Definitions of some common terms used in the sanitary engineering:

REFUSE:
This is the most general term to indicate the wastes which include all the rejects left as worthless, sewage, sullage – all these terms are included in this term.

GARBAGE:
It is a dry refuse which includes, waste papers, sweepings from streets and markets, vegetable peelings etc. The quantity of garbage per head per day amounts to be about .14 to .24 kg for Indian conditions. Garbage contains large amount of organic and putrefying matter and therefore should be removed as quickly as possible.

RUBBISH:
It consists of sundry solid wastes from the residencies, offices and other buildings. Broken furniture, paper, rags etc are included in this term. It is generally dry and combustible.

SULLAGE:
It is the discharge from the bath rooms, kitchens, wash basins etc., it does not include discharge from the lavatories, hospitals, operation theaters, slaughter houses which has a high organic matter.

SEWAGE:
It is a dilute mixture of the wastes of various types from the residential, public and industrial places. It includes sullage water and foul discharge from the water closets, urinals, hospitals, stables, etc.

STORM WATER:
It is the surface runoff obtained during and after the rainfall which enters sewers through inlet. Storm water is not foul as sewage and hence it can be carried in the open drains and can be disposed off in the natural rivers without any difficulty.

SANITARY SEWAGE:
It is the sewage obtained from the residential buildings & industrial effluents establishments‘. Being extremely foul it should be carried through underground conduits.

DOMESTIC SEWAGE:

It is the sewage obtained from the lavatory basins, urinals &water closets of houses, offices & institutions. It is highly foul on account of night soil and urine contained in it. Night soil starts putrefying & gives offensive smell. It may contain large amount of bacteria due to the excremental wastes of patients. This sewage requires great handling &disposal.

INDUSTRIAL SEWAGE:

It consists of spent water from industries and commercial areas. The degree of foulness depends on the nature of the industry concerned and processes involved.

SEWERS:

Ewers are underground pipes which carry the sewage to a point of disposal.

SEWERAGE:

The entire system of collecting, carrying &disposal of sewage through sewers is known as sewerage.

DRY WEATHER FLOW (DWF):

Domestic sewage and industrial sewage collectively, is called as DWF. It does not contain storm water. It indicates the normal flow during dry season.

BACTERIA:

These are the microscopic organisms. The following are the groups of bacteria:

-Aerobic bacteria: they require oxygen &light for their survival.

-Anaerobic bacteria: they do not require free oxygen and light for survival.

- Facultative bacteria: they can exist in the presence or absence of oxygen. They grow more in absence of air.

Invert:

It is the lowest point of the interior of the sewer at any c/s.

SLUDGE:

It is the organic matter deposited in the sedimentation tank during treatment.

Importance of sewerage system:

One of the fundamental principles of sanitation of the community is to remove all decomposable matter, solid waste, liquid or gaseous away from the premises of dwellings as fast as possible after it is produced, to a safe place, without causing any nuisance and dispose it in a suitable manner so as to make it permanently harmless.

Sanitation though motivated primarily for meeting the ends of preventive health has come to be recognized as a way of life. In this context, development of the sanitation infrastructure of any country could possibly serve as a sensitive index of its level of prosperity. It is needless to emphasize that for attaining the goals of good sanitation, sewerage system is very essential.

Sources of Sewage:

Sanitary sewage is produced from the following sources:
When the water is supplied by water works authorities or provided from private sources, it is used for various purposes like bathing, utensil cleaning, for flushing water closets and urinals or washing clothes or any other domestic use. The spent water for all the above needs forms the sewage.

1. Industries use the water for manufacturing various products and thus develop the sewage.
2. Water supplied to schools, cinemas, hotels, railway stations, etc., when gets used develops sewage.
3. Ground water infiltration into sewers through loose joints.
4. Unauthorized entrance of rain water in sewer lines.

Nature of Sewage:

Sewage is a dilute mixture of the various types of wastes from the residential, public and industrial places. The characteristics and composition i.e. the nature of sewage mainly depends on this source. Sewage contains organic and inorganic matters which may be dissolved, suspension and colloidal state. Sewage also contains various types of bacteria, Virus, protozoa, etc. sewage may also contain toxic or other similar materials which might have got entry from industrial discharges. Before the design of any sewage treatment plant the knowledge of the nature of sewage is essential.

