THEORY AND ACTIVITIES MODULE 4

(4th week)

CONTENTS:

ACTIVITIES

A. Read the text bellow once to get the general meaning
B. Read the whole text again out loud, checking the audio of the terms. Repeat the text (or chunks of texts) when you find yourself stumbling over words. Do it several times until you can read it fluently.

4.1. INTRODUCTION

This module covers terms of walling systems and openings in façades; such as doors and windows. Walls and their openings are the main elements to build architectonic spaces, but they are much more than that as you will learn in this module.

4.2. WALLS AND TYPES OF WALLS

A wall is a construction of masonry, timber, brick, stone, plaster or other building materials that separates one space from another or surrounds an area.

Different types of walls are designed for needs like:

- Separating exterior spaces, from different owners: **fence**, **boundary wall**, **party wall.**

- Holding back solid material and being capable of carrying the loads transmitted: **retaining wall**.

- Separating interior from exterior spaces, providing privacy and protection from the weather: **façade.**

- Subdividing interior spaces: **partition.**

- Being capable of supporting their own weight: **nonbearing wall** or non-load-bearing wall.

- Carrying all the loads transmitted by other structural elements, such as rafters or roof trusses in addition to its own weight: **bearing wall** or load-bearing wall.

- Providing protection against something undesired: **sound barrier** or **fire wall** to attenuate the spread of fire from one building module to another.

4.2.1. Building walls: materials and systems

There are different ways of building walls:

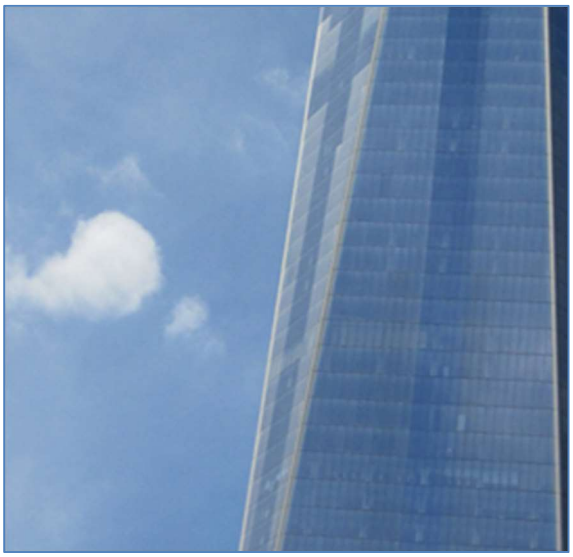
- **Solid walling:** traditional way of building walls. They can be built using stone or earth materials like **adobe** or **brick**. **Concrete blocks** are also used, as well as **formwork**, with **concrete** and **reinforced steel bars**.

- **Cavity wall or hollow walling**: an exterior wall, usually of masonry, with an air space cavity between two leaves. It is a system used for **façades**.

