“What Makes Durable Concrete?”

- Production -

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Proportioning Concrete Mixes

• Start at the Quarry:
  – Best aggregate for making quality concrete
    • Hard, durable particles with moderate absorption
    • Well graded
      – Some proportion of all sizes from coarse to fine
Proportioning Concrete Mixes

• Well graded mixes:
  – Higher percentage of aggregate
  – Less cement paste = Less water needed

• High strength concrete with less shrinkage, better workability & higher durability
Proportioning Concrete Mixes

• **Theory:**
  
  – All-portland cement mixes make the best concrete
  
  • Fly ash – just a filler – makes for a cheaper mix for the producers to produce
Proportioning Concrete Mixes

• **Reality:**
  - Pozzolans or Supplementary Cementitious Materials (SCM)
    - Fly ash, slag or silica fume in combination with portland cement
  - are far more superior to what all-portland cement mixes can achieve on their own
Making Concrete

• Good concrete depends on …

  – Good equipment
    • Plants in good working condition
    • Mixing equipment’s blades or fins not worn out
      – Important for mixing

  – Proper blending of the materials
    • Dispensing the correct amount of each material in the proper sequence
Making Concrete

• Good concrete depends on …
  – Good control of water addition
    • Have your loader operator work the stockpiles properly
    • Know the moistures of your materials
    • When truck drivers leave water in drum from their previous wash out, it compromises their next load
Quality Control

• Every Ready-mix producer should have a quality control program.

  – Hard to produce quality concrete without one
  – If you do not know what is leaving the yard – how can you question the results in the field

• Test, test and test some more!
  – How much testing are too much testing?
Dihydrogen Oxide

• A finisher’s best friend!
  – Helps concrete flow down the chute easier
  – Helps fill the forms faster
  – Can make concrete practically self leveling
  – Slows the setting time when temps are hot
  – Helps with the floating and troweling of concrete in any weather

  “Water”

  – Its known by its nickname . . .
Concrete is the second most used material on the planet, next to water – let’s not be responsible for jeopardizing it’s ranking!

- Good concrete is a result of good planning involving everyone in the construction chain.
- Manage the variables in ready-mix concrete, and day to day operations too will be manageable.

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