

augment and are combined with the manufacturer's start-up checklist.

"Construction Contract" means the contract entered into between the Owner and the Contractor to provide all Work necessary to construct the Project, including the original base contract for construction of the Project, the Oregon University System General Conditions For Public Improvement Contracts, any supplemental general conditions to the Construction Contract, any amendments to the Construction Contract, the plans, specifications, approved shop drawings, all approved change orders, any solicitation documents incorporated into the Construction Contract, and any response by a successful bidder or proposer to any such solicitation documents incorporated into the Construction Contract.

"Construction Documents" means drawings, specifications and other documents setting forth in detail the requirements for construction of the Project, as well as the documents pertaining to bidding and contracting for the construction of the Project.

"Contractor" means the general contractor/construction manager that is awarded the contract to construct the Project.

"Design Criteria" means the Oregon State University Design Criteria/Construction Standards in effect at the time of the Effective Date of this Supplement.

"Design Record" means the compilation of the Owner's Project requirements, Owner objectives, design narrative, design basis and performance metrics.

"Direct Construction Cost" means the cost to the Owner of all divisions of construction, including portable equipment only if designed or specified by the Commissioning Agent for inclusion in the Construction Documents.

"Dynamic Systems" means systems, equipment, assemblies, or features that are composed of or contain components that are mechanical, moving, or electrical, and whose correct function or performance cannot be verified through a simple visual observation without using test instruments.

"Functional Tests" means tests that verify that specific components, assemblies, systems, and interfaces among systems function and perform in accordance with the owner's objectives and the relevant Contract Documents. Functional testing may include manual or monitoring methods. Functional testing is the dynamic testing of specific and interacting equipment and systems in full operation. Functional tests are performed after construction checklists and start-up are complete. Written functional test procedures for a given piece of equipment contain a list of integral equipment and components being tested, associated construction checklists, functions and modes to be tested, required conditions of the test for each mode, specific step-by-step repeatable procedures, the expected or required response and acceptance criteria, a place to record the results and notes, required monitoring and any sampling strategies used.

"Initial Basic Services" are those Services authorized to be performed under the first phase of commissioning, generally described in Section 2.IV of this Supplement.

"Issues Log" means an ongoing record of the issues identified during the commissioning process that require resolution. For each entry the log includes a unique identification number, identification date, identification party, a short description of the issue, the equipment or assembly it is associated with, a long description of the issue, including cause, implications of the

issue, recommendations for correction, assignment of responsibility for correction, an issue closed date and the name of the party verifying the correction. The Commissioning Agent is responsible for maintaining the log.

“Manual Test” means using hand-held instruments, immediate control-system readouts or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the “observation”).

“Monitoring” means the recording of parameters (flow, current, status, pressure, etc.) of equipment operation using dataloggers or the trending capabilities of control systems.

“Seasonal Tests” means functional tests that are deferred until the system(s) will experience conditions closer to their design conditions.

“Services” are all those services to be performed by the Commissioning Agent under the terms of this Supplement.

“Sustainable Goals” means U.S. Green Building Council (USGBC) LEED Certified Gold for the Student Experience Center and Equivalent LEED Certified for the east wing of the Memorial Union.

“Systems Manual” means a manual providing to the current and future operating staff the information needed to understand and optimally operate each system. The manual is in addition to the O&M Manuals submitted by the contractor. The systems manual focuses on operating, rather than maintaining the equipment, particularly interactions between equipment. LEED, Version 2.0, refers to this as the Recommissioning Management Manual.

“Work” means the furnishing of all materials, labor, equipment, transportation, services, and incidentals for the construction of the Project by the Contractor that is eventually awarded the Construction Contract for the Project.