PLUMBING SYSTEMS FOR BUILDING:

Following are the four principle systems adopted in plumbing work in building

1. Two pipe system.
2. One pipe system.
3. Single stack system
4. Partially ventilated single stack system.

1) Two pipe system:

1. This is the best and most improved type of system of plumbing.

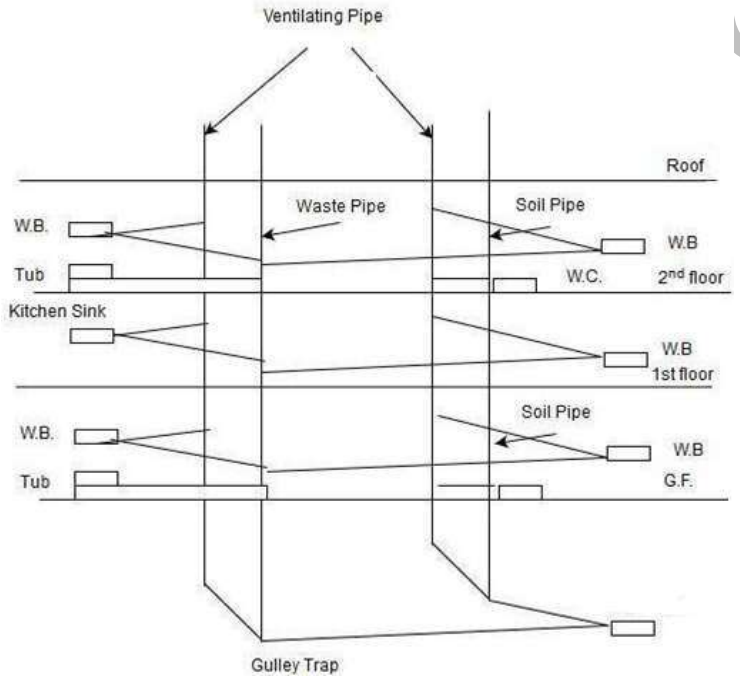
2. In this system, two sets of vertical pipes are laid, i.e. one for draining night soil and other for draining sullage.

3. The pipe of the first set carrying night soil are called soil pipes. and the pipes of the second set carrying sullage from baths etc are called sullage pipe or waste pipe

4. The soil fixtures, such as latrines and urinals are thus all connected through branch pipes to the vertical pipe.

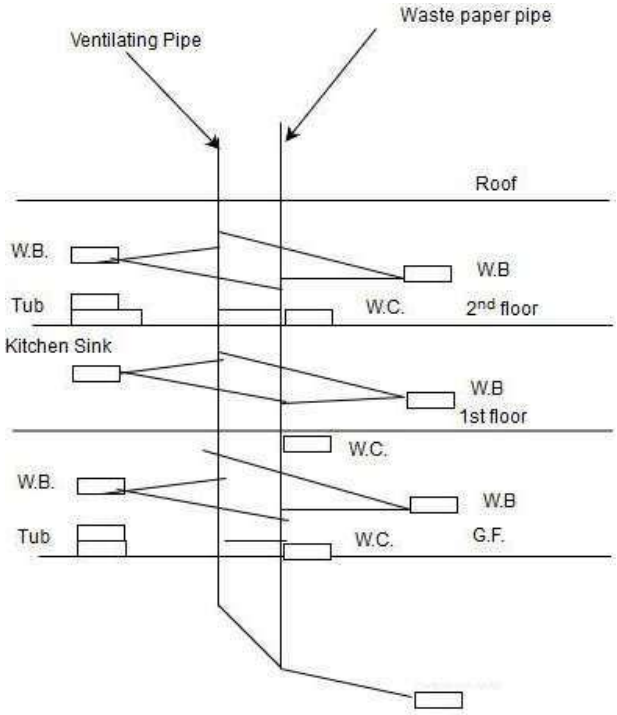
5. Where the sludge fixtures such as baths, sinks, wash-basins, etc are all connected through branch pipes to the vertical waste pipe.

6. The soil pipe as well as the waste pipe are separately ventilated by providing separate vent pipe as shown in figure



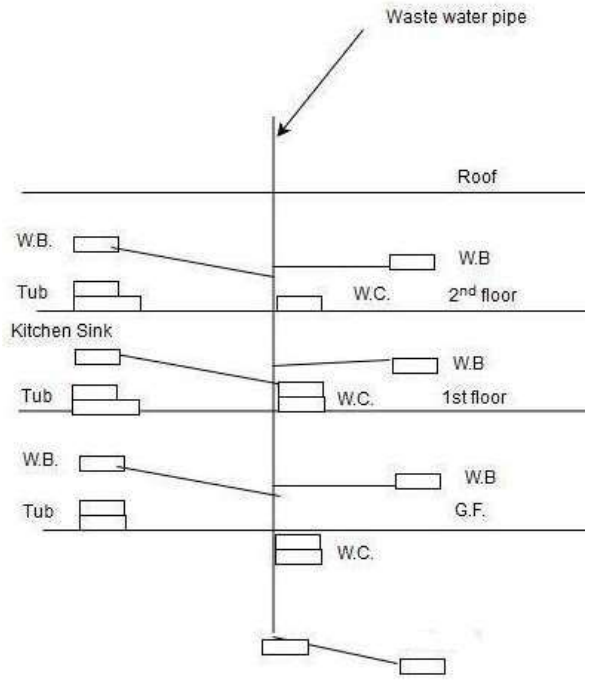
2) One pipe system:

