



Safespan on the Tinsley Viaduct

No bridge too far.....too long, high, wide, complex.....

Safespan is a revolutionary access system for use on civil engineering projects. Developed in the United States in the 1990's, Safespan has been used on over 100 bridge projects.

Safespan Europe, a division of Turner Access, was established in 2001 to promote the use of Safespan in the United Kingdom and continental Europe.

The first major contract won by Safespan Europe was on Tinsley Viaduct, a twin-deck structure over one kilometre in length. The Safespan installation on Tinsley Viaduct is believed to be the world's largest ever suspended access platform. Quite a challenge!

Introduction

Opened in 1968, Tinsley Viaduct was the first twin deck highways structure in Britain to be built using steel box girders. The viaduct is over 1 km long and is perhaps Sheffield's most prominent civil engineering landmark. The two decks of the viaduct are supported by longitudinal box girders and crossbeams which transfer load to the structure's 17 piers. (Photo - General bird's eye view of the viaduct).

The upper deck of the viaduct carries the M1, a key transport link between London and the North of England; the lower deck carries the A631, a major trunk road. The viaduct now carries over 40 million vehicles every year of which almost a quarter are heavy goods vehicles. This equates to an average daily traffic flow of almost 120,000 vehicles – far more than was originally envisaged when it was designed.

Between 1969 and 1971 several catastrophic failures occurred during the erection stage of box girder bridges including the Cleddau Bridge at Milford Haven in Wales. The Merrison Committee¹ was set up in December 1970 and published guidelines for the design, construction and assessment of box girder bridges.

Tinsley viaduct was strengthened between 1973 and 1980 in line with Merrison's recommendations through the addition of a series of inclined raking struts (Photo: Raking struts). By the late 1990s it was clear that further strengthening works were required when the viaduct was assessed by consulting engineers, Owen Williams, for compliance with an EU directive² requiring all structures supporting main roads to be capable of carrying 40t vehicles. Tinsley Viaduct was found not to have sufficient capacity to accommodate 40t vehicles and as a result the upper deck was restricted to two running lanes in each direction.

The requirement for major strengthening works was established as being the most cost-effective solution compared to the cost of a replacement structure or alternative road layout. Whilst the viaduct cost only £6mn to build in the 1960s, the rebuild cost in 2002 was estimated at almost £200mn with an additional £1.4bn of costs inflicted on the national economy due to traffic delays and disruption during the construction period.

