SANITARY FITTINGS AND FIXTURES

CSTSF301

Install sanitary fittings and fixtures

Competence

Credits: 9

Learning hours: 90

Sector: Construction

Sub-sector: Plumbing

Module Note Issue date: July, 2020

Purpose statement

This module describes knowledge and skills required to install sanitary fittings and fixtures. It describes the skills, knowledge and attitudes required for the trainee to prepare the workplace, Perform drilling space for sanitary appliance, Perform Sanitary Mounting and Handover the work.

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Learning Unit 1 Prepare the workplace

LO 1.1: Prepare the working area

Definition of a sanitary fitting and fixture: **means a** receptacle to which water is permanently supplied, and from which waste water or soil water is discharge

Content /Topic 1: Description of Rules and regulations for the installation of sanitary appliances

Water regulation do not refer specifically to sanitary appliances, but do deal with how they perform by covering undue consumption .waste of water and protection against Backflow

The Regulations governing W.C cisterns, urinals and automatic flushing cisterns are limited to the capacity of the water for flushing.

Backflow prevention is achieved either through Mechanical Method (using Valves) or non-Mechanical (Foot Valves /Check valves /Non return valves

- It is important to ensure that commonly used plumbing products and materials are of the same Types
- The process of certification of quality of plumbing product may necessitate the setting up of the testing establishments where products are assessed

- The application of suitable materials and products must be supported by adequate levels of training of plumbers who use them so that they can identify and use only appropriate products
- The materials from which appliances are manufactured are dependent upon the type of fitment and the use of building into which it is to be installed .in general terms the materials must be non-corroding, non-Absorbent and easily cleaned. In factory and schools materials must also be capable of withstanding rough treatment, for domestic use this requirement can be discounted because of the wide variety of materials used and the diversity of cleaning materials ,Manufactures of sanitary appliances always indicate the recommended cleaning materials to be used and give Maintenance instructions. Always ensure a client is given this information on completion of the installation.

Content /Topic 2: description of Types of appliances

Measurements according to sanitary appliances

On the drainage we have two types of sanitary appliances

Soil appliances and waste appliances

A) **Soil appliance** is one type of sanitary appliance which convey human excreta and human waste /

B) **Soil appliances** : Are plumbing fixtures used to receive human excremental and discharge it through a soil pipe (faecal matter

Example of soil appliances: W.C: Water closet and urinals

Waste appliances: is the one type of sanitary appliances which convey the waste water

Examples waste appliances: lavatory (wash hand basin), bath, sink, bidet, shower etc……

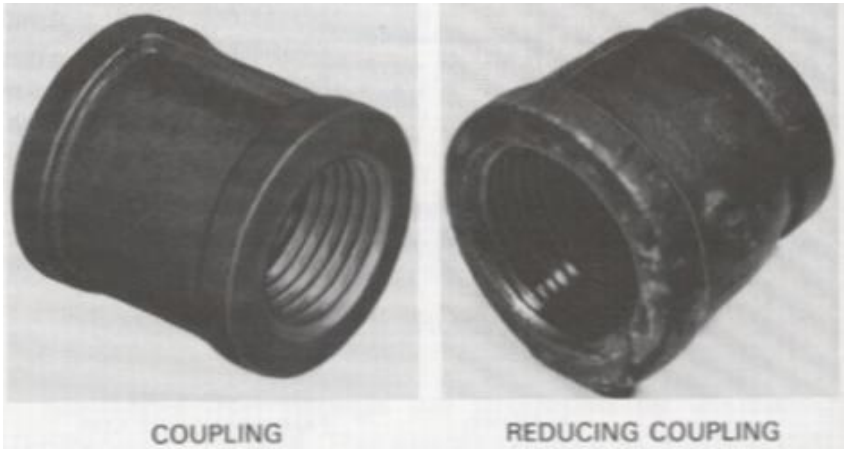
C) **Waste Appliances :** are plumbing fixtures used to receive the liquid discharge free from faecal matter

content Topic 3 identification of Types of fittings

Fitting: is a part on or attached to a piece of furniture or equipment

A) Connection Fittings : Accessories made either of the same or different materials **,**are used to join two pipe of the same size at the straight run

e.g: Socket, Union, Nipple



UNIONS

Since all pipes are right-hand threaded, it would be impossible to assemble or disassemble the last length of threaded pipe without a **union**.

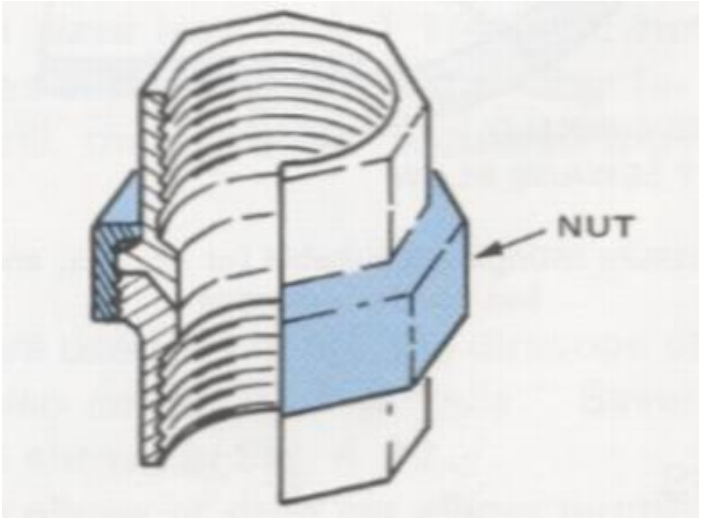
A union can be installed or removed from the system without disturbing other fittings. It consists of three parts: 1. A shoulder with internal threads at one end for attaching to a pipe. The shoulder is shaped to mate with the external part.

2. A collar with internal threads for attaching the other two parts over their mating surfaces.

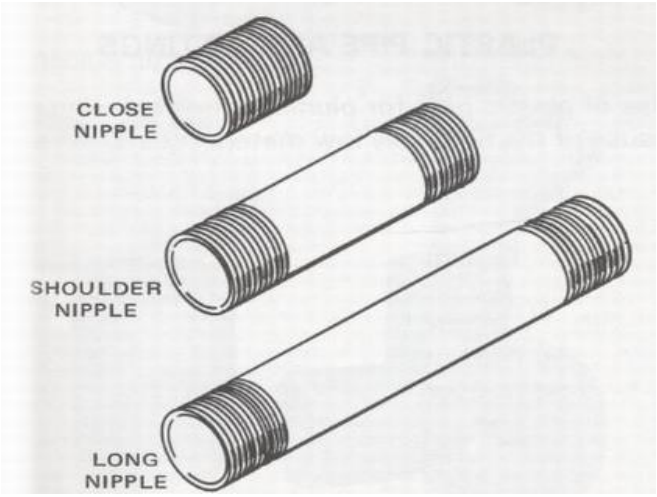
3. A piece with external threads for the collar and mating surface for the shoulder at one end, and internal threads at the other end for attaching to a pipe.

In some designs, the shoulder and the external threaded piece, have a machined spherical joint that provides a watertight seal when the collar is securely tightened.

Dielectric unions are installed when copper and iron pipe are joined. This prevents galvanic corrosion that may destroy the pipe or fitting.



Unions are much alike but may have different shaped joint surfaces. In the spherical type, the end of one part is shaped like a ball with a hole in it. The end of the other part is shaped to fit over it and the two are held together securely by the threaded collar.



NIPPLE

B) Change in Direction through pipe : Are used to change the direction of pipeline

e.g. : Elbow, Bend


Vent elbow
90° elbow
Long
sweep
90° elbow
Closet
bend
Street elbow
Reducing
elbow
22½°elbow
45° elbow

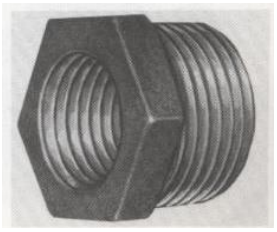
C) Branched by T pieces or Crossing : Are used to make a new branches on existing pipelines

e.g: **Tee and Cross fittings**

D) Change in diameter through pipe : are used to Reduce to size of pipeline

e.g: 1) Reducer

2) **bushing**, has external threads on the outside and internal threads inside. It is used to connect a pipe to a larger size fitting.



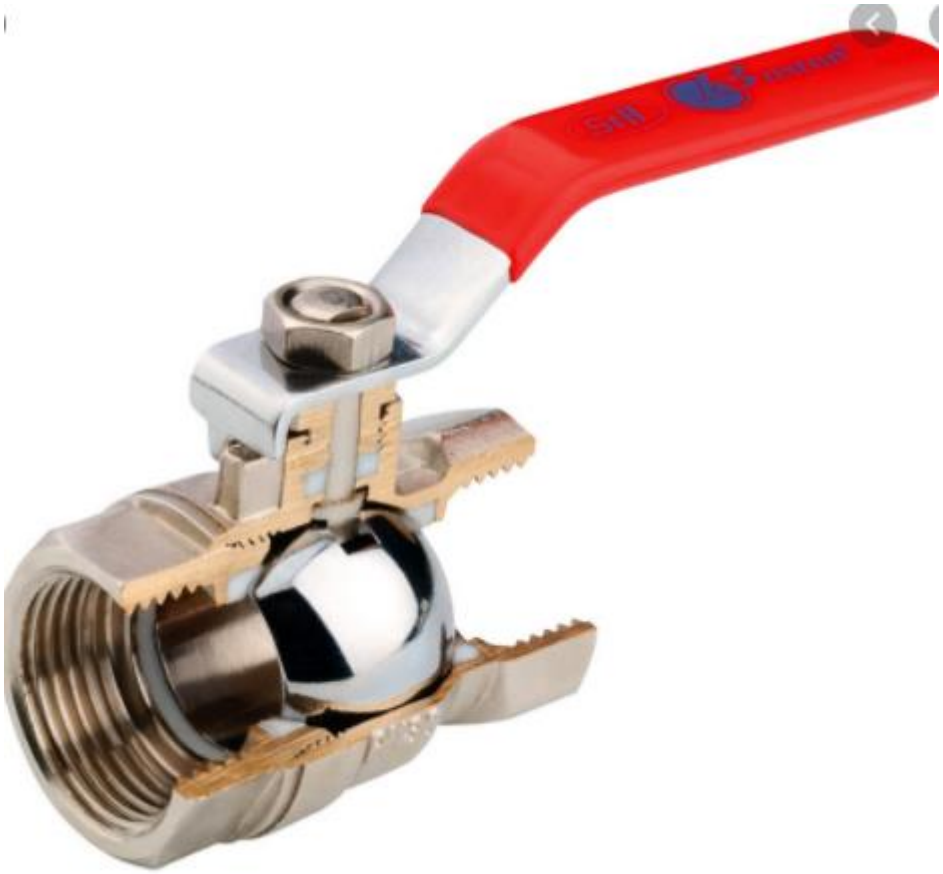
BUSHING

E) Connection for Accessories

e.g: Valves: a device for controlling the passage of fluid or air through a pipe, duct, etc., especially an automatic device allowing movement in one direction only.

Valves can be categorized into the following types, based on their operating mechanism.

