VARIOUS TYPES OF WATER DEMANDS:

While designing the water supply scheme for a town or city, it is necessary to determine the total quantity of water required for various purposes by the city. As a matter of fact the first duty of the engineer is to determine the water demand of the town and then to find suitable water sources from where the demand can be met. But as there are so many factors involved in demand of water, it is not possible to accurately determine the actual demand. Certain empirical formulae and thumb rules are employed in determining the water demand, which is very near to the actual demand.

Following are the various types of water demands of a city or town:

i. Domestic water demand ii. Industrial demand

iii. Institution and commercial demand iv. Demand for public use

v. Fire demand vi. Loses and wastes

The details of the domestic consumption are

a) Drinking -- 5 litres b) Cooking -- 5 litres

c) Bathing -- 55 litres d) Clothes washing -- 20 litres

e) Utensils washing -- 10 litres f) House washing --10 litres

DOMESTIC WATER DEMAND

The quantity of water required in the houses for drinking, bathing, cooking, washing etc is called domestic water demand and mainly depends upon the habits, social status, climatic conditions and customs of the people. As per IS: 1172-1963, under normal conditions, the domestic consumption of water in India is about135 litres/day/capita. But in developed countries this figure may be 350 litres/day/capita because of use of air coolers, air conditioners, maintenance of lawns, automatic household appliances.

INDUSTRIAL DEMAND

The water required in the industries mainly depends on the type of industries, which are existing in the city. The water required by factories, paper mills, Cloth mills, Cotton mills, Breweries, Sugar refineries etc. comes under industrial use. The quantity of water demand for industrial purpose is around 20 to 25% of the total demand of the city.

INSTITUTION AND COMMERCIAL DEMAND

Universities, Institution, commercial buildings and commercial centers includingoffice buildings, warehouses, stores, hotels, shopping centers, health centers, schools,temple, cinema houses, railway and bus stations etc comes under this category.

DEMAND FOR PUBLIC USE

Quantity of water required for public utility purposes such as for washing and sprinkling on roads, cleaning of sewers, watering of public parks, gardens, public fountains etc comes under public demand. To meet the water demand for public use, provision of 5% of the total consumption is made designing the water works for a city.

FIRE DEMAND

Fire may take place due to faulty electric wires by short circuiting, fire catching materials, explosions, bad intension of criminal people or any other unforeseen mishappenings. If fires are not properly controlled and extinguished in minimum possible time, they lead to serious damage and may burn cities. All the big cities have full fire- fighting squads. As during the fire breakdown large quantity of water is required for throwing it over the fire to extinguish it, therefore provision is made in the water work to supply sufficient quantity of water or keep as reserve in the water mains for this purpose. In the cities fire hydrants are provided on the water mains at 100 to 150 m apart for fire demand. The quantity of water required for fire fighting is generally calculated by using different empirical formulae. For Indian conditions kuichings formula gives satisfactory results.

$Q=3182 \sqrt{p}$

Where ‘Q’ is quantity of water required in litres/min

‘P’ is population of town or city in thousands

LOSES AND WASTES

All the water, which goes in the distribution, pipes does not reach the consumers.

The following are the reasons

1. Losses due to defective pipe joints, cracked and broken pipes, faulty valves and fittings.

2. Losses due to, consumers keep open their taps of public taps even when they are not using the water and allow the continuous wastage of water

3. Losses due to unauthorized and illegal connections

While estimating the total quantity of water of a town; allowance of 15% of total quantity of water is made to compensate for losses, thefts and wastage of water.