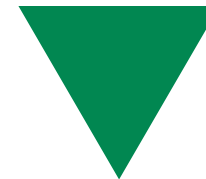
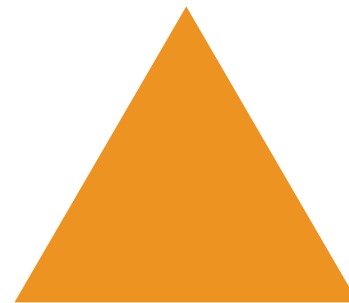




The **THORNBURG BRIDGE**

Rehabilitation and Preservation

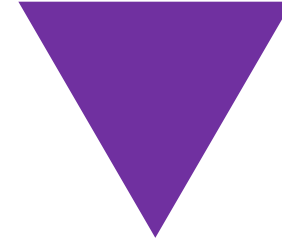


Chris Davis
Engineering Sales Manager
cdavis@ctscement.com
973-568-3134



LEARNING OBJECTIVES

- What is VESLMC?
- What is the main application for VESLMC?
- How can you lower your carbon footprint with VESLMC?
- What is CSA Cement?





➤ What is **VESLMC**?

- Cement (ASTM C1600) — 658 lbs/cu yd
- Sand / Stone (ASTM C33)
- Fine aggregate should be 55% to 70% of total aggregate weight
- Latex — 24.5 gallons per cu yd
- Water — 0.40 w/c ratio
- Strength 2500 psi in 3 hours and 3,500 PSI in 24 hours

➤ What is **CSA CEMENT**?

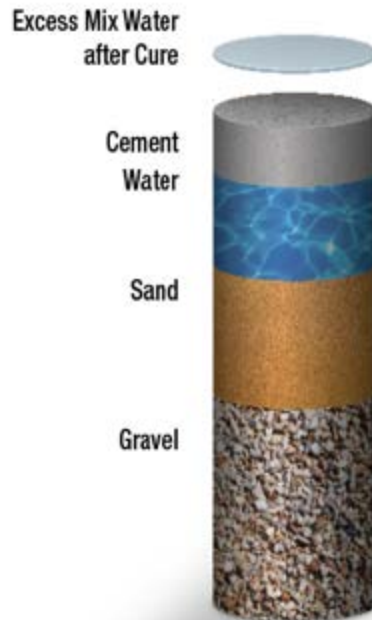
- A calcium sulfoaluminate cement
- Has little or no C_3A , which increases sulfate resistance
- Gains strength of 2,500 to 3,000 PSI in 1.5 hours
- Has very low shrinkage



➤ Overall PROPERTIES

CSA CEMENT CONCRETE

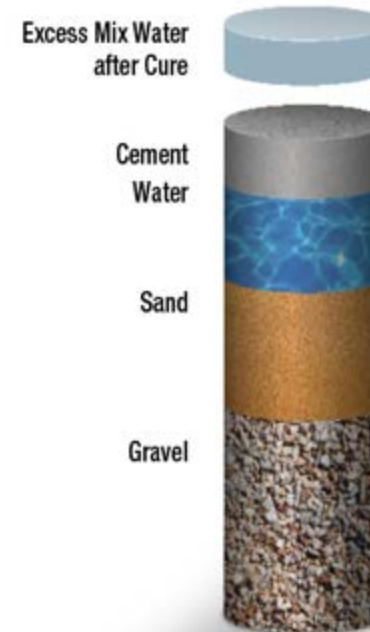
Hydrates approximately 98% (0.45 w/c)
of the mix water, leaving approximately
0-2% for evaporation



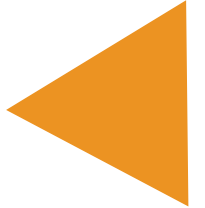
- Faster strength gain
- Higher strength
- Low shrinkage
- More durable

PORTLAND CEMENT CONCRETE

Only hydrates approximately 55% (0.25 w/c)
of the mix water, leaving approximately
45% for evaporation



- Slow strength gain
- Modest strength
- High shrinkage
- Susceptible to sulfate attack