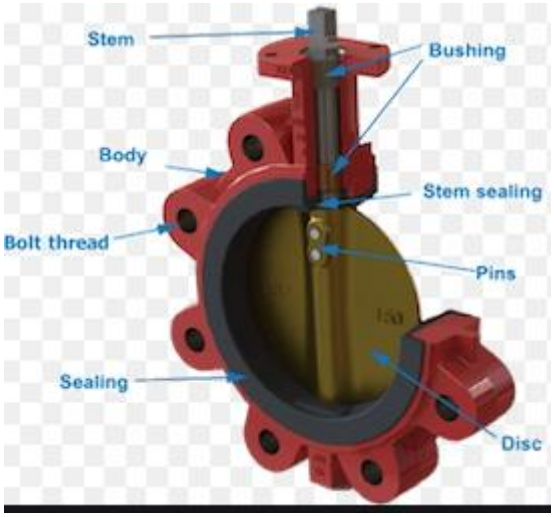
- **Ball valve**, for on/off control without pressure drop. Ideal for quick shut-off, since a 90° turn completely shuts-off, compared to multiple 360° turns for other manual valves.



BALL VALVE

Butterfly valve :a valve consisting of a rotating circular plate or a pair of hinged semicircular plates, attached to a transverse spindle and mounted inside a pipe in order to regulate or prevent flow.

Butterfly valve, for on/off flow control in large diameter pipes.



BUTTERFLY VALVE

BUTTERFLY VALVE

Angle valve : A manually operated **valve** with its outlet opening oriented at right **angles** to its inlet opening; used for regulating the flow of a fluid in a pipe.

Angle valves

Gate valve: A **gate valve**, also known as a **sluice valve**, is a **valve** that opens by lifting a barrier (**gate**) out of the path of the fluid. **Gate valves** require very little space along the pipe axis and hardly restrict the flow of fluid when the **gate** is fully opened.

Gate valve is mainly for on/off control, with low pressure drop.

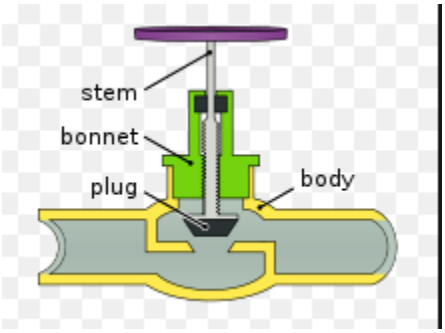
GATE VALVE

GATE VALVE

Gate valves

Globe valve: it is different from ball **valve**, is a type of **valve** used for regulating flow in a pipeline, consisting of a movable plug or disc element and a stationary ring seat in a generally spherical body.

Globe valve ,good for regulating flow. Uses a cylinder movement over a seat..

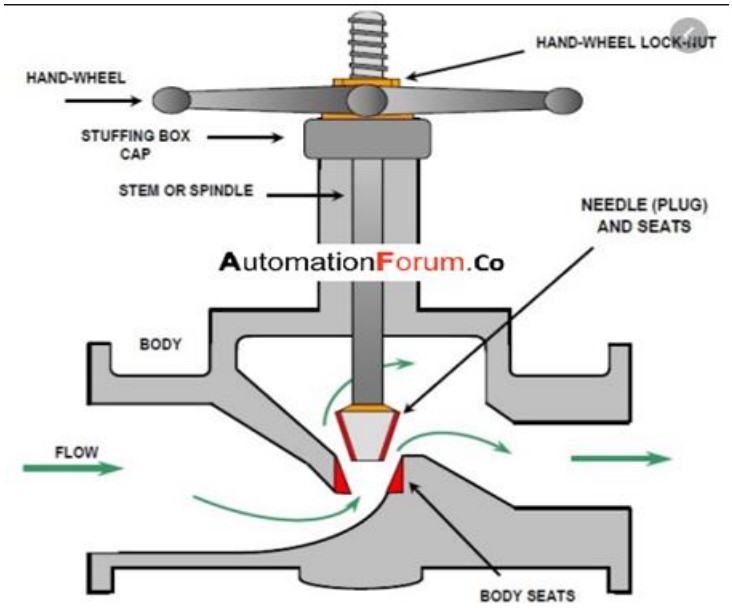


Globe valve

Globe valve

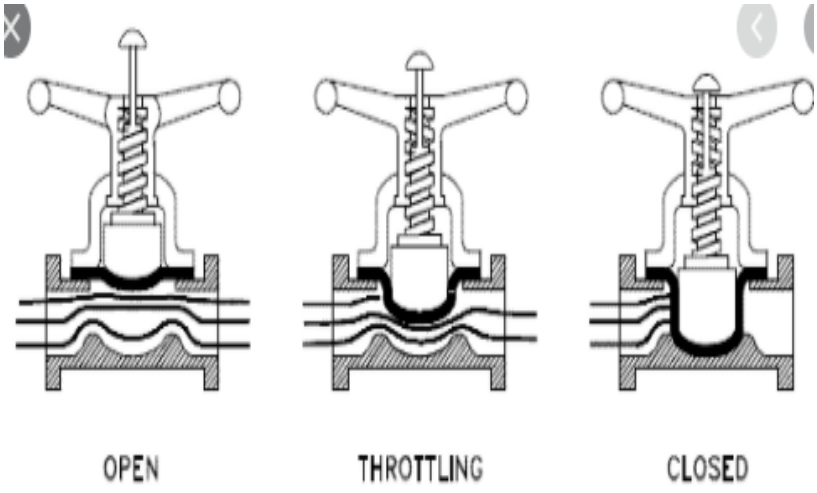
Needle valve : A **needle valve** is a type of **valve** with a small port and a threaded, **needle**-shaped plunger. It allows precise regulation of flow, although it is generally only capable of relatively low flow rates.

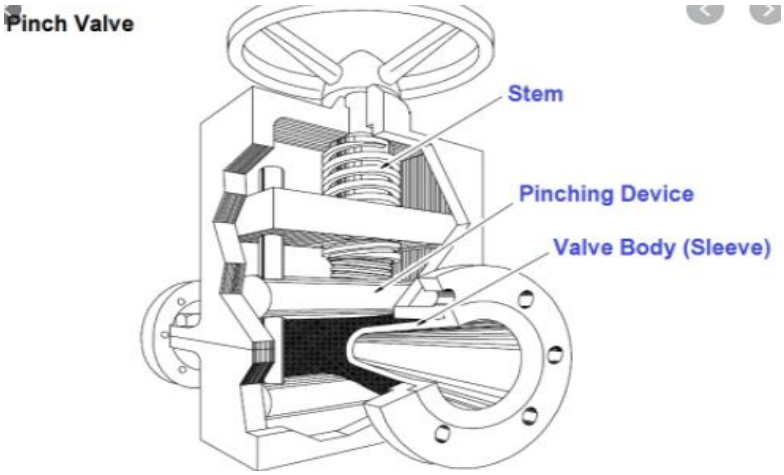
It is used for accurate flow control.



Pinch valve: is a full bore or fully ported type of control **valve** which uses a **pinching** effect to obstruct fluid flow.

It is used for slurry flow regulation and control.

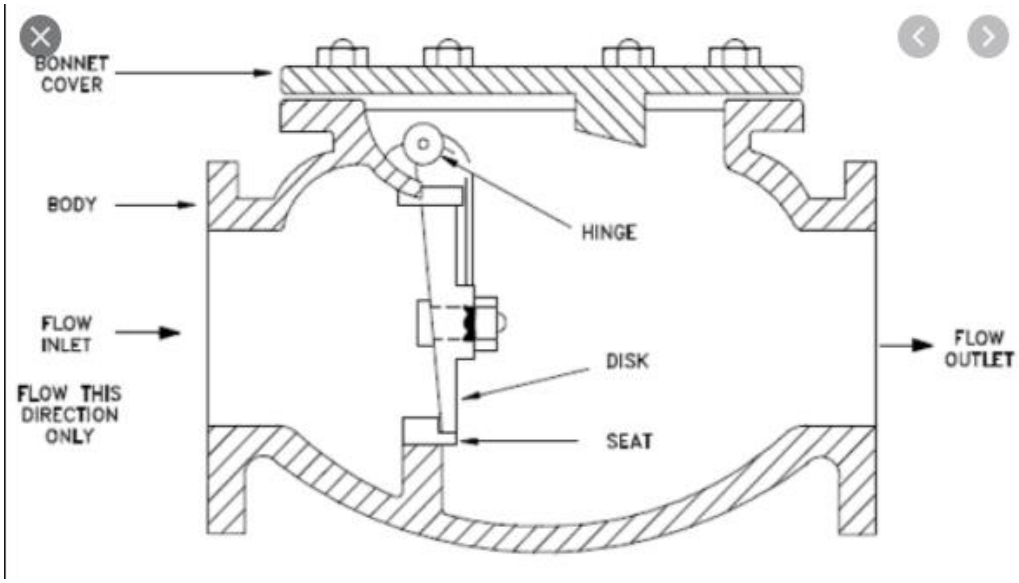




These are more specific types of valves, used only in particular fields or applications. Often they are subcategories of the classification by operating principle and by function.

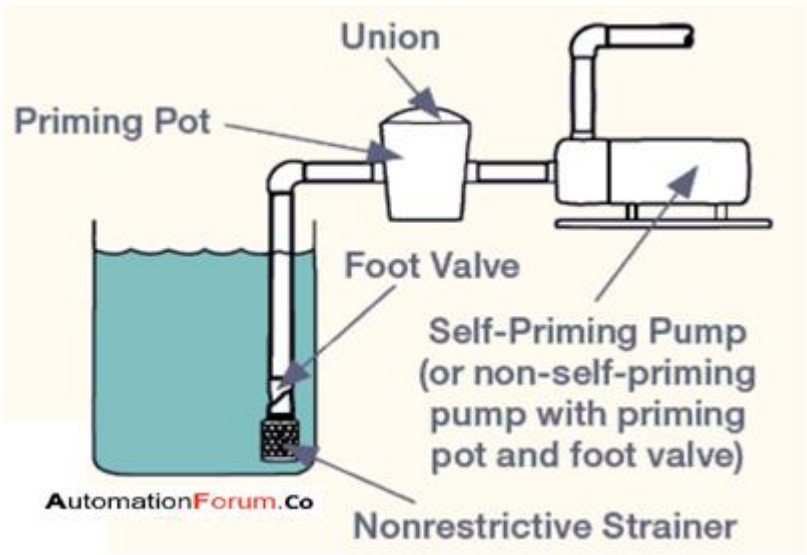
Clapper valve: is a simple **valve** with a hinge on one side; allows fluid to flow in only one direction.

