Ministry of the Environment, Finland
Unofficial translation. Legally binding only in Finnish and Swedish

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Ministry of the Environment Decree

concerning national choices for densities, self-weight and imposed loads for buildings, when applying standard SFS-EN 1991-1-1

By decision of the Ministry of the Environment, the following is laid down under Section 117a of the Land Use and Building Act (132/1999), as it stands in Act 958/2012:

Section 1

Scope

This Decree is applied in the selection of densities, self-weight and imposed loads for buildings and is used in conjunction with the latest version of standard SFS-EN 1991-1-1.

Section 2

Load arrangements for columns and walls

When determining the most unfavourable effect of imposed loads, in accordance with clause 6.2.2(1) of the standard, the imposed load is assumed to be movable at least on the storey just above the column or the wall to be designed.

Section 3

Values of actions for designing residential, social, commercial and administration areas

The minimum values for imposed loads on floors, balconies and stairs in buildings, clause 6.3.1.2(1)P of the standard, are given in Table 1. The loaded area for concentrated load Q_k is 50 x 50 mm^2, if $Q_k \leq 2.0$ kN; otherwise, the loaded area is 100 x 100 mm^2.

Table 1. Imposed loads on floors, balconies and stairs in buildings, uniformly distributed load qk and concentrated load Qk

Categories of loaded areas	q_k [kN/m^2]			Q_k [kN] (stairs in brackets)
	Intermediate floors	Stairs	Balconies	
Category A Areas for domestic and residential activities	2.0	2.0	2.5	2.0 (2.0*)
Category B Office areas	2.5	3.0	2.5	2.0 (2.0)
Category C Areas where people may congregate	2.5	3.0	2.5	3.0 (2.0)
– C1	3.0	3.0	3.0	3.0 (2.0)
– C2	4.0	3.0	4.0	4.0 (2.0)
– C3	5.0	3.0	5.0	4.0 (2.0)
– C4	6.0	6.0	6.0	4.0 (2.0)
– C5				
Category D Shopping areas				
– D1	4.0	3.0	4.0	4.0 (2.0)
– D2	5.0	6.0	5.0	7.0 (2.0)
*Stairs in blocks of flats Q_k = 1.5 kN				

Section 4

Reduction factor

For loaded areas in categories A to D, clause 6.3.1.2(10) of the standard, the value for the reduction factor α_A, calculated according to equation 6.1, shall be at least 0.8. For loaded areas in other categories, the reduction factor α_A is 1.0.

A reduction factor α_A may be applied only to beams and slab structures, in accordance with clause 6.2.1(4) of the standard. The reduction factor may not be applied in structures that are designed as one-way slabs or to horizontal structures with rigid or semi-rigid connection to vertical structures. For continuing horizontal structures the loaded area shall be calculated span by span. Joints between vertical and horizontal structures shall always be designed without a reduction factor.

A reduction factor α_A shall not be applied in accidental design situations, including fire situations.

For serviceability limit state verifications, a reduction factor α_A may only be used with a characteristic combination.

The use of a reduction factor α_A shall be indicated in the design documentation and the party engaging the building project shall be notified of this.

Section 5

Reduction factor for storeys

A reduction factor α_n may only be applied to columns and walls and their foundations, in accordance with clause 6.3.1.2(11) of the standard.

The reduction factor α_n shall not be applied together with a combination factor ψ or reduction factor α_A.

Section 6

Values of actions on areas for storage and industrial activities

For loaded storage, production and access areas under category E1, in clause 6.3.2.2(1)P of the standard, the value for imposed loads on intermediate floors 7.5 kN/m^2 and 3.0 kN/m^2 for stairs shall be used. The value to be used for concentrated load Q_k on floors is 7 kN and for stairs, it is 2.0 kN.

The reduction factors α_A and α_n are not applied to imposed loads on storage and production areas under categories E1 and E2.

The allowable maximum load shall be shown by a permanent sign that is appropriately located and clearly visible. The load shall be stated on this sign in kg/m^2.

Section 7

Values of actions on garages and vehicle traffic areas

The values to be used for actions on garages and vehicle traffic areas, clause 6.3.3.2(1) of the standard, are given in Table 2.

Table 2. Values of actions on garages and vehicle traffic areas

Category of traffic area	q_k [kN/m^2]		Q_k [kN] (stairs in brackets)
	Intermediate floors	Stairs	
Category F Gross vehicle weight: ≤ 30 kN	2.5	3.0	20 (2.0)
Category G 30 kN < gross vehicle weight ≤ 160 kN	5.0	3.0	90 (2.0)

Traffic areas designed to categories F and G shall be posted with the appropriate warning signs, in accordance with clause 6.3.3.1(1)P of the standard.

When a warning sign is not posted, the areas shall be designed to an axle load Q_k and also to an axle group load equal to 190 kN. The axle group load is distributed evenly to all loaded areas.

Adjacent parking and roof structures shall be designed, when necessary, also to loads from fire engines and rescue vehicles, and for a concentrated load of both hydraulic platform and extension ladder vehicles where such access is required.

Section 8

Horizontal loads on parapets and partition walls acting as barriers

Values for horizontal loads on parapets and partition walls acting as barriers, clause 6.4(1) of the standard, are given in Table 3. Horizontal loads on parapets are not combined with other variable loads.

Table 3. Horizontal loads on parapets and partition walls, line load q_k and concentrated load Q_k

Loaded area	q_k **or** Q_k
Category A	0.5 kN/m
Category B	0.5 kN/m
Categories C1 to C4 and D	1.0 kN/m
Category C5	3.0 kN/m
Category E	1.0 kN/m
Category F	Annex B
Category G	Annex B

Parapets in categories A to E and panel parts of walls acting as parapets, as well as their fasteners, shall be designed to the concentrated load $Q_k = 0.3$ kN acting on a random spot. The assumed loaded area for the concentrated load is 50 mm x 50 mm. The concentrated load Q_k and the line load q_k do not act simultaneously.

Annex B shall be applied to parapets and barriers in close proximity to car park lanes and ramps subject to impact by a vehicle driving at the speed allowed in the car park. For other parapets and barriers subject to impact from a vehicle that is stopping, an equivalent static load may be used that is assumed to be at least 5 kN in category F and at least 25 kN in category G.

Section 9

Annex A: Tables for the nominal density of construction materials and the nominal density and angles of response for stored materials

The values to be used for the nominal density of construction materials and the nominal density and angles of response for stored materials are those corresponding to real values.

Section 10

Annex B: Vehicle barriers and parapets for car parks

Annex B shall be used when designing structures for impact barriers.

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This Decree enters into force on 1 January 2017.

This Decree shall apply to projects initiated after the Decree enters into force.

This Decree repeals the National Annex to standard SFS-EN 1991-1-1 concerning the application of Eurocodes in building construction, issued by the Ministry of the Environment on 5 November 2010.

In Helsinki on 7 November 2016

The Minister of Agriculture and the Environment Kimmo Tiilikainen

Senior Engineer Jukka Bergman