PENNSTATE

Office of Physical Plant

The Pennsylvania State University
Physical Plant Building
University Park, PA 16802-1118

DATE: December 12, 2014

SUBJECT: Chemical Engineering/Biomedical Engineering Building,
University Park

TO: Ballinger
Bohlin Cywinski Jackson
Ellenzweig
HOK
KPF/Cope Linder Architects
Payette
Perkins+Will/R3A
Stantec/Pelli Clarke Pelli Architects
Wilson Architects/IKM
ZGF

Congratulations, your firm has been selected as one of the firms on a long list for the design of the above referenced project. The Selection Committee will review responses to this Request for Proposals and identify a short list of three firms to be interviewed.

It is necessary that you provide us with the information requested in the enclosed questionnaire no later than ~~**January 27**~~ **Tuesday, February 10, 2015 at Noon.** Please answer all of the questions in the order requested. This will provide uniform information on all firms for evaluation and ultimate presentation to the Board of Trustees. We encourage you to be as brief as possible without sacrificing accuracy and completeness. A document not exceeding 40 8-1/2 x 11 single sided (20 double sided) pages should be more than adequate to provide the requested information. Please submit to my office **one USB drive and sixteen printed copies** of all materials. In order to better understand our goals and the major issues driving this project, we encourage you to visit the site; please contact Dwayne Rush at dcr13@psu.edu or 814-865-6475 by Wednesday December 17, 2014 to schedule your visit and arrange for a meeting with the appropriate individuals involved in this project. Please contact Dwayne for any project management questions and contact me if you have any process or planning questions.

In addition to the questionnaire, in order to help you formulate a response, enclosed you will find the project's program statement and a site plan. We are not making the BCJ feasibility study available, since we have decided not to retain and renovate the front section of Fenske. That was a critical assumption of the study and this change eliminates the relevance or usefulness of that document in preparing your response.

Also included is a non-binding fee proposal form for you to fill out; please submit one copy of this form under separate cover; to assist you in filling out this form please assume a construction

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budget of $100,000,000 and an FF&E budget of $10,000,000. Finally, you will also find a copy of our Form of Agreement 1-P; please review this agreement to ensure that your firm accepts all terms and conditions as written. In submitting a proposal for this project, you acknowledge that you concur, without exception, with all terms, conditions and provisions of Form of Agreement 1-P.

A decision regarding the firms to be interviewed will be made by ~~February 18~~ Wednesday, February 25, 2015 and posted to our web site. Interviews with the three short-listed firms will be held on ~~Wednesday March 18, 2015 at a location to be determined~~. Thursday, March 12, 2015 at The Penn Stater Conference Center, University Park, PA. Results of the interviews will be announced at the Board of Trustees meeting on Friday March 20, 2015 and posted to our web site.

We appreciate your cooperation and interest in preparing this material. If the Board selects your firm, we will be looking forward to working with you on the development of this important project.

Please do not hesitate to call me if you have any other questions.

Sincerely,

David Zehngut
University Architect
207 Physical Plant
University Park, PA 16802
(814) 863-3158, E-mail dxz3@psu.edu

Enclosures

cc: Selection Committee Members

QUESTIONNAIRE

Chemical Engineering/Biomedical Engineering Building,
University Park

The following items of information must be supplied to the University. We have made no attempt to provide sufficient space below for you to fill in blanks but expect that you will provide the information requested on your own letterhead paper. **Failure to answer all questions will be reason for disqualifying your team from further consideration.** Please provide **one USB drive and sixteen printed copies** of all material submitted. The deadline for submission is ~~**January 27**~~**, February 10, 2015 at Noon.**

1. Please describe your approach to this project. Include a description of the scope of work your team will provide.

2. In addition to any further thoughts you might have on the essence of this project, we would like to see further evidence of your firm's ability to translate design intentions into a meaningful project (including the site). Therefore, please discuss in detail, but in no more than one or two pages, an example from your portfolio, relevant to our project, that best indicates the appropriate resolution of an understanding of the uniqueness of a project, design intentions, and translation of those design intentions into a meaningful and synthesized final solution.

3. Qualifications and experience of the lead design team members, **including consultants**, to be assigned to this project. Provide a clear indication of the roles to be performed by each **individual**. Please be very specific regarding the personal involvement and on-site participation of each lead design **individual.**

4. Consultant firms, if any, proposed for this project:

Firm	No. of Projects Worked With Your Firm	Total Amt. Value
Structural Engineers		
Mechanical Engineers		
Electrical Engineers		
Landscape Architects		
Interior Designers		
Cost Estimators		
Lab Consultants		
Others		

5. Experience of the firm and any consultants in the design of facilities similar to the ones proposed (college and other), completed or under construction during the past ten years. List for each the completion date, final construction cost and gross square feet provided, and be very specific about the services provided by your firm. Identify those specific projects included in the proposed design team experience listed in #3 above.

6. Experience of the firm and any consultants in the design of college and university buildings (not already included in # 5 above) completed or under construction during the past ten years. List for each the completion date, final construction cost and gross square feet provided, and be very specific about the services provided by your firm. Identify those specific projects included in the proposed design team experience listed in #3 above.

7. Evidence of the team's commitment to sustainable design.

8. List five client references for similar scope projects completed during the past ten years, giving name and telephone number. In order to give us an indication of your cost control track record, please **provide accurate and complete data indicating the gross square foot area, the design estimated cost, bid cost, the final total construction cost and the bid date for each project.** Please explain the reason for any major discrepancies between estimated, bid and final construction costs. Please make sure the telephone number of each client reference is current.

9. Graphic examples of selected projects personally done by **the lead design architect**, including brief description and completion date.

10. Please provide a proposed design schedule for each component of this project in graphic form allowing one week for any necessary Penn State University review. Assume the design process will start in April, 2015.

11. List errors and omissions insurance coverage.

12. Number of personnel in present firm(s): Architects _____ Engineers _____
Interior Designers _____ Landscape Architects _____ Others _____

    Which of the above are professionally registered?

13. Briefly tell us how you address diversity within your team.

PENNSTATE

1855

Department of Chemical Engineering
Department of Biomedical Engineering

Chemical Engineering & Biomedical Engineering Building Program Statement

College of Engineering

University Park

College of Engineering
October 14, 2014

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A special note of thanks to committee members and their efforts to complete this program statement.

College of Engineering Dean's Office:
Anthony Atchley; Senior Associate Dean
Clark Colborn; Facilities Administration Officer, Chair

Department of Chemical Engineering:
Andrew Zydney; Walter L. Robb Chair and Professor of Chemical Engineering
Robert Rioux; Friedrich G. Helfferich Assistant Professor
Roger Dunlap; Facilities Representative

Department of Biomedical Engineering:
Cheng Dong; Distinguished Professor and Department Head
Margaret Slattery; Assistant Professor and Undergraduate Program Coordinator
Eugene Gerber; Advanced Engineering Aide

Office of Physical Plant:
Dwayne Rush, Project Manager
Dave Zehngut; University Architect
Dave Breon; Manager, Capital and Space Planning
Ray Alexander; Utility Engineer

Office of Undergraduate Education
Tanya Furman; Associate Vice President and Associate Dean for Undergraduate Education

Development and Alumni Relations
Kristina Meyer; Director of Donor Relations and Special Events

Department of Architecture
Jawaid Haider; Professor

INTRODUCTION

EXECUTIVE SUMMARY

Introduction

The new Chemical Engineering and Biomedical Engineering Building will be constructed on the present site of Fenske Laboratory, placing it near the nexus of life sciences and materials research activity on campus. At a time of rapid and noteworthy growth for both of these departments and the disciplinary foci therein, the project's strategic importance to the College of Engineering and the University cannot be understated.

Background

Fenske Laboratory has been the home of the Department of Chemical Engineering since its construction in 1960; the east wing was added in 1968, with only minor rehabilitation efforts having occurred in the past 46 years. The present condition of facilities in Fenske is of acute concern within the College of Engineering. In its 2008 evaluation of the Chemical Engineering Department, the ABET Engineering Accreditation Committee stated that Chemical Engineering's facilities are "becoming obsolete for a quality program of its size and significance" and that "definite planning for a replacement should be undertaken at the earliest possible time". ABET is presently in the process of re-evaluating the program on its regular six-year accreditation cycle.

Over the past decade, University planners have been examining a variety of options for the rehabilitation or replacement of Fenske. Based in part upon a 2005 recommendation from the architectural firm of Bower Lewis Thrower, the pursuit of a major renovation effort in Fenske was deemed to be economically undesirable. Subsequent planning focus was thus placed on new construction, and in September 2007, the Board of Trustees authorized a $60 million state-supported project to move forward onto the five-year capital plan. In 2010, the architectural firm of Bohlin Cywinski Jackson (BCJ) prepared a study for a new Chemical Engineering Building located east of Tyson Building along Curtin Road on the site occupied by Headhouse I and its associated greenhouses, which were anticipated to be replaced if the project were to proceed. Further study of the cost of greenhouse relocation eventually led planners to conclude that new construction on the present site of Fenske was the preferred approach.

In 2012, the College of Engineering proposed, and the University approved, that space for the Department of Biomedical Engineering (then Bioengineering) should be included in the Chemical Engineering Building program, based on the life sciences synergies between the two departments. Biomedical Engineering is presently headquartered in the Hallowell Building on West Campus. With up to twelve faculty positions scheduled to be added over the next three years, BME will soon be facing extreme space constraints.

In 2013, BCJ produced a more thorough planning study of construction on the Fenske site incorporating the two Departments. This study focused on demolition of only the 1960 west wing section of Fenske, and retention of the 1968 east wing. Subsequently, the decision was made to proceed with a complete demolition of both wings of the building.

Program Elements

As the "under one roof" home of two major College of Engineering departments, the programmatic description of the Chemical Engineering and Biomedical Engineering building obviously presents a large and complex challenge. This program statement establishes an outline of the essential elements of administrative, instructional, research and support spaces that will come together cohesively as the project moves into the design phase.

Administrative space is generally described collectively, with the quantities aggregating the needs of both departments. While each department will require its own distinct identity in the form of an administrative suite, it is expected that resources and functions will be shared between the departments to the greatest degree possible.

The design of instructional space will likewise focus on common usage. Two general purpose classrooms – a 180-seat tiered lecture hall and a 40-seat classroom – are included in the program, as well as a distance learning classroom. Shared study and collaborative spaces, including informal collaborative/social "knowledge commons" spaces, are also included. Course-specific needs will dictate that instructional laboratories be tailored to the specialized needs of the individual laboratory courses, so separate labs are outlined for each department.

The synergistic research opportunities that co-location of the two departments presents are reflected in the "open" research laboratory design approach outlined in the program. While the detailed space descriptions do define research space by department, there is naturally an overarching need to provide a level of integration that will foster collaboration. Chemical Engineering defines three distinct types of research laboratory space – *General Chemical, Heavy Chemical, and Life Science*. There is also a significant amount of computational research within the discipline, which is reflected in enhanced graduate student space defined for this specific purpose. Biomedical Engineering, in addition to having an allotment of open Life Science lab space, has several research spaces dedicated to discipline-specific activity, including spaces dedicated to materials processing and cell culture. Both departments will have research space dedicated to support and shared functions. To allow creative solutions during the design phase, these spaces are defined collectively, as opposed to individually, within the program.

Summary

As outlined in this Program Statement, the project will result in an 188,000 gross square foot facility, providing 117,000 programmable square feet to meet the growing needs of these two dynamic departments. It includes the demolition of all of the existing Fenske Building, replacing that with new, state-of-the-art heavy labs and support spaces. The Work will be accomplished within the $140,000,000 total project budget.

The realization of this important project will understandably represent a milestone of national importance for both departments and the College of Engineering. While the design of this project will serve to fulfill some of the key goals of planning and institutional thrust as established in the College's current five-year Strategic Plan, it must also achieve a modern and adaptable functionality capable of serving instructional and research needs for the next half century and beyond.

Program Committee Charge Letter – January 13, 2014

PENNSTATE

Nicholas P. Jones
Executive Vice President and Provost
The Pennsylvania State University
201 Old Main
University Park, PA 16802-1589

814-865-2505
Fax: 814-863-8583
npj1@psu.edu

DATE: January 13, 2014

FROM: Nicholas P. Jones

TO:

Clark W. Colborn, Chair
Anthony A. Atchley
David C. Breon
Cheng Dong
Roger L. Dunlap
Tanya Furman
Eugene R. Gerber
Jawaid Haider
Kristina L. Meyer
Robert M. Rioux
Dwayne C. Rush
Ian M. Salada
Margaret J. Slattery
David Zehngut
Andrew L. Zydney

SUBJECT: Chemical Engineering and Biomedical Engineering Building

I am writing to invite you to serve on a committee that will develop a program statement to support planning for the construction of a new Chemical Engineering and Biomedical Engineering Building at University Park. Clark Colborn has agreed to serve as the chair for this committee. I will assume that you are willing to serve on this committee unless you advise me to the contrary. The completed program will be provided to the architectural firm approved by the Board of Trustees for the formal design phase of this capital project.

This project will construct new space along with the reuse and renovation of the east wing of Fenske Laboratory. The remainder of Fenske Laboratory will be demolished and the new space for these programs constructed to connect to the remaining section of Fenske Laboratory. The total site capacity including the reuse of the east wing of Fenske Laboratory is estimated to be 180,000 gross square feet to include an estimated 112,000 assignable square feet. The total budget available for this capital project is $140 million. Funding needed for new furnishings and equipment is included within this budget, so it is recommended that the Program Committee consider these needs within the program.

This project has had the benefit of some early architectural planning to assist with the siting, space requirements and budget estimates with a study completed by the firm of Bohlin Cywinski Jackson. Their study is attached for your information.

Thank you for your willingness to serve on the Chemical Engineering and Biomedical Engineering Building Committee. I am requesting the work of this committee to be completed by July 1, 2014. If you have any questions or concerns related to the programming process or procedures, please feel to contact Deborah L. Howard directly at dzh2@psu.edu or 863-0795. Please submit your final report to Deb for a review of the recommendations for subsequent consideration by the Facilities Resources Committee.

cc: Amr S. Elnashai
David N. Wormley
Facilities Resources Committee Members

PROJECT INFORMATION

BACKGROUND AND HISTORY

Department of Chemical Engineering (ChE)

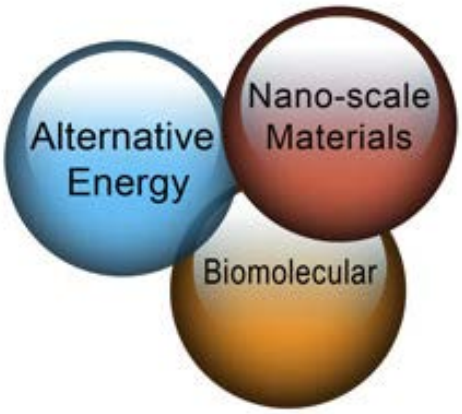
Background

The study of chemical engineering at Penn State has its roots in the discipline of chemistry, which was established as a separate program of study (distinct from the general sciences) in 1888. A formal curriculum in industrial chemistry was introduced in 1902, and this led to the formation of a degree program in Chemical Engineering in 1924. The program was focused on unit operations, with major research efforts in distillation and the properties of petroleum products. Merrell R. Fenske helped establish the Petroleum Refining Laboratory (PRL) at Penn State in 1929, with world-class facilities for distillation research. As many as 70 chemical engineers and chemists were employed in the PRL during World War II.

The Department of Chemical Engineering was separated from the Department of Chemistry in 1948, and the Petroleum Refining Laboratory was officially merged into Chemical Engineering in 1959. The Department was merged into the *College of Engineering* in 1963. Interest in the undergraduate program remained strong, with 62 B.S. degrees granted in 1962-63 making Penn State the 2nd largest chemical engineering program in the U.S. that year. The Department's research and teaching activities expanded dramatically in the 1970's and 1980's, including a major emphasis on bioprocessing, biotechnology, and biomedical engineering.

Interest in chemical engineering is currently in a period of rapid growth, driven by the breadth of the chemical engineering discipline along with the increasing importance of alternative energy in combination with the development of natural gas and oil resources throughout the U.S., including the Marcellus Shale in Pennsylvania. The number of students selecting Chemical Engineering as their major of preference in their first year has increased by more than a factor of two over the last 7 years, from 135 in 2006 to 321 in summer of 2013. The number of Schreyer Honors Scholars enrolled in the Chemical Engineering program has gone up by more than 2.5-fold, from 30 in 2005 to 77 in 2013. The graduate program has also increased dramatically from 57 students in 2007 to 109 students today.

The undergraduate program in Chemical Engineering ranked 14th in the country in 2013 (based on *U.S. News and World Report*), which is up from 16th in 2012 and 21st in 2011. Our PhD program is ranked 21st, and the *Higher Education Evaluation and Accreditation Council of Taiwan* recently ranked Chemical Engineering at Penn State as 2nd in the U.S. based on their evaluation of research productivity, excellence, and impact.



The research activities in the Department continue to evolve, with a strong emphasis on molecular level phenomena and the use of modern computational methods to study a wide range of chemical, physical, and biological processes. The Department has unique strengths in alternative energy, nano-scale materials, and biomolecular engineering, with many of the faculty involved in interdisciplinary research projects working with colleagues across campus and throughout the world. Specific examples include the development of biofuels, studying the nano-structure of plant cell walls, understanding the role of crystallinity in polymeric solar cells, the development of flexible electronics, ion transport in fuel cells, and metabolic pathway engineering (among many others). The Department continues to maintain its core strengths in catalysis, thermodynamics, polymers, and transport phenomena, with applications of these fundamentals in a wide range of exciting areas. The Department is also poised to become a leader in the burgeoning field of natural gas.

Fenske Laboratory

The west wing of Fenske Laboratory, which was originally known as Chemical Engineering Unit 1, was built in 1959 for a total cost of $800,000. This facility was specifically designed to house the Petroleum Research Laboratory, including a 3-story high bay for a full-scale distillation tower. Chemical Engineering Unit 2 (the East wing) was completed in 1968; it originally included the Center for Air Environmental Studies on the second floor with the first floor devoted to classrooms, chemical engineering education, and graduate research laboratories and offices. The two units were subsequently connected and renamed as Fenske Laboratory in 1973 in honor of Merrell Fenske's contributions to the field of chemical engineering and to Penn State. Fenske Laboratory has served as the home of the Department of Chemical Engineering ever since.

The research and educational activities in Chemical Engineering have changed dramatically over the past 2 decades with major new initiatives in the life sciences, materials science and nanotechnology, high performance computing, and energy. The current building is no longer adequate to support the breadth and scope of these highly regarded programs. An ISES report in 2003 identified $15.9 million in existing deficiencies. These deficiencies cover almost all components of the building: failure of mortar joints; degraded ceiling tiles; noncompliance with ADA standards; fire safety not conforming to codes; need for complete HVAC design/replacement; poor lighting; deteriorated laboratory sinks and plumbing; etc. The exterior glazing system and exterior doors are largely original to

the building, energy inefficient, and have reached the end of their useful life. The existing building structure has inadequate lateral and floor-to-floor dimensions, creating significant issues for effective laboratory operation and safety. In addition, the building provides very inefficient use of prime core space on campus, and it lacks the architectural appeal one would expect of a building located in the vibrant heart of campus.

Building materials containing asbestos and lead were likely used in construction of the facility. Hazardous substances were likely introduced into the building's mechanical and plumbing systems during the conduct of research in the facility. Abatement of these materials will be required prior to renovation or demolition of the building.

Chemical Engineering Today

***Faculty*:** The Department of Chemical Engineering currently has 21 full-time tenured or tenure-track faculty (1 Department Head, 12 full professors, 3 associate professors, and 5 assistant professors). The Department also has 2 faculty with joint appointments: an associate professor with a joint appointment in *Energy and Mineral Engineering* and an assistant professor with a joint appointment in *Agricultural and Biological Engineering*. The Department has an additional assistant professor who has accepted a position but is currently completing a post-doctoral appointment at UC Berkeley. In addition, the Department has one multi-year non-tenure track professor who teaches the capstone design course and one full-time lecturer who has primary responsibility for the undergraduate unit operations laboratory. Current projections are for an additional 4-5 faculty hires in the coming years, bringing the total faculty size to 29.

***Research*:** There are currently 109 graduate students in the Department of Chemical Engineering along with another 12 post-doctoral research assistants. In addition, the Department has a very active undergraduate research program – at any one time, there are upwards of 60 undergraduate students involved in research working directly with the faculty and graduate students.

Chemical Engineering is a highly interdisciplinary field – our faculty collaborate with colleagues in Chemistry, Biochemistry and Molecular Biology, Biology, Physics, Materials Science and Engineering, Biomedical Engineering, Mechanical Engineering, Environmental Engineering, Energy Engineering, Engineering Science and Mechanics, and many others. We currently have co-funded faculty with the *Materials Research Institute*, the *Huck Life Sciences Institutes*, the *Penn State Institutes for Energy and the Environment*, and the newly formed *Institute for Natural Gas Research*. Many graduate students are co-advised and conduct research in more than one laboratory.

The faculty have very broad research interests, with a particular focus on:

(1) energy and alternative energy
(2) materials (including both nano-scale materials and polymers)
(3) biological aspects of chemical engineering

Specific projects range from bacterial / eukaryotic cell culture to protein engineering to electronic materials processing to biofuels to fuel cells to catalysis and reaction engineering**.** These activities tend to emphasize the important role of molecular level phenomena, and many faculty lead projects that use a

variety of modern computational methods to study the underlying chemical, physical, and biological processes that govern the behavior of these systems.

***Education*:** The Department graduated 156 students with B.S. degrees in Chemical Engineering in 2013-2014. Although the undergraduate program is currently under enrollment control, with a cap of 150 students, the most recent entrance to major process resulted in more than 190 new students in Chemical Engineering. The current growth is driven by multiple factors, including the growing interest and importance of energy and alternative energy as well as the diverse career paths for chemical engineering graduates; our students consistently command among the highest starting salaries of any undergraduate major.

The undergraduate program in Chemical Engineering at Penn State has been designed so that students can identify and pursue their personal and professional goals while obtaining a strong foundation in the principles and practice of Chemical Engineering. The program aims to produce graduates who will attain one or more of the following:

- Careers as practicing chemical engineers in traditional chemical and energy-related industries as well as in expanding areas of materials, environmental, pharmaceutical, and biotechnology industries.
- Advanced degrees in chemical engineering (or a related technical discipline), medicine, law, or business.
- Positions that provide the technical, educational, business, and / or political leadership needed in today's rapidly changing, increasingly technological, global society.

Most undergraduate courses are taught in lecture-format, often with smaller recitation sections. All students are required to take *CHE 480 Undergraduate Laboratory in Chemical Engineering* – this course exposes students to a wide range of experiments in all aspects of chemical engineering: heat exchangers, pipe flow, distillation, extraction, chromatography, chemical kinetics, and process control. The senior capstone design course (CHE 470) requires all students to design a full-scale chemical facility using state-of-the-art process design software (currently HySYS). This software is only available in the Department's undergraduate computer laboratories. A recently adopted curriculum revision has introduced a new required course in *Computational Tools for Chemical Engineering (CHE 230)*, which provides a foundation for students to use appropriate software packages (e.g., Excel and Mathematica) throughout their undergraduate studies. The Senior Design and Laboratory courses make extensive use of student teams, and smaller group projects are common in several other courses throughout the undergraduate program.

