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October 20, 2026

Via Email nkyriakopoulos@ceengineering.ca
Phone 204 777 1972

Mr. Nikolas Kyriakopoulos, MASc P Eng
Ironclad Developments Inc
101 – 57158 Symington Road
Springfield, MB
R2J 4L6

FIRE UNDERWRITERS SURVEY REVIEW
319 HUNTMAR DRIVE
KANATA, BC **JHS File 260400265**

Dear Nikolas:

We have prepared the following interpretation regarding the Fire Underwriters Survey (FUS) Guide to "*Water Supply for Public Fire Protection*" 2020 Edition. We understand the FUS calculation will be prepared by others. This letter describes an adjustment for applying a modified (interpolated) construction coefficient based on characteristics of the building for calculating the required water supply for firefighting.

In preparation of this letter, we were provided with architectural drawings prepared by McCallumSather. The review provided in this letter is limited to assessing the applicable construction coefficient from the FUS Guide only.

Applicable Code

The applicable Building Code is the Ontario Building Code 2024 (OBC) and references are to this edition.

Project Description

We understand this project consists of the construction of six 6-storey residential buildings. Building A will consist of hybrid mass timber and fire protected wood frame construction, Buildings B1 to B5 will be constructed of fire protected wood frame construction. Each building will be constructed in accordance with Article 3.2.2.51, thus will be sprinklered and all loadbearing elements, floors, and roofs will be constructed to provide a 1h fire resistance rating. In addition to the requirements of Article 3.2.2.51, all buildings of this project will incorporate exterior walls with a 1h fire resistance rating, even where not required by the Building Code. The project site plan is included in *Attachment 1*.

The FUS Guide states that it is a "… *guide and requires specialized knowledge and experience in public fire protection engineering for its effective application*." Based on our knowledge and experience in fire protection engineering, it is our opinion that the following adjustments can be made to the fire flow calculation per the FUS Guide:

- Building A is Type IV-B Mass Timber Construction; based on the combination of mass timber and fire protected wood frame construction, and
- Building B1 to B5 Coefficient of construction can be adjusted; based on fire protected wood frame combustible construction, which is not contemplated in the construction types in the FUS Guide.

Preamble - Performance of Fire Protected Wood Frame Construction

A series of fire tests was undertaken by Codes Canada in 2014 and summarized in a report titled, "*Report to Research Consortium for Wood and Wood-Hybrid Midrise Buildings*" to determine whether protected wood frame construction was a viable alternative to the National Building Code's (NBC) requirement for noncombustible construction. This was part of the research into permitting 5 and 6 storey wood frame buildings in the NBC 2015 edition.

The study undertook four large scale fire tests of mocked up three storey apartments. These were constructed; two of wood frame construction, one of steel stud construction, and one of CLT (mass timber) construction. Exterior walls included various configurations of regular or Type X gypsum board in single or double layers at the interior to simulate exterior walls with and without a fire resistance rating.

The test summary indicates that the steel was significantly impacted by fire with more than 80% loss of strength at 30min and that the steel structure expanded, leading to failure of the gypsum board which contributed to increased ventilation and rapid fire growth and fire spread at 24min. The protected wood frame performed better than the steel, and the structural members were unaffected by fire for more than 30min and did not contribute to fire growth or spread until after 45min in the first protected wood frame test. The second protected wood frame test performed better than the steel but slightly below the first wood test and the wood structure began to contribute at 35min.

The full report can be reviewed at: *Fire safety summary: Fire research conducted for the project on mid-rise wood construction: report to Research Consortium for Wood and Wood-Hybrid Mid-Rise Buildings (canada.ca)* and the relevant discussion is in Chapter 9.

The report concluded that protected wood framing performed *as well as* or better than steel framing and that the wood *met the objectives* attributed to the requirement for noncombustible construction. This is significant as the Building Code defines the acceptable level of performance of an alternative solution to perform "*as well as*" the Division B prescribed solution.

