

THEORY AND ACTIVITIES MODULE 1

(1ST week)

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ACTIVITIES:

A. Read the whole text below once to get the general meaning.

B. Read the whole text again out loud. Repeat the text (or chunks of texts) when you find yourself stumbling over words. Do it several times until you can read it fluently.

1.1. INTRODUCTION

This unit covers general terms related to construction, a wide concept that might be related with architecture, civil engineering, building or **urban planning** studies. You will study some aspects of these broad fields, such as professions and **trades**, building types, and **sustainability**.



1.2. DEFINITIONS OF THE DISCIPLINES

Some of these terms are polysemic.

1.2.1. Architecture

a) The science and art of designing, planning, and constructing buildings, communities, or open areas keeping aesthetic and functional criteria. Some authors do not make a difference between architecture and building. **Architectural** theory goes back to Vitruvius and the ancient Greek writings.

b) It can also mean a unifying form or structure; a method or style of building, for example Gothic architecture.



Read these definitions of 'architecture' written by famous architects:

- "Architecture is an expression of values – the way we build is a reflection of the way we live." - **Norman Foster** in *The European*
- "Architecture is the real battleground of the spirit." - **Ludwig Mies van der Rohe** in *ID Merger Speech*
- "Architecture is not a question of the purely theoretical if you're interested in building buildings. It's the art of what is possible." - **Paul Rudolph** in *Chicago Architects Oral History Project 20*.
- "Architecture is much more than the building of an object on a site: it is a reinvention of the site itself." - **Sean Lally** in *The Air from other Planets*
- "Architecture is intended to transcend the simple need for shelter and security by becoming an expression of artistry." - **Jay A. Pritzker** in his *1985 Pritzker Ceremony Speech*
- "Architecture is more about ideas than materials." - **Qingyun Ma** in *Los Angeles Times*
- "Architecture is not just for big star projects like museums. It's for the slums around them, too." - **Juan Ramon Adsuara** in *npr*
- "Architecture is the sum of inevitable negotiations." - **Felipe Mesa** in *Domus*
- "Architecture is unnecessarily difficult. It's very tough." - **Zaha Hadid** in *The Guardian*
- "Architecture is by definition a very collaborative process." - **Joshua Prince-Ramus** in *Fast Company*

1.2.2. Engineering

The branch of science and technology related to the design, building, and use of engines, machines, and structures. Therefore, it implies the application of scientific principles to practical ends in the design and construction of structures. It has several branches of expertise including civil, mechanical, chemical, etc.

Civil engineering works are construction works that comprise a structure, such as a **dam**, **bridge**, road, railway or a **sewerage system**.



1.2.3. Construction

a) The activity of erecting buildings from **site** preparation through **erection**, **assembly** and finishing operations, including commercial, industrial and residential work. All the assembled or complete part that results from working on site. In other words all the work done in building, from **land clearance to completion**, including **excavation**, erection, and the assembly and installation of components and equipment.

b) The manner in which materials are ordered, assembled, and united into a whole, as in the term '**frame construction**', that is to say, 'a structure'.



1.2.4. Building

a) A more or less enclosed structure which is relatively permanent, constructed over a **plot** of land, distinguished from mobiles structures; it can be executed in **housing**, commerce, industry, etc. A building is any structure with a roof to provide shelter from the weather for occupants or contents. Residential work are sometimes designed by local builders in some countries, while larger projects with complicated services, such as **office blocks** or airport terminals are designed by architects. The parts of a building are the **substructure** where the foundation or structure is settled, and the **superstructure** with the **shell**, that is the exterior framework or walls and roof structure.

b) The action of constructing something



1.3. PROFESSIONS AND CONSTRUCTION TRADES

1.3.1. Professions

The professionals in construction are highly qualified in general and well trained, they contribute with their specific knowledge to deliver the projects in the construction industry successfully. The following are examples of these professionals:

Architect

A person who designs and supervises the construction of buildings.

Civil engineer

An engineer trained in the design of civil structures such as roads, tunnels, bridges, **drainage**, **sewers**, etc.

Engineer

A person engaged in any of the various branches of engineering, such as structural, mechanical, electrical engineering, etc.

Consultant

A person or organization hired to give professional or expert advice concerning a specific aspect of the building.

Contractor

A person who undertakes responsibility for the performance of construction work, including the provision of labors and materials, equipment such as vehicles and tools in accordance with plans and specifications. The general contractor is employed by the client on the advice of the architect or engineer. The general contractor must first assess the project-specific documents (**bid**, proposal or **tender** documents). The bid or tender phase is open to a number of preselected contractors and they are invited to bid, that is to say, to offer a certain price they will charge. The general contractors hires specialized **subcontractors** to perform all or portions of the construction work.

