

## GBG Australia

### Some of our previous work

Western Port, Melbourne. Marine Magnetometer Anchor Location  
Marine Mapping (2005)

Undercliffe, Cooks River, Seismic Refraction river crossing  
Coffey (2006)

Middle Harbour, Sydney. Marine Cable Location.  
Energy Australia (2006)

Thevenard Channel, Marine Seismic Survey  
3D Seismic (2007)

Karratha, Western Australia, Seismic Refraction Survey  
Coffey (2007)

Papua New Guinea, Seismic refraction survey  
Coffey (2008)

Malaysia, Marine Refraction  
Coffey (2008)

Northwest Shelf, WA. Marine refraction survey,  
Geoforce (2009)

## Sydney

18 Fennell Street.  
North Parramatta 2151 NSW  
Telephone: 02 9890 2122  
Fax: 02 9890 2922

### Contact

Simon Williams  
simon@gbgoz.com.au

## Perth

2nd Floor, 2 Hardy Street.  
South Perth 6151 WA  
Telephone: 08 6436 1599  
Fax: 08 6436 1500

### Contact

Rob Hunn  
rob.hunn@gbgmaps.com.au

### Website

<http://www.gbgoz.com.au>

## *Non-destructive methods for*

## MARINE GEOPHYSICS

A number of methods are available to provide a means of obtaining information from the sea floor or below, with greatly reduced costs to diving or drilling. Seismic and magnetic techniques can all be performed under certain conditions to provide our clients with the most accurate and cost effective investigations.



### Marine Geophysical Services

Seismic reflection

Seismic refraction

Single channel subsurface reflection

Marine magnetometer

Side scan sonar

Dual frequency bathymetry

Data processing of any privately collected data

For further information on our services, please visit our web-site:  
[www.gbgoz.com.au](http://www.gbgoz.com.au)



## *Non Destructive Techniques for* **MARINE GEOPHYSICS**



### GBG Australia

GBG Australia is a specialist in applying non-destructive investigative techniques for the assessment of buildings and structures. We offer our clients innovative methods of defining structural and condition information whilst minimising both costs and disturbances to the site.

### Company Profile

GBG Australia is a subsidiary of the GBG Group, a multi-national company specialising in the application of geophysical and advanced applied physics for precision investigations of geotechnical, environmental sites and engineered structures in UK and Europe since 1982. GBG has had a presence in Australia since 1993 originally through a joint venture with CMPS&F and GHD before becoming a stand alone company in 2003, operating in three main areas of business: geotechnical and environmental investigations; non destructive investigation of structures and contracting of equipment and staff for data collection, processing and interpretation of data.