The Department has a very active student chapter of the American Institute of Chemical Engineers (AIChE) and Omega Chi Epsilon (the Chemical Engineering Honor Society). These student organizations play a critical role in supporting our students and programs. They promote fellowship through various academic and social activities; they disseminate information relating to Chemical Engineering; and they host resume workshops, career panels, and information sessions (sponsored by various companies). The Department also has an active Graduate Student Association that fosters the professional and personal development of graduate students by providing opportunities for graduate students to interact with each other and faculty in both professional and social environments.

The Department has not previously had an active Masters of Science program – we typically graduate an average of 5 M.S. students per year, most of whom began in the Ph.D. program but decided to stop with a M.S. However, the Department has plans to significantly expand the M.S. Degree Program through the College of Engineering's recent initiative to develop and foster a 12-month residential M.S. Degree.

Department of Biomedical Engineering (BME)

Background

The intercollege graduate degree program (IGDP) in Bioengineering was founded in 1974. Dr. David B. Geselowitz was recruited from University of Pennsylvania to head a team of faculty drawn from established departments in the Colleges of Engineering, Science, and Medicine. Space for this new program was allocated in EE West on the University Park campus. Until 1987, Bioengineering occupied three laboratories and office space for its three full time faculty in EE West.

In 1987, Hallowell Building was erected on the West Campus to serve as swing space for renovation of Reber Building, the home of Mechanical Engineering. Originally designated as the Engineering Lab/Office Building, Hallowell was constructed with minimal infrastructure for supporting research and teaching and consisted of three floors above ground and one floor below, with utilities (HVAC) situated in the fourth floor penthouse. There were no teaching facilities (labs or classrooms) and no utilities for laboratories (i.e. no gas, vacuum nor deionized water). Due to delays in implementing renovation of Reber Building, several rooms were available in Hallowell, and with impending expansion of the Bioengineering IGDP, the offices and laboratories were moved into Hallowell to occupy half of the second floor (office space), and most of the third floor (laboratory space), for a total of 8545 sq. ft. These facilities housed the laboratory and office space for the three primary Bioengineering faculty at the time, Drs. Geselowitz, Shung and Gaumond.

Figure 1. Hallowell Building, ca 1989

In 1989, Dr. Herbert H. Lipowsky was recruited from Columbia University to head the Bioengineering IGDP and laboratory space in Hallowell was renovated to accommodate his research laboratory. During the subsequent 10 years, additional faculty were hired and situated in the remainder of the 8545 sq ft allocated to Bioengineering Program. In addition to this space, 2500 sq. ft. of space was situated in the Dept. of Chemical Engineering to house ChE faculty members who were part of the Bioengineering IGDP, in the areas of Biofluid Mechanics (J. Tarbell), Pulmonary Gas Exchange (J. Ultman), Mechanobiolgy (J. Frangos), and Drug Delivery (D. Edwards).

In 1998 a grant application to the Whitaker Foundation was submitted by Dr. Lipowsky to support establishment of an undergraduate program in Bioengineering and renovation of Hallowell Building to accommodate an expansion of full time faculty in the new Department of Bioengineering (name was later changed to Department of Biomedical Engineering in 2013). With this $2M award, the department was established in 2000, and the remaining space in Hallowell Building was allocated to the new Department of Bioengineering at that time, to increase the total net space allocated to 18,000 sq ft. These renovations consisted of construction of new laboratory space for research (3772 sq ft), installation of new utilities for gas, air and vacuum, teaching laboratory space (Bio-instrumentation, 927 sq ft, and Bio-Computer

Simulation laboratories, 1150 sq ft), a video conference room, machine shop facilities, a graduate-level cell/molecular biology teaching laboratory, and a new office complex for secretarial, administrative and support staff.

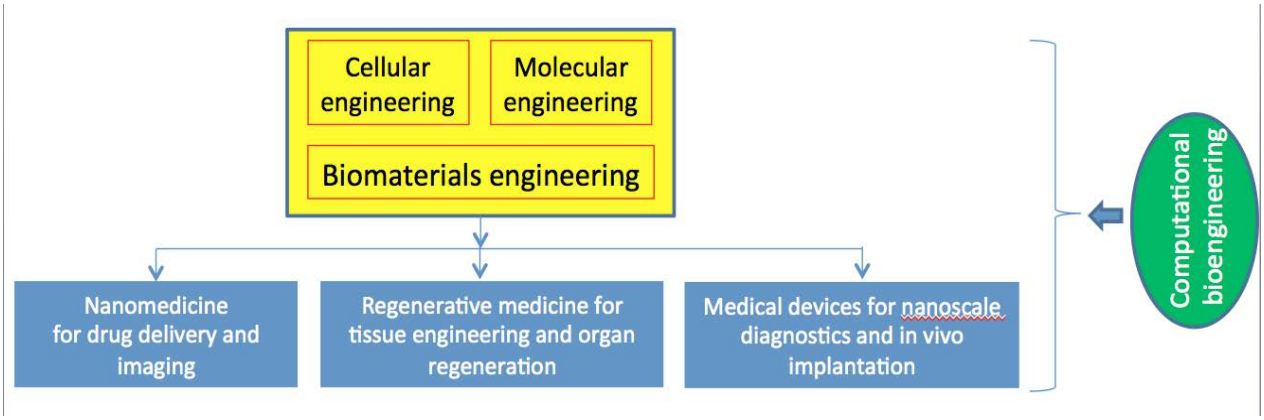
At the time of this expansion, renovations and faculty hiring were planned to accommodate a graduating class size of 40 undergraduate students per year. During the 10 years subsequent to graduation of the first class of undergraduates in 2005, enrollments have grown to more than twice that amount. Current teaching laboratories were not designed to accommodate a throughput of 80+ students per year and hence the computer and instrumentation (which is now also being used for undergraduate capstone senior design) laboratories are overcrowded and cannot satisfactorily meet their intended mission. Further, with impending expansion of the faculty to accommodate this large number of students, research as well as teaching space has become significantly inadequate.

In addition to the growth of the undergraduate program, the field of bioengineering / biomedical engineering has evolved as well. The strongest academic programs are those that have achieved a strong integration of the engineering and life sciences. In this regard, the current program is at a disadvantage since the majorities of life science programs are situated on the central-to-east campus, and are more or less contiguous with the Huck Institute of the life sciences and the new Millennium Science Complex. Thus, to support the growth of academic programs and the evolution of the bioengineering / biomedical engineering discipline, it appears desirable to move the Department of Biomedical Engineering into expanded facilities on the central-to-east campus.

Biomedical Engineering Today

Faculty: The Department of Biomedical Engineering (BME) has 12 full-time tenured or tenure-track faculty (1 Department Head, 3 full professors, 4 associate professors, and 4 assistant professors). The Department also has 1 multi-year fixed-term, non-tenure track assistant professor, who teaches the capstone design course and serves as the BME Undergraduate Coordinator. The current Provost-approved plan on faculty expansion is 9-12 new BME faculty hires in the coming 3-5 years, jointly funded between the Colleges of Engineering, Medicine, and Science, as well as the Huck Institutes of Life Science and Institute for Cyber Sciences. This brings the total faculty size to 21-24.

The strategic research focus and expansion will be built upon the current core areas (yellow highlighted), and integrated to leverage a diverse array of biomedical applications (blue and green highlighted) as our new strategic areas for further expansion:



Research: There are currently 56 graduate students in the Bioengineering IGDP, along with another 8 post-doctoral research fellows, 3 research associates and 5 visiting scholars. In addition, the Department has a rapidly growing undergraduate program. Currently, we have a total of 182 undergraduates (junior and senior classes), among which 51 are Schreyer's Honors students who are involved in thesis research working directly with the faculty and graduate students. There are 19 freshmen Schreyer's Honors students who recently entered the Department of Biomedical Engineering and 13 additional undergraduate students enrolled in Research Experience for Undergraduates (REU) activities in the biomedical engineering laboratories.

Biomedical Engineering faculty and students collaborate with colleagues across the university through highly interdisciplinary fields, including Materials Science and Engineering, Chemistry, Physics, Biochemistry and Molecular Biology, Biology, Neuroscience and many other Huck life science based IBIOS (integrated biosciences) programs, and IGDP-Physiology. From Penn State's College of Medicine in Hershey, Biomedical Engineering is a core collaborating department with the Departments of Surgery, Orthopedics, Neurosurgery, and Radiology. Within the College of Engineering, faculty and students from the Biomedical Engineering actively work together with Chemical Engineering, Mechanical Engineering, Engineering Science and Mechanics, Electrical Engineering, and Computer Science and Engineering.

Biomedical Engineering has co-funded faculty with the Huck Institutes for Life Sciences and the Materials Research Institute. We are expanding with 9-12 joint-hire Biomedical Engineering faculty between the College of Engineering and College of Medicine, Eberly College of Science, Huck Institutes for Life Science, and Institute for Cyber Sciences. These joint-hire faculty members will launch new strategic interdisciplinary research areas, focusing on (not ranked by priority):

(1) Biomedical imaging to enhance neural and cardiovascular-related basic research as well as clinical applications;

(2) Computational bioengineering to apply mathematical and statistical tools to address and find solutions to fundamental questions in biology at the tissue, cell and molecular levels;

(3) Tissue engineering/Regenerative Medicine to advance strategies incorporating biomaterials, soluble factors and/or stem cells aimed at regenerating damaged or diseased tissues and organs;

(4) Biomedical devices and bio-nanotechnology to develop innovative micro/nano technology based platforms including biosensor designs for live-cell imaging with sophisticated tools in chemistry, implantable devices for disease treatment and smart diagnosis, and integrated devices for point-of-care in vitro diagnosis;

(5) Nano-medicine to advance areas of drug delivery for cancer treatment, cardiovascular disease, and diabetic disease; and

(6) Cellular and molecular engineering including quantitative experiments, developing novel instrumentation and leveraging tools from synthetic biology, with applications in cell biology, metabolic engineering, drug production, and energy.

These target areas were chosen because they represent current grand challenges in the Biomedical Engineering profession. While some of these target areas overlap with concentration areas of other leading Biomedical Engineering programs across the country, there exists unique infrastructure at Penn State that Biomedical Engineering can leverage, in terms of strengths and priorities across College of Medicine, College of Science, College of Human Health and Development, Huck, Materials Research Institute, Institute for Cyber Sciences, and many other umbrella units.

Education: The Department graduated 62 students with B.S. degrees in Bioengineering in 2013-14 (the name change to Biomedical Engineering for the B.S. degree will take effect for students graduating in 2016). The most recent entrance to major process has admitted 68 new students in Biomedical Engineering, despite of the undergraduate program enrollment target that has been recently increased from 40 to 60. The growth has been driven by a strong national and international trend that biomedical engineering has grown into a mature and extremely dynamic discipline from its initial phase of collective multidisciplinary programs in addition to an intense interest by students to work to improve human health.

Biomedical Engineering provides solid and balanced fundamental knowledge, engineering and life science skills, builds adaptive expertise, encourages academic excellence and integrity, and develops diversified options. The Department will also ensure academic excellence, foster a positive learning environment, create a supportive system among students, faculty, and staff, and provide supplementary programs for professional and personal development.

The undergraduate program in Bioengineering/Biomedical Engineering at Penn State has been designed so that students can develop core foundational engineering skills while also working to gain depth of focus in an option area and aims to create world-class engineers who after graduation, will contribute to social and economic development through the application of engineering to the solution of problems in medicine and biology.

Within three to five years after graduation, we expect our graduates to be:

- Employed in industry and government positions which include, but are not limited to, research and development, regulation, manufacturing, quality assurance and sales and marketing, or,

- Enrolled in graduate school, continuing education, or other professional development programs related to biomedical sciences and engineering, or
- Enrolled in medical school, dental school, or other health-related professional training programs.

Most undergraduate courses are taught in lecture-format, some with smaller recitation sections. All students are required to take two hands-on laboratory courses: BME 403 Medical Instrumentation Lab and BME 429 Biomechanics and Techniques Lab (housed in and remaining in 201 EES). BME 301 and 401 both have embedded physiological computer simulation lab and recitation components, which require software packages not offered in other locations on campus. The senior capstone design course (BME 450W) requires all students to design, build/implement, and test a prototype of a medical device or process. The Senior Design and Laboratory courses make extensive use of student teams, and smaller group projects are common in several other courses throughout the undergraduate curriculum.

The Department has an active student chapter of the Biomedical Engineering Society (BMES) which is critical in supporting our students and programs. The BMES student group promotes fellowship through various academic and social activities; maintain a mentorship program with alumni; host an annual research (undergraduate and graduate) research symposium; and host professional workshops related to alternative career paths common for students in Biomedical Engineering (medical school etc.)

Strategic goals in education include immediate strategies to meet the Department rapid increase in undergraduate enrollments and strengthen the graduate program in Biomedical Engineering / Bioengineering. Since the graduate program in the Biomedical Engineering Department is currently still part of the IGDP in Bioengineering. The 2012-13 IGDP Task Force recommended a new budget model (not yet implemented) that would significantly increase resources for fostering Biomedical Engineering partnerships with the IGDP-Bioengineering faculty to expand graduate enrollment and the number of PhD graduates in IGDP-Bioengineering, focusing on the following areas:

1. Strengthen the biomedical engineering undergraduate and graduate programs, by significantly expanding the department faculty size in focused Biomedical Engineering strategic areas. This expansion *assures* that the core curriculum will include sufficient content and rigor to practice biomedical engineering; *challenges* students with innovated design projects that test and develop their problem solving skills; *provides* exposure to current topics and leaders in the field; and *fosters* collaborative work with outside entities such as medical schools and industry.
2. Secure needed resources from the university for the IGDP in Bioengineering, increase IGDP faculty opportunities with support of more PhD graduate students.
3. Define and develop a new initiative for an establishment of one-year non-thesis MS degree program in Biomedical Engineering, and enhance the graduate enrollment.
4. Clearly outline key knowledge groups and build them into the curricula. Despite the fast pace in academic research and industrial innovation, knowledge of first-principles is still the cornerstone of good academic training and all engineering practice including Biomedical Engineering. Key foundational knowledge areas will be identified and built into the undergraduate and graduate curricula, and metrics will be established and reviewed annually.
5. Develop strong partnerships with local, national, and global industries to make sure our course offerings match their needs. Match students with industry or academic mentors to help prepare them for jobs or further education after graduation.

Co-location of the Departments

Although the Chemical Engineering and Biomedical Engineering disciplines have very different historical origins, the two now share important educational and research interests. Chemical Engineering began in the late 19th century in support of the growing chemical industry, with most academic programs having their roots in the discipline of chemistry. Biomedical Engineering was established as a well-defined academic discipline in the mid-20th century, with a clear focus on the application of engineering principles to the solution of medical and health-related problems. The majority of Biomedical Engineering Departments were initially aligned most closely with Mechanical Engineering (with a focus on biomechanics and artificial limbs) or Electrical Engineering (with a focus on medical imaging).

The past 30 years have seen tremendous advances in the biological sciences: the mapping of the human genome, the development of recombinant DNA technology, and the birth of synthetic biology and metabolic engineering as new fields of interest. These developments have had a major impact on both Chemical Engineering and Biomedical Engineering, with both disciplines now having a major emphasis on the analysis and control of biomolecular and cellular phenomena. This has resulted in important research collaborations, with faculty in Chemical Engineering and Biomedical Engineering working on joint projects in the areas of cancer cell development / differentiation, biomaterials, and cellular signaling. These research programs would greatly benefit from closer interactions among the faculty and students and from the type of shared instrumentation and core facilities that can only be achieved through the co-location of the Departments in a single building. Additionally, the co-location will help to facilitate joint hires between Chemical Engineering and Biomedical Engineering, further strengthening the interface between these disciplines. There are also exciting opportunities for the development of new educational programs between Chemical Engineering and Biomedical Engineering, including joint M.S. degree programs that would attract top students from both disciplines.

Both Chemical Engineering and Biomedical Engineering Departments have strong intellectual ties to the life and materials sciences. Co-locating these two departments near the core of the life/material science concentration at University Park (close to the Life Science Building, the Chemistry Building, the Millennium Science Complex where both the Huck Institutes of Life Science and the Materials Research Institute are co-located) will certainly serve to enhance the impact of these two departments on university-wide interdisciplinary research and education.

SPACE CONSIDERATIONS

OVERVIEW OF SPACE NEEDS:

A. Public Space

To encourage the type of interactions and collegial activities that are needed to foster a collaborative learning and research environment, there is a need for a variety of public spaces with varying scales and levels of formality / privacy. This includes space to accommodate student interactions, faculty-student conversations, social activities, and casual eating.

B. Educational Space:

The Fenske site is near a number of major classroom buildings on campus (e.g., Thomas and Wartik). In addition, plans are in place for a new Classroom building to be located on an adjacent site. Classroom space is needed to accommodate the Department seminar program – a large Lecture Hall with seating for 180 would serve this purpose while also providing room for teaching many of the large lecture courses. A distance learning Classroom (capacity of 40) is needed, both for simulcasting lectures (e.g., to the Medical School in Hershey) and for faculty who wish to prepare videos for use in on-line education. A computer teaching facility (capacity of 40) is required for hands-on instruction in courses that require extensive use of computational software. An additional computer study laboratory will provide space for students working on their senior capstone design project (using HySYS in Chemical Engineering), weekly homework assignments, and small team projects. Two "knowledge commons" spaces, modeled on the highly successful Tombrose and McWhirter Knowledge Commons located in the Pattee Library (https://www.libraries.psu.edu/psul/kc.html), will provide both individual and collaborative learning spaces for undergraduate and graduate students.

C. Instructional Laboratories:

Three types of instructional laboratories are required: the Chemical Engineering Unit Operations (Senior) Laboratory, the Biomedical Engineering Instrumentation Laboratory, and the Biomedical Engineering Capstone Design Laboratory.

The Unit Operations Laboratory (CHE 230, 340, 415) includes a wide range of experiments: distillation, separations, chemical kinetics, fluid flow, heat transfer, thermodynamics, and process control.

The Biomedical Engineering Instrumentation Laboratory (BME 403) requires equipment and supplies for a typical electronics lab – power supply, function generator, oscilloscope, miscellaneous components to build and test electrical circuits, and computers to record and analyze data.

The Biomedical Engineering Capstone Design Laboratory (BME 450W) requires space to construct mechanical prototypes that range in size from quite small (hand-held devices) to rather large (recumbent bicycles) and level-1 tools to assist in the process of manufacturing prototypes. The lab needs to be in close proximity to the departmental machine shop for access to higher level tools with more safety precautions.

D. Experimental Research Laboratories:

Research laboratories need to accommodate the breadth of experimental work in both Chemical Engineering and Biomedical Engineering. The bulk of the Chemical Engineering space will consist of three main "types" of laboratory modules: General Chemical, Heavy Chemical, and Life Sciences. The *General Chemical Laboratory* module will provide a limited number of fume hoods for handling dangerous chemicals, conducting small-scale chemical syntheses, and decanting chemicals from larger storage vessels. The *Heavy Chemical Laboratory* module will provide fume hoods that will house apparatus used for the conduct of experimental work. The *Life Sciences Laboratory* module will provide biological safety cabinets for use in manipulating biological cells / organisms. These modules should be designed so that they can be easily modified to accommodate the needs of individual research groups.

Biomedical Engineering research space will generally be configured similarly to Chemical Engineering space (specifically the Life Sciences module), with additional specialized spaces for materials processing, wet/cell culture, and specialized laser and optical equipment.

The Research Laboratories should be designed to:

- Emphasize safety as an essential component in the conduct of research.
- Create a collaborative work environment that fosters the exchange of ideas within the Departments and with researchers from other Departments.
- Develop highly flexible and adaptable work-space that can easily accommodate changes in research group size and / or future experimental needs with minimal capital cost.
- Create an environment that encourages undergraduate students to participate in research projects.

To meet these objectives, the laboratories should be designed with the following criteria as a guide:

- Laboratory space must be definitively separate from personal desk space, meeting space, and eating space. Researchers should not have to go through a laboratory in order to exit from non-laboratory areas.
- Each door from adjacent space into a lab should have a view panel to allow individuals to see into the lab in case of an accident or injury
- Use of a flexible, adaptable laboratory casework system that provides adjustable work surface heights, open shelving arrangements, and ease of removal to accommodate the placement of floor mounted equipment.

Conceptual Photo of Typical Lab Benches (Kewaunee Flexible Systems shown)

- Open laboratory design to encourage collaboration and sharing of equipment. A system for easy placement or removal of partitions to allow for partitioning of laboratory modules where needed (e.g., for noise reduction).
- Services for piped gases, house vacuum, compressed air, electrical and data, and point exhaust should be provided from an overhead service carrier to maximize flexibility.
- Placement of laboratory sinks must consider the need to maximize flexibility of the open laboratory design.
- Provide adjacent support space for chemical storage, gas cylinders, etc. Gases should be piped directly to lab benches through the overhead service carrier. The support space can be shared by more than one laboratory / research group where appropriate.

Support space for chemical laboratories, which will house shared fume hoods, refrigerators, freezers, and other shared equipment, should be distributed and integrated the open chemical laboratory space. In addition, core support spaces for Life Science labs should be provided on floor(s) that have significant biological research activities. This core facility will provide space for autoclaves, -80 ^{o}C freezer(s), a floor centrifuge, dishwasher and glassware dryer, walk-in cold rooms, incubator chambers, etc.

E. Office / Administrative Space:

Administrative functions for the Departments of Chemical Engineering and Biomedical Engineering will be housed in separate suites with offices for the Department Head, the Administrative Assistant, Department Head Assistant, Undergraduate and Graduate Program Secretaries, and administrative support staff. The Departments should share common functions as appropriate, including a conference room, a reception area, file storage, a mailroom, and a faculty/staff lounge.

Offices for faculty should be distributed throughout the building, located in proximity to the faculty member's research space wherever possible. Office space for graduate students and post-docs involved in experimental research should be convenient to, but physically separate from, their research laboratories (without need to enter public space in going from offices to laboratories). Offices for graduate students and post-docs involved in computational / theoretical research will serve as both office and research space – these should be designed to provide flexible space for group discussions of computational approaches. Computational office suites should be located near the corresponding experimental laboratories to facilitate interactions between students doing computation and experimental research in the same field.

F. Conference / Meeting Space:

A variety of meeting spaces are required to accommodate faculty meetings, host visiting groups (e.g., the Departments' Industrial and Professional Advisory Councils), research group meetings, candidacy / comprehensive / doctoral defense examinations, and informal collaborations between and among students and faculty. The large Conference Room (40-person capacity) should be located near the Departmental offices. Two medium-sized Conference Rooms (15-person capacity) will provide space for larger research group meetings. Smaller conference rooms for informal gatherings of graduate students and faculty should be distributed throughout the building and located with easy access to the main research laboratories.

