

Owner's Project Requirements (OPR)  
University of Chicago

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**1.0 General**

**Date:** March 31, 2014

**Project:** GCIS PSD Building Laboratory Renovations for Dr. Smith – E247J

**Project Manager:** J.P. Stevens

**Project Charter Status:** Completed

**1.1 Introduction**

The laboratory space to be renovated for Dr. Smith's Lab is located on the 2<sup>nd</sup> floor of the Gordon Center for Integrative Science. The project area consists of two spaces: Room E247J, the main laboratory space (approximately 618 square feet in area) and Room E247, an adjoining vestibule (approximately 321 square feet in area). The lab space will support research and associated equipment.

## **1.2 Key Owner's Project Requirements**

- Provide a state of the art laboratory space that meets the needs of the research to be conducted and a physical environment that is aesthetically pleasing.
- Ensure that the design and construction is of the highest quality. This will maximize the system performance and reduce rework and potential schedule delays. This will also minimize the risk of future issues due to inadequate design or installation.
- Complete the project on time and on budget. The budget is currently being developed and the target occupancy date is September 2013.
- Provide a smooth transition from construction team to the Operations group through a detailed training program and O&M documentation.
- The project shall consist of one lab room and an adjoining vestibule.
- Access to the hallway should be limited to lab faculty and building operations and maintenance staff.
- The lab space (E247J) is to be light-tight.
- Electromagnetic interference should be minimized.
- The lab flooring shall be static free and carpet is not to be used.
- Mechanical systems shall be robust and a level of redundancy should be built in to system design. Down time due to system failure and routine maintenance shall be as minimal as possible.
- Any potential sources of condensation shall be mitigated as equipment is sensitive to moisture.

## **1.3 Occupancy Requirements**

The system shall be capable of operating 24 hours a day 365 days a year. The system should be robust enough to maintain consistent temperature throughout the changing of the seasons.

## **1.4 Performance and Design Criteria**

- The design and construction of this system and equipment room should comply with the University's facilities standards. The University's facilities standards can be found on-line at:
  - <http://facilities.uchicago.edu/about/facilitiesstandards.shtml>
- Vestibule E247
  - Individually controlled HVAC system capable of maintaining  $70-72 \pm 0.5$  degrees F and  $40 \pm 2.5$  % rh year round.
  - Noise level of NC 45 shall be maintained.
  - Vibration shall be kept to a minimum.
  - The space will require nitrogen, compressed air, cooling water and vacuum services.
  - Space for both free-standing and counter top equipment shall be provided.
  - Wall mounted shelving and base storage cabinets with counter/work surface shall be provided.
  - Ceiling shall be exposed construction.
  - Both 208 VAC and 20A 120 VAC service shall be available in the room.
  - T5 IT networking connections shall be available in the room.

- Lab E247J

- Individually controlled HVAC system capable of maintaining  $70-72 \pm 0.5$  degrees F and  $40 \pm 2.5$  % rh year round.
- The existing window openings shall be sealed to prevent light intrusion.
- The opening between rooms E247J and E247H shall be equipped with a dark room door.
- Noise level of NC 45 shall be maintained.
- Air should be HEPA filtered and HVAC design shall minimize air particulates over the laser table. Design shall incorporate dynamic working conditions of researchers and air flow will push particulates away from the table tops.
- Vibration shall be kept to a minimum. Vibrations from new mechanical and electrical systems shall be limited to 250 micro-inches/second as measured in 1/3 octave bands over the frequency range of 8-100 Hz, using a dB(Z) weighting.
- The space shall accommodate owner furnished equipment both free standing and counter top. A fume hood (to be relocated from room E247H) will also be installed.
- Wall mounted shelving and base storage cabinets with counter/work surface shall be provided. The existing sink is to be reused.
- Provide emergency shower and eye-wash station adjacent to the existing sink.
- Ceiling shall be exposed construction.
- The space will require nitrogen, compressed air, cooling water and vacuum services.
- Both 208 VAC and 20A 120 VAC service shall be available in the room.
- T5 IT networking connections shall be available in the room.