Quantity surveyor

Person who manages the cost relating to the construction projects, such as new constructions, maintenance work and **renovations**.

Construction manager

A person that contracts with an owner to advise and coordinate all phases of a building project.

Project manager

Middle level contractor, he can be hired instead of the general contractor.

In general all these professionals are the most important persons involved in the construction industry. Their duties and responsibilities could be described as follows:

- Design: architects, structural engineer
- Surveying: quantity surveyor or building surveyor
- Management: construction manager, project manager, site supervisor

1.3.2. Trades

- a) One of many person's occupations in which craft skills are used, usually involving manual skill, such as the traditional '**building trades**'.
- b) The work done by a **tradesperson** or other specialists. In building construction, the classification of work, such as **masonry**, **carpentry**, and **plastering** is done by masons, carpenters, and plasterers.

Foreperson

A worker who supervises other workers

Steel fixer

They erect steel work, secures reinforcing bars and **mesh** used to reinforce concrete on construction projects.

Mason

A tradesperson skilled in brick and block laying.

Plumbers

They install and maintain systems used for **plumbing**, **heating**, **drainage**, etc.

Carpenters

They build mainly with wood, fixing of **floor joists**, roof **timbers**, doors, windows, etc.

Joiners

In charge of manufacture doors, windows, screens, etc.

Scaffolders

They erect the **scaffolding** that is a temporary structure constructed on the outside of a building, made of wooden **planks** and metal **poles**; these structures are used by workmen while building.

Electricians

They are in charge of the installation of electrical equipment, they are specialized in electrical **wiring** of buildings.

Glaziers

The ones who install the glass.

Decorators/painters (all finishes)

A tradesperson responsible for the painting and decorating of buildings

Plasterer

A tradesperson who works with plaster, laying **plaster** on an interior wall or plaster decorative **moldings** on ceilings and walls.

1.4. BUILDINGS: FUNCTIONS & CONSTRUCTION TYPES

1.4.1. Dwellings: block of flats, detached houses, etc.

Dwelling: a building designed or used as the living quarters for one or more families.

Housing unit: a house, apartment, or single room intended for occupancy as separate living.

Flat: a **dwelling** in a building, originally of one floor. In American English it is called apartment, without considering the size. This type of housing can be in a **medium-rise building** or in a **high-rise building**.

Block of flats



“Corrala” or Block of houses in
Madrid (Spain)



Block of flats: MRV

Duplex: an apartment with two connecting floors.

Penthouse: an apartment on the top floor of a building, often set back from the façade and opening onto a terrace.

Condominium: an ownership of a multifamily residential unit. Each occupant owns 100% of his apartment and shares the ownership of common elements such as hallways, elevators, **plumbing**, etc. Short way of calling it is ‘**condo**’.

Detached house: a house having no wall in common with another house, usually surrounded by a garden. This is a medium-rise building.



Semidetached house: a house joined by a party wall to another house.



Row house: one of an unbroken line of houses sharing one or more sidewalls with its neighbors. It is also called 'terraced house'.



1.4.2. Other building types

There are other types of buildings which are not dwellings; they have other uses such as commercial, educational, transportation, leisure, sports, etc. These types of buildings are usually medium or high-rise buildings, like skyscrapers. Have a look at the following illustration:

FUNCTION AND ABILITY: TYPES OF BUILDINGS



Water tower
in Plaza Castilla square, Madrid, Spain



Office tower



Railway Station
Estación de Chamartín, Madrid



Airport
Barajas Airport, Madrid, Spain



School
New Elementary School, in
Las Tablas, Madrid, Spain



Bank
BBVA Bank Main Offices, Madrid, Spain



Opera House
Teatro Real, Madrid Opera House



Cinema
Real Cinema Building, Madrid



Sport Facilities
Paddle Court, Madrid

1.5. ENVIRONMENT, LOCATION AND PLANNING: THE SITE AND ITS LIMITS

1.5.1. External walls and barriers



Fence: A **railing** or barrier that encloses something, usually an area of land, or provides protection, such as a guard placed around a machine. Usually done with a series of metal bars fixed on supports or to a solid wall.



Boundary wall: a wall that defines the edge, it usually determines the property lines of a piece of land. Usually done in brick or concrete block masonry, with or without render.

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



Basement wall: a foundation wall that encloses usable space under the **ground level** of a building, usually a type of **retaining wall** (if it is totally or partially buried) and sometimes the lower part of the **façade** (if the building has access at two different levels).





