

DESIGNING FOR FIRE SAFETY

**Uniform Building By-Laws 1984
(amendment 2021)**

Fire rated walls

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The Uniform Building By-Laws

is a

“PRESCRIPTIVE” BUILDING CODE

- **Compliance with this code is a requirement by law**
- **Sets rules and regulations on the application of the code**
- **Provides pre-determined prescriptions**

The prescriptions are absolute :

no smaller than.....

no bigger than.....

no shorter than.....

no longer than.....

or

no less than and no more than.


CONCEPTS OF FIRE SAFETY

1 EVACUATION


2 PASSIVE CONTAINMENT

3 ACTIVE INTERVENTION

4 ACCESS FOR FIRE FIGHTING
AND RESCUE



Specific
prescriptions with
reference to
Purpose Group and
occupancy, type,
size and height of
building
**UBBL Schedules
5,6,7,8,9,10**



Prescriptions with
reference to building
Height and Volume, for
ALL building types.

Accepted assumption in designing for safe evacuation:

“Only one fire at one location at a time”

Primary objective of compartmentation:

**“To contain the one fire within
the one location at all times”**

Fire rated walls in the UBBL 2021

1. Party Wall
2. Separating Wall
3. Compartment Wall
4. External Wall
5. Protecting structure (wall)
6. Partition (wall)

1 Party Wall

UBBL 2021

By-law 2 : interpretation

“**Party Wall**” means a wall forming part of a building and used or constructed to be used for separation of adjoining buildings belonging to different owners or occupied or constructed or adapted to be occupied by different persons either constructed over or abutting a common boundary

1 Party Wall

UBBL 2021
By-law 86

1. All party walls shall generally be of not less than
 - 200 millimetres total thickness
 - of solid masonry or
 - constructed of other materials of various thickness if they comply with Parts V, VI and VII of these By-Laws and
 - have an acoustic performance of not less than STC 50 of sound transmission loss attenuation (STC rating)

1

Party Wall

UBBL 2021

By-law 86

2. Such a party wall shall be made up of two separate skins, each of the skins shall not be less than 100 millimetres thickness if constructed at different time.
3. Multi-storeyed residential buildings of reinforced concrete or other framed construction shall be constructed to the requirements of these By-Laws, and the party wall thereof shall not be less than 100 millimetres total thickness at any point on the wall.
4. No combustible material shall be built into the thickness of any party wall unless not less than 100 millimetres of masonry or a fire stop with an equivalent fire resistance period is provided between such materials.

1

Party Wall

UBBL 2021

By-law 86

5. Openings may be made or left in a party wall provided that the written consent of owners of the properties concerned are obtained and in accordance with these By-Laws.
6. Every opening in a party wall shall be reinstated to its original state and properly bonded therewith when the use of such an opening has been discontinued.

2

Separating Wall

UBBL 2021

By-law 133: interpretations

"**separating wall**" means a wall or part of a wall which is common to two adjoining buildings;

2

Separating Wall

UBBL 2021

By-law 141

1. Subject to the exceptions specified in paragraph (2) no openings shall be made in any separating wall which forms a complete vertical wall separating any buildings.
2. Nothing in this by-law shall prohibit-
 - a) the passage through a separating wall of a pipe, if the pipe --
 - (i) is not a flue pipe;
 - (ii) has a diameter not exceeding 25 millimetres if it is made of combustible material or 150 millimetres, if it is made of non-combustible material; and
 - (iii) is fire stopped where it passes through the wall; or
 - (b) an opening in a separating wall which is necessary as a means of escape from fire, if the opening is fitted with a door which has in respect of separating walls FRP of not less than that required in this Part.

2

Separating Wall

UBBL 2021

By-law 141

3. Any separating wall which forms, a junction with a roof shall be carried above the upper surface of the roof to a distance of not less than 225 millimetres measured at right angles to such upper surface.

