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CASE STUDY : Ref 291

Imeretinskaya Valley, Sochi Winter Olympics Site Russia, 2009 – to date

Road Foundation Stabilisation at Imeretinskaya Valley

Tensar TriAx® geogrid being installed at the coastal cluster sites with the winter Olympic ski resorts in the backdrop

BENEFITS TO CLIENT

- Control of differential settlement
- Reduction of construction period
- Fill material saving
- Construction of safe working platform

THE PROBLEM

Access roads were required into the main Winter Olympic stadium area in the Imeretinskaya Valley. These would then become permanent asphalt-surfaced roads to gain access to the Olympic venues.

The natural subgrade was highly variable, consisting of low strength soil: decomposed peat, silts and very soft clay with peat interlayers.

THE SOLUTION

In the weakest sections, one layer of TriAx® geogrid was used in the embankment foundation to gain access to the site and a second layer was used in the sub-base of the road. Thus, stiff and robust structures were built.

PROJECT DESCRIPTION

Typical subgrade conditions

Installation of the mechanically stabilised layer

Sochi is in the south of Russia and experiences a sub-tropical climate. Venues for the 2014 Winter Olympics are split in to two main areas. One area is by the coast and is referred to as the "coastal cluster", while the second area is in the surrounding mountains and is referred to as the "mountain cluster". Imeretinskaya Valley is an area of lowland near the coast that will be the venue for the coastal cluster. This will include the Central Stadium, Bolshoi Ice Palace, Maly Ice Palace, Sochi Curling Center, Figure Skating Rink, Short Track and Speed Skating Center.

The contractor was required to build access roads on the site, which would later be surfaced and adopted by the client. Plate bearing tests taken on the site showed deformation modulus of the subgrade to be in the range of 1 to 1.6 MPa. The subgrade bearing capacity was too low for machinery to operate effectively. The contractor initially tried to use unreinforced crushed stone to gain access, but this was ineffective and lead to significant loss of aggregate and deformation of the soil.

The designed solution involved construction of a mechanically stabilised layer incorporating one layer of TriAx geogrid below the embankment foundation to enable initial access to the site. A second layer of TriAx was incorporated into the sub-base of the road. Plate tests carried out after construction of the access road showed the deformation modulus to be in the range of 77 – 78 MPa, which was acceptable to the client.

CONTRACT DETAILS

The Client: Olympstroy, SC

The Designer: Kubandorblagoustroystvo, PC

The Contractor: Glavstroymontazh, Ltd & Kubandorblagoustroystvo, PC

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