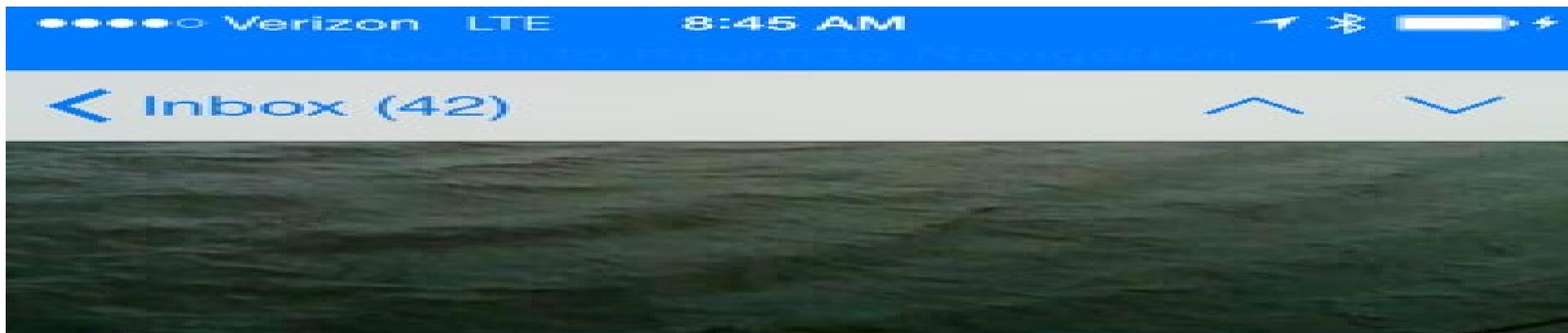


Hey, Everybody Still AWAKE!



Even technology had its issues way back when



Little known fact....

- Concrete is the second most consumed product in the world by weight next to.....

Water

Bob Vila calls it “cement”



FDNY firefighters extricate driver from overturned cement truck on Brooklyn-Queens Expressway



The Industry Doesn't Help with the Confusion



Calling concrete (the batter) cement is like “buying a loaf of flour”



Name the vehicle!



billclowestruckphotographs

2000 6x2A DAF 85CF X792GBF Blue Circle Cement (Lafarge) 050906-2241
06/09/2005. Location: Flash on the A53 Buxton to Leek road, the highest village in Staffordshire ©BillClowes2005



Cement Tanker Driven Into Plastic Concrete



Concrete By Definition

- Concrete is a heterogeneous system of solid, discrete, gradiently sized, inorganic mineral aggregates, usually plutonic (feldspatho-siliceous or ferro-magnesian) or sedimentary-calcareous in origins, embedded in a matrix compound of synthesized poly-basic alkaline and alkaloidal silicates held in aqueous solution and co-precipitate dispersion with other amphoteric oxides, this matrix being originally capable of progressive dissolution, hydration, reprecipitation, gelatin and solidification through a continuous and coexistent series of crystalline, amorphous, colloidal and cryptocrystalline states and ultimately subject to thermoallotriomorphic alteration, the system when first conjoined being transiently plastic during which state it is impressed to a predetermined form into which it finally consolidates, thus providing a structure relatively impermeable and with useful capacity to transmit tensile, compressive, and shear stress.

Some Folks Call It “MUD”



The producer supplies the “batter “The contractor
“bakes” the cake



There are some contractors that don't know



This is some hard work! This concrete is finishing a little *ruff ! Driver add more water!*



THE DAY OF THE PLACEMENT

Subgrade Looks A Little Wet But Send the Concrete Now



0% Chance of Rain



I Have Not Been To The Site But Send The Truck!



Manpower: I Only Need One Man to Pour 20 Yards



How about these guys...check out the footwear!



The guy in the previous slide as a child



Precast vs. cast in place



NIIIIIIICCCCE!



The Developer's Brother Was a Site Contractor



I don't care what it looks like or how it functions I built it per plans and specifications



Guess What Contractor Is Always Complaining Of Being “Shorted” On His Concrete Orders?



