



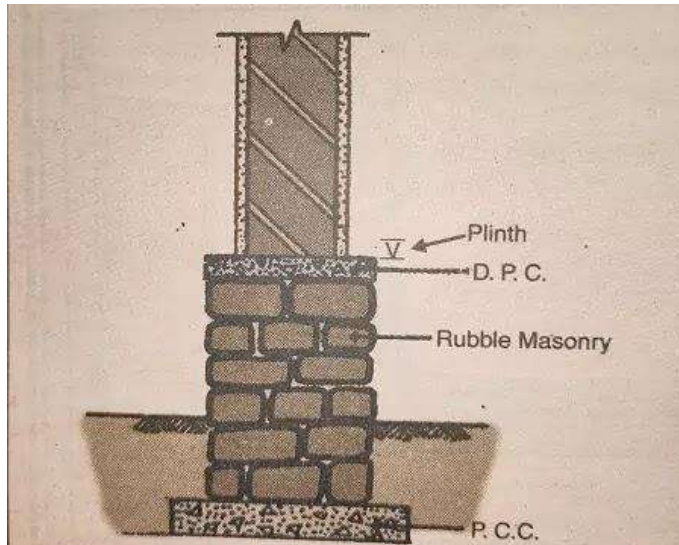
5TH LECTURE (STONE WORK)

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Common uses of stones:

Stones are used in the following engineering constructions:

- (i) Stone masonry is used for the construction of **foundations, walls, columns and arches**.
- (ii) Stones are used for **flooring**.
- (iii) Stone slabs are used as **damp proof courses**, lintels and even as roofing materials.
- (iv) Stones with good appearance are used for the face works of buildings. Polished marbles and granite are commonly used for face works.



(v) Stones are used for paving of roads, footpaths and open spaces round the buildings.

(vi) Stones are also used in the constructions of piers and abutments of bridges, dams and retaining walls.

(vii) Crushed stones with graded are used to provide base course for roads.

(viii) Crushed stones are used in the following works also:

(a) As a basic inert material in concrete mix.

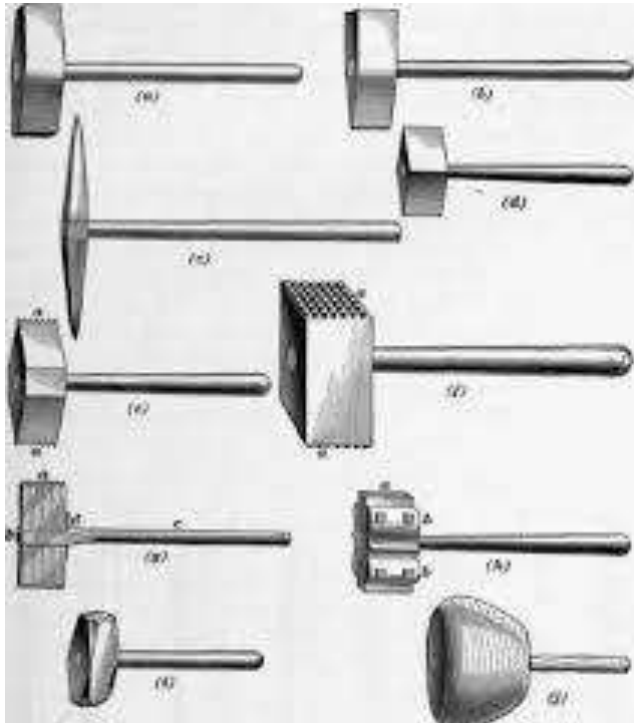
(b) For making artificial stones and building blocks

(c) As railway ballast.

