Sign Conventions and Bonds

Learning Objectives

- Importance of symbols in Civil Engineering
- Symbols and IS:962-1989 recommended symbols of various marerials

Introduction

Importance of Signs and Conventions

- While preparing drawings, we use some conventional signs and symbols to represent various objects. Use of these symbols saves time and space on drawing sheet.
- IS:962-1989 has recommended various types of symbols used in civil engineering drawings.

Symbol

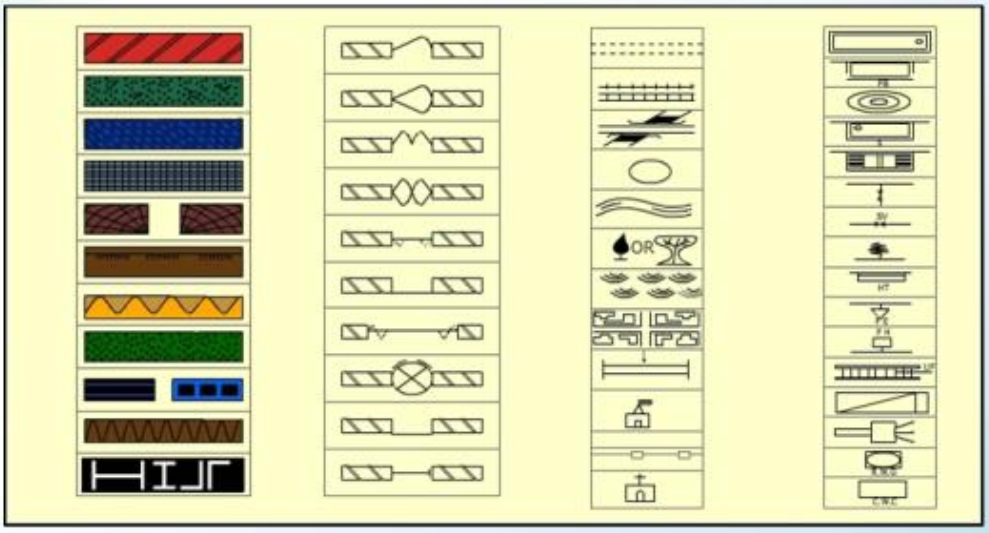
- A symbol is the shortest notation which is used to represent an actual object.
- The symbol is used in Engineering because this saves time, labour and material and also give approximate shape of the object.

Civil Engineering Symbols

Various types of symbols used in civil engineering works are called Civil Engineering Symbols. These are not drawn according to scale but drawn proportionately.

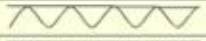
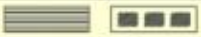
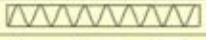
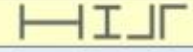
ISI Symbols for Various Materials

The IS:962-1989 has recommended various types of symbols that are used in civil engineering drawings.



ISI Symbols for Various Materials (Contd.,)

The IS:962-1989 has recommended various types of symbols that are used in civil engineering drawings.

S.NO	MATERIAL	SYMBOL	COLOUR
1.	Brick		Vermillion
2.	Concrete		Hoorkers Green
3.	Natural or reconstructed stone		Cobalt blue
4.	Partition blocks		Paynes grey
5.	Wood		Burnt sienna
6.	Earth		Sepia
7.	Hard core		Yellow ochre or chrome yellow
8.	Plaster & Plaster products		Green
9.	Glass		Blue
10.	Fibre building board & insulation board		Sepia
11.	Metal sections		Black

ISI Symbols for Various Materials (Contd.,)

The IS:962-1989 has recommended various types of symbols that are used in civil engineering drawings.

WINDOWS		
S.NO	OBJECT	SYMBOL
1.	VERTICAL CENTRE HUNG	
2.	VERTICAL SLIDING	
3.	HORIZONTAL CENTRE HUNG	
4.	TOP HUNG	
5.	BOTTOM HUNG	
6.	SIDE HUNG RIGHT HAND	
7.	SIDE HUNG LEFT HAND	

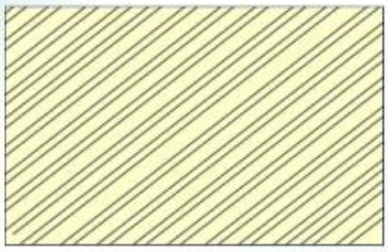
ISI Symbols for Various Materials (Contd.,)

The IS:962-1989 has recommended various types of symbols that are used in civil engineering drawings.

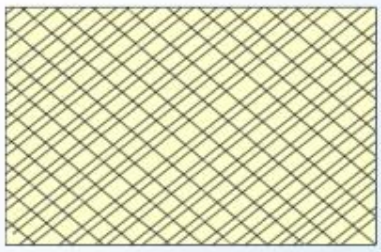
S.NO	OBJECT	SYMBOLS
1.	Un-metalled Road	
3.	Railway Line(Single)	
5.	Road over Railway OR Road Bridge	
7.	Well	
9.	CANAL OR STREAM	
11.	Tree	OR
13.	Grassy Lawn	
15.	City OR TOWN	
17.	Dam	
19.	Temple	
21.	INTERNATIONAL BOUNDARY 1.Without Pillers 2.With Pillers	
23.	Church	

Symbols for Brick

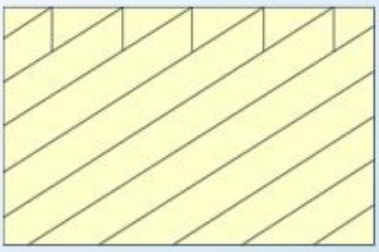
The images below illustrates symbols of **Brick**, **Existing Brick**, and **Fire Brick**.



