

A REVIEW ON GROUND ANCHORS AND ROCKBOLTS FOR GROUND IMPROVEMENT TECHNIQUE.

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ABSTRACT:- Ground anchors are mainly used for stabilization of steep slopes or slopes consisting of soft soils, and also for enhancement of embankment or foundation of soil capacity. Different types of ground anchors are available for different type of problem in site. This paper includes the review of use of different types of ground anchors and rock bolts for different type of geological problem. The tests were also conducted in the laboratory to know the behavior of the anchors in actual site.

Keywords: Ground anchors, rockbolts.

1. INTRODUCTION

Ground anchors are mainly designed to transfer the load from the structure to the ground and it is also used in the retaining structures. The design of anchorages is not as well defined as the design of foundations and there is no evidence of theoretical or scientific method that meets specific engineering needs. Therefore, because soil and anchor parameters vary, there is no single solution for all anchoring situations [4]. Ground anchors allow to improve the mechanical response of retaining structures built in unstable slopes [2]. Anchors are also used to resist the uplift pressure which are incorporated with the structure [3]. Some anchors are installed in angles depending on the soil condition, temporary installations are also done but the data taken will be permeant data [4]. Soil anchors typically used to resist uplift loads, although they also provided as a measure to increase the soil stabilization [3].

From the past 30-year, rock bolts have been used in civil and mining engineering. A rock bolts consist of bar inserted in the bore hole that is drilled in the surrounding soil or rock mass [7]. Rock bolts and dowels have been used for many years for the support of underground excavations and a wide variety of bolt and dowel types have been developed to meet different needs which arise in mining and civil engineering [8].

2. LITRATURE REVIEW

Ali Parsapajouh (2012): In this study the stabilization of excavated ground was done by using post grouted ground anchors in northern zone of Tehran for deep basement construction. The loading test was conducted and anchors locked at 75% of design load. A deep vertical wells and horizontal drainage was provided for effective dewatering and post grouted anchors using multiple grout injection at high pressure are used to obtain the design safety factor.

Jeng, Ching-Jiang (2013): In this study investigation was done on failure of slope accrued in Taiwan in the year 2000 and performance of ground anchor causing the landslides was done. The causes of failure were long term ground water infiltration resulting in softening of thin layer between sandstone and shale and also a corrosion of ground anchor. In order to avoid failure of anchor by corrosion different levels of ground anchors corrosion should be understood. It was also said that bearing plate and trumpet are welded together and put in the embedded hole pipe to avoid angle offset and provide angular bending. Visual inspection, endoscopic detections were recommended for safety.

Monali Bhakare (2015): In this study cement grouted ground anchors with post tensioned cables is used for the construction of basement for car parking in pune at about 8 to 9 m below the ground level. These anchors are drilled in to the basalt rock found in that region and connected to the raft foundation for effective load transfer. Effective dewatering techniques were used to lower the water table.

Maria Cristina Di Gregorio (2016): In this study a laboratory test was conducted for pull out test in undisturbed soil sample using a modified triaxial aperture. And it was compared with the results of convention pull out test on anchors built on flysch formation. The results obtained from the laboratory for skin friction, the difficulties in mechanical characterization of the formation were known.

Deepanshu R Singh (2016): In this case an analysis was done on un-tensioned fully grouted rock bolt in mines of Jharkhand. A in site pull out test was conducted on 30 bolts for 7th and 28th days from the time of installation. A high debonding with the grout was absorbed after 24hours and low peak anchorage strength. From the results obtained it was said that un-tensioned fully grouted bots can be used as supporting structure at metal mines.

3. CONCLUSION

- The type of ground anchor to be implemented depends upon the geological structure, type of soil present. Mainly anchors are provided to stabilize the soil mass.
- Tests should be conducted to know the behavior of the anchors at different stress loads. The pull-out test and its analysis are done.
- Ground anchors should be protected from corrosion and should have knowledge of corrosion of anchors at different levels.
- Rock bolts are drilled and well anchored in tunnel, mines, to resistance against failure during construction and working process.

4. REFERENCES

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