

# Job Reference

MBrace® Gives a  
New Lease of Life  
to a Melbourne Icon

## High Performance Repairs and Structural Strengthening

**Project:**  
Flinders Street Railway Station

**Client:**  
Connex

**Contractor:**  
Eptec Pty Ltd

**Location:**  
Melbourne, Victoria

**Completed:**  
2007

**Products:**  
Concresive® 1375  
Concresive® 1444  
Masterseal® 160D  
Masterflow® 870  
Barra® Mortar HL  
Sonoshield® Sonoguard  
MBrace® Fibre Reinforcement  
System

 **BASF**

The Chemical Company



## Project Background

Completed in 1910, Flinders Street Station is recognised nationally as a Melbourne 'icon'. Indeed, for many people, 'under the clocks at the Flinders Street Station' is still the preferred place to meet in the Melbourne CBD.

While the station continues to serve as the central access point for rail services in the Melbourne CBD, nearly 100 years of continual use was beginning to take toll on the structure. With that in mind, the Victorian Government implemented a \$13 million program to strengthen the deck of the station concourse, together with an additional \$10 million refurbishment and upgrade program to improve facilities, make it more accessible and enhance its visual appeal.



## The Solution

The concourse level upgrade works incorporated the use of a state-of-the-art MBrace® Fibre Reinforcement System. Based on Carbon, Aramid and Glass fibre technologies, MBrace® provides the ideal combination of high strength, lightweight materials and corrosion resistance. The Flinders Street Station application involved the application of MBrace® CF120 unidirectional carbon fibre sheets to the underside of the concourse structure.

The contract for the MBrace® application work was awarded to Sydney-based company Eptec Pty Ltd. In order to minimise the impact of the works on commuters and the day-to-day operations of the station, Connex (the operators of Melbourne's train and tram network) re-routed trains away from the tracks directly below the area where the work was being carried out.

Once the build-up of dirt and grime had been removed from the underside of the concourse slab, exposed cracks were injected with Concessive® 1375, a low-viscosity, high strength epoxy injection resin. The surface was then levelled with BASF's Concessive® 1444 - a thixotropic epoxy mortar paste binder and adhesive - prior to the application of the MBrace® CF120 sheets, which are held in place using the specially-formulated MBrace® Saturant. Over 2,000m<sup>2</sup> of MBrace® sheets were used in the Flinders Street Station project.

The concourse strengthening project also included filling the hollow cast iron columns that support the slab with Masterflow® 870 flowable grout, resulting in solid columns with a strength of over 70MPa. The final stage of the concourse works saw an application of BASF's Masterseal® 160D to protect the concrete arches under the slab and the steel beams from environmental attack from carbon dioxide and chloride ions. The Masterseal® 160D was colour-matched to the 'Flinders Street Heritage Yellow' colour that is so prominent throughout the station.

BASF products were also used to waterproof the historic station awning that forms the interface between the station and the adjacent taxi rank on Swanston Street. Following profiling with Barra® Mortar HL (a lightweight polymer modified repair mortar) to provide adequate fall for drainage, the roof behind the famous dome was waterproofed with Sonoshield® Sonoguard. Specifically developed for vehicular and pedestrian traffic areas, Sonoshield® Sonoguard is a liquid applied moisture-cure polyurethane membrane with an integral aggregate surface that combines long-term waterproofing protection with continuously elastomeric properties and a non-slip surface.

## The Result

Both the repair and strengthening works along the concourse level, and the waterproofing works along the station's awning were completed successfully - improving the structural integrity and condition of the iconic building, whilst enhancing its historic aesthetic appeal.



## The Challenge

Increase the structural strength of the Station's concourse to enable it to cope with the increased loads associated with current activities while preserving the historic value of this Australian icon.

The Flinders Street Station project offered some additional challenges, including: minimising the impact of the works on commuters and the day-to-day operations of the station work; scheduling works amidst an operating railway station; and dealing with over 100 years of built-up dirt and grime on the concrete surface.