Brick



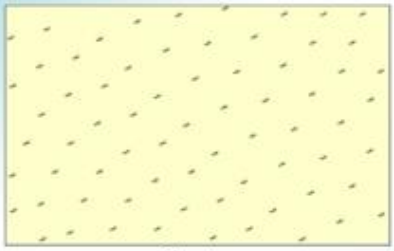
Brick Existing



Fire Brick

Symbols for Plaster

The images below illustrates symbols of **Plaster**, **Plaster Existing, Plaster on Stone Masonry**, and **Solid Plaster Masonry**.



Plaster

Plaster Exsiting

Plaster on Stone Masonry

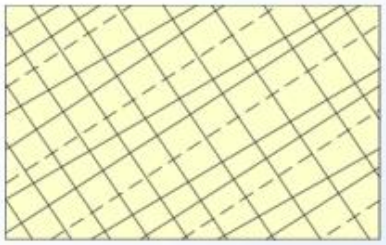
Solid Plaster Partition

Click here to view animation

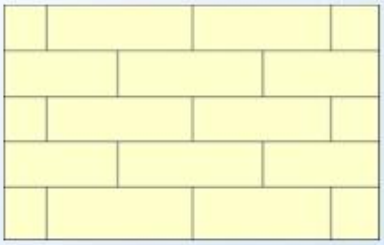
Symbols for Stone

The images below illustrates symbols of **Stone**, **Stone Existing, Ashlar Stone**, and **Marble Slate Porcelain Stone**.

Stone



Stone Existing



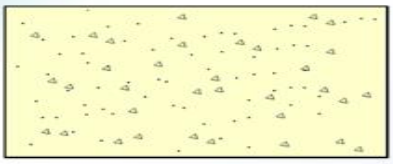
Ashlar Stone

Marble Slate Porcelain Stone

Click here to view animation

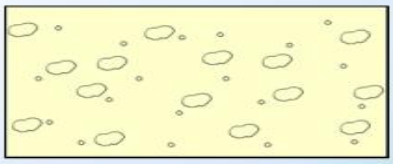
Symbols for Concrete

The images below illustrates symbols of **Concrete**, **Existing Concrete**, and **Light Weight Concrete**.



Concrete

Concrete Existing



Light Weight Concrete

Symbols for Rubble

The images below illustrates symbols of **Rubble** and **Rubble Stone**.

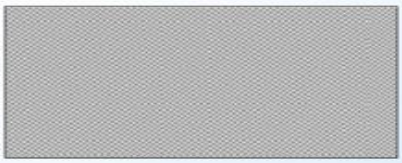
Rubble

Rubble Stone

Symbols for Metals

The images below illustrates symbols of **Alloys**, **Aluminum**, and **Brass** and **Bronze**.

Steel, Cast Iron, and Copper Alloys

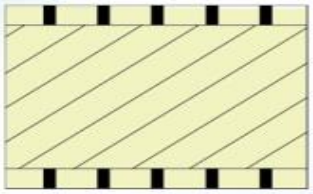


Aluminum

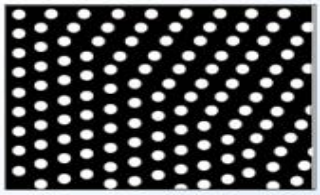
Brass and Bronze

Symbols for Various Types of Tiles

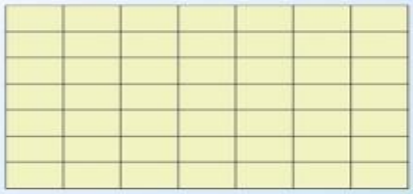
The images below illustrates symbols of **Clay Tile**, **Unglazed Clay Tile**, and **Ceramic Tile**.



Clay Tile (Glazed)



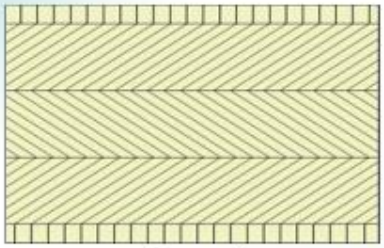
Clay tile (Unglazed)



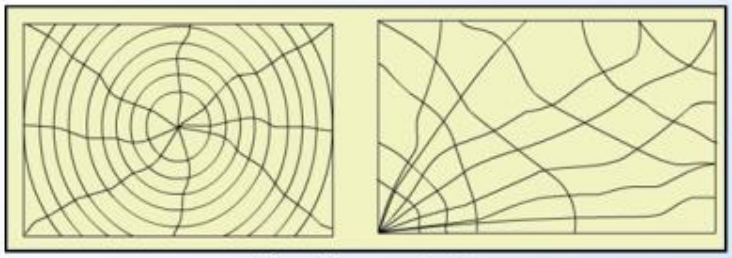
Ceramic Tile

Symbols for Various Types of Wood

The images below illustrates symbols of **Plywood**, **Rough Wood, Wood Across Grain**, and **Wood Along Grain**.

