

Concrete – Helping Keep America Strong!

Benefits of Concrete*

Energy Efficiency

- Structures
 - Depending on location, concrete homes use an estimated 44% less energy to heat and 32% less energy to cool than houses built with other materials, according to a study conducted by the Portland Cement Association.
 - Using concrete for buildings can earn a Leadership in Energy and Environmental Design (LEED) Green Building certification.
 - Concrete structures are more durable and storm resistant, saving the energy associated with rebuilding.
- Pavements
 - Concrete pavements have lower rolling resistance resulting in better gas mileage for vehicles.
 - According to a studies conducted by the National Resources Council of Canada, trucks operating on concrete highways use between 0.8% and 6.9% less fuel.
 - Concrete as a pavement application uses far less energy for placement than other pavement materials.
- Urban Heat Island
 - Concrete, a naturally lighter colored material, reflects light and reduces heat retention.
 - Replacing dark with light paved surfaces can reduce urban summer temperatures by around seven degrees, dramatically reducing energy needs for the entire city.
 - Studies have shown that cities can save up to one-third on the cost of keeping street lights lit by using lighter colored materials, and if concrete was used more readily for buildings, the U.S. could save roughly \$5 billion annually on cooling costs.

Transportation

- Life Cycle
 - By using concrete, a more durable pavement application, costs for repairs, maintenance, and replacement are drastically reduced.
- Bridges
 - According to the National Concrete Bridge Council (NCBC) more than 70% of the bridges built today are made of concrete.
 - Concrete bridges consistently outperform bridges made from other materials. Analysis of National Bridge Inventory data for structures built since 1950 shows that 17% of steel bridges in the U.S. are considered "structurally deficient." Percentages for reinforced concrete and pre-stressed concrete are only 7% and 4% respectively.
 - Bridges built with high performance concrete can have a service life of 100 years, as reported by NCBC.
- Transit and Rail
 - Transit and rail structures and projects are successful because they rely on the unique adaptability of concrete and its superior strength and low costs.
- Noise Pollution
 - Concrete pavements lower tire-road noise.

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Water Infrastructure

- Water Management and Treatment
 - Most U.S. water infrastructure relies upon concrete to ensure durable infrastructure for water conveyance, water and waste water treatment facilities, dams, spillways, canals, bank protection, reservoir liners and storm drains.

Environment

- CO₂ Emission Reduction
 - Over their lifetime, concrete structures and pavement save greenhouse gas emissions through the energy efficient characteristics cited above.
 - By using different types of materials [supplementary cementitious materials (SCMs)] and mixtures, the amount of carbon emitted to batch concrete can be drastically reduced.
- CO₂ Sequestration
 - Studies have shown that concrete structures and pavements reabsorb significant levels of carbon dioxide from the atmosphere over their lifetimes through recarbonation and/or photocatalytic reactions.
 - An NRMCA member company was awarded Wired Magazine's green-tech breakthrough of the year for an innovation that could capture greenhouse gas emissions in a product that could serve as a SCM and/or aggregate in concrete.
- Renewable Energy
 - Concrete is an essential component for erecting wind turbines, hydroelectric dams, and tidal turbines, which provide clean and renewable sources of energy.
- Recycling
 - Concrete is 100% recyclable and reusable.
 - By recycling old concrete, the ready mixed concrete industry drastically reduces its consumption of natural resources and its environmental footprint.
- Water Pollution
 - Through the use of pervious concrete, a widely studied and accepted green construction building material, non-point source water pollution is minimized, and wastewater and storm water management improved.

Extras

- Concrete is the most widely used construction material in the world.
- Most materials for concrete are acquired and manufactured locally, minimizing the energy used and carbon emissions associated with its transportation.
- Ready mixed concrete is strong, adaptable, and resistant to fire, water, and weather and has a longer service life than wood, steel, asphalt and other construction building materials.
- Typically, concrete has a service life of 50 years, other building materials only last 20 years.
- Concrete can be used in architectural and decorative ways to provide an aesthetically pleasing finish.

**Concrete is a mixture of paste and aggregates (sand & rock). The paste, composed of cement and water, coats the surface of the fine (sand) and coarse aggregates (gravel or stone) and binds them together into a rock-like mass known as concrete.*