



8TH LECTURE

1- CONCRETE BLOCK

2- PRECAST CONCRETE

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1- Concrete block

- What is Concrete Block
- Concrete block main mixture component
- Concrete block Type
- Concrete block Size
- Concrete block Shape
- Concrete block wall construction Bonds

WHAT IS BLOCK (CONCRETE BLOCK)

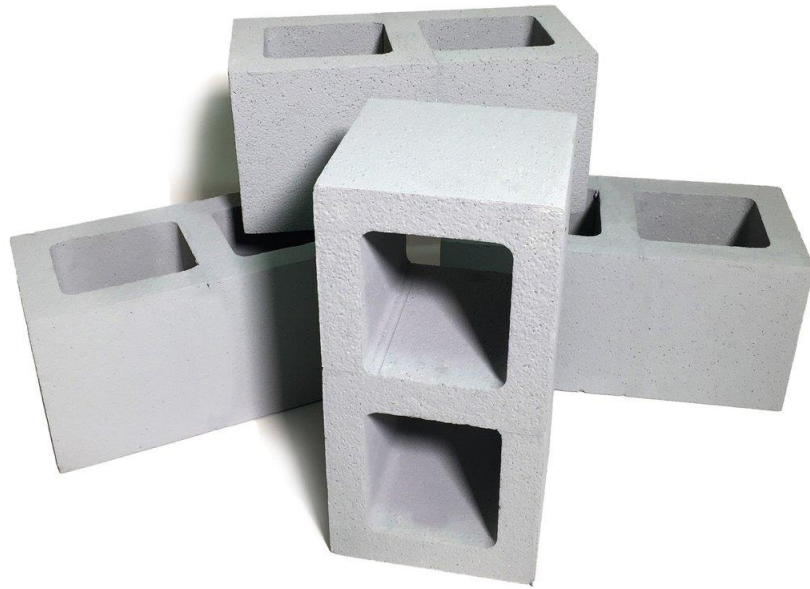
Can be represent as type of masonry unit that used in construction system. The most common concrete masonry units used in building construction are **load bearing units**.

Non load bearing units mostly used in partitions or Asthetic purpose



Concrete block main mixture component

The concrete commonly used to make concrete blocks is a mixture of powdered Portland cement, water, sand, and gravel. This produces a gray block with a fine surface texture and a high compressive strength. A typical concrete block weighs 38-43 lb (17.2-19.5 kg).



Concrete blocks Type

1. Hollow concrete blocks

Commonly used in the construction industry, concrete hollow blocks are usually manufactured using lightweight aggregates with a certain design load depending on the nature of member it will be used into.

Normally, concrete hollow blocks have voids of $\frac{1}{4}$ its gross area and the solid area should be not less than half of its area to attain its maximum allowable load capacity

There are two kinds of concrete hollow blocks; **load-bearing concrete hollow blocks** and **non-load bearing concrete hollow blocks**. It is available in sizes such as 100x200x400mm, 200x200x400mm, 150x200x400mm and so on.



2. Aerated Autoclaved Concrete Block (AAC)

Most of the time compared with bricks but is different in a lot of ways. Aerated Autoclaved concrete blocks are **lighter and bigger version of bricks**.



3. Concrete Bricks

- Concrete bricks typically are small rectangular block arranged and piled systematically to create a rigid wall. These bricks are usually made up of pottered clay or concrete.
- Some manufacturers use solid concrete while others play with its cement and aggregates ratio for economic purposes.
- Other manufacturers also created bricks with different colors as per request of some clients.
- Concrete bricks are usually used in fences, facades, as it provides good aesthetic and slick look.



4. Solid concrete blocks

This type represented **denser and bigger** than concrete bricks, solid concrete blocks are manufactured to be **strong, heavy**, and created out of naturally dense aggregates.

These solid concrete blocks are strong enough that it is used for **large masonry units** that are **load-bearing in nature**.



5. Lintel blocks

These concrete blocks are used in preparation for **lintel beams**.