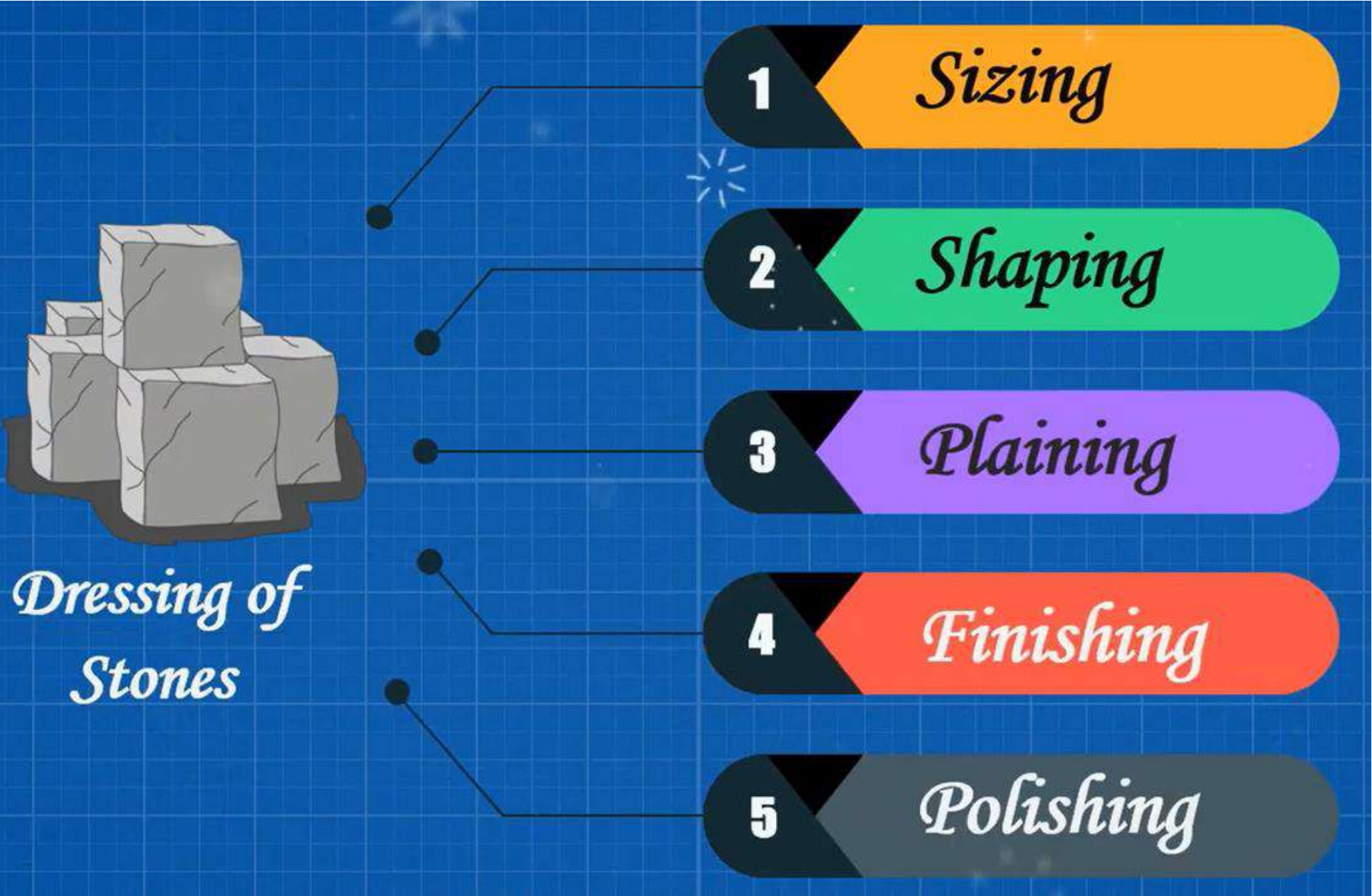


Dressing stone

Dressing of Stone is the process of shaping and sizing quarried stone for usage. This may be essential since quarry stones do not always have the exact proportions or polish that is required.



Process of dressing stones



Types of natural stone finishes

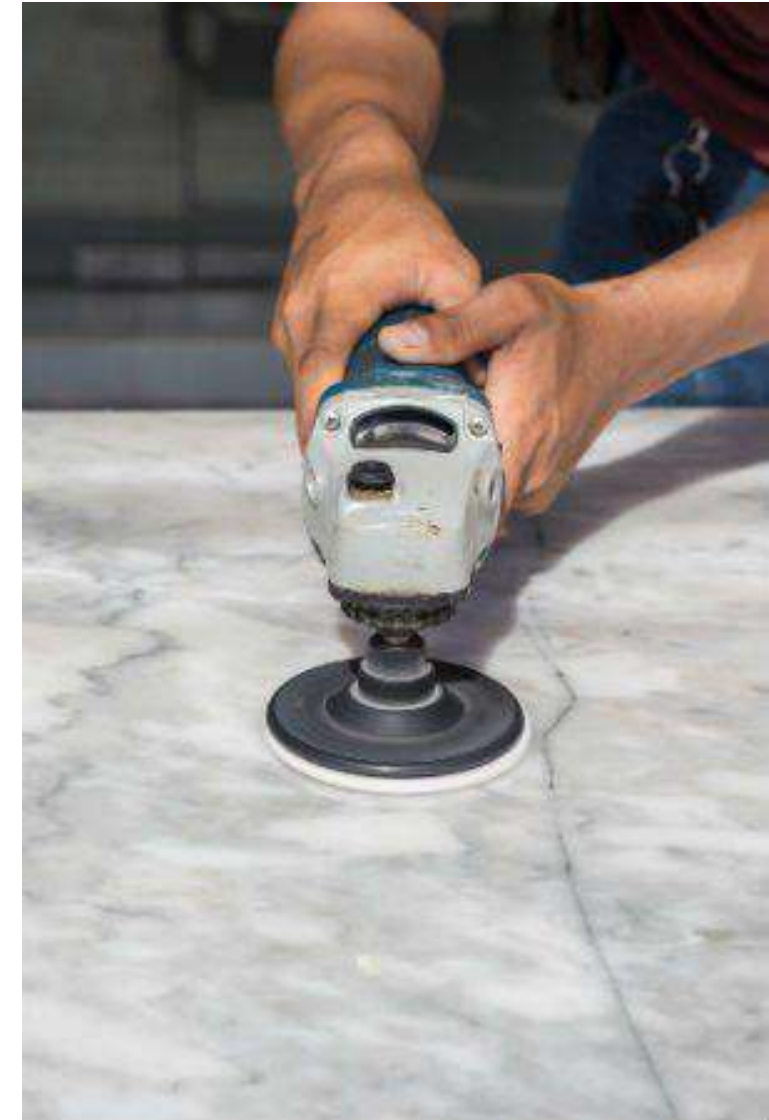
The surface of natural stone may be finished in a wide variety of ways. It is important to choose **Natural Stone finishes** suitable for an intended use. These are the most popular stone finishes:

