

CUT SLOPE STABILIZATION OF BAIRABI-SAIRANG NEW BG LINE (KM 0.00—KM 30.00)

NORTHEAST FRONTIER RAILWAY



CASE REFERENCE: 281/CS/2016-2017/Mizoram

BRIEF:

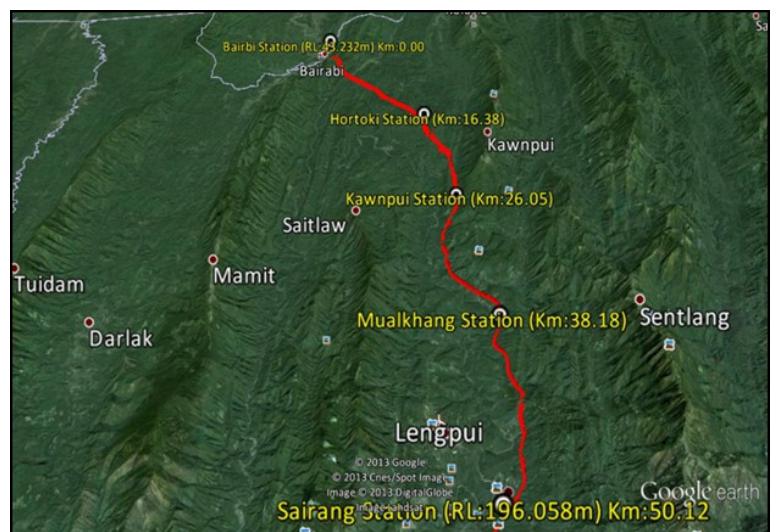
Conducting Slope Stability analysis along with aerial survey of deep cuttings and slopes of major bridge locations, land slide areas, Design/ Suggestion for stable slopes and submission of scheme for remedial measures to protect deep cutting, Design of RCC retaining wall on open and deep foundation, subsurface drainage, covered drains etc. km 0 to km 30 in connection with construction of Bhairabi-Sairang New BG line project.

Duration: December, 2016– May, 2019

Owner/Client: North-East Frontier Railway (NFR)

Location: Bairabi-Sairang, Mizoram, India.

Role of Genstru: Consultant to North-East Frontier Railway (NFR)



Aerial View Bairabi - Sairang Station



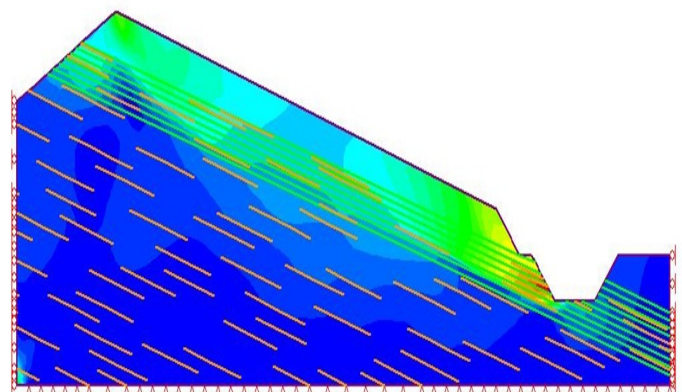
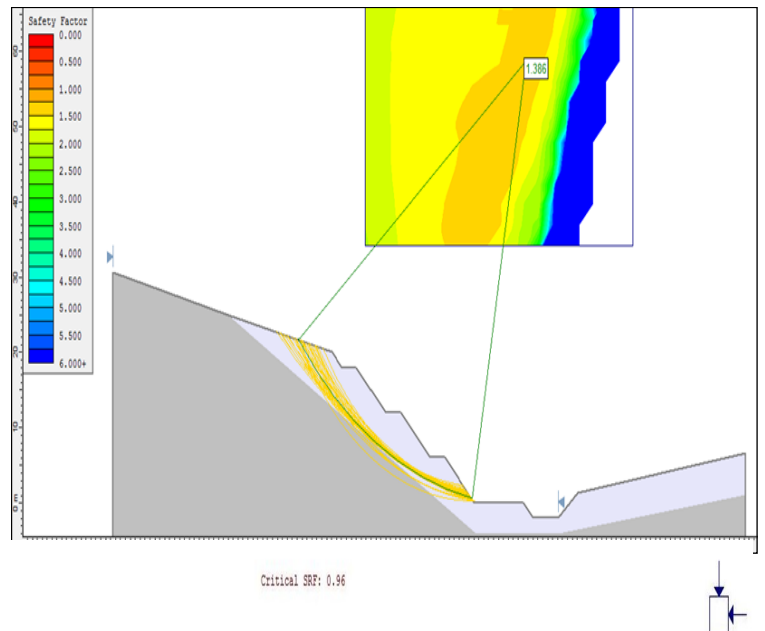
Aerial View Bairabi - Sairang Station

MAIN DELIVERABLES:

- Carrying out slope stability analysis by finite element method & numerical analysis at deep cutting & high embankment showing creep, slip and design of instability.
- Carrying out slope stability analysis by limit equilibrium method at desired location, showing creep, slip and sign of instability Note: Each location will be of up to 100m stretch
- Working out a detailed scheme for Slope protection, Slope stabilization and recommending for providing remedial measure
- Geological mapping at deep cutting, deep filling location as per requirement of Railways for a corridor width up to 200 m (100 m on either side) in scale 1:5000 of critical area and submission of geological Map of relevant areas and cross section (1:5000H & 1:500V) across the valley/ nallah/ streams/ cut slope and across other important geological features including survey work required (by total Station and DGPS) for geological mapping
- Carrying out detailed aerial survey and aerial photography using UAV for the area as shown by Railways. Processing of the data and production 3-D image, generation of point cloud data and submission in the form of 3-D image and point data x, y, z co-ordinates for use in cad software generation of cross sections at every 30 m and contour plan of the surveyed area.
- Visit to the site of work during initial stage of execution or at execution stage and supervising the work to ensure work is being done in conformity with drawing, design and specification etc.



