



## Autoripage® of an 800 Tonne Subway Rochester Station

**Client**  
Network Rail  
**Principal Contractor**  
C Spencer Limited  
**Works Commenced**  
April 2014  
**Works Completed**  
April 2014



Freyssinet's Autoripage® technique is used when a structure is built to one side of the track. When the rail blockade has been secured, the track and embankment are removed and the newly exposed ground is levelled. The structure is then slid from its constructed position beside the tracks to its final position.

Freyssinet were appointed as a specialist sliding subcontractor in October 2013 by the principal contractor, C Spencer Limited. The reinforced concrete subway box had already been constructed at one side of the tracks, weighing 800 tonnes and measuring 27.6m long by 7.6m wide by 4m high. Freyssinet were required to slide the subway 36m across the line of the tracks.

The construction of the subway box was modified in liaison with the Freyssinet design department to accommodate the Autoripage® technique by adding 10 corbels, five on each side. These measured 1.6m by 0.7m wide by 2.5m high, forming lifting points for the 10no 385 tonne capacity lifting jacks. This created a lifting capacity of 3850tonnes, significantly greater than the required 800tonnes. This redundant capacity ensured that if one jack should fail, the others would cope with the added weight. In addition, it reduced the bearing pressure on the ground for each jack position by spreading the load over 10 points.

Upon commencement of the contract, Freyssinet installed the 10m long steel skidways, two weeks prior to the slide. These were lined, levelled and bolted together to form a continuous track either side of the subway. Hydraulic lifting jacks complete with the Air Pad Sliding (APS) feet were placed on the skidway and bolted to the underside of each of the 10 concrete corbels. In order to keep the support pressure uniform, the jacks were linked to a central control system.

Each jack was fixed to a 1125mm square APS foot. Nitrogen was then injected under pressure, held in the foot plate by a rubber seal. This meant the subway effectively 'floated' as it was pushed along the skidways, creating a low friction of 1%.

Freyssinet used twin push-pull jacks to move the subway. These push-pull jacks had a 1200mm stroke and automatically clipped onto the skidway, retracted, re-clipped and repeated throughout the sliding process. The jacks were able to achieve a speed of 20m per hour, saving vital time during a blockage operation.

When the subway had been placed in its final destination, the lifting jacks were depressurised and the subway was allowed to settle down onto the ground. The jacks and skidways were then removed to allow the backfilling operation to commence.

The works were completed on budget and on time to the client's satisfaction.

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