

## **LEGISLATIVE COUNCIL BRIEF**

### **Buildings Ordinance (Chapter 123)**

#### **Building (Construction) (Amendment) Regulation 2011**

### **INTRODUCTION**

In exercise of the power conferred by section 38 of the Buildings Ordinance (Chapter 123) (“BO”), the Secretary for Development has made the Building (Construction) (Amendment) Regulation 2011 (“the Amendment Regulation”), at **Annex**, to modernize and update the design requirements for imposed loads on buildings.

### **BACKGROUND AND JUSTIFICATIONS**

2. The structure of every building shall be capable of safely sustaining and transmitting the combined dead loads (e.g. the weight of walls, floors, roofs, etc.), imposed loads (e.g. the weight of occupiers, furniture, equipment, etc.) and wind loads to the ground. Regulation 17 of the existing Building (Construction) Regulations (Chapter 123 sub. leg. B) (“the Regulation”) stipulates the design requirements of minimum imposed loads and specifies that the imposed load on any building, street, building works or street works shall be the greatest applied load likely to arise from the intended use or purpose of the building, street, building works or street works.

3. In view of the advancement in building technologies, development of international building codes and standards, changes in occupation pattern and emergence of new uses of buildings, the Buildings Department (“BD”) has commissioned a consultancy study on loading requirements for buildings with a view to ensuring that the local statutory requirements meet the modern-day needs of the society

and are in line with the standards of other developed countries. The consultancy study, led by a Steering Committee with members from the academia, professional institutions and relevant Government departments, has come up with recommendations to update the design requirements of imposed loads on buildings or streets under the Regulation.

## **THE AMENDMENT REGULATION**

4. The Amendment Regulation aims to modernize and update the minimum imposed load requirements for buildings with a view to achieving more economical design and construction of building structures in line with local conditions and international standards. It also aims to facilitate the process of structural design of buildings and enhance the efficiency of building control and enforcement.

5. The Amendment Regulation covers the following key amendments:

- (i) **Section 3(7)** of the Amendment Regulation stipulates that where the floor of a building is used to support any equipment, machinery or display item that will result in a greater imposed load than the minimum imposed load specified in Table 1 of the Amendment Regulation, the load of any of those items has to be considered in determining the imposed load on the floor. Under the existing Regulation, only certain uses of buildings require the consideration of equipment, machinery or display items in determining the minimum imposed loads. The amendment will require that the anticipated load of equipment, machinery or display items should be taken into account in the consideration of uses in the design of building structures;
- (ii) **Section 3(8)** of the Amendment Regulation re-categorises the uses of buildings and their corresponding minimum imposed load requirements into eight classes as described below. The re-categorisation is made with reference to international standards, and will facilitate practitioners to ascertain the minimum imposed load requirements for different uses of buildings:

- (a) Class 1 : floors for domestic use and residential activities;
  - (b) Class 2 : floors for offices and other non-industrial work places;
  - (c) Class 3 : floors where people may congregate;
  - (d) Class 4 : floors for shopping purposes;
  - (e) Class 5 : floors for storage, equipment, plant and industrial use;
  - (f) Class 6 : areas for vehicular traffic;
  - (g) Class 7 : roofs; and
  - (h) Class 8 : affiliated building elements;
- (iii) **Section 3(8)** of the Amendment Regulation reduces the existing minimum imposed load requirements for certain uses (e.g. domestic use, restaurants, car-parking areas, etc.), taking into account the latest building design standards and local occupation pattern. Such a reduction will bring about more economical structural design which is in line with international standards and at the same time ensure building safety;
- (iv) **Section 3(8)** of the Amendment Regulation specifies the minimum imposed load requirements for some new uses of buildings (e.g. residential care homes for elderly persons, nursing homes, dance practice rooms, karaoke establishments, museums, etc.) and present-day building elements (e.g. utility platforms). The amendments will modernise the Regulation to cater for present-day activities;
- (v) **Section 3(11)** of the Amendment Regulation disallows load reduction for partitions because such loads are considered permanent imposed loads. Under the existing Regulation, partition load is considered as a kind of imposed loads that load reduction is allowed if the partition is not indicated on the building plans. The amendment will enhance the safety of building structures;