FUS Guide

The FUS Guide has been prepared for usage with Canadian Building Codes (specifically the National Building Code) and relies significantly on the terms and construction requirements in the Building Code. The FUS Guide relies significantly on the fire resistance of assemblies and loadbearing elements in its definitions of construction types but does not define how fire resistance rating is evaluated. Thus, it is understood that the fire resistance rating is evaluated as prescribed by the Building Code (i.e., CAN/ULC-S101 and the MMAH Supplementary Standard SB-2, "Fire Performance Ratings.").

For an exterior wall to achieve a 1h fire resistance rating per the CAN/ULC-S101 test, the assembly, when exposed to a fire (based on a standardized time temperature curve), must prevent the passage of flame from the interior to the exterior for a duration of at least 1h. The CAN/ULC-S101 standard does not limit the material(s) used, nor does it modify its test methodology based on the construction of the assembly. As such, any 1h fire resistance rated assembly is deemed to have the same level of performance as another, regardless of construction materials.

Mass Timber Construction (Building A)

The FUS Guides describes mass timber construction as "Encapsulated Mass Timber, Heavy Timber, and other forms of Mass Timber" and describes subcategories based on the fire resistance rating of assemblies ranging from A (2h fire resistance rated encapsulated mass timber) to D (unrated mass timber).

Type IV-B Mass Timber Construction describes a building that includes mass timber assemblies and all structural elements, exterior walls, interior loadbearing walls, and roofs that have a minimum 1h fire resistance rating. The FUS Guide does not limit the construction types of assemblies and structural elements of a Type IV-B Mass Timber building. Mass timber buildings are typically constructed of hybrid construction, to compensate for design requirements that mass timber is not well suited to address.

Building A will be constructed with CLT floor assemblies and in accordance with Article 3.2.2.51 of the Building Code; as such, all structural elements, interior loadbearing walls, floor and roof assemblies, will have the minimum 1h fire resistance rating as required for Type IV-B Mass Timber Construction. In addition to the requirements of the Building Code, and to meet the definition of Type IV-B Mass Timber Construction, all exterior walls of Building A will be constructed of fire protected wood frame construction with a 1h fire resistance rating.

Thus, the applicable construction coefficient is 0.9.

Protected Wood Frame Construction (Buildings B1 – B5)

The FUS Guide defines ordinary construction as buildings with floors and interior walls that may have no fire resistance rating, and with exterior walls of noncombustible (masonry) construction *or other approved materials* that provide a 1h fire resistance rating.

On the basis that the ordinary, noncombustible, and fire resistive categories specify fire resistance ratings, and the wood frame category does not specify a fire resistance rating, we conclude that the wood frame category is describing unprotected wood frame construction. This type of construction is not

contemplated in the Building Code except for houses (including rowhouses), and the FUS Guide includes a different method of calculation for houses. Ordinary construction describes a type of construction that was common historically; however, it is not common in new construction.

None of the construction types described in the FUS Guide accurately represent the protected wood frame studied in the fire tests by Codes Canada discussed above and proposed for this building. Buildings designed to Article 3.2.2.51 have significantly increased fire protection compared to wood frame construction described in the FUS Guide; both passive protection in the form of fire separations and active fire protection in the form of sprinkler requirements.

As discussed above, the CAN/ULC-S101 test is not dependent on material of construction, thus any 1h fire resistance rated assembly is deemed to have the same level of performance as another, regardless of construction materials. The exterior walls of Buildings B1 to B5 will be constructed of fire protected wood frame construction with a 1h fire resistance rating as determined by the CAN/ULC-S101 test. As discussed below, fire protected wood frame construction meets the functional statements and objectives of noncombustible construction, thus would be considered as '*other approved materials*' described in the FUS Guide definition of ordinary construction.

While Buildings B2 to B5 have not yet commenced construction, the letter provided by McCallumSather, *Attachment 2*, confirms that exterior wall assemblies will be the same 1h exterior walls provided for Building B1.

