

Innovative Approaches to Rapid Archaeological Site Surveying and Evaluation

New Multibeam Test Scheme

PROJECT VARIATION PROPOSAL

INTRODUCTION

The Project Variation proposal is to build and test a new deployment method for a multibeam sonar head to enable higher fidelity recording of submerged archaeological sites. These proposals are based directly on the results and observations made during Year One of the main Project.

It is also suggested that the development of a new towable multibeam platform could greatly increase the ability to use vessels of opportunity in submerged archaeological surveys especially where surveying of sites is a requirement prior to marine aggregate activity.

This Project Variation will go beyond currently available techniques to utilise an innovative approach for investigation of maritime archaeological sites. It is proposed to test a self-contained multibeam deployment system in the vicinity of Ramsgate. This work to be undertaken immediately before the proposed *Stirling Castle* survey in the Spring of 2006.

Innovative Multibeam Deployment System

Closing the Gap – modifications to head deployment to lower it towards the target.

In order to lower the multibeam transducer head near to the target it is proposed to build a towable and floating self-contained multibeam deployment system.

The basic framework will be constructed of light weight, off-the-shelf aluminium trusses. At the lower end would be a detachable mounting for a single Reson 8125 sonar head and a sound velocity probe. At the upper end would be an enclosed watertight box containing a POS MV motion reference unit. Attached to this will be a light aluminium framework for the two GPS antennas which need to be separated by 3m for high accuracy RTK positioning. Primary floatation will be by 1m long cylindrical floats held within the 300m square latticework frame of the truss; the number of floats used would be adjusted to provide the desired water line. The designed floatation height will be with the bottom of the POS MV box c.1m above water level and the GPS antennas c.1m above that. The minimum sonar head depth would be 2m, but we will try different combinations of truss lengths to achieve sonar head depths of perhaps as much as 10m.

During surveys the system would be towed in a vertical attitude at less than three knots, but when making passage the system will be buoyed at the lower end so that it will float at an angle and draw less water. In this configuration

we anticipate safe towing speeds of at least .6 knots, making it more transportable over typical distances between safe havens and aggregate dredging areas.

Use of Vessels of Opportunity

During routine surveys of submerged archaeological sites it is not always possible or economic to commission a custom survey vessel with an experienced skipper and vessels of opportunity must be used. The effort required to measure the offset lever arm lengths is always time consuming and problematic but, with the proposed St Andrews-designed configuration, this would be minimal as the motion reference unit and the sonar head would be in a direct line. The two GPS antennas would also be on the same line but offset 1.5m each side. The similarly time-consuming field calibration for every single deployment would be reduced to a one-off operation on first assembly.

Test area and the *Stirling Castle*

The initial testing will be undertaken close to Ramsgate Harbour, starting in the shallow waters of Pegwell Bay and then moving to deeper water to accommodate increased lengths of the deployment system. Once the best way to handle and safely manage the system has been established, it will be deployed on and around the *Stirling Castle* site as part of the existing ALSF-funded research.

Figure 1 –Schematic of the proposed SASASH deployment system

