

DISMANTLING WORKS OF UNSTABLE ROCK BOULDER LOCATED AT GAYA, BIHAR BRAHMAYONI HILLS, SHAHMIR TAKIYA, GAYA, BIHAR, INDIA

Surface Strengthening and Support

Problem

Bramhani Pahar is located in the eastern part of Gaya, Bihar. In the gentler slope portion of the hill towards the bottom a dense habitat is prevailing. On the hill slope a lots of unstable boulders have been present in precarious condition. During the first week of September 2016, during heavy rainfall a huge boulder (approx. Size-16mx10m) slipped and has moved towards the locality. The boulder has been resting in a precarious position and was expected to move and cause damage to houses on downslope side.

Solution

Immediate protection measure for the massive boulder which was in the verge of sliding has been done by wrapping the boulder with High Energy Absorption (HEA) Panel and mechanically woven hexagonal Double Twisted (DT) Mesh and secured with cable belting using wire ropes (16mm dia) and anchors(32mm dia, Fe-500) of 2m length.

25mm catridge explosives and Nonel units(shock tube detonators) for initiation of in-hole and surface explosions are fixed over the mesh for the purpose of blasting of rock as part of the controlled blasting operations along with necessary precautionary measures. The bigger and smaller fragments have been contained by HEA Panel and DT Mesh respectively. After the controlled blasting, the muck/ fragments contained by HEA Panel and DT Mesh have been removed and cleaned off.

A temporary fence (barrier) with HEA Panel, DT Mesh and support ropes has been additionally installed near the massive boulder during the control blasting to protect the houses nearby from any detachments during blasting.

The blasting has been successfully completed without damage to structures (even for the structures as close as 2m away from blasting zone) and no accidents by employing control blasting and installation of high strength mesh systems.

Client: PWD (Building Division), Bihar

Designer / Consultant: -

Contractor: Innovative Solutions

Products used (Qty.)

- DT Mesh	approx. 100 Sq.m
- HEA Panels	approx. 100 Sq.m, wire ropes
- Anchor Bar	Fe-500-32mm dia

Date of construction: 10/2016 - 12/2016



Figure 1- Initial site condition



Figure 2- Boulder covered with the meshes and mesh fence on side



Figure 3- Boulder covered with the meshes and wire ropes anchored with nails



Figure 4- Catridge explosives and nonel units fixed above the boulder



Figure 5- Boulder after blasting with mesh containing demolished fragments



Figure 6- After removal of rock fragments