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Subject = civil engineering drawing and Theory

Date = 26/09/2020

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BE civil engineering

(16)  
What are the various components of plumbing system of a building? What precautions should be ensured in provision of plumbing system of a multi-storey residential building?

Plumbing  $\Rightarrow$  The word Plumbing comes from the Latin word Plumbum for lead, as pipes were once made from lead.

Plumbing is the system of pipes, drains, fittings, valves, valve assemblies, and devices installed in a building for the distribution of water for drinking, heating and washing and the removal of waterborne wastes, and the skilled trade of working with pipes, tubing and plumbing fixtures in such systems.

"Plumbing" is often denotes the supply and waste system of an individual building, distinguishing it from water

Supply and Sewage systems that serve a group of buildings.

A basic plumbing system consists of three parts: pipes and fittings, fixtures and drainage. Together they combine to create a functional plumbing system that serves a variety of uses in homes. Bathrooms, Kitchens and even garages are all common places where you can find complete plumbing systems. Pipes and fittings are the backbone on which all plumbing systems are built. It's composed of the plumbing system consists of all the pipes that connect the home to the main water supply lines. It also includes any fittings required to connect the various plumbing pipes at various intersections and to create varying angles for the pipes when needed. Most plumbing systems will have a combination of both hot water and cold water pipes each designed to withstand each either high or low temperatures with ease.



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Pipes can also be made from a variety of materials including Copper, brass, lead, PVC or CPVC. The pipes in a basic plumbing system will connect to a variety of plumbing fixtures. Plumbing fixtures can include sinks, bathtub, hot water heaters, toilets, washing machines and dish washers. Each fixture serves a specific need in the house and it is typically designed for inclusion in specific rooms. A bathroom sink, for example, would not be suited for installation in a kitchen. Each fixture will also have a specific set of maintenance needs that should be carried out on a regular basis to keep the fixture in the top working order. Just as pipe connects the fixtures to the main water supplies, drainage systems are the components of basic plumbing system that connect the various fixtures to the waste removal lines and eventually to the sewage system. The drainage system is also the component of a basic plumbing system that often requires the most attention, as clogged drains are common household occurrences. Because of this special

Care should always be taken to ensure no materials are being allowed to enter into the drainage system that are too large or bulky for the particular drain to handle and pass freely. if a blockage does occur

plumbers, jugs and various household chemical drain cleaner can be used to help break up the clog and restore proper drainage to the individual fixture.

designed plumbing system for multiple dwellings and multi-story housing units requires careful attention to factors that are substantially more complicated than those for single-story dwellings. The following overview of some of these important factors can help you understand the what needs to be considered when designing a plumbing system for multi-story dwellings.

Increasing water pressure for multi-story buildings. in multi-story buildings, water pressure will often need to be increased to ensure that water is reaching the upper level of the structures. This can be accomplished in several different ways.



## Installation of booster pumps.

A series of stages can be installed to provide increased pressure for water drawn from the municipal water supply or from gravity storage tanks. These pumps supplement pressures from existing water supply source.

Using a gravity-based roof tank. Water is pumped from a ground level or basement-level storage tank into a roof tank that attains

adequate water pressures through gravity.

Use of hydro-pneumatic storage tank.

Water is pumped from municipal supply lines or gravity storage tank that use internal air pressures to increase the water supply line pressures.

## Avoidance of Cross-Contamination.

Multi-occupancy, multi-story buildings must have plumbing system designs that prevent the possibility of cross-contamination of drinking water from one dwelling to another. Carelessness behaviour from one ~~resident~~ resident should not affect the water quality.

of any other tank.

Installation of Control ~~lines~~ valves. multi dwelling units should have control valves installed to control water supply to each individual unit. This will help preventing cross contamination. it will help with cross contamination.

Control valve also give building managers and owners the option to stop water flow to unoccupied units. In cold ~~water~~ weather for example this could reduce the chance of pipes freezing in vacant units.



Answer ② → Symbols → Just as in chemistry we use symbols to represent elements in architectural floor plans we used symbols to represent electrical, plumbing, sanitary, gas, HVAC etc.

