35th Annual State Construction Conference
LED Lighting Panel Discussion


Department of Environmental Quality
The Panel

Panelists:

• Dr. Lynn Davis, Fellow, RTI International

• Robert Talley, PE, NC Dept. of Administration, State Construction Office

• Dr. Leonard White, PE, RCDD, NSF FREEDM Systems Center, NC State University

• John Anderson, PE, T.E.A.M. Lighting

Moderator:

• Renee Hutcheson, FAIA, NC Department of Environmental Quality
The Work Group

- Department of Environmental Quality
- Public Schools of North Carolina
- State Board of Education
- Department of Public Instruction
- Underwriters Laboratories Inc.
- Illuminating Engineering Society
- DPS: Department of Public Safety
- Wake Tech Community College
The Work Group

Dr. Lynn Davis
Renee Hutcheson, FAIA
Randy Allison, PE
Howard Beasley, PE
David Bell, PE
Eric Frazier
Thomas Hunter, PE, RA

Jonathan Jones, PE
Lalitha Krishnasami, PE
John Majernik, EI, PEM
Jeannie Smith, PE
Robert Talley, PE
Dr. Leonard White, PE

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LESSONS FROM THE FIELD
Office Overview

• NC State Construction Office provides:
  • FCAP - Facilities Condition Assessment Program
    • *What do you need and what will it cost*
  • Contract Administration
    • *Let's find a qualified designer*
  • Design Review
    • *Design must meet codes*
    • *Design must be in budget*
    • *Consider 1ˢᵗ cost and maintenance*
  • Construction Administration
    • *Monitor the expenditure of the funding*
But what if ....

The final project does not meet expectations

• After replacing the utility transformers and the lights
  • The new LED lights start flashing
But what if ....

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• After replacing the utility transformers and the lights
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• Build a new parking deck
  • LED fixtures to have a 5 year unconditional warranty
  • 50% of the new LED lights fail
  • Warranty is not honored
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- New Building with LED lights
  - The lights are failing
  - Colors are changing
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- New Building with LED lights
  - The lights are failing
  - Colors are changing
  - Maintenance issues
Did we create the problem?
Interaction Consideration of LED lighting systems

The Problem:
• A number of facilities in the state have large LED lighting systems. The state has experienced what appears to be an abnormally high failure rate of LED luminaires in a few of these facilities.

Questions:
• Are there standards for warranty protection?
• Who should provide the deconstruction review of the failed LED drivers from the facilities?
• Are there standards for system surge protection?
• Are there specific recommendations for facilities that are looking to deploy large LED lighting loads? Is there a difference for a new building vs renovation?
15 Universities and Affiliates

East Carolina  
UNC Charlotte  
Western Carolina  
UNC Asheville  
Appalachian State  
UNC A&T  
NCCU  
The NC Arboretum  
UNC Pembroke  
School of the Arts  
School of Science of Math  
Fayetteville State  
UNC General Administration  
Winston-Salem State  
UNC-TV

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<table>
<thead>
<tr>
<th>Cost</th>
<th>Item</th>
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</thead>
<tbody>
<tr>
<td>$25.5m</td>
<td>Lighting Contract Costs</td>
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<tr>
<td>96,000</td>
<td>New Fixtures</td>
</tr>
<tr>
<td>174,000</td>
<td>New Lamps</td>
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<td>2,850</td>
<td>Occupancy Sensors</td>
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<td>1,300</td>
<td>Exit Signs</td>
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UNC System-wide Lighting PC

$4m Annual Projected Energy Savings

$29.2m Energy Savings over 7 Years

7 yr. Payback

Improved Light Quality
Lower Maintenance Costs

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New and Old Fixtures Side-by-Side

66% reduction in energy
50% increase in fc

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UNC Chapel Hill – Fetzer Gym B

Before: 400 watt metal halide

After: LED

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(2) 14 w LED with ballast
(2) 32 w T8 with ballast
Talley Student Union

Vet School Parking Deck
LED Specialty Lights at UNC
NC Central Prison

Before: (7) 175 w metal halides

After: (7) 99 w LED’s

View of Dayrooms from Officer’s Control Room
Wake County
Sunnybrook Road Parking Deck
Where Can I Find The Guidance Document?

SCO Website
http://ncadmin.nc.gov/document/ssl-guidance

DEQ Website
http://deq.nc.gov/conservation/utility-savings/tools-technology
For Questions and Comments:

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