

An Architect's Perspective

**Russell Perry, AIA,
LEED AP**

**Vice President
SmithGroup**



Don't know much about

...

Don't know much about
history

Don't know much biology

Don't know much about a
science book

Don't know much about
the French I took

"Wonderful World", 1960



Don't know much about

...

Concrete



Don't know much about

...

Concrete

Or Steel

Or Aluminum

Or Glass

Or Sealants ...

I Love Concrete





I **Hate** Concrete

“Portland cement is the most energy intensive material produced after aluminum and steel.”

- Nehdi 2001



I **Hate** Concrete

“By some accounts, the cement and concrete industry is the largest consumer of natural resources such as water, sand, gravel and crushed rock.”

- Nehdi 2001



I **Hate** Concrete

“Approximately 7% of the world’s carbon dioxide emissions are attributable to Portland Cement.”

- Nehdi 2001



I **Hate** Concrete

**1 trillion liters of fresh
water used for mix
water**



I **Hate** Concrete

1 : 1

The production of one ton of Portland Cement clinker results in one ton of carbon dioxide.



Nature's Design Principles



Nature's Design Principles

All materials are in continuous closed loops

Industrial ecology

Recycled v. recyclable

Disassemblable



Nature's Design Principles

Uses current solar income

Carbon Neutral

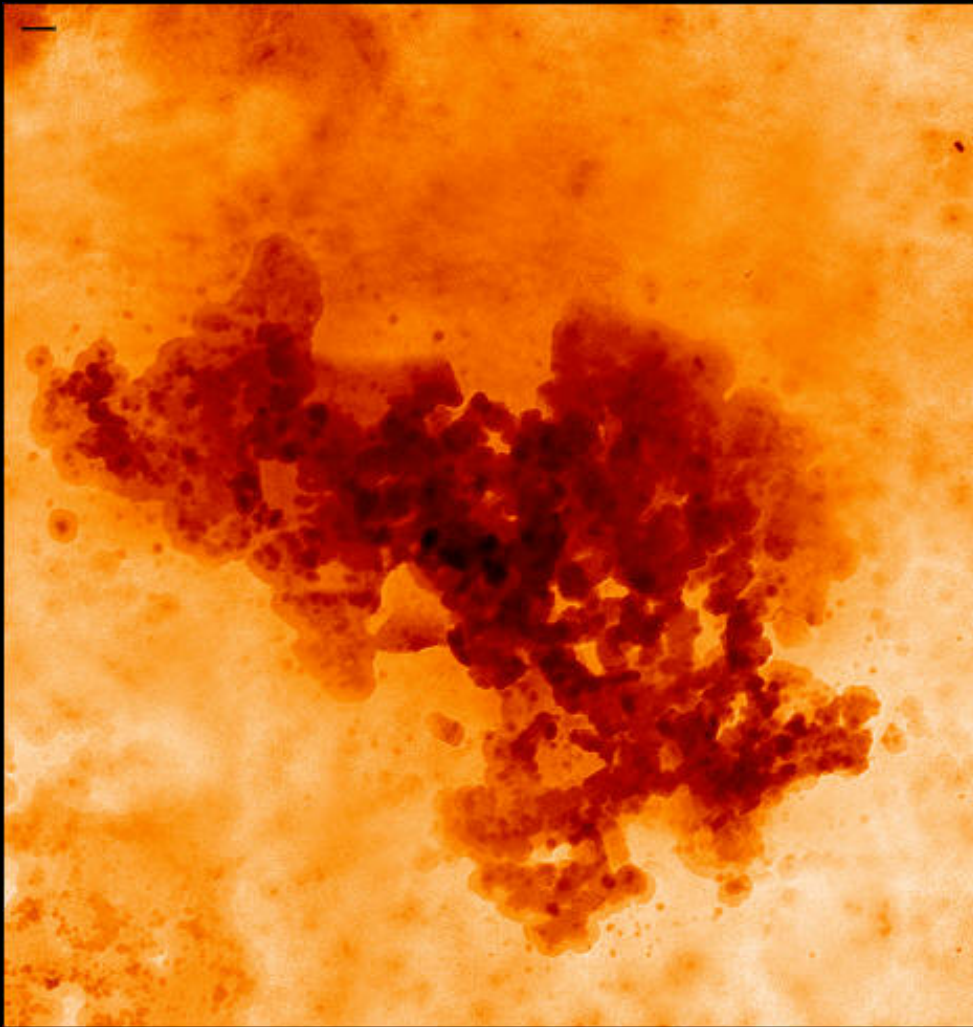


Nature's Design Principles

Creates “high-tech” materials at atmospheric pressure and ambient temperature



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Advancing concrete knowledge



Hydrated for 7 hrs, 35 min.

