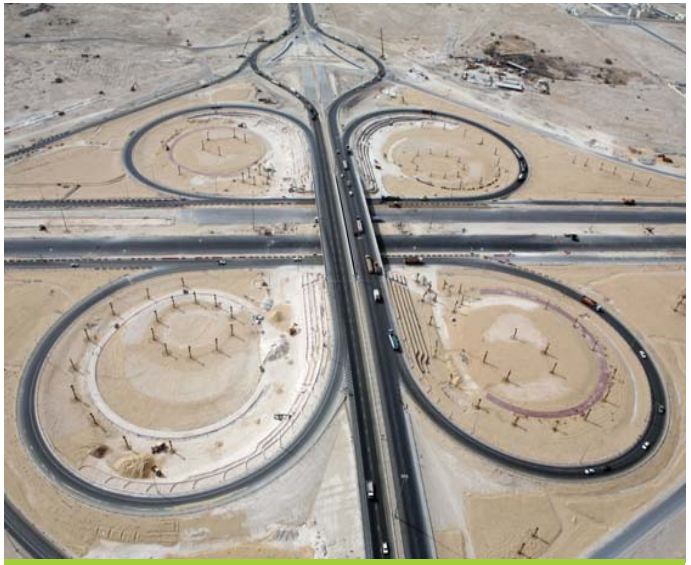


An aerial view of interchange 24. The terracing on each loop is already visible.

Green gateways to Doha:

Local retaining block livens up highway interchanges in Qatar

In mid 2005, Terraforce, Cape Town based precast concrete product licensor, landed their first major contract in Dubai, using the L16 block to curb water erosion on the fronds of Palm Jumeirah, one the largest artificial islands in the world. By the end of that year, Terraforce appointed a Dubai based precast manufacturing company, Consent L.L.C., as exclusive producers of Terraforce blocks in the Persian Gulf Region.

Since the successful completion of the retaining walls on Palm Jumeirah late 2007, Consent has managed to secure several other contracts, the most recent involving the erosion control and landscaping of three large interchanges on the Salwa International Highway.

The Salwa highway is the major arterial connection between Saudi Arabia and the coastal capital of Qatar, Doha. All traffic coming into the city of Doha, including from the United Arab Emirates, enters via this route. The QR441-million project will allow faster commuting for motorists between Abu Samra and Doha and includes a dual four lane highway with 10 major interchanges, three camel crossing underpasses and twenty two Qatar Petroleum culverts.

Setting out of Terraces

Excavated trenches completed

At Interchanges 15, 17 and 24, a detail was prepared by design engineers of Parsons International Limited, one of the world's largest engineering and construction organisations for private industries and government agencies, for a series of terraces on the

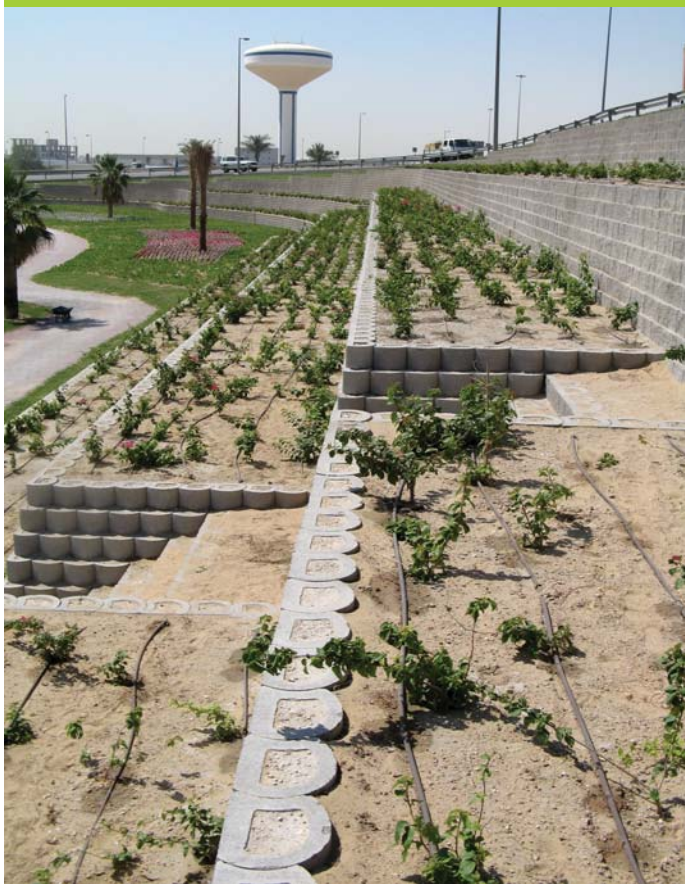
First blocks laid onto goetextile foundations