4.2.2. Types of walls: External walls and barriers

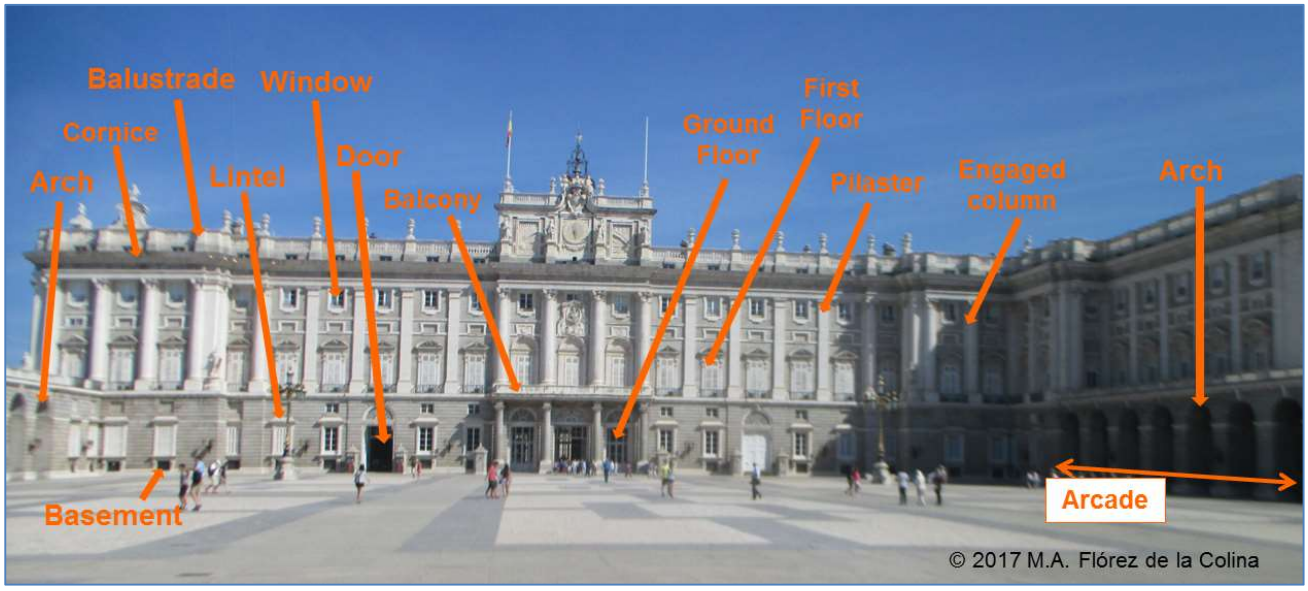
- **Retaining wall**: type of wall designed for holding back earth or solid material, capable of carrying the lateral loads transmitted. Used in gardens, excavations or as **basement walls**. Small low walls may be constructed with **brick** or **concrete block masonry**, higher ones with **reinforced concrete.**

- **Loadbearing wall:** a wall capable of supporting the structure above it, including the walls, floors, roof, and its own weight.



- **Curtain wall:** a non-load bearing wall of sheets of glass or other materials held in a metal frame positioned on the outside of a building and enclosing it saving weight and space and giving a durable external skin to a building.

4.2.3. Façade and parts



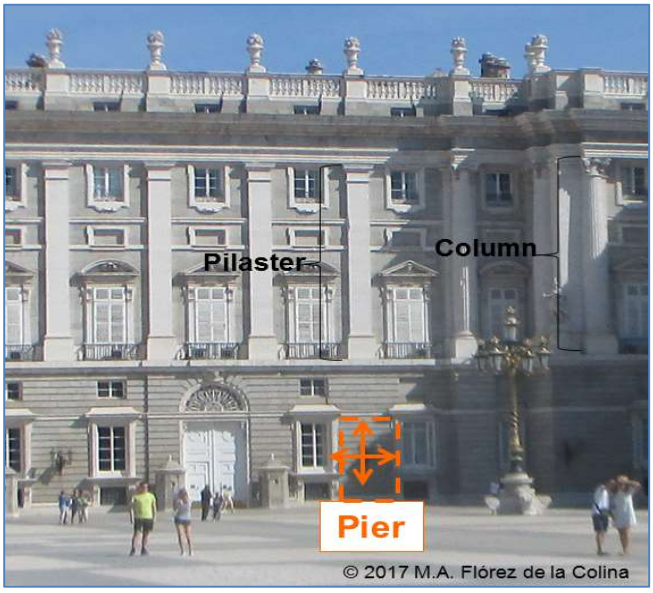
- **Façade:** the architectural front or face of a building, sometimes distinguished from the other faces by ornamental details.

- **Lintel**: a horizontal construction to span an opening; a **beam** carrying the wall above it, usually of steel, stone, or wood.

4.2.4. Piers and pilasters

- **Pier**: a vertical supporting structure between two openings, or one supporting the end of an arch or lintel.

- **Pilaster**: a shallow rectangular element, projecting from a wall, having a capital and a base, and architecturally treated as a column.



4.2.5. Interior walls: partitions

- **Partition**: an interior wall dividing spaces, rooms or part of a building into separate areas. Partitions capable of being moved are called **movable** or **demountable partitions.**

4.3. OPENINGS

An opening is a hole in a wall, partition, or roof for a door or window.

