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INDUSTRIAL PLANTS

Chapter eight:

The industrial buildings – second part

DOUBLE DEGREE MASTER IN

“PRODUCTION ENGINEERING AND MANAGEMENT”

SEAT OF PORDENONE

UNIVERSITY OF TRIESTE

Main parts of an industrial building

An **industrial building** is essentially composed of the following parts:

a) **foundations of the building and machineries**

The foundations of the **machineries** are subjected to the action of **dynamic forces**.

They must ensure the **anchoring** of machinery.

They must avoid putting into **resonance** and vibration transmission to the ground and the structures of the building: for such purposes, foundations are made with a **large mass**, and use **elastic supports** and **antivibration** from machinery and foundations.

Main parts of an industrial building

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a) foundations of the building and machineries

Main parts of an industrial building

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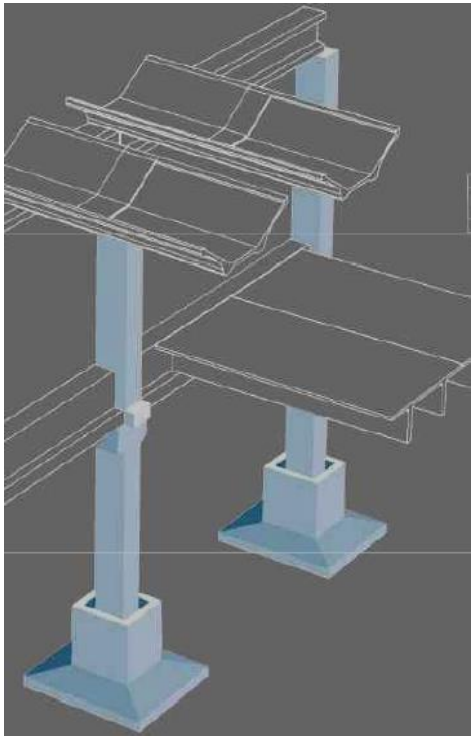
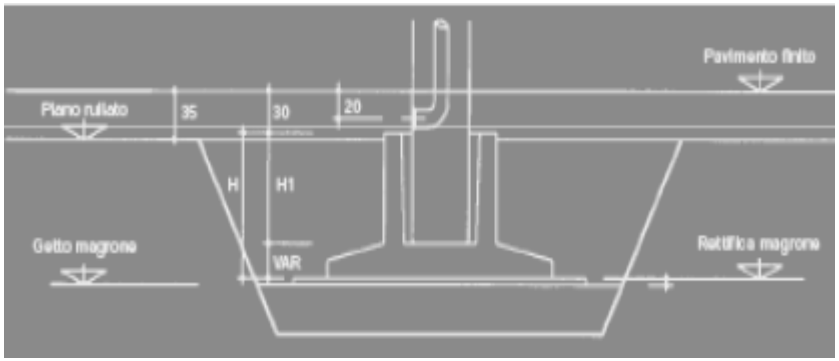
a) foundations of the building and machineries

The foundations of the building best known are: **continuous, at plinth, on poles and at concrete bed**.





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a) foundations of the building and machineries

The **soils** can distinguish between:

- **compacted soils**, such as rocks, whose rate of work is higher than the stress transmitted from foundations
- **loose soils** (sand, clay etc.), whose mechanical properties must be defined in advance;
- **unpacked soils**, on which the foundations require special works (poles, slabs etc.);

Main parts of an industrial building

An **industrial building** is essentially composed of the following parts:

b) bearing structures

The dimensioning of the structures of an industrial building, in addition to meet the **criteria of economy**, must take into account, in particular, of the following stresses:

- **permanent or fixed load** (weight just of structures);
- **seismic overloads**;
- **overhead** consists of the **wind** and **snow**;
- overhead consists of giving any **suspended loads**, such as transportation, pipelines etc.;

