

Commissioning Services Proposal

The University of Central Florida (Owner) requests written proposals to secure commissioning authority (CxA) services for all **new construction and major renovation projects**. The owner is committed to commissioning these facilities to systematically optimize the building and ancillary systems so that they operate efficiently and effectively in accordance with the Owners Project Requirements, and that the facility staff has adequate system documentation, and training. It is the intent of the owner to ensure that the fundamental systems are calibrated and operating as required to deliver functional and efficient performance.

The CxA will plan, manage, perform and report on the commissioning activities, utilizing the reporting formats and standardized forms provided by the CxA **whenever** required. The CxA will submit deliverable report to **the UCF Department of Sustainability & Energy Management (SEM)** according to a project schedule set by CxA and agreed upon by **SEM**. It is extremely important that all commissioning tasks be conducted in a transparent manner and involve the building engineer and operations staff to the greatest degree possible.

The management structure may be **traditional design/bid/build, design/build or construction management** with full design documents and specifications developed by an architectural/engineering firm. The construction documents will be let out to bid and a general contractor will be hired to complete the construction. The owner's primary construction representative on-site will be provided by the separately contracted services of a construction manager. The commissioning authority will be hired by and report directly to the owner.

Typical systems to be commissioned are:

1. Refrigeration systems
2. Heating systems
3. Steam systems
4. Air handling systems
5. Runaround loop energy recovery system
6. Energy management and HVAC controls systems
7. Plumbing water systems
8. Life safety system including fire alarm system, standpipe and sprinkler systems, fire pump and controller, and all piping and ancillary hardware.
9. Electrical systems consisting of substation transformers, switchboards, motor control centers, power & lighting panelboards, lighting fixtures, lighting controls, and connections to equipment.
10. Emergency power supply systems.
11. Security systems consisting of access control and alarm monitoring,
12. Indoor air quality
13. LEED certification will be required for each project.

Scope of Work

Commissioning is required as one quality measure of the construction of this building in order to assure that the final building meets the original intent of the owner's design. The proposer is free to suggest changes and improvements to this process. Following is a summary of the commissioning process and scope of work the owner requests for this project.

Commissioning Process During Pre-Design

The commissioning process activities completed by the commissioning authority during the pre-design phase include:

1. **Facilitate the development and review** of the Owners Project Requirements documentation for clarity and completeness, including language on the following features: mechanical, electrical, plumbing, architectural, structural, lighting, energy consumption, commissioning, indoor environmental quality, environmental sustainability, siting, exteriors, landscaping, interiors, functionality for tenants, and budget. This will be accomplished by the commissioning authority by: extracting salient concepts from the owner's existing programming report, conducting a focus group, and conducting interviews with owner stakeholders.
2. Identifying a scope and budget for the commissioning process.
3. Developing the initial commissioning plan.
4. Acceptance of pre-design phase commissioning process activities.

Commissioning Process During Design

The commissioning process activities completed by the commissioning authority during the design phase include:

1. Lead the commissioning team to document the Owner's Project Requirements for the facility.
 2. Work with the design professionals in documenting the Basis of Design.
 3. Verify the Basis of Design in regard to the Owner's Project Requirements.
 4. Be involved in design workshops, design reviews, and value engineering discussions prior to the start of the construction documents phase of this work.
 5. Participate in discussions relating to new technologies being evaluated to meet LEED certification requirements.
 6. Complete a thorough review of the design documents completed at the end of each design phase. Comments will be submitted in writing to the owner, the A/E team and the LEED consultant (if one is engaged).
 7. Develop full commissioning specifications for all commissioned equipment. Coordinate this with the architect and engineers and integrate the commissioning specifications into the overall project specification package. The specifications shall follow the intent of ASHRAE Guideline 0-2005 *The Commissioning Process*. The commissioning specification will include a detailed description of the responsibilities of all parties, details of the commissioning process; reporting and documentation requirements (including formats), alerts to coordination issues, deficiency resolution, construction checklist and startup requirements, the functional testing process, and specific functional test requirements including testing conditions and acceptance criteria for each piece of equipment being commissioned.
 8. Develop a commissioning plan encompassing the Design, Construction, Occupancy and Operations Phases.
 9. Determine the commissioning requirements and activities to include in the construction documents, with review by the design team, for integration into the project's construction specifications.
 10. Perform commissioning design review at **50%**, **95%**, and **100%** completion of the drawings and specifications.
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Commissioning Process During the Construction Phase

