



The Worlds Only Commercially Available, High Performance & Sustainable Alternative To Traditional Portland Cement

Environmental Benefits Overview



7.15.11





GREEN TECHNOLOGY

The production of CERATECH's cement does not generate CO₂ emissions. With a **carbon neutral footprint, CERATECH's cement qualifies as the only truly "green" cement technology in the world.** By contrast, the Portland cement industry generates more than 5% of all man made CO₂ emissions each year (Ref: EPA). To produce one ton of Portland cement, a cement kiln emits one ton of CO₂ into the atmosphere. Each ton of CERATECH cement eliminates the production of one ton of Portland cement and reducing CO₂ emissions by one ton.

In the past few years, there has been a remarkable shift toward green building products. Green sustainable construction practices, driven by the Green Building Council under the auspices of the Leadership in Energy and Environmental Design ("LEED") program, have reshaped the construction industry. To qualify as a green building material under the LEED program, a product must be comprised of renewable, recyclable, or reusable resources. As fly ash is classified as a post-industrial by-product, CERATECH's pozzolanic cement is, by definition, a green building material. **Using CERATECH's cement to produce concrete for a new construction project will generate LEED project points in a number of categories.**

Sustainable "construction" materials are defined as those materials that can be used indefinitely without negatively impacting the environment. Using fly ash to produce CERATECH's cement meets this definition. Additionally, recycling fly ash to produce an environmentally beneficial product succeeds in: (i) reducing demand on landfills; (ii) preserving virgin materials by eliminating the mining of raw materials needed to produce Portland cement; and (iii) reducing energy consumption by eliminating the need to use a high energy calcining process to produce cement.



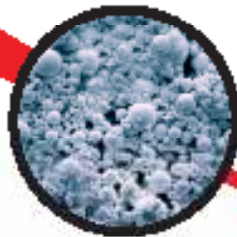
Sustainable Concrete!



Coal



Coal Burning Utility



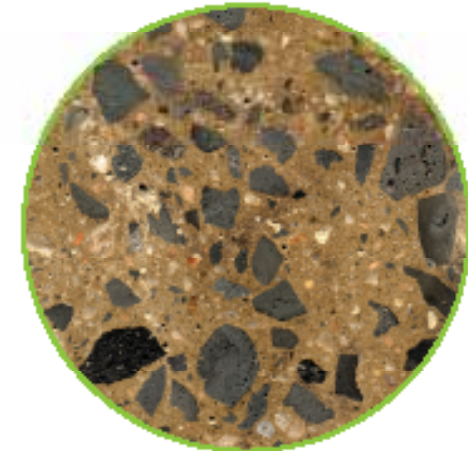
Coal Ash (Fly Ash)