Openings have the following functions:

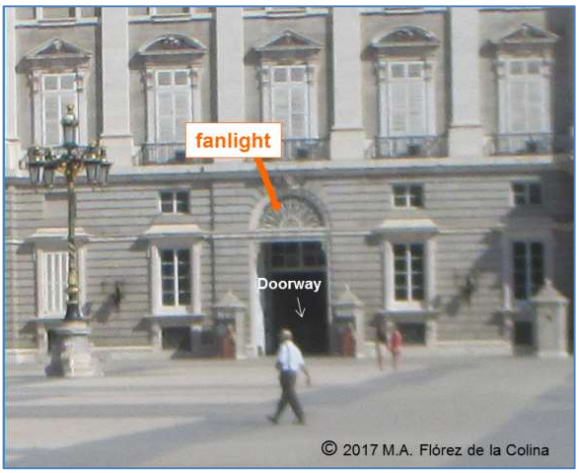
- They usually connect the interior with the exterior spaces of the building, linking both environments in a controlled manner
- They provide views, usually ventilation, and regulate the transfer of humidity and sound
- To ensure a safe indoor climate adjustable openings are necessary

Their orientation, location and dimension are closely linked to their purpose and usage. The opening method can be achieved manually or automatically.

TYPES OF OPENINGS

The most common types of openings in exterior walls are **windows** and **doors**. The size of openings in both solid walls and cavity walls are restricted by regulations according to wall stability and strength.

The openings can have different shapes depending on the structural frame, the building materials, and the designing preferences. Most openings in buildings are rectangular shaped, but other shapes are possible, such as semi-circular like **fanlights** which are above some **doorways**.



- **Fanlight:** a glazed opening to provide light over a door, fan-shaped or not, often with a semi-circular or other type of curved top; also, any upper part of a window hinged to open.

4.3.1. Doors

A door is a polysemic word which can be defined as:

- A hinged, sliding or folding **barrier**, located in an external or internal wall, for **opening and closing the entrance** to a building, a room or a cabinet. It can be made of wood, metal or glass.

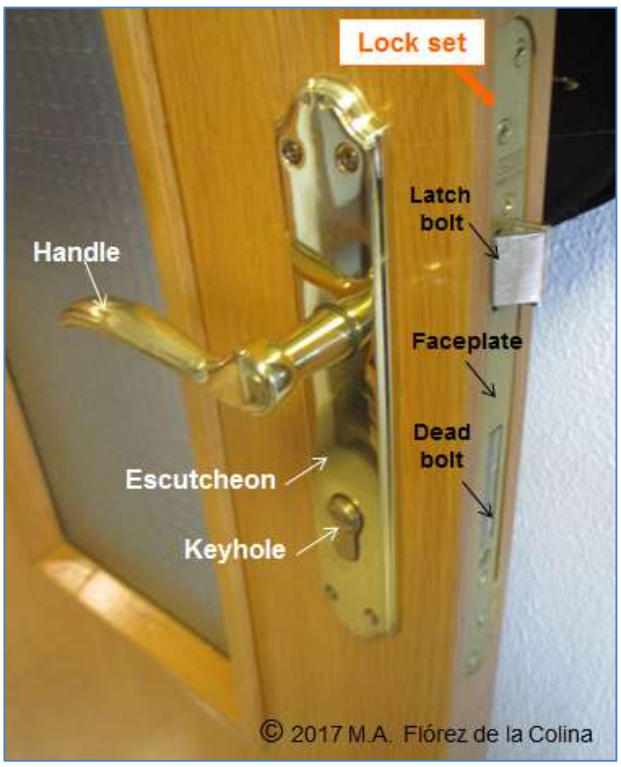
- An entire assembly consisting of a **door frame**, **casing**, **door leaves** and **hardware**, all the elements made to fit a **door opening**.

4.3.1.1. Door components

Frame a structure that surrounds something, such as a picture, a door or windowpane.

- **Door frame**: the framework of a doorway, consisting of two **jambs** and a **head** or **lintel**.