II. Systems to be Commissioned and Services To Be Performed.

- A. **Systems.** The Commissioning Agent agrees to provide, with the assistance of the subconsultants, commissioning Services for equipment and systems to be designed for and installed in the Student Experience Center and Memorial Union East Wing which systems will include, but may not be limited to HVAC, plumbing, HVAC controls (EMS), electrical/secured power, emergency generator system, security systems, fire alarm system, fire protection, lighting controls and irrigation and potentially additional or specialized equipment and/or systems associated with the Project.
- B. **Methodology.** Commissioning Services will conform to (a) “Model Commissioning Plan and Guide Specifications” for large buildings, Version 2.05, dated February 1998, prepared by Portland Energy Conservation, Inc. (PECI) and sponsored by the Oregon Office of Energy, (b) additional guidelines, if any, included in the Commissioning Toolkit dated February 1998, prepared by Peci and sponsored by the Oregon Office of Energy, and (c) the LEED building certification criteria (refer to LEED Reference Guide Version 2.1) (www.leebuilding.org), and (d) the HVAC Commissioning Process, ASHRAE Guideline 1.1-2007 –HVAC&R Technical Requirements for The Commissioning Process, all of which are incorporated herein by reference.

- C. Services. Commissioning Services will include all Services required for the Owner to obtain a performance level equivalent to Sustainable Goals listed above for the Project, including but not limited to equipment and system design, testing, and preparation of all documentation required by the U.S. Green Building Council to fulfill the commissioning prerequisite and additional points within the Energy and Atmosphere credit. Commissioning Services may also include, but not be limited to, all those listed in Parts I through IV of the Model Commissioning Plan and Guide Specifications, Version 2.05. (Refer to (II)(A) above). Commissioning Service deliverables may include, but not be limited to, those listed in Section 3.11 of Section 17100 of the Model Commissioning Plan and Guide Specifications, Version 2.05.

Wherever in the Model Commissioning Plan and Guide Specifications optional methodologies or approaches may be taken, Commissioning Agent shall notify and confer with Owner. Owner, in its sole discretion, shall determine which optional methodology or approach Commissioning Agent shall conform to.

- D. Applicable law. Where State or federal mandatory laws or regulation have established standards governing the functioning, performance level, or testing methodology of any item of equipment or system, Commissioning Agent will, in performance of its Services, conform to such mandatory standards. Provided, however, that where such laws or regulations establish only a minimum quality, accuracy, strength, or safety or health standard, which may be below or less stringent than those required under (II)(A) through (C) above, Commissioning Agent's Services will conform to the higher or more stringent standard.
- E. Phase One/Initial Basic Services. The first phase of commissioning is expected to begin during the development of construction documentation. The scope of Services to be provided during the first phase will include equipment and systems design review and development of documents (including a Design Record) related to design intent and basis of design; development of a Commissioning Plan; specifications; a Construction Checklist; an owner training plan; and development of performance test procedures.
- F. Phase Two/Additional Basic Services. The second phase of commissioning will begin at award of the Construction Contract, and will continue through acceptance of the Project.

The scope of Services to be provided during the second phase may include, but not be limited to, implementation of the Commissioning Plan and specifications; inspection of equipment and systems (Dynamic and static Systems); performance of Functional and Manual Tests; Monitoring; preparation of complete documentation (including checklists, logs, reports, etc.) of all equipment and systems testing and inspections performed; preparation of an Issues Log; development of performance test procedures; observation of systems and equipment testing; review of operations and maintenance (O&M) manuals; review of relevant shop drawings and submittals; and performance of all commissioning Services required for the Sustainable Goals; and testing, adjusting, and balancing ("TAB") Services.

In addition, it is the Commissioning Agents responsibility to schedule, lead, and provide meeting notes for the commissioning meetings that included the general and sub contractors as well as the Owner and the Owner's representatives.

- G. Schedule. The Commissioning Agent shall provide a schedule for the performance of the Initial Basic Services upon execution of this Supplement. The Commissioning Agent agrees that time is of the essence in the performance of this Supplement.