Space Summary

Room Function	Allocation	Chemical Engineering (ChE)		Biomedical Engineering (BME)		Bldg Quantity	Bldg ASF Projected
		Quantity	Total ASF	Quantity	Total ASF		
Office/Administrative							
Department Head Office	350	1	350	1	350	2	700
Chair Faculty Office	220	5	1,100	3	660	8	1,760
Faculty Office	150	23	3,450	17	2,550	40	6,000
Emeritus Faculty Office	75					6	450
Staff Office	120	3	360	3	360	6	720
Technical Staff Workroom	200					1	200
Administrative Suite							
Reception Area	200	1	200	1	200	2	400
Admin. Assist/Dept. Head Staff Asst.	120	2	240	2	240	4	480
Staff Assistant/Prog. Secretary	400/4	1	400	1	400	2	800
Office Support Space	250	1	250	1	250	7	500
Faculty/Staff Lounge	500					1	500
Large Conference Room (40-seat)	800					1	800
Medium Conference Rm (15-seat)	375					2	750
Small Conference Room (6-seat)	150					4	600
Graduate Student Lounge	200	1/floor				5	1,000
Student Organizations	250	1	250	1	250	2	500
Instructional							
180-seat Lecture Hall	16/seat					1	2,880
Projector/Sound/Lighting Booth						1	130
40-seat General Purpose Classroom	25/seat					1	1,000
Gen'l Purpose Classroom Storage						1	75
Distance Learning Classroom	20/seat					1	1,000
Unit Operations Lab (ChE)		1	2,500			1	2,500
Instrumentation Lab (BME)				1	1,500	1	1,500
Capstone Design Lab (BME)				1	1,500	1	1,500
Knowledge Commons	1,000					2	2,000
Computer Teaching Lab						1	1,500
Computer Study Open Laboratory		1	1,200	1	1,000	2	2,200

Research							
General Chemical Labs (ChE)	1,000	16	16,000			16	16,000
Heavy Chemical Labs (ChE)	1,000	8	8,000			8	8,000
Life Sciences Labs (ChE)	1,000	8	8,000			8	8,000
Chemical Laboratory Support (ChE)		1	1,600			1	1,600
Core Life Science Support (ChE)		1	1,000			1	1,000
Biomedical Engineering Labs (BME)	1,000			23	23,000	23	23,000
Material Process Lab (BME)				1	600	1	600
Wet/Cell Culture Lab (BME)				1	800	1	800
Core Life Science Support (BME)				1	3,000	1	3,000
Laser/Dark Room (BME)				1	600	1	600
Grad Student Office Suites (8) (computational)	600	10	6,000			10	6,000
Grad Student Office Suites (4) (experimental)	200	33	6,600	28	5,600	56	12,200
Research Storage						1	1,000
Research Shop						1	1,000
Support							
Central Service						1	250
Mail Room						1	150
File Room						1	115
Loading Dock						1	500
Janitor Break Room						1	250
Janitor Main Equipment Room						1	250
Telecommunications Closet						1	200
TOTAL ASF			57,620		42,740		116,960
Non-Assignable sf (61% eff)							71,345
TOTAL GSF							188,305

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Department Head Office	**ASSIGNABLE SF:**	350
FUNCTION:	meetings with sponsors, potential donors, staff	**NO. SPACES REQUIRED:**	2

UTILIZATION

Hours of typical Occupancy
From 7 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 1

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height 8' min

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☒

Privacy
- Visual ☐
- Acoustical ☒

Security
- Lockset ☒
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer 1
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard yes
- Projection Screen _____
- Office table w/6 chairs 1
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☒
- Desk/Chair 1
- File Cabinet yes
- Bookcases yes

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

Standard Office ☒

Special Service
- 110V, 20A, 1 Phase ☐
- 208V, 30A, 1 Phase ☐
- 208V, 30A, 3 Phase ☐
- 480V, 100A, 3 Phase ☐
- Isolated Ground Outlet ☐
- UPS (OFOI) ☐

Phone (2 outlets standard) ☒

Data (2 outlets standard) ☒

Lighting
- Level
  - Office standard ☒
  - Other _____ ☐
- Task Lighting ☐
- Safe Light (always on) ☐
- Special Lighting ☒
- Zoned Lighting ☒
- Dimmable ☒
- Occupant Sensor ☒

Projection Equipment
- Overhead ☐
- Portable ☐

Video Conferencing
- Receive ☐
- Broadcast ☐

Projection Screen
- Motorized ☐
- Pull-down ☐

Other _____ ☐

REMARKS: locate within Administrative Suite

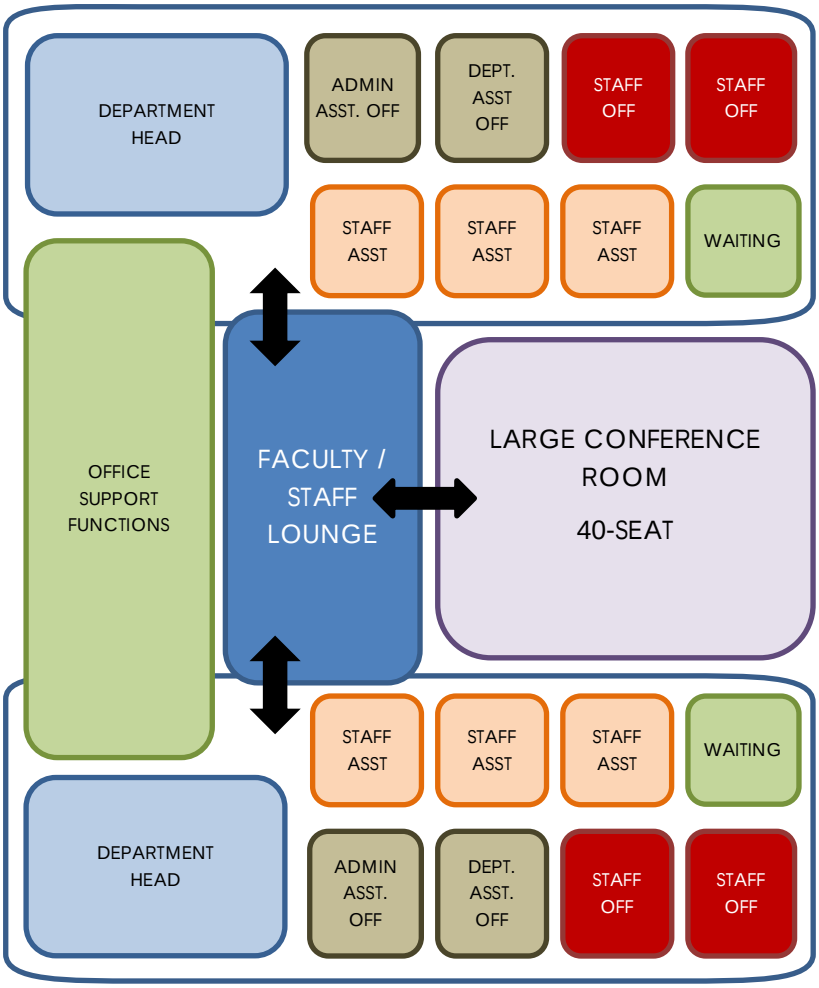
SPACE CONSIDERATIONS

A. Space Relationship:

- Part of Department Administrative Suite
- Directly adjacent to Administrative Secretary
- Adjacent to Departmental Secretary

B. Visual Relationship:

- None



Administration Offices Suite Conceptual Layout

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Chair Faculty Office	**ASSIGNABLE SF:**	220
FUNCTION:	general office work; meetings w/students	**NO. SPACES REQUIRED:**	8

UTILIZATION

Hours of typical Occupancy
From 7 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 1

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☒

Privacy
- Visual ☐
- Acoustical ☒

Security
- Lockset ☒
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer 1
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard yes
- Projection Screen _____
- Small conference table w/2 chairs 1
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Desk/Chair 1
- File Cabinet yes
- Bookcase 1

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☒
- Data (2 outlets standard) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☐
  - Dimmable ☒
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Near research laboratories for that individual

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Faculty Office	**ASSIGNABLE SF:**	150
FUNCTION:	general office work; meetings w/students	**NO. SPACES REQUIRED:**	40

UTILIZATION

Hours of typical Occupancy
From 7 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 1

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☒

Privacy
- Visual ☐
- Acoustical ☒

Security
- Lockset ☒
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer 1
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard yes
- Projection Screen _____
- Small conference table w/2 chairs 1
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☒
- Desk/Chair 1
- File Cabinet yes
- Bookcase yes

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☒
- Data (2 outlets standard) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☐
  - Dimmable ☐
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Near research laboratories for that individual

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Emeritus Faculty Office	**ASSIGNABLE SF:**	75
FUNCTION:	landing space for retired faculty still involved in research	**NO. SPACES REQUIRED:**	6

UTILIZATION

Hours of typical Occupancy
From 8 AM to 5 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants min. 2/room

ARCHITECTURAL

Floor	
VCT	☐
Welded Seam Sheet Vinyl	☐
Epoxy	☐
Carpet	☒
Wood	☐
Other	☐
Partitions	
Gyp Board, Painted	☒
Glass	☒
Other _____	☐
Base	
Resilient	☒
Integral w/floor	☐
Wood	☐
Ceiling	
Open	☐
Acoustical Tile	☒
Gyp Board, Painted	☐
Other _____	☐
Height	8' min
Doors	
Size (if ≠3' width)	_____
Wood	☒
Metal	☐
Vision Panel	☐
Sidelite	☐
Natural Daylight	☒
Privacy	
Visual	☐
Acoustical	☒
Security	
Lockset	☒
Special Measures	☐
Casework	
Base	☐
Wall	☐

MECHANICAL

Temperature	
70°F heat, 75°F cool (std)	☒
Other _____	☐
Humidity Control	
Approx. 50% ± 25%	☒
Uncontrolled	☐
Other _____	☐
Air Changes/hour	_____
100% Make-up Air	☐
Recirculated Air	☒
Air Pressure Positive	☐
Air Pressure Negative	☐
Air Filtration/Supply	☐
Air Filtration/Exhaust	☐
Other _____	☐

SPECIAL FUNCTION CONSIDERATION

Vibration Sensitive	☐
Light Sensitive	☐
Vibration Producing	☐
Heat Producing	☐
Noise Producing	☐
Acoustical Controls required	☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

Computer	1/stn
Stand-alone Printer	_____
Shredder	_____
Multi-function Printer/Copier	_____
Whiteboard	yes
Projection Screen	_____
Other _____	_____
Window Shades	
Black-out Shades	☐
Solar Shades	☒
Desk/Chair	1/stn
File Cabinet	yes
Bookcase	1/stn

PLUMBING

Sink/w drain	☐
Potable Hot Water (HW)	☐
Potable Cold Water (CW)	☐
Special Connections	☐
Hydration Station	☐
Floor Drain (FD)	☐

ELECTRICAL

Standard Office	☒
Special Service	
110V, 20A, 1 Phase	☐
208V, 30A, 1 Phase	☐
208V, 30A, 3 Phase	☐
480V, 100A, 3 Phase	☐
Isolated Ground Outlet	☐
UPS (OFOI)	☐
Phone (2 outlets standard)	☒
Data (2 outlets standard)	☒
Lighting	
Level	
Office standard	☒
Other _____	☐
Task Lighting	☐
Safe Light (always on)	☐
Special Lighting	☐
Zoned Lighting	☐
Dimmable	☐
Occupant Sensor	☒
Projection Equipment	
Overhead	☐
Portable	☐
Video Conferencing	
Receive	☐
Broadcast	☐
Projection Screen	
Motorized	☐
Pull-down	☐
Other _____	☐

REMARKS: these offices could be combined into one large shared space for all 6 emeriti.

SPACE CONSIDERATIONS

A. Space Relationship:

- Near research laboratories for that individual (if appropriate)
- Could be part of a shared office suite (all Emeriti together)

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Staff Office	**ASSIGNABLE SF:**	120
FUNCTION:	specialized administrative duties	**NO. SPACES REQUIRED:**	6

UTILIZATION

Hours of typical Occupancy
From 7 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 1

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☐
- Glass ☐
- Other prefab panel system ☒

Base
- Resilient ☐
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height 8' min

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☒

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer 1
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard _____
- Projection Screen _____
- Other _____ _____
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Desk/Chair 1
- File Cabinet yes
- Guest chair 1

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☒
- Data (2 outlets standard) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☐
  - Dimmable ☐
  - Occupant Sensor ☐
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- Other _____ ☐

REMARKS: Will house support staff such as IT, Facilities, Safety and other administrative personnel. Llocate within Administrative Suite or elsewhere as dictated by function.

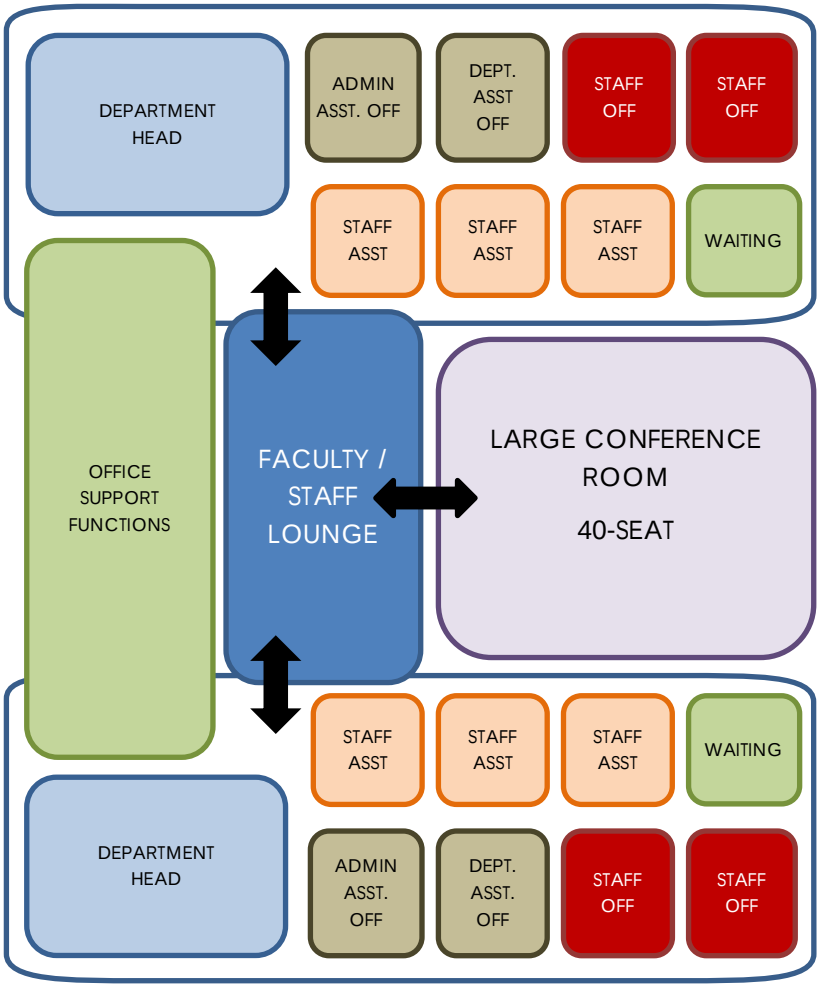
SPACE CONSIDERATIONS

C. Space Relationship:

- One station (Facilities Coordinator) to be close to loading dock
- Other stations to be incorporated within an open landscape office
  - May require more privacy than staff assistant but not full-height walls

D. Visual Relationship:

- Visual connectivity to activities within open office; can be view-obscuring glass



Administration Offices Suite Conceptual Layout

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Technical Staff Workroom	**ASSIGNABLE SF:**	200
FUNCTION:	network and systems repairs/preparation	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 7 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants (Part time only) 2

ARCHITECTURAL

Floor	
VCT	☐
Welded Seam Sheet Vinyl	☐
Epoxy	☐
Carpet	☒
Wood	☐
Other	☐
Partitions	
Gyp Board, Painted	☒
Glass	☒
Other _____	☐
Base	
Resilient	☒
Integral w/floor	☐
Wood	☐
Ceiling	
Open	☐
Acoustical Tile	☒
Gyp Board, Painted	☐
Other _____	☐
Height	8' min
Doors	
Size (if ≠3' width)	_____
Wood	☒
Metal	☐
Vision Panel	☐
Sidelite	☒
Natural Daylight	☐
Privacy	
Visual	☐
Acoustical	☒
Security	
Lockset	☒
Special Measures	☐
Casework	
Base	☒
Wall	☒

MECHANICAL

Temperature	
70°F heat, 75°F cool (std)	☒
Other _____	☐
Humidity Control	
Approx. 50% ± 25%	☒
Uncontrolled	☐
Other _____	☐
Air Changes/hour	_____
100% Make-up Air	☐
Recirculated Air	☒
Air Pressure Positive	☐
Air Pressure Negative	☐
Air Filtration/Supply	☐
Air Filtration/Exhaust	☐
Other _____	☐

SPECIAL FUNCTION CONSIDERATION

Vibration Sensitive	☐
Light Sensitive	☐
Vibration Producing	☐
Heat Producing	☒
Noise Producing	☐
Acoustical Controls required	☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

Computer	4
Stand-alone Printer	_____
Digital back-up storage units	yes
Multi-function Printer/Copier	_____
Whiteboard	_____
Projection Screen	_____
Window Shades	
Black-out Shades	☐
Solar Shades	☐
Desk/Chair	3
File Cabinet	yes
Other _____	_____

PLUMBING

Sink/w drain	☐
Potable Hot Water (HW)	☐
Potable Cold Water (CW)	☐
Special Connections	☐
Hydration Station	☐
Floor Drain (FD)	☐

ELECTRICAL

Standard Office	☒
Special Service	
110V, 20A, 1 Phase	☒
208V, 30A, 1 Phase	☐
208V, 30A, 3 Phase	☐
480V, 100A, 3 Phase	☐
Isolated Ground Outlet	☐
UPS (OFOI)	☐
Phone (4 outlets)	☒
Data (multiple outlets required)	☒
Lighting	
Level	
Office standard	☒
Other _____	☐
Task Lighting	☒
Safe Light (always on)	☐
Special Lighting	☐
Zoned Lighting	☒
Dimmable	☒
Occupant Sensor	☒
Projection Equipment	
Overhead	☐
Portable	☐
Video Conferencing	
Receive	☐
Broadcast	☐
Projection Screen	
Motorized	☐
Pull-down	☐
Other _____	☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Close to undergraduate computer laboratory

B. Visual Relationship:

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Reception Area	**ASSIGNABLE SF:**	200
FUNCTION:	Visitor waiting	**NO. SPACES REQUIRED:**	2

UTILIZATION

Hours of typical Occupancy
From 7 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 4

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☐
- Glass ☐
- Other _____ ☐

Base
- Resilient ☐
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☐
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☒

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset (at suite entrance door) ☒
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer _____
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard _____
- Projection Screen _____
- Area for project displays? 1
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Casual Chair 3
- File Cabinet _____
- Display Case for brochures & Program guides 1

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☐
- Data (2 outlets standard) ☐
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☒
  - Zoned Lighting ☐
  - Dimmable ☐
  - Occupant Sensor ☐
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- WiFi connectivity ☒

REMARKS: locate within Administrative Suite

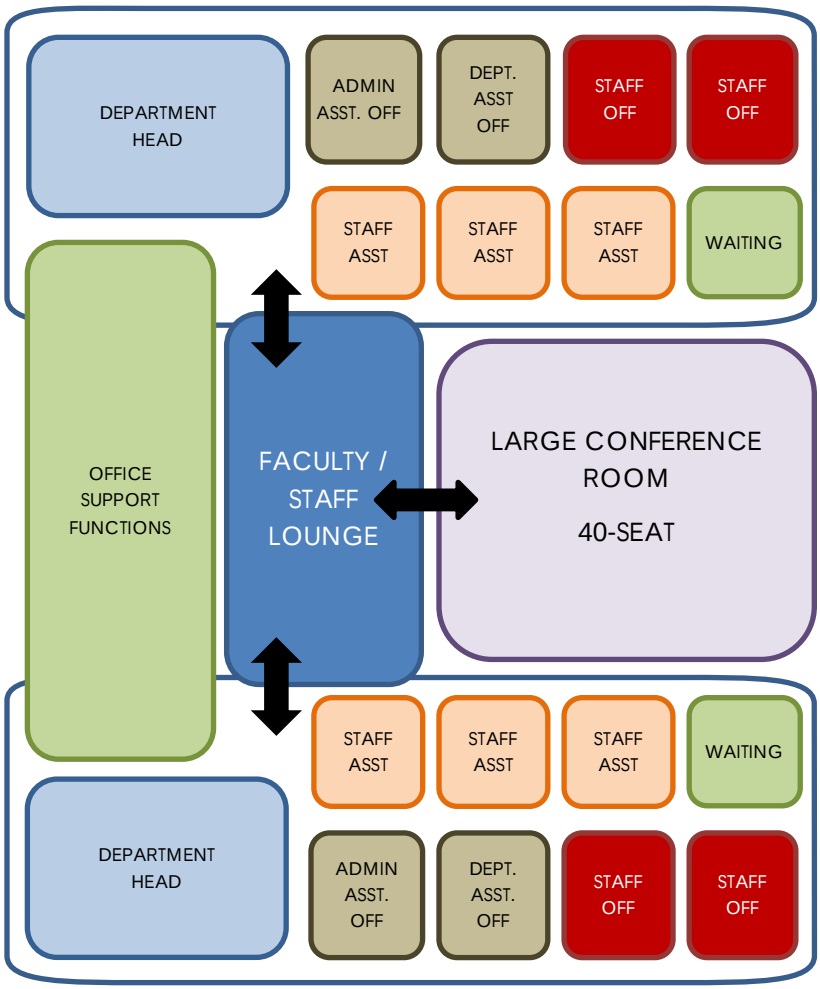
SPACE CONSIDERATIONS

A. Space Relationship:

- Part of Department Administrative Suite (open landscape offices)
- Locate directly at suite entrance

B. Visual Relationship:

- Visually connected to Staff Assistants/Departmental Program Secretaries in the Administrative Suite



Administration Offices Suite Conceptual Layout

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Admin Assistant/Dept. Head Staff Assistant	**ASSIGNABLE SF:**	120
FUNCTION:	assisting Head and screening visitors	**NO. SPACES REQUIRED:**	4

UTILIZATION

Hours of typical Occupancy
From 6 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 1

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☐
- Glass ☐
- Other prefab panel system ☒

Base
- Resilient ☐
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☐
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☒

Privacy
- Visual ☒
- Acoustical ☐

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☒
- Acoustical Controls required ☒

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer 1
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard _____
- Projection Screen _____
- Other _____ _____

Window Shades
- Black-out Shades ☐
- Solar Shades ☐

- Desk/Chair 1
- File Cabinet yes
- Other _____ _____

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒

Special Service
- 110V, 20A, 1 Phase ☐
- 208V, 30A, 1 Phase ☐
- 208V, 30A, 3 Phase ☐
- 480V, 100A, 3 Phase ☐
- Isolated Ground Outlet ☐
- UPS (OFOI) ☐

- Phone (2 outlets standard) ☒
- Data (2 outlets standard) ☒

Lighting
- Level
  - Office standard ☒
  - Other _____ ☐
- Task Lighting ☐
- Safe Light (always on) ☐
- Special Lighting ☐
- Zoned Lighting ☒
- Dimmable ☐
- Occupant Sensor ☐

