# Charlotte Water Design-Build Follow-up

**City of Charlotte**
**Internal Audit Department**
**600 E. Fourth St.**
**Charlotte, NC 28202**

**Staff**

**City Auditor**
Tina Adams, CPA, CIA
**Deputy City Auditor**
Craig Terrell, CPA, CISA
**Senior Auditor**
Kalief Cole, CPA, CIA, CGFM

To learn more about Internal Audit, please visit our website.

**January 21, 2025**

# Charlotte Water Design-Build Follow-up Executive Summary

## Objective

This audit was conducted to determine whether adequate procurement and contract management practices are being followed in water utility-related, design-build construction activities.

## Background

A prior audit and separate cost analysis were conducted in connection with certain design-build projects managed by Charlotte Water, focusing on negotiations and contract administration. The engagements concluded May 2021 and August 2022, respectively.

Recommendations from the prior engagements included improvements in proposal reviews, negotiations, contract language, pay application reviews, and change order processes.

## Conclusion

Charlotte Water's design-build pay application reviews are adequate. Negotiations and contract language have not promoted cost containment, indicating a need for enhanced proficiency in these areas.

## Highlights

***Charlotte Water's design-build procurement activities complied with state requirements.***

***Analysis of work package proposals has been inadequate.***

Management should continue to develop internal proficiency with the cost-plus compensation structure and prepare for future design-build negotiations by performing work package assessments that:

- Clearly show reasonable ranges for proposed prices and suitable compensation structures.
- Are thoroughly documented and centrally stored.

***Design-build contract language is unclear.***

Management should finalize template revisions for design-build contracts and GMP amendments, ensuring compensation structures are:

- Consistent with other contract provisions.
- Aligned with the intended administration of the contract.

***Contingency credits were not processed for identified savings.***

Management should ensure timely credit of change-related savings throughout projects.

## Actions Planned

Charlotte Water has agreed to continue implementing recommendations from prior audits as updated and reflected in this report.

# Table of Contents

## Objective

This audit was conducted to determine whether adequate procurement and contract management practices are being followed in water utility-related, design-build construction activities.

## Background

### Design-Build Contracting and Prior Engagements

*Design-build* is a collaborative project delivery method that integrates design and construction services with one vendor, known as a design-builder (the "DB"). The design-build method offers efficiency and flexibility, and is pursued as an alternative to the conventional, design-bid-build method.

The Internal Audit Department of the City of Charlotte (the "City"), through engagement with consulting firm RSM US LLP ("RSM"), conducted a prior performance audit and a separate cost analysis (collectively, the "Prior Engagements") of certain design-build projects managed by the City's Charlotte Water Department ("Charlotte Water"). Given the risks inherent to non-competitive pricing, the Prior Engagements focused on controls over design-build negotiations and contract management.

> Unlike design-bid-build, and pursuant to North Carolina law, DBs are selected based on qualification - not lowest bid - increasing **risks** of unreasonable pricing.

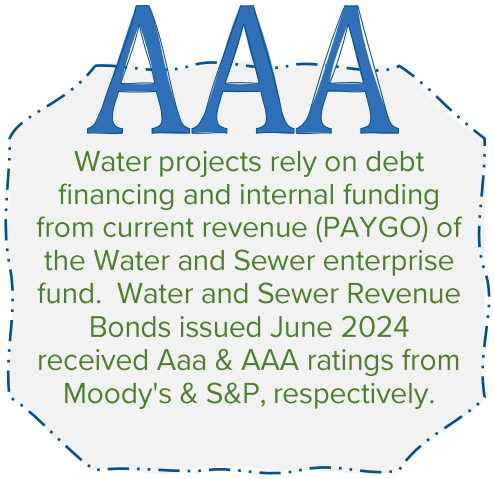
In addition to the focus areas of the Prior Engagements, this follow-up audit assessed Charlotte Water's adherence to state requirements for delivery method selection and design-build solicitations.

***Figure:*** *Audit Scope Areas*


Findings from the Prior Engagements, concluded May 2021 (Report #21-11) and August 2022 (Report #23-01), respectively, are reflected in the *Prior Finding Status Update* table included as Appendix "A."

