11.5. Upgrade Mechanism

11.5.1. General

(See Note A-11.5.1.)

11.5.1.1. Application

1) The *acceptable* level of upgrade required for a *building* shall be determined on the basis of the Upgrade Triggers Mechanism of Subsection 11.5.2., except as otherwise required or permitted by this Part.

2) For a single detached house or duplex, the *acceptable* level of upgrade required shall be determined on the basis of Subsection 11.5.3.

3) The Hazard Index may be determined by the Hazard Index Table or other methodology as deemed *acceptable* to the *Chief Building Official* (see Note A-11.5.1.1.(3)).

11.5.1.2. Required Upgrade Levels

1) The required Upgrade Levels determined by this Part are as follows (see Note A-11.5.1.2.(1)):

Fire

F1 - *Exit*ing to be reviewed to ensure that the *exits* do not present an unsafe condition.

F2 - *Existing building* to meet the fire & life safety requirements of this By-law within the project area and have conforming *exits* leading from the project area to an *acceptable* open space.

F3 - *Existing building* to meet fire, life and health safety requirements within the *project* area. *Existing building* to meet fire, life and health safety requirements within the public areas.

F4 - Entire *building* to substantially meet the intent of health, fire and life safety requirements of this By-law as well as provide protection to adjacent property.

Structural

S1 - Proposed work must not have an adverse effect on the structural capacity of the existing structure.

S2 - Limited structural upgrade required in order to provide minimum protection to *building* occupants during a seismic event within the *project* area.

S3 - The *building* structure shall be upgraded to an *acceptable* level in order to provide a minimum level of property and life safety to unreinforced masonry or other *buildings* having less than 30 percent of the current required seismic resistance. Falling hazards that may impact adjacent properties and over public ways must be addressed.

S4 - The entire *building* structure shall be brought up to an *acceptable* level in order to meet seismic requirements of this By-law.

Nonstructural

N1 - *Project* area to be reviewed to ensure safety from overhead falling hazards.

N2 - *Project* area and *means of egress* to be reviewed to ensure safety from overhead falling hazards.

N3 - *Building exits* and to *acceptable* open space to be reviewed to ensure safety from overhead falling hazards.

N4 - Entire *building* and to *acceptable* open space to be reviewed to ensure safety from overhead falling hazards.

Accessibility

A1 - The proposed work must not adversely affect the existing *accessibility* level of the *building*.

A2 - A limited level of upgrade shall be provided within the *project* area to ensure *access* for persons with disabilities.

A3 - The *existing building* shall be upgraded to an *acceptable* level in order to ensure complete *access* within the *project* area as well as *access* to the remainder of the *building*.