Projection Equipment
- Overhead ☐
- Portable ☐

Video Conferencing
- Receive ☐
- Broadcast ☐

Projection Screen
- Motorized ☐
- Pull-down ☐

Other _____ ☐

REMARKS: locate within Administrative Suite

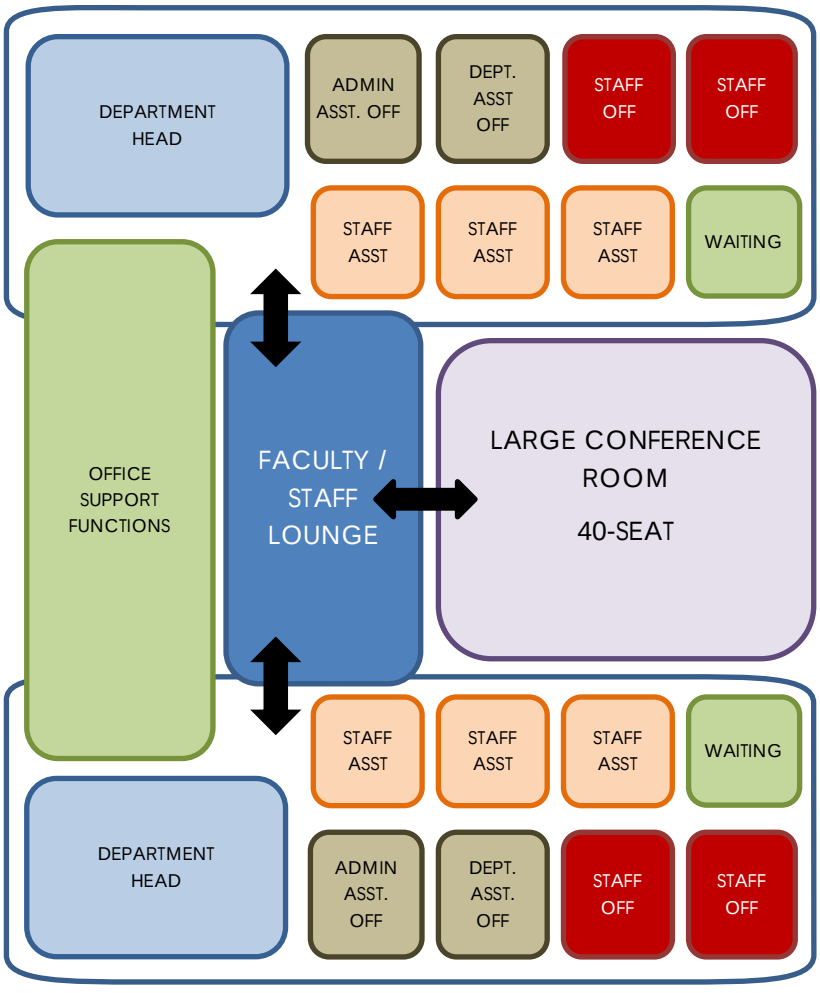
SPACE CONSIDERATIONS

A. Space Relationship:

- Part of Department Administrative Suite (open landscape offices)
- This will be a defined space within the DAS

B. Visual Relationship:

- There should be some level of visual connectivity with other support staff



Administration Offices Suite Conceptual Layout

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Staff Assistant Office/Program Secretary	**ASSIGNABLE SF:**	400
FUNCTION:	general assistance (PS-assist students in program)	**NO. SPACES REQUIRED:**	2

UTILIZATION

Hours of typical Occupancy
From 6 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 4/space

ARCHITECTURAL

Floor	
VCT	☐
Welded Seam Sheet Vinyl	☐
Epoxy	☐
Carpet	☒
Wood	☐
Other	☐
Partitions	
Gyp Board, Painted	☐
Glass	☐
Other prefab panel system	☒
Base	
Resilient	☐
Integral w/floor	☐
Wood	☐
Ceiling	
Open	☐
Acoustical Tile	☒
Gyp Board, Painted	☐
Other _____	☐
Height	_____
Doors	
Size (if ≠3' width)	_____
Wood	☐
Metal	☐
Vision Panel	☐
Sidelite	☐
Natural Daylight	☒
Privacy	
Visual	☐
Acoustical	☐
Security	
Lockset	☐
Special Measures	☐
Casework	
Base	☐
Wall	☐

MECHANICAL

Temperature	
70°F heat, 75°F cool (std)	☒
Other _____	☐
Humidity Control	
Approx. 50% ± 25%	☒
Uncontrolled	☐
Other _____	☐
Air Changes/hour	_____
100% Make-up Air	☐
Recirculated Air	☒
Air Pressure Positive	☐
Air Pressure Negative	☐
Air Filtration/Supply	☐
Air Filtration/Exhaust	☐
Other _____	☐

SPECIAL FUNCTION CONSIDERATION

Vibration Sensitive	☐
Light Sensitive	☐
Vibration Producing	☐
Heat Producing	☐
Noise Producing	☒
Acoustical Controls required	☒

MOVEABLE EQUIPMENT/FURNITURE (list number required)

Computer	1/stn.
Stand-alone Printer	_____
Shredder	_____
Multi-function Printer/Copier	_____
Whiteboard	_____
Projection Screen	_____
Other _____	_____
Window Shades	
Black-out Shades	☐
Solar Shades	☐
Desk/Chair	1/stn.
File Cabinet	yes
Other _____	_____

PLUMBING

Sink/w drain	☐
Potable Hot Water (HW)	☐
Potable Cold Water (CW)	☐
Special Connections	☐
Hydration Station	☐
Floor Drain (FD)	☐

ELECTRICAL

Standard Office	☒
Special Service	
110V, 20A, 1 Phase	☐
208V, 30A, 1 Phase	☐
208V, 30A, 3 Phase	☐
480V, 100A, 3 Phase	☐
Isolated Ground Outlet	☐
UPS (OFOI)	☐
Phone (2 outlets /stn.)	☒
Data (2 outlets /stn.)	☒
Lighting	
Level	
Office standard	☒
Other _____	☐
Task Lighting	☐
Safe Light (always on)	☐
Special Lighting	☐
Zoned Lighting	☒
Dimmable	☐
Occupant Sensor	☐
Projection Equipment	
Overhead	☐
Portable	☐
Video Conferencing	
Receive	☐
Broadcast	☐
Projection Screen	
Motorized	☐
Pull-down	☐
Other _____	☐

REMARKS: locate within Administrative Suite

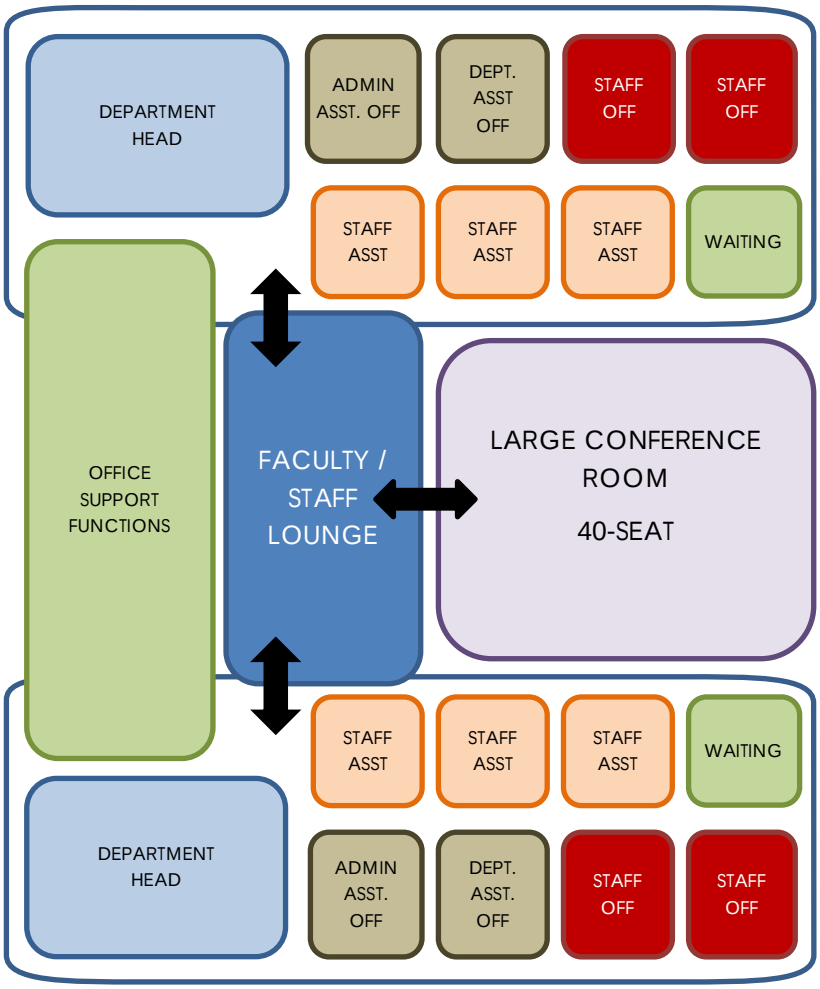
SPACE CONSIDERATIONS

A. Space Relationship:

- Part of Department Administrative Suite (open landscape offices)

B. Visual Relationship:

- Visually connected to each other and activities of Administrative Suite
- Visually connected to Waiting Area



Administration Offices Suite Conceptual Layout

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Office Support Area	**ASSIGNABLE SF:**	250
FUNCTION:	office support functions (files, copier, work area, etc.)	**NO. SPACES REQUIRED:**	2

UTILIZATION

Hours of typical Occupancy
From 6 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 3 at any time

ARCHITECTURAL

Floor	
VCT	☒
Welded Seam Sheet Vinyl	☐
Epoxy	☐
Carpet	☒
Wood	☐
Other	☐
Partitions	
Gyp Board, Painted	☐
Glass	☐
Other prefab panel system	☒
Base	
Resilient	☐
Integral w/floor	☐
Wood	☐
Ceiling	
Open	☐
Acoustical Tile	☒
Gyp Board, Painted	☐
Other _____	☐
Height	_____
Doors	
Size (if ≠3' width)	_____
Wood	☐
Metal	☐
Vision Panel	☐
Sidelite	☐
Natural Daylight	☒
Privacy	
Visual	☐
Acoustical	☒
Security	
Lockset	☐
Special Measures	☐
Casework	
Base	☒
Wall	☒

MECHANICAL

Temperature	
70°F heat, 75°F cool (std)	☒
Other _____	☐
Humidity Control	
Approx. 50% ± 25%	☒
Uncontrolled	☐
Other _____	☐
Air Changes/hour	_____
100% Make-up Air	☐
Recirculated Air	☒
Air Pressure Positive	☐
Air Pressure Negative	☐
Air Filtration/Supply	☐
Air Filtration/Exhaust	☐
exhaust for copier?	☒

SPECIAL FUNCTION CONSIDERATION

Vibration Sensitive	☐
Light Sensitive	☐
Vibration Producing	☐
Heat Producing	☒
Noise Producing	☒
Acoustical Controls required	☒

MOVEABLE EQUIPMENT/FURNITURE (list number required)

Computer	_____
Stand-alone Printer	_____
Shredder	1
Multi-function Printer/Copier	1
Whiteboard	_____
Projection Screen	_____
Misc. small office machines	yes
Window Shades	
Black-out Shades	☐
Solar Shades	☐
Desk/Chair	_____
File Cabinet	yes
Mail cart storage	1

PLUMBING

Sink/w drain	☐
Potable Hot Water (HW)	☐
Potable Cold Water (CW)	☐
Special Connections	☐
Hydration Station	☐
Floor Drain (FD)	☐

ELECTRICAL

Standard Office	☒
Special Service	
110V, 20A, 1 Phase	☒
208V, 30A, 1 Phase	☐
208V, 30A, 3 Phase	☐
480V, 100A, 3 Phase	☐
Isolated Ground Outlet	☐
UPS (OFOI)	☐
Phone (2 outlets standard)	☒
Data (2 outlets standard)	☒
Lighting	
Level	
Office standard	☒
Other _____	☐
Task Lighting	☒
Safe Light (always on)	☐
Special Lighting	☐
Zoned Lighting	☒
Dimmable	☒
Occupant Sensor	☒
Projection Equipment	
Overhead	☐
Portable	☐
Video Conferencing	
Receive	☐
Broadcast	☐
Projection Screen	
Motorized	☐
Pull-down	☐
Other _____	☐

REMARKS: locate within Administrative Suite; will include: large copier/printer, office supplies, central files, work space, mail area. Provide a common area between the 2 departments where equipment can be shared.

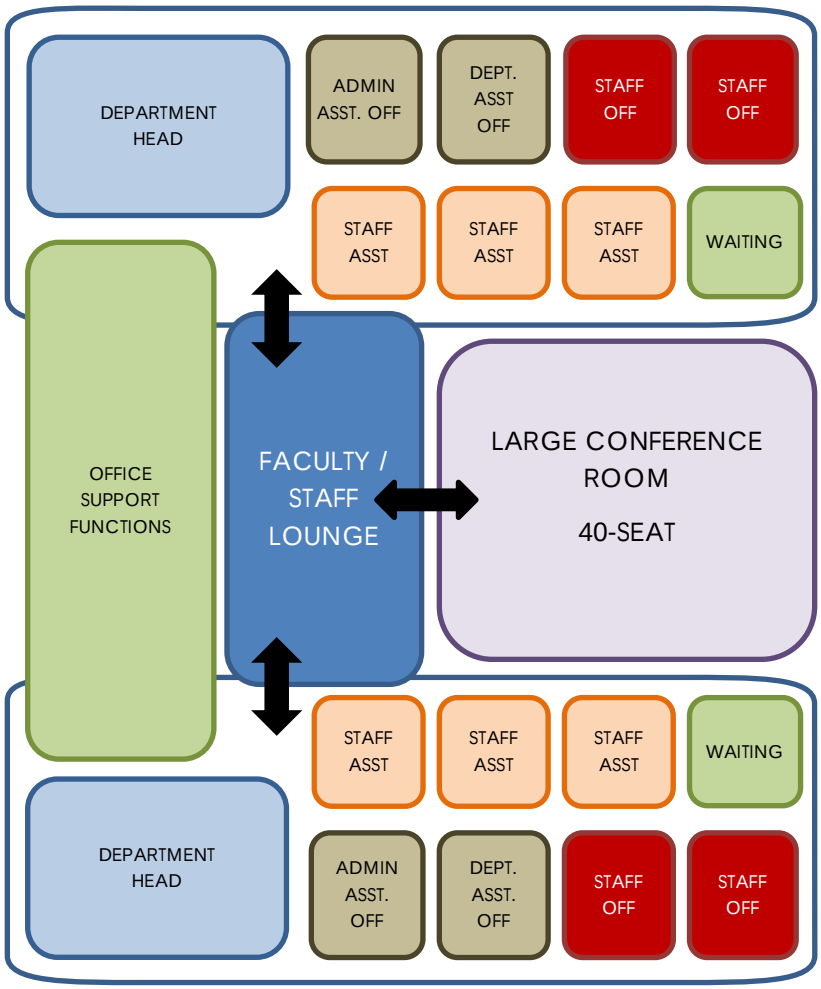
SPACE CONSIDERATIONS

A. Space Relationship:

- Part of Department Administrative Suite (open landscape offices)
- Space can be dispersed within suite as appropriate for functionality

B. Visual Relationship:

- Visually connected to other spaces of Administrative Suite



Administration Offices Suite Conceptual Layout

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Faculty/Staff Lounge	**ASSIGNABLE SF:**	500
FUNCTION:	impromptu gathering, prepare lunches/beverages	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 7 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 15

ARCHITECTURAL

Floor
- VCT ☒
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☒

Privacy
- Visual ☒
- Acoustical ☒

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base ☒
- Wall ☒

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☒
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Non-toxic Odor-Producing ☒
- Heat Producing ☒
- Noise Producing ☒
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer _____
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard _____
- Projection Screen _____
- Casual Seating 4
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Tables w/4 Chairs 3
- File Cabinet _____
- Other _____ _____

PLUMBING

- Sink/w drain ☒
- Potable Hot Water (HW) ☒
- Potable Cold Water (CW) ☒
- Special Connections ☒
  - Coffee maker(s)
  - Refrigerator (s) ice maker
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☒
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☒
- Data (2 outlets standard) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☒
  - Zoned Lighting ☒
  - Dimmable ☐
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- Refrigerators (2) ☒

REMARKS: locate within Administrative Suite

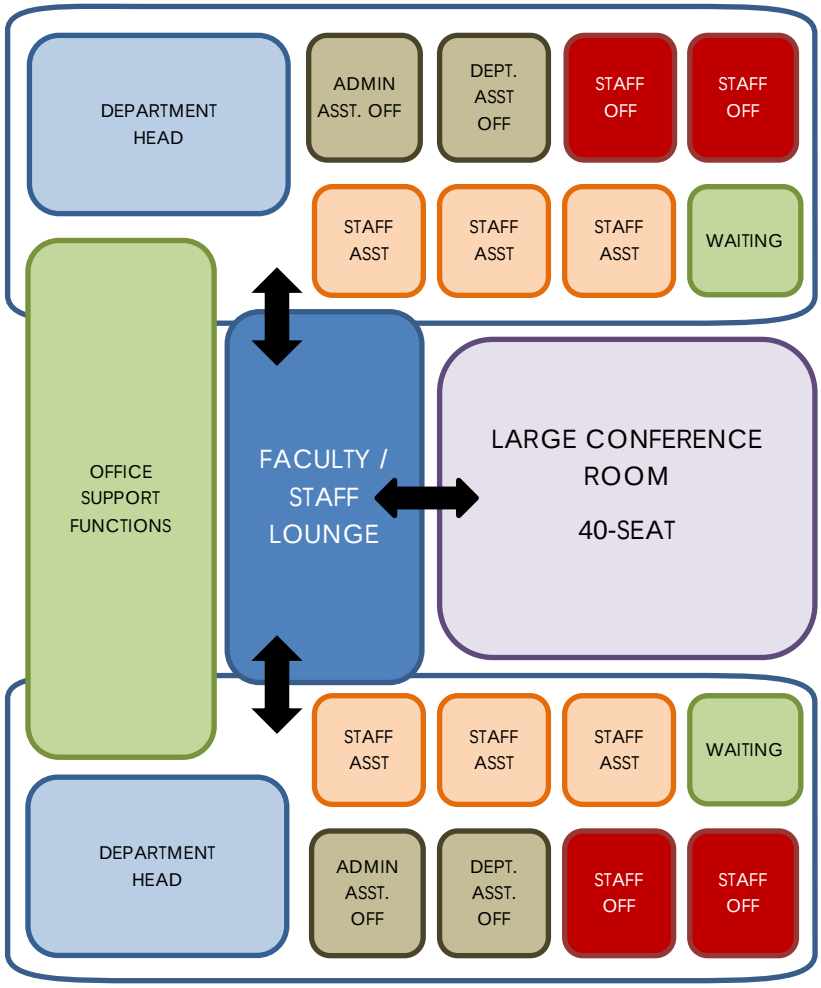
SPACE CONSIDERATIONS

A. Space Relationship:

- Adjacent and with direct access to Department Administrative Suite
- Adjacent and with easy access to the Large Conference Room

B. Visual Relationship:

- Direct visual connectivity is not required



Administration Offices Suite Conceptual Layout

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Large Conference Room	**ASSIGNABLE SF:**	800
FUNCTION:	large meetings (<50)	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 7 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 40

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☒

Privacy
- Visual ☐
- Acoustical ☒

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base (for storage) ☒
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☒
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer _____
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard yes
- Projection Screen yes
- Other _____ _____
- Window Shades
  - Black-out Shades ☒
  - Solar Shades ☐
- Flexible conference table w/40 stackable Chairs 1
- File Cabinet _____
- Other _____ _____

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☒
- Data (2 outlets standard) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☒
  - Dimmable ☒
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☒
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☒
  - Pull-down ☐
- Other _____ ☐

REMARKS:

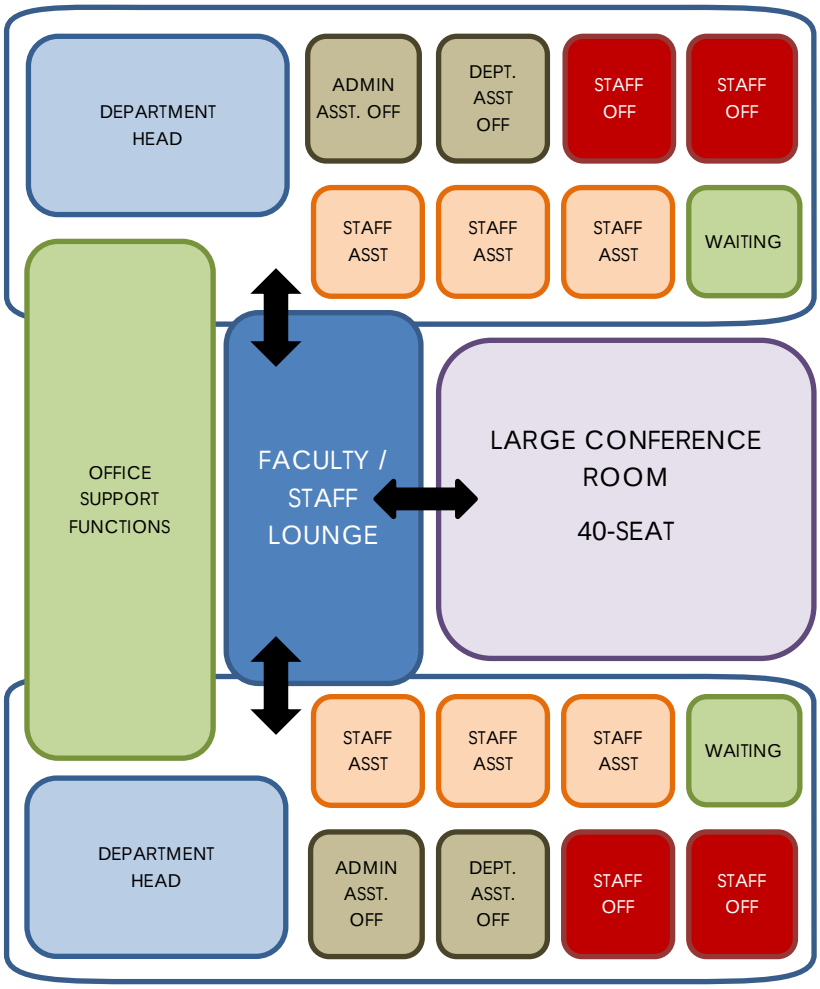
SPACE CONSIDERATIONS

A. Space Relationship:

- Locate adjacent to Administrative Offices Suite
- Locate adjacent to Faculty/Staff Lounge, with easy access between the two spaces

B. Visual Relationship:

- None



Administration Offices Suite Conceptual Layout

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Medium Conference Room	**ASSIGNABLE SF:**	375
FUNCTION:	meetings of 15 individuals	**NO. SPACES REQUIRED:**	2

UTILIZATION

Hours of typical Occupancy
From 7 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 15

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☒

Privacy
- Visual ☐
- Acoustical ☒

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☒
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer _____
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard yes
- Projection Screen yes
- Other _____ _____
- Window Shades
  - Black-out Shades ☒
  - Solar Shades ☒
- Flexible conference table w/20 stackable Chairs 1
- File Cabinet _____
- Other large HDTV monitor 1

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☒
- Data (2 outlets standard) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☒
  - Dimmable ☒
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☒
  - Portable ☐
- Video Conferencing
  - Receive ☒
  - Broadcast ☒
- Projection Screen
  - Motorized ☒
  - Pull-down ☐
- Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Should be located on the same floor as Administrative Suites, or a floor above / below

B. Visual Relationship:

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Small Conference Room	**ASSIGNABLE SF:**	150
FUNCTION:	meetings of 5 or 6 individuals	**NO. SPACES REQUIRED:**	4

UTILIZATION

Hours of typical Occupancy
From 7 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 5-6

ARCHITECTURAL

Floor	
VCT	☐
Welded Seam Sheet Vinyl	☐
Epoxy	☐
Carpet	☒
Wood	☐
Other	☐
Partitions	
Gyp Board, Painted	☒
Glass	☒
Other _____	☐
Base	
Resilient	☒
Integral w/floor	☐
Wood	☐
Ceiling	
Open	☐
Acoustical Tile	☒
Gyp Board, Painted	☐
Other _____	☐
Height	_____
Doors	
Size (if ≠3' width)	_____
Wood	☒
Metal	☐
Vision Panel	☐
Sidelite	☐
Natural Daylight	☒
Privacy	
Visual	☐
Acoustical	☒
Security	
Lockset	☐
Special Measures	☐
Casework	
Base	☐
Wall	☐

MECHANICAL

Temperature	
70°F heat, 75°F cool (std)	☒
Other _____	☐
Humidity Control	
Approx. 50% ± 25%	☒
Uncontrolled	☐
Other _____	☐
Air Changes/hour	_____
100% Make-up Air	☐
Recirculated Air	☒
Air Pressure Positive	☐
Air Pressure Negative	☐
Air Filtration/Supply	☐
Air Filtration/Exhaust	☐
Other _____	☐

SPECIAL FUNCTION CONSIDERATION

Vibration Sensitive	☐
Light Sensitive	☐
Vibration Producing	☐
Heat Producing	☐
Noise Producing	☒
Acoustical Controls required	☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

Computer	_____
Stand-alone Printer	_____
Shredder	_____
Multi-function Printer/Copier	_____
Whiteboard	yes
Projection Screen	_____
Other _____	_____
Window Shades	
Black-out Shades	☐
Solar Shades	☐
Table w/4 Chairs	1
File Cabinet	_____
Wall-mounted HDTV monitor	1

PLUMBING

Sink/w drain	☐
Potable Hot Water (HW)	☐
Potable Cold Water (CW)	☐
Special Connections	☐
Hydration Station	☐
Floor Drain (FD)	☐

ELECTRICAL

Standard Office	☒
Special Service	
110V, 20A, 1 Phase	☐
208V, 30A, 1 Phase	☐
208V, 30A, 3 Phase	☐
480V, 100A, 3 Phase	☐
Isolated Ground Outlet	☐
UPS (OFOI)	☐
Phone (2 outlets standard)	☒
Data (2 outlets standard)	☒
Lighting	
Level	
Office standard	☒
Other _____	☐
Task Lighting	☐
Safe Light (always on)	☐
Special Lighting	☐
Zoned Lighting	☐
Dimmable	☒
Occupant Sensor	☒
Projection Equipment	
Overhead	☐
Portable	☐
Video Conferencing	
Receive	☐
Broadcast	☐
Projection Screen	
Motorized	☐
Pull-down	☐
Other _____	☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Distributed throughout building

B. Visual Relationship:

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Graduate Student Commons spaces	**ASSIGNABLE SF:**	200
FUNCTION:	gathering spaces for students, informal study	**NO. SPACES REQUIRED:**	5

UTILIZATION

Hours of typical Occupancy
From 6 AM to 12 AM
Hours of Equipment Operation
From _____ to _____
Number Occupants 6

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☐
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☐
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☒

Privacy
- Visual ☐
- Acoustical ☒

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Non-toxic Odor-Producing ☐
- Heat Producing ☐
- Noise Producing ☒
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer _____
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard yes
- Projection Screen _____
- Casual seating 6
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- File Cabinet _____
- _____ _____

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☒
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☐
- Data (2 outlets standard) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☐
  - Dimmable ☐
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- Wall-hung HDTV monitor ☒
- WiFi connectivity to HDTV ☒

REMARKS: these spaces are proposed to be open, casual seating alcoves for graduate students to relax and/or study, located on the floor they work on.

