



Facilities Design & Construction

ADDENDUM NO. 1

(Supplement to RFQ #26-054 issued for Wake County Medical Examiners Decedent Storage Designer Request for Qualifications (RFQ))

Notice to Prospective Respondents:

This addendum contains the following clarifications and responses to questions received regarding the original RFQ and is issued prior to receipt of submission packages to be submitted to the County. Receipt of this addendum by respondents must be acknowledged on the cover letter / executive summary to be submitted with Designer firm qualifications packages. **Failure to acknowledge addenda that have been issued by the County can be cause for rejection of the respondent's submission.**

Question #1: --- Section B.1 references a minimum of three (3) projects but item C.4 references five (5) projects. Please clarify.

Section B.1 is asking for three (3) examples of medical examiner facilities or similar projects while section C.4 is asking for broader experience with energy efficiency and sustainability on projects that do not necessarily have to be related to medical examiner facilities but need to demonstrate proficiency in sustainable design and energy efficient systems.

Question #2: --- Is there a link available for the "Form of Agreement for Professional Services" referenced in Section XIII.E?

An Example of the "Form of Agreement" is attached to this Addendum and available for download from the County's website where Bids, RFP's, and RFQ's are located. The Agreement references several attachments in Section 38. Attachments A and C therein will be provided by the proposing Design Team(s) in their submittal, Attachments B, E, and F will be developed with the selected firm and incorporated in the Agreement, and Attachment D (Mediation) is provided with this addendum. The County anticipates using a Construction Manager at Risk (CMAR) delivery method and the Designer should anticipate serving in an advisory capacity to the CMAR Selection Committee.

Question #3: --- The RFQ states that land acquisition is in process and site evaluations/test fits are part of the scope. Has the County narrowed the search to a few specific candidate parcels, or will the selected design team be expected to identify and evaluate completely unvetted sites across the county?

Design teams will be expected to assist with feasibility of sites selected by the County to include test fits, zoning analyses and rezoning assistance, access to utilities and roadways, etc. The Design teams are not expected to identify the site. The County will engage certain consultants directly including surveyors, geotechnical & soils engineers, environmental site assessments, and wetland delineations. The Design firm selected will be expected to help coordinate these activities and provide expertise necessary to take a selected tract of land through the development process.



Facilities Design & Construction

Question #4: --- Section II Project Overview notes that "initial studies" established the 23,000–30,000 GSF program. Was this initial study an internal Wake County effort, or was it conducted by an outside planning/architectural firm? Will the full space programming report, adjacency diagrams, or workload projection data be made available to the shortlisted firms prior to the interviews?

A preliminary program study was conducted by an outside firm, and the study is attached to this addendum. Design firms should anticipate confirming programmatic needs and applying their expertise to the project to determine operational adjacencies.

Question #5: --- The facility is designed to address a 30-year growth projection to the year 2060. Can the County provide current annual caseload data (autopsies, external examinations, and storage peaks) or the projected number of autopsy stations, standard storage spaces, and bariatric storage spaces intended for the final program?

Please see the study attached to this addendum.

Question #6: --- The concept site plan highlights a "mass casualty truck area." Beyond standard mobile refrigeration truck hookups, does the County anticipate this facility functioning as a regional Disaster Mortuary Operational Response Team (DMORT) hub, or is the surge capacity intended strictly for localized Wake County events?

The surge capacity is intended for localized Wake County events.

**** End of Addendum 1 ****

Attachments:

Attachment A: Form of Agreement

Attachment B: Attachment D to Agreement - Mediation

Attachment C: Morgue Operations Program Study

Attachment A
Form of Agreement

This Agreement for Design Professional Services (referred to herein as the “Agreement”) is entered into by and between:

The County of Wake (hereinafter, the "Owner") and

_____ (hereinafter, the "Architect").

The Owner And The Architect Are Sometimes Referred To In This Agreement Collectively As The “Parties”.

CONTENTS

1. EFFECTIVE DATE	2
2. PROJECT	2
3. PROJECT DELIVERY ASSUMPTIONS	3
4. PARTIES	3
5. ARCHITECT’S RESPONSIBLE PERSONNEL	4
6. OTHER PROJECT PARTICIPANTS	5
7. THIRD-PARTY LIABILITY	7
8. DEFINITIONS	7
9. QUALIFICATIONS	9
10. STANDARD OF CARE	10
11. DESCRIPTION OF SERVICES	11
12. BASIC SERVICES	12
13. ADDITIONAL SERVICES	27
14. DURATION OF SERVICES	28
15. AMENDMENTS TO AGREEMENT	30
16. COMPENSATION	30
17. PAYMENTS	33
18. RESPONSIBILITIES OF OWNER	34
19. LIABILITY FOR ERRORS, OMISSIONS AND COST OVERRUNS	36
20. ENVIRONMENTAL HAZARDS AND LIABILITY	37
21. INSURANCE	37
22. INDEMNITY	46
23. SUSPENSION AND TERMINATION	46
24. OWNERSHIP OF DOCUMENTS	48
25. CONFIDENTIALITY	49
26. WAIVER	51

27. ASSIGNMENT	52
28. GOVERNING LAW	52
29. DISPUTE RESOLUTION	52
30. SEVERABILITY	53
31. BINDING EFFECT	53
32. E-VERIFY	53
33. RELATIONSHIP OF PARTIES	53
34. NO WAIVER OF SOVEREIGN IMMUNITY	53
35. NON-APPROPRIATION	55
36. IRAN DIVESTMENT AND DIVESTMENT FROM COMPANIES BOYCOTTING ISRAEL	55
37. ANTI-DISCRIMINATION	55
38. LIST OF ATTACHMENTS	56
39. EXTENT OF AGREEMENT	56
40. AUTHORIZATION, EXECUTION, AND AUDIT	56

AGREEMENT

1. Effective Date

1.1. This Agreement shall be effective this ___th day of [Date], 202_.

2. Project

2.1. The Project is the Wake County [Project] located at _____ in [City], NC. The Project will include either an expansion and renovation of the existing facility or a complete facility replacement. Advanced planning efforts will look at these scenarios to guide subsequent phases of design. The project scope will vary depending on the direction taken, but will consist generally of site modification/development, selective demolition, new construction, and interior renovation.

2.2. The Project is defined in more detail in the Request for Qualifications for Architectural and Engineering Services for the _____, dated [Date], 202_ (referred to herein as the “RFQ”). The RFQ is incorporated into this Agreement for the sole purpose of identifying the Project, identifying the general program for the Project, and identifying the general scope of services required of the Architect as part of the Project. To the extent anything in the RFQ contradicts or conflicts with the provisions of this Agreement, the provisions of the Agreement will govern.

3. Project Delivery Assumptions

- 3.1. The design of the Project shall be subject to Article 1 of Chapter 133 of the North Carolina General Statutes, and this Agreement. The Architect shall be responsible for all of the services described in Section 12 of this Agreement, including without limitation the preparation of all Construction Documents and other documents and materials described and defined in Section 12, plus any additional services for which the Architect is engaged in accordance with Section 13 of this Agreement. The Owner's intent is to award contracts to construct the Project pursuant to the construction management at risk method as set forth in Article 8 of Chapter 143 of the North Carolina General Statutes.
- 3.2. The Owner reserves the right at any time to change the method by which contracts to construct the Project are awarded.

4. Parties

4.1. Owner:

The Owner of the Project is the County of Wake, a political subdivision of the State of North Carolina. The Owner is governed by the Board of Commissioners of Wake County, referred to in the Agreement as the "County Commissioners". The chief executive of the Owner is its County Manager, and for purposes of this Agreement "County Manager" shall mean the employee of Wake County bearing that title at any given time during the performance of this Agreement. The Owner's primary representative and point of contact during the Project shall be the Director, Facilities Design & Construction, referred to herein as the "Director". The Director is the employee of Wake County bearing that title at any given time during the performance of this Agreement.

4.2. Architect:

The Architect is _____, a professional corporation, organized and in good standing under the laws of the State of North Carolina. The chief executive of the Architect is _____, _____[Title]_____, and for purposes of this Agreement "Project Executive" shall mean the principal of the Architect bearing that title at any given time during the performance of this Agreement. The Architect's primary representatives during the Project shall be the person or persons designated as such in Attachment A, Responsible Personnel Organizational Chart, which is incorporated into this Agreement.

5. Architect's Responsible Personnel

5.1. Of Essence:

The services to be provided by the Architect under this Agreement shall be performed by the Architect's Responsible Personnel. The furnishing of services by such Responsible Personnel, and any individuals approved by the Owner to replace them, is of the essence to this Agreement.

5.2. Additions, Removals, Replacements:

From time to time, Responsible Personnel may be added as necessary and appropriate to the stage of planning, programming, designing, and constructing the Project. The Architect shall anticipate the need for such additional Responsible Personnel by submitting to the Owner, no later than seven (7) days prior to the need for the additional personnel, a proposed amendment to Attachment A setting forth the Architect's proposed additions, attaching the resumes of proposed additional staff, and stating the reasons for such additions. The Owner shall promptly review the proposed amendment and either approve or disapprove the additional Responsible Personnel in writing. The Architect shall not employ any individual to perform the functions of any Responsible Personnel without the advance approval of the Owner, which approval may be granted or withheld in its sole discretion. The Architect shall not, for so long as any Responsible Person is employed by the Architect, remove, substitute or reduce the time devoted to the Project by such person without the Owner's prior written approval, which may be granted or withheld in its sole discretion. If the Owner is for any reason dissatisfied with the services rendered by any Responsible Person, the Architect shall promptly remove such Responsible Person and recommend a replacement. If any Responsible Person ceases employment with the Architect, or if the Owner requests the removal of any Responsible Person, then the Architect shall promptly notify the Owner of a proposed substitute of at least equal qualifications to perform the same functions, and provide a resume for the substitute. Each substitute Responsible Person must be approved by the Owner prior to commencing performance of any services for the Project, which approval may be granted or withheld in the Owner's sole discretion. The Architect shall bear, at its own expense and without reimbursement by The Owner, all costs associated with replacing, for any reason, any Responsible Person. The Architect shall remain solely responsible to the Owner, notwithstanding the Owner's approval of any Responsible Person, for the quality and performance of all services provided by Responsible Personnel.

5.3. Architect's Project Representative:

The Architect shall designate a Project Representative, who may or may not be its full-time on-site Field Representative, who has the authority to act on behalf of the Architect in respect to all matters that are the subject of this Agreement, including, without limitation, the power and authority to enter into agreements or modifications that contractually bind

the Architect. The Project Representative shall be qualified and authorized to make interpretations of the Construction Documents and shall be available at all times during all phases of performance of services under this Agreement to consult with the Owner on matters pertinent to design and construction of the Project.

5.4. Architect's Employees:

None of the persons employed by the Architect and its Design Consultants shall be considered employees of the Owner. The Architect and its Design Consultants shall be solely responsible for any workers' compensation obligations, withholding taxes, unemployment insurance, compliance with immigration and licensing laws, and any other employer obligations with respect to all of their respective employees.

6. Other Project Participants

6.1. General:

The Owner acknowledges and agrees that the Architect will delegate to consultants and subcontractors responsibility for certain services required by this Agreement. The Architect acknowledges and agrees that the Owner will contract with a construction manager or other contractors to construct the Project. The Architect also acknowledges and agrees that the Owner will delegate to separate consultants and contractors some of the Owner's responsibilities under this Agreement. Each of the Parties agrees to work with all project participants in good faith and in a spirit of teamwork, putting the interests of the Project first. Each of the Parties agrees to identify all project participants to the other Party, and to notify the other Party of any changes in project participants during the course of the Project.

6.2. Design Consultants:

The Architect may delegate specific design responsibilities to consultants and subcontractors, referred to herein as "Design Consultants", provided prior written notice is first given to the Owner. The Architect shall not employ any Design Consultant without the advance approval of the Owner, which approval may be granted or withheld in its sole discretion. The anticipated Design Consultants for the Project, and their key project personnel, are listed in Attachment A to this Agreement. The Architect's notice that it is engaging or substituting a Design Consultant shall be submitted to the Owner in writing and shall describe the Design Consultant's scope of services, shall include the resumes of key staff (if requested) to be assigned to the Project, and shall summarize the total price and/or hourly rates for the Design Consultant's services. The Owner shall promptly either approve or disapprove each Design Consultant in writing. The Architect shall not remove, substitute or reduce the services of an approved Design Consultant without the Owner's prior written approval, which may be granted or withheld in its sole discretion. If the Owner is for any reason dissatisfied with the services rendered by any Design Consultant, the Architect shall promptly remove such Design Consultant and promptly recommend a

replacement of at least equal qualifications to perform the same functions. Each substitute Design Consultant must be approved by the Owner prior to commencing performance of any services for the Project. The Architect shall bear, at its own expense and without reimbursement by The Owner, all costs associated with replacing, for any reason, any Design Consultant. The Architect shall remain solely responsible to the Owner, notwithstanding the Owner's approval of any Design Consultant, for the quality and performance of all services provided by Design Consultants. Communications by and with the Architect's Design Consultants shall be through the Architect. All of the Architect's contracts with its Design Consultants shall be in writing and shall expressly provide that if this Agreement is terminated for any reason, the Owner may, at its sole option, take the assignment of the Design Consultants' contracts with the Architect, that such assignment shall automatically take place upon notification in writing by the Owner to the Design Consultants and that the Design Consultants shall continue to be bound by the contract after such assignment. Every subcontract or agreement of any kind entered into between the Architect and a Design Consultant (or between any Design Consultant and other independent contractor Design Consultants) shall contain appropriate language whereby the Design Consultant, without creating any contractual obligation on the part of the Owner to the Design Consultant or to anyone working under contract to the Design Consultant, accepts and agrees to be bound by all of the obligations of this Agreement, including, without limitation, those obligations pertaining to indemnification, insurance, accounting records, audit and ownership of documents. A copy of each contract between the Architect and a Design Consultant shall be furnished to the Owner within seven (7) days of its execution.

6.3. Owner's Construction Manager and Consultants

6.3.1. The Construction Manager for the Project (referred to herein as the "CM") shall be selected in accordance with Article 3D and Article 8 of Chapter 143 of the North Carolina General Statutes. The Architect will be provided with a copy of any and all requests for qualifications and requests for proposals published to solicit candidates to serve as CM. The Architect will also be provided with all responses to such requests for qualifications and requests for proposals, and be given an opportunity to comment on the candidates for CM. A copy of the contract between the Owner and the CM, and all addenda thereto, will also be provided to the Architect. It is the intent of the Owner to select a CM during the Schematic Design phase of the project.

6.3.2. In addition to the CM, the Owner reserves the right to contract with additional consultants and contractors to meet the Owner's obligations for the Project. Such other consultants and contractors may include, without limitation and subject to change, the following:

6.3.2.1. Programming Design Consultant

6.3.2.2. Surveyors

- 6.3.2.3. Geotechnical Engineers
- 6.3.2.4. Environmental Engineers or Geologists
- 6.3.2.5. Testing and Materials Inspectors
- 6.3.2.6. Special Inspections Inspectors
- 6.3.2.7. Commissioning Agents
- 6.3.2.8. Security Consultant
- 6.3.2.9. Project Management Consultant(s)

6.3.3. The Owner agrees to provide the Architect with copies of all contracts for such additional consultants and contractors and identify the responsible personnel for each such consultant and contractor if requested by the Architect. These additional consultants and contractors are referred to in this Agreement as the Owner's "separate consultants".

7. Third-Party Liability

7.1. Notwithstanding anything in Article 4 or any other provision of this Agreement, by entering into the Agreement the Owner assumes no obligation to pay fees for services rendered by any Design Consultant, and the Architect assumes no obligation to pay fees for services rendered by the CM or any other consultant or contractor engaged by the Owner.

8. Definitions

8.1. Construction Documents:

The term "Construction Documents" shall mean the drawings and specifications prepared by the Architect and issued for construction of the Project as more fully defined and described in Section 12 of the Agreement.

8.2. Day:

The term "day" shall be deemed to mean a calendar day, unless otherwise specifically indicated.

8.3. Fixed Limit of Project Cost:

At all times during the Project, the Owner shall approve an estimate of the total cost of the Project (the "Fixed Limit of Project Cost"), which shall include the Architect's fees, costs of demolition and site preparation, costs of the construction, costs of equipment, furnishings, furniture and signage, permit fees and appropriate contingencies.

8.4. Milestone Dates:

The term Milestone Dates and Milestone Listing shall mean the dates listed in Attachment B to the Agreement, as more fully defined and described in Article 14 of the Agreement.

8.5. Preliminary Schedule:

Preliminary Schedule shall refer to a critical path method schedule to be prepared by the Architect to facilitate and expedite the management of design and pre-construction services until the CM prepares the Project Schedule defined herein.

8.6. Project Schedule:

Project Schedule shall refer to the critical path method schedule to be prepared by the CM to facilitate and expedite the management and administration of the entire Project, including all design, construction, and inspection activities. Upon approval by the Owner of the Project Schedule, the Project Schedule shall be added to this Agreement by an Amendment signed by the Owner and the Architect and the Project Schedule so incorporated into this Agreement shall govern the schedule of activities of the Architect under this Agreement. No such Amendment shall be effective except upon such Amendment being signed by the Architect and the Owner.

8.7. Substantial Completion:

The date of substantial completion of the Work or designated portion thereof is the date when the Work or a designated portion thereof is sufficiently complete, in accordance with the Construction Documents, so the Owner can fully occupy and utilize the Work or designated portion thereof for the use for which it is intended, with all of the Project's parts and systems operable as required by the Contract Documents. Only incidental corrective Work and any final cleaning beyond that needed for the Owner's full use may remain for final completion.

8.8. Written Notice:

Any and all notices, instructions, requests, demands or other communications required or permitted to be given or made hereunder to the Architect shall be sufficiently given if in writing and sent by first class mail, postage prepaid, or by commercial courier, to the Architect at the place of business of the Architect set forth on the last page of this Agreement or to such other address as shall be designated in writing by the Architect by notice given to the Owner in accordance with this Paragraph. Any and all notices, instructions, requests, demands or other communications required or permitted to be given or made hereunder to the Owner shall be sufficiently given if in writing and sent by first class mail, postage prepaid, or by commercial courier, to the Owner at the place of business of the Owner set forth on the last page of this Agreement or to such other address as shall

be designated in writing by the Owner by notice given to the Architect in accordance with this Paragraph. Other forms of written and electronic communication, such as email, instant message, fax, meeting minutes, and logs are not inherently reliable, and notices, instructions, requests, demands or other communications given by such methods will not be considered sufficiently given unless the parties later agree by written modification to this Agreement that such forms of communication will be sufficient.

8.9. Work:

As used in the Agreement, the term “Work” refers to the construction provided by the CM and its trade contractors and by other separate construction contractors engaged by the Owner, including all labor, materials, supplies, equipment, building components, means and methods to fulfill their respective construction obligations.

9. Qualifications

9.1. General Capability:

By its execution of this Agreement, the Architect represents, warrants and agrees that it is qualified to and fully capable of performing and providing the professional architectural and engineering and other services required or necessary under this Agreement in a fully competent, fully professional and timely manner, and that its Design Consultants are also fully capable of and fully qualified to perform and provide the services that they will provide hereunder.

9.2. Licenses:

All services required of the Architect by this Agreement must be performed under the responsible charge of design professionals duly licensed and in good standing under the laws of the State of North Carolina. The Architect agrees at any time upon seven days notice to provide the Owner with proof of licensure and good standing of any individual whose seal appears on any document produced by the Architect or its Design Consultants for the Project.

9.3. Registration in North Carolina:

The Architect represents and warrants that it and all of its Design Consultants are properly registered and qualified to do business and practice their respective professions in North Carolina. Upon reasonable request by the Owner, the Architect will within seven days provide the Owner with proof that the Architect or any Design Consultant is properly registered and qualified to do business in North Carolina. The Architect agrees to keep its registration(s) current throughout the duration of the Project.

10. Standard of Care

- 10.1. The Architect and its Design Consultants shall exercise reasonable care and diligence in performing their services under this Agreement, including both design and administration services, in accordance with the professional skill and care and generally accepted standards of architectural and engineering practice in North Carolina and on similar projects throughout the United States and in accordance with federal, state and local laws and regulations applicable to the performance of these services. The Architect shall serve as a representative of the Owner in accordance with the terms and conditions of this Agreement to guard the Owner against defects and deficiencies in the Work.
- 10.2. The Architect shall be directly responsible for all errors or omissions in the drawings, specifications, and other documents prepared by the Architect or its Design Consultants. It shall be the responsibility of the Architect throughout the period of performance under this Agreement to use reasonable professional care and judgment to guard the Owner against defects and deficiencies in the Work.
- 10.3. The Architect acknowledges and agrees that the Owner does not undertake to approve or pass upon matters of design. The Architect acknowledges and agrees that the approval or acceptance of the plans and specifications by the Owner and the Owner's decision to proceed with construction work is limited to the function of determining whether there has been compliance with the Owner's program and instructions issued to the Architect regarding general layout of space. The Architect agrees that no approval of plans and specifications by any person, body or agency shall relieve it of the responsibility for the adequacy, fitness, suitability and correctness of architectural and engineering design and for designing the Project in accordance with sound and accepted engineering and architectural principles.
- 10.4. The Architect shall correct at no additional cost to the Owner any and all errors, omissions, discrepancies, ambiguities, mistakes or conflicts in the drawings, specifications and other documents prepared by the Architect or its Design Consultants.
- 10.5. The Architect shall use all reasonable efforts to assure that all drawings, specifications and other documents prepared by it and its Design Consultants hereunder are in accordance with applicable laws, statutes, building codes and regulations and that all necessary or appropriate applications for plan reviews, technical reviews or other approvals of any drawings, specifications or other materials prepared by the Architect are submitted to federal, state and local governments or agencies in a timely manner so as not to delay the design or construction activities of the Project.
- 10.6. The Architect shall use its skills and expertise to review the work product and information furnished to the Architect by other Project Participants, and to report to the Owner, with appropriate recommendations, any errors, conflicts or omissions that it discovers, or that the Architect should have discovered in the exercise of the standard of care required by this

Agreement, that may adversely affect the design or construction of the Project; provided, however, that failure by the Architect to give such notice shall not relieve the other Project Participants of their liability or responsibility.

- 10.7. The Architect and its Design Consultants shall perform all services in a timely manner in accordance with all schedules for the Project required under the Agreement and as provided in the General Conditions of the Owner's contracts with the CM for the Project.
- 10.8. Decisions: Interpretations and decisions of the Architect shall be consistent with the intent of and reasonably inferable from the Construction Documents and shall be in writing or in the form of drawings. When making such interpretations and initial decisions, the Architect shall endeavor to secure faithful performance by both the Owner and the CM and its contractors, shall not show partiality to either, and shall not be liable for results of interpretations or decisions so rendered in good faith. The Architect's decisions on matters relating to aesthetic effect shall be final if consistent with the intent expressed in the Construction Documents. The Architect shall render written decisions within a reasonable time on all claims, disputes or other matters in question between the Owner and the CM and its contractors relating to the execution or progress of the Project. The Architect's decisions on claims, disputes or other matters, including those in question between the Owner and the CM, except for those relating to aesthetic effect, shall be subject to dispute resolution as provided in this Agreement and the CM contract.
- 10.9. Conflicts of Interest and Non-Collusion: Except with the Owner's knowledge and consent, the Architect shall not engage in any activity, or accept any employment, interest or contribution that would reasonably appear to compromise the Architect's professional judgment with respect to this Project.

11. Description of Services

- 11.1. The Architect shall provide the Owner with all architectural and engineering services required to satisfactorily complete all phases of the Project within the time limitations set forth herein and in accordance with the standard of care described in Article 10 of this Agreement. All services of the Architect shall be provided in accordance with the terms and conditions of this Agreement.
- 11.2. The services to be performed under this Agreement consist of Basic Services, as described and designated in Section 12 of this Agreement, and such Additional Services as are designated in Section 13 of this Agreement, or as may from time-to-time be agreed upon by the Owner and Architect by Amendment or Addendum to this Agreement. Compensation to the Architect for Basic Services under this Agreement shall be as set forth herein, and compensation for Additional Services shall be as set forth herein or in any Amendment or Addendum providing for them.

12. Basic Services

12.1. General Scope:

All services performed by the Architect not identified as Additional Services in Section 13 of this Agreement or in a written Amendment or Addendum to the Agreement entered into by the Owner and the Architect and providing for additional compensation for such additional services relating to the Project shall be deemed to be Basic Services which are provided without additional compensation. It is understood that the Architect shall be required, without adjustment or addition to the compensation agreed to in this Agreement, to provide any services, whether or not listed in this Section 12, within the scope of its field of professional practice that (i) are reasonably inferable as being necessary to accomplish the Basic Services set forth in this Agreement, or (ii) that would be customarily furnished by other providers of professional services of the type and nature provided for in this Agreement. Without in any way limiting the general scope of Basic Services, the following is a description of specific Basic Services that the Architect is expected to provide under this Agreement:

12.2. Project Programming, Site Analysis and Pre-Design

As part of its Basic Services, the Architect shall develop a Project program and conceptual blocking diagrams as the design is further developed for the Project. The Architect also agrees to prepare reasonable mass models and artistic renderings for presentations to the County Commissioners, Public Boards, designated advisory committees and the public throughout the duration of the Project. In addition, the Architect agrees to provide the following specific pre-design and site development services:

- 12.2.1. Site Utilization Studies
- 12.2.2. Utility Studies
- 12.2.3. Demolition Engineering and Administration (as required)
- 12.2.4. Conceptual Design for Future Expansion
- 12.2.5. Reuse and Recycling of Existing Facilities (as required)
- 12.2.6. Wake County Energy Efficiency Guideline Compliance
- 12.2.7. Space Planning
- 12.2.8. Warehouse planning and design
- 12.2.9. Furniture, Fixtures and Equipment Selections
- 12.2.10. Security Systems (coordinate with Owner's security consultant)
- 12.2.11. Communications Systems

12.3. Preliminary Scheduling:

By the dates for completion of a Preliminary Schedule set forth in the Milestone Listing, and in any event by the completion of the Preliminary Architectural Design Phase, the Architect will prepare a critical path schedule showing programming activities, site analysis activities, pre-design activities and design activities in detail. The schedule shall be prepared using software and logic reasonably acceptable to the Owner, to a level of detail reasonably acceptable to the Owner. The Preliminary Schedule shall also include general construction activities in sufficient detail to show the relationship of design activities to the commencement and completion of construction.

12.4. Design:

The Architect shall provide the comprehensive design for the Project. The Project design may be developed in phases, including Schematic Design, Design Development, and Construction Documents. At the conclusion of the Schematic Design Phase, the Architect shall present the design to the County Commissioners and other Public Boards, using summaries, renderings and models. The Architect may also be asked to present the design to various committees and groups at the culmination of subsequent phases.

The Architect will be prepared to meet with the Owner at least weekly to discuss design status until the Construction Documents are complete and issued for construction. The Owner, in its sole discretion may vary the schedule for these status meetings or accept written reports in lieu of meetings.

12.4.1. Preliminary Architectural Design Services: Preliminary Architectural Design Services shall consist of Architectural space programming, [verifying existing conditions], and development of multiple improvement options including cost estimates. The improvement options shall explore renovating/expanding the existing facility, replacing the facility on the same site, and replacing the facility on a new undesignated site. Conceptual floor plans/blocking diagrams, site plans, and narratives for structural, plumbing, mechanical and electrical systems shall be submitted for each option in addition to a project budget.

12.4.2. Schematic Design: Schematic Design shall consist of drawings and other documents illustrating the scale and relationship of Project components. The Schematic Design Documents shall include a conceptual site plan and preliminary building plans, sections and elevations. At intervals appropriate to the progress of the Schematic Design Phase and mutually agreeable to the Owner, CM and Architect, the Architect shall provide schematic design studies for the Owner's review and the CM's information. The Schematic Design Documents will include study models, perspective sketches, electronic modeling or

combinations of these media. Preliminary selections and general layout of major building systems and identification of key construction materials shall be noted on the drawings or described in writing. Upon completion of the Schematic Design Phase, the Architect shall provide drawings, outline specifications and other documents for the Owner's approval and the CM's review.

- 12.4.3. Design Development: Based on the approved Schematic Design Documents and any adjustments authorized by the Owner, the Architect shall prepare Design Development Documents for the CM's review and the Owner's approval. The Design Development Documents shall illustrate and describe the refinement of the design of the Project, establishing the scope, relationships, forms, size and appearance of the Project. The Design Development Documents shall consist of plans, sections and elevations, typical construction details, equipment layouts and other documents that establish and describe the size and character of the Project as to architectural, structural, mechanical and electrical systems, materials and such other elements as may be appropriate. The Design Development Documents shall include specifications that identify major materials and systems and establish, in general, their quality levels. At intervals mutually agreeable to the Owner, CM and Architect, the Architect shall provide drawings and other documents which depict the current status of design development for review by the Owner and CM. Upon completion of the Design Development Phase, the Architect shall provide drawings, outline specifications and other documents for the Owner's approval and the CM's information.
- 12.4.4. Construction Documents: Based on the approved Design Development Documents and any further adjustments authorized by the Owner in the scope or quality of the Project or in the Fixed Limit of Project Cost, the Architect, utilizing data and estimates prepared by the CM, shall prepare, for approval by the Owner, Construction Documents consisting of drawings and specifications setting forth in detail the requirements for the construction of the Project. The Construction Documents shall establish in detail the quality levels of materials and systems required for the Project. At intervals mutually agreeable to the Owner, CM and Architect, the Architect shall provide Drawings and Specifications for review by the Owner and the CM. Upon completion of the Construction Documents Phase, the Architect shall provide Construction Documents for the Owner's approval and the CM's information. The Construction Documents shall be prepared utilizing AutoCAD software or comparable software acceptable to the Owner, and shall be of such quality and workmanship so that clear, legible and uniformly sized duplicate tracings or prints may be obtained. All lettering shall be a minimum of 1/8 inch high in order to be reproduced legibly when providing future record drawings. The specifications included with the final Construction Documents shall be printed with black ink on 8½ x 11 white paper stock suitable for producing clear copies on a reproduction machine, or such other process as may be approved by the Owner. The Architect shall provide to the Owner five

sets of prints and copies, and one set on disk in AutoCAD format (or comparable software acceptable to the Owner) of the 100% complete set of Construction Documents, including specifications. The Architect shall be responsible for the content of all Construction Documents. All final Construction Documents prepared or signed by the Architect or its Design Consultants and submitted to governmental authorities and code officials shall be complete, coordinated and contain directions as will (i) enable a competent contractor to carry them out; (ii) meet the requirements of governmental authorities and code officials; and (iii) be sufficiently complete and sufficiently free of conflicts so as to be capable of definitive pricing by contractors with a minimum of further clarifications or detailing by the Architect or its Design Consultants.