Hey, concrete is here, anyone seen the wheelbarrow?



The Supplier.....this guy *always* has the lowest price!



Your concrete supplier is in the delivery business and just happens to be hauling concrete



A concrete supplier told me: “we are only as good as our customers”



This guy plays one of the most important roles @ the plant



Time is \$ for both parties



Dispatchers Famous Line: “Truck should be there any minute now”



Voted best use of a concrete drum



Concrete Materials Testing

(picture of the first plant I worked at)



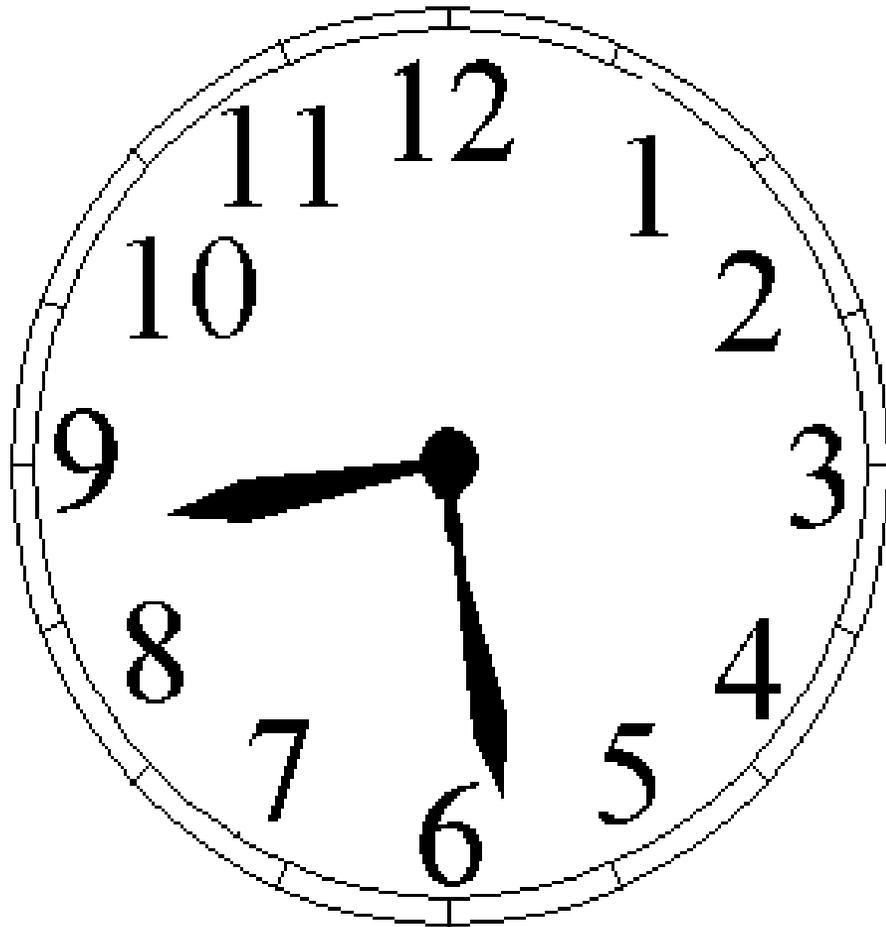
Concrete is an amazing and complicated product. Knowing the product will help you “tame the beast”



There are approx. a 150,000,000,000 grains in
a pound of cement!



Whatever you take from here
today...REMEMBER
The Two "t"s



FOR THE RECORD

If you test concrete with one of these



You *better* have access one of these!



According to ASTM C1064

- Section 5.1

“The accuracy of each temperature measuring device used for determining the temperature shall be verified *annually*, or when there is a question of accuracy.”

The temperature measuring device shall have an accuracy of $\pm 1^{\circ}\text{F}$ throughout a range of 30° to 120°F



Don't let that \$12 thermometer
cost somebody THOUSANDS!



We are having problems getting concrete to at least 50 degrees!



Hopefully 3" from the edge of bucket!