SPACE CONSIDERATIONS

A. Space Relationship:

- One per research floor
- Open space in an appropriate location

B. Visual Relationship:

- In an open area; not hidden from casual view

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Office/Administrative: Student Organizations	**ASSIGNABLE SF:**	250
FUNCTION:	office for undergraduate student groups in ChE & BME	**NO. SPACES REQUIRED:**	2

UTILIZATION

Hours of typical Occupancy
From 8 AM to 5 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 5

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☒

Privacy
- Visual ☐
- Acoustical ☒

Security
- Lockset ☒
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☒
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer 5
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard yes
- Projection Screen _____
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Desk 1
- Office chair 5
- Small conference table 1
- File Cabinet yes
- storage cabinet yes

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

Standard Office ☒

Special Service
- 110V, 20A, 1 Phase ☐
- 208V, 30A, 1 Phase ☐
- 208V, 30A, 3 Phase ☐
- 480V, 100A, 3 Phase ☐
- Isolated Ground Outlet ☐
- UPS (OFOI) ☐

Phone (2 outlets standard) ☒

Data (6 outlets) ☒

Lighting
- Level
  - Office standard ☒
  - Other _____ ☐
- Task Lighting ☐
- Safe Light (always on) ☐
- Special Lighting ☐
- Zoned Lighting ☒
- Dimmable ☒
- Occupant Sensor ☒

Projection Equipment
- Overhead ☐
- Portable ☐

Video Conferencing
- Receive ☐
- Broadcast ☐

Projection Screen
- Motorized ☐
- Pull-down ☐

Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Locate near to Knowledge Commons

B. Visual Relationship:

- None required

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Instructional: 180-seat Lecture Hall	**ASSIGNABLE SF:**	2,880
FUNCTION:	research seminars and large lecture classes	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 7 AM to 11 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 181

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☐
- Glass ☐
- Other _____ ☐

Base
- Resilient ☐
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☐
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☐

Privacy
- Visual ☒
- Acoustical ☒

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☒
- Acoustical Controls required ☒

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer (at Lecturn) 1
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard yes
- Projection Screen yes
- Instructor's Lecturn 1
- Window Shades (if windows)
  - Black-out Shades ☒
  - Solar Shades ☒
- Fixed table/loose Chair 180
- File Cabinet _____
- Other _____ _____

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase (power outlet at each station) ☒
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☒
- Data (1 outlet/seat) ☒
- USB port (1 at each station) ☒
- Lighting
  - Level
    - Office standard ☐
    - Other Auditorium ☐
  - Task Lighting ☒
  - Safe Light (always on) ☒
  - Special Lighting ☒
  - Zoned Lighting ☒
  - Dimmable ☒
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☒
  - Pull-down ☐
- WiFi connectivity ☒

REMARKS: work closely with the University Committee on Instructional Facilities to insure goals and requirements for this classroom are compatible. Space will be tiered seating. Allow for wheelchair accessibility at various locations.

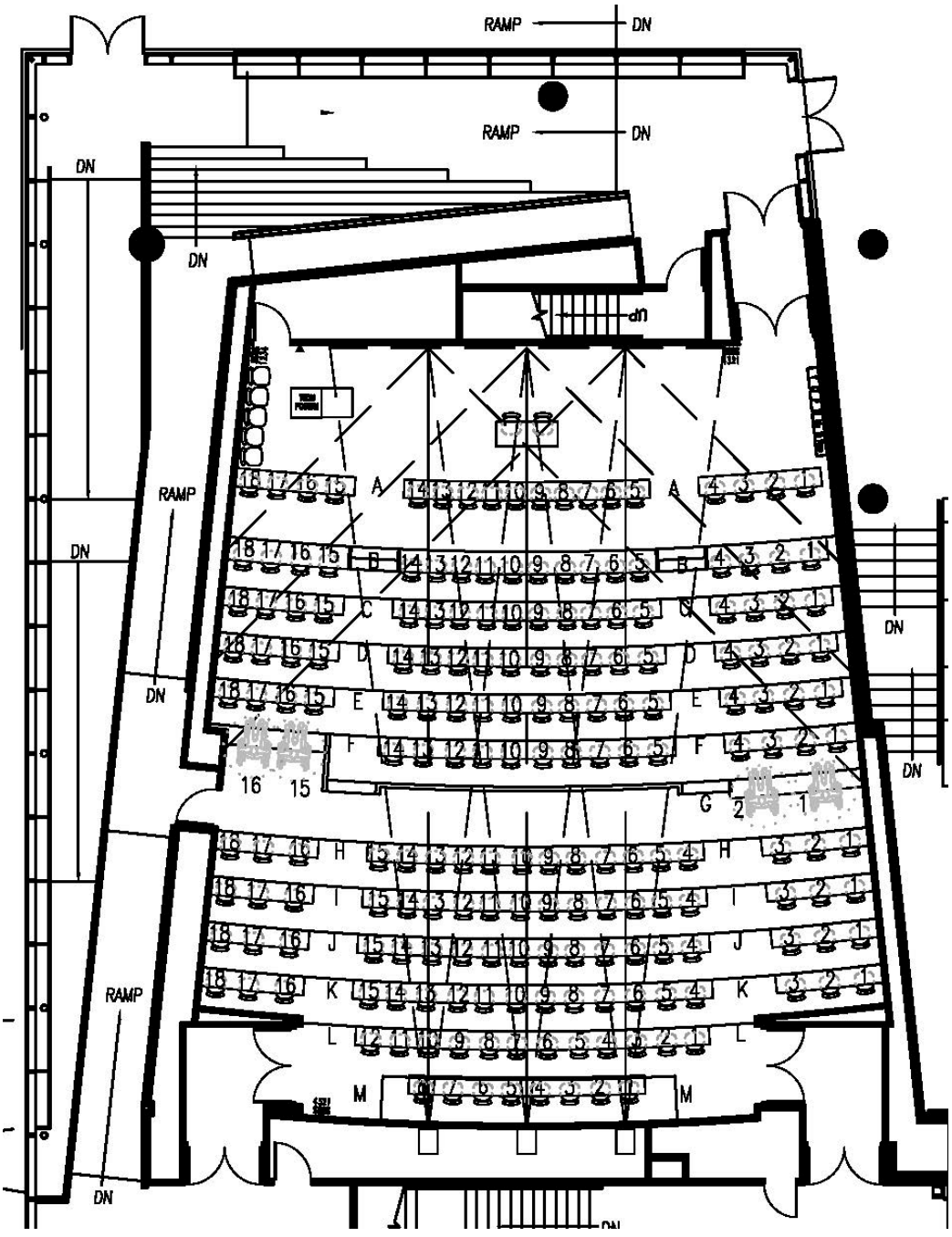
SPACE CONSIDERATIONS

A. Space Relationship:

- Close proximity to main entrance and smaller classroom

B. Visual Relationship:

- None



This is Huck Life Sciences' Room 100. A similar arrangement is envisioned for this space.

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Lecture Hall Projection/Sound/Lighting Booth	**ASSIGNABLE SF:**	130
FUNCTION:	Multimedia support for 180-seat Lecture Hall	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
- From _____ to _____

Hours of Equipment Operation
- From _____ to _____

Number Occupants: up to 2

ARCHITECTURAL

Floor
- VCT (Chemical Resistant) ☐
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Sealed Concrete ☐
- Other _____ ☐

Partitions
- Gyp Board, Epoxy Paint ☐
- Gyp Board, Painted ☒
- Other ☐

Base
- Resilient ☐
- Integral w/floor ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Epoxy Paint ☐
- Height _____

Doors
- Size (list req'd width) _____
- Light Tight Rotating Door ☐
- Vision Panel ☐

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

FURNITURE

Window Shades
- Black-out Shades ☐
- Solar Shades ☐

Desk/Chair _____

Other _____ _____

Screen
- Motorized ☐
- Pull-down ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☐
- Other _____ ☐

Air Changes/hour _____

100% Make-up Air ☐

Recirculated Air ☐

Space air pressure with respect to adjacent spaces (select only one)
- Neutral Air Pressure ☐
- Positive Air Pressure ☐
- Negative Air Pressure ☐

Air Filtration/Supply ☐

Air Filtration/Exhaust ☐

HOODS (list number req'd)

Chemical Fume Hood _____

Radioisotope Hood _____

Laminar Flow Hood _____

Biological Safety Cabinet _____

Snorkel _____

Canopy Hood _____

Low Slotted Exhaust _____

Other _____ _____

LABORATORY EQUIPMENT

Vibration Sensitive ☐

Light Sensitive ☐

Vibration Producing ☐

Heat Producing ☐

Noise Producing ☐

CHEMICALS

Bases ☐

Acids ☐

Solvents ☐

Radioisotopes ☐

Carcinogens/Regulated ☐

Chemical Waste Storage ☐

Biological Storage ☐

Radioisotope Storage ☐

Chemical Storage ☐

MOVEABLE EQUIPMENT

Computer: yes

Stand-alone Printer _____

Shredder _____

Multi-function Printer/Copier _____

Whiteboard _____

Projection Screen _____

Other _____ _____

PLUMBING

Laboratory Gas (LG) ☐

Laboratory Vacuum (LV) ☐

Laboratory Air (LA) ☐
- Pressure: _____
- Dewpoint: _____

Compressed Air, 100 psi (A) ☐

Potable Hot Water (HW) ☐

Potable Cold Water (CW) ☐

High Purity Water (DI) ☐

Process Cooling Water 60°F ☐
- Flow (gpm): _____
- Pressure (psi): _____

Steam/Condensate Return ☐

Carbon Dioxide (CO_2) ☐

Nitrogen Gas (N_2) ☐

Other _____ ☐

Cylinder Gases
- Inert ☐
- Flammable ☐
- Toxic ☐

Floor Drain (FD) ☐

Floor Sink (FS) ☐

Safety Shower/Eyewash (SS) ☐

Eye Wash (EW) ☐

ELECTRICAL

110V, 20A, 1 Phase ☒

208V, 30A, 1 Phase ☐

208V, 30A, 3 Phase ☐

480V, 100A, 3 Phase ☐

Isolated Ground Outlet ☐

Standby Power ☐

UPS (OFOI) ☐

Phone: yes

Data: yes

In Use Light ☐

Task Lighting ☐

Lighting Level
- 100 fc at bench/desk ☐
- 75 fc at bench/desk ☐
- Other _____ ☐

Safe Light (always on) ☐

Special Lighting ☐

Dimmable ☒

Zoned Lighting ☐

Occupant Sensor ☐

Projection Equipment
- Overhead ☒
- Portable ☐

Video Conferencing
- Receive ☒
- Broadcast ☒

Other _____ ☐

REMARKS: other electronics will be required for this space, i.e., sound system control console, lighting control console

SPACE CONSIDERATIONS

A. Space Relationship:

- At rear of lecture hall

B. Visual Relationship:

- Direct viewing of lecture hall

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Instructional: 40-seat General Purpose Classroom	**ASSIGNABLE SF:**	1,000
FUNCTION:	general instruction	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 7 AM to 11 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 41

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☒
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☒

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer (at Lecturn) 1
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard yes
- Projection Screen yes
- Other _____ _____
- Window Shades
  - Black-out Shades ☒
  - Solar Shades ☒
- Moveable Desk/Chair 30
- File Cabinet _____
- Other _____ _____

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☒
- Data (2 outlets standard) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☒
  - Dimmable ☒
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☒
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☒
  - Pull-down ☐
- WiFi connectivity ☒

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Close proximity to main entrance and Lecture Hall

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Instructional: General Purpose Classroom Storage	**ASSIGNABLE SF:**	75
FUNCTION:	general instruction support (supplies, equipment)	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 7 AM to 11 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 0

ARCHITECTURAL

Floor
- VCT ☒
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☐
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☒
- Special Measures ☐

Casework
- Base ☐
- Wall ☒

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☐
- Uncontrolled ☒
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer (at Lecturn) _____
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard _____
- Projection Screen _____
- Other _____ _____
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Moveable Desk/Chair _____
- File Cabinet _____
- Other _____ _____

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☐
- Data (2 outlets standard) ☐
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☐
  - Dimmable ☐
  - Occupant Sensor ☐
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- WiFi connectivity ☐

REMARKS: provide storage shelving for equipment and supplies needed for general-purpose classroom support.

SPACE CONSIDERATIONS

A. Space Relationship:

- Close proximity to Lecture Hall and General Purpose Classroom

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Instructional: Distance Learning Classroom	**ASSIGNABLE SF:**	1,000
FUNCTION:	Classroom for simulcast, distance learning, video recording	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 7 AM to 11 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 50

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☒
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☒

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer (at Lecturn) 1
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard yes
- Projection Screen yes
- Other _____ _____
- Window Shades
  - Black-out Shades ☒
  - Solar Shades ☒
- Moveable Desk/Chair 50
- File Cabinet _____
- Other _____ _____

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☒
- Data (2 outlets standard) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☒
  - Dimmable ☒
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☒
  - Portable ☐
- Video Conferencing (One-Button Studio)
  - Receive ☒
  - Broadcast ☒
- Projection Screen
  - Motorized ☒
  - Pull-down ☐
- WiFi connectivity ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Close proximity to main entrance and Lecture Hall

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Instructional: Unit Operations Laboratory (ChE)	**ASSIGNABLE SF:**	2,500
FUNCTION:	instructional lab for Chemical Engineering	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 8 AM to 5 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 31
Instructors 2
Grad TA's 4
Undergrad Students 25

ARCHITECTURAL

Floor
VCT (Chemical Resistant) ☐
VCT ☐
Welded Seam Sheet Vinyl ☐
Epoxy ☐
Carpet ☐
Sealed Concrete ☐
Other _____ ☐
Partitions
Gyp Board, Epoxy Paint ☐
Gyp Board, Painted ☐
Other _____ ☐
Base
Resilient ☐
Integral w/floor ☐
Ceiling
Open ☐
Acoustical Tile ☐
Gyp Board, Epoxy Paint ☐
Height _____
Doors
Size (list req'd width) _____
Light Tight Rotating Door ☐
Vision Panel ☐
Natural Daylight ☐
Privacy
Visual ☐
Acoustical ☐
Security
Lockset ☐
Special Measures ☐
Casework
Base ☐
Wall ☐

FURNITURE

Window Shades
Black-out Shades ☐
Solar Shades ☐
Desk/Chair (Instructors) 2
Workstation/Chair for students 25
Moveable lab benches
w/casework, ea 5'-6' long 11

MECHANICAL

Temperature
70°F heat, 75°F cool (std) ☒
Other _____ ☐
Humidity Control
Approx. 50% ± 25% ☒
Other _____ ☐
Air Changes/hour _____
100% Make-up Air ☒
Recirculated Air ☐
Space air pressure with respect to adjacent spaces (select only one)
Neutral Air Pressure ☐
Positive Air Pressure ☐
Negative Air Pressure ☐
Air Filtration/Supply ☐
Air Filtration/Exhaust ☒

HOODS (list number req'd)

Chemical Fume Hood 2 @6' ea
Radioisotope Hood _____
Laminar Flow Hood _____
Biological Safety Cabinet _____
Snorkel yes
Canopy Hood _____
Low Slotted Exhaust _____
Other _____ _____

LABORATORY EQUIPMENT

Vibration Sensitive ☐
Light Sensitive ☐
Vibration Producing ☐
Heat Producing ☐
Noise Producing ☐

CHEMICALS

Bases ☒
Acids ☒
Solvents ☒
Radioisotopes ☐
Carcinogens/Regulated ☐
Chemical Waste Storage ☒
Biological Storage ☐
Radioisotope Storage ☐
Chemical Storage ☒

MOVEABLE EQUIPMENT

Computer 27
Stand-alone Printer _____
Fire Extinguisher 1
Laboratory First Aid Kit 1
Whiteboard yes
Various Experiment pods 13
Projection Screen _____
Large HDTV monitor 2

PLUMBING

Laboratory Gas (LG) ☐
Laboratory Vacuum (LV) ☒
Laboratory Air (LA) ☐
Pressure: _____
Dewpoint: _____
Compressed Air, 100 psi (A) ☒
Potable Hot Water (HW) ☒
Potable Cold Water (CW) ☒
High Purity Water (DI) ☒
Process Cooling Water 60°F ☒
Flow (gpm): _____
Pressure (psi): _____
Steam/Condensate Return ☒
Carbon Dioxide (CO_2) ☐
Nitrogen Gas (N_2) ☐
Other _____ ☐
Cylinder Gases ☒
Inert ☐
Flammable ☐
Toxic ☐
Floor Drain (FD) ☒
4 - Sinks w/hands-free operation ☒
Safety Shower/Eyewash (SS) ☒
Eye Wash (EW) ☐

ELECTRICAL

110V, 20A, 1 Phase ☒
208V, 30A, 1 Phase ☐
208V, 30A, 3 Phase ☐
480V, 100A, 3 Phase ☐
Isolated Ground Outlet ☐
Standby Power ☐
UPS (OFOI) ☐
Phone _____
Data yes
In Use Light ☐
Task Lighting ☐
Lighting Level
100 fc at bench/desk ☐
75 fc at bench/desk ☐
Other as required by code ☒
Safe Light (always on) ☐
Special Lighting ☐
Dimmable ☐
Zoned Lighting ☐
Occupant Sensor ☐
Projection Equipment
Overhead ☐
Portable ☐
Video Conferencing
Receive ☐
Broadcast ☐
Other _____ ☐

REMARKS: a space will be required for students to store personal coats and backpacks, laboratory coats and safety glasses; this could be an ancillary space.

SPACE CONSIDERATIONS

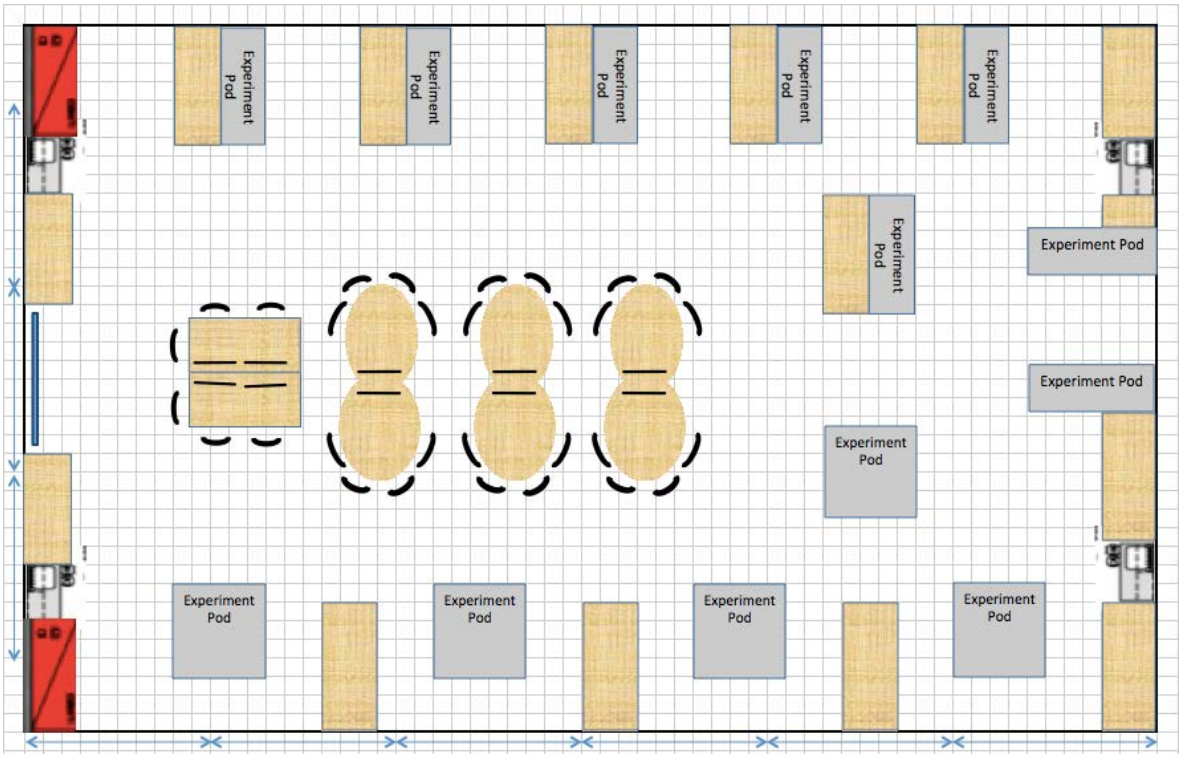
A. Space Relationship:

- Coat room (adjacent or at entrance) for laboratory coats + safety glasses and storage of personal coats + backpacks for student occupants
- Accessible to medium size conference room (12 -15 people)

B. Visual Relationship:

- Experimental "pods" located around perimeter (freestanding and bench-top)
- Prep space (sinks + fume hoods + lab bench) located along one wall
- Desk space with computers located centrally

Experiments located around exterior of room, easily accessible from all sides. Desks + chairs for computer stations located in central core.