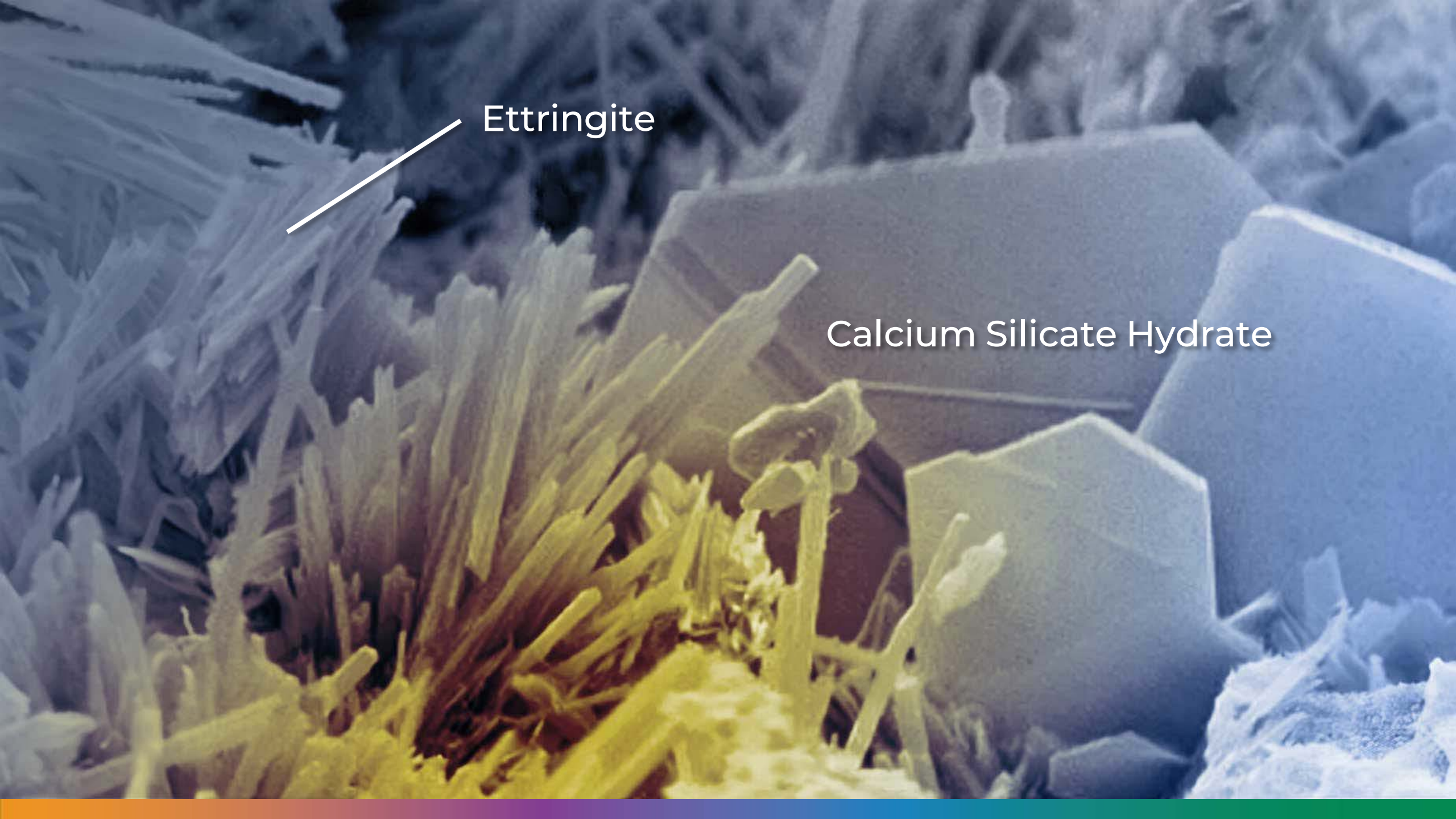




Physical Lab



Analytical Lab

