

Case Study Reference: IEM/2012/001

these case studies highlight actions we are taking to reduce our carbon footprint within the Environment Agency, including benefits and lessons learnt

Weybridge Carbon Reduction Case Study

Background

Weybridge 24hr Moorings in Weybridge, Surrey was a £375K project to build a 120m long river level footpath with access to moorings. The original design was based on the construction of an in situ concrete wall supported by steel sheet piling. However, a design review was undertaken (primarily due to cost constraints and to meet a completion date). The design was changed to utilise less costly and (overall) lower carbon materials whilst maintaining an the same operational life.



Reducing the Carbon Footprint

The post construction emission was reduced by 169 tonnes of CO₂ (tCO₂) compared with original design (from 255 tCO₂ to 86 tCO₂).

Mesh filled concrete

The most significant CO₂ savings was from the 75% reduction in concrete used in the wall. A mesh filled with concrete was used instead of precast concrete blocks. This saved 173 tCO₂ (59 tCO₂ compared to 232 tCO₂ for precast concrete blocks). Originally a cast in-situ concrete wall was planned which involved considerably more material.

Use of plastic piles

Further carbon savings were achieved through the innovative use of plastic piles (89.5% recycled) instead of steel sheet piles. The carbon footprint of the plastic piling was determined to be 8.6 tCO₂ compared to 17 tCO₂ for steel sheet piles.

Form liner

Using a dense foam form liner, saved considerable time and cost compared to an authentic alternative. A brickwork finish was achieved to fit the surroundings using a reusable rubber form liner. This added 4 tCO₂ to the project.

Concrete Specification

The concrete specification/grade was changed from exposure class XC3 to XC4 to increase the speed to of the construction to meet a completion deadline. The carbon footprint increased by 27 tonnes from 228 tonnes to 255 tonnes CO₂ (tCO₂) due to the time constraints.

The lessons to take away

The project was delivered on time and under budget. Overall the project team saved approximately £40,000 compared to the original design, with the same design life. Although the drivers for the 'fresh look' at the design and consideration of innovative materials/approaches were predominantly cost and time, the carbon footprint reduced overall by 50%. This shows that innovation can have multiple benefits. It is well worth having a 'fresh look' even without constraints being imposed.

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