This is just a rough sketch. Experiments (both freestanding and bench-top) located around exterior of room with good accessibility. Desks and chairs for computer workstations located in central core to facilitate teamwork.

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME: Instructional: Instrumentation Laboratory (BME) **ASSIGNABLE SF:** 1,500
FUNCTION: BME 403 class; medical instrumentation **NO. SPACES REQUIRED:** 1

UTILIZATION
Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants 33

ARCHITECTURAL
Floor
VCT (Chemical Resistant) ☐
VCT ☐
Welded Seam Sheet Vinyl ☒
Epoxy ☐
Carpet ☐
Sealed Concrete ☐
Other _____ ☐
Partitions
Gyp Board, Epoxy Paint ☐
Gyp Board, Painted ☒
Other _____ ☐
Base
Resilient ☐
Integral w/floor ☐
Ceiling
Open ☒
Acoustical Tile ☒
Gyp Board, Epoxy Paint ☐
Height _____
Doors
Size (list req'd width) _____
Light Tight Rotating Door ☐
Vision Panel ☐
Natural Daylight ☒
Privacy
Visual ☐
Acoustical ☒
Security
Lockset ☒
Special Measures (Card swipe) ☒
Casework (located around perimeter)
Base w/worktop ☒
Wall ☒

FURNITURE
Window Shades
Black-out Shades ☒
Solar Shades ☒
Chairs 33
Lab bench workstations 16
Projection Screen
Motorized (2 req'd) ☒
Pull-down ☐
Backpack/coat storage lockers 32

MECHANICAL
Temperature
70°F heat, 75°F cool (std) ☒
Other _____ ☐
Humidity Control
Approx. 50% ± 25% ☒
Other _____ ☐
Air Changes/hour _____
100% Make-up Air ☐
Recirculated Air ☐
Space air pressure with respect to adjacent spaces (select only one)
Neutral Air Pressure ☐
Positive Air Pressure ☐
Negative Air Pressure ☐
Air Filtration/Supply ☐
Air Filtration/Exhaust ☐

HOODS (list number req'd)
Chemical Fume Hood _____
Radioisotope Hood _____
Laminar Flow Hood _____
Biological Safety Cabinet _____
Snorkel _____
Canopy Hood _____
Low Slotted Exhaust _____
Other _____ _____

LABORATORY EQUIPMENT
Vibration Sensitive ☐
Light Sensitive ☐
Vibration Producing ☐
Heat Producing ☐
Noise Producing ☐

CHEMICALS
Bases ☐
Acids ☐
Solvents ☐
Radioisotopes ☐
Carcinogens/Regulated ☐
Chemical Waste Storage ☒
Biological Storage ☐
Radioisotope Storage ☐
Chemical Storage ☒

MOVEABLE EQUIPMENT
Computer 17
Stand-alone Printer on stand 1
Shredder _____
Multi-function Printer/Copier _____
Whiteboard yes
Instructor's station 1
Other _____ _____

PLUMBING
Laboratory Gas (LG) ☐
Laboratory Vacuum (LV) ☒
Laboratory Air (LA) (@perimeter casework) ☒
Pressure: _____
Dewpoint: _____
Compressed Air, 100 psi (A) ☐
Potable Hot Water (HW) ☒
Potable Cold Water (CW) ☒
Countertop Sink (2 req'd) ☒
Process Cooling Water 60°F ☐
Flow (gpm): _____
Pressure (psi): _____
Steam/Condensate Return ☐
Carbon Dioxide (CO_2) ☐
Nitrogen Gas (N_2) ☐
Other _____ ☐
Cylinder Gases ☒
Inert ☐
Flammable ☐
Toxic ☐
Floor Drain (FD) ☐
Floor Sink (FS) ☐
Safety Shower/Eyewash (SS) ☐
Eye Wash (EW) ☒

ELECTRICAL
110V, 20A, 1 Phase ☒
208V, 30A, 1 Phase ☐
208V, 30A, 3 Phase ☐
480V, 100A, 3 Phase ☐
Isolated Ground Outlet ☐
Standby Power ☐
UPS (OFOI) ☐
Phone 1
Data 30+
In Use Light ☐
Task Lighting ☒
Lighting Level
100 fc at bench/desk ☐
75 fc at bench/desk ☒
Other standard for function ☐
Safe Light (always on) ☐
Special Lighting ☐
Dimmable ☒
Zoned Lighting ☒
Occupant Sensor ☒
Projection Equipment
Overhead (2 req'd) ☒
Portable ☐
Video Conferencing
Receive ☐
Broadcast ☐
Other _____ ☐

REMARKS: the lab bench workstations shall have an electronics rack containing a power supply, function generation, and oscilloscope, along with a computer and open work space.

SPACE CONSIDERATIONS

A. Space Relationship:

- Close proximity to the workshop/research shop space in the building – perhaps with connecting door that can be locked to secure equipment that requires supervision.

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME: Instructional: Capstone Design Laboratory (BME) **ASSIGNABLE SF:** 1,500
FUNCTION: BME 450 Class **NO. SPACES REQUIRED:** 1

UTILIZATION
Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants 31

ARCHITECTURAL
Floor
VCT (Chemical Resistant) ☐
VCT ☐
Welded Seam Sheet Vinyl ☐
Epoxy ☐
Carpet ☐
Sealed Concrete ☐
Other _____ ☐
Partitions
Gyp Board, Epoxy Paint ☐
Gyp Board, Painted ☐
Other _____ ☐
Base
Resilient ☐
Integral w/floor ☐
Ceiling
Open ☐
Acoustical Tile ☐
Gyp Board, Epoxy Paint ☐
Height _____
Doors
Size (list req'd width) _____
Light Tight Rotating Door ☐
Vision Panel ☐
Natural Daylight ☐
Privacy
Visual ☐
Acoustical ☐
Security
Lockset ☐
Special Measures (Card swipe) ☒
Casework
Base w/counter ☒
Wall ☐

FURNITURE
Window Shades
Black-out Shades ☒
Solar Shades ☒
Chair/Stool 31
Backpack/coat storage lockers 32
Projection Screen
Motorized ☒
Pull-down ☐

MECHANICAL
Temperature
70°F heat, 75°F cool (std) ☐
Other _____ ☐
Humidity Control
Approx. 50% ± 25% ☒
Other _____ ☐
Air Changes/hour _____
100% Make-up Air ☐
Recirculated Air ☐
Space air pressure with respect to adjacent spaces (select only one)
Neutral Air Pressure ☐
Positive Air Pressure ☐
Negative Air Pressure ☐
Air Filtration/Supply ☐
Air Filtration/Exhaust (dust collection system) ☒

HOODS (list number req'd)
Chemical Fume Hood _____
Radioisotope Hood _____
Laminar Flow Hood _____
Biological Safety Cabinet _____
Snorkel _____
Canopy Hood _____
Low Slotted Exhaust _____
Other _____ _____

LABORATORY EQUIPMENT
Vibration Sensitive ☐
Light Sensitive ☐
Vibration Producing ☐
Heat Producing ☐
Noise Producing ☐

CHEMICALS
Bases ☐
Acids ☐
Solvents ☐
Radioisotopes ☐
Carcinogens/Regulated ☐
Chemical Waste Storage ☐
Biological Storage ☐
Radioisotope Storage ☐
Chemical Storage Cabinet ☒

MOVEABLE EQUIPMENT
Computer 31
Team Work Station 6
Shredder _____
Multi-function Printer/Copier _____
Whiteboard ??
Other _____ _____

PLUMBING
Laboratory Gas (LG) ☐
Laboratory Vacuum (LV) ☒
Laboratory Air (LA) ☒
Pressure: _____
Dewpoint: _____
Compressed Air, 100 psi (A) ☐
Potable Hot Water (HW) (@sinks) ☒
Potable Cold Water (CW) (@sinks) ☒
High Purity Water (DI) (@sinks) ☒
Process Cooling Water 60°F ☐
Flow (gpm): _____
Pressure (psi): _____
Steam/Condensate Return ☐
Carbon Dioxide (CO_2) ☐
Nitrogen Gas (N_2) ☐
Other _____ ☐
Cylinder Gases
Inert ☐
Flammable ☐
Toxic ☐
Floor Drain (FD) ☐
3 – Cabinet-mounted Sinks ☒
Safety Shower/Eyewash (SS) ☐
Eye Wash (EW) ☒

ELECTRICAL
110V, 20A, 1 Phase ☒
208V, 30A, 1 Phase ☐
208V, 30A, 3 Phase ☐
480V, 100A, 3 Phase ☐
Isolated Ground Outlet ☐
Standby Power ☐
UPS (OFOI) ☐
Phone _____
Data 31+
In Use Light ☐
Task Lighting ☐
Lighting Level
100 fc at bench/desk ☐
75 fc at bench/desk ☐
Other _____ ☐
Safe Light (always on) ☐
Special Lighting ☐
Dimmable ☒
Zoned Lighting ☒
Occupant Sensor ☐
Projection Equipment
Overhead ☒
Portable ☐
Video Conferencing
Receive ☐
Broadcast ☐
Other _____ ☐

REMARKS: Provide Backpack storage cabinets, perimeter base and wall cabinets with butcher block and lab counters, cabinets to store project prototypes, one instructor's station (w/computer). Team work stations shall be in close proximity to electrical outlets, vacuum and air service. Feed utility services from overhead. Open floor space should be available to allow for work on larger projects (bike/wheelchair, etc). The 3 sinks shall be located on the casework located on the room's perimeter.

SPACE CONSIDERATIONS

A. Space Relationship:

- Close proximity to the workshop/research shop space in the building – perhaps with connecting door that can be locked to secure equipment that requires supervision.

B. Visual Relationship:

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Instructional: Knowledge Commons	**ASSIGNABLE SF:**	1,000
FUNCTION:	Living room for student study	**NO. SPACES REQUIRED:**	2

UTILIZATION

Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants 40

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☒
- Acoustical Tile ☒
- Gyp Board, Painted ☒
- Other _____ ☐
- Height vary

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☒

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☒
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer _____
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard yes
- Projection Screen _____
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Desk/Chair _____
- File Cabinet _____
- Large HDTV monitor 1
- Multiple seating arrangements including: ☒
  - Couches
  - Lounge chairs
  - 1 large table w/10 chairs
  - Pod stations that allow seating for 1 or 2

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
  - Provide gang outlets at study tables for computer connections ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☐
- Data (provide outlets at tables and perimeter of room) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☒
  - Zoned Lighting ☒
  - Dimmable ☒
  - Occupant Sensor ☐
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- Other _____ ☐

REMARKS: provide variation in ceiling height/material to create recognizable separations of space.

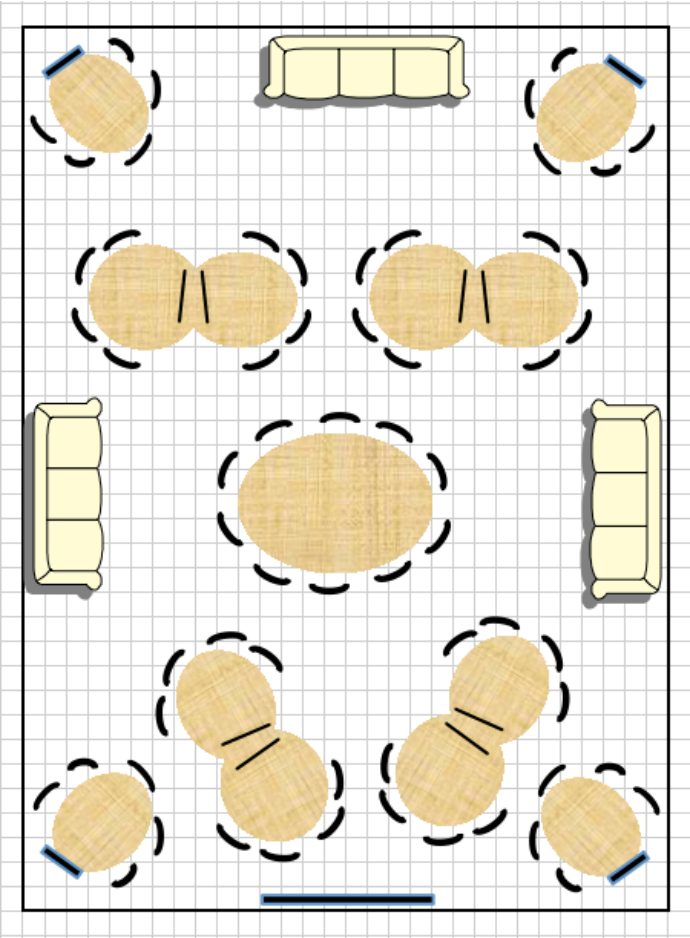
SPACE CONSIDERATIONS

A. Space Relationship:

- Close proximity to Computer Labs?

B. Visual Relationship:

- None required



DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Instructional: Computer Teaching Laboratory (Shared)	**ASSIGNABLE SF:**	1,500
FUNCTION:	Hands-on teaching space for instruction using computers	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants 41

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☐
- Metal ☐
- Vision Panel ☐
- Sidelite ☒

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☒

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☒
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer 41
- Stand-alone Printer 1
- Shredder _____
- Multi-function Printer/Copier 1
- Whiteboard yes
- Projection Screen yes
- Other _____ _____
- Window Shades
  - Black-out Shades ☒
  - Solar Shades ☒
- Desk/Chair 40
- File Cabinet _____
- Other HDTV monitors 6

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☒
- Data (provide outlets for all computers, printers, projectors, monitors) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☒
  - Dimmable ☒
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☒
  - Portable ☐
- Video Conferencing
  - Receive ☒
  - Broadcast ☐
- Projection Screen
  - Motorized ☒
  - Pull-down ☐
- Other _____ ☐

REMARKS: Supports Computer-based instructional in both departments

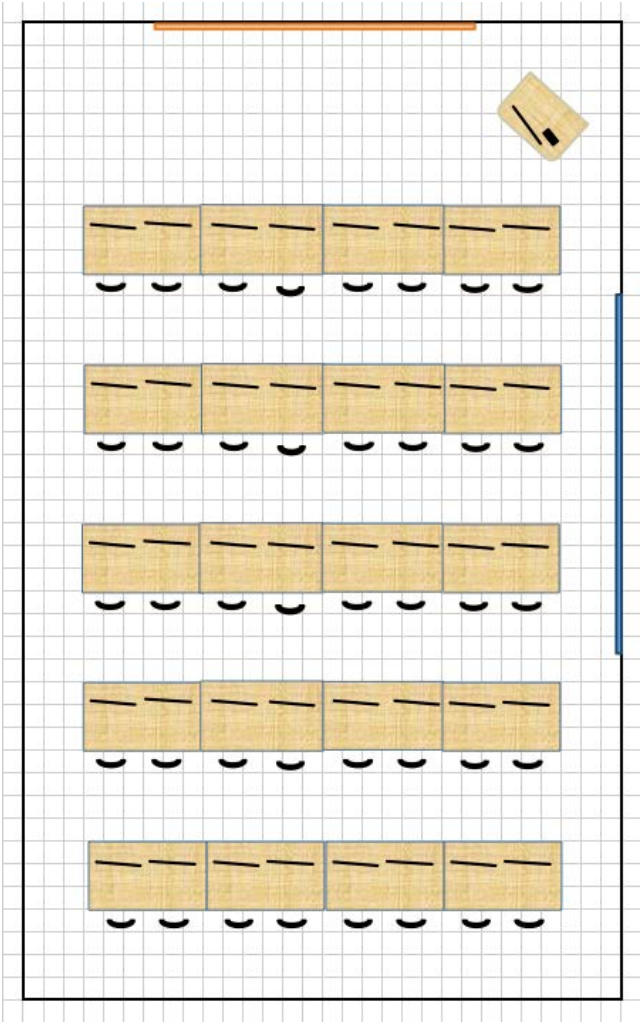
SPACE CONSIDERATIONS

A. Space Relationship:

- Close proximity to Computer Lab

B. Visual Relationship:

- Allow for visual connectivity with corridor



The above diagram shows a suggested layout for the lab. Tables should be reconfigurable to allow for group exercises.

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Instructional: Computer Study Open Laboratory (ChE)	**ASSIGNABLE SF:**	1,200
FUNCTION:	Computer laboratory for students doing homework and senior design projects	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 12 AM to 12 PM
Hours of Equipment Operation
From 12 AM to 12 PM
Number Occupants 70

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☒

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☒

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☒
- Noise Producing ☒
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer 46
- Stand-alone Printer 1
- Shredder _____
- Multi-function Printer/Copier 1
- Whiteboard _____
- Projection Screen yes
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Desk/Chair (w/HySYS) 40
- File Cabinet _____
- HDTV monitors 6
- Group study pod w/5 chairs 6
- TA station w/2 chairs 2

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☒
- Data (provide outlets for all computers, printers, projectors, monitors) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☒
  - Dimmable ☒
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- Other _____ ☐

REMARKS: 40 conventional workstations plus 6 collaborative workstations (5 people per)

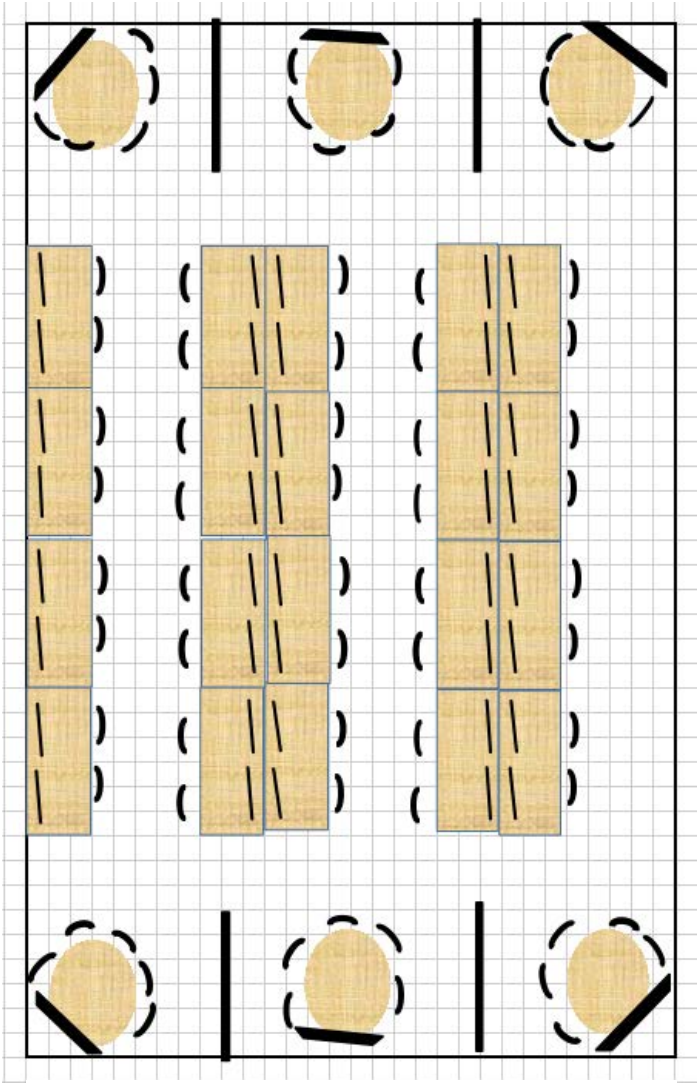
SPACE CONSIDERATIONS

A. Space Relationship:

- Close proximity to Computer Teaching Lab

B. Visual Relationship:

- Allow for visual connectivity with corridor



The above diagram shows a suggested layout for the lab.

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Instructional: Computer Study Open Laboratory (BME)	**ASSIGNABLE SF:**	1,000
FUNCTION:	Computer laboratory for students doing homework and senior design projects	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 12 AM to 12 PM
Hours of Equipment Operation
From 12 AM to 12 PM
Number Occupants 60

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☒

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☒

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☒
- Noise Producing ☒
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer 46
- Stand-alone Printer 1
- Shredder _____
- Multi-function Printer/Copier 1
- Whiteboard _____
- Projection Screen yes
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Desk/Chair (w/HySYS) 40
- File Cabinet _____
- HDTV monitors 6
- Group study pod w/5 chairs 6
- TA station w/2 chairs 2

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☒
- Data (provide outlets for all computers, printers, projectors, monitors) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☒
  - Dimmable ☒
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- Other _____ ☐

REMARKS: 40 conventional workstations plus 6 collaborative workstations (5 people per)

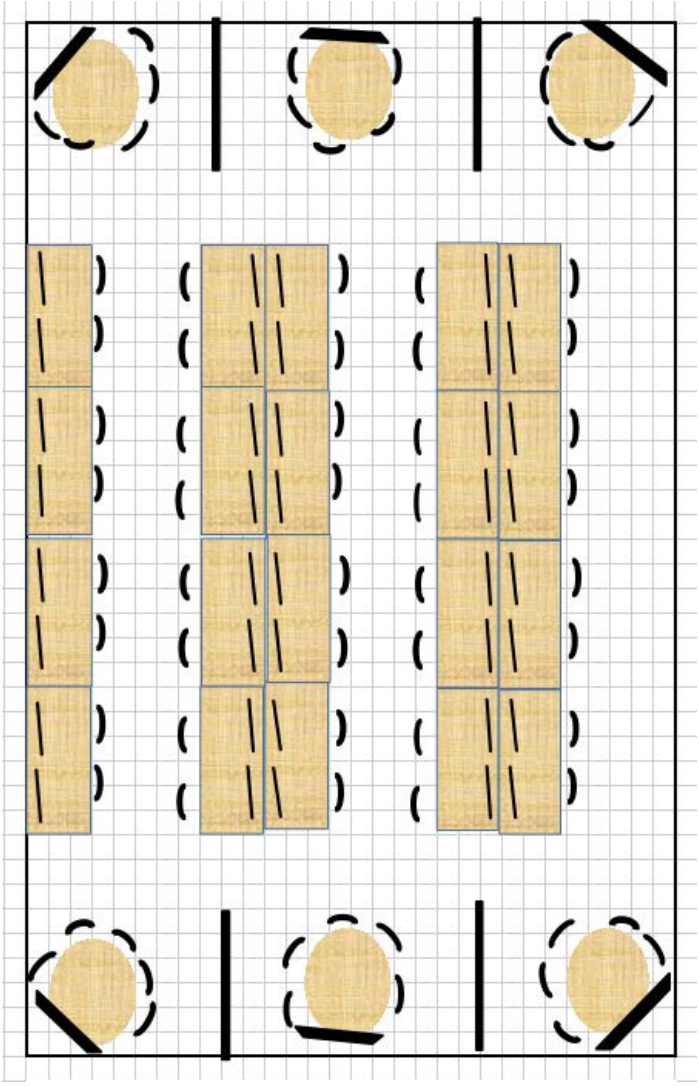
SPACE CONSIDERATIONS

A. Space Relationship:

- Close proximity to Computer Teaching Lab

B. Visual Relationship:

- Allow for visual connectivity with corridor



The above diagram shows a suggested layout for the lab.

