


**SOLID, SAFE
AND LASTING**

Hunter Expressway Paves the Way

Background

The forty kilometre, four lane, dual carriageway expressway provides a more direct and efficient route for freight movements between the Upper Hunter coal fields and the export facility of Newcastle.

AT A GLANCE

Project: Hunter Expressway

Main concrete elements:

- Plain Concrete Pavement
- Continuously Reinforced Concrete Pavement

Photographer: Ben Williams

The Challenge

The Port of Newcastle is the busiest port in New South Wales, handling seventy five percent of the State's total international trade. This level of heavy traffic punishment demands a pavement of superior strength and durability.

Solution/Outcome

Concrete pavements were chosen for a major portion of the Hunter Expressway which is a vital link between the important export city of Newcastle and the upper Hunter River Region of New South Wales.

Concrete pavements are renowned for their long life and low maintenance especially when the going gets tough. They provide a service life of forty years under the most extreme of conditions and will do it with minimum fuss. They are an invaluable asset to the Hunter Expressway as the main artery to the Newcastle International Port.

Export movement at Newcastle doesn't stop and neither can its main supply artery. This is the level of dependability that's demanded and this is the level of reliability that concrete pavements deliver.

The Hunter Expressway project was complex and large and was divided into two sections for contract. The Eastern section was thirteen kilometres long and was designed and constructed by the Hunter Expressway Alliance consisting of: Roads and Maritime Services of New South Wales, Thiess Pty Ltd, Parsons Brinckerhoff and Hyder Consulting.

The Western section was twenty seven kilometres long and as a design and construct contract was completed by Abigroup Contractors Pty Ltd. The total value of the project was \$1.7 billion with the Federal Government providing almost ninety per cent of the funding.



The project is one of the biggest in the Hunter Region, and as it traverses significant environmentally important areas it was built to strict environmental standards. As a challenging project concrete provided the solution. Varying foundation support conditions required a variety of pavement solutions and consequently two forms of concrete pavement were used in different job sections: utilising both Plain and Continuously Reinforced varieties of Concrete Pavement.

The first form was a Plain Concrete Pavement consisting of a 280 mm thick 35 MPa Base constructed over a 150 mm thick 5 MPa Subbase. The second form was a Continuously Reinforced Concrete Pavement consisting of a 250 mm thick 35 MPa Base constructed again over a 150 mm thick 5 MPa Subbase. In both cases the Base was debonded from the Subbase with a 7 mm Spray Seal over a wax curing compound.

The Plain Concrete Pavement contains no steel reinforcement and utilises a system of transverse and longitudinal jointing to manage cracking behaviour. The Continuously Reinforced Concrete Pavement has continuous longitudinal reinforcing steel consisting of N16 bars at 120 mm centres with the transverse steel consisting of N16 bars at 400 mm spacing.



An interesting initiative that was undertaken on some of the concrete pavements in the Hunter Expressway is a surface treatment called Diamond Grinding. In this process small width longitudinal grooves are cut into the surface after the concrete has hardened.

This process delivers a road surface texture that produces a smoother vehicle ride with increased traffic traction and lower perceptible traffic noise: providing a world class road surface texture. With the innate strength and durability of concrete this world class pavement is there for keeps.

Using concrete as the actual trafficable road surface holds considerable benefit and advantage in terms of the low cost of annual maintenance. Concrete is a strong, robust and durable material that resists erosion and deterioration under the rigorous and demanding punishment of traffic.



Concrete pavements durability and strength reduce the need for extensive maintenance and rehabilitation of road surfacing giving a benefit to the road network and a saving to the taxpayer. Additionally Concrete pavements allow a road network manager respite from the never ending and ever increasing road maintenance burden allowing greater control over pavement system management.

Concrete pavements having less repair requirement require less repair downtime, improving traffic access and flow and give a superior service to the traffic network.

The Hunter Expressway, as a valuable gateway to the important export city of Newcastle, requires a dependable and reliable pavement. Concrete pavements provide that dependability and reliability producing a motorway that performs and lasts under extreme conditions. When strength, durability and performance are required concrete pavements are the answer.

BENEFITS OF USING CONCRETE:

- Low maintenance costs
- Durability and strength
- Resistant to erosion and deterioration