



Architecture &
Design Scotland
Ailtearachd is Dealbhadh na h-Alba

Design elements for school grounds

Rain gardens



Rain gardens



Rain gardens are a good way for schools to manage rainwater and moisture on their grounds and help prevent flooding. They collect and filter rainwater by using plants and other organic material, which mimics natural water retention in the soil.

Rain gardens create green, fun and educational play spaces to get pupils and teachers thinking about rainwater, wildlife and nature, whilst making school grounds more climate resilient.

For further examples of rain gardens, visit: www.10kraingardens.scot

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Existing wet and damp areas or soft landscape

Existing boggy or wet areas within soft landscape can be transformed into thriving rain gardens. Smaller, consistently damp areas can become bog gardens, which are shallow areas planted with bog-plants. Larger expanses of wet ground can be developed into wetlands, providing a haven for a wider range of aquatic and semi-aquatic plants and animals. Well-planned tree planting, especially with water-tolerant species like alder and willow, can further enhance water absorption and create a more resilient and ecologically rich landscape.



materials

Depending on your design, you may require materials such as plants, edging (e.g. timber or logs), and guttering – if not connecting to an existing drainpipe.

Suitable planting options include perennials, reeds, sedges, grasses, shrubs, and trees.

Choose plants that can tolerate both drought and periods of waterlogging.



labour and skills

Construction skills will be useful for setting up the area.

Planting skills and knowledge of species that thrive in variable conditions are also important.



estimated time

Designing the rain garden may take 1–2 months.

Implementation can typically be completed within 1–4 weeks, depending on the scale of the project.

Design considerations

Plants should be carefully chosen to withstand drought and waterlogging. Consider incorporating elements such as water and natural play, water butts, rain planters, bug hotels, green roofs, vegetable beds, sandpits, wildflowers and biodiverse planting. Active play areas should be located far away, or a boundary (hedging or fencing) should be installed to avoid pupils running through the area or balls damaging the planting.

Technical considerations

Not applicable.

Legal considerations

Not applicable.



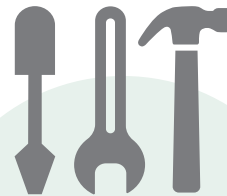
estimated costs

Tree whip planting typically costs £2.50–£3 per sapling.

Willow saplings can often be planted for free using cuttings from existing plants.

Other types of planting, including perennials, reeds, sedges, grasses, and shrubs, may cost around £20 per m².

***see costings note at end of document**



maintenance and lifespan

Monthly weeding is required from April–October during the first 1–2 years, while plants become established.

Occasional weeding is required thereafter.

Replace any failed plants as necessary.



further ideas

Consider placing seating around the rain garden to create a calm reflective area.

Existing wet and damp areas or soft landscape



Here we see a large grassy area turned into a rain garden by the depression in the earth. This is called an in-ground rain garden. When it rains, water flows from the surrounding area and is captured into the rain garden.



Another example of an in-ground rain garden. Here, the rain garden is placed between the paths and is captured in the depression of the landscape. Surface water from the paths and water captured from other parts of the surrounding area will flow into the depression when there is heavy rainfall.



Here we see a carpark bioretention planter, which is another type of rain garden. This shallow depression in the ground is filled with soil, compost and plants designed to capture and treat stormwater runoff.

Rain garden planters

Rain garden planters catch the rainwater coming from a downpipe. The water flows through the plants and soil, then down through different layers of gravel, before coming out of the planter. This is useful for tarmac areas that are prone to flooding as it slows the flow of water.



materials

Planters can be metal or plastic. Timber, which is prone to rotting, is not recommended unless an impermeable liner is used.

Use free-draining soil and gravel.

Choose suitable planting such as trees, perennials, reeds, sedges, grasses, and shrubs.

Instructions for building your own planter can be found at: www.10kraingardens.scot.



labour and skills

Basic construction skills are needed for building the planter, along with planting skills and knowledge of suitable species.



estimated time

Design and implementation may take between 1–3 months, depending on size and complexity of project.

Design considerations

Plants should be carefully chosen to tolerate periods of drought and waterlogging. Consider incorporating elements such as water and natural play, water butts, bug hotels, green roofs, vegetable beds, wildflowers and biodiverse planting.

Technical considerations

Ensure the rain garden planter has the capacity to take water run-off from the roof. Ensure the soil is suitable for a rain garden: free draining and not compacted or rich in clay. Planters should have an overflow to avoid waterlogging.

Legal considerations

Permission or sign off by local authority may be required for any self-build elements.

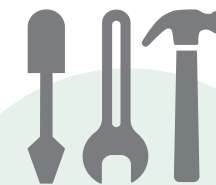


estimated costs

A ready-made planter (1,000 x 650 x 900mm) costs approximately £1,500, excluding soil and planting.

A self-build planter (1,800 x 600 x 450mm) costs approximately £500, excluding soil and planting.

***see costings note at end of document**



maintenance and lifespan

Monthly weeding is required from April–October during the first 2 years, while plants become established.

Occasional weeding is required thereafter.

Replace any failed plants as necessary.

Occasionally clear and repair guttering and downpipes.

Rain garden planters can last over 15 years.



further ideas

Rain garden planters can be integrated into quiet spaces, wellness areas, or sensory gardens to enhance the environment and support biodiversity.

