

What Is Stone and Masonry Construction?

Worksheet

Stone masonry is construction using natural stone blocks laid in coursed or random patterns, typically bonded with mortar, valued for compressive strength, thermal mass and durability.

Questions

1. What distinguishes ashlar masonry from rubble masonry?

- A) Ashlar uses precisely cut, squared stones
- B) Ashlar is always unmortared
- C) Rubble is always stronger
- D) Rubble uses only bricks

2. Stone is structurally strongest in

- A) Tension
- B) Bending
- C) Compression
- D) Shear

3. Using $P=A\sigma$, a stone wall with $\sigma=5$ MPa and $A=0.2$ m can carry

- A) 1000 kN
- B) 100 kN
- C) 10 kN
- D) 10000 kN

4. Which stone type is prized for its fine grain and use in sculpture and cladding?

- A) Marble
- B) Sandstone
- C) Slate
- D) Granite

5. Using $P=A\sigma$, find the axial load capacity of a stone pier with allowable stress 8 MPa and cross-section 0.4 m.

6. A limestone wall section is 600 mm wide 500 mm thick (cross-section area). Allowable stress is 6 MPa. Find load capacity.

7. An ashlar granite column has area 0.25 m and needs to support 2000 kN. What minimum allowable stress is required?

8. Define: What is stone masonry?

9. Define: What's the difference between ashlar and rubble masonry?

10. Define: Why is stone valued as a building material?

Answer Key

1. A) Ashlar uses precisely cut, squared stones - Ashlar masonry uses precisely cut, squared stone blocks with tight uniform joints.
2. C) Compression - Stone has high compressive strength but low tensile strength.
3. A) $1000 \text{ kN} - P = 5 \cdot 0.2 \cdot 1000 = 1000 \text{ kN}$.
4. A) Marble - Marble is known for its fine grain, workability and use in decorative cladding and sculpture.
5. $P = A \cdot 1000 \text{ P} = 8 \cdot 0.4 \cdot 1000 \text{ P} = 3200 \text{ kN}$
6. $A = 0.6 \text{ m} \cdot 0.5 \text{ m} = 0.3 \text{ m} \text{ P} = 6 \cdot 0.3 \cdot 1000 \text{ P} = 1800 \text{ kN}$
7. $P = A \cdot 1000 \cdot 2000 = 0.25 \cdot 1000 = 2000 / 250 = 8 \text{ MPa}$
8. Construction using natural stone blocks, typically bonded with mortar, laid in coursed or random patterns.
9. Ashlar uses precisely cut, squared stones with tight joints; rubble uses roughly shaped stones with irregular joints.
10. High compressive strength, thermal mass, durability and fire resistance.

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