

Unofficial translation.
Legally binding only in Finnish and Swedish

Decree of the Ministry of the Environment

on water and sewerage systems of buildings

By decision of the Ministry of the Environment, the following is hereby laid down pursuant to section 117 c, subsection 3; section 117 d, subsection 2; section 117 f, subsection 3; section 117 g, subsection 4; section 117 i, subsection 4; section 122 a, subsection 3; and section 150 f, subsection 4 of the Land Use and Building Act (132/1999), as laid down in section 117 c, subsection 3; section 117 d, subsection 2; section 117 f, subsection 3; and section 117 i, subsection 4 of Act 958/2012, and section 117 g, subsection 4 by Act 1151/2016, and section 122 a, subsection 3 and section 150 f, subsection 4 of Act 41/2014:

Chapter 1

General

Section 1

Scope

This Decree applies to the design and construction of water and sewerage systems of new buildings as well as those located on property. The Decree also applies to building extensions, increases of calculated floor area, alteration and renovation work as well as alteration of the intended use of the building.

Section 2

Definitions

In this Decree:

- 1) *special water system* means equipment for the conveyance of other than household water;
- 2) *storm water* means rainwater or meltwater to be conveyed from the ground surface, the roof of a building or from other similar surfaces;
- 3) *air gap* means the free vertical distance between the bottom edge (or equivalent) of a plumbing fixture's supply pipe and the highest possible water level in the tank (or equivalent) below it;
- 4) *service pipe* means a water pipe that serves two or more water points;
- 5) *waste water* means, in general, water to be conveyed away via the sewerage system that is chemically, microbiologically, physically or otherwise polluted;
- 6) *support* means a holder that supports a pipe or sewer;
- 7) *throttling valve* means a device for regulating the water flow;
- 8) *fixed point* means the anchorage of a water pipe or sewer which prevents movement of the pipe from its place of support;

- 9) *collector sewer* means a sewer to which two or more drainage points are connected;
- 10) *connector pipe* means a water pipe by which the plumbing fixtures are connected to the service pipe;
- 11) *connector sewer* means a sewer by which a drainage point is connected to the collector sewer;
- 12) *connecting point* means a point at which the building's water and sewerage system is connected to the water and sewerage system network of a water supply plant;
- 13) *domestic hot water* means water produced by the heating of household water;
- 14) *design rainfall* means the maximum rainfall occurring within ten minutes;
- 15) *design flow* means the base flow value used to design water pipes or sewers;
- 16) *standard flow* means the base flow value either obtainable from a water point or to be conveyed to a drainage point;
- 17) *height of backwater* means the approved maximum level to which the water level in a sewer can rise at the point where it joins the property;
- 18) *backwater valve* means a valve which permits the flow of sewage in one direction only;
- 19) *pressure drainage* means a sewerage system in which waste water, storm water or foundation drainage water is pumped;
- 20) *foundation drainage water* means water that has infiltrated into the ground and is conveyed to a sewer or other place of discharge in order to dry the base and foundations of a building;
- 21) *vertical (riser) sewer* means a sewer whose gradient relative to the vertical plane is less than 45°;
- 22) *fire-prevention water system* means equipment intended to extinguish fires;
- 23) *shutoff valve* means a device to open up or shut off water flow;
- 24) *household water* means water that is used for drinking water, for preparing food and for other household use as well as for preparing, processing, storage and marketing of food products in compliance with the provisions of section 16 on household potable water of the Health Protection Act (763/1994);
- 25) *service water pipe* means a water pipe that connects the property's water system to the common water pipe of a number of properties;
- 26) *service sewer* means a sewer that connects a property's sewer to the common sewer of a number of properties;
- 27) *stack vent* means a pipe to ventilate a sewer and to even out pressure fluctuations therein;
- 28) *vacuum relief valve* means a device which, when a specified degree of negative pressure occurs in a pipe or device, opens a link to the surrounding air and thus prevents the occurrence of a siphonage effect, which causes back-siphonage;
- 29) *horizontal sewer* means a sewer whose gradient relative to the vertical plane is greater than or equal to 45°;
- 30) *replaceable water pipe* means a pipe that can be replaced and repaired without excessive work or without breaking any structures;
- 31) *placement of the water pipe or sewer within the building* means a water pipe or sewer installed within or above a building's foundation panel;
- 32) *placement of the water pipe or sewer in the ground* means a water pipe or sewer installed in the ground below a building's foundation panel or outside the foundation wall;
- 33) *plumbing fixtures* mean devices intended to draw water, such as taps, mixers or the like;
- 34) *water system* means the system for conveying household water and domestic hot water;
- 35) *water seal* means a device that prevents sewer gases from escaping from a sewer;
- 36) *water point* means a place where water is drawn and which is equipped with plumbing fixtures;
- 37) *drainage appliances* mean devices intended for sewerage, such as sinks, floor drains, toilet pans or the like;

