RAIN GARDEN

A handbook for residents

What is a rain garden?

A rain garden is made up of plants in the ground or in a container which retain water, thereby increasing retention in areas larger than the garden itself, e.g. roofs or roads, so that less water flows from these areas into the sewerage system.

The plants that will work best in a rain garden are hydrophytic plants, i.e. plants with rhizomes or roots that remove impurities from the water. These plants are tolerant of both excess and scarcity of water.

Rain gardens:

1. improve water relations in a given area;
2. have a beneficial effect on the microclimate of the plot;
3. retain impurities from the collected water through hydrophytic plants;
4. reduce the risk of drought or flooding;
5. contribute to biodiversity by improving the ecosystem for animals;
6. enhance the aesthetic value of the garden;
7. reduce water service charges e.g. for watering plants.

Rain gardens are a tool of blue-green infrastructure.

Rain garden as a system of small retention

- Rain gardens can be the easiest way to manage water not only in the garden, but also on the balcony in a block of flats.
- Rain gardens can be called systems of small retention as they reduce surface run-off.
- Rain gardens are characterised by about 30% more efficient absorption of water into the ground and treat up to 90% of impurities contained in the water.
- Thanks to the use of appropriate vegetation and layers, rain gardens will purify rainwater and incorporate it into the soil.

Types of rain gardens:

Dry rain garden

- the garden is formed in permeable soil so that water infiltrates into the ground and does not accumulate on the surface;
- located at least 5 m from the building to prevent the foundations from becoming damp;
- densely populated with plants.

Wet rain garden with a small area:

- typically established on private property in the form of a pond;
- not densely populated with plants;
- located immediately at a drainage source;
- lined with moisture barrier foil (if located near a building).

Rain garden in a container:

- placed in a wooden box or concrete container;
- receives water fed through a drain pipe, e.g. from the roof of a building;
- classified as a wet garden (equipped with waterproofing and an emergency overflow);
- densely populated with plants.

Wet rain garden with a large area:

- formed in soil with poor permeability, making it difficult for rainwater to infiltrate into deeper layers;
- excess water is drained away by a drainage system;
- typically established in an urban space, e.g. in a park, in the form of a pond.

How to make a rain garden?

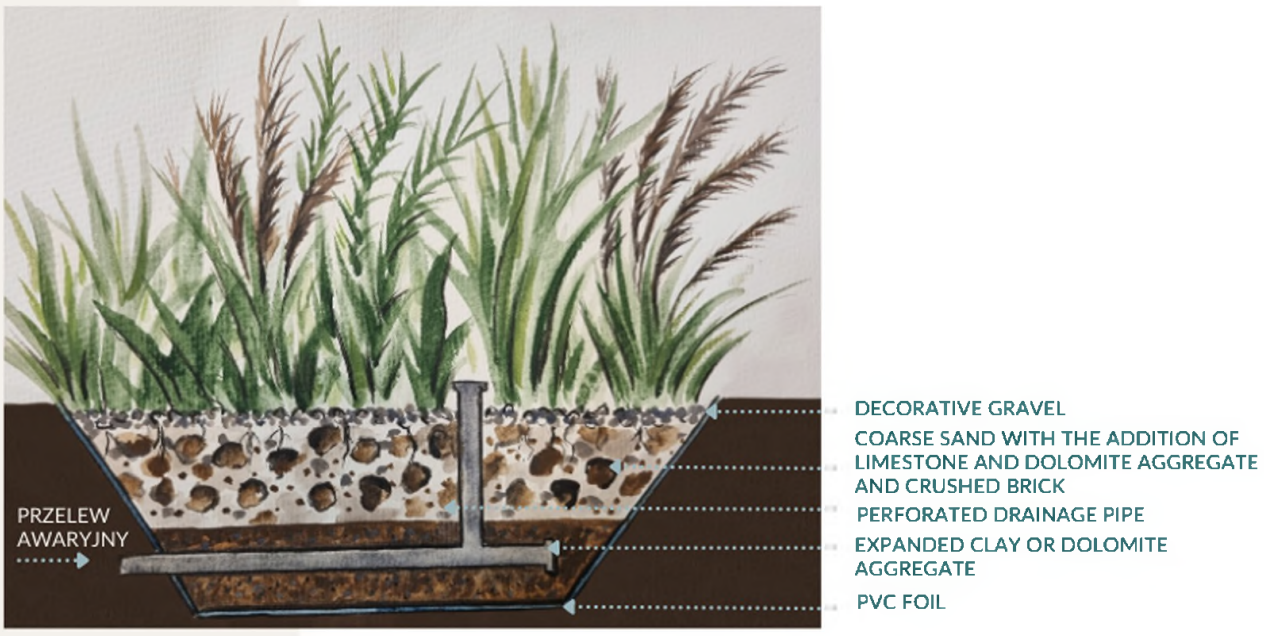
Materials needed:

