

KCRC Crossover Doors

Kowloon, Hong Kong

The doors shown in the pictures are for the Tai Lam tunnel train track crossover which allows trains to change track to be repositioned on the other line. Doors must be installed to close off the passage during normal operation. The doors are designed to separate the two running tunnels to provide a 4-hour fire barrier.

The door system consists of two sliding leaves each approximately 27 metres long and nearly 6 metres high. Each leaf weighs 45 tonnes. They move on two wheels housed in easy-access wheel boxes which run on rails recessed in the concrete floor underneath and fixed in grout. When the door is closed it is lowered to produce a structural gap between door and floor of only 10mm. The doors are made of structured steel sections clad with 5mm plate to help distribute the load. Fire cladding is then attached to the steel plate which provides a 4-hour fire resistance.

How do you open two 45-tonne doors? Very slowly. To open the doors they first have to be raised out of the floor well, two hydraulic jacks under each wheel lift a section of rail in about 20 seconds, then they are slowly driven open at 100mm/sec. The last 150mm is in creep mode and moves at 25mm/sec. The whole process takes approximately 8 minutes for each leaf.

The doors can be operated from any of the four local control panels located 50 meters in both directions from the doors in both tunnels or from the main tunnel control centre. The doors can also be operated manually in the event of power failure.

Bennett Associates (originally founded in 1984) was acquired in 2008 by Atkins; bringing their proven technical expertise to the UK's leading engineering consultancy.

