

# NC Architecture

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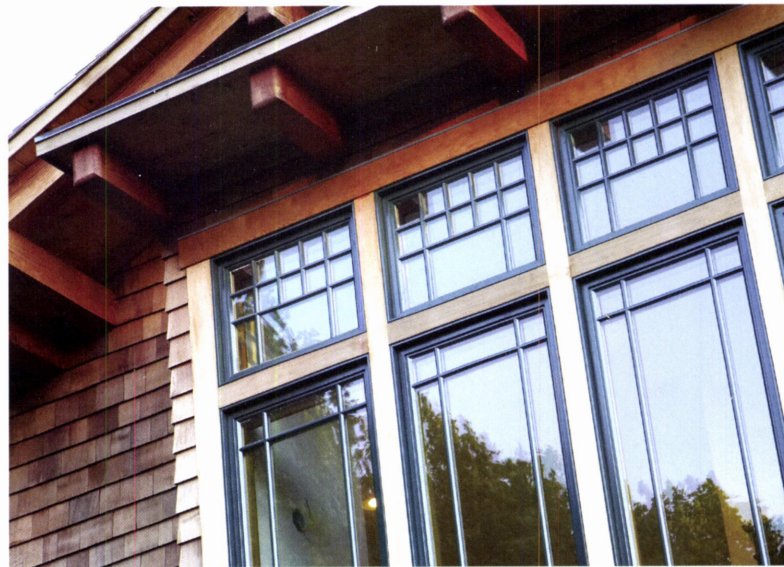
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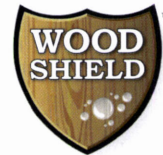
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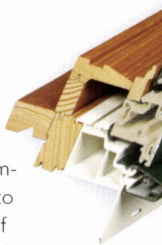
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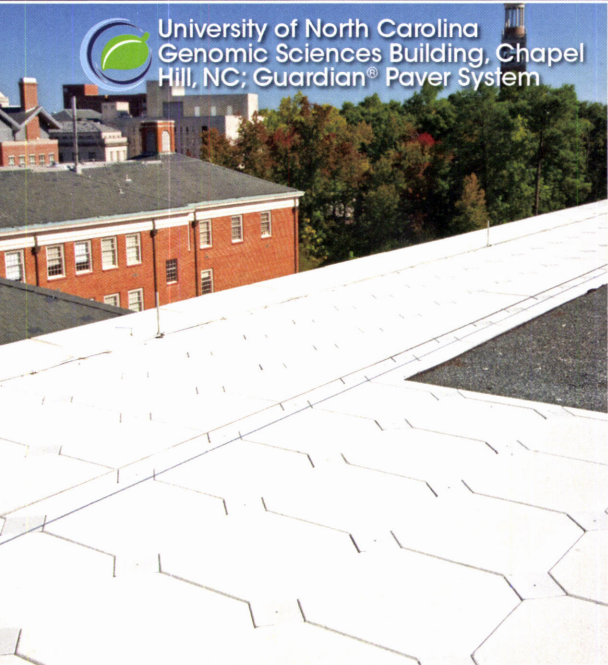
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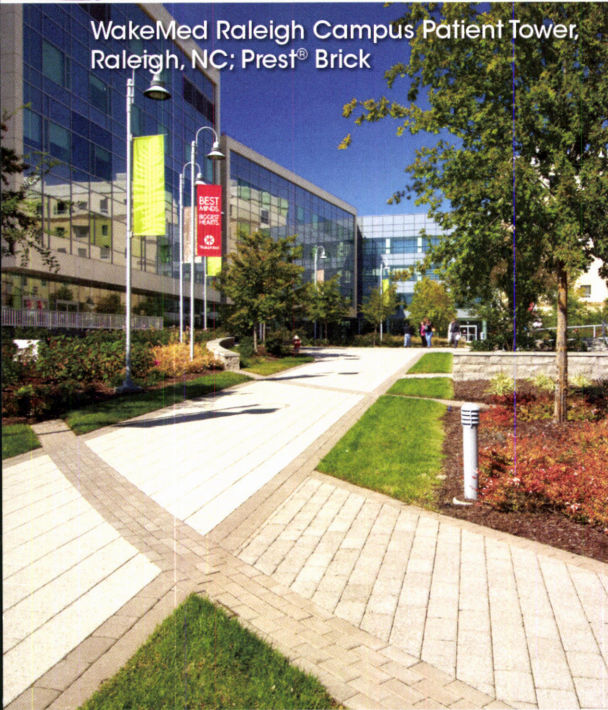
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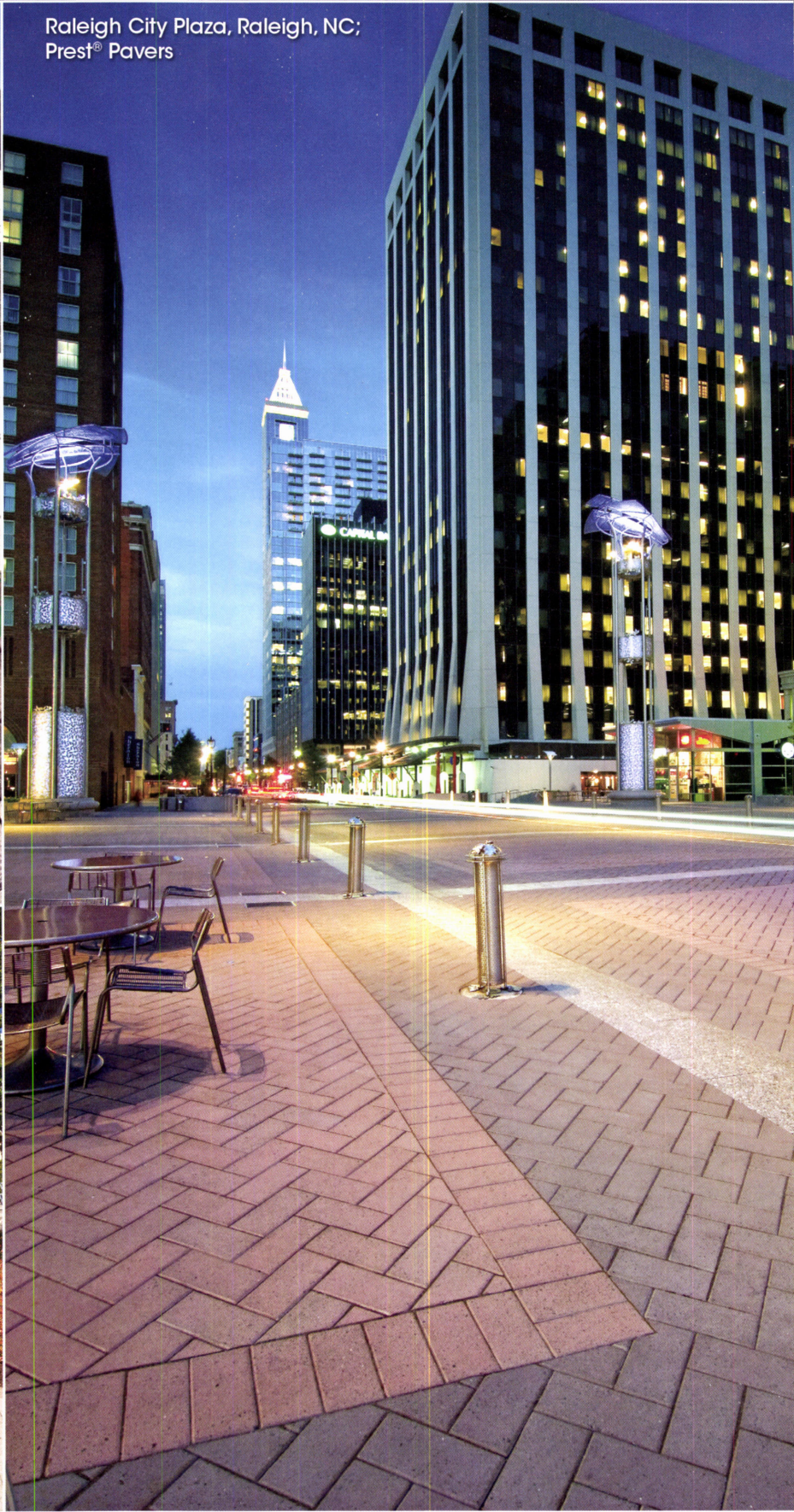
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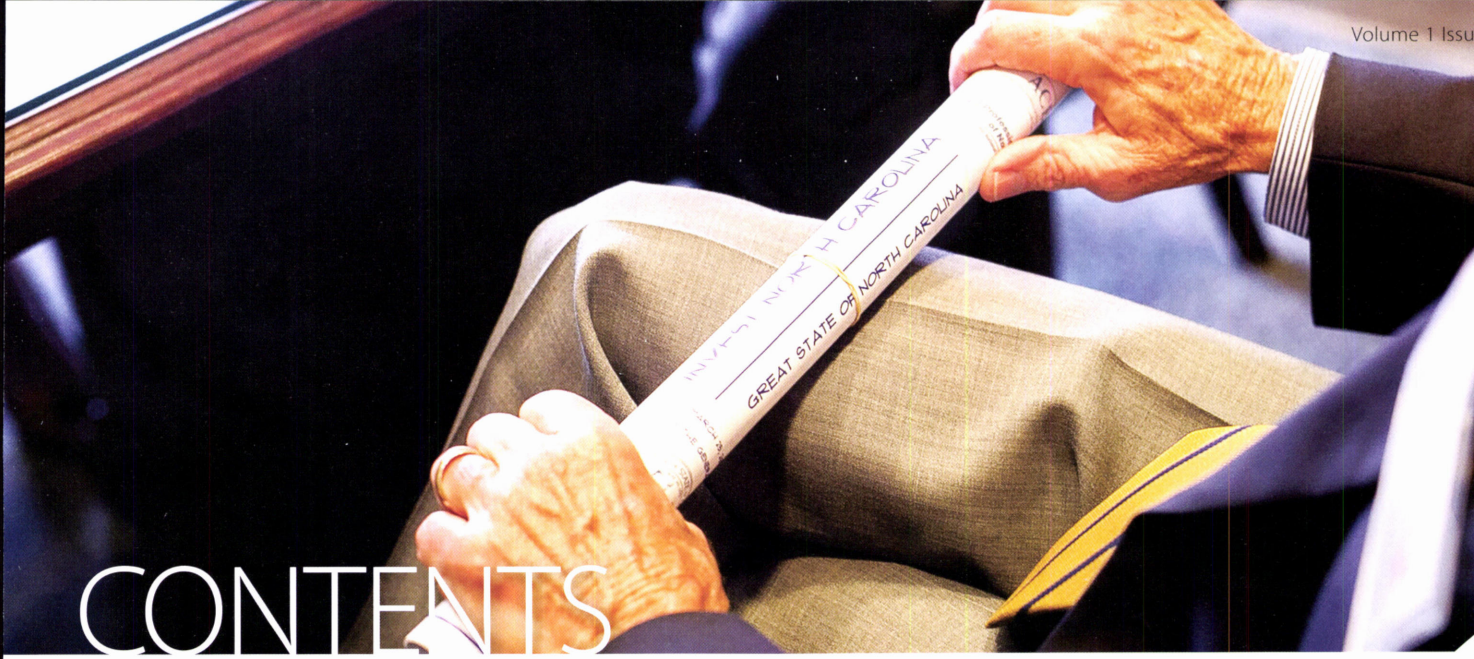


