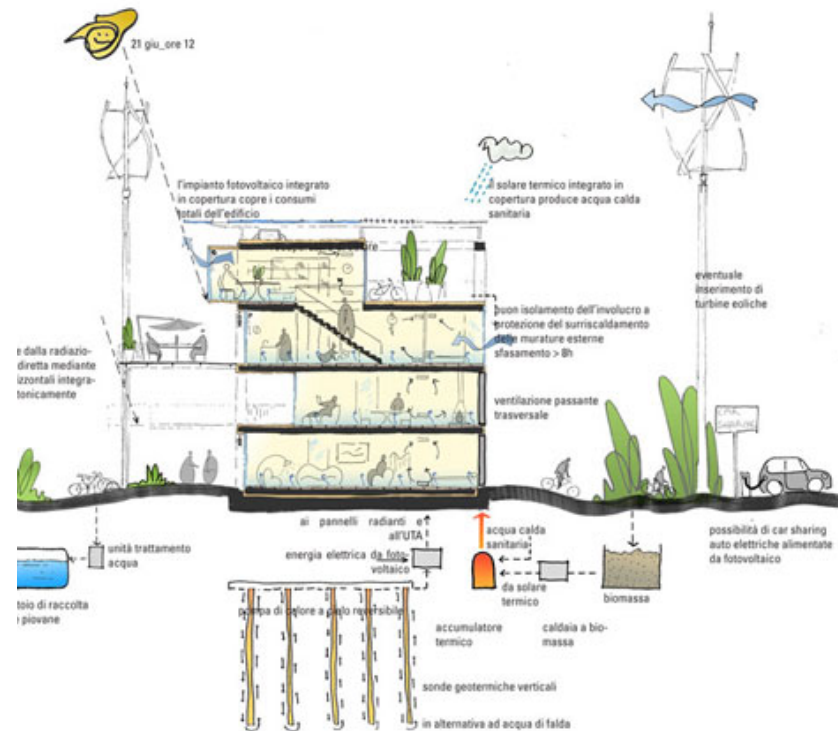


Materials for Architecture and Technological Innovation (6 CFU)

Materials Technologies for the Environment (6 CFU)

Prof. Alberto De Capua



MpA 3 Construction System

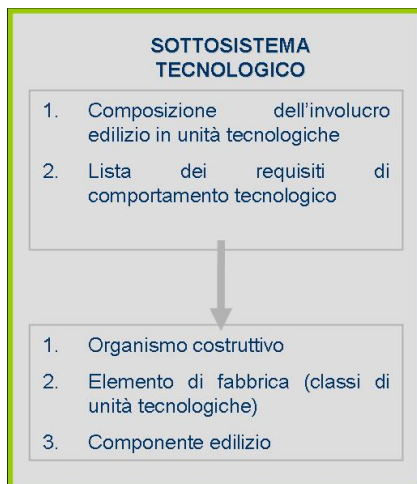
- Building System
- Technological System

Building system

The building is not a simple sum of spaces, technical elements, materials and systems, but it is a system in which each element relates to the other in a complex way to meet the needs of users.

It is a BUILDING ORGANISM and that is a structured set of spatial elements and technical elements, internal and external, relevant to the building, characterized by their functions and their mutual relations, designed to meet the needs of housing.

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BUILDING SYSTEM means all the parts that make up a building work. It is the structured whole of

environmental units/spatial elements (environmental system or environmental subsystem)

and

corresponding technological units/technological elements (technological system or subsystem).

The building system is a way of materializing a certain form, specifying the role of the different parts in order to:

delimiting, defining and classifying space;

to guarantee safety conditions;

to ensure the well-being of the living environment.

