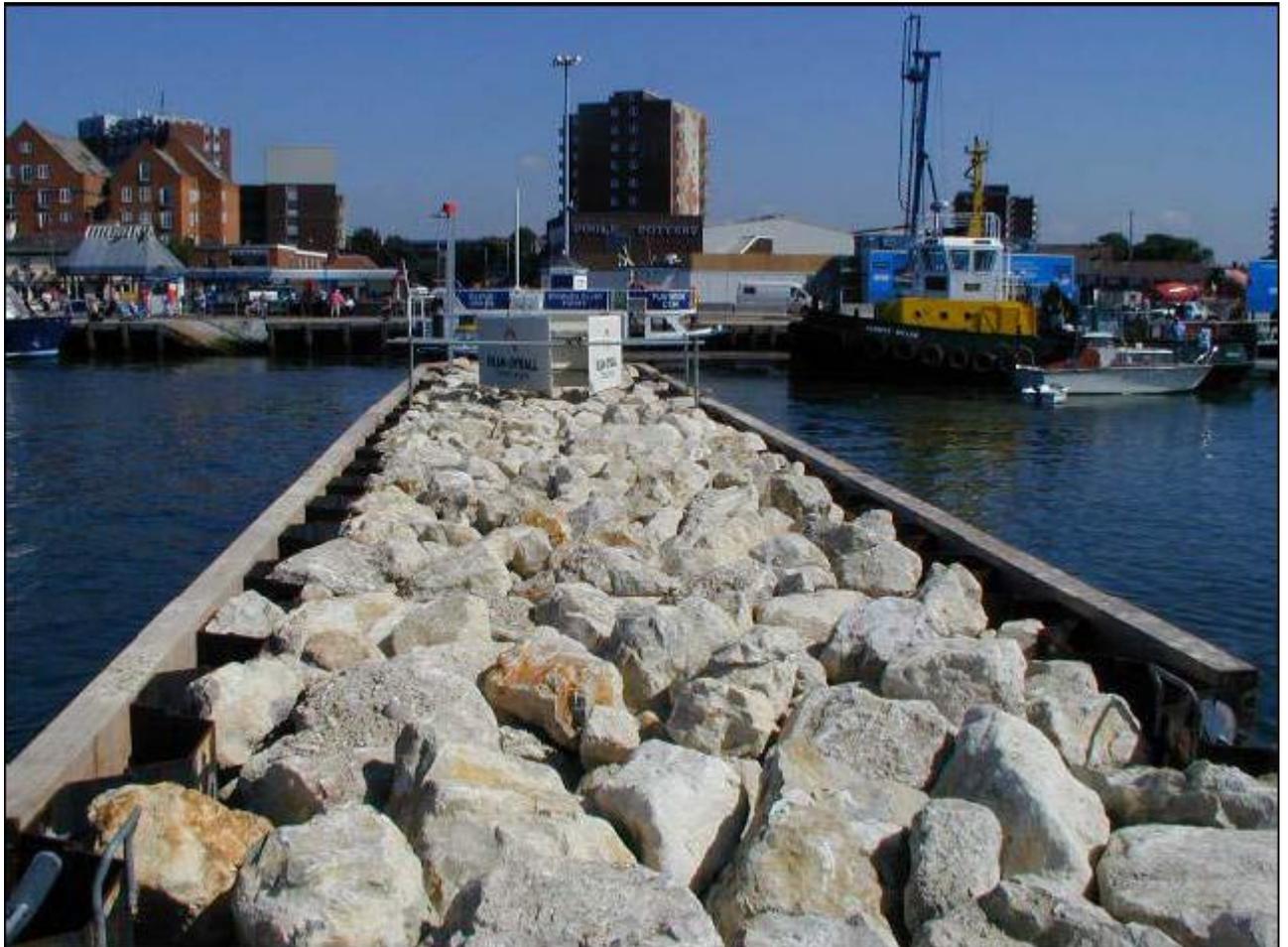


Coastal Schemes with Multiple Funders and Objectives FD2635

Case Study Report 11 Pool Quay Sea Defence Scheme



(image courtesy of the Environment Agency 2010)

This case study is one of 14 documents supporting the research project Coastal Schemes with Multiple Objectives and Funders - Case Studies FD2635, available from <http://randd.defra.gov.uk/>. This research was conducted in 2010/2011 by Maslen Environmental on behalf of Defra and the Environment Agency's Research and Development programme.

Research Contacts:

Defra: Daniel Johns daniel.johns@defra.gsi.gov.uk

Environment Agency: Martin Smalls martin.smalls@environment-agency.gov.uk

Maslen Environmental: Steve Maslen s.maslen@maslen-environmental.com

1 Case Study - Poole Quay Sea Defence Scheme

1.1 Introduction

1.1.1 Description

Poole is a large coastal town and seaport with a population just over 138,000. It is located in the county of Dorset, on the south coast of England and is a tourist hub, attracting many visitors to its large natural harbour, its history, its Arts Centre and its impressive Blue Flag beaches.