3 Compartment Wall

UBBL 2021
By-law 133: interpretations

"**compartment wall**" and "compartment floor" mean respectively a wall and a floor which comply with by-law 148, and which are provided as such for the purposes of by-law 136 to divide a building into compartments for any purpose in connection with by-law 213 or 147;

3 Compartment Wall

UBBL 2021

By-law 136 provision of compartment floors and compartment floors

Any building, other than a single storey building, of a purpose group specified in the Fifth Schedule to these By-laws and which has --

- a) any storey the floor area of which exceeds that specified as relevant to a building of that purpose group and height; or
- b) a cubic capacity which exceeds that specified as so relevant shall be so divided into compartments, by means of compartment walls or compartment floors or both, that --
 - (i) no such compartment has any storey the floor area of which exceeds the area specified as relevant to that building; and
 - (ii) no such compartment has a cubic capacity which exceeds that specified as so relevant to that building:

3 Compartment Wall

UBBL 2021

By-law 138 other walls and floors to be constructed as compartments

The following walls and floors in buildings shall be constructed as compartment walls or compartment floors:

- a) any floor in a building of Purpose Group II (Institutional);
- b) any wall or floor separating a flat or maisonette from any other part of the same building;
- c) any wall or floor separating part of a building from any other part of the same building which is used or intended to be used mainly for a purpose falling within a different purpose group as set out in the Fifth Schedule to these By-laws; and
- d) any floor immediately over a basement storey if such basement storey has an area exceeding 100 square metres.

4

External Wall

UBBL 2021

By-law 2 : interpretation

"**external wall**" means an outer wall of a building not being a party wall notwithstanding that it may immediately adjoin a wall of another building;

4 External Wall

UBBL 2021

By-law 142

1. If any external wall is carried across the end of a separating wall, such external wall and separating wall shall be bonded together or the junction of such walls shall be fire-stopped.
2. Subject to the provisions relating to small garages and open car parks, any side of a building shall comply with any relevant requirements relating to the permitted limits of unprotected areas specified in the Sixth Schedule to these By-laws unless the building is so situated that such side might consist entirely of any unprotected area.
3. Any external wall which constitutes, or is situated within a distance of 2 metres from any point on the relevant boundary or is a wall of a building which exceeds 18 metres in height shall --
 - (a) be constructed wholly of non-combustible materials apart from any external cladding which complies with by-law 144; and
 - (b) be so constructed as to attain any FRP required by this Part without assistance from any combustible material permitted by this Part.

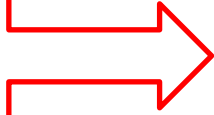
4

External Wall

UBBL 2021

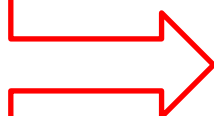
By-law 144 : Cladding on external wall

above 18m height
Full scale test
BS 8414



1. Any cladding on any external wall situated less than 2 metres from any point on the relevant boundary or if the building is more than 18 metres in height, the cladding shall be constructed entirely of non-combustible materials and when tested, shall demonstrate the compliance in accordance with BS 8414.

below 18m height
Material test
BS 476 part 6&7



2. Any cladding on any external wall, if such a cladding is situated more than 2 metres from any point on the relevant boundary and the building is less than 18 metres in height, the cladding shall have a surface complying with the requirements for Class O when tested and in accordance with by-law 204.

4

External Wall

UBBL 2021

By-law 149: Horizontal and vertical barriers of external walls

Openings in external walls located vertically above one another shall be protected by approved flame barriers either extending 750 millimetres beyond the exterior wall in the plane of the floor or by vertical panels not less than 900 millimetres in height.