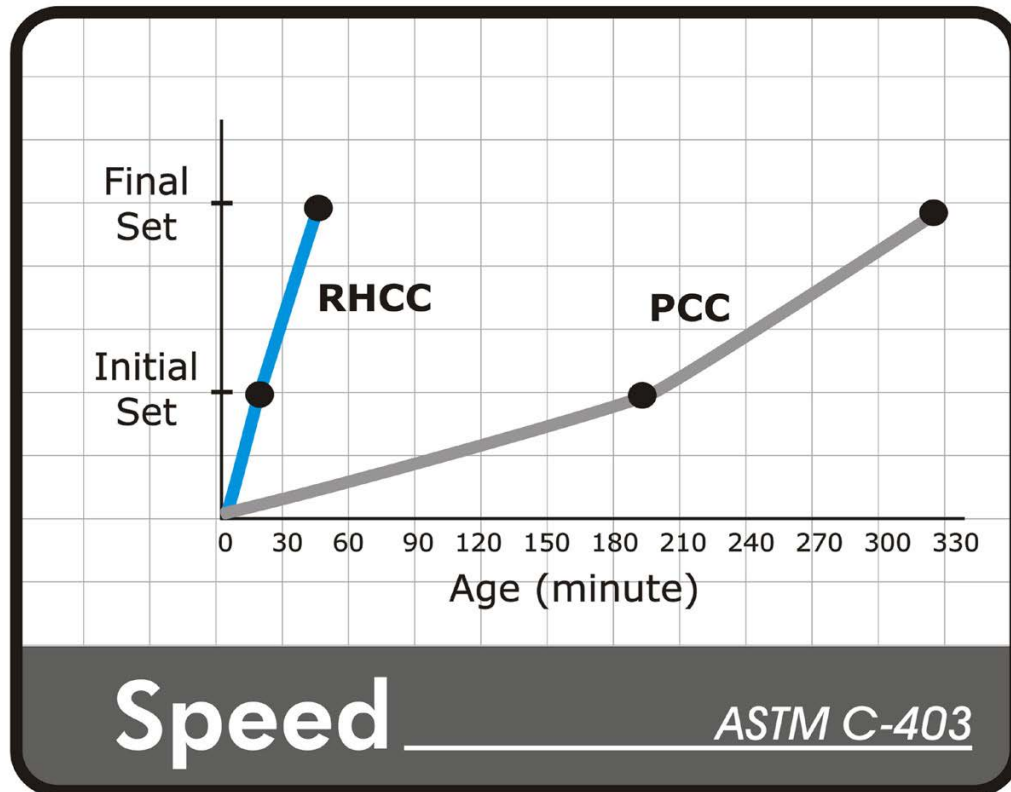
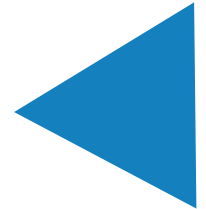