12.4.5. The scope of the design shall include at least the following:

12.4.5.1. Site, Civil and Landscaping

12.4.5.2. Architectural

12.4.5.3. Structural

12.4.5.4. Plumbing

12.4.5.5. Mechanical

12.4.5.6. Fire Sprinkler and Alarm Systems

12.4.5.7. Electrical

12.4.5.8. Specialties

12.4.5.8.1. Security Systems (coordinate with Owner's separate consultant)

12.4.5.8.2. Audio/Video Systems

12.4.5.8.3. Fixtures, Furniture and Equipment

12.4.5.8.4. Signage and Wayfinding

12.4.5.8.5. Elevators (if needed)

12.4.5.9. Life Cycle Cost Analysis

12.4.6. Design by CM and its Contractors: When the Construction Documents provide that a contractor, supplier, or an engineer retained by a contractor or supplier shall design building components or certify performance characteristics of materials, systems or equipment, the Architect shall provide specific and detailed performance and design criteria for the designer to follow and achieve. Notwithstanding the delegation of design responsibility to contractors and suppliers, the Architect shall be ultimately responsible for the conformity of the design of all materials, systems or equipment to the Construction Documents.

12.4.7. Independent Reviews: The Project is subject to independent design reviews conducted by the Owner or consultants retained by the Owner at the Owner's expense. The Architect shall cooperate with these design reviews. The Architect

shall, as part of Basic Services, prepare written responses to the written review comments and shall make changes to the design documents responsive only to those comments that the Architect reasonably deems to require such changes. If the Architect does not deem a comment to require a change, the Architect shall so state in the written response to the comment, providing reasons why no change should be implemented. Should the Owner decide to make changes to the design or the Project based on independent reviews of the design, such changes will be subject to the other relevant Sections of this Agreement.

12.5. Construction Permitting and Procurement:

- 12.5.1. Construction Manager Agreement: The Architect promptly shall review a copy of the CM contract when provided by the Owner to the Architect and shall become familiar with the respective services, authorities, obligations and responsibilities of the parties therein. The Architect agrees to coordinate, assist and develop a working relationship with the CM to effectuate the purposes of the Project.
- 12.5.2. Bid Package Preparation: The Architect agrees to cooperate with the CM and the Owner with respect to the timely division of the drawings and specifications into bid packages for the solicitation of construction contracts. In the event the construction Work for the Project is bid in phases, the Architect agrees to cooperate with the CM and the Owner to prepare bid packages as construction documents become available for release and within the time frames necessary to maintain the Project Schedule. The CM shall arrange for the reproduction of bidding documents for distribution to prospective bidders. The CM shall distribute the bidding documents to prospective bidders and request their return upon completion of the bidding process. The CM shall maintain a log of distribution and retrieval, and the amounts of deposits, if any, received from and returned to prospective bidders. The Architect shall be entitled to a copy of the bidding documents distribution log.
- 12.5.3. Pre-bid conferences: The Architect agrees to preside over and answer questions at pre-bid conferences for each bid package as it is released for bids. The Architect is expected to make a record of the attendees and proceedings at all pre-bid conferences and distribute the record promptly to the Owner, the CM and other appropriate parties.
- 12.5.4. Clarifications and Addenda: The Architect's Basic Services includes the preparation of addenda and the issuance of design clarifications to potential bidders prior to bid opening.
- 12.5.5. Bid Opening: It is expected that the bidding process will be the responsibility of the CM. Nevertheless, the Architect will cooperate with the CM in the bidding

process, and will be provided copies of all bid solicitations and bids. The Architect shall immediately report to the Owner any perceived bidding irregularities or concerns about the bidding process. The Architect shall be given an opportunity to review all bid tabulations, evaluate all bids, and question the selection of any contractor. If requested by the Owner, the Architect shall provide written recommendation to award or not award a contract to any particular bidder.

12.5.6. Re-bidding and Post-bid Negotiations: The Architect's obligation to assist with and cooperate in the bidding process will include re-bidding any bid packages as necessary to comply with the North Carolina competitive bidding laws, and shall extend to post-bid negotiations with bidders as allowed by law.

12.5.7. Approvals, Permits and Code Compliance: Although the responsibility to secure and pay for approvals and permits for the Project rests on the Owner, the Architect shall prepare all applications and supporting documents needed to obtain regulatory approval and construction permits from government agencies and building code enforcement officials with jurisdiction over the Project. The Architect will provide as part of Basic Services all prints, calculations, specifications and reports that are required by government agencies and code enforcement officials, utilizing information provided by the Owner in accordance with this Agreement, plus additional materials developed by the Architect as required. The Architect shall meet and confer with the North Carolina Department of Insurance, the North Carolina Department of Labor, the state fire marshal, local fire authorities, local building officials, local planning officials, city or state street and engineering departments, other pertinent governmental authorities and utility companies to determine their requirements, shall secure their preliminary approval, and shall notify the Owner and the CM of actions they must take in order to secure final approvals and agreements for the Project.

12.6. Budget and Cost Control:

12.6.1. Fixed Limit of Project Cost: This Project currently has a Fixed Limit of Project Cost of **\$13,240,000**, including a construction cost target of \$9,545,000, and other "soft costs" which customarily include professional services fees, and specialties as briefly described in Article 12.4.5. A formatted breakdown of these costs are included as Attachment E hereto. At the completion of Schematic Design, the Architect shall provide the Owner with detailed preliminary estimates of Project cost. These Project cost estimates shall be prepared by a qualified cost estimating consultant to the Architect who is acceptable to the Owner. The cost estimates shall include supporting documents listing quantities, unit price, labor rates, man-hour estimates, overhead and profit. The CM will also provide the Owner with detailed estimates of project costs at the completion

of Schematic Design. The Owner, Architect and CM will then compare and reconcile to the Project Budget.

SAMPLE

- 12.6.2. Coordination with CM: At the completion of Schematic Design and during Design Development, primary responsibility for estimating construction costs, implementing a system of cost control and providing budgetary input to the Architect and the Owner will shift to the CM. The Architect agrees to cooperate with the CM to update the Project budget. At the completion of Design Development, the Architect shall provide the Owner with another detailed estimate of Project cost, which the Architect, Owner and CM will then compare and reconcile to the Project budget. This Project cost estimate shall be prepared by a qualified cost estimating consultant to the Architect who is acceptable to the Owner, and who may be the same consultant who prepares the estimates of Project cost at the completion of Schematic Design.
- 12.6.3. Constructability Reviews and Value Engineering: The CM will be required to review the design for ease and efficiency of construction, and to suggest possible cost savings through product selection and through engineering and fabricating processes available to contractors and suppliers. The Architect agrees to give due consideration to all suggestions for cost savings from the CM. No change in the design to save Project costs will be incorporated into the design for the Project, however, except by documents issued and signed by the Architect and approved by the Owner. Changes in the design to save costs shall be made by the Architect without additional compensation.
- 12.6.4. Redesign or Revisions to Meet Fixed Limit of Project Cost: If upon receipt of bids to construct the Project it is apparent that the Project cannot be completed within the Fixed Limit of Project Cost, the Architect agrees, without additional compensation, in cooperation with the Owner and the CM, to redesign the Project as necessary, re-bid selected bid packages, or re-negotiate construction contracts to bring the Project within the Fixed Limit of Project Cost.

12.7. Construction Administration/Meetings:

The Architect agrees to provide the following Basic Services during the construction phases of the Project:

- 12.7.1. Preconstruction Meetings: The Architect will attend all preconstruction meetings. The CM will schedule and preside over preconstruction meetings and make a record of the attendees and proceedings at all such meetings.
- 12.7.2. Project Schedule Input: The CM shall be responsible for creating and maintaining a Project Schedule. The Architect's schedule for the performance of its activities and the activities of its Design Consultants during the Construction Phase shall be reduced to writing and submitted to the Owner for review and approval and to the CM for inclusion in the Project Schedule. This schedule shall include planned dates and durations for the receipt, review and return of

Submittals and product data from the contractors. The Architect shall prepare and submit to the Owner and the CM a list of events that will affect or determine the completion of individual construction activities, such as pre-installation meetings for key building systems, special and regular inspections, commissioning of building systems, and operation and maintenance training. The Architect shall also prepare and submit for inclusion in the Project Schedule all known approvals or decisions to be furnished or made by the Owner, including the dates by which the Owner shall have all information necessary from the Architect with respect to that approval or decision and the date by which the approval or decision should be communicated to the Architect. The Owner shall always have a reasonable time within which to provide such approval or decision and shall not have any responsibility for any delay occurring by reason of the Owner's being unable, through no fault of the Owner, to supply such item of information, approval or decision.

- 12.7.3. Substitutions and Variations: The Architect will respond to all requests from the Owner, the CM or any contractor to substitute or vary any material, component or other feature of the drawings and specifications.
- 12.7.4. Submittals and Product Data: The Architect shall review and approve or take other appropriate action on all fabrication drawings, erection drawings, details, product samples, product data and other submittals required of the trade contractors and suppliers (referred to generally in this Agreement as "Submittals"). The Architect shall review and return such Submittals in a timely fashion so as to cause no delay in the construction of the Project, while allowing sufficient time in the Architect's professional judgment to permit adequate review. The Architect shall determine whether Submittals conform to the design concept expressed in the Construction Documents. Review of such Submittals is not conducted for the purpose of substantiating instructions for installation, or for guaranteeing the quality or performance of equipment or systems designed and warranted by the contractors and suppliers, all of which remain the responsibility of the contractors and suppliers to the extent required by the Construction Documents. The Architect shall maintain detailed Submittal Logs showing when Submittals were received by the Architect and returned, and the action taken on each submittal. The Submittal Logs shall be provided to the Owner and the CM at all times during the Project upon request. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of construction means, methods, techniques, sequences or procedures.
- 12.7.5. Project Access: The Architect and its Design Consultants shall at all times have access to the Project site for purposes of carrying out their duties and services under this Agreement. The Architect and its Design Consultants shall adhere to all rules governing site access implemented by the CM with the Owner's

approval. The Architect and its Design Consultants shall adhere to all site safety and security rules implemented by the CM and the Owner.

- 12.7.6. General Correspondence: The Architect will be provided with all correspondence between the Owner and the CM that materially involve the design of the Project or the services being provided by the Architect. The Owner will be provided with a copy of all correspondence between the Architect and the CM or any of the contractors.
- 12.7.7. Quality Assurance: It shall be the responsibility of the Architect and its Design Consultants throughout the period of performance under this Agreement to use reasonable professional care and judgment to guard the Owner against defects and deficiencies in the Work. The Architect and Design Consultants as appropriate shall observe the Work at least weekly by the Designer responsible for the discipline of work under construction. The Architect will observe the Work of the contractors in progress, at least often enough to satisfy itself that the Work complies with the Project Construction Documents before the Work is covered up or obscured. All such observations shall be conducted deliberately and thoroughly for the purpose of (i) ascertaining in general that the character, scope, quality and detail of construction (including workmanship and materials) comply with the Construction Documents, the Owner's directives, approved Submittals, the Architect's clarifications, applicable laws and requirements of governmental authorities; (ii) evaluating the progress of the Work; (iii) evaluating the suitability of the Project, or any portion designated by the Owner, for use or occupancy; (iv) investigating and responding to design and constructability issues or questions of concern to the Architect or its Design Consultants, or as noted in any inspection or observation reports furnished to the Architect; (v) observing the overall quality of the contractors' performance; (vi) reviewing construction of crucial components of the Work; and (vii) observing the performance of specified or directed tests significant to the acceptability of components of the Work. Observations shall be separate from any inspections which may be provided by code or other government inspectors, or inspections by the Owner's separate consultants. Such inspections shall not relieve the Architect of its responsibilities under this Agreement. Any Design Consultant who has prepared designs or specifications shall be responsible to observe, in accordance with the provisions of this Agreement, those portions of the Work that it designed or specified. If the Architect believes that construction Work has been covered up or permanently obscured from view before the Architect could observe the Work, the Architect shall immediately notify the Owner that the Work was not observed, describing in detail the Work that was not observed and its location.
- 12.7.8. Site Observation Reports: At least weekly, the Architect shall submit to the Owner a written report detailing the observations of the Architect and its Design

Consultants at the site over the preceding week, detailing those matters with respect to which the Architect is required to conduct such observations as set forth in this Section.

- 12.7.9. Testing and Special Inspections: The Architect shall recommend, review and coordinate with all materials and construction testing and all special inspections in accordance with the provisions of the Construction Documents and applicable laws. The Architect agrees to enter into whatever agreements local code officials and governmental agencies require concerning notification and coordination of special inspections. The Architect shall review inspection reports, laboratory reports and test data to determine conformity of such data with the design requirements expressed in or implied by the Construction Documents and approved Submittals.
- 12.7.10. Rejection of Work: If the Architect or its Design Consultants observe Work in progress that does not conform to the Project design documents, the Architect shall have the right and the obligation to reject the Work by written notice as stated in Section 8.8 to the CM and the Owner. If the Owner thereafter decides to accept non-conforming Work, that decision will be noted in the as-built records of the Project.
- 12.7.11. Stop Work Orders: If the Architect or its Design Consultants observe Work or procedures at the Project site that pose an imminent threat of property damage or bodily injury to any person, the Architect shall immediately order the Work stopped and immediately thereafter notify the CM and the Owner of the stoppage and the nature of the imminent threat. Otherwise, only the Owner shall have the authority to stop the Work.
- 12.7.12. Meetings: The Architect's Field Representative shall attend all construction progress meetings scheduled by the CM. Other representatives of the Architect and the Design Consultants shall attend construction progress meetings at the reasonable request of the Owner. The CM shall preside over and make the minutes of attendance and proceedings at all construction progress meetings, and share copies of the minutes with the Architect and the Owner.
- 12.7.13. CM Payment Applications: The Architect shall review and certify all of the CM payment requisitions. The Architect's certification for payment shall constitute a representation to the Owner, based on the Architect's observations at the site that, in the Architect's professional opinion, the Work has progressed to the point indicated and the quality of the Work is in accordance with the Construction Documents, subject to specific qualifications expressed by the Architect. The issuance of a certificate for payment shall further constitute a representation that the CM and the contractors are entitled to payment in the amount certified. The issuance of a certificate for payment shall not be a representation that the

Architect has ascertained how or for what purpose the CM or any contractor has used money previously paid.

SAMPLE

- 12.7.14. Notices and Requests: The Architect will promptly review and respond to all notices and requests from the Owner or the CM, including without limitation notices relating to unforeseen conditions, requests for information or interpretations relating to design documents, requests for substitutions, and questions raised by government agencies or code compliance officials.
- 12.7.15. Document Interpretations: It shall be the Architect's duty to interpret the Construction Documents on a timely basis whenever a question is raised as to the intent of the documents. All interpretations by the Architect shall be communicated to the Owner, and the Owner will be given an opportunity to comment on the interpretations, before they are communicated to the CM, the contractors or any other third party.
- 12.7.16. Changes and Change Orders: The Architect may authorize minor changes in the Work not involving an adjustment in the Project Cost or an extension of the Project Schedule which are consistent with the intent of the Construction Documents. All changes to the Construction Documents must be made by the Architect, regardless of who requests the change or approves it. The Architect will review all proposals for changes to the Construction Documents and the design of the Project, and will review and make recommendations to the Owner regarding approval of all change orders. If the Architect determines that requested changes in the Work are not materially different from the requirements of the Construction Documents, the Architect may issue an order for a minor change in the Work or recommend to the Owner that the requested change be denied. The Architect shall prepare change orders and construction directives for the Owner's approval and execution. If necessary, the Architect shall prepare, reproduce and distribute drawings and specifications to describe Work to be added, deleted or modified.
- 12.7.17. Claim Evaluations and Recommendations: The Architect shall review all claims by the CM for changes in the Project guaranteed maximum price and all claims for adjustments to the Project Schedule, and will make timely recommendations to the Owner regarding acceptance or rejection of all such claims. A properly prepared claim must be accompanied by sufficient supporting data and information to permit the Architect to make a reasonable determination without extensive investigation or preparation of additional drawings or specifications, or the Architect may recommend that the claim be denied.
- 12.7.18. Site Safety and Security: The Architect shall be responsible for the safety and security of its own personnel and property and the personnel and property of the Design Consultants. The Architect and its Design Consultants shall exercise due care not to harm the personnel or property of others on or about the site of the Project. The Architect shall not, however, be responsible for the safety and security of the entire Project or all of the personnel and property on or about the

Project. The Architect shall have the right to bring safety and security concerns to the attention of the CM and the Owner, and shall have the right to stop the Work to avoid an imminent threat to the health and safety of persons on the Project.

- 12.7.19. Punchlists and Final Completion: Upon notice from the CM that the Project is substantially complete and ready for final inspections, the Architect and its Design Consultants as appropriate under the Architect's supervision shall observe the Project and prepare lists describing Work that is absent, incomplete or otherwise not in compliance with the Construction Documents. If required by the CM contract, the Architect shall determine independently whether the Project is substantially complete, and provide a certificate to the Owner and the CM that the Project is substantially complete. The Architect shall continue to observe the Project until satisfied that all identified non-conforming Work has been completed, corrected or accepted by the Owner as is. When the Architect believes that all identified non-conforming Work has been completed, corrected or accepted by the Owner as is and complies with the Construction Documents, the Architect shall provide its signed certificate that all inspections have been conducted with the degree of care and professional skill and judgment ordinarily exercised by architects and that in the Architect's professional opinion the CM and the contractors have fulfilled the obligations of the drawings, specifications and other Construction Documents.
- 12.7.20. Start-Up and Occupancy Assistance: The Architect shall provide assistance in the utilization of equipment or systems such as commissioning, testing, adjusting and balancing, training personnel for operation and maintenance, and consultation during operation.
- 12.7.21. Commissioning: The Architect shall cooperate with the Owner to develop and actively participate in a comprehensive commissioning plan for Project systems identified by the Owner with input from the Architect. Such systems may include, without limitation, curtain wall systems, HVAC and exhaust systems, temperature control systems, fire detection and alarm systems, emergency power and lighting system, fire suppression system, elevator and escalator systems, security systems, food service equipment and laundry equipment. The Architect shall develop a summary of understanding of the design intent for each of the relevant building systems and equipment. Each design intent summary shall establish critical performance criteria that indicate whether a system is properly functioning. The Architect shall develop a commissioning schedule listing anticipated commissioning activities such as system and equipment manual submittal and approval, equipment start-up, and system and equipment training, combining all such activities in a manner reflecting the inherent subsidiary relationships between activities. This schedule shall be used as a basis for approval of the commissioning portion of the CM's construction schedule. The

Architect will assist the Owner with the identification and selection of commissioning agents. The Architect shall consult with the Owner to clearly define all duties and activities required of the CM and the various contractors relating to commissioning, any necessary order in which these activities and duties must take place, and all critical performance criteria to be achieved. The Architect shall review and monitor all commissioning-related construction activities for timeliness, completeness and conformance with the criteria established by the commissioning plan.

12.7.22. Warranty Inspection: No later than thirty days prior to the expiration of one year from the date of substantial completion of the Project, the Architect shall conduct an inspection of the Project with the Owner to review the operations and performance of the facilities that comprise the Project and to make appropriate recommendations to the Owner. If required by the Owner, on behalf of the Owner the Architect shall notify the CM of any breach of warranty, express or implied by law, describe the breach of warranty, and request that the CM remedy the breach of warranty. The Architect shall assist the Owner to monitor the efforts of the CM to remedy the breach of warranty until the Architect is able to certify to the Owner that the breach of warranty has been remedied.

12.7.23. Construction: The Architect shall not have control over or be responsible for construction means and methods, which will be the responsibility of the CM and the contractors under the contracts for construction. The Architect shall not be liable for the failure of the CM or the contractors to carry out the Work in accordance with the Construction Documents. The Architect shall not be responsible for the performance by the CM of the services required by the CM agreement with the Owner.

12.8. Record Documents:

12.8.1. Permit Documents: The Architect shall compile a comprehensive file of all final regulatory approvals, inspections and certificates of occupancy, and deliver it to the Owner at completion of the Project.

12.8.2. As Built Records: The Architect shall prepare a set of reproducible record drawings showing changes in the Work made during construction of the Project. The record drawings shall be based on the Architect's observations and records kept during the Project. In addition, the Architect shall use marked-up prints, drawings and other data furnished by the CM and its contractors to prepare the record drawings. The Owner shall require the CM to maintain a set of record drawings during the course of the Project, and deliver those record drawings to the Architect at the conclusion of the Project. Unless the Owner later agrees to some other format, the record drawings provided by the Architect shall consist of an electronic file in AutoCAD or other approved compatible software, and one

full size set of reproducible three mil mylars, all fully and neatly coordinated and accurately annotated and cross-referenced to show all of the changes in the Work and to reference and reflect the marked-up drawings and records provided by the CM. The mylars shall be of such quality that clear and legible prints may be made without appreciable or objectionable loss of detail.

12.8.3. Operation and Maintenance Records: The Architect shall compile a catalogue of all operation and maintenance manuals and other product literature that, by the Construction Documents, the Owner is entitled to receive from the contractors, and deliver the catalogue to the CM and the Owner. The CM will be responsible for obtaining all such required manuals and literature and delivering them to the Architect in well organized, professionally prepared binders. The Architect will review the manuals and literature and, once they have all been duly received and reviewed, certify to the Owner that the set of all such manuals and literature is complete, and deliver it to the Owner.

12.8.4. Other Project Records: In addition to the foregoing records, upon reasonable request by the Owner sufficiently early in the Project for the Architect to provide the records, the Architect shall provide the following additional records at the end of the Project:

12.8.4.1. Submittals received during the Project.

12.8.4.2. Final finish and hardware schedules.

12.8.4.3. Attic stock and spare parts inventories.

12.8.4.4. Progress photos and photos of final elevations as specified by the Owner.

13. Additional Services

13.1. If the Architect is requested or required to perform any of the Additional Services described below in this Section, the Architect shall be entitled to additional compensation calculated as set forth in Section 16 of this Agreement. The Architect shall not perform Additional Services unless and until instructed by the Owner in writing to perform specific Additional Services. No payment for Additional Services will be made unless the Architect has notified the Owner in writing at least seven days in advance of performing the services that the Architect expects to be paid for the services as Additional Services and explaining with factual detail why it believes that the services to be provided are Additional Services. Compensation for Additional Services will only be paid for the services expressly described in this Section, upon receipt by the Owner of an invoice for such services in a form acceptable to the Owner, and subject to audit as set forth in this Agreement. If the Owner believes that the services the Architect is instructed to perform are not Additional Services, the Architect shall nonetheless perform the services with a full reservation of rights to seek compensation for the services in accordance with the dispute resolution procedures and compensation provisions in the Agreement. Additional Services include the following:

- 13.1.1. Making major revisions in drawings, specifications or other documents for reasons other than (i) maintaining the Fixed Limit of Project Cost, (ii) correcting errors, omissions, breaches or other failure to exercise due care by the Architect or its Design Consultants, or (iii) conforming the drawings, specifications or other documents to the written program, approvals or instructions previously given by the Owner.
- 13.1.2. Preparing to serve or serving as an expert witness (but not as a fact witness) for the Owner in connection with arbitration or legal proceedings unless the subject matter of the proceedings includes matters arising out of or related to the Architect's or Design Consultants' performance of services with respect to the Project; provided, however, that preparing to serve or serving as an expert witness for the Owner in proceedings to secure governmental approval(s) or clearance(s) for the Project shall not constitute an Additional Service.
- 13.1.3. Providing additional or extended services during the Construction Phase made necessary by (a) defective Work of the contractor(s); (b) prolongation of the time for construction by more than ninety (90) days beyond the date for final completion of the Project shown in the Milestone Listing, Attachment B referenced in Section 14 of this Agreement, provided the prolongation is not due to the fault or negligence of the Architect, its employees, consultants or agents; or (c) default under any construction contract due to delinquency or insolvency.
- 13.1.4. Providing consultation concerning replacement of Work damaged by fire or other casualty during construction, and furnishing services required in connection with the replacement of such Work.
- 13.1.5. If necessary, the Architect agrees to secure a qualified consultant to prepare a traffic study.
- 13.2. The Architect will provide an estimate of the anticipated compensation for the Additional Services sufficient to update the Project budgets and the Fixed Limit of Project Cost.

14. Duration of Services

14.1. Commencement of Services:

The commencement date for the Architect's Basic Services shall be the date of delivery to the Architect from the Owner of a fully executed original of this Agreement.

14.2. Time of the Essence:

Maintenance of all aspects of the Preliminary Schedule and the Project Schedule is extremely important to the success of the Project, and time is of the essence. Attached to this Agreement is Attachment B, which is a Milestone Listing which defines the sequence and timing of the design and construction activities as planned at the time of execution of this Agreement. The Milestone Listing is incorporated into this Agreement. The Architect and its Design Consultants shall schedule and perform their activities so as to meet the Milestone Dates and the Architect's Preliminary Schedule until such time as the CM's Project Schedule is completed and approved by the Owner. No deviation by the Architect or its Design Consultants from the Milestone Listing shall be allowed without prior written approval by the Owner.

14.3. Adherence to Project Schedules:

As set forth in Section 12 of this Agreement, the CM shall be responsible for creating and maintaining a Project Schedule. The Architect's schedule for the performance of its activities and the activities of its Design Consultants during the Construction Phase shall be reduced to writing and submitted to the Owner for review and approval and to the CM for inclusion in the Project Schedule. The Architect shall be given an opportunity to comment on the Project Schedule, and note objections to any durations or schedule logic included in the Project Schedule by the CM. Once the Owner approves the Project Schedule, it shall be binding on the Architect and the Owner. Should the Owner determine that the Architect has fallen behind schedule the Owner may require the Architect to expedite and accelerate its efforts, including providing additional manpower and/or overtime, as necessary, to perform its services in accordance with the Milestone Listing and the Project Schedule, at no additional cost to the Owner.

14.4. Changes in Duration:

If the Architect's work on the Project is or will be delayed for more than ninety (90) days beyond the final completion date in the Milestone Listing through no fault of the Architect, its employees and agents, or the Design Consultants, the Architect may request compensation for Additional Services in accordance with Section 13 of this Agreement. The Architect shall be excused from responsibility for unavoidable delays that are: (i) beyond the Architect's reasonable control or its responsibility under this Agreement (such as, but not limited to, failure by the Owner to provide timely information or approvals, or delays caused by the breach of this Agreement by the Owner), and (ii) not caused by the fault, negligence or violation of a provision of this Agreement by the Architect or its Design Consultants or defects or deficiencies in the design documents prepared by the Architect or its Design Consultants.

14.5. Outside Date for Cessation of Services:

Unless this Agreement is sooner terminated in accordance with Section 23, the Architect agrees to perform all of the services required hereunder, regardless of when the Project is finally complete, its only recourse for delay to be compensation for Additional Services in accordance with Section 13.

15. Amendments to Agreement

- 15.1. The Owner may, for any reason, without invalidating this Agreement, revise, amend or change the Architect's Basic Services or Additional Services under this Agreement by preparing a written Amendment to the Agreement. The Architect's compensation may then be equitably adjusted, provided that within ten (10) days of receipt of a proposed Amendment, the Architect submits to the Owner in writing a proposal for increases or decreases in the Architect's compensation with respect thereto.
- 15.2. If the Architect's proposal for changes in its compensation is agreed to by the Owner, the changes in compensation will be made part of the Amendment. If the Parties cannot agree on the changes to the Architect's compensation, the Architect will nevertheless proceed in accordance with the Amendment, and the Architect's compensation will be equitably adjusted at the end of the Project, utilizing the dispute resolution procedures in the Agreement if necessary. In the meantime, the Architect will be compensated using the rates and accounting records applicable to Additional Services under this Agreement.
- 15.3. The Architect shall proceed to perform the Services required by the Amendment only after receiving a fully executed Amendment from the Owner or a written notice from the Owner directing the Architect to proceed, whichever is earlier.

16. Compensation

16.1. Professional Services:

Compensation for professional services includes the following: 1) for Programming/Pre-Design Services, 2) Basic Services, 3) Specialty Services, and 4) Other Project Specific Services. Fees for these categories represent all compensation due the Architect from the Owner for all services under this Agreement except for Additional Services. This Basic Agreement includes compensation for Preliminary Architectural Design Services only, at the fee listed below. This phase of services shall consist of program confirmation, site analysis and existing facility evaluation of the Alcohol Treatment Center, as previously defined in Paragraph 12.4.1. Based on the results of these services, a final scope of work shall be defined for the project. Should the Owner wish to proceed at that time, Compensation will be stipulated at that time for Basic Services, Specialty Services and Other Specific Services.

SAMPLE

Compensation for the referenced four categories of services consists of the following:

16.1.1.	Programming/Pre-Design Phase. Lump sum fee of:	\$	TBD
16.1.2.	Basic Services. Lump sum fee:	\$	TBD.
16.1.3.	Specialty Services. Lump sum fee:	\$	TBD.
16.1.4.	Other Project Specific Services. Lump sum fee:	<u>\$</u>	<u>TBD.</u>
	TOTAL	\$	TBD

Refer to Attachment F – “Breakdown of Fees for Professional Services” for more detail.

16.1.5. In addition to the foregoing fees, the Architect shall be entitled to reimbursement for the following expenditures to the extent reasonable and actually incurred by the Architect, its employees, or its Design Consultants with respect to the Project, without any markup or premium by the Architect or the Design Consultants:

16.1.5.1. Actual expenditures for postage, reproductions, photography-

16.1.5.2. The actual cost of reproduction of plans and specifications excluding documents for exclusive use by the Architect.