- container with a depth of approx. 0.9 m and a size of min. 2% of the roof drainage area;
- PVC foil;
- drainage pipe with a diameter of 8 cm;
- overflow pipe with a diameter of 8 cm;
- expanded clay or dolomite aggregate;
- coarse sand with the addition of limestone and dolomite aggregate and crushed brick;
- decorative gravel and larger stones;
- plants,
- downpipe.

The diverse composition, high aesthetics and versatile use give a unique character to these gardens.

Location and design:

- check the groundwater level – dig a hole 1.5 m deep, then verify that it fills with water within 24 hours; if so, look for another location (water table is shallow);
- choose an area with only a gentle slope;
- keep a distance of 50 cm from the building (foil-lined garden), or 5 m (garden infiltrating into the ground);
- the size of the garden should be approx. 2% of the roof area;
- the pit should be lined with PVC foil with the edges secured in place with stones;
- fill the excavation to a height of 20 cm with dolomite aggregate;
- place two pipes on this layer: a horizontal drainage pipe, positioned at a slight angle, and a vertical overflow pipe, protruding above the garden surface (the end closed with a drainage grate);
- join the pipes together at a right angle;
- backfill the pit above the pipe, up to a depth of 10 cm with dolomite aggregate and compact the backfill material;
- backfill the resulting surface with 45 cm of coarse sand with limestone and dolomite aggregate and crushed brick and compact the backfill material (additions should be approx. ¼ of the layer);
- plant the plants;
- place larger stones and fill the spaces between them and the plants with decorative gravel up to 1.5 cm in diameter; this layer should not exceed 5 cm in height;
- reinforce the edge of the garden with a kerb.



Maintenance and care of the rain garden

Ongoing

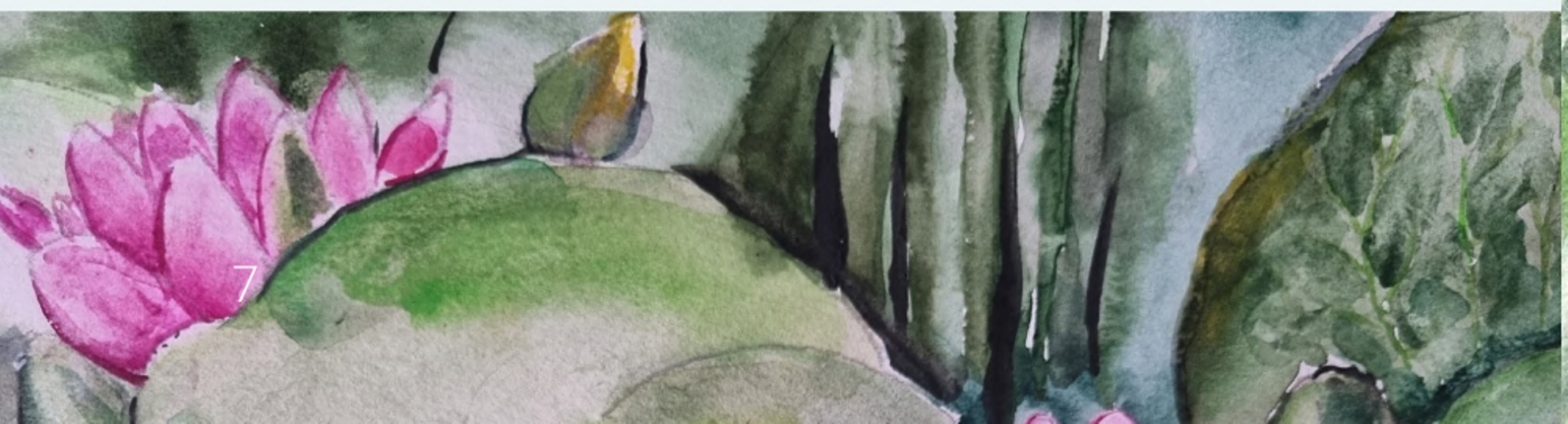
- maintenance of vegetation by removing dead plants;
- removing any dirt and debris;
- weeding.