NATURAL

The natural finish is basically the **absence of treatment**. The stone is sold as extracted from the quarry, once cut into the desired format. The final look depends entirely on the characteristics of the stone and its exploitation. This finish is appropriated for cladding and cobblestones.

POLISHED

Stones are **polished** by repeated application of abrasive treatments. (As shown in picture)This technique produces a shiny surface, with almost zero porosity, while improving resistance. **Polished finish highlights the color and properties of the natural stone**. It is commonly used as interior wall and floor dressing, as well as bench tops and in kitchen countertops.



- AGED

This procedure is characterized by the use of constant vibration on the stone surface to **simulate aging**. Although different methods are used to achieve this finish, all generate soft surfaces.

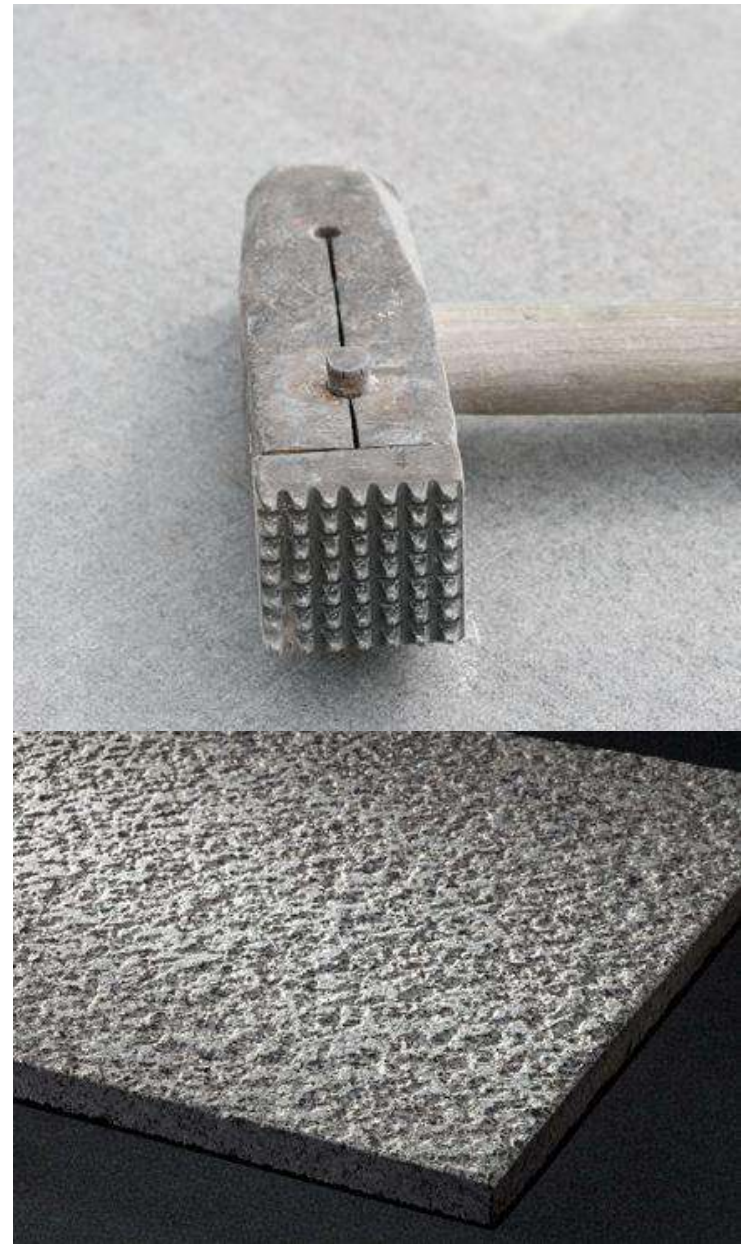
- TUMBLED

This is an aging process similar to the one applied to achieve an **antique finish**. In this case, natural stone is introduced in a vibrating drum-like machine with smaller, more resistant stones that wear the tile completely. Tumbled finish simulates aging and generates soft surfaces and edges.