Ettringite

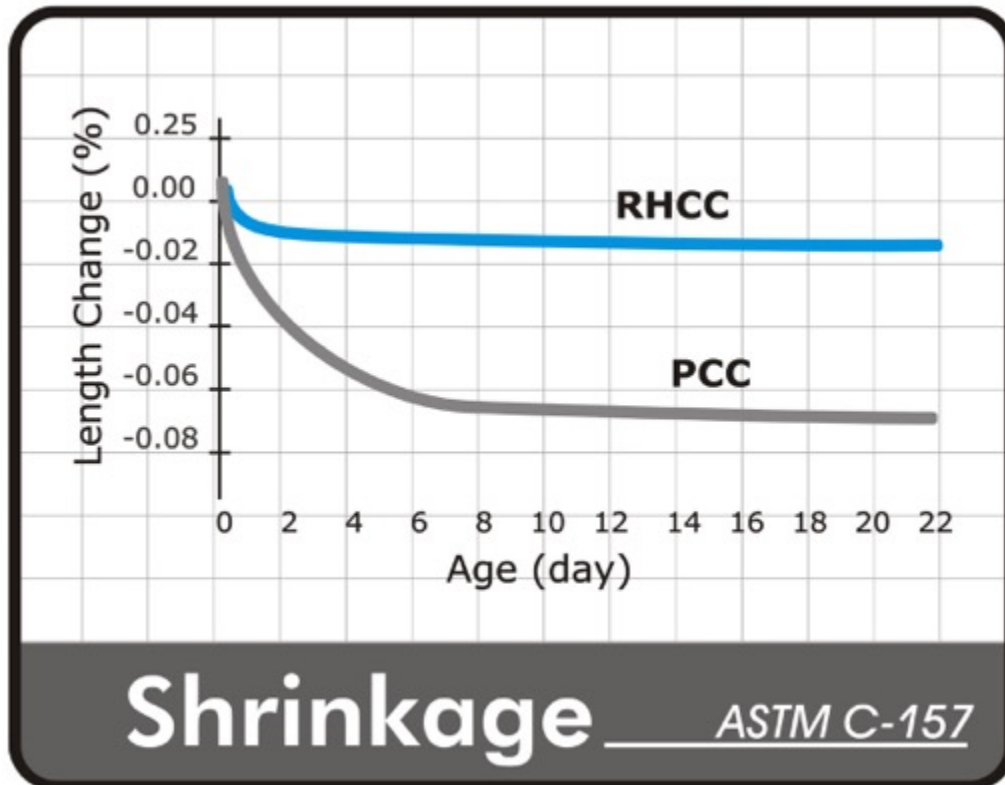
Calcium Silicate Hydrate



➤ SPEED Comparison

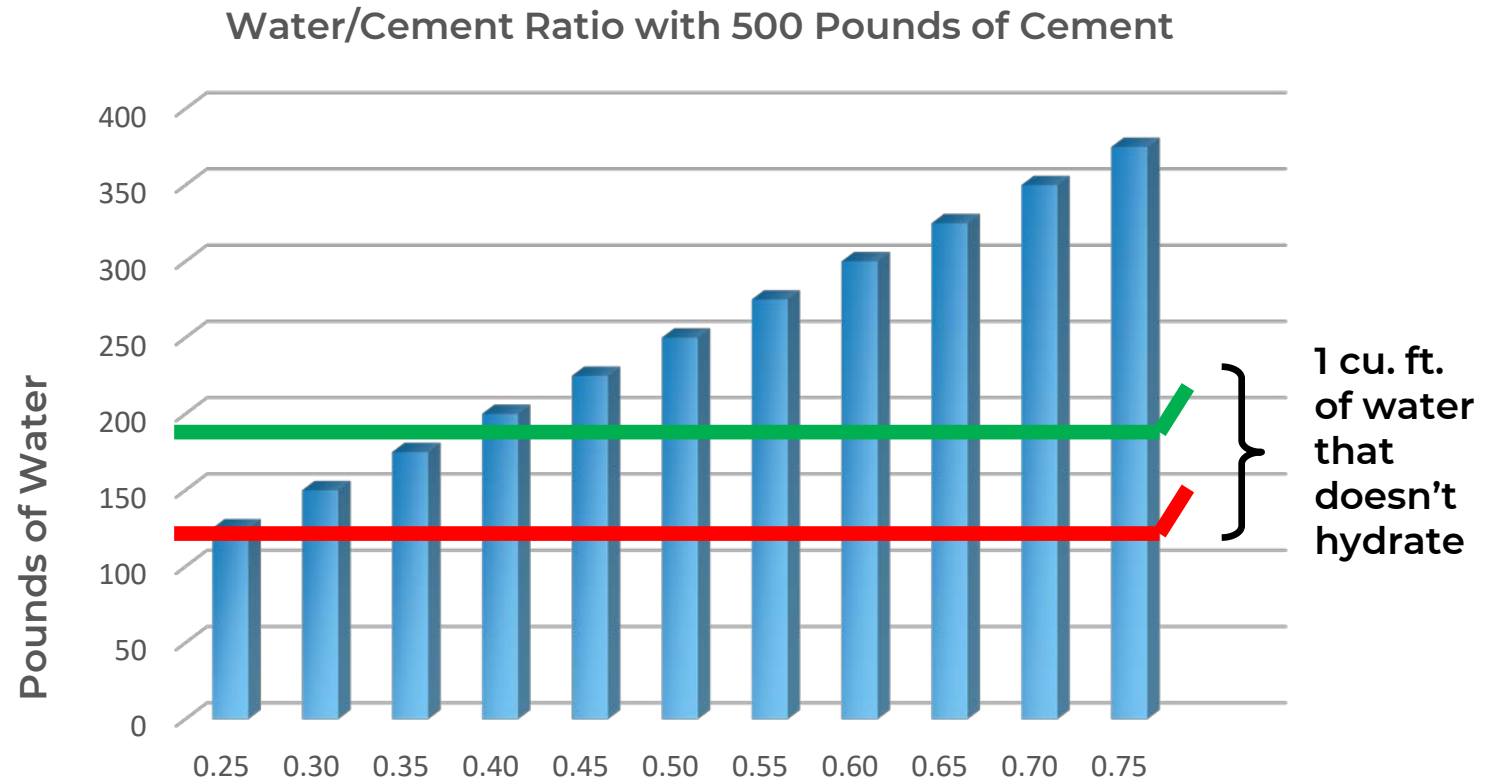
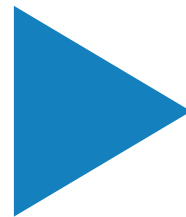