## Charlotte Water System and Fiscal Impact

The City's water system is comprised of supply from the Catawba River, and essential infrastructure which includes three water treatment plants, approximately 4,570 miles of water mains, six sanitary sewer treatment plants, and roughly 4,562 miles of wastewater pipe.




As part of its capital budget for fiscal year ending June 30, 2024 (FY 2024), the City allocated $442.8 million toward construction and other utility investments. Included in that amount was funding for certain design-build initiatives.

During the period under review, September 2022 through June 2024, the City approved contracts and related amendments totaling $415.4 million in support of nine separate Charlotte Water design-build projects.

Auditors reviewed two of the newer contracts, which were initiated after the Prior Engagements. The contracts are detailed below.

## Zone 2 Water Main Replacement and McAlpine Biosolids Projects

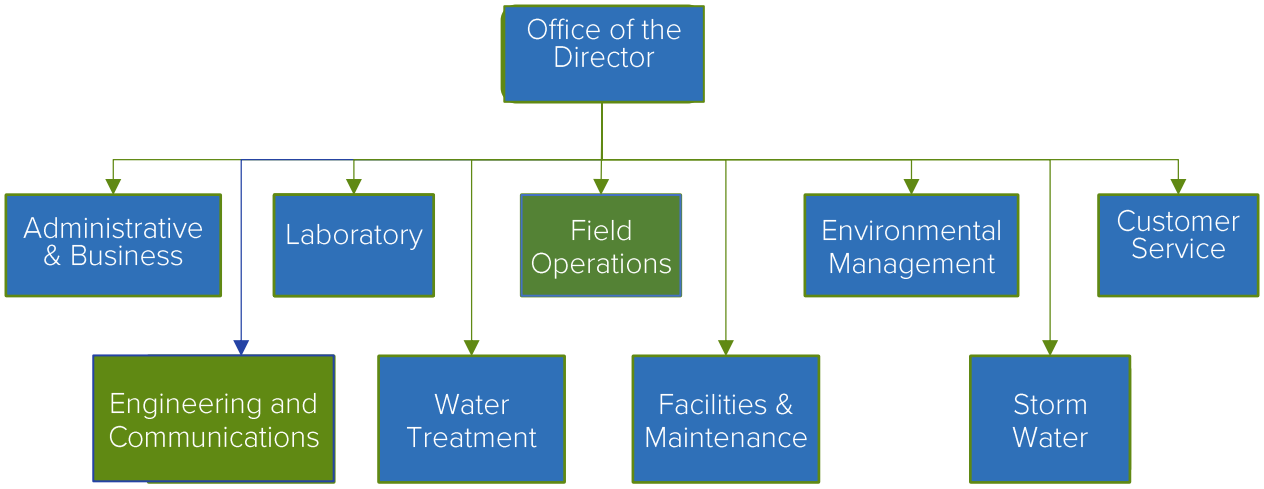
In October 2022, the City entered into an agreement with R.H. Price, Inc., as DB, for design and pre-construction services in connection with the Zone 2 Water Replacement Project ("Zone 2"), part of the City's major water main replacement program. The initial contract price was not to exceed $2.8 million, with project scope to include design and construction services for the replacement of 65,832 linear feet of aging waterline. In February 2023, the City and R.H. Price made the first amendment to the contract, agreeing to a Guaranteed Maximum Price (GMP) of $8.6 million for the first phase of construction. A second amendment was approved in April 2024, in support of the final phase, for a GMP of $13.2 million, bringing the total contract value to $24.6 million. As of its June 2024 Payment Application No. 27, R.H. Price has invoiced a total of $9.8 million. There are no approved change orders increasing the contract value, and the project's estimated completion date has been revised to July 2026.

