

# 03 PLUMBING FIXTURES

Building Services – II  
(Plumbing)

Lecturer; Sarko Hassan  
Sleman Cihan University  
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# PLUMBING FIXTURES

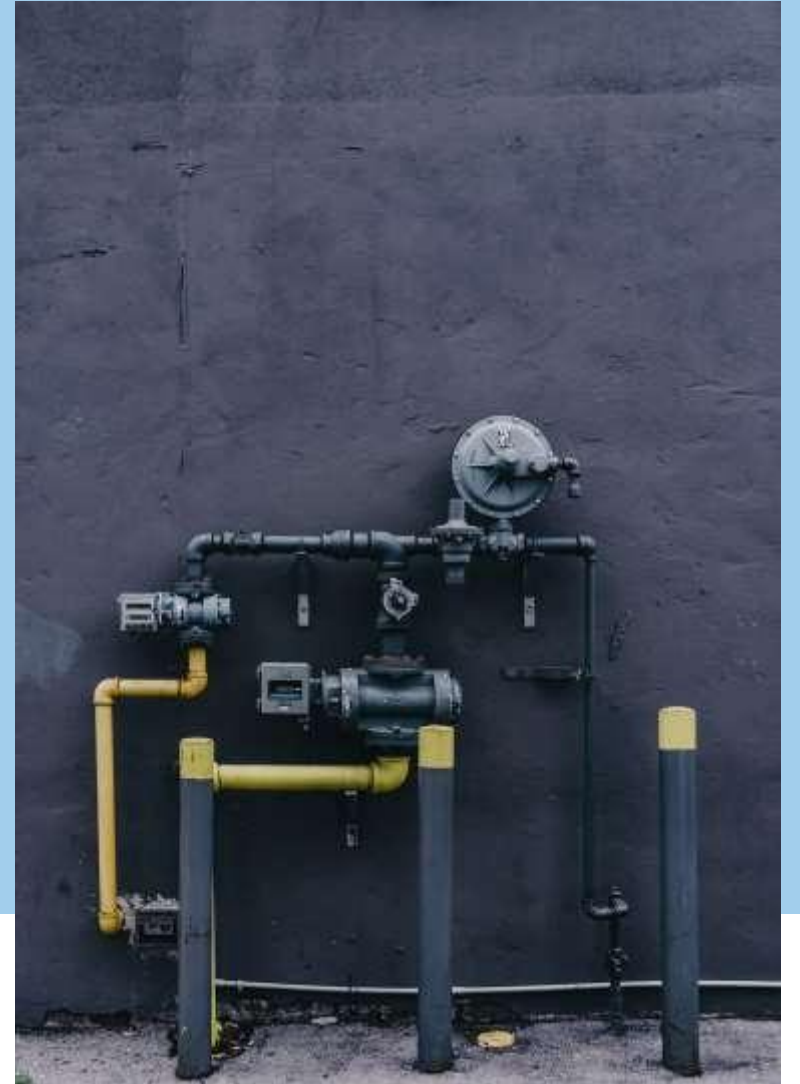
1. Pipes and Bends
2. Valves
3. Taps, Bib Cocks and Mixers

# PIPES

A pipe is a hollow tube, usually of circular cross section, used to facilitate transport materials that can flow.

A water pipe is often made of **plastic** or **metal** and carries pressurized and treated fresh water to a building (as part of a municipal water system).

Pipes are also used to distribute water inside a building.



# TYPES OF PIPES

## 1. METALLIC PIPES

- i. Cast Iron Pipes
- ii. Galvanised Iron Pipes
- iii. Steel Pipes
- iv. Copper Pipes

## 2. ASBESTOS CEMENT PIPES

### **3. PLASTIC PIPES**

- i.** Un-plasticised PVC (uPVC) Pipes
- ii.** Chlorinated PVC
- iii.** Polythene Pipes (low density and high density pipes)

### **4. CONCRETE PIPES**

# CAST IRON PIPES:

These pipes are most commonly used in water distribution system mainly because of the following reasons –

- i.** They are cheaper in cost.
- ii.** They have high resistance to corrosion.
- iii.** These are highly durable.



