

The University of North Carolina at Charlotte
Capital Projects
Facilities Management
9201 University City Blvd.
Charlotte, N.C. 28223-0001
TEL: 704/687-6280

PROJECT: UNC Charlotte
Health & Wellness Center
Commissioning Services
Code 41426, Item 312

Thank you for your interest in the subject project. This information is being provided to all firms which express an interest in the commissioning of the project. Limit the size of your submittal document to no greater than forty (40) pages, (20 pages when printing double sided) 12½ inches in height and 9½ inches in width. Submittals are due in this office by 2:00 p.m., November 3, 2015. **Do not transmit any submittal information via email.**

The University is seeking an engineering firm which is capable of reviewing design documents, preparing commissioning specifications and inspecting constructed facilities to ensure proper Mechanical, Electrical, and Plumbing commissioning of the facility described in the attachment. The selected firm will coordinate commissioning efforts with the project architect, Jenkins Peer Architects and the MEP engineering consultants.

Submittals are to include the attached cover sheet, standard 330 Form, Parts I and II, Commissioning Project Experience Listing form, along with any additional information considered appropriate. Please deliver five (5) hard copies of the submittal to my office at the address noted above along with one (1) digital submission (on CD, DVD, thumb-drive, etc). Commissioning Project Experience Listing form in Excel format is available on request.

In your submittal, please emphasize the achievements and qualifications of those persons who would be working on our project. If you present information on previous projects, include complete descriptions of how each of your team members participated on those projects.

The preliminary evaluation process will be complete within 14 days following the submittal due date and firms winnowed for interviews, if necessary, will be notified by this office. From that group of firms, the committee will select and rank three finalist firms.

Please deliver all submittals to me at the address written above.

Sincerely,

Joyce Clay

The University of North Carolina at Charlotte Health & Wellness Center Building Commissioning Services

PROJECT DESCRIPTION:

The project is for the **construction** of **134,000** (est.) gross square foot **health and wellness facility** to include the following program components:

- Offices & Wellness**
- Gymnasium Space**
- Cardio, Selectorized and Free Weight Training**
- Multipurpose Group Fitness**
- Natatorium**
- Locker Rooms & Support Spaces**
- Core & Circulation**
- Chiller/Boiler Plant Addition**

Additional components may be discovered and evaluated through the advance planning process.

The architect for this building is Jenkins Peer Architects of 112 South Tryon Street, Charlotte, NC . The project is currently in the Advance Planning phase. The selected commissioning firm members will be active advisors to the Project Team and provide both “Enhanced Commissioning” in accordance with University requirements and Senate Bill 668 and provide M&V (Measurement and Verification) of the 1st year’s energy consumption.

SCOPE OF SERVICES

The Commissioning Authority (CxA) will serve as the University’s agent to commission all identified components in the Project. The CxA is not responsible for design concept, design criteria, compliance with codes, design or general construction scheduling, cost estimating, or construction management. The CxA may assist with problem solving or resolving non-conformance or deficiencies, but ultimately that responsibility resides with the general contractor and the architectural design team. The primary role of the CxA shall be to develop and coordinate the execution of a Commissioning Plan; observe and document the installation, checkout, start-up, and equipment and system testing to establish that equipment and systems are functioning in accordance with the requirements of the Contract Documents; and to assist in developing correct and complete documentation of the construction effort. The CxA shall support the architect with their preparation of the required building certification commissioning documentation, if applicable.

The Commissioning Team shall conduct a review of the Schematic Design and Design Development documents prior to the Construction Documents Phase, and shall conduct a separate review of the Construction Documents near completion of the Construction Document Phase.

SYSTEMS TO COMMISSION

Systems that shall be commissioned include mechanical, electrical and plumbing equipment; and systems

to include building automation systems; chilled water systems and associated equipment; boilers/ heat exchangers and associated equipment; air handling units, exhaust and other specialty fans, and terminal units; chemical water treatment systems; utility metering systems; smoke control systems (interfaces, egress pressurization); emergency power system, interior and exterior lighting control systems, electrical system from the building entrance through the main switchboard, switchgear, and to the distribution panels; ductwork and pipe; insulation; irrigation and water conservation fixtures; heat recovery systems; and Special Use Areas.

