

Case study 51. Wandsworth Riverside Quarter

Authors: Joanna Heisse, Jason Small

Main driver: Habitat creation and improved defences.

Project stage: Constructed 2009



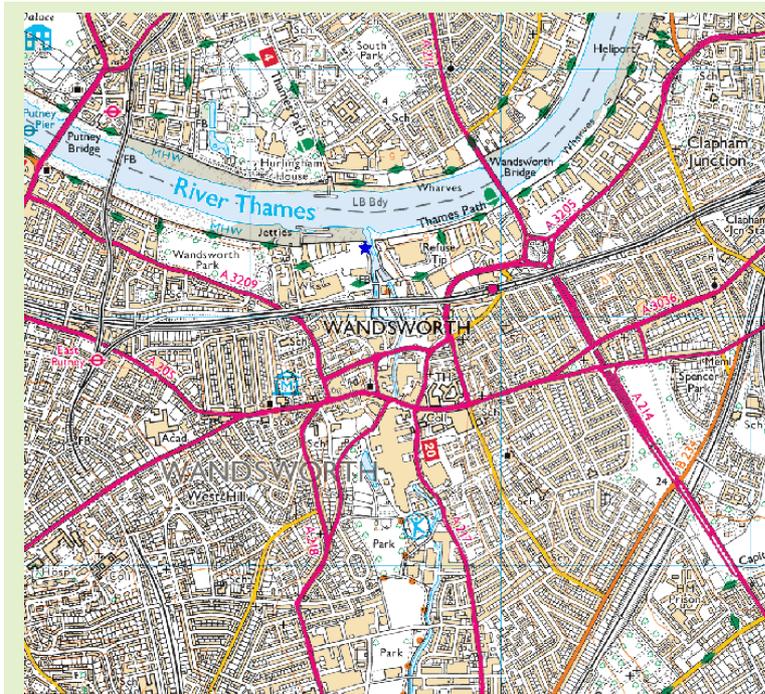
Photo 1: River Terraces following construction (source: Capita Lovejoy)

Project summary:

The site is located at the corner of the confluence of the River Wandle and River Thames in Wandsworth, south London (Photo 1 and Map 1). The site had been vacant for a number of years with tidal flood defences in a poor state of repair. A mixed use development was proposed for the site, which required the tidal defences to be upgraded to ensure they had a residual life commensurate with the lifetime of the development (100 years for residential development). This planning requirement presented an opportunity to deliver new line of setback tidal defences, which included environmental enhancements, in particular, the creation of intertidal terraces formed between the existing and new line of defences.

Key facts:

The redevelopment of the site enabled the creation of 1,153m² of intertidal habitat, providing valuable habitat for fish, invertebrates and birds. Opportunities for such habitat creation within London are rare and provide the local community with greater diversity of views of the river and contact with nature.



Map 1. Wandsworth Riverside Quarter site. Source: Environment Agency

1. Contact details

Contact details	
Name:	Joanna Heisse
Lead organisation:	Frasers Property
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2. Location and coastal/estuarine water body description

Coastal/estuarine water body summary	
National Grid Reference:	TQ2545975281
Town, County, Country:	London, UK
Regional Flood and Coastal Committee (RFCC) region:	Thames
Transitional and coastal water body size (km²):	Tidal Thames catchment
Transitional and coastal water body and location:	Thames Upper

Water Framework Directive water body reference:	GB530603911403
Land use, geology, substrate, tidal range:	Brownfield site Tidal river, brackish and estuarine environment

3. Background summary of the coastal/estuarine water body

Socioeconomic/historic context

The site is within the London Borough Wandsworth on the west bank of the confluence of the River Wandle and the tidal River Thames. It was previously a 4ha Shell Oil terminal and thus a brownfield industrial site. The area had been protected over time from tidal flooding through a combination of concrete quays, timber and sheet pile tidal defences. The history of the site led to issues of contaminated land and a disconnection of the area from the rivers it borders.

Flood and coastal erosion risk management problem(s)

The tidal flood defences were in a poor state of repair (Photo 2), which required replacement to ensure they have a residual life commensurate with the lifetime of the proposed development (100 years for residential development) as required under National Planning Policy Framework.



Photo 2: Tidal flood defences prior to works (source: Unicmarine copyright and database rights)

Other environmental problems

The site lies within a reach of the River Thames that has lost a substantial amount of natural bank and marginal habitats which would ordinarily be present in an estuary such as this. In particular, intertidal habitats have largely been lost, with a relatively small strip of intertidal foreshore present at low tide. These conditions create a more challenging environment for wildlife to thrive. Fish movement can be restricted, for instance, as flows and velocities of water can be too strong for certain age classes of fish to move freely along the river at all times. Creating new intertidal habitat and, in particular, vegetated intertidal habitat creates an additional feeding and refuge area for fish, as well as increasing habitat diversity and the resilience of the river.

4. Defining the problem(s) and developing the solution

What evidence is there to define the flood and coastal erosion risk management problem(s) and solution(s)

The site frontage lies within the tidal Thames and requires tidal flood defences to be built in line with defined crest levels, which in conjunction with the Thames Barrier, provide a 1 in 1,000 year standard of protection from tidal flooding. Wherever possible, opportunities are sought to create additional flood storage and space for water, resisting encroachment into the river when rebuilding tidal flood defences. Through early engagement with the developer, it was possible to influence their masterplan to incorporate a set back from the built development to enable the riverside corridor to become a focal point within the public realm landscaping proposals. This provided an opportunity to achieve the flood defence level in a stepped manner behind the existing river wall, providing multiple benefits such as habitat creation and amenity value for residents and site users.