In this system, instead of using two separate pipes (for carrying sullage and night soil, as it done in the above described two pipe system), only main vertical pipe is provided which collects the night soil as well as the sullage water from their respective fixtures through the branch pipes. This main pipe is ventilated in itself by providing cowl at its top and in addition to this, a separate vent pipe is also provided, as shown in the figure.



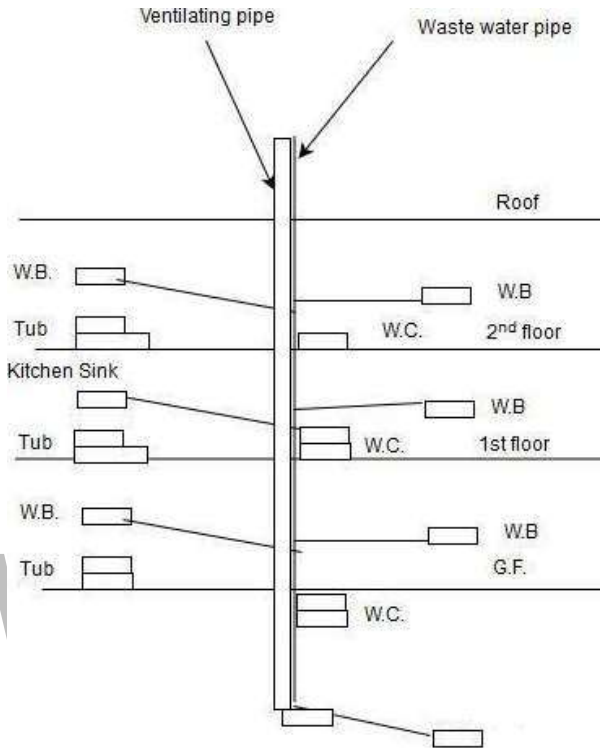
3) Single Stack System:

This system is a single pipe system without providing any separate ventilation pipe. It uses only one pipe which carries the sewage as well as sullage, and is not provided with any separate vent pipe, except that it itself is extended up to about 2m higher than the roof level and provided with a cowl for removal of foul gases as shown in fig.



4) Partially ventilated single stack:

This is an improved form of single stack system in the sense that in this system, the traps of water closets are separately ventilated by a separate vent pipe called relief vent pipe. This system uses two pipes as in single pipe system but the cost of branches is considerably reduced compared to single pipe system.



Quantity of Sanitary Sewage and Storm Water:

The determination of sanitary sewage is necessary because of the following factors which depend on this:

1. To design the sewerage schemes as well as to dispose a treated sewage efficiently.
2. The size, shape and depth of sewers depend on quantity of sewage.
3. The size of pumping unit depends on the quantity of sewage.

Estimate of Sanitary Sewage:

Sanitary sewage is mostly the spent water of the community into sewer system with some groundwater and a fraction of the storm runoff from the area, draining into it. Before designing the sewerage system, it is essential to know the quantity of sewage that will flow through the sewer.

The sewage may be classified under two heads:

1. The sanitary sewage, and
2. Storm water

Sanitary sewage is also called as the Dry Weather Flow (D.W.F), which includes the domestic sewage obtained from residential and residential and industrials etc., and the industrial sewage or trade waste coming from manufacturing units and other concerns.

Quantity of Sewage:

It is usual to assume that the rate of sewage flow, including a moderate allowance for infiltration equals to average rate of water consumption which is 135 litre/ head /day according to Indian Standards. It varies widely depending on size of the town etc. this quantity is known as Dry Weather Flow (D.W.F). It is the quantity of water that flows through sewer in dry weather when no storm water is in the sewer.

Rate of flow varies throughout 24 hours and is usually the greatest in the fore-noon and very small from midnight to early morning. For determining the size of sewer, the maximum flow should be taken as three times the D.W.F.

Design Discharge of Sanitary Sewage

The total quantity of sewage generated per day is estimated as product of forecasted population at the end of design period considering per capita sewage generation and appropriate peak factor. The per capita sewage generation can be considered as 75 to 80% of the per capita water supplied per day. The increase in population also result in increase in per capita water demand and hence, per capita production of sewage. This increase in water demand occurs due to increase in living standards, betterment in economic condition, changes in habit of people, and enhanced demand for public utilities.