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME: Research: General Chemical Laboratory (ChE) **ASSIGNABLE SF:** 1,000
FUNCTION: basic chemical handling, mat'ls characterization **NO. SPACES REQUIRED:** 16

UTILIZATION
Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants (non-permanent) 6

ARCHITECTURAL
Floor
- VCT (Chemical Resistant) ☒
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Sealed Concrete ☐
- Other _____ ☐

Partitions
- Gyp Board, Epoxy Paint ☐
- Gyp Board, Painted ☐
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐

Ceiling
- Open ☒
- Acoustical Tile ☐
- Gyp Board, Epoxy Paint ☐
- Height _____

Doors
- Size (list req'd width) _____
- Light Tight Rotating Door ☐
- Vision Panel ☒

Natural Daylight ☒
Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base (for sinks) ☒
- Wall ☐

FURNITURE
Window Shades
- Black-out Shades ☐
- Solar Shades ☒

Desk/Chair _____
Other Moveable lab benches w/ casework 10' length 6
Screen
- Motorized ☐
- Pull-down ☐

MECHANICAL
Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Other _____ ☐

Air Changes/hour _____
100% Make-up Air ☐
Recirculated Air ☐
Space air pressure with respect to adjacent spaces (select only one)
- Neutral Air Pressure ☐
- Positive Air Pressure ☐
- Negative Air Pressure ☐

Air Filtration/Supply ☐
Air Filtration/Exhaust ☐

HOODS (list number req'd)
Chemical Fume Hood _____
Radioisotope Hood _____
Laminar Flow Hood _____
Biological Safety Cabinet _____
Snorkel (1/5' bench) yes
Canopy Hood _____
Low Slotted Exhaust _____
Other _____ _____

LABORATORY EQUIPMENT
Vibration Sensitive ☐
Light Sensitive ☐
Vibration Producing ☐
Heat Producing ☐
Noise Producing ☐

CHEMICALS
Bases ☒
Acids ☒
Solvents ☒
Radioisotopes ☐
Carcinogens/Regulated ☐
Chemical Waste Storage ☒
Biological Storage ☐
Radioisotope Storage ☐
Chemical Storage ☒

MOVEABLE EQUIPMENT
Fire Extinguisher 1
Lab First Aid Kit 1
Shredder _____
Multi-function Printer/Copier _____
Whiteboard _____
Projection Screen _____
Other _____ _____

PLUMBING
Laboratory Gas (LG) ☐
Laboratory Vacuum (LV) ☒
Laboratory Air (LA) ☐
- Pressure: _____
- Dewpoint: _____

Compressed Air, 100 psi (A) ☒
Potable Hot Water (HW) ☒
Potable Cold Water (CW) ☒
High Purity Water (DI) ☒
Process Cooling Water 60°F ☒
- Flow (gpm): _____
- Pressure (psi): _____

Steam/Condensate Return ☐
Carbon Dioxide (CO_2) ☐
Nitrogen Gas (N_2) ☐
Other _____ ☐
Cylinder Gases
- Inert ☐
- Flammable ☐
- Toxic ☐

Floor Drain (FD) ☒
2-Countertop Sink w/hands-free operation ☒
Safety Shower/Eyewash (SS) ☒
Eye Wash (EW) ☐

ELECTRICAL
110V, 20A, 1 Phase ☒
208V, 30A, 1 Phase (2 req'd) ☒
208V, 30A, 3 Phase ☐
480V, 100A, 3 Phase ☐
Isolated Ground Outlet ☐
Standby Power (2-208V, 1 Phase & 2-120V, 1 Phase) ☒
UPS (OFOI) ☐
Phone 1
Data 1/5' bench
Lighting Level
- 100 fc at bench/desk ☐
- 75 fc at bench/desk ☒
- Other _____ ☐

Safe Light (always on) ☒
Special Lighting ☐
Dimmable ☒
Zoned Lighting ☐
Occupant Sensor ☒
Projection Equipment
- Overhead ☐
- Portable ☐

Gas detectors ☒
Other _____ ☐

REMARKS: utilities to be fed from overhead

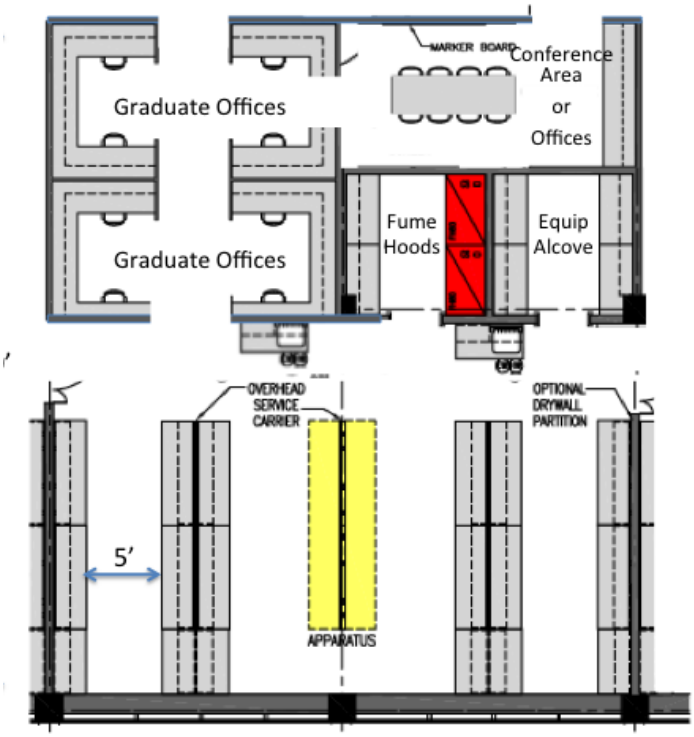
SPACE CONSIDERATIONS

A. Space Relationship:

- Laboratory space connected to office space for student occupants
- Adjacent to computational groups working in same research area

B. Visual Relationship:

- Each door from a hallway into a lab should have a view panel



Note: This is a rough sketch of how the space might be organized. The graduate office space could accommodate students working in these labs and /or students working on computational projects in this same research field. The specifications are based only on the experimental portion of the module.

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Research: Heavy Chemical Laboratory (ChE)	**ASSIGNABLE SF:**	1,000
FUNCTION:	heavy chemical research w/major equip within hoods	**NO. SPACES REQUIRED:**	8

UTILIZATION

Hours of typical Occupancy	
From _____ to _____	
Hours of Equipment Operation	
From _____ to _____	
Number Occupants	6

ARCHITECTURAL

Floor	
VCT (Chemical Resistant)	☒
VCT	☐
Welded Seam Sheet Vinyl	☐
Epoxy	☐
Carpet	☐
Sealed Concrete	☐
Other _____	☐
Partitions	
Gyp Board, Epoxy Paint	☐
Gyp Board, Painted	☒
Other _____	☐
Base	
Resilient	☒
Integral w/floor	☐
Ceiling	
Open	☒
Acoustical Tile	☐
Gyp Board, Epoxy Paint	☐
Height	_____
Doors	
Size (list req'd width)	_____
Light Tight Rotating Door	☐
Vision Panel	☒
Natural Daylight	☒
Privacy	
Visual	☐
Acoustical	☐
Security	
Lockset	☒
Special Measures	☒
Casework	
Base	☐
Wall	☐

FURNITURE

Window Shades	
Black-out Shades	☐
Solar Shades	☐
Desk/Chair	_____
Other Moveable lab benches w/ casework 10' length	4
Screen	
Motorized	☐
Pull-down	☐

MECHANICAL

Temperature	
70°F heat, 75°F cool (std)	☒
Other	☐
Humidity Control	
Approx. 50% ± 25%	☒
Other _____	☐
Air Changes/hour	_____
100% Make-up Air	☒
Recirculated Air	☐
Space air pressure with respect to adjacent spaces (select only one)	
Neutral Air Pressure	☐
Positive Air Pressure	☐
Negative Air Pressure	☐
Air Filtration/Supply	☐
Air Filtration/Exhaust	☒

HOODS (list number req'd)

Chemical Fume Hood	(8) 6' ea
Radioisotope Hood	_____
Laminar Flow Hood	_____
Biological Safety Cabinet	_____
Snorkel	(1)/5'
Canopy Hood	_____
Low Slotted Exhaust	_____
Other _____	_____

LABORATORY EQUIPMENT

Vibration Sensitive	☐
Light Sensitive	☐
Vibration Producing	☐
Heat Producing	☐
Noise Producing	☐

CHEMICALS

Bases	☒
Acids	☒
Solvents	☒
Radioisotopes	☐
Carcinogens/Regulated	☐
Chemical Waste Storage	☒
Biological Storage	☐
Radioisotope Storage	☐
Chemical Storage	☒

MOVEABLE EQUIPMENT

Fire Extinguisher	1
Lab First Aid Kit	1
Shredder	_____
Multi-function Printer/Copier	_____
Whiteboard	_____
Projection Screen	_____
Other _____	_____

PLUMBING

Laboratory Gas (LG)	☐
Laboratory Vacuum (LV)	☒
Laboratory Air (LA)	☐
Pressure: _____	
Dewpoint: _____	
Compressed Air, 100 psi (A)	☒
Potable Hot Water (HW) @ countertop sink	☒
Potable Cold Water (CW) @ countertop sink & each hood	☒
High Purity Water (DI)	☒
Process Cooling Water 60°F	☒
Flow (gpm): _____	
Pressure (psi): _____	
Steam/Condensate Return	☐
Carbon Dioxide (CO_2)	☐
Nitrogen Gas (N_2)	☒
Other _____	☐
Cylinder Gases	
Inert	☐
Flammable	☐
Toxic	☐
Floor Drain (FD)	☒
1-Countertop Sink w/hands-free operation	☒
Safety Shower/Eyewash (SS)	☒
Eye Wash (EW)	☐

ELECTRICAL

110V, 20A, 1 Phase	☒
208V, 30A, 1 Phase 2 req'd	☒
208V, 30A, 3 Phase	☐
480V, 100A, 3 Phase	☐
Isolated Ground Outlet	☐
Standby Power 208V, 30A, 1 Phase 2 req'd	☒
Standby Power 120V, 30A, 1 Phase 2 req'd	☒
UPS (OFOI)	☐
Phone	_____
Data	2/5' of bench
In Use Light	☐
Task Lighting	☐
Lighting Level	
100 fc at bench/desk	☐
75 fc at bench/desk	☒
Other _____	☐
Safe Light (always on)	☐
Special Lighting	☐
Dimmable	☒
Zoned Lighting	☐
Occupant Sensor	☒
Gas Detectors as needed	☒

REMARKS: Chemical Fume Hood quantities will vary from 4 to 8 in each "Heavy" space (6 average). Support space is required for chemical storage (beneath fume hoods for liquids and stand-alone cabinets for solids); space is required for storage of gas cylinders in lab area (may be in adjacent equipment alcove); utilities to be fed from overhead

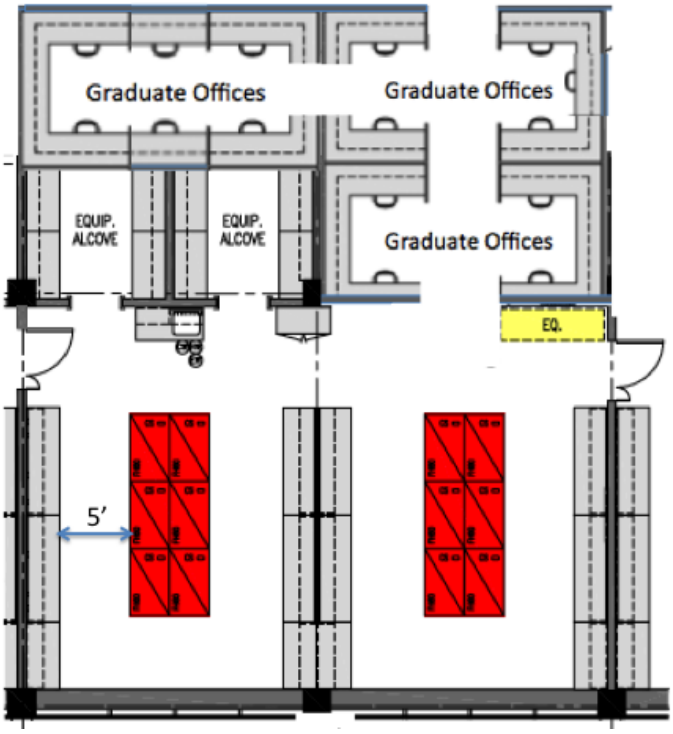
SPACE CONSIDERATIONS

A. Space Relationship:

- Laboratory space to be directly accessible from Graduate Student Offices
- Directly adjacent to Equipment Alcoves
- Adjacent to computational groups working in same research area

B. Visual Relationship:

- Visible from Graduate Student Offices



Note: This is a rough sketch of how the space might be organized. The graduate office space could accommodate students working in these labs and /or students working on computational projects in this same research field. The specifications are based only on the experimental portion of the module.

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME: Research: Life Sciences Laboratory (ChE) **ASSIGNABLE SF:** 1,000
FUNCTION: life sciences, cell culture, tissue culture **NO. SPACES REQUIRED:** 8

UTILIZATION
Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants 6

ARCHITECTURAL
Floor
VCT (Chemical Resistant) ☐
VCT ☐
Welded Seam Sheet Vinyl ☐
Epoxy ☐
Carpet ☐
Sealed Concrete ☐
Other _____ ☐
Partitions
Gyp Board, Epoxy Paint ☐
Gyp Board, Painted ☐
Other _____ ☐
Base
Resilient ☐
Integral w/floor ☐
Ceiling
Open ☐
Acoustical Tile ☐
Gyp Board, Epoxy Paint ☐
Height _____
Doors
Size (list req'd width) _____
Light Tight Rotating Door ☐
Vision Panel ☒
Natural Daylight (borrowed) ☒
Privacy
Visual ☐
Acoustical ☐
Security
Lockset ☐
Special Measures ☒
Casework
Base ☐
Wall ☐

FURNITURE
Window Shades
Black-out Shades ☐
Solar Shades ☐
Desk/Chair _____
Other Moveable lab benches w/ casework 10' length 4
Screen
Motorized ☐
Pull-down ☐

MECHANICAL
Temperature
70°F heat, 75°F cool (std) ☐
Other _____ ☐
Humidity Control
Approx. 50% ± 25% ☐
Other _____ ☐
Air Changes/hour _____
100% Make-up Air ☒
Recirculated Air ☐
Space air pressure with respect to adjacent spaces (select only one)
Neutral Air Pressure ☐
Positive Air Pressure ☐
Negative Air Pressure ☐
Air Filtration/Supply ☐
Air Filtration/Exhaust ☒

HOODS (list number req'd)
Chemical Fume Hood _____
Radioisotope Hood _____
Laminar Flow Hood _____
Biological Safety Cabinet _____
Snorkel _____
Canopy Hood _____
Low Slotted Exhaust _____
Other _____ _____

LABORATORY EQUIPMENT
Vibration Sensitive ☐
Light Sensitive ☐
Vibration Producing ☐
Heat Producing ☐
Noise Producing ☐

CHEMICALS
Bases ☒
Acids ☒
Solvents ☒
Radioisotopes ☐
Carcinogens/Regulated ☐
Chemical Waste Storage ☒
Biological Storage ☒
Radioisotope Storage ☐
Chemical Storage ☒

MOVEABLE EQUIPMENT
Fire Extinguisher 1
Lab First Aid Kit 1
Shredder _____
Multi-function Printer/Copier _____
Whiteboard _____
Projection Screen _____
Other Incubators x

PLUMBING
Laboratory Gas (LG) ☐
Laboratory Vacuum (LV) ☒
Laboratory Air (LA) ☐
Pressure: _____
Dewpoint: _____
Compressed Air, 100 psi (A) ☒
Potable Hot Water (HW) ☒
Potable Cold Water (CW) ☒
High Purity Water (DI) ☒
Process Cooling Water 60°F ☒
Flow (gpm): _____
Pressure (psi): _____
Steam/Condensate Return ☐
Carbon Dioxide (CO_2) ☐
Nitrogen Gas (N_2) ☐
Other Natural Gas for some labs ☒
Cylinder Gases
Inert ☐
Flammable ☐
Toxic ☐
Floor Drain (FD) ☒
2-Countertop Sinks w/hands-free operation ☒
Safety Shower/Eyewash (SS) ☒
Eye Wash (EW) ☐

ELECTRICAL
110V, 20A, 1 Phase ☐
208V, 30A, 1 Phase ☐
208V, 30A, 3 Phase ☐
480V, 100A, 3 Phase ☐
Isolated Ground Outlet ☐
Standby Power 208V, 30A, 1 Phase 2 req'd ☒
Standby Power 120V, 30A, 1 Phase 2 req'd ☒
UPS (OFOI) ☐
Phone _____
Data 2/5' of bench
In Use Light ☐
Task Lighting ☐
Lighting Level
100 fc at bench/desk ☐
75 fc at bench/desk ☐
Other _____ ☐
Safe Light (always on) ☐
Special Lighting ☐
Dimmable ☐
Zoned Lighting ☐
Occupant Sensor ☐
Video Conferencing
Receive ☐
Broadcast ☐
Other CO_2 detectors as needed ☒

REMARKS: support space is required for chemical storage (beneath fume hoods for liquids and stand-alone cabinets for solids); space is required for storage of gas cylinders in lab area (may be in adjacent equipment alcove); utilities to be fed from overhead

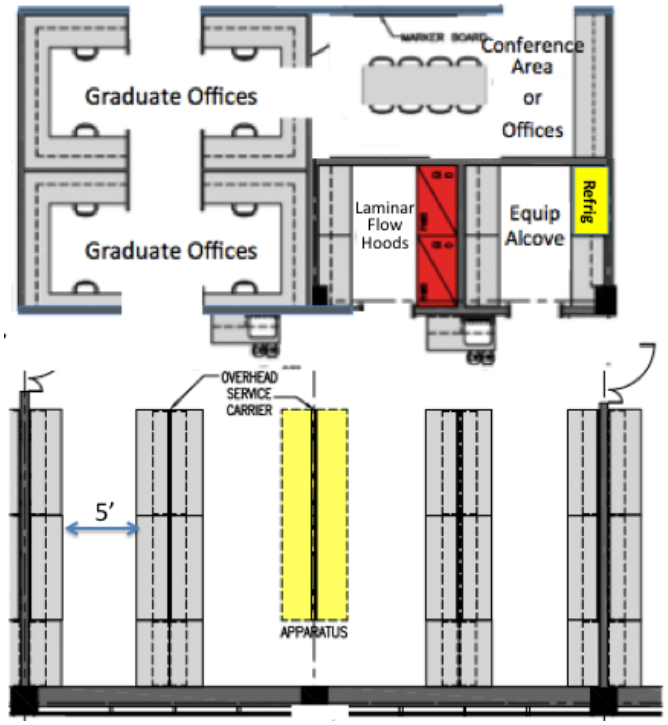
SPACE CONSIDERATIONS

A. Space Relationship:

- Laboratory space to be directly accessible from Graduate Student Offices
- Connected to Life Sciences Core
- Adjacent to computational groups working in same research area
- Directly adjacent to Equipment Alcoves

B. Visual Relationship:

- Visible from Graduate Student Offices



Note: This is a rough sketch of how the space might be organized. The graduate office space could accommodate students working in these labs and /or students working on computational projects in this same research field. The specifications are based only on the experimental portion of the module.

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Research: Chemical Laboratory Support Space (ChE)	**ASSIGNABLE SF:**	1
FUNCTION:	Shared chemical laboratory support functions	**NO. SPACES REQUIRED:**	1,600

UTILIZATION

Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants 0

ARCHITECTURAL

Floor
- VCT (Chemical Resistant) ☒
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Sealed Concrete ☐
- Other _____ ☐

Partitions
- Gyp Board, Epoxy Paint ☐
- Gyp Board, Painted ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Epoxy Paint ☐
- Height _____

Doors
- Size (list req'd width) _____
- Light Tight Rotating Door ☐
- Vision Panel ☐

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base ☒
- Wall ☒

FURNITURE

Window Shades
- Black-out Shades ☐
- Solar Shades ☐

Desk/Chair _____
Other _____ _____
Screen
- Motorized ☐
- Pull-down ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☐
- Other some will require enhanced temp controls ±1°C ☒

Humidity Control
- Approx. 50% ± 25% ☒
- Other _____ ☐

Air Changes/hour _____
100% Make-up Air ☒
Recirculated Air ☐
Space air pressure with respect to adjacent spaces (select only one)
- Neutral Air Pressure ☐
- Positive Air Pressure ☐
- Negative Air Pressure ☐

Air Filtration/Supply ☐
Air Filtration/Exhaust ☐

HOODS (list number req'd)

Chemical Fume Hood	(24) 4'ea
Radioisotope Hood	_____
Laminar Flow Hood	_____
Biological Safety Cabinet	_____
Snorkel	_____
Canopy Hood	_____
Low Slotted Exhaust	_____
Other _____	_____

LABORATORY EQUIPMENT

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐

CHEMICALS

- Bases ☒
- Acids ☒
- Solvents ☒
- Radioisotopes ☐
- Carcinogens/Regulated ☐
- Chemical Waste Storage ☒
- Biological Storage ☐
- Radioisotope Storage ☐
- Chemical Storage ☒

MOVEABLE EQUIPMENT

Refrigerators	1
Freezers	1
Refrigerators	1
Refrigerators	1

PLUMBING

- Laboratory Gas (LG) ☐
- Laboratory Vacuum (LV) ☒
- Laboratory Air (LA) ☐
  - Pressure: _____
  - Dewpoint: _____
- Compressed Air, 100 psi (A) ☒
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☒
- High Purity Water (DI) ☐
- Process Cooling Water 60°F ☒
  - Flow (gpm): _____
  - Pressure (psi): _____
- Steam/Condensate Return ☐
- Carbon Dioxide (CO_2) ☐
- Nitrogen Gas (N_2) ☐
- Other _____ ☐

Cylinder Gases
- Inert ☒
- Flammable ☐
- Toxic ☐

- Floor Drain (FD) ☐
- Floor Sink (FS) ☐
- Safety Shower/Eyewash (SS) ☐
- Eye Wash (EW) ☐

ELECTRICAL

- 110V, 20A, 1 Phase ☒
- 208V, 30A, 1 Phase ☐
- 208V, 30A, 3 Phase ☐
- 480V, 100A, 3 Phase ☐
- Isolated Ground Outlet ☐
- Standby Power ☐
- UPS (OFOI) ☐
- Phone _____
- Data _____
- In Use Light ☐
- Task Lighting ☐

Lighting Level
- 100 fc at bench/desk ☐
- 75 fc at bench/desk ☒
- Other _____ ☐

- Safe Light (always on) ☐
- Special Lighting ☐
- Dimmable ☒
- Zoned Lighting ☐
- Occupant Sensor ☒

Projection Equipment
- Overhead ☐
- Portable ☐

Video Conferencing
- Receive ☐
- Broadcast ☐

Other _____ ☐

REMARKS: Space should be distributed and integrated as a series of alcoves within the ChE Chemical Laboratory Space (General and Heavy). Each fume hood to be equipped with a cup sink, electrical outlets, vacuum and compressed air