5 Protecting Structures

UBBL 2021
By-law 133: interpretations

"**protected shaft**" means a stairway, lift, escalator, chute, duct or other shaft which enables persons, things or air to pass between different compartments; and which complies with the requirements of by-law 150;

"**protecting structure**" means any wall or floor or other structure which encloses a protected shaft other than –

- a) a wall which also forms part of an external wall, separating wall or compartment wall; or
- b) a floor which is also a compartment floor or a floor laid directly on the ground; or
- c) a roof;

6

Partition

UBBL 2021

By-law 2 : interpretation

"partition" means a non-load bearing wall of any internal wall, NOT being a party wall, compartment wall, separating wall or an external wall;

"protected corridor" means a corridor separated from the building it serves by partitions having FRP of not less than half hour and which partitions have all openings therein fitted with fixed lights and self-closing doors each having a FRP of not less than half hour;

"protected lobby" means a lobby enclosed throughout by partitions having an FRP of not less than half hour and has all openings therein fitted with fixed lights and self-closing doors having an FRP of not less than half hour;

Element of Structure

UBBL 2021

By-law 133: interpretations

"element of structure" means –

- a) any member forming part of the structural frame of a building or any other beam or column (not being a member forming part of a roof structure only);
- b) a floor, including a compartment floor, other than the lowest floor of a building;
- c) an external wall;
- d) a separating wall;
- e) a compartment wall;
- f) structure enclosing a protected shaft;
- g) a load-bearing wall or load-bearing part of a wall; and
- h) a gallery;

Separation of Fire Risk areas

UBBL 2021

By-law 139

The following area or use shall be separated from the other areas of the occupancy in which it is located by a fire resisting construction of an element of structure of a fire resistance period according to the Ninth Schedule based on the degree of a fire risk:

- a) a boiler room or associated fuel storage area;
- b) a repair shop involving hazardous process or material;
- c) a storage area of materials in quantities deemed hazardous;
- d) a liquified petroleum gas storage area;
- e) a transformer room or substation;
- f) a flammable liquid store;
- g) a shaft for an electrical riser excluding the shaft for an extra low voltage system; or
- h) a cold room.

Fire Resistance

UBBL 2021

By-law 213

Subject as otherwise provided by this Part every element of structure shall be so constructed as to have fire resistance for not less than whichever of the periods specified in the Ninth Schedule to these By-laws is relevant, having regard to the purpose group of the building of which it forms part and the dimensions specified in that Schedule.

Fire Resistance

UBBL 2021

By-law 224 : Fire resistance for any element of structure

Any element of structure shall be deemed to have the requisite fire resistance if

- a) it is constructed in accordance with the specifications given in the Ninth Schedule to these By-laws and the notional period of fire resistance given in that Schedule as being appropriate to that type of construction and other relevant factors is not less than the requisite fire resistance; or
- b) a similar part made to the same specification as the element is proved to have the requisite fire resistance under the conditions of test prescribed in the foregoing By-laws.

Fire Resistance

UBBL 2021

By-law 221 : Test of Fire resistance

For the purposes of this Part requirements as to fire resistance shall be construed as meaning that an element of structure shall be capable of resisting the action of fire for the specified period under the conditions of test appropriate to such element in accordance with BS 476 subject to such modifications or applications of such conditions of test as are prescribed to these By-laws.

Party Wall or Separating Wall or Compartment Wall?

Part VI

Constructional Requirements

By-law 86 Party wall

“Party Wall” means a wall forming part of a building and used or constructed to be used for separation of adjoining buildings belonging to different owners or occupied or constructed or adapted to be occupied by different persons either constructed over or abutting a common boundary

