Wallands Primary School Rainscape

SuDS used

- Downpipe disconnection
- Rain planters
- Channels and rills
- Cascade
- Swales
- Permeable paving
- Meadow basins

Benefits

- Attenuation during rainfall reduces flood risk to school buildings and surrounding area
- Provision of an important educational and play resource for the school
- Increase in biodiversity
- An inspirational experience for pupils who were involved in the development of the garden from feasibility stage to planting
- Improved access to the playground for a range of abilities
- Creation of an exemplar rainscape which is used to encourage SuDS take-up in other schools and across the region as part of the climate emergency response
- Elevating the quality of the space for the school including opening up far reaching views

1. Location

Wallands Primary School, Gundreda Rd, Lewes, BN7 1PU

2. Description

The playground at Wallands Primary School was of a typical design with a large flat area of hard, impermeable surfacing. There were high laurel hedges around the edge which provided some shelter but blocked beautiful far-reaching views. Good for playing football and other sports, there was not much of interest for children who have other styles of play. During moderate rainfall large puddles sat on the surface and water eroded down a grassy bank, ultimately heading off site and increasing volumes of run-off flowing down roads through the urban catchment.

The Aquifer Partnership (TAP) partnered with Wallands Primary School to renovate the playground creating an inspirational rainscape with emphasis on education and play opportunities.

TAP was established to protect and improve the quality of groundwater in the Brighton Chalk Block as a valuable natural resource. See wearetap.org.uk for more information.

Wallands Primary School was chosen to be part of TAP's SuDS in Schools programme as it is in a source protection zone (an area safeguarded to provide additional protection to drinking water quality), and high in the catchment of an area prone to flooding.

3. Main SuDS components used

Downpipe disconnection; Rain planters; Channels and rills; Cascade; Swales; Permeable paving; Meadow basins.

4. How it works

Figure 1: Site pre-construction

Figure 2: Site pre-construction

Figure 3: Concept (credit Robert Bray Associates)

Downpipes draining a large area of roof space were disconnected and directed through a playful rainscape. Three downpipes convey the water into rain planters with letterbox outlets which overspill onto permeable paving.

Figure 4: Rain planters

A surface-level channel conveys water through the centre of the sports court to a central rain planter.

Figure 5: Central rain planter with disconnected downpipes and surface-level channel seen behind (photo by Sam Moore)

From the central planter the rain passes through permeable paving into a 'dry river' meandering through the playground.

Figure 6: Dry river

Flow continues into meadow basins via grass swales and a cascade.

Figure 7: The dry river joins the cascade

A fourth downpipe flows into a rain planter which overspills to a larger planter/rain garden.

Figure 8: Large rain planter and rain garden

From here overflow passes into a swale and on to the meadow basins. Once in the meadow basins water will be taken up by plants, evaporate or infiltrate.

The planters and rain garden are filled with wildlife-attracting perennials, with extra perennial beds separating the hard and soft rainscape and playground features. These plants have also been chosen for their sensory features.

The meadow basins are seeded with locally-sourced wildflower mix. Boulders add extra seating and play features and create micro-habitats as the planting establishes and biodiversity increases. Minibeast hotel gabions have been added which are part filled with stones and tiles with the remaining space to be filled by the children with materials sourced in the school's woodland area.

Figure 9: Minibeast hotel gabions

In total hundreds of wildlife-attracting plants of 25 species have been incorporated in the rainscape.

The total catchment of the rainscape is 1304m^2 and total attenuation is 31.66m^3. Attenuation describes the volume of water held and slowly released. Around the 1 in 80 rainfall event is managed in the system. A 1 in 80 rainfall event would occur on average once in every 80 years.

Figure 10: The finished rainscape

5. Lessons learnt

- Delays in supply chains likely to impact on construction timescales - ordering of materials should take place early to reduce risk
- Hedge planting needs careful timing and management with increasing risk of drought and particularly in schools with overstretched staff resources
- Wildflower seeding may need repeating if there is too much rainfall after seeding
- Additional resource may be needed (staff, external providers etc.) to maximise pupils' interaction with school SuDS

6. Project details

Construction completed: November 2022

Cost:

Construction cost - £184,605

Total cost including contract management, photography and filming etc. - £189,734

Extent:

Total site area –1458.84m2

Permeable block paving –108.74m2

Resin bound surface (permeable)- 22.77m2

Decking surface (permeable)- 63.64m2

Rain planters –39.10m2

Meadow basins – 150.63m2

7. Project team

Client – The Aquifer Partnership and Wallands Primary School

Designers – Robert Bray Associates

Contractors – Vu Garden and Landscaping

Funders – Community Infrastructure Levy from South Downs National Park Authority, Southern Water, Environment Agency, The Aquifer Partnership