Main parts of an industrial building

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b) bearing structures

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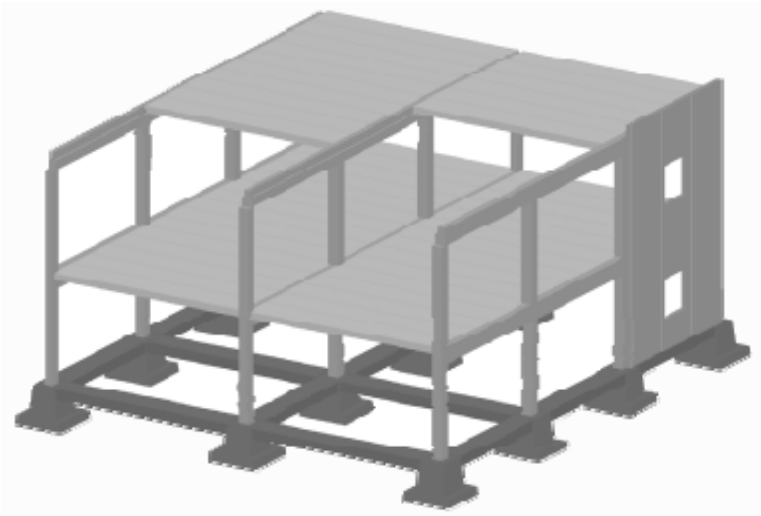

Main parts of an industrial building

An **industrial building** is essentially composed of the following parts:

c) coverings and walls (complete with doors, windows, doors etc.)

The constructive features of the coverings and walls of buildings are established taking into account not only of the weight and ease of installation and maintenance, of the following factors:

- the natural lighting of the area below;
- the acclimatization of the environment (namely the creation of a suitable environmental climate).

The trend today is recorded in the field of industrial coverings is directed to the construction of **lightweight structures** made of **prefabricated elements**, this is because:

- search of the minimum cost of construction;
- reduce the weights imposed on the supporting structures;
- attenuates the effects of explosions, fires, etc.

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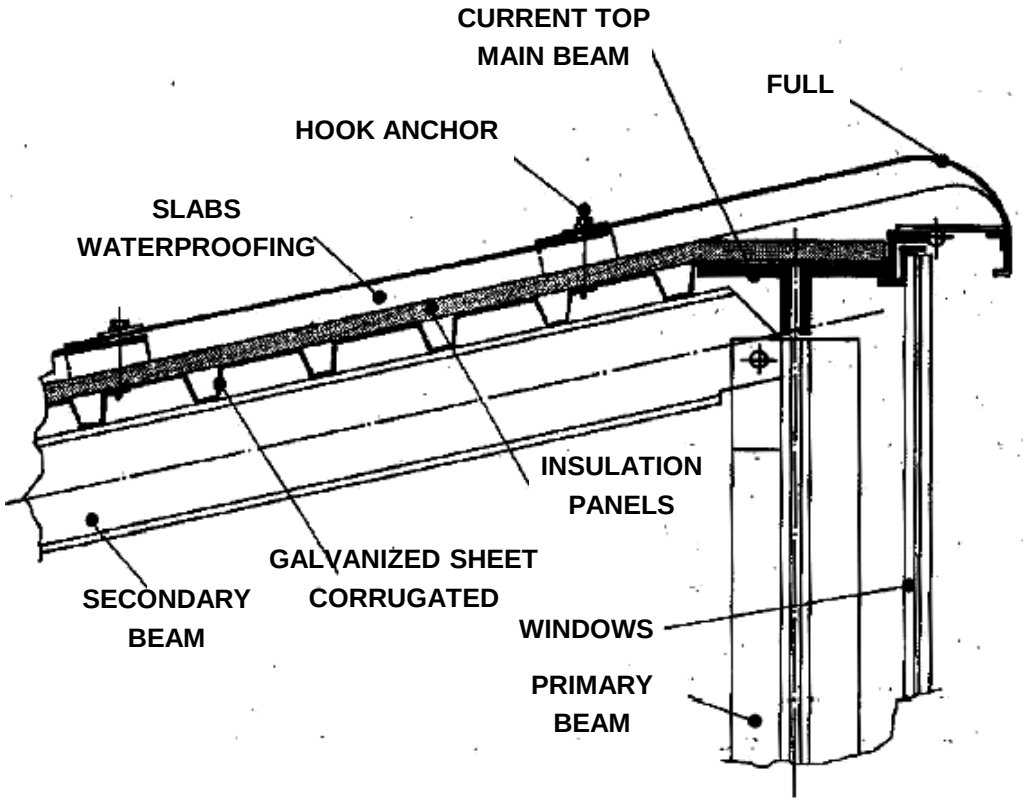