BUSH HAMMERED

This finish is created by **hitting the material, manually or mechanically**, with a masonry tool called a bush hammer. Bush hammered generates uniformly distributed craters of different sizes over the surface of natural stone. The surface becomes non-slip, ideal for high traffic external areas.(As shown in pictures)



SANDBLASTED

This is similar to the bush-hammered finish. This finish is achieved by repeatedly blasting silica sand against the material through an air gun. **Sandblasted finish** generates very small craters that highlight the color of the stone.



MUSHROOM

This finish is made with traditional masonry tools, Cutting the stone with controlled blows. Mushroom finish gives the stone a distinctive **rustic appearance**, with relief and irregularities.



LEATHER

A leather finish is obtained by a process of brushing the slab with a range of brushes. The result is a slightly undulating (متموج) surface, very soft, warm and smooth to the touch. Only a few materials are sourced with this finish such as granite.



FLAMED

This finish is achieved by exposing the surface of the stone directly to a high temperature flame. Flamed finish generates a thin roughness and protects the material for **outdoor installation**.



SAWN

This finish is created by “sawing” the stone with diamond disc teeth. It produces a somewhat rough and irregular surface with small furrows and undulations. Sawn finish makes the stone lighter and gives it a matte tone. **Sawn finish** is available for external paving, steps, pathways, driveways and patios.



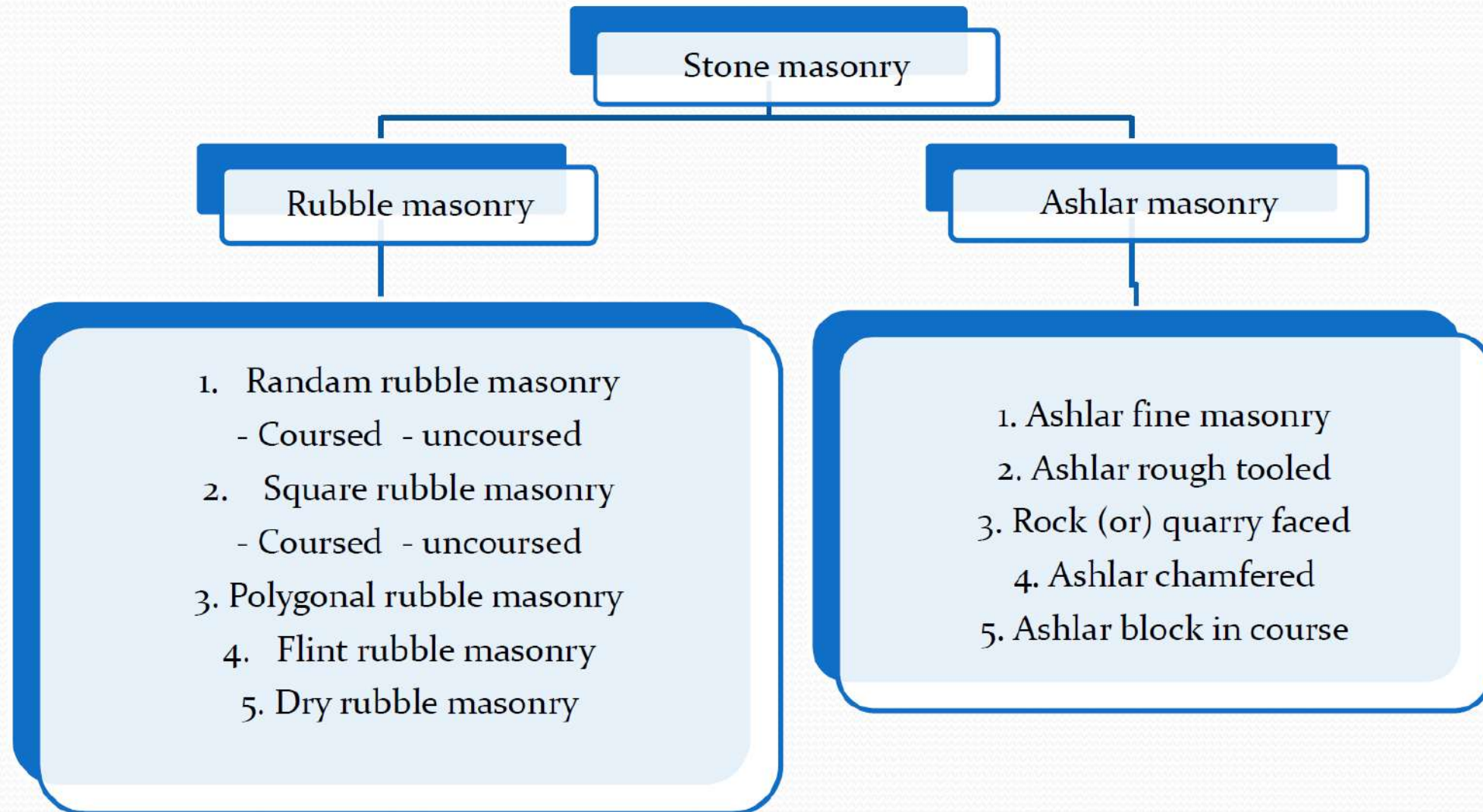
BOND PATTERNS IN STONE MASONRY WALLS

natural stone is not available in uniform sizes, the bond patterns in stone masonry walls are different from those used in bricks.

