

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 CO<sub>2</sub> (tCO<sub>2</sub>) compared with original design (from 255 tCO<sub>2</sub> to 86 tCO<sub>2</sub>).

##### Mesh filled concrete

The most significant CO<sub>2</sub> 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 tCO<sub>2</sub> (59 tCO<sub>2</sub> compared to 232 tCO<sub>2</sub> 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 tCO<sub>2</sub> compared to 17 tCO<sub>2</sub> 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 tCO<sub>2</sub> 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 CO<sub>2</sub> (tCO<sub>2</sub>) 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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**Further information available from Gary Haley or Andrew Powell**

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