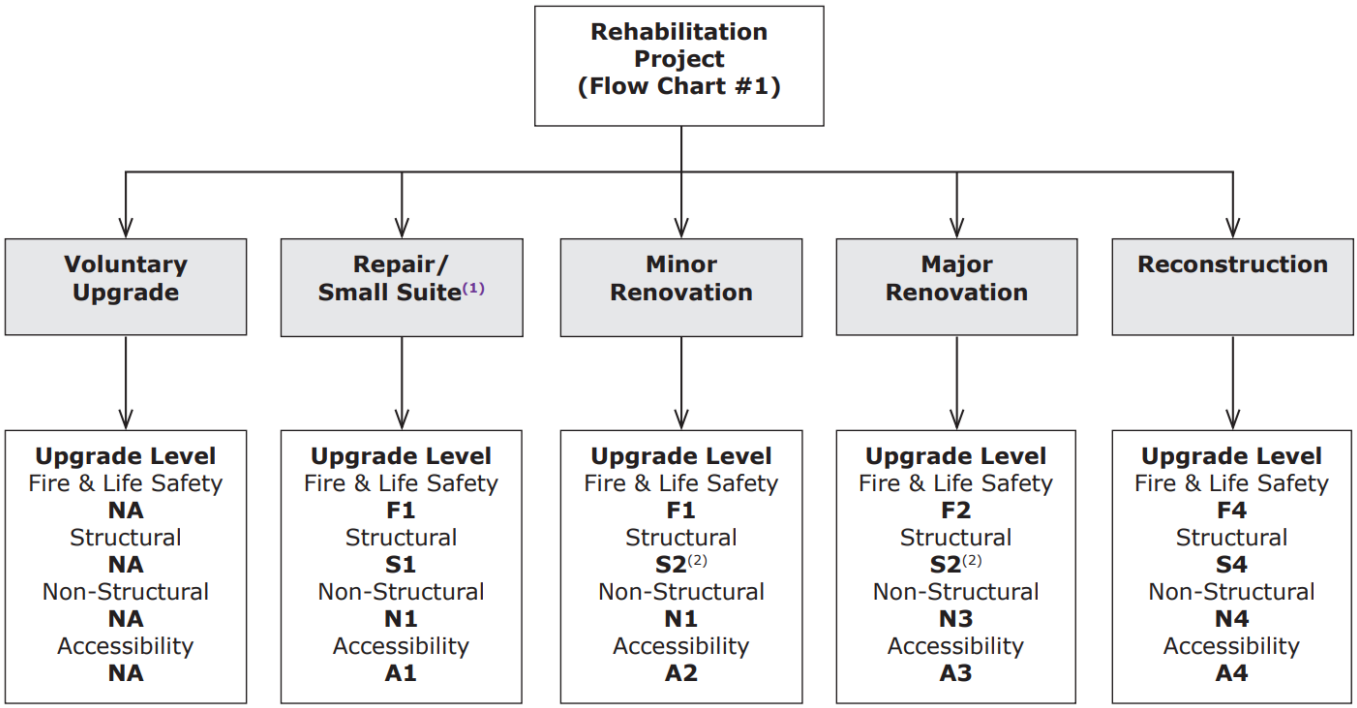
A4 - The *existing building* shall be upgraded in order to provide the minimum *accessibility* requirements of this By-law.

11.5.2. General Upgrade Requirements

11.5.2.1. Upgrade Trigger Mechanism

1) Except as otherwise required or permitted by this Part, the *acceptable* level of upgrade for an *existing building* shall be determined in accordance with Flow Chart 11.5.2.1.-A, -B, and -C for each type of project.

RENOVATION PROJECT TYPE (Flow Chart No. 1)

