REG 16N0V

Construction Techniques or Building Constructions

Textbook :-

(i) Building Construction by BC punmia
(ii) Building construction by Rangwala

Syllabus :-

chapter → 01 → Introduction
chapter → 02 → Foundation
chapter → 03 → Brick Masonry
chapter → 04 → Partition wall and Retaining wall
chapter → 05 → Doors and windows
chapter → 06 → Roof
chapter → 07 → Floor
chapter → 08 → Vertical communication
chapter → 09 → scaffolding and it's type (Skidding)
chapter → 10 → DPC (Damp proof course)
chapter → 11 → paint
chapter → 12 → plastering
chapter → 13 → Miscellaneous

chapter → 01 (Introduction)

⊕ Structure :-

It may be defined as the assemblance (जोड़) of various components in such a manner that it can withstand (सहन करना) the load and transfer it safely to the soil. For example :- Building, cinema hall, Hospital, Highway (Road) etc.

REC 26NOVE

(11) Foram Structure :→

- In frame structure ; the entire load is posses through the slab , beam, column, footing and at last to the soil.
- In main function of brick masonary in this type of structure is to provide partition.
- The durability of frame structure is far better than the load bearing structure
- By frame structure, we can construct G+2, G+3, G+4, G+5, G+6, G+7, and so on as per our requirement.
- In modern time house are generally constructed with frame structure frequently.
- In frame structure generally isolated footing or combined footing is provied.
- When a single column is constructed on a single footing then the footing is said to be Isolated (एकाकी) footing.

→ Isolated footing

- In the load bearing, the entire load of the structure is taken by the brick masonary.
- In the load bearing, brick wall is constructed below the ground level and it is taken above the ground level.
- Durability of load bearing is less.
- By load bearing structure we construct our building up to Ground floor & first floor.
- In load bearing structure we generally provide "Strip Footing".

② Frame structure :-

Column without step

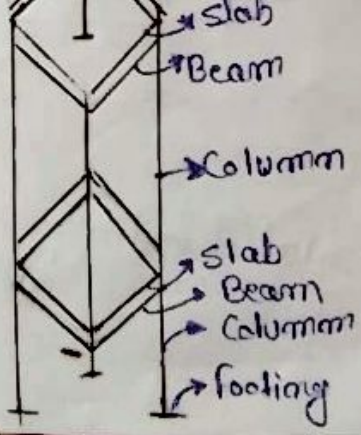
Column with step

sloped footing or foundation

- Column without step
- Column with step
- sloped footing or foundation

→ Isolated footing

(Load transfer mechanism in frame structure



Floor or Roof (special name i.e slab
↓
Beam
↓
Column
↓
Footing
↓
Soil

Ques: Why we provide plinth in a building?

Ans: For the effective drainage of water from the building, we required plinth in a building.

And also to prevent the entry of polluted water from the road or the street to the building; we required plinth in a building.

30 NOV

(II) Substructure :- The component of the building below the ground level is known as "substructure".

For eg :- Foundation.

NOTE :- The stepping part of foundation; is known as "Footing".

Foundation :- The horizontal component of substructure built below the ground level to withstand the load of superstructure load and transfer it safely to the soil.

↳ The durability of complex or composite structure is less than the frame structure the durability of complex or composite structure is more than the load bearing structure.

↳ In complex or composite structure, columns are provide with isolated footing as combined footings.

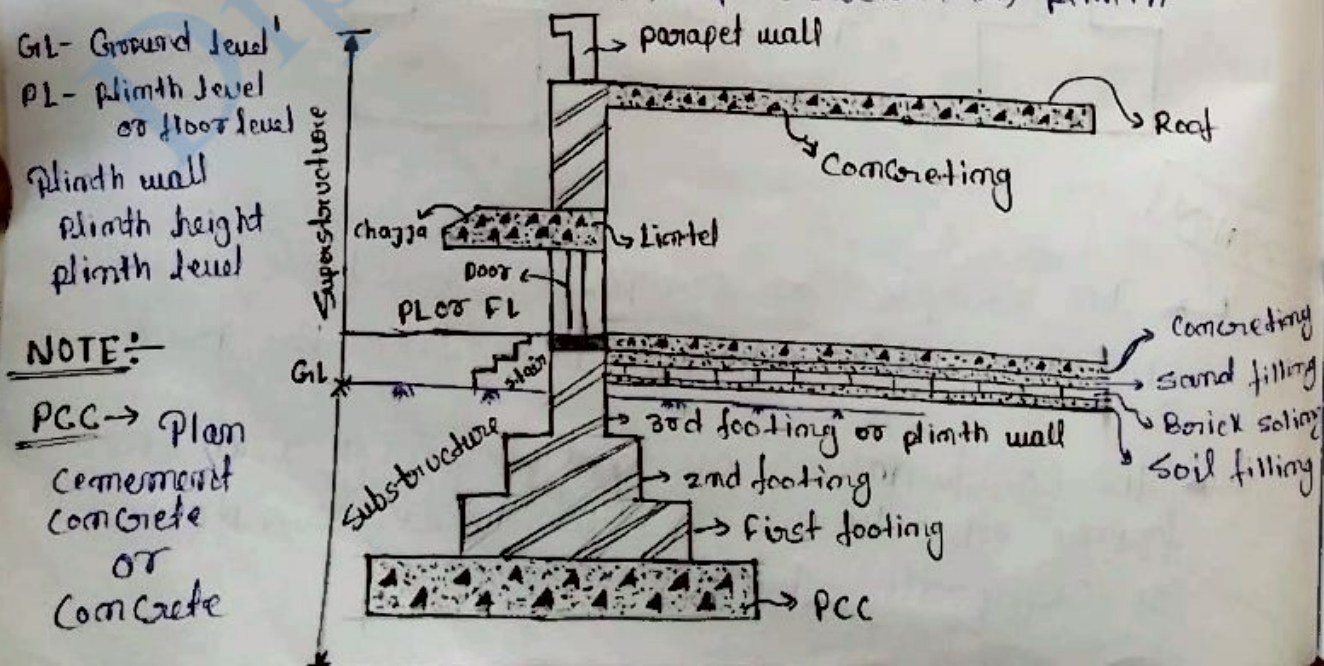
↳ In

↳ In complex or composite structure, brick masonary perform both the function i.e it takes load as well as it acts as a partition.

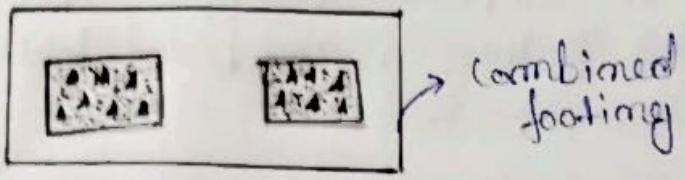
↳ In complex or composite structure; we construct storey (मंजिल) of a building more than load bearing structure but less than the frame structure.

(ii) Classification of structure on the basis of components of a building :→

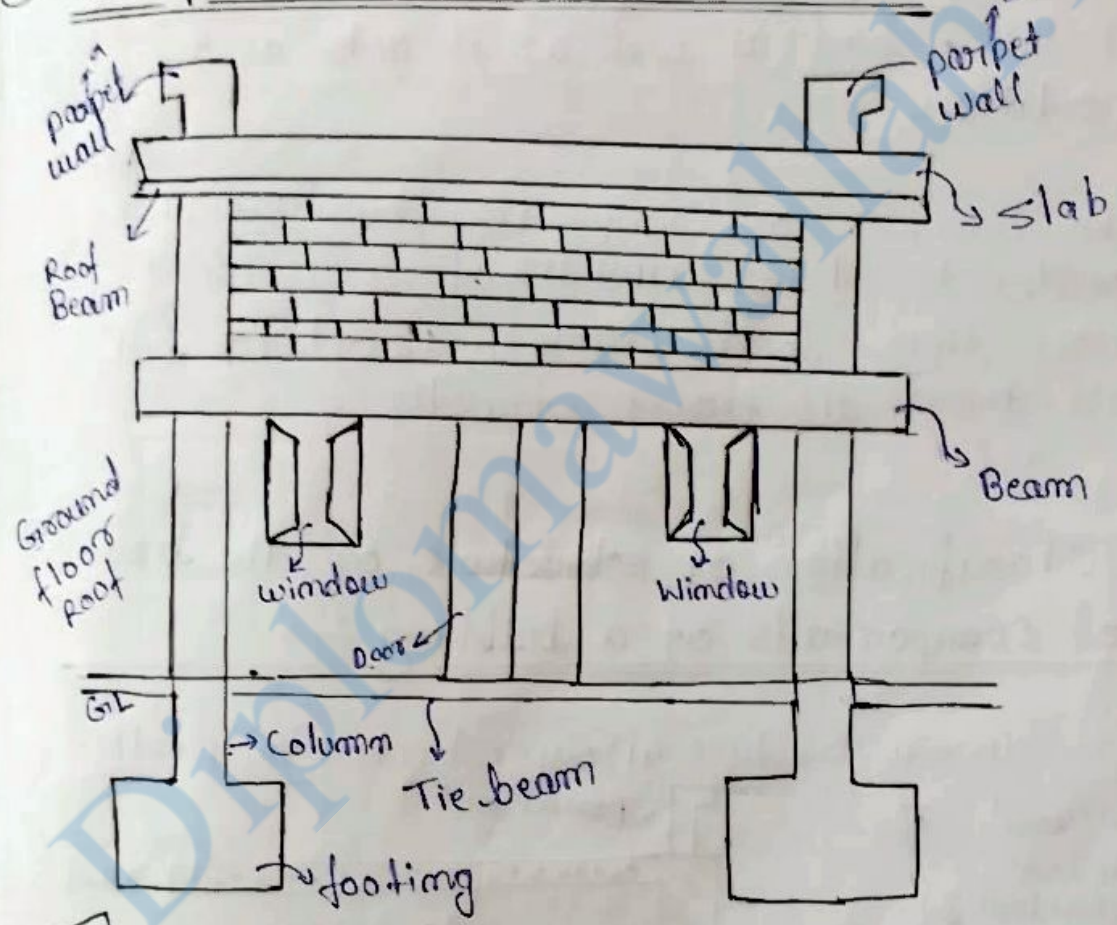
(i) substructure (ii) superstructure (iii) plinth



↳ when two column are constructed on a or single footing then the footing is said to be combined footing.



③ Composite or Complex structure :-



DEC 28 NOV

↳ In Complex or composite structure, brick Masonry and column both take the load.

↳ The Combination of load bearing and the frame structure; is said to be complex or Composite structure.

NOTE :-

Plinth level coincides floor level

Plinth height → Total height of the Plinth wall

Plinth wall → one of the type footing.

Plinth

(4) Superstructure :- The component of the building above the ground level known as "superstructure". For eg :- Lintel Door, window, chhajja, stair, slab, parpet wall etc.

NOTE :- Slab means → Roof or floor or ceiling.

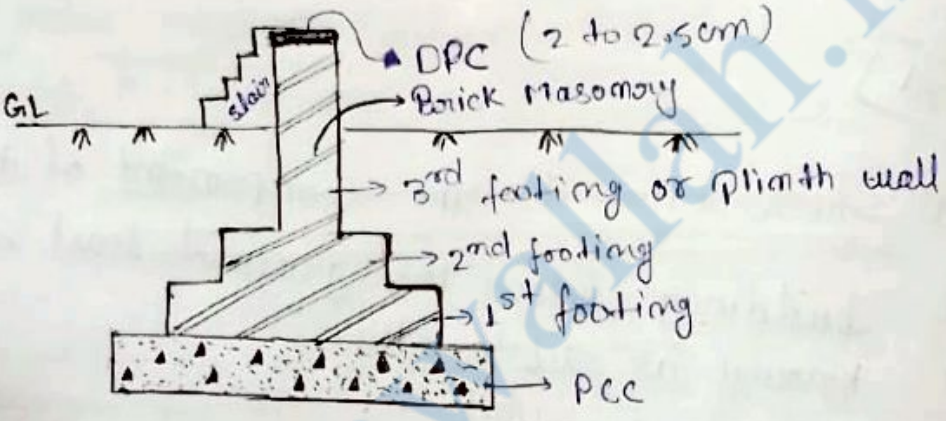
5th Dec Component of superstructure :-

(i) Door :- It is opening provided in the brick masonry wall for the entry or exit of person in a particular room.

(ii) Window :- It is an opening smaller than the door opening in the brick ~~brick~~ masonry wall for the exchange of sunlight and air in a particular room.

(iii) Floor :- It is a bottom horizontal platform of a room. The main function of floor is to provide separation of storey (मंजिल).

(ii) **Plinth :-** It is one of the important component of building that neither to be a structure superstructure component nor do be a substructure component that's why plinth is considered as special type structure in a building.



(iii) **Plinth level :-** The top portion or surface of the plinth wall; known as "Plinth level".

(iv) **NOTE :-** During the construction of building plinth level consider with the floor level.

full form of DPC → Damp Proof Course.

Ques :- Why we provide DPC at the plinth level ??

Ans To Present the moisture from the substructure wall do the superstructure wall, we provide DPC at the plinth level.

NOTE :- DPC Mixture → Concrete or PCC + Damp proffing compounding.

④ Roof :- It is the top most horizontal platform of a building provided to prevent the internal entry of rain water in a room of a building.

⑤ Lintel :- It is a horizontal component provided over wall the top level of door and window to bear the load of of st superstructure wall built over it.

⑥ Cantilever chhajja or chajja :- It is one of the type of slab whose one end is fixed into the wall / column and other and is suspended.

⑦ ~~Ver~~ Stair (सीढ़ी) :- It is one of the type of vertical communication provided for the purpose movement of people or person from one floor to another.

③ Beam :- It is a horizontal component that bears the load of slab.

⑨ Column :- It is a vertical component that bears the load of beam and transfer it safely to the foting or foundation.

⑩ Parapet wall :- It is one of the type. provided on the roof for the safety point of view.