These lintel blocks are manufactured in such a way that it serves as a masonry unit and a formwork itself.

Aesthetically, lintel blocks have a deep groove where reinforcing bars are put along with the concrete.

Meaning, they serve as permanent formwork system for the lintel beam member.



6. Paving Blocks

Paving blocks are generally just a rectangular or square box made up of reinforced concrete.

As these blocks are used in paving and road shoulders, these have to be painted with high-visibility concrete paints so motorists and drivers could see it right away.

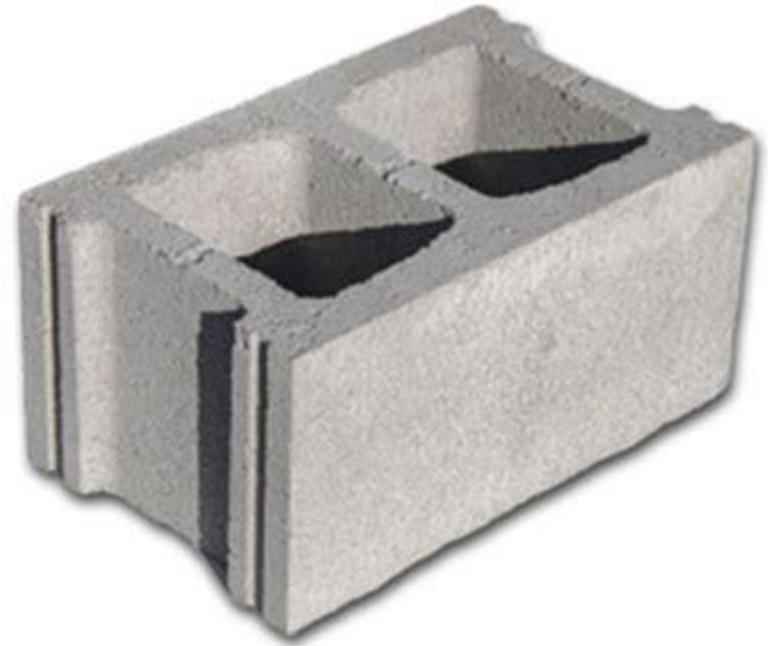
Paving blocks are also used in **parks, walkway**, and sometimes in **parking areas**.



7. Concrete stretcher block

concrete stretcher blocks are used to combine masonry units.

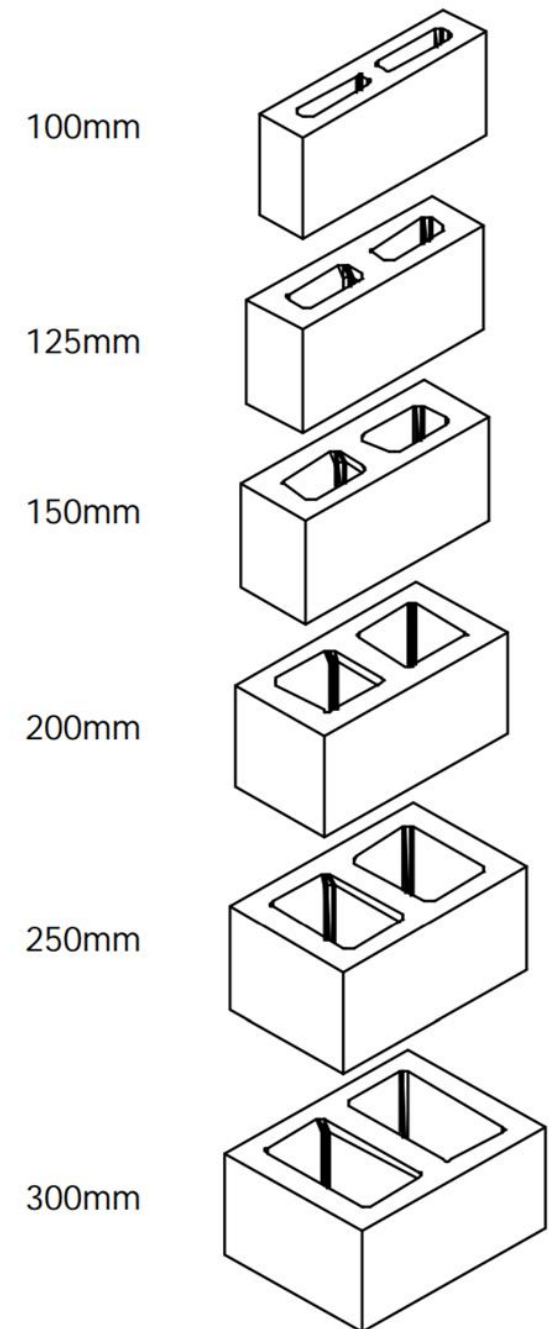
concrete stretcher block is relatively the same with common hollow block but their faces are laid parallel with respect to the face of the wall.