A large area of the historic 'Old Town' of Poole lies at a lower level than the nearby harbour quayside. As a consequence, approximately 350 residential and commercial properties were susceptible to tidal inundation when a combination of high tide levels and wind generated wave action caused overtopping of the quay. There was, therefore, a very good case for flood defences to be built, providing the required protection to properties and various infrastructure assets and to enhance the area around the Quay.



Figure 1. Poole sea defences - raised quayside section. Photograph Courtesy of the Environment Agency



Figure 2. Poole sea defences - long floodwall section. Photograph Courtesy of the Environment Agency

The scheme was completed in 2004 and consists of a rock armour breakwater qroyne, 300m of either raised areas along the length of the quay (Figure 1) or on-shore floodwalls (Figure 2).

The scheme is designed to protect Poole town centre from flooding and remain in-keeping with the historic nature of the working quayside.

To provide a continuous defence, the Poole Quay scheme links into the existing Green Gardens scheme (completed in 1989)¹ and operates in conjunction with the Poole Harbour Commissioners (PHC) off-shore breakwater (Figure 3). This breakwater provides protection to the central area of the quay from wave action. Surface water drainage works have also been incorporated into the scheme to prevent flooding due to backflow through existing quayside outfalls meeting Wessex Water (WW) requirements.

The key partners of this scheme were the Environment Agency, Poole Harbour Commissioners (PHC), Borough of Poole (BoP) and Wessex Water (WW).

¹ The Green Gardens flood defence scheme was completed by the BoP and the National Rivers Authority (now the Environment Agency) following floods to the area in 1989.

The total cost of the scheme was approximately £1.87million of which Defra GiA contributed approximately 45 per cent, the remainder costs was divided between the Environment Agency and BoP (this is discussed in more detail in section 1.5)

1.2 Objective Setting

1.2.1 Project Drivers

Due to climate change and the potential increases in sea levels, the low-lying Old Town with some 350 properties behind the quay was at risk from flooding. In addition, planning requirements meant the scheme was required to be in-keeping with the landscape whilst allowing the quay to remain operational and attracting tourism. The commercial users interests (fishing, sailing, boating) and the quay owner interests (Poole Harbour Commissioners) were all taken into consideration. In conjunction with the Quay Flood Defences, PHC also developed the Haven breakwater to protect the central area from wave action.

There were a number of challenging aspects in developing the scheme, particularly as the area is restrictive in planning terms, due to site designation (SSSI, SPA and Ramsar) status of the harbour. Secondly it was required to link to the Regeneration Strategy of the area.

1.2.2 Partnership Objectives

In summary the partners had slightly different objectives. Whilst the Environment Agency were mainly considering just the flood protection issues, the BoP also needed to consider the economic future of the town, the scheme to be in keeping and enhance the surrounding landscape and to allow Poole Town Quay to remain and to attract tourism. PHC were mainly considering the operational working aspects of the quay. These were all negotiated and agreed upon through extensive collaborative working.

The Environment Agency's priority was managing the flood risk of the 350 properties and the associated infrastructure at risk from flooding in Poole.

One of the BoP's main priorities was increasing the local tourist economy and therefore the defences, in some areas, were setback to fit in with the quayside environment.

PHC operates as a 'Trust Port' in Poole which was established under the Poole Harbour Acts and Orders 1756 to 2001. This states a requirement 'to maintain and improve the harbour for the good of its users'. This duty is today performed within the framework of extensive legislation to avoid damage to critical environmental assets and ensures safety of navigation. Within this the Commissioners' (PHC) operate a policy of seeking to achieve a balance between commercial, recreational and conservation interests in the Harbour. These interests have been developed and incorporated into this scheme to ensure that the working quay continues to operate sensitively.



Figure 3. Poole sea defence - breakwaters.
 Photograph Courtesy of the
 Environment Agency

WW's priorities were the protection of its assets i.e. a pumping station (located in figure 5 to the west). To the west of the pumping station the defences comprise of a raised quay area and reinforced concrete wall on the quay edge. Sealing work was also undertaken around the pumping station to ensure long-term protection of WW assets.