→ These are symbols only and they do not represent the shape size colour of the actual item.

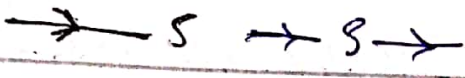
The description of the specific items is covered in the specification documents which forms an integral part of the working drawings.

Standard abbreviations and nomenclature are considered part of symbols.

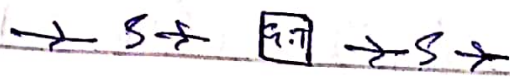
A floor plan, therefore usually contains a list of symbols/legends being used on that particular floor ~~plan~~ plan.



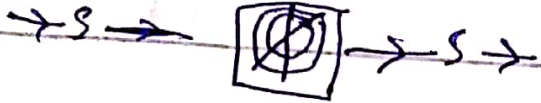
# Sewerage Symbols.

①  main sewerage line

2.  manhole.

3.  Gully Trap.


4)  Grease Trap.

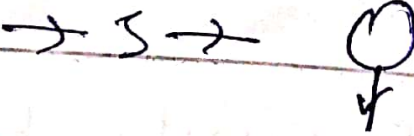
5)  Floor Drain

6.  waste pipe.

7  soil pipe.


8.  vent through the roof

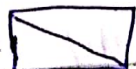
9.  Roof Drain.

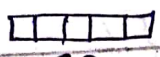
10.  Down Pipe for rain water.

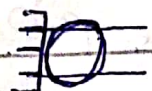
electrical symbols:

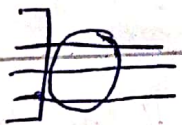
1. —E—E— main supply line.

2. —E—  —E— main control board.


3. —E—  —E— Distribution Board.

4. —E—  SB Switch Board.


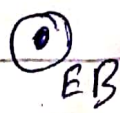
5.  Electrical Outlet - 5 Amps

6)  Electrical Outlet - 15 Amps.

(7)  Gaze light'

8.  Security light

9)  Telephone socket:  
Bell Push

10.   
11.  Cell Bell

12.  mirror light.



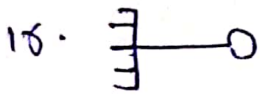
(28)



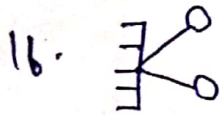
ceiling mounted / porch light



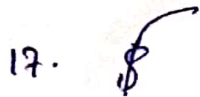
ceiling mounted / Globe light



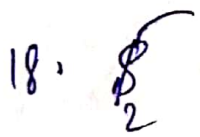
wall mounted / Globe light



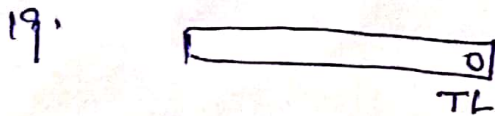
wall mounted / Fancy light



Switch (Single pole)



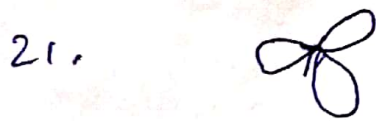
Switch (Double)



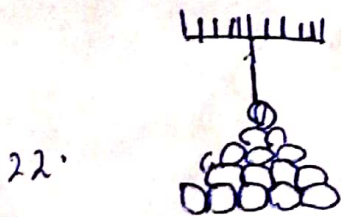
Tube light - 4ft long.



exhaust fan.



Ceiling Fan (48" - 56" Dia)



Chandelier.

(11)

Q.103

Briefly describe various components of frame structure along with Diagram?

Answer

Component of framed building structure -

→ This is a complete building as a framed building -

→ This building has ground floor, first floor, second floor and Terrace floor -

The vertical elements are the columns.

The horizontal bands are the beams.

