

Importance of Geology in Civil Engineering Projects

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ABSTRACT

A detailed and accurate knowledge inventory of geology is an essential part of construction civil engineering project. The application of geology for a safe, stable and economic design and construction of a civil engineering project. In recent years, advances in technology and knowledge of geology has resulted in the accessibility of civil engineering project. It enables a civil engineer to understand engineering implication of certain conditions related to area of construction, which are essentially geological in nature. Full geological information about the site of construction and about the natural materials of construction is of paramount. The local geology of an area is important when planning a major construction. The full knowledge increase the strength, stability and durability, of civil engineering project. Construction of tunnel, dam, reservoir and highways and cut, irrigation project.

Keyword: tunnel, dam, reservoir, highways and cut, irrigation.

INTRODUCTION

A civil engineer is neither expected nor required to undertake himself geological investigation of area before designing and implementing the construction plans of a major civil engineering project.

(a) Planning

Geological information is greatly useful in proper planning of an engineering project:

- (1) **Topographic Maps.** Such maps give details of relief features and are essential to understand relative merits and demerits of all the possible sites for the proposed structure.
The presence and nature of slopes, size, contours, and depths of valleys and gorges and rate of change of elevation in various directions can be easily computed from such maps.
- (2) **Hydrological Maps.** Surface water and groundwater are most important factors that influence the stability and cost of engineering structures in many ways.
- (3) **Geological Maps.** These maps also give an idea about the availability or otherwise of the materials of construction in the area. Further, these maps guide him in locating and limiting the exploration operations for subsurface investigations in the area of interest.

(b) Design

In the matter of designing of an engineering project, the role of geological information can hardly be overemphasized. Some of the geological characters that have a direct or indirect bearing upon the design of proposed project are.

- (1) The existence of hard bed rocks and their depth from and inclination with the surface.

- (2) The position of groundwater table in its totally including points of recharge and discharge and variations during different periods of the year.

(c) Construction:

Construction of underground projects like tunnels cannot at all be undertaken without a thorough knowledge of the geological characters and setting of the rocks and their relevance to the loads imposed on or relieved from them. Hence stability of a structure constructed on them or through them or with them depends considerably on the understanding of the nature of rocks in all seriousness.

Construction of projects under the consideration of geologist: the branch of engineering that deals with planning, design, construction of these major structures is known as civil engineering.

Tunnel: tunnels are underground passages either for traffic of one type or another or for the conduct of water.

- The entire length of tunnel is located above the water table.
- The alignment is partly above the party below the water-table

Dam: Geological investigations of a site proposed for construction of a dam must

Be complete detailed.

- The composition and textures of the rocks exposed along the valley floor, in the walls and up to the required depth at the base.
- Cost factors may demand the adjoining of the site for a better alternative.

Reservoirs: reservoirs are essentially water storage basins, the area should possess such geological characteristics that favors holding of water in the basin so created. Such characters are:

- Topographically
- Ground water conditions
- Permeability
- Trend and rate of weathering

Highways and cuts:

The lubricating action of water besides its negative effect on the strength parameter of rock is the major causes in initiating massive landslides. The study of groundwater regime, therefore, rightly forms a primary step in the studies dealing with stability of slopes.

Irrigation project:

The through study of groundwater regime in irrigated and water-Logged areas forms an important step in their reclaiming for Cultivation.

The main objective of geological investigation for any projects

- The study of seismic condition of that regime.
- Investigation of earth surface area.
- Investigation of sub-surface area.
- Investigation of litho logy of the area.

CONCLUSION

The large construction of civil engineering projects requires knowledge of the area concerned. The geological structure of the area is also determined by conducting extensive and intensive geological surveys. The entire topographic details (i.e. existence of hills, valleys, plains) the geology of an area dictates the location of each of following structures: dams, roads, building foundation. Slope failure causes are considered. Full geological information about the site of construction. Discuss the role of a geologist in the feasibility study and site selection stages of a large civil engineering project.

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