in a single housekeeping unit in a dwelling unit. The unit must have smoke alarms and emergency lighting, and the building must be sprinklered throughout.

Link - 24-0051.pdf

#### BC BUILDING CODE INTERPRETATION COMMITTEE

INTERPRETATION

A joint committee with members representing AIBC, EGBC, BOABC

Page 1 of 2

CALLES AND ADDRESS.	183000339033451830000	150 MCARCONS
Interpretation Date	October 15, 2024	
Building Code Edition:	BC Building Code 2024	
Subject:	Small Residential Core Home	
Keywords:	Care Facility	
Building Code Reference(s):	9.10.2.2 (6)	

#### Opestion:

If a residential care facility in a Part 9 building is small enough that it does not require provincial licencing. Is it required to comply with the BCBC requirements of Semence 9.10.2.2.(6) for residential care facilities?

#### interpretation:

File No: 24-0051

No

Sentence 9:10.2.2.(6) states "A care facility accepted for residential use pursuant to provincial legislation is permitted to be classified as a residential occupancy..." Such a facility is limited to sleeping accommodation for no more than 19 persons who must live in a single housekeeping unit in a dwelling unit. The unit must have sincke alarms and emergency lighting, and the building must be sprinklened throughout.

The Province of BC website includes the following statement, for residential care facilities:
Residential care footbes provide accommodation, meals and care and supervision based on
the person's needs. Facilities that provide care and supervision to three or e-one persons must
have a torics, whether they receive funding (subsidized) from a health subscrip or another
agency, or whether a person pays privately.

Based on this information, if a residential care facility provides care and supervision to only one or two persons, it does not require a licence. In that case, Sentence 9.10.2.2.(6) is not applicable. It is interpreted that if the facility provides care and supervision to fewer than 3 persons, it can be classified as a residential occupancy.

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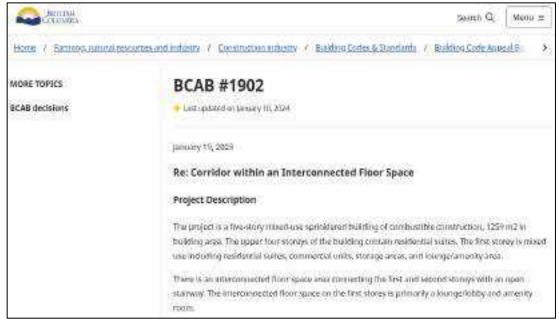
Based on this information, if a residential care facility provides care and supervision to only one or two persons, it does not require a licence. In that case, Sentence 9.10.2.2.(6) is not applicable. It is interpreted that if the facility provides care and supervision to fewer than 3 persons, it can be classified as a residential occupancy.

Note that the Provincial licencing requirements for residential care facilities may be revised from time to time, with no coordination with the BCBC requirements. Any persons referencing this Interpretation should check the current Provincial requirements at the time of application to their project.

<u>Link - Residential care facilities - Province of British Columbia</u>



# BC Code Appeal – Interconnected Floor Space



#### Decision being appealed (local authority's position)

The local authority acknowledges the interconnected space of the second storey is separated from the residential suites by a fire separation with a 1-hour fire resistance rating. However, as access by a public corridor to the required second exit for the residential suites passes through the interconnected space, the local authority considers the subject interconnected space to contain a Group C major occupancy. (2018 BCBC)

Appellant's Position – not supported – fire separation required

BCAB #1902 - Province of British Columbia



Existing three-storey sprinklered building containing offices and classrooms, to which a two-storey horizontal addition is proposed – <u>LG draft stops and</u> closely spaced sprinklers are required (2012 BCBC)

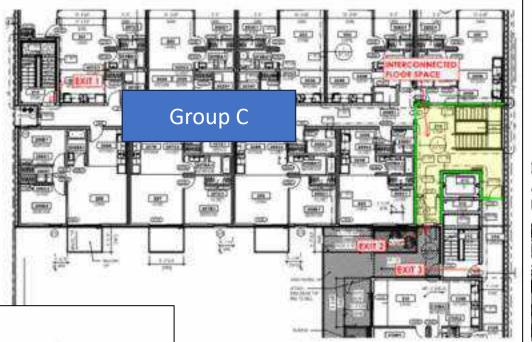
Appellant's Position supported by Board – not required.

BCAB #1800 - Re: Requirements for Interconnected Floor Spaces - Province of British Columbia



## BC Code Appeal – Appeal #1902 Interconnected Floor Space





#### Appeal Board decision #1902

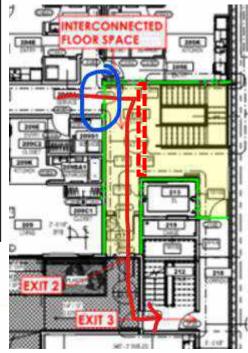
It is the determination of the Board that the subject interconnected floor space contains a Group C major occupancy.

#### Reason for decision

The exceptions to special protection in Sentence 3.2.8.2.(6) do not include Group C major occupancy. Based on the definition of major occupancy, the Board determined that the interconnected floor space contains a Group C major occupancy. Further Sentence 3.1.2.1.(1) requires every part of a building to be classified according to its major occupancy.

Second Storey

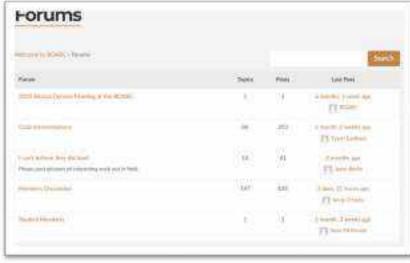
Occupancy solution was to build a fire separation at the opening.

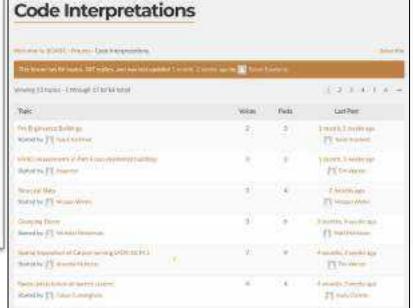




## Members Forum – Don't forget.







Members Discussion			
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## Don't forget to update your CPD!

#### **Technical Training**

time (Certain & Princeton December ) CPC Opportunity - Canadian Brinking Science Series

#### CPD Opportunity - Canadian Building Science Series

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Provider Building Knowledge Centric - Building Science Team

Oate: Mydtad y Dybre

Time: 10:00 - 71/10 am PST

December - 3, 4, 5

December 10

Standpipe systems.