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# 2015 Legislative Session Summary

by Betsy Bailey and David Crawford

## **HB 943 – Connect NC Bond Act of 2015 – Passed**

This legislation would authorize the issuance of \$2 billion of general obligation debt if a majority of voters in the March 2016 primary election vote in favor of the measure. The funds would be used as follows:

- \$980 million would be allocated among 14 projects for new construction for the constituent institutions of the UNC system, including \$45 million for repairs and renovations (R&R). For R&R, any items purchased must have a useful life of at least 10 years or extend the life of the facility by at least 10 years.
- \$350 million would be allocated among the constituent institutions of the NC Community Colleges system. The method of allocation of the \$175 million is based on county wealth, and the remainder is based on:
  - i. County wealth (35 percent)
  - ii. R&R need based on age of square footage (35 percent)
  - iii. Need for additional square footage (30 percent)

Community colleges are required to match funds for new construction with local and/or non-state funds. The amount of match funds is \$1 for every \$3 if the campus is in a tier-one area, \$1 for every \$2 if the campus is in a tier-two area and \$1 for every \$1 if the campus is

in a tier-three area. There is no required match for rehabilitation of existing facilities and R&R.

- \$3 million would be allocated to local units of government for children with disabilities and veterans with disabilities to provide accessible parks and public facilities. Matching funds in the amount of \$1 in local funds for every \$4 in state funds is required. Grants may not exceed \$500,000 per project.
- \$309.5 million would be used for grants and loans for water and sewer improvement divided equally between the State Drinking Water Reserve and the Wastewater Reserve. \$100 million must be used for grants, and the remainder must be used for low-interest loans. Priority goes to projects subject to an EPA administrative order or consent decree. Proceeds are capped as follows:
  - i. For grant funds from the Wastewater Reserve, the cap is the lesser of 50 percent of the project costs or one-third of the proceeds allocated to the Wastewater Reserve.
  - ii. For loan funds from the Wastewater Reserve, the cap is the lesser of all project costs minus grant funds received for the project or \$15 million.
- \$70 million would go to readiness centers for the National Guard.
- \$85 million would go to a new Plant Sciences Building for a partnership between DACS and NCSU.

- \$94 million would go for construction of a new lab for DACS.
- \$25 million would go to replacing the Africa Pavilion at the NC Zoo.
- \$75 million would go to State Parks.
- \$8.5 million would go to the Department of Public Safety for the Samarqand Training Academy.

The bill requires that all bond-proceeds recipients submit a quarterly report beginning January 1, 2017, to the Joint Legislative Oversight Committee on Capital Improvements and the appropriations committees regarding:

- Total project costs
- Amount funded from the bonds
- Expenditures to date
- The percentage of project completion

## **State Budget (HB 97) – Passed Capital:**

- A total of \$22.8 million over the biennium is allocated for capital improvements from the General Fund.
- A total of \$10.7 million of water resources development projects for 2015-16 from carry-over funds.
- A total of \$39.2 million over the biennium is allocated for non-general fund capital projects.



- Renames NC Department of Cultural Resources to Department of Natural and Cultural Resources to include parks, zoo and other state attractions

**Provides \$100,000 to study school construction capital needs for low wealth counties.**

**Provides \$11 million for construction of a collocated middle/high school in Jones County.**

**Provides additional revenue availability of \$708 million over two years for transportation funding in part by ending \$216 million annual highway fund transfer and adjustments in DMV fees. Another \$450 million is generated as a result of a floor on the motor fuels tax.**

**Places a cap on the amount of state money that can be allocated to light rail projects, effectively killing the Durham-Orange Light Rail Project that expected to have federal funding approved (50 percent of the project) in February 2016. Without the state funding, it is very doubtful that the federal funding will be approved.**

**Does not include Tax Credit Extension for Renewable Energy was not included in the budget.**

**Includes a study on transition to rent based model for state owned facilities (March 1, 2016). This may be used as model to fund repair and renovations.**

**Oversight on General Government.**

### **HB 482 – Employee Misclassification Reform – Failed, Eligible for Short Session**

The bill would create a division within the Department of Revenue that would be responsible for investigating misclassification abuse, providing enforcement and levying penalties. The misclassification of workers as independent contractors, instead of employees, allows companies to avoid paying taxes such as unemployment, workers compensation and payroll taxes, enabling them to underbid their law-abiding competitors. The two chambers ultimately could not come to agreement on the bill since the House version would have exempted newspaper carriers from the requirements while the Senate would not.

- All state agencies are required to report on capital projects every six months beginning October 1, 2015. State Construction is also required to complete an FCAP assessment every six months beginning October 1, 2015, and report to the appropriate government oversight committees and state budget and legislative fiscal research.
- The UNC system is required to use non-general funds for advance planning to include schematic design.
- The UNC system is required to complete a debt affordability study by February of each year.
- State agencies are authorized to make small capital repairs less than \$300,000 with funds available.
- The budget creates Joint Legislative Oversight Committee on Capital Improvements.
- The budget does not include Capital Planning Reform, which would have created a Capital Planning Review Commission resulting in a great deal of confusion for the design and construction industry and additional bureaucratic delays in having projects approved.

#### **Reinstated Historic Preservation Tax Credit:**

- Applies to a taxpayer who is allowed a federal tax credit until Section 47 of the Code
- Fifteen percent credit for expenses up to \$10 million
- Ten percent credit for expenses between

\$10 million and \$20 million

- Allows bonus credits of 5 percent if the structure is in a tier one or tier two area of a targeted investment site
- Limits amount of credit to \$4.5 million

#### **Tax Rates:**

- Reduces corporate tax rates from 5 percent to 4 percent
- Increases the standard deduction for individual tax rates
- Reduces personal income tax rates from 5.75 percent to 5.499 percent
- Expands the sales tax base to apply to repair, maintenance and installation services. This additional sales tax is redistributed to low wealth counties under a new distribution formula and must be used for "economic development, public schools or community colleges."

**Funds R&R at \$150 million** – One-third to UNC system and the rest to State Budget office for distribution to state agencies.

#### **Appropriates \$11.9 million in R&R for Department of Transportation.**

#### **Agency Restructuring:**

- Establishes Department of Military and Veterans Affairs
- Renames NCDENR to Department of Environmental Quality



## HB 117 – NC Competes Act – Passed

This legislation increases the cap on incentive awards to \$20 million a year. The cap is increased to \$35 million for any year in which the state has a “high-yield” jobs deal where a company invests at least \$500 million and adds at least 1,750 jobs. Those companies are eligible for more generous incentives. This provision is aimed at attracting a large manufacturer, such as an auto plant. In the state’s wealthiest counties, local governments need to add incentives of their own in order to qualify for a JDIG grant.

## SB 330 – Change Orders on School Construction Projects – Failed, Eligible for Short Session

All school construction change orders would be required to be approved by the local school board unless the school board had already adopted a policy as provided further in the bill. The superintendent or another board member could expedite the process under certain conditions (i.e., emergency, cost overruns, etc.). The policy adopted by a local school board would conform as follows:

- i. In a local school administrative unit that has had an average of at least \$50 million of school construction projects over the prior five years, the amount may not exceed \$100,000.
- ii. In a local school administrative unit that has had an average of less than \$50 million of school construction projects over the prior five years, the amount may not exceed \$25,000.