III. Directives for Performance of the Services.

- A. The Commissioning Agent shall provide all Services for the Project as outlined in this Supplement. The Commissioning Agent's performance of Services shall be as a professional Commissioning Agent for the Owner to carry out the activities of equipment and system commissioning, and to provide the technical documents and testing to achieve the Owner's Project objectives including but not limited to, fulfilling all the requirements for Sustainable Goals of the facility.
- B. The Owner may employ the services of an independent project manager, and potentially, other consultants as needed to fulfill the Owner's objectives. Commissioning Agent shall cooperate with, and coordinate its Services with, such other consultants as the Owner and/or its Project architect may retain, as well as the Project construction Contractor and its subcontractors, in order to complete the commissioning Services and Project in a timely, cost-effective, and efficient manner.
- C. Commissioning Agent shall provide Owner with a list of all consultants Commissioning Agent intends to utilize on the Project. The list shall include such information on the qualifications of the consultants as may be requested by the Owner. The Owner reserves the right to review the consultants proposed, and the Commissioning Agent shall not retain a consultant to which the Owner has a reasonable objection.
- D. Commissioning Agent shall make available key personnel and consultants as identified in its proposal and the attached Exhibit 1. Any attempted substitution without written consent of Owner shall constitute a material breach of the Contract. In the event that key personnel or Consultants become unavailable to Commissioning Agent at anytime through no fault of Commissioning Agent, Commissioning Agent shall replace the key personnel and Consultants with personnel or Consultants having substantially equivalent or better qualifications than the key personnel or consultant being replaced, as approved by Owner. Likewise, the Commissioning Agent shall remove any personnel or Consultants from the Project if so directed by Owner in writing following discussion with the Commissioning Agent, provided that Commissioning Agent shall have a reasonable time period within which to find a suitable replacement.

IV. Commissioning Agent's Services

A. Overview

- 1. The objectives of the Owner in commissioning specified equipment and systems, and selected Sustainable Goals features, are to:
 - a. Ensure and document that all commissioned equipment, systems and assemblies are installed according to the relevant Contract Documents, the manufacturer's recommendations, and, if not at variance with the foregoing, industry-accepted minimum standards, and that they receive adequate operational checkout by installing subcontractors.
 - b. Ensure and document that all commissioned equipment, systems and assemblies function and perform according to the highest or most stringent of the standards

- set forth in the relevant Contract Documents, commissioning specifications, manufacturer's performance standards, State and federal mandatory standards, if any, and the Owner's objectives and requirements that the building function cost-effectively, efficiently, and with minimal environmental impact.
- c. Ensure that specified equipment and assembly operations and maintenance documentation is provided.
 - d. Ensure that operations and maintenance staff receive appropriate training.
- B. The Commissioning Agent will conduct pre-construction phase reviews to ensure that any given feature qualifies for Sustainable Goals credits. Gathering Sustainable Goals required documentation is also part of the scope of commissioning required under this Supplement.
- C. The following Dynamic Systems and features will be commissioned, including submittal review, observation and Functional Testing. Other systems identified as either Initial or Additional Basic Services, will also be commissioned utilizing this process. All general references to equipment in this Section refer only to equipment that is to be commissioned. A "[c]" indicates that Commissioning Agent will develop and complete a Construction Checklist for this system, piece of equipment, or assembly. An "[*]" indicates that the Contractor will document all startup and initial checkout procedures for the system, piece of equipment or assembly.
1. HVAC System and all integral equipment controls. All new HVAC systems shall be commissioned, including, but not limited to:
 - a. Pumps [c] [*]
 - b. Air handling units [c] [*]
 - c. Heating and ventilating units [c] [*]
 - d. Split system AC units [c] [*]
 - e. Exhaust fans [c] [*]
 - f. Chiller [c] [*]
 - g. Heaters (electric and water) [c] [*]
 - h. Energy management control system [c] [*]
 - i. Exhaust hoods [c] [*]
 2. Electrical Systems
 - a. Primary and secondary power [c] [*]
 - b. Emergency and back-up power [c] [*]
 - c. Lighting [c] [*]
 - d. Automatic lighting controls [c] [*]
 3. Plumbing
 - a. Domestic water heaters [c] [*]
 - b. Recirculation pumps [c] [*]
 - c. Sump pumps [c] [*]
 - d. Sewage ejectors [c] [*]
 - e. Lift stations [c] [*]
 - f. Controls [c] [*]
 4. Fire Protection
 - a. Fire alarm system [c] [*]
 - b. Fire/smoke or smoke dampers [c] [*]
 - c. Smoke Evacuation Systems [c] [*]

