

COMMISSIONING SERVICES

EXHIBIT A TO CONTINUING SERVICES AGREEMENT

ARTICLE 1 – SERVICE PROVIDER’S BASIC SERVICES

1.1 GENERAL RESPONSIBILITIES. Service Provider accepts the relationship of trust and confidence established between it and Owner by this Agreement and covenants to use Service Provider's best professional efforts, skill, judgment, and abilities in performing the Services, and to further the interests of Owner in accordance with the usual and customary standards of Service Provider's profession and in compliance with all Applicable Law (the "*Standard of Care*"). Service Provider will allocate adequate time, personnel and resources to each Project to perform the Services as and when required, and will ensure that all documents bear the seal of the licensed professional who prepared them. With respect to each Project and in satisfaction of the foregoing, Service Provider shall:

1.1.1 Comply with Contract Documents referenced in this Exhibit. These include:

1.1.1.1. The current version of the State of Texas Uniform General Conditions for Construction Contracts (“*UGC*”) published by the Texas Facilities Commission on its website, and the University of Houston Supplemental General Conditions (“*SGC*”), which may be found online at http://www.uh.edu/legal-affairs/contract-administration/pdf-documents/Supplemental_general_special_conditions.pdf.

1.1.1.2. The current Campus Design Guidelines (<http://www.uh.edu/plantops/departments/fpc/owners-design-criteria/index.php>) and Master Specifications (<http://www.uh.edu/plantops/departments/fpc/master-specs/index.php>), particularly Master Specifications Section 01 91 13 General Commissioning Requirements <http://www.uh.edu/plantops/departments/fpc/master-specs/01%2091%2013%20fl-general%20commissioning%20reqmts.pdf>.

1.1.1.3. Any capitalized term used but not defined in this Exhibit has the meaning ascribed to it in Master Specifications Section 01 91 13, in the UGC, or in ASHRAE Guideline 0 – The Commissioning Process (current edition).

1.1.1.4. Any proposed deviations from the Contract Documents must be submitted in writing to Owner for approval. Service Provider shall not proceed with any such deviations without the prior written approval of Owner.

1.1.2 Plan and serve as leader in activities related to the sequence of operation, commissioning and start-up of building equipment, and HVAC and control systems and assemblies.

1.1.3 Assist Owner with identifying project goals, performance criteria, cost considerations and make recommendations regarding any possible operation, installation, testing, and/or performance issues.

1.1.4 Coordinate the Services with the Commissioning Team.

1.1.5 Take reasonable precautions to verify the accuracy and suitability of any drawings, plans, sketches, instructions, sequence of operation, information, requirements,

procedures, and other data for a Project and promptly alert Owner in writing of any error, omission or inconsistency in services or information, regarding the Commissioning Equipment. Service Provider shall identify to Owner in writing any such documents or data which, in Service Provider's professional opinion, are unsuitable, improper, or inaccurate in connection with the purposes for which such documents or data are furnished. Nothing shall excuse or detract from Service Provider's responsibilities or obligations hereunder unless Service Provider advises Owner in writing that in Service Provider's professional opinion such documents or data are unsuitable, improper, unavailable, or inaccurate and Owner confirms in writing that it wishes Service Provider to proceed in accordance with the documents or data as originally given.

1.1.6 Correct, at its own cost, any Services rendered by Service Provider and/or any Consultants that do not meet the Standard of Care.

1.1.7 At no cost to Owner, and in accordance with Section 2.1, furnish and deliver to Owner copies of each document made or furnished by Service Provider or its Consultants in connection with the Project, which copies shall become the property of Owner.

1.1.8 At Owner's request, electronically distribute copies of all documents for use by Service Provider and its Consultants to any Owner employee, agent or contractor requiring them, all at no cost to Owner.