# GALVANIZED IRON PIPES:

1. This type of pipes are used for water distribution system inside a building.
2. These pipes are made of wrought iron and have a zinc coating.
3. These pipes are available in light, medium and heavy grade depending on their thickness. For a 15 mm pipe 2mm, 2.65mm and 3.5mm are thickness of light, medium and heavy grade respectively.



# STEEL PIPES:

- 1. Use of steel pipes in water supply systems is suggested when –**
  - i. pipes are subjected to very high pressure (above  $7\text{kg/cm}^2$ )**
  - ii. large diameter pipes are required.**
- 2. Steel pipes are used because they are stronger and lighter compared to Cast Iron pipes.**





# COPPER PIPES :

1. These pipes are used in hot water installation. They have **high tensile strength** and can therefore have thin walls and they can be bent easily.
2. Copper pipes are sometimes coated with chromium to enhance its appearance.



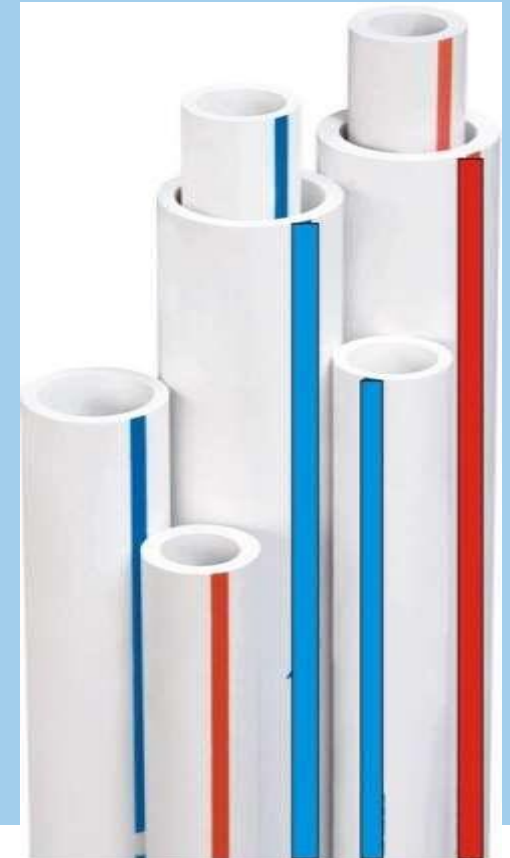
# ASBESTOS CEMENT PIPES:

1. These pipes are used for drainage of rainwater from roofs, soil and waste and also for ventilation.
2. The pipes come in lengths of 3 meters.
3. The principal defect of these pipes is that they are **heavy and thus break easily**.
4. These pipes are **cheaper than PVC pipes**.



# PLASTIC, POLYTHENE AND PVC PIPES :

1. These pipes are being used increasingly these days for supply of cold water in external and internal plumbing work.
2. They are light in weight, non-corrosive, lower in cost and do not require any threading for connections.
3. There are 3 common types of plastic pipes are available in market, as given below –
  - i. Un-plasticized PVC (UPVC) or rigid pipes for use water at temperature up to 45C.
  - ii. Plasticized PVC pipes, are plasticized with addition of rubber, have lower strength and lower working temperature around 30–35C.
  - iii. Chlorinated PVC (CPVC) pipes can withstand higher temperatures up to 120C and are used to carry hot water.



# CONCRETE PIPES:

1. Unreinforced pipes of small diameters as well as reinforced and pre-stressed concrete pipes of large diameters are available for water supply and other uses.
2. Small unreinforced concrete pipes are very much used for **drainage of rain water**.
3. Large diameter pipes are generally used for major water supply works.