Coefficient of Construction Adjustment

Reference to interpolation between consecutive construction coefficients was included in the 1999 FUS Guide. Discussion with staff at Fire Underwriters Survey confirmed that although specific reference to interpolation was removed in the 2020 edition of the FUS Guide, interpolation can still occur. They recommend the methodology for interpolation be documented and submitted to the AHJ. A copy of this email discussion is included in *Attachment 3*.

As noted previously, the Codes Canada testing confirmed that protected wood framing performed *as well as* steel framing and that the wood *met the objectives* attributed to the requirement for noncombustible construction.

The FUS Guide would consider the light steel frame in the fire tests to be of noncombustible construction and would assign a construction coefficient of 0.8. The FUS Guide does not include a comparable category for protected wood framing, as the wood frame category in the FUS Guide does not require a fire resistance rating. Based on the results of the fire tests and the conclusion that protected wood frame performed *as well as* protected steel frame, the proposed construction is equivalent to noncombustible and could be assigned a construction coefficient of 0.8.

The ordinary category is assigned a construction coefficient of 1.0. This category includes exterior walls of noncombustible *or other approved material* having a 1h fire resistance rating, and floors and interior walls with no fire resistance ratings, which, as noted previously, is not permitted in the current Building Code other than for houses. In the proposed buildings, the exterior walls, floor assemblies and vertical fire separations between dwelling units will be protected by Type X (or Type C) gypsum board in accordance

with listed designs per the Building Code providing at least a 1h fire resistance rating. Typically, floors are protected using an assembly that includes two layers of gypsum board and walls are protected with a single layer.

Buildings constructed with exterior walls having a 1h fire resistance rating, as determined by the Building Code, would in our opinion, meet the definition of ordinary construction in the FUS Guide. Additionally, the use of two-layer construction provides increased robustness to exterior wall assemblies by adding mass, structural integrity, and redundancy, leading to improved fire resistance performance. This was demonstrated in the NRC testing data which showed that two-layer exterior wall construction delayed the time of structural member involvement.

Fire testing has shown that fire protected wood framed construction will perform as well as noncombustible construction and thus, can be considered *other approved material*. In our opinion, the proposed six-storey buildings will function as well as, if not better than, a building classified as *Ordinary Construction,* and we are proposing an adjusted construction coefficient of 1.05.

Summary

Building A

As discussed above, Building A will meet the FUS Guide's definition of Type IV-B Rated Mass Timber Construction. Thus, the applicable construction coefficient is 0.9.

Buildings B1 – B5

As discussed above, fire testing has shown that fire protected wood framed construction will perform as well as noncombustible construction and thus, can be considered *other approved material*. Thus, in our opinion, the proposed six-storey buildings will function as well as, if not better than, a building classified as *Ordinary Construction,* and we are proposing an adjusted construction coefficient of 1.05.

Should you have any questions, please contact the undersigned.

Prepared by,
GHL Consultants
Permit to Practice 100555315

2026.10.20
11:49:56-07'00'

Matt Turco, MASc, P Eng, CP

Reviewed by,

Raphael Klensch

Raphael Klensch, PL Eng, CP

Reviewed by



K.M. Gary Chen, MASc, P Eng

2026-10-20

Enclosures

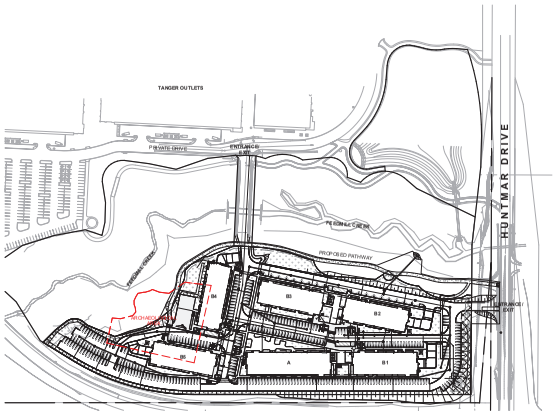
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This technical report addresses only specific Building Code issues under the GHL/Client agreement for this project and shall in no way be construed as exhaustive or complete. This technical report is issued only to the Authority Having Jurisdiction, the Client, Prime Consultants, and Fire Suppression Designer to this project and shall not be relied upon (without prior written authorization from GHL) by any other party.

