Wat 01 Water consumption

(All buildings)

Aim

To reduce the operational water consumption for sanitary uses in new buildings by installing water efficient components and rainwater collection and water recycling systems.

Overview

Assessment type	Available credits	Applicable assessment criteria
Fully fitted	7+2 exemplary	All
Shell and core	7+2 exemplary	All (See ref 1.0)
Shell only	0	Not applicable
Residential: Fully fitted	7+2 exemplary	All
Residential: Partially fitted	7+2 exemplary	All (see ref 1.0)
EU Taxonomy	-	3 (see ref 3.0)

Minimum standards

Rating level	Criteria
Good	1 credit on water efficient components
Excellent	3 credits on water efficient components

Assessment type specific notes

Reference	Assessment type specific note
1.0	Where there will be no in-scope water-using components present in the building, when it is operational, this issue is filtered out.

Building type specific notes

Reference	Building type specific note
2.0	**Healthcare buildings** Water-using components in clinical areas do not need to be assessed. Components in non-clinical areas may also be excluded where they are not appropriate for the needs of patients or may adversely affect the incidence and propagation of infections, where justified by an appropriate health professional. Where all water fittings are excluded from assessment the minimum standard is not applicable.

Issue specific notes

Reference	Issue specific note
3.0	**EU taxonomy** A1-7.1-DNSH 3 and A.1-7.2-DNSH 3 – Maximum water flow on installed water equipment. Three credits for water-consuming components meet above EU Taxonomy requirements.

Assessment criteria

This issue is split into six parts:

- Prerequisite – Microbial contamination
- Predict sanitary water consumption – one credit
- Water efficient components – four credits
- Water efficient appliances – two credits
- Exemplary credit – Water recycling for sanitary use
- Exemplary credit - Water recycling for sanitary use

Prerequisite – Microbial contamination

1 All sanitary water systems in the building are designed in compliance with the measures outlined in national best practice regarding microbial contamination.

2 Documented procedures shall be in place to minimise the risk of microbial contamination during the operational stage. The procedures shall be handed over to the building owner upon project completion.

Predict sanitary water consumption – One credit

3 Estimate the annual operational water consumption for sanitary use in the building.

Water efficient components – Four credits

4 Install domestic scale water consuming components where each individual component meets its corresponding water efficiency values required to achieve the targeted performance level as prescribed in table 64.

Water efficient appliances – Two credits

5 Install water efficient domestic/commercial-scale water-consuming components where each individual component meets its corresponding water efficiency values required to achieve the targeted performance level as prescribed in table 65 .

Exemplary credit – Water recycling for sanitary use

6 Achieve two credits for water efficient components.

7 Use graywater or rainwater systems to meet 25% of the potable water demand required for flushing.

Exemplary credit – Water recycling for sanitary use

8 Achieve the first exemplary credit for water recycling for sanitary use.

9 Use graywater or rainwater systems to meet 50 % of the potable water demand required for flushing.

Checklists and tables

Table 64: BREEAM SE credits available for use of water efficient components

Number of credits	1	2	3***	4	Unit
WC**	4,5	4	3,5*	3	Effective flush volume (litres)
Urinal (timed flush)**	6	3	2	1	Litres/bowl/hour
Urinal (flushing)**	1,5	1,5	1	1	Litres/flush
Wash hand basin taps (non-residential)**	7,5	4,5	3,75	3	Litres/min
Wash hand basin taps (residential)**	8	7	6	4	Litres/min
Showers**	10	9	8	7	Litres/min
Baths	160	140	120	100	Litres
Kitchen taps**	8	7	6	5	Litres/min
Restaurant pre-rinse nozzles only	9	8,3	7,3	6	Litres/min

* A maximum flush volume of 6 l
** Included in EU taxonomy DNSH criteria
*** Flush and flow rates mentioned under performance level 3 meets taxonomy requirement

Table 65 : Credits available for use of water efficient appliances

Number of credits	1	2	Unit
Domestic sized dishwasher	13	11	Litres/cycle
Domestic size washing machines	50	35	Litres/cycle
Waste disposal unit	17	0	Litres/min
Commercial sized dishwashers	6	4	Lires/rack
Commercial or industrial size washing machines	10	5	Litrs/kg

Methodology

M1: In-scope water-consuming components

Identify which of the following sanitary water-consuming components will be present in the building when it is operational:

- WCs/toilets
- Urinals
- Taps/faucets (on wash-hand basins, kitchen sinks and waste disposal units)
- Showers
- Baths
- Dishwashers (domestic and commercial-sized)
- Washing machines (domestic and commercial sized).