The commissioning process activities accomplished by the commissioning authority during the construction phase include:

1. Organize the commissioning process components and conduct a pre-bid and pre-construction meeting where the commissioning process requirements are reviewed with the commissioning team.
2. Coordinate and direct commissioning activities in a logical, sequential and efficient manner using consistent protocols, clear and regular communications and consultations with all necessary parties, frequently updated timelines, schedules, and technical expertise.
3. Provide factory witness testing as required by a particular project.
4. Perform site visits, as necessary, to observe component and system installations. Accomplish a statistical review of construction focusing on the owner's design intent and the quality process. Attend selected planning and job-site meetings to obtain information on construction progress. Review construction-meeting minutes for revisions/substitutions relating to the owner's design intent. Assist in resolving any discrepancies.
5. With necessary assistance and review from the installing contractors, develop and write construction checklists. Submit to **CM** and owner for approval.
6. Organize and conduct periodic commissioning team meetings necessary to plan, develop the scope, coordinate, schedule activities and resolve problems.
7. Review submittals concurrent with the design professional's review.
8. Work with contractors in completing construction checklists and tracking of checklist completion.
9. Statistically sample completion of construction checklists on a periodic basis to verify that contractor's quality process is achieving the owner's project requirements.
10. Approve systems startup by reviewing start-up reports and by selected site observation.
11. With necessary assistance and review from installing contractors, write the test procedures. Submit to A/E and owner for review and approval.
12. Assist **CM** in direction of the contractor to execute the tests.
13. Coordinate witness and recommend approval of test procedure performed by installing contractors. Coordinate retesting as necessary until satisfactory performance is achieved.
14. Recommend approval of air and water systems balancing through statistical sampling of the report and separate field verification.
15. Maintain a master issues log and a separate testing record. Provide to the **[GC] [CM]** and owner written progress reports and test results with recommended actions.
16. Document the correction and retesting of non-compliance items by the contractor.
17. Reviews the systems manual for achieving the owner's project requirements.
18. Review, recommend pre-approval, and verify the training provided by the contractors.

Commissioning Process During the Occupancy and Operations Phase

The commissioning process activities accomplished by the commissioning authority during the occupancy and operations phase include:

1. Schedule and verify deferred and seasonal testing by the contractor.
 2. Verify continuing training.
 3. Schedule, organize, and attend a lessons-learned workshop. The workshop is facilitated by an independent member of the **commissioning authority's firm**.
 4. Complete the final Commissioning Process Report.
 5. Assist in the development of a preventative maintenance plan, a detailed operating plan or an energy and resource management plan.
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6. Return to the site at 10 months into the 12-month warranty period. Review with facility staff the current building operation and the condition of outstanding issues related to the original and seasonal commissioning. Also interview facility staff and identify problems or concerns they have with operating the building as originally intended. Make suggestions for improvements and for recording these changes in the O&M manuals. Identify areas that may come under warranty or under the original construction contract. Assist facility staff in developing reports and documents and requests for services to remedy outstanding problems.

Commissioning Authority Responsibilities

In addition to duties described above, the commissioning authority (CxA) will have the following responsibilities and authority:

1. Develop the commissioning specification for this project and submit to the architect for incorporation into the overall project documents.
2. Issue deficiency notices and verify that they have been corrected. An Issues Log will be maintained and reviewed at the commissioning meetings. Deficiencies that are not corrected in a timely manner will be reported to the owner.

The commissioning authority (CxA) is not required to:

1. Establish 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 design team. The CxA will report to the owner any deficiencies or discrepancies.
 2. Issue change orders; they do review change orders for compliance with the construction documents. Non-compliances will be reported to the owner.
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Observation and Testing Requirements