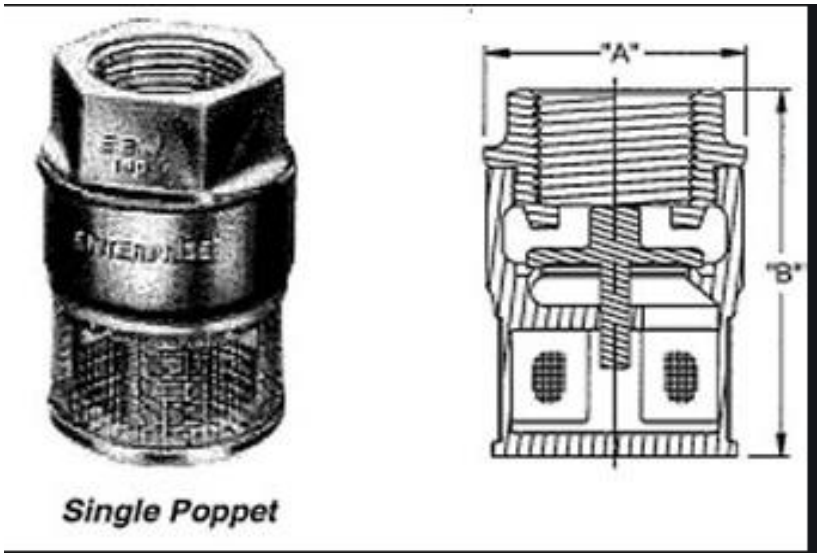
a type of check valve used in the Siamese fire appliance to allow only 1 hose to be connected instead of two (the clapper valve blocks the other side from leaking out



Foot valve: a one-way valve at the inlet of a pipe or the base of a suction pump.

check valve on the foot of a suction line to prevent backflow





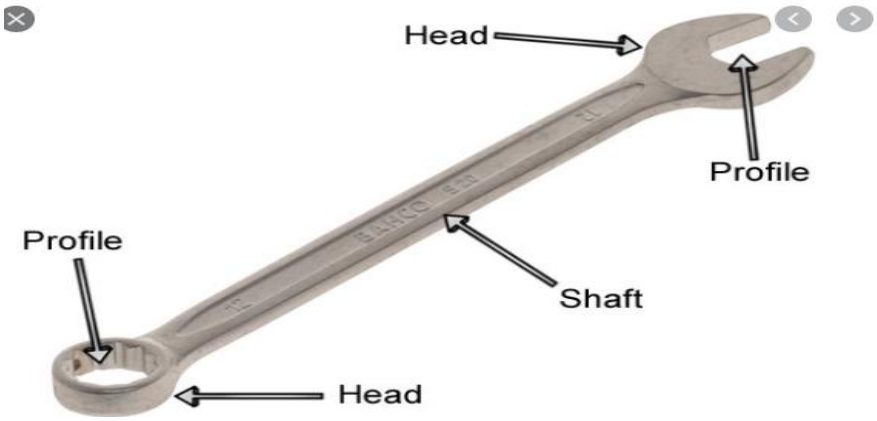
L.O 1.2: **Select tools and equipment**

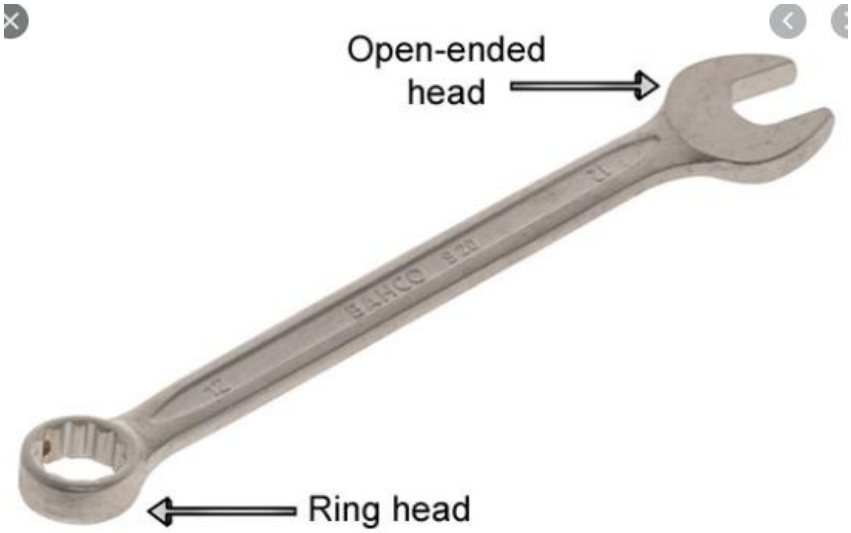
Content/TOPIC 1 the types of tools and equipment

A) **Screw drivers**: is a tool, manual or powered, used for screwing (installing) and unscrewing (removing) **screws**. A typical simple **screwdriver** has a handle and a shaft, ending in a tip the user puts into the **screw** head before turning the handle

B) **Pipe wrench :** a tool having two toothed jaws, one fixed and the other free to grip **pipes** and other tubular objects when the tool is turned in one direction only

C) **Spanners :** a tool with a shaped opening or jaws for gripping and turning a nut or bolt.





D) **Hack saw :** a fine-tooth saw with a blade under tension in a frame that is used for cutting hard materials

E) **Pliers :** pincers with parallel, flat, and typically serrated surfaces, used chiefly for gripping small objects or bending wire

PLIERS

F) Power hand drill : a **hand** tool with a rotating chuck driven by an **electric** motor and designed to take an assortment of **tools** for **drilling**,

G) Hummer :

A) Tape measure: a length of tape or thin flexible metal, marked at graded intervals for measuring

B) PPE **Personal protective equipment**, commonly referred to as "**PPE**", is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses.

Examples of PPE include such items as gloves, foot and eye protection, protective hearing devices (earplugs, muffs) hard hats, respirators and full body suits. Understand the types of **PPE**.

A) Gloves : covering for the hand worn for protection against cold or dirt and typically having separate parts for each finger and the thumb.

B) **Hard boot/Rubber boot** : is a shoe with a reinforced toe cap to minimize **foot** injuries caused by dropped articles.

HARD BOOT

Rubber Boot

C) **eye protection:** is a type of personal protective equipment (PPE) designed to prevent injury to the **eye**. ... **Eyes** are easily injured by many things such as small particles, chemicals, biological agents, strong visible light and non-visible rays. **Eyes** should be protected by using appropriate **eye protection**.

GLASSES

D) **protective hearing devices** : also known as a HPD, is an **ear protection device** worn in or over the ears while exposed to hazardous noise to help prevent noise-induced **hearing** loss.

Ear plugs

E) **hard hats**: a rigid protective helmet, as worn by factory and building workers

Helmets

F) **respirators** : an apparatus worn over the mouth and nose or the entire face to prevent the inhalation of dust, smoke, or other noxious substances.

G) **full body suits**: A **bodysuit** is a piece of clothing that fits tightly over the top part of the **body** and fastens between the legs

OVERALL

C) **Pipe cutter:** A pipecutter is a type of tool used by plumbers to cut **pipe**. Besides producing a clean cut, the tool is often a faster, cleaner, and more convenient way of **cutting pipe** than using a hacksaw, although this depends on the metal of the **pipe**

D)

L.O 1.3: Select materials

content/Topic 1 Identification of Types of materials used

A) **Flexible pipe :** Flexible pipe is characterized by a composite construction of layers of different materials, which allows large amplitude deflections without adverse effects on the pipe

FLEXIBLE PIPE

B) **Pipes :** a tube used to convey water, gas, oil, or other fluid substances.

PIPES

C) **Teflon :** a tough synthetic resin made by polymerizing tetrafluoroethylene, chiefly used to coat non-stick cooking utensils and to make seals and bearings.

D) **Fittings :** a small part on or attached to a piece of furniture or equipment

E) **Soil solvent**

F) **Screws :** a short, slender, sharp-pointed metal pin with a raised helical thread running round it and a slotted head, used to join things together by being rotated so that it pierces wood or other material and is held tightly in place

L.O 1.4: Select sanitary appliances

- W.H. basins

LAVATORY (WASHING BASSIN)

- Lavatory is the one of the waste appliances using in sanitary appliances
- Lavatory: is a basin with running water and drainage facilities, used for washing the face and hands
- Lavatory are located in bath room with other sanitary appliances

Types of lavatory:

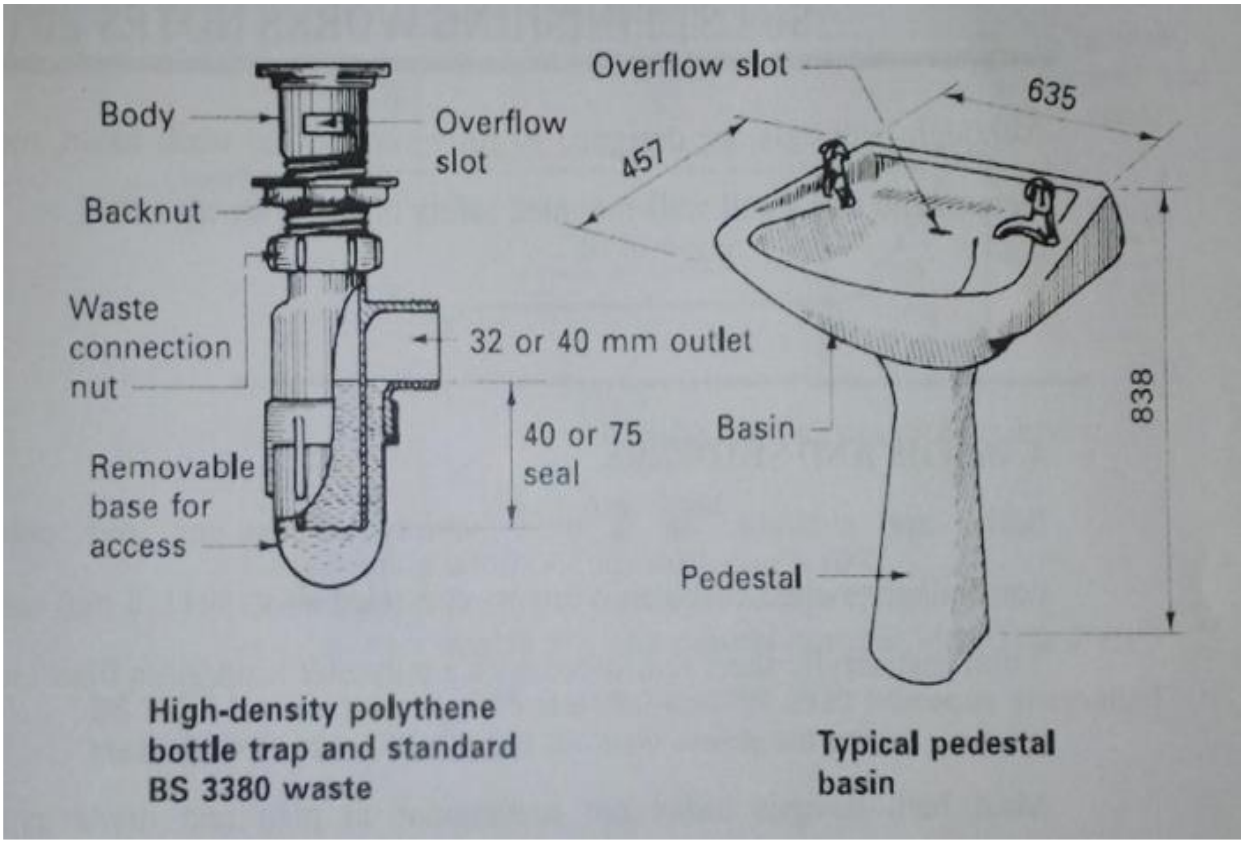
- Wall hang lavatory (wall mounted sink)
- Pedestal lavatory-
- Semi pedestal lavatory

Now we are focusing on wall hang lavatory(wall mounted sink)

Wall hang lavatory

The wall mounted sink is one of the most common types of lavatory used.

LAVATORY/WASH BASIN



WASH BASIN WITH PEDESTAL

BIDET: a low, basin like bathroom fixture, usually with spigots, used for bathing the genital and perinea areas

BIDET

- **Shower tray**: Surface that forms the floor of the shower, which is designed to lead the water to the drain without leakage.