- Type I
- Type II
- Type III
- Type IV
- Type V

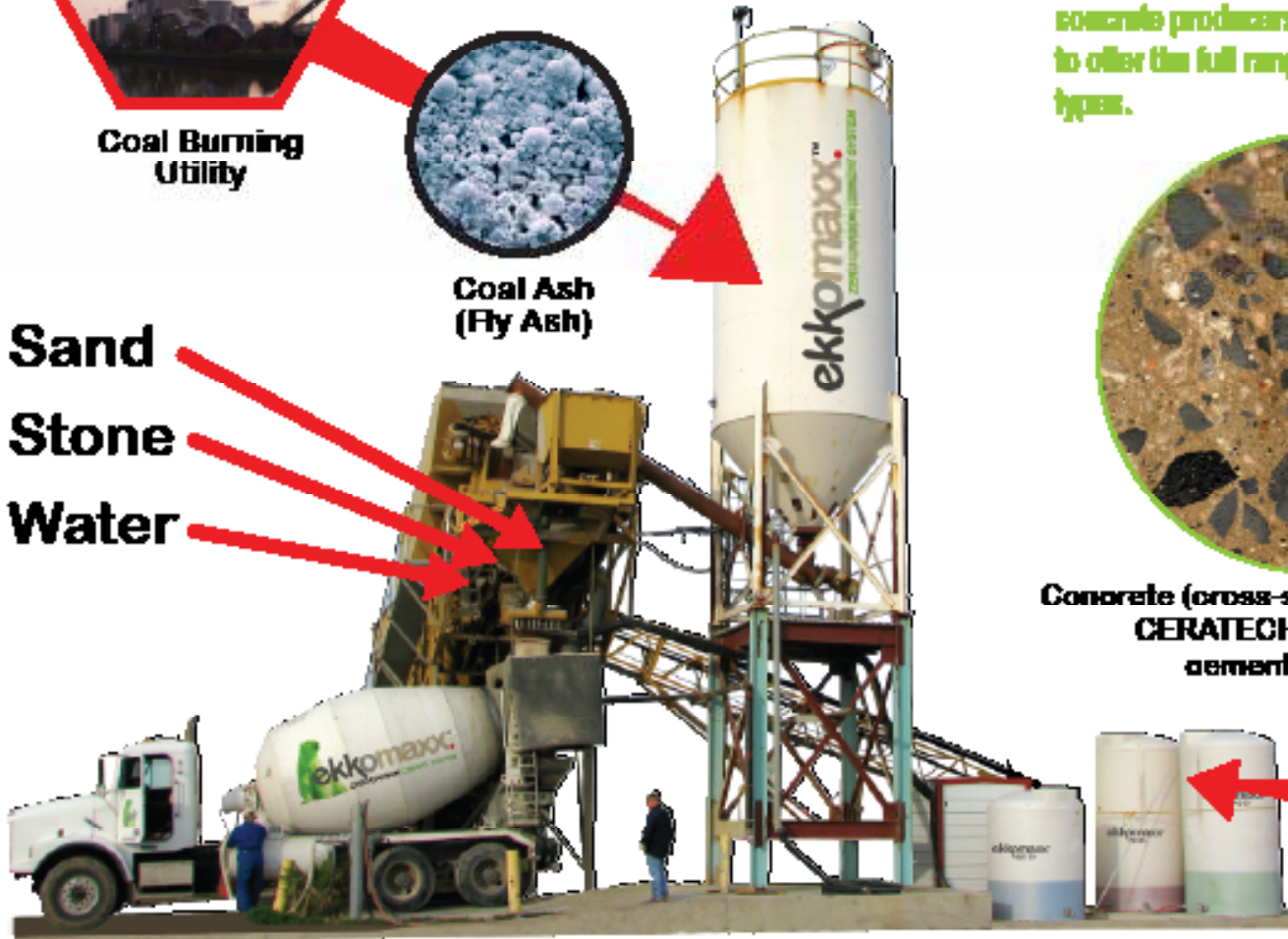
ekkomaxx:
ZERO CARBON CEMENT SYSTEM

CERATECH's single powder, multiple activator cement system allows concrete producers the flexibility to offer the full range of portland cement types.

- Sand
- Stone
- Water



Concrete (cross-section) produced with CERATECH's non-portland cement technology



**CERATECH
Proprietary
100% Rapidly
Re-newable
Liquid Activators**





Sustainability



Materials Usage




One Ton of Cement



One Cubic Yard of Concrete

(Based on 1/3 ton of cement)

	Portland Cement	ekkomaxx [™] CARBON NEUTRAL CEMENT SYSTEM	Portland Cement	ekkomaxx [™] CARBON NEUTRAL CEMENT SYSTEM
Virgin Resources	3500 lbs.	20 lbs.	667 lbs.	6.7 lbs.
Renewable Resources	0 lbs.	80 lbs.	0 lbs.	26.7 lbs.
Pre-Consumer Waste (Coal Ash)	None	1900 lbs.	200 lbs.	602 lbs.
Landfill Relief (Coal Ash)	None	1900 lbs.	200 lbs.	602 lbs.
Recycled Coarse aggregate (Crushed OPC concrete)	NA	NA	Cannot Use	50%
Recycled Fine Aggregate (Pulverized consumer waste glass)	NA	NA	Cannot Use	50%
Post Consumer Waste (Crushed glass as an aggregate)	NA	NA	Cannot Use	Yes
Crude Oil	55 gallons	0 gallons	0 gallons	0 gallons
Total Energy Req'd.	6 M BTUs	0 BTUs	1.7 M BTUs	0 BTUs
 Total CO ₂ Production	2000 lbs.	12 lbs.	667 lbs.	84 lbs.