- **Door leaf:** a hinged or sliding section of a door.



- **Hardware:** metal devices, such as tools, locks, or machine parts
- **Door hardware**: all the devices, fittings, or assemblies necessary to operate a door as intended, such as **hinges**, **handles**, **knobs**, **locks**, etc.
- **Lock:** a devise for securing a door or a window, in position when closed; consisting of a bolt propelled and withdraw a mechanism.
- **Keyhole:** a hole in a lock case or **escutcheon** for inserting the key.

4.3.1.2. Types of doors

- **Swinging door**: a door that turns or pivots on hinges, fixed on a vertical edge, when pushed or pulled. It has a framework of **stiles** (vertical members), **rails** (horizontal members), and sometimes **muntins** (intermediate vertical framed members).

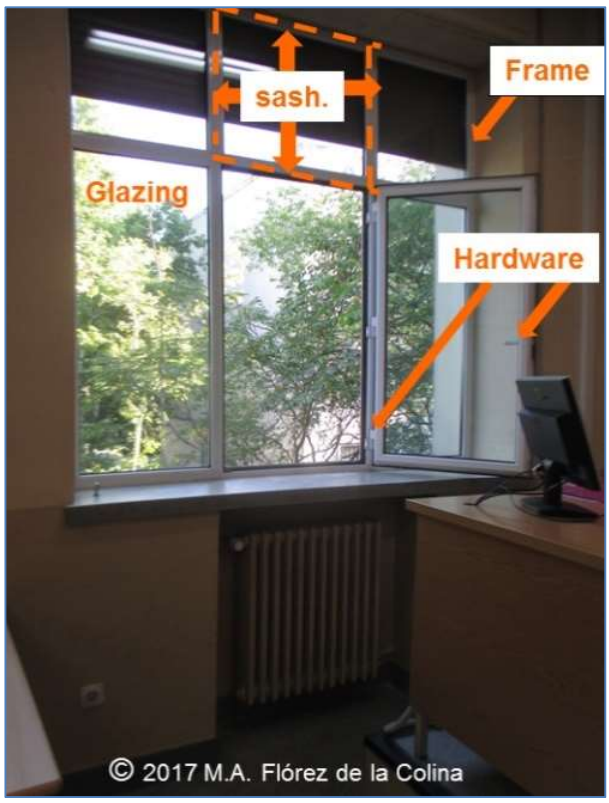
- **Flush door:** A smooth-surfaced door, faced with plywood or hardboard which conceals its rails and stiles.

4.3.2. Windows

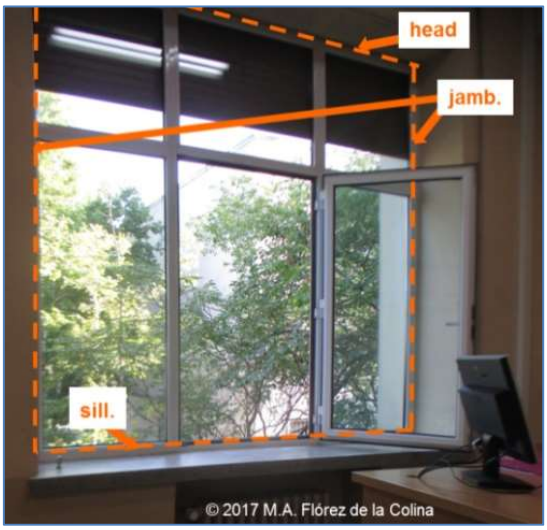
A window in architecture and construction is another polysemic term meaning:

- An **opening** in an external wall of a building to admit light and (usually) air; normally fitted with a frame in which operable sashes are set, containing panes of glass.

- All the elements made to fit a **window opening;** an entire assembly consisting of a **window frame**, **sash**, **glazing** and **hardware**.



4.3.2.1. Window components



- **Window frame**: the fixed frame of a window, consisting of **two jambs**, a **head** and a **sill.**

- **Jamb:** one of the vertical members at each side of an opening.

- **Sash:** the fixed or movable framework of a window in which the panes of glass are set. It may be operable or fixed

- **Casement:** a window sash opening on hinges generally attached to the upright side of its frame.

