What is Concrete and Reinforced Concrete?

Worksheet

Reinforced concrete is concrete cast around steel reinforcing bars; the concrete resists compression while the embedded steel resists tension, letting the composite material span, bend and carry loads that plain concrete alone could not.

Questions

1. What is concrete weak against on its own?

A) Compression
B) Tension
C) Weight
D) Color fading

2. What does rebar stand for in construction?

A) Reinforcing bar
B) Recycled bar
C) Rebound bar
D) Retention bar

3. Which step comes first in reinforced concrete construction?

A) Curing
B) Formwork
C) Formwork removal
D) Pouring

4. Why are stirrups (ties) used around vertical rebar in a column?

A) To add color
B) To confine the core and prevent bar buckling
C) To reduce cement use
D) To speed up curing

5. A concrete slab is poured over a rebar grid spaced 200mm apart. Why not just use plain concrete?

6. The Hoover Dam used massive plain concrete pours instead of thin reinforced sections. Why?

7. A reinforced concrete column carries a 500 kN load. What role does the rebar cage play?

8. Define: What is concrete made of?

9. Define: What is reinforced concrete?

10. Define: Why does concrete need steel reinforcement?

Answer Key

1. B) Tension - Plain concrete resists compression well but cracks easily under tension.

2. A) Reinforcing bar - Rebar is short for reinforcing bar, the steel embedded in concrete.

3. B) Formwork - Formwork is built first to shape the concrete before rebar and pouring.

4. B) To confine the core and prevent bar buckling - Stirrups confine the concrete core and stop longitudinal bars from buckling.

5. Plain concrete resists compression well but is weak in tension Without rebar, the slab would crack and fail under bending loads Steel bars embedded near the tension face carry the tensile stress

6. Dams are primarily loaded in compression by water pressure Thick concrete masses resist compression without needing tensile reinforcement Hoover Dam's concrete is still curing internally due to its enormous 660,000 m volume

7. Rebar increases ductility, letting the column deform slightly before failure Spiral or tied stirrups confine the concrete core, boosting compressive capacity Without ties, the longitudinal bars could buckle outward under load

8. Cement, coarse and fine aggregate (gravel/sand), and water, mixed and cured into a solid mass.

9. Concrete cast around steel rebar so it resists both compression and tension.

10. Concrete is strong in compression but weak in tension; steel rebar carries the tensile forces.