5. Security Systems
 - a. Door access control systems [c] [*]
 - b. Security cameras [c] [*]
 - c. Elevator access control systems [c] [*]

6. Irrigation System
 - a. Irrigation audit [c] [*]

D. Initial Basic Services include but are not limited to:

1. Development of a detailed Commissioning Plan for the Project. The plan will include, but not be limited to:
 - a. Preparation of a proposed outline of the respective responsibilities of the Commissioning Agent, Owner, and design team in the accomplishment of Project equipment and system commissioning and attainment of the required Sustainable Goals of the facility. (Owner shall, in its sole discretion, make all final determinations of the respective responsibilities of the Commissioning Agent, Owner, design team, and Contractor, and will document them in a Contract amendment.)
 - b. Identification of all equipment and systems to be commissioned.
 - c. Identification of scheduling requirements for commissioning activities through Project completion and attainment of the required Sustainable Goals in the facility.
2. Equipment and Systems design intent documentation (part of the Design Record), including but not limited to:
 - a. Design intent documentation describing the concepts and criteria required to be addressed to qualify for attainment of the required Sustainable Goals in the facility, as well as those considered important to the Owner, including general system description; system function; quality of construction; occupancy requirements; indoor air quality; performance criteria; critical systems and environments; and budget considerations. The Commissioning Agent shall review and comment on the design intent document prepared by the Owner and design team.
3. Construction Document review:
 - a. Review of preliminary Construction Documents at the conclusion of the Design Development Phase, at 50% complete and at 90% complete, including provision of written review comments and suggested additions or modifications.
4. Energy Performance Verification
 - a. Coordinate with the Design team in preparation of the Energy Performance ECM Analysis Reports to establish the scope of work for Energy Performance verification.
5. Commissioning Specifications:
 - a. Development of a set of commissioning specifications for all equipment, assemblies,

and systems being commissioned. These commissioning specifications will become part of the specifications included in the Contract Documents. Commissioning Agent shall also coordinate with the design team, review Project construction specifications, and provide the Owner with recommended additions or modifications to the proposed Contract Documents that will clarify the commissioning process and scope of commissioning activities required to be performed during Project construction activities.

6. Owner's Training Plan: Commissioning Agent shall prepare a comprehensive training program covering maintenance and troubleshooting of commissioned equipment and systems.
7. Performance Test Procedures: Commissioning Agent shall prepare a Functional Test Plan for each system, assembly, and item of equipment being commissioned. Each Functional Test Plan shall provide a detailed description of the test procedures to be used to verify proper system/equipment operation.

E. Additional Basic Services:

1. Construction reviews, monitoring, and prefunctional checkouts and start-up plans:

- a. Review all mechanical and electrical subcontractor submittals.
- b. Provide on-site visits to observe and monitor construction. In addition to the time required to witness and document the above items a total of 12 site visits are required by Owner to monitor progress of systems and equipment construction and installation:
- c. Develop Prefunctional Checkouts and Start-up Plans: Develop comprehensive prefunctional checkout and start-up plans for systems, assemblies, and equipment being commissioned. Prefunctional checks shall provide a detailed checkout of completeness of installation prior to initial start-up. Start-up plans shall describe minimum requirements for start-up. (Prefunctional check and equipment start-up shall be performed by the Contractor and witnessed by an Owner's representative.) Prefunctional checks and start-up will only be performed for new systems and equipment.

