FACTORS AFFECTING WATER DEMAND

**WATER DEMAND FOR CERTAIN IMPORTANT INDUSTRIES IS GIVEN AS**

|  |  |  |
| --- | --- | --- |
| **Name of industry and product** | **Units of product or row material used** | **Approx Qty of water sq per unit of production** |
| Automobiles | Vehicle | 40 |
| Distillery | Kiloliters | 120-170 |
| Fertilizers | Tonnes | 80-200 |
| Leather | Tonnes | 40 |
| Paper | Tonnes | 200-400 |
| Special quality of paper | Tonnes | 400-1000 |
| Standard | Tonnes | 75-100 |
| Petroleum refinery | Tonnes (crude oil) | 1-2 |
| Streel | Tonnes | 200-250 |
| sugar | Tonnes (cane) | 1-2 |
| Textile | Tonnes | 80-140 |

**(c) Institutional water demand**

* It is the amount of water required to fulfill the needs of different institutes in the community.
* Water requirements of institutions & commercial establishments are as follows.

**Types of Institution or Commercial Establishment**

|  |  |
| --- | --- |
| **Types of Institution or Commercial Establishment** | **Average water consumption**  **(L/C/D)** |
| Offices | 43-90 |
| Factories |  |
| * Where bathrooms are provided | 45-90 |
| * Where no bathrooms are provided | 30-60 |
| School |  |
| * Day schools | 45-90 |
| * Residential schools | 135-225 |
| Hostels | 135-180 |
| Hotels | 180 per bed |
| Restaurants | 70 per bed |
| Hospitals |  |
| * Number of beds100 | 340 per bed |
| * Number of beds | 450 per bed |
| Nursing home & Medical quarters | 135-225 |



**Note:**

In the general ratio of max demand of the (annual) average demand for any duration can be computed using GOOD RICH EQUATION.

|  |
| --- |
| **f(%) = =** |

t=time(days)

t1day

|  |  |  |
| --- | --- | --- |
| **Time** | **Demand** | **Fluctuation** |
|  | Hourly | 2.7 |
| 1 | Daily | 1.8 |
| 7 | Weekly | 1.48 |
| 30 | Monthly | 1.28 |
| 365 | Yearly | 1 |

**Note:**

Public use = 5% to 6% of total demand of water.

Losses and theft = 10% to 15% of total water demand.

Industrial water = 20% to 25% of total water demand.

**TYPES OF DEMAND**

1. **Domestic water demand – As per IS 1172 :1993**

|  |  |  |
| --- | --- | --- |
| **Use** | **LIG**  **(/pcd)** | **HIG**  **(/pcd)** |
| Bathing | 55 | 75 |
| Flushing of water closets | 30 | 45 |
| Washing of cloths | 20 | 25 |
| Washing utensils | 10 | 15 |
| Washing the house | 10 | 15 |
| Lawn watering & gardening | - | 15 |
| Cooking | 5 | 5 |
| Drinking | 5 | 5 |
| Total | 135 | 200 |

HIG = High income group

LIG = Low income group

|  |  |
| --- | --- |
| **Components** | **Design life** |
| Source dam/ reservoir | 50 |
| Pumping mains (before treatment) | 30 |
| Pumps | 15 |
| Water treatment plant | 15 |
| Gravity mains (after treatment) | 30 |
| Service reservoir | 15 |
| Distribution system | 30 |

**Design periods for different components of a water supply scheme**

|  |  |  |
| --- | --- | --- |
| **S.NO** | **Items** | **Design period in year** |
| 1 | Storage by dams | 50 |
| 2 | Intake works | 30 |
| 3 | Pumping   1. Pumping house 2. Electric motors and pumps | 30  15 |
| 4 | Water treatment units | 15 |
| 5 | Pipe connection to the several treatment units and other small appurtenances | 30 |
| 6 | Raw water and clear water conveying units | 30 |
| 7 | CWR at the head works, balancing tanks and service reservoirs (OHSR or GLR) | 15 |
| 8 | Distribution system | 30 |