16.1.5.3. The cost of travel outside of Wake County, except for travel between Wake County and the permanent office of the person claiming reimbursement.

16.2. Additional Services: With respect to Additional Services performed by the Architect in accordance with Section 13 or any Addendum or Amendment to this Agreement, the Architect shall be compensated in accordance with this Section of this Agreement, unless the Owner and the Architect otherwise agree in writing.

16.2.1. If requested by the Owner, the Architect’s estimate of the anticipated compensation for specific Additional Services will be converted to a lump sum fee or, alternatively, a cap on the Architect’s expenses for the Additional Services.

16.2.2. If the Owner and the Architect cannot agree on a lump sum fee or cap on expenses for Additional Services, the Owner may nonetheless direct the Architect to perform the Additional Services and compensate the Architect for the Additional Services as follows:

16.2.2.1. Personnel Expenses: For all personnel expenses, including direct personnel expenses such as salary and wages, payroll and unemployment taxes, insurance, and benefits, and including all indirect personnel expenses, such as general administrative and office overhead, the Architect shall be compensated at the hourly rates shown in Attachment C to this Agreement.

- 16.2.2.2. Reimbursable Expenses: In addition to the personnel expenses for Additional Services, the Architect shall be entitled to reimbursement for the expenditures described in paragraph 16.1.5 to the extent reasonable and actually incurred by the Architect, its employees, or its Design Consultants with respect to the Project.

16.3. Accounting:

Accounting records of the Architect's compensation for Reimbursable Expenses and for Additional Services pertaining to the Project shall be maintained by the Architect and its Design Consultants in accordance with generally accepted accounting practices and in sufficient detail to permit the Owner, its independent auditors, or a designee of any of them, to thoroughly evaluate and verify the nature, scope, value and charges for services performed under this Agreement. Such records shall be available for inspection and audit by the Owner or the Owner's representatives at mutually convenient times for a period of three (3) years after issuance of the Certificate of Final Completion for the Project.

16.4. Audit:

To the extent that an audit by the Owner, its independent auditors, or a designee of any of them, discloses excess charges inaccurately or improperly attributed to this Project by the Architect, the Architect agrees to remit the amount of the overpayment to the Owner within (5) five days after demand. If such audit discloses an overcharge of five percent (5%) or more of the total amount invoiced to the Owner for any year audited, the Architect shall pay the actual cost of such audit. If such audit is conducted by the Owner using in-house staff, then the Owner's actual cost of the audit shall be computed on the basis of two times the direct payroll of the audit staff completing the audit and audit report. The Architect shall include the provisions of this Section in all contracts it enters into with its Design Consultants.

17. Payments

17.1. Payment for Services Rendered:

Payment to the Architect for Services shall become due and payable monthly in proportion to satisfactory services performed and work accomplished. Payments will be made monthly by the Owner within 30 calendar days of receipt of an invoice which is in form and substance acceptable to the Owner. Each invoice shall contain a good-faith estimate by the Architect of the percent of each phase of Basic Services completed to date. In the case of Additional Services performed and compensated on a hourly (as opposed to a lump sum) basis, the Architect shall provide detailed time summaries that are broken down by timekeeper, task and time expended (block billings are not permitted). If requested, the Architect shall provide with each invoice copies of invoices, receipts and other documentation verifying the amounts of reimbursable expenses for which reimbursement

is sought. In the event the Owner finds any part or parts of all or any portion of an invoice presented by the Architect not to be acceptable, it shall identify to the Architect the part or parts which are not acceptable and shall pay the part or parts of the invoice which are acceptable, if any. No deductions shall be made from the Architect's fees for Basic Services except in accordance with this Agreement or to reimburse the Owner for costs or expenses incurred or anticipated to be incurred for which the Architect is liable.

17.2. Late Payments:

Payments to the Architect will not be deemed overdue until more than 60 days have elapsed since an invoice for payment in good order has been received by the Owner. Interest on late payments shall be simple interest and shall be limited to the Federal Reserve prime rate of interest published in the Wall Street Journal on the date on which payment is due.

18. Responsibilities of Owner

18.1. Representative:

The Owner's Director shall act in the Owner's behalf and as its representative with respect to the Project and shall have the authority to render decisions and approve changes in the scope of the Project within guidelines established by the County Manager and the County Commissioners and shall be available during working hours as often as may be reasonably required to render decisions and to furnish information.

18.2. Basic Programming:

The Owner shall meet with the Architect as necessary at mutually convenient times to describe the Owner's program to the Architect and to provide information necessary to enable the Architect to develop a detailed written analysis and complete needs summary of the Project.

18.3. Fixed Limit of Project Cost:

The Owner has provided the Architect with the initial Fixed Limit of Project Cost, and an explanation of the factors that were used to determine the Fixed Limit of Construction Cost. A copy of the initial Fixed Limit of Project Cost is included herein as Attachment E.

18.4. Project Schedule:

The Owner has provided the Architect with the Milestone Listing, included herein as Attachment B, and will be responsible for the development of a Project Schedule with the assistance of the CM.

18.5. Cooperation and Decisions:

The Owner shall examine documents submitted by the Architect and shall make reasonable efforts to render decisions pertaining thereto no later than the dates specified in the schedule for such decisions described in Section 14 of this Agreement.

18.6. Insurance and Accounting:

The Owner shall furnish all accounting and insurance counseling services as may be necessary at any time for the Project, including auditing services the Owner may require to verify the CM's applications for payment or to ascertain how or for what purposes the CM and its contractors have used the money paid by or on behalf of the Owner.

18.7. Permits and Approvals:

The Owner shall secure and pay for all necessary permits, licenses, approvals, easements, assessments and charges required for the construction, use or occupancy of permanent structures or for permanent changes in existing facilities. The Architect shall provide the Owner with a schedule of all required approvals and of the dates by which application for such approvals must be made in order to avoid any risk of delay to the Project, prepare necessary application forms, present documents requiring approval by the Owner and submit documents with the Owner's approval to the appropriate approval agency.

18.8. Surveys:

The Owner shall furnish the Architect with a certified land survey of the site, giving, as applicable, grades and lines of streets, alleys, pavements and adjoining property; rights-of-way, restrictions, easements, encroachments, zoning, deed restrictions, boundaries and contours of the site; locations, dimensions and complete data pertaining to existing buildings, other improvements and trees, and other pertinent information reasonably requested by the Architect including that concerning available service and utility lines, both public and private, above and below grade, including inverts.

18.9. Geotechnical:

The Owner shall provide the services of a geotechnical engineer or other consultant, when such services are reasonably deemed necessary by the Architect as shown on the Architect's schedule described in Section 14 of this Agreement, to provide reports, test borings, test pits, soil bearing values, percolation tests, soil, air and water pollution tests, ground corrosion and resistivity tests and other necessary operations for determining subsoil, air and water conditions, all together with reports and appropriate professional recommendations.

18.10. Construction and Materials Testing:

The Owner shall furnish services by qualified testing firms for structural, mechanical, chemical, and materials tests required by law or the Construction Documents. The Architect shall cooperate with the Owner to determine necessary or advisable testing services, and assist the Owner with the review of proposals for such services.

18.11. Special Inspections:

To the extent special inspections are required by law, by any building official with jurisdiction, or by the Construction Documents, the Owner will provide the services of a qualified special inspections firm (or firms) to conduct special inspections. The Architect shall cooperate with the Owner to determine necessary or advisable special inspections, and assist the Owner with the review of proposals for such services.

18.12. General:

All services, data, information, surveys and reports required of the Owner pursuant to this Section 18, shall be furnished at the Owner's expense and, absent any negligence or failure to follow professional standard of care on the part of Architect, the Architect shall be entitled to rely upon the accuracy and completeness of such services, data, information, surveys and reports.

19. Liability for Errors, Omissions and Cost Overruns

19.1. Independent Contractor:

The Architect is and shall at all times remain as to the Owner a wholly independent contractor. Neither the Owner nor any of its agents shall have control over the conduct of the Architect or any of the Architect's officers, agents or employees, except as herein set forth.

19.2. Professional Liability:

The Architect shall reimburse the Owner for costs, damages and expenses, including attorney's fees, incurred by the Owner when such costs, damages and expenses are the result of errors, omission or delay of the Architect or its Design Consultants in the performance of their professional services.

19.3. General Liability:

The Architect shall reimburse the Owner for any costs, damages and expenses, including attorney's fees, incurred by the Owner when such costs, damages and expenses are the result of any failure of the Architect or its Design Consultants to exercise due care to avoid causing harm or injury as required by law.

19.4. Liability for Design Consultants:

The Architect shall be liable to the Owner for the errors, omissions, breaches or other failure to exercise the recognized standard of care by the Design Consultants, notwithstanding their status as independent contractors or independent professionals.

19.5. Limitations on Liability:

To the extent that the damage, expense or cost to the Owner for errors, omissions or delays by the Architect is less than one-half of one percent (0.5%) of the Fixed Limit of Project Cost, the Architect shall not be liable to the Owner for such damages, expenses or costs. If the aggregate damage, expense or cost to the Owner for such errors, omissions or delays of the Architect amounts to more than one-half of one percent (0.5%) of the Fixed Limit of Project Cost, the Architect shall reimburse the Owner for all such damages, expenses or costs in excess of said one-half of one percent (0.5%).

20. Environmental Hazards and Liability

20.1. Unless otherwise provided in this Agreement, the Architect and Design Consultants shall have no responsibility for the discovery, presence, handling, removal or disposal of or exposure of persons to hazardous materials in any form at the Project site, including but not limited to asbestos, asbestos products, polychlorinated biphenyl (PCB) or other toxic substances.

21. Insurance

21.1. Owner's Insurance Option:

At any time during the performance of this Agreement, the Owner may, at its sole option, provide for itself, for the Architect and for its Design Consultants any or all of the insurance coverage required under this Article. If the Owner elects to provide such coverage, it shall notify the Architect in writing and provide to the Architect such certificate or certificates of coverage as may be applicable. If the Owner elects to provide such coverage, it shall be entitled to pro rata reduction in the fees for Basic Services equal to the cost of providing such coverage to the Architect and its Design Consultants.

21.2. Owner Provided Insurance:

- 21.2.1. The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.
- 21.2.2. Unless otherwise provided, the Owner shall purchase and maintain, or cause the CM or the contractors to purchase and maintain, until Project completion, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the entire Project construction cost on a replacement cost basis without optional deductibles. Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements and shall cover reasonable compensation for the Architect's services and expenses required as a result of such insured loss. The Owner and the Architect waive all rights against each other and their respective Design Consultants, contractors and the CM for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Paragraph or other property insurance applicable to the Work. The Owner and the Architect, as appropriate, shall require of the CM, the Design Consultants, separate contractors, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated in this Paragraph. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged. If during the Project the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of this paragraph for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

21.3. Architect Provided Insurance:

- 21.3.1. General: The Architect shall, without limiting its obligations or liabilities, procure and maintain such insurance as is required by law and as is required by this Agreement to protect the Architect and the Owner from claims for damages for bodily injury, including death, and from claims for property damage which may arise from the Architect's or its Design Consultants' or employees' operations under this Agreement. Such insurance shall be of the kinds and have limits of liability and coverages not less than the minimum limits hereinafter specified or required by law, whichever is greater. The Owner makes no representation as to the adequacy or sufficiency of such coverages. The following requirements shall in no way be construed to limit or eliminate the liability of the Architect that arises from performance of services under the Agreement. The Architect is strictly responsible for any losses, claims and costs of any kind which exceed the Architect's limits of liability, or which may be outside the coverage scope of the policies.
- 21.3.2. Insurers and Proof of Insurance: The insurance specified shall be provided by an insurer approved by the Owner, authorized to do such business in the State of North Carolina, and on terms approved by the Owner. Insurance companies utilized shall have a minimum rating of A+, as evaluated by the most current A.M. Best Rating Guide. If the insurer has a Best Rating less than A+, the Architect must receive specific written approval from the Owner prior to proceeding. Before providing services under the Agreement, the Architect shall furnish to the Owner a certificate or certificates of insurance in a form satisfactory to the Owner. Upon request of the Owner, the Architect shall provide the Owner with certified copies of the insurance policies required by this Section, including without limitation declaration pages, conditions, exclusions and endorsements and confirmation that each policy premium has been paid for the required term of this Agreement. Certificates shall be signed by a person authorized by that insurer to bind coverage on its behalf. All insurance policies shall provide, as evidenced by Certificates of Insurance, that the insurance shall not expire and shall not be canceled, reduced, materially restricted, or changed in any way without at least 30 days prior written notice to the Owner. With regard to expiration, cancellation, reduction, restriction or any other change, certificates shall state: "Should any of the following described policies be canceled before expiration date or be due to expire within 30 days, the insurer shall mail 30 days prior written notice to named certificate holder". In the event of any such cancellation, non-renewal, reduction, restriction or change in any insurance, the Architect is obligated to replace such insurance within 7 days without a gap in coverage and file accordingly such notice with the Owner, and other interested parties. Failing immediate receipt of evidence of such replacement of insurance, the Owner reserves the right to procure such insurance as the Owner considers desirable and the Architect shall pay the premium in respect thereof. It is

expressly provided, however, that any action or inaction on the part of the Owner in this respect shall in no way change or reduce the Architect's responsibilities and liabilities under this Agreement. Self-funded, policy fronting or other non-risk transfer insurance mechanisms are not acceptable without prior written approval of the Owner. Full disclosure of such a program must be made prior to commencing mobilization to the site. Failure to make a full disclosure constitutes a material breach of the Agreement, justifying termination of the Agreement for default.

- 21.3.3. Owner Coverage: The Architect shall name the Owner as additional insured under all its insurance contracts (except workers' compensation and professional liability) with respect to and including without limitation liability arising out of activities performed by or on behalf of the Architect, and automobiles owned, hired, leased or borrowed by the Architect. The coverage shall contain no special limitations on the scope of protection afforded to the Additional Insured.
- 21.3.4. Order of Coverage: For any claims related to this Project, the Architect's insurance shall be primary and noncontributory as respects the Owner. Any insurance or self-insurance maintained by the Owner shall be excess and noncontributory of the Architect's insurance.
- 21.3.5. Subrogation: All policies of insurance shall contain a clause waiving rights of subrogation against the Owner, unless the Owner approves otherwise in writing.
- 21.3.6. Deductibles: Limits of coverage are not to be amended by deductible clauses of any nature without the express written consent of the Owner. The Architect shall be solely responsible for any deductible assumptions that exist in any insurance policies required under this Agreement. In addition, the Architect shall be responsible and shall not be reimbursed for any losses arising from any risk or exposure not insured as required herein, or not covered as a result of a policy exclusion.
- 21.3.7. Separate Insureds: The Architect's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.
- 21.3.8. Duty to Defend: Any phrase in any policy of insurance covering the Architect stating the intent that "the company has no duty to defend or indemnify against any claim or suit expressly excluded from coverage" must be deleted or shall be construed to be interpreted consistent with the requirements of G.S. 22B-1. . The claim provisions must specifically state the insurance company has both the right and the duty to adjust a claim and provide defense.

- 21.3.9. Third Party Claims: The policies shall not contain any provision or definition which would serve to exclude or eliminate from coverage third party claims, including exclusions of claims for bodily or other injury to shareholders, partners, officers, directors or employees of the insured, the premises owner, real estate manager, the general contractor to which the insured is subcontracted, or the insured's subcontractor or any family relative of such persons.
- 21.3.10. Government Regulations: If the policies contain any warranty stating that coverage is null and void (or words to that effect) if the Architect does not comply with the most stringent regulations governing the Services, it shall be modified so that coverage shall be afforded in all cases except for the Architect's willful or intentional noncompliance with applicable government regulations.
- 21.3.11. Insolvency: The insolvency or bankruptcy of the insured or of the insured's estate shall not relieve the insurance companies of their obligations under these policies. Any clauses to the contrary are unacceptable and must be stricken.
- 21.3.12. Breach of Insurance Obligation: Failure to comply with these requirements shall be a material breach of this Agreement justifying termination of the Agreement for default.
- 21.3.13. Professional Liability Insurance: Upon execution of the Agreement and during the entire period of the Architect's responsibility under the Agreement, the Architect shall maintain professional liability insurance with limits of \$2,000,000 per claim and \$2,000,000 in the aggregate. The Architect shall file with the Owner a certificate of insurance from an insurance company licensed to do business in the State of North Carolina showing evidence of professional liability insurance (errors and omissions insurance). If demanded in writing by the insurer, the deductible limit may be increased to not in excess of the limit established for the Architect under the usual deductible guidelines of the insurer. This certificate shall bear an endorsement in words exactly as follows: "The insurance company certifies that the insurance covered by this certificate has been endorsed as follows: This insurance company agrees that the coverage shall not be canceled, allowed to lapse, or allowed to expire until (30) thirty days after notice to Owner.
- 21.3.14. Worker's Compensation and Employers' Liability Insurance: The Architect and its Design Consultants shall procure and maintain workers' Compensation Insurance in the amount and type required by the State of North Carolina and federal law for all employees employed under the Agreement who may come within the protection of workers' Compensation Laws and covering all operations under the Agreement whether performed by the Architect or by its Design Consultants. In jurisdictions not providing complete workers' Compensation protection, the Architect and its Design Consultants shall maintain employers'

liability insurance in an amount, form, company and agency satisfactory to the State and the Owner for the benefit of all employees not protected by workers' Compensation Laws and covering all operations under the Agreement whether performed by the Architect or by its Design Consultants.

21.3.14.1. The Architect shall pay such assessments as will protect the Architect and the Owner from claims under the workers' Compensation Laws, workers' or workmen's compensation disability benefits and other similar employee benefit acts.

21.3.14.2. Coverage under this Section shall be as required by federal and state workers' Compensation and Occupational Disease Statutes and shall have minimum limits as follows:

Employers' Liability: Each Accident	\$1,000,000
Disease - Policy Limit	\$1,000,000
Disease - Each Employee	\$1,000,000

21.3.14.3. Any and all Occupational Disease Exclusions must be deleted. Such insurance shall include Voluntary Compensation coverage, a Waiver of Subrogation in favor of the Owner as well as other endorsements that may be required by applicable jurisdictions.

21.3.15. General Liability (GL) Policy: The Architect and the Design Consultants shall maintain General Liability Insurance, written on an occurrence basis, with at least the following limits of liability:

Each Occurrence (Loss)	\$1,000,000
General Aggregate	\$2,000,000
Completed Operations Aggregate	\$2,000,000
Personal and Advertising Injury.....	\$1,000,000
Fire Damage - Any One Fire.....	50,000
Medical Expense - Any One Person	5,000

Coverage shall remain continuously in effect for at least 6 years from the date of Substantial Completion. The Architect shall furnish the Owner evidence satisfactory to the Owner of continuation of such insurance annually on the anniversary of the effective date of this Agreement. The insurance shall contain or be endorsed to include the following:

21.3.15.1. Project specific limits, dedicated to services performed under this Agreement only.

- 21.3.15.2. Blanket Contractual Liability covering indemnification obligations under this Agreement, in accordance with ISO policy form CG 00 01. Modifications to the standard provision will not be acceptable if they serve to reduce coverage.
- 21.3.15.3. Premises/Operations Liability.
- 21.3.15.4. Independent Contractor and Independent Subcontractor coverage.
- 21.3.15.5. Broad Form Property Damage.
- 21.3.15.6. Personal Injury.
- 21.3.15.7. Cross Liability/Severability of Interest clause.
- 21.3.15.8. Employer's Stop-Gap Liability endorsement, if applicable.
- 21.3.16. Automobile Liability Insurance: The Architect shall procure and maintain insurance against liability for bodily injury and property damage as described below, that may arise with respect to the Services being performed under the Agreement, and as will provide protection from claims which may arise out of or result from the Architect's performance of the Services and the Architect's other obligations under the Agreement, whether such performance of the Services is by the Architect, by any Design Consultant, by anyone, both officially and personally, directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.
 - 21.3.16.1. This policy of insurance shall carry a combined Single Limit of Liability of \$1,000,000.
 - 21.3.16.2. The policy of insurance shall contain or be endorsed to include Owned, Hired, and Non-Owned Automobile Liability.
- 21.3.17. Property Insurance: The Architect is responsible for all physical damage to owned or rented machinery, tools, equipment and other items owned, rented or used by the Architect and/or the Design Consultants in the performance of the Services provided under this Agreement. The insurance coverage evidencing such shall include a waiver of subrogation in favor of the Owner.
- 21.3.18. Valuable Papers and Records: The Architect shall provide valuable papers and records insurance with coverage in the amount of \$250,000.00 per occurrence.
- 21.3.19. Claims: The Architect shall notify the Owner within 24 hours of any claims or alleged claims related to work performed hereunder received by the Architect.

The Architect shall provide a written copy of the claim or alleged claim to the Owner within 3 days of the Architect's receipt of the claim or alleged claim. If a claim is settled to the satisfaction of the claimant, the Architect shall submit a copy of the claimant's release to the Owner. If a claim or alleged claim is rejected by the Architect and/or its insurance company, the Architect shall immediately report this fact to the Owner. Should 30 days elapse after the claim or alleged claim has been received by the Architect, and the Architect is not able to report a settlement or rejection of the claim, its shall report to the Owner the steps being taken with respect to the claim.

- 21.3.20. Deductibles and Self-insured Retentions: Any deductibles or self-insured retentions must be declared to and approved by the Owner. At the option of the Owner, either: (i) the insurer shall reduce to a maximum of \$250,000 or eliminate such deductibles or self-insured retentions as respects the Owner, or (ii) the Architect shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses within the deductible or self-insured retention amount. Any self-insured retention or deductible amount on the policy shall not reduce the amount of collectible limits or liability.
- 21.3.21. Consultants and Subcontractors: The Architect shall include all Design Consultants as insureds under its policies, or shall furnish separate certificates, policies and endorsements for each Design Consultant the Architect intends to use. Except as otherwise approved by the Owner in writing, limits of liability and coverage scope must be at a minimum as stringent as required of the Architect by the Agreement.
- 21.3.22. Architect as Joint Venture: If the Architect is completing this Project on a joint venture basis, each participant in the joint venture retains all liabilities assumed by this Agreement, individually and collectively. This may include, but is not limited to, all premiums due, deductibles/self-insured retentions, coinsurance provisions, claim provisions, insurance policy conditions and indemnification provisions under the Agreement. Evidence of a Blanket Joint Venture Endorsement must be obtained from the general liability and professional liability carriers of each joint venture participant for a period of 7 years after completion of the Project, substantially as follows:

"With respect to "your work", and the "products-completed operations hazard", you are an insured for your liability arising out of the conduct of any partnership or joint venture of which you were a partner or member, even though this partnership or joint venture is not shown as a Named Insured in the Declarations. This coverage is excess over any available liability insurance purchased specifically to insure the partnership or joint venture. This coverage will not inure to the benefit of any other party except you."

21.3.23 Excess/Umbrella Liability shall be maintained with following minimum limits:

21.3.23.1 \$5 Million per Occurrence

21.3.23.2 \$5 Million Aggregate

SAMPLE

22. Indemnity

- 22.1. To the fullest extent permitted by North Carolina law, including but not limited to G.S. 22B-1, the Architect agrees to indemnify, and hold harmless the Owner and its officers, agents, employees, representatives, volunteers and insurers, utilizing legal counsel reasonably acceptable to the Owner, from all loss, liability, expense, including, without limitation all fees and expenses of engineers, architects, attorneys, and experts and all court, arbitration or other dispute resolution costs incurred to defend against third party claims alleged in any court, tribunal, or alternative dispute resolution (ADR) procedure, including attorneys' fees, litigation or arbitration expenses, or court costs, to the extent caused by the negligence or misconduct of the Architect, which arise out of or result from any of the following:
- 22.1.1. Any alleged or actual act or omission of Architect or its Design Consultants or any person or entity to whom any of them may be liable;
 - 22.1.2. The material inaccuracy of any representation by Architect given in accordance with or contained in this Agreement;
 - 22.1.3. Any claim arising from bodily injury, including death, personal injury, or property damage or other loss, by any third person or entity, arising out of an act or omission of Architect, its Design Consultants or any person or entity to whom any of them may be liable; or
 - 22.1.4. Infringement upon any United States or common law patent, trademark or copyright arising out of the actual or alleged acts or omissions of Architect or its Design Consultants, in connection with performance of this Agreement;
- 22.2. Provided, however, that nothing herein shall be interpreted as obligating Architect to indemnify any indemnitee against the indemnitee's whole or partial active negligence or willful misconduct.

23. Suspension and Termination

23.1. Suspension:

The Owner may by written order direct the Architect to suspend, delay or interrupt all or any part of its Services on the Project for the convenience of the Owner. A suspension, delay or interruption of the Project shall not terminate this Agreement; provided, however, that if such suspension, delay or interruption causes a suspension of the Architect's Services for a period exceeding ninety (90) consecutive days, the Architect's compensation for Basic Services may be equitably adjusted. In the event the Architect believes that any suspension, delay or interruption of any or all of the Work on the Project might require an extension of the duration of Basic Services or an increase in the level of staffing by the Architect, it shall

so notify the Owner and propose an amendment to the Agreement for consideration by the Owner in accordance with Section 15 of the Agreement.

23.2. Termination for Convenience:

This Agreement may be terminated without cause by the Owner and for its convenience upon seven (7) days written notice to the Architect. In the event of termination for the convenience of the Owner, the Architect shall be paid that portion of its fees and expenses that it has earned to the date of termination, plus five percent (5%) of its compensation for Basic Services earned to date or five percent (5%) of its unearned compensation for Basic Services, whichever is less, less any costs or expenses incurred or anticipated to be unearned by the Owner due to errors or omissions of the Architect.

23.3. Termination for Default:

After seven (7) days written notice to the other Party of its material breach of the Agreement, this Agreement may be terminated by the noticing Party, provided that the other Party has not taken all reasonable actions to remedy the breach.

23.4. Compensation After Termination for Default:

If a Party to this Agreement justifiably terminates the Agreement due to a default by the other Party, the final compensation owed to the Architect shall be as follows:

23.4.1. In the event of termination by reason of a material breach of the Agreement by the Owner, the Architect shall be entitled to the same compensation it would have received had the Owner terminated the Agreement for convenience, and the Architect expressly agrees that said compensation is fair and appropriate as liquidated damages for any and all costs and damages it might incur as a result of such termination.

23.4.2. In the event of termination by reason of a material breach of the Agreement by the Architect, the Architect shall be paid that portion of its fees and expenses that it has earned to the date of termination, less any damages, costs or expenses incurred or anticipated to be incurred by the Owner due to errors or omissions of the Architect or by reason of the Architect's breach of this Agreement.

23.5. Disposition of Documents:

Should this Agreement be terminated for any reason prior to completion of the Project, the Owner shall be granted, at no additional cost, ownership and use of all documents, including drawings, specifications, electronic data bases and other materials, relating to the Project, prepared by or in the possession of the Architect. The Architect shall turn over to the Owner within seven (7) days and in good unaltered condition reproducible sets of all such documents.

In the event of such termination, and should the Owner use such documents for completion of the Project, the Owner agrees to release the Architect from any responsibility should the portions of the Project completed after the date of termination fail to conform to such documents, and agrees, if and to the extent allowed by State law, to indemnify and hold the Architect harmless from any and all liability, costs and expenses (including reasonable legal fees and disbursements) for loss of life, personal injury or damage to tangible property which occur subsequent to the termination of this Agreement and which result from causes other than failure by the Architect or its Design Consultants to exercise due care in the preparation of the documents. The Architect specifically agrees to incorporate the provisions of this paragraph in all contracts for the services of Design Consultants. The Owner agrees that the Architect may retain one set of drawings for its records.

23.6. Completion of Documents:

Should this Agreement be terminated, the Owner shall, nevertheless, have the right to require the Architect and/or its Design Consultants to complete such services as may be necessary to providing professionally certified and sealed drawings and to deliver to the Owner such certified and sealed drawings with respect to any phase or item of the Project, for which effort the Architect shall be compensated in accordance with the compensation provisions of this Section of the Agreement.

24. Ownership of Documents

24.1. Ownership and Use by Owner:

All documents, including designs, drawings, specifications, design calculations, notes, electronic data bases and other works developed in the performance of this Agreement, including as-built and other record documents, shall become the property of the Owner whether the Project is constructed or not, and may be used on this Project or any other project for any purpose including, without limitation, future additions, alterations, connections, repairs, information, reference, use or occupancy of the Project, all without additional compensation to the Architect. The Architect shall have no lien or custodial rights in such documents developed in the performance of this Agreement, and the Architect agrees to provide all such documents to the Owner upon request notwithstanding any dispute or disagreement over payment or performance under this Agreement. The use of the documents by the Owner for any purpose other than the Project as set forth in this Agreement shall be at the sole risk of the Owner, and the Architect shall have no liability to the Owner for the use of the documents for any such other purpose. The Owner also agrees, if and to the extent allowed by State law, to indemnify and hold the Architect harmless from any and all liability, costs and expenses (including reasonable legal fees and disbursements) for loss of life, personal injury or damage to tangible property which arise out of the use of the documents by the Owner for any purpose other than the Project as set forth in this

Agreement and which are not caused by a failure by the Architect or its Design Consultants to exercise due care in the preparation of the documents.

24.2. Copyrights:

The Architect shall be deemed to have assigned in perpetuity, with no reserved or retained rights to Architect or to any other persons or entities, all common law, statutory and other reserved rights to use of the designs, drawings, specifications, design calculations, notes and other works developed in the performance of this Agreement to the Owner, including the copyright. The Architect shall insure that a similar assignment of rights is given to the Owner by the Design Consultants. The Architect and its Design Consultants shall be permitted to retain copies, including reproducible copies, of their drawings, specifications and other documents for record information and reference.

24.3. Use by Architect:

The Owner hereby grants to the Architect and its Design Consultants a license, revocable at the will of the Owner, to use and copy the designs, drawings, specifications, design calculations, notes and other works developed in the performance of this Agreement and the designs depicted in them, during the term of this Agreement for the sole purpose of performing the services required under this Agreement. With the exception of (i) standard and generic details in the design documents, and (ii) other designs or details that do not involve a replication of the overall building design or aesthetic appearance, the design documents shall not be used or replicated as a whole, or in substantial part, by the Architect on other projects.

