

SLOPE STABILIZATION AND LANDSLIDE MITIGATION WITH FLEXIBLE GABION STRUCTURES RANCHI-PATRATU-DEM ROAD, JHARKHAND – INDIA

ENVIRONMENTAL / SLOPE PROTECTION

Product: Gabion, Geotextile

Problem:

Ranchi- Patratu- Dem Road project is a prestigious road project being executed by the Jharkhand Accelerated Road Development Company Limited, a joint venture of the State Government (road construction department) and IL&FS Transportation Networks (India) Limited (ITNL), on PPP mode.

The State Road Construction Department aimed to improve the road safety and traffic flow on Ranchi- Patratu- Ramgarh Road.

The proposed road is aligned through a variety of terrains and many locations proposed to have widening, thus retention of hill and cut slopes were required. At two locations landslide occurred when an attempt was made to excavate the toe of the slope for widening of road. Mass Gravity structure was proposed to provide slope stability against environmental effects.

Solution :

The State Road Construction Department was on look out for appropriate mass gravity wall for slope stabilization. Gabion Retaining walls were selected amongst the available alternatives considering its flexible and permeable nature. Further on hill terrain, Gabions are found suitable to retain cut and fill slopes, especially widening on curves and work-place restricted slopes.

The height of retention structure was ranging from 6m to 12m. So it was proposed to construct the gabion wall in 2 steps with a horizontal benching in-between which was formed naturally when the landslide took place at the hairpin bend location. This was done for higher height sections.

Gabion walls being flexible and permeable in nature, could be economised to a considerable extent. The speed of construction achieved at site was impressive and further landslides were prevented during the course of construction.



Photo 1: Site - After landslide



Photo 2: Site-Removal of excess earth



Photo 3: During Construction

Client: Jharkand Accelerated Road Development Company
Contractor: Montecarlo Construction Ltd.
Consultant: Stup Consultants Private Ltd.
Product used: Gabion (Zn+PVC)- 4822 cum, Terram 1000-3600 sqm
Start of construction: 15-01-2012
End of construction: 21-07-2012

MACCAFERRI



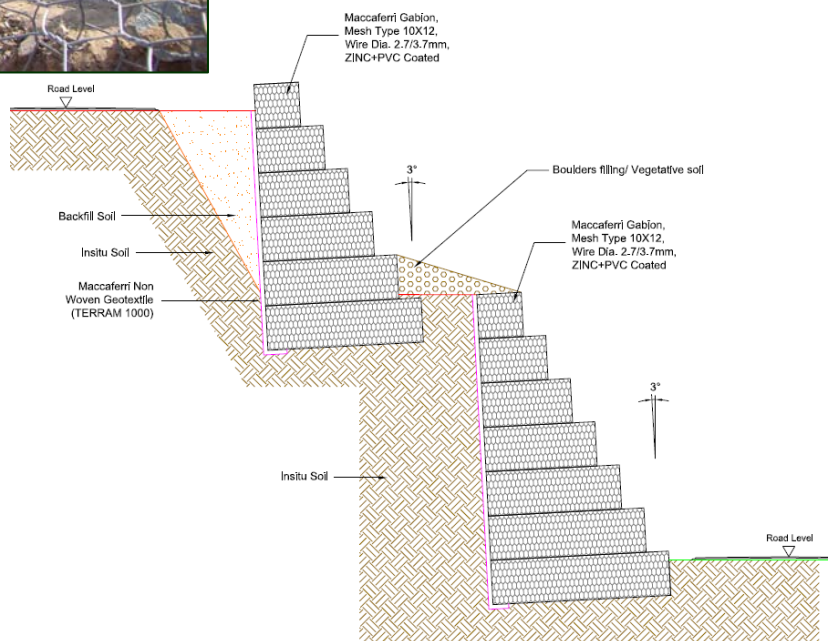
Photo 4: During Construction



Photo 5: During Construction



Photo 6: During Construction



CROSS SECTIONAL DETAILS OF GABION RETAINING WALL
AT CHAINAGE 26+640 (TOP ROAD)

Section Details of Gabion wall



Photo 7: Completed Maccaferri Gabion Structure



Photo 8: Completed Maccaferri Gabion Structure

Present Status of the Project

The Contractor did a good job in terms of gabion construction and quality of work and the structure withstood one heavy monsoon. The structure got well appreciated due to its free draining property, cost effectiveness, environmental balance and aesthetics.