

INSIGHT#4 : WATER

The concrete industry has cut mains water consumption by almost 10%

Climate change and population growth are adding to the complexity of water resource management, increasing the incidence of summer drought and large-scale flooding at any time of year.

Water is important at many stages of concrete production. It is essential to the hydration of cement, which enables it to act as the main binder for concrete, and is also used for washing during the extraction of aggregates, as quenching for GGBS, during the mixing and placing of concrete, for cleaning plant and in dust suppression measures. In some parts of the concrete supply chain water use can be reasonably clearly defined. In others, such as the extraction of aggregates, there is often large-scale water movement – for example, for washing – that does not involve “consumption” as such.

The Concrete Industry Sustainable Construction Strategy included a commitment to develop a water strategy and targets for the

reduction of water consumption. Recognising that the public mains supply is the least sustainable source of water for concrete production, the industry has been measuring mains water usage and reporting annually on efforts to reduce mains water consumption. In the base year 2008, the value was approximately 86 litres/tonne and in 2016 approximately 78 litres/tonne, a 9.3% reduction.

This has been achieved by using alternative sources such as licensed water abstraction, recycled production water and harvested rainwater. Water-reducing admixtures are now used in most types of concrete. Recent developments in high-performance water reducers and such innovations as “wash-water admixtures”, which allow residues in mixer trucks to be treated and reused, have also contributed.

The MPA Water Strategy was published in 2017 following review of the processes used in the concrete supply chain. This is based on three main principles:

1. Minimising water consumption



Photo: Interpave



2. Prioritising use of the most sustainable water sources available
 3. Protecting the environment through good water stewardship
- The concrete production sectors are now working to produce more detailed action plans, which are also part of the industry Resource Efficiency Action Plans (see page 10).

THE MINERAL PRODUCTS ASSOCIATION WATER STRATEGY WAS PUBLISHED IN 2017



Concrete block permeable paving addresses both flooding and pollution by attenuating and cleaning water run-off at source. Peterborough City Council has trialled this approach at Fleetwood Crescent, a development for Cross Keys Homes. The drainage is designed to temporarily store rainwater run-off on site and remove pollutants before gradual discharge to a surface-water sewer that eventually outfalls into a nearby watercourse. House driveways and shared parking areas are also constructed in permeable paving, linked to the road construction with pipes below the footpath. Block paving supplied by Brett Landscaping.

IN PRACTICE

The water hierarchy

The Mineral Products Association's Water Strategy, adopted by the concrete industry, emphasises a hierarchy of water sources, shown below.

The strategy aims to understand how much water is used from each of these sources, and with this knowledge, to improve water efficiency and to optimise use of the most sustainable sources. MPA encourages its members to measure the amount of water abstracted and promotes best practice in efficient water use. Once sufficient data has been collected, the intention is to set targets for industry-wide reduction.

Over the past ten years, great strides have been made to reduce the use of mains water at mineral extraction

and production sites, either by making processes more efficient or by harvesting water from alternative sources that are more sustainable.

For example, at Northfleet Wharf concrete plant in Kent, CEMEX fitted new pipework and valves to a pump that enabled the site team to use surface water in the processing of aggregates. The estimated water saving was 250m³ a month. In Salford, where there is a very high water table, CEMEX has pumped water from a neighbouring disused rail pit to be used for dust suppression and wheel washing. A system of tanks is used to store up to 70,000 litres of water, saving water and reducing costs.

Other innovations by CEMEX include:

- At Kensworth quarry in Bedfordshire, the successful

trailing of the Flosperse 3000 additive in chalk slurry, reducing moisture content by 30 million litres a year

- At Pershore, Oakengates and Redditch in the West Midlands, harvesting surface water in empty intermediate bulk containers (IBCs), storing up to 10,000 litres

- At Chorley concrete plant in Lancashire, IBCs are used to store run-off from the access road and neighbouring business

- At Castleford mortar plant in West Yorkshire, replacing high-volume water pumps with low-volume, high pressure lances, resulting in a 36% saving in mains water consumption

- Redesigning the pipework on aggregate conveyors so that water build-up can be re-used.

