Decree of the Ministry of the Environment

on Foundation Structures
(465/2014)

Issued in Helsinki on this 17 day of June 2014

By decision of the Ministry of the Environment, the following is enacted under section 117a and section 117c of the Land Use and Building Act (132/1999), as they stand in Act 958/2012:

Section 1

Scope of application

This Decree applies to the design and execution of permanent and construction site foundations and to the repair and alteration of foundations.

Foundations are designed by incorporating the behaviour of soil and rock into the design of the foundation structures in such a way that the above-ground structures function as designed and that the building or structure does not become damaged or unusable.

Section 2

Strength and stability of foundation structures

A party engaged in a building project shall ensure that foundation structures are designed and executed in a manner so that they maintain adequate strength and stability against collapse throughout the entire planned service life.

Foundation structures and earthworks shall be designed and executed so that the settlement, shifting, twisting and changes in shape of the structures remain sufficiently minor so that the use of the building or structure is not impaired, and so that structures exhibit no detrimental cracks or permanent deformation. There shall be an adequate factor of safety against collapse of the ground and structures both during construction and during the service life of the structures.

The party engaged in a building project is responsible for ensuring that the construction causes no danger to the immediate environment. The structures shall be designed and executed in such a way that the construction, with due consideration to the conditions of the location, causes as little detriment as possible to the surrounding natural environment, to the health and comfort of people in the nearby areas, and to adjacent buildings.

Section 3

Design and execution of foundation structures

The essential technical requirements for buildings are met if the foundation structures and earth structures are designed and executed in accordance with the Eurocodes and the relevant national decisions issued by decree of the Ministry of the Environment.

If design and execution systems other than those specified in subsection 1 are applied, the party engaged in a building project shall demonstrate to the building control authority, if so required by the authority, that the design and execution fulfil the essential technical requirements regarding the strength and stability of the structures, serviceability and service life.

Only one unified design and execution system may be used for new structures that function as one structural unit.

Section 4

Geotechnical design

A party engaged in a building project shall ensure that the design of foundation structures takes into consideration the conditions of the construction site and its immediate environment, nearby foundations of buildings and structures and other foundation structures, and the potential effects of possible future construction. Additionally, it shall be taken into account in the design that any potential future construction is not impeded.

Foundation structures shall be strengthened if so required because of changes in loads, damage to foundations, neglect of maintenance, a deepening of basement space, construction nearby or deeper into the ground, a change in the intended use of a building, or other special reasons.

Furthermore, foundation structures and earthworks shall be designed to prevent the detrimental effects of moisture transfer from the ground into the structure, and to avoid harm and structural damage from ground frost. The radon risks of the construction site shall also be taken into consideration.

Section 5

Seriousness of consequences

The susceptibility of the building and structure to risk and any expected consequences of potential damage or defect shall be taken into consideration in the design and execution of foundation structures.

Consequences are deemed severe if the potential damage or defect in a structure may cause significant personal injury or have extensive societal effects. Extremely demanding structures, specified in section 150d of the Land Use and Building Act (132/1999), and exceptionally demanding structures, specified in section 120d of the Land Use and Building Act are included in the severe consequences class. The terms extremely demanding structures and exceptionally demanding structures can be considered to refer to structures in relation to which the requirement for an exceptionally in-depth knowledge of the related theoretical principles and design methods is emphasised, and to innovative structures with regard to which no prior design experience is available. Consequences are medium if they are neither severe nor low. These are demanding structures where the design and dimensioning require a good knowledge of the related theoretical principles. Consequences are low if the repercussions attributable to the potential damage or defect in a conventional structure with regard to personal injury, or to societal effects, are small or negligible.

In cases where the building or structures consist of structurally independent parts, the seriousness of consequences for each part may be determined separately.

Section 6

Construction site investigation and survey of environmental conditions

A party engaged in a building project shall, in connection with the planning of the construction project, assess the ground conditions by means of a ground survey to be conducted at the construction site.

A party engaged in a building project shall determine whether the ground at the construction site is contaminated, if activities have been carried out on the site earlier, or if the ground is contaminated for any other reason, or if harmful substances may be released from the ground.

If it is to be expected that construction will cause detrimental changes to the natural environmental conditions, to soil and rock, to groundwater flow, to groundwater or to buildings and structures in the surrounding environment, the party engaged in a building project shall determine the effects of these changes. To avoid detrimental changes, the effects during the construction and possibly during the use of the building shall be monitored according to a monitoring programme drawn up by the party engaged in a building project and a monitoring system shall be applied when necessary.

Section 7

Design plans for foundation structures

The design plans for foundation structures shall show, as applicable to the design task, the following:

1) the structural function and models describing the bracing of the structure;
2) the seriousness of consequences, requirements for execution or execution class, exposure class related to environmental conditions describing the stress on the environment and, where applicable, the tolerance class;
3) loading and combinations of loads;
4) force variables;
5) requirements for construction product properties;
6) ultimate limit state and serviceability limit state tests, and the appropriate accident design tests and fire design;
7) the fastening of structures and the functional parts of structures, and the dimensions of joints, and the weight and centre of gravity of elements to be lifted;
8) durability and service life;
9) bracing and stability tests for the duration of the execution and the finished structure;
10) structures to be restored and demolished during repair and alteration work;
11) data affecting the use and maintenance of new and restored foundation structures.

