



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY  
GOVERNOR

ANTHONY J. TATA  
SECRETARY

December 1, 2014

TO:

Senator Kathy Harrington  
NC Senate  
16 W. Jones St., Room 1127  
Raleigh, North Carolina 27601-2808

Representative Frank Iler  
NC House of Representatives  
300 N. Salisbury Street, Room 534  
Raleigh, NC 27603-5925

Representative John A. Torbett  
House of Representatives  
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Representative Mike Hager  
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Representative Ruth Samuelson  
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Senator Brent Jackson  
NC Senate  
16 W. Jones St., Room 1127  
Raleigh, North Carolina 27601-2808

FROM: Michael L. Holder, PE  
Chief Engineer - NCDOT

This letter serves as the report on the Department of Transportation's review of past studies of and plan for evaluating additional opportunities to increase beneficial use of coal combustion products (CCPs) also referred to as coal combustion residuals (CCRs) as required by Senate Bill 729, Section 14 which reads as follows:

**SECTION 14.** The Department of Transportation shall evaluate additional opportunities for the use of coal combustion products in the construction and maintenance of roads and bridges within the State. The Department shall report the results of its study, including any recommendations, to the Environmental Review Commission and the Joint Legislative Transportation Oversight Committee no later than December 1, 2014.

As a result of earlier studies, NCDOT has allowed the use of fly ash (a type of CCP) in concrete mixes used on road and bridge construction projects since March of 1985. In an industrial context, fly ash usually refers to ash produced during combustion of coal. An

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estimated 20,000 tons of this material was used on Department projects in 2013. Fly ash is required in those instances where the material provides a long term benefit to the service life of concrete or prevents the risk of concrete failure caused by harmful reactivity of certain cement and stone types. Additionally, there have been several structural fills built with CCPs on NCDOT projects starting in 1995 and continuing through the early 2000s. This practice was discontinued in 2010 due to concerns about the proposed EPA rulemaking on the conditions for beneficial use of CCPs.

After studying the issue in the context of current operations, the Department is exploring several additional opportunities for incorporating CCPs into road and bridge construction projects. The following is a summary of the actions NCDOT proposes to take:

- Resume the use of CCPs in structural fill/embankments in accordance with the language in S 729 (less than 8000 tons per acre or 80,000 tons per project) beginning in 2015. The Environmental Protection Agency's final rule regarding regulation of CCRs is expected to be published in December 2014. The agency is anticipated to rule that CCRs are listed as either special wastes or non-hazardous wastes under the Resource Conservation and Recovery Act. NCDOT will review the final ruling and adjust our beneficial utilization plan accordingly. Specifications will be updated as necessary to ensure compliance with the current legislation and the final EPA ruling.
- Continue to work with NCDENR on expanded use in structural fills and specific requirements for NCDOT projects as allowed by Section 130A-309.220 of the bill.
- Consider expanding the requirement to use beneficial fly ash in concrete, particularly in bridge decks and concrete pavement where the benefits are most realized. Use of fly ash in concrete often requires processing of the fly ash material to remove excess carbon and can also be impacted by seasonal energy use. Spring and fall are typically light energy consumption seasons and this has a direct effect on the availability of fly ash. Various industry groups need to be consulted to ensure there will be availability of acceptable fly ash before making it a requirement.
- Revise Standard Specifications to allow more use of fly ash in any concrete mixes by reducing the requirement to replace each pound of cement with 1.2 pounds of fly ash. The new requirement would allow a 1 to 1 replacement ratio provided that all strength requirements are met. An allowance for 1 to 1 replacement could potentially reduce the overall cost of the concrete and thereby make use of fly ash more attractive to concrete producers.
- Research the potential to use bottom ash as an aggregate replacement in concrete brick and block. If determined to be feasible, discuss and develop specifications that allow the use of bottom ash with brick and block manufacturers.

Please advise should you have any questions or need further clarification on current requirements or planned actions.

cc:

Fiscal Research  
Keith Weatherly