

# Fife ITS M90 & A92—Mine Workings Consolidation

## Project Profile

**Client:** Graham Construction for  
Transport Scotland

**Value:** £359k



Treatment of shallow coal workings carried out in three locations as advance works for construction of new overhead information gantries on the approach roads to the new Forth Road Crossing. The three areas requiring treatment were situated beneath the M90 and A92 roads. The site investigations had identified workings in one seam below Gantry 08 and in two seams at gantries 18 and 20. Gantry 08 was located on the M90, with G18 and G20 located on the A92. Throughout the work one lane was closed in each direction and a 40mph speed limit enforced.

The treatment areas were designed adopting a 3.5m grid spacing. As the vast majority of the holes were located under live carriageways, they were drilled at an angle from safe working areas at each side of the carriageway using the hard shoulder and the closed inside lanes.

- 805 boreholes of up to 50m in depth were drilled equating to a total of 24,800 m.
- 3,580 Tonnes of PFA/Cement infill grout was injected into the workings.
- On completion of the works grout acceptance tests were carried out at each gantry to validate the treatment effectiveness.

In addition to the treating the shallow mine workings, we also carried out proof grouting in the superficial deposits beneath the foundations pads at Gantry 18 to improve ground bearing capacity. This area had previously been the site of an opencast mining operation. The proof grouting process involved drilling steel casing to rockhead and then injecting grout under controlled pressure in 1 metre lifts to ground level using end-of-casing techniques. The limiting pressure was calculated as 10kN/m<sup>2</sup> per metre depth. In this section 150T of grout was injected into 52 holes.

As this project was carried out on and adjacent to live dual carriageways high standards of Health and Safety had to be maintained at all times. This approach is one which lies at the heart of the Forkers Scotland philosophy and we were proud to be recognised for this “Continued commitment to Health and Safety” with the presentation of an award by main contractor Grahams.