Figure 4. Town Quay West Poole Sea Defences - General Location Plan

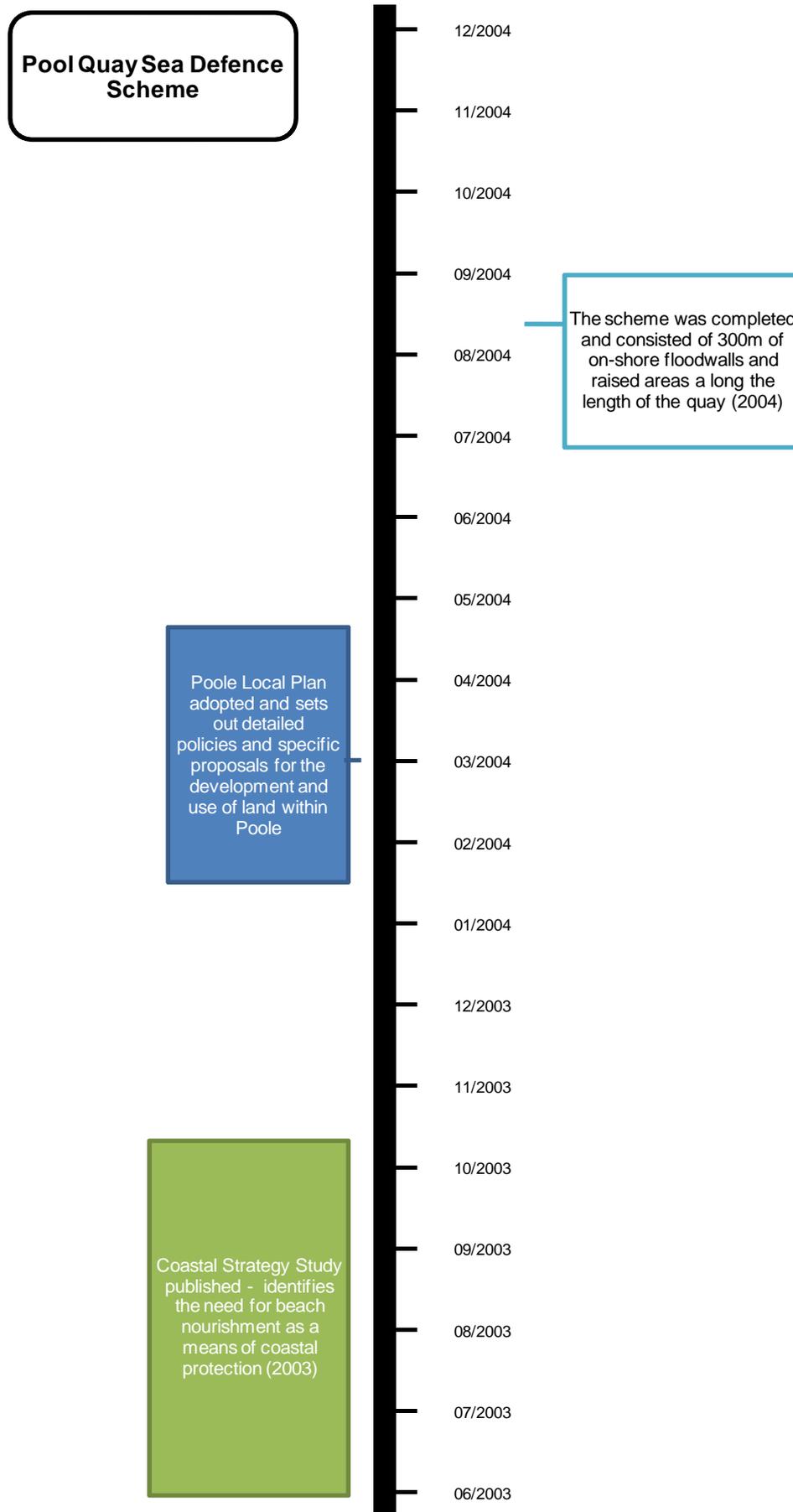


Figure 5. Timeline for Poole Quay Sea Defence scheme

1.2.3 Project Objectives

The two main objectives agreed in partnership were as follows:

1. **Flood Risk** objective was to raise the quayside defences to provide a standard of service of 1 in 200 year annual chance of flooding.
 - This has been achieved by either raising the entire quay or by the use of low walls positioned along the quayside on the seaward (south) side of the old town. These tie into the existing walls and features, which are already at or above the required design standard. The wave crest levels will be reduced by the Haven breakwater, or defended against by higher quayside levels in those areas subject to attack.

2. **Regeneration** objectives were to enhance the area, to increase tourism and provide recreation space for the public and for public arts, linked to area's future Regeneration Strategy. This was achieved by the following:
 - Designing the flood defence walls as areas where the public can sit and create several pedestrian only areas
 - Pedestrian, disabled and vehicular access ramps over the defences have been provided for access to the quayside
 - Due to the prominent location of the defences and the projected high numbers of tourists, a very high standard of public realm and hard landscaping has been utilised throughout the scheme
 - Areas of public space were created and public art has been incorporated into the scheme
 - A new marina has been created with the construction of the breakwater
 - Traffic calming measures have been constructed on the road adjacent to the quay

1.3 Partnerships

1.3.1 Building the Partnership

The key partners involved in this scheme included PHC, BoP, WW and the Environment Agency. Both PHC and BoP own part of the Poole Quay and therefore have strong stake in the success of this scheme. Most partners had an established relationship through previous projects, such as the Green Gardens scheme.