24.4. Advertising and Promotional Materials:

The Architect and its Design Consultants shall have the right to include representations of the design of the Project, including photographs of the exterior and interior, among their promotional and professional materials. Such promotional materials shall not include the Owner's confidential information. The Owner shall provide professional credit for the Architect and its Design Consultants on the construction sign and in the promotional materials for the Project as deemed appropriate by the Owner.

25. Confidentiality

- 25.1. The Architect and its Design Consultants shall use their best efforts not to disclose or permit the disclosure of any confidential information, designated "confidential" by Owner in writing, relating to the Project, except to its agents, employees and other consultants who need such confidential information in order to properly perform their duties relative to this Agreement. This provision shall not prohibit disclosure when required by law, court order or subpoena from a court or government entity. In such situation the Designer shall give the Owner seven (7) days' notice before the disclosure.

SAMPLE

- 25.2. Public Records: Notwithstanding the foregoing paragraph, and consistent with the RFP, the Architect acknowledges that its designs, drawings, specifications, design calculations, notes and other works developed in the performance of this Agreement will become public records, and will be subject to public disclosure. North Carolina General Statutes Section 132-1.2 and 66-152 provide a method for protecting some documents from public disclosure. If the Architect follows the procedures prescribed by those statutes and designates a document “confidential” or “trade secret”, the Owner will withhold the document from public disclosure to the extent that it is entitled or required to do so by applicable law. If the Owner determines that a document that the Architect has designated “confidential” or “trade secret” is not entitled to protection from public disclosure, the Owner will notify the Architect of that determination at least five business days prior to its public disclosure of the document. If the Architect does not initiate judicial proceedings to protect the confidentiality of the document, the Owner will not have any obligation to withhold the document from public disclosure. By submitting to the Owner a document that the Architect designates as “confidential” or “trade secret”, the Architect agrees that in the event a third party brings any action against the Owner or any of its officials or employees to obtain disclosure of the document, the Architect will indemnify and hold harmless the Owner and its affected officials and employees from all costs, including attorney’s fees, incurred by or assessed against them defending against such action. The Architect also agrees that at the Owner’s request the Architect will intervene in any such action and assume all responsibility for defending against it, and that the Architect’s failure to do so will relieve the Owner of all further obligations to protect the confidentiality of the document.

26. Waiver

- 26.1. The payment of any sums by the Owner under this Agreement or the failure of the Owner to require compliance by the Architect with any provisions of this Agreement or the waiver by the Owner of any breach of this Agreement shall not constitute a waiver of any claim for damages by the Owner for any breach of this Agreement or a waiver of any other required compliance with this Agreement by the Architect.
- 26.2. Occupancy by the Owner of the Project when complete shall not constitute acceptance of Work not complying with requirements of the Construction Documents, whether such non-compliance is known or unknown. The Owner's inspection and any notice of objection are made solely for the purpose of determining whether the Owner will occupy the Project. No occupancy of the Project shall relieve the Architect of its contractual or professional obligations to the Owner or in any way preclude the Owner from asserting any claims or demanding redress of any non-compliance of the Work with the Construction Documents, whether known or unknown. No objection or specification of the basis for the objection shall relieve the Architect of its contractual or professional obligations to the Owner or in any way preclude the Owner from asserting any claim or demanding redress of any non-compliance of the Work with the Construction Documents, whether known or unknown,

and whether or not such claim or non-compliance is specified as a basis for the Owner's objection.

- 26.3. Except as expressly stated in Section 19, nothing set forth in any provision of this Agreement shall be interpreted as a limitation upon any of the Owner's rights or remedies that may exist under law or in equity.

27. Assignment

- 27.1. The Owner and the Architect each bind themselves, their successors, assigns and legal representatives to the terms of this Agreement.
- 27.2. The Architect shall not assign or transfer its right to payment or other commercial interest in this Agreement without the written consent of the Owner.
- 27.3. The Architect shall not delegate any of its duties under this Agreement except strictly in accordance with its terms.
- 27.4. Change in Ownership: The Architect shall notify the Owner within seven (7) days of any change in the ownership of the Architect.

28. Governing Law

- 28.1. This Agreement and the duties, responsibilities, obligations and rights of respective parties hereunder shall be governed by the laws of the State of North Carolina.
- 28.2. Jurisdiction and Venue: Any and all suits or actions to enforce, interpret or seek damages with respect to any provision of, or the performance or non-performance of, this Agreement shall be brought in the General Court of Justice of North Carolina sitting in Wake County, North Carolina, and it is agreed by the parties that no other court shall have jurisdiction or venue with respect to such suits or actions.

29. Dispute Resolution

- 29.1. Mediation: Attachment D, Mediation, shall be a part of this Agreement. Prior to initiating any civil action to enforce, interpret or seek damages with respect to any provision of, or the performance or non-performance of, this Agreement, any Party to this Agreement shall initiate the mediation process as provided in Attachment D. The Design Consultants shall be Parties for purposes of this Section and Attachment D. The Architect, by means of its contracts with its Design Consultants, shall specifically require its Design Consultants to be bound by this Section and Attachment D.

- 29.2. Continuing Obligation to Perform: The Architect shall, notwithstanding the existence of a dispute between the Owner and the Architect, maintain the continuous and uninterrupted performance of its obligations under this Agreement.

30. Severability

- 30.1. If any provision of this Agreement is held as a matter of law to be unenforceable, the remainder of this Agreement shall be enforceable without such provision.

31. Binding Effect

- 31.1. The Architect binds itself and its partners, shareholders, members, affiliates, successors, assigns and legal representatives to this Agreement.

32. E-Verify

- 32.1. To ensure compliance with the E-Verify requirements of the General Statutes of North Carolina, all contractors, including any subcontractors employed by the contractor(s), by submitting a bid, proposal or any other response, or by providing any material, equipment, supplies, services, etc, attest and affirm that they are aware and in full compliance with N.C.G.S. Chapter 64, Article 2 (N.C.G.S. 64-26(a)) relating to the E-Verify requirements.

33. Relationship of Parties

- 33.1. Architect is an independent contractor of the County. Consultant represents that it has or will secure, at its own expense, all personnel required in performing the services under this Agreement. Such personnel shall not be employees of or have any contractual relationship with the County. All personnel engaged in work under this Agreement shall be fully qualified and shall be authorized or permitted under state and local law to perform such services. It is further agreed that the Consultant will obey all State and Federal statutes, rules and regulations that are applicable to provisions of the services called herein. Neither Consultant nor any employee of the Consultant shall be deemed an officer, employee or agent of the County.

34. No Waiver of Sovereign Immunity

- 34.1. Wake County and the Consultant agree that nothing in this Agreement shall be construed to mandate purchase of insurance by Wake County pursuant to N.C.G.S. 153A-435; or to be inconsistent with Wake County's "Resolution Regarding Limited Waiver of Sovereign Immunity" enacted October 6, 2003; or to in any other way waive Wake County's defense

of sovereign or governmental immunity from any cause of action alleged or brought against Wake County for any reason if otherwise available as a matter of law.

SAMPLE

35. Non-Appropriation

- 35.1. Consultant recognized that Wake County is a governmental entity, and the contract validity is based upon the availability of public funding under the authority of its statutory mandate. In the event that public funds are not available and not appropriated to purchase the services specified in this Agreement, then this Agreement shall automatically expire without penalty to Wake County and without the thirty (7) day notice requirement set forth in Article 11.
- 35.2. In the event of a legal change in Wake County's statutory authority, mandate, and mandated functions which adversely affects Wake County's authority to continue its obligations under this Agreement, then this Agreement shall automatically expire without penalty to Wake County and without the thirty (7) day notice requirement set forth in Article 11.

36. Iran Divestment and Divestment from Companies Boycotting Israel

- 36.1. By signing this agreement; accepting this contract/purchase order; or submitting any bid, proposal, etc., vendors and contractors certify that as of the date of execution, receipt, or submission they are not listed on the Final Divestment List created by the NC Office of State Treasurer pursuant to NCGS 147 Article 6E, Iran Divestment Act, Iran Divestment Act Certification. Vendors and contractors shall not utilize any subcontractor that is identified on the Final Divestment List.
- 36.2. Any organization defined under NCGS 147-86.80(2), Divestment from Companies Boycotting Israel, shall not engage in business totaling more than \$1,000 with any company/business, etc. that boycotts Israel. A list of companies that boycott Israel is maintained by the NC Office of State Treasurer, pursuant to NCGS 147-86.81(a)(1). Any company listed as boycotting Israel is not eligible to do business with any State agency or political subdivision of the State.

37. Anti-Discrimination

In consideration of signing this Agreement, the Parties hereby agree not to discriminate in any manner on the basis of race, natural hair or hairstyles, ethnicity, creed, color, sex, pregnancy, marital or familial status, sexual orientation, gender identity or expression, national origin or ancestry, marital or familial status, pregnancy, National Guard or veteran status, religious belief or non-belief, age, or disability with reference to the subject matter of this Contract. The Parties agree to comply with the provisions and intent of Wake County Ordinance SL 2017-4. This anti-discrimination provision shall be binding on the successors and assigns of the Parties with reference to the subject matter of this Contract.

38. List of Attachments

38.1. The following Attachments are incorporated herein and made a part of this Agreement by reference:

- 38.1.1. Attachment A - Consultant's Key Personnel
- 38.1.2. Attachment B – Project Milestone Dates
- 38.1.3. Attachment C - Consultant's Hourly Rates
- 38.1.4. Attachment D – Mediation
- 38.1.5. Attachment E – Fixed Limit of Project Cost
- 38.1.6. Attachment F – Breakdown of Fees for Professional Services

39. Extent of Agreement

39.1. This Agreement represents the entire and integrated agreement between the Owner and the Architect and supersedes all prior negotiations, representations or agreements, either written or oral. This Agreement may be amended only by written instrument signed by both the Owner and the Architect.

40. Authorization, Execution, and Audit

By signing this agreement; accepting this contract/purchase order; or submitting any bid, proposal, etc.,

IN WITNESS WHEREOF, the parties, by and through their authorized agents, have hereunder set their hands and seal, all as of the day and year first above written.

DESIGNER

ATTEST:

By: _____

By: _____

Title: _____

Title: _____

SEAL

COUNTY OF WAKE

By: _____

Name: _____
Wake County Manager or Designee

Date: _____

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

Wake County Finance Officer

This instrument has been reviewed by Wake County Facilities, Design & Construction.

Mark Forestieri
Director, Facilities Design & Construction

The person responsible for monitoring the contract performance requirements is
_____.

_____ Department Head Initials

**ATTACHMENT D
TO
AGREEMENT FOR DESIGN PROFESSIONAL SERVICES
WAKE COUNTY MEDICAL EXAMINERS DECEDENT STORAGE**

**MEDIATION
DISPUTE RESOLUTION PROCEEDURES FOR WAKE COUNTY BUILDING
CONSTRUCTION RENOVATION AND REPAIR PROJECTS**

Table of Rules

Rule

Initiating Mediated Settlement Conferences

- A. Purpose of Mandatory Settlement Conferences
- B. Initiating the Dispute Resolution Process

2. Selection of Mediator

- A. Mediator Listing
- B. Selection of Mediator
- C. Disqualification of Mediator

3. The Mediated Settlement Conference

- A. Where Conference is to be Held
- B. When Conference is to be Held
- C. Request to Modify Deadline for Completion
- D. Recesses
- E. Project Delay

4. Duties of Parties and Other Participants in Formal Dispute Resolution Process

- A. Attendance
- B. Finalizing Agreement
- C. Payment of Mediation Fee
- D. Failure to Compensate Mediator

5. Authority and Duties of Mediators

- A. Authority of Mediator
- B. Duties of Mediator

6 Compensation of the Mediator

7. Rule Making

8. Definitions

9. Time Limits

RULE 1. INITIATING MEDIATED SETTLEMENT CONFERENCES

A. Purpose of Mandatory Settlement Conferences. Pursuant to G.S. §143-128(f1) and 143-135.26(11), these Rules are promulgated to implement a mediated settlement program designed to focus the parties' attention on settlement rather than on claim preparation and to provide an opportunity for orderly settlement negotiations to take place. Nothing herein is intended to limit or prevent the parties from engaging in settlement procedures voluntarily at any time prior to or during commencement of the dispute resolution process.

B. Initiating the Dispute Resolution Process

1) Any party to a County public construction contract (referred to herein generally as the "Contract") governed by Article 8. Ch. 143 of the General Statutes and identified in G.S. § 143-128(f1) and who is a party to a dispute arising out of the Contract and the construction process in which the amount in controversy is at least \$15,000 may submit a written request to the County for mediation of the dispute.

2) Prior to submission of a written request for mediation to the County, the parties should give notice of any and all claims in accordance with their respective contracts, obtain decisions on the claims as required or allowed by their respective contracts, and attempt to resolve the dispute according to the terms and conditions in their respective contracts. The Mediator may adjourn any mediated settlement conference if the Mediator believes, in his or her sole discretion, that the parties have not satisfied all of the terms and conditions of their respective contracts and that doing so will enhance the prospects for a negotiated settlement.

C. Condition Precedent to Litigation. Before any party to a Contract may commence a civil action against the County seeking remedies for breach or non-performance of the Contract by the County, said party must first initiate the dispute resolution process under these rules and attend the mediated settlement conference.

RULE 2. SELECTION OF MEDIATOR

A. Mediator Listing. A list of Mediators acceptable to the County is attached to and incorporated by reference into these Rules. The party requesting mediation shall select a Mediator from the designated list. If the County fails to provide a list of acceptable mediators, the list of Mediators shall be deemed to be the list of mediators certified by the North Carolina Dispute Resolution Commission to conduct mediated settlement conferences in the North Carolina Superior Courts.

B. Selection of a Mediator. The party requesting mediation shall select a Mediator from the County's list of Mediators and shall file, with the County, a Notice of Selection of Mediator within 21 days of the request for mediation. Such notice shall

state the name, address, and phone number of the Mediator selected. If the Mediator selected is not available or declines to participate for any reason, the requesting party shall select another person from the County's list of Mediators. If the party requesting mediation does not select and designate a mediator within 21 days of the request for mediation, the County shall have the right in its absolute discretion to appoint a mediator from its list of Mediators.

- C. Disqualification of Mediator.** Any party may request replacement of the Mediator for good cause. Nothing in this provision shall preclude Mediators from disqualifying themselves.

RULE 3. THE MEDIATED SETTLEMENT CONFERENCE

- A. Where Conference is to be Held.** Unless all parties and the Mediator otherwise agree, the mediated settlement conference shall be held in Wake County. The Mediator shall be responsible for reserving a place, making arrangements for the conference, and giving timely notice of the time and location of the conference to all attorneys, unrepresented parties and other persons or entities required to attend.
- B. When Conference is to be Held.** The mediation shall be completed within 90 days after selection of the Mediator.
- C. Request to Accelerate or Extend Deadline for Completion.** Any party or the Mediator may request the County to accelerate or extend the deadline for completion of the conference. Such request shall state the reasons the extension is sought and shall be served by the moving party upon the other parties and the Mediator. Objections to the request must be promptly communicated to the County and to the Mediator.

The County, with the concurrence of the designated Mediator, may grant the request by adjusting the time for completion of the conference.

- D. Recesses.** The Mediator may recess the mediation conference at any time and may set times for reconvening. If the Mediator determines the time and place where the conference is to reconvene before the conference is recessed, no further notice is required to persons present at the conference.
- E. Project Delay.** The mediated settlement conference that results from a construction contract dispute shall not be cause for the delay of the construction project.

RULE 4. DUTIES OF PARTIES AND OTHER PARTICIPANTS IN FORMAL DISPUTE RESOLUTION PROCESS

A. Attendance.

1. All parties to the dispute must designate an official representative to attend the mediation.
2. "Attendance" means physical attendance, not by telephone or other electronic means. Any attendee representing a party must have authority from that party to bind it to any agreement reached as a result of the mediation.
3. Attorneys representing parties may attend the mediation, but are not required to do so.
4. Sureties and insurance company representatives are required to physically attend the mediation unless the Mediator and all of the other parties to the mediation excuse their attendance or consent to their attendance by telephone or other electronic means.
5. The parties who attend a duly scheduled mediation conference shall have the right to recover their share of the Mediator's compensation from any party or parties who fail to attend the conference without good cause.

B. Finalizing Agreement. If an agreement is reached in the conference, the terms of the agreement shall be confirmed in writing and signed by all parties.

C. Mediation Fees charged by the Mediator shall be paid in accordance with G.S. § 143-128(f1).

D. Failure to compensate Mediator. Any party's failure to compensate the Mediators in accordance with G.S. § 143-128(f1) shall subject that party to a withholding of said amount of money from the party's monthly payment by the County.

Should the County fail to compensate the Mediator, it shall hereby be subject to a civil cause of action from the Mediator for the 1/3 portion of the Mediator's total fee as required by G.S. § 143-128(f1).

RULE 5. AUTHORITY AND DUTIES OF MEDIATORS

A. Authority of Mediator.

1. Control of Conference. The Mediator shall at all times be in control of the conference and the procedures to be followed.
2. Private Consultation. The Mediator may communicate privately with any

participant or counsel prior to and during the conference. The fact that private communications have occurred with a participant shall be disclosed to all other participants at the beginning of the conference.

3. Scheduling the Conference. The Mediator shall make a good faith effort to schedule the conference at a time that is convenient with the participants, attorneys and Mediator. In the absence of agreement, the Mediator shall select the date for the conference.
4. Determining good cause for a party's failure to appear at a scheduled mediation conference.

B. Duties of Mediator.

1. The Mediator shall define and describe the following at the beginning of the conference:
 - a. The process of mediation.
 - b. The difference between mediation and other forms of conflict resolution.
 - c. The costs of the mediated settlement conference.
 - d. That the mediated settlement conference is not a trial, the Mediator is not a judge, and the parties retain their legal rights if they do not reach settlement; however, the Mediator will advise all parties that failure to appear at mediation without good cause may result in imposition of sanctions and may be asserted as a bar to lawsuits by claimants who have failed to exhaust this administrative remedy.
 - e. The circumstances under which the Mediator may meet and communicate privately with any of the parties or with any other person.
 - f. Whether and under what conditions communications with the Mediator will be held in confidence during the conference.
 - g. The inadmissibility of conduct and statements as provided by G.S. §7A-38.1(1).
 - h. The duties and responsibilities of the Mediator and the participants.
 - i. That any agreement reached will be reached by mutual consent.
2. Disclosure: The Mediator has a duty to be impartial and to advise all participants of any possible bias, prejudice or partiality.
3. Declaring Impasse: The Mediator may determine at any time during the mediation conference that an impasse exists and that the conference should end.
4. Reporting Results of Conference. The Mediator shall submit a written report to the County and the other parties within 10 days of the conference stating whether or not the parties reached an agreement. The Mediator's report shall indicate the absence of any party from the mediated settlement conference without permission or good cause.

5. Scheduling and Holding the Conference. It is the duty of the Mediator to schedule the conference and conduct it prior to the deadline of completion set by the rules. The Mediator shall strictly observe deadlines for completion of the conference unless said time limit is changed by agreement of the parties.

RULE 6. COMPENSATION OF THE MEDIATOR

- A. The parties shall compensate the Mediator for mediation services at the rate proposed by the Mediator and agreed to by the parties at the time the Mediator is selected. .

RULE 7. RULE MAKING

- A. These Rules may be amended by the County at any time. Amendments will not affect mediations where claims and/or requests for mediation have been filed at the time the amendment takes effect

RULE 8. DEFINITIONS

- A. “County” shall mean the County of Wake, North Carolina
- B. “Project Designer” is that person or firm stipulated as project designer in the Contract Documents for the project.
- C. “Claim” is a demand or assertion by a party seeking adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The term “Claim” also includes other disputes and matters in question between the parties to a Contract involved in the County’s building construction renovation and repair projects arising out of or relating to the Contract or the construction process. Claims must be initiated by a written notice. The responsibility to substantiate Claims shall rest with the party making the Claim.
- D. “Good Cause” generally includes any circumstance beyond the control of a party, which prevents that party from meeting obligations. When good cause is asserted as an excuse for a party’s failure to appear at a mediation conference or to otherwise comply with the requirements of these Rules, the Mediator, in his or her sole discretion, will determine whether good cause exists to excuse the party’s failure to appear or otherwise comply with these rules.

RULE 9. TIME LIMITS

- A.** Any time limit provided for by these Rules may be waived or extended at the sole discretion of the County, if no Mediator has been selected, and at the discretion of the County with concurrence of the Mediator if a Mediator has been selected.

MORGUE OPERATIONS PROGRAM STUDY

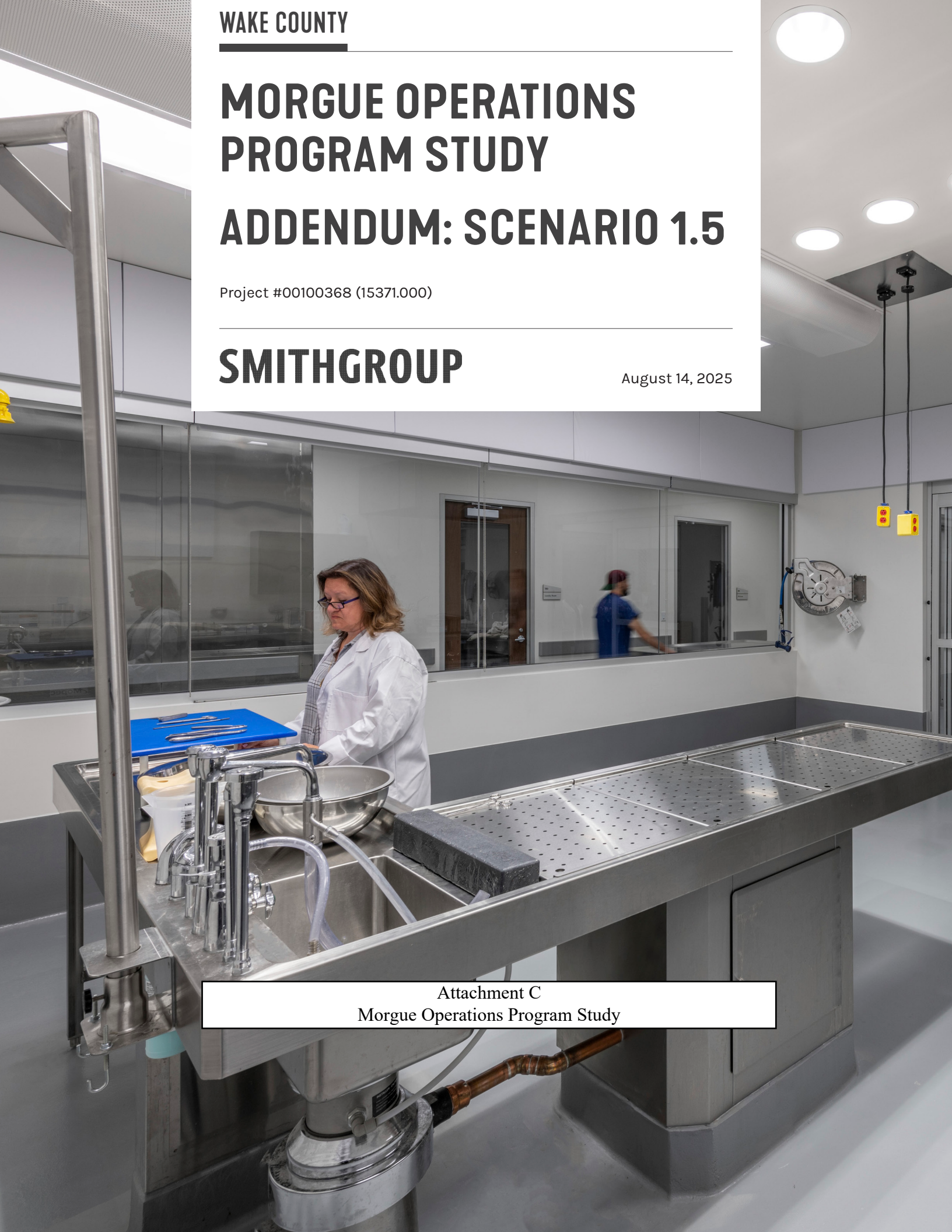
ADDENDUM: SCENARIO 1.5

Project #00100368 (15371.000)

SMITHGROUP

August 14, 2025

Attachment C
Morgue Operations Program Study





ADA COUNTY CORONER FACILITY - STAFF ENTRY

TABLE OF CONTENTS

INTRODUCTION	
EXECUTIVE SUMMARY	04
SECTION 01	
ANALYSIS	06
SECTION 02	
OPERATIONAL CRITERIA AND STAFFING	14
SECTION 03	
BUILDING PROGRAM & DESIGN CONSIDERATIONS	18
SECTION 04	
PROJECT SCHEDULE	22
SECTION 05	
PROJECT COSTS	26

EXECUTIVE SUMMARY

In November of 2024, SmithGroup assisted Wake County in the development of a Morgue Operations Program Study that evaluated three different scenarios for construction of a facility that would accommodate the storage and examination of decedents. After that report was reviewed by county leadership, it was determined that a modification to the operational goals for the facility was needed. This report details a facility that will support external examinations of decedents or complete autopsies conducted by forensic pathologists employed outside of Wake County. This document is an update to the earlier Morgue Operations Program Study and has been adjusted to meet the operational goals.

Wake County, North Carolina, is one of the fastest-growing counties in the United States. Located in the heart of the Research Triangle, it includes the state capital, Raleigh, and several other vibrant municipalities. The County has seen consistent population growth. Key reasons for that population growth include:

- Economic Opportunities:** The establishment of Research Triangle Park (RTP) in neighboring Durham County in 1959 has been a significant catalyst for growth. RTP is one of the largest research parks in the world, attracting numerous tech companies, research institutions, and high-paying jobs¹.
- Quality of Life:** Wake County offers a high quality of life with excellent schools, low cost of living, healthcare facilities, and recreational opportunities. The area is known for its parks, green spaces, and cultural amenities, making it an attractive place to live².
- Educational Institutions:** The presence of renowned universities such as North Carolina State University in Raleigh, and those in the surrounding area like Duke University in Durham and the University of North Carolina at Chapel Hill, contributes to the county’s appeal. These institutions not only provide educational opportunities but also drive innovation and economic growth³.
- Net Migration and Natural Births:** A significant portion of Wake County’s population growth is due to net migration, with more people moving into the county than leaving. This trend has been consistent since the 1970s¹.
- Housing Development:** The county has seen substantial residential development to accommodate the growing population⁴.

These factors collectively make Wake County a dynamic and rapidly growing region, attracting people from across the country and around the world. With the increasing population of the county and state, several significant challenges related to the increasing need for services present themselves. As the population grows, the public health and safety infrastructure is placed under greater strain. With an increase of 57 people per day⁵ in Wake County, this growth naturally leads to a higher number of deaths, thereby increasing the demand for medicolegal examination services.

There has also been a dramatic rise in opioid overdose deaths, tripling since 2020⁵, and the recent change in law with Senate Bill 189 Fentanyl Drug Offenses and Related Changes, effective December 1, 2023. This surge has significantly contributed to the number of bodies requiring external examination and autopsies. These issues highlight the critical need for improved infrastructure and resources to handle the increasing strain on Wake County.

While Wake County’s situation is significant, it reflects broader statewide issues with autopsy services. Per NC State General Statute, 130A-383, when a death occurs in a manner that is “suspicious, unusual or unnatural circumstance, the medical examiner of the county in which the deceased is found shall be notified...” Although the county medical examiner is to be notified, “when an autopsy is required as part of the death investigation, the decedent may have to be transported to a designated regional facility for examination⁶.” The North Carolina Office of the Chief Medical Examiner (NC OCME) is charged with conducting autopsies and in the case of Wake County, those cases are sent to the NC OCME office in Raleigh, North Carolina.

The NC OCME has experienced considerable challenges in conducting autopsies and issuing examination reports expeditiously, leading to significant backlogs. This has caused delays for families in understanding what may have happened to their loved ones by “months or even more than a year”⁷. This issue is not unique to Wake County; however, due to the number of cases contributed by Wake County, the NC OCME has pressed the County to develop an external examination facility with decedent storage that would serve the residents of Wake County.

Beyond the primary NC OCME facility, the State has regional autopsy centers and hospital-based pathology practices that perform autopsies for the medical examiner system⁶. Despite these resources, the demand often exceeds throughput capacity, leading to delays and storage issues across the State, similar to those experienced by Wake County.

References:

¹ Tippet, R. (2016, March 24). Wake’s path to 1 million. <https://carolinademography.cpc.unc.edu/2016/03/24/wakes-path-to-1-million/>

² Niche. <https://www.wake.gov/departments-government/planning-development-inspections/planning/census-demographics/growth-and-population-trends>

³ NC State University. <https://research.ncsu.edu/administration/statistics/>

⁴ Wake County, North Carolina. <https://www.wake.gov/departments-government/planning-development-inspections/planning/census-demographics/growth-and-population-trends>

⁵ Creighton, J. (quoted), (2023, May 24). Wake County to store bodies awaiting autopsy in refrigerated shipping containers. <https://www.wral.com/story/after-capacity-issues-wake-county-to-use-refrigerated-shipping-containers-to-store-bodies-awaiting-autopsy/20878492/>

⁶ N.C. OCME Frequently Asked Questions. (2022, March 4). <https://www.ocme.dhhs.nc.gov/faq/index.shtml>

⁷ Terry, M. (2023, June 5). NC’s major autopsy delays impact families, law enforcement. NC’s major autopsy delays impact families, law enforcement | WFAE 90.7 - Charlotte’s NPR News Source

⁸ Curtis, G. (2023, March 16). 9 Investigates: Incomplete autopsies from state impacting deadly NC drug cases. <https://www.wsoc.tv.com/news/local/9-investigates-incomplete-autopsies-state-impacting-deadly-nc-drug-cases/XAPXKKNAIJB7PSQYTDA2FRM54/>

Acknowledging the issues with certification of suspicious deaths in the State, Wake County has commissioned SmithGroup to assist them in understanding what options there may be for the development of a dedicated facility to conduct external decedent examinations. The option presents the County with opportunities to resolve some or much of the issues currently experienced, however, at an added cost for construction and operation.