Where the building under assessment has multiple specifications for the same water-consuming component type, each fitting and component needs to comply with the performance specification mentioned under respective level.

All other potable water used is considered non-sanitary use.

M2: Estimate the annual operation water consumption for sanitary use

Where the intended occupier is known, information on occupancy patterns should be obtained from the intended occupier, for example through structured interview.

Where no intended occupier has been identified, the occupancy patterns must be based on that of a similar project or a typical value for the building type.

Typical values for water usage can be obtained from IVL's report with instructions for calculating LCA for construction projects "Anvisningar för LCA-beräkning av byggprojekt" or BRE statistics in table 66, but can also be estimated from project specific information.

Table 66: Standard values for common scenarios, in uses per person per day or visit. Optional to use.

	Staff	Retail customers	Restaurant customer	Hotel guests	Residential
WC	4	0,09	0,5	4	7
Wash hand basin taps	4	0,09	0,5	4	8
Showers	0,03	0	0	0,5	0,5

M2.1: Effective flush volume for toilets

The effective flush volume of a single flush WC is the volume of water used for one flush. The effective flush volume of a dual flush WC is the ratio of full flush to reduced flush. This is taken to be one full flush for every three reduced flushes for nondomestic buildings and one full flush for every two reduced flushes in domestic (residential) buildings or areas.

Example

The effective flush volume can therefore be calculated as follows, using a 6/4 litre dual flush volume WC as an example:

- Non-domestic: {(6 litre × 1) + (4 litre × 3)}/4 = 4.5 litre effective flushing volume (for a 6/4 dual flush WC)
- Domestic: {(6 litre × 1) + (4 litre × 2)}/3 = 4.67 litre effective flushing volume (for a 6/4 dual flush WC).

The differing ratio between non-domestic and domestic buildings reflects the different patterns of user behaviour between these building types.

Where buildings have both domestic and non-domestic function areas, conduct the calculations accordingly for the WCs specified in the relevant spaces. For example, in a hotel building, for WCs in hotel rooms use the 'domestic' effective flush volume calculation and for WCs in staff areas use the 'non-domestic' calculation.

M2.2: Calculating flow rates for push and automatic shut-off taps

The water consumption of push and automatic shut-off taps using the following steps:

Step 1: Calculate the water consumption per person per use. If a tap runs for less than 20 seconds per activation, assume it will be activated twice per person for the timed duration.

Example

For a tap with a flow rate of 9 litres/min and a 15 second usage duration, the water consumed per person would be: 9 x (15/60) x 2 = 4.5 litres/min.

If a tap runs for 20 seconds or more per activation, assume one activation per person for the timed duration.

For example, for a tap with a flow rate of 9 litres/min and a 20 second usage duration, the water consumed per person would be: 9 x (20/60) x 1 = 3 litres/min.

Step 2: Multiply the water consumption figure per person by 1.5 and enter this figure into the calculator tool.

Multiplying by 1.5 adjusts the consumption figure to compensate for the typical non-timed tap use of 40 seconds that has already been taken into account in the tool.

Example

Taking the first example above, 4.5 litres/min multiplied by 1.5 gives 6.75 litres/min. When this is used in the tool as the flow rate specification, the consumption is 4.57

litres/person/day which more closely reflects the true level of water consumption for the push tap.

M3: Greywater and rainwater systems

M3.1 Data needed for greywater systems:

Estimate the percentage volume of waste water collected (and reused) from the following, where relevant: wash-hand basins, showers, kitchen sinks, dishwashers, baths, washing machines and sources of waste water from non-domestic and non-sanitary components.

M3.2: Data needed for rainwater systems:

Either

- Horizontal projection of the collection area (m²)
- Surface yield co-efficient (%)
- Hydraulic treatment efficiency co-efficient (%)
- Annual local rainfall (mm/year)

OR

- Daily rainfall collection (litres)

Daily rainfall collection (litres) must be calculated in accordance with credible and verifiable national or local data, e.g. a regional, national or international meteorological organisation, datasource or equivalent.

M3.3: Calculating percentage used for flushing

Use the estimated water-consumption for toilet and urinal flushing from M2 to calculate the percentage of water demand for flushing covered by water collected in gray- och rainwater systems.