- (vi) **Section 3(12)** of the Amendment Regulation revises the allowable reduction of total imposed loads for buildings in light of the general increase in the number of storeys of buildings nowadays. The amendment will enhance the structural safety of buildings by allowing less load reduction in structural design for high-rise buildings and such reduction is in line with the requirements in other developed countries;
- (vii) **Section 3(13)** of the Amendment Regulation specifies the horizontal imposed load on protective barriers for areas where people may congregate but overcrowding is not expected (e.g. a theatre with fixed seating). The amendment will bring about more economical structural design of protective barriers and at the same time ensure building safety; and
- (viii) **Section 3(14)** of the Amendment Regulation combines the two mathematical formulae for calculating impact forces on vehicle barriers in the Regulation into one single formula applicable to all situations. The amendment will facilitate practitioners in structural design of vehicle barriers.

## LEGISLATIVE TIMETABLE

6. The legislative timetable is as follows:-

Publication in the Gazette	14 January 2011
Tabling in the Legislative Council	19 January 2011
Commencement Date	1 August 2011

7. The Amendment Regulation will apply to new buildings and alteration and addition works in existing buildings. Under section 39(2) of the BO, where at the date of the coming into operation of the Amendment Regulation any building works or street works are being carried out or consent to their commencement has been given, the provisions of the law prior to the coming into operation of the Amendment Regulation shall apply to such works.

## **IMPLICATIONS OF THE AMENDMENT REGULATION**

8. The Amendment Regulation is in conformity with the Basic Law, including the provisions concerning human rights. The Amendment Regulation will bring about positive environmental impact and enhance sustainability by facilitating more economical building design and construction of buildings. This will lead to saving of building materials, saving of energy in material production, saving of floor area for structural elements, and reduction in construction costs. The Amendment Regulation has no productivity, competition and civil service implications.

## **PUBLIC CONSULTATION**

9. We consulted the Panel on Development of the Legislative Council on the proposed amendments to the Regulation on 23 June 2009. Members of the Panel generally welcomed the proposed amendments. The BD has also consulted the relevant professional institutions of the building industry, including the Hong Kong Institution of Engineers, Hong Kong Institute of Architects, Hong Kong Institute of Surveyors and local trade associations on the proposed amendments. The stakeholders are generally supportive of the proposed amendments. The amendment proposal was also discussed at the Building Sub-Committee of the then Land and Building Advisory Committee<sup>1</sup> and the then Authorized Persons and Registered Structural Engineers Committee<sup>2</sup>. Members of these two committees were generally supportive of the proposal to amend the loading requirements in the Regulation and welcomed early implementation of the amendments as incorporated in the Amendment Regulation.

---

<sup>1</sup> The Land and Building Advisory Committee has been renamed as Land and Development Advisory Committee.

<sup>2</sup> The Authorised Persons and Registered Structural Engineers Committee has been renamed as the Authorised Persons, Registered Structural Engineers and Registered Geotechnical Engineers Committee.

**PUBLICITY**

10. A press release will be issued on 14 January 2011 when the Amendment Regulation is published in the Gazette and a Government spokesman will be made available to answer media enquiries. A code of practice promulgating technical guidelines in relation to the new loading requirements will be issued by the Building Authority upon commencement of the Amendment Regulation to facilitate practitioners in the industry to follow and comply with the new requirements. In addition, the BD will conduct briefing sessions for building professionals on the new requirements under the Amendment Regulation.

**ENQUIRY**

11. Enquiry on this brief can be addressed to Mr. Edward TO, Principal Assistant Secretary for Development (Planning & Lands) 3, Development Bureau at 2848 6288 or Mr. C.M. KOON, Assistant Director/New Buildings 2, Buildings Department at 2626 1138.

