

Peartree Station Bridge



PARAPET WALL STRENGTHENING

Peartree Station Bridge carries the Derby ring road (A5111) over the main rail connection between Derby and Birmingham. For reasons of safety both the North and South 40m long parapet walls required significant strengthening. A level of containment in excess of P1 was agreed based upon the 1500mm wall comprised of brick with a concrete core. A detailed survey and bridge analysis revealed highly variable brick quality, an unpredicted sandy core fill and extensive services running through the structure. A large gas main near the north wall (fig 1) further complicated drilling and anchor placement. An engineering solution was provided by Gifford's and Southampton using an extensive array of Cintec anchors installed vertically, horizontally and diagonally. Work commenced in early 2004. With the use of non-percussive diamond core drilling, vertical anchors of 25mm diameter high grade stainless steel were installed through the parapet wall in 65mm diameter holes, these varied in lengths of 1.3 to 3.6 meters.

A matrix of over 600 smaller 10mm diameter consolidating anchors 0.5m in length (fig 2) ensured both the brick and concrete elements of each wall acted together in the event of a vehicle impact. 16mm diameter transverse anchors within the barrel of the arch (fig 3) were installed to spread the load of an impact into the body of the structure and finally a series of 32mm raking anchors were installed diagonally from the base of the concrete wall lintel (fig 4) and secured at their base into tapered holes to ensure a maximum required loading of 245kN.

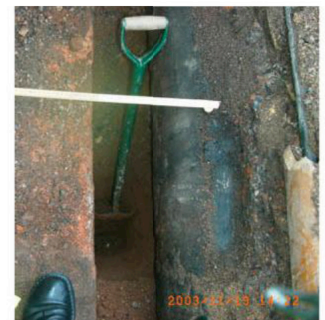


Fig 1. Excavations revealed a large gas main close to the north wall.