With the Environment Agency (EA) leading the project and promoting the flood risk issues, existing relationships between the different organisations were revived and developed as the project moved forward. The EA Project Manager needed to be very flexible and accommodating to lead and promote the scheme. The partnership was then formed when the different organisations deemed they could take advantage of the opportunities that were being presented and that their own objectives could be met.

1.3.2 Partnership Working and Governance

The Environment Agency led the scheme with BoP as a key funding partner and PHC as the main Quay operating organisation. These organisations were supported by a team of consultants and contractors employed by the Environment Agency. Regular and clear communication was very important. Due to the variety of issues, there were regular partner meetings to maintain working relationships and resolve issues and then regular project team meetings to maintain contractor relationships and to move the scheme forward efficiently.

It was recognised from both the Environment Agency and the BoP that there were difficulties in working arrangements. The Environment Agency found it difficult working with the various departments within the local authority that were all key stakeholders in this scheme. Within the Local Authority it was discovered that the permissions to undertake any construction work needed to be approved by different departments. Therefore speaking to the right people and integrating working practices was challenging to begin with.

From BoP's perspective they noted that the Environment Agency's procurement procedures were difficult to deal with and for the Environment Agency, asset ownership identification was a challenge.

It was also important that the scheme was discussed at the Poole Harbour Steering Group meetings chaired by PHC. The Steering Group includes Purbeck District Council (PDC), BoP, the Environment Agency, the Harbour Master, the Coast Guards Agency, RNLI, Southern Fisheries Association and Natural England (formerly English Nature).

The group meets twice a year and amongst all the others issues regarding Poole Harbour they discussed the scheme. This was useful and ensured that all members of the group were kept updated on the scheme and could provide feedback on behalf of their own organisation. However, as PHC were heavily involved in the details of the scheme, most of the feedback had usually already been taken account of.

1.4 Approvals, Planning Context and Legislation

Regarding the works, consultations were held with all interested stakeholders and the public to communicate the options. A Coastal Protection Act licence was required for the harbour breakwater works. But in summary planning and approvals went fairly smoothly mainly due to a lot of work up front on consulting and explaining the scheme and resolving the issues.

1.5 Funding Arrangements

The total cost of the scheme was approximately £1.87million for the floodwalls of which Defra Grant in Aid (GiA) contributed approximately 45 percent, the remaining costs were divided between the Environment Agency and BoP. The benefits are estimated in the order of £3.4million. The BoP contributed small amounts e.g. £40,000 for any works that were over and above flood defence works e.g. notice boards or art works these were not priced in the GiA Project Appraisal Report (PAR).

The scheme has a design life of 50 years, and providing it is maintained and repaired as necessary, will function effectively throughout this period. The scheme is a passive, and the only moving parts are several flap valves installed on gravity outfalls. These will require routine maintenance (by WW and others) have a design life exceeding 50 years. The Environment Agency is responsible for the long-term maintenance costs of the floodwalls. PHC are responsible for maintenance of their long-term assets *i.e. the quay and the wooden timbers* which were lengthened as the height of Poole Town Quay was raised.

In conjunction, but as a separate scheme, the PHC developed the Haven Breakwater at a total cost of £2million (Defra FDGiA covered 50 percent of these costs). Recognising the breakwater's flood defence function, the Environment Agency contributed £200,000 towards the construction costs).

1.6 Lessons Learnt

- The scheme is a good example of multi-project working to create efficiencies, with the Poole Quay Sea Defence scheme taking advantage of the works programmed by the PHC; Without the construction of the breakwater, extensive other works would have been required along other areas of the quay at a greater cost.
- All of the project objectives were met, thus the scheme should be considered successful;
- There were a number of challenges described by the partners, that should be communicated to other practitioners attempting similar scheme, these included:
 - Creating a flood defence in a very restricted area,
 - Planning criteria and meeting planning objectives,
 - Quality of build and aesthetics, "an in-keeping design for the area" (Conservation area (Heritage), Site of Special Scientific Interest at harbour, Ramsar site and Special Protection Area),
 - The long term maintenance needs to be carefully considered at the onset of the scheme development;
 - Adequate time must be allowed for partnership working and meetings; and
 - A flexible leadership approach is required to accommodate all partners.
- The opportunities described by the partners include (Malpass, 2010b):
 - Good partnership working – started with Green Garden Scheme in 1989,
 - Taking advantage of different grant rates,
 - Win, win situation for both Environment Agency (flood defence) and BoP (enhancing the quay), and
 - Good timing - taking advantage of breakwater being carried out by PHC;

1.7 References

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