In December 2022, the City entered into an agreement with PC Construction Company, as DB, for design and pre-construction services in connection with the McAlpine Creek Wastewater Management Facility Thermal Hydrolysis Process and Biosolids Improvement Project – Phase 1 ("Biosolids"), part of the City's broader Biosolids Program. The initial contract price was not to exceed $14.1 million, with project scope to include design services for construction of a new Biosolids system and related infrastructure required to establish regionalized solids treatment at the McAlpine Creek plant. The project has not yet reached construction and, as of its April 2024 Payment Application No. 14, PC Construction has invoiced a total of $6.1 million. There are no approved change orders increasing the contract value, and the project's completion date is estimated to be June 2029.

## Management

The Zone 2 and Biosolids contracts are managed by Charlotte Water's Field Operations and Engineering divisions, respectively. Leadership of the Field Operations and Engineering divisions, together with other Charlotte Water leadership, are herein referred to as "Management."

***Figure:*** *Charlotte Water Org. Chart*




The Charlotte Water team is recognized for managing an award-winning "OneWater" utility.[1] Throughout this follow-up, auditors sought to identify opportunities for Charlotte Water staff to better align with Management's expectations and departmental objectives of "ensuring] reliable [water] infrastructure to serve the community today and into the future" as well as "equitably managing financial resources, balancing affordability and growth."[2]

[1] Recipient of the 2023 National Association Clean Water Agencies (NACWA) Platinum and Gold Peak Performance Award and the American Water Works (AWWA) George Warren Fuller Award, among others.
[2] City's FY 2024 Adopted Budget.

## Audit Results

The engagement focused on Charlotte Water design-build activities within each of the audit areas. The following legend is used to summarize the results:

- **5** – Practices appear adequate in all material respects
- **4** – Practices are approaching adequacy, minor improvements are required
- **3** – Practices require improvement
- **2** – Practices require significant improvement
- **1** – Practices reveal material inadequacies, major improvements are required

| AUDIT AREA | PROCESS | STATUS | REFERENCE |
|---|---|---|---|
| Delivery Method Selection (Compliance) | Procurement | 5 | |
| Solicitations (Compliance) | Procurement | 5 | |
| Negotiations | Procurement | 2 | See Findings 1 & 2 |
| Pay Applications | Construction: Contract Management | 5 | |
| Change Orders | Construction: Contract Management | 3 | See Finding 3 |

## Findings and Recommendations

### *1. Analysis of work package proposals has been inadequate.*

There are several alternative methods for pricing design-build contracts and related amendments. These include setting a single fixed price for an entire contract, or amendment; or applying a not-to-exceed amount (i.e., a GMP) to compensate DBs for all subsidiary work components (or work packages), each assigned an agreed-upon compensation structure.

City staff involved in contract negotiations have a responsibility to pursue pricing, compensation structures, and other terms that are in the City's best interest[3], and that are consistent with policy goals (e.g., the City's CBI Policy). Best practice suggests the following:

- **Negotiate suitable compensation structures** – When negotiating a compensation structure for each work package, owners should consider, among other factors, the structure's: i) ability to control costs, in combination with GMPs and/or cost-reduction incentives; ii) risk allocation between owner and design-build team; iii) ability to handle complexity or uncertainty; iv) ability to accommodate scope changes; and v) administrative burden. Compensation structures commonly used for work packages in design-build contracts include:

**Cost-Plus:** DB and subcontractors[4] are compensated for actual costs reasonably incurred to complete work packages, in addition to profit, expressed as a fixed dollar amount or percentage. A variant of cost-plus, the *Time and Materials* (T/M) method, compensates DBs for labor (either at cost or a stipulated rate), cost of material, and a percentage markup for overhead and profit. Cost-plus and T/M provide transparency, but, relative to other methods, place greater administrative burden on DBs. Costs associated with this burden is generally passed to the owner.

**Unit Price:** DB is compensated at pre-established prices for completed or installed units, either by individual work package in a Schedule of Values (SOV) or, at a blended rate determined by dividing the sum of all line-item extension prices by a key driver, such as linear feet. This method provides less transparency than cost-plus, results in less administrative burden on DBs and requires careful oversight of service delivery to ensure conformance with agreed-upon construction *means and methods* (the techniques, procedures, and material used during the construction process).