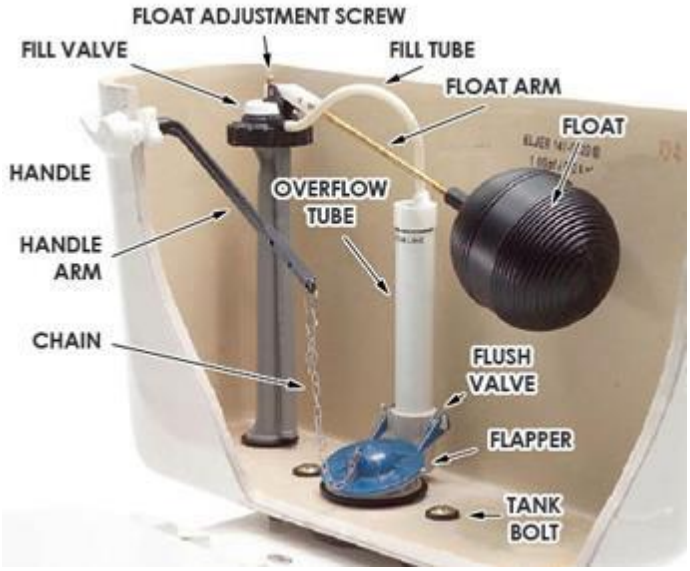
SHOWER TRAY

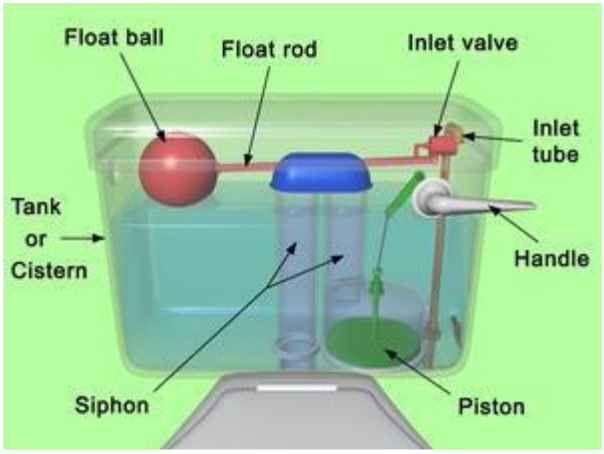
- **Bath tubs** :is a **bathroom** fixture, a **tub** that you can fill with water for **bathing**. Some people like to soak in **a bathtub** at the end of a long day. Many **bathtubs** are made of ceramic or porcelain, and they're large enough for an adult to lie down in at least partially submerged in water.

BATH TUB

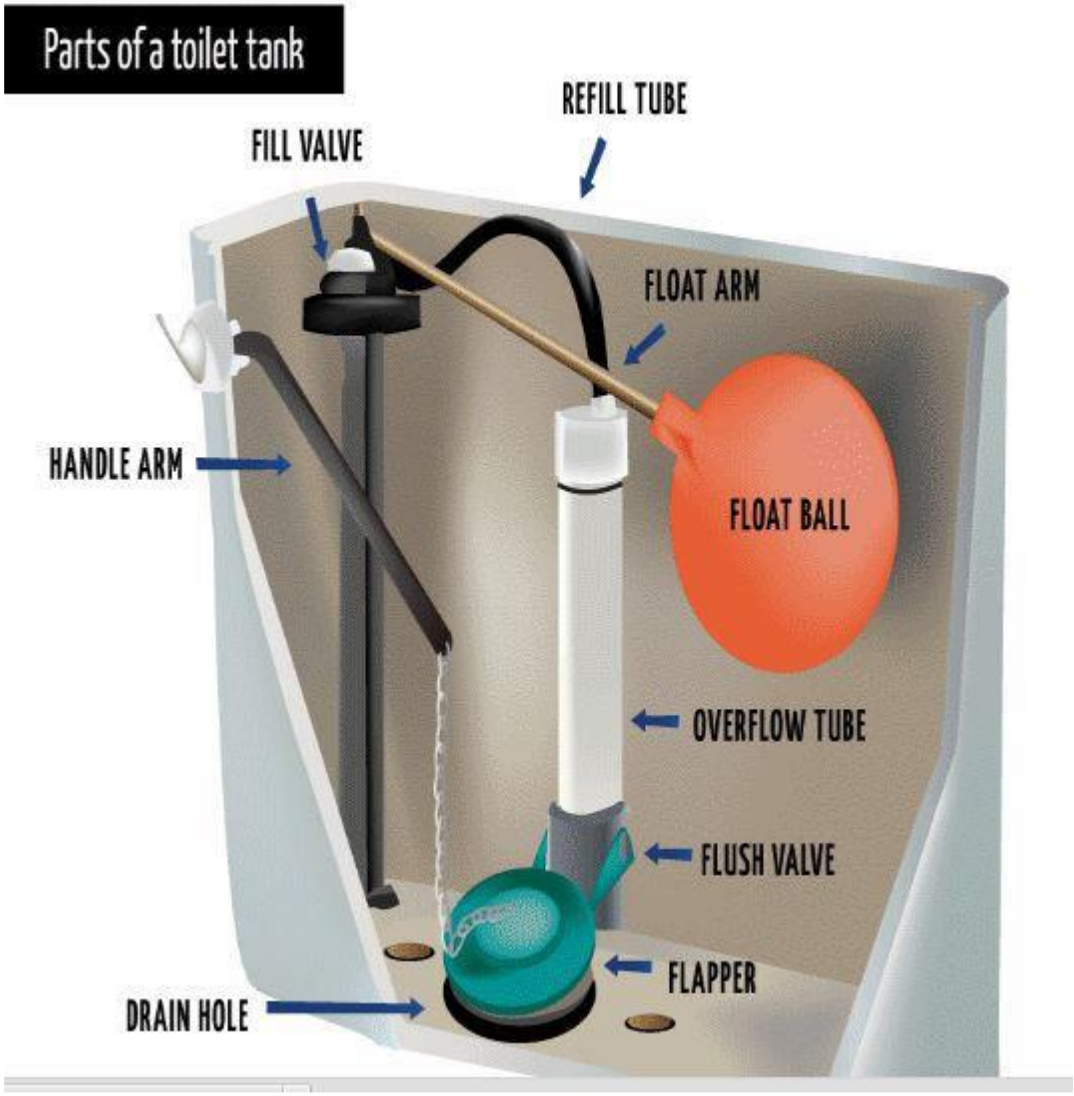
content/Topic 2 Description of **Soil appliances**

W.C : is defined as water closet or bath room used for liquid and solid waste holding

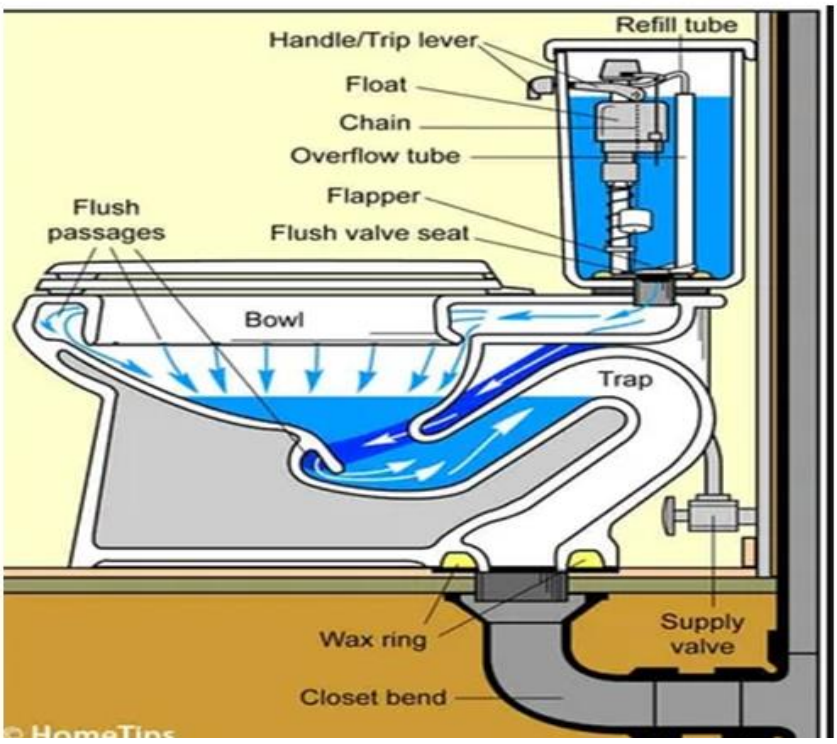




PARTS OF W.C LOW LEVEL



PARTS OF TOILET TANK



Squat Toilet :A toilet, usually consisting of a hole in the ground and sometimes a tank, which is operated by squatting, as opposed to sitting

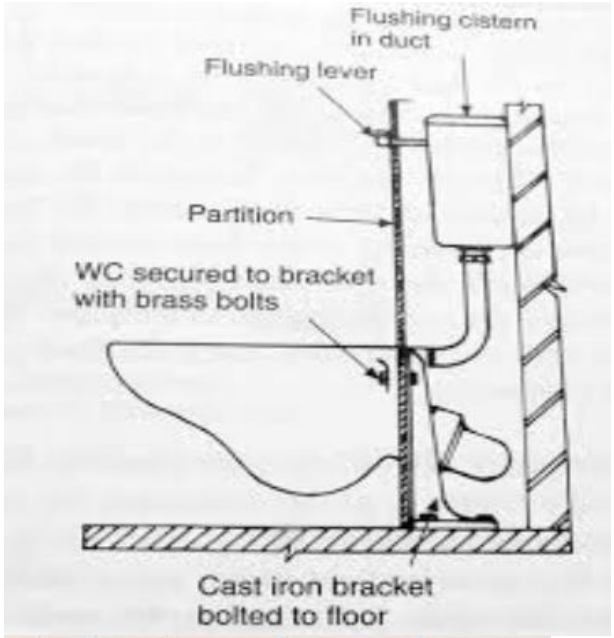
SQUAT TOIET

SQUAT TOIET

SITTING : A toilet which is operated by sitting, as opposed to squatting, such as a flush toilet

SITTING TOILET

URINAL: Is a bowl or other receptacle typically attached to a wall in public toilet into which men may urinate , a receptacle used to receive the urine of person with urinary incontinence



DESIGN REQUIREMENT

Sanitary appliances should be designed in order to reduce area to the minimum and should have durable, easily cleaned and according to the users.

Before starting to design the floor plan of any structure ,the design needs to know the following information:

-Types of building: residential or public building

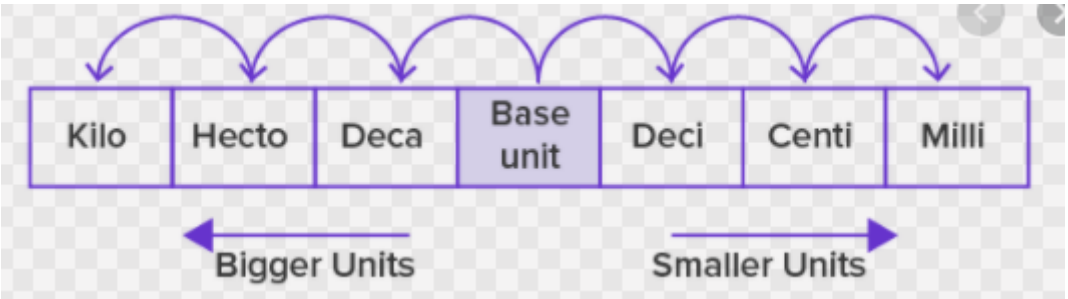
-consumers: number of users of that building

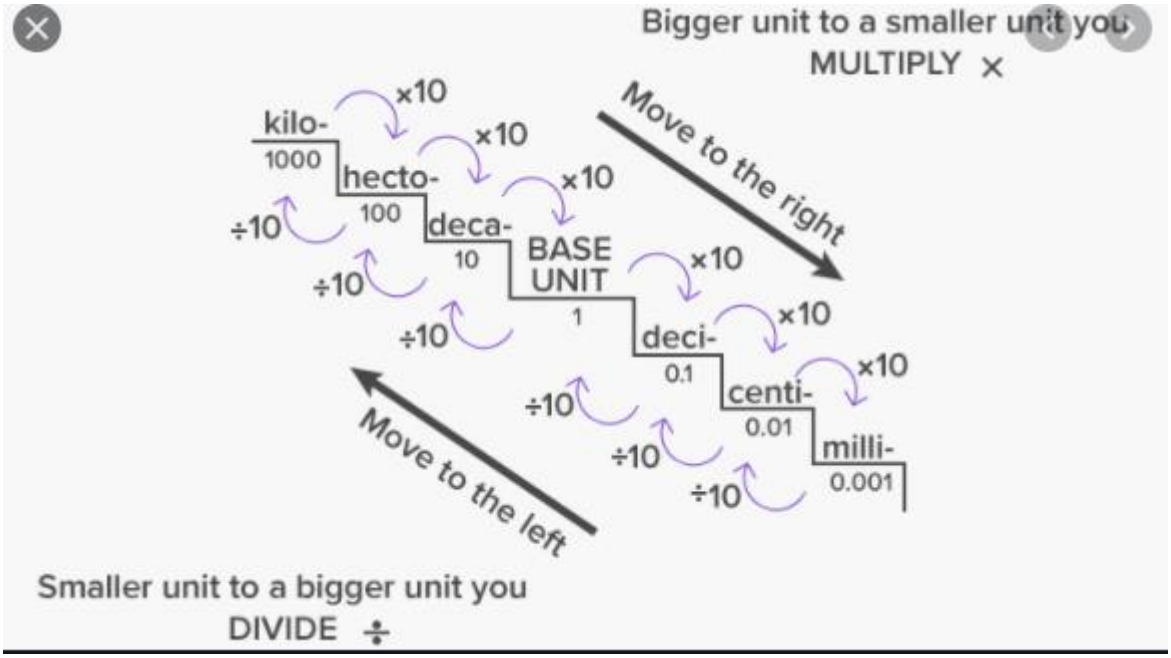
L.U.2 Perform drilling space for sanitary appliances.