## HB 44 – Local Government Regulatory Reform – Passed

Numerous provisions affecting local government:

- Cities and counties are prohibited from requiring compliance with voluntary regulations and rules adopted by state departments or agencies.
- Fence wraps displaying signage when affixed to perimeter fencing at a construction site are exempt from zoning regulation pertaining to signage under this article until the certificate of occupancy is issued for the final portion of any construction at that site or 24 months from the time the fence wrap was installed, whichever is

shorter. If construction is not completed at the end of 24 months from the time the fence wrap was installed, the county may regulate the signage but shall continue to allow fence-wrapping materials to be affixed to the perimeter fencing. No fence wrap affixed pursuant to this subsection may display any advertising other than advertising sponsored by a person directly involved in the construction project and for which monetary compensation for the advertisement is not paid or required.

- If a permit applicant submits a permit application for any type of development and a rule or ordinance changes between the time the permit application was submitted and a permit decision is made, the permit applicant may choose which version of the rule or ordinance will apply to the permit. This section applies to all development permits issued by the state and by local governments.
- A city or county shall notify the property owners and adjacent property owners prior to commencement of any construction project by the county (amended in HB 765). For purposes of this section, “construction”

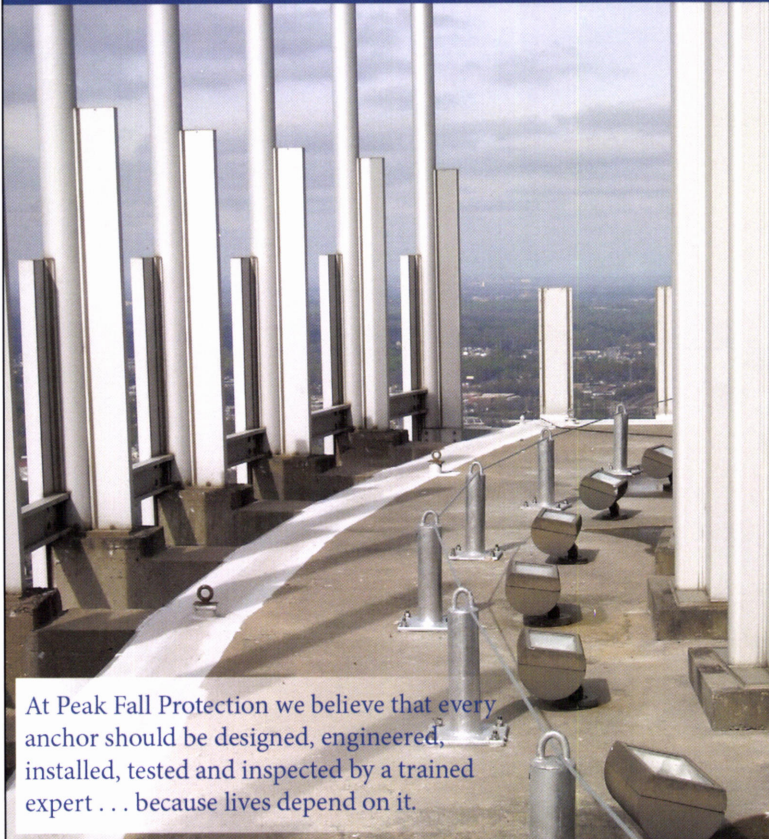
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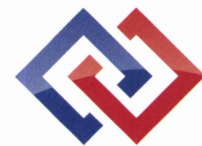
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shall mean the building, erection, or establishment of new buildings, facilities, and infrastructure and shall not include routine maintenance and repair.

### HB 255 – Building Code Regulatory Reform – Passed

Supported by the Homebuilders and primarily affects residential construction. The bill raises the threshold for building permit requirements, puts limitations on code enforcement officials, requires inspections to be done in a timely manner and to include all items failing to meet code requirements, and provides for a study of alternative approval methods. The bill also requires the BCC to

post all actions related to the code, restricts inspection fees to only be spent for activities of the inspection department, and exempts certain commercial building projects less than \$90,000 from the requirement of a professional architectural seal. The legislation also creates both a residential and non-residential code committee within the Building Code Council.

### HB 765 – Regulatory Reform Act of 2015 – Passed

- Includes a study on the use of open and fair competition with respect to materials used in wastewater, storm water and other projects
- Provides for a voluntary environmental self-audit and limited immunity
- Creates an “Engineered Option Permit” for wastewater collection, treatment and disposal
- Requires Department of Insurance to study flood elevations and building height requirements for coastal areas
- Except as required by federal law, the Department of Environment and Natural Resources shall not require mitigation for impacts to an intermittent stream

### HB 679 – UNC Self-Liquidating Projects – Passed

This bill authorizes UNC to finance and construct capital improvement projects utilizing obligated resources such as fees, debt service, donations or gifts. Projects total \$184.5 million and include:

- ASU – Replacement for Winkler Resident Hall: \$32 million
- ECU – Renovation of Four Residence Halls: \$65 million
- NCCU – Deferred Maintenance and Infrastructure: \$10.5 million
- NCSU – Engineering Oval and Campus Infrastructure: \$77 million

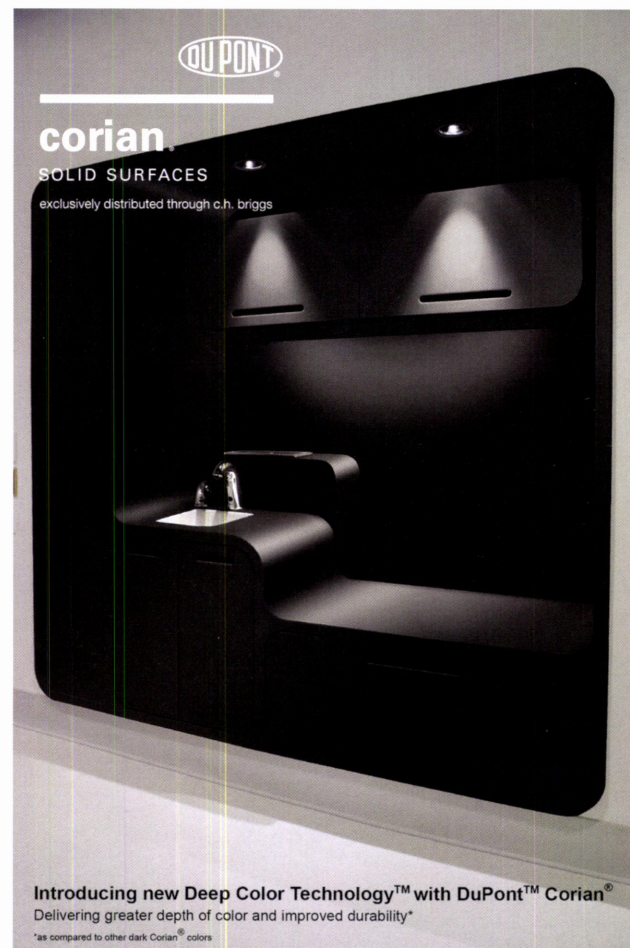
The bill also authorizes NCSU to use up to \$14 million for advance planning of the Plant Science Building, and \$5 million may come from general funds carried forward by NCSU. The remaining \$9 million must come from non-general fund receipts. Anticipated cost is \$180 million.

*Betsy Bailey is the North Carolina Building Director for Carolinas AGC, and David Crawford is the Executive Vice President for AIA North Carolina.*



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The following section contains some helpful articles about working on construction projects with local governments within North Carolina. These articles will break down the new ways local governments can enter into contracts with both designers and contractors.

# New Design-Build Construction Method

## *No Local Act Required*

by Norma Houston



Those familiar with local government construction contracting know the drill — put out an RFQ to hire an architect or engineer to design the project and then bid the construction work. But what if a local government wants to hire both its design professional *and* its contractor at the beginning of the project to work together from conception to completion? How does a local government bid that kind of contract?

The General Assembly answered this question during the 2013 session when it enacted legislation authorizing three new contracting methods for public construction projects: design-build (DB), design-build bridging (DBB) and public-private partnerships (P3).

**S.L. 2013-401/H857**<sup>1</sup> (Public Contracts/Construction Methods/DB/P3) accomplishes this in three primary ways:

1. Amends **G.S. 143-128**, authorizing these new construction delivery methods for large building construction projects.
2. Requires governmental units to enter into these contracts under the qualifications-based selection method of **G.S. 143-64.31** (the Mini-Brooks Act).

3. Establishes specific procurement requirements for each type of contract by enacting three new statutes:

1. **G.S. 143-128.1A** for design-build
2. **G.S. 143-128.1B** for design-build bridging
3. **G.S. 143-128.1C** for public-private partnerships

The new delivery methods are authorized for any state or local government capital project. This article discusses the first of these new methods — design-build.