MT/RK/GC/kl/dh C:\Box\260400265 - 10239 - 319 Huntmar Drive, Kanata\Report\2026-10-20 Kyriakopoulos- Fire Flow Letter (JSH 260400265).docx

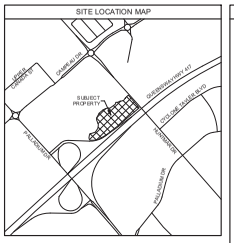
Attachment 1

Site Plan

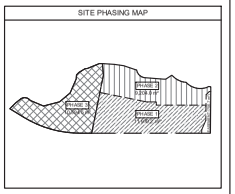


OVERALL SITE PLAN - SITE ENTRANCES

SITE LOCATION MAP

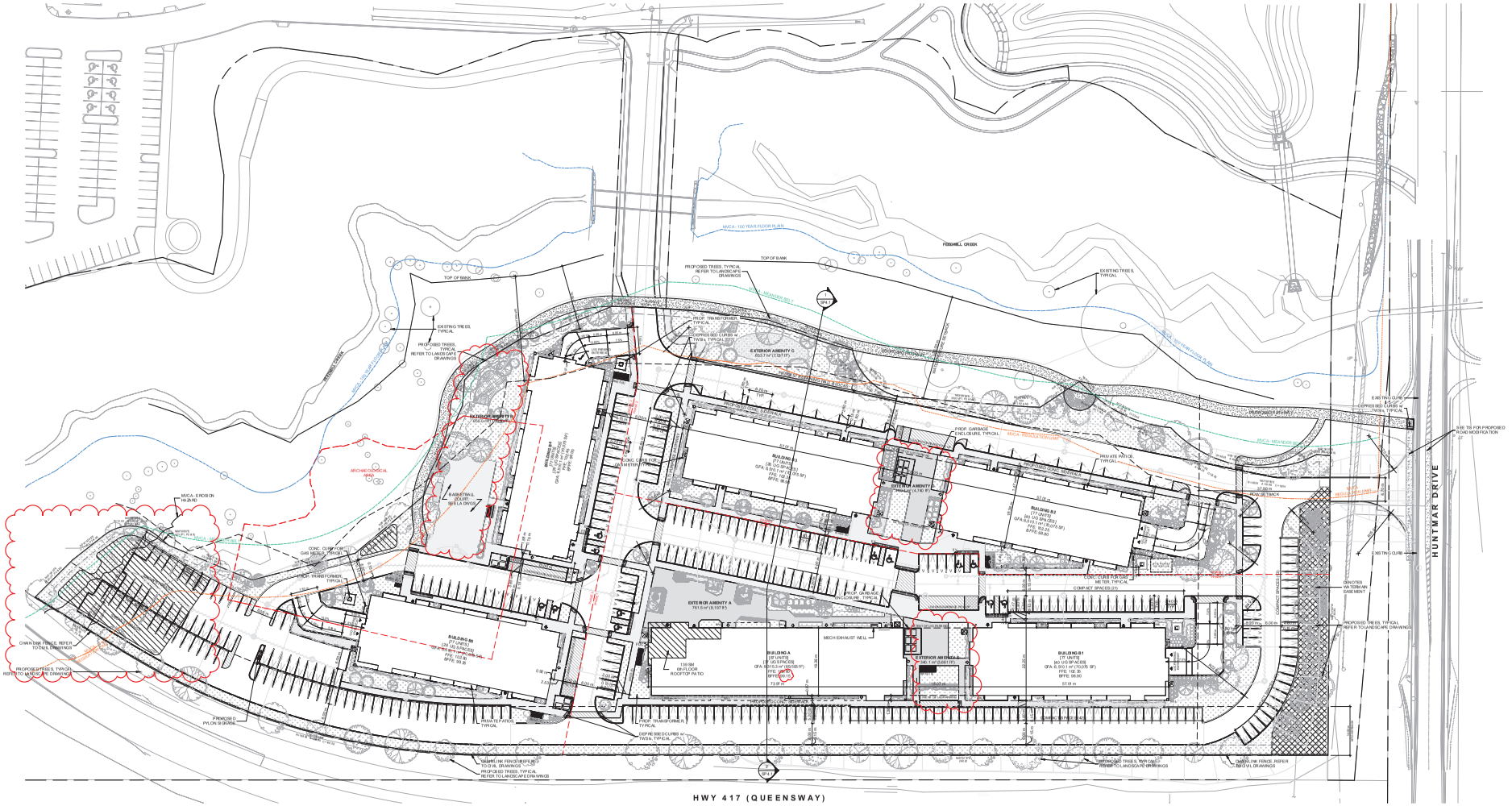


SITE PHASING MAP



SITE PLAN LEGEND

- EXTENT OF UNDERGROUND PARKING GARAGE
- LINE OF SETBACK
- CENTERLINE OF ROAD
- PROPERTY LINE
- DRIP LINE
- MAIN BUILDING ENTRANCE/ FIREFIGHTER ENTRANCE
- SECONDARY BUILDING ENTRANCE
- FIRE EXIT
- PARKING ENTRANCE
- FDC — FIRE DEPT CONNECTION
- BOLLARD
- LBD — LIGHT BOLLARD
- MANHOLE COVER
- CATCH BASIN
- FIRE HYDRANT
- GAS — GAS METER
- EX. WATER VALVE
- SIGNAGE
- EX GUY — EX. GUY WIRE
- EX WUP — EX. WOOD UTILITY POLE
- F.F.E. — FINISHED FLOOR ELEVATION
- 000.0 — SITE ELEVATIONS (SHOWN TO ESTABLISH AVERAGE GRADE)
- FIRE ACCESS ROUTE - SIGNAGE PLACED ON WITH RESIDE
- FIRE ACCESS ROUTE
- WASTE COLLECTION POINT
- SOFT LANDSCAPING
- REGULATED AREA
- DISTANCE FROM PRINCIPAL ENTRANCE TO FIRE ROUTE
- DISTANCE FROM FIRE HYDRANT TO FIRE DEPARTMENT CONNECTION
- MVCA - MEANDER BELT
- MVCA - REGULATION LIMIT
