

The RIGHT Choice

FOR HEAVY-DUTY PAVEMENTS

RCC

ROLLER-COMPACTED CONCRETE

Strength and Economy

 PORTLAND CEMENT ASSOCIATION



The RIGHT Choice

FOR TOUGH DUTY

A DIFFERENT KIND OF CONCRETE

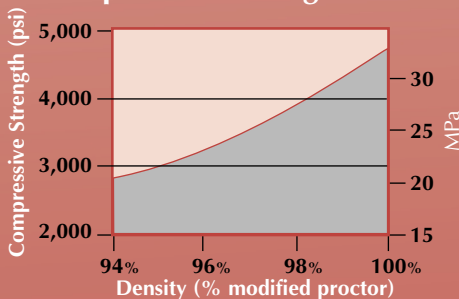
Roller-compacted concrete, or RCC, takes its name from the construction method used to build it. It's placed with conventional or high-density asphalt paving equipment, then compacted with rollers.

RCC has the same basic ingredients as conventional concrete: cement, water, and aggregates, such as gravel or crushed stone.

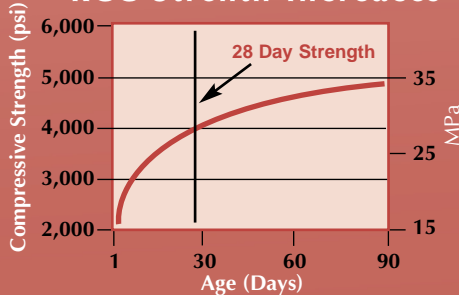
But unlike conventional concrete, it's a drier mix—stiff enough to be compacted by vibratory rollers. Typically, RCC is constructed without joints. It needs neither forms nor finishing, nor does it contain dowels or steel reinforcing.

These characteristics make RCC simple, fast, and economical.

High Density Ensures Superior Strength



RCC Strength Increases with Age



RCC

ROLLER-COMPACTED CONCRETE FOR HEAVY-DUTY PAVEMENTS

TOUGH. FAST. ECONOMICAL.

These qualities have taken roller-compacted concrete from specialized applications to mainstream pavement. Today, RCC is used for any type of industrial or heavy-duty pavement.

The reason is simple. RCC has the strength and performance of conventional concrete with the economy and simplicity of asphalt.

Coupled with long service life and minimal maintenance, RCC's low initial cost adds up to economy and value.

ROOTS IN LOGGING

Durability— even under severe loads— gave RCC pavements their start for log-sorting yards.



RCC got its start in the Seventies, when the Canadian logging industry switched to environmentally cleaner, land-based log-sorting methods.

The industry needed a strong pavement to stand up to massive loads and specialized equipment. Yet economy was equally important: log-sorting yards can span 40 acres (16 hectares) or more. RCC met this challenge and has since expanded to other heavy-duty applications.

Today, RCC is used when strength, durability, and economy are primary needs: Port, intermodal, and military facilities; parking, storage, and staging areas; streets, intersections, and low-speed roads.



RCC's economy of scale made it ideal for roads, parking, and staging areas at the Saturn Plant in Spring Hill, Tenn. At 135 acres, it's the largest RCC pavement project to date.

NO RUTTING, NO POT HOLES

The high strength of RCC pavements eliminates common and costly problems traditionally associated with asphalt pavements.

RCC pavements:

- Resist rutting
- Span soft localized subgrades
- Will not deform under heavy, concentrated loads
- Do not deteriorate from spills of fuels and hydraulic fluids
- Will not soften under high temperatures

UNIQUE MIX, UNIQUE CONSTRUCTION

RCC owes much of its economy to high-volume, high-speed construction methods.

Large-capacity mixers set the pace. Normally, RCC is blended in continuous-mixing pugmills at or near the construction site. These high-output pugmills have the mixing efficiency needed to evenly disperse the relatively small amount of water used.

Dump trucks transport the RCC and discharge it into an asphalt paver, which places the material in layers up to 10 inches (250 mm) thick and 42 feet (13 m) wide.

Compaction is the most important stage of construction: it provides density, strength, smoothness, and surface texture. Compaction begins immediately after placement and continues until the pavement meets density requirements.

Curing ensures a strong and durable pavement. As with any type of concrete, curing makes moisture available for hydration—the chemical



RCC's high strength stands up to heavy loads and special equipment at port and intermodal facilities



reaction that causes concrete to harden and gain strength. A water cure sprays or irrigates the pavement to keep it moist. A spray-on membrane can also be used to seal moisture inside.

When appearance is important, joints can be saw cut into the RCC to control crack location. If economy outweighs appearance, the RCC is allowed to crack naturally.

Once cured, the pavement is ready for use. An asphalt surface is sometimes applied for greater smoothness or as a riding surface for high-speed traffic.

ECONOMY. PERFORMANCE. VERSATILITY

For RCC, economy was the mother of invention. The need for a low-cost, high-volume material for industrial pavements led to its development.

Low cost continues to draw engineers, owners, and construction managers to RCC. But today's RCC owes much of its appeal to performance: The strength to withstand heavy and specialized loads; the durability to resist freeze-thaw damage; and the versatility to take on a wide variety of paving applications. From container ports to parking lots, RCC is the right choice for tough duty.



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Portland Cement Association conducts market development, research, education, and public affairs work on behalf of its members—cement companies in the United States and Canada. Want to know more about RCC and its applications? Visit our Web site at: www.portcement.org



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TO COME

CONCRETE PERFORMANCE

FEATURES

BENEFITS

High flexural strength (500 to 1000 psi) (3.5 MPa to 7.0 MPa)	Supports heavy, repetitive loads without failure and spans localized soft subgrade areas, which reduces maintenance costs and down time.
High compressive strength (4,000 to 10,000 psi) (28 MPa to 69 MPa)	Withstands high concentrated loads and impacts from heavy industrial, military, and mining applications.
High shear strength	Eliminates rutting and subsequent repairs.
High density, low absorption	Provides excellent durability, even under freeze-thaw conditions; eliminates seepage through pavement.
Low water content, low water/cement ratio	Increases strength, reduces permeability, and enhances durability and resistance to chemical attack.
Aggregate interlock	Provides high shear resistance at joints and uncontrolled cracks to prevent vertical displacement or faulting.
No steel reinforcing or dowels	Speeds and simplifies construction, reduces costs, and eliminates the need for preventative measures taken to minimize corrosion of reinforcing steel.
No forms or finishing	Speeds construction, reduces cost, minimizes labor.
No formed or sawed joints	Speeds construction, reduces cost. (To enhance appearance, joints can be sawn into RCC pavement.)
Hard, durable, light-colored surface	Resists abrasion, eliminates need for surface course and reduces cost. The light color reduces lighting requirements for parking and storage areas.

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