# VALVES:

A valve is a device that regulates, directs or controls the flow of fluids by opening, closing, or partially obstructing passageways.



# TYPES OF VALVES

1. Sluice Valves Or Gate Valves
2. Air Valves
3. Reflux Valves
4. Relief Valves
5. Altitude Valves
6. Scour Valves
7. Fire Hydrants
8. Float Valve

# SLUICE VALVE OR GATE VALVE

1. These are also known as shut off valves or stop valves.
2. They are extensively used in the distribution system to shut off the supply where desired.
3. They are also used to divide the water mains into suitable sections, of between 150 to 300m.
4. They can also be used at street corners or where two pipe lines intersect.
5. They have the advantage over most other types of valves in that they are relatively **less expensive**, and they offer almost **no resistance to the flow** when the valve is wide open.



# AIR VALVE:

1. The water flowing through the pipe lines always contain some air. When this air collects at high points, it may affect with the flow.
2. Air relief valves are provided at the summits along the water pipe, to provide an exit for the collected air.
3. Air valves are also required to discharge air when a main is being filled and to admit air when it is being emptied, the latter especially important in large steel mains which may flatten if the pressure falls below that of the atmosphere.





# REFLUX VALVE:

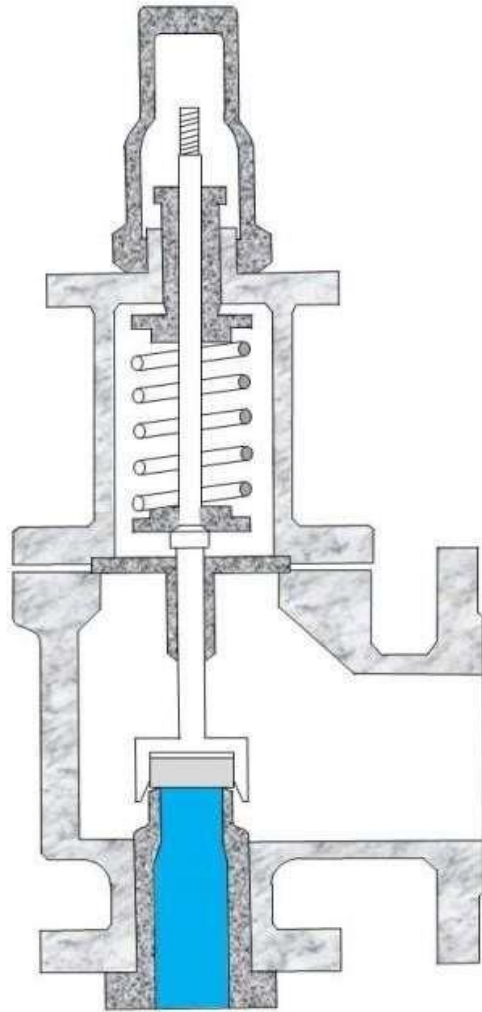
1. These are also known as check valves or non-return valves. They are placed in water pipes which receive water directly from the pump.
2. When the pump is stopped, these automatic devices only allow water to flow in one direction, preventing it from rush back and damaging the pump.



