Scope of Engineering Geology

- Engineering geology may be defined as the branch of applied science which deals with the application of geology for a safe and economic design and construction of a civil engineering projects

The basic objective of engineering geology are two fold:

- It enables a civil engineer to understand engineering application of certain conditions related to the area of construction, which are essentially geological in nature.
- It enables a geologists to understand the nature of geological information that is absolutely essential for the safe design and construction of a civil engineering project.

Scope of Engineering Geology

Scope of Engineering Geology

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- The scope of engineering geology is best studied with reference to major activities of the profession of civil engineer which are: Construction, water resource development, town and regional planning.

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Geology in Construction Jobs

- In all types of heavy construction jobs such as buildings, towers, tanks, dams and reservoir, highway bridges, traffic and hydropower tunnels etc. full geological information about the site of construction (or Excavation) and about the natural materials of construction is paramount importance.

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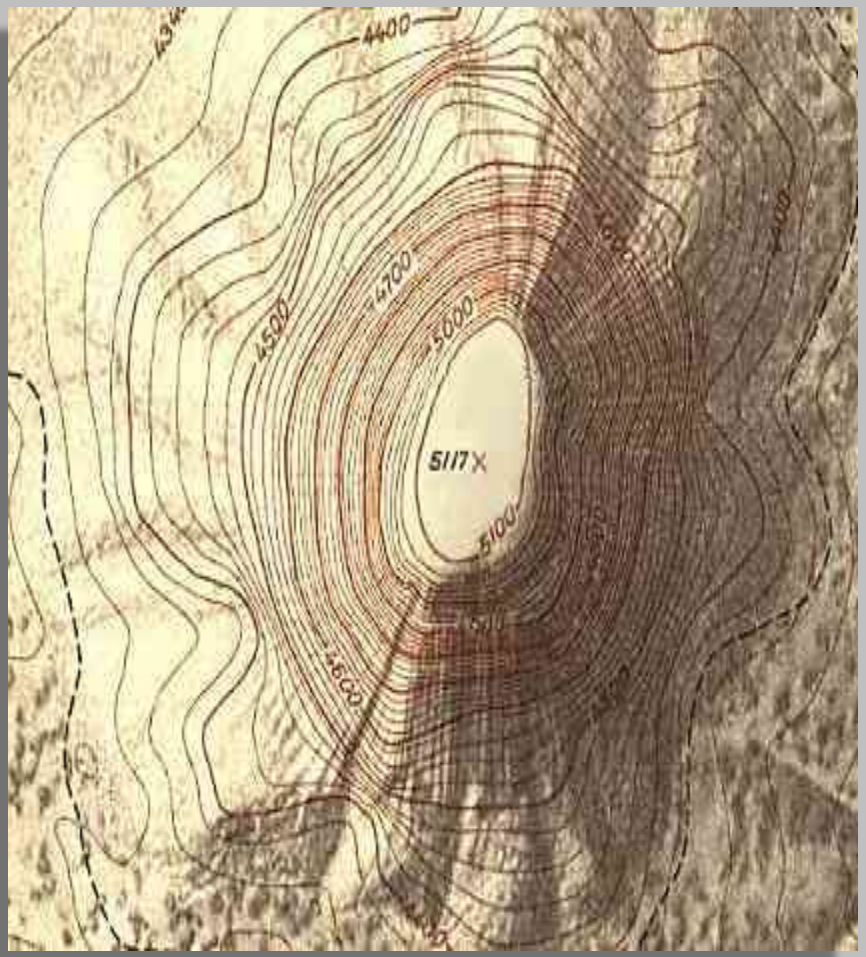
- The aspect of geology has full relevance in all the three aspects of each construction i.e. planning, designing and execution.

Planning

- Following geological information is greatly useful in planning an engineering project.
- Topographical maps Such maps give details of relief features and are essential to understand relative merit and demerit of all the possible sites.
- Hydrological Maps. These maps give broad details about the distribution and geometry of the surface water channels and also the occurrence and depth contour of groundwater.
- Geological Maps. Petrological characters and structural disposition of rock types as developed in the proposed area depicted in geological maps.