Factors affecting the quantity of sewage flow: -

The quantity of sanitary sewage is mainly affected by the following factors:

1. Population
2. Type of area
3. Rate of water supply
4. Infiltration and exfiltration

In addition to above, it may also be affected by habits of people, number of industries and water pressure etc.

The quantity of sanitary sewage directly depends on the population. As the population increases the quantity of sanitary sewage also increases. The quantity of water supply is equal to the rate of water supply multiplied by the population. There are several methods used for forecasting the population of a community.

The quantity of sanitary sewage also depends on the type of area as residential, industrial or commercial. The quantity of sewage developed from residential areas depend on the rate of water supply to that area, which is expressed a litres/ capita/ day and this quantity is obtained by multiplying the population with this factor.

The quantity of sewage produced by various industries depends on their various industrial processes, which is different for each industry.

Similarly, the quantity of sewage obtained from commercial and public places can be determined by studying the development of other such places.

Rate of water

Truly speaking the quantity of used water discharged into a sewer system should be a little less than the amount of water originally supplied to the community. This is because of the fact that all the water supplied does not reach sewers owing to such losses as leakage in pipes or such deductions as lawn sprinkling, manufacturing processes etc.

However, these losses may be largely be made up by such additions as surface drainage, groundwater infiltration, water supply from private wells etc. On an average, therefore, the quantity of sewage maybe considered to be nearly equal to the quantity of water supplied. Ground water infiltration and exfiltration.

The quantity of sanitary sewage is also affected by groundwater infiltration through joints. The quantity will depend on, the nature of soil, materials of sewers, type of joints in sewer line, workmanship in laying sewers and position of underground water table.

Infiltration causes increase to the ―legitimate‖ flows in urban sewerage systems. Infiltration represents a slow response process resulting in increased flows mainly due to seasonally-elevated groundwater entering the drainage system, and primarily occurring through defects in the pipe network.

Exfiltration represents losses from the sewer pipe, resulting in reduced conveyance flow rate is due to leaks from defects in the sewer pipe walls as well as overflow discharge into manholes, chambers and connecting surface water pipes. The physical defects are due to a combination of factors including poor construction and pipe joint fittings, root penetration, illicit connections, biochemical corrosion, soil conditions and traffic loadings as well as aggressive groundwater.

It is clear that Infiltration and Exfiltration involve flows passing through physical defects in the sewer fabric and they will often occur concurrently during fluctuations in groundwater levels, and particularly in association with wet weather events; both of which can generate locally high hydraulic gradients. Exfiltration losses are much less obvious and modest than infiltration gains, and are therefore much more difficult to identify and quantify. However, being dispersed in terms of their spatial distribution in the sewer pipe, exfiltration losses can have potentially significant risks for groundwater quality.

Quantity of storm water:

When rain falls over the ground surface, a part of it percolates into the ground, a part is evaporated in the atmosphere and the remaining part overflows as storm water. This quantity of storm water is very large as compared with sanitary sewage.

Factors affecting storm water:

The following are factors which affect the quantity of storm water:

1. Rainfall intensity and duration.
2. Area of the catchment.
3. Slope and shape of the catchment area.
4. Nature of the soil and the degree of porosity.
5. Initial state of the catchment.

If rainfall intensity and duration is more, large will be the quantity of storm water available. If the rainfall takes place very slowly even though it continues for the whole day, the quantity of storm water available will be less.

Harder surface yield more runoff than soft, rough surfaces. Greater the catchment area greater will be the amount of storm water. Fan shaped and steep areas contribute more quantity of storm water. In addition to the above it also depends on the temperature, humidity,wind etc.

Estimate of quantity of storm water: -

Generally, there are two methods by which the quantity of storm water is calculated:

1. Rational method
2. Empirical formulae method

In both the above methods, the quantity of storm water is a function of the area, the intensity of rainfall and the co-efficient of runoff.

Rational method:

Runoff from an area can be determined by the Rational Method.The method gives a reasonable estimate up to a maximum area of 50 ha (0.5 Km2).

The minimum duration to be used for computation of rainfall intensity is 10 minutes. If the time of concentration computed for the drainage area is less than 10 minutes, then 10 minutes should be adopted for rainfall intensity computations.

