

# GLENUGIE UPGRADE

## A SAFER ROAD - GLENUGIE



**CONTRACTORS :** Alliance (Roads and Maritime Services, ARUP and Macmahon Contractors)  
**CLIENT :** Roads and Maritime Services  
**COMPLETION :** Late 2011  
**LENGTH :** 7 Kilometres  
**PROJECT END VALUE :** \$54.5 Million  
**SURVEYOR :** Prosurv



The Glenugie Upgrade was built by the Alliance construction team of the Roads and Maritime Services (RMS), Arup and Macmahon Contractors. The seven kilometre stretch of upgraded Pacific Highway is part of the larger Woolgoolga to Ballina project, and the entire Glenugie project site passes through forest areas with identified endangered and threatened flora and fauna. For this reason, extensive and highly detailed environmental assessments and environmental management planning has been a major feature of the project, with measures including rope crossings of the road for arboreal mammals, fauna underpasses, and the creation of a new forest reserve as a biodiversity offset for rare Eucalyptus and other threatened fauna species affected by clearing works.

The Glenugie Upgrade extends from Franklins Road to Eight Mile Lane, approximately 15 kilometres south of Grafton. The benefits of the upgrade are improved road safety, through the elimination of several lower standard curves and replacement of the previously existing two lane

highway with a four lane divided road, with a wide median allowing for the future addition of a third lane in each direction when warranted.

A connection to the existing highway has been constructed at the southern end to the south of Franklins Road and at the northern end to the south of Eight Mile Lane. The northern tie in is via a two-lane road 1.5 kilometres in length. The existing highway has been retained for local traffic.

The upgrade has been completed under an Alliance Design and Construct. A range of consultants, including an Independent Environmental Representative, SKM and State Forests NSW have also contributed. Working closely with State Forests NSW was important, as access for logging operations in the Glenugie State Forest needed to be accounted for in terms of works scheduling, and the overall health and protection of the State Forest Estate was an important consideration.

This filtered down into highly detailed actions as part of the overall Environmental Management Plan, using specific Work Method Statements for all key activities (Clearing and Grubbing, Spray sealing, Temporary Watercourse crossings, etc).

Major construction commenced in March 2010, with the project complete in late 2011. At the peak of works, over 90 workers and 42 pieces of large plant were on site. With over 320,000 man hours worked to date, the safety record for the project was excellent, with no LTIs.

“There are three aspects of the Pacific Highway Glenugie upgrade of particular interest; firstly, the upgrade will feature a heavy duty crushed rock, granular flexible pavement, with a spray sealed wearing surface, rather than a traditional rigid pavement” said an RMS Spokesperson. “Secondly, the upgrade adopts a landscape treatment based on a native regeneration strategy. This strategy is based on using the native forest

seedbank within the topsoil to regenerate the forest bush landscape. The soils are stabilised by combining the shredded mulch from the clearing operations with the topsoil stripped from the site. The two combined together make the landscaped areas resistant to raindrop impact, so soil is not washed onto the road or the environment around the road. The overall landscape scheme aims to reduce the impact of landscaping, reintroduce the native species, limit the invasion of weeds and protect against erosion to provide an environment which will allow the native vegetation to successfully establish.

Community input was an important part of the development of the concept design and the assessment of environmental impacts. Community involvement activities during the project's development included community updates, advertisements, information displays and stakeholder meetings.

For year 12 engineering studies students at Grafton and South Grafton High Schools, community involvement included a visit to the site to see engineering in action. The students were escorted by one of their teachers and guided around the site by a former Grafton High student who has been on a six month civil engineering internship with the RMS, which has included work experience and hands on learning at the Glenugie project site.

In total, Macmahon estimates this project has involved 400,000m<sup>3</sup> earthworks; placement of 215,000 tonne crushed rock; installation of 3400m of longitudinal drainage pipe culverts; and the placement of 125,000m<sup>2</sup> two coat spray seal wearing surface. Of the 14 cross drainage structures built under the motorway, two are concrete arch structures, eight are box culverts and four are pipe culverts.