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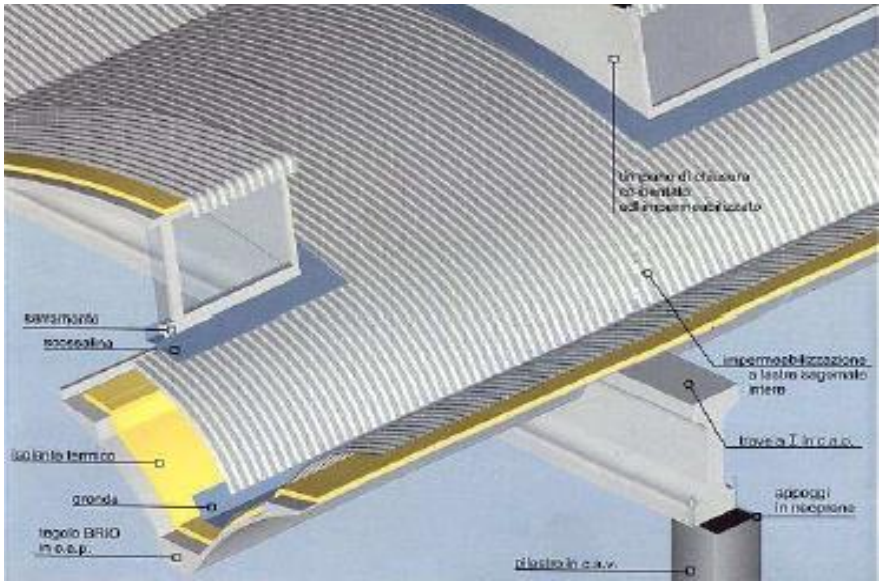

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There are various types of wall of current use.

One must distinguish between *exterior walls* and *interior walls* or *dividers*.

The **exteriuor walls** have the function to isolate, from the outside, the internal environment of a building.

The **interior walls** divide between them different premises of the same building.

The **exterior walls**:

- protect the workplace from the weather;
- provide thermal and acoustic insulation;
- allow natural light through windows.

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The desired characteristics of the external walls are:

- insulation and high thermal capacity;
- low permeability;
- allow a good lighting.

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The types of construction of the *exterior wall*:

- may be of traditional type and, if so, their characteristics do not deviate from those of the walls of civil buildings;
- are built with bricks in brick solid or semisolid, with or without plaster, pumice, in concrete mixes etc.

The use of prefabricated structures can reduce the manpower effort.

Important for the building industry are the interior walls and their insulation.

Main parts of an industrial building

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c) coverings and walls (complete with doors, windows, doors etc.)

It makes use of wall coverings and ceiling panels made of sound absorbing materials: installing panels in perforated sheet metal or plaster with a small pad of glass wool placed against or slightly spaced from the panels, or wood fibers, synthetic fibers etc.

The partition walls are made with materials having a high inertia (such as solid bricks), which can reduce noise.