Technological system and manual classification of Petrignani



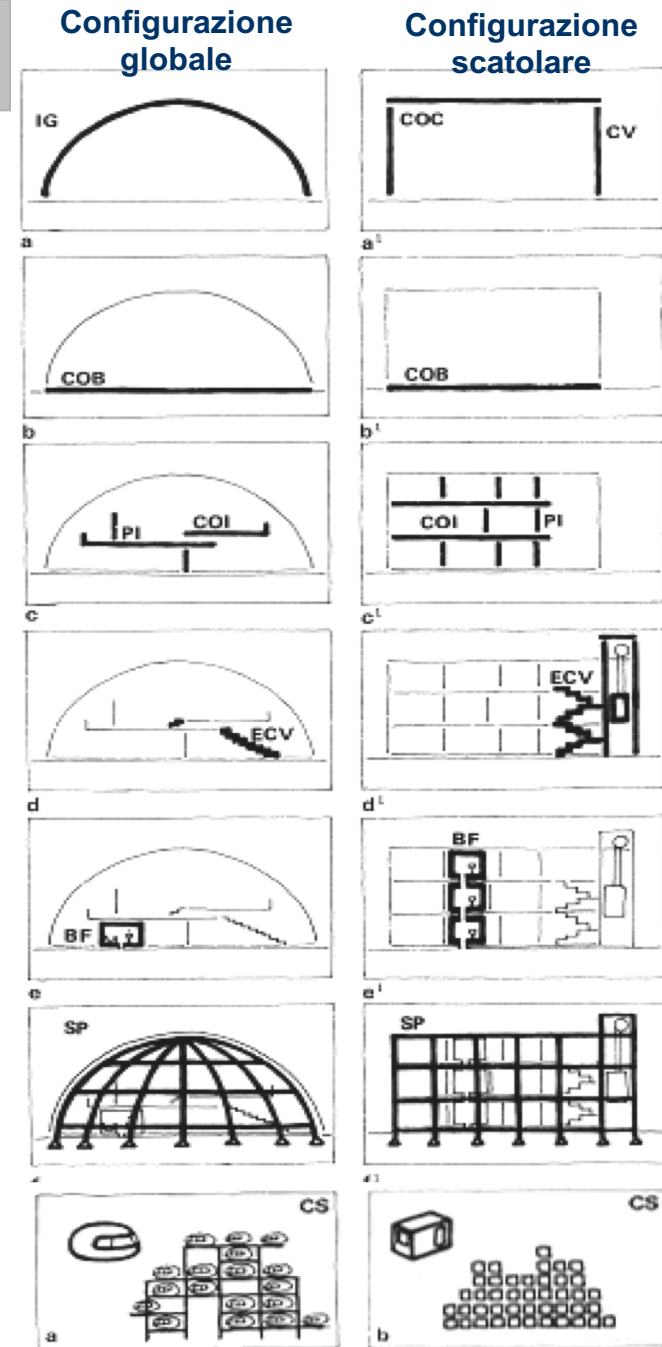
For the purpose of the delimitation and classification of the space, the apparatus-involvulus can present itself in two different forms:

- Global geometry
- Box geometry

It is in the second case, that is in the box geometry, that the parts are distinguished:

- CV vertical closures
- CO horizontal closures
- PI internal partitions
- ECV vertical communication elements
- SP load-bearing skeleton
- BF function blocks
- CS space cells

These parts constitute the components of the CONSTRUCTIONAL BODY



Technological system and classification UNI 8290

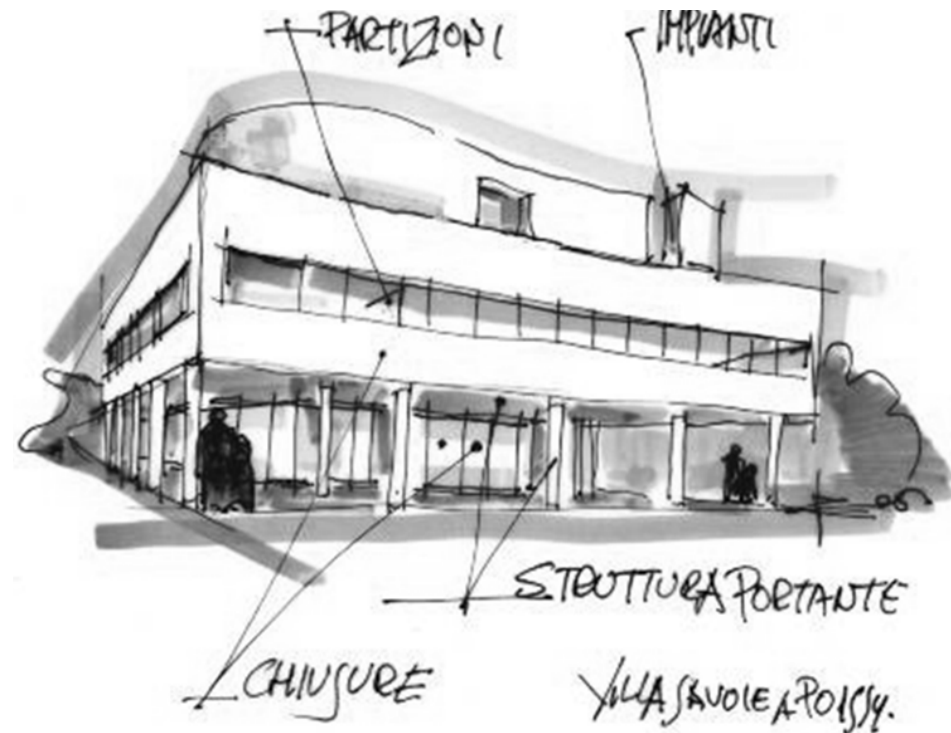
The UNI 8290 standard provides the classification and articulation of the technological units and technical elements that make up the TECHNOLOGICAL SYSTEM.