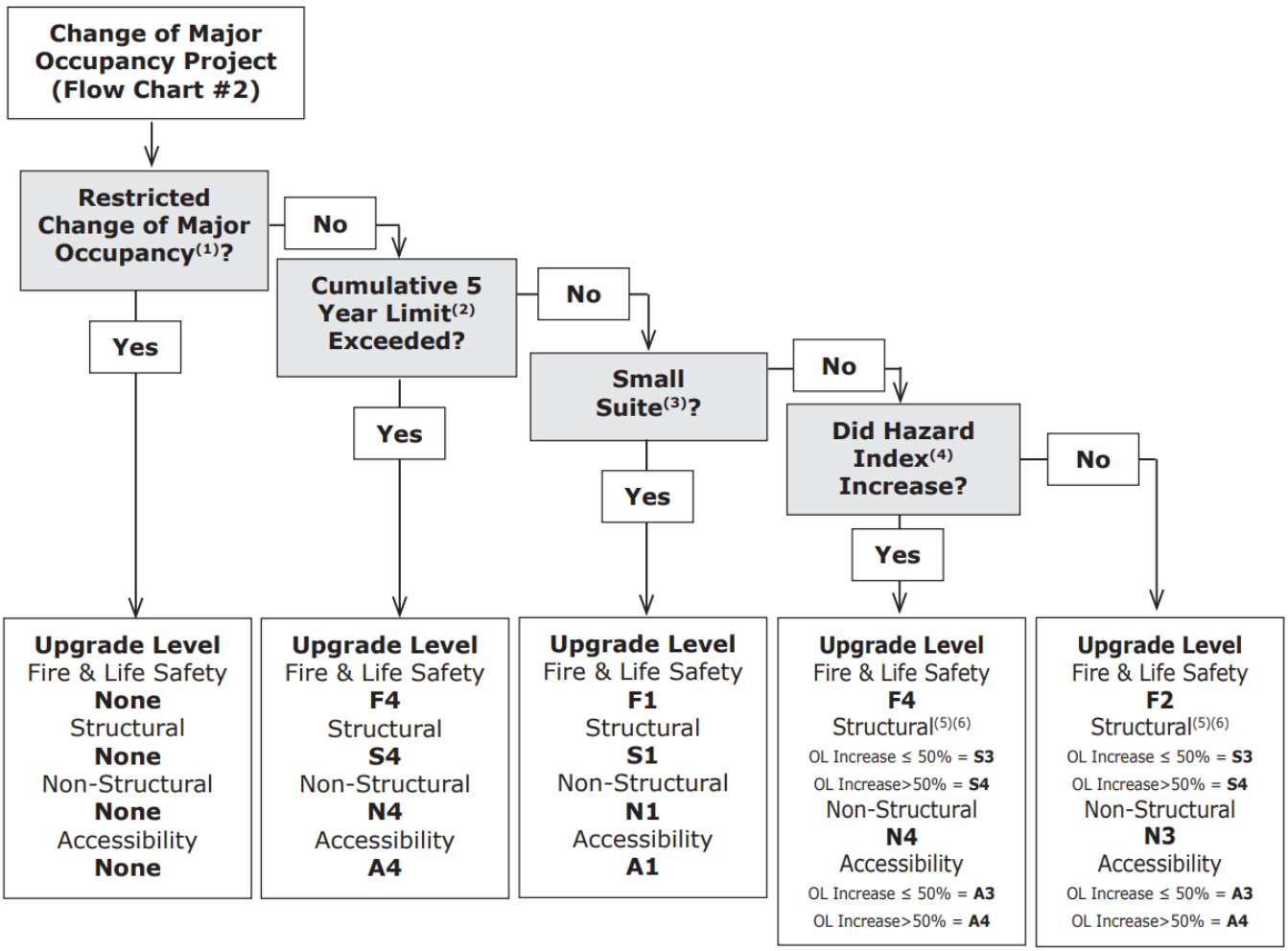


Notes to Flow Chart No. 1:

(1) For small *suite*s, the small *suite* must be separated on the *suite* side of the *suite* separation with at least two layers of gypsum wall board (GWB) as required by Sentence 11.5.1.1.(5).

(2) Notwithstanding the upgrade levels in Flow Chart #1, where a minor or major renovation involves an entire *building* and the renovation includes the removal of the majority interior wall cladding then the structural seismic upgrade level shall be S3.

CHANGE OF *MAJOR OCCUPANCY* CLASSIFICATION PROJECTS (Flow Chart No. 2)



Notes to Flow Chart No. 2:

(1) Restricted Change of *Major occupancy* (see Article 11.5.3.1.(2))