**Lump Sum:** DB is compensated at a single fixed price for an individual work package, without regard to units installed or completed, though estimates for unit quantities may be prepared. Thus, if all work packages in a GMP contract are priced using the lump sum method, the contract becomes *de facto* fixed-

[3] City Policy EPM 1 Para. 16: "Department Directors and their designees are responsible for…entering into contracts that are in the City's best interest."

[4] Certain contracts require proof of actual costs incurred by subcontractors – not just prime contractors – where subcontractors are *not* selected through a competitive process. Conversely, these contracts may allow subcontractor invoices to be accepted as actual costs where subcontractors compete for trade package awards.

price. This method provides the least transparency, results in the least administrative burden on the DB and requires careful oversight of means and methods.

- **Negotiate fair and reasonable pricing** – Owners should set target prices from which to negotiate, having first assessed whether proposals received for each work package are fair and reasonable.[5] Proposed work package pricing from DBs should be assessed using price analysis – a top-down comparison of proposed prices against prevailing market rates – or, where applicable, cost analysis – a bottom-up examination of all estimated costs a DB plans to incur for each work package.

- **Document and develop rationale** – While concessions are sometimes necessary to achieve mutual agreement, owners should develop rationale to guide negotiations on compensation structure and pricing for each work package. Given the subjective nature of these analyses and related negotiations, owners should apply consistent methodologies and maintain sufficient documentation.

During review, auditors confirmed that third-party firm, Gavel & Dorn Engineering, PLLC, performed a reasonableness assessment of proposed GMP amendments to the Zone 2 contract. However, Charlotte Water produced no evidence that proposed compensation structures or design phase pricing had been adequately analyzed.

Charlotte Water stated that the price of the Biosolids contract with PC Construction for design services "was reasonable at ten percent of construction metrics" and "built up from an estimate of hours and billing rates to substantiate the number for the Lump Sum Basis…" However, a reconciliation of the estimated labor hours and billing rates to the contract price was not provided to auditors, nor the rationale or formal analysis used to validate the proposed rates and hours, or the 10-to-1 construction-to-design contract price ratio.

A list of proposal questions and responses between the City and PC Construction for the Biosolids contract shows only administrative burden as a factor in determining compensation structure. Within the responses, Charlotte Water agreed to "convert Phase 1 services to lump sum" in exchange for a $250,000 "reduction in cost [of] Project Management to simplify invoices based on Schedule of Values." Administrative records do not demonstrate Charlotte Water's validation of the cost reduction calculation.

Charlotte Water has lacked in-house estimating capacity and acknowledged that significant training is needed. Consulting firm Freese and Nichols has been engaged to provide training on use of the cost-plus compensation structure and other contract administration methods. A kick-off event was held in March 2024.

[5] NCGS § 143-64.31 provides that after a DB is selected based on qualification, the City must, "…negotiate a contract for those services at a *fair and reasonable fee* with the best qualified firm." "If a contract cannot be negotiated with the best qualified firm, negotiations with that firm shall be terminated and initiated with the next best qualified firm." Federal Acquisition Regulations (FAR) 31.201-3 holds "A cost is reasonable if, in its nature and amount, it does not exceed that which would be incurred by a prudent person in the conduct of competitive business."

Proficiency in identifying and managing compensation structures, combined with comprehensive proposal analysis, allows the City to effectively control construction costs and manage contract claims, adjustments, and change order proposals.

***Recommendation 1A:*** Charlotte Water should continue to develop internal proficiency; and pursue resources needed to take advantage of the cost-plus compensation structure, where it is determined to be the most suitable for a given work package.

***Value Added:*** Cost savings

***Charlotte Water Response:*** To preserve flexibility with project delivery and when appropriate, CLTWater will use respective Owner Advisors or Program Managers to recommend if/when to implement the cost-plus, unit-price, or lump-sum compensation structures on future design-build projects. Either or all of these methods may be used within the same project, as it depends upon overall project analysis as well as individual scopes within each project. For future design-build contracts, CLTWater will document all analyses including all reviews performed to determine whether to accept Owner Advisor's or Program Manager's recommendations.

