

# 'Green Walls', reinforced with Fortrac® Geogrid, for the National Highway N° 1 in Spain



## The Situation:

Green walls, reinforced with **Fortrac®** geogrid, ensure natural integration of the newly aligned National Highway N° 1 into the landscape at the Etxegarate Pass, between the provinces of Gipuzkoa and Navarra.

A Joint Venture formed by Ferrovial, Gedi, Amenabar, Suquia and Campezo carried out the construction work, while a joint venture between Eurostudios and Saitek was responsible for managing the project. The Provincial Council of Gipuzkoa was the project developer.

Two of the most extensive walls in the project, with an external surface area of almost 6,000 m<sup>2</sup> and a maximum height of 24 m, were subcontracted to HUESKER.

## The Solution:

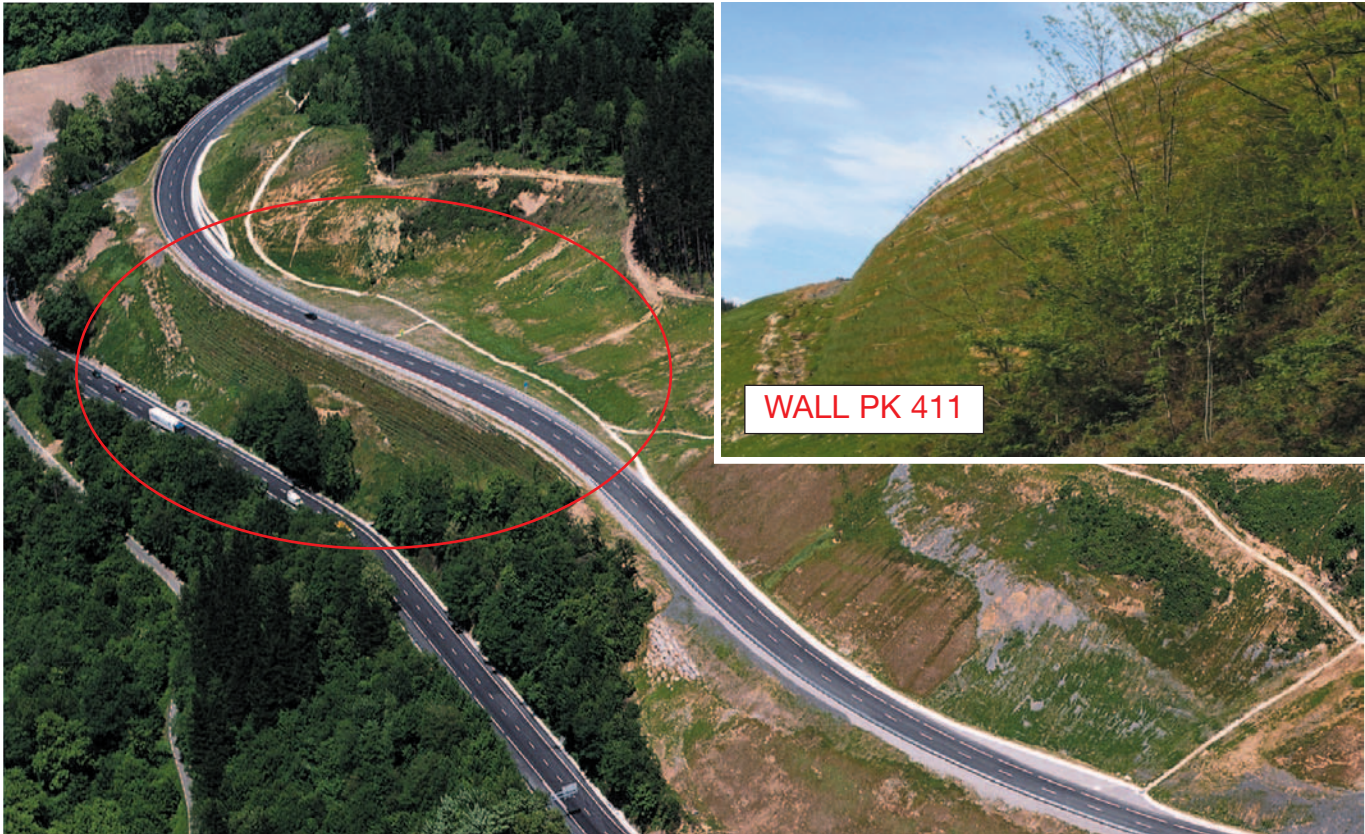
The vegetated walls comprise blasted, ungraded

gravel layers, reinforced with **Fortrac®**. This geogrid is made from high tenacity polyester yarn with strength from 110 to 150 kN/m<sup>2</sup> and a special mesh size of 50 x 50 mm. This generously-sized mesh facilitates better interlocking between this type of backfill and the geogrid.

Calculations were carried out following the DIN 4084 guidelines for slope stability. Positive drainage of the reinforced mass was one of the key factors in carrying out the calculations and determining the choice of backfill.

On the outer face of the wall, corrugated steel

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welded rebar mesh with a diameter of 10 mm and a mesh size of 150 x 150 mm was used as the external shuttering. This welded mesh protects the outer face of the wall from potential external physical damage arising, for example, from vehicle impact or acts of vandalism.

In addition to the metal rebar mesh, a very tight - mesh geogrid prevents the erosion of topsoil fines and still allows the hydroseeding to germinate and grow in the topsoil.



Client: Gipuzkoa Provincial Council  
 Project Management: Eurosetek JV [Joint Venture]  
 Construction Contractor: Etxegarate JV  
 Product: Fortrac® geogrid

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