



Public Schools of North Carolina  
State Board of Education  
Department of Public Instruction

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# Report to the North Carolina General Assembly

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Plant Operation Funding  
*SL 2008-107, 7.18(b)*

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**Date Due: April 15, 2010**  
Report # 50  
DPI Chronological Schedule, 2009-2010

**Plant Operation Section  
Division of School Support  
Department of Public Instruction**

One of the challenges facing our state is the increased budgetary pressures on North Carolina's schools and its associated facilities. Since a good environment is crucial to each student's ability to learn, school administrative officials are appreciative when an efficient, cost savings solution is available. DPI's Plant Operation Section serves as this solution on a daily basis by making our facility consulting, engineering design and construction liaison skills available to all of the Local Education Agencies (LEAs) in North Carolina. This Section ensures efficient operation by providing wide-ranging services addressing energy management design, life safety systems design, clean water and wastewater treatment design, management of hazardous materials, and indoor/outdoor air quality assistance. From ADA access to sophisticated boiler control systems, Plant Operation staff offer the full range of services for a school system.

This technical assistance is vital to the majority of counties in North Carolina, considering that 68% of the LEAs are low wealth and may be unable to afford outside consulting. These valuable services are available to all local school administrative units due to the funding provided by Section 7.18.(a) of G.S. 115C 546.2 (a). Sample Case Histories are provided on the back of this page.

**Engineers' Primary Purpose**

Mechanical System Engineer: Retrofit existing building mechanical systems using state of the art design strategies resulting in energy saving and more efficient schools.

Civil/Environmental Systems Engineer: Provide professional technical design and assistance in the realm of civil engineering projects, indoor air quality, hazardous waste disposal, and support for the operation of LEAs' water supply and wastewater treatment facilities.

Electrical Systems Engineer: Design state of the art electrical, security, and fire alarm systems to promote energy conservation and safety.

Structural Engineer: Provide state of the art engineering design and consulting to LEAs with respect to their physical facilities ranging from the foundation to the roof.

**New Initiatives**

Plant Operation made a concentrated effort to "ramp up" investigating and implementing new technologies, techniques, and methods in an effort to save money associated with the schools' essential projects. The following provide three sample efforts:

- **Metal Roof Restoration** – Several schools reported problems with deteriorating metal roofs. Plant Operation personnel investigated the issue and found that, in

various cases, primer coats had failed allowing deterioration of the protective coating which in turn allowed rusting and shortening of the roof's life. By working with paint formulation companies, vendors, contractors, and school owners, a new method of removing the faulty coating, cleaning the steel roof, and recoating with a new kynar based finish was developed and is being tested at facilities in Alamance County. This method is extremely cost effective compared to replacing the steel roof with a new one. For a 50,000 square foot roof a new steel roof could cost approximately \$750,000 while using this new method would cost approximately \$200,000 – a projected savings of \$550,000.

- Plant Operation/NCSU Energy Saving Pilot Program – Plant Operation has begun collaboration with the NC State Energy Management Program (at NC State University) investigating ways to better utilize energy in our public schools. We recently initiated a pilot program investigating boiler efficiencies in various Tier 1 and Tier 2 counties; the emphasis of the effort seeks to get existing boilers to run as efficient as possible with minimum expenditures by the school. The data is currently being evaluated and reports to the schools will be forthcoming to the representative LEAs.
- Energy Star Certification – EPA's Energy Star Program has become a focal point in helping school facilities reduce energy consumption. An important component in this effort has been the certification effort required by Professional Mechanical Engineering personnel. Staff have provided these certification efforts to numerous schools across the state and the demand continues to grow.

### **Sample Case Histories/Savings**

#### Scotland County Schools

Plant Operation mechanical engineering provided cooling tower replacements at both Wagram Primary School and Sycamore Lane Middle School. These projects not only improved operations but again provided significant energy savings. Scotland County is scheduled to begin Energy Star Certification in multiple schools beginning this spring.

#### McDowell County Schools

Plant Operation personnel furnished the design and expertise for several projects including wastewater treatment plant improvements, water supply and collection sewer systems, mechanical system evaluation for indoor air quality, roofing design, and technical expertise regarding public relations efforts.

#### Perquimans County Schools

Plant Operation personnel provided engineering expertise and guidance in response to a federal government investigation of indoor air quality. We have also been involved in efforts aimed at upgrading lighting (and saving energy) in Perquimans' school facilities.

#### Life Safety - Various Counties

The design of a new Life Safety system has occurred in various school systems such as Orange Co, Bladen County, Person County, and Wayne County. This effort is critical to the safe operation and use of the associated schools.

#### Various LEAs - Training

In addition to furnishing engineering services, the Plant Operation Section also provides valuable training in a variety of different fields such as facility related asbestos remediation and school maintenance electrician review (exam and certification related).