The intent of this report is to present the physical footprint and considerations for operation in a way that will equip Wake County with pertinent information as they plan into the future. At the onset of this study, the county team was asked, “what will be the most important issue to overcome for a successful project?” A timely and respectful solution to the current issues encountered by the overloaded system was the resounding response. The aim of this report is to achieve that admirable goal and assist the County in answering the questions from their community members of what happened at the end of a loved one’s life.

KEY FINDINGS

- The County is expected to see continued growth over the next 30-year period, placing greater strain on the current OCME.
- The new facility will allow the County to bring decedent transport and external examinations in-house.
- The overall project cost will be approximately \$41M.

SECTION 01

ANALYSIS

INDUSTRY STANDARDS

Based on population growth projections, historical caseload data from the NC OCME, and staffing, the study evaluated the potential 30-year growth projection for administrative, morgue, examination, and building support functions to the year 2060. Recommendations from the Scientific Working Group for Medicolegal Death Investigation (SWGMDI), supported by the National Institute of Justice (NIJ), were evaluated for this Needs Assessment in benchmarking the facility. A complete program for the operational scenario was developed based on caseload projections.



POPULATION DATA

The catchment area for this study is exclusively Wake County. The boundaries of the County fall well within the SWGMDI recommendation for a 100-mile maximum service radius which will limit additional expenses for decedent transport.

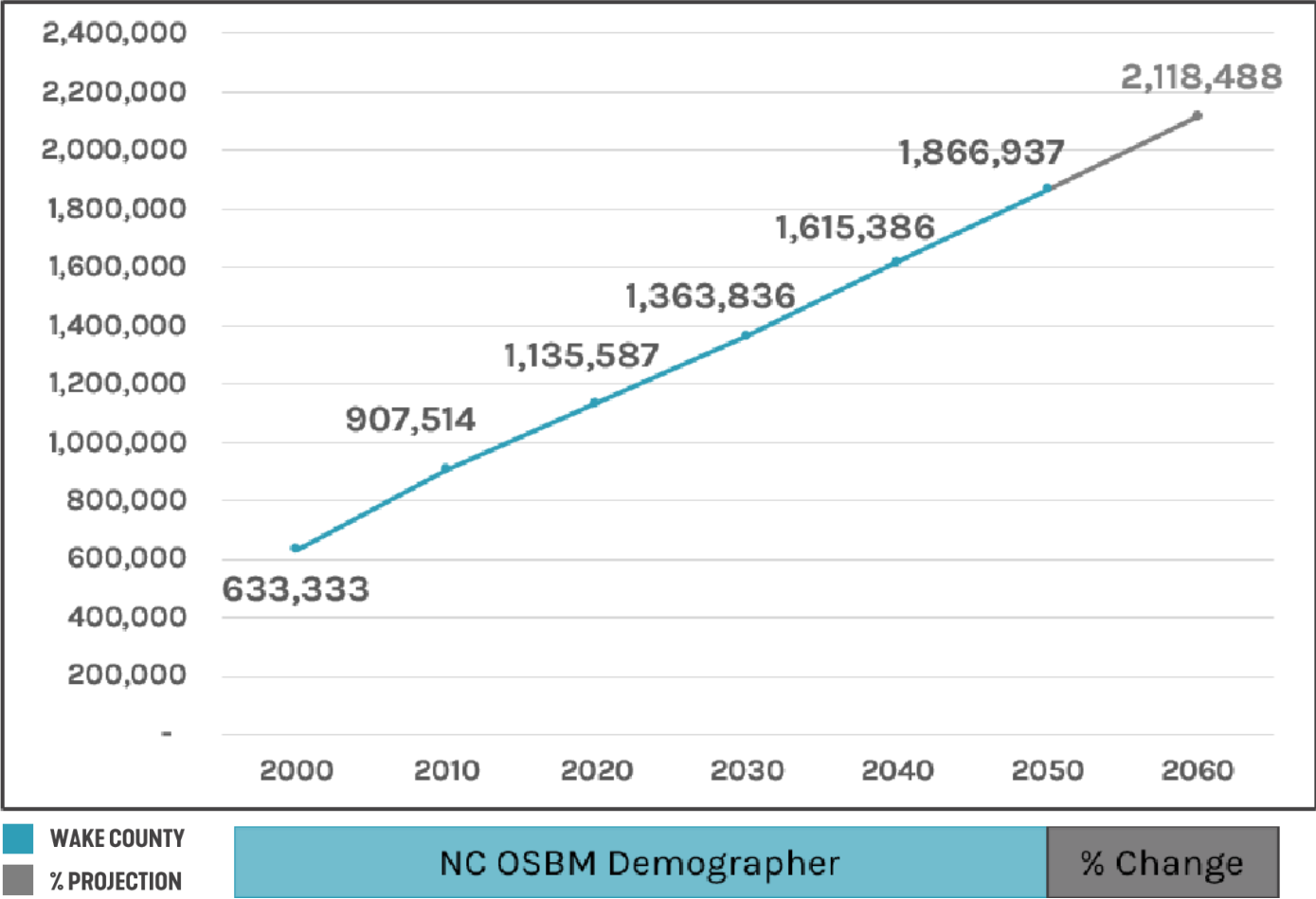
Historic population sizes and future projections are based on information gathered from the North Carolina Office of State Budget and Management (NC OSBM). Although population growth change projections developed by the NC OSBM extends to the year 2050, this goal of this study is to accommodate the facility need to the year 2060. The remaining decade projects population change using the same percentage of population growth between years 2040 and 2050. This results in a total population of 2,118,488.



COUNTY SERVICE AREA



POPULATION GROWTH
WAKE COUNTY



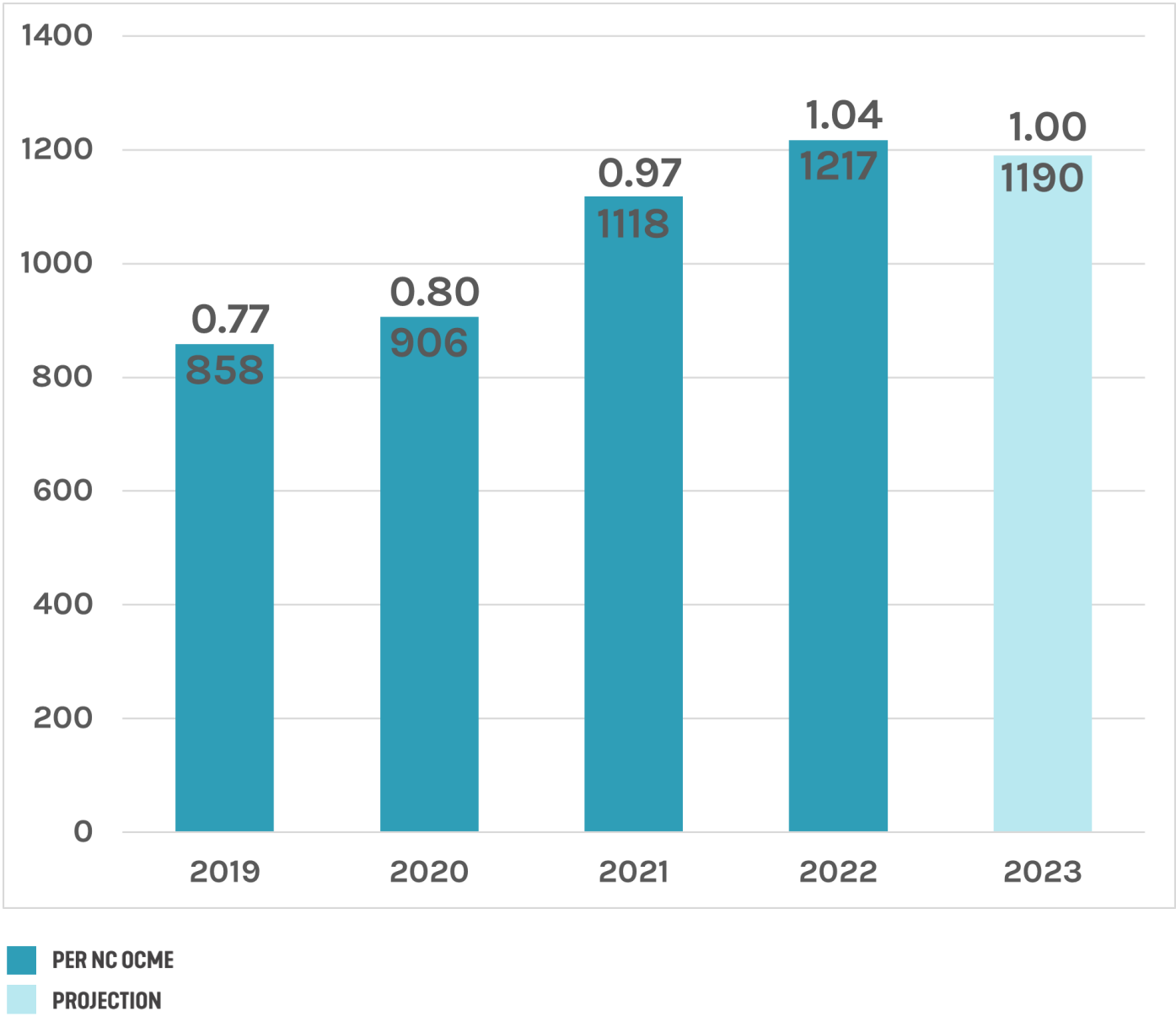
HISTORICAL DEMAND ANALYSIS

Although Wake County will continue to refer autopsies to the State OCME, understanding the historical rate will allow a projection for future total caseload and an estimation of the external examinations that the County could expect to conduct annually.

Recent autopsy rates for Wake County have ranged from a low of 0.77 autopsies per 1,000 people in the population, to a high of 1.04. Although the rate across the most recent 5 years varies notably, this aligns with the national trends, influenced by the post-COVID pandemic and the ongoing opioid epidemic.

This study uses a rate of 1.0 which is the approximate average for Wake County between the years 2019 - 2022 and a common benchmark for other peer facilities with similar population demands. It is also in alignment with National Association of Medical Examiners Scientific Working Group on Medicolegal Death Investigation (NAME SWGMDI) upper rate recommendations.

AUTOPSY RATE

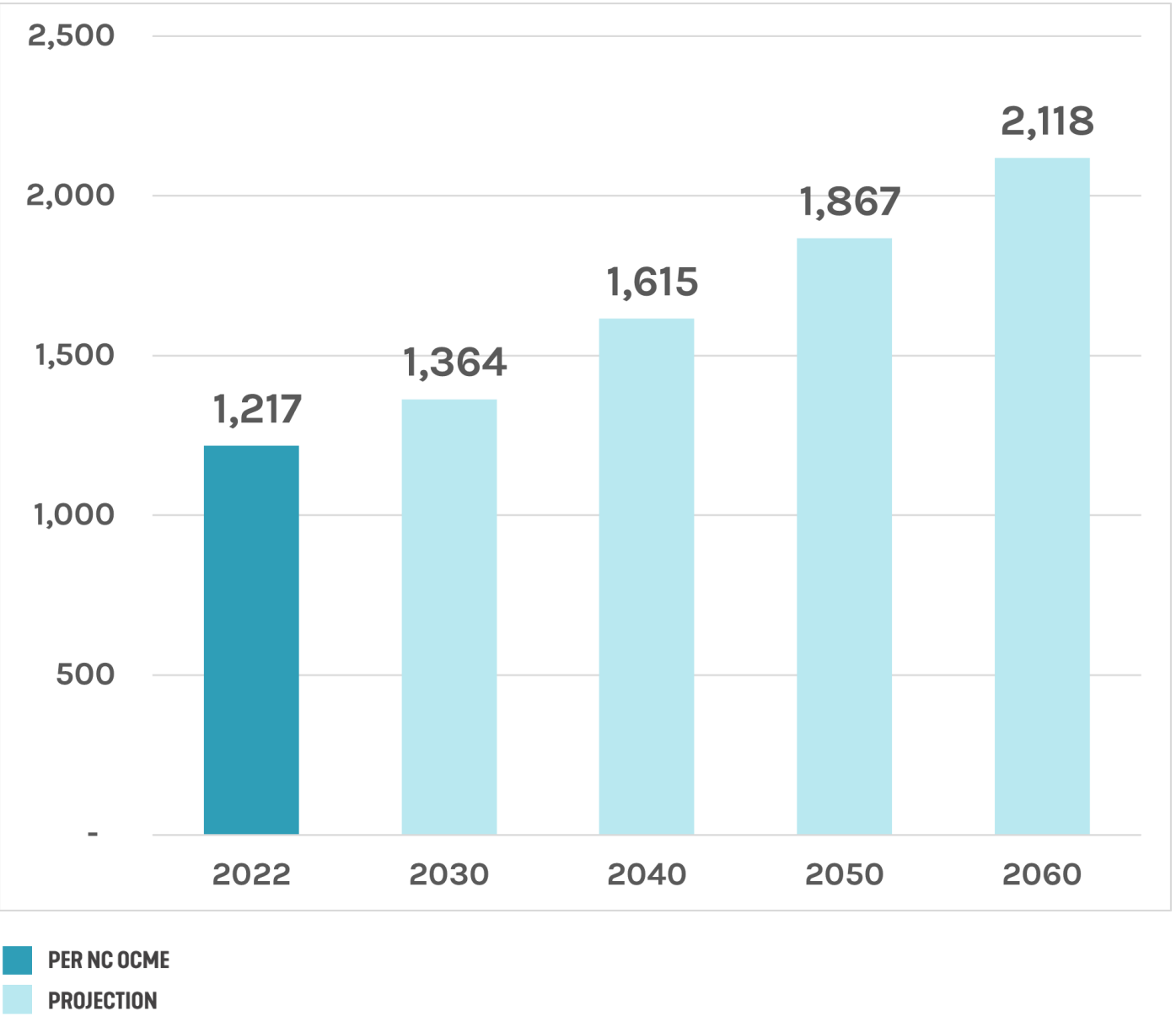


CASELOAD DEMAND

Utilizing an autopsy rate of 1.0 per 1,000 people in the population drives an ultimate expected caseload of 2,118 in year 2060.

This complete caseload quantity would be the traditional cases sent to the State Medical Examiner’s office. Examinations by Wake County will be a percentage of this number and the breakdown of referrals to examinations is identified on the following page.

TOTAL CASELOAD PROJECTION



EXTERNAL EXAMINATION PROJECTIONS

Although having the total number of potential cases is important to consider, understanding the actual quantity of external examinations conducted by Wake County is the ultimate goal. Data was received from the NC OCME that broadens the understanding of the breakdown in the historical findings for manner of death, and an analysis is included below. This evaluation is important because some case types will automatically be sent to the OCME for a complete autopsy, while others will see a percentage that will be referred to autopsy.

Below is the analysis of the historical manner of death along with the assumed percentage of cases that would be sent directly to the OCME from the scene. By the year 2060, an annual total of 913 external examinations would be conducted by the Wake County Medical Examiner team.

	Manner of Death					
	Accident	Homicide	Natural	Suicide	Undeterm.	
2024 Manner of Death %*	54%	5%	27%	13%	1%	
2023 Manner of Death %*	59%	5%	23%	12%	2%	
2022 Manner of Death %*	59%	4%	24%	11%	2%	
2021 Manner of Death %*	57%	5%	27%	9%	2%	
2020 Manner of Death %*	55%	5%	27%	10%	2%	
Average Manner of Death %	57%	5%	26%	11%	2%	
Assumed % Directly to OME	50%	100%	50%	80%	100%	
External Exam Quantity						Annual Exams
2030	368	-	184	35	-	588
2040	436	-	218	42	-	696
2050	504	-	252	49	-	805
2060	572	-	286	55	-	913

* Pending cases are not included in the annual percentages

COUNTY MEDICAL EXAMINER STAFF REQUIRED FOR EXAMINATIONS

A staffing model for County Medical Examiner staff can be derived using the anticipated effort associated with the projected number of annual exams. This model makes the following assumptions:

- Decedents would arrive at the facility 7-days a week.
- Examinations would occur 5-days a week across a 52-week calendar year.
- Monday would traditionally be a busier day for examinations due to cases received over the weekend.
- A single examination would require approximately 30-minutes to complete.
- County Medical Examiners would conduct examinations for 4-hours a day, allowing time for report writing.
- County Medical Examiners would not have field duties, allowing for time to focus on examinations and report writing.

Annual Exams		Average Daily (Tu-F)		Max Daily (M)		Hrs/Wk	Hrs/Yr	Base FTE
		Caseload	Hours	Caseload	Hours			
2030	588	2.0	1.00	5.0	2.50	6.50	338	0.33
2040	696	2.0	1.00	6.0	3.00	7.00	364	0.35
2050	805	3.0	1.50	7.0	3.50	9.50	494	0.48
2060	913	3.0	1.50	8.0	4.00	10.00	520	0.50

Using the available data and the aforementioned criteria, the ultimate caseload of external examinations in the year 2060 would require 0.5 FTE without other required activities like report writing and coordination with the OCME. These activities would occupy the remainder of the work week, leaving little additional capacity for potential surges in caseload. Due to the demand and expectations for sick leave and other time away from the operation, it is recommended to have a minimum staffing quantity of two (2) to fulfill the role of County Medical Examiner.

Allowing the Medical Examiners to focus on the skilled work required for the examination and associated tasks will be imperative. As such, examination assistants would be requied to optimize the work flow. The speed at which the examinations will occur and the potential for two Medical Examiners to be conducting examinations at one time would lead to a need for a minimum of four (4) assistants. As is the case with the Medical Examiners, this quantity of assistants would accommodate time away and providing coverage for other important tasks during regular business hours.

When examinations are occurring, it is disruptive for an examination assistant’s efforts to be redirected to other facility needs like the receipt or release of decedents. Due to the inconsistency of calls for scene response, the transport team members could support this activity of the operation. Supporting the operation in this way would prevent transport staff from a low utilization rate.

The projected daily caseload also has an impact on the number of stations required to complete the examinations. Assuming that each County hires assistants to support the examinations, two stations per Medical Examiner would be the minimum quantity required to maintain greatest efficiency. If two County Medical Examiners are working at the same time, four stations would be the minimum requirement but that will not afford redundant capacity in the event a station is unusable due to a maintenance issue. Area for six examination stations would provide ample area for the future operations, with a minimum of four installed initially.

SECTION 02

OPERATIONAL CRITERIA AND STAFFING

STAFFING

Staffing is based on the 30-year planning horizon for the facility. It is worth noting that Wake County currently employs investigators that perform the traditional role of a Medicolegal Death Investigator (MDI). These Wake County team members would not be relocated in any of the operational models though they would work closely and communicate regularly with the individuals that work in the facility.

OPERATIONAL SCENARIO 1.5: COUNTY-EMPLOYED MEDICAL EXAMINERS

As previously referenced, this model assumes the NC OCME would continue to perform autopsies and provide direction to the scene investigators and County Medical Examiners which cases could be referred to the State. The Morgue Operations team would be primarily focused on administrative duties while the morgue assistants would support the County Medical Examiners. A new staffing role of "business manager" would also be included which would attend to the facility operation and HR matters. Since the County wishes to bring decedent transportation in-house, a shared office work zone would accommodate their needs. Overall, this model accommodates 11.5 FTE, but with a maximum anticipated occupancy of eight (8) due to the multi-shift schedule of the transport staff.

Decedent transportation is currently handled by a third party contractor. That service is to be brought in-house with a minimum number of staff to provide 24-hour service at 5.5 FTE. This staffing level would be required today to accommdate a 24/7 operation and maintained to support the operation through the planning horizon. This service should be evaluated by the County to ensure that added staffing costs are outweighed by benefits to greater control of the team conducting decedent transportation.

Morgue facility includes exam stations, body (cold) storage, gross tissue storage, materials / chemical / PPE storage, locker rooms, receiving and discharge spaces, sally port, imaging suite and administrative spaces such as lobby, offices, collaborative spaces, break room, restrooms, etc. Imaging (full body) equipment can consist of X-Ray or CT scanning. Commonly, a full-body X-Ray is employed at facilities where there is limited teaching, research, or regions where there may be a low population of groups that have religious objections to autopsy. The initial installation costs for full body X-Ray unit can vary from \$350,000 to \$600,000, with annual maintenance costs of \$20,000.



Assumptions for operational scenario 1.5 include:

- Wake County would send a transport staff member and a records investigator to scenes based on a request for service.
- NC OCME in Raleigh provides autopsy coverage to perform postmortem examinations at the existing State OCME facilities.
- NC OCME triages deaths reportable to the Medical Examiner pursuant to § 130A-383 using OCME staff (Medicolegal Death Investigators (MDIs)) and documents those reports in the existing NC OCME case management system (CMS) or appoints community medical examiners to serve a similar function for external examinations.
- NC OCME services as custodian of record for postmortem examination reports authored by NC OCME FP staff for examinations performed. NC OCME would therefore retain responsibility for records requests and retentions.
- NC OCME provides toxicology services as part of their current activities.
- NC OCME will release the decedents directly to funeral homes to limit the potential for errors in the chain of custody for the decedent and their belongings.
- The County would receive only decedents that will receive an external examination and imaging for cases that the OCME will not take into their system.
- Intake of decedents to the county facility would occur 7-days a week, with examinations occurring 5-days a week.
- Records investigators would add cases into the LIMS with morgue operations staff assisting when needed.
- In the event a County Medical Examiner identifies evidence of concern during an examination, the NO OCME will be consulted and decedent will be transported by the State for autopsy.
- Organ and tissue donation cases will occur off site.

APPROXIMATE STAFFING COSTS

What are competitive compensation estimates for the above described classifications?

The figures below are estimates based on review of compensation from available national postings and consultant experience. A regional salary study could be undertaken by the County for comparable North Carolina compensation as necessary. Per the Job Titles and Salary Structure website, Wake County sets a salary structure that, “serves as the foundation for making meaningful talent decisions including performance management, compensation, development and career movement.” Although the compensation listed is comparable for the market, the salary ranges should be reviewed for alignment to the existing compensation structure.

Classification	Salary Range		
	Minimum	Midpoint	Maximum
County Medical Examiner	\$135,086	\$189,126	\$243,165
Deputy County Medical Examiner	\$61,470	\$82,989	\$104,506
Examination Assistant	\$ 46,097	\$ 54,164	\$ 62,230
Business Operations Manager	\$75,109	\$105,157	\$135,202
Records investigator Supervisor	\$ 57,607	\$ 69,128	\$ 80,649
Records Investigator Staff	\$ 49,763	\$ 59,715	\$ 69,668
Operations Manager	\$ 80,508	\$ 96,610	\$ 112,711
Administrative Assistant	\$ 34,398	\$ 40,418	\$ 46,437
Transportation Staff	\$ 27,120	\$ 33,680	\$ 40,680

*NC Department of Health and Human Services currently identifies that Medical Examiners in their system receive \$200 per completed investigation. Based on the projected demand when the facility begins operation, each of the Medical Examiners salary would be approximately \$60,000 as part-time employees. Full time equivalent employees that will take on a greater role in the operation of the facility and support the activities at a level consistent with a mid-level employee within Health Services, similar to a Dentist or Registered Nurse. An HS23 level employee would likely be the upper limit of staff compensation for a Medical Examiner position, with an HS18 level employee being the lower limit. The Medical Examiner compensation ranges are based on the Wake County proposed market ranges for compensation in fiscal year 2026.

WHAT ABOUT OTHER SERVICES AND SYSTEMS?

Comparing the projected costs for transcription, histology, and toxicology services to a peer facility with approximately the same ultimate caseload is helpful to consider. The Pima County Office of the Medical Examiner (Tucson, Arizona) currently has a caseload of approximately 2,100 full and external autopsies each year. The approximate annual costs for supporting the other investigative activities for Pima County are:

- Transcription: \$25,000
- Toxicology: \$250,000

Although the quantity of Toxicology cases and required transcription may be limited under this operational model, it should be noted that it is much more cost effective to outsource the above services rather than create or procure the infrastructure, staffing, equipment, and consumables required to provide these services in-house. However, Wake County should consider how the activities for these necessary elements of a death investigation are to be conducted and balance the cost against the County’s ultimate goals.

A case management system is an additional consideration and pricing for those systems can vary greatly depending on the customization requested by the County. Two major vendor hosted systems are CME/VertiQ and MDI Log. Following the initial purchase price of between \$50,000 and \$200,000, an annual maintenance fee of \$100,000 should be expected. The systems can be inclusive for investigations, photographs, records, reports, lab functions, and loadable forms for specific death types.

Retention of records and materials is governed by the jurisdictional requirements, but generally aligns with national accreditation criteria. Paper and electronic records are often held to the same retention standard and retained by both manner of death and case type. Physical materials (gross tissue, histology slides and blocks, DNA, etc.) also have retention schedules. An example of a retention schedule that would align with national accreditation criteria includes:

RECORDS RETENTION SCHEDULE EXAMPLE

Retained Item	Retention Duration
Case File by Manner of Death	
Homicide	50 years
Suicide	20 years
Accident	10 years
Natural	10 years
Undetermined	50 years
Case File by Type of Case	
Jurisdiction Decline	10 years
Death Certificate	10 years
Storage	10 years
Examination Reports	Permanent following case file retention
Gross Tissue	1 year
Blocks	10 years
Slides	Permanent
DNA	Permanent
Toxicology	1 year
Radiographs	Per case file retention
Photographs	Per case file retention
Evidence	6 months

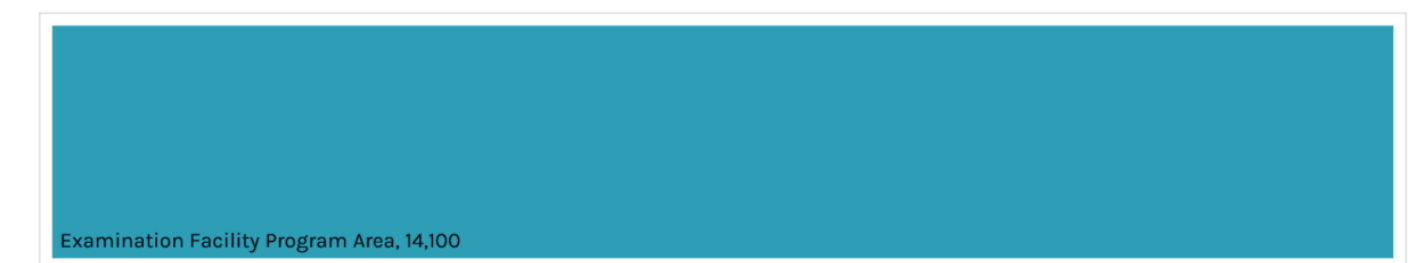


SECTION 03

BUILDING PROGRAM & DESIGN CONSIDERATIONS

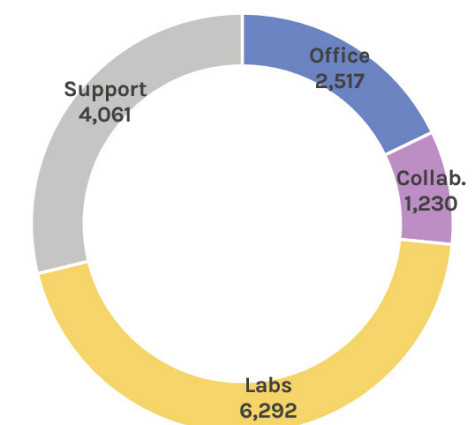
Wake County Examination Facility Program				
Facility Summary	Staff	Grossing	Total NASF	Total GSF
Examination Facility	31	60%	14,100	23,500

Examination Facility	Staff	Total NSF	Total NASF	Total GSF
Examination Facility Program Area	31	13,519	14,100	
Sub-total NSF and NASF	31	13,519	14,100	
Grossing at		60%		23,500



	Office	Collab.	Labs	Edu	Support	Total NASF
Examination Facility Program A	2,517	1,230	6,292	0	4,061	14,100

Scenario 1.5: Examination Facility



Wake County Examination Facility Program

Examination Facility Program Area

Space Name	Staff	NSF	Qty.	Total NSF	Mult.	NASF	Total NASF	Comments
Office								
Morgue Operations Manager Office	1	120	1	120	1.3	156		Enclosed Office
Morge Operations Staff	4	64	4	256	1.3	333		Open Office
Medical Examiner Supervisor	1	160	1	160	1.3	208		Enclosed Office
Medical Examiner	1	120	1	120	1.3	156		Open Office
Morgue Staff	4	64	4	256	1.3	333		Open Office
Records Investigator Supervisor	1	64	1	64	1.3	83		Enclosed Office
Records Investigator Staff	12	64	12	768	1.3	998		Open Office
Transport Staff	5.5	36	2	72	1.3	94		Share (2) stations across each shift
Business Operations Manager	1	120	1	120	1.3	156		
Sub-Total	30.5			1,936			2,517	

Collaboration

Lobby / Public Interface		200	1	200	1.0	200		
Break Room		350	1	350	1.0	350		
Small Conference Room		200	1	200	1.0	200		
Medium Conference Room		480	1	480	1.0	480		
Sub-Total	0			1,230			1,230	

Laboratory

Examination Station		363	4	1,452	1.0	1,452		
Examination Station (Future)		363	2	726	1.0	726		
Examination Station Support		121	2	242	1.0	242		
Examination Station Support (Future)		121	1	121	1.0	121		
Observation		242	2	484	1.0	484		
Examination Station - Isolation		484	1	484	1.0	484		
Imaging and Control Room		363	1	363	1.0	363		
Main Cooler		1,706	1	1,706	1.0	1,706		
Decomp Cooler		230	1	230	1.0	230		
Receiving and Release		484	1	484	1.0	484		
Sub-Total	0			6,292			6,292	

Wake County Examination Facility Program

Examination Facility Program Area

Space Name	Staff	NSF	Qty.	Total NSF	Mult.	NASF	Total NASF	Comments
Educational								
Sub-Total	0			0			0	
Support								
Copier / Work Room		120	1	120	1.0	120		
Records Room		250	1	250	1.0	250		
Personal Health Room		80	1	80	1.0	80		
Lobby Restroom		88	1	88	1.0	88		
Sallyport		1,089	1	1,089	1.0	1,089		
Transport Toilet Room		62	1	62	1.0	62		
PPE Vestibule		242	1	242	1.0	242		
PPE Vestibule Isolation		121	1	121	1.0	121		
Property Room		121	1	121	1.0	121		
Staff Restrooms / Locker		400	2	800	1.0	800		
Scrubs Laundry Room		121	1	121	1.0	121		
Morgue Janitor Closet		121	1	121	1.0	121		
Dry Supply Storage Room		242	1	242	1.0	242		
Chemical Storage Room		60	1	60	1.0	60		
Biohazard Storage Room		60	1	60	1.0	60		
Trash / Recycling Room		121	1	121	1.0	121		
Maintenance Storage		121	1	121	1.0	121		
Records Investigator Gear Storage		242	1	242	1.0	242		
Sub-Total	0			4,061			4,061	
TOTAL	30.5			13,519			14,100	

SECTION 04

PROJECT SCHEDULE

Because construction cost is so greatly impacted by project schedule and escalation, it is important to establish realistic durations for the primary steps in the overall project. This project schedule can be explained in three primary periods of procurement, design, and construction.

