

REPORT

Selsey Haven – Key Technical Issues Consultation

Client: Chichester District Council

Reference: WATPB3800R001D0.1

Revision: 0.1/Draft

Date: 21 April 2017

HASKONINGDHV UK LTD.

Burns House
Harlands Road
Haywards Heath
West Sussex
RH16 1PG
Water
VAT registration number: 792428892

+44 1444 458551 **T**
info.haywards.heath@uk.rhdhv.com **E**
royalhaskoningdhv.com **W**

Document title: Selsey Haven – Key Technical Issues Consultation

Document short title:

Reference: WATPB3800R001D0.1
Revision: 0.1/Draft
Date: 21 April 2017
Project name: Selsey Haven
Project number: PB3800
Author(s): Simon Howard, David Brew and Thomas Green

Drafted by: Simon Howard

Checked by: Thomas Green

Date / initials: 21.04.2017 / TG

Approved by: Alexander Lee

Date / initials: 21.04.2017 / TG

Classification

Project related



Disclaimer

No part of these specifications/printed matter may be reproduced and/or published by print, photocopy, microfilm or by any other means, without the prior written permission of HaskoningDHV UK Ltd.; nor may they be used, without such permission, for any purposes other than that for which they were produced. HaskoningDHV UK Ltd. accepts no responsibility or liability for these specifications/printed matter to any party other than the persons by whom it was commissioned and as concluded under that Appointment. The integrated QHSE management system of HaskoningDHV UK Ltd. has been certified in accordance with ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2007.

Table of Contents

1	Introduction	1
2	Purpose of this document	2
3	Plans and Cross-Section	3
4	Design and Operation	3
5	Coastal Processes	4
6	Conclusions	6

Appendices

1 Introduction

Chichester District Council is currently investigating the feasibility of the construction of a small harbour near East Beach Green, Selsey, West Sussex.

In 2015 – 2016 Royal HaskoningDHV undertook preliminary consultation on behalf of Chichester District Council exploring the technical and environmental issues that may have an impact on planning permissions and associated licences necessary to build the small harbour. Three initial options were presented during this consultation. These options were explored with regulators and key stakeholders during a technical workshop held on the 3rd December 2015. Representation was made by the Environment Agency; Natural England, Chichester District Council Planning; Chichester and Arun District Council Coastal & Land Drainage Engineers; Crown Estate; Marine Management Organisation; Selsey Fishermen's Association; Selsey Town Council; Manhood Peninsula Partnership and Coastal West Sussex Partnership.

Following the workshop, a preliminary consultation report was produced summarising the outcomes of the workshop. A copy of the report can be found in following website link:

<http://peninsulapartnership.org.uk/projects/selsey-haven/>

Of the 15 or so topics considered in the workshop, coastal processes, and in particular sediment transport, were found to be the most critical. For this reason a land based harbour was identified as the most favourable option because it has the lowest potential impact on sediment transport.

2 Purpose of this document

This consultation document follows on from the preliminary consultation undertaken in December 2015.

The key conclusions from the preliminary consultation are as follows:-

- Sediment transport is by far the most critical issue particularly in respect of obtaining the necessary permissions and licences for the harbour.
- For this reason a land based harbour is the most favourable option because it has the lowest impact on sediment transport.
- However it will almost certainly still be necessary to undertake regular beach by-passing to maintain existing sediment transport rates.
- With a land based harbour there will be significant impacts on the adjacent properties and these impacts need to be examined more closely.
- The harbour entrance will need to be looked at more closely in order to ensure maximum accessibility under a range of operating conditions.

In response to these key conclusions this document is providing further information in order to gain updated feedback from key consultees on the following matters:

- The potential impact of the harbour on sediment transport.
- Issues associated with artificial beach by-passing as a means of maintaining sediment transport rates.
- Issues associated with constructing the harbour close to a residential area.
- The feasibility of a harbour entrance that is accessible under a range of operating conditions.

In order to facilitate this consultation process this document includes the following:-

- An updated Location Plan that incorporates recent bathymetric data, a wave rose, and a wind rose.
- An updated Site Plan that provides more detail on access arrangements, berthing arrangements, and adjacent land use.
- A Cross-Section through the harbour that illustrates its proximity to, and visual impact on, the nearby properties.
- A brief commentary on the anticipated design and operation of the harbour.
- A brief commentary on the local coastal processes.

It should be noted that the above information on the harbour only represents an indication of its proposed location, size, and type of construction. It is anticipated that this current round of consultation will result in a further development of the concept design.

3 Plans and Cross-Section

These can be found in Appendix A. They comprise the following:-

- Drg No PB3800-0001 Location Plan
- Drg No PB3800-0002 Site Plan
- Drg No PB3800-0003 Cross-Section

The Location Plan sets out the overall context in terms of the English Channel, The Solent, and the town of Selsey. It also shows the proximity to Selsey Bill and Pagham Harbour. The plan includes bathymetric information, a wave rose, and a wind rose.

The Site Plan shows the general arrangement of the harbour including associated structures and land use. It also shows its immediate context in terms of the foreshore, green area and adjacent properties.

The Cross-Section provides a visualisation of how the harbour “fits-in” with the existing coastline features and gives an indication of sight lines.

4 Design and Operation

At this stage in the development of the harbour, its design and operation is seen as follows.

The main construction will be in twin walls of steel piles with a concrete deck. Most of the walls will be in steel sheet piling (a non-permeable face) but in key locations intermittent piles will be used that present a permeable face. Where there are two lines of steel sheet piles, general granular fill will be placed between them. Where intermittent piles occur, armourstone fill will be used. The use of armourstone in this way will reduce wave reflections off the wall and provide some absorption of wave energy.