NOTE :- Roof, slab, floor, ceiling :-

(11) Types of shallow foundation :→

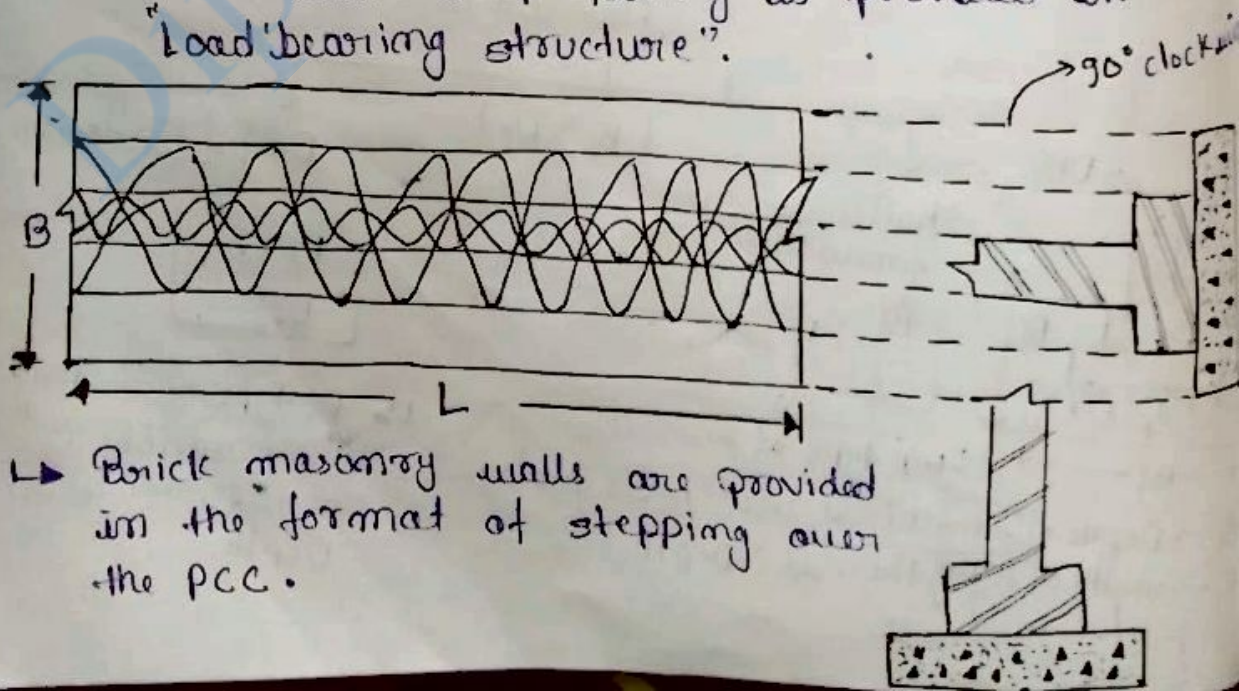
(i) Wall with step } strip footing
(ii) wall without step }
(iii) strap footing } Isolated footing
(iv) Column with step }
(v) Column without step
(vi) Combined footing.
(vii) Mat or Raft footing

From above conclusion ; we should have do atleast these four foundation types of shallow foundation :→

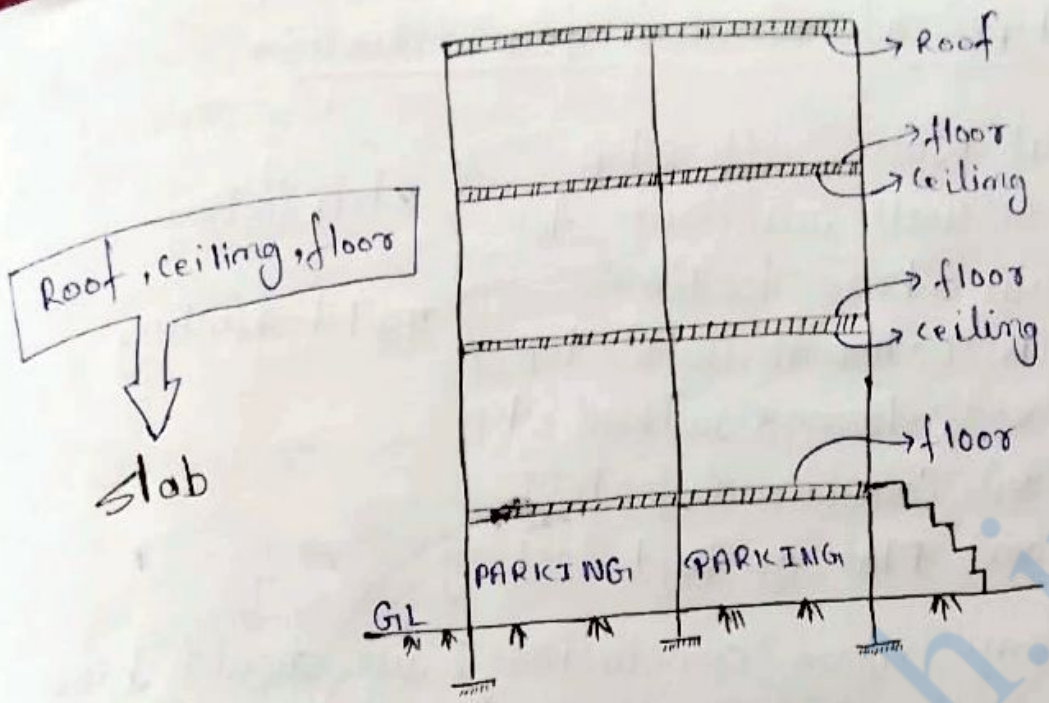
(i) strip footing
(ii) strap footing
(iii) Isolated footing
(iv) Combined footing
(v) Mat or Raft footing

(1) Wall with step :→

↳ Wall with step footing is provided in "Load bearing structure".



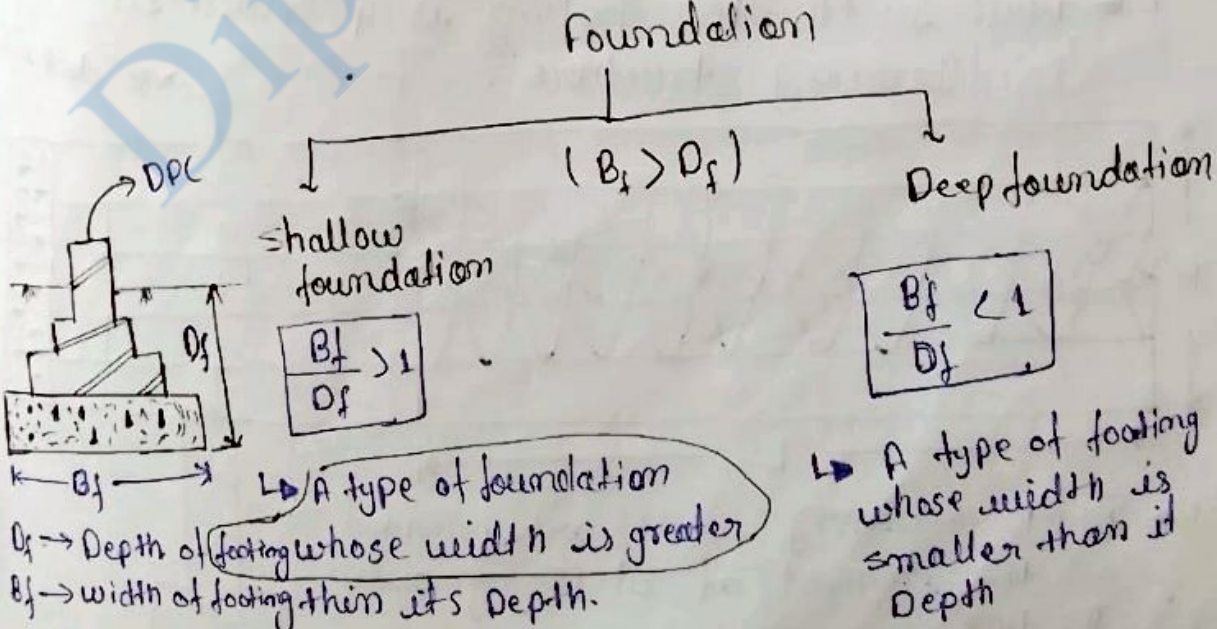
↳ Brick masonry walls are provided in the format of stepping over the PCC.



UNIT → 02 (FOUNDATION)

(#) **Foundation :→** It may be defined as the component of substructure built as a horizontal platform to bear the load of column or brick masonry wall and transfer it safely to the soil.

(#) **Types of foundation :→**



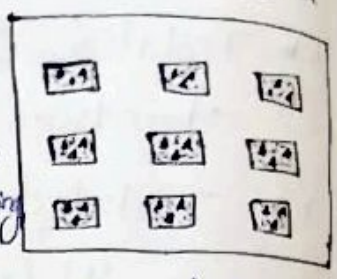
↳ A type of foundation whose width is greater than its Depth.

D_f → Depth of footing
B_f → width of footing

↳ A type of footing whose width is smaller than it Depth

(H) Mat or Raft :→

$P1 = \frac{load1}{Area}$



↳ When the allowable or permissible soil pressure is low and load is very high; then in this condition; we should prefer mat or Raft footing

↳ Mat or Raft footing is type of shallow foundation in which more than two columns are constructed on a single footing.

(H) Deep foundation :→

Deep foundation

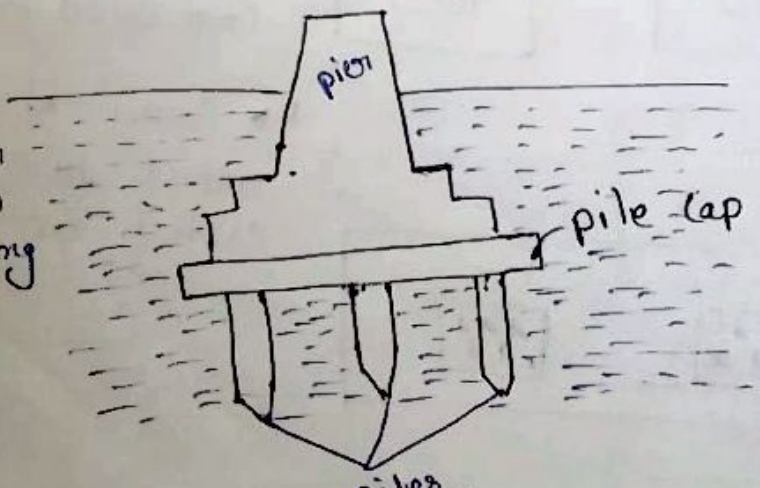
pile foundation — well foundation (vertical)

↳ **PILE :→** It may be defined as the long, slender member driven into the ground to support the structure

Column :→ vertical member (made of RCC)

pillar :→ vertical member (made up of brick masonry)

NOTE :→ Columns are known by pier or abutment in Bridge engineering



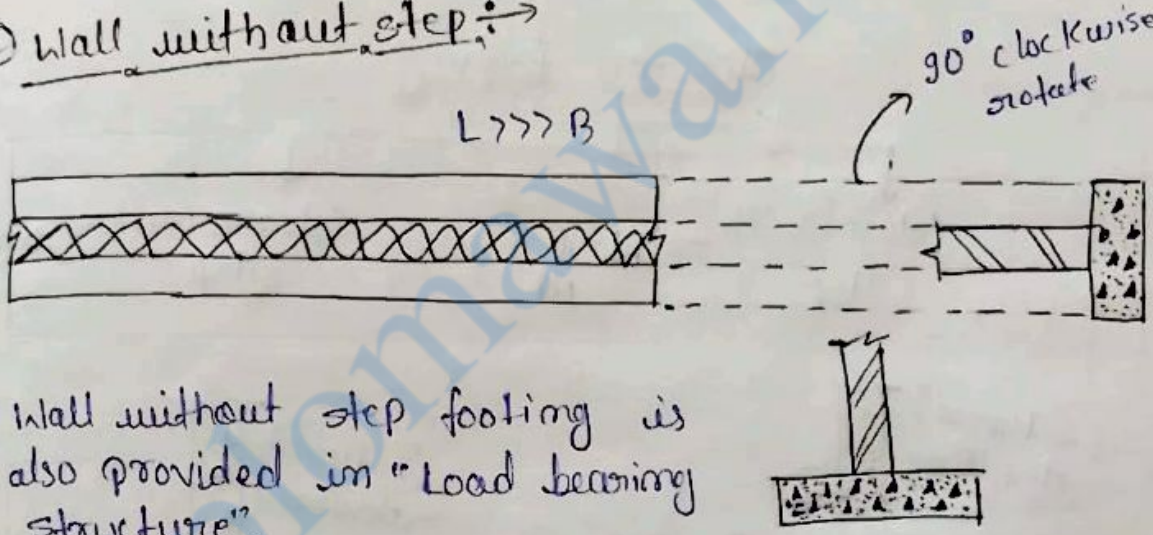
Advantage of providing wall with step footing :→

$$\text{Pressure} = \frac{\text{force}}{\text{Area}}$$

$$P = \frac{f}{A} \quad \left[\begin{matrix} P \propto F \\ P \propto \frac{1}{A} \end{matrix}\right]$$

Conclusion :→ Wall with step footing have larger area in compare with wall without step footing. Therefore pressure is less in wall with step footing as compare to wall without step footing.

② Wall without step :→

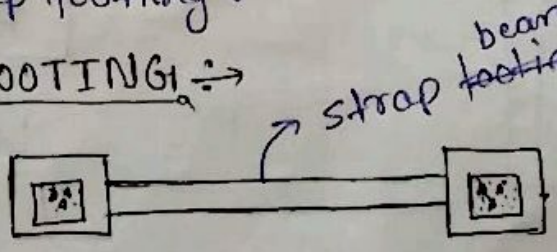


↳ Wall without step footing is also provided in "Load bearing structure".

↳ Brick masonary walls are not provided in the format of stepping over the PCC.

↳ Pressure coming on the wall without step footing is more in compare with wall with step footing.

③ STRAP FOOTING :→



↳ when two or more footing are inter connected with the help of strap beam; then the footing is said to

Isolated footing :→

↳ Isolated footings are provided for the frame structure and the composite structure.

↳ Isolated footing are of two types :→

(i) Column with steps

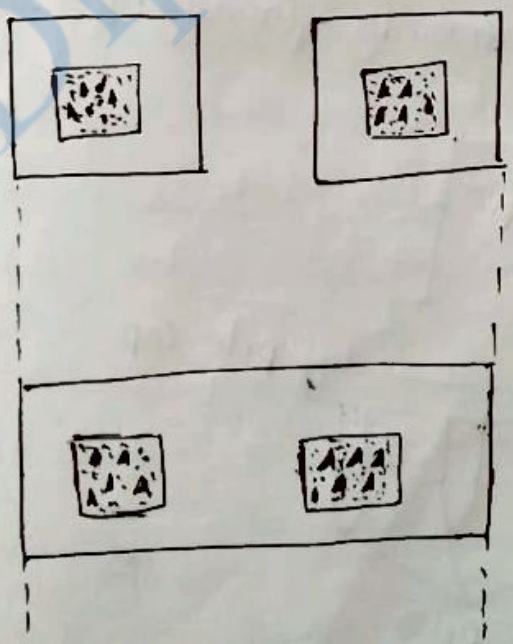
(ii) Column without steps

↳ Now these days isolated footings are frequently used for the construction of bulding.