➤ SHRINKAGE Comparison



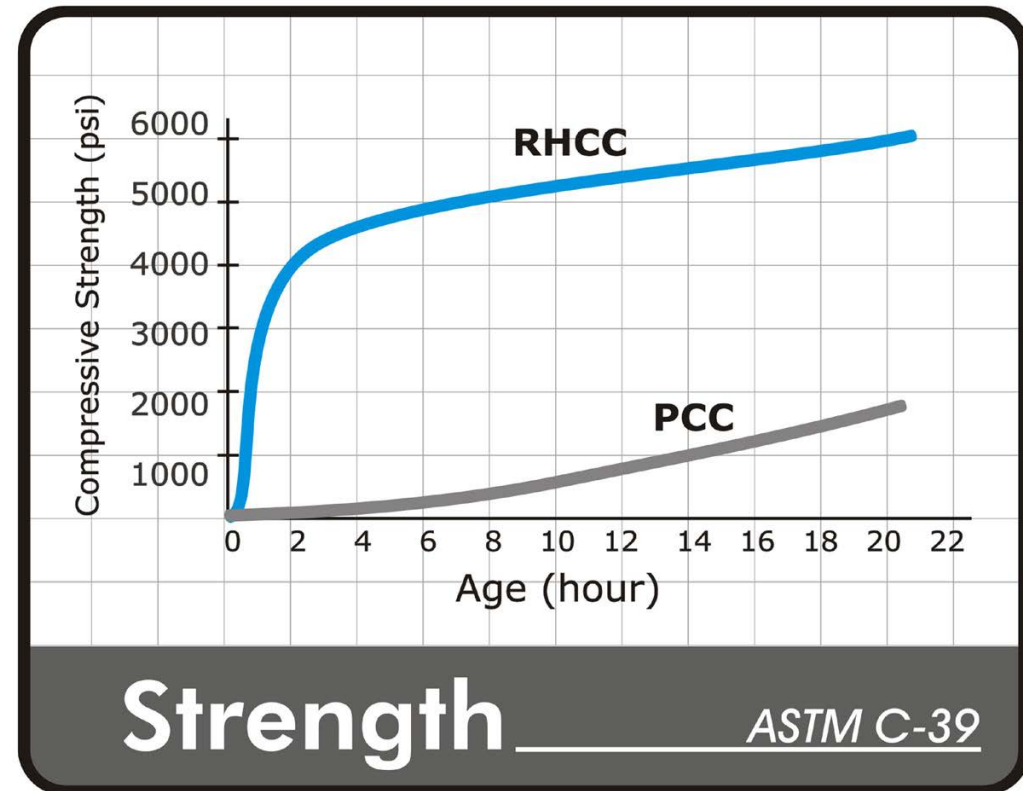
➤ Water/Cement Ratio for HYDRATION

- Portland cement .25
- CSA Cement .38
- Excess water used up
- Little excess to form bleed channels