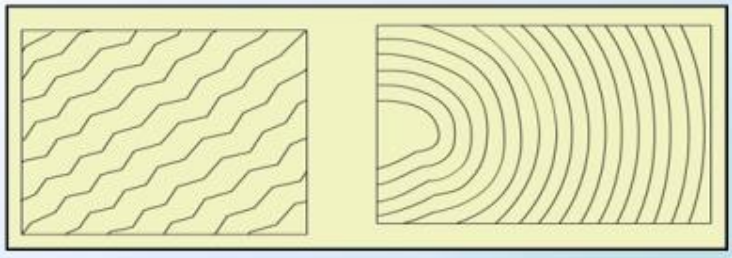


Plywood



Wood Across Grain

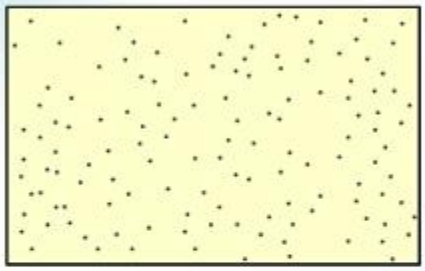
Rough Wood



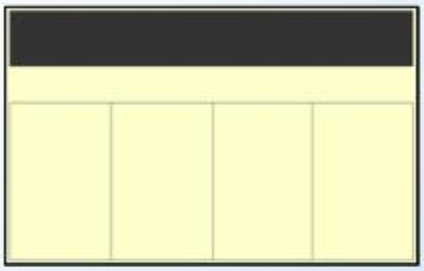
Wood Along Grain

Symbols for Sand, Cinders, Floor Finish, and Earth

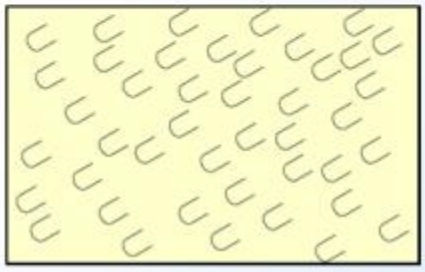
The images below illustrates symbols of **Sand**, **Cinders, Floor Finish**, and **Earth**.



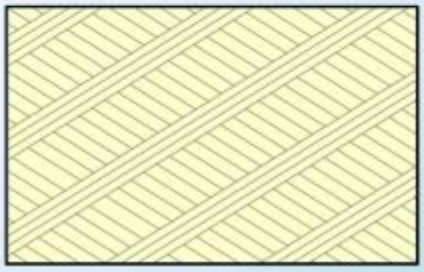
Sand



Floor Finish



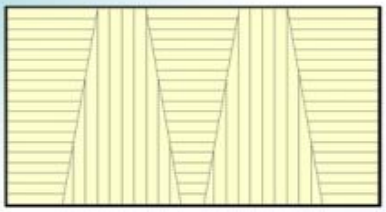
Cinders



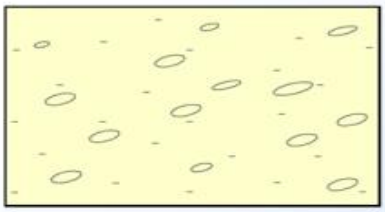
Earth

Symbols for Rock, Moorum, Lime Terrace, and Glass

The images below illustrates symbols of **Rock**, **Moorum, Lime Terrace**, and **Glass**.

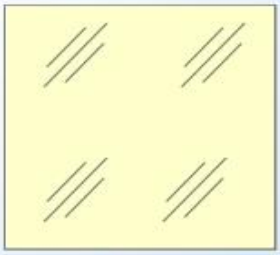


Rock



Moorum or Moulder

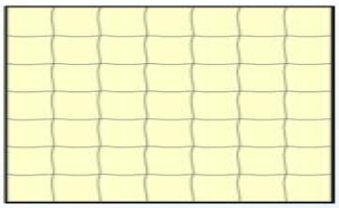
Lime Terrace



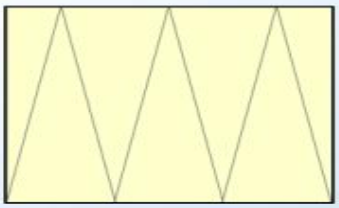
Glass

Symbols for Solid Cork & Partition Block and Hard Core

The images below illustrates symbols of **Solid Cork & Partition Block** and **Hard Core**.



