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ROLLER-COMPACTED CONCRETE

INTEGRATED PAVING SOLUTIONS

WHAT IS IT?

Roller-compacted concrete (RCC) is an ultra-tough, zero-slump concrete with compressive strengths greater than 4,000 psi. It is placed with asphalt pavers to form a nonreinforced, concrete pavement. RCC successfully and economically combines strength and durability with ease of construction.

RCC consists of portland cement, coarse and fine aggregates, and water. RCC requires no forms, finishing, steel reinforcement or joint sawing. However, saw-cut joints can be easily created to offer an enhanced appearance and to help control cracking.

The Process

RCC takes its name from the method used to build it.

- **Mix** – An RCC mixing facility, such as a pug mill, tilt drum, or dry batch ready-mixed plant, must have the efficiency to evenly disperse the relatively small amount of water present in the stiff, dry mix which resembles damp gravel.
- **Transport** – Dump trucks transport the RCC mix from the plant to the conventional or high-density asphalt pavers.
- **Placement** – The mix is placed in layers (or lifts) 4-9 inches thick.
- **Compaction** – Steel drum vibratory rollers compact the concrete.

Compaction is the most important step in RCC construction because it provides density, strength, smoothness, and surface texture. The process begins immediately after placement and continues until the pavement meets density requirements. The pavement must be cured to ensure proper strength gain.

When to use it?

RCC pavement is best suited for low-speed, industrial or military applications such as intermodal yards, distribution centers, or equipment hardstands where surface smoothness and appearance are secondary to high durability, low maintenance, and low initial cost.

To improve surface smoothness and texture, RCC can be diamond ground or a thin asphalt or concrete overlay can be applied.

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Within the past decade, improvements for placing equipment and mix design have resulted in smoother, tighter pavements with good surface appearance, expanding RCC's application.

Can also be used for surfaces and rehabilitation of:

- Streets and local roads
- Residential streets
- High-volume intersections/roads (rehab)
- Industrial access roads
- Parking lots
- Highway shoulders
- Airport aprons and taxiways

Solutions Provided:

- **Low initial cost** – RCC is competitive with alternative pavement options on a first-cost basis.
- **High durability** – Resists rutting and will not deform under heavy, concentrated loads.
  - Resists deterioration from fuel and hydraulic fluid spills
  - Performs well in freeze-thaw climates
  - Supports heavy, repetitive loads without failure and spans localized, soft subgrade areas
- **Low maintenance** – Fewer associated costs
  - No need for surface sealing or overlays
- **Reduces down time** – Fast return to service and minimizes elevation changes for rehab projects

Features:

- **Fast construction** – With no forms or finishing and minimal labor, RCC is placed quickly
  - The low water-to-cement ratio and zero slumb consistency of the mix allows for quick strength gain.
- **Quick return to service** – RCC pavement can often be opened to local traffic in as little as 4 hours after placement and can accept heavy traffic 24-48 hours after placement.
- **Lighter surfaces** – Reduce urban heat island effect and lighting requirement for parking and storage areas.
- **Strong** – High flexural strength (500 to 1000 psi)
  - High compressive strength (4,000 to 10,000 psi)
  - High shear strength
  - Low shrinkage
- **Simple design/Construction** – No steel reinforcing or dowels
  - Aggregate interlock provides excellent load transfer, eliminating need for dowels.
  - No forms or finishing
  - Joint sawing is optional for aesthetic purposes

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