The execution class referred to above in subsection 1(2) is a set of classes of itemised execution requirements that may be applicable to the entire construction project, a specific structural member or a specific detail.

Section 8

Execution documents for foundation structures

The structural designer of a foundation structure shall prepare the execution documents containing the technical specifications and requirements needed for the execution of the foundation structures before starting the execution of the foundation structure in question. The execution documents include the geotechnical design report, the drawings for earthworks and foundation plans, geotechnical and structural design calculations and the specifications. If Eurocodes are applied in the design and execution process, the execution specification is considered to be an execution document. The geotechnical design report shall present the initial assumptions, original data and calculation methods of the geotechnical plan, and the results of the verification of safety and serviceability. Additionally, the design report contains the ground survey report and the monitoring and follow-up plans.

Foundation structures which require inspections during construction or maintenance after the completion of construction shall be specified in the geotechnical design report.

Section 9

Inspection plan for foundation designs

The structural designer of foundations shall ensure the quality control of foundation designs so that the foundation plans are inspected before they are submitted to the building control authority. The quality control of the plans focuses on the calculations, drawings and text documents prepared by the structural designer, and on other design data provided by the structural designer.

The scope of the inspection plan for foundation designs is determined on the basis of the consequences for the building or a specific foundation structure, or on how demanding the design task is.

In order to ensure the quality of the plans, an inspection plan for foundation designs must be drawn up describing the plan inspection procedure, persons responsible for the inspection, and the relationship of these persons to the project team of the design project, if the potential consequences for a building or specific structural member are severe or medium.

For severe consequences or design tasks classified as exceptionally demanding or extremely demanding, quality control shall, in accordance with the practices of the design office, be carried out by a third party or a person assigned exclusively to quality control in the project and who has the qualifications for the competence class of the design task.

For medium consequences or design tasks classified as demanding, quality control shall be carried out by a person who has the qualifications for the competence class of the design task.

Section 10

Planned service life

The structural designer shall define the planned service life of the foundation structure, i.e. the period for planning purposes during which the structure or structural member is expected to be used for the planned purpose with the anticipated maintenance measures, and the exposure categories representing the environmental conditions.

A party engaged in a building project shall ensure that the structure is designed and executed so that the required properties laid down in the plans for the structure and for the building materials used are maintained throughout the entire planned service life.

Section 11

Work plan for the execution of foundation structures

A party engaged in a building project shall ensure that a work plan for the execution of foundation structures is drawn up and that the work plan contains sufficient data for the execution.

When the potential consequences of a defect or damage in a building or structure are severe or medium, a quality control plan shall be prepared for the building as part of the work plan for the execution of the structure. This plan shall contain an assessment of the executing party's competence and resources in terms of the requirements that have been set, a description of the executing party's project team and its responsible persons, the principles of the inspection and responsibilities, and a plan for the quality control measures and records.

Section 12

Repair and alteration of foundation structures in buildings and changes in the intended use

In the planning and execution of building repair and alteration work and of changes in the intended use, the properties and conditions of a building and its foundation structures shall be taken into account and, for special reasons investigated, and the possibility of an increase in loading on the foundation structures shall be determined. For partial alteration of structures, it shall be ensured that the alterations to the structural system do not affect the fulfilment of requirements, in accordance with section 3 of this Decree.

When the repair and alteration work in buildings or changes in the intended use do not cause an increase in the loading on foundation structures, but the condition of the foundation structures is such that the strengthening of them is required, the regulations valid at the time of the construction of the building, and the best building practices in effect at that time may be applied.

When the repair and alteration work in buildings or changes in the intended use do cause an increase in the loading on foundation structures, sections 2 to 7 of this Decree shall apply in the design and execution of new foundations and foundations to be strengthened.

Section 13

Construction products

The properties of construction products used in foundation structures shall meet the requirements presented in the respective design plans and the construction products shall be suitable for the construction site conditions.

Construction products shall be used in the construction of earthworks and foundations according to the design plans and by applying the working methods in the plans.

Soil materials used at the construction site shall not contain harmful amounts of contaminants and their use shall not be detrimental to health. The use of these materials shall not pose a risk to ground water at the construction site or in its vicinity, shall not contaminate the ground or cause damage such as corrosion from contact between materials and structures.

A party engaged in a building project shall ensure that the suitability of construction

products is checked prior to the execution of their use.

Section 14

Suitability of structures

A party engaged in a building project shall ensure that the foundation structures or construction products fulfil the requirements set on them.

Section 15

Entry into force

This Decree enters into force on 1 September 2014.

This Decree repeals B3 (2004) of the National Building Code of Finland, Decree of the Ministry of the Environment on Foundation Structures.

Any projects initiated before the entry into force of this Decree shall be subject to the provisions and regulations effective upon the entry into force of this Decree.

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