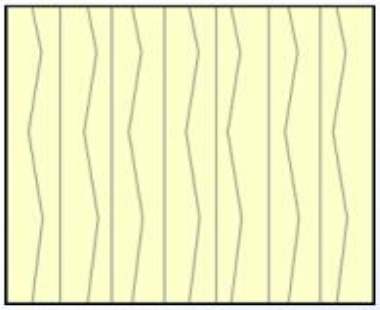
Solid Cork & Partition Block



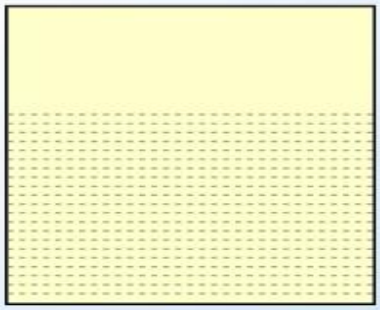
Hard Core

Symbols for Sheet Metal and Water & Fuels

The images below illustrates symbols of **Sheet Metals** and **Water, Oil, Petrol, Kerosene etc**.



Sheet Metal

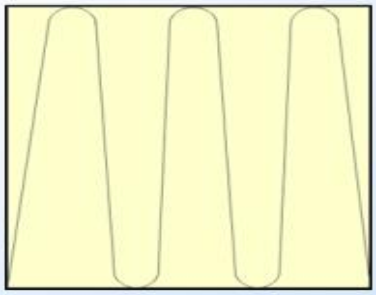


Water, Oil, Petrol, Kerosene etc.

Symbols for Fire Building & Insulating Board and Asbestos

The images below illustrates symbols of **Fire Building and Insulating Board** and **Asbestos**.

Asbestos

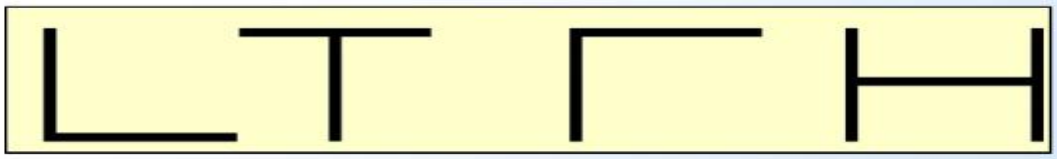


Fire Building and Insulating Board

The symbol used to represent a Asbestos, Fibre, Felt, Synthetic Insulating & Packaging Materials, Resin Products, Paper Cork, Rubble, Leather, Wax

Symbols for Metal Sections

The images below illustrates symbols of various metal sections.



Metal Section

Bonds - Introduction

- A **bond** is the name given to any arrangement of bricks in which no vertical joint of one course is exactly over the one in the other course above or below it.
- A **brick** is used for masonry and should be molded to suitable dimensions. Practically, the size of the brick is little less so as to include the thickness of mortar, when used.
- A brick, according to Indian standards is **200mm x 100 mm x 100mm** in size. It should be thoroughly burnt so that it may be hard and durable to withstand pressure.

Bonds - Introduction

Technical Terms:

Stretcher
- It is the longitudinal face of the brick with size **200mm x 100 mm**.

Header
- It is the cross face of the brick with face of size **100 mm x 100 mm**.

Bat
- It is a piece of brick, usually known, according to their fraction of a whole brick, such as ½ or ¾ bats or shape headers

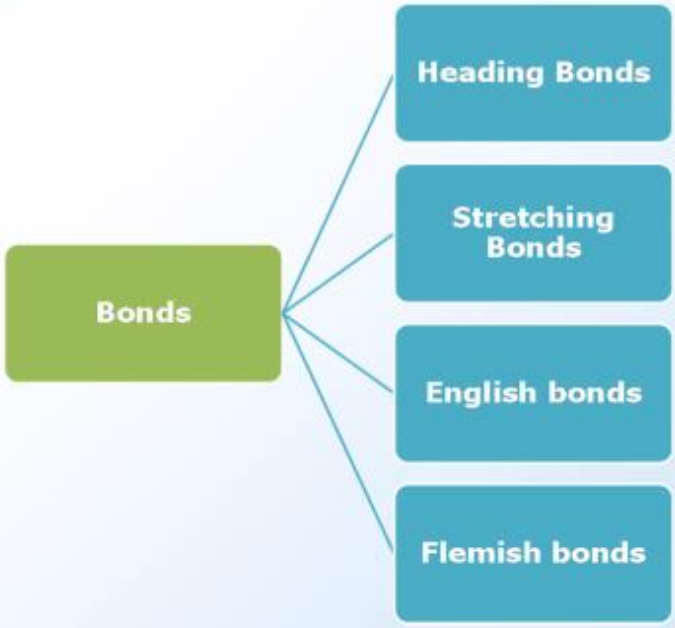
Quoin
- It is the brick used at the corner exposed to two surfaces.

King Closer
- It is formed by removing a corner and leaving half header and half stretcher facer.

Queen Closer
- It is usually employed next to the first brick in a header course. The size of queen closer formed is **200 mm x 50 mm x 100 mm**.

