

## GABION WALLS FOR MUNNAR VATTAVADA ROAD MUNNAR, KERALA, INDIA

### Mass Gravity Retaining Walls

#### Problem

Munnar is one of the main tourist attractions of India. The misty hills, valleys and tea gardens attract a lot of tourists to visit to this place in all the seasons. Seeing the importance of the place and the bad state of hill roads, Kerala State Transport Project (KSTP) authorities included this road under the maintenance scheme, which aims to improve traffic flow and road safety on Kerala State's primary road network, and to strengthen the institutional and financial capacity of Kerala's key transport sector agencies. Munnar is located at 1600 m above sea level. The project was World Bank aided costing 336 million US dollars - of which World Bank financing is US \$ 255 million and State's contribution is US \$ 79.00 million.

The foundation and back fill soil is ranging from medium type Laterite to hard Laterite and is porous. The soil is devoid of any humus and is unable to retain much moisture. However, it becomes soft when it gets saturated. Also, as Munnar witnesses very heavy rains and as all the structures built previously were failing due to properties of the soil on site, it had become a challenging job for Maccaferri team.

#### Solution

Taking into consideration the critical situation at site, Maccaferri adopted Gabion for embankment and culverts head walls. The height of the walls which was suggested by Maccaferri was ranging from 2m to 8m above ground level and the materials used were Zinc coated Gabions with wire diameter of 3mm & mesh size of 10x12. The main advantages for selecting the above solution were due to the following reasons.

- 1)Flexibility :- Flexibility of system helps the structure to accommodate differential settlement without any compromise in structural integrity.
- 2)Simplicity in construction:- The construction of gabion wall is simple and do not involve deep excavation, dewatering of trenches, erection of formwork, etc.
- 3)Cost-effectiveness:-The total cost of gabion solution was less than rubble wall and R.C.C. wall. Also minimum foundation preparation is required.
- 4)Permeability:- The ability to combine drainage and retention functions make the ideal structure. The conventional methods are not able to provide this advantage.

**Client:** Kerala State Transport Project (PWD)

**Designer / Consultant:** ICT Delhi

**Contractor:** RDS Project Ltd.

**Products used (Qty.)**

- Gabion 5000 Cum

**Date of construction:** 11/2005 - 01/2008



Photo 1: Site Photograph before construction



Photo 2: Gabion wall construction



Photo 3: Gabion filling during construction



Photo 4: Culvert protection under construction stage



Photo 5: Vegetated Gabion walls after completion of one year



Photo 6: Vegetated Gabion walls after completion of one year