ASTM C 172

Sampling Freshly Mixed Concrete



According to ASTM C172

- Section 5.2.3

“Sample the concrete by collecting *two or more portions* taken at regularly spaced intervals during discharge of the middle portion of the batch.”



Why is it that every wheelbarrow designated to sample concrete has a flat tire?



Wheelbarrows are expensive! At least you don't have to worry about a flat tire!

iPad

12:14 PM

82%

photos poor concrete testing









Where should concrete be sampled



According to ASTM C 172

•5.2

Note 2- Sampling should normally be performed from the mixer to the conveying vehicle used to transport the concrete to the forms; however, specifications may require other points of sampling, such as the discharge of a concrete pump.

ASTM C 143

Do you think all concrete has slumps this easy to measure?



NO!



Clean around base of mold prior to lifting. Lift the mold upward in one smooth motion, without twisting the mold, in *5 +/- 2 seconds*.



Measure to the nearest 1/4 inch the slump from the top of mold to the displaced original center of the top surface of the specimen. Perform the test within 2-1/2 minutes.



The Testing “Hall of Shame”

The technician does a beautiful job sampling the concrete from the middle of the drum. His technique is next to perfect and pulls up the cone in a steady consistent motion in 5 seconds. He looks around and can not find a ruler to measure the concrete from the displaced center to the bottom of the rod.....so what does he do? The next best thing..... he then proceeds to write 2” on his field report.....what do you think?



A LITTLE TIGHT



A LITTLE LOOSE



WORK SHOES?



Work Shoes?



Come to find out they were both related to these guys!







9318 L
818

9318 L
702
42-8667C



LATERAL FILE
UP ↑
FURNITURE
FRAGILE Handle With Care
DO NOT DROP

HON
OFFICE FURNITURE



I think a 3-5" slump won't work



There was no superplasticizer in the budget



Local Church

Concrete tested fine



Who cares (close up)



Inspector says slump looks OK!



But if it's going here is it OK?



Determine the mass of the full measure.



Cover 2/3 & withdraw with sawing motion.
Then place at 2/3 and advance with sawing motion until
completely off the far side of the measure.



Air entrainment..it can change by the minute

- Time and temperature
- Type of mix design (low w/c ratios)
- Type and addition of certain types of admixtures
- How the admixtures are added to the mix
- Shape and size of bubble
- Cement blaine and alkalie content
- LOI of Ash
- Slump
- Gradation fluctuations and particle shape
- Mixing action
- Water retempering
- Vibration
- Free Fall
- Pumping
- Over troweling
- Etc.

Air is a pain in the



I Don't Understand?!

If you spend \$650.00 to \$700.00 for
this



Then spend \$50.00 to \$75.00 for this



DARN!
ANOTHER BAD
CYLINDER

When Cylinders Go Bad



Whether you have a testing budget or not do not let pennies hold up a dollar







Mark specimens with positive identification, *not on removable caps*, using a method that does not alter the top surface of the specimen.







POTOMAC
PCI
CONSTRUCTION

Certified Quality

Asphalt - Paving - Concrete - Materials

(304) 263-1500

www.pci-potomac.com

Big Buck Initial Curing



RETAILS @ ABOUT \$15



Curing tables used in Atlanta keep cylinders moist with burlap drapes that also provide evaporative cooling. Table tops are painted white to reflect sunlight.

RETAILS @ ABOUT \$8.00



Four 4x8-inch cylinders can be totally immersed in a 5-gallon pail to prevent any moisture loss.

So where do we put the \$2.68 curing vessel?



The “names have been changed
to protect the innocent”



“Amazing stuff” Phone fell out during production...how did they find it?



This is a true crime scene! Moisture loss on cylinders and beams, no temperature control!



Another crime scene minus the yellow tape...Moisture loss, not level, no temperature control.....no labels on cylinders!



There is so much concrete crime committed daily each producer has to hire their own concrete cops!



We're have some issues with the concrete contractor....lets send out our most *fearless* technician



It's called a curing box....you know a place to cure cylinders?!