Parapet: a low, protective wall at the edge of a terrace, balcony or roof, usually to prevent falls from one level to another; also the upper part of an exterior wall or façade, of a retaining wall, of a fire wall or a party wall, that sometimes rises above the roof.

Coping: a finishing or protective part of an exterior wall, a **facade** or a **parapet**, usually sloped or curved to shed water.

Railing: a protection barrier made up of vertical bars and their horizontal supports or **rails**, used as a **fence** to control access to propriety, or used as a guard in a balcony or stair, usually made of **wood** or metals such as **cast iron** or **wrought iron** in heritage buildings or **steel** in modern buildings.



1.5.2. Gates and types of gates

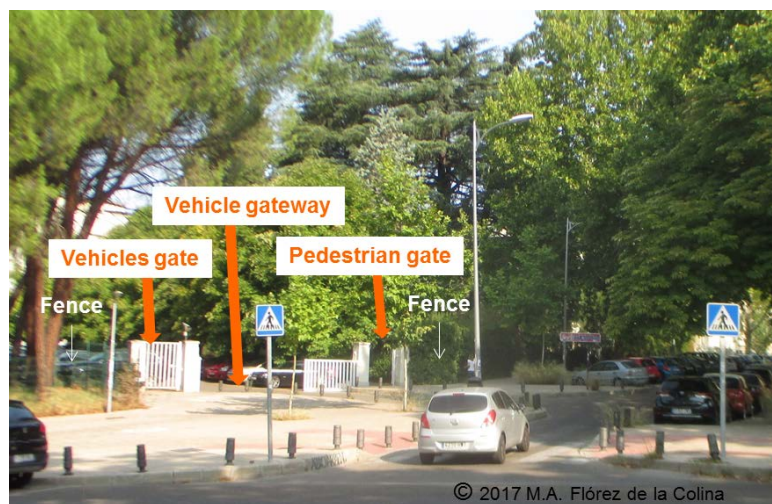
Gate as a term (in building and civil engineering):

- a) A device to prevent or control the entry or exit of individuals to a space which is enclosed by walls or fences, that can be swung, drawn, or lowered to block an entrance or a passageway.
- b) An opening permitting passage into or out through an enclosure, a path or way usually called **gateway**.
- c) The structure surrounding such an opening, for defending or adorning, for providing a fortified or monumental entrance to a palace, a walled city, a park, a street...

Types of Gates



Monumental gate: structure surrounding a gateway for providing a monumental entrance to a palace, a park, a city...



Vehicle gateway: opening permitting passage of cars into or out, through an enclosure.

Pedestrian gate: device to prevent or control the entry or exit of individuals into or out, through an enclosure; also **walkway** through the opening allowing passage.

1.6. SUSTAINABILITY

Sustainability is a broad concept having differing interpretations. In construction it denotes the preservation of the **environment** and the efficient use of **resources**.

The commercial and residential building sector is responsible for 39% of **carbon dioxide** emissions in the United States per year, more than any other sector, and in China this figure increases. Most of these emissions come from the combustion of fossils to provide heating, cooling and lighting in a building.

In general, buildings in developing countries account for more than 38% of **energy consumption** over their lifetime. In addition to this problem more than half of the world's population live in **urban environments**, so sustainable building has become vital at present.

The aim of sustainable construction is to meet present needs for housing, working environments and infrastructure without compromising the future generations. It involves