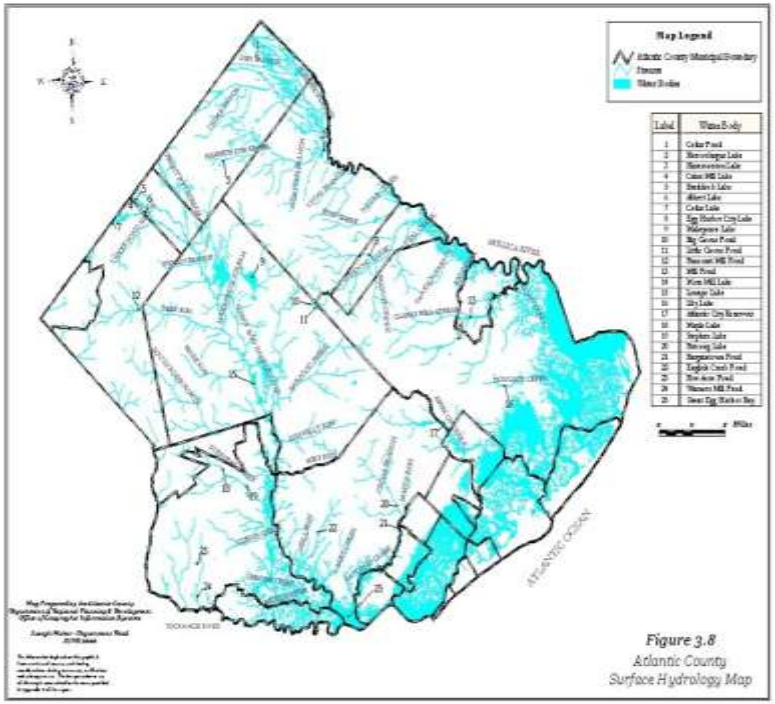
Planning



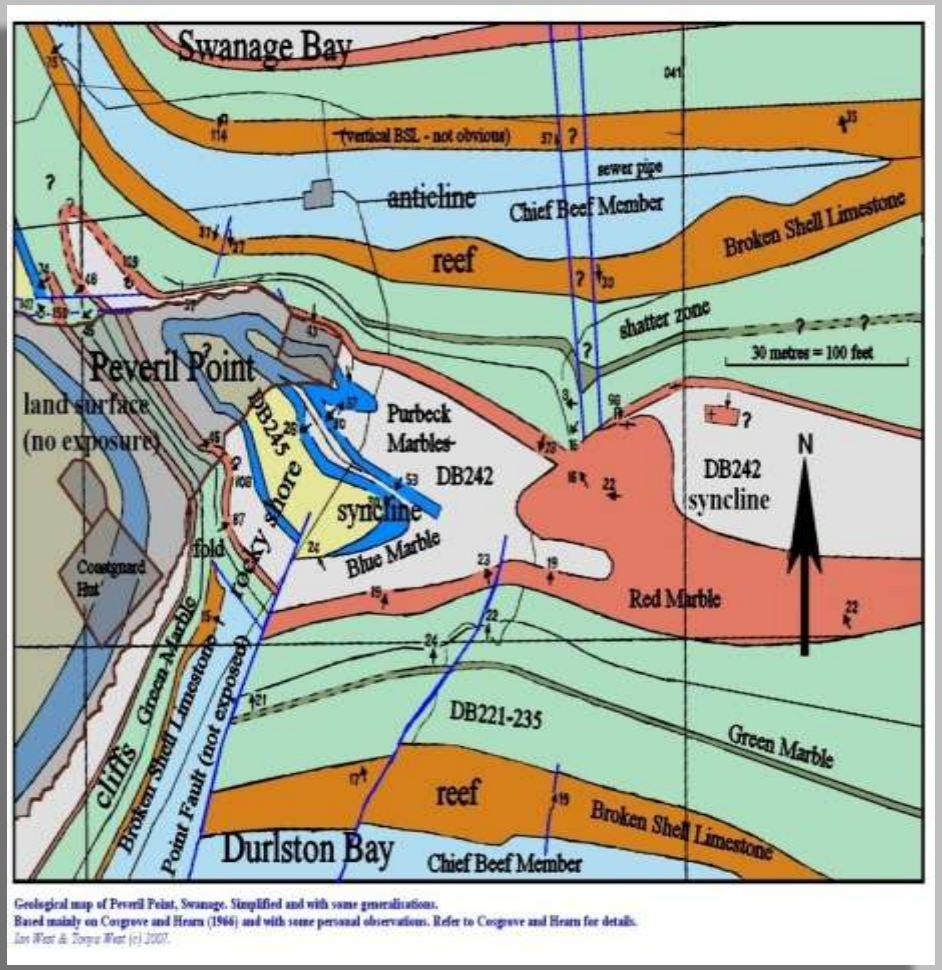
Topographical maps

Planning

Hydrological Maps



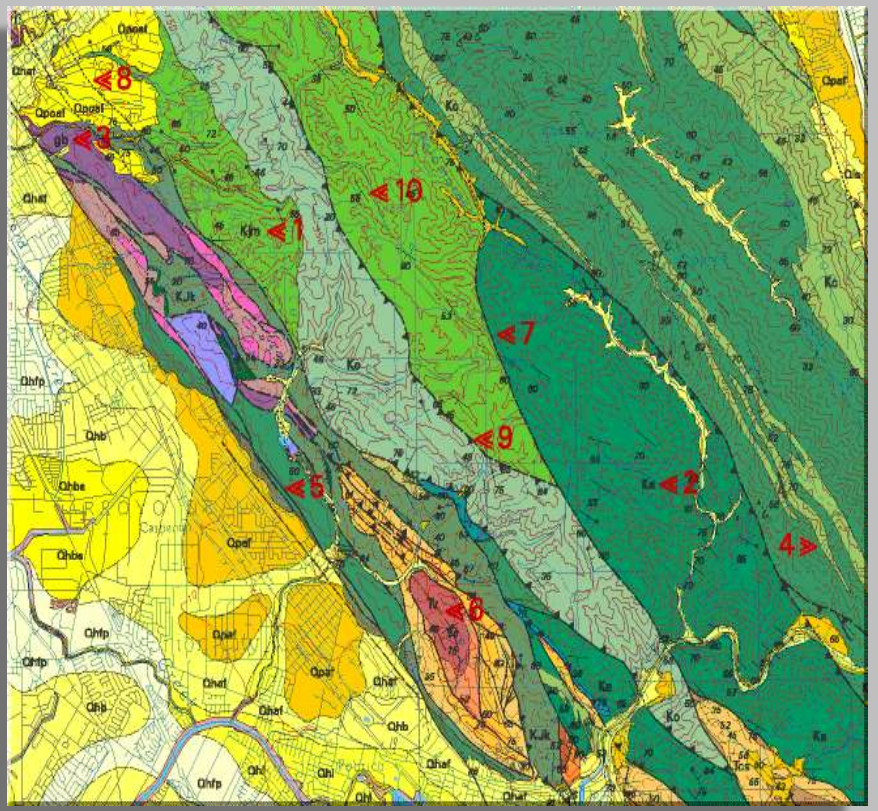
Geological Maps



Planning

Hydrological Maps

Geological Maps



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Design

- Some of the geological characters that have a direct or indirect bearing upon the design of a proposed project are:
- (i) the existence of hard bed rocks and their depth from and inclination.
- (ii) The mechanical properties along and across the site of the proposed project;
- (iii) Presence, nature and distribution pattern of planes of structural weakness
- (iv) The position of ground water table in totality.
- (v) Seismic character of the area as deciphered from the seismic history and prediction about future seismicity.