Technology Overview



1994

Combine Coal Ash With Magnesium Phosphate To Produce A Ceramic Cement



2001

Commercialized Family of Ultra High Performance Concrete Repair Products



2006

Transition To All Coal Ash Bulk Cement Technology



2010

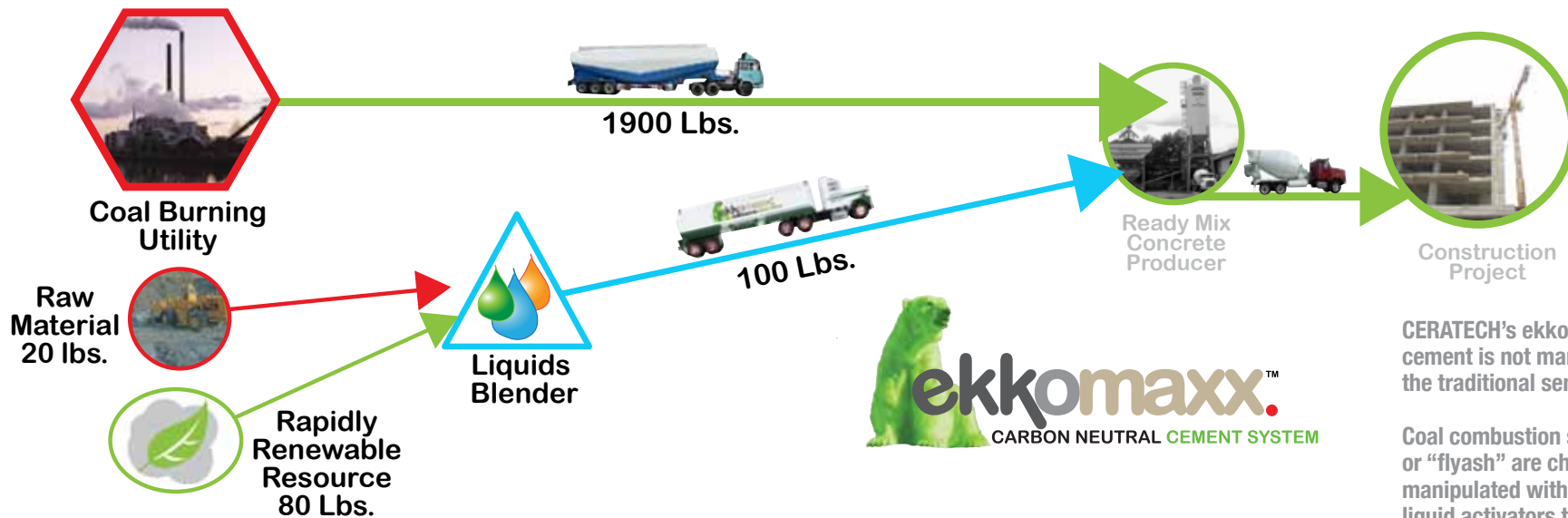
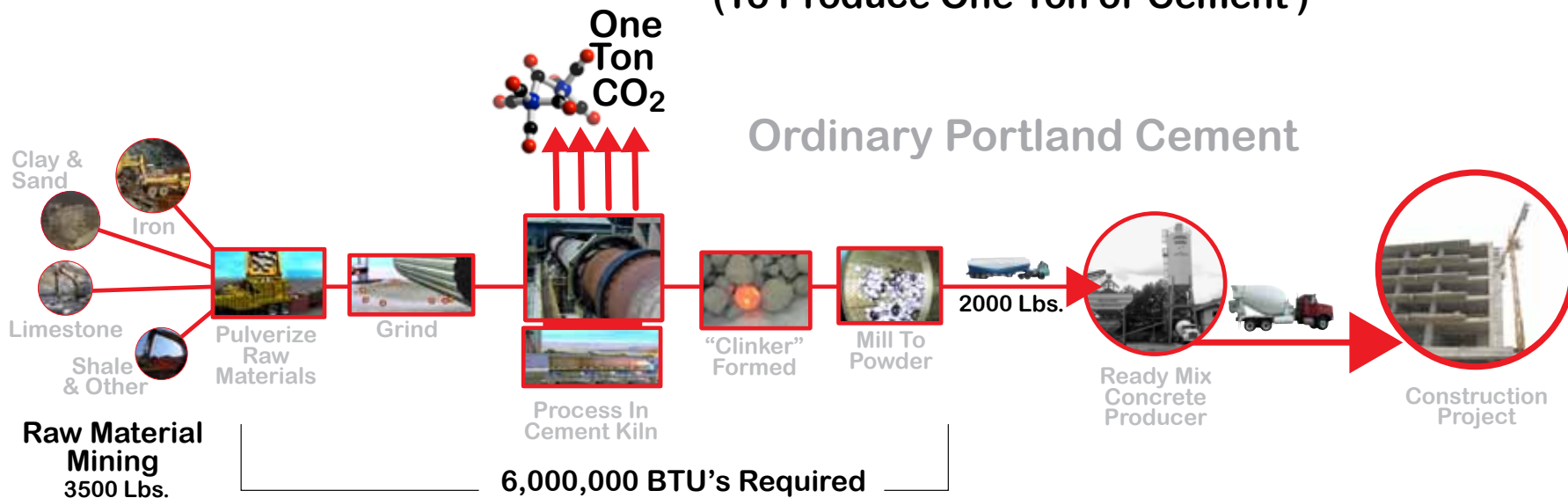
Formed Strategic Partnerships With Ash Sources & Ready Mix Concrete Producers.

