## Re-Connecting Green and Blue Infrastructure: Lower Swansea Valley Flood Risk Management Scheme (FRMS)

The Lower Swansea Valley FRMS project, although primarily about raising the standard of flood defences, provides a range of other landscape and environmental benefits. From the development of the EIA through to construction, it demonstrates the value of a well-integrated design and build project team, and marks the start of an era in the delivery of flood defence projects where design and build partnerships look set to be the preferred approach.

The project is located along a 4km stretch of the River Tawe, two miles north of Swansea City Centre. The well wooded river corridor is flanked with public footpaths / cycleways and green spaces, connecting a mix of business, industrial and housing areas. The land is primarily owned by the City and County of Swansea, a key stakeholder and collaborator on the scheme.

The project’s purpose was to deliver improved flood protection for over 300 businesses and homes through a range of measures including increasing capacity by setting back existing defences, constructing improved raised flood embankments and walls, removing three redundant bridges and providing one new pedestrian bridge. This is predicted to generate £28 million of benefits to the wider economy through reduced flood risk.

### ENVIRONMENTAL DESIGN OBJECTIVES

Key issues that were identified in the EIA included a focus on landscape and visual aspects, and the need to:

- preserve the character and multi-functional benefits of the river corridor as a component of the local green infrastructure network
- visually integrate the new structures into the landscape, with particular consideration for the views from major roads towards a new set back embankment at a key gateway into Swansea Vale, an area for potential economic development
- replace extensive loss of woodland planting and retain continuity of tree cover for ecological value

A key concept was to visually re-connect the densely vegetated green corridor with the river. The existing vegetation had become very dense, with a sense of the area being neglected and unsafe. A range of ‘accelerated management’ interventions were devised to open up connections with the river from areas of existing woodland, whilst increasing ecological diversity. The thinning out of existing planting, establishing a more species-rich groundflora, helped to improved natural surveillance and light penetration. Where new structure planting was required this helped define and frame a series of key views from strategic points along footpaths, retaining visual connections with the river.

The landscape scheme also created new habitat areas including wet grassland, wildflower meadow and wet woodland. New and improved public footpaths ramps and access points for fishing, and a range of furniture and signage also contributed to the public use and recreational opportunities within the riverside corridor.

### PLANNING FOR SOIL RESOURCES

A likely shortfall in on-site resources of topsoil was identified; budgets provided no allowance for importing soils, and suitable existing soils were limited, with widespread contamination from Japanese knotweed. A 'Soil Resource Plan' was then produced in line with Defra’s ‘Construction Code of Practice for the Sustainable Use of Soils on Construction Sites’, which identified suitable on-site sources of material, mostly in the form of a resource of alluvium which was buried beneath extensive areas of hard standing and filled ground. The alluvium was excavated, stockpiled and allowed to re-aerobicize, for re-use in landscape planting and seeding areas.
Whilst this added a layer of complication to the earthworks operations, any impacts on programme were offset by significant savings from avoiding the costly importation of topsoil.

COLLABORATIVE DESIGN AND BUILD PARTNERSHIP
A range of skills including hydraulic modelling, civil and geotechnical engineering, ecology and landscape were all provided within the design and build partnership, which also enabled close collaboration between designers and constructors throughout the process. The overriding benefit of this approach is efficiency, an area in which the project has succeeded, having been delivered under budget.

The delivery of Environment Agency / NRW FRMS projects through design and build contracts is an evolving area and the lessons learned on this scheme will be invaluable moving forward. During the next ten years the Environment Agency will be investing more than £2.5 billion to reduce the risk from river and coastal flooding. The Agency’s new Water and Environment Management (WEM) framework will run for at least the next four years, and aims to secure efficiencies in delivery, with the design and build approach being a key route to finding these efficiencies. The partnership of Galliford Try and Black and Veatch has now been formalised as a joint venture (‘GBV’) which is set to continue delivering high quality and efficient flood protection projects through WEM, with landscape architects and environmental specialists firmly integrated into the design teams.

PROJECT DETAILS SUMMARY
- **Client:** Natural Resources Wales (NRW)
- **Local authority partner:** City and County of Swansea
- **Project Budget:** £7 million
- **Design and build contractor:** Galliford Try, with Black and Veatch (BV) as design and EIA consultant

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