

Hydraulically treated soils in residential construction

John Kennedy and Julie Bregulla





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1 Overview

This publication focuses on soil treatment for residential construction using lime, cement, ground granulated blastfurnace slag (ggbs) and coal fly ash. Whilst the application of soil treatment has been common for road and airport construction since the 1970s in the UK, its use in residential application has been more limited. This guidance draws on available knowledge and provides information on the technical issues to be reviewed when considering its use.

This report is subdivided into four parts, followed by appendices:

- Part I: Introduction
- Part II : Principles of soil treatment
- Part III: Design
- Part IV: Realisation in the field
- Part V: Appendices.

The guidance is intended to inform developers, engineers and other building professionals considering the use of soil treatment and wanting to learn more about the subject and its application. It also suggests a regime of validation and testing to support the review of suitability and appropriateness of the technique.

In this guidance, 'treatment' refers to the process of using lime, cement, ggbs and coal fly ash to render mainly wet natural or reworked natural soils suitable for use as engineered fill. The treatment, which uses the ability of the treating agents to alter favourably the properties of the soil, usually by removing free or excess water from the soil, is then competent to support foundations, ground floors, services and infrastructures without excessive deformation.

The processes reviewed in this report use the traditional technique of in situ soil treatment to produce successive horizontal layers of treated soil. There are also techniques that use deep column mixing or injection techniques applied vertically. These are not covered.

Horizontal-layer soil treatment using lime and/or cement has a long history in the road and pavement sectors. It is also used for:

- improvement of trafficking on construction sites
- construction of car and lorry park pavements
- foundations for industrial floor slabs (mainly large commercial)
- pavements for airport runways, taxiways and aprons
- reclamation and remediation of contaminated land.

As a result of this diversification in use, there is a substantial body of work and information on the subject, the vast majority of which is concerned with pavement works and remediation. There is little, if any, current authoritative guidance specifically for housing development in the UK. The guidance here draws together learning and experience to provide recommendations for consideration of the technique for residential construction. The reader should ensure to refer to the latest version of all standards referred to in this report.

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