Part VII

Fire Safety Installation Requirements

By-law 136, 138, 148 Compartment walls and compartment floors

By-law 141, 147 Separating walls

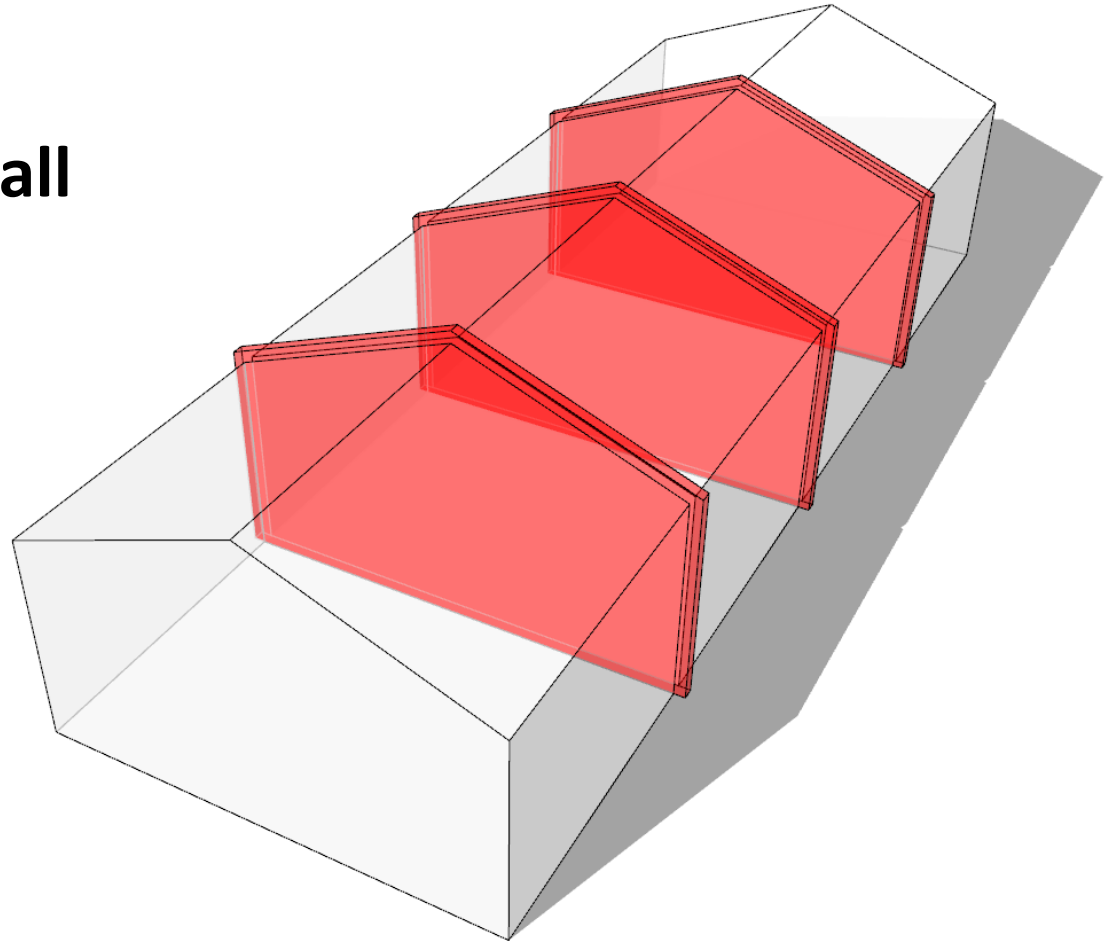
“Compartment Wall” and “Compartment Floor” mean respectively a wall and a floor which comply with by-law 148, and which are provide as such for the purposes of by-law 136 to divide a building into compartments for any purposes in connection with by-law 213 or 147

“Separating Wall” means a wall or part of a wall which is common to two adjoining buildings

Example: Terrace houses

To be constructed to comply with
by-law 86 **Party wall** and
by-law 141 and 147 **Separating wall**

