

Aci 207 5r 11 report on roller compacted mass concrete

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Roller-Compacted Concrete**

What is Roller-Compacted Concrete (RCC)?

RCC is a type of zero-slump concrete that is compacted using heavy rollers. It is typically used in large-scale projects such as dams and pavement.

ACI Code for RCC:

The ACI code for RCC is ACI 327R "Roller-Compacted Mass Concrete."

Methodology of RCC:

1. Mixing: RCC is mixed in a concrete plant and delivered to the site.
2. Placement: RCC is placed in layers using a paver or spreader.
3. Compaction: The RCC is compacted using heavy rollers, such as vibratory rollers.

Advantages of RCC:

- Low cement content and cost
- Fast placement and compaction
- Excellent durability
- High strength

Disadvantages of RCC:

- Lack of workability
- Difficulty placing in thin sections
- Potential for cracking

Mass Concrete

ACI Requirements for Mass Concrete:

ACI defines mass concrete as concrete with a volume greater than 1 cubic yard (0.76 cubic meters) and meets the following criteria:

- Minimum dimension of 3 feet (0.91 meters)
- Minimum grade of 3,000 psi (20.7 MPa)
- Minimum cement content of 564 pounds per cubic yard (335 kg/cubic meter)

ACI Code for Mass Concrete:

The ACI code for mass concrete is ACI 117 "Standard Specifications for Tolerances for Concrete Construction and Materials and Commentary."

Difference between ACI 318 and ACI 332

- ACI 318: Building Code Requirements for Structural Concrete
- ACI 332: Code Requirements for Residential Concrete Buildings

Difference between ACI 301 and ACI 318

- ACI 301: Specifications for Structural Concrete
- ACI 318: Building Code Requirements for Structural Concrete

ACI in Concrete

ACI (American Concrete Institute) is a professional organization that develops and publishes codes and standards for concrete construction.

Roller-Compacted Concrete Applications

- Dams
- Pavements
- Embankments
- Slope protection

Strength of Roller-Compacted Concrete

RCC typically has a compressive strength of 3,000 to 6,000 psi (20.7 to 41.4 MPa).

Principle of Roller Compaction

Roller compaction uses heavy rollers to apply pressure and vibration to concrete, forcing the particles into a dense and cohesive mass.

Roller-Compacted Concrete Mix Ratio

RCC typically contains a low cement content of around 200 to 300 pounds per cubic yard (120 to 179 kg/cubic meter).

Slump for Roller-Compacted Concrete

RCC has a zero slump.

ACI Code Specifications

ACI code specifications provide guidelines for concrete design, construction, and inspection.

Latest ACI Code

The latest ACI code is ACI 318-19/318.2R-19 "Building Code Requirements for Structural Concrete/Commentary."

ACI 318 Code:

- ACI 318: Building Code Requirements for Structural Concrete
- ACI 318-14: Building Code Requirements for Structural Concrete 2014 Edition

- ACI 318-19: Building Code Requirements for Structural Concrete 2019 Edition
- ACI 318-89: Building Code Requirements for Reinforced Concrete, 1989 Edition

Mass Concrete Criteria:

- Volume greater than 1 cubic yard (0.76 cubic meters)
- Minimum dimension of 3 feet (0.91 meters)
- Minimum grade of 3,000 psi (20.7 MPa)
- Minimum cement content of 564 pounds per cubic yard (335 kg/cubic meter)

Self-Compacting Concrete

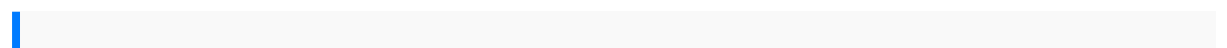
There is no specific code for self-compacting concrete, but it is covered by ACI 237R "Self-Consolidating Concrete."

ASTM Code for SCC:

ASTM C1611 "Standard Specification for Mixing Rooms, Concrete Mobile Equipment, and Accessories Used in the Production and Transportation of Concrete" contains specifications for SCC.

ASTM ACI 318

ASTM ACI 318 refers to the American Society for Testing and Materials (ASTM) publication of the ACI 318 building code.



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