PROCUREMENT

Following the completion of this needs assessment update, Wake County leadership will undoubtedly require time to discuss the process for securing project funding, approve a contractual approach, and establish the mutually agreeable framework for operations. It is expected that this procurement and planning phase would require approximately six months to complete.

Following the planning phase, a design team will need to be selected as a partner of the County. Advertising the project, reviewing proposals, interviewing the shortlisted teams, and making a final presentation to the County Leadership is identified with a duration of three months.

DESIGN

Although this study can help Wake County establish an estimated facility size and project cost, there remains considerable effort to develop documentation for a General Contractor to build from. At the beginning of the process, a program will be required which establishes the overall quantity and relationship to spaces within the facility. Following programming would be the Schematic Design (SD) phase where the general concept for the facility would be generated.

In Design Development (DD), an increasing amount of detail is added to the concept which would anchor major building components and partitions. Finally, the Construction Document (CD) phase would resolve the final connections and details necessary to establish the final project scope and allow Permit review by the Authorities Having Jurisdiction (AHJ).



PLACER COUNTY SHERIFF CORONER'S FACILITY

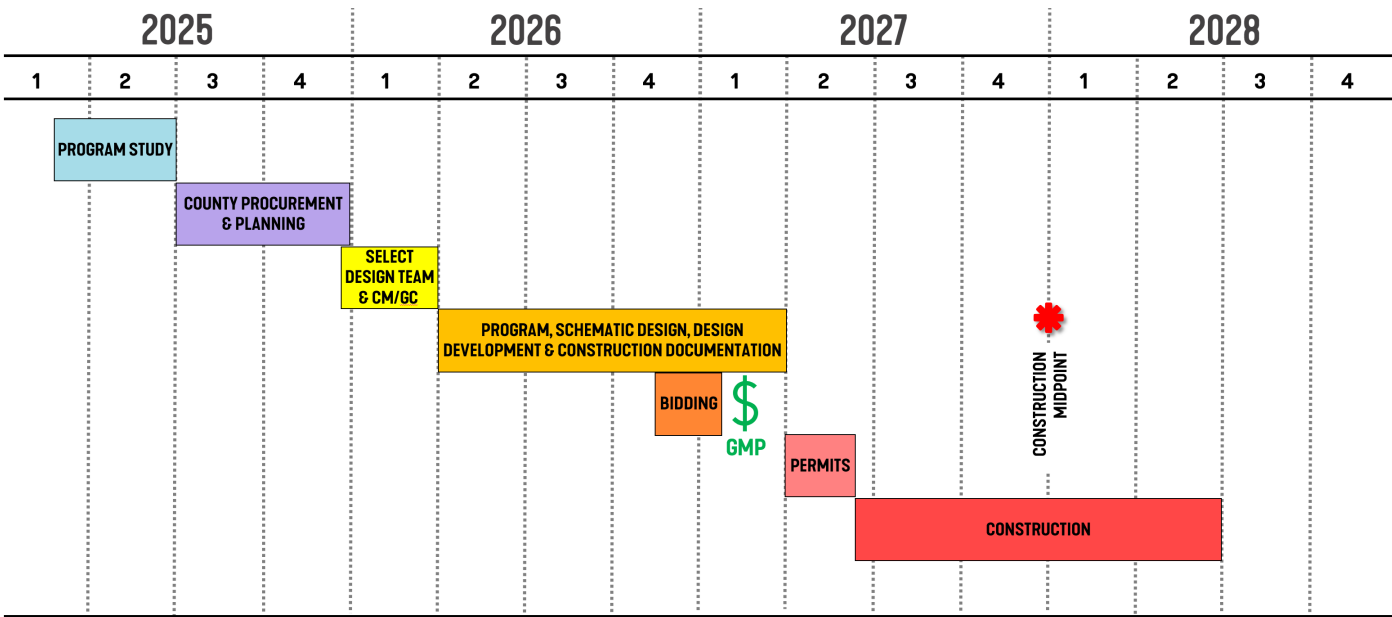
CONSTRUCTION

In a Construction Manager/General Contractor (CM/GC) or Construction Manager at Risk (CM@R) delivery scenario, bidding/pricing may occur during Design Development (DD). During this time, the CM/GC or CM@R and their trade partners will ask for clarification to provide a Guaranteed Maximum Price (GMP) for the scope identified in the project documents at the end of the DD phase. In addition, early procurement of long lead equipment may commence.

The full duration of construction is critical to consider, but for establishment of a construction budget, it is important to acknowledge the midpoint of construction. This is the approximate point from which the mean escalation value is calculated - lower escalation during the first half of construction and higher escalation in the second half.

In this estimated project schedule, a midpoint of construction for the Wake County Facility is assumed to be the end of 2027.

PROJECT SCHEDULE



Multiple factors will impact each of the major durations and can be adjusted as the project progresses. This study attempts to provide conservative estimates of durations due to multiple unknowns that will be realized throughout the process.



SECTION 05

PROJECT COSTS

The breakdown shown on the next page indicates the projected cost of construction and total project costs for the updated scenario. The scenario assumes construction on County-owned land and is based on a midpoint of construction in January of 2028. This estimation does not include estimated costs for site procurement which would require minimum 4.5 to 5-acres of development.

SIZE

The anticipated facility size is based on the total staff numbers. There are limits to how small a facility can be to adequately function and meet the anticipated external examination demand. The approximate building area would be 23,500 Gross Square Feet (GSF). GSF refers to the area, measured to the outside face of the exterior walls, within a building including toilet rooms and utility rooms; whereas Net Square Feet (NSF) is the space that the individual room occupies.

CONSTRUCTION COST / PER SF

The estimated construction cost per square foot is based on construction costs for other medicolegal autopsy facilities and adjusted for conditions in the North Carolina region surrounding Wake County. Although only external examinations are anticipated for this facility at this time, the finishes, systems, and area required for an external exam aligns closely with the requirements necessary for an autopsy facility and is therefore used within the cost model. Escalation within the construction marketplace has been considered in the development of the estimated construction cost.

To establish the full construction cost, the facility size and space requirements were evaluated against historical cost data from other similar projects. Among other items, construction costs includes:

- On-site site development
- Core and shell elements
- Tenant improvement items
- Morgue casework and equipment

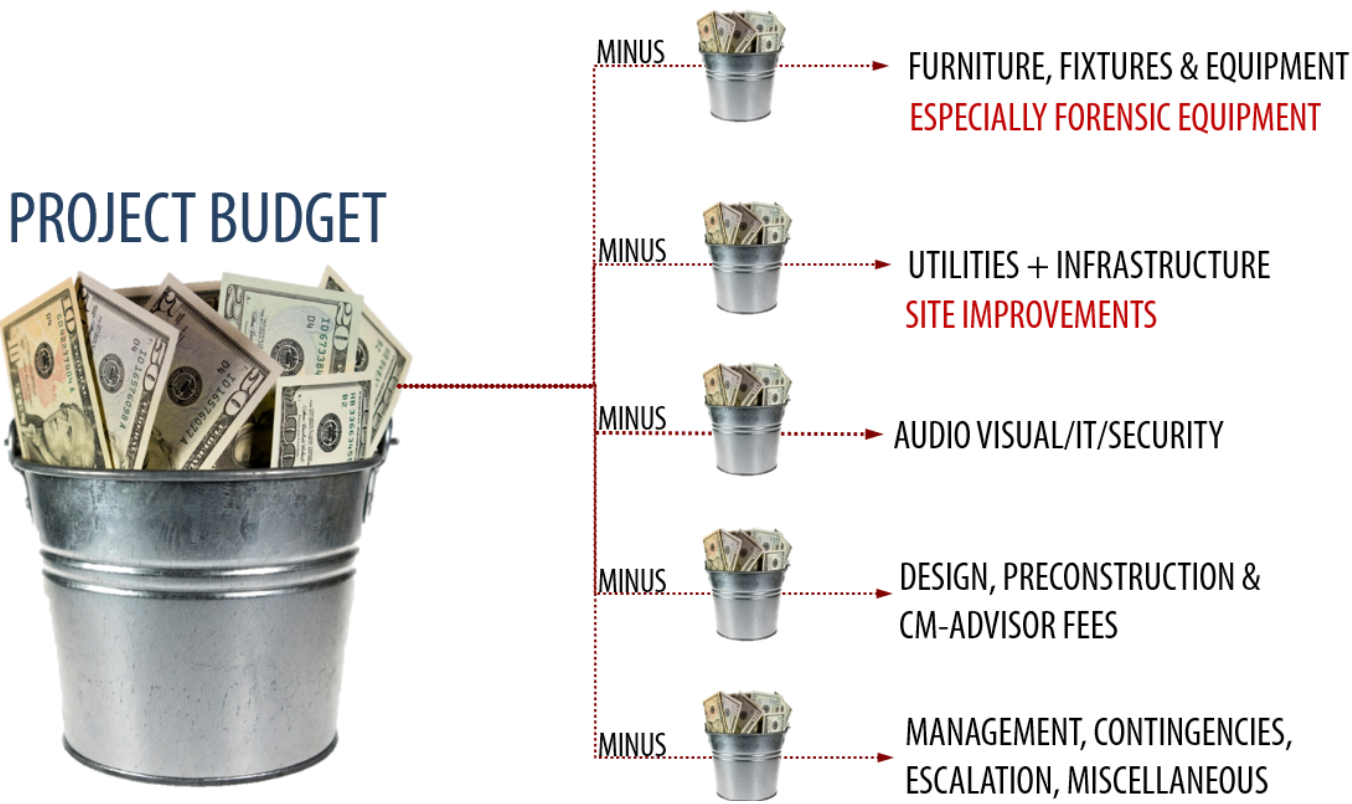


PLACER COUNTY SHERIFF CORONER'S FACILITY

PROJECT COST

The estimated Construction Cost is generally between 70% and 75% of the overall cost to develop a project. Because the County will be starting a new operation, it is recommended that a lower ratio of construction cost to project cost be utilized due to greater associated soft costs. Existing programs may have an established Lab Information Management System (LIMS), imaging equipment, drying cabinets, and examination instruments that could be relocated to a new facility. Wake County will need to procure these items and establish service contracts which will increase the foundational costs. A 30% markup to construction cost is recommended to address the aforementioned items which broadly include:

PROJECT COST BUCKETS



CONSTRUCTION BUDGET ~ 70%-75%

STARTING A NEW PROGRAM WILL REQUIRE GREATER SOFT COSTS - 70% RATIO IS RECOMMENDED

Scenario 1.5: External Examination Facility

	23,500 GSF
Building:	\$28,469,000
	\$1,211/SF
Soft Costs:	\$12,201,000
Total:	\$40,670,000

*Cost estimate is preliminary and assumes escalation to January 2028.

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SECTION 04

BUILDING SYSTEMS

MECHANICAL SYSTEMS

MECHANICAL DESIGN OBJECTIVE

The mechanical design narrative describes the mechanical systems to be provided for the proposed Wake County Facility. The project would be provided with mechanical systems that are cost effective, energy efficient, environmentally friendly, and easily maintainable. Strategies would be employed to conserve energy and provide improved indoor environmental quality. The design of the mechanical systems should promote forward thinking in engineering and flexibility in design.

MECHANICAL GENERAL OVERVIEW

CODES AND STANDARDS

ENVIRONMENTAL DESIGN CONDITIONS

CLIMATE ANALYSIS AND SYSTEM OPERATING MODES

BUILDING COOLING AND HEATING LOADS

CHILLED WATER SYSTEM

HEATING WATER SYSTEM

CONSIDERATIONS FOR ELECTRIFICATION + DECARBONIZATION

HEAT RECOVERY WATER SYSTEM

SUPPLY AIR SYSTEMS

LABORATORY EXHAUST SYSTEMS

ENERGY MANAGEMENT AND CONTROL SYSTEM (EMCS)

INNOVATION INITIATIVES

CODES AND STANDARDS

The latest version, or current adopted version, of the following codes and standards will be used as:

- 2018 International Building Code (IBC) with Local Amendments
- 2018 International Mechanical Code (IMC) with Local Amendments
- 2018 International Plumbing Code (IPC) with Local Amendments
- 2017 National Electrical Code (NEC) with Local Amendments
- National Fire Protection Association (NFPA) Standards
- American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Standards
 - ASHRAE 55-2017 – Thermal Environmental Conditions for Human Occupancy
 - ASHRAE 62.1-2016 – Ventilation for Acceptable Indoor Air Quality
 - ASHRAE 90.1-2016 – Energy Standard for Buildings Except Low-Rise Residential Buildings
- Leadership in Energy and Environmental Design (LEED) v4 (for Reference Only)
- American Society for Testing and Materials (ASTM)
- American National Standards Institute (ANSI)
- Occupational Safety and Health Administration (OSHA)
- Underwriters' Laboratories (UL)
- Sheet Metal and Air-Conditioning Contractors National Association (SMACNA) Standards

ENVIRONMENTAL DESIGN CONDITIONS

Site Location / Elevation:	Raleigh, NC / 450 Feet Above Sea Level
Latitude / Longitude:	35.89 °North / 78.78 °West
OUTDOOR DESIGN TEMPERATURES (ASHRAE 99.6% / 0.4% DATA)	
Winter Dry Bulb:	19.7 °F (-1 °F Extreme)
Summer Dry Bulb / Coincident Wet Bulb (Hot):	95.0 °F / 75.6 °F (106.8 °F Extreme)
Summer Dry Bulb / Coincident Wet Bulb (Peak Enthalpy):	90.0 °F / 78.4 °F
Humid Dry Bulb / Coincident Wet Bulb:	82.8 °F / 77.3 °F
Air-Cooled Equipment:	105 °F
INDOOR DESIGN TEMPERATURES	
Winter / Summer Dry Bulb Temperature (Office and Lab):	70 °F / 74 °F
Relative Humidity Control (Minimum / Maximum):	No Minimum / 55% at 74 °F
Winter / Summer Dry Bulb Temperature (Support Areas):	55°F / 85 °F

CLIMATE ANALYSIS AND SYSTEM OPERATING MODES

The site was analyzed using SmithGroup’s Climate Analysis Tool and hourly weather data to inform both the local climate and potential operating modes for systems. This visual representation, from January through December over the course of the day, is then used to inform energy efficient system solutions.

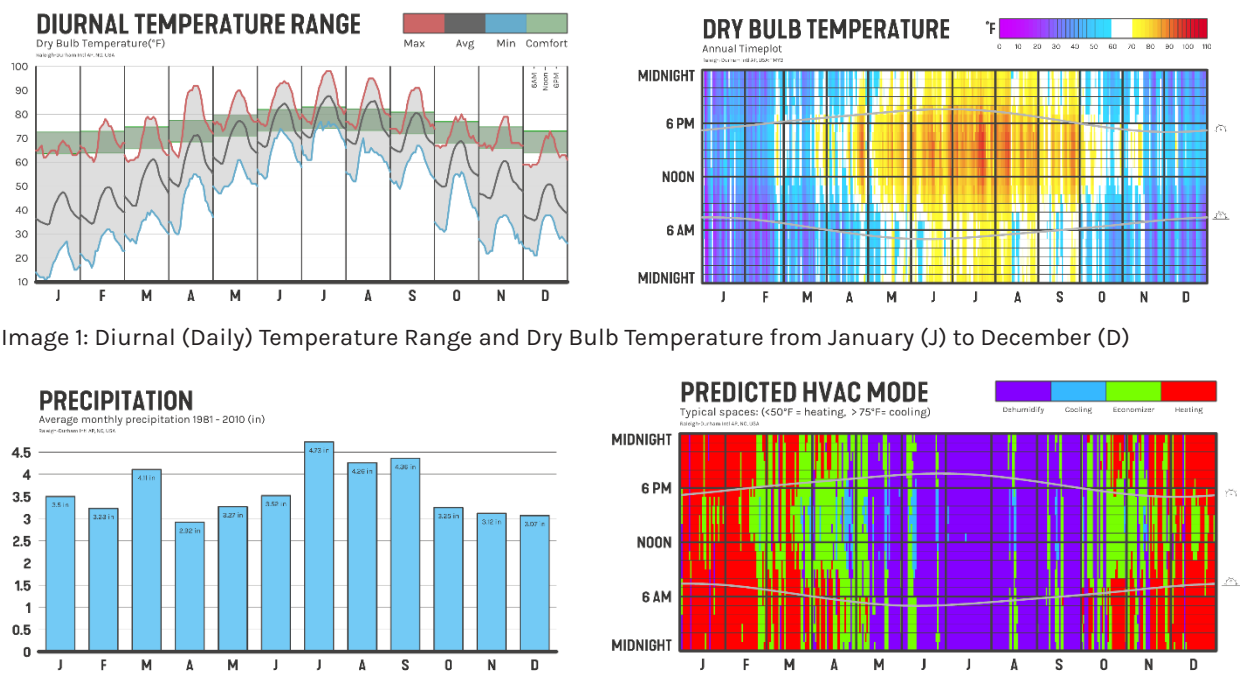


Image 1: Diurnal (Daily) Temperature Range and Dry Bulb Temperature from January (J) to December (D)

Image 2: Average Precipitation (Rainfall) and Predicted HVAC Operating Modes from January (J) to December (D)

The above Predicted HVAC Mode chart highlights that Raleigh is a more balanced climate with humid summers, and periods of dehumidification (purple) in a typical year of up to 41%. Mechanical cooling is needed 44% of the year (combined purple and blue) while free cooling outside air economizer operation (green) is available for up to 27% of the year. Note while heating of outside air (red) is around 30% of the year, this facility will require some degree of heating year-round associated with dehumidification and the tempering of high ventilation spaces. To avoid large swings in building humidity, mechanical systems need to provide continuous cooling (chilled water system preferred).

BUILDING COOLING AND HEATING LOADS

Based on the current building program, a preliminary estimate for facility loads is as follows:

- 190 tons of cooling load (for medical examiner + investigations programs). With the potential addition of a toxicology program, the cooling load increases to around 270 tons. Two (2) 200-ton air-cooled variable speed chillers should be provided. Sizing provides N+1 redundancy for the medical examiner + investigations programs, with each chiller sized at around 70% of design with the addition of toxicology.
- 1,200 MBH of heating load (for medical examiner + investigations programs) when including a 50% effective heat recovery system. If a potential toxicology program were to be added, heating load would increase to 1,700 MBH and two (2) 1,250 MBH gas-fired high-efficiency condensing boilers would need to be provided. This sizing provides N+1 redundancy for the medical examiner + investigations programs, with each boiler sized at around 70% of design with the addition of toxicology.
- Considerations for electrification + decarbonization. In lieu of traditionally independent heating + cooling systems, an alternative solution utilizes modular air-source heat pumps (ASHP) to support heating, cooling, and simultaneous heating + cooling operating modes (waste heat from the cooling process provides beneficial building heating). Provide for:
 - (2) Sets of (4) 50-ton ASHP modules approximating cooling + heating performances above for the traditionally independent heating + cooling systems.
 - Select ASHP manufacturers with ability to operate down to -5F for extreme conditions.

The above loads assume that a minimally code-compliant (50% effective) lab exhaust runaround recovery system with redundant pumping pre-conditions outside air without the potential of cross-contamination of the outside air stream.

CHILLED WATER SYSTEM

The chilled water system would utilize high-performance variable-speed air-cooled chillers for energy efficiency, increased reliability, reduced water usage, and reduced maintenance requirements. The chilled water system except for the air-cooled chillers would be in a mechanical room adjacent to the equipment yard. Full size emergency chilled water valves at the mechanical room would allow for the use of temporary air-cooled chillers (supports continued redundancy with an equipment replacement).

The chilled water system would be designed as a variable-primary system for energy efficiency and increased system reliability. The primary pumps are sized at one per chiller with an additional pump as stand-by. The system configuration would allow the use of any pump with any chiller, with a bypass control valve in the mechanical room modulating to ensure that the minimum chiller flow rates are maintained. Two-way control valves at cooling coils would modulate to maintain their respective set points with select 3-way control valves ensure minimum system circulation. A 30% propylene glycol solution protects against freezing in winter.

The chilled water system would consist of vertical inline pumps, variable-frequency drives (VFDs), control modules, buffer tank to reduce compressor cycling, expansion tank, coalescing air separator, chemical feed tank, and a packaged glycol feed system. Preliminary equipment sizes are as follows:

- Two (2) 200-ton air-cooled variable-speed chillers. The chillers would be located outdoors adjacent to the mechanical room with aboveground chilled water piping. Provide chillers complete with hail guards.
- Three (3) vertical inline pumps, nominal 420 GPM / 15 HP each, with suction diffusers, inlet strainers, and discharge check valves. Design to operate any pump with any chiller with one pump being redundant. Provide a dedicated VFD per pump.
- 500-gallon pre-insulated buffer tank to limit compressor cycling.
- 6-inch high-velocity coalescing air separator and diaphragm-type expansion tank.
- Packaged propylene glycol feeder with local alarm and BMS interface.

The chilled water system would be dedicated to the air-handling units. This would allow the system to be shut down with outdoor temperatures of less than 55F (less than 40% of the year) when the air-handling units are operating in full outside air economizer and do not require mechanical cooling.

HEATING WATER SYSTEM

The heating water system will utilize natural gas-fired high-efficiency condensing boilers located in a mechanical room adjacent to the equipment yard with direct access to the outdoors. Full size emergency heating water valves at the mechanical room allow for the use of temporary boilers (supports continued redundancy with an equipment replacement).

The heating water system would be designed as a variable-primary system for energy efficiency and increased system reliability. The variable speed primary pumps would be sized at one per boiler with an additional pump for system redundancy. Three-way control valves at remote heating coils would ensure continuous circulation with a bypass control valve near the boilers to maintain the minimum flow rates through the active boilers. A 30% propylene glycol solution protects against freezing in winter.

The heating water system would consist of boilers, pumps, VFD drives, coalescing air separator, expansion tank, chemical feed tank, and a packaged glycol feed system. Hydronic snowmelt systems are not recommended at this time given the limited heating season but can be included if driven by other factors (steep driveways at sallyport). Preliminary equipment sizes are as follows:

- Two (2) natural gas high-efficiency condensing boilers, nominal 1,250 MBH each, with independent sealed-combustion air, independent flue venting, and a minimum 15:1 turndown ratio. A master boiler controller provides capacity control for optimum energy efficiency.
- Three (3) vertical inline water pumps, 140 GPM / 5 HP each, with suction diffusers, inlet strainers, and discharge check valves. The heating system will allow for operation any pump with any boiler with one pump being redundant. Provide a dedicated VFD per pump.
- 4-inch high-velocity coalescing air separator and diaphragm-type expansion tank.
- Packaged propylene glycol feeder with local alarm and BMS interface.

The heating water system serves the building air-handling units, terminal unit & supply valve heating coils, and unit heaters. Air-handling unit coil sizing allows for continued building operation with a failure of the exhaust heat recovery coils (or exhaust coils bypassed). Under normal conditions, the heat recovery system provides the equivalent of over half of a single boiler of capacity in winter.

CONSIDERATIONS FOR ELECTRIFICATION + DECARBONIZATION

In lieu of separate air-cooled chillers and gas-fired boilers, air-source heat pumps (ASHP) could provide for both heating, cooling, and simultaneous heating + cooling. ASHPs could be placed in the equipment yard adjacent to the mechanical room. All other aspects of the cooling + heating water systems, including full size emergency valves for temporary equipment, would remain. Preliminary equipment sizes for the ASHPs are as follows:

- (2) Sets of (4) 50-ton ASHP modules (or other combination of equivalent capacity) with each module having the ability to operate in heating only, cooling only, and simultaneous heating + cooling modes (for increased energy efficiency with simultaneous demands).
- Minimum of 2 compressors per ASHP module with low ambient kits and defrost capability. Provide ASHPs complete with hail guards.

HEAT RECOVERY WATER SYSTEM

The heat recovery water system transfers energy from the laboratory exhaust to precondition the outside air via hydronic coils. The hydronic coils would ensure no cross-contamination between airstreams. The pump speed modulates to maximize the energy transfer between the systems with local air-handling unit control valves to protect against excess heat recovery. Summer operation is limited.

The heat recovery water system would consist of vertical inline pumps, variable-frequency drives (VFDs), air-handling unit and lab exhaust recovery coils, expansion tank, coalescing air separator, chemical feed tank, and a packaged glycol feed system. Preliminary equipment sizes are as follows:

- Two (2) vertical inline water pumps, nominal 160 GPM / 7.5 HP each, with suction diffusers, inlet strainers, and discharge check valves. Provide a dedicated VFD per pump.
- 4-inch high-velocity coalescing air separator and diaphragm-type expansion tank.
- Packaged propylene glycol feeder with local alarm and BMS interface.

The system would utilize a 40% propylene glycol solution to protect against freezing during extreme conditions. Bypass valves at lab exhaust coils will allow for all heating from the heating water system.

SUPPLY AIR SYSTEMS

A common supply air system would serve the office, medical examiner, and potential toxicology programs. While air from the office is permitted to be returned, all air serving medical examiner or potential toxicology spaces is single-pass exhaust. This configuration simplifies system air distribution, increases flexibility, and provides increased ventilation to office areas. Unit sizing allows for full redundancy day one with a fan array configuration to provide increased resiliency should the toxicology program be added. Provide (2) 24,000 CFM high efficiency fan array air handling units connected in parallel to support the building.

Design the face velocities for the air-handling units to 450 FPM. As these units will operate in parallel, they will naturally operate at lower velocities under normal conditions. Outdoor units have double-wall insulated construction with a solid inner liner (perforated in fan section and discharge section) and will be in a screened area on the roof. Each air-handling unit will be designed for a site elevation of 450 feet above sea level and will carry a Miami-Dade rating for hurricane resistance which includes ratings for intake louvers where provided. Minimum humidification is not provided given the local climate and building program. The air-handling units will consist of the following components:

- Outside Air Inlet Plenum with Intake Hood/Louvers and a Modulating Control Damper
- MERV 8 Pre-Filter Section
- Heat Recovery Coil Section
- Mixing Section for Return Air (from Office Areas only) with a Modulating Control Damper
- Heating Coil Section
- Cooling Coil Section (minimum 8 rows) with full size stainless steel IAQ drain pan and ultraviolet (UV) sterilizers downstream of cooling coils.
- Supply Fan Array Section complete with inlet backdraft dampers (no system effect type), piezo-ring type airflow measuring stations, and a motor removal rail.
 - Minimum four fans at 15 HP (60 HP each unit) with dedicated VFDs per fan.
- MERV 14 Final Filter Section
- Discharge Plenum

A combination relief air damper/relief air fan (5 HP, separate from the air-handling unit) for full outside economizer from administrative areas while maintaining positive building pressurization. A dedicated 1 HP general exhaust fan provides general exhaust for the office area. Both fans would be located within the screened area of the facility roof.

All fans would have variable frequency drives for capacity control. Supply air from air-handling units would be distributed throughout the building via medium pressure ductwork to single duct variable air volume terminal units with hydronic reheat. Separation of interior and exterior zones would be provided for optimum zone control. Laboratories, autopsy, and similar spaces would utilize pressure-independent venturi-type supply valves with hydronic reheat. A fixed airflow offset from exhaust would maintain the relative space pressurization relationships. Active pressurization control would be provided for the medical examiner circulation corridor to ensure the medical examiner suite remains negative from the office, observation, and non-lab support areas.

Office areas would generally utilize plenum return with return air ducted directly to the air-handling unit. Modulating control dampers would ensure positive building pressurization. The air distribution system would be constructed of G90 galvanized sheet metal, rectangular, round, or oval ductwork per SMACNA standards. In general, the HVAC system would be designed to maintain an acoustic noise criterion of less than 35 NC in occupied spaces in office areas and less than 45 NC in laboratory zones.

Telecom, electrical rooms, elevator equipment rooms (if provided), and other areas with 24-hour internal heat gains would be conditioned from ceiling or wall mounted DX fan-coil units fed from either a central variable-refrigerant unit or multiple outdoor units. Units serving electrical rooms and elevator machine rooms would be located outside of their respective rooms in compliance with the NEC. Outdoor units would be provided with hail guards and the assembly would be rated for hurricane force winds.

Dedicated fan coil units would be provided for the enclosed sallyport. Fan coil units utilizing both chilled and heating water (in reheat position for humidity control) would have the ability to increase ventilation for free-cooling economizer or to flush the sallyport during purge mode. Hydronic unit heaters at roll-up doors would provide for trim heating. (2) 8-foot diameter industrial circulators may provide increased circulation. Waiting areas within the sallyport would be served by the air-handling units.

With activation of carbon monoxide (CO) or nitrogen dioxide (NO₂) sensors at sallyport monitoring system, ventilation/exhaust would be increased to flush the sallyport (purge mode). Note that sallyport exhaust would be integrated into the laboratory exhaust system to improve energy performance.

Coolers within proximity of outdoors (if provided) would be served with desiccant dehumidifiers to remove moisture and prevent the development of ice.

LABORATORY EXHAUST SYSTEMS

The laboratory exhaust system would serve the medical examiner, potential toxicology, and sallyport. A dedicated general exhaust fan would be provided for office and non-lab areas excluding the sallyport.

