01 HÉROES DEL CHACO BRIDGE APPROACHES

SLOPE REVEGETATION AND EROSION CONTROL — ASUNCIÓN

CASE STUDY · PARAGUAY



The Ece crew applying hydraulic mulch on one of the approach slopes

HM+TRM
HYDRAULIC MULCH + REINFORCEMENT MAT

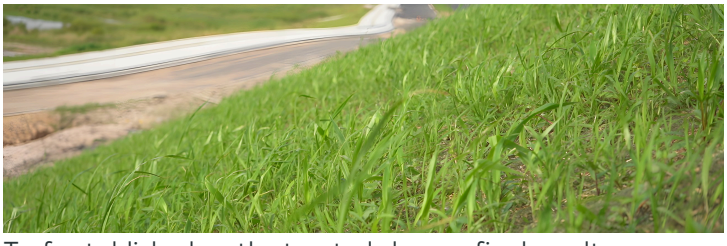
100%
VEGETATIVE COVER ON THE TREATED SLOPES

2 in 1
LANDSCAPE + EROSION CONTROL

The challenge: the slopes of the complementary works of the Héroes del Chaco bridge — the new gateway to Asunción — needed protection that would withstand rain on freshly shaped soils and also offer a landscape worthy of a landmark project.

The solution: on the **slopes**, Ece did the complete execution: **hydraulic mulch** applied over the shaped soil and **vegetation reinforced with mats** turf reinforcement, with immediate erosion protection and a permanent green surface. The access ramps, with their wall, are a different scope of the same project and are not part of this case.

> **The versatile system:** where the slope demands more, the reinforcement mat anchors the roots; where the landscape rules, the vegetation takes the lead. A single work front, with Ece crews.



Turf established on the treated slope — final result



Freshly seeded slope beside the carriageway; at the toe, the turf reinforcement mesh already in place

PROJECT FILE

Project	Ancillary works, Héroes del Chaco Bridge
Location	Asunción, Paraguay
System	Hydraulic mulch + turf reinforcement mat
Scope	Approach slopes: complete execution by Ece (the ramps are a different scope)

02 BIOCEANIC HIGHWAY — LOT 1

SLOPE PROTECTION WITH HYDRAULIC MULCHES — PARAGUAYAN CHACO

CASE STUDY · PARAGUAY



From the hydroseeder: the hydraulic mulch advances in a continuous strip beside the carriageway

+1,000,000
M² PROTECTED AGAINST EROSION

11 of 21
SECTIONS PROTECTED BY ECE

17,000
M² PER DAY, WITH TWO HYDROSEEDERS AT ONCE

The challenge: the road linking Carmelo Peralta with Loma Plata crosses three Chaco ecosystems with **highly saline soils**, rainfall concentrated in sharply defined periods and a **wind erosion** constant. Establishing vegetation there is one of the hardest challenges in the region.

The solution: slope protection with **hydraulic mulches** applied by Ece with two hydroseeders at once, of 600 and 1,100 gallons, at **17,000 m² per day** over **18 months**. The forage seed mix was adjusted to the soil analysis, which showed high sodium. More than **one million square metres** on 11 of the 21 sections of the works — the largest area of hydroseeding applied in Paraguay.

> **Why it works:** the mulch pins the seed and the moisture down against the Chaco wind and sun, and protects the soil from day one, without waiting for the vegetation to come up.



Freshly applied mulch beside the carriageway: in the



The first shoots break through the mulch on Chaco soil

PROJECT FILE

Project	Bioceanic Highway, Lot 1
Location	Carmelo Peralta – Loma Plata, Chaco
System	Profile hydraulic mulches
Area	Over 1,000,000 m² (11 of 21 sections)
Duration	18 months · 17,000 m²/day

03 EXPORT CORRIDOR

REVEGETATION OF NEAR-VERTICAL CUT BACK SLOPES

CASE STUDY · PARAGUAY



Cut slope with the freshly applied mulch: green marks what is treated, red what is left

~90°
EXTREMELY STEEP CUTS

6
TRIALS OVER 15,000 M² BEFORE GETTING THE FORMULA RIGHT

100%
VEGETATIVE COVER ACHIEVED

The challenge: the cut back slopes of the Export Corridor were left almost vertical on the red soil of the east — a surface where water does not stop, conventional seed does not hold, and every rainfall opened new rills.

The solution: a programme of **hydroseeding with hydraulic mulches** adjusted in the field: Ece carried out **six trials over 15,000 m²** —formulation, application rate and timing— before getting a recipe that holds on the cut. Today the slopes are fully vegetated.

> **What this project proves:** on slopes where "you cannot seed", the right combination of fibre, additives and professional application turns the hardest cut into a stable green hillside.



