



CASE STUDY:

LAKE MACQUARIE CYCLEWAY

LAKE MCAQUARIE, NSW

APRIL 2018

**CLIENT/CONTRACTOR: LAKE MACQUARIE CITY
COUNCIL**

GEOWEB GEOCELL CELLULAR CONFINEMENT SYSTEM

The Geoweb system consists of a robust three-dimensional structure housing a network of interconnected cells that confine and compact soil. The confinement action prevents erosion and improves the structural performance of the soil or aggregate infill providing an alternative to reinforced concrete or armour. Geoweb's soil confinement system can be used to increase the load capacity in areas with high traffic or heavy use, ideal for permanent and temporary access roads that need to be constructed over soft ground.

The Geoweb cellular confinement system comes in collapsed, lightweight panels which can be handled easily and safely onsite.

Lake Macquarie is Australia's largest salt water lake, and is located south of Newcastle, New South Wales. Lake Macquarie City Council has embarked on a project to construct a cycleway and pedestrian access around the shoreline of Lake Macquarie.

The section at Green Point, between Belmont and Valentine, required a number of embankments to be constructed over gullies to maintain a satisfactory grade for cyclist and walkers. Due to the area's environmental sensitivity, it was a requirement that the base of the proposed structure be kept to a minimum to reduce the impact on the surrounding vegetation.

Lake Macquarie City Council approached Geofabrics and requested a solution. In consultation with Council, Geoweb was proposed. Geoweb has many advantages that it can not only be installed on a slope, anchored by pins or tendons, but it also can be laid horizontally in layers. Geoweb is available in various panel depths from 50 mm to 300 mm but for this application, Geofabrics suggested Geoweb 300 mm deep with large cells be utilised to construct the embankment structure.

Council's final design for the embankment was approximately 3 m in height. Using Geoweb 300 mm panels, reduced in size to 1.20 m x 3.0 m allowed the embankment to be constructed with a smooth radius. Council constructed a light steel frame with pins that allowed the Geoweb panels to be expanded uniformly to the required dimensions and placed accurately to meet the required shape. The structure was constructed without any soil reinforcement or geogrid, as each Geoweb panel embedment depth of 1.2 m imparted sufficient stability and allowed the structure to act a gravity wall.

> Lake Macquarie Cycleway – Continued.



Embankment construction

Utilising different cell depths council was able to construct an embankment with a smooth radius

The panels were orientated such that the exposed outside cells were infilled with a sandy friable soil. Native grasses and vegetation were planted to complement the surrounding native bushland environment and mulch was used to maintain soil moisture levels.

The resulting structure met the criteria of Council, environmental groups and residents. Over three to six months, establishment of natural vegetation has concealed the Geoweb structure, producing a natural and pleasing aesthetic embankment.



A green embankment

Using Geoweb to form the embankment has allowed for a face that can be greened