38) *sewerage system* means the system to remove waste water, storm water or foundation drainage water;

39) *drainage point* means a place of drainage that is equipped with a drainage appliance;

40) *gradient sewer* means a sewerage system in which waste water, storm water and foundation drainage water are removed by gravity;

41) *minimum gradient* means the smallest permitted gradient of a gradient sewer at which the sewer operates in a self-cleaning manner;

42) *back check valve* means a valve that permits the flow of water in a water pipe in one direction only;

43) *overflow pipe* means a pipe that prevents the device from overflowing.

Section 3

Design of a water and sewerage system of a building

When designing a building, the principal designer, specialist designer and construction designer shall each in accordance with their respective duties ensure that the building, in accordance with its intended use, meets the requirements regarding the safety, healthiness, operational reliability, durability and energy efficiency of the water and sewerage systems. The design plan shall indicate the components, products and materials to be used in the water and sewerage systems.

Chapter 2

Water system of a building

Section 4

Water quality

The quality of the water intended to be conveyed to the building's water system shall be known to the specialist designer for the technical design of the system and for corrosion prevention. Only water that meets the quality requirements set on household water may be conveyed to the water system.

Water drawn from the water system may not endanger health and it may not contain taste or odour nuisance.

Section 5

Protection against health risks and other harm

Water systems connected to the network of a water supply plant may not be in direct contact with any water system, sewerage system or special water system that obtains its water from some other water source.

Products to be used in the water system shall be suitable for conveying household water.

The water system shall be designed to prevent the back-siphoning of water and the risk of contamination caused by the penetration of liquids and gases. If the water pipe is located in contaminated ground or there is a risk of contamination, diffusion-tight pipe material shall be used.

Section 6

Water temperature

The cold water pipe shall be designed and installed so that the temperature in the cold water system may not exceed 20 degrees Celsius. After a period of non-use of at least eight hours, the water temperature may not exceed 24 degrees Celsius.

The water temperature of the water in the hot water system shall be at least 55 degrees Celsius and available from the hot water plumbing fixture within 20 seconds. The temperature of the water available from the hot water system may not exceed 65 degrees Celsius.

The water system shall be designed so as to prevent detrimental cross-flow of water from the hot water pipe to the cold water pipe or vice versa.

Section 7

Dimensioning of the water system

The water system shall withstand internal excess pressure of at least 1 000 kilopascals.

The plumbing fixtures shall provide a flow, which is steady in view to its intended use without annoying noise and detrimental pressure shocks.

Section 8

Domestic hot water ring duct

The domestic hot water ring duct of a new building may not have heat emitters or floor heating connected to it.

In connection with repair and alteration work, the heat emitters connected to the domestic hot water ring duct may be replaced so that the heat emission capacity of the heat emitters to be installed does not exceed 200 Watts per room. Domestic hot water may, however, not be used for floor heating.