***Recommendation 1B:*** To guide negotiations, Charlotte Water should perform (either in-house or using a consultant) a formal work package proposal assessment to include a compensation structure evaluation; and a price or cost analysis. The assessment should:

- Be methodical, using decision matrices and appropriate criteria, statistical methods, market comparisons, or similar tools.
- Present a reasonable or creditable range for any proposed prices, costs (including preconstruction labor costs, general conditions and requirements, and subcontractor bids) and profits.
- Identify the compensation structure Charlotte Water determines to be the most suitable for each work package. When determining the most suitable compensation structure, Charlotte Water should consider design-builder's confidence level, or certainty, with respect to quantities included in project plans and designs (*see* example in Appendix "B").
- Be thoroughly documented and maintained, as part of a negotiating transcript, in a central repository, readily accessible by Management and auditors upon request. Any concession or adjustment causing the agreed-upon compensation method to deviate from that which has been identified as the most suitable should also be documented.

For each work package, DBs should be required to present sufficient detail (labor hours, equipment hours, materials) to facilitate Charlotte Water's analysis. Where cost-plus is utilized for individual work packages, DBs should be required to bifurcate cost of work and fee.

***Value Added:*** Risk Reduction

***Charlotte Water Response:*** As of mid-July 2024, CLTWater procured Project Cost Solutions, Incorporated for professional independent, cost analysis and estimating services. In addition, CLTWater uses other third-party consultants to perform similar work as warranted and prescribed. For future design-build contracts, CLTWater will document all analyses and require work components to be presented in a manner that is at least as detailed as described in audit recommendation 1B.

## 2. *Design-build contract language is unclear.*

Design-build contracts should expressly and accurately reflect the agreed-upon compensation structure for each work package.

Charlotte Water utilizes the Design-Build Institute of America (DBIA) contract template in design-build solicitations. Once agreement is reached for Phase 1 (design) services, Article 7, "Contract Price", of the template is updated to reflect agreed-upon compensation structures.

Section 7.1.2 of the design contracts establishes cost-plus and lump sum as optional compensation structures for subsequent "Phase 2" (construction) services. The agreed-upon structure is specified at time of agreement for each individual GMP amendment to the contract.

Auditors noted the following contract language ambiguity in connection with compensation structures:

- The Zone 2 design contract does not clearly specify a compensation structure.
- Although the Unit Price method was designated in the first amendment (GMP) to the Zone 2 contract, the Time and Materials (a variant of Cost-Plus) structure has been assigned to specific work packages. In further contradiction of the pricing provision, section 7.6.3 "Savings" states that a "majority of this GMP utilizes unit price."
- Section 2.2.1 of the contract template provides that, "The Contract Price for Phase 2 shall be developed during Phase 1 on an '*open-book*' basis."[6] "Open-book" is not clearly defined in the contract.

In response to recommendations from the Prior Engagements, the City Attorney's Office drafted proposed revisions to the contract template for Charlotte Water's consideration. Charlotte Water chose to postpone implementation of the revisions, citing i) workload; ii) the need to maintain flexibility; and iii) training requirements.

Without clear contract language, Charlotte Water risks incurring unnecessary costs, facing contentious claims and disputes, and forfeiting certain recourse.

***Recommendation 2:*** Charlotte Water should confer with the City Attorney's Office to finalize template revisions for design-build contracts and related amendments which should, at minimum, provide definition for "open book". When modifying templates for specific agreements, the compensation structure for each work package included in the Schedule of Values should be i) clearly specified, ii) consistent with other contract provisions, and iii) consistent with how the contract will ultimately be administered.

---

[6] In certain contexts, "Open-book" may be construed as the cost-plus compensation structure. According to *Maximizing Success in Integrated Projects, An owner's Guide*, a Pennsylvania State University white paper published to the DBIA website, "In open-book accounting, team members are paid for completed work based upon the cost of the work in place, plus a fee for the services performed" (Leicht, Molenaar, Messner, Franz, & Esmaeili, 2016).

***Value Added:*** Risk Reduction; Cost Savings

***Charlotte Water Response:*** CLTWater agrees to continue working the City Attorney's Office to finalize template revisions to the design-build contract and related agreement. In addition, we will work to implement training for appropriate staff on these updates. This will be implemented through training between the City Attorney's Office and CLTWater and anticipated to be completed by September 30, 2025.

