

Construction on Antarctica: Dismantling an existing wharf structure

Koen van Doremaele

BAM (Delta Marine Consultants), Gouda, The Netherlands

Contact: koen.van.doremaele@bam.com

Abstract

Rothera is the main mooring location in Antarctica for research vessels of the British Antarctic Survey (BAS). The existing wharf had reached the limit of its design life. To provide mooring of the new UK polar research ship, the RRS *Sir David Attenborough*, a larger wharf structure was designed that required removal of the existing structure. This paper describes the engineering and technical challenges on providing a safe and stable structure during dismantling as well as the effects of icebergs, low temperatures and wildlife around this Antarctic research station.

Keywords: wharf; quay wall; dismantling; environmental challenges; Antarctica; polar climate.

1 Introduction

The Natural Environmental Research Council (NERC) and British Antarctic Survey (BAS) are undertaking a major Antarctic infrastructure modernisation programme that will ensure that the UK remains at the forefront of climate, biodiversity and oceanographic research. The programme is the largest government investment in polar science infrastructure since the 1980's.

Rothera Research Station is the largest UK research facility and supports a range of national and international collaborative science programmes focussed on causes and impacts of climate change. The programmes first phase is a £100M investment to berth the RRS *Sir David Attenborough* and enhance station facilities.

The specialist team that supports BAS – consisting of BAM, Sweco, Ramboll, Turner & Townsend – combines knowledge and expertise to improve environmental sustainability, living experience and reduce running costs at the station.

After winning the contract BAM commissioned its inhouse design team 'Delta Marine Consultants' to

develop the Technical Design from a concept prepared by BAS Technical Advisor, Ramboll.

This paper focuses on the environmental and technical challenges regarding the dismantling design of the existing wharf.

Figure 1 shows 'Biscoe Wharf' that was built in 1991 and survived longer than its design life.

The wharf has a width of 59,2 m and a top level at +4,70 mCD. The mean sea level is at +1,19 mCD, with an average seabed depth of about -7,0mCD and a maximum at -8,65mCD.



Figure 1. Biscoe Wharf (2016)