Concrete Block Sizes :-

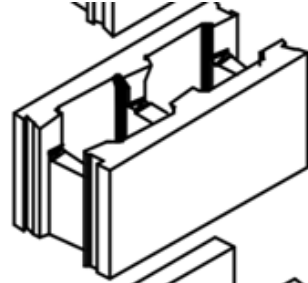
Concrete masonry units are made in various sizes and shapes to fit different construction needs. Concrete unit sizes are usually referred to by their nominal dimensions.

Thus, a unit known as **200x200x400mm** will actually measure 190x190x390mm. When it is laid in a wall with 10mm joints, this unit will occupy a space 400mm long and 200mm high

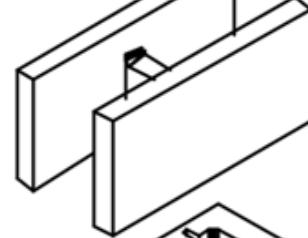


Concrete Block Typical shapes include stretcher; double end; half unit; bond beam; half-high unit; H-block unit; multi block unit..

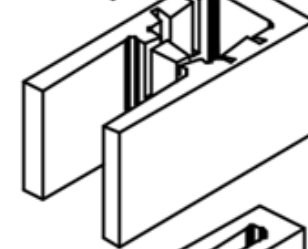
Bond-beam



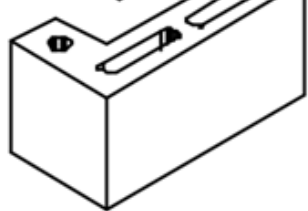
H-Block



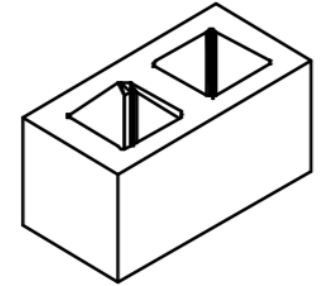
Multi-block



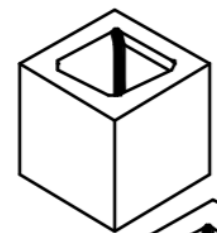
L-corner (100mm)