Location: Online sections was provided approximate between

Cost free

Registration, Fundocordina

CPO Eligibility. 1.11 CPD uninto per webirar under category A4 you will need to self-report these points?

the Promote Personal Development (CPD Opportunity - DASA Empirical Service Service Service

#### CPD Opportunity - CASA Educational Seminar Series

Catio will once again be offering a series of Live Minus Educational Serieson, in 2004. The serieson will make a category of the Springher / Fire Respection retainst orders, in accordance with the appropriate NPPA Scridings. Number of Part Code requirements. The University continues will had advante and offer best publics to the automatics on where to find the appropriate information in the referenced NPPA Scriding and individual public of the many classes that the NPPA Scriding is the Minus Pre-Casia. The seminary will be appropriate by the Zhana Market of the seminary will be the NPPA Scriding in the NPPA Scriding Code & National Pre-Casia. The seminary will be amended in a virtual intrinsic Zhana Welse Conformating and all other other pre-listed with an advance workbook.

#### Cost

- + Montervate: \$105 plus QST
- 4 NON member rate: £300 also CET

#### CPD Eligibility

- . 4 desires for a 4-train websor
- . Sipplies for a 5-faser widerian

Descriptions quality under Catagory AA and Will result to be self-reported.

#### Session times and details:

- + Tracks Newtonian (N. 2023 Pumps for Principlosocian Sentral Overview of NFPA 20, from \$1,000ar 4,00pm (ST)
- Turning December 15, 2001 Streeting Summer for Fire Properties, Character of NATA 14 from 15 from 200 and 200

## **Education Opportunities**

#### **Soft Skills Training**



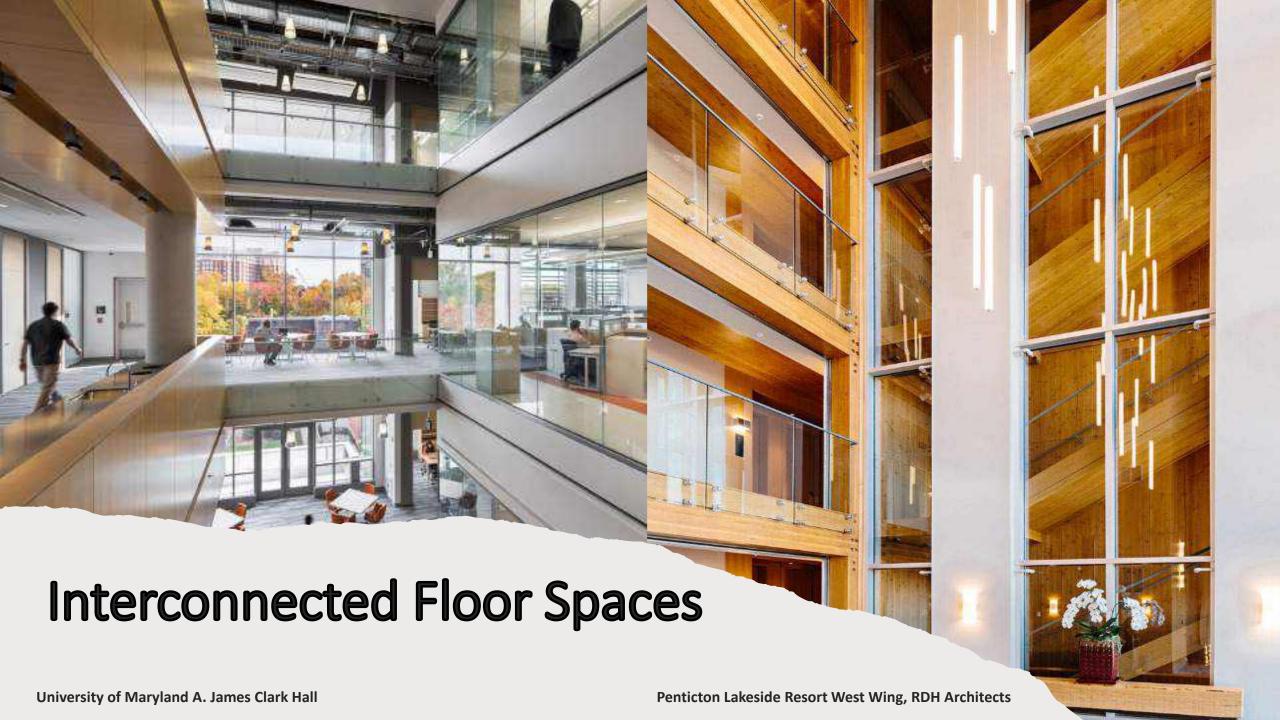
#### ICC Inspectors Skills course - highly recommend!





<u>Tim Arnold - Books -</u> <u>Tim Arnold: Author,</u> <u>Speaker, Trainer</u>

#### Leadership and Team Development





## **Poll Questions**

# Poll Question #3 Have you dealt with an interconnected floor space project?

- Yes = 69%
- No = 31%

#### **Poll Question #4**

## What occupancy types have you encountered?

- Large Part 3 (no exceptions) = 27%
- Part 9 = 22%
- Group B = 5%
- Group A (1, 2, 3) = 19%
- Group D = 17%
- Group E = 9%

(multiple answers)

#### **Poll Question #5**

If you have reviewed an interconnected floor space, have you had an Alternative solution proposal for the design?

- Yes = 45%
- No = 55%



## Interconnected Floor Space

2024 Code

Changes

#### **Overview**

- What is an interconnected floor space
- Table 1.1.1.1. Heritage Buildings
- 3.2.3.2 Exposing Building Face -Spatial requirements
- 3.2.8. Mezzanines and Openings through Floor Assemblies
  - 3.2.8.1. Application
  - 3.2.8.2. Exceptions to Special Protection
    - Functional and Objective Statements
  - 3.2.8.3. Sprinklers
  - 3.2.8.4. Vestibules
  - 3.2.8.5. Protected Floor Space
  - 3.2.8.6. Draft Stops
  - 3.2.8.7. Mechanical Exhaust System
  - 3.2.8.8. Combustible Contents
  - 3.4.3.2. Exit Widths & 3.4.4.2. Exits through a Lobby

#### **NOTE**

The majority of the items reviewed today cross reference to the new Single Egress Stairs in controlling smoke/fire.