The decomposition defines three levels and gives rise to three sets called:

**1 Classes of technological units
(factory elements).**

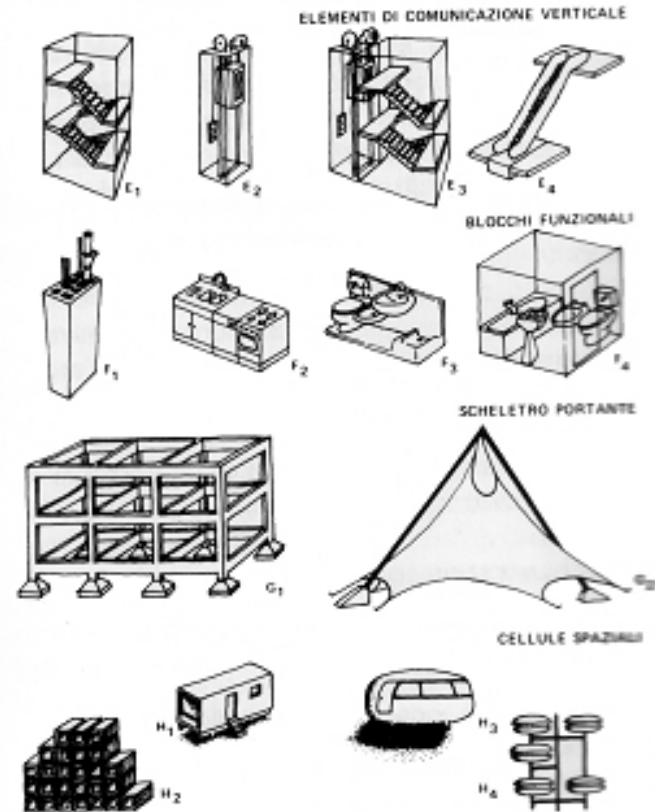
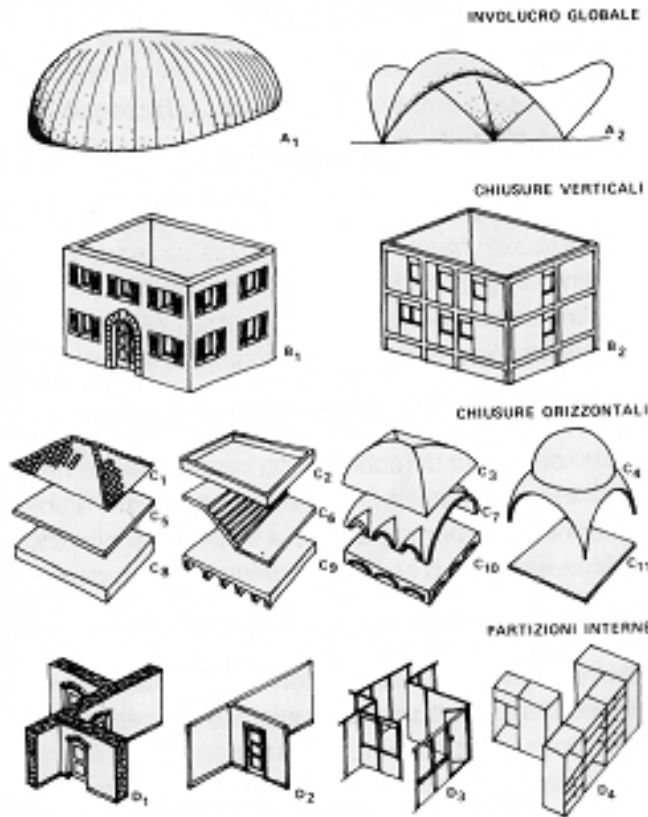
**2. Technological units: grouping of
technologically compatible functions
necessary to achieve predetermined
performance.**

**3. Classes Technical elements:
elements capable of performing, in
whole or in part, functions specific to
one or more technological units.**