Baking nicely in the sun...they should be nice and hard when they get picked up





Field curing



Field curing (what is wrong)



That's Better!



The Testing “Hall of Shame” goes back a long way



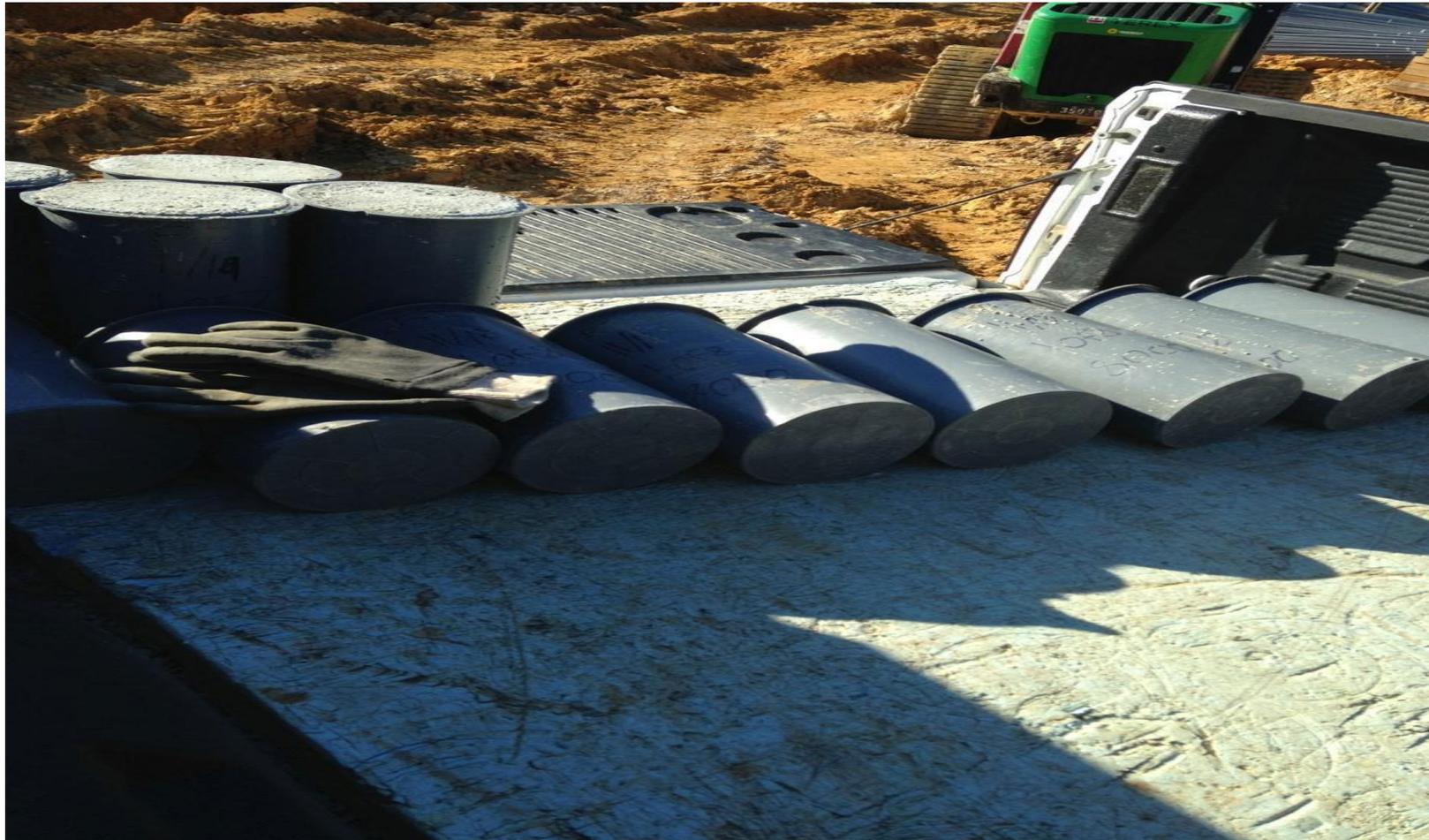
Secured for transport to lab



USELESS!