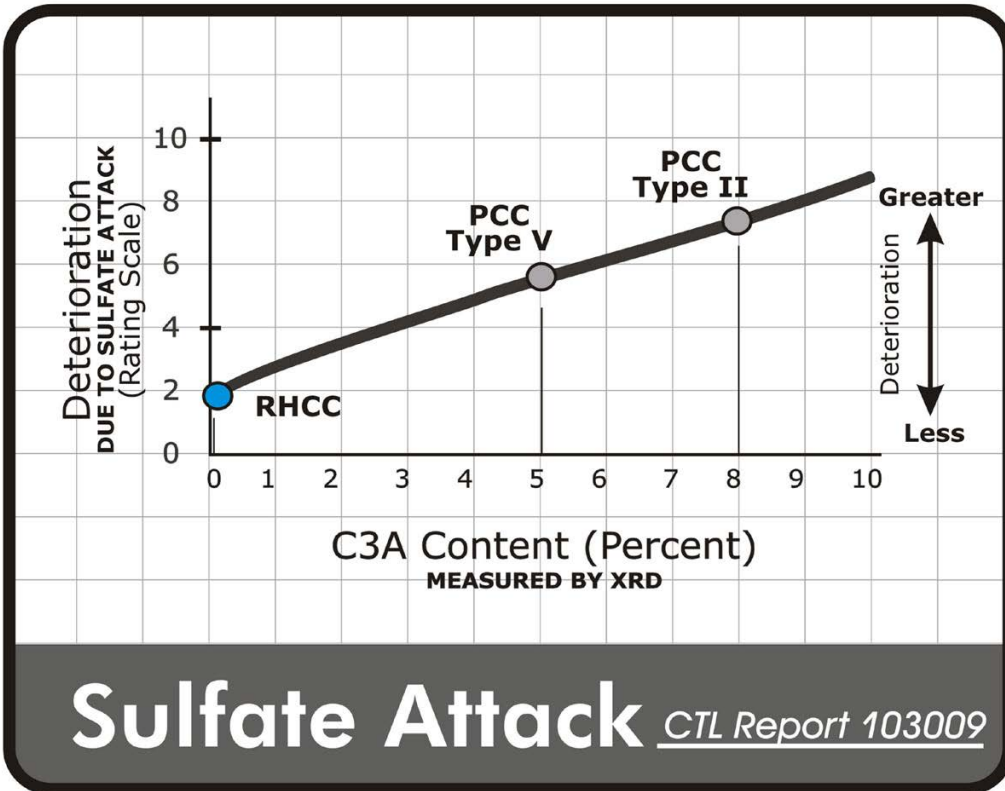
STRENGTH Comparison



ACI 365.1R-00 SERVICE LIFE PREDICTION

“Because it is the C_3A that is attacked by sulfates, the concrete vulnerability can be reduced by using cements low in C_3A ...”

➤ SULFATE ATTACK Comparison



➤ SULFATE ATTACK



Type II Portland 8% C₃A



CSA Cement 0% C₃A

➤ GLOBAL WARMING POTENTIAL (GWP) of CSA Cement

- Type CSA
 - 673 kg of CO₂-eq/metric ton cement
- Portland cement*
 - 1,040 kg of CO₂-e/metric ton cement
- Type IL* (portland limestone cement)
 - 846 kg of CO₂-e/metric ton cement