The system consists of (2) 27,000 CFM exhaust energy recovery units with (2) 13,500 CFM laboratory exhaust fans each connected in parallel. Each exhaust recovery unit has isolation and bypass dampers to allow for continued exhaust operation with isolation of the energy recovery coil and pre-filters. The use of bypass outside air dampers near fan inlets allows for a variable amount of exhaust from the building while maintaining a constant stack velocity. Note that the energy recovery unit + laboratory exhaust fans are oversized such that one fan is redundant. Given oversizing, the maximum face velocity for coils is 500 FPM to reduce system pressure drop and increase energy efficiency.

The outdoor units would be designed for a site elevation of 450 feet above sea level and carry a Miami-Dade rating for hurricane resistance which includes ratings for intake openings where provided. Energy recovery units consist of the following components and sections:

- Inlet Plenum with modulating control damper and MERV 8 Pre-Filters
- Extended Energy Recovery Coil Section (minimum 6 rows with a heresite coating) with a modulating control damper.
- Bypass laboratory exhaust ductwork with a modulating bypass control damper around the unit allows for the unit to be isolated for service. Laboratory exhaust fans connect to the exhaust plenum downstream of the bypass damper with a bypass outside air control damper and inlet hood to ensure minimum stack velocity at laboratory exhaust fans.
- (2) 13,500 CFM 15 HP centrifugal laboratory exhaust fans, high speed motorized isolation dampers, inlet backdraft dampers, and piezo-ring type airflow measuring stations are provided per energy recovery unit. Provide packaged fan assembly with high velocity discharge nozzles together with dilution wind bands to promote mixing and dilution of exhaust air. Fan assembly to be Miami-Dade rated for hurricanes and secured to the roof.

Laboratory exhaust fans would have a protective paint coating together with a zinc primer and have remote VFD drives for capacity control. Laboratory exhaust ductwork would utilize minimum 20 gage G90 galvanized construction, with branch ductwork to autopsy stations, canopy hoods, and cart washing equipment in minimum 20 gage stainless or coated steel. Laboratory exhaust valves associated with stainless steel or coated ductwork would utilize stainless steel or heresite coated construction. All rectangular, round or oval ductwork would be constructed per SMACNA standards. All exposed outdoor laboratory exhaust ductwork to be stainless steel.

Considerations for the installation of a dual Bag-in/Bag-out HEPA filter assemblies with bubble-tight dampers would be provided for the Autopsy Suite. The units would be outdoor rated with multiple tunnels each and located within the screened roof area. Filter velocities would be sized for 300 FPM, with a single tunnel being redundant to support full airflow to support on the remaining filters with filter changing. Under normal operation, both sides of the tunnel are open allowing for reduced pressure drop and fan energy.

ENERGY MANAGEMENT AND CONTROL SYSTEM (EMCS)

To monitor and control building system systems, an electronic direct digital control system would be required. A direct digital control system would provide precise temperature control and include operational strategies to maximize the energy effectiveness and proper maintenance of the building systems. Control strategies for the air handling systems could include system start-stop, supply air static control, economy cycle, air conditioning, heating, outside air control, and maintenance routines.

Dedicated local lab controllers might be provided for autopsy, medical examiner, and potential toxicology lab areas. A centralized laboratory controller would consolidate the local controllers in one location and allow for integration into the EMCS. Such a configuration would allow for monitoring and set point adjustment. Local LED room pressure monitors would provide visual indication of negative space pressurization for main autopsy, isolation autopsy, medical examiner circulation corridor with active space pressurization control, and potential toxicology labs.

Laboratory equipment and evidence / cold storage areas would be monitored by the EMCS for alarms and provide notification of failures. Metering should also be provided to ensure optimum building performance. Items that can be metered and trended include, but are not limited to, the following: electrical total energy use, mechanical energy use (through VFDs and controllers), lighting energy use, natural gas (if provided), building water use, and irrigation water use.

An EMCS's historian (software) could provide trending information for laboratory zones and equipment for the purpose of documenting the testing and storage areas' local environmental conditions (potential toxicology). Provisions to support an energy dashboard output is recommended in order to highlight energy use and provide a means to document system optimization.

INNOVATION INITIATIVES

An evaluation of sustainable strategies may be coordinated, with mechanical emphasis primarily in energy, indoor environmental quality, and efficient use of water. Systems alternatives might include solutions that support electrification, decarbonization, and promote energy reuse.

The use of cooling, heating, and recovery systems, combined with reduced face velocities of the air-handling units, would provide improved energy performance when compared to minimum, code-compliant configurations. The incorporation of alternative system solutions can further improve systems energy performance.



ELECTRICAL SYSTEMS

ELECTRICAL DESIGN OBJECTIVE

This electrical design narrative describes the electrical systems for the proposed Wake County facility. The intent is to describe electrical work to be performed and materials to be provided that will provide flexible systems designed to be cost effective, energy efficient, environmentally friendly, and easily maintainable.

ELECTRICAL GENERAL OVERVIEW

CODES AND STANDARDS

NEW SITE ELECTRICAL UTILITIES

POWER DISTRIBUTION

METERING

BACKUP EMERGENCY POWER

UNINTERRUPTIBLE POWER SUPPLY – LOCALIZED

POWER QUALITY

GROUNDING

LIGHTNING PROTECTION

GENERAL ELECTRICAL MATERIALS

LIGHTING DESIGN

LIGHTING CONTROL

SUSTAINABLE INITIATIVES

SPECIAL SYSTEMS

VALUE OPPORTUNITIES

CODES AND STANDARDS

The latest version, or current adopted version, of the following codes and standards will be used as:

- 2018 International Building Code (IBC) with Local Amendments
- 2018 International Electrical Code (IMC) with Local Amendments
- 2018 International Plumbing Code (IPC) with Local Amendments
- 2017 National Electrical Code (NEC) with Local Amendments
- National Fire Protection Association (NFPA) Standards
- 2018 National Fire Alarm and Signaling Code with Local Amendments
- FM Global Standards and Certifications
- National Fire Protection Association (NFPA)
- Illuminating Engineering Society of North America (IESNA)
- American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Standards
 - ASHRAE 90.1-2016 – Energy Standard for Buildings Except Low-Rise Residential Buildings
- Leadership in Energy and Environmental Design (LEED) v4
- American Society for Testing and Materials (ASTM)
- American National Standards Institute (ANSI)
- Occupational Safety and Health Administration (OSHA)
- Underwriters' Laboratories (UL)

NEW SITE ELECTRICAL UTILITIES

For this study a specific site has not been selected and there is the potential to expand from approximately 20,000 sqft to 37,500 sqft. The intent of this analysis will be to plan for the full buildout of the building distribution of 37,500 sqft.

It is assumed that the ground level of the site is not in a floodplain.

The intent is to reserve space for a future MV transformer and service dedicated for Electric Vehicle Charging.

It is assumed that new Medium Voltage (MV) manholes will be provided to serve local MV transformers for the new buildings.

It is intended that all site power will be fed from underground and will be coordinate on the site with the utility design. All new utility equipment shall be located in a mutually acceptable and secure location with limited and coordinated visibility in conjunction with the utility company.

It is expected that all new underground service laterals are recommended to be grouped together in a shared duct bank with no more than (8) 4" conduits. The new ductbank will feed across the site to a new pad mounted MV transformer. The MV transformer and primary feeders are assumed to be provided by the utility company. Trenching and backfill for all primary and secondary feeders are recommended to be provided by the contractor as well as primary and secondary ducts/duct banks, transformer pad, and secondary conductors. No medium-voltage ductbanks will be allowed to be routed beneath the building structure.

The new pad mounted transformer is assumed to be provided and connected by the utility company. The MV transformer is assumed to be FM Approved, oil-filled, less-flammable type. The new MV transformer is to be rated and provided by the utility, it is assumed to be **2,000kVA** footprint for the Wake County Facility.

POWER DISTRIBUTION

A new MV transformer will supply a **2,500A with 2,500A bussing**, 277/480V, 3ph, 4w Service Entrance Section (SES) switchboard for the Wake County Facility. The Main Breakers shall be within the same enclosure. Pathway provisions for a future PV systems are recommended at the building service and there may also be pathway provisions for a potential future phase PV system to connect to the building. The switchboards are sized to the nearest nominal value based on the Electrical Load Estimate. A future built-out spare breaker capacity is recommended to be provided proportionally to any future area potential. A 20% built-out spare breaker capacity should also be provided.

The SES boards shall be configured at 277/480-Volt, 3-phase, 4-wire with a main breaker, ground-fault protection, and arc energy reduction devices. The SES board and building Distribution boards should include adjustable, LSIG breakers for the Main and Feeder breakers as a minimum. The SES boards shall distribute power throughout the project; distribution boards shall distribute power throughout the designated areas. The SES boards should be located indoors and adjacent to the electrical room on the ground level and/or above the 100 year flood plain. The main electrical room houses distribution sections, dry-type step-down transformers, and panelboards. The voltage are stepped down by transformers to 120/208-Volt, three-phase, four-wire to feed loads throughout the facility.

SES boards also include a building level meter that integrate with the BMS system. This is recommended to be accomplished as a digital connection. Refer to the metering section of this report for more information. There should also be a SCADA connection provided for remote monitoring of distribution equipment as required by Wake County.

It was requested that space is to be reserved in the room for a future service dedicated to a new service for Electric Vehicle charging. Pathways and pullboxes are recommended to be provided in the initial scope and routed to a low impact location on the site.

It is understood that power quality conditioners, including Harmonic Filter/Capacitors, are not required.

Refer to the Plumbing Narrative for more detail, but it is understood that a Fire Pump connection will not be required for this facility.

Demand Response system is understood to not be required.

PV Provisions are assumed as empty conduit with pull string to each potential canopy location in the secure parking area, PV rated meter, and end of line reserved breaker space. A high-level PV Load Estimate based on the overall bus rating has been provided in the table below for basis of design future planning.

PV ESTIMATE (AT BUSS RATING)		
Below is a rough estimate of the maximum breaker ratings and conduits needed if the service is provided with PV provisions as allowed by NEC 705.12(B)(2)(b) - (120% RULE)		
Service Bus Rating	2,500 A	Limiting Value
Service Breaker Rating	2,500 A	
120% Allowance	3,000 A	Max PV Connection
	500 A	Max Breaker Value
(2) Sets of 3" C.		

A breakdown of the Electrical Load is estimated in the following table:

M.E. ELECTRICAL LOAD ESTIMATE (C)				
AREA	SQFT	37,458	TOTALS	
	VA/SQFT		VA	AMPS
LIGHTING	1.72		64,428	77
POWER	7		254,714	306
HVAC	30		1,124,864	1,353
	SPARE	20%	288,801	347
GRAND TOTAL:			1,732,807	2,084
2500A, 480V/3PH SERVICE				

It is recommended that Electrical rooms should be provided on each floor and at each area of the Wake County Facility. Electrical rooms shall have separate 277/480-Volt panels for distribution to lighting and mechanical equipment as well as 120/208-Volt panelboards for distribution to receptacles and other miscellaneous loads.

All branch circuit power panelboards are recommended to be a single section with 84-ckt minimum. Heating, ventilating and air conditioning (HVAC) equipment and select specialty appliances and equipment are recommended to be supplied with 480-Volt, three-phase power where required. HVAC equipment shall be controlled by individual motor starters or variable frequency drives (VFDs) if controls are not furnished with equipment.

If occupancy sensing is required or recommended by the mechanical system during energy analysis, then the lighting occupancy sensors shall also tie into the BMS system in order to control VAV and FCU output during occupied and unoccupied modes. The occupancy sensors would be networked to a central panel and a single terminal would be integrated into the BMS system. This integration is to utilize the lighting occupancy sensors as much as possible and not provide VAV-only occupancy sensors if it can be avoided.

Refer to the Mechanical Narrative for the HVAC system summary. The electrical connections to mechanical equipment are recommended to be provided with individual disconnects mounted local to the equipment. All mechanical equipment are recommended to be connected to the 277/480-Volt distribution system. If electrical characteristics are coordinated prior to procurement integrated fused disconnects with HVAC equipment will be considered. Any equipment located outside will be provided with weatherproof housings. Weather-resistant GFCI receptacles with Wet-Listed, In-Use covers within 25 feet of all mechanical or plumbing units will be provided.

Lighting will be served from 277-Volt circuits. Refer to the Lighting Section of this narrative for more information.

If in the future Wake County would like to comply to LEED there is an assumed penalty to the energy model for not providing switched receptacles as a prerequisite. Energy compliance can be met under IECC with switch receptacles not being provided. Private Offices and Open Offices as required can be offset by an energy model penalty and not installed.

Power for plug loads are recommended to be distributed throughout the facility with wall receptacles, above counter receptacles, and above counter surface raceway in appropriate locations. General branch circuit are recommended to be designed with a maximum of six general use duplex convenience receptacles on one 20-amp circuit. Additional special dedicated receptacles should be provided for equipment, refrigerators, disposals, vending machines, microwaves, copiers, etc. where required. Specialty equipment heights are to be coordinated with the specific equipment.

Systems furniture are recommended to be powered from the wall or floor as required, similar to office receptacles. The intent for Open Office areas would be to provide a plug and cord system, and not a systems furniture whip.

All penetrations into and conduits passing the Autopsy areas shall be stopped and sealed to prevent condensation, insect pollution, and odor travel. Wall receptacles in the Autopsy Suite shall be provided with GFCI, weather-resistant devices and in-use covers in 2' OC increments above countertop spaces. It is assumed that the Autopsy Station headwall is pre-wired with limited points of connection. Each Autopsy table is recommended to be provided with a 40' cord reel with double GFCI duplex receptacles.

Special dedicated receptacles are recommended for laboratory equipment where required.

Floorboxes shall be provided in appropriate locations, recommended to be distributed throughout the space to provide flexible layouts. At a minimum (2) duplex receptacles are recommended for each floorbox. The floorboxes can be shared with and include devices for AV and IT requirements. As required by the NEC 2017 all conference or meeting-like rooms greater than 200sqft shall be assumed to require floorboxes until validated otherwise.

Combination USB receptacles are recommended to be provided strategically in public waiting areas and all charging stations for visitors' convenience.

Provisions for special trailer connections should be located on the site to accommodate Refrigeration Trailers in coordination with the area's response framework; provisions include standalone pedestals or wall- type connections.

METERING

A utility meter shall be provided for the Wake County Facility.

Owner defined metering are likely required. The specific monitoring points shall be defined during the design phase, but are assumed to be included in the elements listed below.

ATS units are recommended to be specified with integral metering and BMS integration.

Metering the motor loads can predict efficiency losses and operational tuning of the building. The VFD should be provided with internal energy meters that report back to the BMS.

The external metering system, if provided, shall be tied back into the central BMS system which can calculate and totalize the performance of the building. All meters should have accuracy listed for the use of billing reports.

Any metering devices provided shall be strategically located to minimize the number of locations and quantity. Distribution level and external meters, if provided, should be located in the main electrical room.

BACKUP EMERGENCY POWER

The requirements of the emergency system are to be discussed with the Wake County in detail upon project initiation, including approaches for emergency operations and performance during an outage. According to Wake County, it is not uncommon for extended outages to occur for as long as two-weeks. It is understood that operations in the building would pause no longer than 72 hours before attempting to resume regular working hours for emergency work while on generator. The following recommendations for the emergency system are provided planning development.

Emergency systems are intended to provide the required life safety branch (NEC 700) and a series of optional stand-by branch systems (NEC 702). The emergency and stand-by systems shall consist of a series of priority ranking automatic transfer switches (ATS), which shall transfer power in rank of priority and in reference to legal and owner defined parameters. All ATS units are recommended to be located in a collective location in the building.

The recommended basis of design for the Wake County Facility would include the partial build-out of an emergency system including (1) 750kW Day-1 Diesel Generator with the provisions and ability to add a future generator to a 2,500A distribution board with fully rated triple-switch configuration and interlock control. This configuration would be sized to serve code required loads (Life Safety 700, Legally Required 701) with critical refrigeration devices and support for an orderly shut down, assumed as about 50% of the total building load. Refrigeration devices include walk-in coolers and site mobile refrigeration units. HVAC would be assumed to reduce to a minimum and provided limited runtime. Wake County's preference is to provide a scheme that will allow an N+1 configuration for emergency management.

It is recommended that the generator be located in an outdoor, limited/restricted access yard on the ground level with a sub-base fuel tank, assuming that the ground level is located above the 100 year floodplain.

As required by the NEC, when there is a single generator serving emergency loads (NEC 700) a roll-up generator connection shall be provided. A triple-switch type connection matching the distribution board rating should be provided in the utility yard in lieu of separate load bank terminals.

If preferred by Wake County, a full service rated cam-lock cabinet connected to the SES can be provided for a temporary generator in the event of an extended outage.

During an outage it is recommended that non-essential mechanical systems will reduce to a minimum required load with minimal re-heat for an orderly shut-down. The reduction in load will be managed by the BMS and coordinated between the HVAC and electrical system. Once the orderly shut-down is complete the BMS will have the ability to deactivate the HVAC system.

A walking platform could be provided for maintenance and accessibility; refer to image below as an example.



Emergency loads may include the following:

A Life Safety branch: The intent of the Life Safety branch would be to comply to code required system connections.

- Life Safety Priority 1
 - All illumination of means of egress
 - Exit signs
 - Fire alarm systems
 - Access Controls
 - Security Panels/Locks
 - Elevator Support Equipment
 - Lighting
 - Receptacles/Power

Optional Stand-By branches: The intent of the Optional Stand-by branch(es) would be to provide electrical coverage for the Users and Occupants to be able to systematically and safely shut-down non-critical pieces of equipment while maintaining essential equipment. It is expected that there would be strategic equipment required for maintaining full operation during and throughout an outage. It is expected that the facility is to have a long operating life; therefore, will be strategically organized to meet the needed flexibility and redundancy of all systems in the building.

- Optional Stand-by Priority 2
 - MDF/IDF Room Racks and support equipment
 - MDF/IDF/Control room systems
 - All telephone equipment.
 - **All essential refrigeration and freezer equipment.**
 - Lighting in the facility required so that necessary functions can continue in a normal power outage (is not required to include storage rooms, non-critical office and similar areas).
 - Egress lighting is to be included in the Life Safety equipment
- Optional Stand-by Priority 3
 - Medical Exam Distribution
 - All loads in the facility required so that necessary function can continue or for a systematic shut-down in a normal power outage (does not include general purpose outlets, vending, break rooms and similar areas).
 - Equipment as defined by the User and accepted by the Owner
 - All other items as directed by owner required so necessary functions can continue in a normal power outage.
- Optional Stand-by Priority 4
 - Pre-determined mechanical systems in the facility
 - Necessary functions that are required to continue in a normal power outage to serve critical areas
 - Intending to have full mechanical connections to this branch for full redundancy of connections
 - Generator would be rated for emergency loading only



The generator(s) should have the following accessories:

- Motor rated per installed site altitude
- An electronically operated output breaker sized for the rated load
- A sub-base mounted fuel tank capable to power the Building Generator for based on the scenarios described in this section of the report:
 - 24 Hours Fully Loaded (to be confirmed by the Owner, with no less than 2 hours)
 - Wake County houses and deploys their own fuel
- The base mounted tank to be provided with code required containment.
- Lead calcium batteries and battery charger.
- Jacket water heater.
- Control panel
- Muffler (critical grade).
- Weather protective housing
 - Marine/Evaporative-Salt Rating
- Sound Attenuated housing, Level 2 minimum
 - Sound shall meet all required Noise Ordinances per Wake County
- Remote annunciator panel
- Power-zone Accessories Panel
- Full BMS monitoring

The automatic transfer switches shall be 480/277 Volt, four-pole with time delay and auto exercising feature, with internal meter reporting, and sized to the nearest nominal value. The ATS will be sized to meet both the maximum short circuit current available from the combined sources (in case of a direct fault during transfer). By-pass switch sections are recommended to be provided as a-part of this project scope.

UNINTERRUPTIBLE POWER SUPPLY – LOCALIZED

For general building equipment local Uninterruptible Power Supply (UPS) units are recommended to be provided by the owner or equipment manufacturer local to the device or equipment requiring a non-interrupted power source. This building is assumed to be a non-centralized system.

A cost alternate should be provided for a centralized UPS system that would include sensitive autopsy equipment, MDF/IDF, and sensitive laboratory equipment and corresponding distribution boards with adjacent UPS panelboards.

POWER QUALITY

As noted in the Power Distribution section of the report, a power quality conditioner Harmonic Filter/Capacitor may not be provided due to local power quality issues.

Surge Protective Devices (SPD's) should be installed at the Service Entrance Sections (SES) and downstream at the distribution panelboards. Panelboards feeding sensitive equipment should also be protected by SPD at the distribution board level.

GROUNDING

The electrical power distribution systems should be provided with a "single-point ground system" and made available in all telecommunication rooms and exam/laboratory corridors for signal ground referencing purposes. Interconnection of the service ground, system neutral, and equipment grounded conductors shall be made within the service equipment.

The ground bus at the main service equipment shall be connected to a concrete-encased grounding electrode, building water piping system, building gas piping system, building perimeter ground ring, and building steel.

Each electrical and telecommunication rooms are recommended to be provided with a ground buss bar.

All transformers shall have the neutral of the separately derived system bonded to building steel, the nearest metal water pipe, and the transformer enclosure. An insulated ground conductor shall run back to the supply equipment in same raceway as the phase conductors.

An insulated equipment grounding conductor should be installed with feeders and branch circuits. Metal raceways, boxes, equipment, receptacles, and light fixtures shall be bonded to the equipment grounding system.

LIGHTNING PROTECTION

Based on the location, building dimensions, and building contents lightning protection is recommended for the Wake County Facility, and should be specified as a NFPA 780 and UL listed and tested system for the building. As a system that should be installed meeting the UL Master Label requirements and as recommended by NFPA 780, lightning protection calculations shall be specific to the site location and function of the building.

Earth electrodes and down conductors should be provided through the structure. This system shall include air terminals and conductor downleads as required and coordinated with the façade of the building. If the building is of steel structure, the down conductors will be bonded to that steel, which will serve as down conductors for the building

A counterpoise ground system shall be provided.

Ground rods shall be copper clad steel or stainless steel and should be inter-connected with copper grounding conductors.

GENERAL ELECTRICAL MATERIALS

The following are recommended general specifications for electrical materials.

Switchboards shall be free-standing, NEMA 3R, with metering compartment per Owner's requirements installed on concrete housekeeping pads. Main breaker and feeder breakers shall be fully A.I.C. rated; series rating is not acceptable. All bussing shall be copper. Neutral and ground bus shall run the entire length of the switchboard.

Panelboards shall be provided with a "door-in-door" construction with bolt-on breakers to allow for the entire front cover to swing open for easy maintenance. Panelboards shall be copper bus and fully A.I.C. rated. A.I.C. ratings for each switchboard and panelboard shall be determined based on a short-circuit current study. Below is a list of minimum requirements.

- ~ 10K.A.I.C. minimum for 120/208 volt panelboards

- ~ 14K.A.I.C. minimum for 277/480 volt panelboards

If the electrical or mechanical closets are provided with liquid fire sprinkler coverage, sprinkler shields shall be provided.

The contractor shall include in the project scope the short-circuit, fault, and arc rating analysis based on the final submitted manufacturer. The final Coordination Study working file (SKM or Approved Equal) should be provided in the final Operations Manual to the owner prior to project close-out.

Solid state circuit breakers are recommended to be provided at all main circuit breakers and feeder breakers where necessary to achieve selective coordination of overcurrent protection devices and arc energy reduction. Adjustable Long Time, Short Time, Instantaneous, and Ground Fault breakers are recommended to be provided as required in the service and distribution equipment to provide a selectively coordinated system.

Electronically Operated breakers are recommended to be provided at the generator and/or generator distribution to provide integral paralleling controls.

Distribution panels and power panels are recommended to include circuit breaker-type utilizing molded-case and insulated-case breakers. Lighting panels are recommended to be commercial-type with bolt-on circuit breakers.

Transformers shall be provided to convert 480-volt power to 208Y/120 volts for receptacle and equipment needs. Transformers shall be NEMA I or 3R as required. Transformers shall be standard high efficiency, NEMA STP TP1 dry-type rated for 115 degree C rise. Windings should be copper unless otherwise approved by the owner. Transformers rated 75kVA or smaller may be wall, suspended, or floor-mounted. Transformers rated 112.5kVA or greater are to be floor-mounted, stacked, or suspended. Transformers should be located in the electrical rooms as necessary for the 120/208-Volt distribution. Isolated ground transformers are recommended to be provided where required. Provide "isomode" pads under all transformers.

Disconnect switches shall be heavy-duty fuse type. Exterior switches shall be rain-tight.

Magnetic motor starters shall include hand-off-auto (H-O-A) switch, auxiliary contacts, control power transformer, and a motor running pilot light. Starters shall have a minimum inrush rating of 140% of that for a standard motor to meet the NEC requirement for use with energy efficient motors. Loose starter shall be combination-type with an MCP.

All distribution equipment shall be of the same manufacturer. Manufacturers to be considered include Square D, Siemens, Eaton Cutler Hammer

Raceways shall be as follows:

- MC cable shall not be allowed without Owner authorization.
- Rigid steel conduit – feeders, branch circuits, exposed.
- PVC – feeders and branch circuit underground.
- EMT – feeder, branch circuits, and low tension.
- Flexible Metallic Conduit (FMC): May be used in dry locations for connections from adjacent outlet boxes to motors, transformers, vibrating equipment and machinery and lighting fixtures installed in suspended ceilings, minimum sizes shall be 3/8" for lighting fixtures and control wiring and 1/2" for motor and transformer connections.
- Liquid tight Flexible Metallic Conduit (LFMC): May be used in damp and wet locations for the same applications as for Flexible Metallic conduit specified under this Section. Connections to all pump motors, solenoid valves, float switches, flow switches and similar devices shall be made using liquid tight flexible metallic conduit. Minimum sizes shall be 3/8" for lighting fixtures and control wiring and 1/2" for motor and transformer connections.

All penetrations into acoustically sensitive areas shall be provided with acoustically putty. All surfaces are to be reviewed prior to the finishes being applied.

All penetrations and back-boxes into Autopsy suites shall be puttied, sealed, and capped to prevent the transfer of odor and pests. All surfaces are to be reviewed prior to the finishes being applied.

Wire and Cable:

- All wire shall be copper, with no exceptions without written authorization by Owner.

Outlet, Pull and Junction Boxes:

- There shall not be horizontal runs through stud walls; all pathways shall homerun in an accessible ceiling space.

Wiring Devices:

- Cover plates shall be stainless steel in Lab areas and thermoplastic white elsewhere.
- Devices in the Autopsy areas shall be provided with In-Use covers.
- Receptacles in the Autopsy areas shall be WR, GFCI rated.



LIGHTING DESIGN

Lighting for the facility should meet the lighting-level recommendations of the IESNA Handbook as well as be designed to balance energy efficiency, cost considerations, and sound lighting design principles. Daylighting controls should be introduced in appropriate locations to provide comfortable ambient light levels while reducing the cost of energy from electric lighting systems during the day. Selected lighting fixtures shall be conducive to the performance of visual tasks while providing general visual comfort for the occupants. In addition, the selection of lighting fixtures should consider the aesthetics of the space, energy and economic constraints, energy efficient light/driver/power supply sources, and lighting fixture standards.

INTERIOR LIGHTING

Lamp types are recommended to be limited to LED for maintenance and stocking purposes. Linear LED fixtures are recommended to be specified with dimmable high efficiency electronic drivers and as appropriate for the interior space. Standard lengths for linear fixtures are recommended to be in 1 foot increments and custom lengths where appropriate. Other LED lamp applications include downlights, spot lights, flood lights, and decorative fixtures. LED boards are recommended to be specified as replaceable without uninstalling the housing by the manufacturer for maintenance purposes. All LED sources shall have a baseline color temperature of 4000K with a color rendering index (CRI) of 90 or higher. All LED sources shall have a minimum listed life of L70 (or 24,000 hours). Indirect lighting are recommended to be prioritized to reduce glare and eye strain. All light fixtures shall be a coordinated selection with the program design.

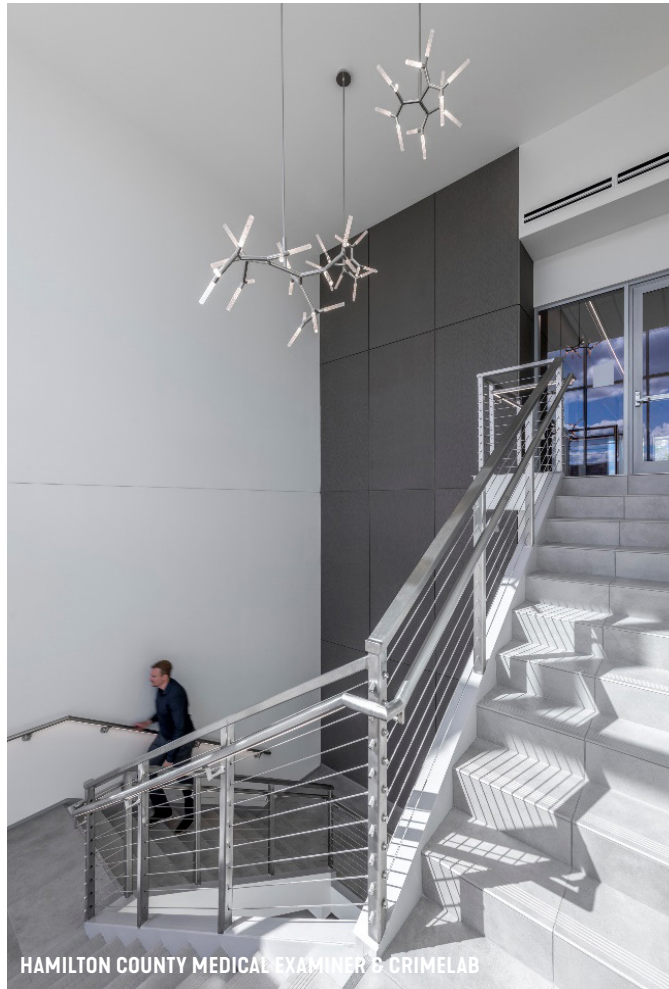
Target Illumination Levels	
Space Type	Target
Office	30FC AVG @ 30" AFF
Collaboration	30FC AVG @ 30" AFF
Public/General	10FC AVG @ Floor
Support	20FC AVG @ Floor
Morgue	100FC AVG @ 36" AFF
Autopsy (Table)	500FC AVG @ Task (36" AFF)
Walk-in Cooler	50FC AVG @ 30" AFF
Sallyport	30FC AVG @ 36" AFF
Crematory	50FC AVG @ 36" AFF

Minimum lighting standards shall be defined as average maintained foot-candles (within the range of -10% to +25%) over the life of the lamps.