L.O 2.1: Measure spaces and apply metric systems

content/Topic 1 identification of Standard unit used in plumbing:

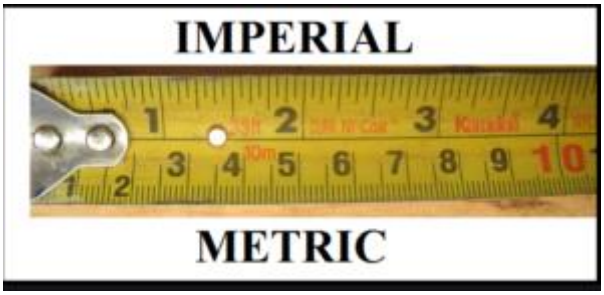
1. Metric system unit :A system of measurement in which the basic **units** are the meter,





2. Imperial system unit : is a **system** of weights and measures that includes pounds, ounces, feet, yards, miles, etc. We also call it **imperial units**

A **system** of measurement in use in the United Kingdom and other Commonwealth countries, now mostly superseded by the metric **system**; similar to the **system** currently used in the United States; consisting of **units** such as the inch, the mile and the pound (of weight)



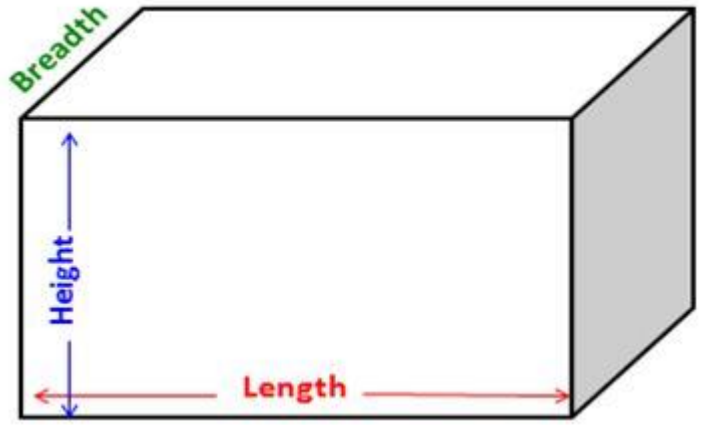
Relationship between Metric System and Imperial system

1Inch =25.4mm

Imperial system	Metric System
1inch	25.4mm

content/Topic 2 Measuring the space:

- Height :the measurement of someone or something from head to foot or from base to top.
- Length :the measurement or extent of something from end to end; the greater of two or the greatest of three



- Width :the measurement or extent of something from side to side; the lesser of two or the least of three dimensions of a body.

- Deep :extending far down from the top or surface.

content/Topic 3 Different measuring tools:

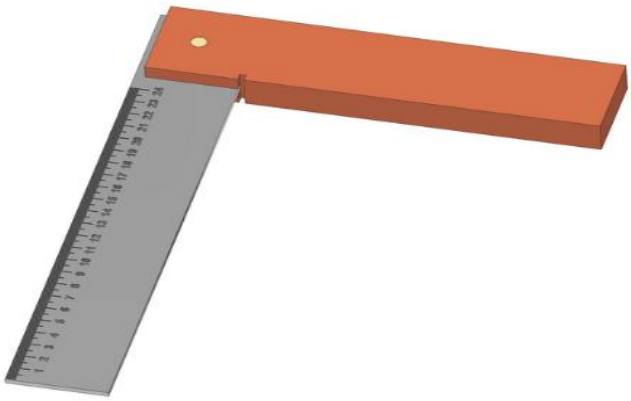
- Rulers : are used for measuring a line, and the straight edge allows them to be used for drawing, scoring, or cutting. They are often used in technical drawing, math & geometry, engineering, carpentry,

RULERS

- Tape measure :A tape measure or measuring tape is a flexible ruler used to measure size or distance. It consists of a ribbon of cloth, **plastic**, fibre **glass**, or metal strip with linear-measurement markings. It is a common measuring tool

TAP MEASURE

- Try Squares : is a woodworking tool used for marking and measuring a **square** piece of wood. The **square** refers to the tool's primary **use** of measuring the accuracy of a right angle (90 degree angle); to **try** a surface is to check its straightness or correspondence to an adjoining surface

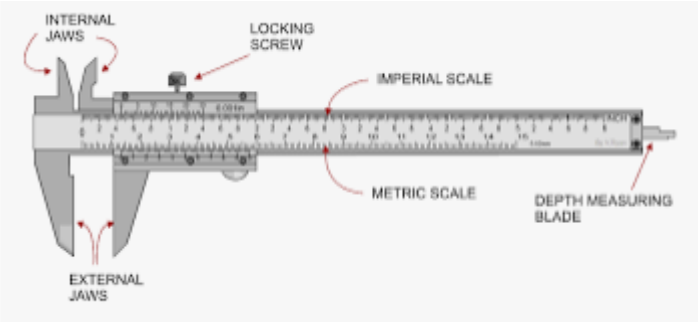


TRY SQUARE

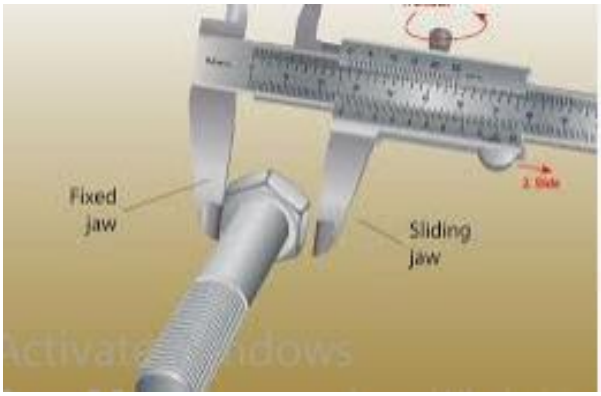
- **Foot steel tape**:A **steel** ribbon **used** for the measurement of distances; in the US, surveyor's and engineer's **tapes** usually are accurately graduated in **feet**, tenths, and hundredths of a **foot**; builder's **tapes** are graduated in **feet**, inches, and fractions of an inch; also called a **steel** measuring **tape**.

FOOT STEELTAPE

- Vernier caliper: are **used** to measure the inner and outer breadth of rods and domains and thickness of any sort of object accurately. The **Vernier calipers** can also be utilized to measure deepness of holes and objects which can be too hard to do with any other **scale**.



Vernier Calliper

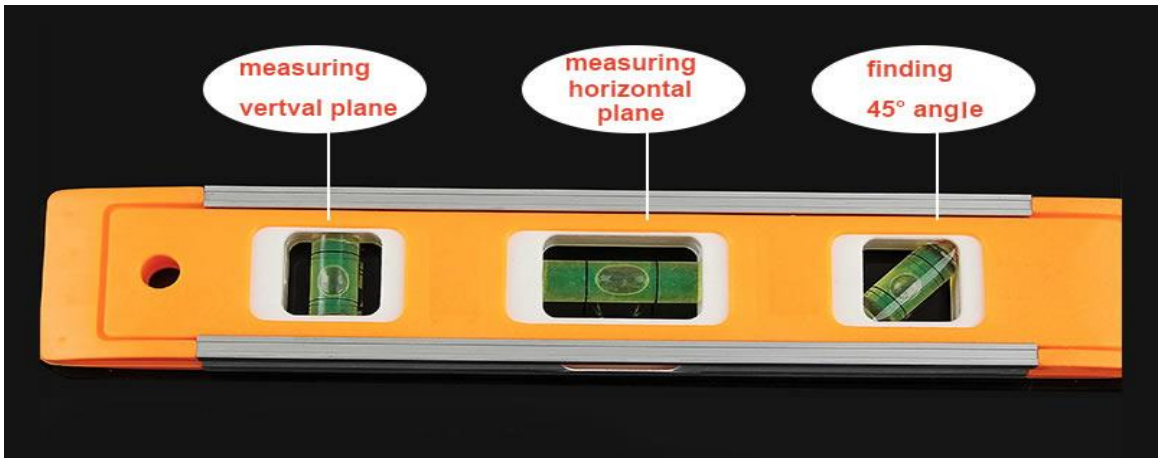


VERNIER CALIPER

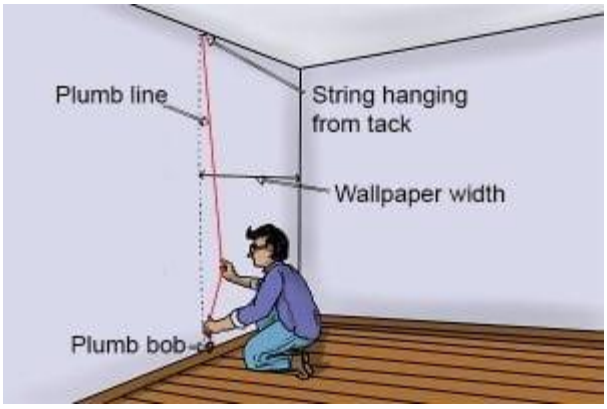
Content/Topic 4 Different Alignment Tools

- Spirit level :A **spirit level** is used for determining horizontal and vertical **levels** and can be used on a variety of DIY projects in and around the home. A **spirit level** is used to designed to indicate whether a surface is **level** on the horizontal or vertical planes

Spirit level



- Plumb bomb:A **plumb bob**, or plummet, is a weight, usually with a pointed tip on the bottom, suspended from a string and **used** as a vertical reference **line**, or **plumb-line**. It is a precursor to the spirit level and **used** to establish a vertical or horizontal datum.