## Research & Education



#### Jensen Hughes-SFPE-02252020.pdf





Fires in atrium buildings can pose a serious threat to occupants as a result of smake migration. This Update, intended for building designers and property managers, outlines the basic principles of smoke management in atriums that must be understood in order to enhance occupant safety.

Attitum have Secome popular elements in commercial, office and residential buildings. because they can provide attractive, enviconcurredly controlled, samually in spaces. Such spaces, however, present a challenge for fire projection engineers because their beight Oyphally greater than 20 ml cleaveaves the effectiveness of automatic sprinkler systems and because they lack the floor toface separations that can limit the likelihood of flee and anothe appearing from the floor of the origin to other areas of the buildings. Evacuation rostes in virtuits are of greates). concern because they become volnerable to spreading simple enders emoke management measures are used.

#### Smoke Hazards

Mose fire-related deaths are acethorable to smoke relatedation rather than botto. In the context of the safety degineering saintee is defined as the combinatoric of althoray solids. Biguit particulates one guest produced when a material home play the air that become encounted to cooperated was the first of it. Boaneds from smoke its halfdings befolder.

 Toxic gases. Carbon recrucicle is the most complete of these. Necrosic gases (which can minder a person unconscious) such as hydrogen cyaride and initiants with as actific hallfest and armiete may also be produced, depending as the comlated in unertials present.

- Reduced oxygen levels. This can result in suffication.
- High temperatures. Extreme heat is potentially heardists to people interpreted in the smale or exposed to its radiation.
- Reduced visibility. This can hinder both evacuation and resour efforts.

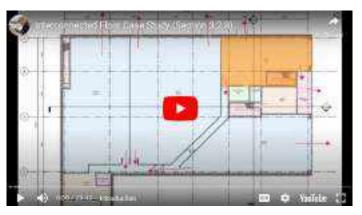
The reduction in visibility is a major hazard in artism fires that needs to be considered in any, incohe management dealay; sepecially in it affects occupents who are not located in the immediate fire area. If they have to evaluate through the simple, the intraparts may become disortened. It general, if them is recough workflay through the smale for people to see the emispecty exist, such products are callidely to prevent them from excaping. To active sufficient visibility, training occupants should be physically separated from the smale or the article constraints.

A wide range of acceptable levels, of visibility has been suggested as the fire protection literature. 21 For occupants brailing units a balliting and oble to evacuate Quickly, being able to see a distance of 3.5 m may be sufficient. For those less familiar with the building, a distance of up to 25 m has been recommended. The latter criterion was used to the translating requirements for escape routes in high rise buildings first introduced in the 1970 edition of the Northwest familiating Code.

Basic Principles of Smoke Management for Atriums



## <u>2022-03-18-Smoke-Control-in-Atria-Newletter-Address-Update.pdf</u>



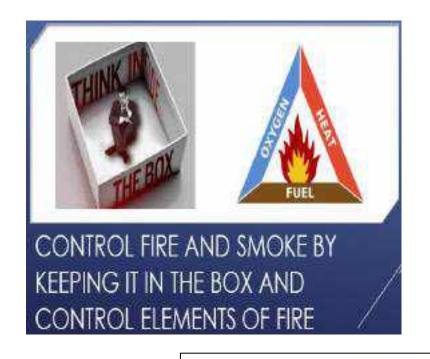
https://youtu.be/90oDkLKx el

<u>Course Registration – BOABC</u> (updates early 2025)

## **Fire Protection**

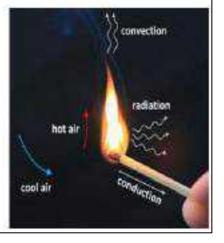
The Fire Protection section of the BCBC for all buildings including houses is founded on principles intended to establish provisions that provide a reasonable level of life safety and property protection to occupants of premises and safety to fire fighters and emergency responders engaged in emergency operations.

We've talked a lot about keeping fire and smoke in the box with fire separations/fire blocking/firestops – so extra Challenge in working with Interconnected Floor Spaces.



#### How fire spreads

- Convection
- Radiation
- Conduction



# Fire Protection

BOABC Module 15

#### Introduction

Sentence 3.2.8.1.(1) establishes the general rule for a portion of a floor area or mezzanine that doesn't terminate at an exterior wall, firewall, or vertical shaft.

The floor assembly must terminate at a fire separation with a FRR equal to that of the floor assembly which extends to the underside of the next floor assembly or the roof above OR comply with Articles 3.2.8.3. to 3.2.8.8.

This Sentence also includes the exceptions to this rule and references Article 3.2.8.2. for mezzanines and other allowed openings, and Sentence 3.3.4.2.(3) for two-storey dwellings within a building.



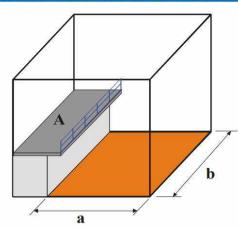


## Mezzanine Or I.C. Floor Space

Interesting how Interconnected Floor Spaces is not part of <u>9.10.4.2</u>. <u>Mezzanines not Considered Storeys</u> like <u>3.2.8</u>. <u>Mezzanines and Openings through Floor Assembles</u>

#### Mezzanine

#### 40% of the open area of the room

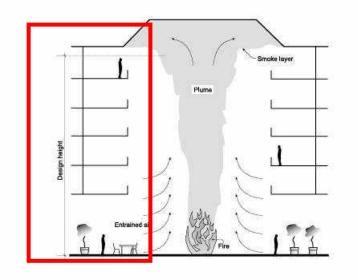


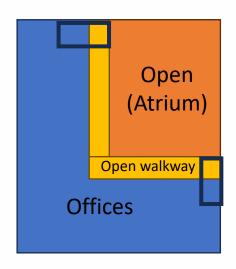
<u>Microsoft PowerPoint - Mezzaines</u> <u>- Spring Seminar 2018 - Geoff</u> <u>Mikiolayenko</u>

A = area of the mezzanine

Mezzanine means an intermediate floor assembly between the floor and ceiling of any room or storey and includes an interior balcony.

#### Interconnected Floor Space





Interconnected floor space means superimposed floor areas or parts of floor areas in which floor assemblies that are required to be fire separations are penetrated by openings that are not provided with closures.

Superimposed floor areas – not for a mezzanine.