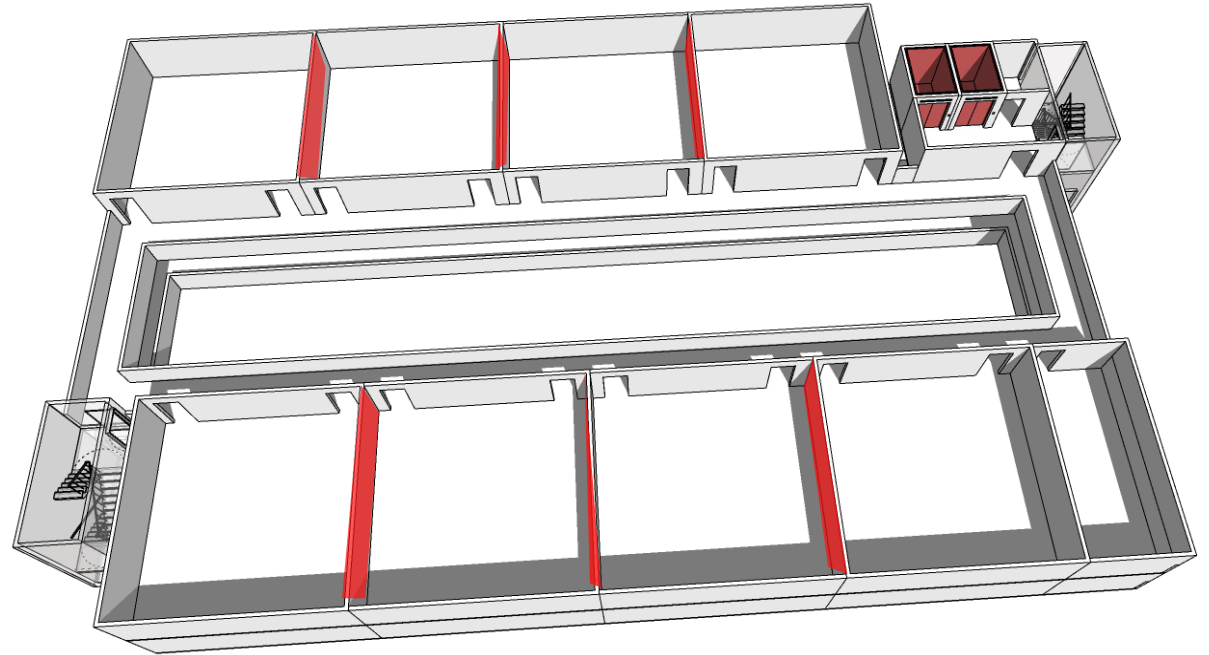
Except any penetrations or
crossings of pipes, flues, ducts
or combustible materials or
dimensions which
contravenes by-law 86



