INNOVATIVE WALLING SOLUTIONS FOR SYDNEY GATEWAY

The Sydney Gateway project in New South Wales represents a major step forward in connecting Sydney's motorway network to the Airport Precinct, delivering significant improvements in journey times and accessibility. With a toll-free connection from the St Peters Interchange, the project streamlines travel to Sydney Airport, the M5 and the Eastern Distributor.

Having opened on 1st September 2024, Sydney Gateway is already proving to be a vital artery in Sydney's transport network, addressing long-standing traffic congestion and significantly improving overall efficiency.

PRECAST RETAINING SOLUTION

National Precast Master Precaster, The Geoquest Company Australia and New Zealand, a key partner in the Sydney Gateway project, played a crucial role in the project – designing, supplying and installing over 50 Geoquest Mechanically Stabilised Earth (MSE) walls.

These walls were constructed across five main work areas – Northern Lands, St Peters Interchange, Tempe Tip, Airport Drive and Qantas Drive. They cover more than 15,000 square metres and include a range of structures, from abutment walls to approach ramps and retaining walls. Heights varied from 1.5 metres to over 8.5 metres.

The MSE wall technology incorporates the company's TerraPlus® concrete panels, each three metres wide by 1.5 metres high.

According to the Geoquest's Managing Director in Australia, Riccardo Musella, the walls provide not only structural

PROJECT: Sydney Gateway

LOCATION: Sydney, New South Wales

MASTER PRECASTER: The Geoquest Company Australia and New Zealand

HEAD CONTRACTOR: John Holland and Seymour Whyte Joint Venture

Precast elements have helped in the delivery of the Sydney Gateway project in New South Wales.

Images: National Precast.

The project replaced traditional cement with fly ash, further contributing to sustainability efforts.

integrity, but also flexibility in design, thanks to custom-made form liners that allow for unique urban patterns on the panels.

"This project marked a milestone for us as it was the first time we had provided both design and installation services, in partnership with a reputable installer," Musella says.

Musella adds that the integration of design and installation streamlined the project, simplified processes and offered a cohesive solution, all under one contract.

PRECAST INNOVATION FOR FAST CONSTRUCTION AND SUSTAINABILITY

Several innovative technologies were applied to optimise the project's efficiency and sustainability. Among these were adjustable precast hanger bars for lifters and ferrules, the first-ever three metre wide x 1.5 metre high concrete panels, and a panel block-out system using removable plates and z-bars. Additionally, multiple eight-in-a-row table moulds were utilised, further enhancing production efficiency.

These technologies improved the speed and stability of the panel manufacture, while reducing waste and pour time, ensuring both cost-effectiveness and environmental sustainability.

COMMUNITY AND ENVIRONMENTAL BENEFITS

The Sydney Gateway project has had a profound impact on both the local community and the broader Sydney region. It is not only improving traffic flow but also returning local roads to communities, enhancing pedestrian and cycling links and creating better community spaces.

Environmentally, the project made significant strides with the use of a 25 per cent supplementary cementitious material (SCM) concrete mix, replacing traditional cement with fly ash, further contributing to sustainability efforts.

The Sydney Gateway project exemplifies the transformative power of innovative engineering and infrastructure development. By connecting key parts of Sydney's motorway network to the airport precinct, the project significantly enhances transport efficiency, safety and sustainability.

The successful integration of Geoquest's MSE wall technology, coupled with the use of advanced construction methods and a focus on community and environmental benefits, sets a new benchmark for future urban infrastructure projects. ■

THE ROLE OF PRECAST MECHANICALLY STABILISED EARTH WALLS IN INFRASTRUCTURE

Mechanically Stabilised Earth (MSE) walls are a type of retaining wall that are quick to install and adaptable to various site conditions. MSE walls rely on the interaction between soil and reinforcements to provide stability and support. They are usually integrated with precast concrete facing panels for enhanced performance and aesthetics. MSE walls are widely used in civil engineering and construction for their cost-effectiveness, flexibility, and ability to withstand various environmental conditions. Typically used in highway and rail embankments, on bridge abutments, at industrial sites and in urban construction, their immense value comes from their aesthetic appeal, durability, sustainability and cost efficiency.