Protected floor space means that part of a floor area protected from the effects of fire and used as part of a means of egress from an interconnected floor space.



## **Typical Occupancies**

#### Mezzanine

A – Div 2 Restaurants – Coffee Shops

C – Residential Lofts

D – Offices - lofts

E – Retail Shops

F – Industrial (1, 2, 3)

Combo – Industrial/Office

#### Interconnected Floor Space

A - Assembly - Div 1, 2, 3

B – Care Homes & Hospitals – Div 2,3

C – Hotels & Schools

D - Offices

E – Department stores, Markets

F – Div 1, 2, 3?

Mezzanine means an intermediate floor assembly between the floor and ceiling of any room or storey and includes an interior balcony.

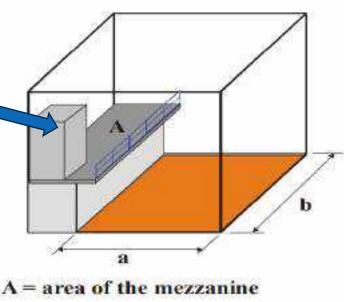
Interconnected floor space means superimposed floor areas or parts of floor areas in which floor assemblies that are required to be fire separations are penetrated by openings that are not provided with closures.

#### 9.10.4.1. Mezzanines not Considered as Storeys (recap)

#### 9.10.4.1.2.

- (a) the aggregate area of *mezzanines* that are not superimposed does not exceed 40% of the open area of the room in which they are located (see A-3.2.1.1.(3)(a), and
- (b) Except as permitted in Sentence
- (3), the space above the mezzanine floor is used as an open area without partitions or subdividing walls higher than 1070mm above the mezzanine floor.





#### 9.10.4.1. Mezzanines not Considered as Storeys

A-3.2.1.1.(3)(a) Mezzanine Area. The permitted area of the mezzanine for the purposes of determining the allowable percentage is to be based on the open area of the floor of the space in which the mezzanine is located. The Code does not restrict the enclosing of space below the mezzanine, but the enclosed area must be deducted from the area of the overall space before applying the percentage allowance

# 40% of the open area of the room

A = area of the mezzanine

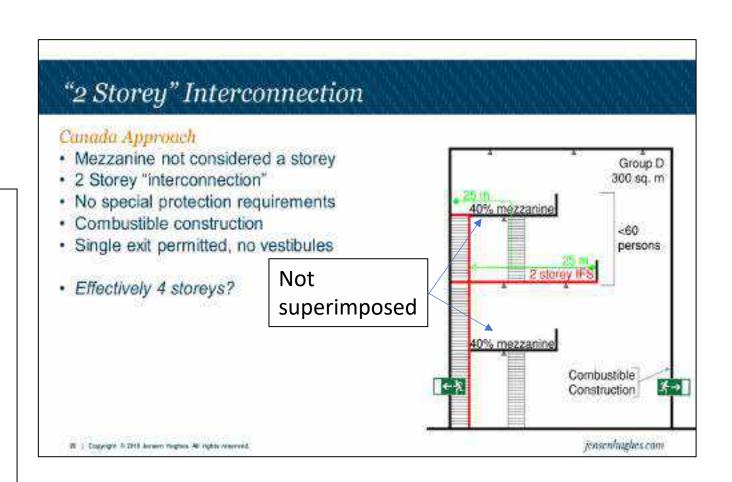
# Interconnected Floor Space (Jensen Hughes) Case Study – Review this one with your team!

Two Storey Office Building (Group D) - Part 9 & 3

- Sprinklered
- Combustible or Non-Combustible
- 45 Minute Floor Fire Separation
- Single Egress Stair permitted
- Interconnected space with no special protection

#### 3.4.2.1. Minimum Number of Exits

- 2) A floor area in a building not more than 2 storeys in building height, is permitted to be served by one exit provided the total occupant load served by the exit is not more than 60, and
- a) in a floor area that is not sprinklered throughout, the floor area and the travel distance are not more than the values in Table 3.4.2.1.-A, or
- b) in a floor area that is sprinklered throughout i) the travel distance is not more than 25 m, and ii) the floor area is not more than the value in Table 3.4.2.1.-B.

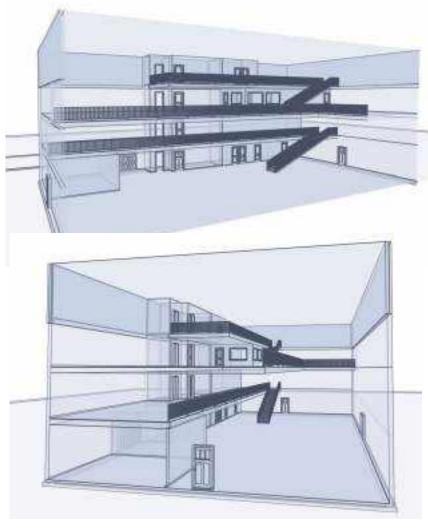


## Interconnected Floor Space Case Study – does it work for two story - SES?









FBS drawing for space planning – single egress at two storeys



## Division B – Part 09

## 9.10.9. Fire Separations and Smoke-tight Barriers between Rooms and Spaces within Buildings

9.10.9.5. Interconnected Floor Spaces

**1)** *Interconnected floor spaces* shall conform to Subsection 3.2.8.



## Table 1.1.1.1.(5) — Heritage Bldgs.

8	Mezzanines Sentence 3.2.1.1.(4) and Sentence 3.2.1.1.(7), Article 9.10.4.1. Mezzanines enclosing more than 10% above the horizontal plane are considered as storey in building height.	Enclosed mezzanines may be up to 40% of the storey in which they occur and not be considered a storey in building height if the building is sprinklered.
14	Interconnected Floor Space Subsection 3.2.8., Sentence 9.10.1.3.(6)	1. Open stairs in buildings of maximum 4 storeys in building height need not comply with Subsection 3.2.8., provided  (a) the building contains a Group C or D occupancy, (b) the building is sprinklered with fast-response sprinklers,  (c) corridors opening into the interconnected floor space are separated from the interconnected floor space by a fire separation with the rating required for the corridor, and  (d) smoke detectors are installed in the rooms opening into the interconnected floor space and the smoke detectors are connected to the fire alarm system 2. Open stairs in buildings of maximum 3 storeys in building height, or first 2 storeys and basement, need not comply with Subsection 3.2.8. of Division B, provided:  (a) the building contains a Group C or D occupancy, (b) the building is sprinklered with fast response sprinklers,  (c) smoke detectors are installed in the rooms opening into the interconnected floor space and the smoke detectors are connected to the fire alarm system, and (d) at least one means of egress is not through the interconnected floor space.