inside faces of all four quadrants of the conventional clover leaf interchanges. Their original design, which closely mapped the original ground profiles - a series of tapered and curved embankments running parallel with the edge of the ramps - called for precast walling, but after AG Middle East (AGME), the appointed landscaping contractor, proposed the use of the Terraforce L16 blocks, based on the successful use of the product on Palm Jumeirah, the alternative designs supplied by Simon Knutton of Knutton Consulting – a well established engineering consultancy involved in authoring the original design guidelines for concrete retaining block walls in South Africa - were accepted.

The retaining walls were mainly necessary due to extensive wind erosion on the side slopes and to reduce the physical footprint of the intersection ramps - the sand materials are so dry and the grading such that side slopes between 1:3 and 1:5 are not uncommon. Also, the surrounding area is pure desert: sand, rock and more sand.

Says Knutton: “The three interchanges chosen for landscaping will be the busiest and Ashghal, the Public Works Authority who initiated the project, wanted to ensure they are eye catching and finally, once completed, present as colourful oasis type features on an otherwise very boring drive.” Each interchange will be irrigated from dedicated

Completed wall with plants, irrigation and stairs



underground water tanks holding a minimum of 3 million litres of water each.

Late 2007, detailed designs were finalised and approved for all three intersections, which involved

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Interchange with rock-face elevation

an adaptation to the wall at Interchange 17 to accommodate a series of culverts which carry the main natural gas pipelines across the desert. Also, each wall is intersected at certain points with access stairs to allow maintenance staff to move up and down the terraces easily.

The walls designs were to undergo one more revisit at a later stage of construction. Says Knutton: "Due to the four loops at each interchange being different the Client requested that each interchange design be unique. The challenge was to be creative, functional (for maintenance), have aesthetic appeal and to maintain the structural integrity required. This kind of variation could not have been achieved with the precast walls originally proposed." As a result, the walls showcase the remarkable design flexibility that is possible with a Terraforce block, by alternating between a flush, round or rock face finish, varied setbacks for a featuresque appearance, integrated steps and good plant cover.

A total of 300 000 L16 blocks were budgeted, with the first pallets arriving in Qatar beginning 2008. As this was the first Terraforce installation in Qatar, the Client and Consultants were anxious to see early

Interchange with round-face elevation

Stepping up of terraces to match ground profiles

results to confirm that their decision to use Terraforce was justified. At the first interchange progress was slow, as the contracting teams and the excavator operators had to be trained by Bryan Newby of Namwall, Terraforce licensee in Namibia. Once the walls took shape, however, everybody relaxed and was well pleased with the outcome.

Knutton feels that the project was an overall success: "Considering that the labour force was made up of at least 10 different nationalities, sandstorms that endured for 6 weeks non-stop and temperatures