Example: multi-storey apartments

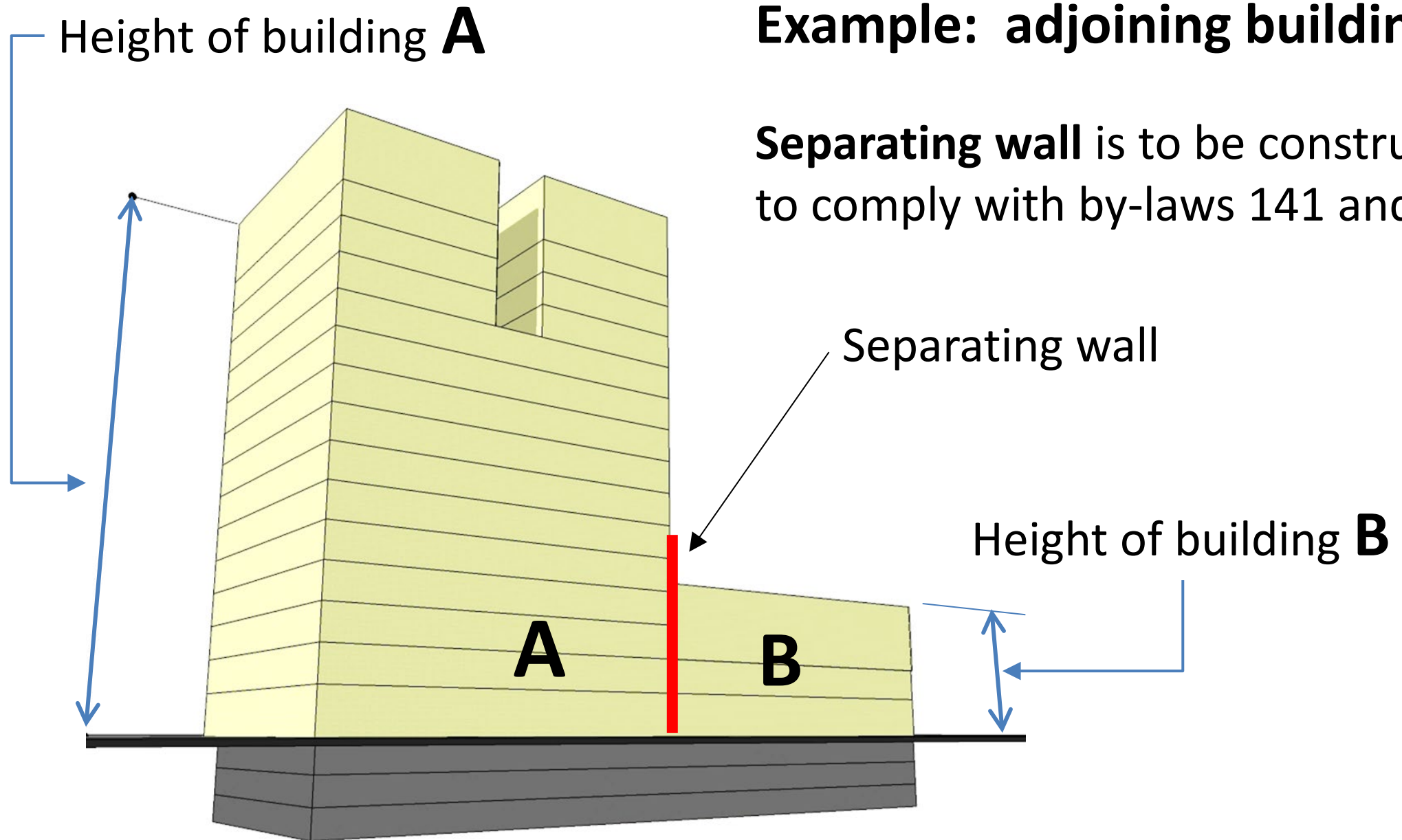
To be constructed to comply with
by-law 86 **Party wall** and
by-laws 136, 138, 148 **Compartment wall**

Except any penetrations or crossings of pipes, flues, ducts or combustible materials or dimensions which contravenes by-law 86



Example: adjoining buildings

Separating wall is to be constructed to comply with by-laws 141 and 147





JABATAN BOMBA DAN PENYELAMAT MALAYSIA

ARAHAN KETUA PENGARAH BIL.2/2012

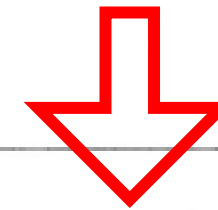
Tarikh: 30 April 2012

Rujukan : JBPM/IP/KOR:100-1/9/1 (5)

**KETETAPAN TEKNIKAL
DIALOG BERSAMA JBPM – BADAN PROFESIONAL
(IFEM, IEM, ACEM, PAM & SIRIM)
17 FEBRUARI 2012**

3.3. Had kegunaan bagi "Drywall Construction/Partition System".

3.3.1. Ketetapan bagi had kegunaan ke atas "drywall construction / partition system" adalah seperti berikut;



BIL.	JENIS DINDING	CONTOH DINDING	HAD KEGUNAAN
1.	Dinding Prosenium (Prosenium Wall)	<ul style="list-style-type: none">Dinding di dalam Dewan Perhimpunan yang memisahkan pentas dengan kawasan auditorium.	DIBENARKAN dengan syarat mematuhi had-had ketinggian dan tahap ketahanan api melebihi 1 jam serta mematuhi uuk 158.