This method is mostly used in determining the quantity of storm water. The storm water quantity is determined by the rational formula:

$$Q = \frac{C.i.A}{360}$$

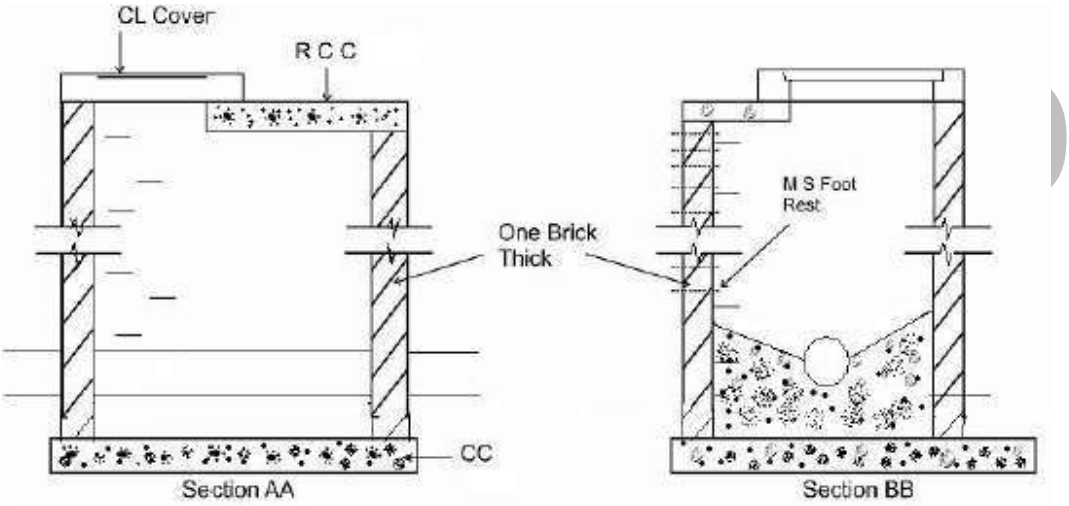
SEWER APPURTENANCES:

The structures, which are constructed at suitable intervals along the sewerage system to help its efficient operation and maintenance, are called as sewer appurtenances. These include:

(1) Manholes, (2) Drop manholes, (3) Lamp holes,
(4) Clean-outs, (5) Street inlets (6) Catch basins,
(7)Inverted siphon,

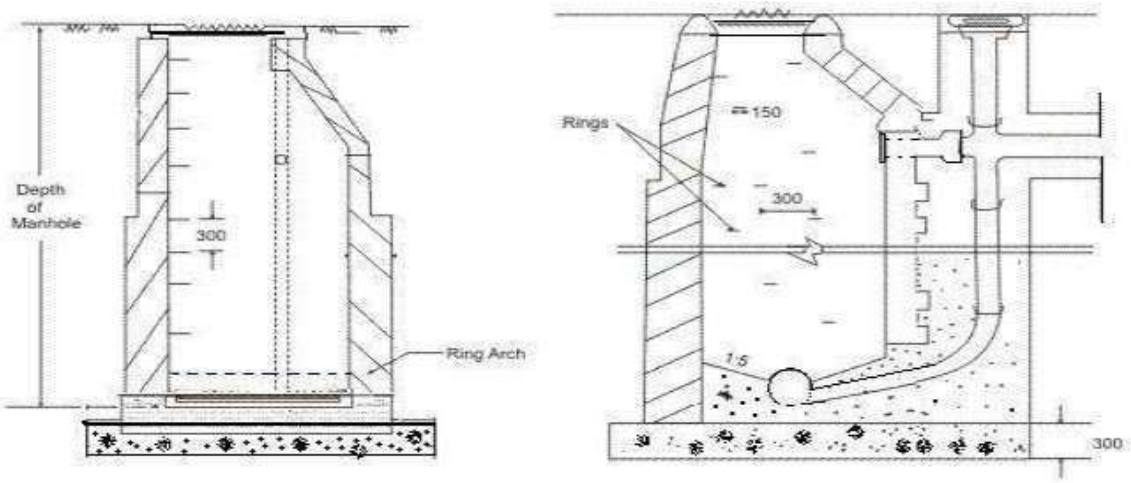
Manholes

The manhole is masonry or R.C.C. chamber constructed at suitable intervals along the sewer lines, for providing access into them. Thus, the manhole helps in inspection, cleaning and maintenance of sewer. These are provided at every bend, junction, change of gradient or change of diameter of the sewer. The sewer line between the two manholes is laid straight with even gradient. For straight sewer line manholes are provided at regular interval depending upon the diameter of the sewer. The minimum width of the manhole should not be less than internal diameter of the sewer pipes plus 150 mm benching on both the sides.



Drop Manholes

When a sewer connects with another sewer, where the difference in level between invert level of branch sewer and water line in the main sewer at maximum discharge is greater than 0.6 m, a manhole may be built either with vertical or nearly vertical drop pipe from higher sewer to the lower one. The drop manhole is also required in the same sewer line in sloping ground, when drop more than 0.6 m is required to control the gradient and to satisfy the maximum velocity i.e., non-scouring velocity.

