

Govanhill 4 Sites—Mining Consolidation Works, Glasgow

Client: Glasgow City Council

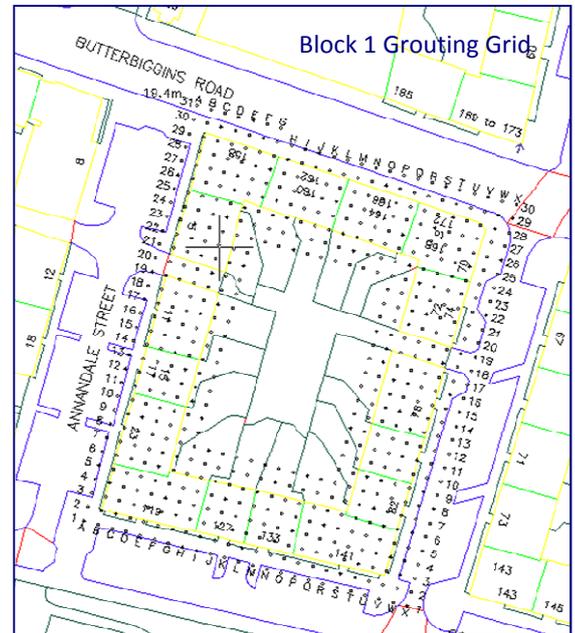
Value: £500k

Date: Feb—May 2011

This scheme was carried out for Govanhill Housing Association and involved treating shallow coal workings beneath 4 large residential housing blocks, Coplaw Street (Site 1), Inglefield Street (Site 2), Langside Road (Site 3) & South Annandale Street (Site 4).

Previous site investigations had identified that three coal seams, conjectured to be the Ell, Main and Upper Coals, were found to underlie the site at shallow depth. The Ell outcropped beneath the South Eastern corner of Block 1 and the Main cropping half way up Blocks 2 and 3 and beneath the North Western tip of Block 1, the general dip being to the south east. The Upper Coal lay beneath Block 4 however it was anticipated that this seam may not have been worked in this location and a trial drilling and grouting exercise proved this to be the case.

The treatment works design required that a 3m grouting grid was completed over the footprint of the housing blocks however this necessitated that the majority of the boreholes were angle drilled at up to 50° to the vertical. (See Block 1 plan above).



Drilling work was carried out from the streets surrounding the blocks using versatile Casagrande C6 rotary percussive drilling rigs with multi-angling kinematics however for Block 1, at our suggestion, it was agreed to complete a large proportion of the drilling from the rear courtyard.

The principal quantities involved were;

- 794 No rotary percussive boreholes up to 35m deep (50m drilled depth) - 24,500m of drilling
- Up to 20m of 88.9mm dia rotary percussive steel casing was used in all drill holes to case off overburden
- 424.45 Tonnes of pfa/cement infill grout injected to the workings
- A number of grout acceptance test holes were completed to validate treatment effectiveness



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The housing blocks were situated in the vicinity of Govanhill Park and it was agreed with Glasgow City Council Parks Division to establish a 60m x 60m site compound in a quadrant of the park adjacent to Site 1 at Coplaw Street, the area providing space for grout materials storage, grout mixing plant, water storage, flush returns settlement tanks and general plant and materials storage which would otherwise have had to have been set up on the streets surrounding the housing blocks. The bulk pfa storage and grout mixing areas were container surrounded to provide pfa bunkering, worksite screening and control of dust and noise nuisance. This central, off street compound location ensured that close management and cleanliness of the grouting operation could be achieved. Mixed grout and flushing water for the drill rigs were pumped from the compound through a bank of unobtrusively placed HDPE pipelines which were extended to each treatment area. Collected flush returns were also pumped back to the compound for treatment.

Prior to drilling, CAT scanning and trial pits were carried out to locate or prove the absence of services and utilities, up to 8 drill holes at varying angles were completed from each trial pit through plastic sleeves placed at the correct angle in the backfilled pit. Where drilling was carried out in the roads, it was generally from the block paved parking bays along the building frontages. The block paving was removed in advance of the work and the area temporarily filled with type 1 stone to form a working platform.



Drilling from the backcourts area of Block 1 resulted in removing the need to drill from 3 of the streets surrounding the block. This significantly reduced disruption to traffic and to parking. While increasing some of the drill hole lengths there were significant savings in preliminary works, trial holes, fencing, traffic management and reinstatements. As a result no parking was lost on three sides of Block 1 and there was no requirement to use the opening permits on Inglefield and Annandale Streets.

Customer care and community liaison were given the highest priority during the work and we ensured that continuous attention was given to site tidiness, cleanliness and high quality reinstatement. Our alternative proposals for the compound location and drilling from backcourts significantly reduced the impact, inconvenience and nuisance of the scheme on the public during the work. Commendations have been received from Glasgow City Council Engineers and residents for our commitment to customer care during the work.