↳ Isolated footings are more strength in compare with strip footing.

↳ Isol footings are consist of R.C.C (ie Reinforced cement concrete).

Combined footing :→



↳ when the space between two isolated footing is very less, the for economical design; we should prefer Combined footing.

↳ Combined footing on which two column are casted on a single footing.

L→ when two or more footing are inter connected with the help of strap beam; then the footing is said to be "strap footing"

Advantage of strap footing :→

. By the help of strap footing : all the interconnected footing are unite and perform a single function

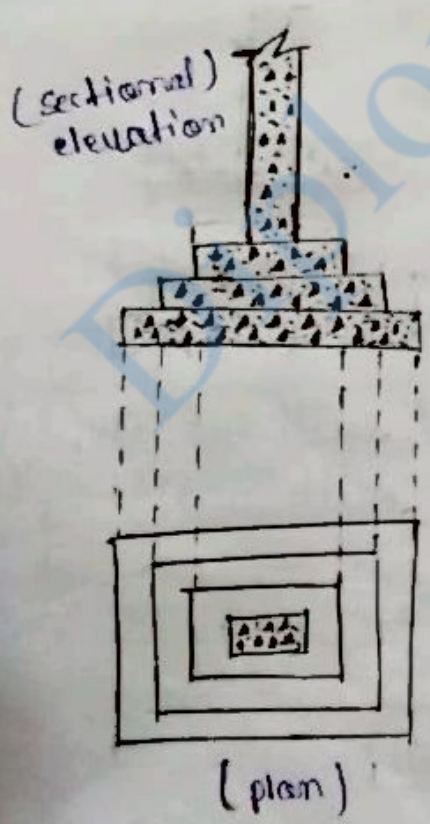
(4) Isolated footing :→

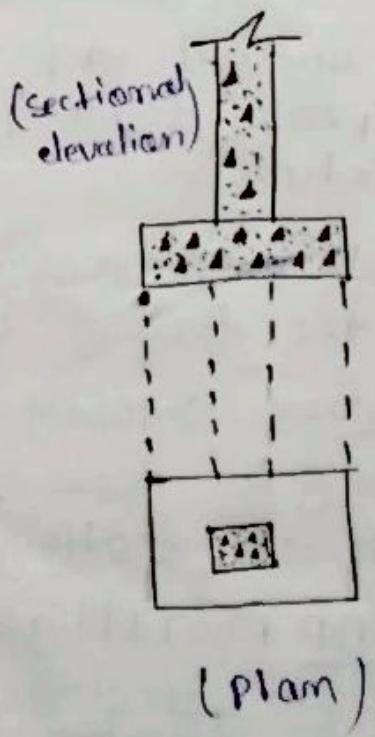
meaning— Single column on the single footing.

Isolated footing

Column with step ⇒ $P_1 = \frac{F}{A_1}$

Column without step ⇒ $P_1 = \frac{F}{A_1}$





Pier :→ Intermediate support of the bridge structure known as pier Abutment → End support of the bridge structure is known as Abutment

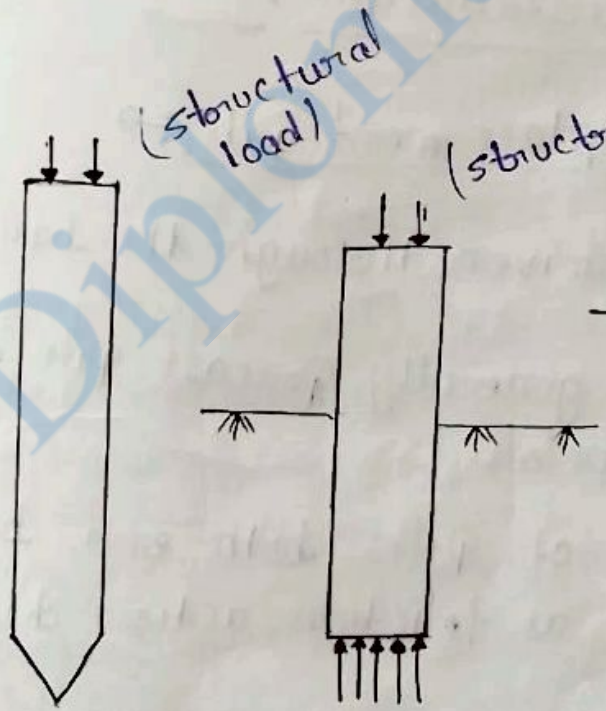
10th DEC

(II) Types of Piles :→

(B) Classification of pile on the basis of their action :→

(i) End bearing pile
(ii) Friction pile or Hanging Pile
(iii) End bearing and friction Pile

(ii)

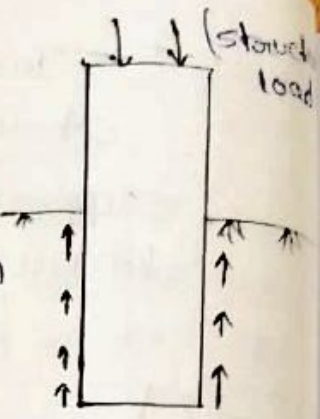


End bearing Pile :→

A types of pile on which structural load is resisted by the end strata ; is known as End bearing pile.

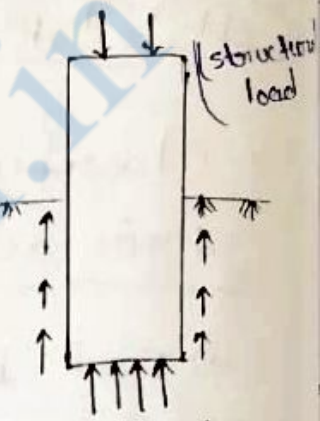
(ii) Friction Pile or Hanging Pile :→

A type of pile on which structural load is resisted by the side strate, is known as friction pile or "hanging pile".



(iii) End bearing and friction pile :→

A type of pile on which structural load is resisted by the end strate as well as side strate; is known as End bearing and "fraction pile"



(II) Classification of pile on the basis of method of installation :→

(i) Driven or Displacement Pile :→

- These piles are driven through the hammer action.
- These piles are generally precast pile made up wood or metal.
- In these types of piles both end bearing action as well as friction action developed.

(i) Bored Pile :→ These are the precast or cast-in-situ pile. These are less efficient pile.

(11) Types of Piles :→

(11) classification of Pile on the basis of their Function

(i) Compaction pile :→

↳ These are driven in lose or soft sand in order to increase their respective density and bearing capacity.

↳ These piles are provied in those soil which are prone to liquefaction.

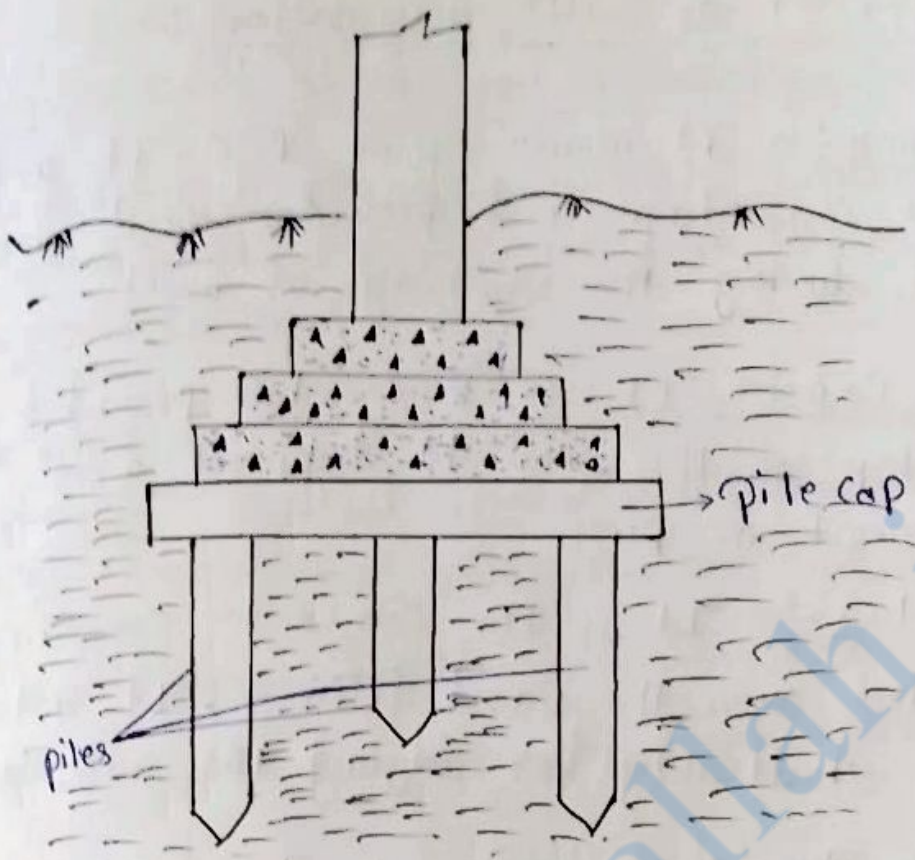
Liquefaction ⟹ Soil state
⇓ losses
∴ completely strength

12thDec

(ii) Tension pile :— It is use to anchor (दाबना) the structure subjected to uplift Pressure caused by swelling of soil for eg :- Black cotton soil. ↑ or uplit pile :—

(iii) Fender Pile :- It is used to anchor the structure subjected to tidal waves (समुद्र की लहरें) or seis seismic waves (भूकंप की लहरें).

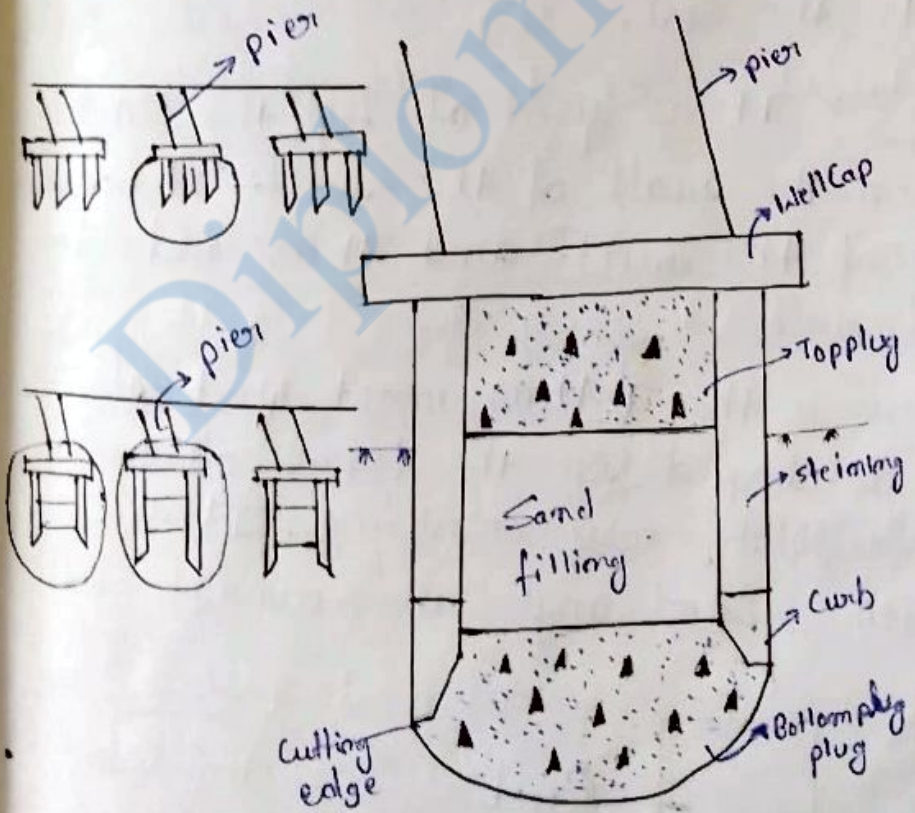
(iv) Batten Pile :→ These piles are driven in the inclined inclined direction to prevent the horizontal thrust or force.



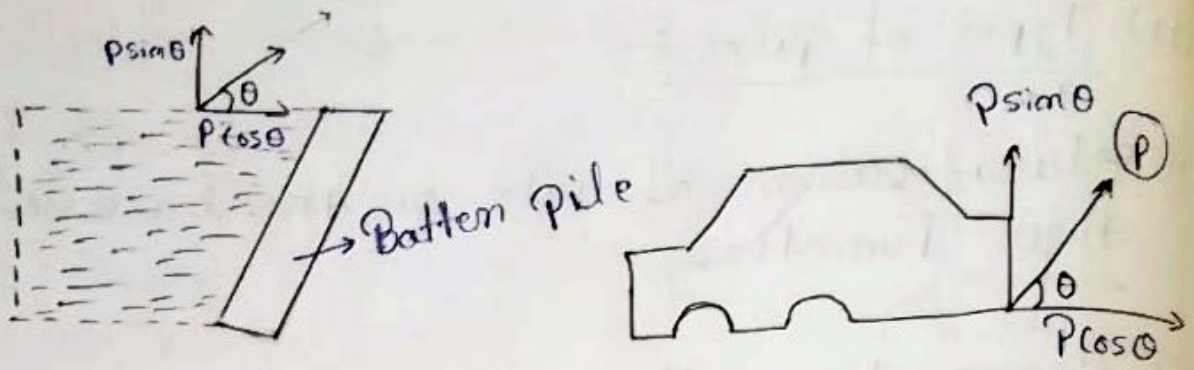
14th Dec

(11) Well foundation :→

Engineering principle
↓
Safety and economical



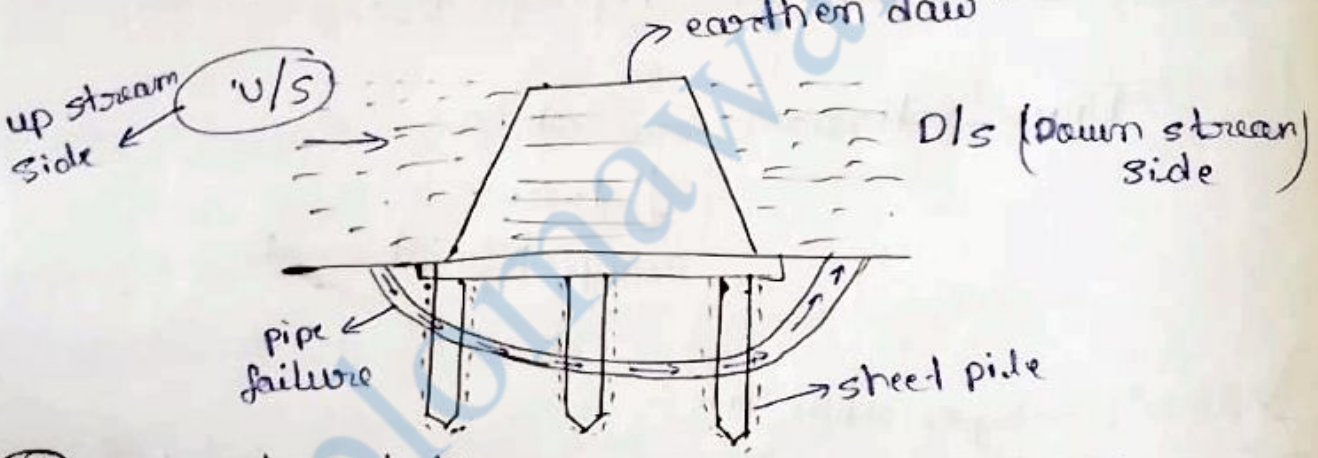
NOTE :- Now in these days, well foundation is frequently used for the bridge foundation.