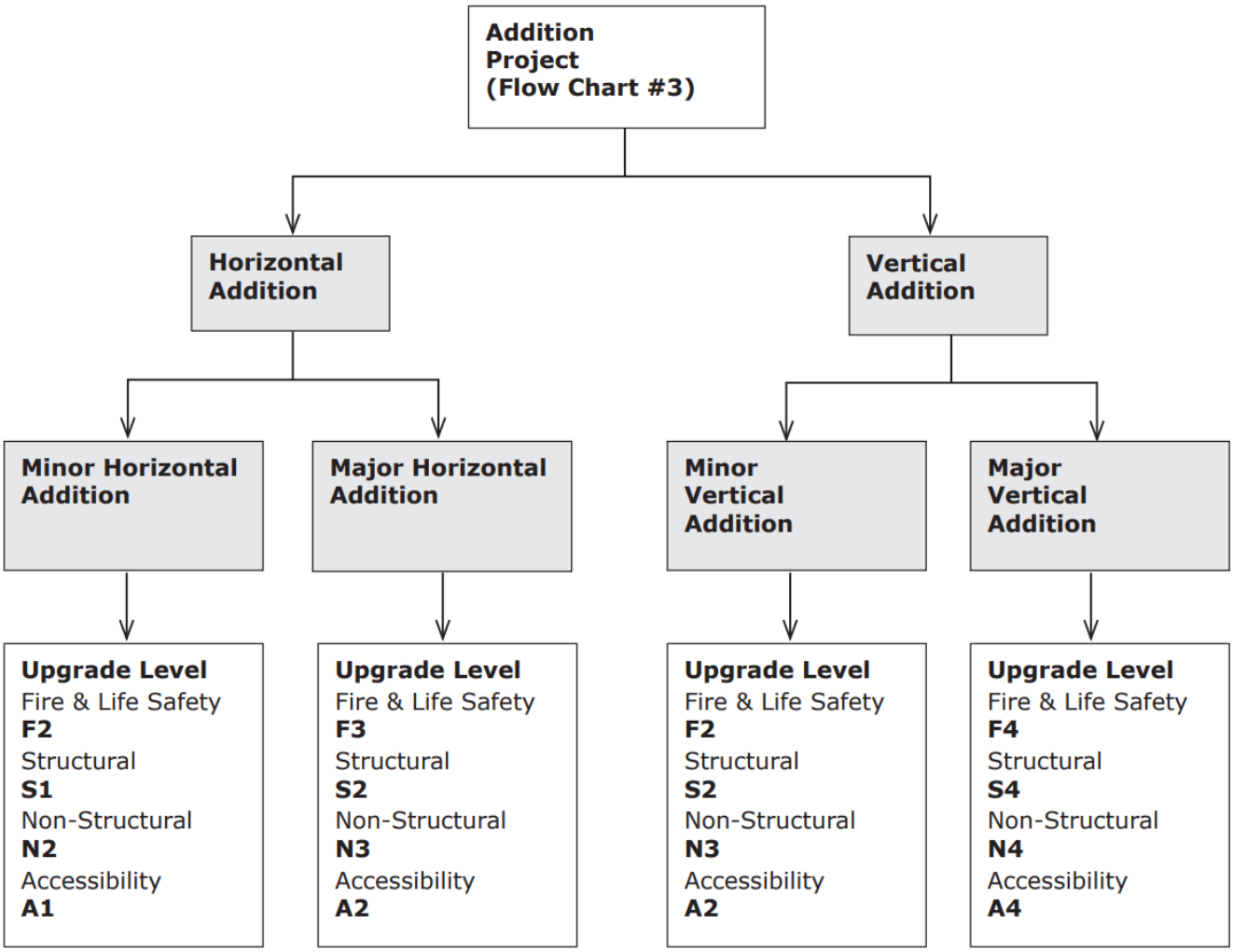
(2) The cumulative 5 year limit is triggered when there is a change of *major occupancy* in an *existing building* and the aggregate area of the change in *major occupancy* including the current work within any 5 year period is greater than 50% of the *building area* (as defined in Article 1.4.1.2. of Division A) in a *building* of not more than one *storey*, or the aggregate area of the change in *major occupancy* within any 5 year period is greater than 100% of the *building area* (as defined in Article 1.4.1.2. of Division A) in a *building* of more than one *storey*.

(3) For small *suite*s, the small *suite* must be separated on the *suite* side of the *suite* separation with at least two layers of gypsum wall board (GWB) as required by Sentence 11.5.1.1.(5).

(4) Where there is a change of *major occupancy* and the structural load paths or structural design criteria are altered then it must be demonstrated that the *existing building* has the structural capacity to carry the increase in load or the *building* shall be structurally upgraded to carry the increase in live load.