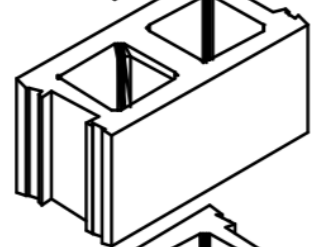
Double-ender



Half



Stretcher



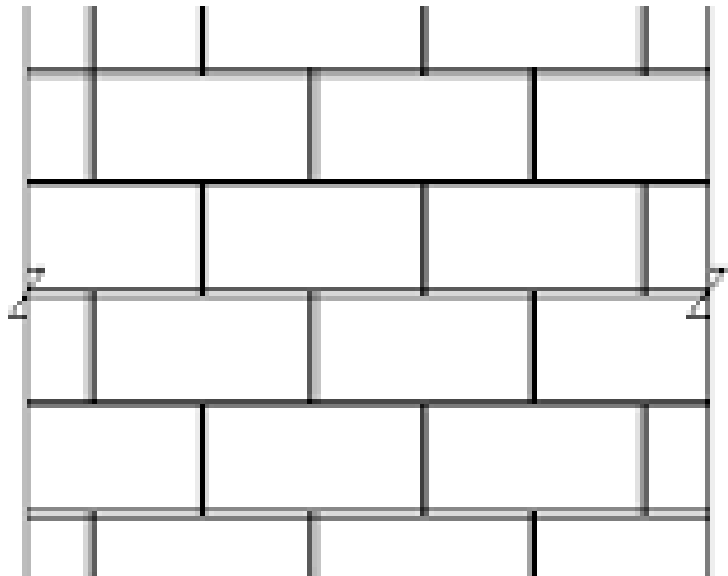
Half-high



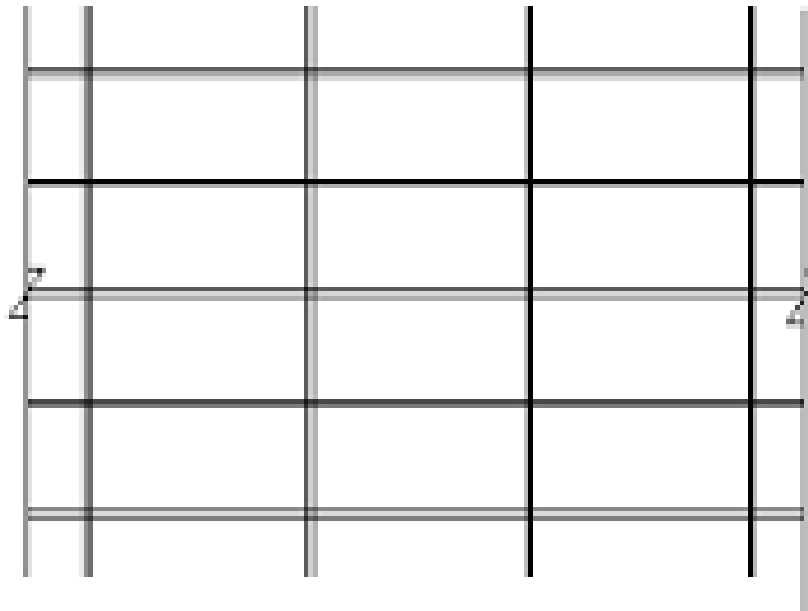
Concrete Block Masonry Bonds

The most popular and general for use in concrete block masonry walls bonds were :-