Optional

- in the case of perennials, it is advisable to remove dry leaves and plant parts at the end of the growing season;
- water new plantings in the initial phase of growth or during dry periods;
- prune the plants for aesthetic reasons;
- inspect the container (wooden boxes should be treated);
- monitor the technical condition of the components, e.g. pipes and drains, on an ongoing basis;
- clean the inspection chambers and flush the drainage pipes;
- check that the stone layer is compact and that the plants that do not have the capability to purify water do not overgrow other plants.

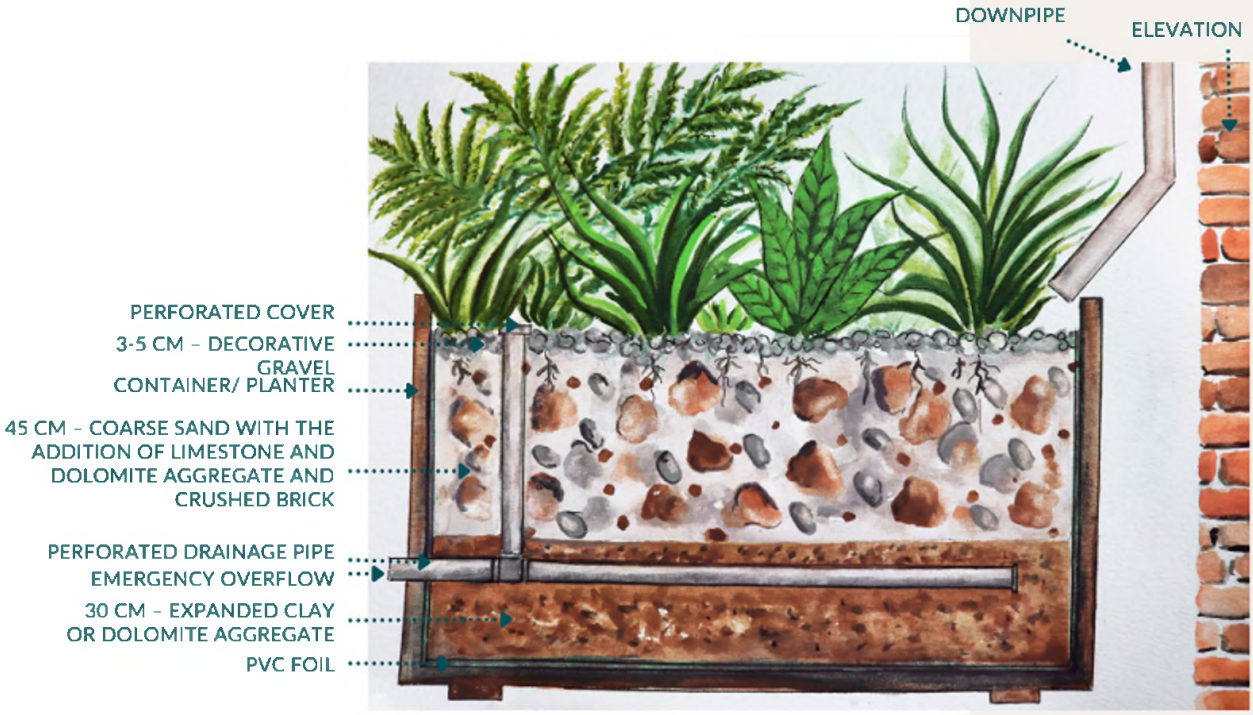
If the soil moves out of the garden during rainfall, this may be a sign that infiltration is too slow in relation to the amount of water, in which case the garden should be enlarged.

To ensure that rainwater gently spills over the garden, large flat stones should be laid in the garden and the spaces between them filled with smaller stones. The layer should be about 5 cm high.