P cosθ → Horizontal thrust or Horizontal force

J.N.V.T

(ii) Sheet Pile :→ It is used to retain the earth mass below the hydraulic structure minimize the failure.



(iii) Pile foundation :→ It is a type of deep foundation in which number of piles are cast deep into the ground and these piles are held together by pile cap and over this pile cap our abutment or pier are cast in effective and efficient manner.

NOTE :→ Pile foundation is used in Bridge engineering.

23th DEC

(10) Requirement of a good foundation :→

(1) Foundation should be such that, it should be uniform settled under the action of load of superstructure.

(2) Foundation should be sufficient strong and strength that it bear the load of superstructure and transfer it safely to the sub soil.

(3) foundation should be such that ; it resist the swelling and shrinkage action.

(4) The performance foundation for taking and transfer

VVI (11) SUITABILITY OF VARIOUS FOUNDATION ACCORDING TO VARIOUS COUNDITION :→

Condition	Foundation
(i) structure is load is less and soil is medium to dense.	→ shallow foundation
(ii) structure load is heavy and soil is medium to load.	→ Either raft foundation or deep foundation.
(iii) structure load is heavy and foundation is to be plays on running water	→ well foundation
(iv) for expensive soil (the soil subject swelling and shrinkage action for	→ under reamed pile foundation

(11) Component of well foundation :-

① **Steining :-** It made up of RCC. It acts as a cofferdam and provides need dead load during the sinking of well.

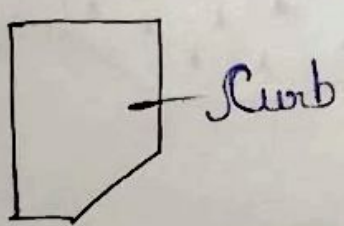
② **Well Cap :-** It is R.C.C slab provided at the top of the well to support and abutment or pier.

③ **Top Plug :-** It is the concrete covering provided over the sand filling. It acts as a shuttering for laying the well up

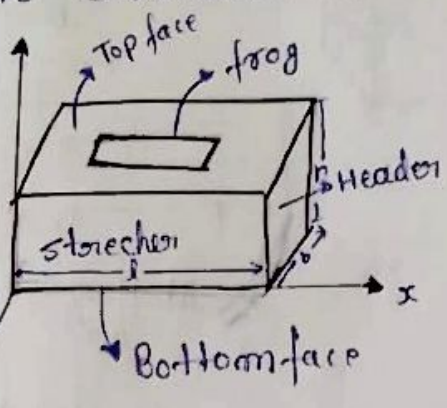
④ **Bottom Plug :-** The concrete layer provided at the bottom of the well after its sinking is called bottom plug. The bottom plug is a via media for transferring the load from steining to the soil.

⑤ **Sand filling :-** It is used of fill the blank space between the wall of the well. It increases the weight of the well. and thus adds to stability of well.

⑥ **Curb :-** This is the bottom most part of a well. It is shaped in the form of a wedge to facilitate easy sinking. It is provided with a steel angle all around.



(11) **Brick** :→ Brick may be defined as the building unit for the construction of wall.



↳ Length of brick is represented by x-axis.

↳ Breath of brick is represented by z-axis.

↳ Height of the brick is represented by y-axis.

↳ frog is situated on the top face of a brick.

↳ Brick is 3D object.

↳ Dimension → l x b x h

↳ Dimension of frog = 10cm x 11cm x 3cm

↳ frog :→ The indent or depression made on the top face of the brick for holding mortar is is known as "frog".

Size of Brick

- Standard size or Modular size
  - Actual standard size or modular size → without considering mortar thickness → 19cm x 9cm x 9cm
  - Nominal standard size or Modular size → Considering mortar thickness → 20cm x 10cm x 10cm
- Conventional size or traditional size
  - Actual CS or TS → without CMT → 22.9cm x 11.2cm x 7.0cm
  - Nominal CV or TS → CMT → 22.9cm x 11.4cm x 7.6cm

Condition	Foundation
⑤ soil is loose saturated sand which is prone for liquefaction	→ Compaction pile
⑥ For individual houses or light building (2 to 4) floor building	→ strip footing or Isolated footing.

Chapter → Brick Masonry.

(H) Masonry → जोड़ना → जोड़ने का काम

जोड़ने वाला → Mason (मिस्त्री)

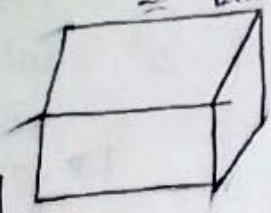
Brick or stone
ईंट पत्थर

(H) Masonry :→ Addition or Assemble of two as more object, known as Masonry.

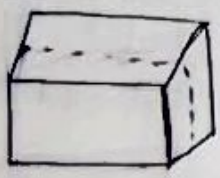
(H) Brick Masonry :→ The addition or assemble of two or more brick in a definite pattern to construct a wall so that it bear the load coming on it and transfer it safely known as "brick Masonry."

(H) stone Masonry :→ The addition or assemble of two or more stone in a definite pattern to construct a wall so that it bear the load coming on it and transfer it safely; known as stone masonry.

31/10/21



Queen closer



Queen closer

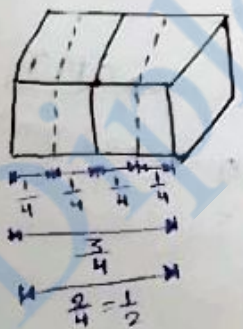
= Cutting of a full brick along it's length into two equal parts.

Queen closer →

length = 10"
breath = 2.5"
thickness / Height = 3"

for construction a brick wall and "b" of queen closer plays an important role.

Bat ⟹ Cutting of brick along the breath.



1/2 bat = 2/4 bat = दो चौथाई

bat = 1/2 bat

3/4 bat = तीन चौथाई = three quater bat

1/4 bat = Quater bat = एक चौथाई

" One quater bat.

↳ Quater Bat = 1/4 bat = एक चौथाई bat

length = 5"
breath = 2.5"

Field tradition brick →

= 9" x 4 1/2" x 3"
= 10" x 5" x 3"

Half brick wall = 5" wall ⇒ breath wall = 5"

one brick wall = 10" wall → breath = 10"

one and half wall = 1 1/2" wall ⇒ breath wall =

Two brick wall = 20" wall ⇒ breath wall = 20"

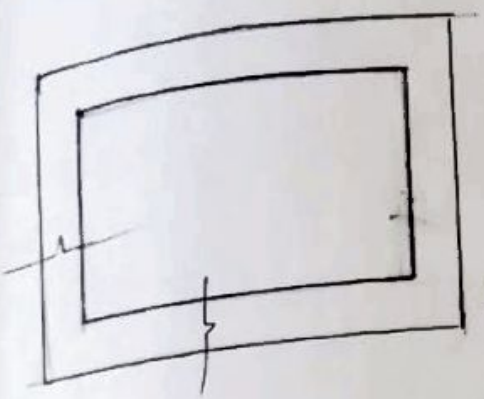
Two and half brick wall = 25" wall ⇒ breath wall = 25"

(11) Bond :→ It may be defined as the arrangement of bricks in such a manner to bear load. Some of the important bonds are listed below :→

① Header Bond
② Stretcher Bond
③ English Bond ⇒ English bond is considered to be the strongest bond in brick masonry
④ Flemish Bond

(41) One brick wall plan in english bond :-

Brick wall ⟹ Bricks are arranged layer by layer :-



Odd layer starting :-

1, 3, 5, ...

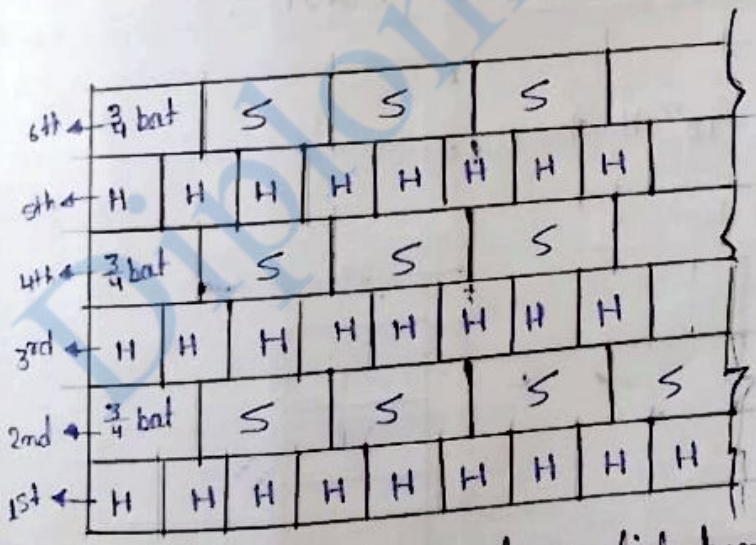
↳ In odd layers bricks are arranged in same way.

Even layer starting :-

2, 4, 6 ...

↳ In even layer bricks are arranged in same way.

(42) English bond :- A type of bond in which header and stretcher are arranged in alternate layer. This can be seen in the elevation of the english bond.

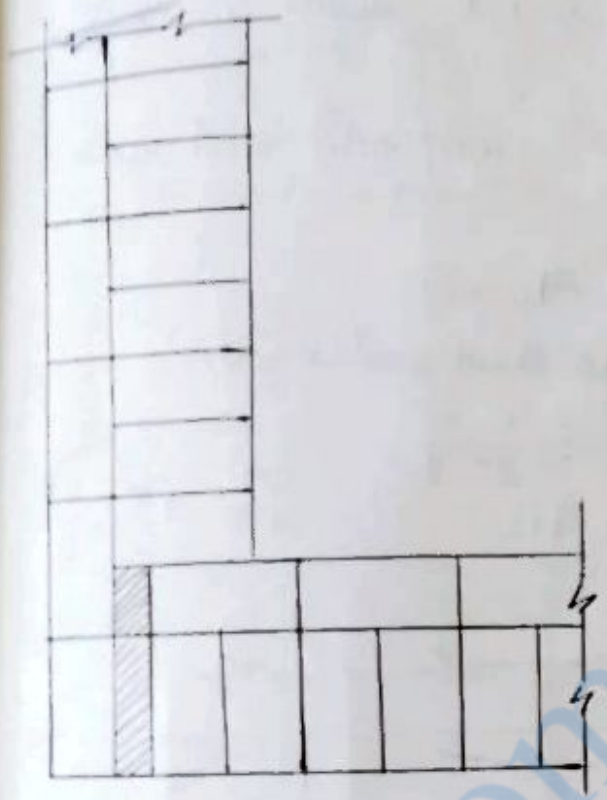


Elevation of English bond.

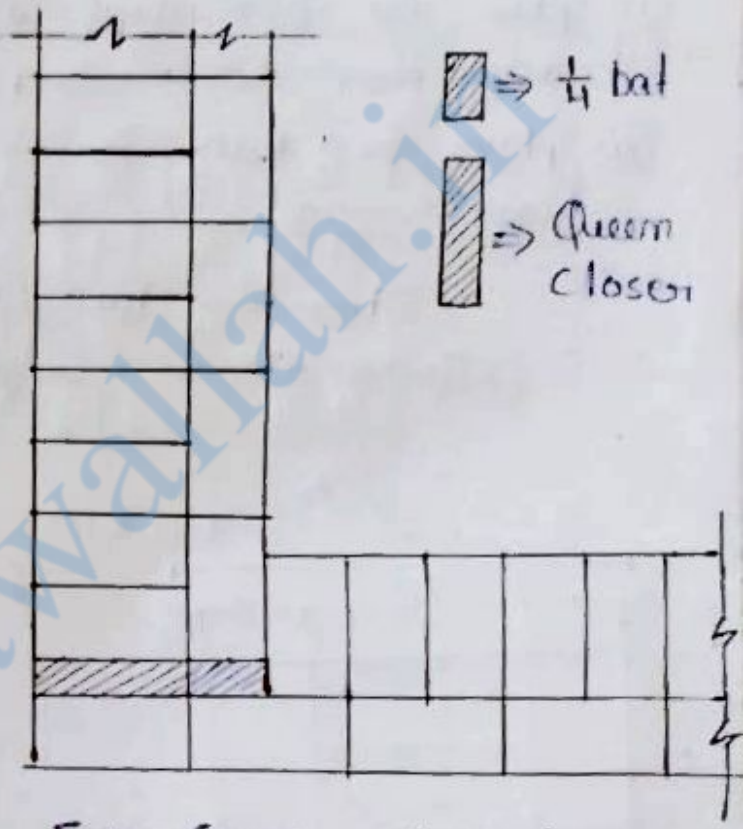
$\frac{1}{4}$ bat (Quater bat) = Length = 5", Breath = 2.5"

② One and half Brick = 15" = thickness of Wall.

Scale ⇒ 1 Cm = 5"



Odd Course - 1, 3, 5 ...



Even Course = 2, 4, 6 ...