Cut slope already vegetated next to the road



Hydraulic mulch applied with the cannon — the green colour marks the coverage

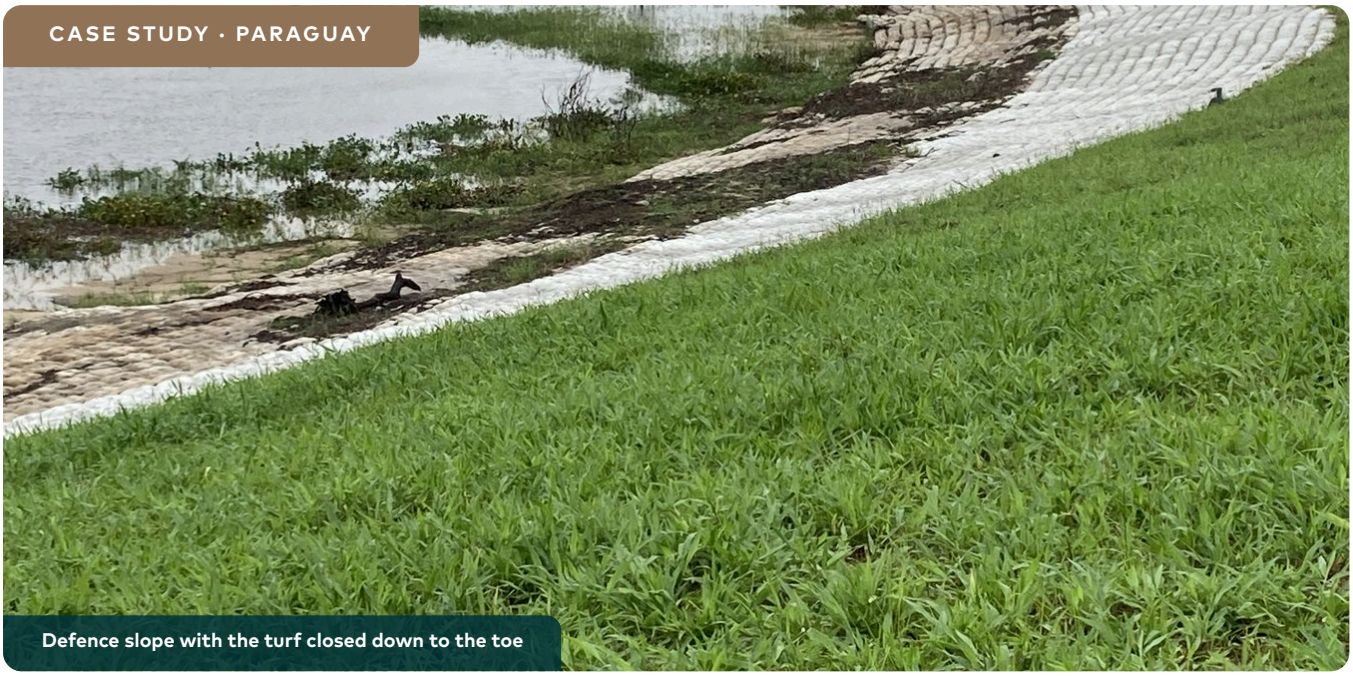
PROJECT FILE

Project	Export Corridor
Location	Eastern Region, Paraguay
System	Hydroseeding + Profile hydraulic mulches
Scope	Steep cut back slopes

04 PILAR COASTAL DEFENCE

CHANNEL AND SLOPE REVEGETATION WITH MULCHES AND MATS

CASE STUDY · PARAGUAY



Defence slope with the turf closed down to the toe

15 km
OF DEFENCE ON THE PARAGUAY RIVER

14 km
OF REVEGETATED DIVERSION CHANNEL

750,000
M² OF REINFORCED REVEGETATION IN THE DIVERSION CHANNEL

The challenge: the Pilar coastal defence — 15 km on the Paraguay River, with a 14 km diversion channel, drainage channels and gates — needed its embankments and earth channels to withstand rain and water flow without eroding.

The solution: hydraulic mulches to establish vegetation on embankments and banks, and **turf reinforcement mats** in the channels, where the reinforced grass withstands flood flows: **750,000 m²** of reinforced revegetation in the diversion channel. Vegetation as an engineered lining.

> **One party responsible:** in Pilar, Ece carried out the complete revegetation — hydroseeding and turf reinforcement — along the 14 km of the channel, with the same technical team.



Biodegradable erosion control blanket: it protects soil and seed until the grass closes over



Defence slope in full revegetation: the grass spreads over the treated soil

PROJECT FILE

Project	Pilar Coastal Defence
Location	Pilar, Ñeembucú
System	Hydraulic mulches + turf reinforcement mats
Scope	Diversion channel (750,000 m²), drains and embankments