### *3. Contingency credits were not processed for identified savings.*

Contingency credits should be processed promptly to maintain project momentum and cost control.

In reviewing Payment Application No. 27 of the Zone 2 contract, auditors noted that R.H. Price credited a total of $272,434.40 in savings related to a change affecting certain cost components. While Charlotte Water has a process in e-Builder, a project management solution, to capture contract savings, no contingency credit was processed for this amount.

Charlotte Water currently accounts for overall project savings through final adjusting change orders during project closeout processes. By not crediting change-related savings to owner's contingency throughout the project, the DB may invoice against the savings without completing the contractual contingency approval process.

***Recommendation 3:*** Charlotte Water should ensure timely credit of change-related savings throughout projects.

***Value Added:*** Risk Reduction; Cost Savings

***Charlotte Water Response:*** While Charlotte Water acknowledges the contingency crediting process as a component of project controls, there are other controls to ensure Charlotte Water and the DB are agreeable to project invoicing. After Workday implementation for construction projects and e-Builder interface is completed and operable, we are amenable to exploring system features to detect savings which require contingency credit during the construction process.

## Conclusion

Charlotte Water's design-build pay application reviews are adequate. Negotiations and contract language have not promoted cost containment, indicating a need for enhanced proficiency in these areas.

## Distribution of Report

This report is intended for the use of the City Manager's Office, City Council, and all City departments. Following issuance, audit reports are sent to City Council and subsequently posted to the Internal Audit website.

# Scope, Methodology, and Compliance

## Scope

This engagement was conducted as follow-up to a Charlotte Water design-build performance audit and subsequent cost analysis completed May 2021 (Report #21-11) and August 2022 (Report #23-01), respectively. Audit procedures were designed and executed to assess procurement and contract management activities from September 2022 through June 2024.

Although centered on Charlotte Water design-build, concepts included in this report broadly apply to citywide alternative delivery procurement and contract management.

## Methodology

To achieve the audit objectives, auditors performed the following:

- Interviews and meetings with Charlotte Water staff.
- Facilitation and evaluation of self-assessment completed by Charlotte Water.
- Review of project delivery method selection analysis prepared by Charlotte Water.
- Comparison of solicitation activities against state requirements for design-build contracts.
- Review of third-party evaluations prepared by Gavel & Dorn Engineering, PLLC.
- Limited comparison of line-item pricing against *RSMeans* Construction Cost Data.
- Comparison of level of effort estimated for contract design components against similar contracts.
- Review of 28 judgmentally selected pay applications. Auditors reviewed as to the following:
    - Workflow approval in e-Builder.
    - DB signature
    - Sequential submission
    - Accuracy of carryforward calculation
    - Allowability of billings, including contingency and allowance items
- Comparison of contingency use approvals against controlling contract provisions.
- Confirmation that total contract price was reduced at project closeout and as planned in connection with an observation from a prior audit.

## Compliance

Auditors conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that audits are planned and performed to obtain sufficient, appropriate evidence to provide reasonable basis for findings and conclusions based on audit objectives. Auditors believe that the evidence obtained provides a reasonable basis for findings and conclusions based on audit objectives.

Government auditing standards require that auditors determine which internal controls are material to the audit objective(s) and obtain an understanding of those controls. To evaluate internal controls, the City Auditor's Office follows the Committee of Sponsoring Organizations of the Treadway Commission's Internal Control – Integrated Framework (COSO Framework) as included in Standards for Internal Control in the Federal Government (GAO Green Book).

In planning and performing the audit, auditors obtained an understanding of the design-build procurement and contract management processes at Charlotte Water and associated internal controls; assessed the internal control risks; and determined the following internal control components were significant:

- Control Environment – The set of standards, processes, and structures that provide the basis for carrying out internal control across the organization.

- Control Activities – The actions management establishes through policies and procedures to achieve objectives and respond to risks.

Internal control deficiencies that are significant within the context of this audit's objective(s) are stated in the Findings and Recommendations section of this report. For additional information regarding internal control components and the related principles of internal control, *see The Five Components and 17 Principles of Internal Control* included as Appendix "C".

