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Biodiversity net gain. Good practice principles for development

Case studies

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22 Enhancing freshwater habitats, Holbrookes Streams

Details

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22.1 PROJECT SUMMARY

This project aimed to mitigate the effects of profile changes to a culvert following the installation of a UV-cured liner (in particular, the step into the new culvert lining) by providing a continuously accessible passage for fish (eels as a priority) and other freshwater fauna.

To upgrade a road culvert, carrying the Holbrookes Stream under the A3054 on the Isle of Wight, Island Roads (Highways PFI) commissioned the installation of a UV cured cast-in-place pipe (CIPP) liner. The scheme required ecological assessment for the local authority and an environmental permit application to the Environment Agency. As a result, mitigation for changes to the profile of the culvert (a raised step from the spillway) was recommended, responding to the potential for additional obstruction to fish passage.

Consulting ecologists Arc worked with the Environment Agency and Island Roads to address this issue, but also to extend the reach of this work to solve an additional, existing problem of connectivity – the large drop from the spillway to the downstream channel. In this way, a compliance and mitigation project became an ecological gain project and collaboration between the regulator, the contractor and the advisory team.

Figure 22.1 Elevator pavement with dimpled backwater section for plant colonisation

Figure 22.2 Newly laid tiles showing the double pattern

The resulting 'Eelevator', designed by Artecology, comprises a modular tile system, retrofitted easily into the existing concrete channel with an additional steel ramp, installed and connected so that the tile pavement runs seamlessly from the stream bed to the top of the culvert. It provides a combined solution to the culvert lip and the spillway drop, meeting the objective of providing a continuously accessible passage for fish (eels as a priority) and other freshwater fauna.

22.2 ISSUES

This project began as a standard compliance exercise, but quickly became a partnership between regulator, contractor and advisers, collaborating for ecological gain. The construction of the tile array became a collective effort, with staff from each organisation working together to finish the installation. In this way, the process of ecological appraisal, mitigation strategy, enhancement design and construction method created a new relationship and shared objective between regulator and contractor. Another result has been a willingness among all the partners to consider new and unconventional approaches to ecological gains in engineering and infrastructure projects.

An important lesson was that the institutional and bureaucratic barriers to new thinking, required to deliver BNG in urban environments, can be broken down when all parties collaborate around a shared task of ecological design.

22.3 OUTCOMES

The project has delivered a permanent enhancement of ecological connectivity and *in situ* habitat quality within the built environment of the river channel and its road culvert. The complexity of the existing and repaired concrete surfaces has been significantly increased, creating new and varied micro-habitats as well as the physical connector for wildlife passage across a previously-obstructed stream reach.

The project was awarded a special commendation at the CIRIA Big Biodiversity Awards 2017.

Following the success of the Eelevator project, the use of ecologically-designed surfaces for biologically-favourable repairs and retrofit enhancements, has become a mainstream consideration for the Highways PFI engineering team.

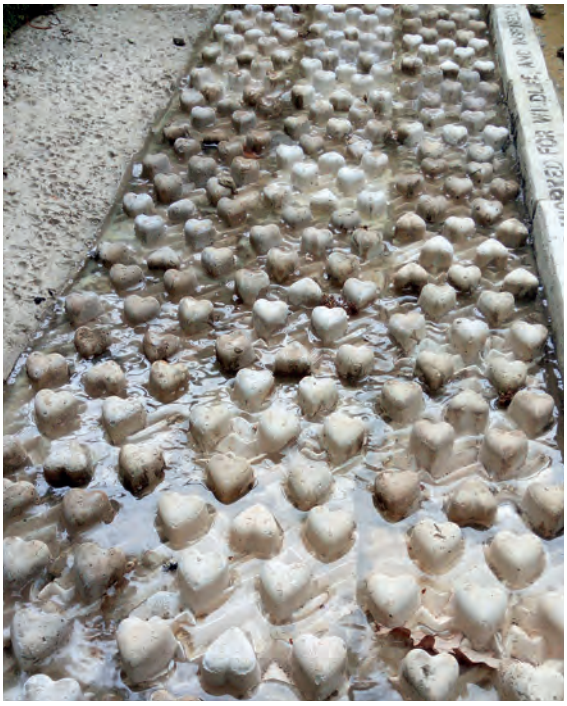

Figure 22.3 The channel beginning to green

Figure 22.4 Eel pass greening