*Industry-standard EPDs, not plant-specific



➤ Typical Mobile VOLUMETRIC MIXER

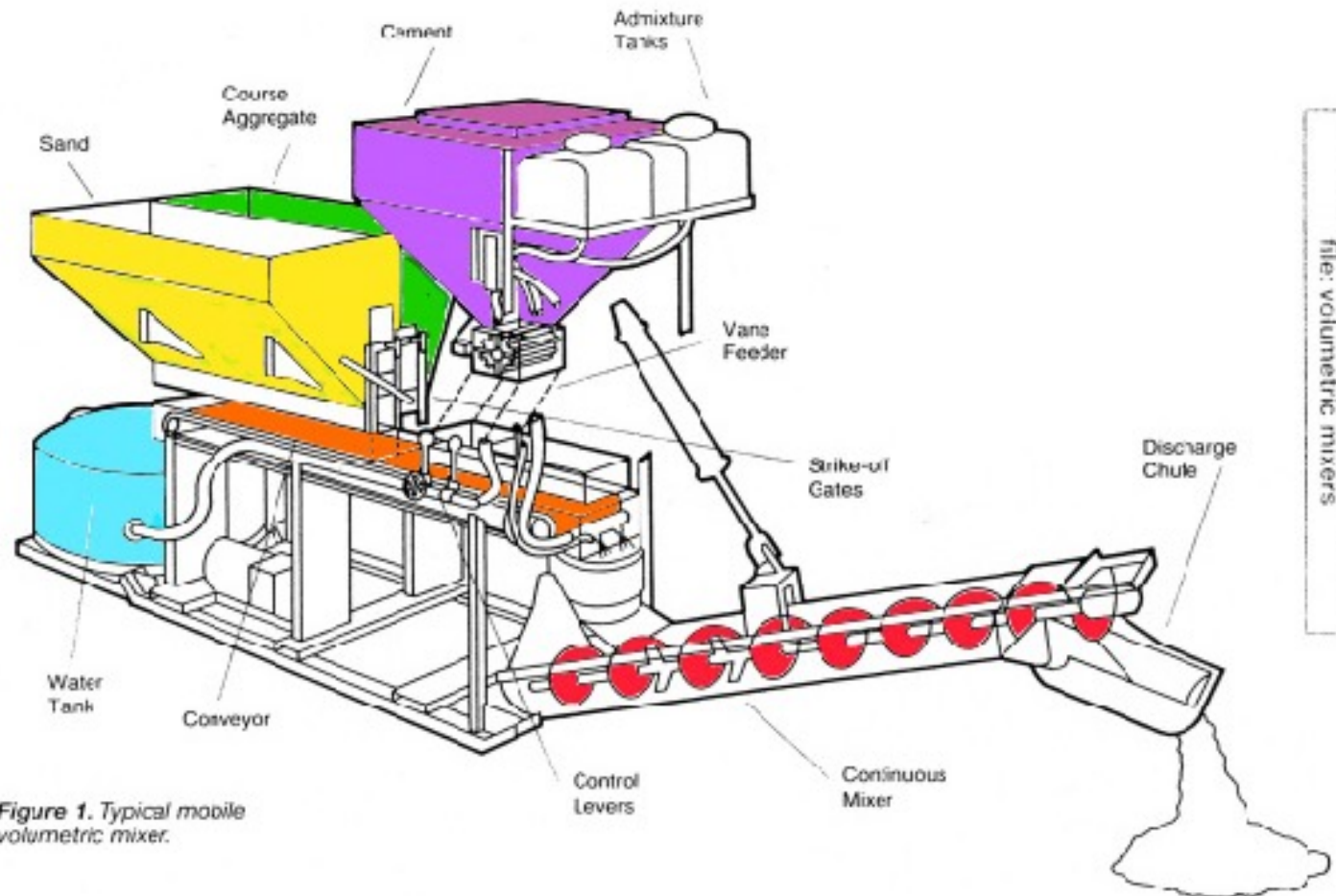


Figure 1. Typical mobile volumetric mixer.



