The Case for Fly Ash

Virginia Concrete Conference

Richmond, VA

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About ACAA

• American Coal Ash Association was founded in 1968 as the National Ash Association
• 140 members
• Headquartered in Farmington Hills, MI
ACAA Mission

• To encourage the beneficial use of coal combustion products (CCP) in ways that are protective of the environment, technically appropriate, commercially competitive, and supportive of a more sustainable society.
Agenda

• What is fly ash?
• How does fly ash improve concrete mixtures?
• How important is fly ash to the transportation industry?
• Challenges for coal fired generation
• Reclaiming fly ash
Main types of CCP

- Fly ash – portland cement, concrete
- Bottom ash – aggregate for geotechnical applications, masonry units
- Boiler Slag – shingles, blasting grit
- Synthetic gypsum – portland cement, wallboard, agriculture
By the numbers - 2015

• 117 million tons of coal ash produced
• 44 million tons of fly ash produced
• 24 million tons of fly ash used in all applications
• 15.7 million tons of fly ash used in concrete products
• Another 3.6 million tons of fly ash used in cement production
What is Fly Ash?

• Residual material from combustion of coal slightly finer than Portland cement
• Spherical in particle shape
• Reacts with calcium hydroxide providing a pozzolanic reaction
• ASTM C618 covers Class F and Class C fly ashes
How Fly Ash Improves Concrete

• Improves pumpability
• Increased flexural and compressive strengths
• Reduces permeability
• Mitigates alkali-silica reaction
Fly Ash is Important to Transportation

- The American Road and Transportation Builders Association surveyed DOTs across the U.S.
- If fly ash was not available the impact on transportation projects would be $104 billion over 20 years.
Other SCMs work, but.....

• Fly ash is one of many supplementary cementitious materials (SCM) used in concrete
• Slag cement, silica fume, metakaolin, natural pozzolans all have similar effects on concrete performance
• Supply and pricing is quite different
Challenges to fly ash supply

• Coal fired generation has declined from 50% to 34%
• Some old power plants have closed
• Natural gas is plentiful and cheap (for now)
• More renewables being used
• Environmental regulations
There is hope…

- Technologies are being developed to meet combustion issues
- Logistics are being improved
- CCP is starting to be reclaimed
- According to the U.S. EIA, the amount of coal-fired generation will increase slightly to 2040
Summary

• Fly ash has become a strategic tool for production of more durable and sustainable concrete structures
• We still are disposing of millions of tons of fly ash each year
• Coal-fired generation of electricity will continue for at least 25 years
World of Coal Ash 2017

• Flagship event for the coal ash industry
• May 8 to 11 in Lexington, KY
• Over 200 presentations
• Over 80 exhibitors
• Attendance in 2015 was 900 persons
• http://www.worldofcoalash.org/
Thank You

AMERICAN COAL ASH ASSOCIATION

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