Main parts of an industrial building

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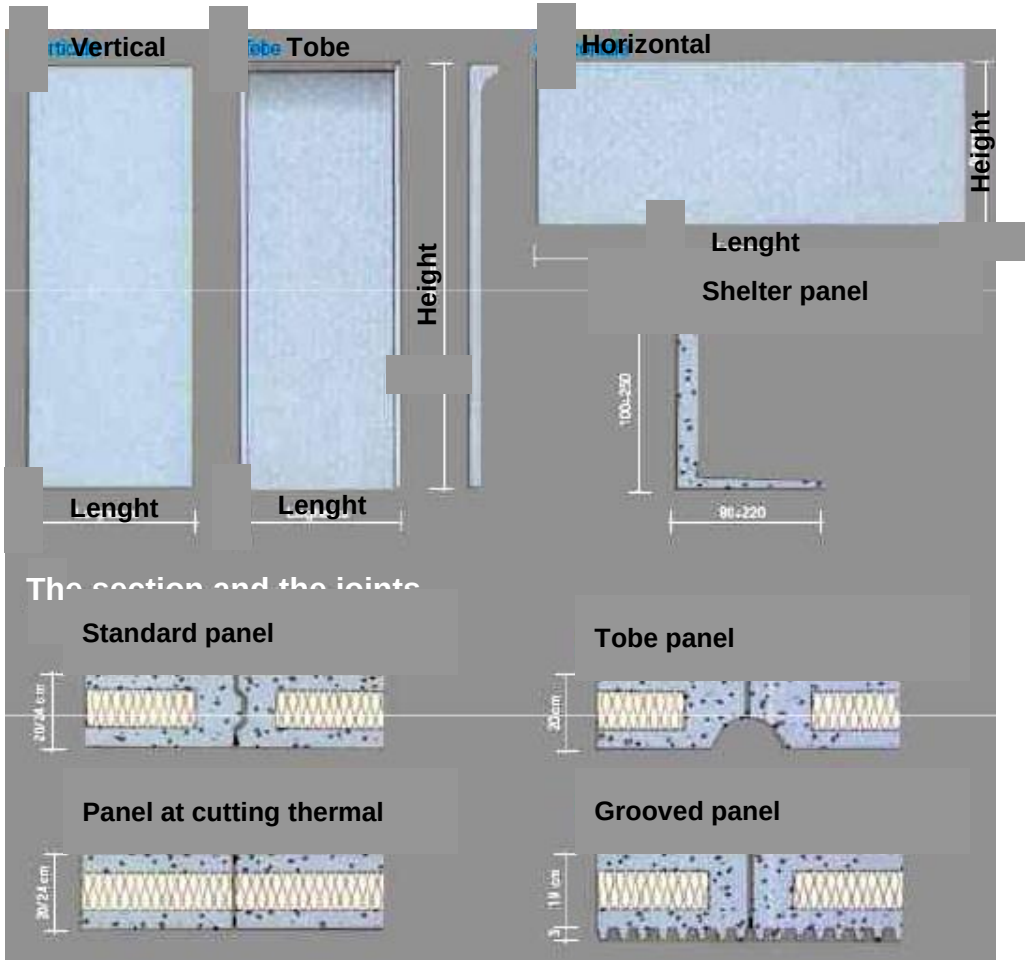
c) coverings and walls (complete with doors, windows, doors etc.)

Inner walls prefabricated



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Inner walls prefabricated

Main parts of an industrial building

An **industrial building** is essentially composed of the following parts:

d) floors

The essential requirements of the floors are:

- resistance to shock and vibration, which is the most important technical requirement;
- lower costs, both materials that the installation;
- not slippery;
- good noises absorption;
- insulation against heat and cold;
- elasticity to prevent breakage of tools and other delicate materials and precious;
- antidust;
- ease of maintenance, repair and cleaning;
- ease of installation of machinery.

Main parts of an industrial building

An **industrial building** is essentially composed of the following parts:

d) floors

The floors must have industrial strength characteristics superior to those of offices and residential buildings in general.