PLUMB BOB

L.O 2.2: Expand drill holes to the solid materials

content/Topic 1 Different types of drill bit :

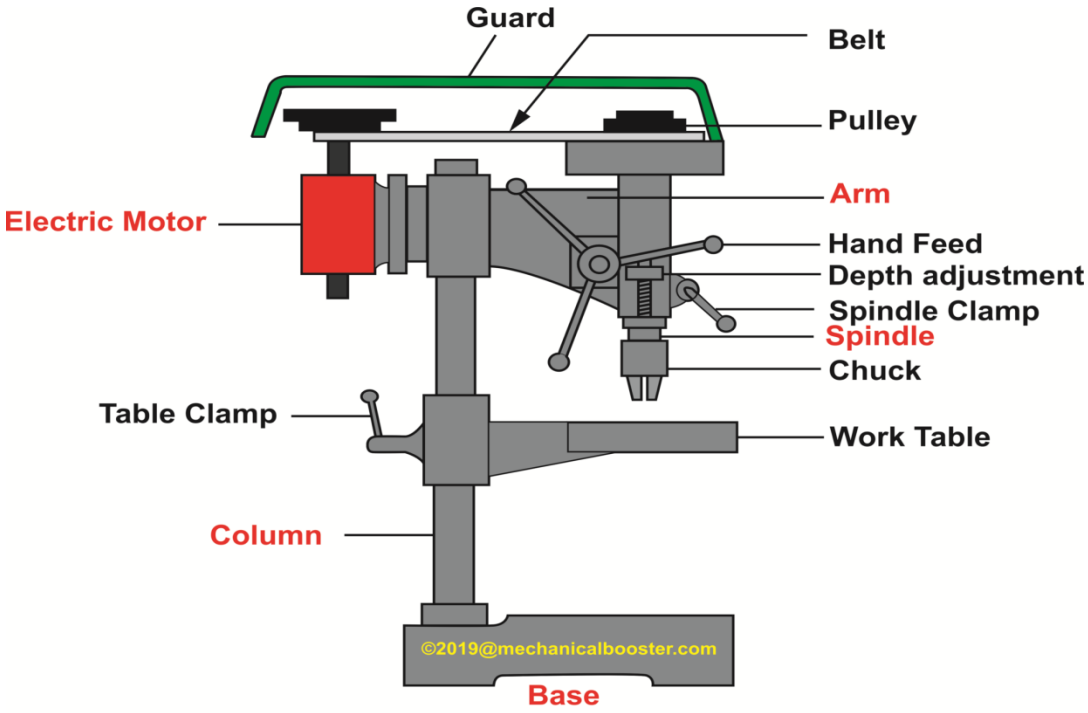
- **Masonry drill bit : Drill bits** that can **drill** through **concrete** are called **masonry bits**. ... **Masonry bits** cut holes through **concrete** in two steps. The tip of the **drill bit** is larger in diameter than the shaft below so that when the shaft reaches the hole

- **Twist drill bit :** are the most widely used of all **drill bit** types; they will cut anything from wood and plastic to steel and concrete. ...
  A **twist drill** is a metal rod of a specific diameter that has two, three or four spiral flutes running most of its length

- **Wood drill bit**: Any other style of cutter, for **example** a spade **drill**, that is rotated and fed in a similar manner as a twist **drill** to of cut a hole in metal, **wood** or other materials.

content/Topic 2Different types of hand drilling machine

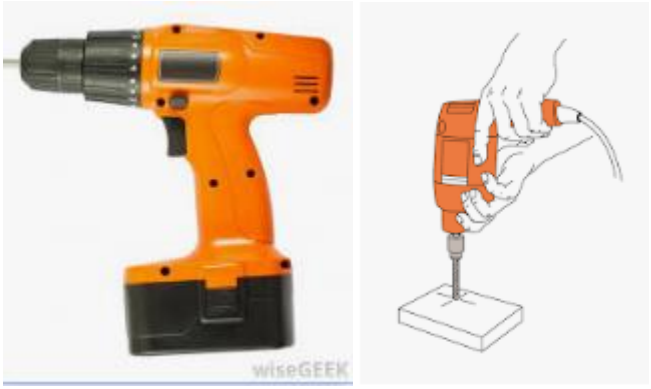
- Mechanical hand drilling machine : A device, usually motor-driven, fitted with an end cutting tool that is rotated with sufficient power either to create a hole or to enlarge an existing hole in a solid material. Also known as **driller**.



Main Parts of Drilling Machine

Drilling Machine

- **Power hand drilling machine** is a **power** tool for **drilling** holes into hard materials. **drill** - a tool with a sharp point and cutting edges for making holes in hard materials (usually rotating rapidly or by repeated blows



Power Hand Drill

- **Battery hand drilling machine** :A **cordless drill** is an electric **drill** which uses rechargeable **batteries**.

Battery hand drilling machine

L.O 2. 3: Fix wall plugs

content/Topic 1Identification of Different types of plugs

Definition of plug:also known as an anchor,is a fibre or plastic (originally wood) insert used to enable the attachment of a screw in material that is porous or brittle or that would otherwise not support the weight of the object attached with the screw.

- Plastic wall plugs
- Metallic wall plugs
- Wood wall plugs

Plastic wall plug:suitable for all kinds of concrete and masonry substrate materials

Metallic wall plugs

L.U 3 Perform sanitary mounting

L.O 3.1: Pose sanitary appliances

Topic 1 Identification of Materials used

- Screws
- Plugs
- Silicon
- Cement
- Soil solvent
- Mastic

Screws

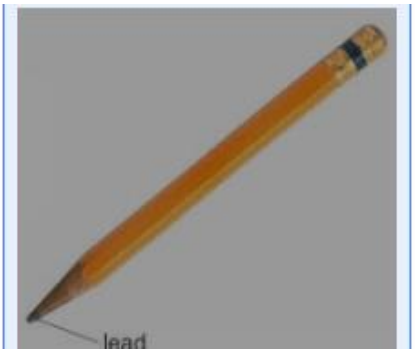
a short, slender, sharp-pointed metal pin with a raised helical thread running round it and a slotted head, used to join things together by being rotated so that it pierces wood or other material and is held tightly in place


Wall Plug :a piece of solid material fitting tightly into a hole and blocking it up.

"somewhere in the pipes there is a plug of ice blocking the flow

content/Topic 2 Identification of Marking tools used

- **Pencil :** an instrument for writing or drawing, consisting of a thin stick of graphite or a similar substance enclosed in a long thin piece of wood or fixed in a cylindrical case.

- **Pieces of chalk :** 1. a soft fine-grained white sedimentary rock consisting of nearly pure calcium carbonate, containing minute fossil fragments of marine organisms, usually without a cementing material.
  2. a **piece of chalk** or a substance like **chalk**, often coloured, used for writing and drawing on a blackboard.


- **Marker :** is a **pen** which has its own ink-source, and usually a tip made of a porous, pressed fibers such as felt. A typical permanent **marker** consists of a container and a core of an absorbent material such as felt.

L.O 3.2 :Fixe and seal sanitary appliances

Topic1different types of fastening and different types of fixing

Fastener is a device that is used to mechanically join (or **fasten**) two or more objects together. There are many different **types** of mechanical **fasteners**, but, in general,

fasteners can be divided into two main **categories**; non-permanent and permanent **fasteners**.

Definition: a device that closes or secures something




Types of fixing

- Nails.
- Screws.
- Nuts and bolts.

- Special plugs (anchors)
- Rivets.
- Adhesives.
- Welding.

Nails: a small metal spike with a broadened flat head, driven into wood to join things together or to serve as a hook

Screws:a short, slender, sharp-pointed metal pin with a raised helical thread running round it and a slotted head, used to join things together by being rotated so that it pierces wood or other material and is held tightly in place

screw | meaning of screw in Lo...
ldoceonline.com

Types of screws - Designing Buildings Wiki
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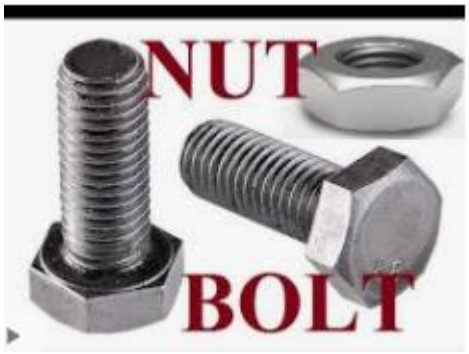
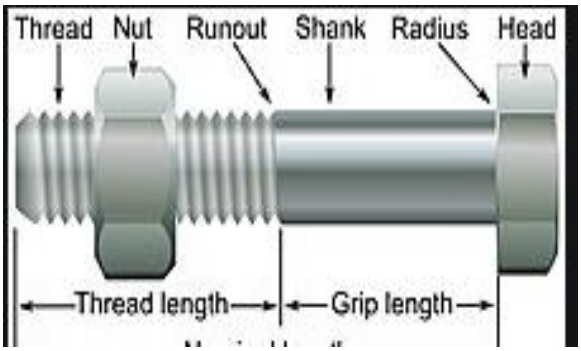
BOLTS AND NUTS

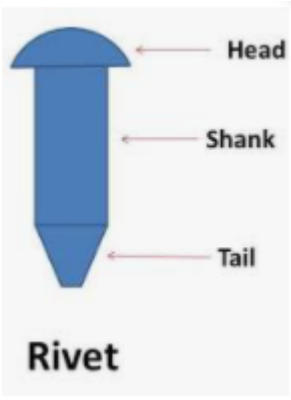


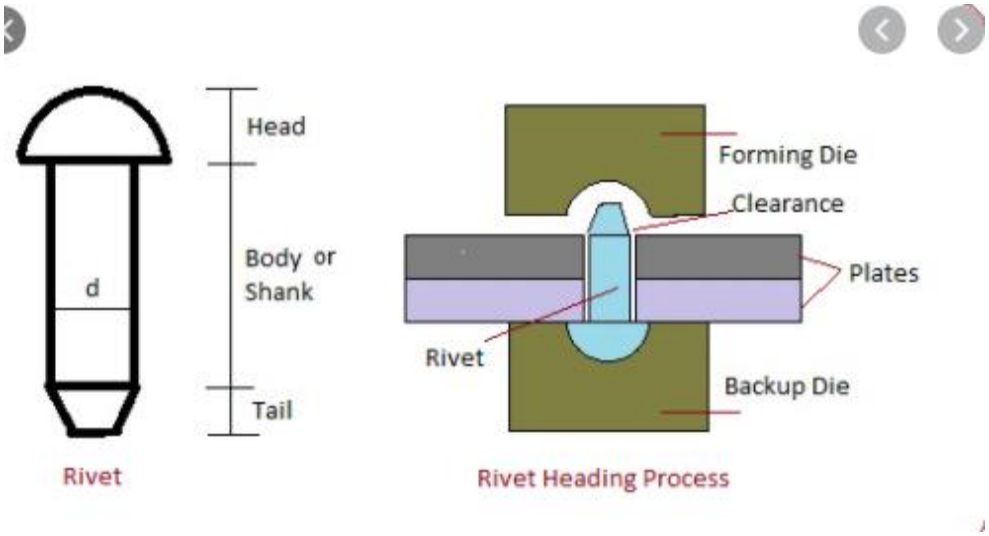


SPECIAL PLUGS (ANCHORS)

WALL PLUGS

RIVETS: a metal pin for passing through holes in two or more plates or pieces to hold them together, usually made with a head at one end, the other end being hammered into a head after insertion.