They will be fine!



No Jarring During Transport?!
No Moisture Loss?!
Would this be acceptable for field curing
cylinders?



The things people do !?



“THE BISHOP”



The "NIKE" (when you have to pump up your air)



This takes an effort

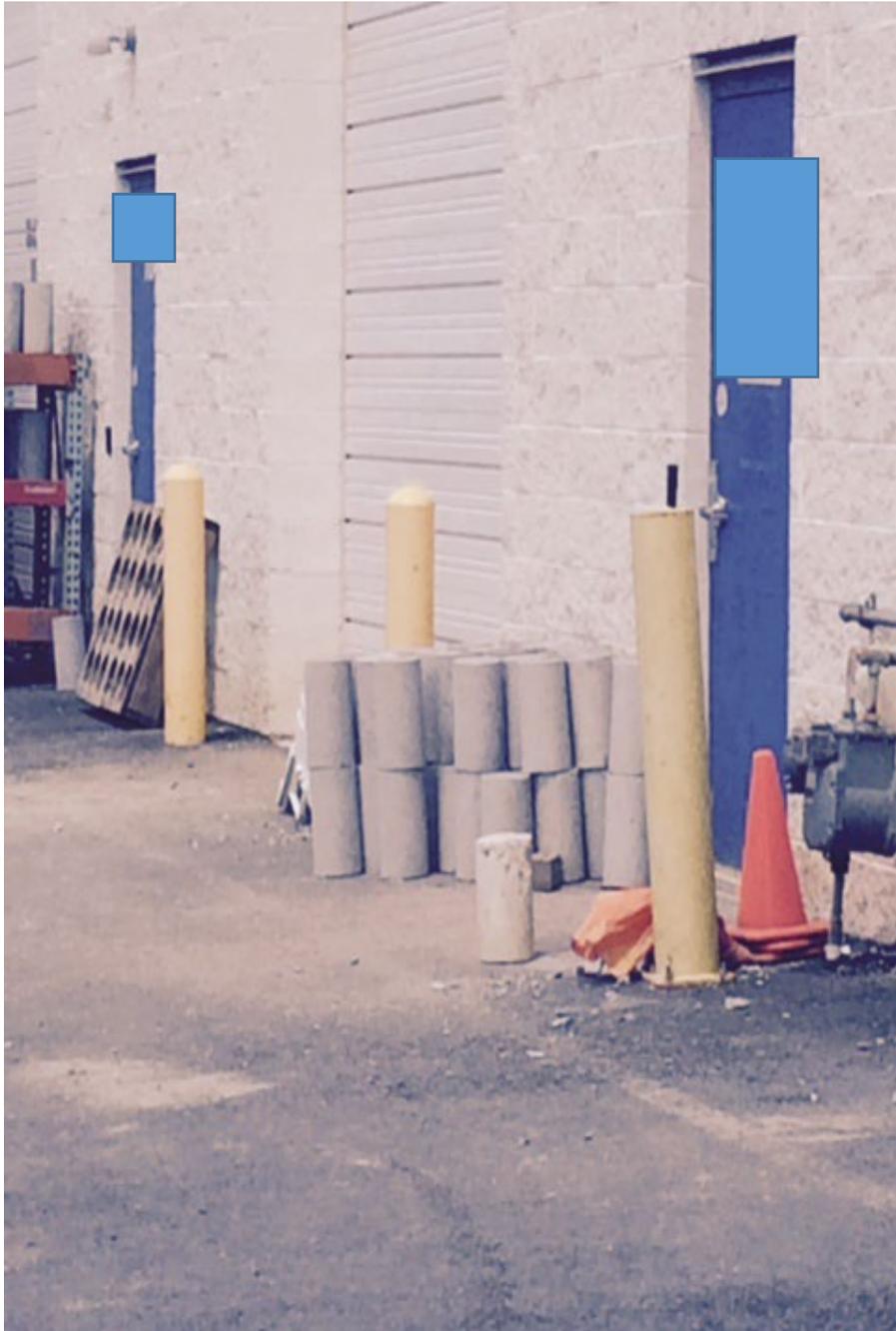


We have the strength “in the bag”



WHY BOTHER?