There are:

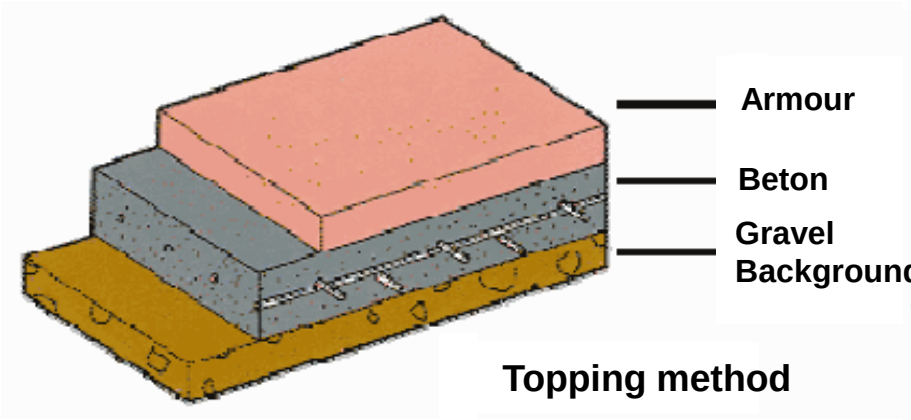
- floors for *processing departments or stores*. These floors are subjected to the continued passage of heavy means of transport, the fall of materials etc.;
- floors subject to *chemical agents*;
- floors for offices, canteens, services, etc.

Main parts of an industrial building

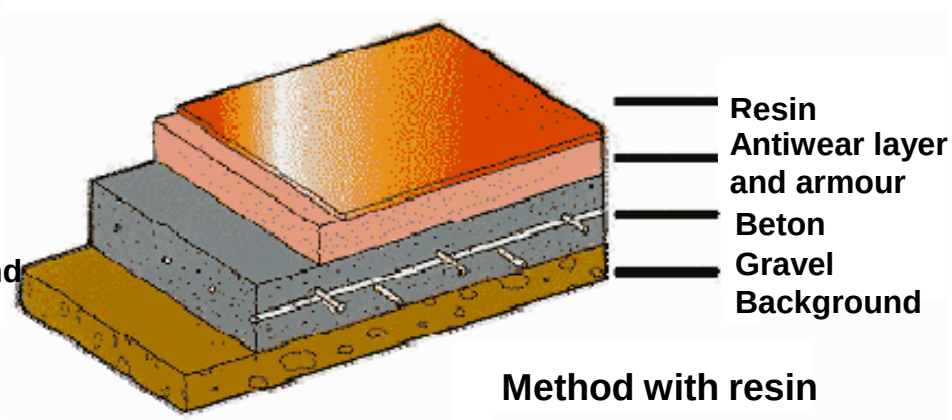
An **industrial building** is essentially composed of the following parts:

d) floors

Section with an industrial floor topping method and method with resin



Topping method



Method with resin

Main parts of an industrial building

An **industrial building** is essentially composed of the following parts:

e) miscellaneous structures

Are part:

- **gates**, along the fence of the factory, and **doors and gates** along the buildings. Their size and characteristics depend on the type and the amount of traffic that the crosses

Main parts of an industrial building

An **industrial building** is essentially composed of the following parts:

e) miscellaneous structures

Are part:

- **scales**, which must be carefully designed to avoid a barrier in view of the circulation of materials and persons;

Main parts of an industrial building

An **industrial building** is essentially composed of the following parts:

e) miscellaneous structures

Are part:

- **frames**, which must be robust and easy to the maintenance, with adjustable parts so that the air that enters the room is facing upwards. If the frames are passed from the sunlight they should not get at jobs;

Main parts of an industrial building

An **industrial building** is essentially composed of the following parts:

e) miscellaneous structures

Are part:

- **discharges of rainwater**, which collect the rainwater that falls on the roof of the building and that air to gutters and flashings, and through the rain (down pipes) are discharged into the sewer system;
- **drainage**, allowing the evacuation of rain water white or black or cloacal and technological and industrial. The evacuation of the three types of networks are separated. The discharge of white water can be performed directly in water or public sewer. The sewage may be discharged into public sewer, provided that the flow does not exceed certain values in relation to the disposal capacity of the sewer, while the discharge into surface water discharge must meet the regulatory requirements;

Main parts of an industrial building

An **industrial building** is essentially composed of the following parts:

e) miscellaneous structures

Are part:

- **drainage**: The waters technological instead must be treated in an appropriate facility before being released into surface waters or drainage system.