1.2 COMMISSIONING SERVICES.

1.2.1 Service Provider shall verify that the Project and all Commissioning Equipment (defined below) are planned, designed, installed, tested, operated, and maintained to meet Owner's Project Requirements ("**OPR**"). The following systems and assemblies may require Services (collectively, the "**Commissioning Equipment**," though not all listed items may be applicable to or included within a specific Project):

1.2.1.1. **HVAC Systems**

Air Handling Units	Fan Coil Units
Outside Air Units	Air Terminal Units
Make-up Air Units	TAB Verification
Humidifiers	Stair Pressurization System
Unit Heaters	Smoke Control System
Cabinet Unit Heaters	Pressure Mapping
Heat Recovery System	Building Automation System
Convectors Exhaust Fans	Barrier Integrity
Chilled Water System	Containment Test
Condenser Water Systems	Refrigeration Systems
Heating Hot Water System	HEPA Filters
Process Hot/Cold WaterSystems	

1.2.1.2. **Electrical Systems**

Normal Power Distribution System
Emergency Power Distribution System
Lighting and Daylighting Control Systems
Low Voltage Systems (Telecom, Data, etc.)
Switchgear
Motor Control Centers

Transformers
Primary Distribution Panels
Panelboards
Utility Metering
Lightning Protection
Path of Egress Lighting
Generators and Automatic Transfer Switches under “emergency power”
Medium Voltage Transfer Switches
Medium Voltage Cabling and Terminations
Variable Speed Drives
UPS Systems

1.2.1.3. Plumbing Systems

Domestic Hot & Cold Water Distribution
Laboratory Gas and Vacuum Systems
Laboratory Compressed Air Systems
Medical Compressed Air Systems
Nitrogen, Natural Gas, Oxygen, Carbon Dioxide, and Specialty Gases Systems
RO/DI or Pure Water System
Sump Pumps
Waste Neutralization Systems
Retention Process System
Liquid Effluent Monitoring
Emergency Eyewash/Shower Safety Equipment

1.2.1.4. Conveying Systems

Elevators

1.2.1.5. Life Safety Systems

Fire Suppression System
Fire Alarm System
Emergency Egress Lighting
Security and Access Control Systems
Fall Protection Systems

1.2.1.6. Laboratory Equipment

Fume Hoods Face Velocity and Alarms (not certification)
Biosafety Cabinets Face Velocity and Alarms (not certification)
Cage Wash (Cage and Rack Washers)
Glass Washers
Autoclave and Autoclave Cooling System
Freezer Room

1.2.1.7. Integrated Building System Testing

Barrier Integrity Containment Test
Pressure Cascade Failure/Recovery Scenarios (Lab/Clean Rooms)

1.2.1.8. Other Systems

Building Envelope & Roof System (Thermal Imaging)
Irrigation Systems
Weight handling and hoist systems

1.2.2 Pre-Design Phase Services. During the pre-design phase of a Project, Service Provider will, with input from the Owner Contact and any other representative or contractor of Owner assigned to a Project, develop commissioning matrix, develop OPR for the commissioning process, the commissioning budget and initial Commissioning Plan, and close of phase report, and submit each to the Owner Contact for review and approval.

1.2.3 Design Phase Services. During the design phase of a Project, Service Provider will:

1.2.3.1. Schedule and chair all document review coordination meetings and ensure execution of all agenda items. Prepare minutes of every meeting and send copies to all Commissioning Team members and attendees within five business days after the meeting.

Update OPR and Commissioning Plan as necessary to reflect changes in planning, design, proposed occupancy and operations of the Project, and submit to the Owner Contact for review and approval.

1.2.3.2. Prepare all required Project-specific specification sections for commissioning and submit to the Architect/Engineer (as defined in the UGC) for inclusion in its final submission. Commissioning specifications shall include sufficient information to enable the bidding contractors to fully understand and fulfill their scope of work for the Project. Specifications shall be provided in the format specified by the Architect/Engineer.

1.2.3.4. Review and comment on the Project's final plans and specifications for adequacy relating to the commissioning process. Specific areas for review include but are not limited to:

- Adequate access area to read gauges, replace filters, maintenance points.
- Required isolation valves, dampers, interlocks, piping, etc. to allow for manual overrides, simulating failures, seasonal and other testing conditions.
- Uniform inlet connection requirements to variable air volume terminal boxes.
- Location of pressure and temperature plugs close to controlling sensors for verifying their calibration.
- Location of pressure gauges, thermometers and flow meters in strategic areas to facilitate verifying system performance and ongoing Operations and Maintenance (“*O&M*”).
- Location of pressure and temperature plugs at less critical locations and on smaller equipment where gauges and thermometers would be cost excessive.