The plate surface on which you can stand is the slab -



(12)

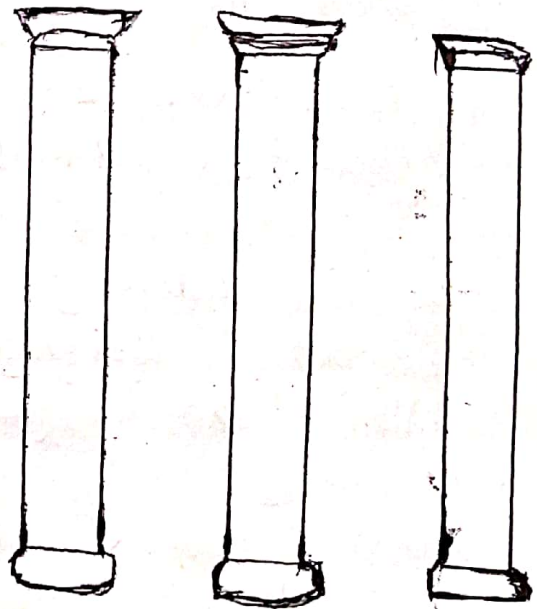
Walls, windows are added later to give protection to inhabitant.

The loads such as human beings, furniture etc is carried by

this frame,

The walls have no role except protecting the inhabitant from weather.

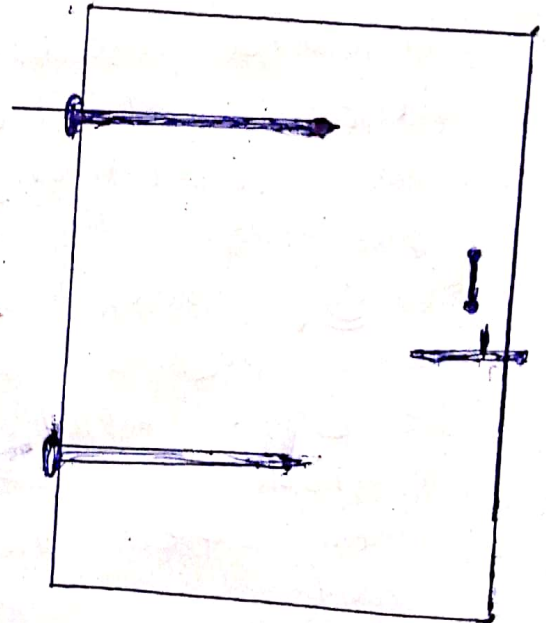
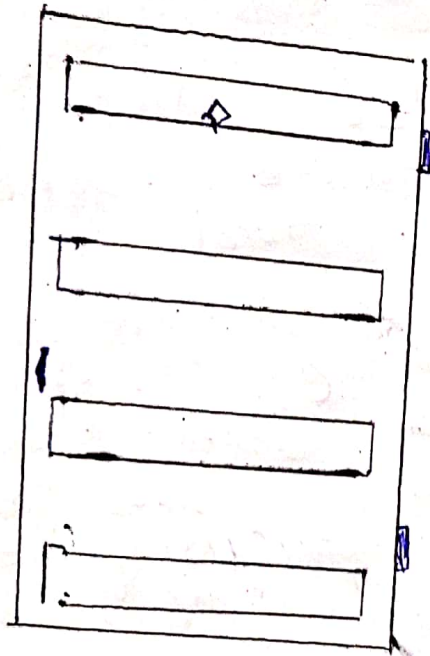
## Columns



Columns are vertical members along which beam and slab is supported they are square, rectangular and circular in shape in C/S

# Doors and windows.

A door provides a connecting line between rooms, allowing easy free movement in the building. windows are openings provided in walls. Doors <sup>and</sup> windows are ~~openings~~ provide lighting and ventilation. They provide resistance to weather, sound and heat. They provide security and privacy.





