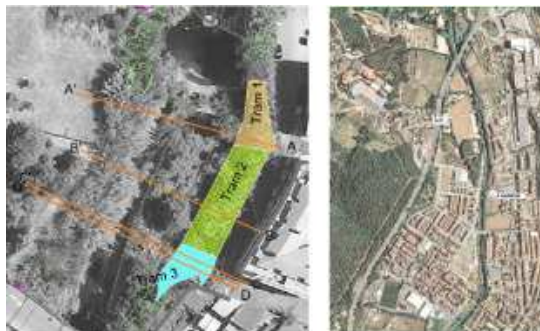


## Draft of the project for the protection of the left bank of the river Congost, upstream from the bridge of Can Noguera in La Garriga (Barcelona)

Client: La Garriga City council  
Drafting date: April 2014

The goal of this project is the design of necessary actions for the protection of the left bank of the river Congost in this area. This design superficially protects against runoffs and floods.



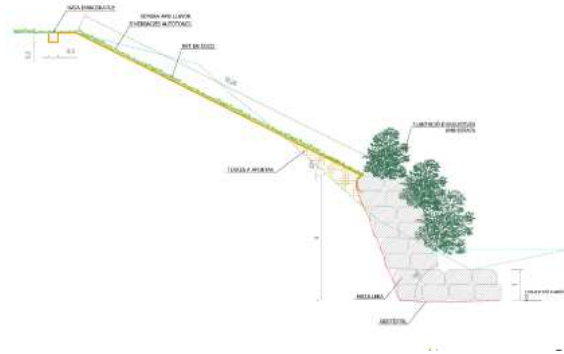
Based on the characteristics of each slope section and the need for a natural transition between this and the surrounding area, different solutions have been defined. The first part is the removal of rubble and cane using mechanical means.

To protect the slope, the action areas are divided into three sections. Sections 1 and 3 require the creation of a transition zone between a hard element (bedrock and concrete structure) and a soft element (eroded slope). Section 1 acts as the transition between the surfaced bedrock and the slope. Section 3 corresponds to the section downstream from the point of maximum sag, and therefore, is the most susceptible to erosion. It is also the transition zone from the concrete wall upstream to the bridge of Can Noguera. The action consists of the construction of a stone revetment with blocks of 0.5m diameter and 65° slope and a height of up to 5m. A geotextile will be installed between the revetment and the back land. The rest of the slope up to street level will be re-profiled to 45° and protected with coconut mesh.



Section 2 // Lattice with C350 Vmax reinforced mat, fiber roll secured with tubular gabions Rock roll and a plantation of shrubs. Coir netting at the top of the slope.

For section 2 the solution consists of fitting coconut mesh in the upper part of the slope and lattice at the base, with a final slope of 60°. In order to increase protection, a permanent reinforced mat C350 Vmax type will be installed between the lattice and the soil at the closest part to the base of the slope. To secure the mat a ditch of 1 m in depth has been designed, which will run below the level of the actual river bed and will be fixed with a flexible tubular gabion Rock roll type. The base will also be protected with a vegetated Fiber roll with helophytes at the contact point between the lattice and the base of the slope. The vegetated fiber roll will protect this weak point and will allow native helophytes to be introduced into the river.



Section 1 and 3 // Revetment with stakes and coir netting at the top of the slope.