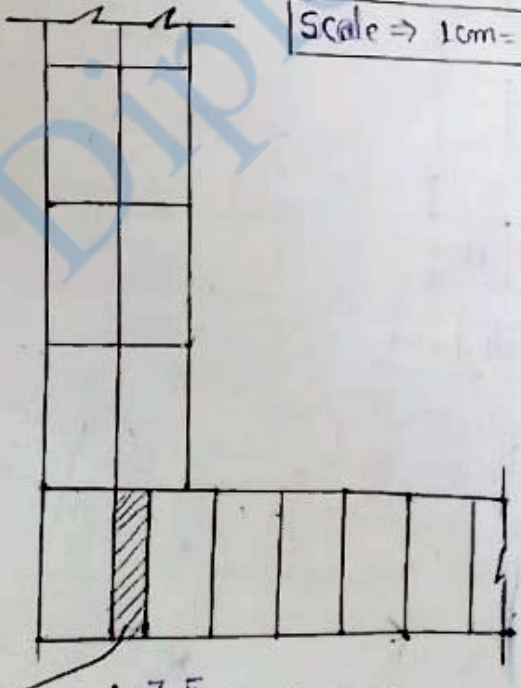
9th Jan

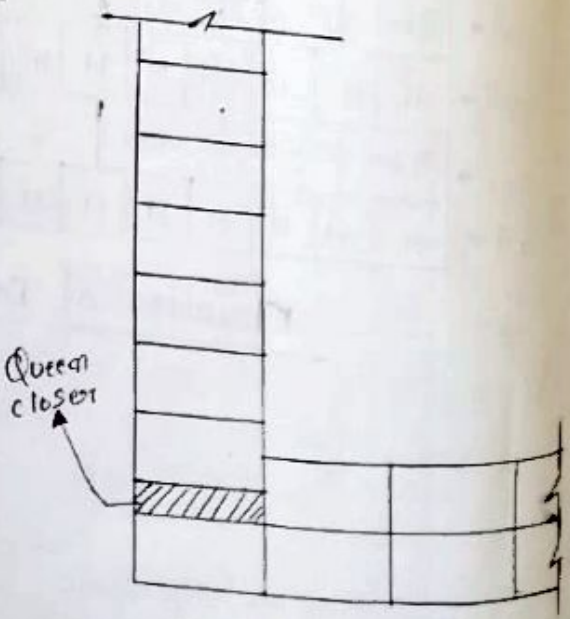
(#) English bond :→

(#) PLAN OF ODD AND EVEN COURSES FOR VARIOUS BRICK WALL IN ENGLISH BOND :→

(1) ONE BRICK WALL = 10" thickness of wall

Scale ⇒ 1cm = 5"





(ii) ENGLISH BOND :→

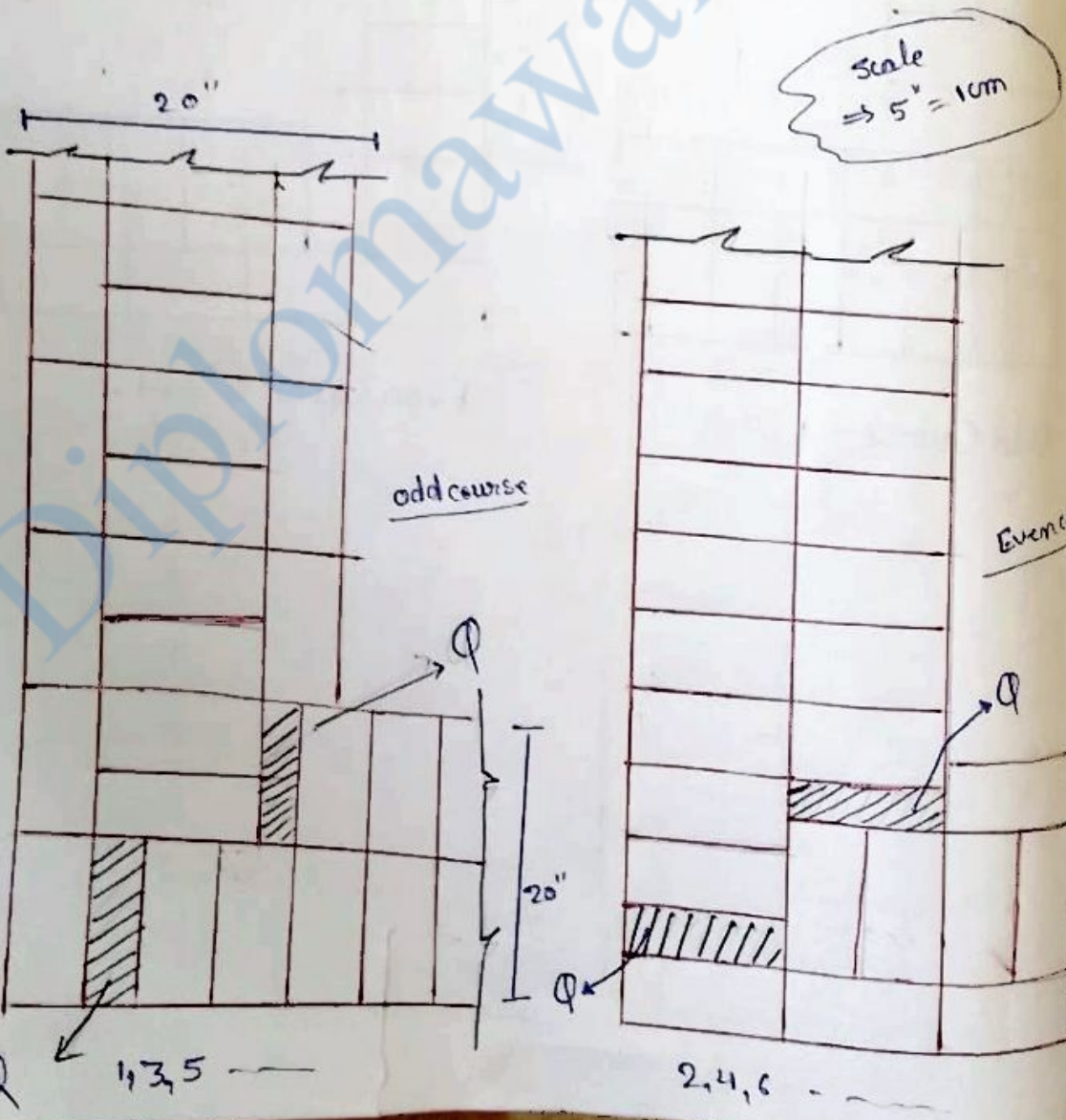
(i) Plan for one brick wall in odd and even Corse ⇒ 10"

(ii) Plan for one and half brick wall in odd and even Corse ⇒ 15"

(iii) Plan for two brick wall in odd and even course = 20"

Closer → Two Queen closer

Queen closer → length = 10" and width = 2.5"



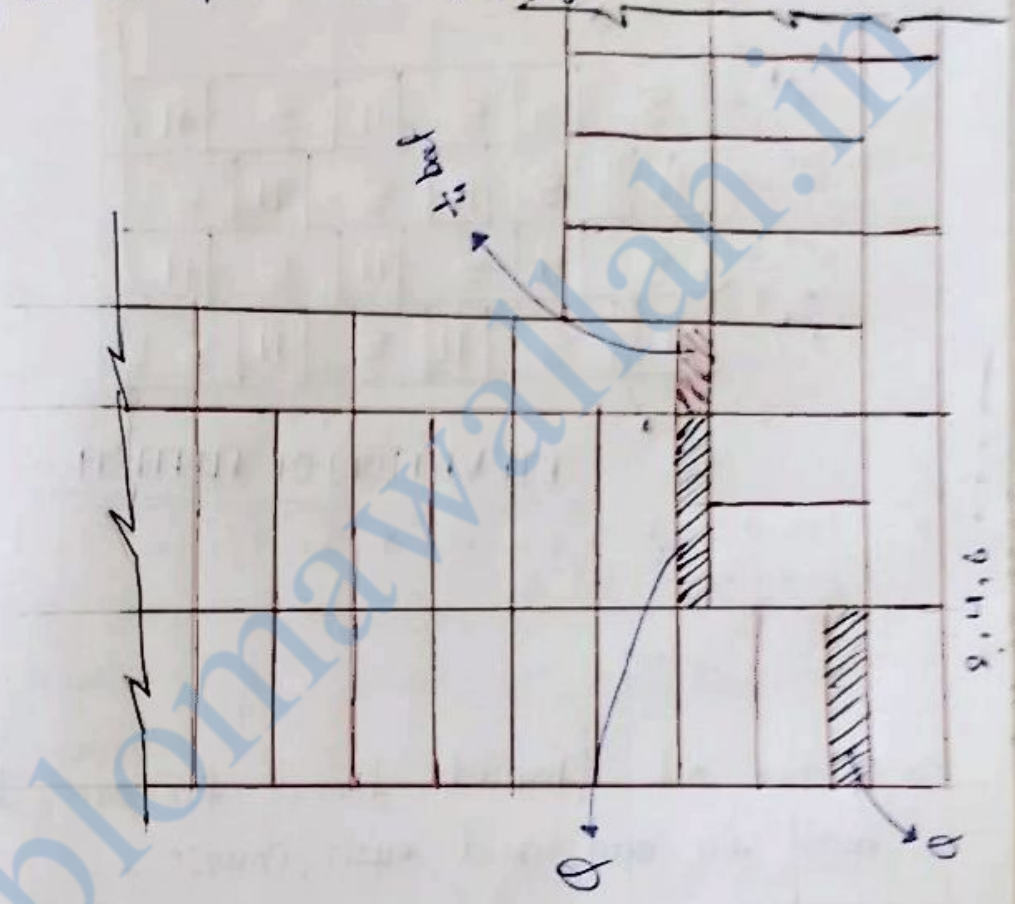
17 JAN

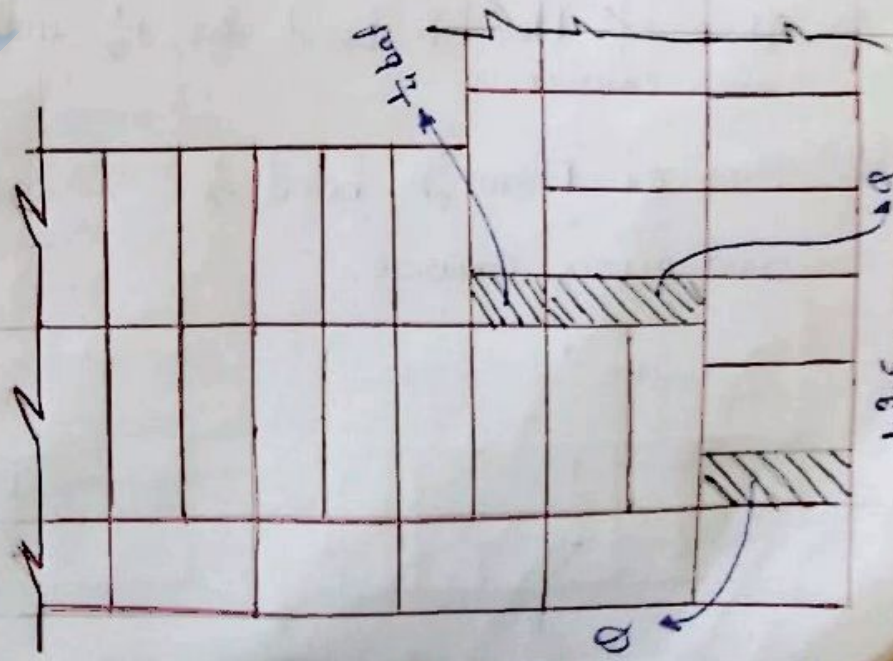
(4) PLAN FOR TWO AND HALF BRICK WALL IN ODD AND EVEN COURSE = 25"

Closer ⇒ Two Queen closer ; $\frac{1}{4}$ bat

Queen closer ⇒ length = 10" ; width = 2.5

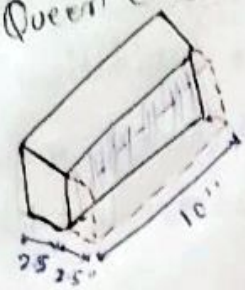
$\frac{1}{4}$ bat or Quater bat ⇒ length = 5" ; width = 2.5



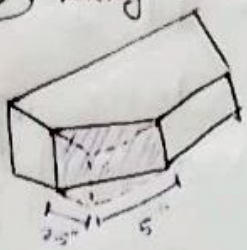


(c) DIFFERENT TYPES OF CLOSER :→

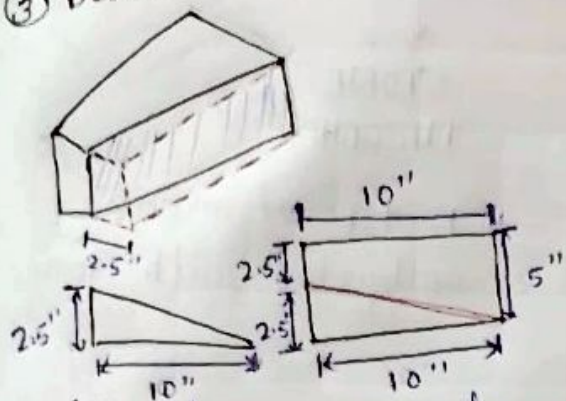
(1) Queen closer



(2) King closer



(3) Bevelled closer



(4) Mitred closer

Closer :→ Closer may be defined as the piece of a brick mainly used for making the joint discontinuous.

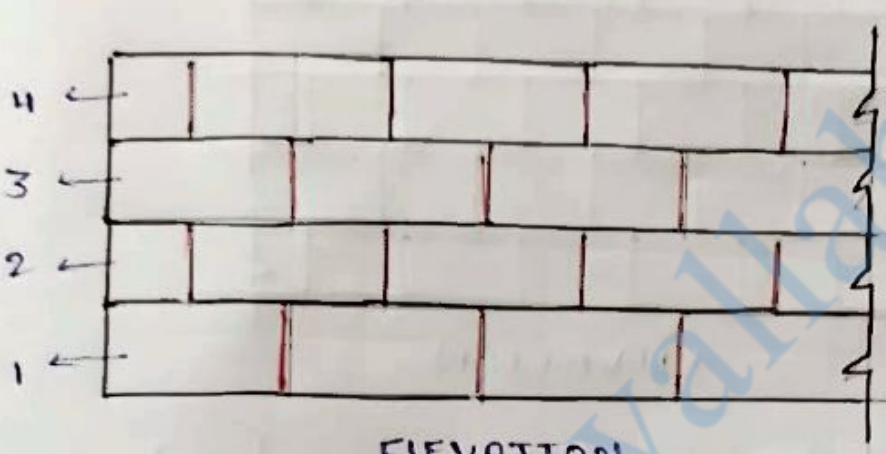
(d) Comparison between the brick masonry and stone masonry :→

BRICK MASONRY	STONE MASONRY
(i) It is less stronger.	(i) It is more stronger
(ii) It is less durable	(ii) It is more durable
(iii) It is suitable where bricks are easily available.	(iii) It is suitable where stones are easily available
(iv) Chances of dampness is more.	(iv) chances of dampness is less
(v) It will stand the fire of 1200°C	(v) It will stand the fire a 600°C

② STRETCHER SIE

③ STRETCHER BOND :→

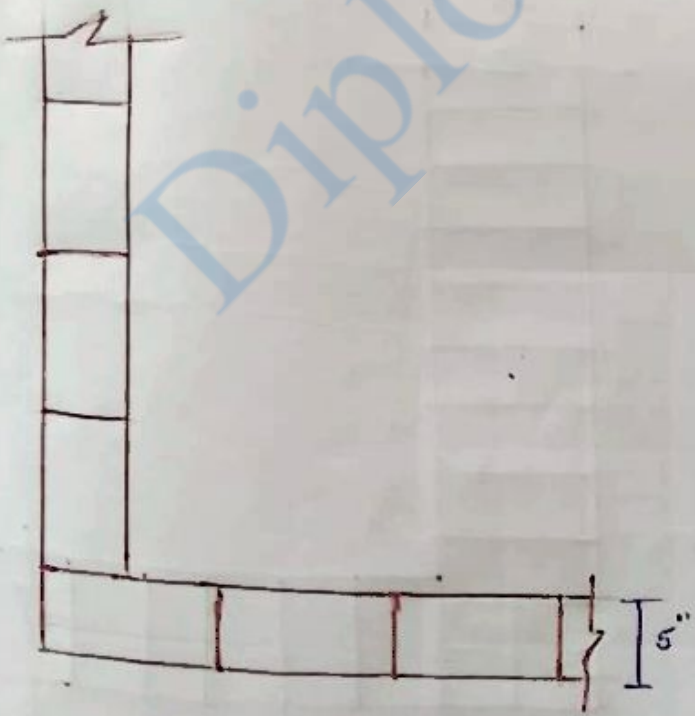
↳ Strecher bond is a type of brick masonary bond in which all the bricks are laid as strechers in the faces of the wall.