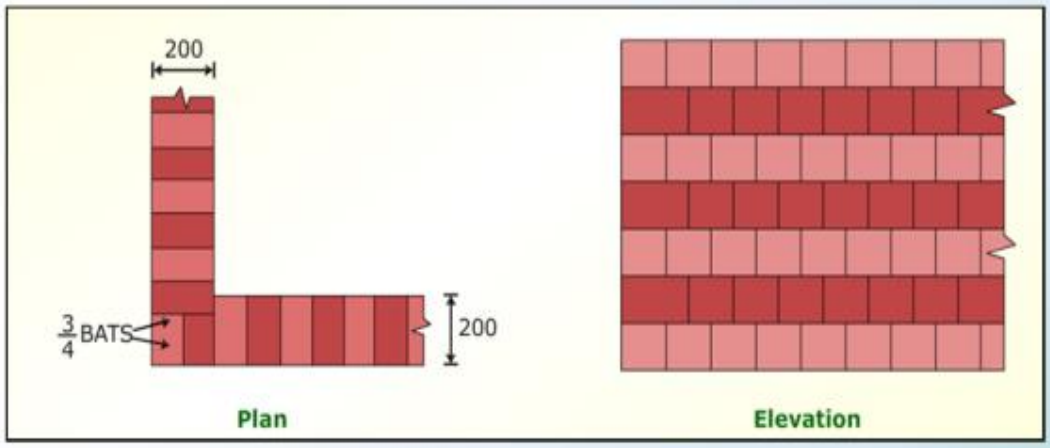
Bonds - Introduction

Bonds are classified in to the following:



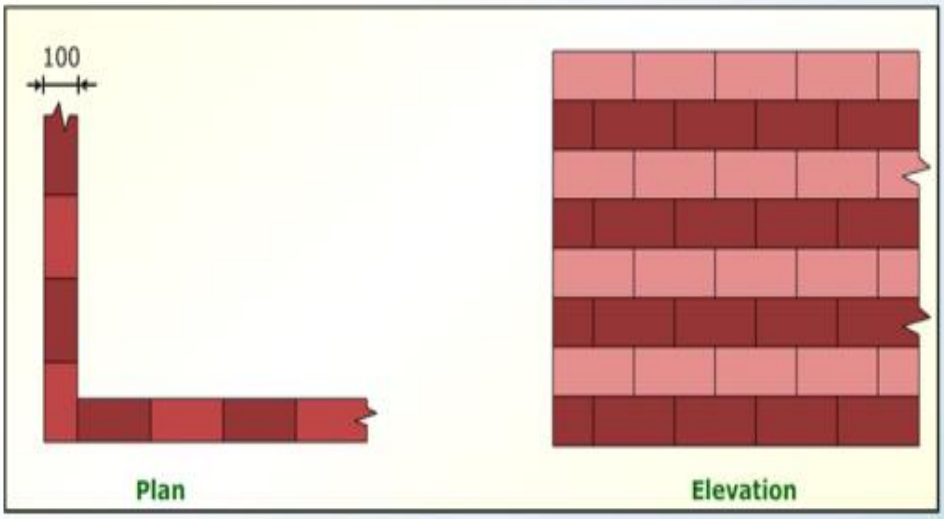
Bonds – Types of Bonds: Heading Bond

A layer of continuous headers in elevation is called **Heading** Bond. The images below illustrates the **Plan** and **Elevation** of the Header Bond.



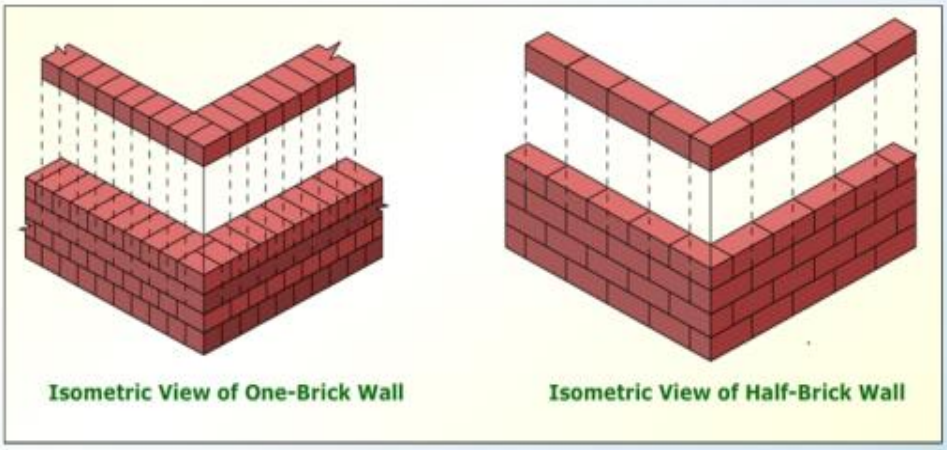
Bonds – Types of Bonds: Stretching Bond

A layer of continuous stretchers in elevation is called **Stretching** Bond. The images below illustrates the **Plan** and **Elevation** of Stretcher Bond.



Bonds – Types of Bonds: Header & Stretcher Bond Isometric Views

The images below illustrates the **Isometric views** of **One-Brick** and **Half-Brick Wall** of **Header** and **Stretcher Bonds**.



