



the **BIG**
Biodiversity
Challenge
do one thing

Par & St Blazey Flood Alleviation Scheme

Location: Par - Cornwall

Kier Infrastructure for Environment Agency

BIG Biodiversity Challenge Award Category: **Construction Phase Award**

Project overview

The Project forms part of the multimillion-pound St Austell Resilient Regeneration flood scheme (StARR) which consists of a series of innovative measures to help store and manage the flows through the Par and Sandy River catchments and thereby reduce flood risk to over 800 homes and businesses in the area

What were the biodiversity conditions on site, prior to the enhancement?

The site covers a 2km section of river corridor through St Blazey and, to the South, Par. The site was characterised by unimproved highly managed grassy areas along existing flood banks. The river has been heavily modified over time and is largely a straight channel (approx. 2m wide) between rock reinforced banks with minimal marginal vegetation. The channel has been culverted under two minor roads and a railway line. There is a small area of mixed woodland adjacent to the river bound by housing and a road to the north and a caravan park to the south.

What were the reasons behind this project ?

While landscape elements such as soft bank enhancements were incorporated in design, in the absence of any contractually established biodiversity requirements such as a BNG target, the initiatives on this project have all been driven by the desire of the Kier Project Team to identify and deliver biodiversity enhancements where possible. Part of this has also been driven by the recognition that this will support good community relations which are an essential part of successful scheme delivery.



Completed marginal planting using Salix coir rolls



Fish ladder installation

What were the biodiversity measures taken?

Biodiversity improvements to improve public engagement with the area were initiated at early project stages. Prior to tree clearance works, ten species specific bird boxes were installed in the wooded areas within, and bordering the site. Felled trees were turned into cycle storage racks and benches adjacent to footpaths in consultation with local community wildlife groups and the Council Wildlife Ranger. Two hibernacula were also constructed from felled timber and excavated soils and brash windrows were established across more open ground to support habitat connectivity between areas of retained trees. Replacement planting consists of a UK scrub mix including hawthorn and blackthorn which provides enhancement at woodland edges which were lacking in lower-level scrub vegetation. River margins have been reinforced through introduction of vegetated coir rolls held in place by wooden stakes which provide increased flow variation and through the summer will provide much needed shading along the river corridor to the benefit of fish species such as sea trout. Upstream, Kier challenged the design for gabion baskets and instead used pre-seeded Geogrow bags to provide a soft engineered solution delivering carbon, cost and biodiversity benefits. Further enhancements to the river environment include timber flow deflectors and introduction of stepped rocks in place of a concrete weir structure. The rock has been placed to maintain a minimal depth even under low flow conditions which addresses fish passage constraints. Recesses provided in stonework and slate ledges provide fish refuges and eel pipes have also been introduced.

On land, bee bricks, sourced from a local supplier and made from china clay waste have been installed every 10m along a flood wall with the aim of supporting solitary bees. Additionally, Kier initiated replacement of a standard amenity grass seed mix with a UK perennial wildflower mix along the flood embankments. Two kingfisher tunnels have also been provided.



Completed fish ladder



Cycle rack and bench created from felled timber

Further information

Ecological survey prior to clearance works and watching brief including fingertip searches helped to mitigate impacts of clearance. Specialist advice was also sought on the placement of bird and bat boxes e.g. height, aspect, cover to optimise outcomes. Likewise, installation of the bee bricks was based on ecologist advice also taking into account plant growth and potential flood heights. Use of the bee bricks was publicised both internally and externally on International Bee Day, generating a very positive internal and external response. The Geogrow bags, embankment planting and coir rolls have developed rapidly, improving visual amenity of the scheme for pedestrians and providing biodiversity enhancement. Provision of the bird boxes, benches and cycle racks has been very well received by the local community which has facilitated ongoing engagement for the rest of the work – a precedent of working as a considerate contractor was established early which engendered a high level of trust in the project team from initial works phases.

Initiatives have been shared more widely both within and external to Kier. The team were keen for example to show biodiversity enhancement of the bee bricks to illustrate what could be achieved in hard engineered structures with a little forethought

Project Team

- Environment Agency
- Kier (Tier 1 contractor)
- Atkins, MottMacDonald (designers)



Locally sourced bee bricks installed every 10m along new wall



Drilled 'habitat log'

What was the motivation for carrying out the enhancement?

Initiatives were driven by the Kier team, based on the belief that it was the right thing to do. There were, however a number of supporting factors that provided context and opportunity:

- Willing client open to discuss anything to improve environment, save carbon, and increase biodiversity
- Diverse nature of works gave excellent opportunity for biodiversity improvements.
- The wider StARR scheme is all about regeneration, making the area a nicer place to live and work in.
- As contractor, the Kier team are in the best place to instigate change.



Pre-seeded geogrow bags providing embankment stabilisation