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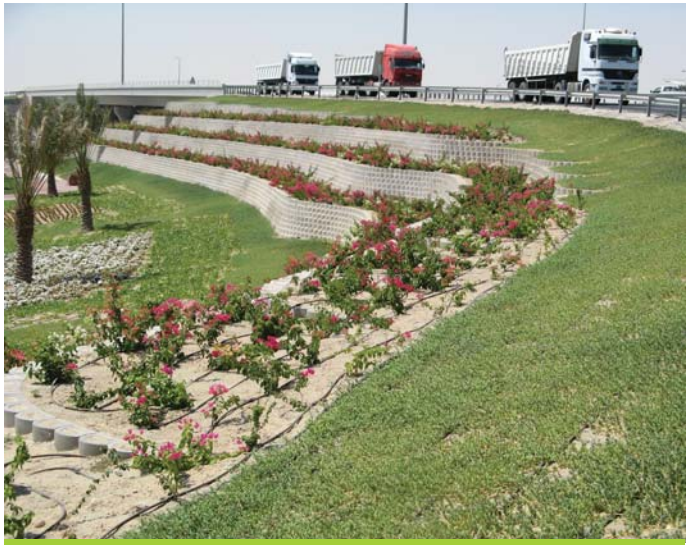


Completed wall with plant cover

topping 55 deg Celsius with humidity regularly in at 90% plus, the installation progressed well within a nine month time frame. This Terraforce installation has impressed and is so successful that the product is being considered for another unique project in Doha."

Special commendations:

Terraforce wishes to extend special thanks to Brian Newby of Namwall and Jad Sakr of AG Middle East for their hard work and dedication in ensuring the success of the project.

Project participants:

PROJECT: Salwa International Highway– Qatar

CLIENT: Ashgahl Roads Authority, Qatar

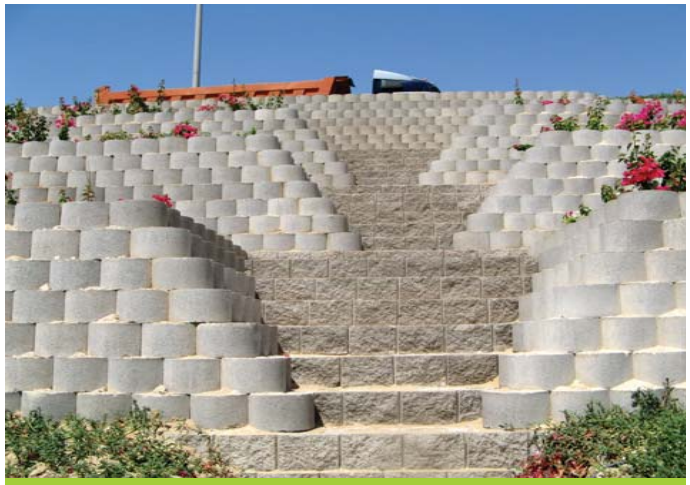
PROJECT CONSULTANTS: Parsons International Limited

CONTRACTOR (Landscaping & Irrigation): AG Middle East, Qatar

TERRAFORCE WALL DESIGN: Simon Knutton of Knutton Consulting, Gauteng, South Africa

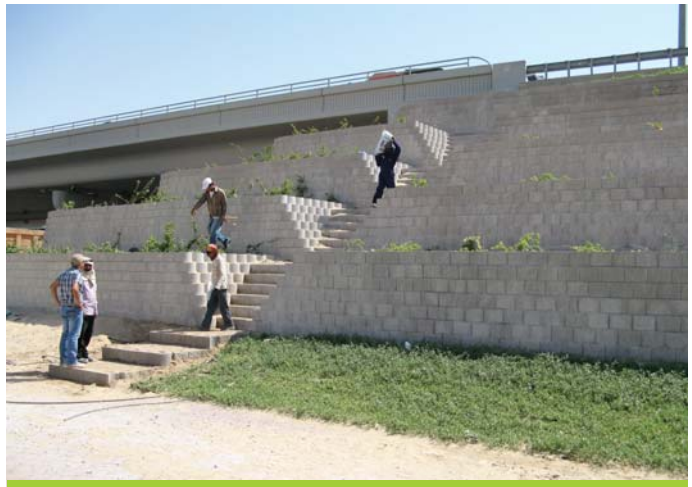
SUPERVISION OF TERRAFORCE INSTALLATION: Bryan Newby of Namwall, Namibia

SUPPLIERS OF TERRAFORCE BLOCKS: Consent L.L.C., Dubai, UAE



Detail of maintenance stairs

Overall view of interchange 24



Maintenance in progress

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