**Development Bureau**  
**13 January 2011**

**Building (Construction) (Amendment) Regulation 2011**

(Made by the Secretary for Development under section 38 of the Buildings Ordinance (Cap. 123))

**1. Commencement**

This Regulation comes into operation on 1 August 2011.

**2. Building (Construction) Regulations amended**

The Building (Construction) Regulations (Cap. 123 sub. leg. B) are amended as set out in section 3.

**3. Regulation 17 amended (Imposed loads)**

(1) Regulation 17(1)(a)(ii)—

**Repeal**

“300 mm side; or”

**Substitute**

“50 mm side (or over any square otherwise specified in that column) or the line load specified in that column.”

(2) Regulation 17(1)(a)—

**Repeal subparagraph (iii).**

(3) Regulation 17(1)(a), Chinese text—

**Repeal**

“三”

**Substitute**

“兩”.

(4) Regulation 17(1)—

**Repeal paragraph (b).**

(5) Regulation 17(1)(c), before “a building”—

**Add**

“the floor of”.

(6) Regulation 17(1)(c)(ii)—

**Repeal the full stop****Substitute a semicolon.**

(7) After regulation 17(1)(c)—

**Add**

“(d) where the floor of a building is to support any equipment, machinery or display item that will result in a greater imposed load than that specified in Table 1, the load of any of those items has to be considered in determining the imposed load on the floor.”.

(8) Regulation 17(1)—

**Repeal Table 1****Substitute**

**“Table 1**

**Minimum Imposed Loads**

1	2	3	4
Class	Use	Distributed load in kPa to be applied uniformly on plan	Concentrated load in kN to be applied on plan over any square with a 50 mm side (unless otherwise specified in this column), or line load in kN per metre length
1	Floors for— domestic use; dormitories; private sitting rooms, bedrooms and toilet rooms in hotels, motels and guesthouses; wards, bedrooms and toilet rooms in hospitals, nursing homes and residential care homes for elderly persons	2.0	2.0
2	Floors for— medical consulting or		

1	2	3	4
Class	Use	Distributed load in kPa to be applied uniformly on plan	Concentrated load in kN to be applied on plan over any square with a 50 mm side (unless otherwise specified in this column), or line load in kN per metre length
	treatment rooms; hospital operating theatres and X-ray rooms	2.5	3.0
	Floors for — laboratories; light workrooms with neither central power- driven machines nor storage; offices for general use; rooms for lightweight electrical and electronic installations	3.0	4.5
	Floors for — banking halls; kitchens and laundries not in domestic buildings	4.0	4.5



Section 3

1	2	3	4
Class	Use	Distributed load in kPa to be applied uniformly on plan	Concentrated load in kN to be applied on plan over any square with a 50 mm side (unless otherwise specified in this column), or line load in kN per metre length
3	Floors for— childcare centres and kindergartens	2.5	3.0
	Floors for— billiard rooms and bowling alleys; classrooms, lecture rooms, tutorial rooms, computer rooms and reading rooms without book storage; dance practice rooms; leisure, recreational and amusement areas that cannot be used for assembly purposes	3.0	4.5
	Floors for—		

Section 3

1	2	3	4
Class	Use	Distributed load in kPa to be applied uniformly on plan	Concentrated load in kN to be applied on plan over any square with a 50 mm side (unless otherwise specified in this column), or line load in kN per metre length
	assembly areas with fixed seating <sup>(1)</sup> ; chapels, churches and places of worship with fixed seating <sup>(1)</sup> ; restaurants, night-clubs, lounges, bars, canteens, fast food shops and dining rooms not in domestic premises	4.0	4.5
	Floors for— art galleries and museums; grandstands; public halls; theatres and cinemas	5.0	4.5
	Floors for— assembly areas without		

1	2	3	4
Class	Use	Distributed load in kPa to be applied uniformly on plan	Concentrated load in kN to be applied on plan over any square with a 50 mm side (unless otherwise specified in this column), or line load in kN per metre length
	fixed seating <sup>(1)</sup> ; dance halls; footbridges between buildings; footpaths, terraces, plazas and areas used for pedestrian traffic; gymnasia; karaoke establishments and discotheques; refuge floors	5.0	4.5
	Floors for— stages and television studios used as stages	7.5	9.0
4	Floors for— department stores, supermarkets, markets		