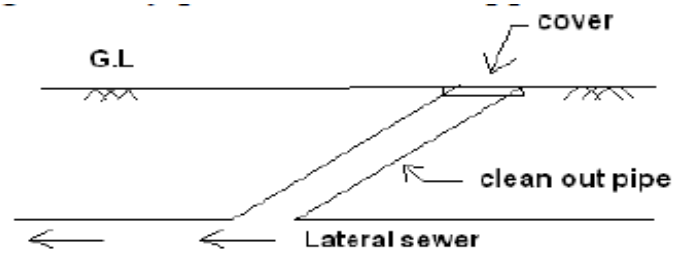


Lamp hole

It is an opening or hole constructed in a sewer for purpose of lowering a lamp inside it. It consists of stoneware or concrete pipe, which is connected to sewer line through a T-junction as shown in the. The pipe is covered with concrete to make it stable. Manhole cover of sufficient strength is provided at ground level to take the load of traffic. An electric lamp is inserted in the lamp hole and the light of lamp is observed from manholes. If the sewer length is unobstructed, the light of lamp will be seen. It is constructed when construction of manhole is difficult. In present practice as far as possible the use of lamp hole is avoided. This lamp hole can also be used for flushing the sewers. If the top cover is perforated it will also help in ventilating the sewer, such lamp hole is known as fresh air inlet.

Clean out

It is a pipe which is connected to the underground sewer. The other end of the clean-out pipe is brought up to ground level and a cover is placed at ground level (Figure 8.8). A clean-out is generally provided at the upper end of lateral sewers in place of manholes.



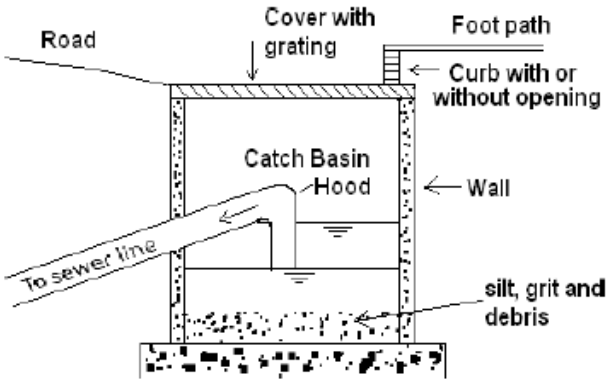
During blockage of pipe, the cover is taken out and water is forced through the clean-out pipe to lateral sewers to remove obstacles in the sewer line. For large obstacles, flexible rod may be inserted through the clean-out pipe and moved forward and backward to remove such obstacle.

Storm water inlets

Storm water inlets are provided to admit the surface runoff to the sewers. These are Classified in three major groups viz. curb inlets, gutter inlets, and combined inlets. They are provided either depressed or flush with respect to the elevation of the pavement surface. The structure of the inlet is constructed with brickwork with cast iron grating at the opening confirming to IS 5961. Where the traffic load is not expected, fabricated steel grating can be used. The clear opening shall not be more than 25 mm. The connecting pipe from the street inlet to the sewer should be minimum of 200 mm diameter and laid with sufficient slope. A maximum spacing of 30 m is recommended between the inlets, which depends upon the road surface, size and type of inlet and rainfall.

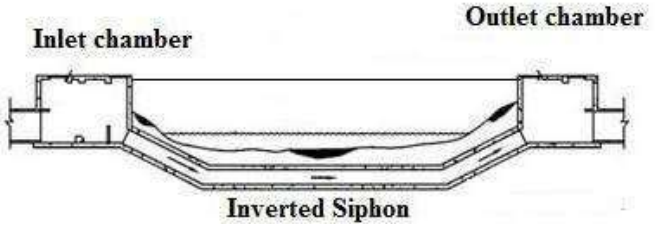
Catch basins

Catch basins are provided to stop the entry of heavy debris present in the storm water into the sewers. However, their use is discouraged because of the nuisance due to mosquito breeding apart from posing substantial maintenance problems. At the bottom of the basin space is provided for the accumulation of impurities. Perforated cover is provided at the top of the basin to admit rain water into the basin. A hood is provided to prevent escape of sewer gas.



Inverted Siphon

An inverted siphon or depressed sewer is a sewer that runs full under gravity flow at a pressure above atmosphere in the sewer. Inverted siphons are used to pass under obstacles such as buried pipes, subways, etc. This terminology ‘siphon’ is misnomer as there is no siphon action in the depressed sewer. As the inverted siphon requires considerable attention for maintenance, it should be used only where other means of passing an obstacle inline of the sewer are impracticable.



SEWER MATERIALS:

Sewer is a pipe or conduit carrying sewage. Sewers are usually not flow full (Gravity Flow). The full flowing sewers are called force main as the flow is under pressure.