View along the proposed Alignment towards Sairang

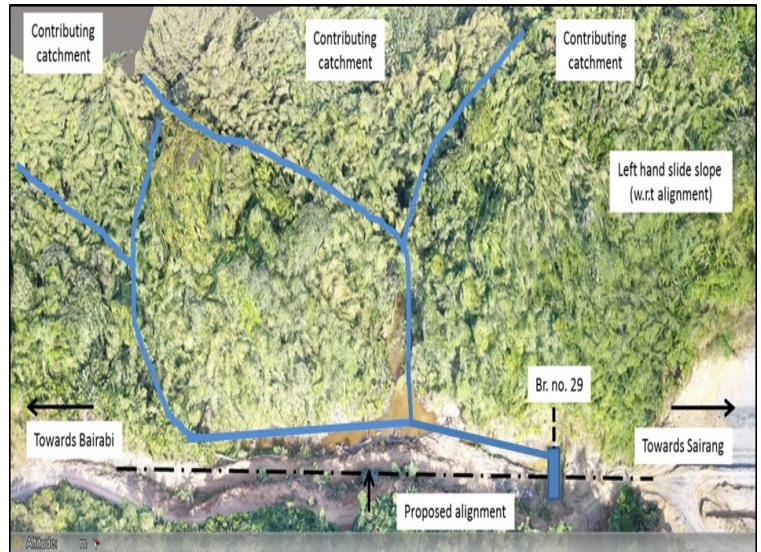


Analysis for Cut Slope

PROJECT HIGHLIGHTS:

In majority of locations the rock mass consists of soft sedimentary rock with large variation in orientation of bedding plane, joints and lithology (sequence and thickness of sandstone and shale formation). Innovative and site specific solutions were evolved using a combination of conventional and non-conventional measures to mitigate slope failures and landslides.

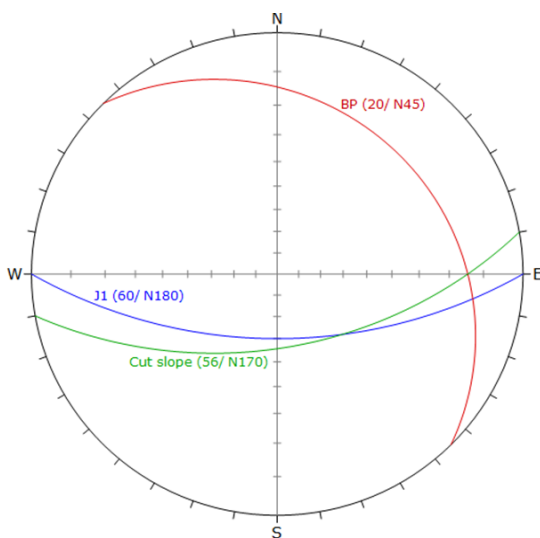
Stabilization measures have been proposed for almost 40 vulnerable locations which includes cut slopes, high embankments, bridge locations and tunnel portal—along the railway alignment. The measures included geometrical correction, erosion control, drainage, surficial strengthening, RCC and reinforced soil structures for retention, rock bolts and deep cable anchors, piled walls, extension of tunnel portal and cut and cover tunnel.



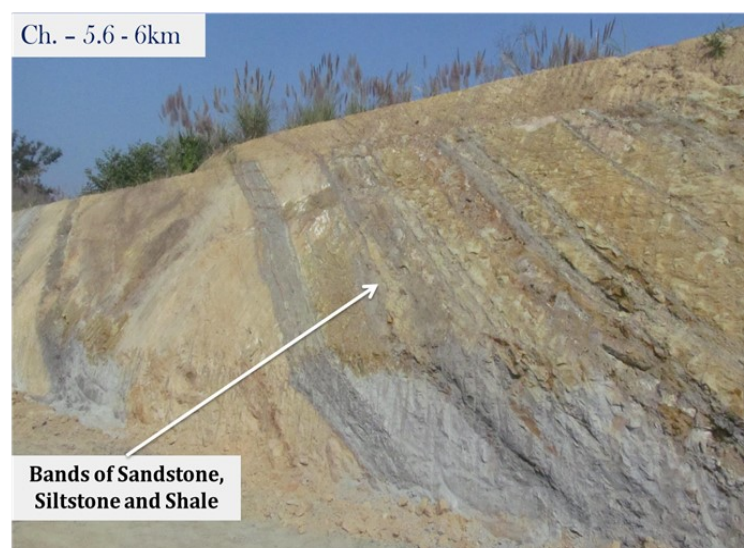
Drainage Pattern in Surrounding Area



Aerial View of a Location



Stereonet Plot



Geological Formation at a Particular Location