3. Constructions Systems of Multi-Storey Buildings











Basic Classification of Construction Systems of Multi-Storey Buildings

- According to the type of vertical load-bearing structures
 - Wall construction system
 - Column construction system (skeleton construction system)
 - Combined construction system
 - Core structures
 - Superconstruction
- The construction system of multi-storey buildings is characterized by the predominance of vertical load-bearing structures, transferring all loads to the foundation soil.









Wall Construction System

Longitudinal construction systém

• The load-bearing walls are arranged parallel to the longitudinal axis to form longitudinal tracts. The ceiling structure is normally laid in a direction perpendicular to the longitudinal axis of the building.

Transverse construction systém

• The load-bearing walls are perpendicular to the longitudinal axis of the building and form transverse tracts. The ceiling construction is realized in the longitudinal direction.

Two-way construction systém

• In the case of a two-way (bi-directional) construction system, the supporting walls are arranged in the longitudinal and transverse directions.







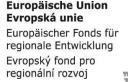


Column Construction System – Skeleton System

- Principle of the column system consists in separating the load-bearing function and the function of cladding.
- According to the method of transferring the load, the column system is divided - Frame skeleton system x Flat slab with column capital skeleton system x Flat slab skeleton system.
- The basic element of the frame skeleton is a frame made up of two columns and a beam:
 - Longitudinal frames the beams are parallel to the longitudinal axis.
 - Transverse frames the beams are perpendicular to the longitudinal axis.
 - Two-way frames The beams are positioned in the transverse and longitudinal directions.











Combined Construction Systems

- Combined construction systems can be implemented in a number of variations:
 - Combination of longitudinal wall system with inner column system
 - Combination of transverse wall system with inner column system
 - Combination of transverse and longitudinal walls with inner column system
 - Combination of two-way (bidirectional) column system with inner core
- The combination of load-bearing walls and columns creates diverse spatial formations with high stiffness and minimum weight









Core Construcion System

- The core construction system transfers the load to the building foundation with a central stiff core. The construction of individual floors of core systems can be carried:
 - Primary lower horizontal supporting structure cantilevered overhang from the parterre core which carries the secondary uprights upper floors.
 - Primary upper support structure disposed in the core head, on which the ceilings of the lower floors are suspended.
 - Ceilings individually executed from the core into which all loads are transmitted directly.







Superconstruction

- **Superconstruction** are two-stage building constructions that arise by concentrating loads into a limited number of massive elements of the main (primary) supporting structure into which a secondary (secondary) structure is inserted.
- The primary load-bearing structure is typically formed of a superframe by which each floor having a height corresponding to the height of several storeys inserted.