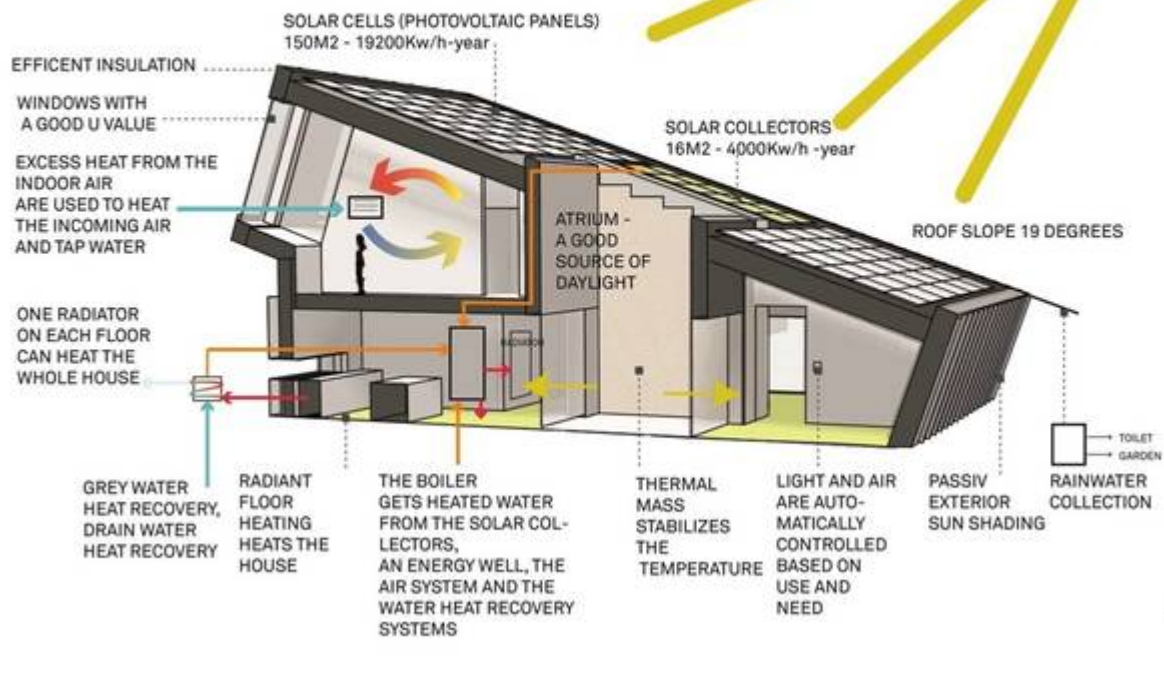
issues such as the design and **management of buildings**; **materials performance**, construction technology and processes; energy and resource efficiency in building, and operation and maintenance.

Sustainable building, also called green building or green construction refers to both a structure and the application of processes that are environmentally responsible and resource efficient throughout a **building's life-cycle**, from planning to design, construction, operation, maintenance, renovation, and demolition.

Sustainable building requires close cooperation of the people involved in the construction such as the contractors, the architects, the engineers, and the clients at all **project stages**. These should be capable of being maintained at a steady level without exhausting natural resources or causing severe ecological damage. Consequently, it is the use of resources in a more efficient, environmentally friendly way.

Sustainable construction means also using materials that are naturally obtained and readily available, which may include using recycled materials, reducing needs for lighting, etc.

The United States Green Building Council devised a rating system to evaluate the environmental performance of a building is called **LEED certification** (Leadership in Energy and Environmental Design). It was launched to accelerate the development and implementation of green practices. Have a look at the sustainable house below:



1.7. POLYSEMY

Some of the terms we have seen in this module are polisemic, that is to say, they have more than one meaning. Sometimes, the semantic field is the same in English and Spanish, as in the first example below. We say 'mortar' in English, or 'motero' in Spanish interchangeably.

It is equally used in different fields in both languages:

- A mixture of lime or cement with sand and water, used to hold stones or bricks together,
- A container in which substances can be ground with a pestle,
- A short cannon for throwing shells at high angles.

Have a look at the illustration below:

**BASIC ENGLISH TERMINOLOGY FOR
BUILDING AND CIVIL ENGINEERING CONSTRUCTION**

Polysemy

mortero 🇪🇸 mortar 🇬🇧

brick masonry grinding bowl weapon

However, the problem comes when the semantic field of a word does not coincide in both languages. For example in Spanish the word 'planta' is very polysemic, but not that much in English. We use it in architecture with two senses two senses:

- a) Level, floor, story
- b) Floor plan

It has other meanings in other fields, see example below:

**BASIC ENGLISH TERMINOLOGY FOR
BUILDING AND CIVIL ENGINEERING CONSTRUCTION**

Polysemy (cont)

planta 🇪🇸

a. story, level, floor (arch) 

b. floor plan (arch) 


sole plant (factory) plant

1.8. FALSE CONGNATES

Another difficult case when comparing two languages is the false cognates or false friends, that is to say, words that seem similar in both languages, but they are different. Look at the examples bellow:


- 'Facility' in English is not 'facilidad' in Spanish, but 'instalación'.
- 'Fábrica' in Spanish is not fabric, but factory.

**BASIC ENGLISH TERMINOLOGY FOR
BUILDING AND CIVIL ENGINEERING CONSTRUCTION**


 **mooe**
Universidad Politécnica de Madrid

False cognates

SPANISH	LOOKS LIKE ENGLISH WORD	BUT MEANS	EQUIVALENT IN SPANISH
facilidad	facility	ease	instalación
fábrica	fabric	factory	tela, tejido



factory



fabric