What was the design rationale?

The rationale for the project was to:

- maximise the amount of habitat creation in an area of set back flood defences
- ensure that the design was sensitive to the requirements of the species that would be expected to use and access the habitat, in particular fish

The aesthetic and visual aspect of the terraces was also an important consideration as the Thames Path would run along the top of the terracing. The existing river wall was cut down to bed level and a number of stepped, sloping terraces created into the corner of the site, with the new flood defence alignment being achieved at the back of the intertidal terrace. The design of the terraces was given careful consideration to ensure they would be accessible to a wide range of fish species by making them sloping and connecting to each other.

Project summary

Area of transitional and coastal water body or length benefiting from project:	1,153m ²
Types of measures/interventions used (Working with Natural Processes and traditional):	<ul style="list-style-type: none">• Preserve and improve water's edge and bankside habitats• Retain and improve existing water's edge and bankside habitats in modified watercourses• Realign flood defences to increase coastal and intertidal habitat• Restore aquatic habitats in modified watercourses• Use green engineering techniques instead of hard bank protection
Numbers of measures/interventions used (Working with Natural Processes and traditional):	5
Standard of protection for project as a whole:	
Estimated number of properties protected:	

How effective has the project been?

The success of intertidal terracing in the River Thames is measured through the effective establishment of vegetation within the terracing. In this site, the terraces established very successfully, with a wide range of species becoming present, providing long-term stability for the habitat and flood defence. There has been no erosion of the terraces as created and minimal management has been required. Fisheries monitoring from other similar sites on the Thames suggest that these newly created vegetated areas are used by fish, as feeding and resting areas. Opportunities for this are rare along the river in London and, as such, the scheme is judged as being very successful in creating new intertidal habitat along the Thames.

In terms of flood risk management, the terracing provides additional structural stability to the set back line of flood defence by protecting the riverward toe of the defences from hydrodynamic scour effects.

5. Project construction

How were individual measures constructed?

The site was created in a number of steps, outlined below and in Photos 3 to 6.

Formation works (January 2009)

- Preparation of the site (coffer dams, excavation and soil removal, bank reprofiling and set up of site compound)

Hard landscape works (February 2009):

- Laying contamination textile to reduce the risk of contaminated soils entering the Thames during the works
- Constructing timber terraces
- Placing backfill materials
- Laying root membrane
- Laying silt accretion geotextiles to encourage silt to accrete within the terraces
- Fixing coil rolls at channel margin
- Installing dead wood habitat staked at the margins between the slop and channel to encourage more diverse plant establishment and flow conditions.

Monitoring March to May 2009)

- After installation, silt was allowed to accrete naturally in the lower terraces to allow for the establishment and growth of vegetation. Silt accumulation was monitored during this period and a significant amount of accretion was recorded.

Rock roll installation (May 2009)

- Rock rolls were installed along with coir matting to protect and dissipate wave energy onto the terraces and encourage successful vegetation establishment.

Planting (June 2009)

- Intertidal vegetation was planted and dead wood installed along the terraces.



Photo 3: Construction of timber terraces (source: Capital Lovejoy)



Photo 4: Backfilling behind upper terraces (source: Capital Lovejoy)



Photo 5: Installation of rock rolls and coir matting (source: Capital Lovejoy)



Photo 6: Placement of gravels and planting (source: Capital Lovejoy)

How long were measures designed to last?

Intertidal terracing is design to act as a permanent habitat feature.

Were there any landowner or legal requirements which needed consideration?

There were potential contaminated land issues and a requirement to ensure navigational safety on the Thames.

6. Funding

Funding summary for Working with Natural Processes (WWNP)/Natural Flood Management (NFM) measures

Year project was undertaken/completed:	2009
How was the project funded:	The developer funded the entire project.
Total cash cost of project (£):	Not available
Overall cost and cost breakdown for WWNP/NFM measures (£):	Not available
WWNP/NFM costs as a % of overall project costs:	Not available
Unit breakdown of costs for WWNP/NFM measures:	Not available
Cost–benefit ratio (and timescale in years over which it has been estimated)	Not available

7. Wider benefits

What wider benefits has the project achieved?

The project provided an enhanced environment, along with interpretation for the local community.

How much habitat has been created, improved or restored?

Some 1,153m² of intertidal habitat was created, along with terrestrial habitat creation and green roof installation across the remainder of the development.

8. Maintenance, monitoring and adaptive management

Are maintenance activities planned?

Maintenance is required to the vegetation on the upper terraces only, as part of the wider landscape management of the site. Lower terrace vegetation and habitat is self-sustaining.

Is the project being monitored?

There was initial site monitoring during construction, with infrequent and ad hoc visual inspection now.

Has adaptive management been needed?

No

9. Lessons learnt

What was learnt and how could it be applied elsewhere?

- Proactive and early discussion with planners and developers is crucial in being able to identify opportunities for combining habitat enhancement and creation with flood risk management requirements.
- Allowing enough time for the habitat to settle and accrete with silt provides a good base for vegetation to establish successfully.

10. Bibliography

Not applicable

Project background

This case study relates to project SC150005 'Working with Natural Flood Management: Evidence Directory'. It was commissioned by Defra and the Environment Agency's [Joint Flood and Coastal Erosion Risk Management Research and Development Programme](#).