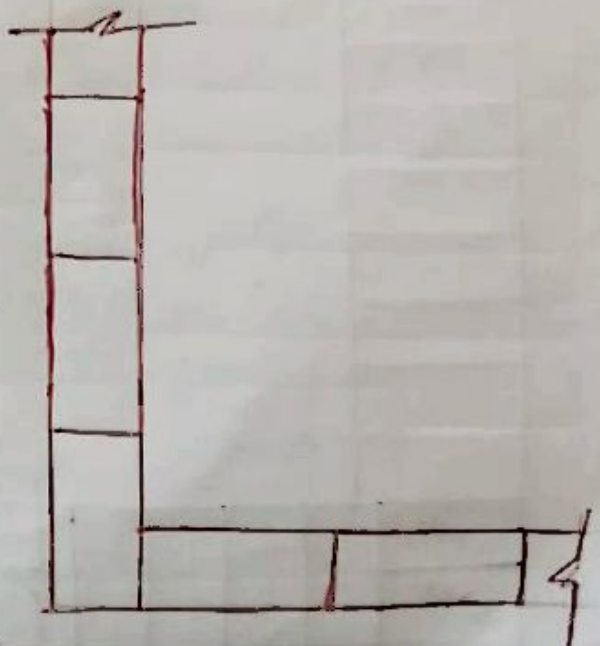
NOTE :→ Stretcher bond is used in partition wall.

ELEVATION

↳ By strecher bond, we can construct a wall thickness of "5" i.e we are constructing half brick wall.

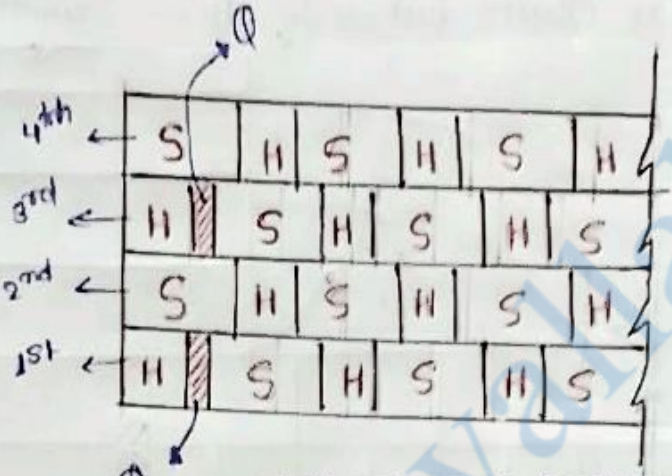


1, 3, 5 - - -



2, 4, 6 - -

(iii) FLEMISH BOND :→ A type of brick masonry bond in which header and stretcher are arranged in each layer that can be seen easily in the elevation.



ELEVATION OF FLEMISH

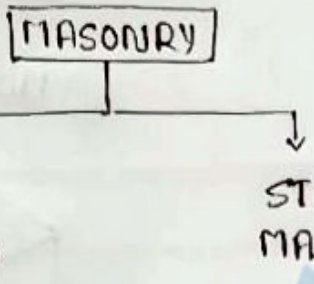
(i) Plan of flemish bond for one brick wall in odd and even course.

(ii) Plan of flemish bond for $1\frac{1}{2}$ wall in odd and even course.

(iii) Plan of Flemish bond for 2 wall in odd and even course.

CHAPTER :→ STONE MASONRY

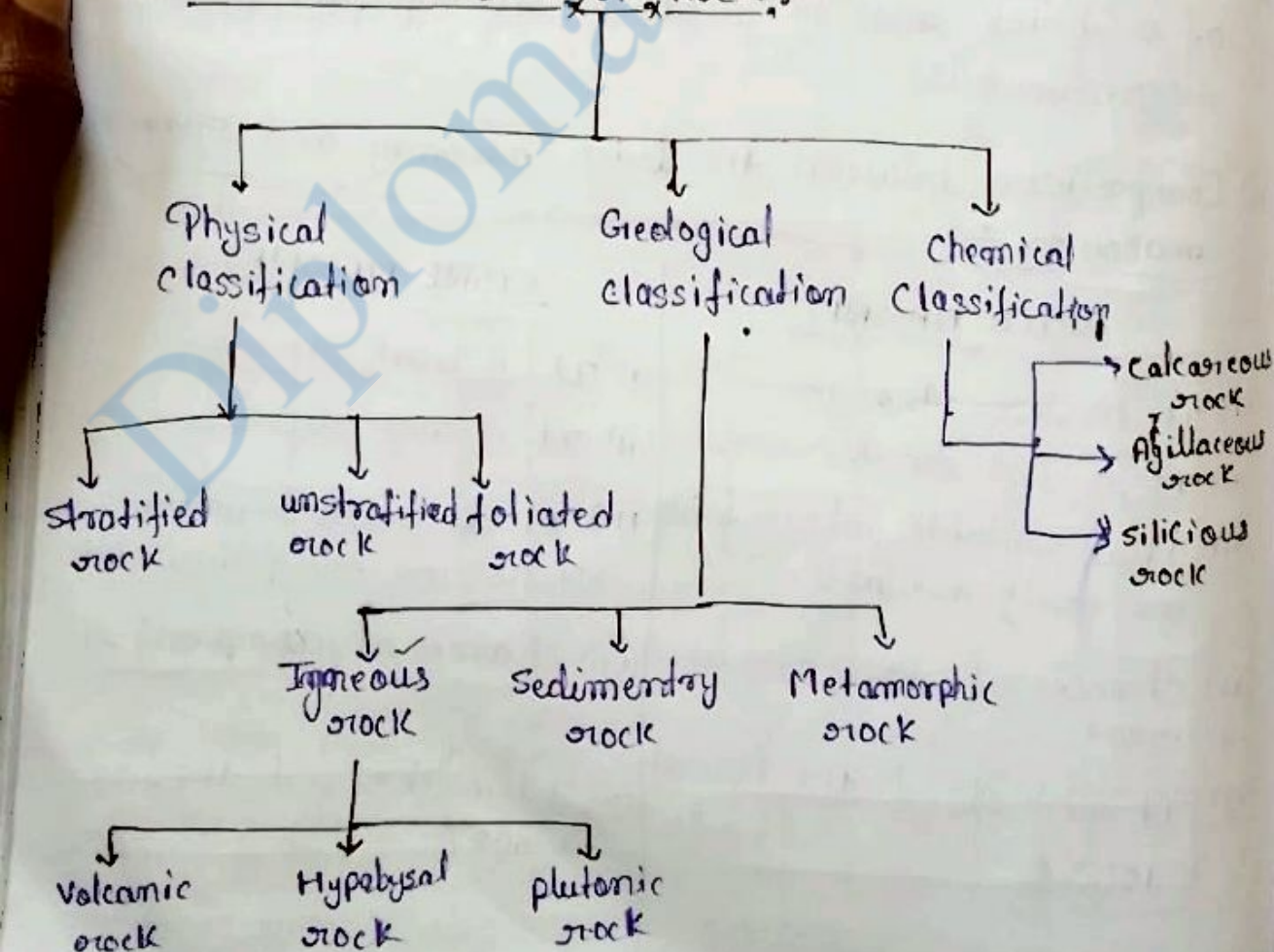
(1) MASONRY :→ It is the process of addition of brick or stone in a well defined manner or in a definite manner so as to take load



↳ A type of masonry constructed with brick.

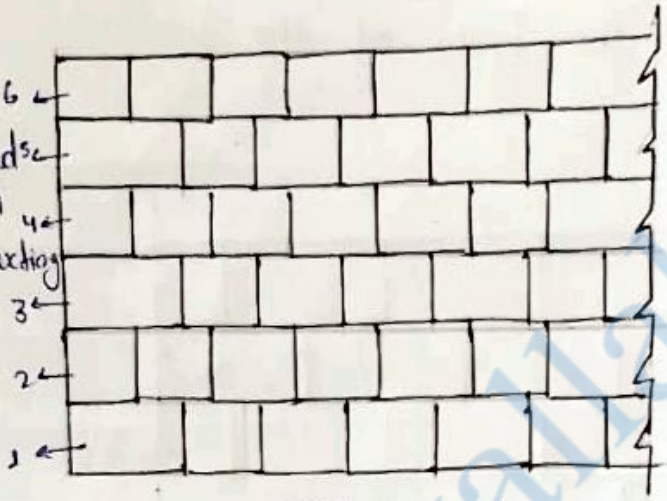
→ A type of masonry constructed with stone.

(2) CLASSIFICATION OF ROCK :→



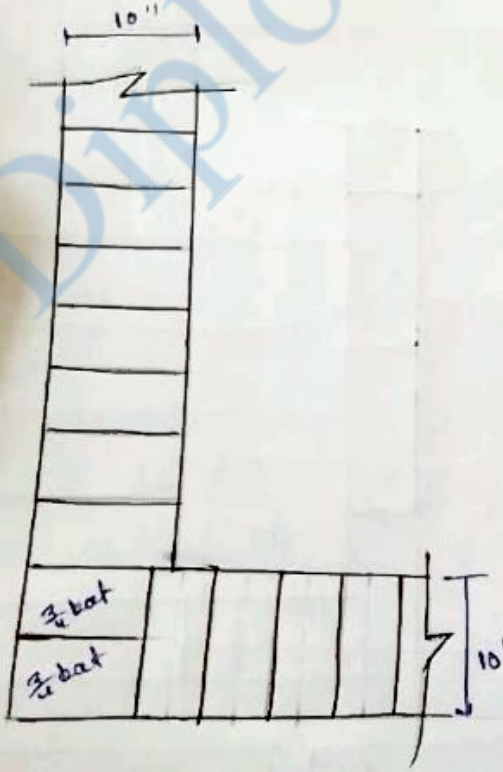
(11) **HEADER BOND** :→ Header bond is a type of brick masonary bond in which all the bricks are laid as header on the faces of the

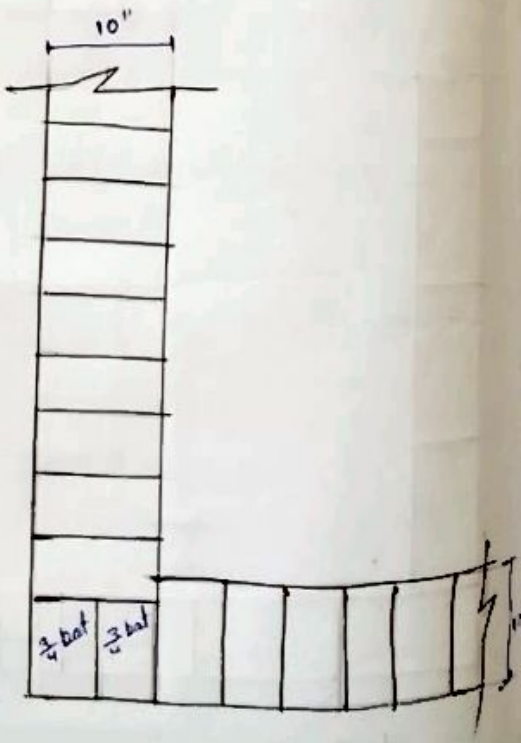
NOTE :→ Header bond is used in the constructing of footing.



ELEVATION

→ By the header bond ; we constwct a wall thickness of 10" i.e we are constructing one brick wall.





(II) PHYSICAL CLASSIFICATION OF ROCK :→

आधार पर भौतिक वर्गीकरण :→

① STRATIFIED ROCK :→ It posses plane of stratification or "CLEAVAGIE".

Stratification ——means——→ Formation in a layer (परत दर परत)

plane of stratification

Rock is easily split out along the plane of stratification.

