



PARAGRID
The Ultimate Geogrid

Lower courses of acoustic bund



CASE STUDY

LONDON GATWICK AIRPORT ACOUSTIC BUND

GATWICK | UNITED KINGDOM

CLIENT NAME

BAA AIRPORTS LTD

MAIN CONTRACTOR NAME

CARILLION plc

CONSULTANT

SCOTT WILSON LTD

SPECIALIST REINFORCED

SOIL INSTALLER:

PML GEOTECH

PRODUCTS USED

PARAGRID®, BIOMAC® C

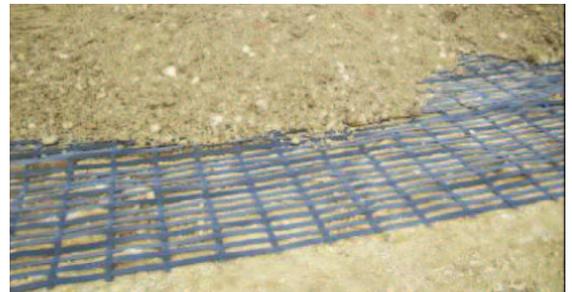
DATE OF CONSTRUCTION

Summer/Autumn 2009

PROBLEM

Investment in Gatwick Airport was required to increase flexibility for aircraft operators and to accommodate the new Airbus A380 aircraft, soon to be joining fleets around the world. 100,000m² of new aircraft stands and taxiways were to be constructed to the north-western side of the airport. The airport's nearest neighbours would be able to see the tail-fins of the A380 as the existing visual and acoustic bund at Gatwick airport stands at only 8m high.

Committed to ensuring that any development does not negatively impact the local area, the then airport operator, BBA Airports Ltd, wanted to increase the height of the visual and acoustic bund, thereby shielding the neighbours from visual impact.



Recycled granular fill was used at the base of the bund



Wrapping Paragrid geogrid back to form face of bund



Section showing Biomac C, Paragrid and face formwork

SOLUTION

Consulting engineers Scott Wilson and Maccaferri worked with main contractor Carillion plc, specialist soil reinforcement installer PML Geotech and fill supplier P.J.Brown, to optimise the complex relationship between:

- Geometry of the bund
- Available fill types
- Cost efficient use of geogrid reinforcement
- Design & construction of the bund

It was initially considered to use the site won Class 7C1 clay material as structural fill throughout the bund. However, finite element analysis revealed that pore water pressures would build up within the bund during construction

Working with local stakeholders and councils, it was determined that a 16m high bund was needed. Furthermore, it was to be constructed wherever possible using wite won fills, created through other works on the Gatwick campus. To maximize the space for development, it was decided that a soil reinforced bund would be required, with a 63' face on the airport side, and a gentle grassy slope on the outer face to the bund.



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Hydroseeding the bund during construction

CASE STUDY



The bund nearing full-height

This could have potentially led to an unstable situation in the short term before pore water pressures had the chance to dissipate. Therefore, in the tallest sections of the bund where this problem was greatest, recycled granular material was used in the lower layers of the bund.

Consideration was given to the use of Maccaferri's unique Paradrain® geogrid as it features an integral drainage channel with a filter fabric closure. This reduces pore water pressures in wet marginal fills. However, as the recycled granular fill was available at low cost, the economics of using Paradrain® were not beneficial enough.

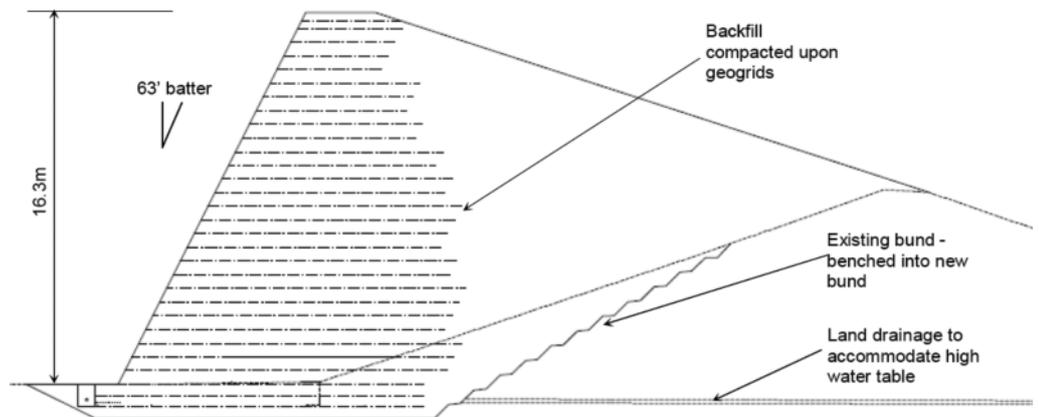
Maccaferri's Paragrid® geogrid (manufactured by Maccaferri's sister company Linear Composites in Yorkshire) was used as the soil reinforcement. Made from polyester with a tough polyethylene protective coating, it has high resistance to damage during installation. It is particularly suited for use with marginal fills. 200kN strength Paragrid® was used in the base of the structure, reducing to 80kN towards the top.

A complex layout of grids was required to accommodate the variety of backfills used in the construction of the bund. This required careful and regular coordination between the parties on the contract.

A 300mm wedge of topsoil was installed immediately behind the front face of the bund to provide the vegetation medium. Biomac® C, a biodegradable soil blanket was used to stop the soil from washing out.

Wherever possible within the bund construction, the site-won clay material was reused. Earthworks contractor P.J.Brown supplied the 22,000t of imported local clay, 60,000t of site won clay and 96,000t of imported recycled granular material that was used in the 360m long bund. The bund reached a maximum of 16.3m high at its peak.

Hydroseeding was applied to the face of the bund to accelerate the development of vegetation on the bund and integrate it back into the environment.



Typical cross section through 16.3m high section

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MACCAFERRI

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