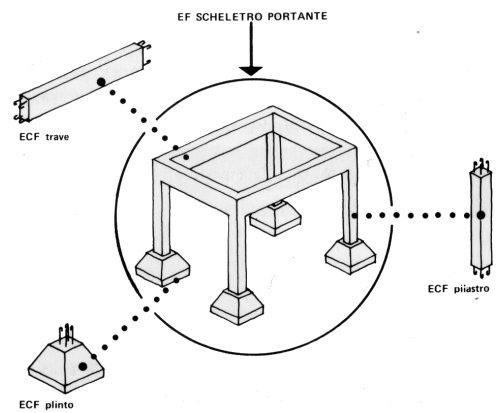
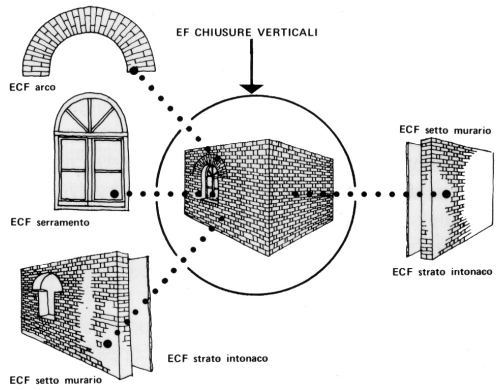
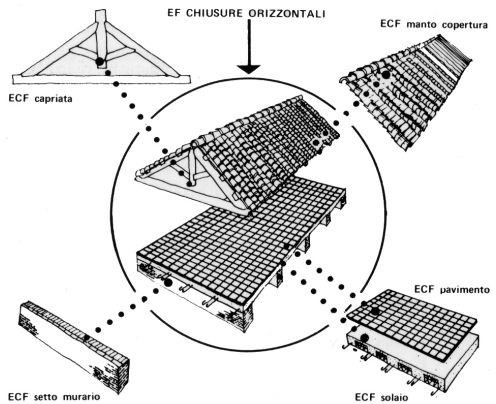


Technological System and Classification UNI 8290

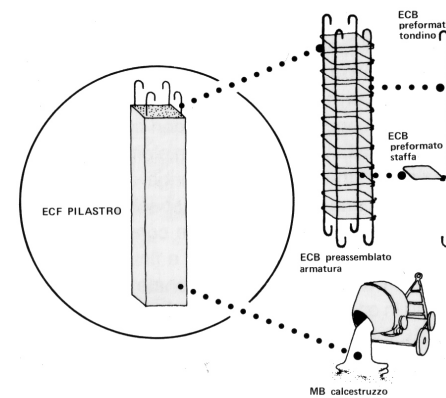
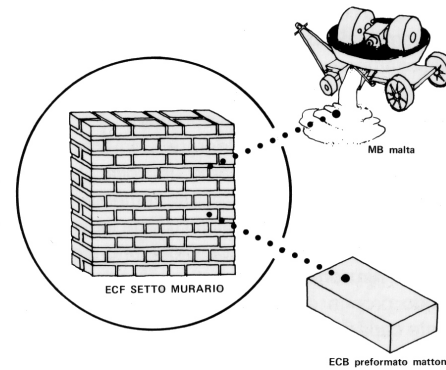
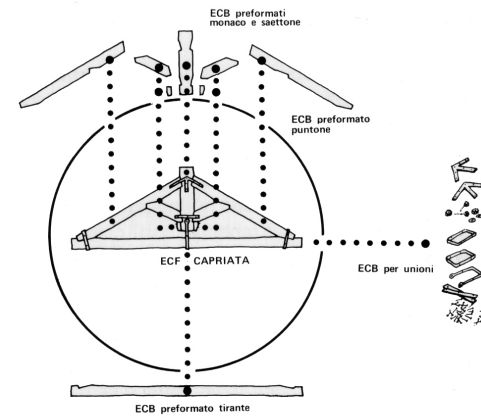
Supporting structure	Foundation Structure	Structure of direct foundations	
		Structure of indirect foundations	
	Elevation structure	Containment structure	Vertical elevation structure
			Horizontal and inclined elevation structure
Spatial elevation structure			
Vertical closure	Horizontal lower closure	Vertical containment structure	
		Horizontal containment structure	
Closures	Vertical closure	Vertical perimeter walls	
		Vertical perimeter walls	
	Horizontal lower closure	External vertical frames	
		Floor slabs on the ground	
		Horizontal windows	
Horizontal closing on outdoor spaces	Ceilings on outdoor spaces		
Top closure	Roofing		
Internal partitions	Vertical internal partition	External horizontal fixtures	
	Horizontal internal partition	Vertical internal walls	
		Vertical interior doors	
		Protective elements	
	Inclined internal partition	attics	
Mezzanines			
Horizontal interior fixtures			
External partition	Vertical external partition	Internal stairs	
		Internal ramps	
	Horizontal external partition	Protective elements	
		Separating elements	
Inclined external partition	Balconies or loggias		
	Walkways		
	External stairs		
	External ramps		