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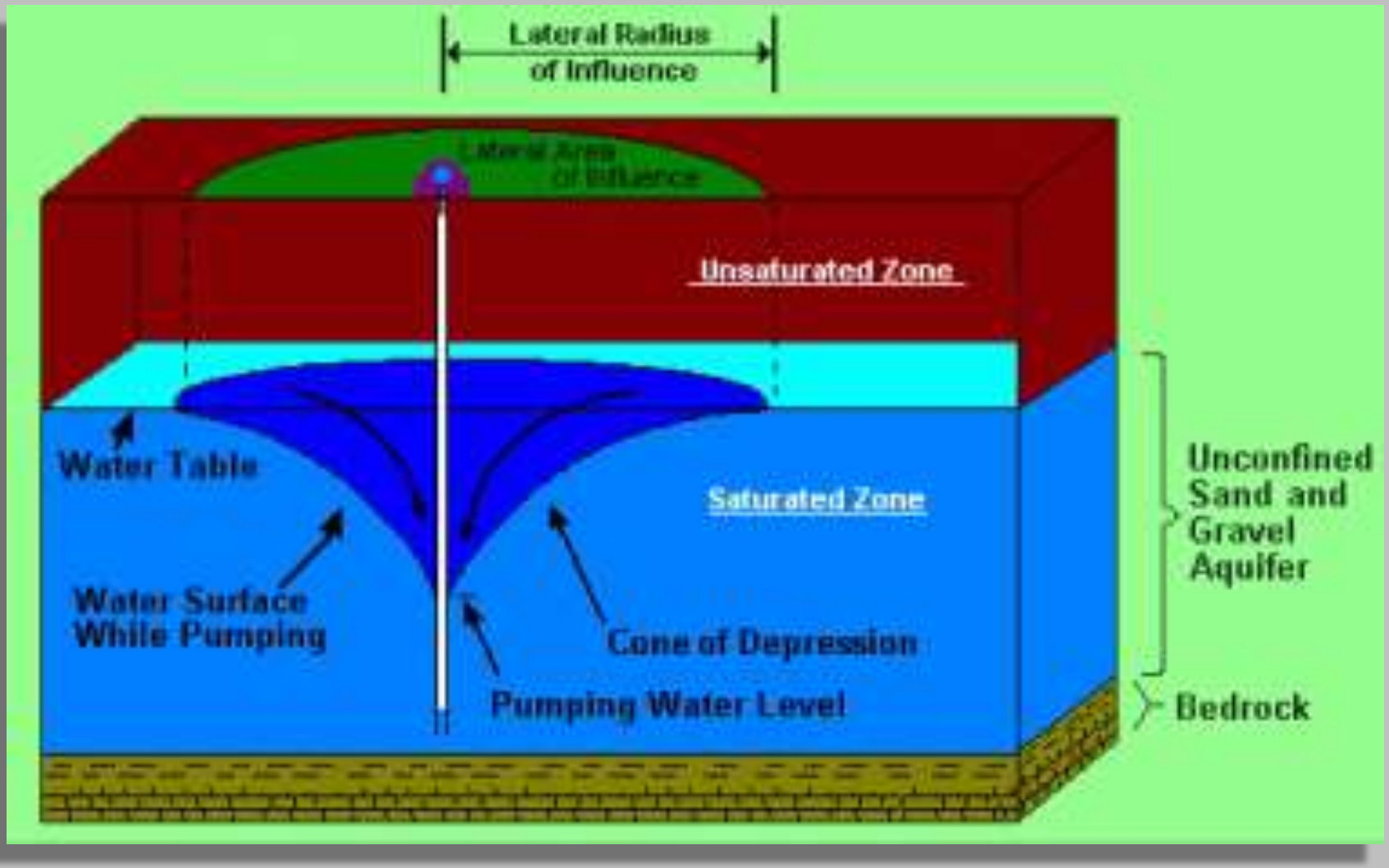

