Sydney Desalination Plant

Project Owner
Water Delivery Alliance (McConnell Dowell, Bovis Lend Lease, Worley Parsons, Kellog Brown Root, ERM and Sydney Water)

Service Engineer
Halcrow Pacific

Precast Manufacturer
Humes

www.nationalprecast.com.au

Sydney Desal uses segmental shaft linings

Whilst the use of precast tunnel linings is becoming more prevalent in Australia, the use of segmental shaft linings is a new concept in this country.

Precast manufacturer Humes was recently involved in the construction of two temporary shafts using the caisson technique, a method that proved extremely successful for the Water Delivery Alliance (WDA) constructing the desalination pipeline in Sydney.

The precast concrete lining used to sink the shaft is designed to form the permanent lining, offering significant savings in construction costs. The caisson technique involves jacking concrete segments into the ground to form a shaft structure. This approach reduced shaft construction times and provided considerable cost benefits over other temporary structures.

With international experience in constructing caisson shafts in tight locations, Alliance partner McConnell Dowell investigated the suitability of this construction method for the desalination pipeline project. Following discussions with the precaster regarding the application, economic viability and availability of the system, the WDA decided to proceed with this construction technique. By introducing the use of segmental linings into an urban project with restricted access, significant benefits with the caisson technique were gained including cost efficiencies, reduced plant and personnel numbers for installation, reduced noise pollution, and reduced hazards as operatives were not required to work inside the shaft during excavation.

Humes

NATIONAL PRECAST
CONCRETE ASSOCIATION AUSTRALIA
making precast easy

The WDA sub-contracted Humes to supply and design the proposed shafts, who then in turn engaged Halcrow to check the segmental linings, design the shaft and all temporary works for the shaft construction process, and provide details for openings in the lining to receive the tunnelling machine being jacked from another shaft. Both of the temporary shafts were designed with a 7.5m internal diameter and measured 12 to 15 metres deep.

Segmental linings for the construction of shafts in both temporary and permanent conditions provide a viable alternative to the techniques traditionally undertaken in Australia. They can be cast in various sizes and are available throughout Australia. The adoption of the caisson and underpin methods provides significant benefits, especially in time and cost savings to both the contractor and client.

The Sydney desalination plant and pipeline has been built to deliver up to 250 million litres of water a year, and at full capacity will supply up to 15 percent of Sydney's water needs each year. The plant's power needs are fully offset by renewable energy produced at Capital Wind Farm.