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For Green Concrete, Slow and Steady Is the Winning Pace, Clark Pacific Says

The iMasons Legacy Podcast
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Render courtesy of Clark Pacific

Less Cement, More Impact

Price. Schedule. Sustainability. These are three primary drivers for purchasing decisions in the data center industry, according to market participants, leaders and observers.

“The one that brings you into the conversation is sustainability,” said Jon Mohle, Director of Product Innovation at Clark Pacific, a leading provider of prefabricated building systems. “The one that wins you the job is schedule.”

Mohle spends most of his time lowering the amount of carbon in Clark Pacific’s structural systems used in data center construction while also maintaining speed and efficiency.

The task requires him to “make incremental improvements project to project to project,” he said.

Today, his focus is on concrete, which is responsible for at least 8% of global carbon dioxide emissions.

Concrete is a mixture of sand, gravel, cement and water that can be molded into building blocks for everything from stadiums and warehouses to bridges and skyscrapers. Its durability and ingredient abundance make it the most ubiquitous building material in the world.

Cement – the glue that binds the mixture – is responsible for most of concrete’s carbon footprint. This is due to a chemical reaction during the breakdown of limestone, the key ingredient in cement, and the fossil fuels burned to generate the heat that drives the chemical reaction.

“We can use less concrete, we can use less reinforcing steel, we can optimize our designs, but to have a huge impact, we need to use less cement in our concrete,” Mohle said. “So that’s our main focus.”

Photo courtesy of Clark Pacific

Carbon reduction and capture in concrete are key focus areas for building data centers to reduce and ultimately achieve net-zero carbon emissions, noted Miranda Gardiner, Executive Director of the iMasons Climate Accord.

The iCA is an initiative of Infrastructure Masons, a global nonprofit professional association for the builders of the digital age. Member companies of the iCA are focused on carbon reductions in digital infrastructure across materials, equipment and power.

In 2023, several hyperscale data center companies – AWS, Google, Meta and Microsoft – signed an open letter and call-to-action from the iCA to use greener concrete in data center infrastructure.

Clark Pacific joined iMasons as a Global Partner and the iCA as a Champion Mover in March 2025.

“The expansion of iCA membership to include firms like Clark Pacific demonstrates a shared understanding that progress depends on their engagement – they represent a critical step in making change possible,” Gardiner said.

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‘100 Small Steps’

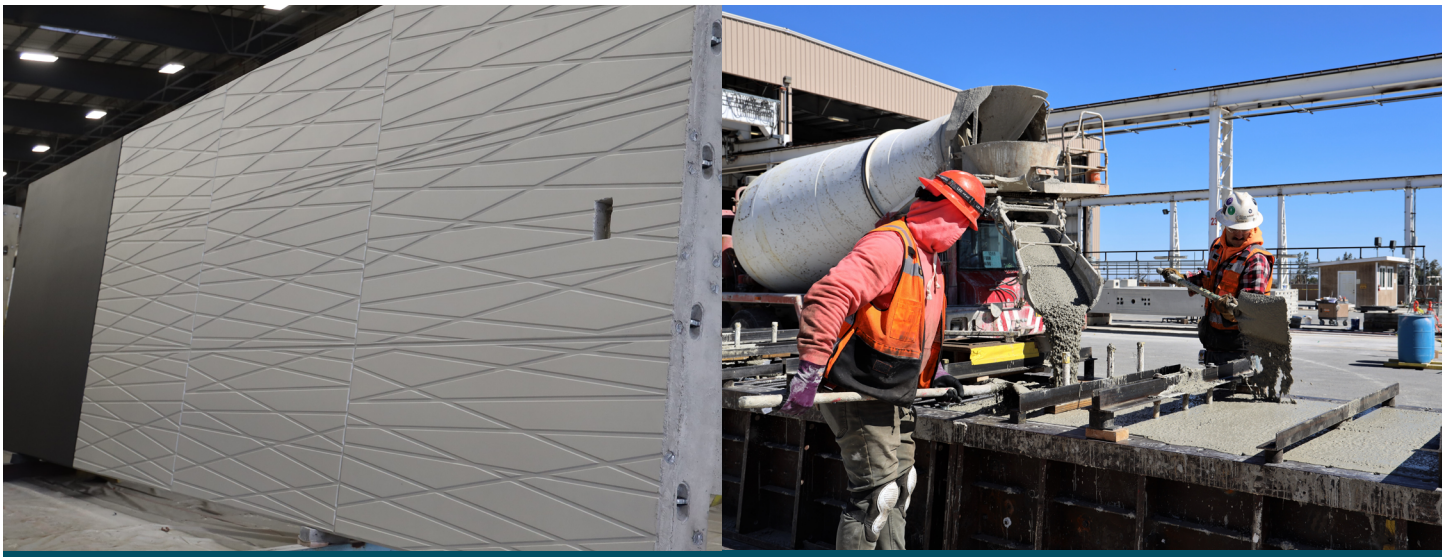
Lower carbon concrete mixes typically replace a portion of traditional cement with materials such as fly ash, which is a powdery byproduct of coal combustion, and slag, which is a glassy byproduct of steel and iron making. Doing so lowers the amount of carbon intensive clinker needed and diverts waste from landfills. Clinker is the primary intermediate product in cement manufacturing.