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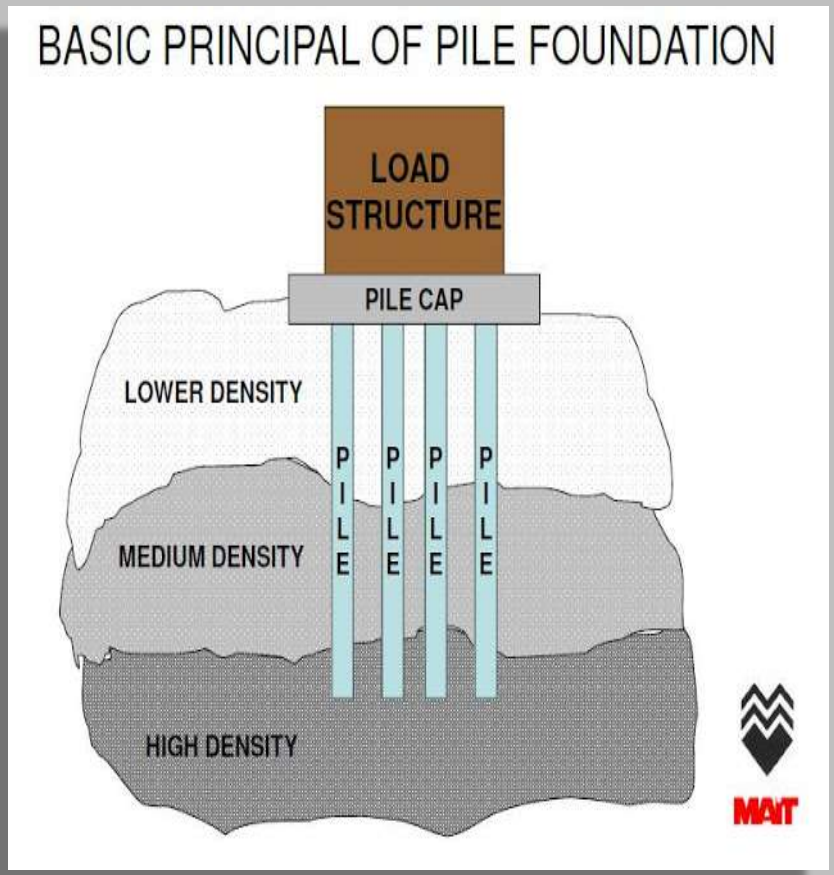

