



Combined Soil Stabilisation



Combined Soil Stabilisation Limited

Case Study

Project Thunderbird 2 - Islip, Kettering

Presented by

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The British Cementitious Paving Association





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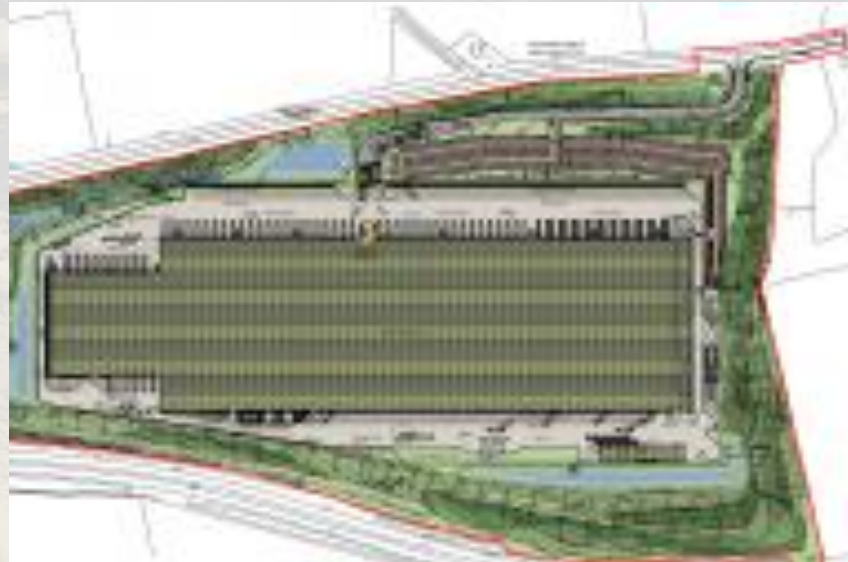




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The Project

- Thunderbird 2 (thought to be named after shape of site) – 1,060,000ft² distribution facility on a 70 acre site at Islip near Kettering
- £77m facility developed by London Metric for Primark and constructed by Sir Robert McAlpine
- Willowbrook Construction appointed as earthworks subcontractor
- Tight programme with known sulphate bearing soil issues





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Interested Parties

CSSL became involved through a recommendation from Sir Robert McAlpine following excellent performance on a large shed in Warrington. A number of parties involved;

- **Sir Robert McAlpine** – main contractor with an earthworks specification which had to be adopted
- **Hydrock** - designer for the earthworks and engineered fill and stone replacement option specification. Their specification had to be adopted
- **Nicholls Colton Group** - designer of the concrete slab to the building and had input into specification for any material placed under the building
- **WSP** – geotechnical engineer to London Metric had to agree to any specification issued to ensure acceptance with end user requirements

A collaborative, proactive teamworking approach was adopted in the interest of maintaining the progress of the project.





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Sampling

- CSSL responded quickly and took bulk samples back to a UKAS accredited laboratory for mix design
- Four party trial pit and sampling exercise involving Nicholls Colton (sulphate testing), Hydrock (Willowbrook's designer responsible for sign off), Willowbrook and CSSL
- Samples from stockpile and cut materials to be stabilised
- Sulphate testing at circa 500m³ and bulk sample at every 3rd location for mix design





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Testing & Mix Design – Phase 1

- CBR specimens for lime, lime and cement and lime and GGBS made prior to Xmas shutdown and soaked for period to determine heave potential
- Heave considerably lower than maximum tolerance
- Accelerated swell tests taken on cohesive materials
- Full mix design carried out in accordance with HA74/07
- Sulphate tests and mix design analysed
- Earthworks strategy developed for use of suite of mixes to a number of materials with differing end uses
- An Inspection and Test Plan developed by CSSL and agreed by all parties





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A Major Dilemma!

- Granular material depleted fast and not sufficient volume to stabilise as capping replacement
- All parties convinced of benefit of site won material
- Further trial pit and full sampling and testing exercise undertaken to determine the suitability of the site won Class 2 materials for a class 9E mixture for capping replacement
- Slightly elevated sulfate levels noted therefore decided to use a lime/GGBS mix for the class 2 materials
- Timescales remained an issue and the areas required handover after 7 days at 15% CBR - CSSL worked materials to lower moisture limits to achieve this





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Testing & Mix Design – Phase 2

- Lime/GGBS mix adopted for fill to mitigate sulfate potential as testing not as comprehensive
- Lime/cement mix adopted for stockpiled granular material used as capping replacement material to achieve 15% CBR
- Lime mix adopted for materials excavated from ponds as sulfate levels acceptable to achieve 5% CBR
- Ongoing sulfate testing continued from Phase 1 on all materials placed for stabilisation at a rate of 1 suite per 250m³ to cover and deal with hotspots





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The Works

- 10 week contract utilising up to 3 gangs (resourcing not stretched)
- 62,000m³ fill material lime treated to 5% CBR
- 12,000m³ material lime/GGBS treated to 5% CBR
- 40,000m² lime/cement stabilised Class 1 material as capping replacement to 15% CBR
- 39,000m² of lime/GGBS stabilised Class 2 material as capping replacement to 15% CBR





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The Benefits

- Saving around 53,000 tonnes of primary aggregates
- Approaching £550k landfill tax saving
- Over 5,000 wagon movements transporting waste and stone
- Vastly reduced disturbance to neighbours and wear on local infrastructure
- Fast track programme maintained following delayed start
- All testing carried out by UKAS accredited laboratory under CSSL guidance covering three specifications
- All parties very satisfied with the outcomes





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Our Credentials



ISO 9001
FS 20968



OHSAS 18001
OHS 549561



ISO 14001
EMS 549560



CONTRACTORS HEALTH & SAFETY ASSESSMENT SCHEME

Accredited Contractor
www.chas.gov.uk



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Contact

If you are interested in any of the services or products offered please don't hesitate to contact us:

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