2.	Struktur Perlindungan (<i>Protecting Structure</i>)	<ul style="list-style-type: none"> • Dinding lift shaft • Dinding Tangga terlindung • Chute 	TIDAK DIBENARKAN
3.	Dinding Dua Pihak (<i>Party Wall</i>)	<ul style="list-style-type: none"> • Dinding antara unit rumah teres • Dinding antara unit rumah pangsa • Dinding antara unit rumah kedai • Dinding antara unit rumah kedai/ pejabat 	TIDAK DIBENARKAN

4.	Dinding Pangsa (<i>Compartment Wall</i>)	<ul style="list-style-type: none"> Dinding yang digunakan untuk mengurangkan keluasan dan isipadu sesuatu bangunan dan dinding yang digunakan untuk mengasingkan risiko. Dinding yang digunakan untuk mengasingkan dua kumpulan maksud penggunaan yang berlainan sebagai contoh; Car park dengan <i>Retail area</i> <i>Office</i> dengan <i>hotel</i>. 	TIDAK DIBENARKAN. (Kecuali untuk <i>drywall</i> jenis <i>Solid / Infilled</i>)

5.	Dinding Pengasing (<i>Separating Wall</i>)	<ul style="list-style-type: none"> • Dinding antara 2 bangunan bersampingan seperti; • Hotel – Pasaraya • <i>Office – Hotel</i> 	TIDAK DIBENARKAN. (Kecuali untuk <i>drywall</i> jenis <i>Solid / Infilled</i>)
6.	Dinding Luar (<i>External Wall</i>)	<ul style="list-style-type: none"> • Dinding luar sesuatu bangunan 	DIBENARKAN

7.	Dinding Sekat (Partition)	<p>a. Dinding bagi kawasan atau penggunaan Bahan merbahaya (uuk 139);</p> <p>i. Bilik dandang & kawasan storan bahan api.</p> <p>ii. Dobi</p> <p>iii. Bengkel membaiki yang melibatkan proses dan bahan berbahaya</p> <p>iv. Kawasan storan bahan yang banyak yang disifatkan bahaya</p>	TIDAK DIBENARKAN
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- iii. Bengkel memperbaiki yang melibatkan proses dan bahan berbahaya
- iv. Kawasan storan bahan yang banyak yang disifatkan bahaya
- v. Kawasan storan gas petroleum cecair
- vi. Bilik linen
- vii. Bilik *transformer* dan substesyen
- viii. Stor cecair mudah terbakar

TIDAK DIBENARKAN

	b.Dinding stor pejabat/ stor am	DIBENARKAN
	c.Dinding bilik fail	DIBENARKAN
	d.Dinding bilik-bilik hotel	DIBENARKAN - Dengan syarat tiada apa-apa pembukaan & tiada pendawaian di dalam dinding sebagaimana spesifikasi ujian.

		e. Dinding "protected corridor"	DIBENARKAN (Kecuali bagi yang melibatkan <i>sleeping risk</i> hendaklah dari jenis <i>solid / infilled</i>)
		f. Dinding lobi menentang kebakaran	TIDAK DIBENARKAN
		g. Dinding lobi lif biasa	DIBENARKAN

h. Dinding bilik data dan dinding bilik komputer (Termasuk yang mempunyai sistem pemasangan tetap)

DIBENARKAN

i. Bilik *Operation Theater* (yang tiada sistem perlindungan kebakaran, hanya ada detection system.

TIDAK DIBENARKAN

<div>Fire rated walls</div> <div></div>	UBBL 9th schedule	Drywalls Solid or infilled	Drywalls
Party wall By-Law 86			
Protecting structures			
By-law 139 separations			
Separating wall			
Compartment wall			
External wall-protected areas			
External wall-unprotected areas	NA	NA	NA
Partitions			

Thank you