- **Glazing**: it can have two meanings: a) the complete element of construction in glass, including the **glass pane** or **sheets of glass** and the frame, and b) the process of installing the glass or glass product, setting the **glass pane** in a rabbeted frame, holding it in place with **glazier's points** and sealing it with **face putty** on the exterior side.

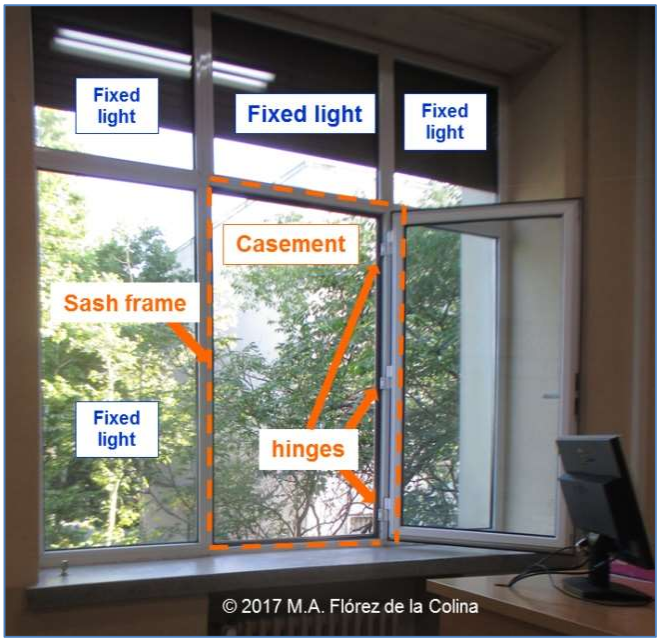
- **Window hardware**: all the devices, fittings, or assemblies necessary to operate a window, such as **hinges**, **handles**, locks, catches, cords, fasteners, pivots, pulls, pulleys, and sash weights.

- **Hinge:** a movable joint on which a window, door, gate, shutter, or other attached part turns, swings, or moves. Hinges are usually made of steel and fixed with screws.

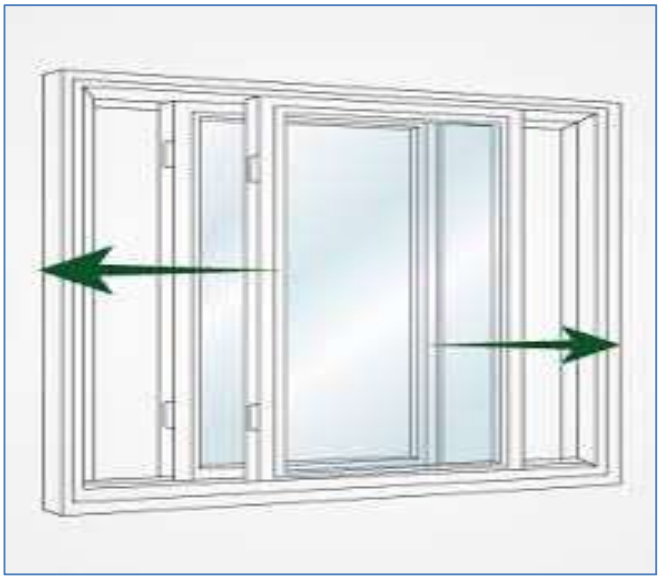
4.3.2.2. Types of windows

- **Fixed window**: a window that cannot be opened; it provides light or views to the interior. One type is **picture window**, a large, fixed window, placed to frame an attractive exterior view.

- **Operable window:** a window having a sash that opens for ventilation.



- **Casement window**: a window with at least one **casement**, often used in combination with **fixed lights.**



- **Horizontally sliding window**: a window having at least two **sashes**, of which one (or more) moves by sliding along horizontal grooves or tracks, located at the top and the bottom of the window frame.

- **Tilt and turn window:** a window that opens inward and combines two opening types (hung and tilt) in one sash. In a tilt and turn window, there is usually an **easy-to-reach handle**.