Why Does Mix #3 Test Stronger Than Mix #6...Strip them on a Friday and have them sit out over the weekend in the middle of summer!

MSHA Specification

SECTION 111 SAMPLING DEVICES, TESTING AND SAFETY EQUIPMENT

Sampling Devices and Testing Equipment with Accessories.

Section:

(h) Concrete Tests.

(14) **4 x 8 in.** cylinder molds (for compressive strength specimens).

(15) 3 x 6 in. cylinder molds for latex concrete.

(16) 6 x 12 in. cylinder molds for density (unit wt) of lightweight concrete and when otherwise specified

Hunk of wood to send a message
(when production is mad at q/c)





What's wrong?



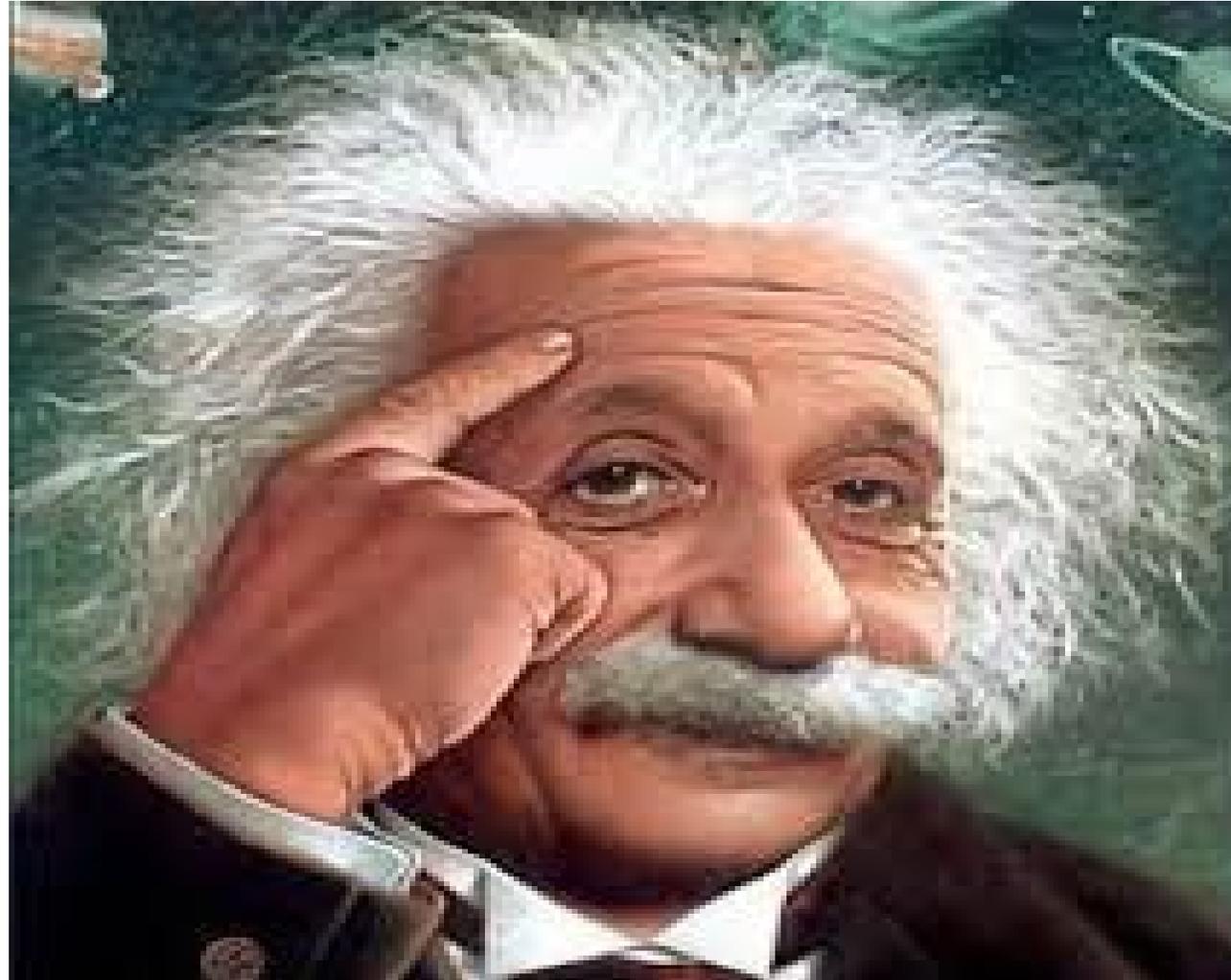
Which is better?