### Background

Prior to H857's enactment, state law authorized four contracting methods for large building construction projects: single-

prime, separate-prime (also referred to as multi-prime), dual-bidding (bidding both single- and separate-prime simultaneously), and construction management at risk.<sup>2</sup> Design-build was considered an alternative construction method requiring either State Building Commission approval or legislative authorization. While design-build was not statutorily restricted for building construction projects costing \$300,000 or less<sup>3</sup> or projects that did not involve a building, such as installing sewer pipes or erecting a water tank, the competitive bidding requirements of **Article 8 of Chapter 143** made entering into this type of contract or a public-private partnership both legally and practically unwieldy. Consequently, it was not uncommon for local governments to request, and

the General Assembly to enact, local bills authorizing individual local governments to use design-build or public-private partnerships for specific projects. For example, during the 2013 session, Buncombe County (S.L. 2013-31 and -40), the town of Clinton (S.L. 2013-115), and the town of Cornelius (S.L. 2013-352) were authorized to use design-build, and Onslow County received authorization for a public-private partnership project (S.L. 2013-37). H857 eliminates the need for these types of local acts for future projects.<sup>4</sup>

## Who Is a Design-Builder?

The new design-build statutes define a design-builder as “an appropriately licensed person, corporation, or entity that, under a single contract, offers to provide or provides design services and general contracting services.”<sup>6</sup> Architectural and engineering services must be performed by licensed architects and engineers, and contractor services must be performed by a licensed general contractor. While it is possible for one individual to hold both an engineering license and a general contractor license, a design-builder typically is a corporation, firm or joint venture that employs both licensed design professionals and licensed general contractors, or a construction firm that subcontracts with an architect or engineer. The new design-build statute requires the design-builder to certify that each licensed designer and sub-consultant who is a member of the design-build team was selected based on “demonstrated competence and qualifications” under the qualifications-based selection process of the **Mini-Brooks Act (G.S. 143-64.31)**.<sup>7</sup>

## New Design-Build Contracting Process

To enter into a design-build contract, the unit of government must follow specific procurement procedures set out in the new **G.S. 143-128.1A**.

**Criteria for Using DB.**<sup>8</sup> To initiate the contracting process, the unit must establish written criteria for determining when design-build is appropriate for a project. While the criteria



must be in writing, governing board approval is not specifically required (although it may be highly advisable). The statute requires the unit to adopt the criteria for each project.

The criteria must address at least the following six factors:

1. The unit’s ability to “adequately and thoroughly” define the project requirements in the RFP
2. Time constraints for project delivery
3. The unit’s ability to ensure that a quality project can be delivered
4. The availability of qualified staff or outside consultants experienced in design-build to manage and oversee the project
5. Good faith efforts to comply with historically underutilized business participation requirements (**G.S. 143-128.2** and **-128.4**) and to recruit and select small business entities (the term “small business entities” is not defined in the statute)
6. The criteria used by the unit, including a cost-benefit analysis of using design-build in lieu of traditional construction bidding methods

An example of criteria adopted by the city of Greenville under this new statute is available on the School of Government’s **Local**

**Government Purchasing and Contracting website** under “legislative updates.”

**Public Notice.**<sup>9</sup> After adopting its criteria, the unit must issue a public notice of a request for qualifications (RFQ) for the project. The statute does not specify a minimum time for or method of notice. For example, formal published notice is not required. Since a design-builder is selected under the qualifications-based selection method of the Mini-Brooks Act, units may wish to use the same notice procedures they employ for announcing requirements for architects and engineers. In the alternative, units could choose to follow the published notice procedures for formal purchase and construction contracts under **G.S. 143-129(b)**. As with other contracts subject to the Mini-Brooks Act, the unit must make good faith efforts to notify minority firms of the opportunity to submit qualifications.<sup>10</sup>

**RFQ Requirements.**<sup>11</sup> The RFQ must include information on the following eight items:

1. Project site
2. Project scope
3. Anticipated project budget
4. Project schedule
5. Qualifications selection criteria and criteria weighting

6. Notice of the unit's rules, ordinances, or goals (presumably related to the project), including goals for MWBE and small business participation
7. Other information provided to potential design-bidders in submitting qualifications for the project
8. Statement requiring each design-builder to submit, *with its RFP*, an explanation of its project team selection consisting of either:
  - a. List of licensed contractors, licensed subcontractors and licensed design professionals the design-builder proposes to use on the project
  - b. The design-builder's strategy for selecting contractors and subcontractors based on the requirements of **Article 8 of Chapter 143** (i.e., competitive bidding procedures)

*Note:* Design-builders must also certify that each licensed design professional who is a member of the design-build team, including subconsultants, was selected through the qualifications-based selection method required under the Mini-Brooks Act.<sup>12</sup> While it appears that this certification is required of each design-builder submitting a proposal in response to the unit of government's RFQ, it is unclear whether the certification must be submitted with the proposal, as is the case

with the project team members or selection strategy described above. Units of government can clarify this uncertainty by specifically stating in the RFQ that the certification be submitted with the proposal.

**Receiving Proposals:**<sup>13</sup> In order to consider proposals, the unit must receive at least three responses to its RFQ. If the unit receives less than three responses, it must re-solicit (this requirement mirrors the "3-bid minimum" rule for formal construction bids<sup>14</sup>). After the second solicitation, the unit may consider proposals even if three are not received. As with the initial solicitation, the statute does not specify a method or time frame for resolicitation, so units should follow the same procedures used for the initial solicitation.

**Evaluating Proposals and Awarding the Contract:**<sup>15</sup> After receiving proposals, the unit evaluates them and ranks the three most qualified respondents based on the criteria included in the RFQ. The unit then negotiates a contract at a "fair and reasonable price" with the highest ranked design-builder. **As with other contracts subject to the Mini-Brooks Act, the unit cannot solicit project cost estimates or fees in the RFQ, and can only negotiate contract price after ranking the respondents based on qualifications.** If



negotiations with the highest ranked respondent are not successful, the unit may initiate negotiations with the second-highest ranked and so on, until the unit either rejects all proposals or selects a design-builder with whom to contract. During its evaluation process, the unit may, if it chooses to do so, interview some or all of the respondents. The design-build statute does not require governing board approval of the contract award, even for those projects costing \$500,000 or more, which, under traditional construction bidding methods, do require governing board approval.



**Performance and Payment Bonds:**<sup>16</sup> Once the contract award decision is made, the selected design-builder must provide bonds under **Article 3 of Chapter 44A**, which requires performance and payment bonds for 100 percent of the contract amount for each contract costing more than \$50,000 on projects costing over \$300,000.

**Substituting Key Personnel:**<sup>17</sup> After contract award, the design-builder can only substitute key personnel (the contractors, subcontractors, and design professionals identified in the design-builder's response to the RFQ) after obtaining written approval from the unit. This requirement does not apply if the design-builder selects contractors and subcontractors under the competitive bidding requirements of **Article 8 of Chapter 143**. Since design professionals are not selected

under Article 8, it is unclear whether this exception applies to substituting design professionals. Local governments could address this ambiguity in the terms and conditions of the contract with the design-builder.

For more information about the design-build contracting method visit the **Design-Build Institute of America** (DBIA) at [www.dbia.org/Pages/default.aspx](http://www.dbia.org/Pages/default.aspx). A discussion of design-build, design-build bridging, public-private partnerships is now included in the curriculum for the School of Government's **Contracting for Construction and Design Services** course which is primarily offered in early on October.

#### References

1. S.L. 2013-401 became effective on September 22, 2013, and applies to all projects bid on or after that date.
2. G.S. 143-128(a1).
3. The limitations on construction contracting methods under G.S. 143-128(a1) only apply to construction and repair projects involving buildings that cost over \$300,000 (G.S. 143-128(g)(2)).
4. S.L. 2013-401 does not supersede any design-build local acts enacted prior to July 1, 2013; local acts that became law prior to July 2, 2013, remain in effect, and local governments may continue to proceed on projects authorized under those local acts. The one exception is authorization for Durham County to use design-build for a water and wastewater treatment facility. The local authorization was enacted in S.L. 2013-386, Sec. 5 (S315), and then repealed in S.L. 2013-410, Sec. 39.5 (H92). Durham County may still use the newly authorized design-build or design-build bridging methods for this project.
5. NC State Building Commission Resolution on Design-Build Construction (adopted May 22, 2012), available at [www.nc-sco.com](http://www.nc-sco.com).
6. G.S. 143-128.1A(a)(1), cross-referencing G.S. 143-128.1B(a)(2).
7. G.S. 143-128.1A(e).
8. G.S. 143-128.1A(b).
9. G.S. 143-128.1A(c).
10. G.S. 143-64.31(a).
11. G.S. 143-128.1A(c).
12. G.S. 143-128.1A(e).
13. G.S. 143-128.1A(d).
14. G.S. 143-132.
15. G.S. 143-128.1A(d), (e); G.S. 143-64.31.
16. G.S. 143-128.1A(f); G.S. 44A-26.
17. G.S. 143-128.1A(f).

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# New Design-Build Bridging Construction Method

## Design-Build “Lite”

by Norma Houston

### Design-Build Bridging Compared to Design-Build

The design-build bridging construction method is a two-step process that differs from design-build in two significant ways. First, the unit contracts separately with an architect or engineer to design 35 percent of the project, referred to in the statute as the “design criteria.”<sup>1</sup> The unit then solicits proposals from design-build firms based on the design criteria package and contracts with a design-builder to complete the design and perform construction. The design criteria package acts as “bridging” documents between the initial project concept and the design-build phase — hence the name of this construction method. These bridging documents provide enough project requirements in preliminary drawings and specifications to enable design-build bidders to submit a responsive bid.<sup>2</sup>

The second difference between design-build bridging and design-build involves the solicitation of fees and the standard of award for the contract. Under the design-build method, fees are not solicited in the RFQ for design-build services, and the contract is awarded based on the qualifications-based selection method of the Mini-Brooks Act (**G.S. 143-64.31**), found at [www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-64.31](http://www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-64.31). Under the design-build bridging method, fees and price estimates are solicited in the RFP for design-build services, and the contract for these services is awarded based on the lowest responsive, responsible bidder standard of award.

### Design-Build Bridging Contracting Process

To enter into a design-build bridging contract, the unit of government must follow specific procedures set out in the new **G.S. 143-128.1B**, [www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-128.1B](http://www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-128.1B). While many aspects of these procedures mirror those for design-build (see G.S. 143-128.1A), there are some notable differences. Units of government should be aware of these differences and take them into account when considering whether either design-build or design-build bridging is an

appropriate construction delivery method for a particular project.