Isometric View of One-Brick Wall

Isometric View of Half-Brick Wall

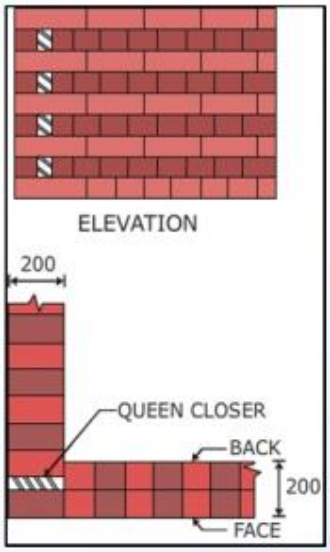
Bonds – Types of Bonds: English Bond

Definition:

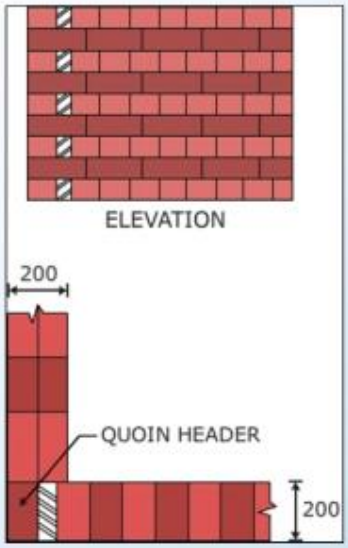
- This consists of one course of headers and one course of stretchers. In each heading course a queen closer is placed next to the queen header and the remaining bricks are headers. There should be no continuous vertical joints.
- Walls of an even number of half bricks in thickness present the same appearance on both faces i.e., if a course consists of headers on the front elevation shall also share headers on back elevation.
- Walls of the odd number of half bricks in thickness will show each course consisting of headers on one face and stretchers on the other face.

Bonds – Types of Bonds: English Bond

The images below illustrates the **Odd** and **Even Course** of One Brick wall.



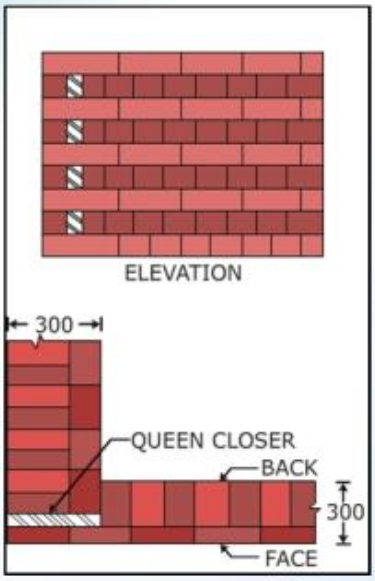
Odd Course of a One-Brick Wall



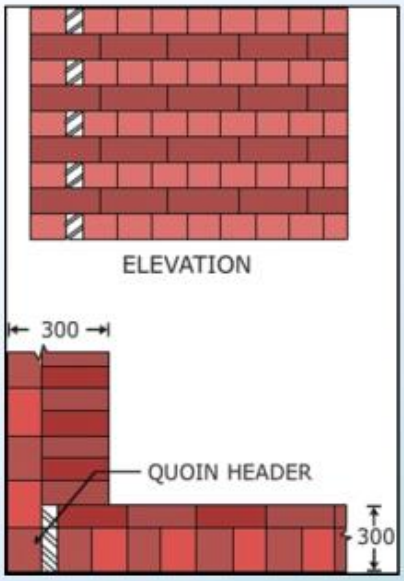
Even Course of a One-Brick Wall

Bonds – Types of Bonds: English Bond

The images below illustrates the **Odd** and **Even Course** of a **One and Half Brick wall**.



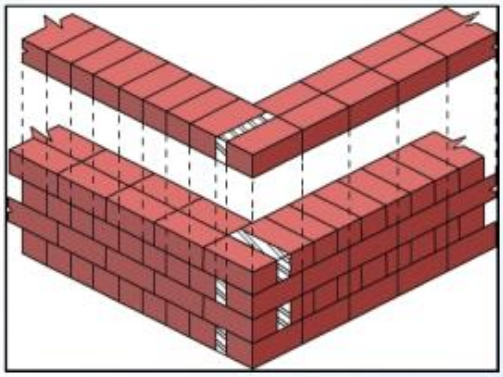
Odd Course of a One and Half Brick Wall



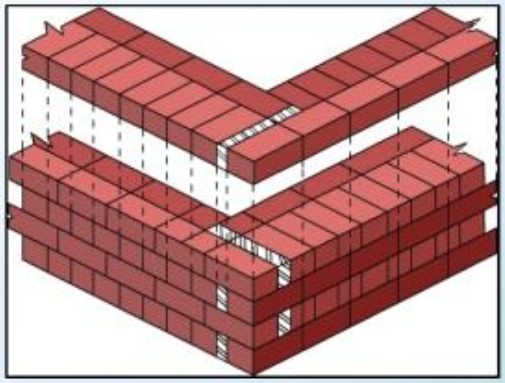
Even Course of a One and Half Brick Wall

Bonds – Types of Bonds: English Bond

The images below illustrates the **Isometric Views** of **One Brick** and **One and Half Brick** walls.