1	2	3	4
Class	Use	Distributed load in kPa to be applied uniformly on plan	Concentrated load in kN to be applied on plan over any square with a 50 mm side (unless otherwise specified in this column), or line load in kN per metre length
	and shops for display and sale of merchandise	5.0	4.5
5	Floors for— library rooms with book storage (excluding library stack rooms); offices for storage and normal filing purposes	5.0	4.5
	Floors for— (a) stack rooms in book stores and libraries	3.5 for each metre of storage height <sup>(2)</sup> but not less than 10.0	to be determined according to the weight of storage material, but not less than 9.0
	(b) cold storage	5.0 for each metre of storage height <sup>(2)</sup> but not less	to be determined according to the weight of storage material, but not

Section 3

9

1	2	3	4
Class	Use	Distributed load in kPa to be applied uniformly on plan	Concentrated load in kN to be applied on plan over any square with a 50 mm side (unless otherwise specified in this column), or line load in kN per metre length
	(c) paper storage in printing plants	than 15.0 8.0 for each metre of storage height <sup>(2)</sup>	less than 9.0 to be determined according to the weight of storage material, but not less than 9.0
	(d) battery rooms and uninterruptible power supply rooms	10.0 for each metre of storage height <sup>(2)</sup>	to be determined according to the weight of storage material, but not less than 9.0
	(e) general storage other than those specified in (a), (b), (c) or (d) immediately above, including storage in warehouses	2.5 for each metre of storage height <sup>(2)</sup>	to be determined according to the weight of storage material, but not less than 9.0
	Floors for— plant rooms, boiler rooms, fan rooms, motor rooms		

Section 3

10

1	2	3	4
Class	Use	Distributed load in kPa to be applied uniformly on plan	Concentrated load in kN to be applied on plan over any square with a 50 mm side (unless otherwise specified in this column), or line load in kN per metre length
	and the like	7.5	9.0
	Floors for— workshops, factories and other buildings or parts of buildings of similar category for industrial use— (a) for light weight loads (b) for medium weight loads (c) for heavy weight loads (d) for printing plants	5.0 7.5 10.0 12.5	9.0 9.0 9.0 9.0
6	Areas for — car parking, carriageways, floors, driveways and		

1	2	3	4
Class	Use	Distributed load in kPa to be applied uniformly on plan	Concentrated load in kN to be applied on plan over any square with a 50 mm side (unless otherwise specified in this column), or line load in kN per metre length
	ramps used by vehicles— (a) for vehicles not exceeding 3 000 kg gross weight  (b) for vehicles exceeding 3 000 kg gross weight	3.0  to be determined according to recognized engineering principles	20.0 to be applied on plan over any square with a 200 mm side (instead of a 50 mm side)  to be determined according to recognized engineering principles
7	Inaccessible roofs (where no access is provided except such access as may be necessary for maintenance work only) with a slope— (a) of or less than 5°	2.0	1.5

1	2	3	4
Class	Use	Distributed load in kPa to be applied uniformly on plan	Concentrated load in kN to be applied on plan over any square with a 50 mm side (unless otherwise specified in this column), or line load in kN per metre length
	(b) greater than 5° but less than 20° (c) of or greater than 20° but less than 40° (d) of or greater than 40°  Accessible roofs (where access is provided in addition to such access as may be necessary for maintenance work only) with a slope— (a) of or less than 20° (b) greater than 20° but less than 40°	0.75 linear interpolation from 0.75 to 0 according to the slope 0  2.0 linear interpolation from 2.0 to 0 according to the	1.5 1.5 1.5