### 1.5 Building Site

Project will follow all applicable standards as described in **Volume III, Section A. General Design and Construction Requirements, Section B. Stewardship and Heritage Resources, Section C. Sustainability, Section D. Accessibility, Section F. Site, Civil, and Grounds Requirements, and Section G. Utilities Systems.** *List any project specific requirements if required by the program.*

### 1.6 Transportation & Parking

Project will follow all applicable standards as described in **Volume III, Section C. Sustainability, Section D. Accessibility, Section F. Site, Civil, and Grounds Requirements, and Section S. Safety & Security.** *List any project specific requirements if required by the program.*

### 1.7 Building Envelope

Project will follow all applicable standards as described in **Volume III, Section C. Sustainability, and Section H. Building Envelope.** *List any project specific requirements if required by the program.*

### 1.8 Indoor Environmental Quality

Project will follow all applicable standards as described in **Volume III, Section C. Sustainability, Section H. Building Envelope, Section K. Mechanical Systems, and Section L. Building Automation Systems.** *List any project specific requirements if required by the program.*

### 1.9 Emergency or Backup Power

Project will follow all applicable standards as described in **Volume III, Section M. Electrical Systems.** *List any project specific requirements if required by the program.*

### 1.10 Telecommunications and A/V Systems

Project will follow all applicable standards as described in **Volume III, Section M. Electrical Systems** and **Section Q. Information Technology Services**. *List any project specific requirements if required by the program.*

#### *Telecommunications:*

- ☐ Provide wireless access throughout the spaces
- ☐ Provide ample I/T and A/V pathways throughout to allow for growth, flexibility, and greater technological demands
- ☐ Provide network drops for Owner-furnished mass emergency notification (IP) speakers
- ☐ Also provide network drops for Owner-furnished web-based security cameras
  
- ☐ Owner-furnished VOIP telephone handsets will be used throughout the facility
- ☐ In order to ensure sufficient time for Commissioning, the specifications for voice/data systems and work shall stipulate that all network infrastructure, structured cabling, and other telecommunications work be completed at least 45 days prior to Substantial Completion

#### Audio/Visual

- ☐ Provide flat-screen (LED/LCD) monitors with network connection to playback gear or digital signage software and/or CATV throughout the space; in office reception areas, collaboration spaces, lobby/entry areas, etc.
- ☐ Link all A/V control rooms and closets together with conduit & cabling so A/V signals can be sent from any source to any destination (monitor, speakers, or other playback device)
- ☐ Ensure coordination of lighting and A/V design and installation/integration

### 1.11 Safety & Security

Project will follow all applicable standards as described in **Volume III, Section S. Safety & Security, and Section T. Environmental Health & Safety**. *List any project specific requirements if required by the program.*

- ☐ Access control systems – including card or proximity readers – shall restrict access into the building and into certain rooms and otherwise record traffic in same; system shall be designed in accordance with the University FS2 Standards
- ☐ Provide door position switches on all exterior doors and certain interior doors as identified during program verification and schematic design
- ☐ Provide additional wall-mounted or ceiling-mounted network drops for IP-based security cameras to be installed by the University

### 1.12 Hazardous Materials

Project will follow all applicable standards as described in **Volume III, Section S. Safety & Security, and Section T. Environmental Health & Safety**. *List any project specific requirements if required by the program.*

### 1.13 Furnishings and Equipment

Project will follow all applicable standards as described in **Volume III, Section M. Electrical Systems, and Section Q. FF & E**. *List any project specific requirements if required by the program.*

#### Owner-Furnished, Owner-Installed FF&E (including but not limited to):

- ☐ Network electronics (telecomm room)

- ☐ Permanent door cylinders & keys
- ☐ IP speakers for emergency notification
- ☐ Computers & office machines
- ☐ Kitchen appliances
- ☐ Certain fixtures/equipment in Starbucks
- ☐ Telephone handsets
- ☐ Moveable furniture
- ☐ Signage
- ☐ Security cameras
- ☐ Certain toilet accessories

#### **1.14 Commissioning, Inspection, and Q.A.**

The Commissioning (Cx) consultant will be independent of the design and construction teams, will be selected by the SD phase, and will be responsible for peer review of the design and construction documents; development of the project-specific Cx specification using the University's template "non-technical" spec; development of the project-specific Cx Plan; construction and acceptance phase commissioning and documentation; development of the facility's Systems Manual; and post-occupancy commissioning, testing, and documentation.

