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

9/16

Ministry of the Environment Decree

concerning national choices for actions during execution, when applying standard SFS-EN 1991-1-6

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 actions during execution and is used in conjunction with the latest version of standard SFS-EN 1991-1-6.

Section 2

Construction loads

The limits of the area where construction loads may be moved shall be marked in the plans, in accordance with clause 2.2(4) of the standard, when the magnitude of the actions is significant in terms of the structure.

Section 3

Design situations to be verified

The design situation for wind actions during exceptional weather conditions shall be interpreted as an accidental design situation, in accordance with clause 3.1(1)P of the standard.

There are no recommended values for return periods in clause 3.1(5) of the standard for the determination of characteristic values of variable actions during execution regarding the nominal duration of a design situation lasting no more than three days.

In the determination of the characteristic values of variable actions, in accordance with clause 3.1(5) of the standard, a nominal duration of three days, to be chosen for short execution phases, corresponds to the extent in time of reliable meteorological predictions for the location of the construction site. In such a case, the magnitude of the action shall be chosen according to the meteorological predictions. The minimum value to be used for the fundamental value of the basic wind velocity is 10 m/s.

The fundamental value of the basic wind velocity $v_{b,0}$ during the execution for a nominal duration up to three months is 18 m/s, in accordance with clause 3.1(5) of the standard, and this may be applied in the entire country, including sea and mountain areas.

For the combination of snow loads and wind actions, in accordance with clause 3.1(7) of the standard, no reductions are allowed if the snow loads and wind actions that are used are less than in persistent design situations.

Section 4

Imperfections and restraint actions

For a persistent design situation during execution, in accordance with clause 3.1(8) of the standard, the imperfections in the geometry of the structure and of structural members shall be those imperfections due to normal use of the completed structure.

The imperfections to be defined, however, shall be determined on a project-by-project basis when the execution includes stages where a structure or a structural member has an imposed load in a different position or location than when the structure or the structural member is in the final state.

The imperfections caused by restraint actions and their deflections during erection work shall be taken into consideration. The imperfections caused by deflections in auxiliary construction works shall be taken into account if they differ from the imperfections of the persistent design situation.

Section 5

Serviceability limit states

Any deformation during execution shall not cause damage to adjacent structures nor to the surface materials of the structural members, in accordance with clause 3.3(2) of the standard. The deformation during execution can, however, be greater than the allowed deformation for the completed structure if the deformation is reversible when the actions due to execution are removed.

The design situation during execution, compared to the persistent design situation, shall not cause larger crack widths in the structure and the cracking shall not reduce the stiffness of the structure, if this has not been taken into consideration in the persistent design situation.

Auxiliary construction works shall be designed so that the tolerances of the completed structure are not exceeded, in accordance with clause 3.3(6) of the standard.

Section 6

Actions due to atmospheric icing

Actions due to atmospheric icing shall be determined on a project-by-project basis, in accordance with clause 4.10(1)P of the standard.

Section 7

Construction loads

When considering construction loads, clause 4.11.1(1), Note 1, of the standard, the characteristic value of load $q_{ca,k}$ is 1.0 kN/m^2. The characteristic value of load $q_{ca,k}$ for precast slabs before grouting is 0.5 kN/m^2.

The characteristic values of loads q_{cb} and F_{cb} for the actions caused by the temporary storage of material are determined on a project-by-project basis, in accordance with clause 4.11.1(1), Note 3, of the standard.

Section 8

Accidental actions

The dynamic amplification factor in accidental design situations is 2, in accordance with clause 4.12(1)P, Note 2, of the standard.

The dynamic effects, clause 4.12(2) of the standard, are determined on a project-by-project basis. Actions due to equipment falling or the dropping of equipment are taken into account where there is an exceptionally demanding work stage or structure, and where the equipment falling or the dropping of equipment will cause a disproportionately large amount of damage in relation to the initial incident.

Structures shall be designed to take into account a human impact load as an accidental action, when stumbling could lead to a person falling or when the structure under consideration has to prevent the fall of a person.

The design values of the human impact force to be used in the accidental design situation, clause 4.12(3) of the standard, are:

1) 2.5 kN applied over an area of 200 mm x 200 mm; this design value takes into account a situation where a possible stumble does not lead to a person falling due to the collapse of the structure; or

2) 10.0 kN applied over an area of 300 mm x 300 mm or the action is applied to fastening points for safety devices. This is to verify the design of protective structures, and the resistance of the fastenings, that will prevent the fall of a person.

Section 9

Annex A: Supplementary rules for buildings

For ultimate limit state verifications, in clause A1.1(1), Note 2, of the standard, the recommended value for the combination factor ψ_0 for the variable action due to construction loads is 1.0 and the recommended value for the quasi-permanent combination factor ψ_2 for the variable action is 0.3 shall be used.

The characteristic value of equivalent horizontal forces, clause A1.3(2) of the standard, is 3% of the vertical loads from the most unfavourable combination of actions. A lower value can be used if skewness of the vertical action during the execution can be estimated.

When casting concrete it shall be assumed that a variable horizontal point load acts in a random direction on the surface level of cast concrete, with a characteristic value of 1.5 kN.

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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 1991-1-6 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