

# Dixon Avenue—Mining Consolidation Works, Govanhill, Glasgow

## Project Profile

**Client:** Glasgow City Council

**Designer:** Glasgow City Council

**Value:** £680k



This scheme was designed to consolidate abandoned mine workings in the 'Ell' and 'Upper' coal seams below a large residential tenement block in Govanhill, South Glasgow.

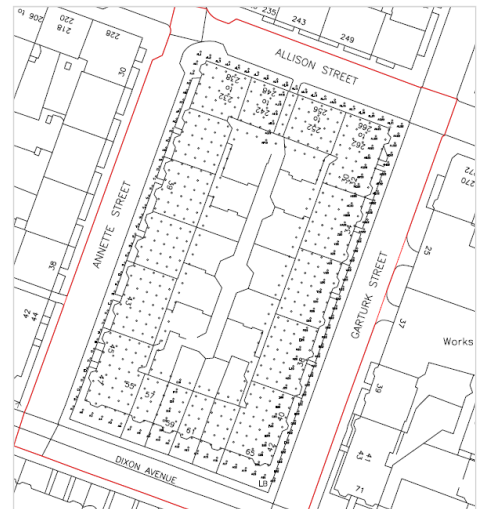
We proposed in our tender that a large proportion of the drilling was carried out from the rear courtyard of the housing block to avoid disruption to both traffic and to parking in the busy surrounding streets however a limited amount of drilling from on-street locations was unavoidable in order to ensure treatment works could be satisfactorily completed. While increasing some of the drill hole lengths there were significant savings in preliminary works, trial holes, fencing, traffic management and reinstatements.

The treatment works design required that a 3m drilling and grouting grid was completed over the footprint of the housing blocks which necessitated that the majority of the boreholes were angle drilled at up to 50° to the vertical. (see plan opposite).

On-street boreholes completed from the carriageway were drilled from a series of 1.5m x 1.5m x 1.5m trial pits which exposed any services present but also contained the flush returns from the water flush drilling allowing it to be pumped to a settlement facility at the compound before discharge to sewer. Up to 8 drill holes were completed at varying angles from each trial pit through plastic sleeves placed at the correct angle.

The work carried out included;

- A total of 580 treatment holes were drilled (13,241m of drilling)
- A number of grout acceptance test holes were completed to validate treatment effectiveness
- 330 tonnes of 10:1 PFA/Cement grout was injected into the workings.
- Rotary percussive steel casing was used in all drill holes to case-off overburden
- Water flush drilling was used throughout with returned flush water collected and pumped to the compound for treatment
- Holes were drilled with 101mm OD rotary percussive steel casing drilled and sealed into rockhead followed by drilling a 75mm open hole allowing insertion of 50mm MDPE grout tremmie pipes.



# Dixon Avenue—Mining Consolidation Works, Govanhill, Glasgow (Cont'd).

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The compound was set up on Annette Street with the area providing space for grout materials storage, grout mixing plant, water storage, flush returns settlement tanks and general plant and materials storage. The grout materials storage and mixing area was enclosed with heras fence panels backed with debris netting in order to provide worksite screening as well as to control dust or grout splash nuisance.

Grout was mixed using a 2.5m<sup>3</sup> Edeco mixer, held in agitation tank and pumped through unobtrusively placed HDPE pipelines through one of the entries into the back court area. This single compound location ensured that close management and cleanliness of the grouting operation could be achieved

As the dwellings were still occupied while the work was carried out we minimised the impact on the residents by erecting hoardings around the working area in the back courts to act as a noise buffer and also to contain dust, water and any grout splashes.

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, debris removal and high quality reinstatement of paths, fences and grassed areas on completion as shown in the photos opposite.

Our proposals for drilling from the backcourts significantly reduced the impact, inconvenience and nuisance of the scheme on the public during the work.

