

HARBOUR BOARD

1st February 2019

Subject:	Whitstable Harbour Dredging Report
Director of Service:	Tricia Marshall, Deputy Chief Executive
Decision Issues:	These matters are within the authority of the Harbour Board.
Classification:	This report is open to the public.
CCC Ward(s):	Gorrell & Tankerton Wards
Summary:	<i>This report outlines dredging works at Whitstable Harbour.</i>
To Note	a. The current dredging regime is proving to be successful by carrying out the programme on an annual basis
Next stage in process:	Continue with the bathymetric surveys using land based surveying equipment to target specific areas of the harbour to maximise operational requirements.

SUPPORTING INFORMATION

1. Introduction

This report outlines dredging works at Whitstable Harbour. Accumulations of silts which build up over time need to be dredged to allow safe passage for harbour users. The report will outline amounts of silt, in cubic metres (m³) that need to be dredged to achieve the design level of the harbour basin and harbour approach.

2. Detail

Baseline Survey

On Sunday 29th April, Canterbury City Council (CCC) carried out a topographic survey of the seabed levels within Whitstable Harbour. A Leica C10 laser scanner (figure 1) was used to collect data from 10 locations around all quays on a spring low water to optimise exposure of the bed levels. The survey was accurate to +/-15mm. Traditionally, a bathymetric survey by boat was commissioned, however CCC decided to trial this method as it offered significant cost savings and health and safety benefits of not having personnel on water.



Figure 1: A Leica C10 Laser Scanner

The scanner collected a large dataset of the seabed levels within the harbour. Although, a limitation of this method is the laser reflects from any standing water, which causes gaps in the data. However, this is not considered a problem as any level lower than the standing water is an acceptable bed level. The data collected is then used to create a Digital Ground Model (DGM), which is compared to a further DGM of the design level of the seabed, with the basin being -2.3mOD and the outer harbour -2.5mOD. A difference model of the two DGMs, shown in Figure 2 is then created to illustrate where areas are above or below design level. A series of polygons are used to pinpoint areas where dredging needs to be undertaken to lower the levels of silt to design levels. The amount of material in cubic metres above design level can then be calculated.



Figure 2: A model showing the differences in the surveyed height of the seabed and the design level. The polygons shown are areas in which need to be dredged, although not all can be dredged in one programme

Completed Works

During the week commencing 19th October 2018, a total of 3,000m³ of silt was dredged from the harbour basin. The dredging works followed strict guidelines in a licence obtained from the MMO, including at a specified time of year (April & October) for environmental reasons, quantity of deposits in the licenced disposal site and sample analysis every 4 years. Sampling this year proved to be acceptable for the threshold levels of contaminants however it did delay the dredging programme until October

Four locations across the harbour were focused upon during dredging, the harbour entrance, the entrance at the east quay, the harbour approach (west quay) and the harbour basin (south quay). Amounts dredged at each location are shown in Table 1.

Area	Amounts Dredged (m³)
Entrance (East Quay)	190 (Picture 1)
Harbour Entrance	200 (Picture 1)
Harbour Approach (West Quay)	1,100 (Picture 3)
Basin (South Quay)	1,510 (Picture 5)

Table 1: Amounts dredged at Whitstable Harbour during the week commencing 19th October 2018

A further laser scan of silt level post dredging was planned for the 5th November 2018. Due to a positive residual storm surge on low tide and daylight, the scan was not completed. Please see photographs showing comparisons.

Future Works

A further laser scan is scheduled for Saturday 23rd March 2019 to obtain where dredging activities will be concentrated during planned works in April 2019. The predicted tide level on the day is -2.64mOD, which, in theory means any areas that still have standing water are already below the design levels for the harbour and will not need to be dredged.

Once the scan is processed and analysed, a further dredging report with recommendations will be provided to the Harbour Master and an update provided at a future Whitstable Harbour board meeting.

It is intended to continue joint working with the Port of Ramsgate to utilise mobilisations costs of the dredger.