Research

**Promote and
communicate**



Annual Metrics

**The State of the
Concrete Industry**

Cement Conservation

**Ground granulated
blast-furnace slag**

Fly ash



Annual Metrics

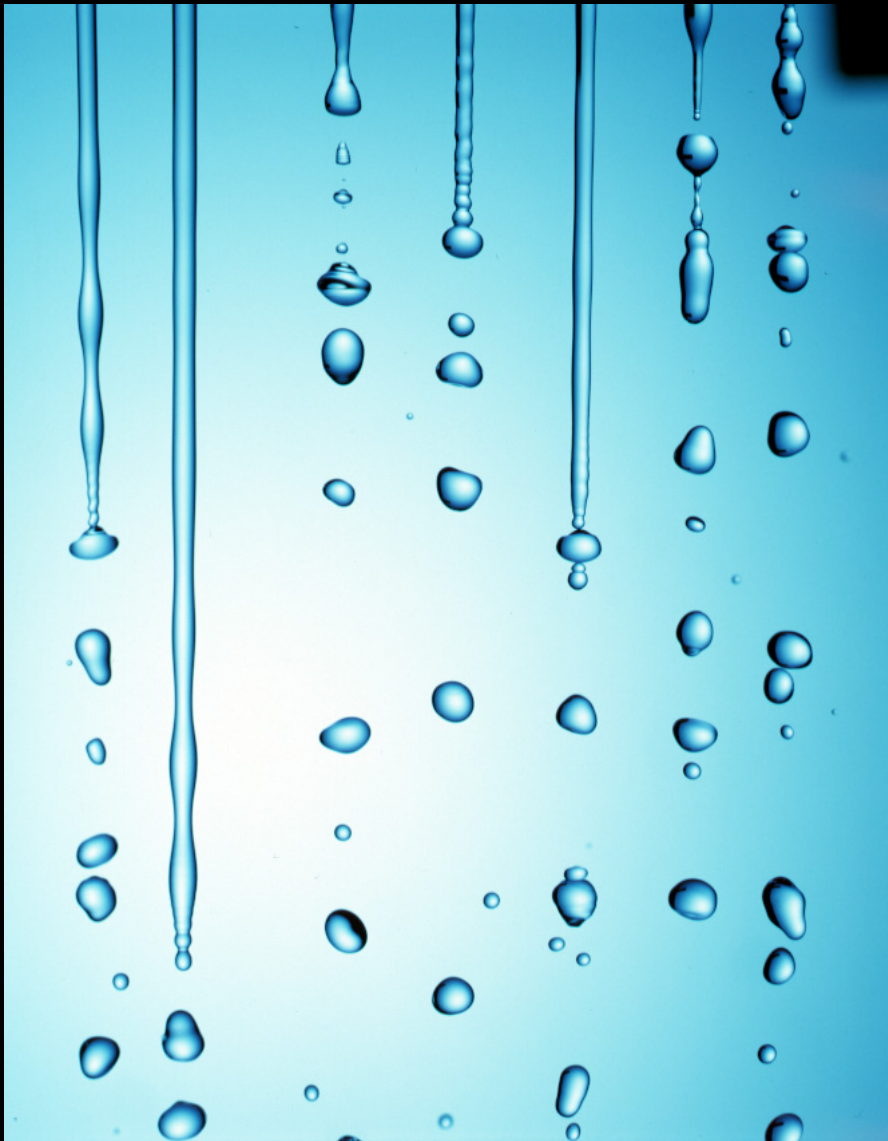
**The State of the
Concrete Industry**

**Aggregate Conservation
and Extraction Practices**

Course aggregate reuse

Fine aggregate reuse

Habitat loss/restoration



Annual Metrics

**The State of the
Concrete Industry**

Water Conservation

Non-potable use

Wash water reduction

Mix water optimization



Annual Metrics

**The State of the
Concrete Industry**

Durability

Life cycle assessment



Honest Broker

"Portrait of Oliver Cromwell", Sir Peter Lely



Honest Broker

“Concrete is an environmentally friendly material of choice for construction of the world’s vast infrastructure.”

- Concrete International, July 2002



Honest Broker

**The ACI Board Advisory
Committee on
Sustainable
Development – White
Paper on Sustainable
Development**

– carbon emissions?



Recognition

**Promote competition
around environmental
performance**



Tools

Codes

Green specs

LCA tool

**Thermal mass
calculator**



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Advocacy

“... To address questions of sustainability [ACI] must move away from its purely technical base and include advocacy for certain position.”

- Terence C. Holland, President – ACI, 2002



It's Time

“... it is time for ACI members individually and collectively to get on board the environmental train and begin finding ways to reduce consumption in construction.”

- Merle E. Brander, Concrete International, August 1997