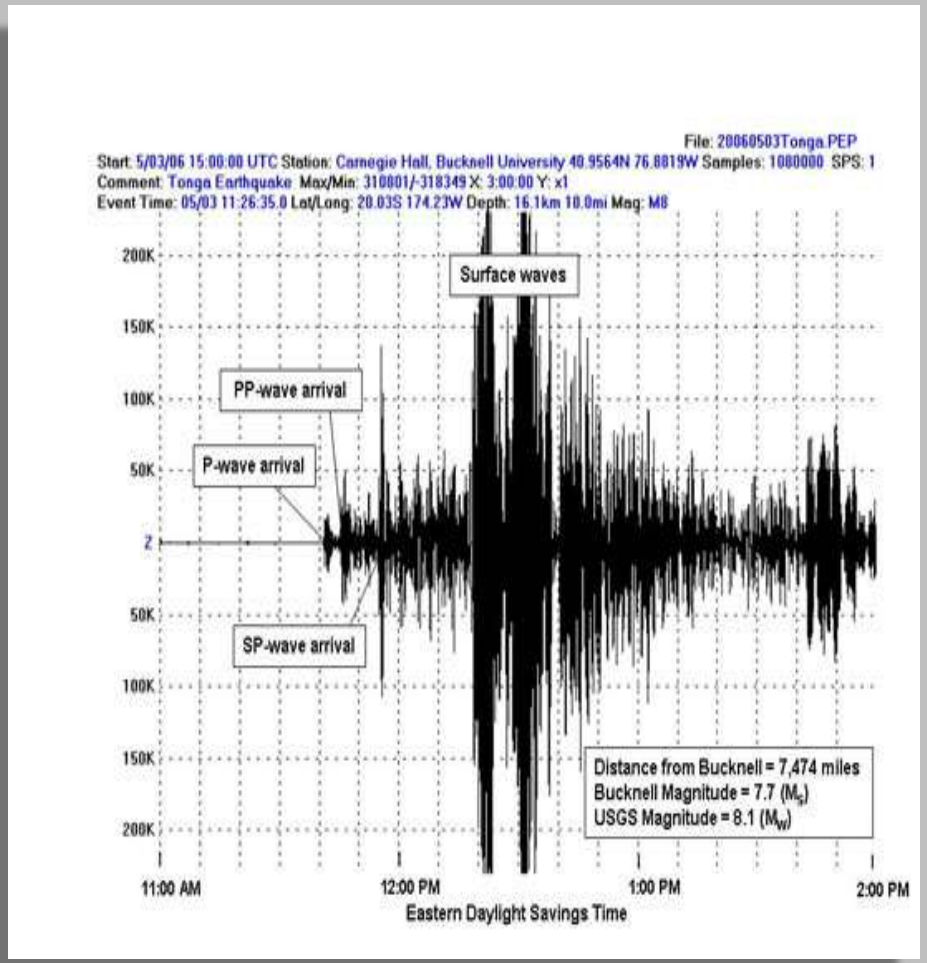

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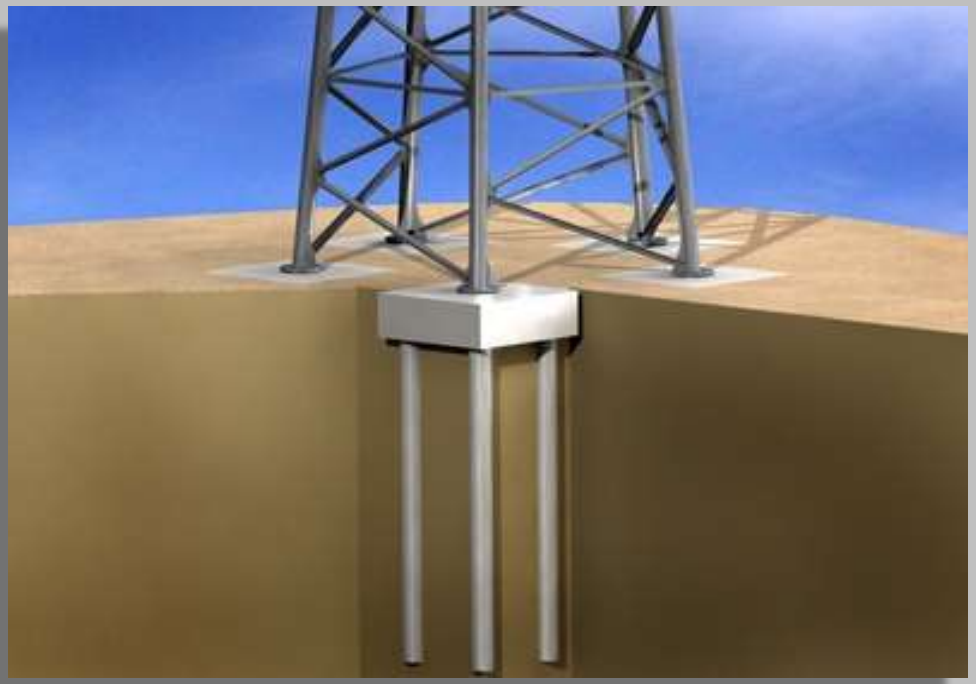

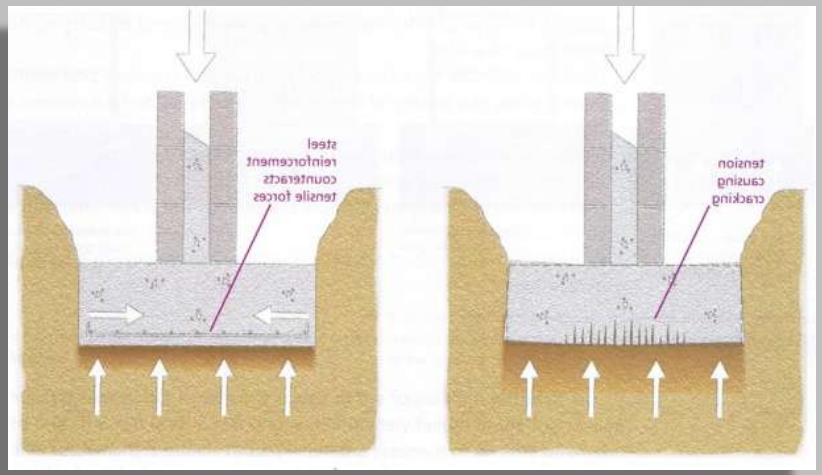

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Construction

- The engineer responsible for the quality control of construction materials will derive enormous benefit from his geological background of the nature material such as sand, gravel, crushed rocks.
- Similarly for construction in geologically sensitive areas as those of coastal belts, seismic zones and permafrost regions, knowledge of geological history of the area is of great importance.
- Construction of underground projects like tunnels cannot at all be undertaken without a through knowledge of the geological characters and setting of the rocks and their relevance to the loads imposed.