With all the technology at our fingertips.....
Poor concrete testing still raises its ugly head



If anyone tells you they are a concrete expert.....



My best advice if involved with concrete problems.....



All things considered: even when some folks
try to kill it with water



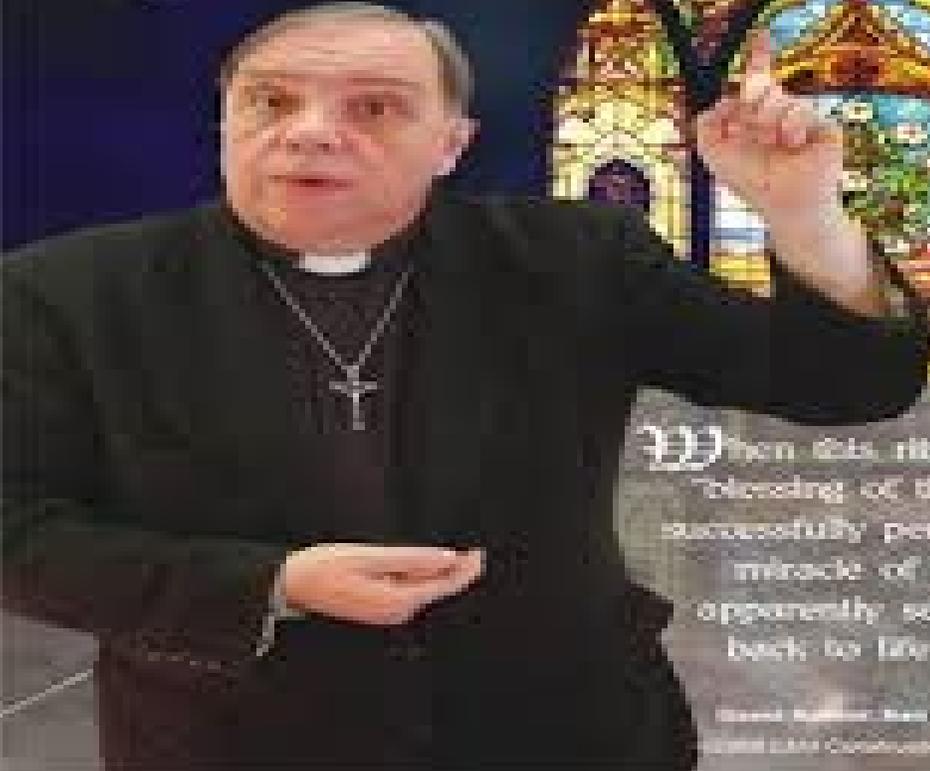
Or kill it with temperature



Or kill the surface



Blessing the Slab

A priest in black clerical attire is shown performing a ritual. He is holding a small object in his hands and pointing upwards with his right hand. The background features a large, colorful stained-glass window with a Gothic arch design.

When this ritual of the "bleeding of the slab" is successfully performed, the miracle of bringing apparently set concrete back to life occurs.

Based on the book "The Slab" by P.O. O'Neil
© 2011 O'Neil Construction Company, Inc.

Concrete usually still ends up



THANKS!