3. Relevant Council Policy/Strategies/Budgetary Documents

Whitstable Harbour Strategic Plan 2017

To meet the ambitions of the local community

Whitstable Harbour is a public asset directed by a Board of elected and appointed independent members. The Board will retain a position of being responsive, through public consultation where appropriate and through direct consultation with interested groups, to the ambitions of the local Whitstable community. Maintaining the Harbour as a working facility with active shipping is seen as a key ambition.

To maintain and develop the Harbour's environs

The infrastructure of the harbour, its land, quays, buildings and premises, represent the basis from which all the harbour's operations are conducted. The Board will maintain and develop these for the long-term use of current and future stakeholders. The highest practical environmental standards will be sought.

To support the local community

The Board recognises the importance of the harbour to the local economy in terms of both direct and indirect employment as well as the total level of economic activity in the community associated with the harbour's activities as a whole. Whitstable is an attractive town both for residents and incoming tourists and the harbour and surrounding area represent its focal point. The Board will support the activities of the harbour to enhance these local economic benefits.

To support the fishing and shellfishing activities and markets

Fishing and, in particular, shell-fishing are a key feature of Whitstable. These industries and their related markets (such as shellfish processing, retail and restaurant facilities) should, as far as possible, be protected and supported.

Financial implications

A bathymetric survey by boat has been used successfully in the past to obtain silt levels within the harbour. The hiring of the boat, collection of data and analysis of data was £1500. Since April 2017, the Leica laser scanner has been deployed to obtain silt levels. The scanner is equipment used by the coastal monitoring project and therefore costs are kept to a minimum for the harbour board. For two officers to collect, process and analysis the data, the cost is £600.

During this current licence period, a further 6 pre dredging scans will need to be conducted. Carrying out the bathymetric surveys by laser scan, and not by boat, will see cost saving of £6,300, which includes the scan already completed.

4. Consultation planned or undertaken

Not applicable

5. Options to consider with reasons for suitability

As stated above, cost savings of up to £900 per bathymetric survey are a large cost-

saving for the Harbour Board and should be considered as a reason for suitability.

Data collected using the Leica laser scanner has a high accuracy. We allow survey data to have an error of up to +/-30mm, however most data collected using the scanner has an accuracy of +/-15mm. This is deemed more accurate than a boat based bathymetric survey, which has limitations due to depth of water and the presence of waves whilst surveying.

6. **Reasons for supporting option**

There are health and safety benefits that come with the use of the Leica laser scanner, which include officers conducting the survey from the quay side, and not being over water.

For both boat and land-based bathymetric surveys, the weather can play a role in the successful collection of data. A boat is unable to be deployed to collect data if the sea state is moderate or worse as the boat needs to be relatively stable during collection. This could cause a delay in the collection of data, which could have a knock on effect for the rest of the programme.

The scanner is also limited by weather conditions as it is unable to scan in heavy rain. Light Rain is okay to survey in, however during heavy rain the laser hits water droplets and records them as a data point.

7. **Implications**

(a) Financial Implications

To continue making savings for the Harbour Board and reduce the contribution to the dredging budget from harbour reserves.

(b) Legal Implications

To comply with all the necessary licencing requirements as set out by the Marine Management Organisation (MMO).

As per licencing requirements, a sample of silt was sent off to the MMO for analysis to confirm that silt in the basin is between 31.26 and 62.5um).

(c) Equalities

Not Applicable

Other implications

(d) Staffing/resource - Officer Participation

(e) Property Portfolio – Harbour Estate

(f) Environmental Sustainability/Biodiversity - To comply with all the necessary licencing requirements as set out by the Marine Management Organisation (MMO).

The use of a land based scanner rather than bathymetric survey by boat also reduces CO² emissions.

- (g) Planning/Building Regulations – None envisaged
- (h) Human Rights issues - None envisaged
- (i) Crime and Disorder – None envisaged
- (j) Safeguarding Children – None envisaged

8. Conclusions

Dredging on an annual basis is in its fourth year, and it is proving to be a successful method of dredging. It is providing financial savings, health and safety benefits and utilising existing equipment to improve accuracy of survey data.

We are now in a position to keep accurate records, which are provided to the harbour master on a regular basis, to analysis trends in silt accumulations and any areas of specific concern.

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