② INSTRATIFIED ROCK :→

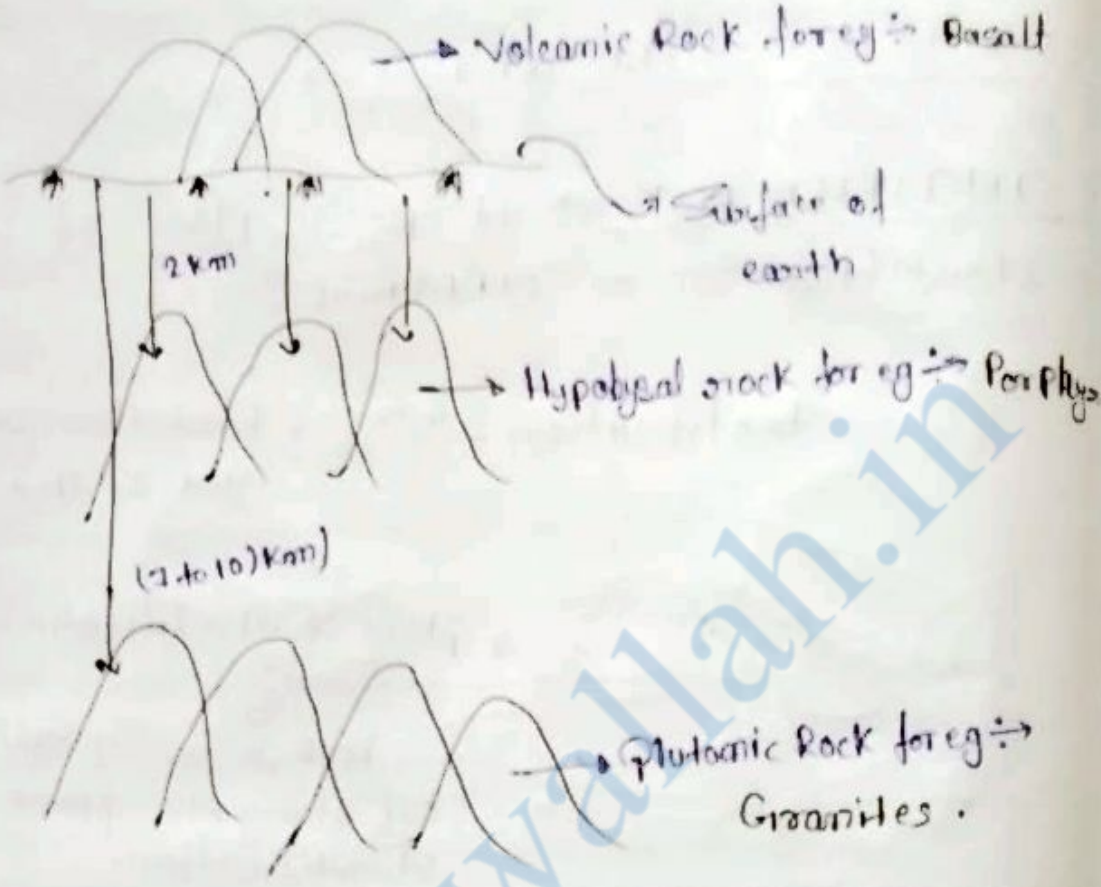
It does not posses plane of stratification or cleavage.

↳ Rock is generally does not easily split along the plane of stratification.

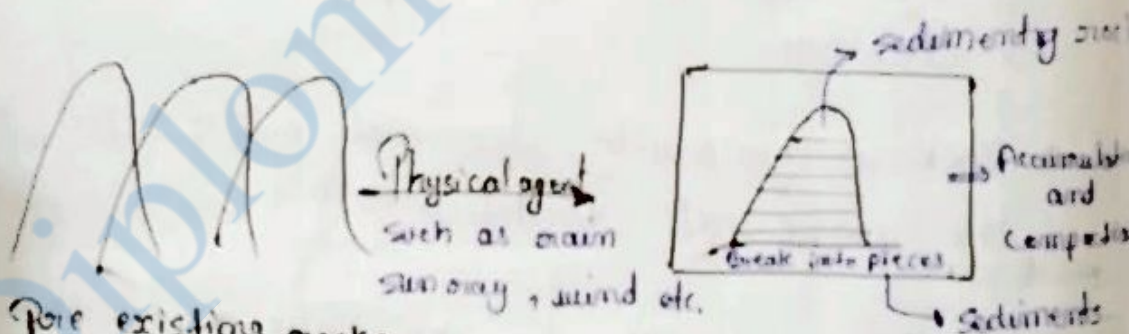
③ Foliated Rock :→ These rocks have a tendency do split along a definite direction.

(III) GEOLOGICAL CLASSIFICATION OF ROCK :→

① IGINEOUS ROCK :→ A type of rock formed by the process of cold cooling and Crystallization of hot molten material i.e magma or Lava.



(2) SEDIMENTRY ROCK :-



↳ A type of rock that is formed by the process of accumulation and compaction of sediments known as Sedimentry rock.

↳ The character of sedimentry rock is match with their pre existing rock or parental rock.

1 FEB

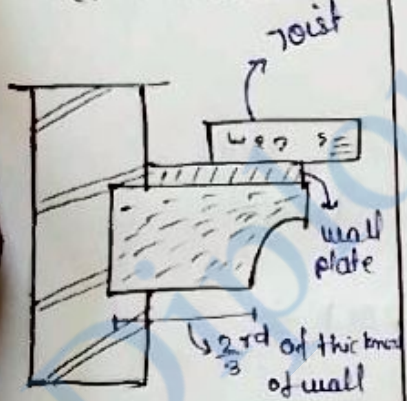
(10) REQUIREMENTS OF A GOOD BUILDING STONE :-

1. It should be strong
2. It should be hard
3. It should be tough
4. It should be durable
5. It should be chemical attack
6. It should be properly dressed
7. It's crushing strength is 100 kg/cm²
8. It's specific gravity is 2.4
9. It's water absorption tendency is low.

V.V.I

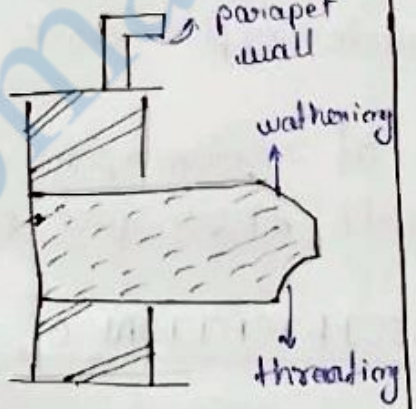
(11) IMPORTANT TERMINOLOGIY IN STONE MASONRY :-

(1) CORBEL



↳ Corbel may be defined as the projecting stone which is usually provided to serve serve as a support for roof truss beam.

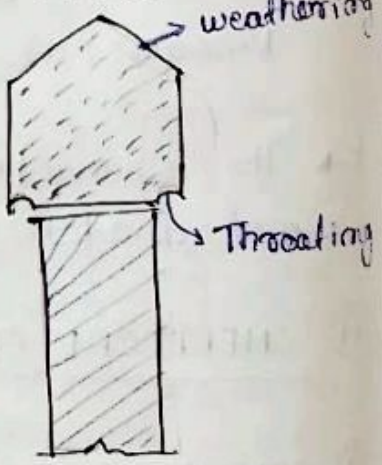
(2) CORNICE



↳ Cornice may be defined as the course of stone provided at the top of the wall.

It is weathered and throated to dispose off rain water.

(3) COPING



↳ Coping may be defined as the course of stone which is laid at the top of the wall so as to protect the wall from rain water.

UNIT I

(#) QUARRING OF STONE AND DRESSING OF STONE :→

↳ Quarrying of stone :→

QUARRING

Quarry ⟶ खदान में हुआ खनन अर्थात निष्कर्षण

The process of extracting or taking out the stones from the natural rock bed ; is known as Quarrying of stone.

The Quarrying operation may either be carried out by hand hand tools or with the help of explosives.

↳ DRESSING OF STONE :→

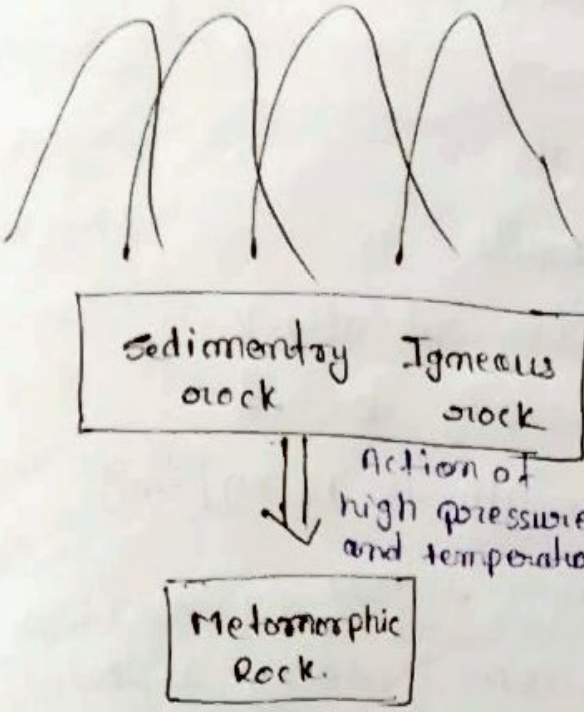
The process of providing a suitable shape and size to the stone and make it fit for the working purpose ; is known as Dressing of stone.

The dressing operation of stone is done with the help of chisel or Hammer.

(#) CLASSIFICATION OF STONE MASONRY :→

- Rubble masonry
  - → uncoursed rubble M
  - → Coursed RM
  - → Random RM
  - → Dry RM
- Ashlar masonry
  - Ashlar fine M
  - Ashlar rough tooled M
  - Ashlar rock or grauity faced M
  - Ashlar chamfered M
  - Aslar block in course

③ METAMORPHIC ROCK ÷



↳ under the high pressure and temperature sedimentry rock as well as igneous rock Converted into a special type of rock known as metamorphic rock.

↳ The character of metamorphic rock does not match with their pre-existing.

④ CHEMICAL CLASSIFICATION OF ROCK ÷

① CALCAREOUS ROCK ÷ for eg ÷ Limestones, marbles etc.
- predominary (प्रचुर मात्रा में या अधिकता) → Calcium Carbonate ($CaCO_3$)

② ARGILLACEOUS ROCK ÷ for eg ÷ Slates, laterites etc.
- means clay → (प्रचुर मात्रा में या अधिकता) (predominary)

③ SILICIOUS ROCK ÷
- predominary (प्रचुर मात्रा में) silica for eg ÷ Granite; Quartzite.

(i) Definition :→ It may be defined as the hollow wall consists of two separate wall called leaves or skins, within a gap between them.

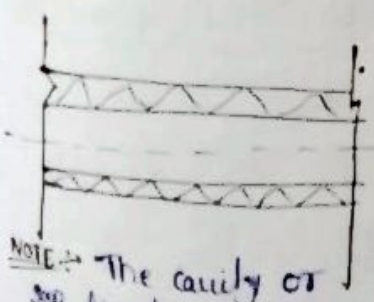
The two separated walls are connected by metal pins.

(ii) Advantages of Cavity wall :→

(i) It prevents the entry of moisture.
(ii) It prevents the entry of heat.
(iii) It prevents the entry of sound.
(iv) Load on foundation is less because there is a gap between two walls.
(v) Construction of cavity wall is cheaper or economical.

(iii) Construction of Cavity wall :→

↳ Cavity wall is constructed at the centre of the concrete base.
↳ The gap should not be less than 40mm.
↳ The falling down of mortar in the gap should be prevented by providing timber batten quarries
↳ The two walls are raised simultaneously.



NOTE :→ The cavity or gap lies between (4 to 6)cm

RUBBLE MASONRY :→ It is of the type of stone masonry in which irregular shape and sizes of stones are generally used.

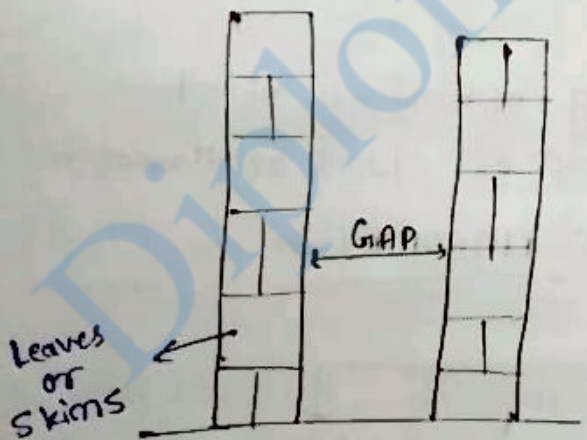
Ashlar Masonry :→ It is the type of stone masonry in which square or rectangular block of stones are used.

6 FEB

CHAPTER :→ CAVITY WALL, PARTION WALL AND DPC

(11) CAVITY WALL :→ OR HORROW WALL

Cavity means, Gap



Two wall are constructed simultaneously and parallel to each other and a certain gap between gap.

(iii) Concrete block partition wall

(iv) Glass partition wall

(v) Timber partition wall

(vi) Metal lath partition wall

JUT :→ Ques Define partition wall and write down it's types.

Ques Explain the function and application of partition wall.

V.V.I

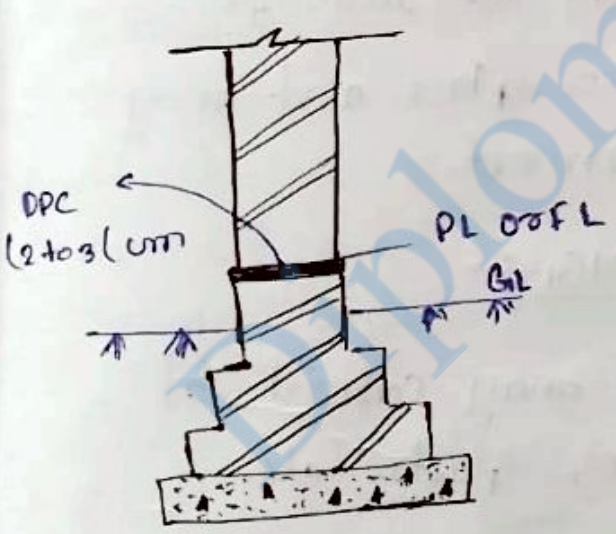
DPC :→

↳ It stands for Damp proof course.

Provision of DPC :→ (प्रावधान, विधा)

↳ To prevent the entry of moisture i.e the superstructure wall from the underground capillary action of water or moisture.

DPC is provided below the entire length of the superstructure wall.



Damp proofing :→

It is the method or technique by which the entrance of moisture from the wall, ceiling, floor etc is prevented.

NOTE :→ The Inner and outer skins should not be less than 10 cm.

JUT Define cavity wall. write down it's advantage write down the construction of cavity wall.

(H) PARTITION WALL :→

↳ It is also known as non load bearing wall

↳ It is a thin wall constructed to divide the room into two parts.

(H) FUNCTION OF PARTITION WALL :→

The main function of partition wall is to divide bifurcat (बाँटना) and separate out the floor level.

(H) Application of partition wall :→

In frame structure building the use of partition wall is more frequerd.

NOTE :→ Partition wall generally does not bear any type of load.

(H) Types of partition wall :→

① Brick partition wall

② Clay partition wall

If the binding material is lime, sand alongwith suitable proportion of water then the mortar is said to be lime mortar.

(II) OBJECTIVE OR PURPOSES OF PLASTERING :→

(i) It protects the exposed surface such as stone masonary or brick masonry from the weathering action.

(ii) It provides the decorative effects.

(iii) It protects the surface from vermit(illegible)

(III) REQUIREMENT OF A GOOD PLASTER :→

(i) It stand should be hard and durable.

(ii) It should be cheaper.

(iii) It should be provided in all weather condition.

(IV) DEFECTS OF PLASTERING :→

(i) CRACKS :→ Sometimes a hair like structure is foam formed on the surface of plaster ; "known as Crack".