In addition, auditing standards require consideration of fraud as well as laws and regulations relevant to audit objectives. Of principal relevance is North Carolina State Law 2013-401/H857 which, in 2013, i) authorized certain alternative project delivery methods, including design-build[7], establishing procedures for the same and ii) established requirement that local governmental units procure such services under the qualification-based selection method. [8]

***Figure:*** *North Carolina General Statute 143-128.1A – Required Design-Build Use Considerations*

1. The extent to which the governmental entity can adequately and thoroughly **define the project requirements** prior to the issuance of the request for qualifications for a design-builder.
2. The **time constraints** for the delivery of the project.
3. The ability to ensure that a **quality project** can be delivered.
4. The capability of the governmental entity to manage and oversee the project, including the availability of experienced staff or outside consultants who are **experienced with the design-build** method of project delivery.
5. A good-faith effort to comply with G.S. 143-128.2, G.S. 143-128.4, and to recruit and select **small business entities**.
6. The **criteria utilized** by the governmental entity, including a comparison of the advantages and disadvantages of using the design-build delivery method for a given project in lieu of the delivery methods identified in subdivisions (1), (2), and (4) of G.S. 143-128(a1).

*NCGS 143-128.1A requires the establishment and use of written criteria for determining when to use the design-build method which, at minimum, must address these six considerations.*

No instances of fraud or non-compliance were found during this audit.

[7] NCGS 143-128
[8] NCGS 143-64.31 (the Mini-Brooks Act)

# Appendix A
## Charlotte Water Design-Build Engagements
### Prior Finding Status Update

🟢 Resolved in all material respects  🟡 In progress/Actions taken  🔴 Not resolved

| | Finding | Recommendation | Action/Audit Results |
|---|---|---|---|
| 🟡 | 21-11 – #1: The process by which Charlotte Water project management is administering the contract does not align with certain articles of the DBIA agreement and GMP amendments. | A) Evaluate opportunity to exercise the right to audit clause, and enforce the cost-plus provisions noted in the observation. Should management pursue, CLTW should obtain detailed report of the actual costs.<br><br>B) Remove all reference to the contracting approach not being utilized.<br><br>C) Use cost plus methodology. | A) Resolved in all material respects.<br><br>B) Contract template revisions have been drafted but not yet implemented. Recommendation updated as part of follow-up Finding 2.<br><br>C) Recommendation updated as part of follow-up Finding 1. |
| 🔴 | 21-11 – #2: There was no evidence that a reasonableness assessment was performed as to labor rates, subconsultant fees, or the total cost agreed upon for Phase 1 Design services. | A) Charlotte Water should perform and document review of DB design and preconstruction labor rates, labor multipliers, level of effort to complete the design phase scope, and subconsultant quotes and/or contracts. | A) Recommendation updated as part of follow-up Finding 1. |
| 🔴 | 21-11 – #3: There was no evidence that an assessment of the GMP amendment was performed to evaluate the reasonableness or accuracy of the material and equipment quantities, labor rates and | A) Should Charlotte Water utilize DBIA cost-plus fee contract language on future [contracts], design-builders should be required to propose their GMP price amendments in a manner which bifurcates actual costs of work and fee. | A) Recommendation updated as part of follow-up Finding 1. |