Section 9

Plumbing fixtures

The plumbing fixtures shall be suitable for their intended use. The functions and directions of movement of the appliances for controlling water volume and temperature shall be safe. The structure of the control appliance of the plumbing fixture shall be such that its surface temperature does not arise above 40 degrees Celsius.

Section 10

Water meters

The water meter of a property shall be located in a place where it is easy to install, read and service and where it cannot freeze.

A building shall have apartment-specific water meters for measuring the cold and hot water entering the apartment so that the water consumption indicated by the meters can be used as basis for billing. The apartment-specific water meters shall be located in a place where they are easy to install, read and service.

Section 11

Connecting a fire-prevention water system to a building's water system

A fire-prevention water system may be connected to a building's water system with the permission of the water supply plant.

The fire-prevention water system may not cause health-related or other detriment to the building's water system or to its functioning. A fire-prevention water system that uses substances that are harmful to health may not be connected to the water system.

The fire-prevention water system may not cause backflow into the building's water system.

Section 12

Installation of a special water system

In a special water system, water for technical use other than household water may only be conveyed if the equipment is separated from the household water system by an air gap.

Each water point and network component of the special water system shall have a clear and permanent marking stating the quality and intended use of the water.

Chapter 3

Operational reliability of the water system

Section 13

Detectability of leaks

The specialist designer shall design the water pipes and devices connected thereto to be installed to the building so that any leak is easily detectable and the water pipes and devices can be easily inspected, repaired and replaced. The connector pipes in the wall structures shall be seamless. Lead-through holes for water pipes may not be made in the floor of a wet room.

In order to detect water leaks, structural solutions that direct the leaked water in sight shall be used. Vertical service pipes shall be equipped with mechanical or structural leak detectors at each floor if the service pipes are not visible.

Section 14

Integrity of a water system

The water system shall be leakproof. The integrity of the water system shall be ensured by using compatible products, components and materials.

Section 15

Prevention of freezing

The water in the water system may not be allowed to freeze. Water pipes that are located in cold premises shall be thermally insulated. Water pipes to be installed in the ground shall be situated below the frost depth unless the freezing of the water pipes is prevented otherwise.

Section 16

Supports and fasteners

The supports and fastening points of water pipes shall be such that neither heat expansion nor forces generated by water flow cause the pipes to shift, loosen, break or make disturbing noises. The supports and products used in fastening shall be corrosion resistant in their environment of use.

Section 17

Shut-off and safety devices of a water system

A water system shall incorporate shut-off options to ensure that the equipment is easy to use, service and repair.

The shut-off valves shall be located:

- 1) at each house;
- 2) at each apartment;
- 3) in vertical service pipes;
- 4) on both sides of devices installed in the service pipes;
- 5) before a device or fixture that is connected to the connector pipe;
- 6) on both sides of the water meters.

The domestic hot water equipment shall have a safety device to prevent excess pressure.

Section 18

Measurement and regulating devices of a water system

A water system shall have a measurement and regulating option to control the principal operating values. The water system shall incorporate:

- 1) a pressure gauge;
- 2) thermometers in the water pipe of mixed domestic hot water from the water heater and in the domestic hot water ring duct to measure the temperature of return water;
- 3) throttling valves.

Section 19

Changing the water pipe pressure

The specialist designer shall draw up a pressure loss calculation for the water system.

If the water pressure in the service pipe exceeds 500 kilopascals, a reducing valve shall be used to reduce the pressure to the level required by the design of the water system.

If the pressure level is so low that the water system does not provide the discharge flow required by its design, water pressure booster equipment shall be used. The booster equipment shall be fitted with regulating devices to control the outlet pressure so that no disturbing pressure fluctuations or noises are generated as well as with safety fittings to prevent excessively high overpressure.

Chapter 4

Water system commissioning measurements

Section 20

Establishing the integrity of the water system

The specialist supervisor shall ensure that the integrity of the water system has been tested before commissioning a building. The integrity of the water system shall be ensured with pressure testing using water. The test shall be carried out so that the water pipes and their joints are uninsulated and easily visible.