<u>Equipment or Systems</u>	<u>Sampling Rate</u>
<u>HVAC Systems</u>	
Chillers	100%
Cooling Towers/Evaporative Fluid Cooler	100%
Boilers and Associated Equipment	100%
Heating Heat Exchangers	100%
Pumps	100%
Air Handling Units	100%
Laboratory Exhaust Fan Systems	100%
Ventilation Fans	25%
VFDs	100%
Air Terminal Units	25%
Laboratory Air Valves	100%
Ductwork	50%
HEPA Filter Systems	100%
Piping	25%
Temperature Control	75%
<u>Building Automation Systems</u>	
Temperature/Humidity Sensors	100%
Pressure Sensors and Controllers	100%
Sequence of Operation	100%
Airflow Stations	100%
Damper/Valve Actuators	100%
<u>Plumbing and Fire Protection Systems</u>	
Plumbing Equipment	25%
Plumbing Fixtures	25%
Plumbing Piping Systems	25%
Effluent Decontamination System	100%
Animal Watering System	100%
Fire Pump	100%
<u>Electrical Systems</u>	
Normal Power Electrical Systems	50%
Emergency Power Systems	100%
Fire/Life Safety Systems	50%
Security Systems	100%
<u>Miscellaneous Systems</u>	
IAQ Pre-Occupancy - office	100%
IAQ Post-Occupancy - office	100%

Desired Qualifications

It is the owner's desire for the person(s) designated as the site commissioning authority (CxA) to satisfy as many of the following requirements as possible:

- Acted as the principal commissioning authority for at least five projects of over 50,000 square feet.
- Extensive experience in the operation and troubleshooting of HVAC systems and energy management control systems.
- Extensive field experience. A minimum of five full years in this type of work is required.
- Knowledgeable in building operation and maintenance and O&M training.
- Knowledgeable in national building & fire codes as well as water-based fire extinguishing systems, smoke control systems, detection systems and alarms systems.
- Knowledgeable in test and balance of both air and water systems.
- Experienced in energy-efficient equipment design and control strategy optimization.
- Direct experience in monitoring and analyzing system operation using energy management control system trending and stand-alone data logging equipment.
- Excellent verbal and writing communication skills. Highly organized and able to work with both management and trade contractors.
- Experienced in writing commissioning specifications.
- A bachelor's degree in mechanical or electrical engineering is strongly preferred, and P.E. license is desired. However, other technical training, past commissioning, and field experience will be considered as a substitute.
- Certification as a Certified Commissioning Professional with the Building Commissioning Association or Certified Building Commissioning Professional with The Association of Energy Engineers is highly desired but not required.
- Membership in the Building Commissioning Association and The Association of Energy Engineers is highly desired.

The required expertise for this project will be based on the skill and experience set of the full team making the proposal. A member of the prime firm will be the designated commissioning authority who is the member of the team that will coordinate the commissioning activities from the technical perspective. This party may not necessarily be the team's overall project or contract manager. The commissioning authority must have significant in-building commissioning experience, including technical and management expertise on projects of similar scope. If the commissioning authority or prime firm does not have sufficient skills to commission a specific system, the prime firm shall subcontract with a qualified party to do so. Subcontractor qualifications shall be included and clearly designated in the response to this scope of work.

Proposal

Proposals need not be voluminous, but shall provide sufficient information to allow the owner to evaluate the consultant's approach, experience, staff and availability.

The proposer shall:

1. Limit their proposal to 20 single-sided pages, including graphics. A letter of introduction, section dividers, detailed resumes and the sample work products are not included in this limit.
 2. Have the proposal signed by an officer of the proposing firm with the authority to commit the firm.
 3. Fill out the attached Commissioning Firm Experience form and the Commissioning Task Listing form (Exhibits 1 and 2) for each firm on the team. List no more than four projects in Exhibit 2.
 4. List the individual(s) who will serve as the lead CxA for the design phase and for the construction phase of the contract.
 5. Provide resumes for key staff and subconsultants. The resumes shall include specific information about expertise in commissioning tasks, (e.g. design reviews, specification writing, commissioning management, troubleshooting, test writing, test execution, energy management, sustainable design, etc.).
 6. Briefly describe "relevant" experience (project phasing, life cycle costing, testing, adjusting and balancing, building simulation, IAQ, campus projects, etc.) of the proposer's team in the following areas.
List involvement of key team members.
 - a) projects similar to this one
 - b) O&M experience
 - c) energy-efficient equipment design and control strategy optimization
 - d) project and construction management
 - e) system design (specify)
 - f) troubleshooting
 7. Describe your proposed approach to managing the project expertly and efficiently, including distribution of tasks, travel, and duration of which staff will be on site during what periods of time, etc. Describe how you intend to determine the appropriate level of commissioning effort for the various systems and equipment.
 8. Provide a statement of proposer's liability insurance coverage (type, and dollar amount of coverage). Proof of this insurance will be required prior to the award of this contract to the winning proposal.
 9. For planning purposes, the proposer must also provide a cost "estimate" range for the construction and warranty phase tasks using the form below. Also provide an hourly rate for each team member for work that may exceed the scope. For each phase, provide the percentage level of effort for each primary team member.
 10. Use the budget table shown in Exhibit 3 (or a suitable equivalent) to provide a cost breakdown.
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Exhibit 1: Commissioning Firm Experience
 FILL OUT A SEPARATE FORM FOR EACH FIRM ON THE TEAM