COMMISSIONING TASKS

The following tasks will be accomplished by the CxA to provide Commissioning during the design, construction and acceptance phases of the project. Reference Attachment A for listing of minimum formal written documents required.

A. Design Phase

The CxA shall advise and lead the owner and the Design Team in documenting the written Owner Project Requirements (OPR) and University design intent, and the Design Team's Basis of Design (BOD) and rationale for accomplishing these requirements. The CxA shall also provide Design Team members with Commissioning items to be considered during design, perform a focused design review of the Schematic Design and Design Development Documents and Construction Documents (95% design stage), prepare Commissioning specifications for the construction bid documents for all systems and equipment that are to be commissioned and prepare draft of functional tests for equipment and systems to include in specifications.

B. Construction Phase

During the Construction Phase, the CxA will monitor construction progress to ensure that established commissioning objectives will be achieved. The CxA shall provide the following tasks during the construction phase:

- Conduct a Pre-construction Commissioning Meeting to review Commissioning scope, plan, and schedule with the Designer's architect and engineering team, Construction Project Manager, Site Superintendents, and Project Managers and Superintendents of applicable subcontractors. Applicable subcontractors must include mechanical, electrical and plumbing.
- Coordinate the Commissioning work and, with the General Contractor (GC), ensure that Commissioning activities are being scheduled into the Contractor's Project Schedule.
- Review Bulletin Drawings and Shop Drawings and inform University in situations where Commissioning Objectives are at risk.
- Attend Designer's Monthly Project Progress Meetings and address major issues which impact successful commissioning.
- Continue to update Commissioning Schedule and coordination throughout construction with GC and subcontractors.
- Continually update and modify Commissioning Plan based on actual construction and installed equipment, and distribute to University, Design Team and GC.
- Prepare final pre-functional and final functional test procedures for the equipment and systems.
- Review and approve TAB Execution Plan.

- Maintain a Construction Variance and Deficiency Log of any items observed to be a problem, poorly installed, or discrepancies.
- Verify accessibility and maintainability of all operable equipment with emphasis on equipment mounted in the ceiling.
- Witness a sample of pipe test and flushing procedure, sufficient to be confident that proper procedures are followed.
- Witness a sample of any ductwork testing and cleaning procedures, sufficient to be confident that proper procedures are followed.
- Witness a sample of checkout, TAB, end-to-end testing, and calibration of controls.
- Observe first Pre-functional Test of each type of system, including mechanical, controls, electrical, and specialty systems.

C. Acceptance Phase

Commissioning during the Acceptance Phase is required to demonstrate that performance of the installed equipment and systems meet the requirements of the Contract Documents and Commissioning Plan. The CxA shall complete the following tasks during the Acceptance Phase:

- Obtain copies of Pre-functional Reports from Contractor with sign-offs verifying that the systems have been checked out in compliance with the Commissioning Plan and manufacturers requirements. Check the accuracy of the TAB effort. Direct the TAB contractor to take sample readings and compare to TAB report.
 - check 10% of the TAB report readings of diffusers, grilles, hoods, and terminal devices;
 - check 100% of the TAB report readings for main AHU's, main pumps, and main exhaust fans;
 - document findings.
- Witness Performance Testing of smoke purge systems.
- Functional Testing shall be performed on all control loops to include terminal boxes, chilled and hot water control valves, and vfds.
- Witness Functional Testing of each major piece of equipment to demonstrate that each item of equipment and system is operating according to the Design Intent and contract documents. Functional Testing shall include operating the system and components through each of the written sequences of operation. Test on respective HVAC equipment shall be executed during both heating and cooling seasons.
- Assist in troubleshooting to resolve control problems as they are discovered.
- Check the system graphics to assure all specified graphics and associated trends are provided. Check a 10% sample of mapped points to assure reported data is consistent with actual data of monitored point.
- Commission all utility meters to include power, water, gas and BTU.
- Maintain a Functional/Performance Test Deficiency Log of any items found to be a problem, poorly installed, or discrepancies. Provide the log and test results to the Owner, Contractor, and ARCHITECT with recommended actions.
- Notify the Owner, GC and architect of the unacceptable findings if 10% of identical pieces of equipment fail to perform to the requirements of the contract documents.
- Review O & M documentation for completeness. This review shall be in parallel with the Design Team's review of the O & M documentation for conformance to the project specification.
- Document the designer's a 1/2 day systems training to user staff on "how the building is supposed to operate."

