

## MODULE - I

### Introduction to Civil Engineering :-

Civil Engineering is a professional Engineering discipline which deals with the design, Construction and maintenance of the physical/Artificial and naturally built environment.

This branch of Engineering has several sub-disciplines as ,

- Environmental Engineering
- Geotechnical Engineering
- Structural Engineering
- Transportation Engineering
- Water resources Engineering.

Earthquake engineering, Quantity Surveying, Town planning, Public health engineering, Remote sensing, project management are also specialization of Civil engineering.

### Importance of Civil Engineering in Infrastructure development :-

Infrastructure development of an area is possible due to Civil engineering activities , as mentioned below,

- A proper planning of a town and extension of an area is required to accommodate different facilities like offices, educational institutions, markets, hospitals, residential blocks .

- Vertical growth of a city is necessary to meet fast rate of urbanization & increase in the cost of land.
- Exploitation of various water resources and supervision of water supply to urban areas. Since rural areas need water for agriculture hence construction of canals, distributaries, tanks, dams is required.
- Design of good communication road with appropriate base course thickness, finishing surfaces, cross drainage, horizontal and vertical curve is required to provide various services for the public.
- Control of air pollution, noise pollution and land pollution.

## Role of Civil Engineers :-

A civil engineer has to develop plan, prepare estimate, get approval and to maintain all civil engineering infrastructure activities. Some of the important role in the development of infrastructure are outlined below.

- Measurement & preparation of map for the earth surface.
- Preparation of New plan & Extension plan of towns and Cities.
- Construction of suitable structure for rural and urban areas for various service utilities.
- Construction of Reservoir, tanks and other intake structure to exploit water resources.

- To Build a river navigation System and flood Control projects.
- To Build Canals and distributaries to take water onto the agricultural fields.
- To purify and supply water to residential areas, offices.
- To provide and maintain communication systems like roads, railways, harbours and airports.
- Implementation of Control system for Smooth and efficient movement of traffic.
- Construction & maintenance of waste water disposal system.
- To monitor and to take preventive measures to Control land, water and air pollution.

# Types of Building as per NBC of India

NBC : National Building Code

Type - A Residential Buildings

Type - B Educational Buildings

Type - C Institutional Buildings

Type - H Storage Buildings

Type - D Assembly Buildings

Type - I Hazardous  
Buildings.

Type - E Business Buildings

Type - F Mercantile Buildings

Type - G Industrial Buildings

## Type - A Residential Buildings

- Lodging and Rooming house - sleeping accommodation
  - Not more than 15 persons
  - Dining facilities (optional)
  - Cooking (x)
- One or two family private dwelling -
  - Sleeping accommodation shouldn't exceed 20 persons.

• Dormitories

• Apartment houses (Flats)

• Hotels

- Detached houses
- Semidetached
- Row of houses
- Apartment
- Duplex , Skyscrapers

## Type - B Educational Buildings

School , College , Day Care Centre .

( 8 hrs )

## Type-C Institutional Buildings.

- Hospitals and Sanatoria
- Custodial institution
- Penal institution.

## Type-D Assembly building

Theatres, Auditorium, Dance hall, museum, assembly hall, exhibition ground/hall, restaurants, place of worship, stadium, gymnasiums, club house etc.

D<sub>1</sub> - > 1000 persons, D<sub>3</sub> - > 300 persons

D<sub>2</sub> - < 1000 persons, D<sub>4</sub> - < 300 persons

D<sub>5</sub> - outdoor assembly of people.

## Type-E Business Buildings

Transaction of Business, Keeping of accounts & Records  
beauty parlour, launch Counter. (< 100 persons)

## Type-F Mercantile Buildings.

Shop, marketplace, stores, showrooms

## Type-G Industrial Buildings

product fabrication plant, gas plant, textile mills

## Type-H Storage Buildings

Warehouse, Cold storage, freight depots, store houses  
garage, hanger, railway shed