- Specification of the location and criteria for the variable air volume ducts static pressure sensor and hydronic system differential pressure sensors.
- Adequate balancing valves, flow metering and control stations and control system functions to facilitate and verify reliable test and balance.
- Detailed and complete sequences of operations.
- Detailed Commission Equipment Matrix with required functions.
- Inclusion of complete O&M documentation and complete training requirements.

1.2.3.5. Develop the initial format to be used for Issues Logs (as defined in ASHRAE Guideline 0) throughout and for each phase of the commissioning process.

1.2.3.6. Prepare and issue close of phase report to the Owner Contact for review and approval.

1.2.4 Construction Phase. During the construction phase of a Project, Service Provider will:

1.2.4.1. Update OPR and Commissioning Plan as necessary to reflect changes in construction, proposed occupancy and operations of the Project. Service provider will submit its draft updates to the Owner Contact no later than semi-monthly for Owner's review and approval.

1.2.4.2. Plan, lead, schedule, and coordinate all commissioning testing, demonstrations, training events, performance verifications, manufacture start-up, pre-function test, and other Services as described in the Contract Documents and approved Commissioning Plan.

1.2.4.3. Act as chair at all construction-phase commissioning meetings and ensure execution of all agenda items. Prepare minutes of every commissioning meeting and send copies to all Commissioning Team members and attendees within five business days after the meeting.

1.2.4.4. At the first construction-phase meeting, establish a tentative schedule for HVAC and electrical system orientation and inspections, O&M submittals, training sessions, system flushing and testing, testing, adjusting, and balancing work, and functional performance testing and completion of Services.

1.2.4.5. Verify and confirm to Owner in writing that submittals relating to the Commissioning Equipment comply with the OPR. Develop detailed test procedures and data forms.

1.2.4.6. Supervise and advise Owner in writing regarding the installation, start-up and testing of the Commissioning Equipment. Ensure the results are documented properly, including a summary of deficiencies.

1.2.4.7. Supervise the Commissioning Team members in the functional performance tests. The test data shall be included in the close of phase report.

1.2.4.8. Prepare and issue the Systems Manual (as defined in ASHRAE Guideline 0) and close of phase report to the Owner Contact for review and approval.

1.2.4.9. Ensure all deficiencies are re-inspected and corrected.

1.2.5 Training Phase. Within fifteen (15) working days following Substantial Completion of a Project, schedule and attend an initial training session for Owner’s personnel, confirm any and all (on-site or out-of-state) manufacturer training to be conducted by the design professional(s) and construction contractor on the Project, concerning the Commissioned Equipment. The Service Provider will review the OPR and the design professional(s) will review the Basis of Design.

1.2.6 Warranty/Post-Acceptance Phase. Within one-hundred-twenty (120) working days after Substantial Completion of a Project, Service Provider will:

- 1.2.6.1 Review with Owner’s personnel the current building operation and the condition of outstanding issues related to the original and seasonal commissioning; and
- 1.2.6.2 Interview Owner’s personnel to identify problems with or concerns about the Commissioning Equipment and/or its operation; and
- 1.2.6.3 Provide to the Owner Contact written suggestions for improvements and for documentation of its suggested changes in the O&M manuals; and
- 1.2.6.4 Identify areas that may come under warranty or under the original construction contract for the Project.

1.3 **SCHEDULE OF SERVICES.** Service Provider shall prepare and submit to Owner as part of each Project Proposal a schedule for the performance of Service Provider’s Services that shows the order in which Service Provider proposes to carry out Service Provider’s Services (the “*Schedule*”). Once approved by Owner and incorporated as part of a Project Agreement, time limits established by the Schedule shall not be exceeded by Service Provider, except for reasonable cause, as approved by Owner in writing. If Service Provider determines that the Schedule should be adjusted at any point prior to commencement of a Project, then Service Provider shall submit to Owner a revised Schedule and an explanation of the change(s) and the reason(s) for the change(s) for Owner’s prior written approval. If approved in writing by Owner, the revised Schedule shall replace the prior Schedule for all purposes under this Agreement for such Project.

