

## Background

Peabody's Islington Estate is a Victorian housing estate located just south of Essex Road train station. First constructed in the mid-1800s, it was the second estate to be built by housing provider Peabody, and is now protected by English Heritage as a Grade II listed building. Originally hard surfaced entirely, alterations have been made over the years to include car parking and a play area, but with a reliance on the underground drainage for the surface water run-off.

Peabody's IMPROVE programme aims to deliver key improvements to shared spaces across its housing stock to include new hard and soft landscaping, play spaces, gardens, open amenity spaces, food growing spaces, tree planting, as well as areas for parking, waste, and general storage for residents as well as specific cycle storage. As well as creating opportunities for residents to enjoy the open spaces, we wanted to ensure there was less reliance on the underground drainage system to address surface water run-off and redirect these water resources so that they could be used and accessible in the new scheme.

## Rain garden

We created a rain garden at the bottom of a surface decline outside of Block I (this can be seen on the attached landscape plan). This hard surfaced area previously experienced problems with water pooling on the surface. The new white concrete blocks have been added to the landscape to provide several functions. They help to define the soft landscaping, create seating areas, a playable element, and allow water to filter through into the rain gardens.

## Underground drainage system

We installed a comprehensive sustainable underground drainage system in conjunction with a mixture of permeable and impermeable paving, to positively drain the roads and pavings and to cater for a 1 in 100 year storm plus an allowance for future Climate change of 30%. This will also help to prevent surface water building up in the quadrants whilst providing irrigation for the trees and plants.

We installed 2no layers of "greanleaf" storage cellular crates (as specified by the Landscape Architect) on a 200mm thick bed of clean stone with no fines fill to provide a minimum total SW storage of **180m<sup>3</sup>** of Surface Water Attenuation across the site. We have ignored the potential additional storage volume with the granular bed which could be up to 30% of the total granular volume, approximately 20m<sup>3</sup>.

A Perforated Land drain passes through the granular bed to distribute rainwater around the site. The storage crates under the tree root cells were filled with loam to support the tree growth and the cells were all wrapped in a geotextile filter sheet to retain the loam and reduce silt within the voids (the filled cells are excluded from the attenuation Volume). The rain garden contains a small swale for some infiltration, more planting with a granular build up and a land drain but no cellular storage crates.

The attenuation crate system and the rain gardens connect to 3no outfall manholes via silt traps and flow controls restricting the SW discharge at each point and drained away from there to Public Sewer. Apart from the storage, by draining the site in this way we are also increasing the "Time of Concentration", i.e. the time it takes for water to get from the surface to the Sewer, which is an additional benefit to the scheme.

The Surface Water flow rates were reduced by 50% in accordance with the Mayors Essential Standard of the London Plan. The design storm used was for a 1:100 year event plus 30% for climate change with a 60 minute duration. The external areas excluding the buildings equate to 4600m<sup>2</sup>, based on a rainfall intensity of 50mm/hr creates a discharge of 64 litres/sec. This is reduced in accordance with the London Plan by 50% to 32 Litres/Second.

Not all the site is affected by the works so the permissible discharge was pro-rated to suit and then divided between the three discharge points in accordance with the contributing areas to create 3No outfalls of 7, 5 and 8 Litres/Second. Apart from the above works the existing and retained SW from the buildings, along with the foul water drainage serving the Estate were CCTV surveyed and any apparent remedial works were put in place to restore the integrity of the drains.

## Results

As a result of these works the estate is much greener and no longer experiences water pooling. Less rainwater is being added to the Public Sewer Infrastructure and by providing attenuation we have reduced the risk of flooding the estate and its neighbours. We are also currently providing SW attenuation schemes on other new build projects on the same basis as the above.