Rain garden planters

Existing situation

A school suffers from high surface water flooding that comes through a downpipe. After heavy rainfall, the surrounding area and pathway become unusable and unsafe for pupils.

Proposed elements

In this scenario, a school is looking to implement a rain garden planter to capture the water coming from the downpipe. The location for the planter has already been selected, so the next step is to identify what the planter will be made from. The planter must be a watertight box, strong enough to hold soil, gravel, plants, and the weight of the rainwater.

An example of a rain garden planter is shown here.

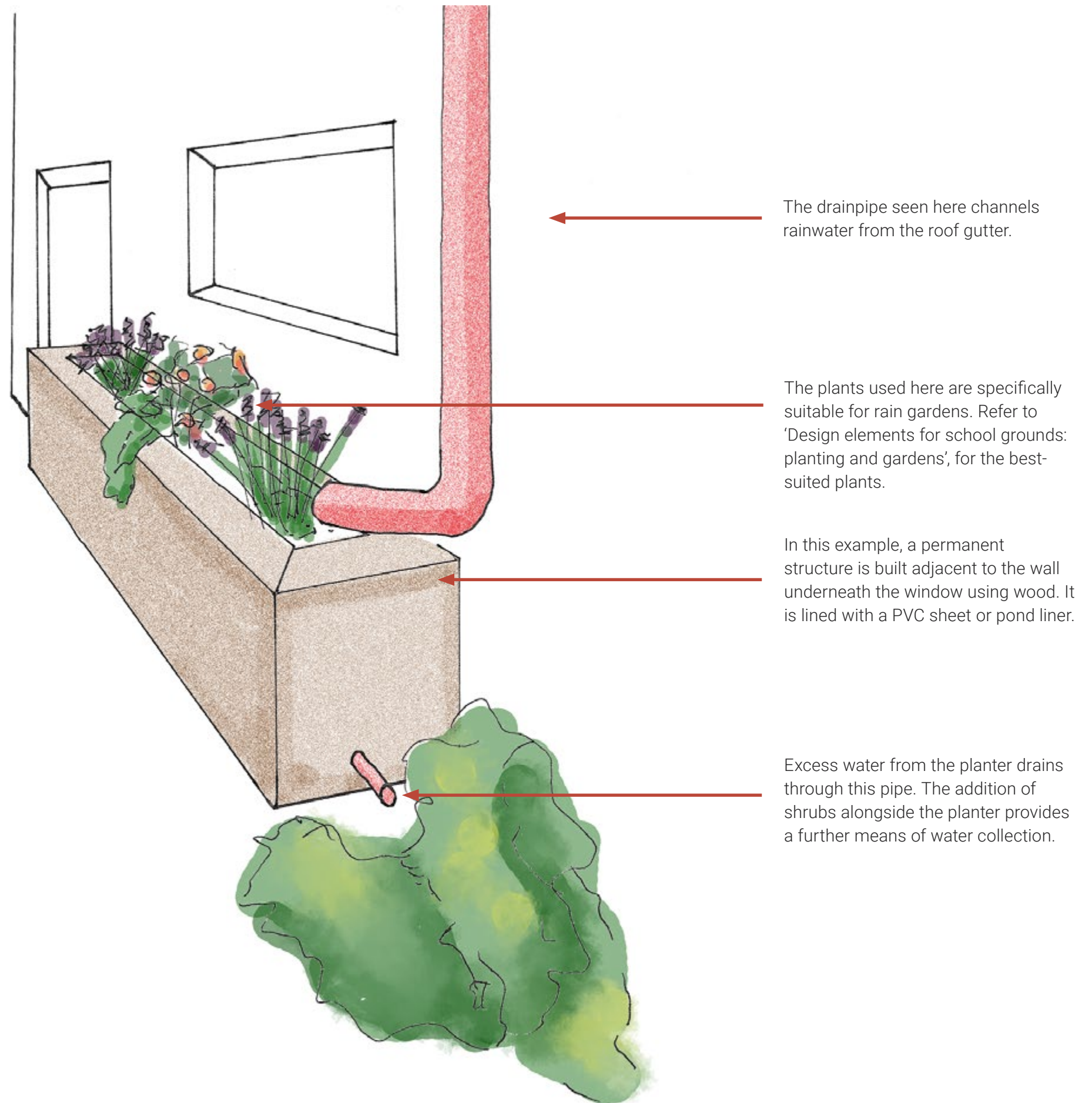


Image credits and acknowledgements

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Cover: Urban Pioneers

Page 2, 6, 7: Architecture and Design Scotland

Page 10, 11: Urban Pioneers

Please note that all pricing information contained within these design guidance reflects estimates based on market conditions as of the 2024-2025 period. Due to the dynamic nature of industry costs, including material fluctuations and evolving labour rates, these prices are subject to change.

Explore our other resources related to design elements for school grounds

This resource is part of a series of six documents looking at design elements for school grounds. Each document focuses on different parts of our school grounds and provides design ideas on how to enhance them for activities and learning. Other topics are:

- enhancing surfaces
- food growing
- furniture and shelter
- planting and gardens
- play and outdoor learning

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Get in touch:

www.ads.org.uk
T: 0131 556 6699
E: info@ads.org.uk

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