CALCIMA
California Construction and Industrial Materials Association

aggregate uses

Sand, Gravel, and Crushed Stone ("Aggregates") are Essential for Making Cement, Concrete, and Asphalt, the Basic Building Blocks of Our Buildings and Roads

fast facts:

Twice as Much Concrete is Used Worldwide than all Other Building Materials Combined![1]

What is the Difference Between Cement, Concrete, and Asphalt?

Cement:

A fine powder made by combining limestone and other minerals, which then becomes the "glue" in making concrete.

Concrete:

Made by combining cement, water, sand and gravel.

Asphalt:

Asphalt pavement is approximately 95% aggregates, and 5% asphalt cement as a binder. The binder is a product of oil refining that acts to "glue" the aggregates together.

Aggregates are Used in Thousands of Everyday Applications:

Infrastructure

Highways
Bridges
Roads
Streets
Homes
Schools
Hospitals
Shopping Centers
Airports
Railroads
Rapid Transit
Ports
Tunnels
Dams
Commercial and Government Buildings
Sewer Systems
Water Purification and Sewage Treatment
Playing Fields
Golf Courses
Sidewalks

Environmental Protection

Soil erosion control programs along rivers and shorelines
Reduction of sulfur dioxide emissions generated by electric power plants
Beach replenishment
Water storage
Spawning beds
Flood control
Groundwater replenishment
Recycling

Agriculture

Agricultural Crops
Reminalization of soils in agriculture and forests for healthy soil and growth

Homes and Buildings

Much of our homes and buildings are made up of aggregates or of items that include aggregates:

Carpet Backing
Fireplace
Bricks
Foundation
Toilets, Sinks and Bathtubs
Windows
Roofing Tiles and Shingles
Plaster
Wallboard
Glass
Marble
Sandstone
Granite
Insulation
Concrete Pipes
Paving Stones

[1] *Cement Association of Canada*

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Construction Material Carbon Reduction Opportunities

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Asphalt

Asphalt is a ubiquitous paving material composed of construction aggregates bound together with asphalt binder. Asphalt typically consists of approximately 95% construction aggregates and 5% asphalt binder. The dominant additional embodied energy added to asphalt, above that derived from the production of construction aggregates, results from the embodied carbon in the asphalt binder and the energy necessary to heat the aggregates and binder.

California and CalCIMA members aggressively support the responsible use of recycled materials and sustainable best practices in production and placement asphalt mixtures including: the use of Reclaimed Asphalt Pavements (RAP), Recycled Asphalt Shingles (RAS), Ground tire rubber (rubberized asphalt), the use of Warm Mix Asphalt (WMA) technologies.

Concrete

Portland cement concrete is both a building and paving material that is composed of construction aggregates bound together with cement activated by water. In general, a cubic yard of concrete contains 10-15% cement, 60-75% construction aggregates and 15-20% water.

Approximately 90% of the embodied carbon in concrete comes from cement while the remaining embodied carbon comes from the construction aggregates and water.It is generally recognized that reducing embodied carbon can be achieved through: the use of Portland Limestone Cement, the use of Supplementary Cementitious Materials (SCMs), technology advancements with the development of new cements or supplemental materials and recycling of concrete materials, whether rebatching returned plastic concrete or reusing aggregate from returned concrete.

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