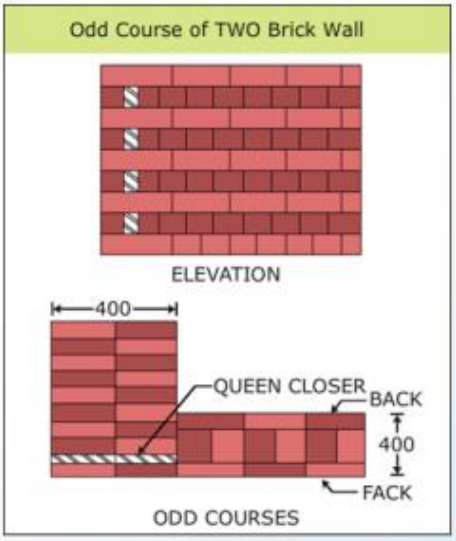
Isometric view of One Brick Wall

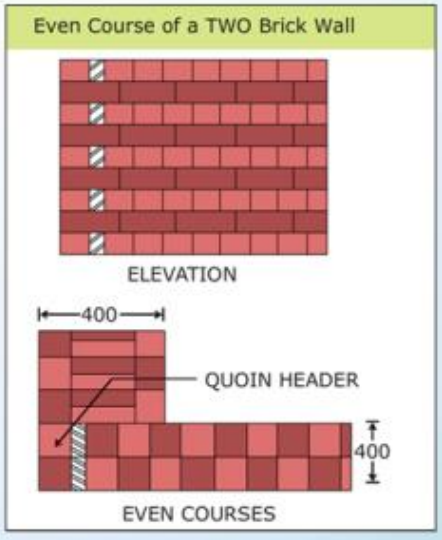


Isometric view of One and Half Brick Walls

Bonds – Types of Bonds: English Bond

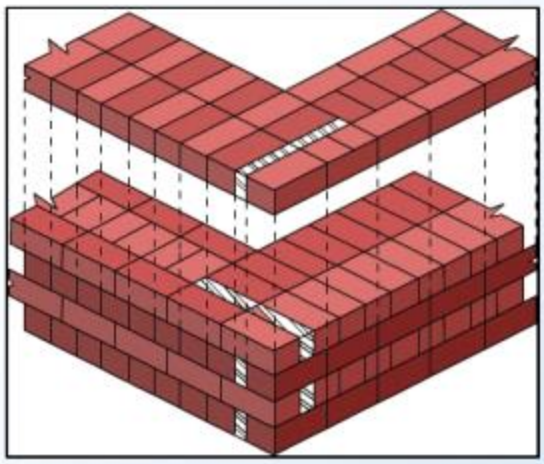
The images below illustrates the **Odd** and **Even Course** of a **Two Brick** wall.





Types of Bonds: English Bond

The images below illustrates the **isometric views of the two brick** wall.



Isometric views of the two Brick Wall

Types of Bonds: Flemish Bond

Single Flemish Bonds

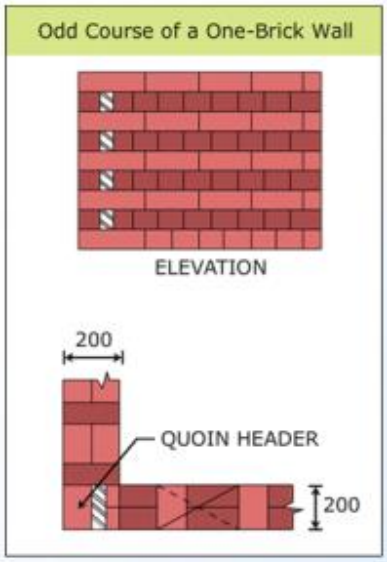
- This consists of headers and stretchers in the same course both in external and internal surface. Each header comes centrally over stretchers.
- This bond is weaker than English Bond because it consists of a large numbers of short continuous vertical joints. In case of one brick wall, double Flemish has got some more pleasing appearance than the English bond.

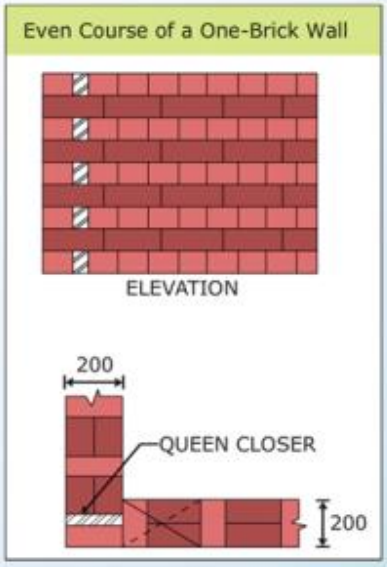
Double Flemish Bonds

- In this type of bond the facing the Flemish Bond and the backing of English Bond. This bond cannot be less than one brick thickest.
- Generally, it is used at places where expensive facing bricks are specified and comparatively cheaper bricks are used for backing. This front elevations of single Flemish bond are the same as that of the double Flemish bond.