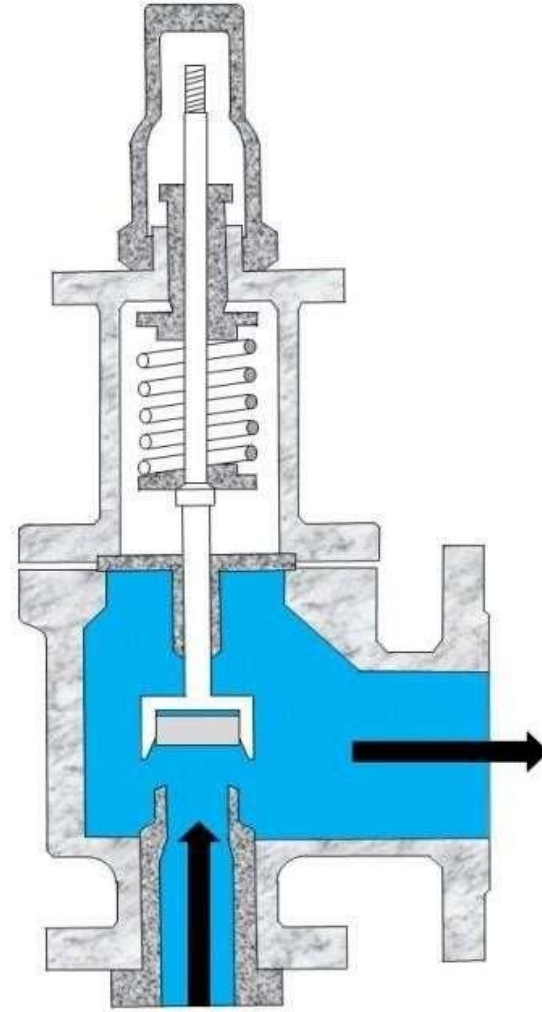
# PRESSURE RELIEF VALVE:

1. These are also known as automatic cut-off valves or safety valves. They are located at points where pressure is likely to be maximum.
2. When the line pressure increases above the pre-set value, the valve operates automatically, and the pressure is reduced.