Permeable walls will be used around the entrance area and along the seaward face of the harbour. For the entrance area the intention is to facilitate access into the harbour under heavy sea conditions. For the seaward face the intention is to encourage the build-up of beach material in front of the harbour in order to promote natural by-passing.

The entrance area and mooring basin will be excavated down to below Mean Low Water Spring tide level in order to provide an all-tide facility.

From the excavation arisings the beach material will be placed on the foreshore to the north and the rest of the material will be placed on the green area to the north in order to raise it to the same level as the existing seawall promenade.

The mooring basin will be equipped with 3 sets of floating pontoons (1 dedicated to the fishermen, 2 dedicated to leisure use) comprising a central pontoon with finger pontoons either side. Access to the pontoons will be from the West Quay via articulated ramps. The basin will also be equipped with a fixed slipway for launch and recovery of craft, and for harbour maintenance.

The quaysides and pier structures will be kept clear of any significant buildings in order to maintain access for vehicles and reduce visual impact.

Immediately to the south of the harbour there will be an area for the fishermen's compound, and immediately to the north, an area for harbour and public facilities.

The fishermen's compound will have direct access from Kingsway. Also the fishermen's pontoon will be the closest to their compound.

The area for harbour and public facilities will provide space for new development and compensate for an existing public area that will be lost to the new works. The area will also have direct access from Kingsway.

To the south and north of the harbour there will be beach ramps. The one to the south is primarily for beach by-passing purposes. However it could also act as a "back-up" to the fishermen. The one to the north is for both beach by-passing and for general public use.

For beach by-passing the anticipated haulage route is along the South, West and North Quays and then the road that runs along the seaward side of the green area. Beach material would be excavated from the south side of the harbour and deposited on the north side in the vicinity of the beach ramp.

For general public use of the beach ramp to the north of the harbour, there will be access from the existing Car & Boat Park and from the new quayside development area.

5 Coastal Processes

The following is based on existing available literature and our knowledge of the Solent and in particular along the Selsey Bill to Pagham Harbour frontage.

For the Selsey Bill to Pagham Harbour frontage there are believed to be two offshore to onshore sediment supplies. The first is to the south of the harbour, from the Kirk Arrow Spit onto Selsey Bill. The second is to the north of the harbour at the Inner Owers, see Figure 1. The SCOPAC Sediment Transport Study (2004) estimates the Kirk Arrow Spit supply to be between 10,000 and 20,000 cubic metres per annum and the Inner Owers supply, between 20,000 and 40,000 cubic metres per annum.

For East Beach, between Selsey Bill and the Inner Owers, Lewis and Duvivier (1976) assessed the south to north sediment transport rate without groynes to be of the order of 15,000 to 25,000 cubic metres per annum, and approximately 10,000 cubic metres per annum with groynes.

Hume Wallace (1990/1996) inferred a sediment transport rate of 42,000 cubic metres per annum without groynes. However, this rate is based on the observed build-up of sediment to the south of the Pagham Harbour entrance and it would seem that no allowance has been made in this calculation for sediment transported onshore from the Inner Owers. This figure may therefore be regarded as an over estimate.

HR Wallingford (1995) modelled south to north potential longshore transport rates of about 32,000 to 33,000 cubic metres per annum for the frontage from East Beach to Pagham Harbour. A corresponding potential rate of 8,000 cubic metres per annum is given for a groyned frontage. The HR Wallingford modelled potential transport rate is higher than the conceptual rate of Lewis and Duvivier (1976) although the HR Wallingford upper beach quantity is more corresponding to Lewis and Duvivier.

Assuming a groyned sediment transport rate of 8,000 to 10,000 cubic metres per annum suggests that there should be an ongoing steady accretion with time on the East Beach frontage assuming the onshore supply to East Beach from Kirk Arrow Spit is on average 10,000 to 20,000 cubic metres per annum. However, there is no long-term evidence for accretion and therefore the estimated rate of feed from the Kirk Arrow Spit must be open to some quite wide confidence boundaries. The supply is also acknowledged to be very variable. Hence, it is possible to suggest that the supply and transport rates are sufficiently close to maintain an adequate quantity of sediment to East Beach albeit from time to time with variations.

In summary, net sediment transport along the coast at Selsey is from south to north at rates between about 10,000 to 25,000 cubic metres per annum, depending on whether there are cross-shore structures or not. The presence of the proposed Selsey Haven will provide a blockage to this sediment transport and there is the potential for erosion due to sediment starvation immediately north of the Haven. Hence, a suggested mitigation for this potential erosion is sediment bypassing from south of the Haven to north of the Haven. Any impact on Pagham Harbour due to an interruption at Selsey Haven would be significantly attenuated by the sediment supply to the coast from the Inner Owers, north of the harbour.



Figure 1: East Head to Pagham, West Sussex: Sediment Transport.

6 Conclusions

Individual consultees will be asked to comment on one or more of the following issues:

- Views on the likely impact of the harbour on sediment transport.
- The practicality of undertaking regular beach by-passing.
- The acceptability of artificial beach by-passing as a means of maintaining sediment transport rates.
- The acceptability of constructing the harbour close to a residential area.
- The feasibility of designing a harbour entrance that is accessible under a range of operating conditions.

This report aims to provide most of the background information and overall context for the issues in question.



Appendix A

- Drg No PB3800-0001 Location Plan
- Drg No PB3800-0002 Site Plan
- Drg No PB3800-0003 Cross-Section