Entered Bulk Cement Market



Cement Manufacturing Process Comparison

(To Produce One Ton of Cement)



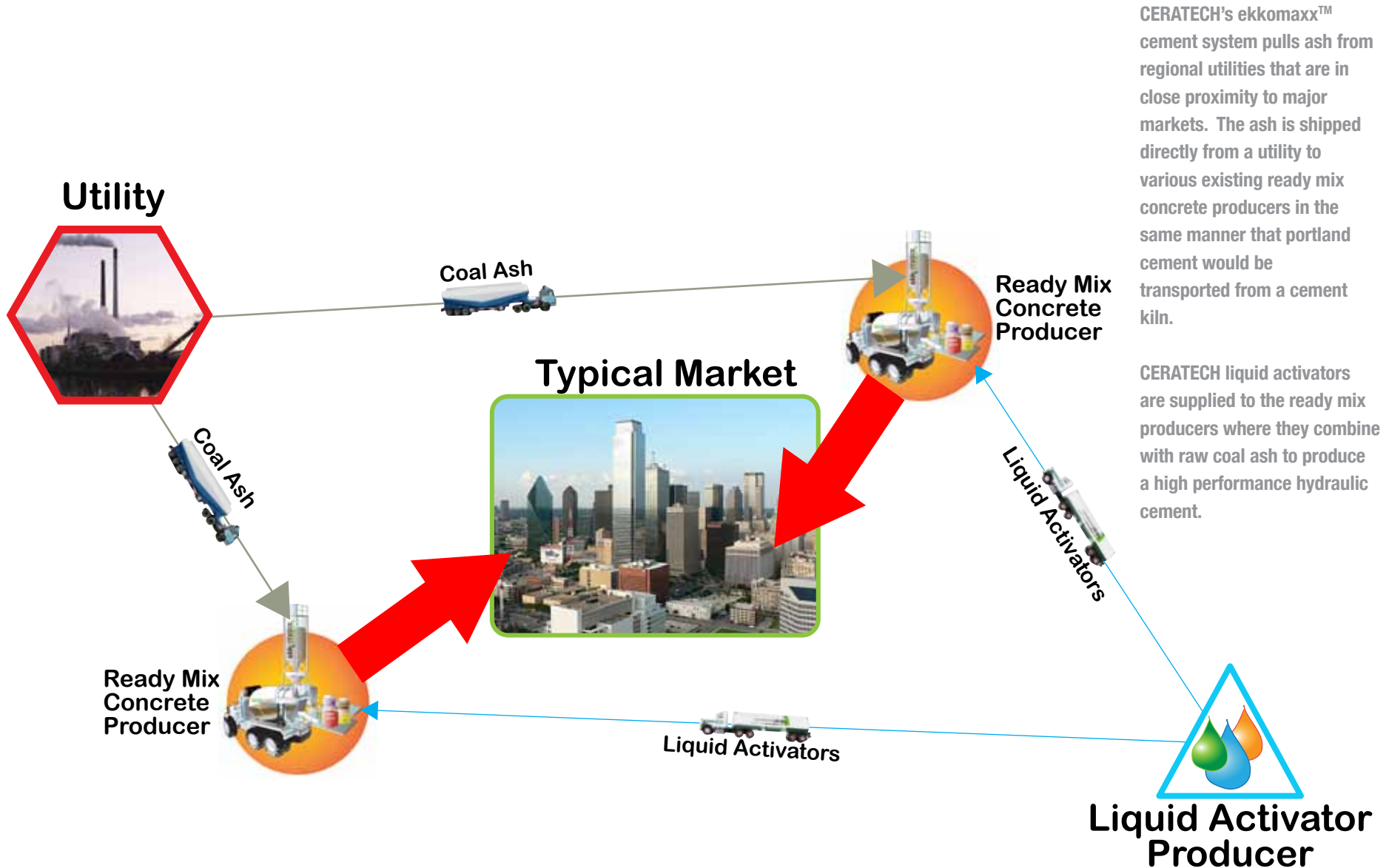
CERATECH's ekkomaxx™ cement is not manufactured in the traditional sense.