Location and design:

- the container should be placed at least 30 cm from the wall of the building, immediately at the rainwater downpipe;
- make a hole with a diameter of 8 cm in the wall of the container, at a height of about 30 cm from the bottom;
- if the container is not waterproof (e.g. made of bricks), its base should be lined with PVC foil;
- fill with a layer of expanded clay or dolomite aggregate to a height of 20 cm;
- place two pipes on this layer: a horizontal drainage pipe, positioned at a slight angle (one end of the pipe closed and the other extending beyond the container) and a vertical overflow pipe protruding above the garden surface (the end closed with a drainage grate);
- join the pipes together at a right angle;
- backfill the drainage pipe with 10 cm of dolomite aggregate and compact the backfill material;
- backfill the resulting surface with 45 cm of coarse sand with limestone and dolomite aggregate and crushed brick and compact the backfill material (additions should be approx. ¼ of the layer);
- plant the plants;
- place some larger stones and fill in the spaces between them and the plants with decorative gravel up to 1.5 cm in diameter, this layer should not exceed 5 cm in height.



Which plants do you plant in your garden?

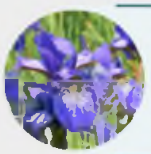
- The choice of plants for a rain garden is extremely important. It is recommended that they are so-called hydrophytic plants (more than 50% of the plants in the garden) because their roots and rhizomes remove impurities from the water before it enters the deeper layers of the soil, and they also retain water (bioretention);
- these plants are tolerant of excess (coastal plants) and scarcity of water (drought-tolerant plants);
- plants of native species (best adapted to the local soil and climatic conditions) and perennial plants are also preferred;
- other species can be added to ensure biodiversity in the landscape;
- it is important to take into account the light requirements of the plants and their growth; some of them can grow very large;
- perennials are ideal for smaller gardens and shrubs and trees for larger ones.

Choosing the plants

REQUIREMENTS:

- SUN
- MODERATE SUN
- PARTIAL SHADE
- FULL SHADE

Bulbous plants

	ENGLISH NAME	LATIN NAME	GENUS/ DISTRIBUTION RANGE	REQUIREMENTS
	SIBERIAN IRIS	IRIS SIBIRICA	DROUGHT-TOLERANT, COASTAL PLANT	
	YELLOW FLAG IRIS	IRIS PSEUDACORUS	DROUGHT-TOLERANT, COASTAL PLANT	

Aquatic perennials

	ENGLISH NAME	LATIN NAME	GENUS/ DISTRIBUTION RANGE	REQUIREMENTS
	YELLOW WATER LILY	NUPHAR LUTEA	STILL AND SLOW-FLOWING WATERS	
	WHITE WATER LILY	NYMPHAEA ALBA	STILL AND SLOW-FLOWING WATERS	
	COMMON DUCKWEED	LEMMA MINOR	STILL AND SLOW-FLOWING WATERS	
	HYDROCHARIS MORSUS-RANAE (FROGBIT)	HYDROCHARIS MORSUS - RANAE	STILL AND SLOW-FLOWING WATERS	

Perennials

	ENGLISH NAME	LATIN NAME	GENUS/DISTRIBUTION RANGE	REQUIREMENTS
	BOGBEAN (MENYANTHES TRIFOLIATE)	MENYANTHES TRIFOLIATA	COASTAL PLANT	
	MARSH CRANESBILL	GERANIUM PALUSTRE	COASTAL PLANT	
	MOURNING WIDOW	GERANIUM PHAEUM	DROUGHT-TOLERANT, COASTAL PLANT	
	CALTHA PALUSTRIS (MARSH-MARIGOLD)	CALTHA PALUSTRIS	COASTAL PLANT	
	VALERIAN	VALERIANA OFFICINALIS	DROUGHT-TOLERANT, COASTAL PLANT	
	PURPLE LOOSESTRIFE	LYTHRUM SALICARIA	DROUGHT-TOLERANT, COASTAL PLANT	
	FLOWERING RUSH	BUTOMUS UMBELLATUS	COASTAL PLANT	
	WATER MINT	MENTHA AQUATICA	DROUGHT-TOLERANT, COASTAL PLANT	
	WATER FORGET-ME-NOT	SCORPIOIDES	COASTAL PLANT	
	GLOBEFLOWER	TROLLIUS EUROPAEUS	DROUGHT-TOLERANT	