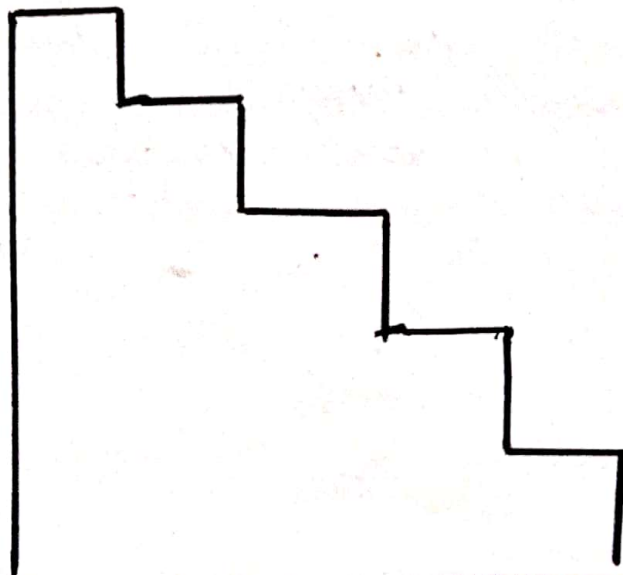
## Steps and Stairs: (14)

Steps and stairs are meant to provide access b/w different levels. Stairs should be properly located to provide easy access and fast services to the building -

In one flight maximum 8 steps should be provided for more than 8 steps it is recommended to provide them than with landing.

Generally for vertical building width of stair is 1.0m and 1.2m

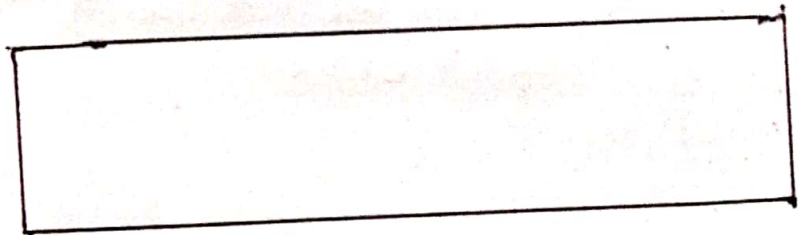
No of risers = Total height of floor / height of riser.  
No of tread = Number of riser - 1



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## Beams

Beams are horizontal members above which the slabs are provided. The beams are instead supported on walls and columns. They are generally 20, 39, 48, 60 cm thick and deep members as for structural design.



Beam



Q No<sup>4</sup> what is the importance and characteristic of Damp proof Course?

Ans. A Damp-proof Course (DPC) is a horizontal barrier in a wall designed to resist moisture rising through the structure by capillary action - a phenomenon known as rising damp. DPC is used to stop dampness in buildings. In theory, due to the ~~building~~ capillary movement of water, water rises from the earth to the building. Passing through the foundation it rises higher to reach the walls. If water reaches the wall it may damage them by creating cracks, breaking cement-paints bonds and creating dark spots on the wall etc. So to avoid water from reaching to the wall DPC is laid at Plinth level.

→ The importance of good damp proofing around the home being a damp and mildew environment in the house often causes problems for people suffering from asthma. The best solution is to damp proof the



house is to use the DPC damp proofing method since 1970 more than a million homes have benefited from this damp proofing system.

⇒ Benefits of damp proofing your homes following are some of the benefits of damp proofing your homes.

Damp proofing your homes is a sure fire way of keeping it in top working order. By using the DPC system you can ensure that your homes stay in superior condition. Damp proofing can also help you get rid of excess mildew and bacteria.

these are definite triggers for people suffering from asthma. Damp proofing ensures that your family stay safe and healthy always. The chemical damp proofing injections, the same as damp proofing in South Africa will not only prevent moisture from seeping in to the walls but will also help in getting rid of the residual moisture. Your paint and plaster will be remain in superior



condition when you damp proof your home. The importance of damp proofing buildings damp problems are one of the most recurrent issue affecting buildings and protection of a building starts in its most basic construction. It's easier to prevent rising damp than it is ~~to~~ to treat it and this is where damp proofing comes in. They are moisture control treatments applied to the walls and floors of buildings to prevent damp problems. This will inevitably lead to mould, dark and damp patches on walls, wallpaper stain wet rot, peeling wallpaper, peeling paint, musty and damp smell salt stain on outside walls, the decay of timber and plaster and crumbling mortar on outside walls any or all of these are likely to lead to expensive and extensive property restoration work by a building contractor.