None of which will be noticed by the Sugar gliders or Yellow-bellied gliders bustling across the three overhead rope crossings, nor by the Rufous bettongs and Brush tailed phascogales passing under the road via the two dedicated fauna underpass structures, five combined drainage / fauna structures and seven incidental fauna underpass structures. It will all, however, be vastly appreciated by drivers on the Pacific Highway, who will also enjoy passing through this stretch of forest far more safely.

[www.rfa.nsw.gov.au](http://www.rfa.nsw.gov.au)

# MOVING THE EARTH

McLennan Earthmoving provided various quarry products along with plant and equipment for the Glenugie Upgrade Alliance, which is responsible for the \$60m upgrade of a 7km section of the Pacific Highway south of Grafton between Franklins Road and Eight Mile Lane.

Working on the Glenugie Upgrade required McLennan Earthmoving to meet the specifications of a DGB20 Heavy Duty Base material which is a relatively new product for the region. McLennan Earthmoving also has a range of crushing and screening equipment producing concrete aggregates, sealing aggregates, drainage materials, road bases and rock.

Located in Grafton and established in 1992, McLennan Earthmoving is an earthmoving and civil construction contractor servicing the North Coast area for commercial, government and private projects. Current projects the company is working on include the Grafton GP Super Clinic, New Water Based Hockey Field in Grafton, Copmanhurst Public School Sportsgrounds

and the subdivisions at Arthur Street and North Street, Grafton. A member of the Civil Contractors Federation, the company prides itself on its ability to deliver the latest methods of construction for all projects with its current and well maintained fleet of plant and equipment, all of which are hired out with their own licensed and experienced operators.

McLennan Earthmoving performs high quality work to schedule and to budget, with a strong commitment to managing risk for all involved on site.

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## SAVVY ENVIRONMENTAL ADVICE

Onsite Environmental Management (OSEM) was approved by the NSW Department of Planning and Infrastructure as the independent environmental management representative on the Glenugie Upgrade project. The role required an experienced team of environmental professionals to act separately from the construction team to ensure that all aspects of the approval conditions, environmental assessments and licences were adhered to.

The project was constructed through a section of Glenugie State Forest adjacent to the existing Pacific Highway. Due to the presence of several threatened fauna and flora species on the alignment, strict limits were imposed on the clearing of vegetation and fauna habitat areas. The project design included two arch structures across Nine Mile and Glenugie Creeks incorporating fauna and fish passage structures. Other fauna crossing structures were also built, including aerial rope ladder crossings for gliders and arboreal fauna and dedicated culvert structures fitted with rails and logs to convey fauna beneath the roadway.

OSEM audited compliance with all management plans, approval conditions and licence requirements. Advice was also provided on revegetation, monitoring and approval requirements. OSEM conducted regular inspections to monitor the project. As a result of good management, the project achieved a consistent green environmental performance status and remains the RTA flagship for environmental performance. OSEM will continue to conduct environmental monitoring of the unique rehabilitation methods on the project over the next 5 years.

The company was formed in 2004 by ecologist David Bone after he had worked for 15 years in large environmental planning consultancies. He saw a need for experienced and practical site based management staff on construction and mine development sites during those years of planning approval negotiations, compliance auditing and due diligence studies. Clients always commented on the lack of site-experienced personnel available and the apparent inability of large firms to provide staff with practical construction and development experience. OSEM's focus is on the activities required to get a project running and keep it running. The company is now recognised as a trusted provider of 'construction savvy' environmental professionals.

Because OSEM employs only qualified and experienced environmental engineers (certified to CPESC qualifications) and ecology graduates, the ability to identify and manage flora and fauna issues along with sediment and erosion control, noise, vibration, air and water quality issues is all available in house.

### ONSITE ENVIRONMENTAL MANAGEMENT

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