## 3.2.3.2. Area of Exposing Bldg. Face

#### 3.2.3.2. Area of Exposing Building Face

- **1)** Except as permitted by Sentences (2) and (3), the area of an *exposing building face* shall be calculated as the total area of an exterior wall facing in one direction on any side of a *building* measured from the finished ground level to the uppermost ceiling.
- **2)** If a *building* is divided by *fire separations* into *fire compartments*, the area of *exposing building face* is permitted to be calculated for each *fire compartment* provided the *fire separations* have a *fire-resistance rating* not less than 45 min.
- **3)** In a *building* that is *sprinklered* throughout and contains an *interconnected floor space*, the area of the *exposing building face* for the *interconnected floor space* is permitted to be determined by considering each *storey* as a separate *fire compartment* notwithstanding openings through the floor assemblies.



3.4 - Exits

3.5 – Vertical Transportation

3.6 – Service Facilities

# 3.2.8. Mezzanines and Openings through Floor Assemblies

3.2.8. Mezzanines and Openings through Floor Assemblies

3.2.8.1.

Application

3.2.8.2. Exceptions

3.3.4.2. Residential Occupancy - Fire Separations

- Except as permitted by Article 3.2.8.2. and Sentence 3.3.4.2.(3), the portions of a floor area or a mezzanine that do not terminate at an exterior wall, a firewall or a vertical shaft shall
  - a) terminate at a vertical fire separation having a fire-resistance rating not less than that required for the floor assembly and extending from the floor assembly to the underside of the floor or roof assembly above, or
  - b) be protected in conformance with the requirements of Articles 3.2.8.3. to 3.2.8.8.
- 2) The penetration of a floor assembly by an exit or a vertical service space shall conform to the requirements of Sections 3.4., 3.5. and 3.6.
- 3) A floor area containing sleeping rooms in a building of Group B, Division 2 major occupancy shall not be constructed as part of an interconnected floor space.

3.2.8.3. Sprinklers

3.2.8.4. Vestibules

3.2.8.5. Protected Floor Space

3.2.8.6. Draft Stops

3.2.8.7. Mech Exhaust System

3.2.8.8. Combustible Contents

2015 NBC Intent Statements

#### Group B, Division 2

Care facilities with treatment

Convalescent /recovery/rehabilitation centres with treatment

Hospicos with treatment

Hospitals

Infirmaries

Nursing homes with treatment

Psychiatric hospitals without detention quarters

Respite centres with treatment

#### Sentence 3.2.8.1.(3)

#### 1. ±

#### Intent

#### Intent

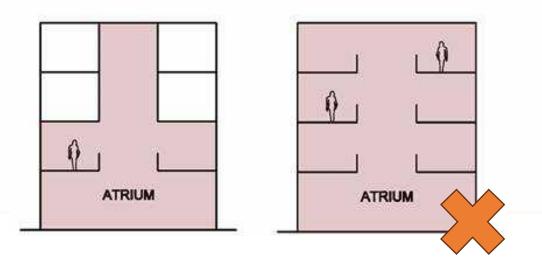
To supersede the requirements of Clause 3.2.8.1.(1)(b) and not permit a certain occupancy within an interconnected floor space is designed with certain fire protection measures, on the basis that persons who are sleeping will be exposed to an undue fire risk.

Top of Page



# 3.2.8.2 Exceptions to Special Protection

**4)** An *interconnected floor space* in a Group B, Division 1 *occupancy* need not conform to the requirements of Articles 3.2.8.3. to 3.2.8.8. provided the *interconnected floor space* does not interconnect more than 2 adjacent *storeys*.



#### Sentence 3.2.8.2.(4)

## 1. ±

#### .....

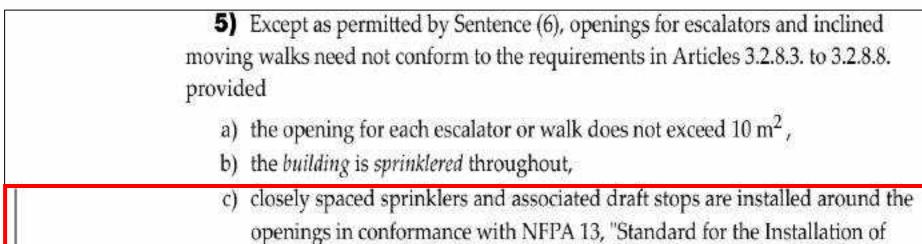
To exempt interconnected floor spaces in Group B, Division 1 occupancies from the requirements of Articles 3,2.8.3, to 3,2.8.8., which would otherwise require certain fire protection measures, if the number of interconnected storeys is limited, on the basis that such occupancies [e.g. prisons or detention buildings] are expected to have:

- continuous supervision that will be able to respond to a fire quickly and, if needed, evacuate the
  occupants, and
- · a minimized fire load within any fire compartment.

Top of Page



## 3.2.8.3 (5) Exceptions to Special Protection



Sprinkler Systems," and

Closely spaced sprinklers are also known as a "water curtain".

d) the interconnected floor space contains only Group A, Division 1, 2 or 3, Group D or Group E major occupancies (see Note A-3.2.8.2.(6)(c)).

#### 2018 BC Building Code

Provision	Functional Statements and Objectives (1)
(E)	[ F02, F03 - OS1.2 ]
(5)	[F02, F03 - OP1.2]

- 5) Except as permitted by Sentence (6), openings for escalators and inclined moving walks need not conform to the requirements in Articles 3.2.8.3. to 3.2.8.8. provided
  - a) the opening for each escalator or walk does not exceed 10 m<sup>2</sup>,
  - b) the building is sprinklered throughout, and
  - the interconnected floor space contains only Group A, Division 1, 2 or 3, Group D or Group E major occupancies (see Note A-3.2.8.2.(6)(c)).



## 3.2.8.3 (5) Exceptions to Special Protection

**F02** To limit the severity and effects of fire or explosions.

F03 To retard the effects of fire on areas beyond its point of origin.

**OS Safety** An objective of this Code is to limit the probability that, as a result of the design, construction or demolition of the building, a person in or adjacent to the building will be exposed to an unacceptable risk of injury.

