



Al Mawaleh Highway Bridge Abutment and Embankment in Muscat, Oman, 2005



Al Mawaleh Highway Bridge

BENEFITS TO CLIENT

To build an architectural bridge abutment fast and with limited costs.

THE PROBLEM

The beautiful mountain and desert country of Oman is characterised by the site of many castellated forts which speak of its rich tribal culture. It was important that the design of the Tensar wall structure was in keeping with the surroundings. The Sultan Qaboos Road is a 6 lane 200km highway connecting Muscat with Oman's second city Sohar. It was therefore important to find a solution that would ensure construction was fast and effective.

THE SOLUTION

The Tensartech TW1 Wall System saved about 40% in time and material costs over conventional reinforced concrete techniques. The fast track completion of 9400m² of wall facing was completed in only 90 days through the inherent simplicity of the Tensartech TW1 wall construction and 24 hour support from local Tensar agents Muna Noor Manufacturing & Trading LLC. Tensar geogrids have capability to accommodate a wide variety of fill materials, allowing the project to benefit from using structural fill from a local borrow pit.

PROJECT DESCRIPTION

The aggregate fill was reinforced with layers of Tensar uniaxial geogrid, which were connected to the block face using Tensar's unique high strength polymer key. The versatility of the system readily accommodated the construction of the bridge abutments, benched embankment and the 4 circular towers. The circular towers were constructed with the geogrid strips laid in a radial direction.

The walls of the towers, the face to the abutments and the benched embankments were completed with Tensartech TW1 modular pre-cast concrete blocks to match the stone used in the locality. The versatility of the system enabled them to be dry laid over a concrete footing in a variety of configurations to meet the design requirements.



The tower walls were inclined over the 8 metre height from 6.05 metres radius at ground level to 4.8 metres radius at the top, below the concrete fascia. Decorative elements like false doorways, windows and rifle apertures were also incorporated.

In contrast, the horizontal alignment of the bridge abutment face was straight, with a face angle of 86 degrees. The layers of Tensar uniaxial geogrid extended back from the face to the piles, which took the load from the bridge deck, hence providing a stable structure without the need for heavy concreting.

The Tensartech Wall System has British Board of Agrément (BBA) certification and consists of modular pre-cast concrete facing blocks and geogrid, which reinforce the granular fill behind. The geogrids are connected to the block wall by a unique high-strength polymer 'key'. The Tensartech TW1 blocks **required** a one-man lift.

CONTRACT DETAILS

Consultant:

Parsons International (USA)

Contractor:

Galfar Engineering and Contracting Co. LLC

Client:

Municipality of Oman



Tensar International Limited
Cunningham Court
Shadsworth Business Park
Blackburn BB1 2QX
United Kingdom
Telephone: +44 (0) 1254 262431
Facsimile: +44 (0) 1254 266867
Email: info@tensar.co.uk
www.tensar-international.com

Muna Noor Manufacturing & Trading LLC
PO Box 1598, Jibroo, PC 114
Sultanate of Oman
Telephone: +968 24490483
Facsimile: +968 24490486
E-mail: munanoor@omantel.net.om