Coal combustion solids, or "flyash" are chemically manipulated with CERATECH's liquid activators to produce a high performance hydraulic cement that can mirror the respective performance characteristics of all portland cement types.





Typical Distribution Model



CERATECH's ekkomaxx™ cement system pulls ash from regional utilities that are in close proximity to major markets. The ash is shipped directly from a utility to various existing ready mix concrete producers in the same manner that portland cement would be transported from a cement kiln.

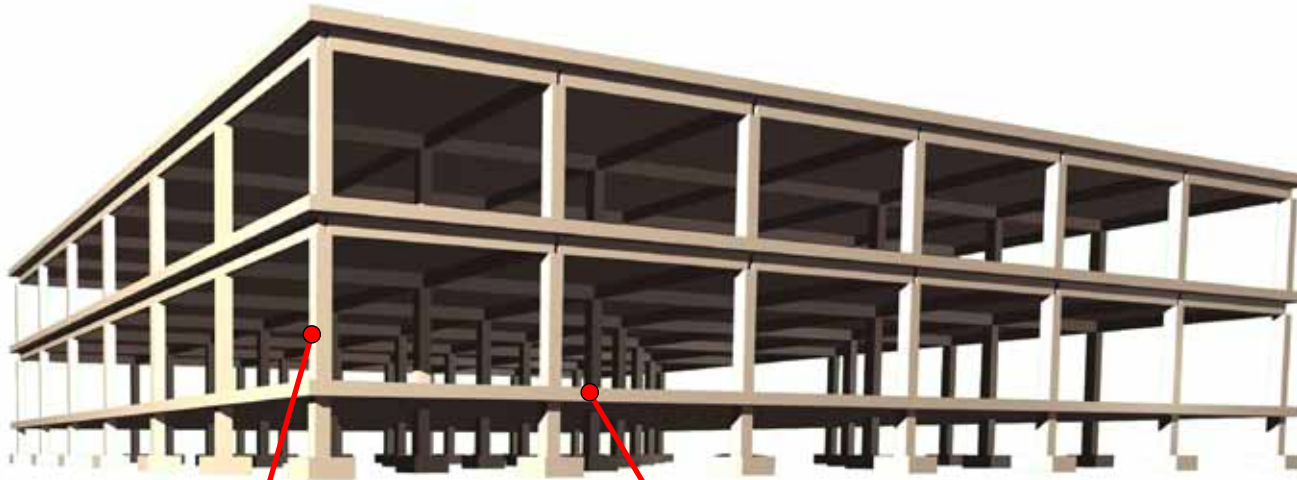
CERATECH liquid activators are supplied to the ready mix producers where they combine with raw coal ash to produce a high performance hydraulic cement.



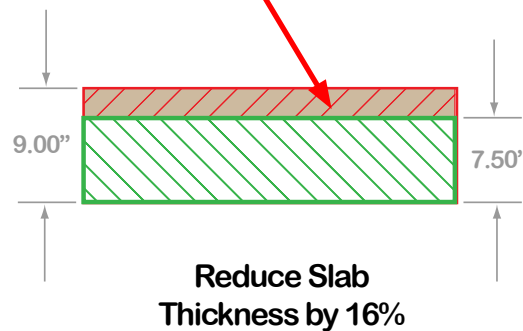
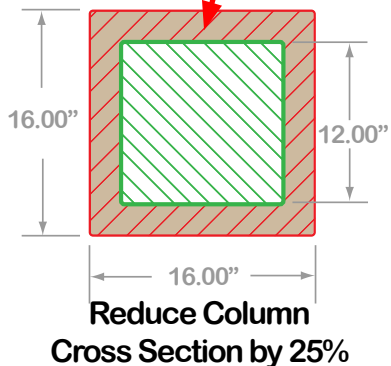


Advantages

Typical 50,000 Sq. Ft. 3 story Commercial Building



- 239 Cu. Yds. LESS Concrete
- 37 Tons LESS Rebar
- 66 Sq. Ft. MORE Floor Space
- 353 Tons LESS CO₂
- 412 Tons of Coal Ash Diverted From Landfill



Reduce Reinforcing Steel Requirements By 12 - 18%

! Meets or Exceeds ALL Requisite ASTM Specifications





Concrete Benefits

- Lower Heat of Hydration
- Sulfate Resistant
- Reduced Permeability
- Low Shrinkage
- ASR Mitigation
! Use Greater Variety of Aggregates Including Waste Glass
- Mild MoE
! Stable Modulus of Elasticity As Compressive Strengths Increase Over Time
- Improved Early Flexural Strengths
- Rebar Corrosion Resistant