- 1- Running Bond
- 2- Stack Bond



RUNNING BOND

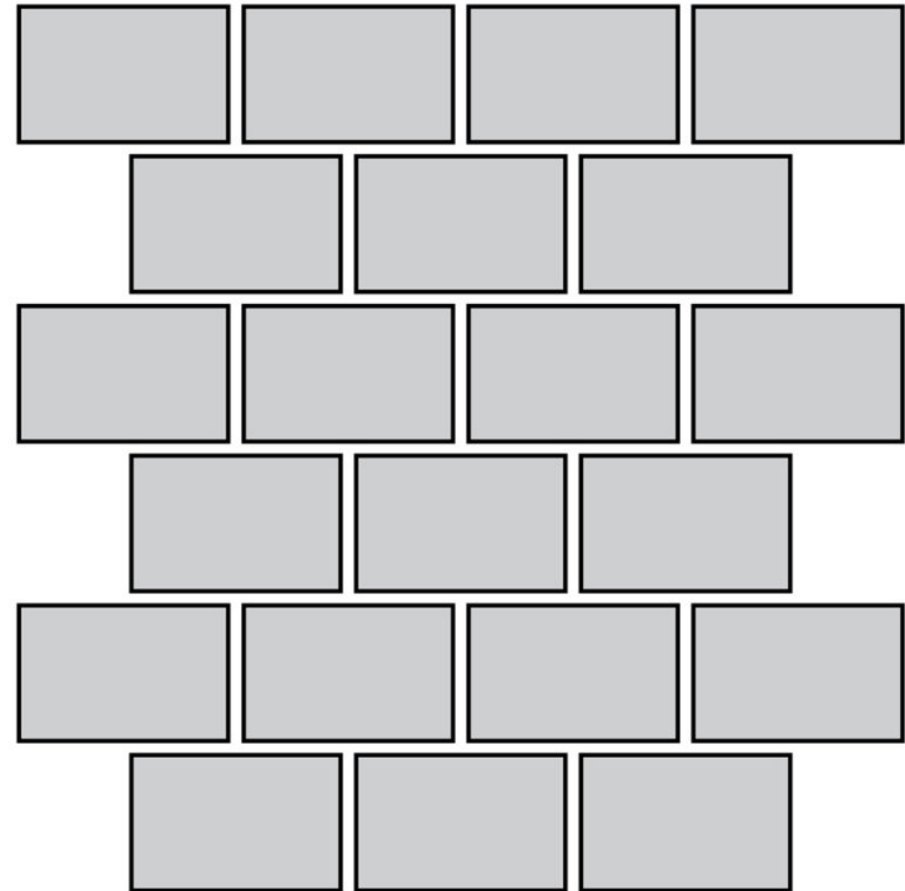


STACK BOND



1.RUNNING BOND CONSTRUCTION

A running bond is a bond in which each unit is staggered a $\frac{1}{2}$ unit further than the adjacent course, resulting in a one-over-two pattern. It is considered to be the most common type of bond pattern used in construction and can be applied to any hard surface that consists of similar building units, such as tile, modular flooring, carpet, and brick.

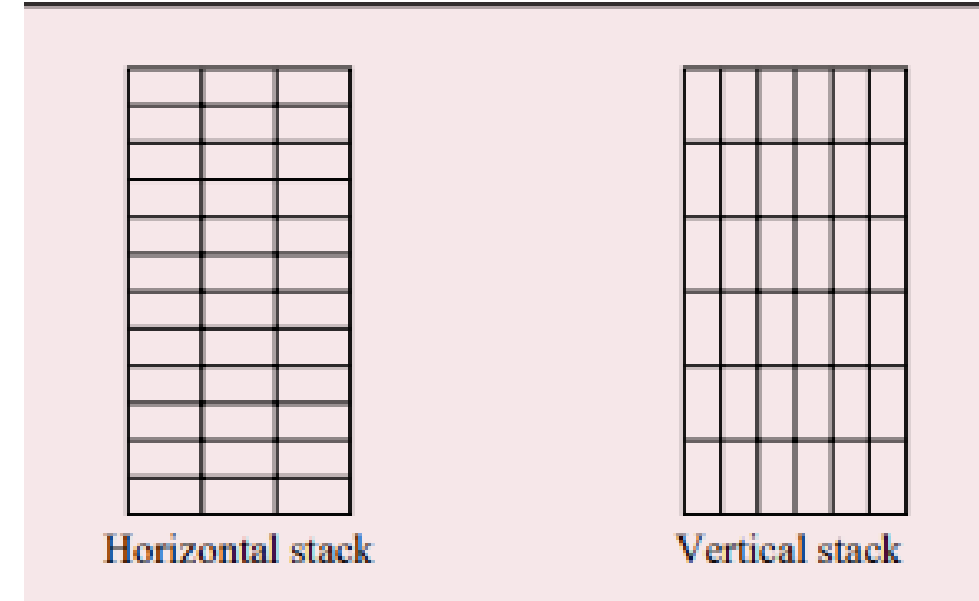


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2.STACK BOND CONSTRUCTION

In stack bond, blocks are laid directly on top of one another with joints aligned, running vertically down the entire wall. Blocks can either be stacked horizontally or vertically.

The alignment of joints results in minimal bonding which means that this bond is weak and often structurally unsound unless wire bed-joint reinforcement is placed in every horizontal course or, where loading is moderate, every alternate course. This is often used purely for decorative purposes and in rain-screen applications.



Practical Part

1- What is precast concrete

2-What is the advantage of precast concrete?

3-What is the difference between concrete and precast concrete?



Thank you