It is anticipated that the following building systems will be commissioned:

- ☐ Mechanical and HVAC systems
- ☐ Electrical and lighting systems, including emergency (generator) power (if any)
- ☐ Domestic hot water systems, including solar (if any)
- ☐ Building envelope systems

The following items of particular interest to the University shall be addressed and verified by the Cx consultant throughout the term of service:

1. Accuracy of utilities metering and integration of same with the Building Automation System (BAS)
2. Measurement & Verification of energy usage, performance, and efficiency

#### **1.15 Construction Completion and Turnover**

Inspection, testing, and commissioning culminates in a declaration of Substantial Completion by University. This date establishes both the beginning of the warranty period and commencement of operation and maintenance by University. Move-in of occupants and their personal belongings will not take place until all Substantial Completion "punch list" items are completed.

The University wishes to capture as much relevant and usable information on building products, equipment, systems, and materials in the "as-built" Building Information Model (BIM) as possible. See project-specific BIM Execution Plan and Level Of Detail table, but the A/E shall ensure its specifications require the submission of Revit-compatible "drop-ins" for installed products, equipment, systems, and materials as available.

#### **1.16 Facilities Requirements**

- The lab shall have a grounding rod.
- Low ballast solid state incandescent lighting fixtures shall be used.
- The HVAC system will be fully automated with graphical interface through the existing building Johnson System and fully Bacnet compatible.
- The system graphics will be installed with as-built sequence of operations linked at the main screen.

- Project documentation requirements – in order to properly install, start-up, operate, troubleshoot and maintain the system for the useful life accurate and accessible documentation is required. The owner requires all documentation to be electronic and tailored to the specific components installed. The timing of completion of key documentation is essential:
  - Draft System manual within 30 days of 50% construction completion
  - Training Material 30 days prior to the system start-up.
  - Final Systems manual 30 days after construction completion.
- Warranties for systems shall not be less than one year after substantial completion.
- Spare parts to be provided at the turnover of this project shall include:
  - 1 extra set of belts for all belt-driven equipment.
  - 1 extra set of filter media for each filter (not each type)
- Training will be provided by the construction team prior to building turnover and shall consist of:
  - Classroom sessions, which shall provide instruction on system overview/theory of operation and also provide an overview of the operation and maintenance manuals.
  - Hands-on sessions, which shall provide instruction at the actual equipment including demonstration of startup, shut-down, safeties, maintenance procedures, and setup and use of building automation system trend reports to evaluate system performance (at a minimum).
- Engineer shall instruct the facilities engineering staff on the design and operation intent, sequences of operation, setpoints and alarms,

#### **1.17 Owner Training**

Onsite training for the Owner – whether operators/maintainers or users/occupants – shall include a description and overview of systems, not just the components and equipment that comprise each system.

Training – which is ideally held in conjunction with commissioning – should include general orientation and reviews of the written O&M instructions, relevant health and safety issues or concerns, operation in all possible modes, preventive maintenance, and common troubleshooting problems & solutions.

Building systems that staff shall be trained include:

- ☐ HVAC systems
- ☐ BAS/controls
- ☐ Electrical systems
- ☐ Lighting controls
- ☐ Security Systems and CCTV
- ☐ Fire Alarm system
- ☐ Fire Protection system
- ☐ Audio/Visual (A/V) systems

#### **1.18 Energy Efficiency Goals**

Although system performance and reliability take precedence the system shall operate as efficiently as possible. Premium efficiency motors shall be used and variable frequency drives will be used for all pumps. Any energy saving equipment or controls should also be considered.

**1.19 Post Occupancy & Warranty**

The Cx consultant, CM/GC, and all subcontractors whose systems were commissioned shall meet with the Owner's O&M staff quarterly during the first year after Substantial Completion to offseason test, optimize, and otherwise troubleshoot all commissioned systems.

Also, an onsite meeting will be conducted 10-11 months after Substantial Completion to review performance and quality of the facility with all affected parties – University occupants & users, FS staff, the design team, and the contractor and its subcontractors.

**1.20 Owner's Project Requirements: Version History**

The following is a summary of the changes made to the Owner's Project Requirement document throughout Design, Construction, and Occupancy and Operations. This information is critical to understand and document the trade-offs made and the resulting impact on the project.

Rev. No.	Date	Description of Revisions
1		