(ii) EFFLORESENCE :→ A white patches is formed on the plastered surface dure to the presence of salt in the plaster material

(II) Causes of dampness :→

(i) Rise of water level from the wall by capillary action
(ii) Improper drainage of water from the building
(iii) Improper exist of floor water.
(iv) Condensation of atmospheric moisture

(III) EFFECTS OF DAMPNESS :→

(i) It may lead to short circuit.
(ii) It may cause corrosion in iron parts.
(iii) It may damage the paint or distemper.
(iv) Breeding of moisture takes place and may lead to unhealthy environment.

(IV) METHOD OF DAMP PROOFING :→

(i) Damp proof course :→ It may consist of mastic, asphalt, polyethene, plastic etc.
(ii) Construction of cavity wall.
(iii) Internal damp proofing :→ Compounds of sodium and calcium stearate may mixed with concrete so as to avoid the entry of moisture.

Sodium stearate ⟶ Chemical compound damp proofing

Calcium stearate ⟶ chemical damp proofing

(VI) Surface Treatment :- A special type of layer should be provided over the roof surface so as to avoid the entry of moisture.

11/02/2025

Chapter :- Plastering and pointing.

(I) Definition of Plastering :-

The process of providing a continuous layer of cement mortar or lime mortar on the exposed surface of brick masonry or stone masonry to achieve a uniform, even and smoth surface. Known as plastering.

Binding material ⟶ Cement or lime.

Mortar mixture ⟶ Binding material sand along with suitable proportion of water.

If Binding material is cement, Sand alongwith suitable proportion of water then the mortar is said to be cement mortar.

(#) Types of pointing :→

(i) Flush pointing
(ii) Recessed pointing
(iii) Grove or keyed or rubbed pointing
(iv) Beaded pointing
(v) Struck pointing
(vi) TucK pointing
(vii) weathered pointing
(viii) V pointing

NOTE :→

(#) pointing surface is kept watering for 3days in case of lime mortar.

(#) pointing surface is kept watering for 10 days in case of cement mortar.

11/02/2023

Chapter :→ Scaffolding and shoring

Scaffolding → मचान

Definition :→ When the height above the floor exceeds about 1.50 m, a temporary structure usually of timber is erected close to the work to ~~provid~~ provide spa safe working Platform for the workers and to provide

(2) UNEVEN SURFACE :- It is usually formed due to poor workmanship.

(3) POPPING :- It is a type of conical hole provided on the surface due to the particles such as Kankar in the plaster which expand (फैलना) on setting.

(4) REMEDIES (उपचार) TO OVERCOME THE DEFECTS IN PLASTER :-

(i) The white patches produced on the plaster surface can be cleaned by rubbing brush.

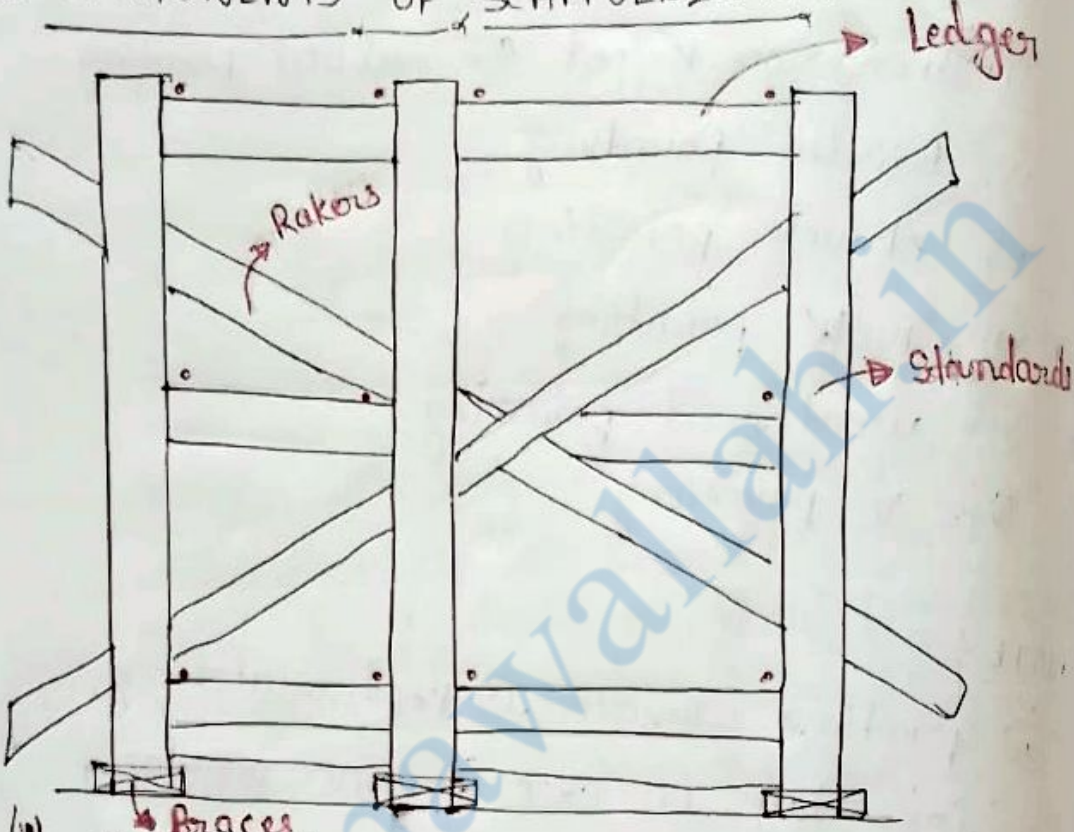
(ii) The mortar used for the plastering should be done carefully and good workmanship (कुशल कारीगरी)

(iii) Plaster surface should be provided with sufficient quantity of water so that the surface on which plaster in applied does not absorb water from the plaster.

(iv) Proper bonding should be done between the masonry and plaster.

limited space for the storage of building materials and tools.

(H) COMPONENTS OF SCAFFOLDING :-



(1) Standards :- Vertical member of the frame work and supported on the ground.

(2) Ledgers :- Horizontal member parallel to the wall.

(3) Rakers → This is an inclined support.

(4) Braces → Cross piece fixed on the standard

(H) TYPES OF SCAFFOLDING :-

(1) Single scaffolding or brick layer scaffolding
(2) Double scaffolding or mason scaffolding
(3) Contilivor scaffolding or needle scaffolding

(5) Brick of uniform size should be used.

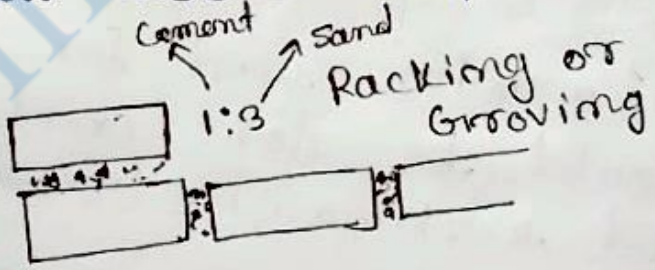
NOTE :→ The ratio of mortar used for plastering is between 1:4 to 1:6

where.

1:4

1 = cement , 4 = sand

(III) POINTING :→ It may be defined as the finishing of mortar joint consisting of racking the mortar joint to a depth of about (10 to 20) mm and then these spaces are filled up with suitable portion of cement mortar in desired shape.



Bonding
↓
pointing
↓
plastering
↓
white washing

NOTE :→ (i) for the pointing Ratio of cement mortar is 1:3

(ii) for pointing Ratio of lime mortar is 1:2.

(6) Building maintance :→

Building maintance performs the repair to building and preventives measures so as to maintain the strength of the structure and increase durability and life.

(11) CRACKS :→ It may be defined as the hair like fracture develop on the surface of the wall, is known as cracks.

following are the reasons for the cause of Cracks :→

(i) Insufficient

(ii) Sieving is not perform well for the sand.

(iii) use of inferior quality of paint.

(iv) We does not care for the dampness during the construction.

(11) Repair of Cracks :→ Repair of cracks are done by the following methods :→

(i) Grouting and Gunniting

(ii) epoxy oresin

(iii) Cracks fill

Grouting → mixture of → cement mortar

or mixture of cement slurry → सीमेंट का लेप

(i) Suspended scaffolding
(ii) Trestle scaffolding

CENTERING
SHUTTERING
VERTICAL SUPPORT | INCLINED SUPPORT
SHORING

(II) SHORING :→

T.I may be defined as the unclinales support provided to a structural member temporarily.

Some time structures are to be supported temporarily in case of :→

(i) Adjacent structure is dismantle (तोड़ना)
(ii) Defective wall of building are to be dismantled and rebuilt (construct) in such a case support is required to support floor and roof.

(III) Types of shoring :→

(i) Racking shoring
(ii) flying or horizontal shoring
(iii) Dead or vertical shoring

(IV) UNDER PINING :→ The planing of new foundation below an existing foundation as a process of strengthening the existing foundation is known as underpining.

21/07/2025

Chapter → Door and windows

(#) **DOOR** :→ A door may be defined as an openable barrier secured in a opening left in a wall for the purpose of providing access to the users of the structure.

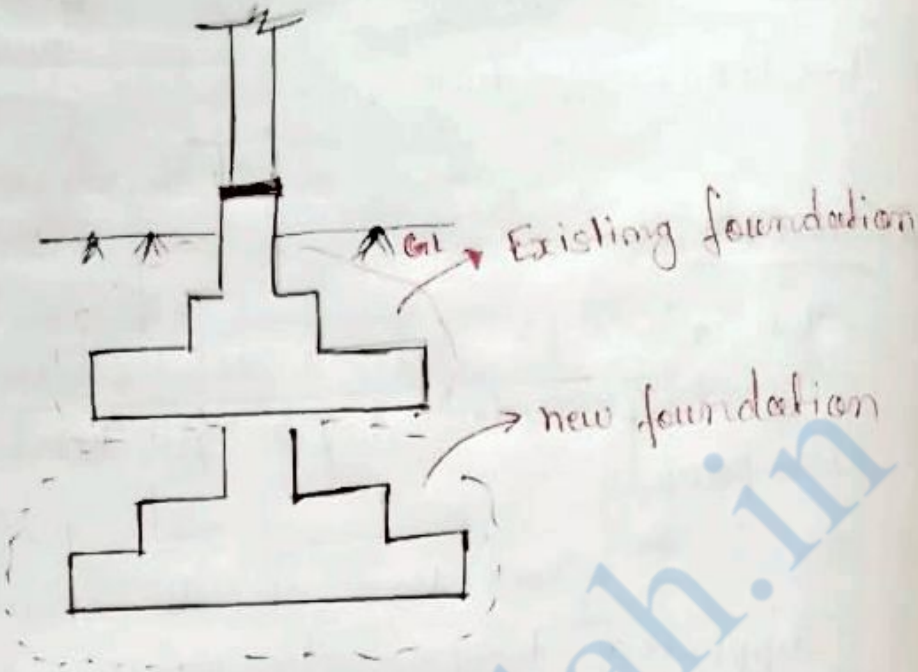
It is basically consists of two parts namely frames and sutter.

The door shutter is held in position by the door frames which in turn is fixed in the opening of the wall by some suitable means.

(#) **WINDOW** :→ A window may be defined as an opening made in the wall for the purpose of providing day light, vision and ventilation.

It also consists of two parts ie frame and shutter.

The window shutter is held in position by the window frames which in turn is fixed in the opening of the wall by some suitable means,



Ch- Building finishes and maintenance.

(1) Building finishes :- finishes are used in the final part of the construction process forming the final surface of the structure.

They can protect the structure from frost, abrasion, water and so, on finishes also provides decorative look or apperance.

NOTE :- Building finishes includes :-

(i) Pointing and plastering
(ii) white washing and distempering
(iii) Marble flooring and tiles flooring etc.

(vi) LOCK RAIL :→ The middle horizontal member of a shutter.

(vii) BOTTOM RAIL :→ The bottom most horizontal member of a shutter.

(viii) PANEL :→ Area of shutter enclosed between the adjacent rail

(ix) HORN :→ The horizontal projection (प्रक्षेप) of head beyond the face of the frame.

(I) TYPES OF DOORS :→

(i) Loced and braced door.
(ii) Frame and panel door.
(8) Collapsible steel door.
(iv) Revolving door.
(v) Rolling steel door
(vi) Louvered door.
(vii) sliding door

(II) TYPES OF WINDOW :→

(i) Louvered window
(ii) Metal window
(iii) Glazed window (शीशा)
(iv) sliding window

(6) Recommended Dimensions for doors :→

Sr.no	Designation	Size of opening (mm) ×100	Size of door frames (mm)(-
(1)	8 DS 20 (Single Sutter)	800 × 2000	790 × 1990
	8 DS 21	800 × 2100	790 × 2090
	9 DS 20	900 × 2000	890 × 1990
	9 DS 21	900 × 2100	890 × 2090
	10 DS 21	1000 × 2100	990 × 2090
	10 DT 21 (Double Sutter)	1000 × 2100	990 × 2090
	12 DT 20	1200 × 2000	1190 × 1990
	12 DT 21	1200 × 2100	1190 × 2090

(7) Recommended dimensions for windows :→

Sr.no	Designation	size of opening (mm)	Size of window frames (mm)
1	6 WS 12	600 × 1200	590 × 1190
2	10 WT 12	1000 × 1200	990 × 1190
3	12 WT 12	1200 × 1200	1190 × 1190
4	6 WS 13	600 × 1300	590 × 1290
5	10 WT 13	1000 × 1300	990 × 1290
6	12 WT 13	1200 × 1300	1190 × 1290

22 FEB

Ch- Floor and Roof

(i) **FLOOR :-** It is a horizontal flat supporting member of a building. It divides the building into the various level.

(ii) **TYPES OF FLOOR :-**

1. Timber floor
2. Composite floor

(i) **Timber Floor :-** A types of floor in which only timber is used for flooring.

(ii) **Composite floor :-** A type of floor in which more than one material is used for flooring. For eg :- RCC flooring, PCC flooring etc.

(iii) **MATERIALS USED FOR THE FLOORING :-**

(1) Mooram (2) Marbles (3) Plastic (4) Glass.

(iv) Factors affecting the choice or selection of the flooring material :-

(1) Cost
(i) Damp resistant
(ii) Fire resistant
(iii) Hardness
(5) No provision of cleaning
(6) provision of maintenance
(7) Resistant to slipperiness.

~~IPS~~

NOTE :→

IPS :→ It stands for indian patent stone flooring.

(i) Cement Concrete = 1 : 2 : 4 (cement → 1, sand → 2, ~~Glass chips~~ stone chips → 4)

(ii) The size of aggregates varies from 6mm to 20mm

(ii) ROOF :→ It may be defined as the structural covering of a building that protect the building ~~the building~~ from weathering action such as sun, rain, wind etc.