Slope stability analysis of pir ki gali Mughal road

Basharat Ayoub Bhat[1] , Humaib Nasir[1],Baryalai-hajizada[2]
1 ,2 Department of Civil Engineering, Lovely Professional University, Phagwara – 144411,Punjab, India;

ABSTRACT

The slope stability analyses in geotechnical engineering have followed closely the developments in soil and rock mechanics as a whole .Slopes either occur naturally or are engineered by humans. Slope stability problems have been faced throughout history when men and women or nature has disrupted the delicate balance of natural soil slopes. Failure of natural slopes and man-made slopes has resulted in much death and destruction. Some failures are sudden and catastrophic; others are widespread; some are localized The main objective of this project is therefore, aimed at to discuss the landslide causes in a stretch of Mughal road at Shopian region for which there is lack of information till date and this communication also suggests some measures to check stability of slopes.

Keywords: slope,mechanics,delicate,catastrophic.

Introduction:

Mughal road is located in the state of J&K and falls in the pirpanjal ranges joining Poonch and Shopian districts. The Mughal road connects the Poonch and Shopian districts at a longitude of 74-22' & 74-50' and latitude of 33-37' & 33-43'. The length of road is 83.9 km. Historically the route was traversed by the armies of Mughal Emperor's Akbar, Jahangir and Shahjahan. In most applications, the primary purpose of slope stability analysis is to contribute to the safe and economic design of excavations, embankments, earth dams, landfills, and spoil heaps. Slope stability evaluations are concerned with identifying critical geological, material, environmental, and economic parameters that will affect the project, as well as understanding the nature, magnitude, and frequency of potential slope problems. When dealing with slopes in general and slope stability analysis in particular, previous geological and geotechnical experience in an area is valuable. The aims of slope stability analyses are;

• To understand the development and form of natural and manmade slopes and the processes responsible for different features.

• To assess the stability of slopes under short-term (often during construction) and long term conditions.

• To assess the possibility of slope failure involving natural or existing engineered slopes.

• To analyze slope stability and to understand failure mechanisms and the influence of environmental factors.

• To enable the redesign of failed slopes and the planning and design of preventive and remedial measures, where necessary.

• To study the effect of seismic loadings on slopes and embankments.

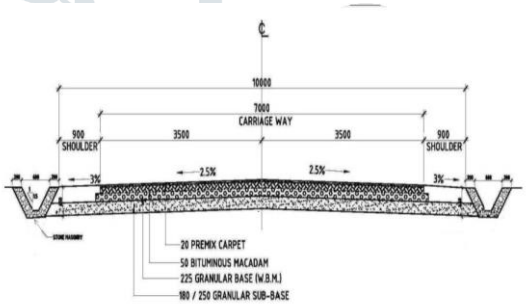


Figure 1: Cross section of Mughal road

Information concerning the geologic conditions in proximity to the site was obtained from MRO (Mughal road organization) department located at Srinagar.

Formation/Group from North to South			Lithology	Age
Alluvial Deposits			Clay, Sandy Clay, Silt with occasional gravel	Recent to Sub-Recent
Loess-Paleosol succession of Dilpdr Formation Krungus Member Pampur Member Shupian Member	Dilpur Formation	KAREWA GROUP	Layers of brown silt vary from calcareous to non calcareous type	Upper Pleistocene
	Nagum Formation		Gravels, sand, sandy clay, marl and silt	Middle Pleistocene
--ANGULAR UNCONFORMITY....			--ANGULAR UNCONFORMITY....	
Methawoin Member Rambiara Member ..Er. Unconformity Dubjan Member	Hirpur Formation		Clay, sandy clay, conglomerate, varve sediments, lignite and sand	Pliocene to Pleistocene
	.....UNCONFO RMITY.....			
Triassic Formation	Limestone, shale etc.			Triassic
Panjal Trap	Panjal Volcanic Series		Andesite, Basalt etc.	Permain
Aggmeratic slate			Slates	Upper carboniferous
PIR-KI-GA`LI				
Panjal Trap			Volcanic Basalt	Permo-Carboniferous
			Tanavals	--
-----CHANDIMAR Fault-----				
Salkhalas			Slates	Paleozoic
-----PANJAL THRUST-----				
Shali Formation			Aglomeratic Slate	Permain
MURREE THRUST				
Sabathu			Sandstone, limestone	Eocene
-----JAMMU FAULT -----				
Siwaliks			Sandstone	

METHODOLOGY:

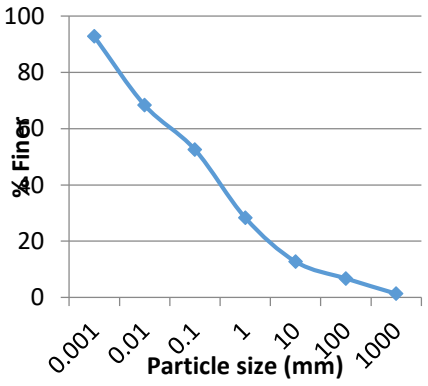
Particle size distribution:

Sample C2

Total Mass of dry soil = 500g

Mass of soil retained on 4.75 mm sieve =37g

Mass of soil passing 4.75mm sieve = 463



Graph 1: Particle size distribution of sample C2

Proctor test:

Sample C2

Diameter of mould = 100mm

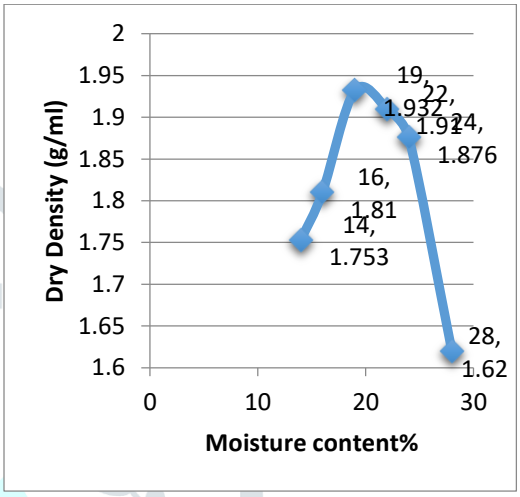
Height of mould = 127.3 mm

Volume of mould, V = $\frac{\pi}{4} \times d^2 \times h$ = 1000 ml

Results:

Max. Dry density = 1.941 g/ml

Optimum moisture content = 19%



Graph 2: compaction curve for Sample C2

Acknowledgement:

References

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