- MVCA - 100 YEAR FLOOD PLAIN



1 SP1.0 OVERALL SITE PLAN

1 : 400

Issued for Schematic Design	2025.03.06
Issued for Design Development	2025.04.10
Issued for Site Plan Control	2025.04.10
Issued for Permit	
Issued for Tender	
Issued for Construction	

NO.	DATE	BY	REVISIONS

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OAA

CONSULTANTS

PROJECT
319 HUNTMAR - SITE PLAN

319 HUNTMAR DR, KANATA, ON, K2S 0P6

DRAWING TITLE
SITE PLAN

SHEET SIZE	DATE
ARCH D (24"x36")	As indicated

PROJECT NO. 25066

DRAWING NO. SP1.0

File Number D07-12-25-0037 | Plan Number #19483

Attachment 2

Letter dated October 16, 2026 from McCallumSather to GHL Consultants re Fire Underwriters Survey Review

mcCallumSather

October 16, 2026

ATTN: Matt Turco, MASc, P Eng, CP | Associate
GHL Consultants, a part of J.S. Held
700 West Pender Suite 800, Vancouver, BC V6C 1G8
September 21, 2026

Subject: FIRE UNDERWRITERS SURVEY REVIEW
319 HUNTMAR DRIVE
KANATA, ON

To whom it may concern,

We confirm that although construction drawings have not yet commenced for Buildings B2, B3, B4 and B5, the intent is for these buildings to utilize the same building assemblies as those specified for Building B1.

