

GEOFABRICS®

METROPLEX WEST

RETAINING WALL



SLOPES AND WALLS

CASE STUDY

GEOFABRICS CONTACT
DALE CHAYCHUK

PROJECT LOCATION:
WACOL, QUEENSLAND

DATE:
JUNE 2020

DESIGNER:
SHEEHY PARTNERS

HEAD CONTRACTOR:
SHADFORTH CIVIL CONTRACTORS

INSTALLATION CONTRACTOR:
CONCRIB PTY LTD

END USE CLIENT:
ASSET OWNER - METROPLEX WESTGATE

PRODUCTS USED

MACCAFERRI GABIONS

Rectangular woven wire mesh baskets filled with rock to create flexible, permeable retaining walls for architectural, mining, industrial and road projects.

MACCAFERRI TERRAMESH

A versatile, modular system for reinforced slope systems and mechanically stabilised earth walls.

BIDIM GEOTEXTILE

Australia's leading nonwoven geotextile, has a number of applications in all civil engineering construction projects.

MEGAFLO

Is an effective subsurface drainage for the removal of excess water from the aggregate layers within road and rail formations, from behind retaining walls or in sports fields.

POLYESTER GEOGRID

Engineered materials suitable for short and long term soil reinforcement applications.

PROJECT DESCRIPTION

Shadforths Civil was engaged to build the new Volvo Australia headquarters at the MetroPlex Westgate Business Park in Wacol, Queensland. The \$30m development will house the truck operations including a full dealership, showrooms, workshop and training facilities. Additionally, the site includes 254 car parking spaces, 98 prime mover parking spaces and 7 semi-trailer parking spaces across the 3.25ha site.

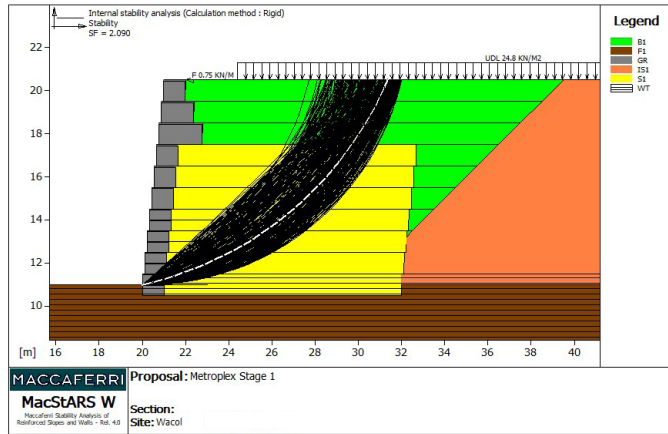
A retaining wall up to 9.5m high and 350m (1,700m²) long was required on the northern boundary of the property. Consultation with stakeholders was held at early works stage where various options for proprietary retaining wall systems were presented.

Geofabrics was contacted by Sheehy Partners to provide specialist design assistance for the hybrid Terramesh reinforced soil / mass gravity Gabion wall.

CHALLENGE

Preliminary stability assessments for the Terramesh wall were carried out by Geofabrics using the Maccaferri MacSTARS design software, and typical details were provided. A mass gravity Gabion wall was proposed for the top 2.5m to allow for services to be installed behind the structure without interference from the soil reinforcement. **Maccaferri Terramesh® System** is a modular system used to form rock-faced reinforced soil walls (also known as Mechanically Stabilised Earth) and embankments. It has been used globally on some of the most significant infrastructure schemes, including what is believed to be the tallest reinforced soil structure in the world at 74m high. On higher slopes and structures, it can also be used in conjunction with our high-performance primary geogrids to augment the strength of the integral woven mesh soil reinforcement. It consists of pre-assembled units of double twisted wire mesh with the facing section of the unit formed by connecting a back panel and diaphragms to the main fascia unit, thus creating the rectangular shaped

cells used for rock confinement. The woven mesh soil reinforcement, fascia and lid are all one continuous panel of mesh. Following assembly on site, the fascia unit is filled with suitable rock fill, and structural backfill is then placed upon the soil reinforcement and compacted. Subsequent Terramesh® layers are placed onto the completed layer beneath. Terramesh® units are fabricated from heavily galvanised GalMac® and polymer-coated steel wire.



Maccaferri MacStars W preliminary assessment

A sample 2m high Gabion wall was constructed on-site for approval by the stakeholders which set the standard of finish required for the whole project. Gabion rock was placed using an excavator and then hand-packed manually to form a smooth-faced finish and to minimise voids within the cages. Pneumatic powered lacing tools were utilised to connect adjoining units and to close unit lids and preformed bracing wires were installed at third height intervals within each unit to create straight vertical faces.

Special steel frames were designed and manufactured for temporary attachment to the face of the Terramesh structure during the rock packing procedure to ensure a uniform finished face was presented. Highly experienced and trained Terramesh installation crews were utilised to ensure manufacturers recommendations were followed and regular inspections by the certifying engineer (Sheehy Partners) were carried out to ensure wall structure was installed in accordance with the design intent. A program duration of eight weeks was proposed which required 200m² of the wall to be constructed each week with 17,000t of select backfill also placed and compacted each week.

SOLUTION

Several design options were considered until a hybrid Terramesh reinforced Soil / Gabion mass gravity wall was chosen. This solution offered both structural integrity as well as a unique architectural aesthetic of Gabion rockfill creating banded and coloured patterns in the face of the wall. The three rock types selected were Keperra Granite, Bluestone Quartz and recycled concrete.

Costings and benefits for each system, including aesthetic and fit for purpose considerations were provided as well as preliminary design proposals and associated costings for consideration. Lead times and construction programmes for each option proposed were assessed as well as cost versus speed of delivery.

All program milestones were achieved, and the Terramesh structure was completed within budget.



NOMINATED PROJECT

This project was nominated for the CCF Earth Award – Excellence in Civil Construction. Scan the QR code below to view the project video.