**Criteria for Using Design-Build Bridging:**<sup>3</sup> The unit must establish written criteria for determining when using this method is appropriate for a project. While the criteria must be in writing, governing board approval is not specifically required. The statute requires the unit to adopt the criteria for each project. In other words, the unit cannot adopt blanket criteria. The criteria must address the same six factors as are required for a design-build project:

1. The unit’s ability to “adequately and thoroughly” define the project requirements in the RFP
2. Time constraints for project delivery
3. The unit’s ability to ensure that a quality project can be delivered
4. The availability of qualified staff or outside consultants experienced in design-build to manage and oversee the project
5. Good faith efforts to comply with historically underutilized business participation requirements (**G.S. 143-128.2** and **-128.4**) and to recruit and select small business entities (the term “small business entities” is not defined in the statute)
6. The criteria used by the unit, including a cost-benefit analysis of using design-build in lieu of traditional construction bidding methods

**Selecting the Design Criteria Design Professional:** Before issuing the RFP for design-build services, the unit selects either a staff design professional, an architect or engineer employed by the unit, or follows the Mini-Brooks Act to contract with an architect or engineer. This design professional, whether he or she is an employee or an outside design professional, develops the design criteria package and acts as the unit’s representative during the design-build contracting process and through the life of the project. The design professional is not eligible to bid on the design-build contract or provide input to a design-build bidder during the procurement process.

**Design Criteria Package:**<sup>4</sup> The design criteria design professional develops the design criteria for the project in consultation with the unit and prepares a design package consisting of 35 percent of the design documentation for the entire project. The design criteria package must include the following nine items:

1. Programmatic needs, interior space requirements, intended space utilization, and other capacity requirements
2. Physical characteristics of the site such as a topographic survey
3. Material quality standards or performance criteria
4. Special material requirements



5. Provisions for utilities
6. Parking requirements
7. Type, size, and location of adjacent structures
8. Preliminary or conceptual drawings and specifications in sufficient detail to enable design-build teams to submit responsive bids
9. Notice of the unit's rules, ordinances, or goals (presumably related to the project)

**Public Notice:**<sup>5</sup> After developing the design criteria package, the unit must issue a public notice of a request for proposals (RFP) for design-build firms to complete the design and perform the construction. The statute does not specify the minimum time for or method of publication. Since the design-build contract is awarded based on the lowest responsive, responsible bidder standard of award, units may want to follow the published notice procedures for formal purchase and construction contracts under G.S. 143-129(b) ([www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-129](http://www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-129)).

**RFP Requirements:**<sup>6</sup> The RFP must include general information on the same eight items required for a **design-build RFQ** (<http://canons.sog.unc.edu/?p=7493>), but it must also include two additional elements:

1. The design criteria package prepared by the design criteria design professional
2. A statement that each design-build bidder must submit, with its proposal in a

sealed envelope, its price for providing the general conditions of the contract and fees for design services and general construction services

The solicitation of fees and prices is a significant departure from the design-build process, which prohibits soliciting fee and price estimates in the RFQ for design-build services. Note also that this information must be submitted with the bidder's proposal in a sealed envelope; a bid that does not contain sealed fee and price proposals would be considered non-responsive.

**Receiving Responses:**<sup>7</sup> As with design-build, the unit must receive at least three responses to its RFP in order to consider proposals. If the unit receives less than three responses, it must re-solicit, just as is required for formal construction bids. After the second advertisement, the unit may consider proposals even if three are not received. Each bidder must certify that all members of its design-build team who are licensed design professionals, including sub-consultants, were selected as required under the Mini-Brooks Act.

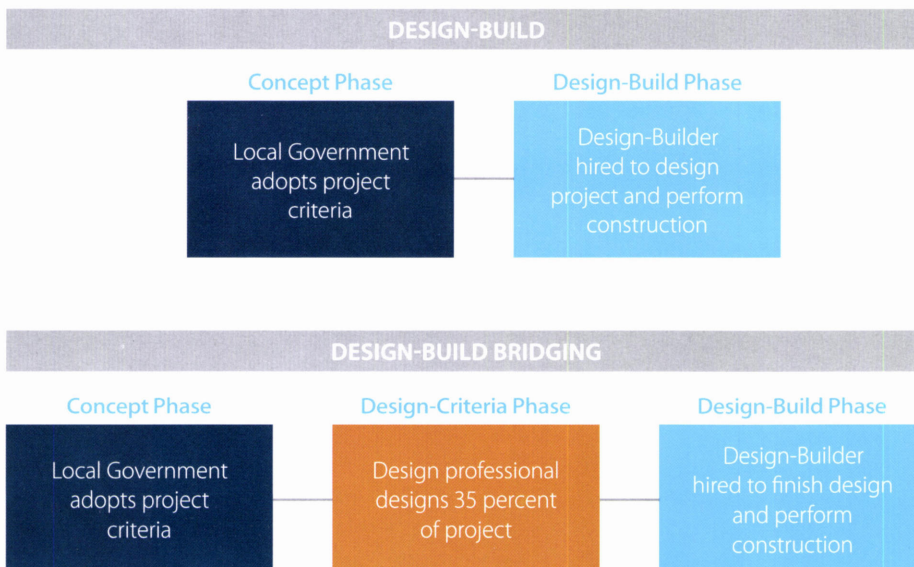
**Evaluating Responses and Awarding the Contract:**<sup>8</sup> After receiving proposals, the unit evaluates and ranks them and then groups the top three without specific ordinal ranking. From among these three

respondents, the unit selects the design-builder who is the lowest responsive, responsible bidder based on the cumulative amount of fees for providing the general conditions of the contract, design services and general construction services and taking into consideration quality, performance, and the time specified in the proposal for performance of the contract. This standard of award is substantially different from that for design-build where the design-builder is selected based on qualifications.

**Subcontractors:**<sup>9</sup> The design-builder with whom the unit contracts must use the competitive bidding requirements of **Article 8 of Chapter 143** in hiring first-tier subcontractors on the project (design professionals are not considered first-tier subcontractors).<sup>10</sup>

**Performance and Payment Bonds:** As with design-build, the selected design-builder must provide bonds under **Article 3 of Chapter 44A** ([www.ncleg.net/EnactedLegislation/Statutes/HTML/ByArticle/Chapter\\_44A/Article\\_3.html](http://www.ncleg.net/EnactedLegislation/Statutes/HTML/ByArticle/Chapter_44A/Article_3.html)), which requires performance and payment bonds for 100 percent of the contract amount for each contract costing more than \$50,000 on projects costing over \$300,000.

**Substituting Key Personnel:** After the contract is awarded, the winning bidder can only substitute key personnel after obtaining written approval from the unit of government.<sup>11</sup>



**References**

1. G.S. 143-128.1B(a)(3).
2. *Id.* Because of the cost involved in preparing a response to a design-build solicitation, the North Carolina State Building Commission recommends developing bridging documents to reduce costs to potential bidders and encourage competition.
3. G.S. 143-128.1B(b).
4. G.S. 143-128.1B(c).
5. G.S. 143-128.1B(d).
6. *Id.*
7. G.S. 143-128.1B(e).
8. *Id.*
9. G.S. 143-128.1B(f).
10. G.S. 143-128.1B(a)(5).
11. G.S. 143-128.1B(g).

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# New Construction Delivery Methods

## *Public-Private Partnerships (P3)*

by Norma Houston

### What Is a Public-Private Partnership?

The basic concept of the P3 legislation is to provide flexible contracting authority under which units of government can partner with a private developer for the construction, operation and financing of a capital project. Prior to the legislation's enactment, local governments had to seek authorization from the General Assembly through local acts to enter into public private partnerships. The new legislation makes this development and financing option available statewide to all public entities.

A public-private project is defined under the new **G.S. 143-128.1C**, [www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-128.1C](http://www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-128.1C), as a "capital improvement project undertaken for the benefit of a governmental entity and private developer pursuant to a development contract that includes construction of a public facility or other improvements, including paving, grading, utilities, infrastructure, reconstruction, or repair, and may include both public and private facilities."<sup>1</sup> Under the P3 construction delivery method, the unit of government is authorized to acquire, construct, own, lease (as lessor or lessee) and operate a public-private project or facilities within a public-private project and may make loans or grants for these purposes. Importantly, the private developer must provide at least 50 percent of the financing for the total cost of the project.<sup>2</sup> The Local Government Commission must approve the contract if it involves a capital or operating lease.<sup>3</sup>

### P3 Contracting Process

To enter into a P3 contract, units of government must comply with the statutory requirements set out in **G.S. 143-128.1C**, [www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-128.1C](http://www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-128.1C). The procedures are similar to those required for design-build and design-build bridging contracts only in that they are based on the Mini-Brooks Act. Otherwise, the P3 procurement requirements are substantially different.

**Adopt Written Findings:** To begin the P3 contracting process, the unit of government must make written findings that it has a critical need for the project. While the statute does not specifically require governing board approval, entities that are a public body under the Open Meetings Act (**Article 33C of Chapter 143**, [www.ncleg.net/EnactedLegislation/Statutes/HTML/ByArticle/Chapter\\_143/Article\\_33C.html](http://www.ncleg.net/EnactedLegislation/Statutes/HTML/ByArticle/Chapter_143/Article_33C.html)) must adopt these findings at an open meeting of the body, which for local governments means the governing board must approve the findings. Unlike the design-build and design-build bridging statutes, there are no specific criteria that must be adopted by the governing board other than a finding that there is a critical need for the project.

