



**Gerald's International Airport
Montserrat - Western and
Eastern Embankments
Project Date: June 2005**



Figure 1: View of the 31.5m high western embankment

B E N E F I T S T O C U S T O M E R

The use of reinforced soil 45° slopes in the construction of a new airport runway in mountainous terrain allowed a realistic land-take area or footprint for the main embankment,

T H E P R O B L E M

The original Montserrat W H Bramble airport was destroyed during the eruption of Soufrière Hills Volcano in 1995. It was planned to relocate the airport to a safer area in the north of the island. The terrain here was extremely undulating and it was necessary to raise the existing ground levels by 30 metres at the western end of the runway. Because Montserrat is an active volcanic island it was necessary for the design to take account of seismic loading.

T H E S O L U T I O N

In such mountainous terrain where ground levels fall away from the area of construction it was decided to construct 45° reinforced soil slopes at both ends of the runway in order to prevent the need to "chase" the toe of the slope as the natural ground fell away quite steeply, which would necessitate the importation of large quantities of additional fill material.

PROJECT DESCRIPTION

The construction of the new Gerald's airport and terminal comprised a 600m long airstrip and asphalt surfaced link taxiway, aircraft parking apron, helipad and a corrugated steel tunnel beneath the proposed runway including a new carriageway and pedestrian footpath. In order to provide the 600m long runway it was necessary to construct two very large reinforced soil slopes; one at the eastern end 12m high at 45° and the other at the western end some 31.5m high at 45°.

The fill material used in the structures was as dug Volcanic ash. The scheme was a design and supply project from Tensar International in cooperation with W S Atkins. The design paid particular attention to the fact that Montserrat is a tropical island with very heavy seasonal rainfall and is also actively volcanic; therefore seismic loading was a major consideration in the design.

To deal with the consequence of high seasonal rainfall the design team used elevated pore water pressure values (R_u) within 3 metres of the slope face.

Designed using Tensar's Winslope software, internal compound and global stability were considered with a minimum target factor of safety of 1.3 for the static condition. For the dynamic (seismic) condition a target of 1.05 was used for both internal compound and global factors of safety.

Both of the embankments were profiled at 45° and planted with native grass species to form an erosion resistant yet attractive finish, which blends well with the natural surroundings of the area.

Gerald's airport was opened in June 2005, providing a vital lifeline to the people of Montserrat and allowing them to look to the future with greater hope and also help rebuild the tourist trade which was so badly affected after the catastrophic eruption of 1995.



Figure 2: View along the runway from the eastern embankment

CONTRACT DETAILS

Contractor:
Lagan International Plc

Consultant:
W S Atkins

Client:
The Government of Montserrat
Ministry of Communication and
Work



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