# Appendix A
## Charlotte Water Design-Build Engagements
### Prior Finding Status Update

Resolved in all material respects | In progress/Actions taken | Not resolved

| | Finding | Recommendation | Action/Audit Results |
|---|---|---|---|
| | multipliers, lump sum elements of the work. | B) Regardless of contracting approach, Charlotte Water should perform and document an evaluation of the GMP amendment which should include, at minimum: i) review of subcontractor bids; ii) schedules of general conditions and requirement costs; iii) verification of quantities in conformance with the project plans for high-value line items; and iv) assessment of reasonableness of prices. | B) Recommendation updated as part of follow-up Finding 1. |
| | 23-01 – #1: Contracts were billed on unit price basis, while the design-build agreement outlines a cost-plus billing basis. | A) Implement the cost-plus billing method on design-build contracts.<br><br>B) Should unit price be used, agreement should require a reconciliation of incurred costs to billings at end of contract. | A) Recommendation updated as part of follow-up Finding 1.<br><br>B) Resolved in all material respects. *See* follow-up Finding 2. |
| | 23-01 – #2: Construction plan changes resulted in $500,000 proposed savings to a specific cost component for which a change order was not executed. | A) Charlotte Water should initiate a change order at end of contract to decrease contract value for the savings.<br><br>B) Charlotte Water should execute change for any changes made to project costs or schedules as changes occur. | A) The contract value was adjusted for the $500,000 savings as proposed. Resolved in all material respects.<br><br>B) Recommendation updated as part of follow-up Finding 3. |

# Appendix A
## Charlotte Water Design-Build Engagements
### Prior Finding Status Update

Resolved in all material respects | In progress/Actions taken | Not resolved

| | Finding | Recommendation | Action/Audit Results |
|---|---|---|---|
| | 23-01 – #3: Pay applications were not carried forward accurately. | A) Charlotte Water should perform procedures when reviewing DB pay applications to include confirming DB signature; verifying sequential submission; recalculating carryforward values; confirming cost per unit billed at established rates; confirming adequacy of supporting documentation. | A) Charlotte Water disclosed that review processes were covered at monthly meetings and check-ins. No control exceptions were found. Resolved in all material respects. |

# Appendix B

## Compensation Structure Decision Matrix Example

***Figure:*** *Compensation Structure Decision Matrix Example*

| Criteria | Weight | Cost-plus | Unit Price | Lump Sum |
|---|---|---|---|---|
| **Cost Control** | 4 | 4 (16) | 3 (12) | 5 (20) |
| **Risk Allocation** | 5 | 3 (15) | 4 (20) | 5 (25) |
| **Complexity** | 3 | 4 (12) | 3 (9) | 2 (6) |
| **Flexibility** | 3 | 5 (15) | 3 (9) | 2 (6) |
| **Administrative Burden** | 2 | 3 (6) | 4 (8) | 5 (10) |
| **Total Weighted Score** | | **64** | **58** | **67** |

*This example illustrates a decision matrix where weights are assigned based on owner priorities for each work package, with values ranging from 1 to 5. The criteria ratings may vary depending on the cost composition of individual work packages. This matrix is provided for illustrative purposes. When developing similar matrices, management should exercise judgment to set criteria, weights, and ratings that are appropriate for specific contracts.*

# Appendix C

## The Five Components and 17 Principles of Internal Control

| | |
|---|---|
| **Control Environment** | 1. The oversight body and management should demonstrate a commitment to integrity and ethical values.<br>2. The oversight body should oversee the entity's internal control system.<br>3. Management should establish an organizational structure, assign responsibility, and delegate authority to achieve the entity's objectives.<br>4. Management should demonstrate a commitment to recruit, develop, and retain competent individuals.<br>5. Management should evaluate performance and hold individuals accountable for their internal control responsibilities. |
| **Risk Assessment** | 6. Management should define objectives clearly to enable the identification of risks and define risk tolerances.<br>7. Management should identify, analyze, and respond to risks related to achieving the defined objectives.<br>8. Management should consider the potential for fraud when identifying, analyzing, and responding to risks.<br>9. Management should identify, analyze, and respond to significant changes that could impact the internal control system. |
| **Control Activities** | 10. Management should design control activities to achieve objectives and respond to risks.<br>11. Management should design the entity's information system and related control activities to achieve objectives and respond to risks.<br>12. Management should implement control activities through policies. |
| **Information & Communication** | 13. Management should use quality information to achieve the entity's objectives.<br>14. Management should internally communicate the necessary quality information to achieve the entity's objectives.<br>15. Management should externally communicate the necessary quality information to achieve the entity's objectives. |
| **Monitoring** | 16. Management should establish and operate a monitoring mechanism that monitors both internal and external activities that impact the control system and evaluate the results.<br>17. Management should remediate identified internal control deficiencies on a timely basis. |