2. Verification

- a. Functional Testing, Adjusting and Balancing: Commissioning Agent shall conduct functional testing in accordance with the Functional Test plans, and shall document and submit to Owner a record of all test results. Commissioning Agent shall prepare completion reports summarizing results of testing, description of deficiencies identified, and corrective action required to correct deficiencies.
- b. Troubleshooting: Commissioning Agent shall perform troubleshooting inspections and tests on all systems, assemblies, and equipment being commissioned. Commissioning Agent shall meet with Owner and design team to develop recommendations for correcting performance deficiencies identified through troubleshooting inspections and tests.
- c. Retesting: Commissioning Agent shall retest all systems, assemblies, and equipment

with performance or design deficiencies to verify that corrections are complete, and that the system, assemblies, and equipment are functioning as intended.

3. Review of O&M Manuals: Subsequent to the design team review, Commissioning Agent shall review the Contractor's O&M manuals. Commissioning shall also verify completeness from an operational perspective and provide written comments and suggested additions or modifications, if any.
4. Coordinate training of the operation staff: Commissioning Agent shall coordinate training of Owner's maintenance personnel in the operation and maintenance of commissioned equipment, assemblies, and systems. The Commissioning Agent shall meet with the Owner's representatives, review training requirements, and prepare training plans for the Contractor. It shall also verify that minimum training requirements established in the construction specifications have been met.
5. Systems Manual: Commissioning Agent shall prepare a Systems Manual for all commissioned systems.
6. Final Commissioning Report: Commissioning Agent shall provide Owner with a final commissioning report to include:
 - a. Summary of the commissioning process implemented on the Project
 - b. Detailed prefunctional checkout and start-up plans
 - c. Detailed Functional Test plans and comprehensive documentation of results of Functional Testing.
 - d. Final review of how well systems, assemblies, and equipment met the design intent, noted discrepancies, and any recommendations for equipment, assembly or system modifications required by performance issues.

The Commissioning Agent agrees to perform the Services according to the terms and conditions of this Supplement and the Retainer Agreement, and the Parties agree that the Retainer Agreement is incorporated into this Supplement, as if fully set forth herein. All services shall be performed in compliance with the OSU Design Criteria in effect as of the date of this Supplement.

The Project description, scope of the Commissioning Agent's Services, and fee breakdown are outlined in the proposal dated _____, signed by _____ (the "**Proposal**"). The Proposal is attached to this Supplement as **Exhibit 2** and is incorporated herein by this reference.

3. **INCORPORATED DOCUMENTS:** This Supplement, the Retainer Agreement and the Proposal are all intended to be complementary. However, in the event of conflicts or discrepancies among these contract documents, any such conflicts or discrepancies will be resolved utilizing the following descending order of precedence: a) this Supplement, excluding the Retainer Agreement and the Proposal; b) the Retainer Agreement; and finally c) the Proposal.
4. **COMPENSATION:** The maximum, not-to-exceed, total amount payable under this Supplement for the combination of Initial Basic Services and Reimbursable Expenses is \$ _____, more particularly described as follows:
 - A. Initial Basic Services: The Owner agrees to compensate the Commissioning Agent for Initial Basic Services, including any such Services performed by its consultants, on a time and materials basis, and to reimburse the Commissioning Agent for related direct expenses (the "Reimbursable Expenses"), in accordance with the Retainer Agreement and the provisions of this Supplement.

1. **Initial Basic Services.** The Commissioning Agent shall perform the Initial Basic Services, directly or through its consultants, on a time and materials basis for the maximum not to exceed price of \$_____.00.
 2. **Reimbursable Expenses.** The Owner shall reimburse the Commissioning Agent for any allowable Reimbursable Expenses, up to a maximum amount of \$_____.00.
- B. **Additional Basic Services:** Upon execution of an amendment to this Supplement and Owner's written authorization to proceed, the Maximum Compensation shall be adjusted for the Additional Basic Services, provided, however, that Owner shall not be obligated to authorize performance of Additional Basic Services.

The Commissioning Agent agrees to perform the Services according the schedule developed in cooperation with the Owner in order to meet Project needs.

In the event of an amendment of this Supplement to include additional Services to be performed by the Consultant, the Parties understand and agree that the total Maximum Compensation under the Supplement, as amended, cannot exceed the maximum amount allowed under OAR 580-063-0025.

