

### **Giving railway heritage structures a new lease of life**

The four bridges at Rail Corridor (Central) have been sensitively restored and refurbished. These include the two iconic conserved truss bridges at Upper Bukit Timah Road and Bukit Timah Road, a steel girder bridge over Hindhede Drive, as well as the former Singapore Quarry concrete bridge.

#### Sensitive restoration works and safety features

Following structural investigations, the bridges were sensitively repaired and refurbished in three stages:

*a. Repairing and repainting the main bridge structure*

For the two truss bridges, we erected three-tier scaffolds that cantilevered over both sides of the bridges to allow workers to grind off old paint and rust from surfaces and repair the damaged steel members. Old paint and rust were also removed from Hindhede Bridge and new protective paint applied to prevent future corrosion.

We sealed gaps in the truss bridges to prevent rainwater from collecting. The damaged members of the Hindhede Bridge's girder structure were either carefully knocked back into shape or cut and replaced.

In addition, cracks on the Hindhede Bridge abutment, discovered during the construction of the new underpass, were stitched up with rebars and sealed.

We also added reinforcement bars, patched pieces of concrete that had fallen off the ceiling and columns of the Singapore Quarry Bridge, and left the bridge unpainted to retain a weathered look.

*b. Prolonging the lifespan of the bridge deck*

To repair and restore the steel decks, and to lay the new waterproofing membrane, we had to remove the rails, timber, concrete sleepers and ballast stones from the bridges before the old bitumen layer underneath could be removed and new waterproofing installed.

The position and condition of every piece of timber and concrete sleeper were carefully documented before removal in order to facilitate the subsequent reinstallation process. Laser scanning technology was adopted to ensure accuracy and effectiveness in the process.

Over at the Singapore Quarry Bridge, we added a new layer of waterproofing on the surface of the deck and the two side walls.

*c. Making the bridge safer and more accessible for its new use as a pedestrian bridge*

To make these bridges more inclusive and safer for visitors of all ages and abilities, safety features were sensitively introduced, like railings and improved flooring for the metal bridges. The ballast stones were re-laid to form a contiguous, flat and even path on both sides of the rails. Besides retaining the look and feel of the bridge, the improved path is suitable for visitors both on foot and on wheels.

In addition, we restored a damaged brick staircase at Hindhede Bridge and installed new railings at the sides of all steel bridges to protect visitors from falling over. Several options were considered and evaluated with the Friends of Rail Corridor before we selected the eventual light and porous design for the railings.

**Before enhancement works**



*Truss bridge before enhancements*

**After enhancement works**



*Restored truss bridge*



*The truss bridge had large openings at the sides*



*New railings were added*



*Old railway track sleepers at Hindhede*