Classification of technological units (factory elements).



factory element as a whole
correlated with functional building elements



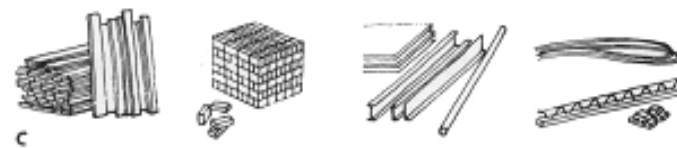
functional construction element as a whole
of basic components and basic materials



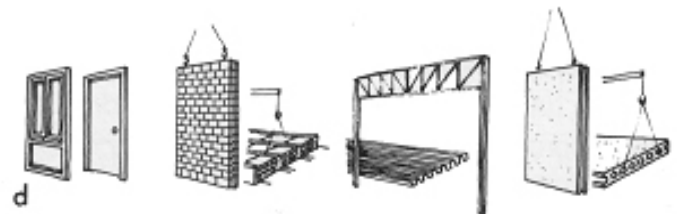
feedstock



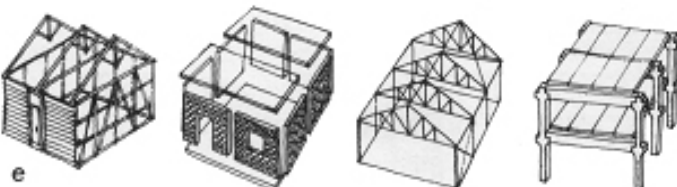
loose or pre-packaged basic materials



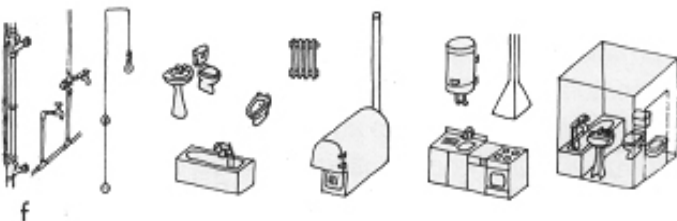
preformed or pre-assembled basic elements and components



functional elements and components



prefabricated factory elements in the workshop



facilities

materiali da costruzione disponibili sul mercato

Standard UNI 8290 (II PART): Requirements for technical elements

Requirements for technical elements:

- Reliability
- Asepticity
- Acoustic absorption
- Ability to integrate
- Plant engineering
- Attractibility
- Convenient operation and manoeuvring
- Comprehensibility of manoeuvres
- Ease of intervention control
- Water repellency
- Water resistance to airborne fluids
- Liquid impermeability
- Acoustic insulation
- Thermal insulation
- Limitation of explosion risks
- Maintainability
- Cleanability
- Reaction to fire
- Recoverability
- Adjustable
- Resistance
- Reparability
- Disposal of harmful gases
- Substitutability
- Stability
- Sealing
- Ventilation

Riferimenti bibliografici

- Asimov M., *Principi di progettazione*, Marsilio ed., Padova 1968,
- Nardi G., *Le nuove radici antiche*, F. Angeli ed., Milano 1986.
- Blachère G., *Saper costruire*, Hoepli, Milano, 1971.
- Quaroni L., *Progettare un edificio*, Mazzotta, Milano 1977.
- Mandolesi E., *Edilizia*, vol. 1, Hoepli, Milano, 1978-82
- Blachère G., Sinopoli N., Laner F., Manfron V., Roccatagliata G., Zennaro P., *Qualità norma e progetto*.
Arsenale Editrice Venezia, 1988.
- Boaga G., *Tecnologia delle costruzioni*, ed. Calderini, Bologna, 1990.
- Nardi G., *Tecnologie dell'architettura*, Clup, Milano, 2001.
- Sinopoli N., Tatano V., *Sulle tracce dell'innovazione. Tra tecnica e architettura*. F. Angeli, Milano, 2002.
- De Capua A., *Nuovi paradigmi per il progetto sostenibile. Contestualità, Adattabilità, Durata, Dismissione*, Gangemi, Roma, 2002.