- Review, pre-approve, and document training of the university operating personnel by the contractor.
- Attend State Final Inspection.
- Perform seasonal testing checkout of equipment – in September for cooling systems and in January for heating systems.
- Provide three (3) hard copies and an electronic copy of the Commissioning management report (Commissioning Final Report). The report shall include an executive summary, list of participants and roles, brief building description, and the following sections:
 - OPR
 - Design Intent
 - Basis of design
 - Pre-functional checklists complete
 - Functional checklists complete
 - TAB reports
 - System schematics
 - Control strategies and set points
 - Deficiency Log
 - Guidelines for energy accounting
 - Recommissioning manual

D. M & V

Commissioning Scope

- In each of the first four (4) quarters of the 1st year of occupancy, gather all measurement data from BAS. Summarize data in spreadsheet form and compare to final energy model submitted by designer.
- Identify any areas for investigation and forward spreadsheet and list of variances to Owner and Designer.
- Provide a summary report each quarter and a final annual summary. Final report to be submitted to Designer, Owner and SCO.

Test Equipment

The Contractor shall provide all tools or the use of tools as specified by the CxA in the Construction Documents that are required to start, checkout, and functionally test equipment and systems, except for identified testing with supplemental portable dataloggers, which shall be supplied and installed by the CxA.

Datalogging equipment, monitoring devices, specialized equipment, and software not required to be provided by the installing contractor in the Contract Documents, and provided by the CxA to monitor, confirm, or verify the contractor's testing procedures, shall remain the property of the CxA. Equipment provided shall meet the minimum accuracy, calibration, and performance standards required by the specified Performance Test.

EXPECTATIONS OF THE COMMISSIONING TEAM

Members of the Commissioning Team must be capable of listening, comprehending and responding to

University leaders who will give both general and specific guidance for desired project parameters. The team must have a principal-in-charge that is a Professional Engineer in the State of North Carolina, with other Engineers as appropriate that are also registered Engineers. Project managers, lead field Engineers, and field support staff may be non-Engineers who have the technical training, past field experience and skill in Commissioning, especially in the areas of TAB, HVAC operations, DDC systems and electrical system operations. The required expertise for this project must be part of the skill and experience set of the firm making the proposal. It is the university's desire that the Commissioning Authority (CxA) satisfy as many of the following preferences as possible:

1. It is desirable that the CxA will have acted as the principal CxA for multiple projects over 100,000 square feet, and will have acted as principal CxA for a project of a similar type facility as the Project at hand.
2. The Commissioning team members should have extensive experience in:
 - A. operation and troubleshooting of HVAC systems,
 - B. direct digital control (DDC) systems,
 - C. lighting control systems, and
 - D. testing, adjusting, and balancing (TAB) of HVAC systems. Extensive (minimum of five years) field experience is required for this type work and systems.
3. Team members have knowledge and experience in building operations and maintenance, and have provided O & M training.
4. Team members have experience in energy-efficient systems design, and control strategy optimization.
5. Team members have experience writing commissioning specifications and test procedures.

BUDGET

The construction budget for this project is approximately \$45,000,000.

This sheet is to be the cover sheet for the submittal. If the submittal is bound in a binder, this will be the top sheet visible upon opening the binder cover.

