



Walls and Slopes

Geosynthetic Reinforced Soil

Reducing the environmental impact on the Cadagua motorway, Spain

Green walls reinforced with **Fortrac®** Geogrids



General view of the works



Wall reinforced with geogrids completely covered with vegetation

Situation

The autonomic highway B-636 that unites the province of Bizkaia with that of Burgos crosses various locations and has a traffic volume of around 24,000 vehicles each day. With the aim of decongestion this highway and improving connections between the two provinces, the Cadagua motorway was constructed.

Its track crosses a zone that is of major scenic value and its axis, running parallel to the Cadagua river, cuts through the corridor bearing the same name. For that reason, right from the project phase much attention was paid to studying the environmental impact of the work, the intention being to reduce this by means of green walls.

In total, five green walls were constructed, covering a surface area of 5,140 m² and with a maximum height of 15.5 m. The inclination of the walls is 65° and a metallic grid was used to shape the anterior face of the wall.

Solution

Fortrac® geogrids with a resistance between 35 and 200 kN/m were used to construct these walls. An anti-erosion geogrid was also placed in the anterior face of the walls to prevent the vegetative soil being washed away.

The entire material employed to fill in the walls was obtained from blasting work carried out along the stretch of this highway. This material was processed in a crushing plant used for the project until material with a maximum granulometry of 16 cm in diameter was obtained.





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Wing of the viaduct measuring 15.5 m in height

This had a beneficial effect on the soil, while reducing the costs incurred by the construction firm.

To achieve a vegetative cover for these walls, hydro-seeding was conducted using various native species which, benefiting from the climatic conditions of the zone, gave rise to walls that blended perfectly into the surrounding area.

Proprietor: DIPUTACION DE BIZKAIA

Works management: INTERBIAK, Spain

Project and technical assistance: SAITEC., Spain

Construction firm: UTE NOCEDAL, Spain

Constructed: August 2005 to March 2008

Product: **Fortrac®** geogrids



Example of two finished walls



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