Company Name	Contact Person	Title
Address	City	State
		Zip/Postal Code
Telephone	Fax	E-Mail

Description of Business

Commissioning Activities

Percentage of overall business devoted to commissioning services _____%

How long has the firm offered commissioning services _____years

Average number of commissioning projects performed each year: _____projects

Number of registered engineers on staff who have directed commissioning projects:

The firm has provided commissioning services in the following: (check all that apply)

<u>Building Sector</u>	<u>New Construction Major Renovation</u>	<u>Existing Building Retro/Re</u>	<u>Equipment Replacement</u>
Office or retail	☐	☐	☐
High Rise Facilities and Buildings	☐	☐	☐
Hospitals	☐	☐	☐
Assisted Living	☐	☐	☐
Laboratories	☐	☐	☐
Multi Family	☐	☐	☐
Industrial / Manufacturing	☐	☐	☐
Special purpose—prisons, museums, libraries, etc.	☐	☐	☐
Jails, Prisons, Correctional Facilities	☐	☐	☐
Other; Describe	☐	☐	☐

Exhibit 2: Commissioning Task Experience for Similar Projects

FILL OUT A SEPARATE FORM FOR EACH FIRM ON THE TEAM

Project (Name, Date, Bldg Size, Type, new or existing)	
<u>Owner Contact</u> (Title, City, State, and Phone)	
Name & Role of Persons(s) Assigned to Project by Firm (identify any sub-consultants)	

	Task	✓	Comments
Commissioning	Developed Owner's Project Requirements		
	Wrote commissioning plan		
	Wrote commissioning specs		
	Wrote construction checklists		
	Wrote functional test procedures		
	Witnessed and documented functional tests		
	Performed functional tests (hands-on)		
	Wrote systems manual		
	Used data loggers or EMS trend logs for testing		
	Developed or approved staff training		
	Reviewed completed O&M manuals		
Management	Commissioning provider was part of the firm		
	Supervised a sub-consultant commissioning provider to our firm.		

	Task	✓	Comments
	Worked with a commissioning provider hired by others		

	✓	System or Equipment
Commissioning Tasks Performed	☐	Central building automation system
	☐	All equipment of the heating, ventilating and air conditioning systems
	☐	Enhanced Filtration Units
	☐	Scheduled or occupancy sensor lighting controls
	☐	Daylight dimming controls
	☐	Refrigeration systems
	☐	Emergency power generators and automatic transfer switching
	☐	Uninterruptible power supply systems
	☐	Life safety systems (fire alarm, egress pressurization, fire protection)
	☐	Electrical (service switchgear, switchboards, distribution panels, transformers, motor control centers, power monitoring and metering, transient voltage surge suppressors, variable speed drives, grounding and ground fault systems, over current protective devices, low voltage busway, thermographic survey, white sound system).
	☐	Domestic and process water pumping and mixing systems
	☐	Equipment sound control systems and testing
	☐	Data and communication
	☐	Paging systems
	☐	Security system
	☐	Irrigation
	☐	Plumbing
	☐	Vertical transport
	☐	Building envelope including the different types of curtain wall assemblies (specify roofing, windows and doors, construction joints, etc.)
	☐	Sustainability features
	☐	Effluent decontamination systems
	☐	Process instrumentation and controls
	☐	Other: Describe as an attachment to this exhibit

Exhibit 3: Budget Table

Task	Budget (\$)
Pre-Design and Design	
1. Develop or review Owner's Project Requirements (per scope)	
2. Design documents reviews of plans, specifications; narratives	
3. Commissioning plan, specification development and bid meeting	
4. Other	
Subtotal	
Construction	
1. Commissioning plan and submittal reviews	
2. Construction checklists; observation of installation and startup	
3. Functional test writing	
4. Functional test execution and documentation	
5. O&M manual review and training review	
6. Compilation of commissioning record	
7. Systems manual development	
8. Other	
Subtotal	
Occupancy and Operations	
1. Seasonal testing	
2. Near-warranty end review	
3. Other	
4. Other	
Subtotal	
Total	