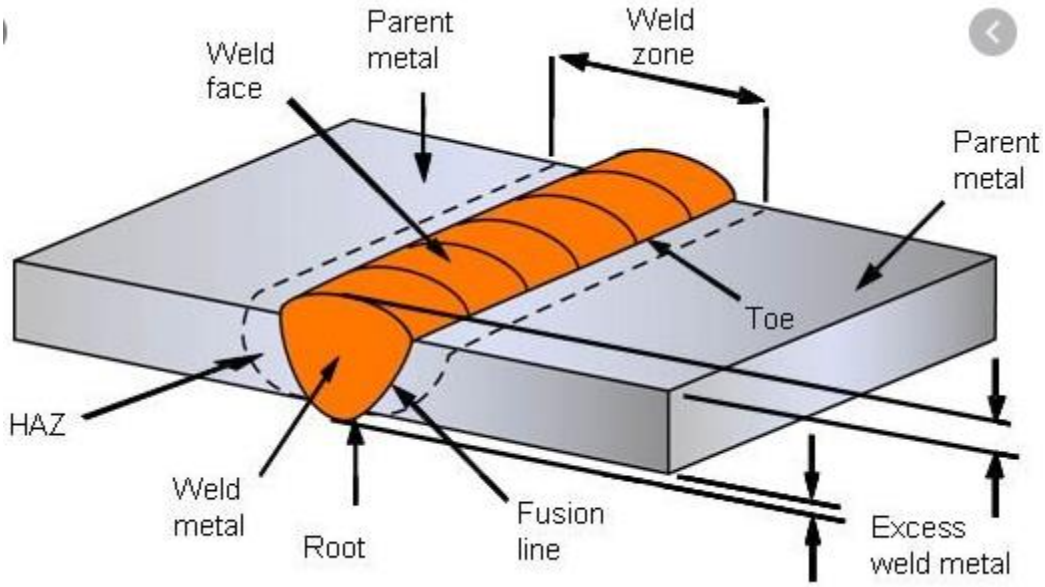




ADHESIVE :a substance used for sticking objects or materials together; glue

ADHESIVES

WELDING : join together (metal parts) by heating the surfaces to the point of melting with a blowpipe, electric arc, or other means, and uniting them by pressing, hammering, etc



content/Topic 3 Description of Materials used for sealing

- **Soil solvent :** it can be defined as the study of the chemical and physical forms and distribution of contaminants in soils, since it is tenaciously held by solis through both electrostatic and nonelectrostatic mechanisms
- **Mastic :** an aromatic gum or resin that exudes from the bark of a Mediterranean tree, used in making varnish and chewing gum and as a flavouring.
- **Cement :** a powdery substance made by calcining lime and clay, mixed with water to form mortar or mixed with sand, gravel, and water to make concrete.
- **Silicon** : the chemical element of atomic number 14, a non-metal with semiconducting properties, used in making electronic circuits. Pure silicon exists in a shiny dark grey crystalline form and as an amorphous powder.

L.O 3.3: Mount cistern

Topic 1 identification of Materials used

- **Screws** : a short, slender, sharp-pointed metal pin with a raised helical thread running round it and a slotted head, used to join things together by being rotated so that it pierces wood or other material and is held tightly in place

- **Wall Plugs** : also known as an anchor ,is a fibre or plastic (originally wood) insert used to enable the attachment of a screw in material that is porous or brittle or that would otherwise not support the weight of the object attached with the screw.

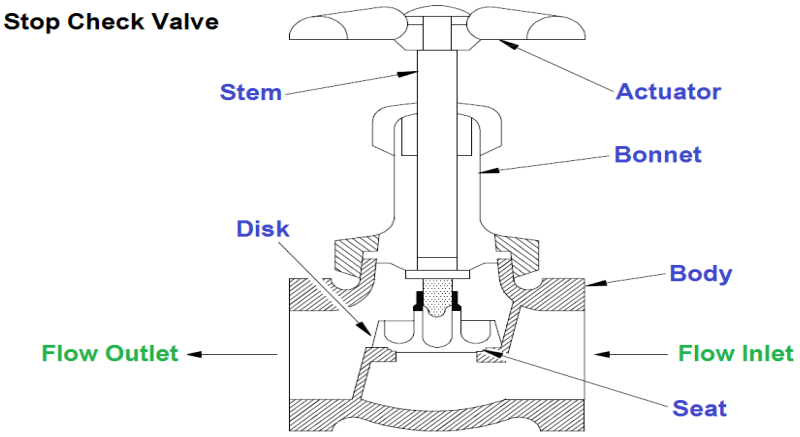
3.4: Connect inlet and outlet for appliances

content/Topic 1 Connection of the stop valve

Steps of replacing stop valve

1. Identify the Existing Valve
2. Remove the Old Valve
3. Prepare the Pipe
4. Install the Valve
5. Attach Supply Lines
6. Check for Leaks

Definition of stop valve : a valve used to stop the flow of liquid in a pipe**.**



FUNCTIONS FROM VALVES ARE:

- Stopping and starting flow
- Reduce or increase a flow
- Controlling the direction of flow
- Regulating a flow or process pressure
- Relieve a pipe system of a certain pressure

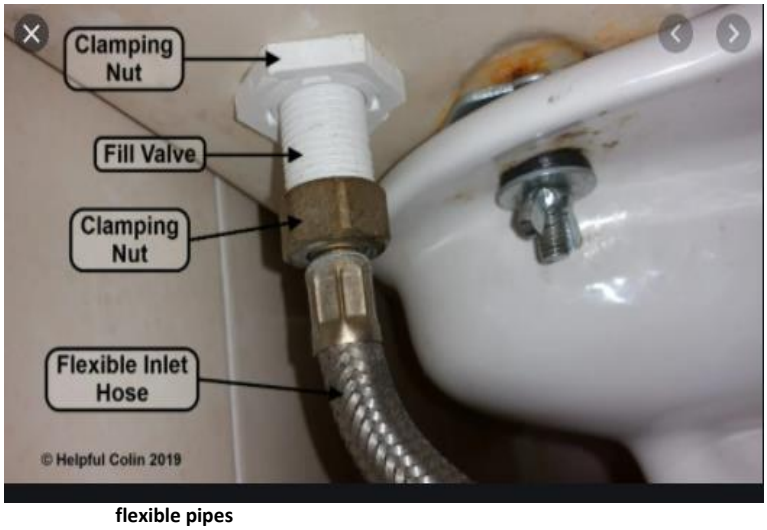
content/Topic 2 Connection of flexible pipe to the cistern

flexible pipe : is characterized by a composite construction of layers of different materials, which allows large amplitude deflections without adverse effects on the **pipe**. This product may be delivered in one continuous length or joined together with connectors


flexible pipes

flexible pipes

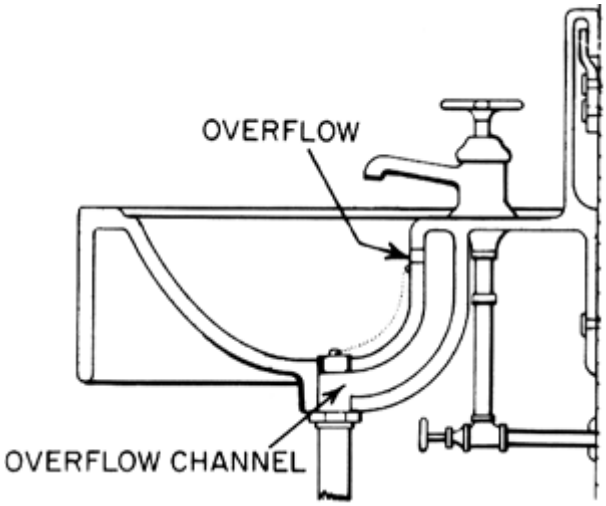
flexible pipes



flexible pipes

Topic3 Connection of the outlet pipe

Outlet pipe: a pipe with an opening which permits escape or release (of liquid, etc



1. **Low Level Water Closets with Wash Down Pan**

Operational Steps

1. Mark the position of the flushing cistern.
2. Drill a hole of the correct diameter and depths using a suitable masonry drill to receive plastic plug or ribbed plug.
3. Insert the plug to the wall.
4. Pass the screw through the item to be fixed and into the plug.
5. Screw home the bracket for the WC cistern until tight.
6. Place the WC cistern on the bracket and screw home the cistern to the wall.
7. Place the WC on the floor
8. Align the WC flush pipe connectors with the flush pipe of the cistern.
9. Fix the WC to the floor by using the screw and plastic plugs.
10. Connect the flush pipe from the flush cistern to the WC pan.
11. Connect water supply pipe to the flushing cistern.
12. Connect the waste outlet.

2. **Coupled Water Closet with Siphonic Action Pan**

These rely on siphonic action to empty the contents of the pan; the flushing water is used to clean the pan and refill the trap seal.

Operational Steps

1. Place the WC pan on the floor
2. Fix the WC pan to the floor by using the screw and plastic plugs.
3. Place the flushing cistern on the WC pan.
4. Align the holes to connect the cistern and WC pump.
5. Insert bolt to the align holes.
6. Tie the bolt and nuts to connect the WC pan and the flush cistern.
7. Connect water supply pipe to the flushing cistern.
8. Connect the waste outlet

3. **High Level WC with Squatting Pan**

Operational Step

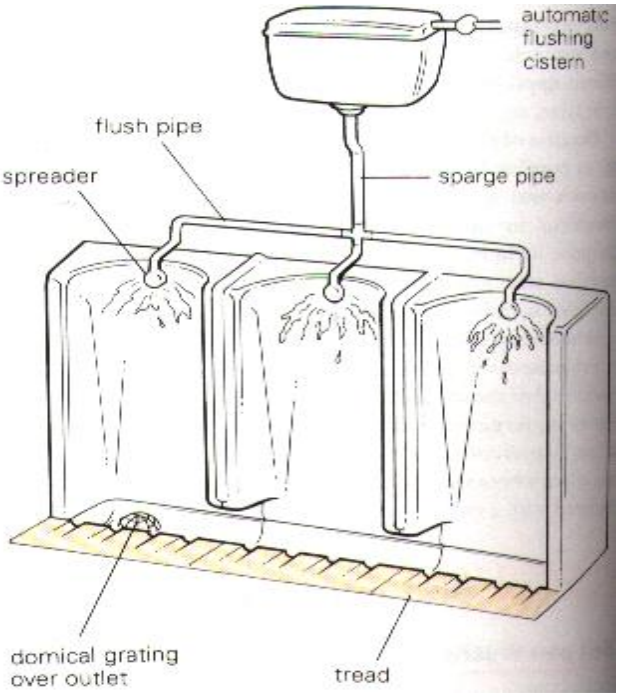
1. Mark the position of the flushing cistern.
2. Drill a hole of the correct diameter and depths using a suitable masonry drill to receive plastic plug or ribbed plug.
3. Insert the plug to the wall.
4. Pass the screw through the item to be fixed and into the plug.
5. Screw home the bracket for the WC cistern until tight.
6. Place the WC cistern on the bracket and screw home the cistern to the wall.
7. Place the WC pan in position to align flush pipe connector and the cistern.
8. Mount the WC pan to the floor having the outlet connection to the trap.
9. Connect water supply pipe to the flushing cistern.
10. Connect the waste outlet

4. **Urinals**

These can be slab, stall or bowl types. They are flushed every 20 minutes, by means of an automatic flushing cistern at the rate of 4.5 litres per stall or bowl. Slab types require a flush of a 4.5 litre per 600mm of slab length.In order to conserve water, the valve supplying the automatic flushing cistern may be a hydraulically operated type, so that the valve is shut off automatically during the hours when the building is unoccupied.