(5) Occupant load (OL) increase is based on the proposed occupant load for the entire *building* versus the current occupant load for the entire *building*. The OL change may be assessed in a comparative manner by considering only those areas undergoing a change of *major occupancy*, where the occupant load of the remainder of the *building* cannot otherwise reasonably be assessed. Occupant loads are to be determined by the *acceptable* solutions in Subsection 3.1.17. of Division B.

ADDITION PROJECTS (Flow Chart No. 3)



2) Where a project scope includes multiple categories of work the highest upgrade level in each category shall apply and include the requirements of all lower upgrade levels.

3) Where a *suite* is altered as a small *suite* renovation or small *suite* change of *major occupancy*, and the existing framed ceiling/floor and wall assemblies separating the *suite* from adjacent spaces in the *building* are not constructed with at least 2 layer of 13 mm thick gypsum board on the interior side, the *suite* separation shall be upgraded to include at least 2 layers of 13 mm thick gypsum wall board.

11.5.3. Upgrade Requirements for Single Detached House and Duplex Building

11.5.3.1. Upgrade Requirement

1) An *alteration* or addition to a single detached house or duplex *building* containing not more than two principal *dwelling units* shall comply with this By-law, and the existing portions of *building* shall be upgraded to an *acceptable* level as determined by Tables 11.5.3.1.(1)-A, 11.5.3.1.(1)-B, and 11.5.3.1.(1)-C.

Table 11.5.3.1.(1)-A
Fire and Life Safety Upgrade requirements for Residential Buildings containing not more than Two Principal *Dwelling units*
Forming part of Sentence 11.5.3.1.(1)

Scope of Work	Smoke Alarms[1]	CO Alarms[2]	Guards[3]	Spatial Separation[4]	Structural[5]
Renovation	Y	Y	Y	N	N
Relocation or Reconstruction	Y	Y	Y	Y	Y

Horizontal Addition *Floor area*					
up to 25%[6]	Y	Y	Y	N	N
over 25%[7]	Y	Y	Y	Y	Y
Vertical Addition *Floor area*					
up to 25%[6]	Y	Y	Y	N	Y
over 25%[7]	Y	Y	Y	Y	Y

Notes to Table 11.5.3.1.(1)-A:

(1) Smoke Alarms: to be installed in conformance with Subsections 3.2.4. and 9.10.19. as applicable.
(2) CO Alarms: to be installed in conformance with Subsections 6.9.3. and 9.32.4. as applicable.
(3) Guards: all unsafe guards to be upgraded to the satisfaction of the *Chief Building Official*.
(4) Spatial Separation: Spatial separation of the *building* shall comply with Subsections 3.2.3., 9.10.14. or 9.10.15. as applicable; or as permitted by Section 11.3.
(5) All existing wood frame walls to be anchored to existing concrete foundation walls for seismic resistance.
(6) Aggregate increase in *floor area* less than 25% of the *building area* (see flow chart #3 of Note A-11.2.1.2).
(7) Aggregate increase in *floor area* greater than 25% of the *building area*.

Table 11.5.3.1.(1)-B
Egress and *Exit* Upgrade requirements for Residential Buildings containing not more than Two Principal *Dwelling units*
Forming part of Sentence 11.5.3.1.(1)

Scope of Work	*Means of egress*[1]	Handrails[2]	*Exit* Exposure[3]	Stair Dimensions[4]	Building Services[5]	Falling Hazards[6]
Renovation	N	Y	N	N	N	N
Relocation or Reconstruction	Y	Y	Y	Y	Y	Y
Horizontal Addition *Floor area*						
up to 25%[7]	Y	N	N	N	N	Y
over 25%[8]	Y	Y	Y	Y	Y	Y
Vertical Addition *Floor area*						
up to 25%[7]	Y	Y	N	N	N	Y
over 25%[8]	Y	Y	Y	Y	Y	Y

Notes to Table 11.5.3.1.(1)-B:

(1) *Means of egress*: confirm that access to *exit* (9.9.9.) and means of escape (9.9.10.) from all *floor areas* is compliant with regards to travel distance and *fire separation* (where applicable).
(2) Handrails: all unsafe handrails to be upgraded to the satisfaction of the *Chief Building Official*.
(3) *Exit* Exposure: *Exits* to be confirmed to be compliant with regards to *exit* exposure where applicable.
(4) Stair Dimensions: Existing stairs in *means of egress* to comply with the dimensional requirements of Subsection 9.8.2.
(5) *Building* Services: Restrain *building* service piping, conduit, and appliances to resist lateral movement due to earthquake.
(6) Falling hazards: Restrain falling hazards within 3 m of the egress path to resist lateral movement due to earthquake.
(7) Aggregate increase in *floor area* less than 25% of the *building area* (see flow chart #3 of Note A-11.5.2.1).
(8) Aggregate increase in *floor area* greater than 25% of the *building area*.

Table 11.5.3.1.(1)-C
Floor area* Upgrade Requirements for Residential Buildings containing not more than Two Principal *Dwelling units
Forming part of Sentence 11.5.3.1.(1)

Scope of Work	Flame Spread[1]	Floor *Fire separations*[2]	*Suite Fire separations*[3]	Lighting & Emergency Lights[4]	Door Hardware[5]
Renovation	N	N	N	N	N
Relocation or Reconstruction	Y	Y	Y	Y	Y
Horizontal Addition *Floor area*					
up to 25% [6]	N	N	N	N	N
over 25% [7]	Y	Y	Y	Y	Y
Vertical Addition *Floor area*					
up to 25% [6]	N	N	N	Y	N
over 25% [7]	Y	Y	Y	Y	Y

Notes to Table 11.5.3.1.(1)-C:

[1] Flame Spread Rating: Exposed wall and ceiling finishes of egress routes to meet the requirements of Subsection 9.10.17. in *exits*
[2] Floor *Fire separations*: Floor and occupied roof assemblies to be fire rated per Article 9.10.8.1.

(3) *Suite Fire separations* (where applicable): Residential *suites* to be provided with a *fire separation* in accordance with Article 9.10.9.14. and Section 9.37.
(4) Lighting & Emergency Lights (where applicable): Lighting and emergency lighting to be provided in *means of egress* in accordance with Subsection 9.9.12.
(5) Door Hardware: Door hardware within existing *floor areas* to be made adaptable as per Subsection 3.8.5.
(6) Aggregate increase in *floor area* less than 25% of the *building area* (see flow chart #3 of Note A-11.5.2.1).
(7) Aggregate increase in *floor area* greater than 25% of the *building area*.

2) Where an *alteration* or addition is made to an existing residential *building* containing not more than two principal *dwelling units*, the energy efficiency of the *building* shall be upgraded to an *acceptable* level in conformance with Table 11.5.3.1.(2).

Table 11.5.3.1.(2)
Energy Efficiency Upgrade Requirements for Residential Buildings containing not more than Two Principal *Dwelling units*
Forming part of Sentence 11.5.3.1.(2)

Alteration construction value(1)	EnerGuide Assessment(2)	Air tightness upgrades(3)	Attic and Sloped Roof Insulation(4)	Hot Water Heating	Electric Space Heating
$0.00 to $142,999	N	N	N	N	N
$153,000 to $254,999	N	N	N	Y(5)	N
≥$255,000	Y	Y	Y	Y	Y

Notes to Table 11.5.2.1.(2):
(1) "Construction Value" - see note A-11.1.4.3.(6), 11.2.3.1.,11.5.3.1.(2)&(4), and 11.5.4.2.(4).
(2) An EnerGuide Assessment completed within the last 4 years must be submitted, a post-construction assessment must also be completed.
(3) Where EGH>5 air changes per hour, air sealing is required.
(4) Where attic insulation <R12 (2.11RSI), increase to R28 (4.93RSI); where attic insulation ≥R12 (2.11RSI), increase to R40 (7.04RSI); Insulation in existing attics shall not exceed R43.7 (7.7RSI). All flat roof and cathedral ceiling insulation shall be upgraded to ≥R14 (2.47RSI).
(5) Domestic hot water equipment must be replaced in compliance with the domestic hot water requirements of Article 10.2.2.12. or a uniform energy factor of not less than 1.0, except the system may be gas-fired with a uniform energy factor of not less than 0.78 or a thermal efficiency of not less than 90% where