1	2	3	4
Class	Use	Distributed load in kPa to be applied uniformly on plan	Concentrated load in kN to be applied on plan over any square with a 50 mm side (unless otherwise specified in this column), or line load in kN per metre length
	(c) of or greater than 40°	slope 0	1.5
8	Floors for — Utility platforms	same as the floors to which they give access but not less than 4.0	line load of 2.0 kN per metre length to be applied along the outer edge
	Floors for — Balconies	same as the floors to which they give access but not less than 3.0	line load of 2.0 kN per metre length to be applied along the outer edge
	Stairs, landings and corridors	same as the floors to which	4.5

1	2	3	4
Class	Use	Distributed load in kPa to be applied uniformly on plan	Concentrated load in kN to be applied on plan over any square with a 50 mm side (unless otherwise specified in this column), or line load in kN per metre length
		they give access but not less than 3.0 and not more than 5.0	

Notes:

- (1) Seating is regarded as fixed if the removal of the seating and the use of the relevant space for other purposes are unlikely to occur.
- (2) *Storage height* (貯存高度) means the height of the space between the following: the floor, and a physical constraint to the height of storage formed by a ceiling, soffit of a floor, roof or other obstruction.”.

(9) After regulation 17(1)—

**Add**

“(1A) The greatest applied load mentioned in subregulation (1) must be derived from reliable data obtained from a source recognized by the Building Authority.”.

(10) Regulation 17(2)(e)(iii)—

**Repeal**

- “and floors used for storage purposes”.
- (11) Regulation 17(2)(e)—  
**Repeal subparagraph (v)**  
**Substitute**  
 “(v) forces produced by dynamic effects; or  
 (vi) floors used for storage purposes; or  
 (vii) loads from partitions the positions of which are not indicated on the plan of the building.”.

- (12) Regulation 17(2)—  
**Repeal Table 2**  
**Substitute**

**“Table 2**  
**Reductions of Total Distributed Imposed Loads**

Number of floors (including the roof) with loads qualifying for reduction carried by the member under consideration	Percentage reduction of total distributed imposed load on all floors (including the roof) carried by the member under consideration	
	Classes 1, 2, 3, 4 and 7 of Table 1	Workshops and factories under Class 5 of Table 1 with distributed imposed load of not less than 7.5 kPa
1	0	0
2	5	10
3	10	20
4	15	25 maximum
5	20	
6	25	
7	30	
8	35	
over 8	40 maximum	

- (13) Regulation 17(3)—  
**Repeal Table 3**  
**Substitute**

"Table 3

**Minimum Horizontal Imposed Loads on Protective Barriers to Restrict or Control Movement of Persons**

Category	Line load to be applied at a height of 1.1 m above floor level	Uniformly distributed load to be applied on the infill between floor and top rail	Concentrated load to be applied on any part of the infill between floor and top rail
	kN/m	kPa	kN
Areas where congregation of people is not expected	0.75	1.0	0.5
Areas where people may congregate but overcrowding is not expected	1.5	1.5	1.5
Areas susceptible to overcrowding	3.0	1.5	1.5

(14) Regulation 17—

**Repeal subsection (4)****Substitute**

"(4) Vehicle barriers for carriageways, floors, driveways and ramps used by vehicles must be designed to withstand the greatest impact force anticipated subject to the following requirements—

- (a) the minimum design impact force on vehicle barriers is to be  $[0.5 Mv^2 / (\delta_c + \delta_b)]$  kN,

where—

$M$  is the gross mass in kg of the heaviest vehicle to be accommodated,

$v$  is the velocity of the vehicle normal to the barrier in metre per second,

$\delta_c$  is the deformation of the vehicle in mm, and

$\delta_b$  is the deflection of the barrier in mm; and

- (b) the impact force is to be uniformly distributed over any length of 1.5 m and acting horizontally at the bumper height of the vehicle."

Secretary for Development

2011

---

### Explanatory Note

This Regulation amends the Building (Construction) Regulations (Cap. 123 sub. leg. B) (*Regulations*) to—

- (a) update the imposed load requirements in the Regulations;
- (b) rearrange the generic classification of uses;
- (c) adjust the reduction factors on total distributed imposed loads;
- (d) rationalize the imposed load requirements on protective barriers; and
- (e) simplify the calculation of impact forces of vehicle barriers.