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IMPORTANCE OF GEOLOGY IN CIVIL ENGINEERING

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The term geology is the backbone and covers a widespread area in the field of civil engineering. This branch/relevant subject covers the varieties of systems and concepts about nature and how we can find the concepts or essence of civil engineering in this. It has widespread varieties from rocks and minerals to hill areas and normal lowlands, construction of civil engineering structures by maintaining the laws and regulations enacted, last but not the least with slope stability, embankment construction and an introduction to the several natural calamities without whose study awareness among society and people cannot be successful. It covers and introduces us with different rocks, nature of formation concept developed from that, with the names of minerals and alloys formed which forms a main natural resource. Construction of building or any structure in different areas with different parameters and conditions also forms a major part of this subject. Major construction as well as minor construction needs basic study which is the platform to proceed further. This subject gives rise to the study of soil, foundation, hydrology, irrigation etc. so, the subject forms a major base or preliminary study of the branch civil engineering. Geology looks at some of the

most important issues in society today including energy sources and sustainability, climate change, the impacts of developments on the environment, water management, mineral resources and natural hazards. A detailed and accurate knowledge inventory of geology is an essential part of construction and hazard analysis.

The landslides, earthquake, and tsunami must also be located accurately and mapped as polygons depicting their true shapes. Detailed inventory maps of land-slide triggered by earthquakes began in the early 1960s with the use of aerial photography. In recent years, advances in technology and knowledge of geology have resulted in the accessibility of civil engineering projects and high resolution to identify. Producing the earthquake in sea triggered the tsunami. An earthquake may serve as a warning that a tsunami is coming, and so may a rapid fall or rise in coastal waters. Earthquakes are an unavoidable natural hazard, but proper planning and a well-informed and well-prepared public can reduce their impact. Construction of dam, tunnel, reservoir and other civil engineering projects under the consideration of safety precaution, and using material are more stable, durable and economical due to the knowledge of geology. Rocks are the most common material which is used in the construction of foundation. The local geology of an area is important when planning a major engineering

The full knowledge of geology increases the strength, stability, and durability of civil engineering projects. The construction of large civil engineering projects requires knowledge of the geology of the area concerned. The geology of an area dictates the location and nature of each of the following structures: Dams, Building foundations, roads and railways. Describe causes of slope failure and preventive measures that can be taken. Discuss the role of a geologist in the feasibility study and site selection stages of a large civil engineering project. There must be continuous efforts

among the government and various stakeholders on public awareness and preparedness. The local government need to establish a Disaster Preparedness Education Center, where an Audio Visual/Training Room, a small disaster management museum, and a disaster management library that can be used by children as well as adults. A Disaster Management Handbook that contains instructions on how the public should prepare for emergencies lists what to do during emergencies, and other emergency information is essential in public information. This handbook should be distributed to the residents and other community organizations

OCCURRENCE OF HAZARDS AND THERE PREVENTION:

I. Earthquake:

Earthquake capable of causing structural damage is expected to occur somewhere in the province about once every decade. There is a real risk that one of these could be The shaking motion of an earthquake is due to this sudden release of energy. The first sign of an earthquake may be a loud bang or a roar. The ground may start to pitch and roll like a ship for several seconds to several minutes) An earthquake is defined as a natural force which originates below the earth surface, work randomly and creates irregularities on the surface of earth. Since the earthquake is capable of server damaging to any civil engineering structure Seismic areas are the place which experiences the earthquake frequency. In this region following precaution is taken in to account,

- Construction is earthquake proof.
- For large building, the raft type of foundation is desirable.
- Formed R.C.C. structure is preferred.
- To prevent the sliding, the foundation structure should be thoroughly tied up.

II. Landslide:

Landslide is a general term for a wide variety of down slope movements of earth materials that result in the perceptible downward and outward movement of soil, rock, and vegetation under the influence of gravity . The materials may move by falling, toppling, sliding, spreading, or flowing. Some landslides are rapid, occurring in seconds, whereas others may take hours, weeks, or even longer to develop Many factors contribute to slides, including geology, gravity, weather, groundwater, wave action, and human actions. Although landslides usually occur on steep slopes, they also can occur in areas of low relief. Landslides can occur as ground failure of river bluffs, cut and-fill failures that may accompany highway and building excavations, collapse of mine-waste piles A landslide occurs when several of these factors converge.

- Gravity
- Geological factor
- Earth quake
- Forest fire
- Volcanoes
- Waves
- Heavy rainfall

One of the important tasks of a civil engineer is to design and construct retaining walls in the active slide regions this method depends upon the slope geometry. Retaining walls protects the land slide movement and regulate the surface drainage system. It is necessary to construct retaining walls taking in to consideration all the safety factors.