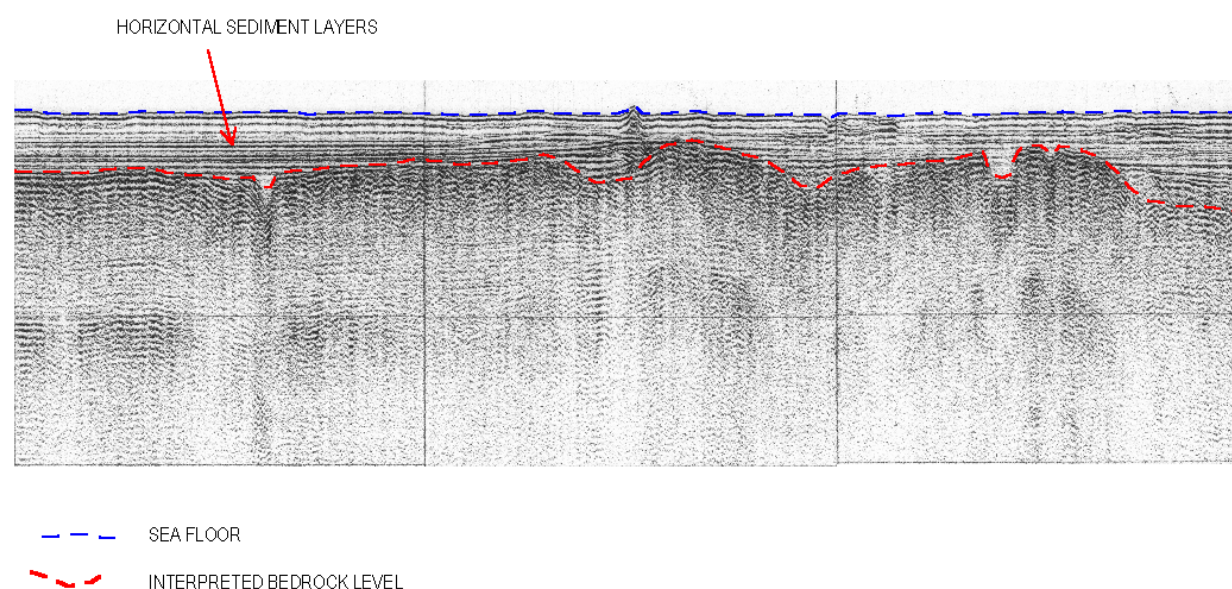
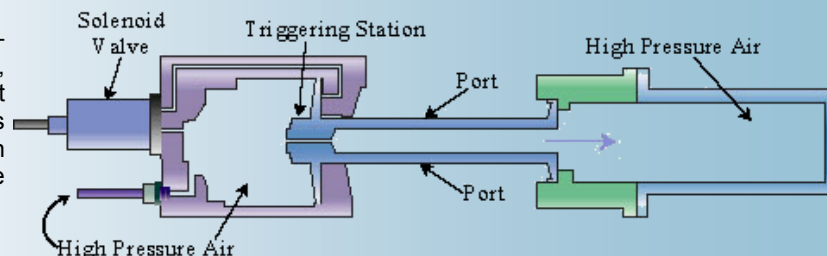
GBG Australia is an independent provider of non destructive and shallow geophysical investigation services with applications ranging from the location of a single pre-stressing strand in a concrete slab to mine scale exploration geophysics. With clients ranging from Local to Federal Government, and from developers and engineering companies to private individuals, we can provide tailored solutions to your particular subsurface investigation requirements.



# Applications for Marine Geophysics

GBG Australia is capable of undertaking a number of shallow marine geophysical techniques such as Seismic reflection and refraction, single channel subsurface reflection, marine magnetometer, side scan sonar and dual frequency Bathymetry. Through our link with McMullen and Nolan surveys in WA we have highly skilled survey staff for location and navigation referencing.

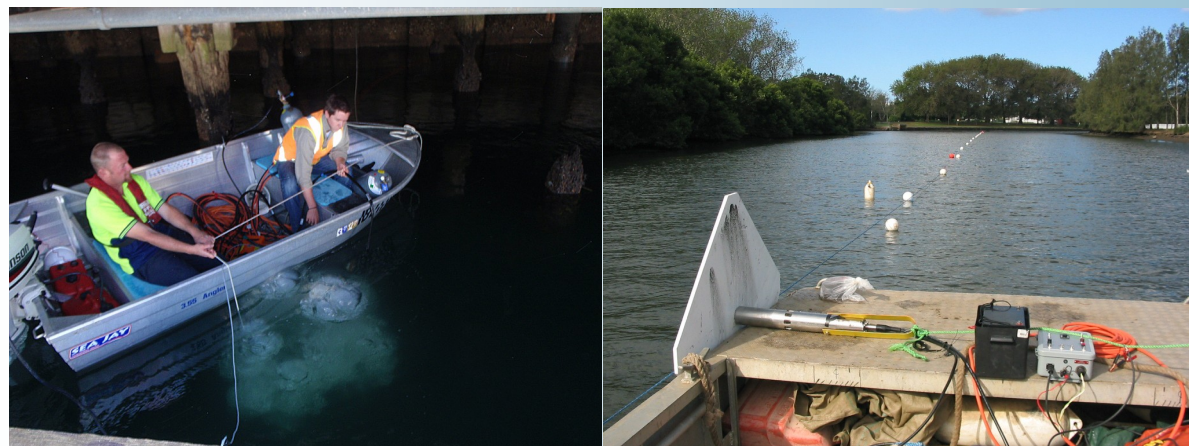
Shallow marine investigations can be undertaken for dredging, marina or port development, pipe line or cable routes, river crossings or just to locate missing objects such as large anchors or containers that have fallen off vessels in navigation routes or dredge channels. A couple of example techniques are described below.