#### OS1.2 - fire or explosion impacting areas beyond its point of origin

**OP Fire and Structural Protection of Buildings** An objective of this Code is to limit the probability that, as a result of the design, construction or demolition of the building, the building or adjacent buildings will be exposed to an unacceptable risk of damage due to fire or structural insufficiency, or the building or part thereof will be exposed to an unacceptable risk of loss of use also due to structural insufficiency.

**OP1.2** - fire or explosion impacting areas beyond its point of origin



## 3.2.8.3 (6) Exceptions to Special Protection

- **6)** An *interconnected floor space* need not conform to the requirements of Articles 3.2.8.3. to 3.2.8.8., provided
  - a) it consists of the first storey and the storey next above or below it, but not both,
  - b) it is *sprinklered* throughout or, where the *building area* is not more than one half of the area permitted by Subsection 3.2.2., the openings through the floor are used only for stairways, escalators or moving walks (see Note A-3.2.8.2.(6)(b)), and
  - c) it contains only Group A, Division 1, 2 or 3, Group D, Group E, or Group F, Division 2 or 3 major occupancies (see Note A-3.2.8.2.(6)(c)).

2018 BC Building Code had already made modifications to sentence (b)



# 3.2.8.3. Sprinklers

#### 3.2.8.3. Sprinklers

- 1) A building containing an interconnected floor space shall be sprinklered throughout.
- **2)** Except for large floor openings as defined in NFPA 13, "Standard for the Installation of Sprinkler Systems," closely spaced sprinklers and associated draft stops shall be installed around floor openings in conformance with NFPA 13.

**2018 BC Building Code** 

3.2.8.3. Sprinklers

1) A building containing an interconnected floor space shall be sprinklered throughout.



## 3.2.8.4. Vestibules

#### 3.2.8.4. Vestibules

- 1) An exit opening into an interconnected floor space shall be protected at each opening into the interconnected floor space by a vestibule
  - a) with doorways that are not less than 1.8 m apart,
  - that is separated from the remainder of the floor area by a fire separation that is not required to have a fire-resistance rating (see Note A-3.1.8.1.(1)(b)), and
  - c) that is designed to limit the passage of smoke so that the exit stair shaft does not contain more than 1% by volume of contaminated air from the fire floor, assuming an outdoor temperature equal to the January design temperature on a 2.5% basis determined in accordance with Subsection 1.1.3. (see Note A-3.2.8.4.(1)(c)).
- **2)** An exit opening into an interconnected floor space shall conform to Sentence 3.4.3.2.(6).
- 3) If an elevator hoistway opens into an interconnected floor space and into storeys above the interconnected floor space, either the elevator doors opening into the interconnected floor space or the elevator doors opening into the storeys above the interconnected floor space shall be protected by vestibules conforming to Sentence (1).

A-3.2.8.4.(1)(c) Contamination of Vestibule. The vestibule should have equipment capable of maintaining a supply of air into the vestibule that is sufficient to ensure that the air pressure in the vestibule when the doors are closed is higher by at least 12 Pa than the air pressure in the adjacent floor areas when the outdoor temperature is equal to the January design temperature on a 2.5% basis.



#### • BOABC Module 15

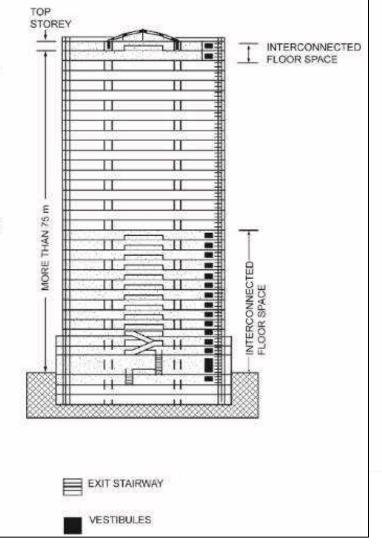
## 3.2.8.4. Vestibules

#### Vestibules - 3.2.8.4.

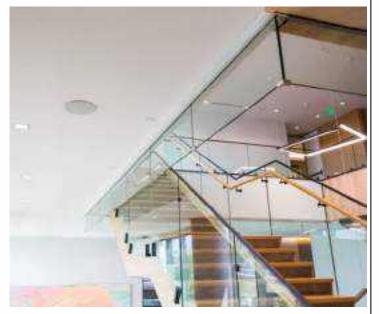
Sentence 3.2.8.4.(1) requires that where an exit opens into an interconnected floor space, the exit stair shaft needs to be protected by a vestibule.

#### The vestibule needs:

- doorways at least 1.8 m apart
- separation from the rest of the floor area by a fire separation not required to have an FRR – see Note A-3.1.8.1.(1)(b)
- to be designed to limit smoke passage so that the exit stair shaft doesn't contain contaminated air of more than 1% by volume from the fire floor, assuming an outdoor temperature equal to the January design temperature on a 2.5% basis determined in accordance with Subsection 1.1.3. – see Note A-3.2.8.4.(1)(c)







SMOKE BAFFLE™ System | Viva Railings | VIVA Railings

#### Clause 3.4.3.2.(6)(b)

b) protected floor spaces conforming to Article 3.2.8.5. are provided at each floor level and the protected floor space on a floor level has not less than 0.5 m<sup>2</sup> of space for each occupant of that floor level of the interconnected floor space. 3.2.8.5. & 3.2.8.6.

#### 3.2.8.5. Protected Floor Space

- A protected floor space used to satisfy the requirements of Clause 3.4.3.2.(6)(b)
  - a) be separated from the <u>interconnected floor</u> space by a fire separation having a fireresistance rating not less than that required for the floor assembly of the storey in which it is located,
  - b) have all openings in the vertical fire separation between a protected floor space and the adjacent interconnected floor space protected by vestibules conforming to Sentence 3.2.8.4.(1), and
  - be designed so that it is not necessary to enter the interconnected floor space to reach an exit.

Code Inter. #1902?

#### 3.2.8.6. Draft Stops

1) A draft stop shall be provided at each floor level within an interconnected floor space, immediately adjacent to and surrounding the opening, and shall be not less than 500 mm deep measured from ceiling level down to the underside of the draft stop.

Protected floor space means that part of a floor area protected from the effects of fire and used as part of a means of egress from an interconnected floor space.