1.4 **TYPICAL COMMISSIONING REPORT DOCUMENTS DUE DATES.**

Document Type	Due Date
Focused design reviews during the pre-design and design phases	Two weeks after receipt of pre-design and design issue package
Design Phase Commissioning Plan	Concurrent with 50% design issue package
Commissioning Specifications	Concurrent with final design issue package
Final Commissioning Plan	Prior to scheduled construction phase kick-off meeting
Field Observation Reports	No later than two days after the field visit
Submittal Reviews	No later than five days after receipt of submittal
Issues Log	Ongoing entries; log shall be reviewed at each commissioning meeting
Commissioning Process Progress Report	Ongoing entries; reports shall be compiled into close of phase report.
Close of Phase Report	No later than five days after completion of (each) pre-design, design, and construction phases.
Systems Manual	No later than five days after completion of

	construction phase.
Start-Up and Testing Schedule Workshop	Minimum of 4 month prior to scheduled equipment or system start-up
Installation Verification Forms	Minimum of 4 months prior to scheduled equipment or system start-up
Functional Performance Test Protocols	Minimum of 4 months prior to scheduled equipment or system test phase
Testing Discrepancy Reports	End of each test day
Final Report	Within one month after completion of testing
Addendum to Final Report	Within two weeks after opposite season testing

1.5 DOCUMENT FORMAT. Each report must be submitted in electronic and hard versions as follows:

1.5.1 Each document must be submitted electronically in searchable PDF format, maximum size 15MB; and

1.5.2 Owner also may request print copies of individual documents, and may request a complete original, signed spiral-bound copy of the final report, if any. All print versions shall be printed on 8.5" x 11" paper.

1.6 USE OF DOCUMENTS. The Commissioning Plan and reports required hereunder are deemed to be instruments of service and Service Provider shall retain ownership to such documents subject to the provisions of this Section 1.6.

1.6.1 Ownership. Upon Owner's final payment for Services performed by Service Provider with respect to a Project, the report documents for such Project shall become the property of Owner to the extent allowed by Applicable Law.

1.6.2 Required Disclosures. Owner's submission or distribution of any or all of the report documents to meet official regulatory requirements or for other purposes in connection with the Project publication is not in derogation of Service Provider's rights, and is here specifically authorized and permitted by Service Provider.

1.6.3 Inspection by Others. In the event a federal grant or other federal financing agency participates in the funding of a Project, Service Provider shall permit access to and grant the right to examine its books covering its Services for such Project, comply with all federal agency requirements as to work hours, overtime compensation, nondiscrimination, contingent fees, etc., and attend meetings, prepare reports and submit data for approval, as required by the agency involved.

ARTICLE 2 –ADDITIONAL SERVICES

2.1 GENERAL. If authorized in writing by Owner, Service Provider shall provide any or all of the Services listed in Section 2.2 (the "**Additional Services**") in accordance with this Section 2.1. Prior to commencing any Additional Service, Service Provider shall submit to Owner an Additional Services Proposal. The Additional Services Proposal shall describe in detail (a) the nature and scope of the Additional Services, (b) the basis upon which Service Provider believes such services constitute Additional Services rather than Basic Services, (c) the maximum amount of fees and Reimbursable Expenses for Service Provider's performance of the Additional

Services, and (d) a proposed schedule for performance of the Additional Service. At Owner's request, Service Provider shall deliver to Owner a proposal in a form acceptable to Owner for performance of any proposed Additional Services on a fixed- price basis. Upon acceptance by Owner, each Additional Services Proposal shall become part of this Agreement and shall be subject to all terms and conditions of this Agreement, as fully and completely as though the same had been included in this Agreement as a Basic Service at the original execution of this Agreement, except that payment for any such accepted Additional Service shall be in accordance with Section 2.3.

2.2 ADDITIONAL COMMISSIONING SERVICES.

- 2.2.1 Testing for water intrusion in the building envelope;
- 2.2.2 Water quality testing and/or sampling;
- 2.2.3 Thermal performance continuity review;
- 2.2.4 Other commissioning services requested by Owner not included within Section 1.2.

2.3 COMPENSATION. As compensation for any Additional Services rendered in compliance with the provisions of this ARTICLE 2, Service Provider shall receive a fee (a) equal to the DSE with multiplier pursuant to Section 5.1 of the Agreement for such Additional Service, or (b) fixed price agreed to by the parties prior to Service Provider's performance of such Additional Services.