**AN EXAMPLE OF A MARINE REFLECTION PROFILE. THE BLUE LINE REPRESENTS THE REFLECTION FROM THE SEA FLOOR AND THE RED LINE SHOWS THE REFLECTION AT THE BOTTOM OF THE SEDIMENT**

## Example 1: Marine Seismics

GBG Australia is one of only a few companies in Australia with in-house equipment for Marine Refraction Surveys to provide bedrock depths and strengths for geotechnical assessment. We have 2 Bolt Air gun sources and a number of bottom towed or static arrays which can be set up and combined to provide profile depth of 1 – 50m depth. All the equipment is portable and can be set up on a boat from 6m to 20m length depending on the extent of the job and depth of the water. All data is tied together with DGPS referencing.



## Example 2: Marine Magnetometer

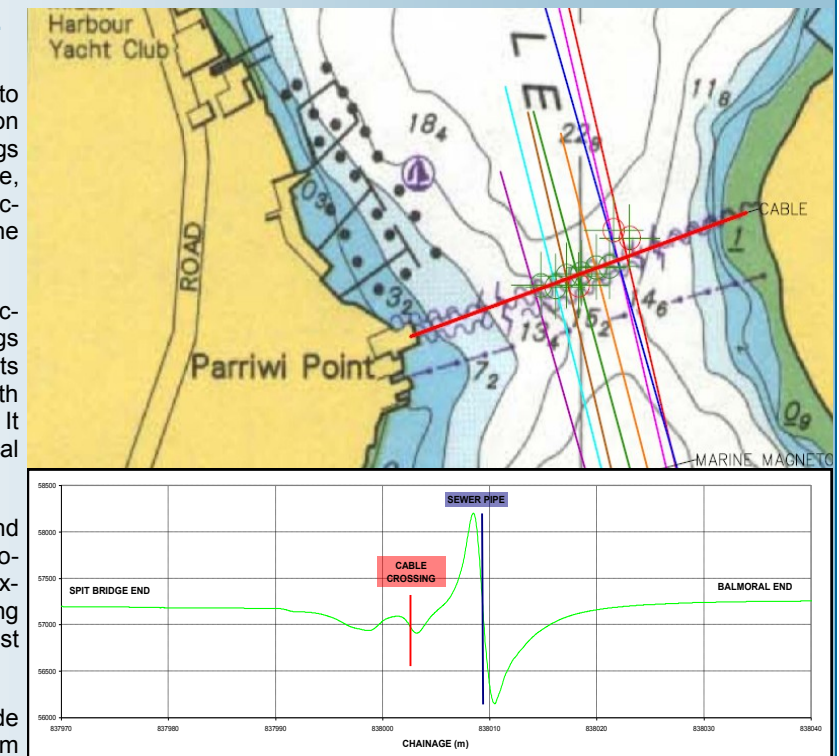
### APPLICATION 1: Underwater Cable Location.

A disused high voltage power cable was known to cross Middle Harbour. However its exact location and depth across the harbour and at both landings was not certain. In order to re-establish the cable, excavation and continuity testing of the cable sections was required. An accurate location of the cable was needed to undertake this.

The aim of the investigation was to provide an accurate location of the power cable at both landings and along the harbour crossing. Previous attempts had been made to locate the landfall position with standard induction methods with little success. It was proposed to use a number of geophysical techniques to locate the cable.