Two basic patterns used in stone masonry walls are

1. Rubble masonry
2. Ashlar masonry

Classification of stone masonry



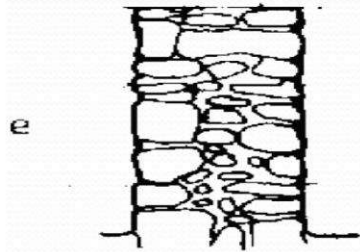
Rubble Masonry

1- Random Rubble masonry

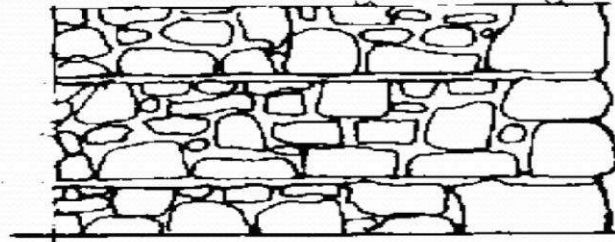
- Coursed



PLAN



SECTION

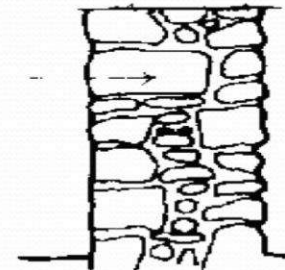


ELEVATION

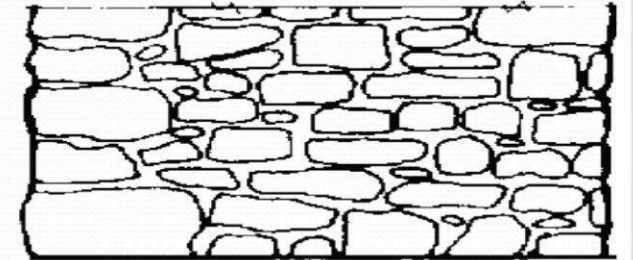
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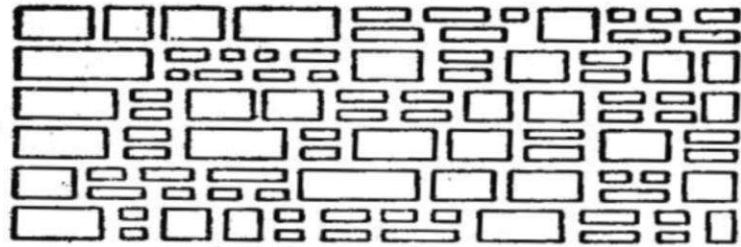
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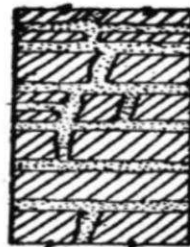
ELEVATION