The person in charge of the construction phase shall make an entry in the construction inspection document regarding the establishment of integrity of the water system.

Section 21

Water system flushing

The specialist supervisor shall ensure that the water pipe equipment is flushed prior to its commissioning. The flushing shall be carried out with household water to remove any dirt and debris from the pipe network.

The person in charge of the construction phase shall make an entry in the construction inspection document of the flushing.

Section 22

Cleansing and disinfection of the water system

If there is reason to suspect that the water system has been exposed to the effects of pathogenic micro-organisms or other substances that are hazardous or harmful to health, the specialist supervisor shall ensure that the equipment is cleansed and disinfected prior to commissioning.

The person in charge of the construction phase shall make the necessary entries in the construction inspection document of the cleansing measures.

Section 23

Measurement and regulation of water system pressure and flow for plumbing fixtures

The specialist supervisor shall ensure that the water system pressure and the flow for plumbing fixtures are measured, regulated and established to comply with the plans prior to commissioning.

The person in charge of the construction phase shall make an entry in the construction inspection document stating that the measurement and regulation work complies with the plans.

Section 24

Regulation of flow in the domestic hot water ring duct

The specialist supervisor shall ensure that the flow rate of the ring duct is measured and regulated prior to commissioning.

The person in charge of the construction phase shall make an entry in the construction inspection document of the regulation of the flow.

Chapter 5

Waste water system of a building

Section 25

Removal of waste water

The waste water system of a building may not cause health hazards, odour nuisance, sewer overflows, noise or environmental harm.

Waste water shall be conveyed to the sewer of the water supply plant or for purification property-specifically or to a cesspit.

The size of the sewer pipe may not diminish in the flow direction.

Section 26

Arrangement of drainage

A water point shall incorporate a drainage point that is connected to the sewer via a drainage fixture. No drainage point is required for irrigation posts, fire posts, emergency sprinklers or individual refrigeration or drinking appliance.

No more than two drainage wells may be connected to a floor drain and they may be located at a maximum distance of three meters from the floor drain. In the construction of a new building as well as in repair and alteration work corresponding to the construction of a new building, the premises to be fitted with a floor drain shall be:

1. showers and bathrooms as well as wash rooms in connection with saunas;
2. laundry room;
3. heat distribution room;
4. ventilation unit room;
5. toilet facility intended for public use;
6. technical utility room with a possibility to water damage;
7. car wash facility;
8. special facilities cleansed by water rinsing.

Section 27

Waste water pumping station

If waste water cannot be conveyed from the drainage points of a building with gravity unloading via a gradient sewer, the waste water shall be pumped. The pumping station shall be watertight and resistant to earth pressure and it may not cause odour problem. The waste water pumping station shall be ventilated.

The pumping station shall be equipped with a malfunction detector. The pumping station shall be located in a place where it can be easily inspected and serviced. The waste water may not be allowed to flow back to the pumping station.

If a drainage point is located below the height of backwater, the waste water must be pumped. In repair and alteration work, a drainage point located below the height of backwater may be

fitted with a backwater valve instead of pumping with the exception of waters from a water toilet.

Section 28

Prevention of spread of sewer odours

The sewerage system may not cause odour nuisance.

A drainage point shall be equipped with a cleansable water seal.

Sewers shall be connected to a stack vent that extends above the roofing of a building. A stack vent located in cold premises shall be thermally insulated.

Section 29

Drainage of overflow and discharge waters

Overflow and discharge waters from water tanks and discharge water from washing machines and dishwashers may not be allowed to flow from the drain back to the appliances.