Stall Urinals

Stall urinals are made in single units complete with a floor channel and have sides which provide some privacy. They can be built up into ranges by bedding them together and covering the joints with a capping piece. They are usually made from glazed fireclay or stone ware



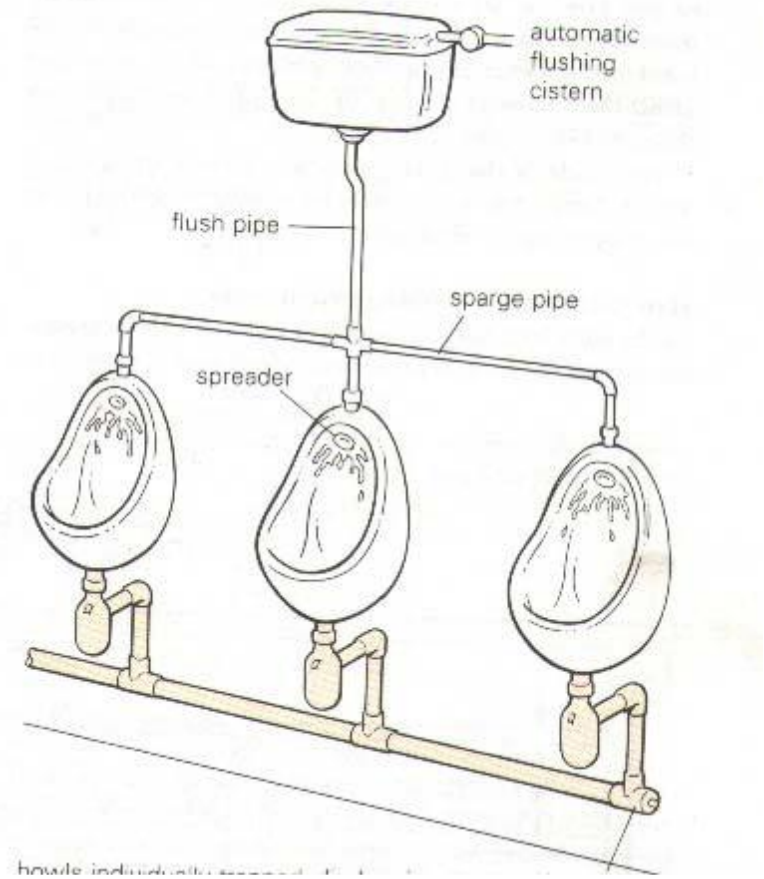
Slab urinals

Slab Urinals

Slab urinals can also be built up to any required length but they do not generally have the side pieces except at the ends of the range. Traditional materials are glazed fireclay or stoneware. The floor channel is built up separately and must be made first by laying each piece perfectly level; the fall is in the channel itself so each piece is numbered in sequence at the factory. Once positioned, a weak grout of sand and cement must be poured behind the slabs.

Bowl Urinals

Bowl urinals are the easiest type of urinal to install, consisting of a wall-mounted bowl with optional separate screens if fitted in ranges. They are available in glazed fireclay, stoneware, vitreous china or stainless steel.
Another type of urinal, even cheaper and easier to install than a range of bowl urinals, is the stainless steel trough urinal. Fitted at the same height as bowl urinals, these are available in 4m long one-piece sections.



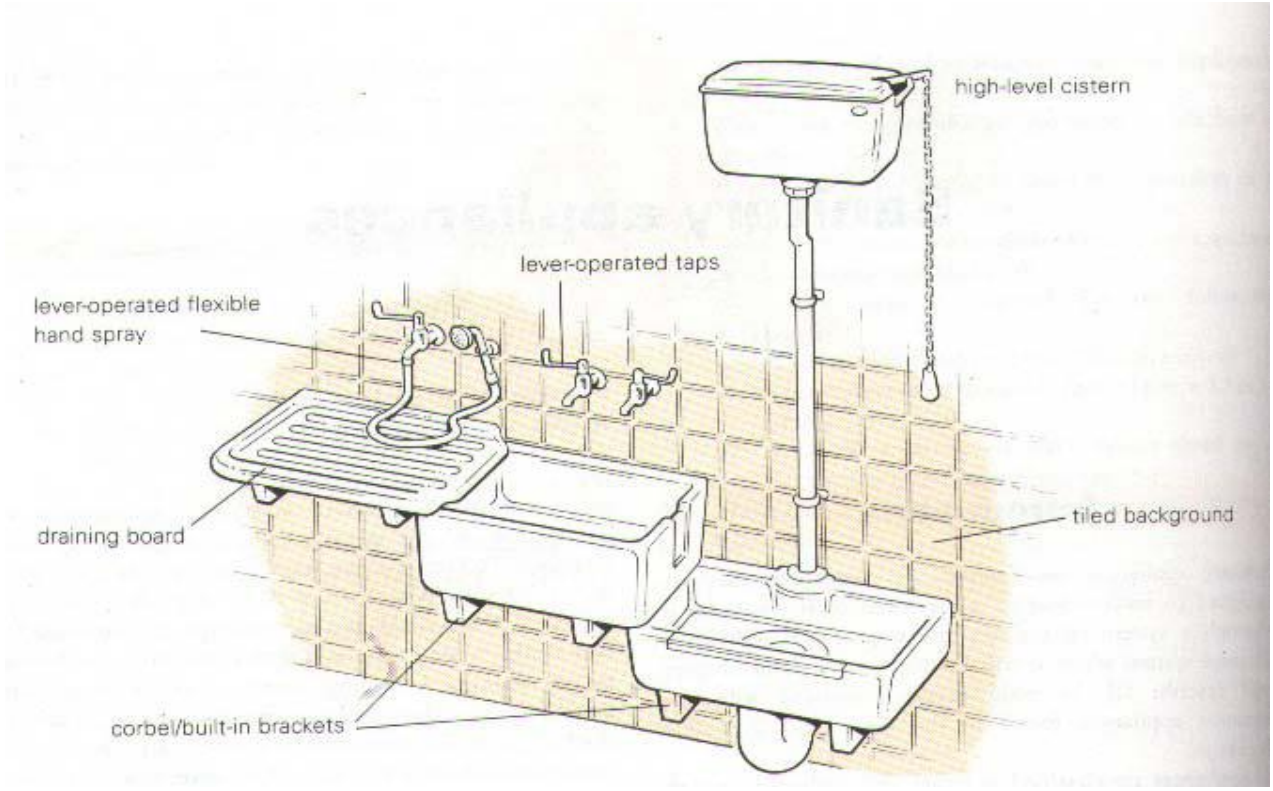
Bowl urinal

Operational Steps (Stall, Slab and Bowl Urinals)

1. Mark the position for the flushing cistern.
2. Drill a hole of the correct diameter and depths using a suitable masonry drill to receive plastic plug or ribbed plug.
3. Insert the plug to the wall.
4. Pass the screw through the item to be fixed and into the plug.
5. Screw home the bracket for the urinal flush cistern until tight.
6. Mount the stall and slab urinals up into ranges by bedding them together and covering the joints with a capping piece.
7. In case of bowl urinal, the bowl should be mounted to the wall with optional separate screens if fitted in ranges.
8. Connect cold water supply pipe to the flushing cisterns
9. Connect the waste outlet.

Bed-Pan Washers

These are installed in hospital sluice rooms and are provided with a bed pan and urine bottle jet. Since the jet is below the flooding level of the appliance, there is a danger of pollution of water by back siphonage. The jet should therefore be supplied with water from a cold water storage cistern through a separate pipe.



Operational Steps (Slop Sinks and Bed Pan Washers)

1. Mark the position for the flushing cistern.
2. Drill a hole of the correct diameter and depths using a suitable masonry drill to receive plastic plug or ribbed plug.
3. Insert the plug into the wall.
4. Pass the screw through the item to be fixed and into the plug.
5. Screw home the bracket for the urinal flushing cistern until tight.
6. The corbel/built in brackets are fixed into the wall.
7. The fittings (bed pan and slob sink) can be placed on the brackets and the flush pipes connected.
8. Connect hot and cold water supply pipes
9. Connect the waste outlets

Wash Hand Basins

Operational Steps

1. Mark the position for the wash hand basin brackets (in the case of bracket types).
2. Drill a hole of the correct diameter and depths using a suitable masonry drill to receive plastic plug or ribbed plug.
3. Insert the plug to the wall.
4. Pass the screw through the item to be fixed and into the plug.
5. Screw home the bracket until tight.
6. Place the basin on the bracket.
7. Connect the hot and cold water supply to the pipe.
8. Connect the waste outlets.
9. In case of the pedestal type mark the position for the bolts and nuts to hold the basin.
10. Place the basin to the wall and align the holes in the basin to the bolts.
11. Tight the bolts and nuts to hold the basin

12. Fix down the pedestal to the floor with brass screws to support the basin

Baths

Operational Steps

1. Place the bath on the floor.
2. Adjust the legs to make the bath to slop to the outlet.
3. Connect the hot and cold water supply to the pipe.
4. Connect the waste outlets.

Showers

Operational Steps

1. Mount the shower tray on the floor
2. Connect the hot and cold water supply pipe.
3. Connect the waste outlets.

Sinks

Operational Steps

1. Mark the position for the sink brackets.
2. Drill a hole of the correct diameter and depths using a suitable masonry drill to receive plastic plug or ribbed plug.
3. Insert the plug into the wall.
4. Screw home the bracket until tight.
5. Place the sink on the bracket.
6. Connect the hot and cold water supply pipe.
7. Connect the waste outlets.
8. In case of the stainless steel sink the timber drawer and the cupboard unit should be constructed.
9. Place the stainless steel sink on the cupboard unit/timber drawer.
10. Connect the hot and cold water taps
11. Connect the waste outlets.

L.U 4 Handover the work.

L.O 4.1: Clean the workplace

content/Topic 1 Method of cleaning:

A) **Air pressure**: is the force exerted onto a surface by the weight of the air.

B) **Cleaning with cloth rugs** : means a cleaning product designed for the purpose of eliminating dirt and stains on rugs, carpeting, and the interior of motor vehicles or on household furniture or objects upholstered or covered with fabrics such as wool, cotton, nylon, or other synthetic fabric

C) **Soaps:** are special, powerful cleansers that can break up dirt, oils, and grease in clothing or on dishes. You might buy laundry detergent for washing your dirty clothes and dish detergent for the sink full of plates and bowls after your dinner party

L.O 4.2: Clean and store tools and equipment

content/Topic 1 Cleaning with

A) **Water :** a colourless, transparent, odourless liquid that forms the seas, lakes, rivers, and rain and is the basis of the fluids of living organisms.

The Many Uses of Water

Water can be used for direct and indirect purposes. Direct purposes include bathing, drinking, and cooking, while examples of indirect purposes are the use of water in processing wood to make paper and in producing steel for automobiles. The bulk of the world's water use is for agriculture, industry, and electricity. The most common water uses include:

- Drinking and Household Need
- Recreation
- Industry and Commerce
- Agriculture
- Thermoelectricity/Energy
- Cleaning

B) **Rugs** : a floor covering of thick woven material or animal skin, typically not extending over the entire floor.

RUGS

C) Oil : a viscous liquid derived from petroleum, especially for use as a fuel or lubricant.

OIL

D) **Brushes:** an implement with a handle and a block of bristles, hair, or wire, used especially for cleaning, applying a liquid or powder to a surface, or arranging the hair.

Cotton waste: **means** any material **defined** under **cotton** by-products containing more than seven per cent of trash, hull, leaf, stem, pulp, etc., and includes **cotton** motes.

E)

content/Topic 2 Rearrange :reorder Tools in tools boxes /Chelf according to their specification

content/Topic 3 Remove the remains, metals chips and dust from the working place

The remains materials chips should be removed at workplace

L.U 4.3: Prepare a relevant report of the work

Content/Topic 1 Writing the correct report

Prepare relevant report of work directly related, connected or pertinent to a topic not out of date

Usable materials : capable materials of being used

Remain materials :materials which are left (remainder) to stay behind while others have been removed or destroyed

References :

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2. BS 6465: Part 1: 1984 *Code of practice for the provision, selection and installation of sanitary appliances*
3. Google Scholar