2- Square rubble masonry

- Coursed



Elevation

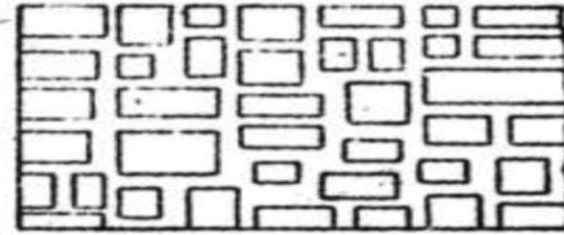


Section



Plan

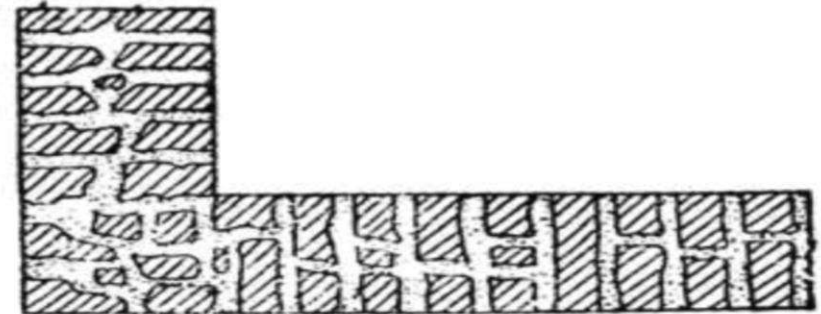
- uncoursed



Elevation

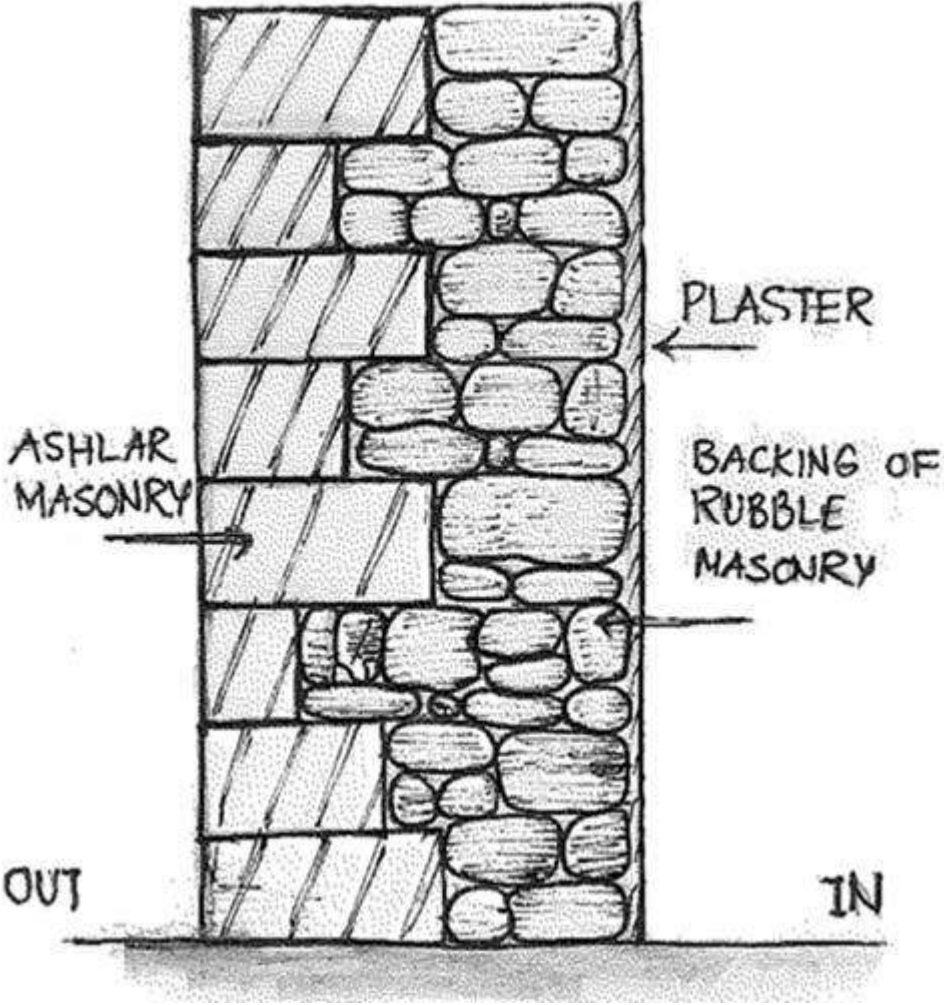


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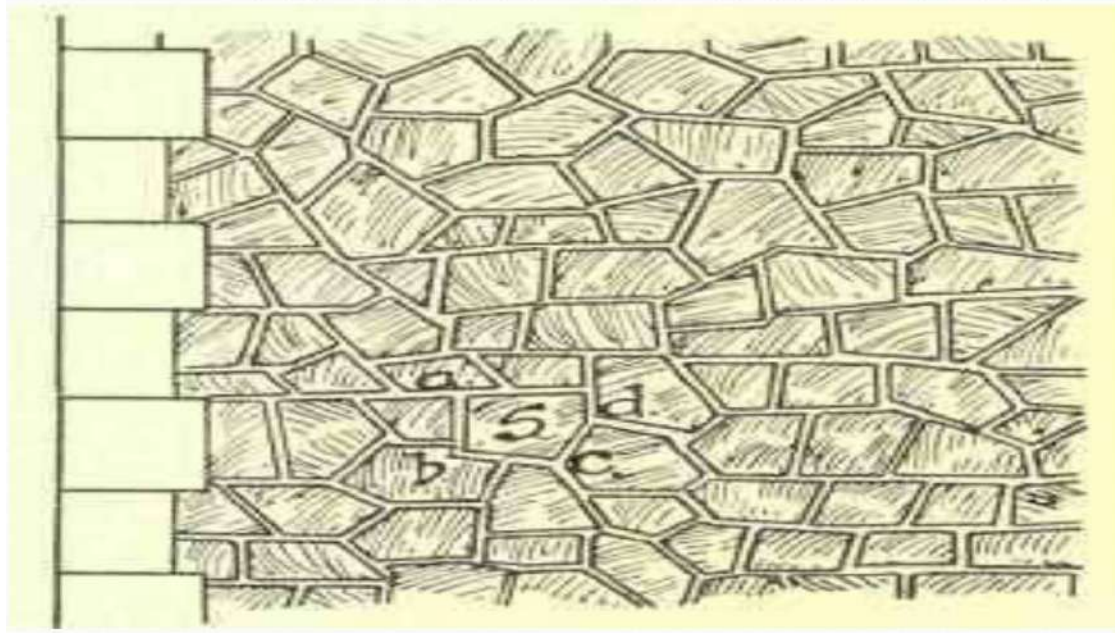