SUBMITTAL COVER SHEET

COMMISSIONING SERVICES

Health & Wellness Center

Commissioning Firm

Engineer of Record

Mechanical Engineering Firm

Mechanical Engineer

Electrical Engineering Firm

Electrical Engineer

Plumbing Engineering Firm

Plumbing Engineer

Other Firm

ATTACHMENT A

COMMISSIONING FORMAL WRITTEN WORK PRODUCTS

| Product | Created By | Product and Form | Description | Due Date | Deliver To |
|--------------------------------------------|------------------|------------------------------------------------------------------------------------------------------------|-------------|-----------------------------------------------------------|----------------------------|
| Scoping Mtg Minutes | CxA | Minutes and notes of the scoping meeting | | < 1 week after meeting | All Cx team |
| Develop OPR | CxA | Report | | Prior to SD | Design Team & University |
| Obtain BOD | Design Team | Report | | Prior to SD | Design Team & University |
| Schematic Design Review | CxA | Summary report of observed concerns and deficiencies relative to University Design Intent and Cx | | 1 week after release of SD | Design Team & University |
| Construction Documents Design Review | CxA | Summary report of observed concerns and deficiencies relative to University Design Intent and Cx | | 1 week after release of DD and 1 week after release of CD | Design Team & University |
| Final Cx Plan | CxA | Final Cx plan for const. phase (edited version of Draft plan of bid documents) | | 1-2 weeks after Cx scoping mtg. | All Cx team |
| Cx Schedule | CxA | Initial summary schedule and detailed version | | Summary schedule: 1wk after scoping | All Cx team |
| Equipment submittals | All Subs | Detailed data on all Cx'd equip. | | during normal submittals | CxA |
| Prefunctional tests and checklists | Specs and CxA | List by equipment of Prefunctional checklists and Prefunctional tests | | During normal submittals | Subs |
| Start-up and initial checkout plans | All Subs and CxA | Specific listing of procedures for combining CxA Prefunctional checklists with Sub's startup and checkout. | | 2-weeks before execution | CxA |
| Start-up and initial checkout reports | All Subs | Filled out Prefunctional checklists, tests, startup and initial checkout | | 1-week after startup completion | CxA + normal others; O&M's |
| Controls Contractor Initial Check-out Plan | Controls Contr. | Complete step-by-step plan on checkout and CxA calibration procedures, including forms for documentating | | 3 weeks before beginning checkout | CxA |

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|----------------------------------------|-----------------|---------------------------------------------------------------------------------|------------------------------------------------|----------------------------|
| TAB plan and approach | TAB | Outline of TAB plan, approach and schedule | < 6weeks before TAB | CxA, CM; Cntrls contr. |
| TAB progress reports | TAB | List of discrepancies, interpretations needed, tests completed | Twice a week | CxA and CM |
| Draft TAB report | TAB | Draft TAB report with method and results | < 2weeks after TAB completion | CxA + normal others |
| Final TAB report | TAB | Draft TAB report with method and results | <2 weeks after TAB completion | CxA + normal others; O&M's |
| Change orders | CM; PM | Change orders that affect Cx'd equipment | <1-week after approved | CxA + others |
| Issues Log | CxA | Record / track of all issues and deficiencies | ongoing | CM + University |
| Non-Compliance /Deficiency reports | CxA | List of deficiencies and non-compliance with Contract Docs identified during Cx | Issued within 3 days of identifying | Cx Team |
| Cx'g Progress Record | CxA | Record / track of all submittals, checklists, tests, etc. | ongoing | CM |
| Cx progress reports | CxA | Gives scheduling needs and update, deficiency report, Cx progress | Weekly to Monthly | CM + University |
| Owner-contracted functional test forms | Subs/ vendor | Full description of test procedures in "form" format | >4-weeks before test | CxA |
| Functional test forms | CxA | Full description of test procedures in "form" format | >4-weeks before test | CM, Subs, O&Ms; ___A/E |
| Filled out functional test forms | CxA | Recorded documentation of the test on the form | With final report | CM, O&Ms; ___A/E |
| Functional test final approvals | CxA | List of test number, and descript., date of test, approval signatures of CxA | Within 4 days of successful completion of test | CM |

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|--------------------------|-------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------|
| O&M manuals (normal) | CM and Subs | Documentation of design, equipment, operations and maintenance, as-builts, etc. | Before substantial completion | CxA reviews on-site |
| Training plan | Subs | Topics and methods | 2 weeks before training | CxA; CM |
| Training completion form | CxA | List of trainees, completed hrs and topics and approvals (Form C-5c) | <2 weeks after training completion | CxA |
| Final Cx report | CxA | 4-6 page summary report with important findings, etc. | Draft within 60 days of substantial completion | CM + University |
| Deferred testing reports | CxA | Documentation of seasonal and deferred tests | Within 2 weeks of test | CM + University |
| Re-commissioning Manual | CxA | Information required for re-commissioning building systems | Draft within 30 days of State Final Inspection | University |
| M & V | CxA | Quarterly and Annual Final Report | Within 30 days of each quarter and 1 st yr of operation | Owner, Designer and SCO (final report only) |