Chapter 6

Operational reliability of the waste water system

Section 30

Supporting and fixing sewers to structures

Sewers shall be supported and fixed to structures so that mechanical forces and heat expansion do not cause dents or detrimental changes in the sewers. A sewer shall be anchored if the forces generated by the flow of the waste water are so strong that the sewer will not otherwise remain in place without causing problems. The supports and products used in fastening- shall be corrosion resistant in their environment of use.

The supports of a sewer that is cured-in-place by coating or lining shall be of such condition that they withstand the stress generated by the use of the repaired sewer.

Section 31

Observance of conditions in the location of a sewer

A sewer installed in the ground shall withstand the load imposed by soil, soil corrosion as well as subsidence of soil. Leakage from a pressure sewer located in a groundwater zone shall be detectable.

Water pipes and sewers installed in the ground shall be identifiable and they shall be located separate from one another.

The sewerage system may not be allowed to freeze.

Section 32

Integrity of the sewerage system

The sewerage system shall be leakproof. The materials and fittings shall be compatible.

The person in charge of the construction phase shall make an entry in the construction inspection document regarding the establishment of integrity of the sewerage system.

Section 33

Separators of the sewerage system

If sand, sludge, grease, petrol, oil or other detrimental physical or chemical substances may end up in the sewerage system or network or in the environment, the sewerage system shall be equipped with a separator or treatment device.

The separator devices shall be located so that they can be serviced and emptied easily and without causing problems.

The oil and grease separators shall be equipped with a filling alarm. The sewer pipe located behind the separator shall provide a sampling possibility.

Section 34

Cleanouts of waste water sewers

The sewerage system shall be equipped with cleanouts that are easy to handle and lockable in both horizontal and vertical sewers. The cleanouts shall be located so that the entire pipeline may be cleansed.

Chapter 7

Storm water system

Section 35

Design of the storm water system

The principal designer and specialist designer shall each in accordance with their respective duties design the storm water system so that the first solution for the removal of storm water is its delaying and infiltration within the property. If storm water infiltration is not possible due to the characteristics of the soil, the property shall have a storm water system through which the storm water flows into a ditch, a body of water or the municipal storm water sewer. Waste water may not be conveyed to the storm water system.

The design of the storm water system shall be such that the flow, equivalent to the design rainfall which is conveyed into the sewer, does not cause the sewer to overflow.

Section 36

Location of the storm water system

Storm water sewers within a building may not generate noise. A storm water sewer installed in the ground shall withstand, without sustaining damage or loss of function, the effects of soil pressure, stress and soil corrosion as well as any subsidence of its location. The storm water system shall be cleansable via manholes and fittings.

The storm water sewer may not be allowed to freeze.

Section 37

Integrity and operational reliability of storm water sewers within a building

The specialist supervisor shall ensure that the integrity of the storm water sewers within the building is checked. The storm water sewer shall be fixed to structures so that no harmful dent can arise thereon and so that a possible heat expansion will not cause problems as well as so that the forces generated by the flow of storm water cannot result in harmful movement of the pipes. The storm water sewers within the building shall be equipped with condensation insulation.

The person in charge of the construction phase shall make an entry in the construction inspection document regarding the establishment of integrity of the storm water sewers within the building.

Section 38

Removal of the foundation drainage water of a building

Drains shall convey foundation drainage water via drainage wells to a collection well. The foundation drainage water shall flow away from the property in such a way that it does not cause problems to the waste water and storm water systems. Depending on the sewerage system of the area, the foundation drainage waters of a building may flow into an open ditch, a water body, the municipal storm water sewer or they may infiltrate into the ground. Waste and storm waters may not be conveyed into the foundation drainage water sewers.

Chapter 8

Entry into force and transitional provisions

Section 39

Entry into force

This Decree enters into force on 1 January 2018.

Upon the entry into force of this Decree, pending projects shall be subject to the rules valid at the time of entry into force of this Decree.

Helsinki, 22 December 2017

Kimmo Tiilikainen, Minister of the Environment, Energy and Housing

Kaisa Kauko, Senior Engineer