Plan

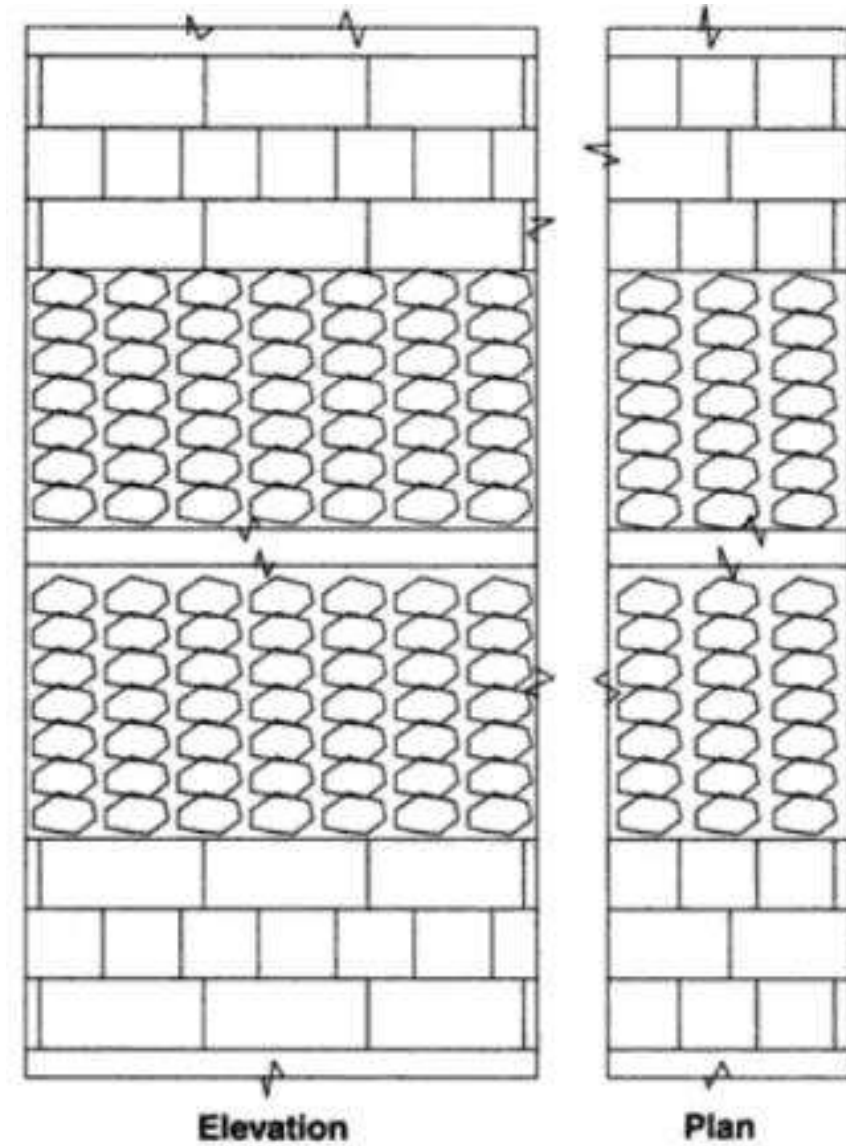
Mixing (Random and square) stone wall



3- Polygon Rubble masonry



4- Flint Rubble Masonry

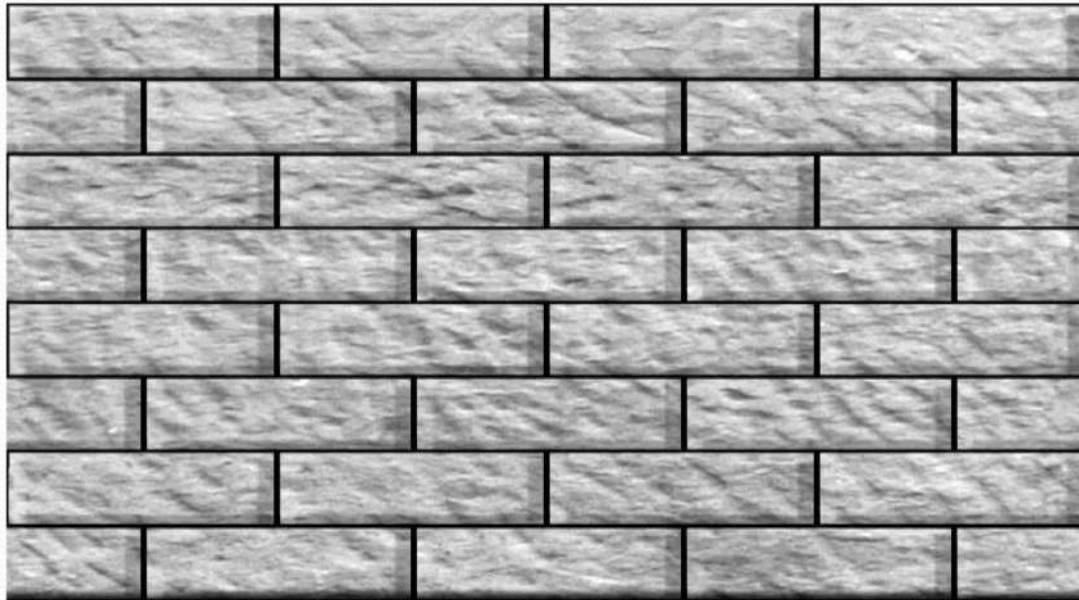


5- Dry Rubble Masonry



Ashlar Masonry

1- Ashlar fine masonry



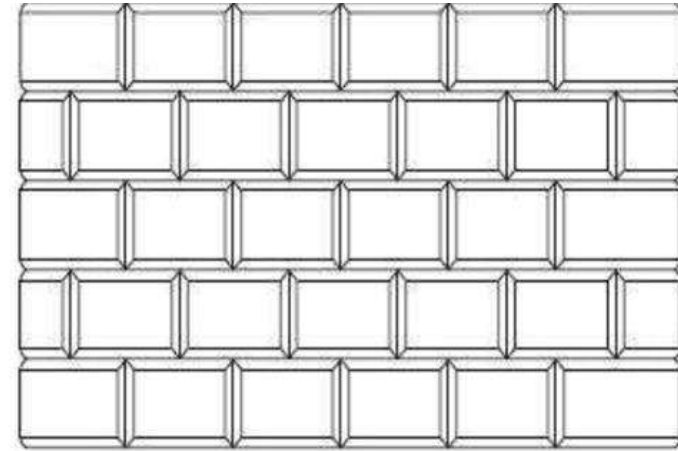
