britpave
The British In-situ Concrete Paving Association

Stabilised floor enables pre-war building to be re-used

The refurbished building ready for use as warehouse/distribution centre

Introduction

In 2006 John Jones/Norwest were awarded the contract to redevelop an 27,500 m^2 building for use as a distribution/storage unit. Thought to date back to the inter-war years, it had been used to assemble aircraft, but there were doubts about the ability of the slab and the ground beneath it to support its new role.

The ground beneath the slab consisted of irregular deposits of firm clays; soft, wet, sandy clays; layers of mixed clay and decomposed vegetable matter; layers of very fibrous peat; and made ground (including clay, brick, gravel and plastic)

Design

All U1A (unsuitable) material was to be removed from under the slab area. As an alternative to importing suitable fill it was decided to assess the possibility of processing the U1A to give an acceptable general fill CBR of 5%. This is where Britpave members, Combined Stabilisation, were called in, and the production of a stabilised capping layer (CBR15%) was also investigated. Trial pits were dug to enable samples of all materials to be recovered and tested.

The U1A was tested for sulfate content according to TRL 447 and for organic content to BS 1377. Material destined for use as general fill underwent a series of tests designed to show the optimum lime addition needed to give both (1) an MCV of approximately 9 to allow placing and compaction as fill to HA requirements and (2) a CBR of 5% at seven days. The mixture for use in the cement treated surface layer was tested to establish its moisture/density relationship and from this the upper and lower moisture (MCV) limits for the works were chosen. CBR specimens were then prepared at dry density and moisture values equating to these limits. The specimens were tested in a soaked condition at seven and 28 days.

Construction

The works involved the excavation of all unsuitable material down to a point where existing ground properties were acceptable. This reached a depth of 6 m in some parts. The void so formed was re-filled with lime modified U1A, now acceptable material, in layers 300 mm deep. While the most efficient way to do this is in-situ, some areas were too small to allow access of the mixing rotovator