THORNBURG Bridge

Route 60 in Pittsburgh, PA











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Pizza & Draft House
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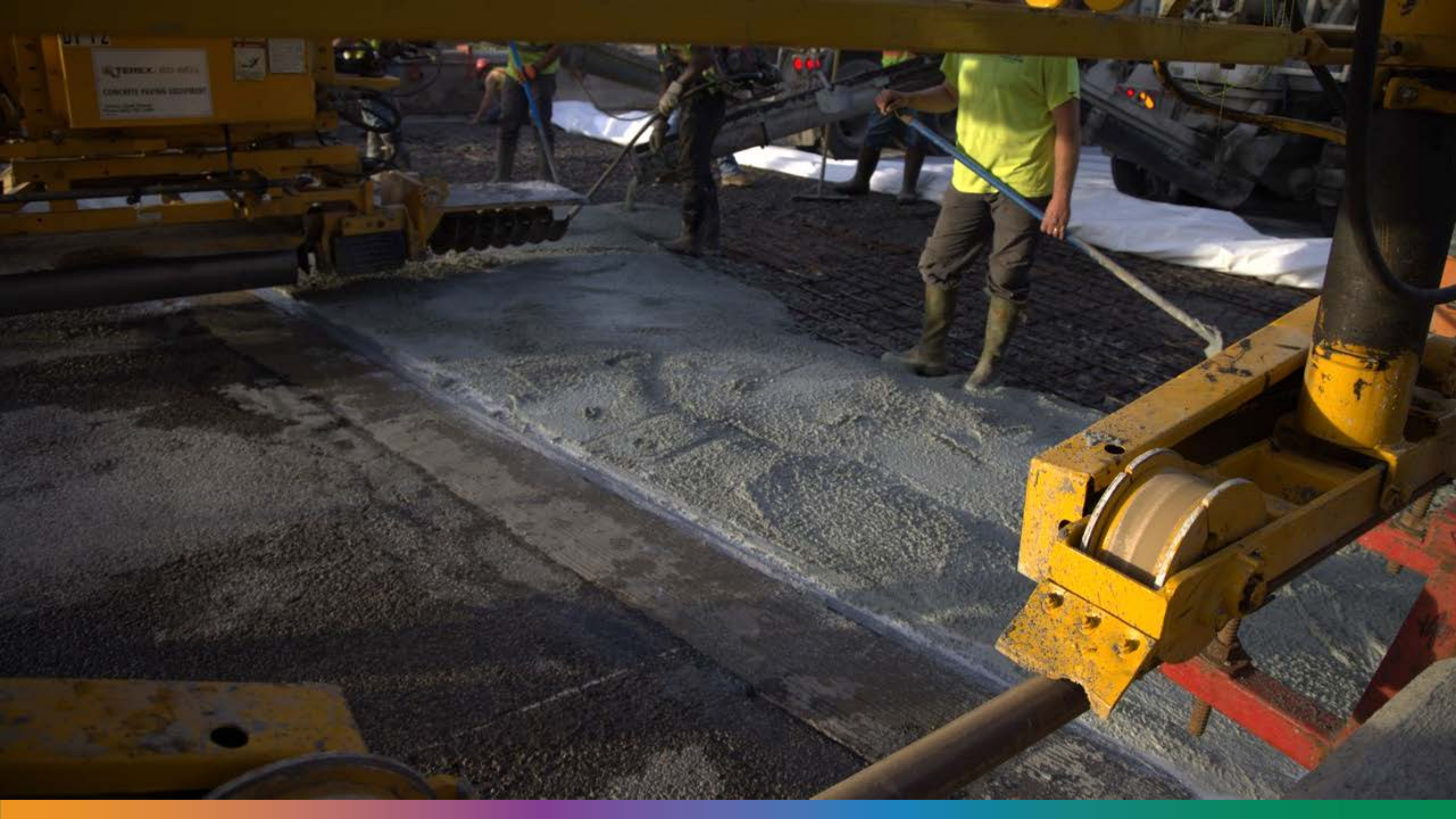
3.79
4.75

WANK

0537

210

LOWEST PRICES



BT 12

TEHCK 100-4074
CONCRETE FINISH EQUIPMENT





WEST PITTSBURGH
BUSINESS PARK

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DATE		STRENGTH @ 3 HRS PSI	
05/06/2023		3,740	
05/06/2023		3,360	
05/06/2023		4,420	
05/06/2023		3,295	
05/07/2023		3,050	
05/07/2023		3,105	
05/07/2023		3,263	
05/07/2023		3,677	
05/07/2023		3,083	















MADE IN
US

DIESEL

WARD POINT

DANGER
Do not ride on front
or back of machine

TBG 134

DANGER
Do not ride on front
or back of machine

DANGER
PINCH
POINT

DANGER
PINCH
POINT

AMPA







*Thank
You!*

For more information, visit CTScement.com.
For support, contact your local CTS Representative.

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Engineering Sales Manager

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(973) 568-3134