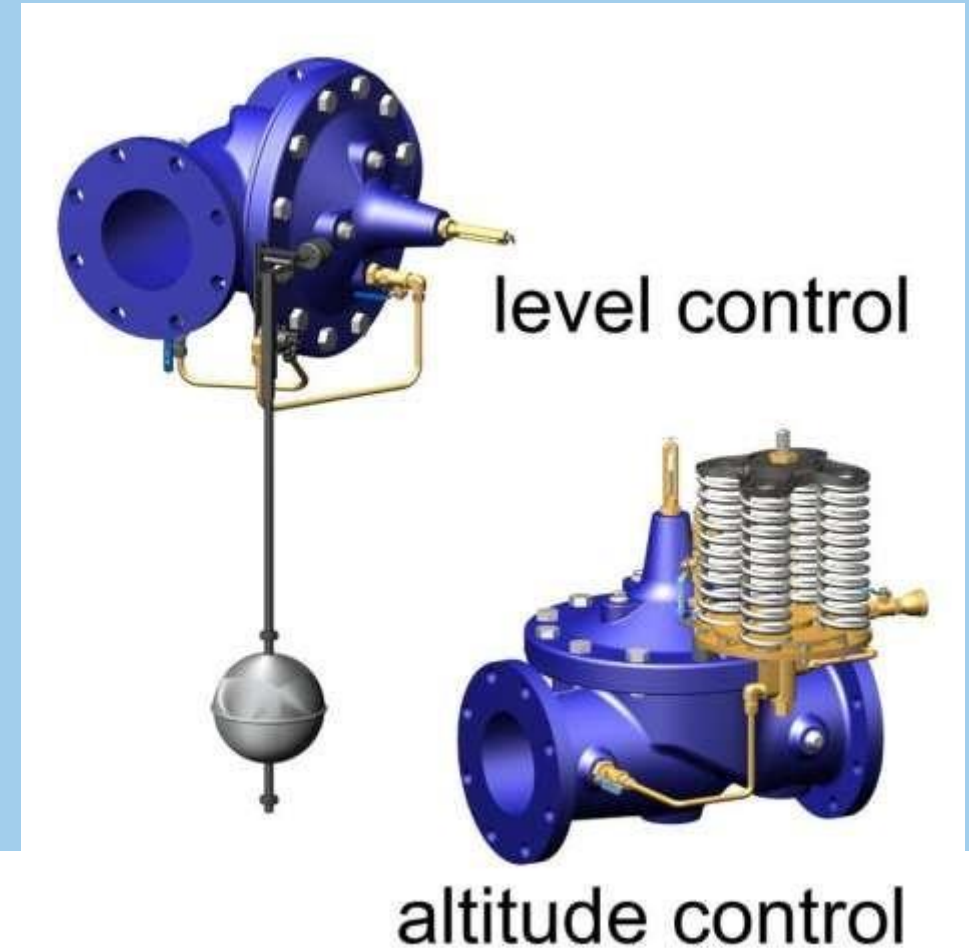
Relief Valve Closed



Relief Valve Relieving

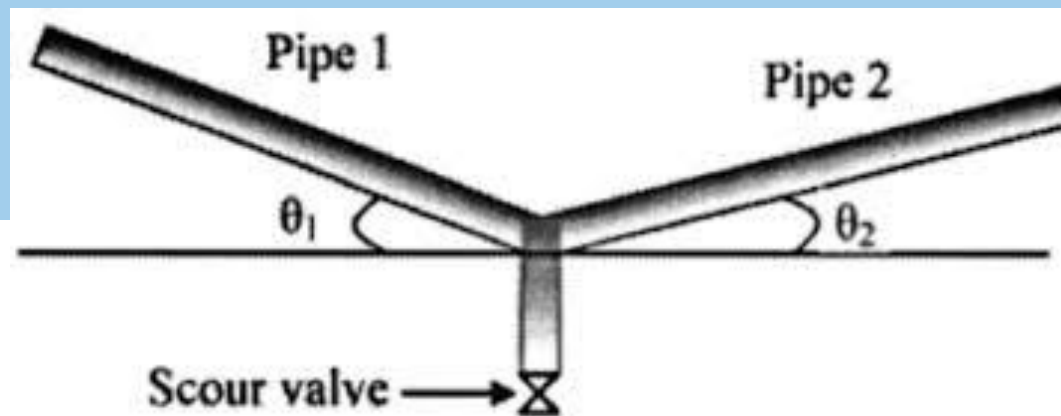
# ALTITUDE VALVE:

1. These are mainly used in lines which supply water to elevated tanks.
2. They close automatically when the tank is full and open when the pressure on the pump side is less than that on the tank side of the valve.



# SCOUR VALVE:

1. Scour valves or blow-off valves or washout valves are ordinary sluice valves that are located either at dead ends or at the lowest points in the mains.
2. They blow off or remove sand and silt deposits in the pipe.



# FIRE HYDRANT:

1. Hydrants provide access to groundwater mains for the purpose of extinguishing fires, washing down streets, and flushing out water mains.
2. The typical parts of a hydrant are the cast iron barrel and the shutoff valve. The cast iron barrel is fitted with an outlet on top and the shutoff valve at the base is operated by a long valve stem that terminates above the barrel.
3. A typical unit has two 2 ½ inch diameter hose nozzles and one 4 ½ inch pumper outlet for a suction line. Hydrants are installed along streets behind the curb line



# FLOAT VALVE:

1. Float valve is used to supply water to a storage tank or flushing cistern. This valve automatically shuts-off the supply when the predetermined level is reached.
2. When the water level is below the required level, the float is also at the lower level. Hence the water starts flowing from the valve to the tank.
3. Float rises with the rising water, thus, closing the valve. This shuts-off the water-supply when the required level is reached.



# TAPS:

Tap is nothing but a valve used to control the movement of fluids.

Taps, Bib-cocks, mixers are variations of valves used for controlling fluid movement indoors. These are regularly found in kitchens, bathrooms, toilets etc.



