SUSTAINABILITY SPECIFICATION
What is low carbon concrete?

The evolution of concrete as a durable and reliable material now has an added focus towards sustainability. Low carbon concrete is rapidly becoming the standard as Ontario works toward achieving net-zero carbon concrete by 2050. This global initiative is being led by the Cement Association of Canada's (CAC) Roadmap to Net-Zero here in Canada, with support from various allied Associations across the country.

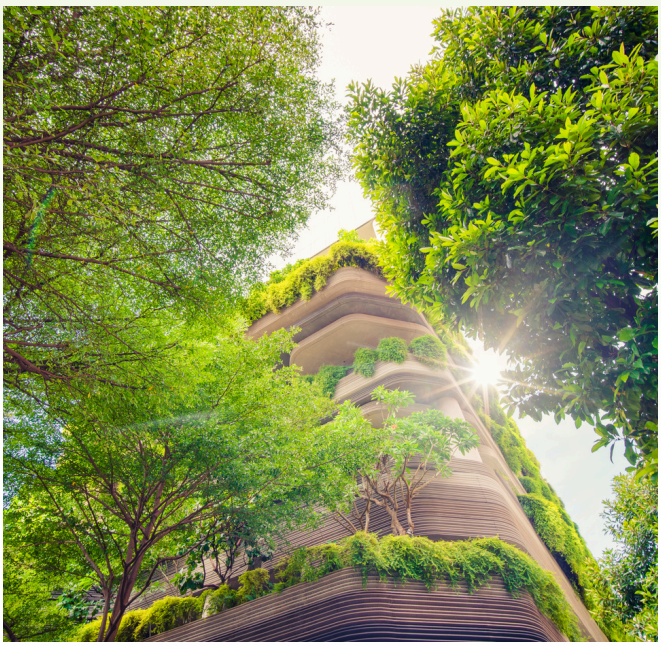
Definition

Despite significant progress in sustainability, Ontario has yet to establish an official definition for low carbon concrete. In the United States, a definition has been proposed through the ACI CODE-323-24: Low-Carbon Concrete, which uses regional benchmarks and a carbon budgeting approach. A similar method is currently being explored by the Concrete Ontario Sustainability Committee, drawing from the Concrete Ontario Member Industry-wide EPD for Ready-mixed Concrete report.

In simple terms, low carbon concrete refers to concrete produced with a reduced carbon footprint compared to typical mix designs, while still meeting all necessary performance standards. Performance criteria is clearly defined in CSA A23.1 and may include:

- Minimum compressive strength
- Surface and overall durability
- Permeability
- Placeability and pumpability
- Finishability

These factors are crucial to ensuring the concrete's long-term reliability and are essential for maintaining the high level of durability and service life that the public relies on from concrete.



Quantifying Carbon

The carbon footprint of concrete can be assessed through Environmental Product Declarations (EPDs), which provide detailed information on the environmental impacts associated with its production. North American EPDs typically focus on the "cradle to gate" life cycle, meaning they measure the environmental effects from the extraction and production of all raw materials including cementitious materials, aggregates, admixtures, etc. (the cradle) through to the point at which the concrete leaves the ready-mix facility (the gate). These declarations take into account factors such as energy consumption, greenhouse gas emissions, water usage, and waste generation during the production process.

EPDs serve as a valuable transparency tool helping ready-mixed producers in their efforts towards more sustainable products and practices, while also helping specifiers and builders make informed choices when selecting concrete products based on their environmental performance.

Sources:
1. CSA A23.1:24/CSA A23.2:24 - Concrete materials and methods of concrete construction/Test Methods and Standard Practices for concrete
2. ACI CODE-323-24: Low-Carbon Concrete - Code Requirements and Commentary

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