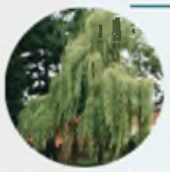
Perennials

	ENGLISH NAME	LATIN NAME	GENUS/DISTRIBUTION RANGE	REQUIREMENTS
	COMMON SPIKE-RUSH	ELEOCHARIS PALUSTRIS	COASTAL PLANT	
	COMMON BISTORT	POLYGONUM BISTORTA	DROUGHT-TOLERANT	
	AMPHIBIOUS BISTORT	POLYGONUM AMPHIBIUM	COASTAL PLANT	
	HEMP-AGRIMONY	EUPATORIUM CANNABINUM	DROUGHT-TOLERANT	
	MARSH CINQUEFOIL	POTENTILLA PALUSTRIS	COASTAL PLANT	
	DOTTED LOOSESTRIFE	LYSIMACHIA PUNCTATA	DROUGHT-TOLERANT, COASTAL PLANT	
	CREEPING JENNY	LYSIMACHIA NUMMULARIA	DROUGHT-TOLERANT, COASTAL PLANT	
	MEADOWSWEET	FILIPENDULA ULMARIA	DROUGHT-TOLERANT, COASTAL PLANT	
	HOARY WILLOWHERB (SMALLFLOWER HAIRY WILLOWHERB)	EPILOBIUM PARVIFLORUM	DROUGHT-TOLERANT, COASTAL PLANT	
	WATER PLANTAIN	ALISMA PLANTAGO-AQUATICA	COASTAL PLANT	

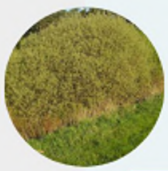
Ornamental grasses

	ENGLISH NAME	LATIN NAME	GENUS/DISTRIBUTION RANGE	REQUIREMENTS
	BRANCHED BUR REED	SPARGANIUM ERECTUM	COASTAL PLANT	
	REED SWEET GRASS	GLYCERIA MAXIMA	COASTAL PLANT	
	REED CANARY GRASS	PHALARIS ARUNDINACEA	DROUGHT-TOLERANT, COASTAL PLANT	
	NARROWLEAF CATTAIL (LESSER BULRUSH)	TYPHA ANGUSTIFOLIA	COASTAL PLANT	
	CATTAIL (TYPHA GRACILIS)	TYPHA GRACILIS	COASTAL PLANT	
	COMMON RUSH	JUNCUS EFFUSUS	DROUGHT-TOLERANT, COASTAL PLANT	
	TUFTED HAIR GRASS	DESCHAMPSIA CESPITOSA	DROUGHT-TOLERANT	
	SWEET FLAG	ACORUS CALAMUS	COASTAL PLANT	
	COMMON REED	PHRAGMITES AUSTRALIS	DROUGHT-TOLERANT	
	WOOD SEDGE	CAREX SYLVATICA	COASTAL PLANT	

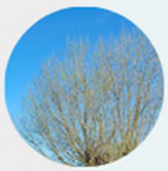
Trees

	ENGLISH NAME	LATIN NAME	GENUS/DISTRIBUTION RANGE	REQUIREMENTS
	BLACK ALDER	ALNUS GLUTINOSA	COASTAL PLANT	
	WHITE WILLOW	SALIX ALBA	COASTAL PLANT	
	ALMOND WILLOW	SALIX TRIANDRA	COASTAL PLANT	

Shrubs

	ENGLISH NAME	LATIN NAME	GENUS/DISTRIBUTION RANGE	REQUIREMENTS
	GOAT WILLOW	SALIX CAPREA	COASTAL PLANT	
	PURPLE WILLOW	SALIX PURPUREA	COASTAL PLANT	
	GREY WILLOW	SALIX CINEREA	COASTAL PLANT	

Trees/shrubs

	ENGLISH NAME	LATIN NAME	GENUS/DISTRIBUTION RANGE	REQUIREMENTS
	BAY WILLOW/ LAURENT WILLOW	SALIX PENTANDRA	COASTAL PLANT	
	BASCET WILLOW	SALIX VIMINALIS	COASTAL PLANT	

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LIFE PACT

Remember, by creating a rain garden, you become the architect of your immediate space by increasing its aesthetic value, enhancing biodiversity, but above all you have a real impact on water retention.