Concrete mixes that contain these supplementary cementitious materials take longer to cure, which is the process of hardening and strengthening. When pouring a building foundation, 70% or more of the traditional cement can be replaced with supplementary materials, but schedule may require re-evaluation and review to ensure on-time delivery.

“When we’re talking about pre-cast concrete, we’re on a one-day cycle,” Mohle said, explaining that his concrete mix needs to cure sufficiently overnight to remove it from its form so the form can be cleaned and reused.

Maintaining that pace of production is essential to the value proposition of prefabrication – speed and certainty, which are the efficiency gains that come with offsite manufacturing in a controlled environment.

“The trick is to have an accelerated strength curve while still taking the cement out,” Mohle explained.



Photos courtesy of Clark Pacific

Clark Pacific's CarbonShield ®, a lower-carbon concrete mix, uses 25% less cement than traditional prefabricated concrete mixes, which lowers the embodied carbon by 20%. The company's goal is to use 50% less cement in data centers by 2030.

To reach the goal will require continued innovation with materials and curing techniques, such as applying varying levels of heat to the forms.

"Our production teams are used to concrete behaving in a certain way and we're changing it," Mohle said. "Slow and steady is the way we are approaching it. We're not trying to take one big leap; we're trying to take 100 small steps."

Photo courtesy of Clark Pacific

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>
> — Jon Mohle,
> Director of Product Innovation,
> Clark Pacific

Giant Leap

As Mohle makes improvements to CarbonShield from project to project, he also focuses on innovation across the building industry. For example, several startups are working on alternative zero-carbon approaches to cement production.

“Then the cement itself is not as carbon intensive,” Mohle said. “I think that’s going to be the game changer.”

These startups produce teaspoons of cement today, he added. Once they industrialize and scale, they will change the concrete industry.

Several members of the iCA are supporting this transformation through direct investments and commitments to use the alternative products, including formation of the Sustainable Concrete Buyers Alliance, noted Gardiner.

For now, the demand for concrete in data center construction exceeds the pace of innovation needed to scale production of lower carbon concrete.

Signs of change, Gardiner added, are seen among the persistence of companies, such as Clark Pacific, engaged in iCA working groups to develop detailed specification language on low-carbon concrete to support industry standards for procurement and delivery teams.

“It is our collective responsibility to educate the industry in understanding the benefits of lower carbon solutions while continuing delivering during this transition,” she said.

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— Miranda Gardiner,
Executive Director,
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