Compliance notes

Reference	Terms	Description
CN1	Flow rate for click taps	The flow rate for click taps shall be taken as the maximum flow rate, as quoted by the manufacturer, of the lower range before the water break or 'click'.
CN2	Flow rate with flow restrictors	Maximum flow rate for taps, faucets and showers are given in litres per minute, including any reduction achieved with flow restrictors
CN3	Water pressure	The flow rate of a tap or shower will vary depending on the water pressure. • For high pressure supply systems, test measurements should be undertaken at 3 ± 0.2 bar (0.3 ± 0.02 MPa). • For low pressure supply systems, test measurements should be undertaken at 0.1 ± 0.02 bar (0.01 ± 0.002 MPa).

Reference	Terms	Description
CN4	Baths	The calculation of water consumption for baths assumes 40% of the capacity to the overflow. This is to reflect that users tend not to fill the bath to overflow and the displacement effect the user has on the actual volume of water required for a bath.
CN5	Combined washing and drying machines	The washing cycle of the combined washing and drying machine shall be included in the wat 01 assessment as a domestic sized washing machine. The dryer cycles potential water-use is assessed in wat 04.
CN6	Swedish best practice	National best practise on preventing microbial contamination can be found in Säker Vatteninstallation. SS-EN 16941-2 is national best practise for specifying and installing greywater and rainwater systems.

Evidence

Criteria	Interim design stage	Post construction stage
1	Design drawings, relevant sections of the building specification, schedules or other documentary evidence identifying all watersystems are designed according to Swedish best practise.	Written confirmation that all watersystems are installed according to Swedish best practise.
2	Writen confirmation that procedures for minimising the risk for microbial contamination during operation will be established.	Procedures to minimise the risk for microbial contamination during operation have been established and handed over to the owner.
3	Documentation detailing all water-using components and equipment, such as specifications, design drawings or schedules. Calculations and data sources used to confirm the overall estimated annual operational water consumption for the building. Where known, manufacturer's product details.	As built documentation detailing all water-using components and, such as final construction drawings or schedules. Final calculations and data sources used to confirm the overall estimated annual operational water consumption for the building including manufacturer's product details.
4	The relevant sections or clauses of the building specification, design drawings or schedules confirming the number, specification and water consumption of all water-consuming components. Where specific products are specified, manufacturer's literature, EU Energy Label or European Unified Water Label information must be provided to support the water consumption values used. Calculations e.g., relating the flow rate for push and automatic shut off taps or for blackwater, greywater, or rainwater collection systems. Relevant clauses from green lease agreements.	Final construction drawings or sanitaryware schedule to confirm the number and type of water-consuming components installed. Assessor site inspection report with photographic evidence or proof of purchase such as purchase orders to confirm that the fittings have been installed as specified. Copy of the manufacturer's product details, EU Energy Label or European Water Label to confirm water consumption for all installed products. Relevant clauses from green lease agreements.
5-6	Technical details and calculations for specified greywater or rainwater collection systems,	Technical details and calculations for installed greywater or rainwater collection systems.

Definitions

Click taps

Taps where the flow volume has more than one preset level rather than permitting continuous adjustment.

Clinical areas

Areas of the building in which medical functions are carried out that require specific restricted environmental conditions, affecting factors such as such as humidity, daylighting, temperature etc. (e.g. X-ray, operating department, delivery room etc.).

Green lease agreement

A green lease agreement is a contract that includes additional clauses which provide for the management and improvement of the environmental performance of a building by both owners and occupiers. To be acceptable for BREEAM a green lease agreement must cover all relevant BREEAM requirements and must be signed by both the lessor and the lessee or, where the lessee is unknown, a commitment must be provided by the client that the green lease agreement will be implemented when the building is let.

Greywater recycling

The appropriate collection, treatment and storage of waste water discharged from baths or showers, laundry rooms and similar to meet a non-potable water demand in the building, e.g. WC flushing, or other permissible non-potable use on the site of the assessed building.

Hydraulic filter efficiency

This recognises the efficiency of the hydraulic filter. Where the coefficient for the system is not known a default value of 90% may be used.

Non-potable water

Any water other than potable water, also referred to as unwholesome water.

Potable water

Water suitable for human consumption that meets the requirements of Section 67 (Standards of Wholesomeness) of the Water Industry Act 1991 is referred to as 'wholesome water'.

Rainwater recycling

The appropriate collection and storage of rainwater run-off from hard outdoor surfaces to meet a non-potable water demand in the building, e.g. WC flushing, or other permissible non-potable use on the site of the assessed building.

Additional information

European Unified Water Label

The European Unified Water Label is a scheme initiated by bathroom manufacturers across the globe and it provides a database of bathroom products of different levels of water efficiency. It includes products by multiple European bathroom manufacturers and can help project teams identify products appropriate for their specifications. Find out more at: uwla.eu