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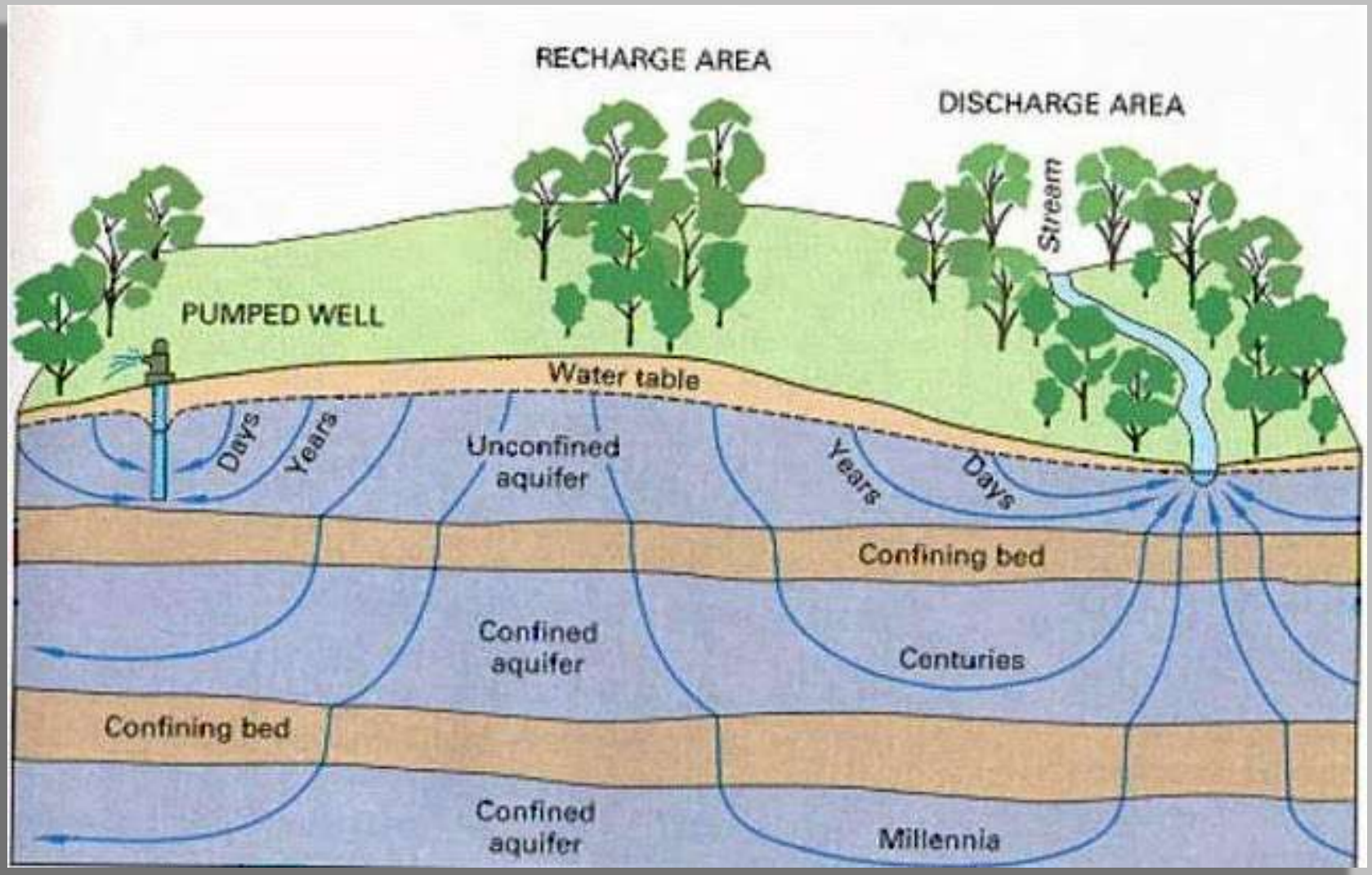
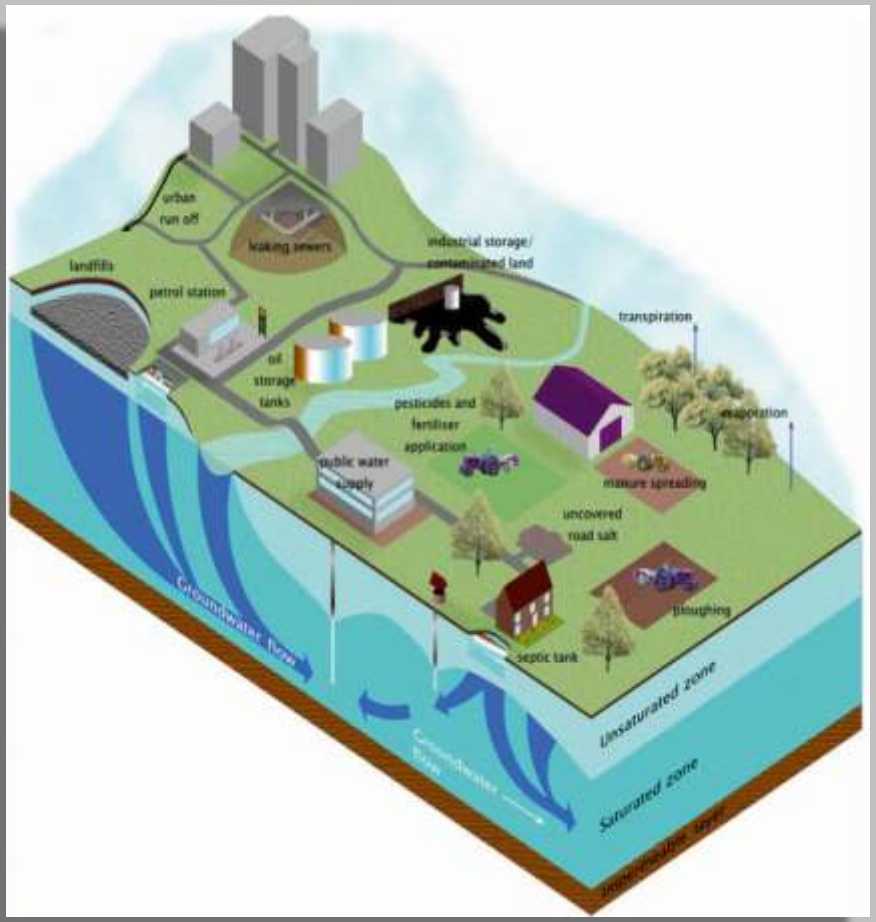
Geology in Water Resource Development

- Exploration and development of water resources have become very important areas of activities for scientists, technologists and engineers in all parts of the world.
- The water resource engineers has to understand the water cycle in all essential details. Study of water cycle is an essential prerequisite for effective planning and execution of major water resource development programmers on national and regional level.

Geology in Water Resource Development



Geology in Water Resource Development



Geology in Water Resource Development

Geology &Civil Engineering

Geology in Town and Regional Planning

- A town planner is concerned essential with land utilization in as best and as aesthetics a manner as possible for developing cities and towns for meetings social needs in different areas.
- The regional Town Planner is responsible for adopting an integrated approach in all such cases of allocation of land for developmental projects.
- Thus a change induced in the natural setup of an area due to a proposed new project is going to lead a series of changes in the adjoining and even in distant places. In nature, nothing works in isolation. As such all sound planning must be in tune with the natural features and processes of a region.

Geology in Town and Regional Planning

Geology in Town and Regional Planning