



Cem-FIL® GRC in Mass Transit

Bangkok BTS “Skytrain”

INTRODUCTION:

The BTS “Skytrain” is the first Mass Transit system to be completed in Thailand.

Designed to carry up to 700,000 passengers per day, the first dual-track phase of this project extended for 23km through the heart of Bangkok. The entire project is elevated, in most parts 12m above street level, and many of the stations along its length have “skylinks” into adjacent commercial buildings, shopping malls, etc.

GRC APPLICATIONS:

The initial choice of GRC for the parapets was based on their ability as noise barriers. For most of its length the elevated track is very close to the buildings lining the streets, so the GRC was required to provide the necessary level of noise reduction whilst minimising the weight on the elevated structure. It was then decided to use GRC also for the quadrant-shaped panels at the base of the parapets.

The civil engineering main contractor for the project was Italian-Thai, and they elected to set-up their own GRC factory to manufacture the panels rather than subcontracting the work. GRC production started in 1994, and this 23km first phase of the project was completed in 1999.

The Electrical and Trackwork contractor, and supplier of the trains was Siemens. They also found a need for GRC products, and specified the use of GRC cable ducting for the signalling cables for the complete 23km project length. In the event of the train needing to be evacuated on the viaduct, Siemens also needed a means to protect the signalling cables from damage at locations where they crossed between the two rail plinths. At this point the cable was suspended and exposed. They also had to avoid the use of anything metallic in close proximity to the cables (i.e. no steel reinforcement).

The solution was the use of GRC evacuation bridges, which ranged from 1.5 – 7m in length. These were designed to support an equivalent weight of 4 people moving or 6 people standing per square metre, and were well tested by Siemens engineers. The GRC steps onto the evacuation bridges were perforated to reduce the wind load on the steps as the trains passed, and also to enable the drainage of water during heavy rain.

In total, the first phase of this project consumed approximately 5,000 tonnes of Cem-FIL® GRC, making it the largest GRC project of its time in SE Asia.

FACTS:

- First Mass Transit system in Bangkok, opened in Dec. 1999
- 46 km of GRC parapets and quadrant panels
- 23km of GRC cable ducts
- > 5,000 tonnes of Cem-FIL® GRC produced over 6 years



GRC Noise Barriers and Quadrant Panels



GRC Evacuation Bridge

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