Following are types of sewer according to material

1. Asbestos Cement (AC) Sewer
2. Brick Sewer
3. Cement Sewer
4. Cast iron (CI) Sewer
5. Steel Sewers
6. Plastic Sewers

1. Asbestos Cement (AC) Sewer

Types of sewer like Asbestos Cement (AC) Sewers are manufactured from a mixture of cement and asbestos fiber. Asbestos Cement (AC) Sewers are suitable for carrying domestic sanitary sewage.

Asbestos cement sewer is best as vertical pipe for carrying sullage from upper floors of multistory buildings (in two pipe system of plumbing).

Advantages of Asbestos Cement (AC) Sewer

1. Smooth
2. Light in weight
3. Can easily be cut, fitted and drilled
4. Durable against soil corrosion

Disadvantages of Asbestos Cement (AC) Sewer

1. Brittle cannot withstand heavy loads
2. They are easily broken in handling and transport.

2. Brick Sewers

These types of sewer (Brick Sewers) are made at site and used for construction large size sewer. Brick Sewers are very useful for construction of storm sewer or combined sewer**.** Nowadays brick sewers are replaced by concrete sewer. Brick sewers my get deformed and leakage may take place. A lot of labour work is required.

Note: To avoid leakage the brick sewer should be plastered.

3. Cement Concrete

i. PCC - for dia upto 60 cm

Suitable for small storm drains. Not durable.

ii. RCC - for dia > 60 cm

They may be cast in situ or precast, resistant to heavy loads, corrosion and high pressure. These are very heavy and difficult to transport.

4. Cast Iron (CI) Sewers

These types of sewer are High strength and durability water tight. Cast Iron sewers can withstand high internal pressure and can bear external load. Cast Iron sewers are suitable for the following conditions.

When the sewage is conveyed under high pressure.

When the sewer line is subject to heavy external load e.g. under railway line

When there is considerable difference in temperature.

5. Steel Sewers

These types of sewer (steel sewers) are Impervious, light, resistant to high pressure, flexible, suitable when;

The sewage is carried under pressure

The sewage has to be carried across a river under water

The sewer has to cross under a railway track.

6. Plastic sewers

Nowadays PVC sewers are used for carrying sewage. Plastic sewers are resistant to corrosion. Such types of sewer are light in weight, smooth and can be bent easily. But these types of sewer (Plastic sewers) are having high co-efficient of thermal expansion and cannot be used in very hot areas.

SEWERAGE SYSTEMS:

1) Separate system of sewage
2) Combined system of sewage
3) Partially combined or partially separate system

SEPARATE SYSTEM OF SEWERAGE

In this system two sets of sewers are laid. The sanitary sewage is carried through sanitary sewers while the storm sewage is carried through storm sewers. The sewage is carried to the treatment plant and storm water is disposed of to the river.

Advantages:

1) Size of the sewers is small
2) Sewage load on treatment unit is less
3) Rivers are not polluted
4) Storm water can be discharged to rivers without treatment.

Disadvantage:

1) Sewerage being small, difficulty in cleaning them
2) Frequent choking problem will be their.
3) System proves costly as it involves two sets of sewers
4) The use of storm sewer is only partial because in dry season the will be converted into dumping places and may get clogged.

COMBINED SYSTEM OF SEWAGE

When only one set of sewers are used to carry both sanitary sewage and surface water. This system is called combined system.

Sewage and storm water both are carried to the treatment plant through combined sewers.

Advantages:

1) Size of the sewers being large, chocking problems are less and easy to clean.
2) It proves economical as 1 set of sewers are laid.
3) Because of dilution of sanitary sewage with storm water nuisance potential is reduced

Disadvantages:

1) Size of the sewers being large, difficulty in handling and transportation.
2) Load on treatment plant is unnecessarily increased
3) It is uneconomical if pumping is needed because of large amount of combined flow.

4) Unnecessarily storm water is polluted

PARTIALLY COMINED OR PARTIALLY SEPARATE SYSTEM

A portion of storm water during rain is allowed to enter sanitary sewer to treatment plants while the remaining storm water is carried through open drains to the point of disposal.

Advantages:

1) The sizes of sewers are not very large as some portion of storm water is carried through open drains.
2) Combines the advantages of both the previous systems.
3) Silting problem is completely eliminated

Disadvantages:

1) During dry weather, the velocity of flow may be low.
2) The storm water is unnecessary put load on to the treatment plants to extend.

Suitable conditions for separate sewerage systems:

A separate system would be suitable for use under the following situations:

1. Where rainfall is uneven.
2. Where sanitary sewage is to be pumped.
3. The drainage area is steep, allowing to runoff quickly.
4. Sewers are to be constructed in rocky strata.
5. The large combined sewers would be more expensive.