- the *building* mechanical room, storage or service spaces have insufficient space to accommodate the footprint, height, or manufacturer-specified space requirements of the new equipment;
- the existing electrical panel has insufficient circuit or amperage capacity to accommodate the new equipment;
- the existing domestic hot water system is part of a combined system that also provides space-heating;
- the existing domestic hot water equipment was installed with a valid permit within the previous five years; or
- equivalent emissions reduction measures are completed as *acceptable* to the *Chief Building Official*.".

3) Where an *alteration* is made to an existing residential *building* containing not more than two principal residential *dwelling units*, a sprinkler system shall be installed
a) throughout the *building*, where more than one *dwelling unit* is created, reconstructed, or both,
b) throughout any *storey* on which a new principal *dwelling unit* is created and all *storeys* below, or
c) throughout any *storey* on which an *alteration* increases the existing *building floor area* by more than 50%.

4) A *building* need not be *sprinklered* in accordance with Sentence (3), if the construction value of the *alteration* does not exceed $255,000 (see Note A-11.1.4.3.(6), 11.2.3.1.,11.5.3.1.(2)&(4), and 11.5.4.2.(4)).

11.5.4. Special Cases

11.5.4.1. General

1) Where there is a change of *major occupancy* in a *building*, and the aggregate area of the change in *major occupancy* within any 5 year period is greater than 50% of the *building area* in a one *storey building* or greater than 100% of the *building area* in a *building* of more than one *storey*, the entire *building* shall be upgraded to design upgrade levels F4, S4, N4 and A4 as detailed in the Upgrade Trigger Mechanism except where
a) the change in *major occupancy* is to a single *suite* of not more than 100 m², and the work does not exceed 5% of the *building area*, or
b) such upgrades are in conflict with an approved heritage retention plan.

2) Where there is a change of *major occupancy* in a *building*, the upgrade requirements of Flow Chart #2 of the Upgrade Trigger Mechanism need not be provided where
a) the change in *major occupancy* is to a single *suite*,
b) the aggregate *suite* area does not exceed the lesser of 50% of the *building area* or 300 m²,
c) the *major occupancy* of the *suite* is Group D or Group E, and
d) the use and aggregate *suite* area complies with Table 11.5.4.1.(2)

Table 11.5.4.1.(2)
Maximum Aggregate *Suite* Area
Forming part of Sentence 11.5.4.1.(2)

Major occupancy	***Suite* Use**	**Aggregate *Suite* Area**

		≤200 m²	201 to 300 m²
Group D	Administrative & Business Offices	Y	Y
	Barber and Hairdressing Shop	Y	Y
	Beauty Salon	Y	Y
	Health Care Offices (non-surgical, non-sedation)	Y	Y(1)
Group E	General Retail (Non-hazardous materials)	Y(1)	N(2)

Notes to Table 11.5.4.1.(2).:
(1) Provided the Hazard Index of the space is not increased (see Table A-11.5.4.1.C)
(2) Except as *acceptable* to the *Chief Building Official*

3) Where a *building* is altered and is a *post-disaster building* as defined in Table 4.1.2.1., or where there is a major addition to a *post-disaster building*, the entire *building* shall be upgraded to design upgrade levels F4, S4, N4 and A4 as detailed in the Upgrade Trigger Mechanism.

4) Except as permitted by Article 11.5.3.1., where a *building* is relocated from another municipality to the City, from another lot within the City or within its existing lot, the *building* shall be upgraded to Design Upgrade Levels F4, S4, N4 and A4, as determined by the Upgrade Trigger Mechanism.

sification as specified in Sentences 12.2.2.1.(4) and (5)