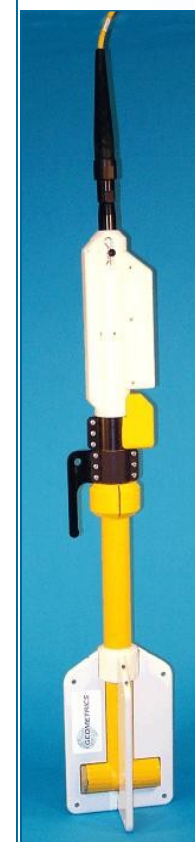
A G-856 proton magnetometer was towed behind a survey vessel and traversed along parallel profiles at 10 m centres set perpendicular to the expected direction of the cable. Spatial position along the profiles was captured with DGPS whilst bathymetry was captured with echo-sounder.

The investigation found that on the eastern side park the actual cable position was some 35 m from the position marked by warning signs and were at a depth of 3.5 m. On the western side park the cable came ashore with a number of telecom cables and was at a depth of 1.5 m, less than half the depth expected.

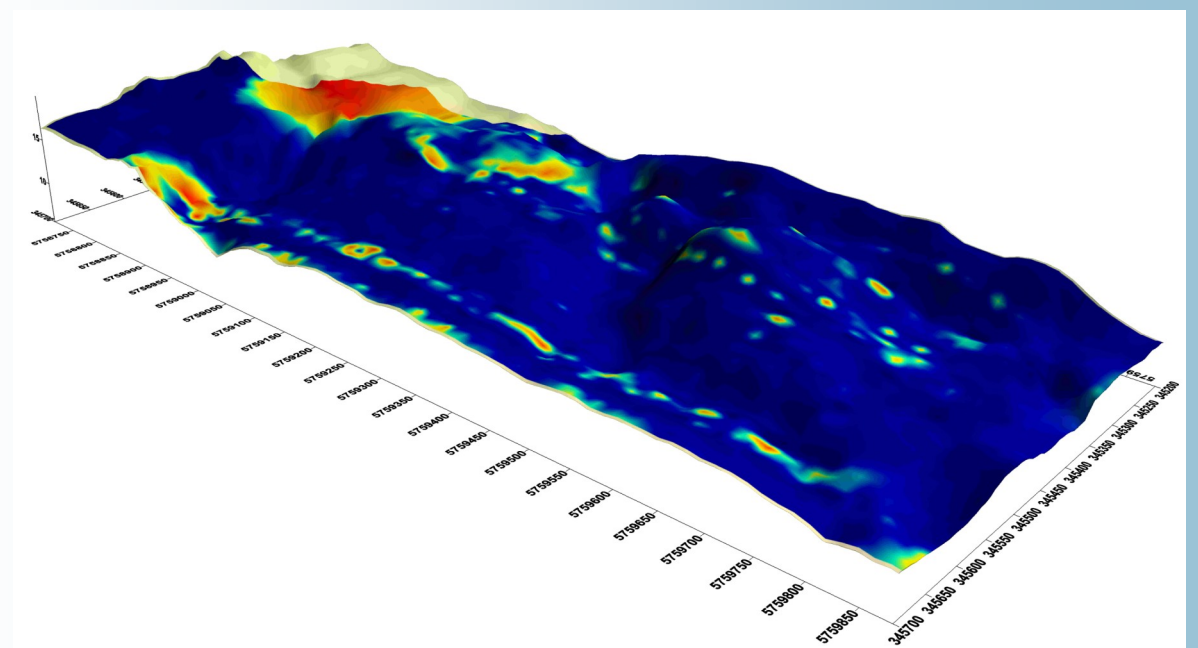


### APPLICATION 2: Locating an Iron Anchor in a Shipping Lane

An iron anchor had been lost off a ship in a busy shipping lane. The precise location of the anchor was unknown but it was known that it was a hazard to large ships and to dredging vessels. To determine the location of the anchor a magnetometer survey was undertaken to highlight all magnetic targets in the port.



The results of the investigation appear to indicate many highly magnetic responses, which may represent submerged marine dredging cables, barges, channel buoys and other submerged metallic objects. A list of targets was given to port authorities.



**THE RESULTS OF THE MAGNETOMETER SURVEY IN THE PORT. THE PLOT SHOWS 3D BATHYMETRY AND COLOURS REPRESENT MAGNETIC INTENSITY. RED SUGGESTS A METAL OBJECT SUCH AS AN ANCHOR.**