**Determine Programming Needs:** After approving the use of the P3 method, the unit must determine its programming requirements for the facilities to be constructed under the P3 contract and the form in which private developers submit their qualifications. This information forms the basis of the RFQ the unit advertises.

**Publish Notice of RFQ:** Next, the unit must advertise notice for interested private developers to submit their qualifications. The advertisement must be published in a newspaper of general circulation within the county in which the unit is located. The statute does not specify a

minimum timeframe for the publication period, but units should choose a time sufficient for interested parties to develop a proposal taking into consideration the complexity of a P3 project. While the unit is not required to publish the programming requirements in the advertisement itself, it must make these requirements available to potential respondents in whatever form the unit deems appropriate.

**Receive Responses:** Units may choose to receive responses to its RFQ in any form it deems appropriate; sealed proposals and a public opening are not required. Private developers must submit the following information as part of their response to the RFQ:

1. Evidence of financial stability (The statute specifies that information that constitutes a "trade secret" under **G.S. 66-152(3)**, [www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=66-152](http://www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=66-152), remains confidential)
2. Experience with similar projects
3. An explanation of project team selection by either listing licensed contractors, licensed subcontractors, and licensed design professionals whom the private developer proposes to use for the project's design and construction or a statement outlining a strategy for open contractor and subcontractor selection based competitive bidding procedures
4. A statement of the developer's availability to undertake the public-private project and projected time line for project completion
5. Any other information required by the unit



**Evaluate Responses and Select Developer:** The unit may award the development contract to the private developer it determines to be best qualified, which is the standard of award under the Mini-Brooks Act (**G.S. 143-64.31**, [www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-64.31](http://www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-64.31)). However, unlike a traditional Mini-Brooks Act selection process, the unit may negotiate with one or more of the respondents during the evaluation process. The statute is silent on the criteria the unit must use in evaluating the qualifications of the respondents, so the unit is free to develop their own criteria based on its programming needs, project scope and any other factors related to the project it deems appropriate.

**Award Development Contract:** The unit's governing board must award the development contract at an open meeting after a public hearing and at least 30 days' published notice of the terms of the contract. The

advertisement of the terms of the contract and the public hearing must be in a newspaper of general circulation within the county in which the unit is located. The unit must also make available a summary of the contract terms and conditions, and indicate how to obtain a copy of the complete contract.

**Development Contract Terms and Conditions:** The development contract between the unit and the private developer specifies the parties' interests, roles, and responsibilities for the project. At a minimum, the contract must address:

1. The property interests of the unit and the private developer (could include ownership, lease arrangements, or both)
2. The development responsibilities of the unit and the private developer (could include both construction and on-going operation and maintenance activities)
3. The financing responsibilities of the unit and the private developer (remember that the private developer must provide at least 50 percent of the financing for the total cost of the project)
4. The parties' good faith efforts to comply with HUB participation requirements and to recruit and select small business entities (the term "small business entities" is not defined in the statute)

The development contract also may require the developer to be responsible for some or all of the construction, purchase of materials and equipment, compliance with HUB participation requirements, and to use the same contractor(s) as the unit. It also may require the developer to purchase materials for the project at a reasonable price. If the project utilizes the design-build construction delivery method, the procurement requirements of the new design-build statute (**G.S. 143-128.1A**, [www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-128.1A](http://www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-128.1A)) apply. Performance and payment bond requirements also apply, and the statute sets out specific procedures for claims under a payment bond made against the private developer.<sup>4</sup>

The private developer with whom the unit contracts cannot perform any design or construction work on the project unless a contractor defaults, a qualified replacement cannot be obtained in a timely manner, and the unit approves.

Finally, the private developer and its contractors must comply with state HUB participation requirements, which include bidders' good faith efforts to solicit historically underutilized businesses on building construction projects costing \$300,000 or more (**G.S. 143-128.2**, [www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-128.2](http://www.ncleg.net/gascripts/statutes/statutelookup.pl?statute=143-128.2)).

#### References

1. G.S. 143-128.1C(a)(8).
2. G.S. 143-128.1C(b).
3. G.S. 143-128.1C(j). A capital or operating lease involving a public school cannot contain provisions relating to student assignment (G.S. 143-128.1C(l)).
4. G.S. 143-128.1C(g)

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# Detailed Look at Connect NC Bond

The Connect NC Bond package authorized by the General Assembly during the final days of the 2015 session sends a referendum to the voters on March 15, 2016, to approve \$2 billion worth of mostly building construction throughout the state. It has been 15 years since the state asked voters to authorize construction bonds. This round of bond debt has been crafted in such a way that there will be no additional tax increases on the citizens of North Carolina and the annual debt load as a percentage of the state budget will remain well below the General Assembly's self-imposed limit of 4 percent.

We have reprinted here all of the projects that are detailed in the bond package. As you read through the list, you can see that every attempt was made by legislative leaders to support all the regions of the state with needed building infrastructure projects.

AIA North Carolina has signed on as a supporter to the Connect NC Bond campaign and encourages its members and all employees in

the design and construction community to get out and vote for the bond during the March 15 primary election. If you'd like to get more information about the bond, get involved in the campaign or make a donation to the advocacy effort, go to the campaign web site at [www.voteinvest.com](http://www.voteinvest.com).

## University of North Carolina

- 1 Appalachian State
- 2 East Carolina
- 3 Fayetteville State
- 4 NC Central
- 5 NC State
- 6 NC A & T
- 7 NC School of Science & Math
- 8 UNC – Chapel Hill
- 9 UNC – Charlotte
- 10 UNC – Greensboro
- 11 UNC – Pembroke
- 12 UNC – Wilmington
- 13 Western Carolina

- 14 Winston-Salem State
- 15 Various

## NC Community Colleges

- 16 Alamance Comm. College
- 17 Asheville-Buncombe Technical Comm. College
- 18 Beaufort Co. Comm. College
- 19 Bladen Comm. College
- 20 Blue Ridge Comm. College
- 21 Brunswick Comm. College
- 22 Caldwell Comm. College
- 23 Cape Fear Comm. College
- 24 Carteret Comm. College

- 25 Catawba Valley Comm. College
- 26 Central Carolina Comm. College
- 27 Central Piedmont Comm. College
- 28 Cleveland Comm. College
- 29 College of the Albemarle
- 30 Coastal Carolina Comm. College
- 31 Craven Comm. College
- 32 Davidson County Comm. College
- 33 Durham Tech. Comm. College
- 34 Edgecombe Comm. College
- 35 Fayetteville Tech. Comm. College

- 36 Forsyth Tech. Comm. College
- 37 Gaston College
- 38 Guilford Tech. Comm. College
- 39 Halifax Comm. College
- 40 Haywood Comm. College
- 41 Isothermal Comm. College
- 42 James Sprunt Comm. College
- 43 Johnston Comm. College
- 44 Lenoir Comm. College
- 45 Martin Comm. College
- 46 Mayland Comm. College
- 47 McDowell Tech. Comm. College
- 48 Mitchell Comm. College
- 49 Montgomery Comm. College
- 50 Nash Comm. College

51 Pamlico Comm. College  
 52 Piedmont Comm. College  
 53 Pitt Comm. College  
 54 Randolph Comm. College  
 55 Richmond Comm. College  
 56 Roanoke-Chowan  
 Comm. College  
 57 Robeson Comm. College  
 58 Rockingham Comm. College  
 59 Rowan-Cabarrus  
 Comm. College  
 60 Sampson Comm. College  
 61 Sandhills Comm. College  
 62 South Piedmont  
 Comm. College  
 63 Southeastern Comm. College  
 64 Southwestern Comm. College  
 65 Stanly Comm. College  
 66 Surry Comm. College  
 67 Tri-County Comm. College  
 68 Vance-Granville Comm. College  
 69 Wake Tech. Comm. College  
 70 Wayne Comm. College

71 Western Piedmont  
 Comm. College  
 72 Wilkes Comm. College  
 73 Wilson Comm. College

#### Local Parks and Infrastructure

74 DENR  
 75 Department of  
 Environmental Quality

#### National Guard

76 National Guard

#### Agriculture

77 NC State University  
 78 Agriculture and  
 Consumer Services

#### State Parks and Attractions

79 Cumberland  
 80 Durham/Orange  
 81 Washington/Beaufort  
 82 Onslow

83 Dare  
 84 Vance/Warren  
 85 Burke/McDowell  
 86 Iredell  
 87 Yancey  
 88 Various  
 89 Surry/Yadkin  
 90 Camden  
 91 Watauga  
 92 Durham/Wake  
 93 New Hanover  
 94 Transylvania  
 95 Stokes  
 96 Guilford/Rockingham  
 97 Chatham/Wake  
 98 Columbus  
 99 Scotland/Hoke/  
 Robeson/Columbus  
 100 Rockingham  
 101 Tyrell/Washington  
 102 Burke  
 103 Alleghany/Wilkes  
 104 Wake

105 Avery  
 106 Watauga  
 107 New Hanover  
 108 Rutherford  
 109 Wayne  
 110 Gaston  
 111 Chatham  
 112 Carteret  
 113 Watauga  
 114 Bladen  
 115 Chatham  
 116 Halifax  
 117 Gates  
 118 Stanly  
 119 Ashe  
 120 Ashe  
 121 Harnett  
 122 Bladen  
 123 Moore  
 124 Randolph

#### Public Safety

125 DPS

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## The New NC Historic Preservation Tax Credits – *The Basics*

After allowing the old state historic preservation tax credit program to sunset in 2014, the North Carolina General Assembly agreed to bring a new tax credit program back for 2016 by passing a provision in the 2015 budget bill. The following outline was prepared by the North Carolina Department of Natural and Cultural resources to quickly explain the major provisions of the newly enacted state historic preservation tax credit program.