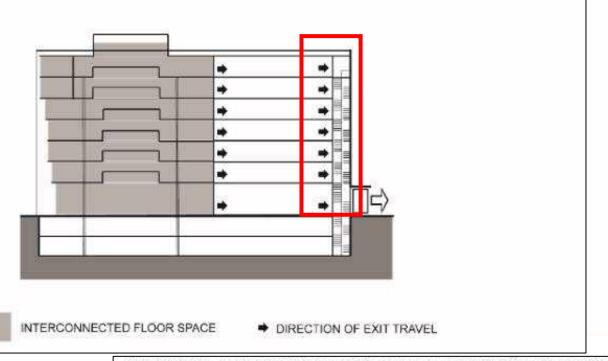
BOABC Module 15

# 3.2.8.5. Protected Floor Space.

#### **Exiting Protected Floor Space**

The diagram below highlights some of what we just reviewed.

However, the diagram isn't completely correct. There should be a vestibule on each floor level separating the interconnected floor space from the protected floor space.

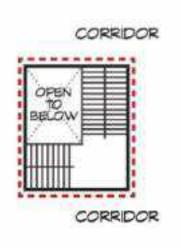


Protected floor space means that part of a floor area protected from the effects of fire and used as part of a means of egress from an interconnected floor space.



# 3.2.8.6. Smoke Baffle Option?







Option to have a concealed baffle for atheistic reasons – still requires closely spaced sprinklers.

Is there a specific design requirement beyond 500mm?

Does it need an Alternative Solution?

CASE 5: Deployable Draft Curtains and Closely Spaced Sprinklers | McKEON



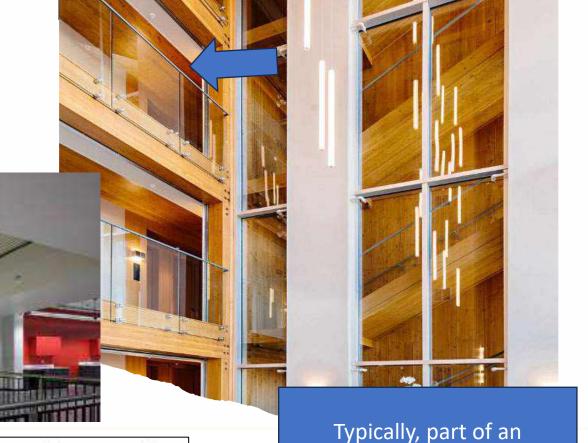
CASE 2: Horizontal (Floor)

Shutter | McKEON

Should we also be concerned if something could block the closer post-occupancy?
Signage?

Use of Fire Curtain/Shutters as part of an Alternative Solution of Mechanicals systems - closures

# **Closure Options**



Alternative Solution.

Interconnected floor space means superimposed floor areas or parts of floor areas in which floor assemblies that are required to be fire separations are penetrated by openings that are not provided with closures.



# BC Code Appeal – Interconnected Floor Space

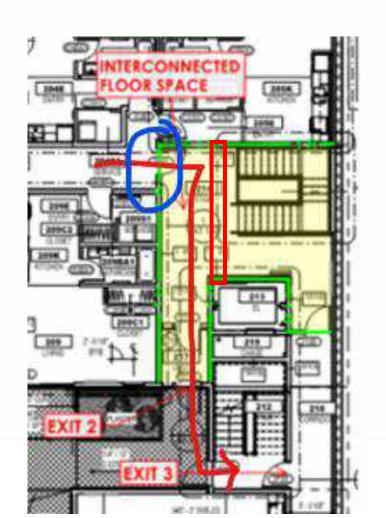


Picture does not represent image of floor plan.



Could this have been a solution to the problem early in the design phase?

Yes, as it separates Group C use?





## 3.2.8.7. & 3.2.8.8.

#### 3.2.8.7. Mechanical Exhaust System

- **1)** A mechanical exhaust system shall be provided to remove air from an *interconnected floor* space at a rate of 4 air changes per hour. (See Note A-3.2.8.7.(1).)
- **2)** The mechanical exhaust system required by Sentence (1) shall be actuated by a switch located on the *storey* containing the entrance for firefighter access referred to in Articles 3.2.5.4. and 3.2.5.5. near the annunciator for the fire alarm system.

#### 3.2.8.8. Combustible Content Limits

How is this determined?? Do you get the calculations?

**1)** An *interconnected floor space* shall be designed so that the *combustible* contents, excluding interior finishes, in those parts of a *floor area* in which the ceiling is more than 8 m above the floor, are limited to not more than 16 g of *combustible* material for each cubic metre of volume of the *interconnected floor space*.

What about special events – like Santa display?

**A-3.2.8.7.(1) Smoke Exhaust System.** The mechanical exhaust system is intended as an aid to firefighters in removing smoke and is to be designed to be actuated manually by the responding fire department. Although smoke is normally removed from the top of the interconnected floor space, exhaust outlets at other locations may be satisfactory.



### 3.4.3.2. Exit Widths

- **6)** The required *exit* width for *exit* stairs that serve *interconnected floor space* designed in accordance with Articles 3.2.8.3. to 3.2.8.8. shall be cumulative, unless
  - a) the stairs provide not less than 0.3 m<sup>2</sup> of area of treads and landings for each occupant of the *interconnected floor* space (see Note A-3.4.3.2.(6)(a)), or
  - b) protected floor spaces conforming to Article 3.2.8.5. are provided at each floor level and the protected floor space on a floor level has not less than 0.5 m<sup>2</sup> of space for each occupant of that floor level of the interconnected floor space.

3.2.8.5. Protected Floor Spaces

**A-3.4.3.2.(6)(a) Temporary Safety Area.** The objective of Clause 3.4.3.2.(6)(a) is to provide an area of temporary safety in the exit stair shafts for the occupants of the interconnected floor space. This requirement is considered to be met if 0.3 m<sup>2</sup> per person is provided in the stair shaft between the floor level served and the floor level immediately beneath it.



# A-3.4.3.2.(6) Evacuation of Interconnected Floor Space.

To ensure that evacuation is not unduly delayed and that queuing of the occupants in the protected floor space can be accommodated, requires careful consideration in the design of the interface between the interconnected floor space/protected floor space/exit.

