

9. Vertical Load-Bearing Masonry Structures

Vertical Load-bearing Masonry Structures

- The basic function of **vertical load-bearing structures** is to transfer all loads from horizontal structures to the foundations of the object and stiffened the object. Other features may be dividing, thermal, acoustic, fireproof or aesthetic. Structures: **the walls, the columns, the pillar.**
- **The masonry structures** are made of individual natural or artificial masonry elements connected by mortar or laid dry. According to the **type of masonry element used**, there are brick masonry, block masonry, stone masonry and mixed masonry.

Brick Masonry

- Bricks are manufactured in various materials and dimensional formats with holes or without holes.
- The **classic brick bond** is characterized by:
 - A masonry pieces that are placed in horizontal layers
 - Head joints should be shifted in two layers above each other
 - Bed joints and head joins should be completely filled with mortar
- Classic masonry bonding includes **stretcher bond** (by $\frac{1}{2}$ bricks), **header bond** (by $\frac{1}{4}$ bricks) and **English bond** (by $\frac{1}{2}$ bricks, in the longitudinal direction by $\frac{1}{4}$ bricks).

Block Masonry

- **Block masonry** have evolved from brick masonry in response to stricter thermal technical requirements. Blocks are made from lightweight concrete, diatomaceous earth, slag, fly ash, etc.
- **Ceramic blocks.** With the latest types, blocks are already filled with heat insulating material (EPS, mineral wool) from production.
- **Lightweight concrete blocks.** The products have high precision and can be bonded dry in the head joints without the use of mortar or can be bonded by tongue and groove.

Stone Masonry

- Natural **stone masonry** is currently not used widely. The disadvantage is mainly its density, difficult and costly workability, poor thermal insulation properties and airtightness.
 - **Random rubble masonry** is used for base structures and plinths.
 - **Squared rubble masonry** is made of partially worked stones.
 - **Polygonal rubble masonry** is used for terrain and decorative purposes.
 - **Ashlar masonry** is made from machined stones of prescribed shapes and dimensions.

Mixed Masonry

- **Mixed masonry** is a combination of two or more building materials in one construction unit. Typically, this is a combination of bricks and stones, bricks and concrete, concrete and stone, blocks and concrete. The advantage of mixed masonry is the possibility of using the advantages of individual materials, such as the aesthetic effect of stone on the outer face of the building and high strength of concrete.