**Income Producing Property** – Continues to piggyback onto the Federal credit

- Former regular historic credits and enhanced Mill credits combined.
- Tiered base credit – 15 percent up to \$10 million of Qualified Rehabilitation Expenditures (QREs), 10 percent from \$10 million to \$20 million, no credit above \$20 million.
- Bonus credits – 5 percent Development Tier Bonus for projects in Tier 1 or 2 county. 5 percent Targeted Investment – manufacturing or agricultural-related at least 65 percent vacant for two years preceding eligibility certification.
- Maximum credit \$4,500,000, based on a \$20 million project of a vacant mill in distressed county.
- Mandatory five-year carry forward eliminated. Credit may be taken in year structure placed in service and carried forward for nine years.
- New credit effective January 1, 2016, sunsets January 1, 2020.

- Eligibility certification for projects certified under the previous Mill program expire January 1, 2023.
- Fee schedule to be determined, no greater than 1 percent of QREs.

**Non-Income Producing Property** – Homeowner credits

- Property must be National Register listed or be contributing to an NR listed Historic District.
- Credit 15 percent of eligible rehabilitation expenses.
- Project threshold reduced to \$10,000 of rehabilitation expenses.
- Project cap limits eligible rehabilitation expenses to \$150,000 – maximum credit is \$22,500.
- Eligible rehabilitation expenses must be incurred within any 24-month period.
- Mandatory five-year carry forward eliminated. Credit may be taken in year structure placed in service and carried forward for nine years.
- Credits may be transferred with property so long as transfer of property occurs before it is placed in service.
- Taxpayer is allowed to claim credits for a rehabilitation once every five years.
- New credit effective January 1, 2016, sunsets January 1, 2020.
- Fee schedule to be determined, no greater than 1 percent of rehabilitation expenses.



# The Cost of Doing **Nothing**

## Why You Will Pay For Delaying Repairs and Renovations

By Matt Parker, PE; Roger Woods, PE; and Bill Smith, PE

**P**icture this: It's the middle of the coldest winter in a decade, and the nearly 20-year-old furnace in your home has stopped working. Its components are aged, and its technology is dated. Repair costs are feasible, but the fix will only extend what the repair technician calls "borrowed time." A new furnace is costly and not in your budget; however, it would be more efficient and won't require repairs for some time. You are faced with a not so simple decision. You can:

- Repair the unit and allow it to run at reduced efficiency, curbing family member complaints and hoping it continues to operate
- "Borrow" money from the household budget to replace it with a newer model, banking on long-term savings and peace of mind
- Turn the unit off and move your family into a hotel or apartment until spring

What is the best choice? Is there really a decision to make? Where would the money

come from to replace the furnace or pay for temporary housing?

Can you afford to do anything other than make emergency repairs?

Businesses and governments are faced with a similar dilemma every year but on a much graver scale. The crucial difference between a private home and a government building is that public safety, health and welfare are at risk when large, high-usage structures languish in a state of disrepair. In this article, engineering principles are applied to suggest that delaying repairs and renovations (R&R), or deferred maintenance, is far more costly over the life of a building than a planned and funded maintenance and replacement program. By funding phased equipment upgrades and replacements at the appropriate time in a building's life, expensive emergency repairs can be avoided. Looking at the state government in North Carolina as a case study, qualitative analysis strongly suggests

that reliable, perpetual funding for scheduled repair and renovation expenditures should be established.

The state is responsible for more than 12,000 buildings, totaling more than 119 million square feet. The Higher Education Bond of 2000 added more than 100 buildings to the inventory, and new buildings are continuing to be completed and brought online.

The state is responsible for many types of buildings, including historic landmarks, high-way department storage sheds and state-of-the-art libraries, laboratories and offices. These assets serve many state agencies and departments, including the University of North Carolina system.

As traditional consumers of nearly half the allocated repair and renovation funding each year, the UNC system is by far the largest single entity with assets in the state building inventory. According to a recent report,

UNC alone has a backlog of repairs of \$2.2 billion through 2013. Extending that value as representative of the state's entire building inventory, the total backlog of repairs is currently estimated to be at least \$4.4 billion. Data suggests that tackling this backlog could create or sustain 125,400 construction-related jobs. At a minimum, the state should curb this deficit of repairs, because, as comedian Will Rogers once said, "If you find yourself in a hole, stop digging."

Unfortunately, the funding level for R&R of state buildings shows a declining average



over the last decade, to the current level of \$150 million over two years. The harsh reality in North Carolina, and many other states and municipalities throughout the country, is a trend for reduction in R&R funds, which contradicts the trend toward more buildings. Most buildings are built to meet growth demand and don't replace aging ones. Given this notable trend of reduced R&R funding for nearly a decade, the current backlog may

already be insurmountable. The challenge is to recognize the additional cost of unfunded R&R and to develop new methods for generating those funds for new and future buildings. See Figure 1.

It is helpful for this analysis to define the types of funding discussed. There are generally three categories of maintenance and repair funds — preventive maintenance and minor repairs, unscheduled maintenance, and R&R. In North Carolina, the first category is funded through the operational budget of the agency occupying the building. This article focuses on the last category, which is funded through budgeted appropriations approved by the General Assembly. Historically, unscheduled maintenance has been funded through operational budgets. Over time, this funding strategy puts a significant strain on planned maintenance effectiveness as more and more dollars are diverted from preventive activities to reactive fixes. One directly observable effect of this trend is an increase in energy costs. Poorly maintained systems are less efficient, and reduced efficiency directly translates to increased energy consumption.

### The Basics

To identify the impact of maintenance on life-cycle costs, consider a building's major systems and equipment that have a statistical failure rate as a function of time. An example of this is shown for a typical chiller, which has a life span of 20 years.

While the level for minimal acceptable condition is somewhat subjective, this data translates to a predictable service life curve. This curve can represent most any build-

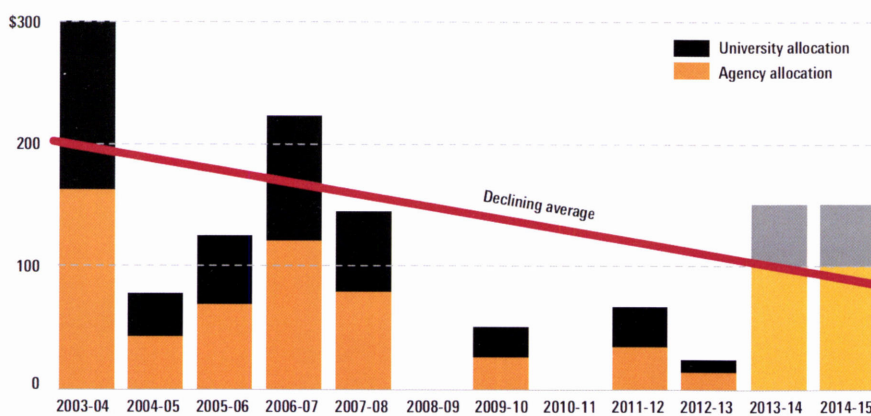
*For many years, proponents of deferred maintenance have argued that the total maintenance costs for a given system will be less because of shortened service life.*

ing system, from mechanical HVAC systems to roofing or windows. Though the rate of decline may change for various building systems, the life cycle for most major building components falls between 10 and 25 years. The base assumption in producing this curve is that the recommended maintenance was performed throughout the life of the equipment.

The slight increase in condition or performance of equipment at the early stage of operation identifies a normal period of optimization, a result of commissioning or other quality assurance methods. The optimal condition is the level at which the equipment or system performs the intended or designed function 100 percent of the time. The minimal acceptable condition is the statistical failure point, beyond which normal equipment could not perform the intended function. The purpose of this life-cycle view is to emphasize that in the latter half of service life, there is an inevitable loss of function, which translates to system downtime and, by extension, loss of building function. The cost of that loss could be as low as uncomfortable occupants for short periods of time or as high as weeks of lost time and productivity while occupants are relocated and major damage from a failed system is repaired.

Plotting the relative cost of a complete building over its entire life cycle creates a frame of reference for the cost of operations, maintenance and R&R. A simplified cost analysis shows the cumulative cost of owning and operating a building can easily be five to 10 times the initial cost. This curve shows a steady rise over time because of varying system life cycles, with a significant R&R expenditure required in the 20- to 25-year range. For a building that costs \$5 million to construct initially, the total cost of ownership could exceed \$50 million. Initially, this seems an extraordinary amount of money, but it emphasizes the

FIGURE 1



importance of life-cycle analysis during design and construction. Policymakers and legislators rarely make decisions based on life-cycle data. Budgeting and funding pressures narrow the typical decision-making horizon to only a few years, masking the true impact of today's decisions regarding maintenance and R&R on tomorrow's financial responsibilities.

Design decisions made in the initial delivery phase can have significant impacts on the total cost of a building. Some research suggests a 1:10:100 life-cycle-cost ratio, where the construction cost is 10 times the design cost, and life-cycle operations, maintenance and repair is a staggering 100 times the design cost. When choosing an architect or engineer and allocating design fees, this ratio confirms the importance of quality design decisions over fee-based decisions.