It is not appropriate, for example, to share a common vestibule in complying with Sentences 3.2.8.4.(1) and 3.2.8.5.(1). Under evacuation conditions, occupants entering the vestibule would flow towards the exit, as opposed to the protected floor space, thus resulting in queuing outside the vestibule and potential exposure to fire. To comply with the intent, it is necessary to design the egress path such that the occupants enter the protected floor space through a vestibule, then in turn enter the exit stair from the protected floor space. In addition, sufficient space should be provided between the vestibule and the exit to allow for the queuing of occupants in the protected floor space.

- **3.2.8.4. Vestibules**
- 3.2.8.5. Protected Floor Space



# A-3.4.3.2.(6) Evacuation of Interconnected Floor Space.

**A-3.4.3.2.(6) Evacuation of Interconnected Floor Space.** This Sentence ensures that egress facilities allow for the simultaneous evacuation of all portions of an interconnected floor space. It does not contemplate the phased evacuation of occupants; thus in buildings where that type of evacuation is intended, fire protection requirements in addition to those prescribed in the Code may be necessary.

In the first instance, this Sentence provides for cumulative exiting that can accommodate the efficient movement of all occupants in the exit stairs. Clause 3.4.3.2.(6)(a) permits an alternative approach that will accommodate all the occupants in the stairs but will restrict the egress flow rate. Clause 3.4.3.2.(6)(b) provides a second alternative that assumes the occupants must queue before entering the stair. A "protected floor space" conforming to Article 3.2.8.5. is intended to provide an intermediate area of safety that is protected from the hazards of the interconnected floor space. It does not provide a holding or refuge area for all occupants of a floor area for an extended period of time.

To ensure that evacuation is not unduly delayed and that queuing of the occupants in the protected floor space can be accommodated, requires careful consideration in the design of the interface between the interconnected floor space/protected floor space/exit.

#### 3.2.8.5. Protected Floor Space



# 3.4.4.2. Exits through a Lobby

- **2)** Not more than one *exit* from a *floor area* is permitted to lead through a lobby, provided
  - a) the lobby floor is not more than 4.5 m above grade,
  - b) the path of travel through the lobby to the outdoors is not more than 15 m,
  - c) the adjacent rooms or premises having direct access to the lobby do not contain a care, residential or industrial occupancy,
  - d) the lobby is not located within an interconnected floor space other than as described in Sentence 3.2.8.2.(6),
    - An interconnected floor space need not conform to the requirements of Articles 3.2.8.3. to 3.2.8.8., provided
      - a) it consists of the first storey and the storey next above or below it, but not both,
      - b) It is sprinklered throughout or, where the building area is not more than one half of the area permitted by Subsection 3.2.2., the openings through the floor are used only for stairways, escalators or moving walks (see Note A-3.2.8.2.(6)(b)), and
      - e) it contains only Group A, Division 1, 2 or 3, Group D, Group E, or Group F, Division 2 or 3 major occupancies (see Note A-3.2.8.2.(6)(c)).



# 3.5.3.1. Fire Separations for Elevator Hoistways

2) Passenger elevators, other than those provided for firefighters in accordance with Article 3.2.6.5., are permitted to be located within interconnected floor space without being enclosed in a hoistway separated from the remainder of the building, provided the elevator machinery is located in a room separated from the remainder of the building by a fire separation having a fire-resistance rating not less than that required for hoistways by Sentence (1).



3.2.6.5. Elevator for Use by Firefighters



## A-3.4.3.2.(6)(a) Temporary Safety Area

**A-3.4.3.2.(6)(a) Temporary Safety Area.** The objective of Clause 3.4.3.2.(6)(a) is to provide an area of temporary safety in the exit stair shafts for the occupants of the interconnected floor space. This requirement is considered to be met if 0.3 m<sup>2</sup> per person is provided in the stair shaft between the floor level served and the floor level immediately beneath it.



# **Ensure Integrated Systems Testing**

#### 3.2.9. Integrated Fire Protection and Life Safety Systems

#### 3.2.9.1. Testing

1) Where fire protection and life safety systems and systems with fire protection and life safety functions are integrated with each other, they shall be tested as a whole in accordance with CAN/ULC-S1001, "Standard for Integrated Systems Testing of Fire Protection and Life Safety Systems" to verify that they have been properly integrated. (See Note A-3.2.9.1.(1).)



### **POLL QUESTION – Presentations**

#### What would you like to see for future Lunch and Learn sessions (Ken K)?

- Level 01 Decks foundation to final = 27% (February)
- Level 02 & 03 Roof top occupancies = 70% (January)
- Other put in the chat or email kkunka@boabc.org

Please forward any questions or suggestions for the presentation to <a href="kkunka@boabc.org">kkunka@boabc.org</a>.



### Next Lunch and Learn – December

### December 12, 2024

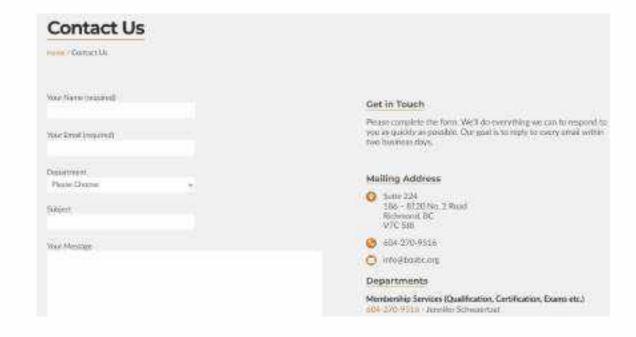
Year end wrap up and review of MHABC permit application and inspection checklists.

Please forward any questions or suggestions for the presentation to <a href="kkunka@boabc.org">kkunka@boabc.org</a>.



## **Questions - Contact Us**





Webinar survey to follow.



PPT - The Building / Fire Codes PowerPoint Presentation, free

download - ID:8927209

Basic Principles of Smoke Management for Atriums

Jensen Hughes-SFPE-02252020.pdf

[May 26, 1967] Flames over Brussels: The À l'Innovation Department Store Fire - Galactic Journey

**Bing Videos** 

Auto-Set® H200 Series | McKEON

<u>2022-03-18-Smoke-Control-in-Atria-Newletter-Address-Update.pdf</u>

https://firecurtaintechnologies.com/wp-content/uploads/2020/06/FCT-SmokeBaffleSystem0620.pdf

BCAB #1902 - Province of British Columbia

BIM objects - Free download! SMOKE BAFFLE™ Systems | BIMobject

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