These assemblies will be incorporated into the construction documents as design progresses in phase 2 and 3 of the 319 Huntmar Drive project located in Kanata, Ontario.

Yours truly,



Morgan Wright, OAA.
Project Architect, Associate

Attachment 3

FUS Email Correspondence on Construction Coefficient

Cindy Yee

From: Kevin To
Sent: October 16, 2023 11:14 AM
To: Frankie Victor
Subject: FW: 2023-10-04 - Technical Query (GHL) - FUS 2020 Guide_Question of Construction Coefficient

Follow Up Flag: Follow up
Flag Status: Flagged

See below.

Kevin To, M Eng, P Eng, ing, CP

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From: King, Michael
Sent: Thursday, October 5, 2023 12:11 PM
To: Kevin To
Cc: Banyi, Gabriela
Subject: 2023-10-04 - Technical Query (GHL) - FUS 2020 Guide_Question of Construction Coefficient

Hi Kevin,

I am doing well. Hope you have been good as well.

With the update of the Construction Coefficient terms of reference and Items of Note Regarding Construction Coefficients item II, the note from the 1999 edition was removed. The updated terms of reference provides guidance to aid users of the document in selecting an adequate Construction Coefficient based on the predominate Construction Coefficient for new construction and structures already built.

Interpolation can still occur by users of the document. Methods of interpolation may exist if a user of the guide chooses to not apply Note II. The method of interpolation chosen by a user should be well document and submitted to the authority having jurisdiction (AHJ - municipality and/or water purveyor) for acceptance. The AHJ can permit or restrict how the document is used for the analysis of structural fire protection needs in the community for the development of a water distribution infrastructure and fire department.

A note will be created to review the past note during the next revision cycle of the guide.

If you wish to discuss further, please let us know.

Michael King, B.Sc & Fire, C.Tech
Public Fire Protection Specialist, Fire Underwriters Survey
+1.604.609.4137 direct | +1.778.227.7039 mobile | +1.800.665.5661 toll free
fireunderwriters.ca



From: Kevin To <kto@ghl.ca>
Sent: October 4, 2023 3:17 PM
To: King, Michael <Michael.King@verisk.com>
Subject: FUS 2020 Guide_Question of Construction Coefficient

Hi Mike,

Hope all is well. It has been a while. I believe Rob has mentioned that you I would get in touch.

I came across a question on the changes in the 2020 version of the guide from the 1999 version.

In the 1999 version, there is discussion on interpolating the construction type coefficient as shown below. This text has been removed in the 2020 version. I was wondering if there is a particular reason that has been removed.

Some “practitioner” seems to interpret that it is not possible to apply 1.2 as C for example due to this change. So it is either 1.5 or 1.0 and nothing in between. I just wanted to see if this is indeed the intent for current calculation method and the thinking behind this change if that is the case.

Your insight would be helpful and appreciated.

1. An estimate of the fire flow required for a given area may be determined by the formula:

$$F = 220\ C\sqrt{A}$$

where

F = the required fire flow in litres per minute.

C = coefficient related to the type of construction.

- = 1.5 for wood frame construction (structure essentially all combustible).
- = 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior).
- = 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls).
- = 0.6 for fire-resistive construction (fully protected frame, floors, roof).

Note: For types of construction that do not fall within the categories given, coefficients shall not be greater than 1.5 nor less than 0.6 and may be determined by interpolation between consecutive construction types as listed above. Construction types are defined in the Appendix.

A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building being considered.

For fire-resistive buildings, consider the two largest adjoining floors plus 50 percent of each of any floors immediately above them up to eight, when the vertical openings are inadequately protected. If the vertical openings and exterior vertical communications are properly protected (one hour rating), consider only the area of the largest floor plus 25 percent of each of the two immediately adjoining floors.

Thanks,

Kevin To, M Eng, P Eng, ing, CP

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