



# Chapel Street, South Yarra

**BRIDGING THE TRACKS IN STEEL – TURNING EMPTY AIR SPACE INTO VALUABLE COMMERCIAL PROPERTY**



**THE BUILDING DEVELOPMENT LOCATED ABOVE THE RAIL LINE ON THE SOUTH EAST SIDE OF CHAPEL STREET AND THE CORNER OF PALERMO STREETS, SOUTH YARRA IS JUST ONE OF SEVERAL LOCATIONS IN MELBOURNE TAKING ADVANTAGE OF EMPTY AIR SPACE OVER ESTABLISHED RAIL LINES TO CREATE A DECK AND ACCOMMODATE NEW COMMERCIAL USES (THE HIGH PROFILE FEDERATION SQUARE IS ANOTHER) MAXIMISING LAND USE AND MEETING DEMAND FOR SPACE IN THE INNER CITY.**

**BUILDING CONTRACTOR**  
**Probuild Constructions**

**STEEL FABRICATOR**  
**GFC Industries**

**ARCHITECT**  
**SJB Architects**

**STRUCTURAL ENGINEER**  
**Bonacci Group**

**FIRE ENGINEERING**  
**Philip Chun and Associates**

Located at the corner of Palermo Street, the Chapel Street project is typical of many suburban shopping centres. Part of the single storey building incorporates a number of major retail outlets positioned on the composite steel deck bridging the busy railway tracks on the south east side of Chapel Street.

Steel beams were the natural choice for this deck as they offer high strength-to-weight ratio and fast erection. Grade 400 OneSteel welded beams at close centres span a distance of some 26 metres. These beams support a 150mm lightweight concrete slab poured on 1.0mm permanent metal deck formwork and act compositely with the concrete deck.

Dr Ian Bennetts from OneSteel's fire research group at the Victoria University of Technology carried out a fire engineering and risk assessment of the deck structure and the superstructure. The roof level plate girder at the Chapel Street frontage and its stabilising elements were fire-rated by spray application. This element had to be relied on to support the deck structure, in the event of a fire without any risk to the trains operating below.

The beams are painted but have no fire protective coating as the bare steel construction has sufficient fire resistance. Also it has been estimated that the probability of a major fire within a train at this location is less than one in a million per year.

Traditionally, construction over railway tracks has been required to have high levels of fire resistance, sometimes up to four hours. However it is now recognised that each project needs its own individual fire-

engineering assessment. In this particular case, the risk-to-life due to a fire in the building above the deck is considerably greater than that associated with the activity of trains below. Similarly, it was demonstrated that for the train occupants, the greatest threat to life, should there be a fire below the deck, is from the smoke and flames within the train, as opposed to the deformation of the deck structure above the train.