The following is an outline of potential fixture types:

- Lobby
 - Mullion mounted continuous LED fixtures.
 - Recessed continuous LED fixtures can provide vertical brightness to the lobby and establish way-finding for transition.
 - All soffit and soffit-like lighting shall be accessible.
 - Decorative pendant fixtures can be used to highlight reception areas.
- General Transition
 - Linear recessed/pendant LED fixtures with backlit diffuse acrylic lensing provide functional lighting to the corridors.
 - LED downlights.
- Collaboration Area/Office Area
 - LED Pendant mounted linear LED fixtures with components allowing multi-functional lighting.
 - Pendant mounted linear LED fixtures with direct and indirect components allowing multi-functional lighting.
 - Recessed LED Troffer Panels.
- Multi-purpose room and Conference rooms
 - Pendant mounted linear LED fixtures with direct and indirect components allowing multi-functional lighting.
 - LED downlights provide functional lighting to the entry areas.
 - Perimeter lights and wall recessed linear LED fixtures for accent lighting.
- Shower Rooms/Restrooms
 - Lensed LED downlights light the toilet and shower area of the bathroom.
 - Showers shall be provided with non-conductive trim.
- Technical Spaces
 - High output troffer LED fixtures with direct and indirect components allowing multi-functional lighting.
 - Exam area lighting will allow for complete darkness where lighting control is critical to and color rendering is sensitive.
- Autopsy Suite/Clean Space
 - 2' x 2' / 1' x 4' wet listed high output troffers.
 - Round Super High-output wet-listed downlights above the autopsy station.
 - All autopsy exposed areas shall have fully gasketed light fixtures that are capable of being wiped down and direct pressure of liquid spray. Gasketing helps minimize damaging exposure to liquids, allows the fixture to be cleaned, minimizes the transfer of odors, as well as limits opportunities for insect transfer. All lighting conduit entering the autopsy suite shall maintain the internal and external sealing of the conduit.



EXTERIOR LIGHTING

For exterior applications the design shall be guided by IESNA Handbook recommendations for walkways, employee safety, and security camera requirements.

LED lighting options should be considered first for their energy efficiency and long lamp life. Fixture selection shall be cognizant of Dark Sky ordinances for cut-off fixtures and shall incorporate reduced lighting levels for post-curfew hours as required.

All lighting shall be served with underground cable and underground served poles. All pole based are to be grounded with 20'-0' of #2 copper wire and rated for a 100 mph wind loading. All pole mounted fixtures shall be fused and breakaway type. At minimum, all exterior lighting shall have the following IP ratings:

- IP64 rating for under canopy lighting.
- IP65 rating for pole top lighting, wall mounted lighting and all other exposed lighting installed 2ft above the ground plane.
- IP66 rating for all exposed lights installed below 2ft above the ground plane.
- IP67 rating for all recessed inground light fixtures flush with paving and lights installed in architectural details that are subject to water retention.
- IP68 rating for all lighting that will be continuously submersed in water i.e. lighting in recessed patio areas, etc.

In addition to required lighting for exterior spaces, the lighting design team shall explore opportunities for key architectural features that may include landscape lighting, façade lighting, and public art or sculptural feature illumination.



- Building Entrances
 - Entrances and soffits shall be illuminated with LED downlights and LED canopy mounted fixtures.
- Exterior Patios
 - Entrances and soffits shall be illuminated with LED downlights.
- Parking Lot
 - LED bollards mounted within the perimeter planting beds provide low level brightness to the side-walks and a non-uniform functional lighting to the outdoor space.
 - LED light poles for safety lighting to define parking area.
- Paved Sidewalk along Entry
 - LED bollards or pedestrian scale poles mounted along the perimeter to provide low level bright-ness to the paved walkway areas.
- Loading Areas
 - LED Wallpacks will be building mounted to provide for functional lighting while in-use.



TRAVIS COUNTY MEDICAL EXAMINER

EMERGENCY AND EXIT LIGHTS

Emergency lighting shall be provided along the paths of egress in accordance with the life safety code (NFPA 101), providing average illumination of 1 foot candle (10 lux) along the path of egress and 10 foot candles (100 lux) at all new stair treads.

Emergency and exit lighting shall utilize the life safety branch of the generator system.



SAN DIEGO COUNTY CRIME LAB

LIGHTING CONTROL

The lighting control system shall be designed to comply with the requirements from IECC and ASHRAE with consideration of the LEED prerequisites (if applicable), as well as the needs for the program of the building.

Each electrical room is recommended to be provided with a lighting control system for both normal and emergency system control systems. The main lighting control interface is recommended to be located on the ground level and integrate with the Building Management System as necessary for monitoring to provide HVAC controllability. The interface shall be designed as a single point to the BMS system providing the status of the occupancy sensors, status of the lighting levels, and energy utilization of the control zones.

The automatic shut-off controls for the building are recommended to be a combination of a lighting control system (LCS) for common areas and localized occupancy sensors in restrooms, utility rooms, and other small spaces. Localized sensors are recommended to be prioritized over lighting control programming. The intent is to minimize the amount of time-dependent lighting.

Light level tuning, beyond daylight harvesting, is not anticipated. Dimming shall be manual.

Multilevel lighting controls shall be provided as necessary with the appropriate dimming scheme and local override controls. Areas with dimming control shall include, but are not limited to, group spaces, lab spaces, and individual working zones. Additional spaces may be provided dimming control based on the needs of the program.

Dual-technology (passive infrared/ultrasonic) is the default occupancy sensor type. Occupancy sensors are recommended to be used for control of storage spaces, bathrooms, mechanical rooms, and other areas subject to intermittent occupancy.

Occupancy sensors shall also integrate with the BMS system to control VAVs where specified and as noted in the Power Distribution section of this report.

Daylight sensors are recommended to be used to lower lighting levels when natural lighting is sufficient. Areas of consideration are general transition spaces, lounges, lobbies, and primary side-lit areas.

Exterior lighting is recommended to be routed through, and integrated with, a scheduled lighting control system. Astronomical programming is recommended to be utilized in conjunction with occupancy control and photometric controlled dimming. It is recommended to provide occupancy based high/low light levels with either on-board integral occupancy sensors or a series of wall mounted weather rated sensors. All decorative lighting shall be provided full dimming.

SUSTAINABLE INITIATIVES

Electrical sustainability initiatives are recommended to be pursued in compliance with code, best practice, project goals, forward thinking, and in alignment with the Owner's commitments. Additional initiatives of substantial cost are recommended to be reviewed by the owner. Examples of additional initiative may include extending the metering system, installing a PV system, and electric vehicle stations or EV provisions.

EV provisions shall be provided.

Provisions may be considered for a future PV system.

It is understood that a Demand response provisions will not be provided.

It is understood that LEED compliance is not a requirement of this project.

Electrification is not a requirement of this project but should be reviewed in more detail in later iterations of the project development. Wake County has indicated that if the impact of electrification is manageable, the system will be considered.

SPECIAL SYSTEMS

Special systems requirements shall include fire alarm system and infrastructure for telephone, data (cable tray, conduit, back-boxes), security (card access, intrusion and close circuit television (CCTV) systems), audio/visual, paging, CATV, and building management systems. Infrastructure shall include all conduit, pull string, and boxes required to support the applicable systems.

The basis of design shall include conduit in-wall to accessible ceiling with j-hooks to cable tray to for all normal special systems; all conduit should be 1" minimum.

FIRE ALARM SYSTEM

The facility fire alarm system shall be a deferred submittal, delegated to the contractor and specified as an intelligent microprocessor-based, voice-evacuation fire alarm system complete with individually addressable alarm and initiating devices. The approved manufacturer will be required to provide a complete and coordinated design signed by an approved Fire Alarm engineer for approval by the Authority Having Jurisdiction (AHJ) prior to procurement. The basis of design shall be Edwards with Fire-lite.

System components should include a Fire Alarm Control Panel, Fire Alarm Annunciator Panel, manual pull stations, automatic fire detectors, speakers, clear and amber strobes, combination speaker/strobes, and remote-control devices. Closed loop initiating device circuits with individual zone supervision, individual indicating appliance circuit supervision, and incoming and standby power supervision should be used.

The Fire Alarm system monitors manual pull stations (double action with sounder at all floor and ground level exits), smoke detectors, water flow and tamper switches, air-handling equipment, elevator status, air bleeders, fire pump status, chemical injection systems, and miscellaneous supervisory devices and will be zoned per device. The Fire Alarm system shall provide coordinated supply side duct detectors on all AHU and fan coil units when required. Provide independent supervision for opens of the air handling on/off/auto switch control output wiring and grounding. Provide sprinkler supervisory initiation device circuits for connection of all sprinkler valve tamper switches to perform the Supervisory Service Operation.

The Fire Alarm system shall have battery back-up in the central control panel.

The Fire Alarm system shall report back to the Security Office and interface with the security system and elevator.

The all open high-bay spaces are to be analyzed and provided Photoelectric Projected Beam Detectors as required.

The Fire Alarm system shall include Emergency Responder Radio Coverage if required by the AJH. All pathways shall be coordinated and provided with the Emergency Responder Radio system.

All doors normally held open by door control devices shall release upon AC power failure.

The Fire Alarm system shall provide an connection to the generator controls to monitor if the generator is running or has a fault. The Fire Alarm system shall also provide a connection to the ATS units to monitor the position.

A Mass Notification system is not expected to be included in the project scope.

All fire alarm wiring is recommended to be installed in conduit. Fire alarm system junction-boxes and conduit shall be pre-finished, red color. Each device shall be identified with circuit information on vinyl label. Each junction box shall be labeled with circuit information.

It is assumed that Clean Agent systems are not currently in this project scope but is to be coordinated if specified by the Fire Sprinkler design.

The design shall include a 25% spare capacity for future use.

COMMUNICATION SYSTEMS

Every telephone/data outlet shall be furnished as a double gang wall box, single gang plaster ring and conduit to accessible ceiling; conduit shall be 1" minimum.

A cable tray system is assumed to be required. Cable tray are recommended to be in the corridors to transition data cables to data zones from the MDF/IDF rooms. It is assumed that the cable tray will be limited to communications only. J-hooks shall be provided by the cabling contractor.

The basis of design shall include conduit in-wall to accessible ceilings with j-hooks to cable tray to for all normal telephone and data systems.

CARD READER AND SECURITY SYSTEMS

A conduit system shall be installed as part of this project. The basis of design shall include conduit in-wall to accessible ceilings with j-hooks to the associated closet to for all normal card and security systems. The basis of design system may be coordinated with Gen-Tech and Stanley.

AUDIO/VISUAL AND PAGING SYSTEMS

A conduit system shall be installed as part of this project. The basis of design shall include conduit in-wall to accessible ceilings with j-hooks to the associated closet to for all normal AV and Paging systems.

VALUE OPPORTUNITIES

All value requests shall comply with the project requirements, local code(s), and AHJ requirements.

The following value opportunity has been expressly rejected by the owner:

- Aluminum wire

PLUMBING SYSTEMS

PLUMBING DESIGN OBJECTIVE

The following narratives describes the conceptual basic plumbing work to be performed and materials to be provided for the new Wake County Facility. The goals for the facility include plumbing systems that are cost effective, energy efficient, environmentally friendly, and easily maintainable.

PLUMBING GENERAL OVERVIEW

CODES AND STANDARDS

PLUMBING SYSTEMS SUMMARY

SANITARY WASTE & VENT SYSTEM

CONDENSATE DRAIN SYSTEM

ROOF DRAIN SYSTEM

DOMESTIC COLD-WATER SYSTEM

NON-POTABLE WATER SYSTEM

DOMESTIC HOT WATER SYSTEM

EMERGENCY FIXTURES

LEGIONELLA PREVENTION FOR DOMESTIC WATER SYSTEM

NATURAL GAS SYSTEM

PLUMBING FIXTURES

PIPE MATERIALS

FIRE PROTECTION SYSTEMS

AUTOMATIC SPRINKLER SYSTEMS

CODES AND STANDARDS

The latest version, or current adopted version, of the following codes and standards shall be used as references in the design of the building:

- 2018 International Building Code (IBC) with Local Amendments
- 2018 International Mechanical Code (IMC) with Local Amendments
- 2018 International Plumbing Code (IPC) with Local Amendments
- 2017 National Electrical Code (NEC) with Local Amendments
- National Fire Protection Association (NFPA) Standards
- American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Handbooks
 - ASHRAE 90.1 – 2016
- American Society for Testing and Materials (ASTM)
- American National Standards Institute (ANSI)
- Occupational Safety and Health Administration (OSHA)
- Underwriters' Laboratories (UL)
- Sheet Metal and Air-Conditioning Contractors National Association (SMACNA) Standards
- Occupational Safety and Health Administration (OSHA)
- American Society of Sanitary Engineering (ASSE)

PLUMBING SYSTEMS SUMMARY

Design of the plumbing system shall promote forward thinking in engineering and be flexible in design, incorporating minimum requirements to ensure a safe and healthy building as it meets environmental impact guidelines. Plumbing systems and equipment shall be sized to accommodate worst case operational conditions. The design of the systems and materials shall not compromise the cleanliness or purity levels of the systems.

Isolation valves should be provided to facilitate independent shutdowns at each floor, restroom, and any other location that may require service or modifications to be performed without affecting other areas of the building. Each plumbing equipment or fixture shall be provided with individual isolation valves or fixture supply stops.

The plumbing system will generally include, but not be limited to, the following:

- a. Sanitary drainage system
- b. Storm drainage system
- c. Condensate drains
- d. Domestic cold water
- e. Domestic hot water
- f. Natural gas system
- g. Plumbing fixtures
- h. Insulation systems
 - i. Piping
 - ii. Equipment
- i. Test and Balancing
- j. Miscellaneous Equipment/Systems
- k. Equipment supports

SANITARY WASTE & VENT SYSTEM

It is expected that one 6-inch sanitary sewer drain pipe will exit the building footprint underground and will continue to the municipal sanitary sewer, sloping at 2%. Sanitary waste and vent systems should be provided for all plumbing fixtures, floor drains and equipment drains. Plumbing fixtures will be drained by gravity through soil, waste, and vent stacks and travel horizontally outside the building footprint. The building plumbing fixtures shall be provided in compliance with applicable codes, connecting to a code compliant sanitary waste & vent system. Two-way directional cleanouts should be provided at the building exterior.

Per code requirements, all vents from plumbing fixtures shall extend to the roof and be located more than 25 feet away from air intakes.

Sanitary Waste & Vent Piping Design Criteria	
Sizing	International Plumbing Code
Piping Slope	Minimum 1/4" per foot
Pipe Material (Below Grade)	PE Encased hubless cast-iron pipe with CISPI 301 stamp, IAPMO UPC-approved service weight cast-iron, heavyweight no-hub couplings with 4-band stainless steel clamps.
Pipe Material (Above Grade)	Hubless cast-iron pipe with CISPI 301 stamp, and IAPMO UPC-approved service weight cast-iron, heavyweight no-hub couplings with 4-band stainless steel clamps.
Pipe Material (Pumped Waste)	ASTM B88 and ANSI/NSF 61 type 'L' hard drawn copper pipe and soldered/brazed joints

CONDENSATE DRAIN SYSTEM

Air conditioning condensate waste pipes shall connect indirectly to the drainage system through an air gap to properly vented floor sinks. Condensate piping shall be type 'M' hard drawn, copper pipe and fittings with lead free solder joints. Pipe within the building shall be insulated. Condensate piping will be sloped at 1/8" per foot.

Condensate Piping Design Criteria	
Sizing	International Plumbing Code
Piping Slope	Minimum 1/4" per foot
Pipe Material (Above Grade)	ASTM 88 and ANSI/NSF 61 type 'M' hard drawn copper pipe (Insulate within the building)

ROOF DRAIN SYSTEM

A complete storm drainage system should be provided to convey rainwater from the roof of the building to a point of discharge exterior to the building. Overflow drains should be provided to convey emergency storm water by gravity through a separate piping system discharging 2'-0" above grade utilizing downspout nozzles with bird screens.

A heat trace system should be provided at each roof drain pair and discharge location susceptible to freezing.

Storm Drain Piping Design Criteria	
Sizing	International Plumbing Code
Piping Slope	Minimum 1/8" per foot
Pipe Material (Below Grade)	PE Encased hubless cast-iron pipe with CISPI 301 stamp, IAPMO UPC-approved service weight cast-iron, heavyweight no-hub couplings with 4-band stainless steel clamps.
Pipe Material (Above Grade)	Hubless cast-iron pipe with CISPI 301 stamp, and IAPMO UPC-approved service weight cast-iron, heavyweight no-hub couplings with 4-band stainless steel clamps. ASTM C1540, FM 1680 CLASS 1

Storm Drain Distribution	
Inches of Rainfall per Hour	3.5"
Approximate Number of Storm Drain Exiting Outside of Building	Six inches pipe minimum (x2-3)
Approximate Roof Area	18,729-27,613 SF
Total Roof Capacity (GPM)	682-1,005 GPM

DOMESTIC COLD-WATER SYSTEM

A new 3" domestic water service shall be provided to the building and a 2" water meter will be located outside the building. The water meter should be connected into the BMS (building management systems). The Fire service line is to be provided as a dedicated service entering the building.

Domestic Water Piping Design Criteria	
Approximate building supply pipe size	3"
Approximate GPM	150 GPM
Velocity (Cold Water)	Maximum 8 feet per second
Pipe Material (Below Grade)	Seamless copper tube, ASTM B88, Type K
Pipe Material (Above Grade)	ASTM B88 and ANSI/NSF 61 type 'L' hard drawn copper pipe and soldered/brazed joints

A minimum of 35 psi shall be delivered to the most hydraulically remote fixture.

It is assumed that the building will not require a domestic pump; however, this should be confirmed with a fire flow test and resulting data.

Shut-off valves shall be provided on all branch connections and at all equipment connections. Water-hammer arrestors with accessible isolation valves should be provided at all quick closing valves and other potential shock sources. Sizing and locations of hammer arresters should be determined per PDI standards.

Domestic water isolation valve serving building core restrooms shall be located inside the janitor's room and mounted along the wall for easy access. Hose bibbs should be provided on all exterior walls.

NON-POTABLE WATER SYSTEM

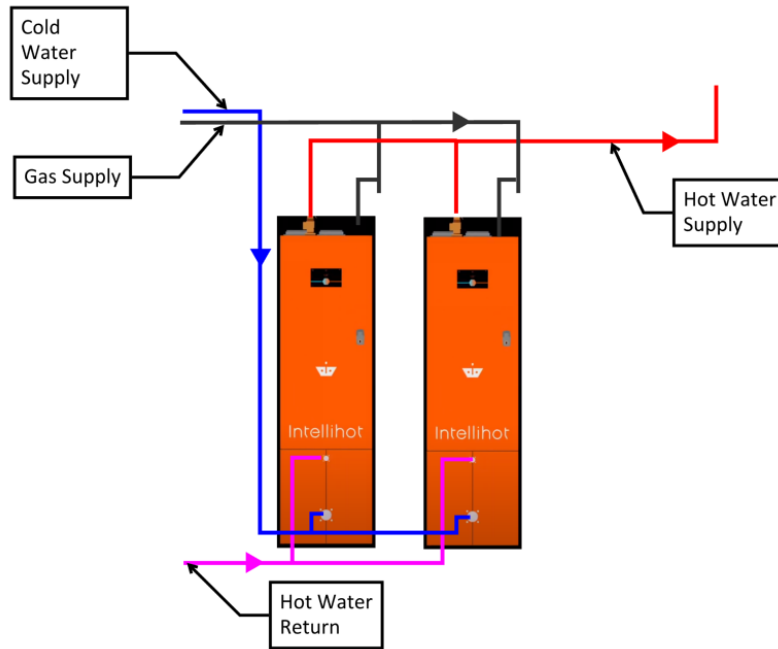
Non-potable water systems shall be provided to make-up water to equipment, separated from the domestic water systems through a lead-free reduced pressure backflow preventer.

DOMESTIC HOT WATER SYSTEM

The piping layout design shall be based on a loop system with valved branches to all rooms and sectional valves. Domestic hot and cold-water piping shall be extended to all plumbing fixtures and equipment to satisfy the building requirements. Non-recirculated fixture branch piping 'dead leg' shall not exceed 25 feet in length. For public lavatories, a flow-splitter unit with shut-off valves shall be provided on the hot water piping.

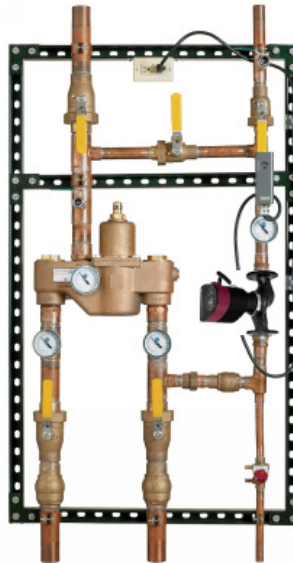
Domestic Water Heater:

- Option 1: Two Intellihot model iN501, multiple 316 stainless steel heat exchangers, maximum gas input of 499 CFH each with 96% thermal efficiency.
- Option 2: Electrification in sustainable design – two electric water heaters.



Domestic Water Heaters

The Domestic hot water system shall include circulation pumps and an expansion tank. Central thermostatic mixing station should be provided for hot water distribution, set at 120 deg. F.



Mixing Station and Recirculation Pump

Domestic Hot Water Piping Design Criteria	
Velocity (Hot Water)	Maximum 5 feet per second.
Pipe Material (Below Grade)	Seamless copper tube, ASTM B88, Type K.
Pipe Material (Above Grade)	ASTM B88 and ANSI/NSF 61 type 'L' hard drawn copper pipe and soldered/brazed joints.
Insulation	Hot water piping to be insulated.

The domestic hot water system components should be controlled by the Building Management System (BMS). Temperature valves are to be provided to automatically regulate the temperature of hot water delivered to plumbing fixtures to a range of 105 deg. F minimum to 120 deg. F. maximum. Non-recirculated fixture branch piping 'dead leg' shall not exceed 25 feet in length. Hot water delivered into public-use lavatories shall be limited to a maximum of 120 deg. F. and will be supplied with an ASSE 1070 thermostatic mixing valve.

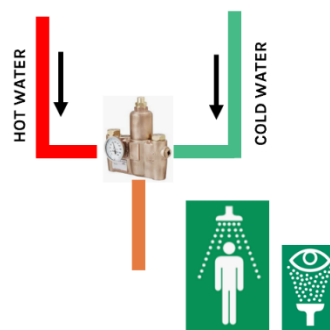
A thermostatically controlled zone balancing valve shall be installed at each domestic hot water loop/zone. Include test port which can also be used as bleed valve during setup.

Provide Mixing valve to the following:

1. Master thermostatic mixing valve that is ASSE 1017 compliant shall be provided to temper building hot water distribution from the water heater.
2. Public restrooms: ASSE 1070 valves
3. Emergency eyewash and shower: ASSE 1071

EMERGENCY FIXTURES

Emergency shower and eyewash fixture shall be connected to domestic potable hot and cold water per ANSI Z358.1 and ASSE 1071 water tempering device. Isolation valves shall be labeled and locked open.



Individual Mixing Valve

LEGIONELLA PREVENTION FOR DOMESTIC WATER SYSTEM

Prevention is encouraged over treatment. Potential prevention strategies include:

- No dead legs (as short as possible, valve and cap only) for future.
- Hose valve connections at strategic locations near drains for flushing capabilities.
- Circulation of domestic hot water (at approx. 115 -120 deg. F) for 24 hrs. /day.
- Faucets shall deliver hot water between the ranges of 85 degrees F to 110 deg. F. Domestic hot water to faucet must be available within 15 seconds of the time of operation.

NATURAL GAS SYSTEM

A new gas line shall be provided to the site by the local Gas Service Company, who should also provide and install the meter and regulator at the building. Gas service piping will need to penetrate the outside building wall above grade and be routed to boilers and domestic water heaters.

Natural Gas Design Criteria	
Natural Gas Load	* CFH (x1 To Be Determined)
Pipe Material	Pipe: Carbon Steel, Schedule 40, Grade B. Use A53 below 5 PSIG and A106 Above 5 PSIG

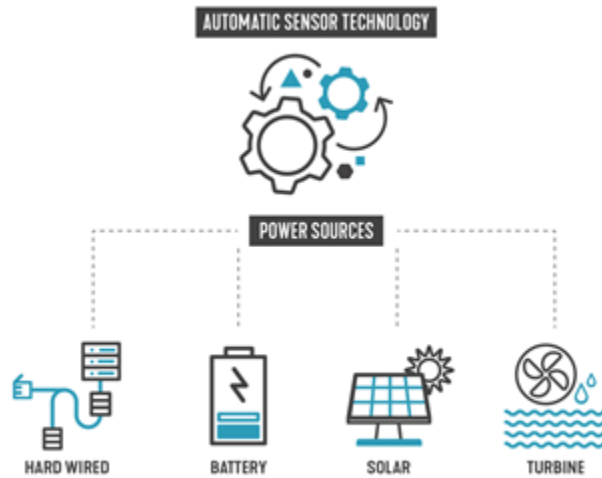
PLUMBING FIXTURES

All applicable fixtures shall meet the American Disabilities Act (A.D.A.) requirements for accessibility. Use of advanced innovative, water efficient plumbing fixtures can attain water conservation goals. Plumbing Fixtures shall be high efficiency types, decreasing total water demands without negatively impacting the quality of use.

Touchless plumbing bathroom fixtures should be considered, as the touch-free sensor facilitates water conservation and prevents runs-on.

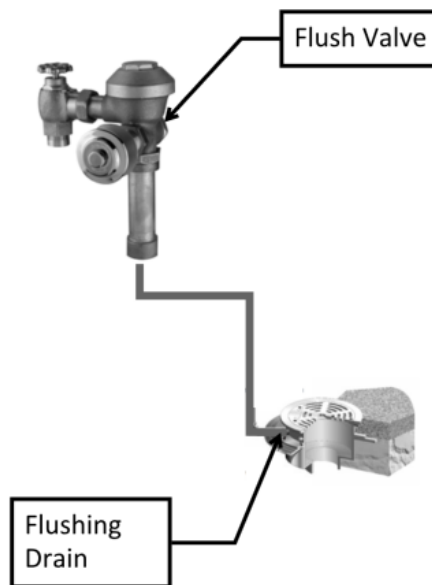
Automated fixture energy source options:

- Hard-wired
- Battery
- Solar cells
- Miniaturized turbines



Plumbing fixtures power source

Autopsy room drains shall be cast iron trap drain with acid resisting enamel interior, nickel bronze flushing rim and loose set wide bar grate. Flushing connection $\frac{3}{4}$ " for the rim.



Autopsy Floor Drain

PIPE MATERIALS

All piping, fittings and joint materials and methods shall be compatible with systems application.

1. Sanitary Waste and Vent (Below Grade)
 - a. CISPI 301 and IAPMO UPC-approved service weight cast-iron, no-hub and fittings with neoprene gas-kets and stainless-steel bands.
2. Sanitary Waste and Vent (Above Grade)
 - a. CISPI 301 and IAPMO UPC-approved service weight cast-iron, no-hub and fittings with neoprene gas-kets and stainless-steel bands.
3. Storm and Overflow Drain (Below Grade)
 - a. CISPI 301 and IAPMO UPC-approved service weight cast-iron, no-hub and fittings with neoprene gas-kets and stainless-steel bands.
 - b. PVC Schedule 40 solid wall and PVC DWV fitting systems and solvent weld joints.
4. Storm and Overflow Drain (Above Grade)
 - a. CISPI 301 and IAPMO UPC-approved service weight cast-iron, no-hub and fittings with neoprene gas-kets and stainless-steel bands.
5. Domestic Hot and Cold Water (Below Grade)
 - a. Type 'K' seamless hard drawn copper pipe and fittings with lead free solder joints (Insulate domestic hot water and circulation piping).
6. Domestic Hot and Cold Water
 - a. ASTM B88 and ANSI/NSF 61 type 'L' hard drawn copper pipe and fittings with lead free solder joints. (Insulate domestic Hot water and circulation piping)
7. Condensate Drain
 - a. Type 'M' hard drawn, copper pipe and fittings with lead free solder joints (Insulate pipe within the building)
8. Natural Gas Pipe
 - a. Below Grade - PE pipe and fittings joined by heat fusion or mechanical couplings, service-line risers with tracer wire.
 - b. Above Grade - ASTM A53 black steel schedule 40

FIRE PROTECTION SYSTEMS

The prime objective of the Fire Protection system is to provide an effective means of protecting the facility and its occupants through careful selection of building construction materials, the design of fire and smoke separations, and installation of an automated sprinkler system and a monitored fire alarm system.

A fire flow test should be performed to ascertain the need for a fire pump and standpipes.

AUTOMATIC SPRINKLER SYSTEMS

Automatic Wet Sprinkler systems shall be provided throughout the building, including any accessory buildings. The system shall be hydraulically designed and installed per the latest edition of NFPA 13; a 10% safety factor shall be included in the calculations.

Provide a minimum hose stream allowance for total combined inside and outside firefighting to comply with NFPA 13 requirements. The building sprinkler system shall be fed off a fire water line with a double detector check valve provided at the point of connection to the main. The building fire riser shall be provided with an approved shut off valve with a tamper and a flow switch that ties to the building fire alarm system.

Quick response sprinklers heads shall be provided in all areas with the exception of rooms where high temperatures are expected. The commissioning of the Fire Sprinkler system shall be implemented to verify the intent of the design.