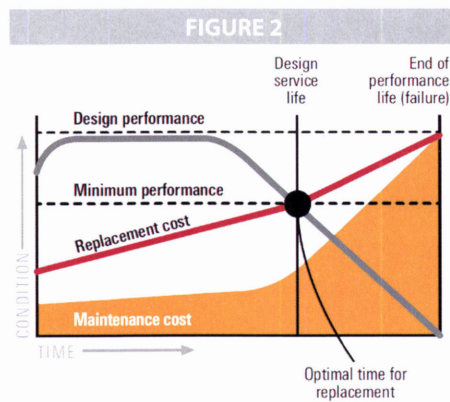
### Maintenance vs. Time

What happens to system-service life when maintenance is not performed? Existing studies confirm that service life can be reduced by 20 percent to 50 percent, creating several effects. First, the cost of maintenance for a given system increases, with dramatic increases in both maintenance and replacement costs, once the design service life is exceeded. Second, an entire life-cycle replacement can be added to the life-cycle delivery curve.

Figure 2 shows an overlay of projected life-cycle maintenance and replacement costs with the service life curve previously

described. A basic tenet of building design and engineering is to select equipment for design service life. This time is less than the full service life and is defined as the point where system performance reaches a minimum acceptable level. Any time beyond this point, defined as the optimal time for replacement, both the maintenance and replacement costs increase dramatically for a given system.

One study concluded that the total cost of "emergency replacement" of a failed system is equal to the square of the cost of the



failed part alone, if replaced on schedule. For a \$100 fan that fails, for example, the emergency replacement cost can be reliably estimated at \$10,000. This difference arises from the idea that a failed part could result in catastrophic damage to the entire system, requiring complete replacement. This replacement cost must at least include increased collateral costs such as overtime

labor, damaged finishes and lost productivity for occupants.

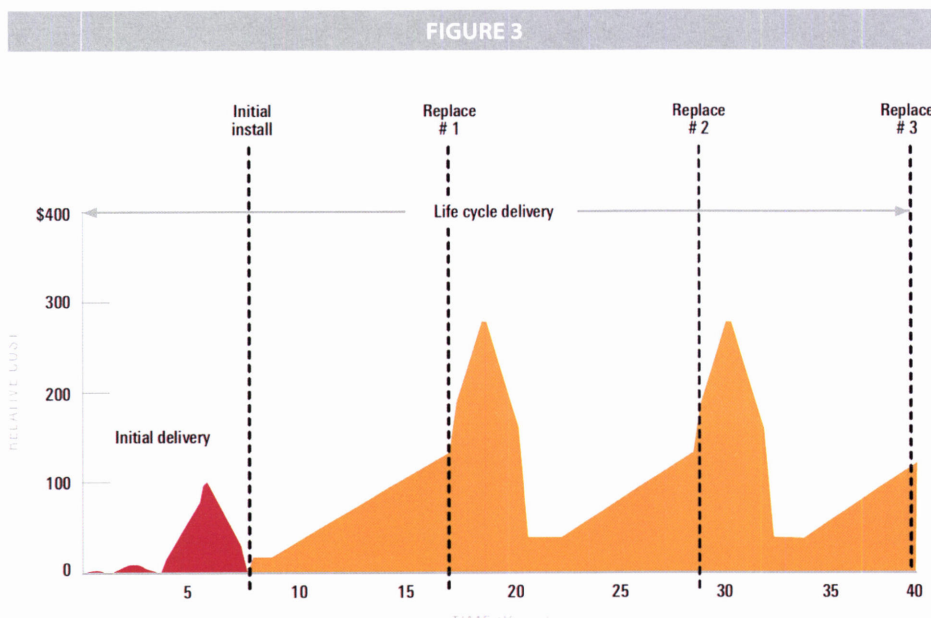
Another negative cost result of reduced, delayed or deferred maintenance is an energy cost premium. Maintenance factors, such as dirty filters, poorly adjusted equipment, faulty controls and many others create system inefficiencies. The authors of a separate study demonstrated that lack of maintenance for large HVAC systems can increase energy costs by more than 30 percent. These system losses increase operational costs through energy bills, the size of which will equal and possibly exceed the original savings from reduced maintenance.

### Replacement vs. Time

For many years, proponents of deferred maintenance have argued that the total maintenance costs for a given system will be less because of shortened service life. Initially, this seems logical and may hold true for some systems and equipment. However, if we return to the relative life-cycle cost plot presented earlier and adjust for more replacements because of shorter life cycles, the total cost of ownership increases dramatically. By adding an entire replacement period to the life cycle of a building, the \$5 million building referenced previously would cost \$70 million over the total life cycle, an increase of nearly 40 percent. See Figure 3.

The observed reality is that deferred or ignored maintenance does not reduce life-cycle cost. Instead, ignored repairs can lead to an operational work-around. For example, a variable speed drive on a fan or pump fails, and the building loses heating or cooling capability. To quickly address complaints, a maintenance technician switches to manual bypass and operates the equipment at full speed rather than make the necessary repair. This work-around alleviates the immediate temperature issue but bypasses one of the most effective energy-saving measures available for an air-conditioning system.

Repairs of this kind create poor system performance and increased operational costs. Perhaps more importantly, not operating equipment as it is designed increases the likelihood of premature failure. As noted above, early failures resulting in emergency repairs can have exponential cost implications.







## Hidden Effects

The above examples demonstrate how deferred maintenance and unfunded R&R significantly increase both the operational and life-cycle costs of buildings. In many cases, additional effects arise that are more difficult to quantify yet very real. Some may include:

- Lost hours/productivity from occupants or employees
- Lost revenue from reduced operating hours during emergency repairs
- Incidental damage
- Lost research/inventory
- Overworked maintenance staff
- Additional public welfare concerns, when extending these effects across an entire building inventory, such as that of North Carolina, including:
  - Spread of contaminants in public spaces (e.g. dust, mold, viruses through faulty HVAC systems)
  - Unreliability of safety systems in an emergency (egress and exit lighting, emergency generators)
  - Adverse working/learning environments (public schools, community colleges, universities)

The ultimate question is: Who suffers from lack of maintenance and R&R funding?

## Report Card

How does the state government of North Carolina stack up to industry standards for funding R&R projects? The recommended annual maintenance and repair cost needs of a typical building range from 2 percent to 4 percent of the replacement cost of the buildings. With potentially a \$21 billion building inventory, North Carolina's optimal annual repair and renovation budget would be \$630 million. The budgeted funding for this year and next is \$150 million — only 0.3 percent.

Unfortunately, the state is failing to address the significant R&R funding deficit and not providing for current and future needs. Based on the information presented here, properly maintained buildings cost at least five times the construction value to operate and maintain. In this case, the total life-cycle cost of the existing inventory approaches \$105 billion. In contrast, since poorly maintained buildings cost approximately 40 percent more than well-maintained buildings, the annualized cost of unfunded repairs over 30 years approaches \$1.4 billion. This is the cost of doing nothing.

## Recommendations

Abraham Lincoln once noted, "You cannot escape the responsibility of tomorrow by evading it today."

Looking at the state government of North Carolina as a case study, there appears to be a building R&R funding gap that cannot be overcome. A satisfactory answer will not be found in waiting for appropriated budget funds. The engineering, design and construction community has a responsibility to help policymakers and legislators develop new, innovative ways to fund R&R projects in the future.

There are many possibilities for both funding R&R projects and reducing obligations, including:

- Facility usage fees
- Establishing a capital construction
- Setting aside budget for R&R projects
- Rewards or incentives for decreasing energy operating budgets
- Fund sharing from non-appropriated revenue-generating facilities
- Divesting from real estate ownership

Solutions will not come easily and will most certainly involve a change in attitudes and perceptions about construction, use and maintenance of publicly funded facilities.

*Matt Parker is building systems manager for Falcon Engineering; Roger Woods is buildings energy and infrastructure business development leader for McKim & Creed; and Bill Smith is president of Stanford White. They may sometimes be competitors, but they are always colleagues, interested in working together to further the engineering profession. They have served together for many years on various endeavors to enact change and improvements to the practices of engineering, most notably in the field of mechanical and electrical engineering for facilities.*

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# AIANC Needs Your Input on New Existing Building Code

In March 2015, the Building Code Council authorized the use of the new NC Existing Building Code. At the same time, they authorized a three-year phase-in of the code as designers transitioned from using the NC Rehab Code.

AIANC requested that the phase-in be conducted so that architects and owners could fully vet the new Existing Building Code against the old NC Rehab Code. During this three-year period (2015-2018), AIANC agreed to collect comments from its members on the differences between the two codes that could help to harmonize the new Existing Building Code with provisions from the Rehab Code. We want to make sure that helpful provisions from the Rehab Code have neither been overlooked nor excluded from the new code.

You can review these codes online at [www.ncdoi.com/OSFM/Engineering\\_and\\_Codes/Default.aspx?field1=Codes\\_-\\_Current\\_and\\_Past&user=State\\_Building\\_Codes](http://www.ncdoi.com/OSFM/Engineering_and_Codes/Default.aspx?field1=Codes_-_Current_and_Past&user=State_Building_Codes).

You can comment two ways:

- Go to [www.aianc.org/building-code-council/existing-building-code-comments](http://www.aianc.org/building-code-council/existing-building-code-comments) and leave a comment.
- Email your thoughts and/or comments to AIA NC Executive Vice President David Crawford at [dcrawford@aianc.org](mailto:dcrawford@aianc.org).



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