Building Sustainably with CO$_2$ncrete

PRESENTORS:
NRMCA DIL SUSTAINABILITY TEAM
KEY TOPICS

UNDERSTANDING SUSTAINABILITY AND CARBON

CONSTRUCTION INDUSTRIES CARBON FOOTPRINT

SUSTAINABLE PRACTICES IN THE READY-MIX INDUSTRY

INNOVATIVE TECHNOLOGIES

PROMOTION
What is “SUSTAINABILITY”???

- Sustainability focuses on meeting the needs of the present **environmentally** without compromising the ability of future generations to meet their needs.

WHAT IS CARBON?

- By products: (Inorganic) Limestone, dolomites, and carbon dioxide & (Organic) coal, peat, oil, methane, clathrates
WOOD

Deforestation
- 15% of global greenhouse gas emissions.
- Demand vs Supply

Transportation
- Harvested lumber - Mills - Retailers - Destination

Bio Sequestration
- One acre of new forest ~ 2.5 tons of CO2
- As lumber decays it will release internal carbon previously stored
STEEL

- 5% of the world's greenhouse gas emissions.
- In 2018 2 billion tons of steel was produced globally.
  - 50% utilized by construction industry
- 2.4 tons of CO2 per 1 ton of steel produced
- Recycle Rates
  - 95% for automotive sector
  - 85% for construction
  - 70% for packaging
CONCRETE

Cement
▶ 8% of the world’s CO2 output.
▶ ONE ton of cement produces nearly ONE ton of carbon dioxide

Aggregates
▶ Pollution
▶ Energy consumption
▶ Transportation

Water
▶ Stormwater Runoff
▶ Potable Water
CONCRETE (cont)

- Locally Produced!!!
- Supplementary Cementitious Materials (SCMs)
- Recycled Aggregates
- Recycled Concrete
  - ASTM C1798 - Specification for Returned Fresh Concrete
- Recycled Water
  - ASTM C94 - Specification for Ready-Mixed Concrete
  - ASTM C1602 - Specification for Mixing Water
- Thermal Mass
- Urban Heat Island Reduction
- Durable & Resilient
- Environmental Protection Declaration Reports
Technology
- Locally sourced CO2
- Injected into a concrete mix, where it chemically converts to a mineral.

Benefits
- Increased Strengths
- Mix Optimization

A net reduction
- 25 lbs. of CO2 per cubic yard of concrete.
Technology

Transforms waste CO2 into synthetic limestone aggregates.

Can be used as a replacement for sand, gravel, and stone.

Every ton of Blue Planet’s synthetic aggregate contains 970 lbs. of captured CO2.
Two technologies: cement and carbon capture

Cures in 24 hours with CO2, rather than 28 days with water.

This process captures up to 661 lbs. of CO2 per ton of Solidia cement used.

70% lower compared to Portland cement-based concrete.
NRMCA EPD Program

PAVE AHEAD
DURABLE. SUSTAINABLE. CONCRETE.

BUILD WITH STRENGTH
A COALITION OF THE NATIONAL READY MIXED CONCRETE ASSOCIATION

NRMCA
NATIONAL READY MIXED CONCRETE ASSOCIATION
TO LEARN MORE...

- https://www.carboncure.com/
- http://www.blueplanet-ltd.com/
- https://www.solidiatech.com/
- https://carbon.xprize.org/prizes/carbon
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