Types of Bonds: Flemish Bond

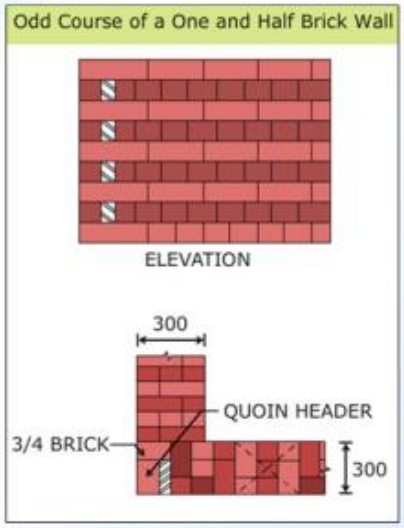
The images below illustrates the **Odd** and **Even Course** of one **Brick** wall.

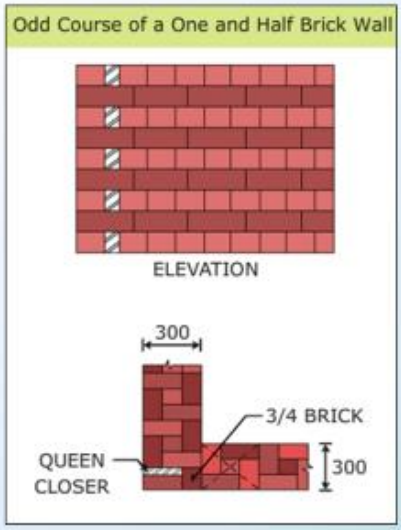




Types of Bonds: Flemish Bond

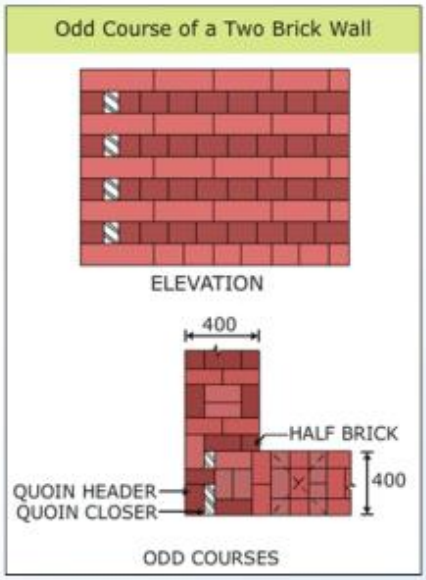
The images below illustrates the **Odd** and **Even Course** of one and half **Brick** wall.

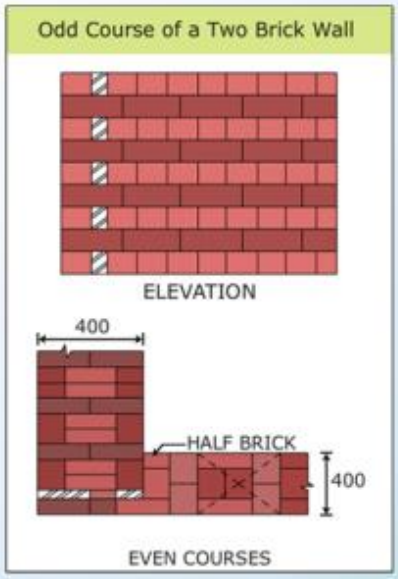




Types of Bonds: Flemish Bond

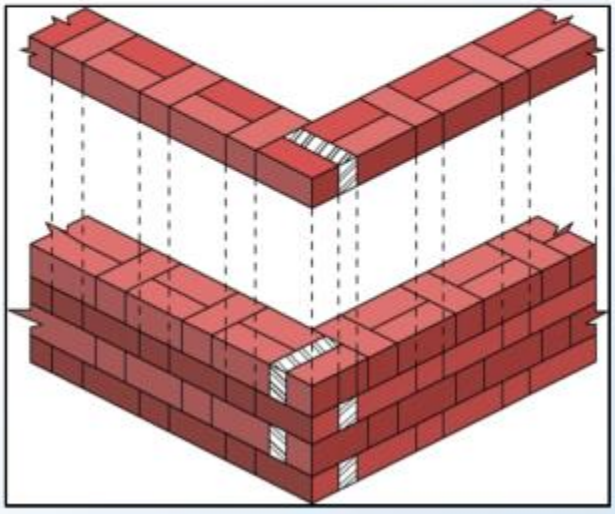
The images below illustrates the **Odd** and **Even Course** of Two **Brick** wall.





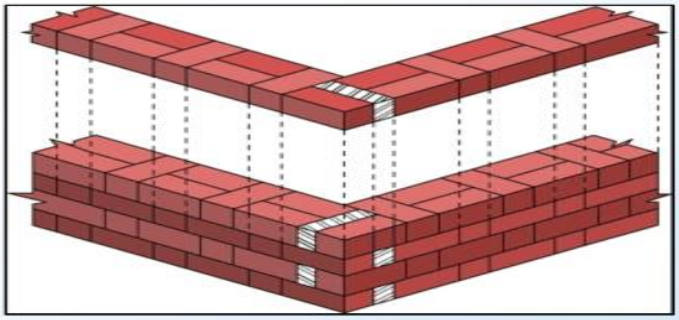
Types of Bonds: Flemish Bond

The images below illustrates isometric view of one **Brick** wall.



Types of Bonds: Flemish Bond

The images below illustrates isometric view of one and half b**rick** wall.



Types of Bonds: Flemish Bond

The images below illustrates isometric view of two b**rick** wall.