2- Ashlar rough tool



3- Ashlar rock or quarry faced masonry



4- Ashlar chamfered Masonry



5- Ashlar block in course masonry

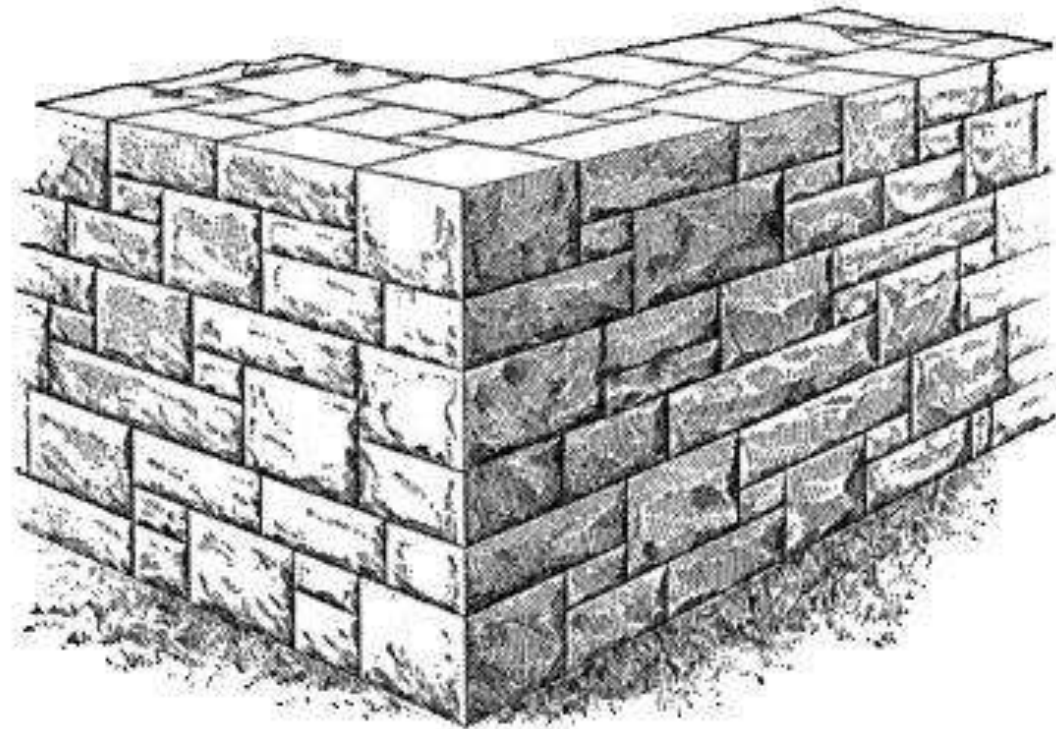


FIG. 28



ASSIGNMENT

Draw the following below;-

(Square or Random) Rubble masonry (coursed or un coursed)

THANK
YOU