

Construction in Antarctica and South Georgia: delicate works in a pristine environment

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Abstract

This paper describes the design and construction works of the new wharves in Rothera in the Antarctic Peninsula and in the Sub-Antarctic island of South Georgia, two exceptionally isolated and environmentally protected locations with extreme climate conditions. Construction in such pristine locations requires special measures and an integrated design, preparation and construction approach. Minimum impact is achieved by re-using existing materials and reducing the amount of new materials required. Strict biosecurity and environmental monitoring has been in place. Design choices were focused on limiting the extent of the works on site by pre-fabrication of the structural elements in Europe, which also ensures the quality standards can be achieved. Low maintenance and durability are also keys aspects to the design choices.

Keywords: Wharf; quay wall; dismantling; environmental challenges; modular construction; circularity; Antarctica; South Georgia

1 Introduction

The Antarctic Infrastructure Modernisation Programme commissioned by the Natural Environment Research Council (UKRI-NERC) will enable a world-leading capability to ensure that Britain remains at the forefront of climate, biodiversity and ocean research in the Polar regions. Through the programme, British Antarctic Survey (BAS) is upgrading station facilities. Upgrading the wharves will allow the new and highly advanced polar research vessel *RRS Sir David Attenborough* to berth.

The AIMP projects developed so far include the upgrade of the wharves at Bird Island, Rothera and in South Georgia (locations highlighted in Figure 1) as well as the construction of a new research building in Rothera.

This paper focuses on the aspects related to the design and construction works of the new wharves in Rothera and South Georgia, two exceptionally

isolated and environmentally protected locations with extreme climate conditions.



Figure 1. BAS research stations

2 Construction in a remote, pristine environment

The specific conditions of the sites require special measures and an integrated design, preparation