Suitable conditions for combined system:

1. Rainfall in even throughout the year.
2. Both the sanitary sewage and the storm water have to be pumped.
3. The area to be severed is heavily built up and space for laying two sets of pipes is not enough.
4. Effective or quicker flows have to be provided.

After studying the advantages and disadvantages of both the systems, present day construction of sewers is largely confined to the separate systems except in those cities where combined system already exists. In places where rainfall is confined to one season of the year, like India and even in temperate regions, separate system is most suitable.

Sl. no.	Separate system	Combined system
1.	The quantity of sewage to be treated is less, because no treatment of storm water is done.	As the treatments of both are done, the treatment is costly.
2.	In the cities of more rainfall this system is more suitable.	In the cities of less rainfall this system is suitable.
3.	As two sets of sewer lines are to laid, this system is cheaper because sewage is carried in underground sewers and storm	Overall construction cost is higher than separate system.
4.	In narrow streets, it is difficult to use this system.	It is more suitable in narrow streets.
5.	Less degree of sanitation is achieved in this system, as storm water is disposed without any treatment.	High degree of sanitation is achieved in this system.

Methods of domestic waste water disposal:

After the waste water is treated it is disposed in the nature in the following two principal methods

a. Disposal by Dilution where large receiving water bodies area available

b. Land disposal where sufficient land is available

The choice of method of disposal depends on many factors and is discussed later. Sanitary engineering starts at the point where water supply engineering ends. It can be classified as

- Collection works
- Treatment works
- Disposal works

- The collection consists of collecting tall types of waste products of town. Refuse is collected separately. The collection works should be such that waste matters can be transported quickly and steadily to the treatment works. The system employed should be self-cleaning and economical.

- Treatment is required to treat the sewage before disposal so that it may not pollute the atmosphere & the water body in which it will be disposed of. The type of treatment processes depends on the nature of the waste water characteristics and hygiene, aesthetics and economical aspects.

- The treated water is disposed of in various ways by irrigating fields or discharging in to natural water courses.

Different Methods of domestic waste water disposal include (Systems of Sanitation):

1) Conservency System
2) Water Carriage System

CONSERVENCY SYSTEM:

Sometimes the system is also called as dry system. This is out of date system but is prevailing in small towns and villages. Various types of refuse and storm water are collected conveyed and disposed of separately. Garbage is collected in dustbins placed along the roads from where it is conveyed by trucks ones or twice a day to the point of disposal. all the non-combustible portion of garbage such as sand dust clay etc are used for filling the low level areas to reclaim land for the future development of the town. The combustible portion of the garbage is burnt. The decaying matters are dried and disposed of by burning or the manufacture of manure.
Human excreta are collected separately in conservancy latrines. The liquid and semi liquid wastes are collected separately after removal of night soil it is taken outside the town in trucks and buried in trenches. After 2-3 years the buried night soil is converted into excellent manure. In conservancy system sullage and storm water are carried separately in closed drains to the point of disposal where they are allowed to mix with river water without treatment.

WATER CARRIAGE SYSTEM

With development and advancement of the cities urgent need was felt to replace conservancy system with some more improved type of system in which human agency should not be used for the collection and conveyance of sewage. After large number of experiments it was found that the water is the only cheapest substance which can be easily used for the collection and conveyance of sewage. As in this system water is the main substance therefore it is called as water carriage system.
In this system the excremental matter is mixed up in large quantity of water their taken out from the city through properly designed sewerage systems, where they are disposed of after necessary treatment in a satisfactory manner.
The sewages so formed in water carriage system consist of 99.9% of water and .1% solids. All these solids remain in suspension and do not changes the specific gravity of water therefore all the hydraulic formulae can be directly used in the design of sewerage system and treatment plants.

Difference between Conservancy system and Water carriage system:

CONSERVENCY SYSTEM	WATER CARRIAGE SYSTEM
Very cheap in initial cost.	It involves high initial cost.
Due to foul smells from the latrines, they are to be constructed away from living room so building cannot be constructed as compact units.	As there are no foul smell latrines remain clean and neat and hence are constructed with rooms, therefore buildings may be compact.
The aesthetic appearance of the city cannot be improved	Good aesthetic appearance of city can be obtained.
For burial of excremental matter large area is required.	Less area is required as compared to conservancy system.
Excreta is not removed immediately hence its decomposition starts before removal,	Excreta are removed immediately with water, no problem of foul smell or hygienic trouble.
This system is fully depended on human agency .In case of strike by the sweepers; there is danger of insanitary conditions in	As no human agency is involved in this system ,there is no such problem as in case of conservancy system