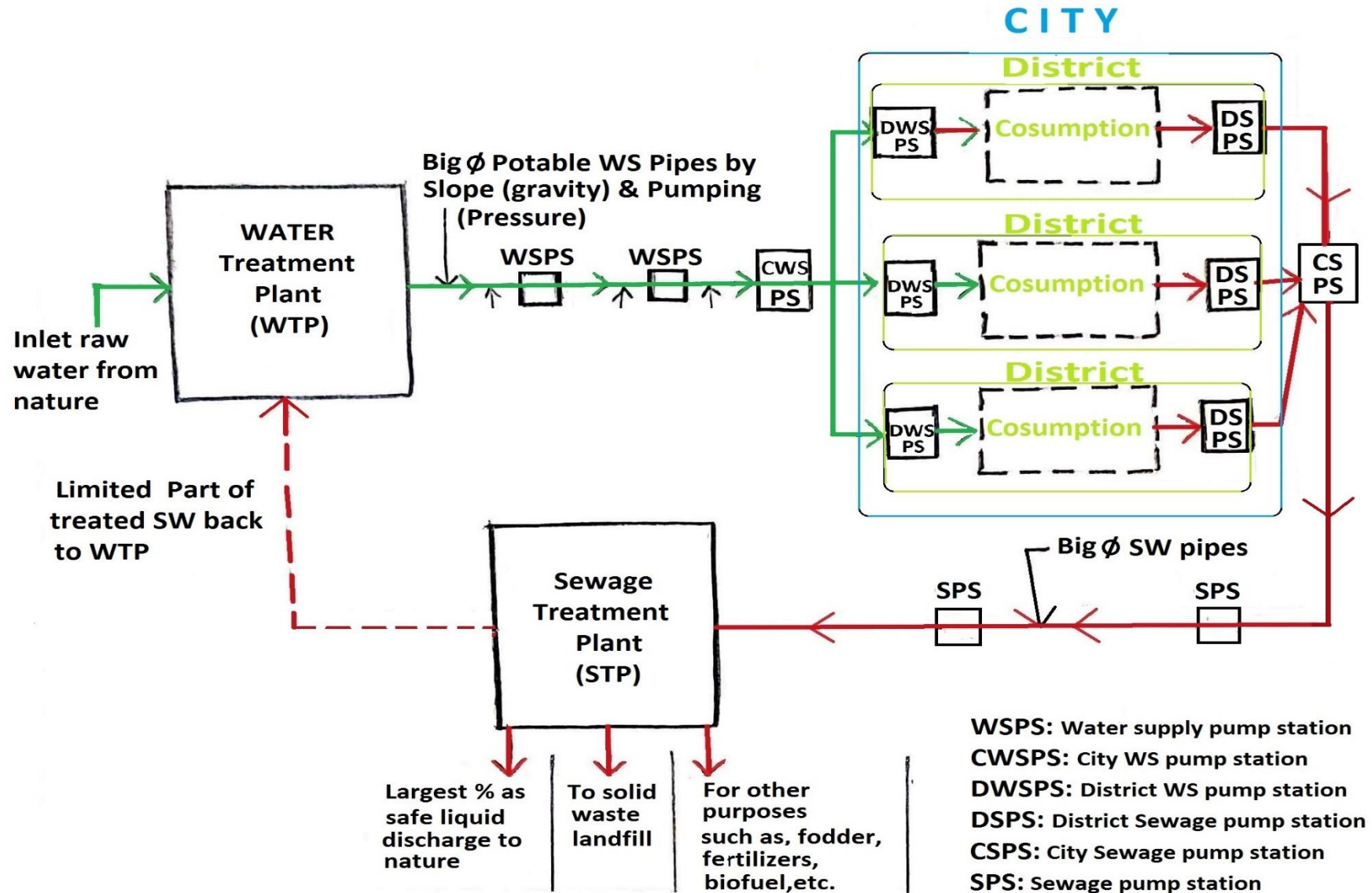


# TYPES OF WATER TAPS:

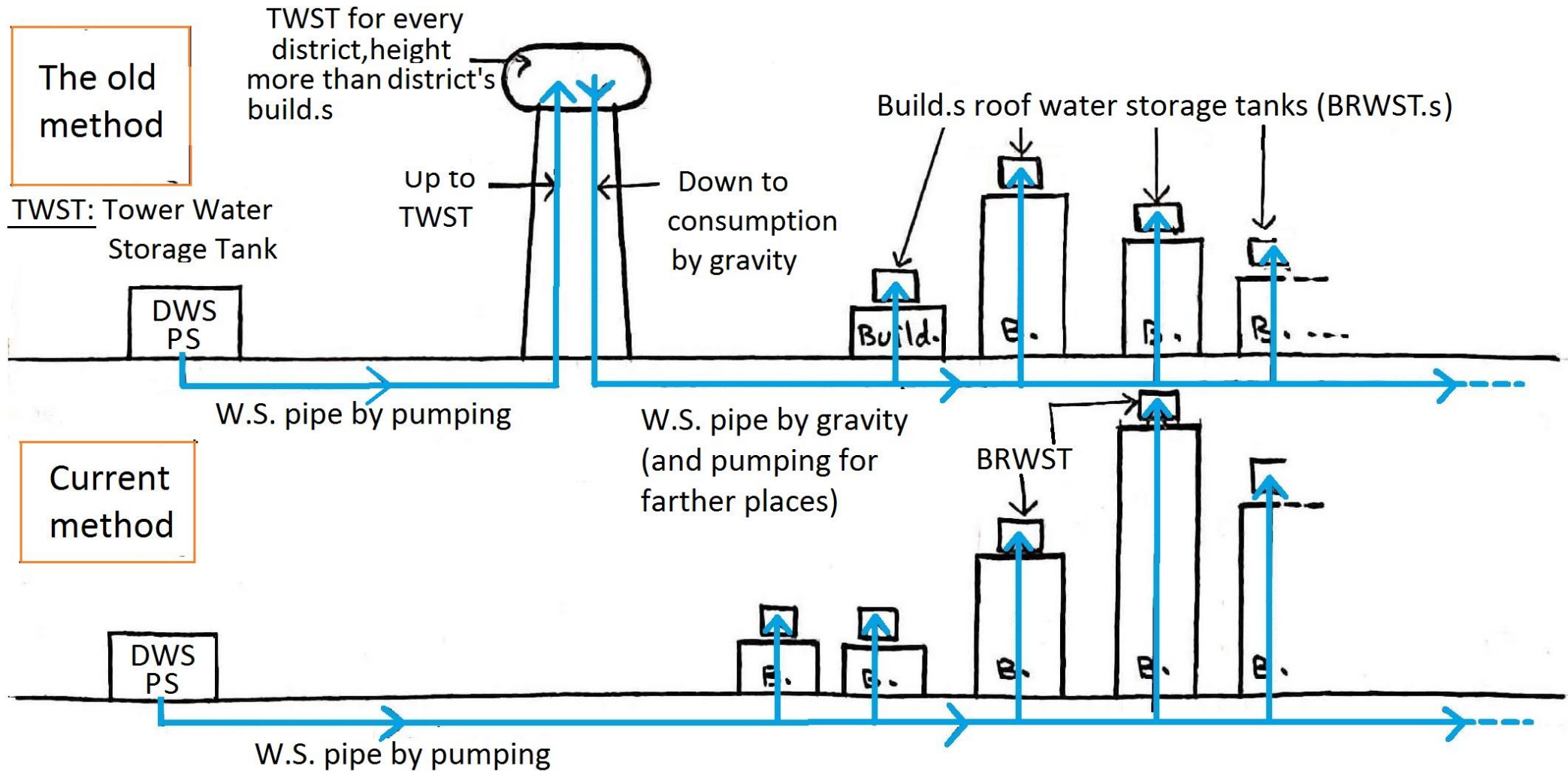
Some of the regular water tap types are listed below :

- i. Pillar Taps
- ii. Mixer Taps
- iii. Monoblocs
- iv. Disk Taps
- v. Washer less Taps
- vi. Thermostatic Taps
- vii. Infra-red Taps

# Water consumption and discharge cycle



# In a City District : How Potable Water Supply is Delivered to the Buildings for Consumption



THANK YOU.....