5. **TERM:** This Supplement is effective on the date it has been signed by every Party hereto and all necessary State approvals have been obtained (the "Effective Date"). No Services shall be performed or payment made prior to the Effective Date. The Consultant shall perform its obligations according to this Supplement, unless terminated or suspended, through final completion of construction and completion of all warranty work. Termination or suspension shall not extinguish or prejudice Owner's right to enforce this Supplement with respect to any breach of a Consultant's performance that has not been cured.
6. **TAX COMPLIANCE CERTIFICATION:** By signature on this Supplement, the undersigned hereby certifies under penalty of perjury that the undersigned is authorized to act on behalf of the Consultant and that the Consultant is, to the best of the undersigned's knowledge, not in violation of any Oregon Tax Laws. For purposes of this certification, "Oregon Tax Laws" means a state tax imposed by ORS 401.792 to 401.816, ORS chapters 118, 314, 316, 317, 318, 320, 321 and 323; the elderly rental assistance program under ORS 310.630 to 310.706; and local taxes administered by the Department of Revenue under ORS 305.620.
7. **INSURANCE REQUIREMENTS.**
 - A. **Workers' Compensation** – The Consultant, its Sub-consultants, if any, and any other employers providing work, labor or materials, under this Supplement, are subject employers under the Oregon Workers' Compensation Law and shall either comply with ORS 656.017, which requires such employers to provide Oregon Workers' Compensation coverage for all their subject workers working in Oregon or shall comply with the exemption in ORS 656.126.
 - B. **Commercial General Liability** - Consultant shall obtain, at Consultant's expense, and keep in effect during the term of this Supplement, Commercial General Liability Insurance covering bodily injury and property damage in a form and with coverages that are satisfactory to the OWNER. This insurance shall include personal injury liability, products and completed operations, and contractual liability coverage for the indemnity provided under this Supplement, and is made on an occurrence basis. Combined single limit per occurrence shall not be less than \$1,000,000.00
 - C. **Automobile Liability** - Consultant shall obtain, at the Consultant's expense, and keep in effect during the term of this Supplement, Automobile Liability Insurance covering all owned, non-owned, or hired vehicles. This coverage may be written in combination with the Commercial General Liability Insurance. Combined single limit per occurrence shall not be less than \$1,000,000.00.

D. Professional Liability/Errors & Omissions - Consultant shall provide the OWNER with proof of coverage for Professional Liability/Errors & Omissions insurance covering any damages caused by any negligent error, omission, or any act for the Project, its plans, drawings, specifications and project manual, and all related work products of Consultant. The policy may be either a practice based policy or a policy pertaining to the specific project. Professional Liability insurance required to be provided will have a combined single limit of not less than \$1,000,000.00.

8. **OTHER TERMS.** Except as specifically modified by this Supplement, all terms of the Retainer Agreement remain unchanged and apply to the Services.

9. **EXECUTION AND COUNTERPARTS.** This Supplement may be executed in several counterparts, each of which shall be an original, all of which shall constitute but one and the same instrument.

Consultant hereby confirms and certifies that the representations, warranties and certifications contained in the Retainer Contract remain true and correct as of the Effective Date of this Supplement.

IN WITNESS HEREOF, the Parties have duly executed this Supplement on the dates indicated below.

Consultant		STATE OF OREGON ACTING BY AND THROUGH THE STATE BOARD OF HIGHER EDUCATION, on behalf of Oregon State University, Owner
By	_____	By _____ Heather M. Cooney
Title	_____	Construction Contract Officer
Date	_____	Date _____

EXHIBIT 1

COMMISSIONING AGENT'S KEY PERSONNEL AND CONSULTANTS

Key Personnel

Principal: _____

Senior Commissioning Agent: _____

Commissioning Agent: _____

Project Manager: _____

Production Personnel/Project Commissioning Agent: _____

Clerical: _____

Consultants

1. _____

2. _____

3. _____

4. _____

[DRAFTER'S NOTE: This Exhibit 1 needs to be revised and completed to fit the particular Project. The key personnel positions above are examples only.]