SPACE CONSIDERATIONS

A. Space Relationship:

- Fume Hood Alcove to be directly accessible to Laboratory space (see diagram under General Chemistry Lab)

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Research: Core Life Sciences Suite (ChE)	**ASSIGNABLE SF:**	1,000
FUNCTION:	Shared Core life sciences support functions	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants 0

ARCHITECTURAL

Floor
- VCT (Chemical Resistant) ☐
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Sealed Concrete ☐
- Other _____ ☐

Partitions
- Gyp Board, Epoxy Paint ☐
- Gyp Board, Painted ☐
- Other _____ ☐

Base
- Resilient ☐
- Integral w/floor ☐

Ceiling
- Open ☐
- Acoustical Tile ☐
- Gyp Board, Epoxy Paint ☐
- Height _____

Doors
- Size (list req'd width) _____
- Light Tight Rotating Door ☐
- Vision Panel ☒

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

FURNITURE

Window Shades
- Black-out Shades ☐
- Solar Shades ☐

Desk/Chair _____
Other _____ _____
Screen
- Motorized ☐
- Pull-down ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Other _____ ☐

Air Changes/hour _____
100% Make-up Air ☐
Recirculated Air ☐
Space air pressure with respect to adjacent spaces (select only one)
- Neutral Air Pressure ☐
- Positive Air Pressure ☐
- Negative Air Pressure ☐

Air Filtration/Supply ☐
Air Filtration/Exhaust ☐

HOODS (list number req'd)

Chemical Fume Hood _____
Radioisotope Hood _____
Laminar Flow Hood _____
Biological Safety Cabinet Yes
Snorkel _____
Canopy Hood _____
Low Slotted Exhaust _____
Other _____ _____

LABORATORY EQUIPMENT

Vibration Sensitive ☐
Light Sensitive ☐
Vibration Producing ☐
Heat Producing ☒
Noise Producing ☐

CHEMICALS

Bases ☐
Acids ☐
Solvents ☐
Radioisotopes ☐
Carcinogens/Regulated ☐
Chemical Waste Storage ☐
Biological Storage ☐
Radioisotope Storage ☐
Chemical Storage ☐

MOVEABLE EQUIPMENT

Cold Chamber (4 C) 2
Incubation Chamber (37 C) 1
Fire Extinguisher 1
Lab First Aid Kit 1
Autoclave 1
Floor Centrifuge 1
Dishwasher 1
Glassware Dryer 1
Icemaker 1

PLUMBING

Laboratory Gas (LG) ☐
Laboratory Vacuum (LV) ☐
Laboratory Air (LA) ☐
- Pressure: _____
- Dewpoint: _____

Compressed Air, 100 psi (A) ☐
Potable Hot Water (HW) ☒
Potable Cold Water (CW) ☒
High Purity Water (DI) ☐
Process Cooling Water 60°F ☒
- Flow (gpm): _____
- Pressure (psi): _____

Steam/Condensate Return ☒
Carbon Dioxide (CO_2) ☐
Nitrogen Gas (N_2) ☐
Other _____ ☐

Cylinder Gases
- Inert ☐
- Flammable ☐
- Toxic ☐

Floor Drain (FD) ☒
1- Sink w/hands-free operation ☒
Safety Shower/Eyewash (SS) ☒
Eye Wash (EW) ☐

ELECTRICAL

110V, 20A, 1 Phase ☐
208V, 30A, 1 Phase (2 req'd) ☒
208V, 30A, 3 Phase ☐
480V, 100A, 3 Phase ☐
Isolated Ground Outlet ☐
Standby Power 208V, 30A, 1 Phase (2 req'd) ☒
Standby Power 120V, 30A, 1 Phase (2 req'd) ☒
UPS (OFOI) ☐
Phone _____
Data (for equipment interconnect) yes
In Use Light ☐
Task Lighting ☐
Lighting Level
- 100 fc at bench/desk ☐
- 75 fc at bench/desk ☒
- Other _____ ☐

Safe Light (always on) ☐
Special Lighting ☐
Dimmable ☐
Zoned Lighting ☐
Occupant Sensor ☒
Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Connected to ChE Life Sciences Research Labs

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME: Research: General Engineering Laboratory (BME) **ASSIGNABLE SF:** 1,000
FUNCTION: basic cell research, etc. **NO. SPACES REQUIRED:** 23

UTILIZATION

Hours of typical Occupancy
From 8 AM to 3 AM
Hours of Equipment Operation
24/7
Number Occupants 6

ARCHITECTURAL

Floor
- VCT (Chemical Resistant) ☐
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Sealed Concrete ☐
- Other _____ ☐

Partitions
- Gyp Board, Epoxy Paint ☐
- Gyp Board, Painted ☐
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐

Ceiling
- Open ☒
- Acoustical Tile ☐
- Gyp Board, Epoxy Paint ☐
- Height _____

Doors
- Size (list req'd width) _____
- Light Tight Rotating Door ☐
- Vision Panel ☒

Natural Daylight ☒

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base ☒
- Wall ☐

FURNITURE

Window Shades
- Black-out Shades ☐
- Solar Shades ☒

Desk/Chair _____
Moveable lab benches w/ casework 10' length 6
Screen
- Motorized ☐
- Pull-down ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Other _____ ☐

Air Changes/hour _____
100% Make-up Air ☐
Recirculated Air ☐
Space air pressure with respect to adjacent spaces (select only one)
- Neutral Air Pressure ☐
- Positive Air Pressure ☐
- Negative Air Pressure ☐

Air Filtration/Supply ☐
Air Filtration/Exhaust ☒

HOODS (list number req'd)

Chemical Fume Hood _____
Radioisotope Hood _____
Laminar Flow Hood 1
Biological Safety Cabinet _____
Snorkel 1/5' bench
Canopy Hood _____
Low Slotted Exhaust _____
Other _____ _____

LABORATORY EQUIPMENT

Vibration Sensitive ☒
Light Sensitive ☐
Vibration Producing ☐
Heat Producing ☐
Noise Producing ☐

CHEMICALS

Bases ☒
Acids ☒
Solvents ☒
Radioisotopes ☐
Carcinogens/Regulated ☒
Chemical Waste Storage ☒
Biological Storage ☒
Radioisotope Storage ☐
Chemical Storage ☒

MOVEABLE EQUIPMENT

Fire Extinguisher 1
Lab First Aid Kit 1
Shredder _____
Multi-function Printer/Copier _____
Laser assembly 1
Microscope 1
Optical Table 1

PLUMBING

Laboratory Gas (LG) ☐
Laboratory Vacuum (LV) ☒
Laboratory Air (LA) ☐
- Pressure: _____
- Dewpoint: _____

Compressed Air, 100 psi (A) ☒
Potable Hot Water (HW) ☒
Potable Cold Water (CW) ☒
High Purity Water (DI) ☒
Process Cooling Water 60°F ☐
- Flow (gpm): _____
- Pressure (psi): _____

Steam/Condensate Return ☐
Carbon Dioxide (CO_2) ☐
Nitrogen Gas (N_2) ☐
Other _____ ☐
Cylinder Gases
- Inert ☐
- Flammable ☐
- Toxic ☐

Floor Drain (FD) ☐
1-Countertop Sink w/hands-free operation ☒
Safety Shower/Eyewash (SS) ☒
Eye Wash (EW) ☐

ELECTRICAL

110V, 20A, 1 Phase ☒
208V, 30A, 1 Phase (2 req'd) ☒
208V, 30A, 3 Phase ☐
480V, 100A, 3 Phase ☐
Isolated Ground Outlet ☐
Standby Power (2-208V, 1 Phase & 2-120V, 1 Phase) ☒
UPS (OFOI) ☐
Phone 1
Data 1/5' bench
In Use Light ☐
Task Lighting ☐
Lighting Level
- 100 fc at bench/desk ☐
- 75 fc at bench/desk ☒
- Other _____ ☐

Safe Light (always on) ☒
Special Lighting ☐
Dimmable ☒
Zoned Lighting ☐
Occupant Sensor ☒
Projection Equipment
- Overhead ☐
- Portable ☐

Gas detectors as req'd ☒

REMARKS: utilities to be fed from overhead

SPACE CONSIDERATIONS

A. Space Relationship:

- Connected to office space for student occupants
- Adjacent to shared alcoves containing biological safety cabinet / laminar flow hoods and incubators

B. Visual Relationship:

- Visibility from hallway, if lab entrance is from hallway
- Visibility into student offices

[Insert diagram here]

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Research: Material Process Lab (BME)	**ASSIGNABLE SF:**	600
FUNCTION:	dicing laser cutting, lapping/polishing; deposition/coating	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 8 AM to 5 PM
Hours of Equipment Operation
From 8 AM to 5 PM
Number Occupants 3-7

ARCHITECTURAL

Floor
- VCT (Chemical Resistant) ☐
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Sealed Concrete ☐
- Other _____ ☐

Partitions
- Gyp Board, Epoxy Paint ☐
- Gyp Board, Painted ☐
- Other _____ ☐

Base
- Resilient ☐
- Integral w/floor ☐

Ceiling
- Open ☐
- Acoustical Tile ☐
- Gyp Board, Epoxy Paint ☐
- Height _____

Doors
- Size (list req'd width) _____
- Light Tight Rotating Door ☐
- Vision Panel ☐

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

FURNITURE

Window Shades
- Black-out Shades ☐
- Solar Shades ☐

Desk/Chair _____
Other _____ _____
Screen
- Motorized ☐
- Pull-down ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Other _____ ☐

Air Changes/hour _____
100% Make-up Air ☐
Recirculated Air ☐
Space air pressure with respect to adjacent spaces (select only one)
- Neutral Air Pressure ☐
- Positive Air Pressure ☐
- Negative Air Pressure ☐

Air Filtration/Supply ☐
Air Filtration/Exhaust ☐

HOODS (list number req'd)

Chemical Fume Hood _____
Radioisotope Hood _____
Laminar Flow Hood _____
Biological Safety Cabinet _____
Snorkel (laser cutter) _____
Canopy Hood _____
Low Slotted Exhaust _____
Local Exhaust for equipment 2

LABORATORY EQUIPMENT

Vibration Sensitive ☐
Light Sensitive ☐
Vibration Producing ☐
Heat Producing ☐
Noise Producing (Dicing saw) ☒

CHEMICALS

Bases ☐
Acids ☐
Solvents ☐
Chemical Waste Storage ☐
Biological Storage ☐
Chemical Storage ☐

MOVEABLE EQUIPMENT

Fire Extinguisher	1
Lab First Aid Kit	1
Laser Cutter	1
Parylene Deposition System	1
Chrome/gold Sputtering Sys.	1
Dicing Saw	1
Microscope	1
Storage Cabinets	2
Benches w/granite or glass lapping surfaces + chairs	yes
Thickness Measurement Tools	yes

PLUMBING

Laboratory Gas (LG) ☐
Laboratory Vacuum (LV) ☒
Laboratory Air (LA) ☒
- Pressure: 100psi (±5% @ 10 scfm)
- Dewpoint: _____

Compressed Air, 100 psi (A) ☐
Potable Hot Water (HW) ☒
Potable Cold Water (CW) ☒
High Purity Water (DI) ☐
Process Cooling Water 60°F ☒
- Flow (gpm): _____
- Pressure (psi): _____

Steam/Condensate Return ☐
Carbon Dioxide (CO_2) ☐
Nitrogen Gas (N_2) ☐
Other _____ ☐

Cylinder Gases
- Inert ☐
- Flammable ☐
- Toxic ☐

Floor Drain (FD) ☒
Sink ☒
Water Filtration System ☒
Safety Shower/Eyewash (SS) ☒
Eye Wash (EW) ☐

ELECTRICAL

110V, 20A, 1 Phase ☒
208V, 30A, 1 Phase (2 req'd) ☒
208V, 30A, 3 Phase ☐
480V, 100A, 3 Phase ☐
Isolated Ground Outlet ☐
Standby Power ☐
UPS (OFOI) ☐
Phone 1
Data 2
In Use Light ☐
Task Lighting ☐

Lighting Level
- 100 fc at bench/desk ☐
- 75 fc at bench/desk ☐
- Other _____ ☐

Safe Light (always on) ☐
Special Lighting ☐
Dimmable ☐
Zoned Lighting ☐
Occupant Sensor ☐

Projection Equipment
- Overhead ☐
- Portable ☐

Video Conferencing
- Receive ☐
- Broadcast ☐

Other _____ ☐

REMARKS: No Chemical Storage needed; mostly water and water-based slurries used for cutting and lapping of materials.

SPACE CONSIDERATIONS

A. Space Relationship:

- Near to BME Teaching Laboratory

B. Visual Relationship:

- None

[Insert diagram here]

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Research: Wet / Cell Culture Lab (BME)	**ASSIGNABLE SF:**	800
FUNCTION:	research and teaching lab for cell culture, microscopy, etc	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants _____

ARCHITECTURAL

Floor
- VCT (Chemical Resistant) ☒
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Sealed Concrete ☐
- Other _____ ☐

Partitions
- Gyp Board, Epoxy Paint ☐
- Gyp Board, Painted ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐

Ceiling
- Open ☐
- Acoustical Tile ☐
- Gyp Board, Epoxy Paint ☐
- Height _____

Doors
- Size (list req'd width) _____
- Light Tight Rotating Door ☐
- Vision Panel ☒

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base ☐
- Wall ☐

FURNITURE

Window Shades
- Black-out Shades ☐
- Solar Shades ☐

Desk/Chair _____
Moveable lab benches w/ casework 10' length 6

Screen
- Motorized ☐
- Pull-down ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Other _____ ☐

Air Changes/hour _____
100% Make-up Air ☒
Recirculated Air ☐

Space air pressure with respect to adjacent spaces (select only one)
- Neutral Air Pressure ☐
- Positive Air Pressure ☐
- Negative Air Pressure ☐

Air Filtration/Supply ☐
Air Filtration/Exhaust ☐

HOODS (list number req'd)

Chemical Fume Hood _____
Laminar Flow Hood
Laminar Flow Hood
Biological Safety Cabinet (6') 1
Biological Safety Cabinet (4') 2
Snorkel _____
Canopy Hood _____
Other _____ _____

LABORATORY EQUIPMENT

Vibration Sensitive ☐
Light Sensitive ☐
Vibration Producing ☐
Heat Producing ☐
Noise Producing ☐

CHEMICALS

Radioisotopes ☐
Chemical Waste Storage ☐
Biological Storage ☐
Radioisotope Storage ☐
Chemical Storage ☒

MOVEABLE EQUIPMENT

Fire Extinguisher 1
Lab First Aid Kit 1
Incubator 2
Shaker Oven 2
Centrifuge 1
Water Bath 1
Refrigerator 2
Chest Freezer 1
Fluorescence Microscope 1
Phase Microscope 2
Gel Documentation system 1
Balance 2
Liquid Nitrogen Dewar (for cell storage) 1

PLUMBING

Laboratory Gas (LG) ☐
Laboratory Vacuum (LV) ☒
Laboratory Air (LA) ☐
- Pressure: _____
- Dewpoint: _____

Compressed Air, 100 psi (A) ☒
Potable Hot Water (HW) ☐
Potable Cold Water (CW) ☐
High Purity Water (DI) ☒
Process Cooling Water 60°F ☐
- Flow (gpm): _____
- Pressure (psi): _____

Steam/Condensate Return ☐
Carbon Dioxide (CO_2) ☐
Nitrogen Gas (N_2) ☐
Other _____ ☐
Cylinder Gases ☒
- Inert ☐
- Flammable ☐
- Toxic ☐

Floor Drain (FD) ☐
2-Countertop Sink w/hands-free operation ☒
Safety Shower/Eyewash (SS) ☐
Eye Wash (EW) ☒

ELECTRICAL

110V, 20A, 1 Phase ☒
208V, 30A, 1 Phase ☐
208V, 30A, 3 Phase ☐
480V, 100A, 3 Phase ☐
Isolated Ground Outlet ☐
Standby Power ☐
UPS (OFOI) ☐
Phone 1
Data 1/5' bench
In Use Light ☐
Task Lighting ☐
Lighting Level
- 100 fc at bench/desk ☐
- 75 fc at bench/desk ☒
- Other _____ ☐

Safe Light (always on) ☐
Special Lighting ☐
Dimmable ☒
Zoned Lighting ☐
Occupant Sensor ☒
Projection Equipment
- Overhead ☐
- Portable ☐

Other _____ ☐

REMARKS:

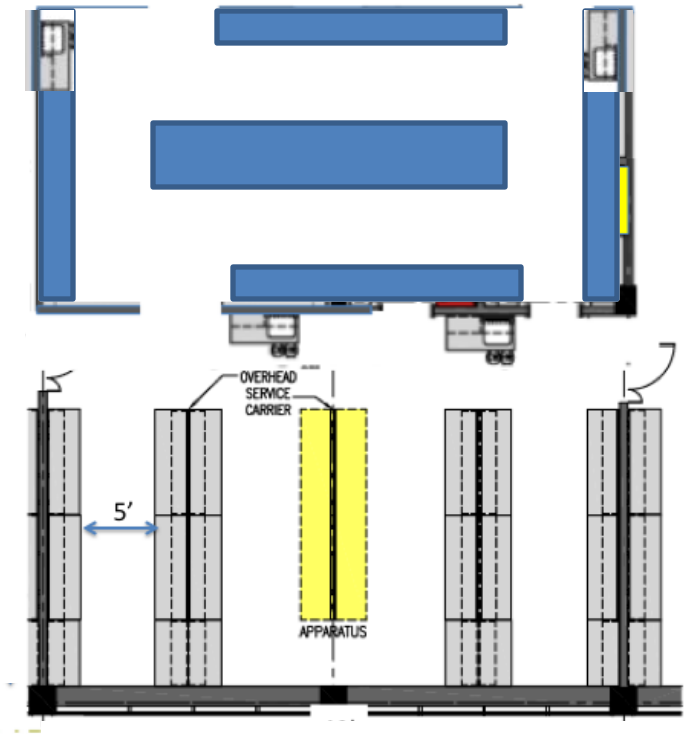
SPACE CONSIDERATIONS

A. Space Relationship:

- Adjacent to Biomedical Engineering General Research Labs

B. Visual Relationship:

- Visibility from hallway



DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Research: Core Life Sciences Shared Support Space (BME)	**ASSIGNABLE SF:**	3,000
FUNCTION:	core life sciences support space	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 8 AM to 3 AM
Hours of Equipment Operation
24/7
Number Occupants 1-8; no permanent

ARCHITECTURAL

Floor
- VCT (Chemical Resistant) ☐
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Sealed Concrete ☐
- Other _____ ☐

Partitions
- Gyp Board, Epoxy Paint ☐
- Gyp Board, Painted ☐
- Other _____ ☐

Base
- Resilient ☐
- Integral w/floor ☐

Ceiling
- Open ☐
- Acoustical Tile ☐
- Gyp Board, Epoxy Paint ☐
- Height _____

Doors
- Size (list req'd width) _____
- Light Tight Rotating Door ☐
- Vision Panel ☒

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

FURNITURE

Window Shades
- Black-out Shades ☐
- Solar Shades ☐

Desk/Chair _____
Other _____ _____
Screen
- Motorized ☐
- Pull-down ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☐
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☐
- Other _____ ☐

Air Changes/hour _____
100% Make-up Air ☐
Recirculated Air ☐
Space air pressure with respect to adjacent spaces (select only one)
- Neutral Air Pressure ☐
- Positive Air Pressure ☐
- Negative Air Pressure ☐

Air Filtration/Supply ☐
Air Filtration/Exhaust ☐

HOODS (list number req'd)

Chemical Fume Hood _____
Radioisotope Hood _____
Laminar Flow Hood 1
Biological Safety Cabinet _____
Snorkel _____
Canopy Hood _____
Low Slotted Exhaust _____
Other _____ _____

LABORATORY EQUIPMENT

Vibration Sensitive ☒
Light Sensitive ☐
Vibration Producing ☐
Heat Producing ☒
Noise Producing ☐

CHEMICALS

Chemical Waste Storage ☐
Biological Storage ☐
Chemical Storage ☐

MOVEABLE EQUIPMENT

Fire Extinguisher	1
Lab First Aid Kit	1
Autoclave	2
-80°F Freezer	4
-20°F Freezer	4
Refrigerator/Freezer	3
Floor Centrifuge	1
Atomic flow Microscope	1
Walk-in cold room	2
Walk-in 37°C room	2
Glassware dryer	1
Ice Maker	1
Dishwasher	1

PLUMBING

Laboratory Gas (LG) ☐
Laboratory Vacuum (LV) ☐
Laboratory Air (LA) ☐
- Pressure: _____
- Dewpoint: _____

Compressed Air, 100 psi (A) ☐
Potable Hot Water (HW) ☐
Potable Cold Water (CW) ☐
High Purity Water (DI) ☐
Process Cooling Water 60°F ☒
- Flow (gpm): _____
- Pressure (psi): _____

Steam/Condensate Return ☐
Carbon Dioxide (CO_2) ☐
Nitrogen Gas (N_2) ☐
Other _____ ☐

Cylinder Gases
- Inert ☐
- Flammable ☐
- Toxic ☐

Floor Drain (FD) ☒
1-Countertop Sink w/hands-free operation ☒
Safety Shower/Eyewash (SS) ☒
Eye Wash (EW) ☐

ELECTRICAL

110V, 20A, 1 Phase ☐
208V, 30A, 1 Phase (2 req'd) ☒
208V, 30A, 3 Phase ☒
480V, 100A, 3 Phase ☒
Isolated Ground Outlet ☐
Standby Power (2-208V, 1 Phase & 2-120V, 1 Phase) ☒
UPS (OFOI) ☐
Phone _____
Data _____
In Use Light ☐
Task Lighting ☐
Lighting Level
- 100 fc at bench/desk ☐
- 75 fc at bench/desk ☒
- Other _____ ☐

Safe Light (always on) ☐
Special Lighting ☐
Dimmable ☐
Zoned Lighting ☐
Occupant Sensor ☒
Projection Equipment
- Overhead ☐
- Portable ☐

Other _____ ☐

REMARKS: Space should be distributed and integrated with BME General Laboratory Space.

SPACE CONSIDERATIONS

A. Space Relationship:

- Connected to biological research laboratories

B. Visual Relationship:

- If entered from hall, door shall have a vision panel

[Insert diagram here]

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME: Research: Laser/Dark Room (BME) **ASSIGNABLE SF:** 600
FUNCTION: Heart Lab **NO. SPACES REQUIRED:** 1

UTILIZATION
Hours of typical Occupancy
From 8 AM to 7 PM
Hours of Equipment Operation
24/7
Number Occupants Up to 10; no permanent

ARCHITECTURAL
Floor
- VCT (Chemical Resistant) ☐
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Sealed Concrete ☐
- Other _____ ☐

Partitions
- Gyp Board, Epoxy Paint ☐
- Gyp Board, Painted ☐
- Other _____ ☐

Base
- Resilient ☐
- Integral w/floor ☐

Ceiling
- Open ☐
- Acoustical Tile ☐
- Gyp Board, Epoxy Paint ☐
- Height _____

Doors
- Size (list req'd width) _____
- Light Tight Rotating Door ☐
- Vision Panel ☒

Natural Daylight ☐
Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

FURNITURE
Window Shades
- Black-out Shades ☐
- Solar Shades ☐

Desk/Chair _____
Other _____ _____
Screen
- Motorized ☐
- Pull-down ☐

MECHANICAL
Temperature
- 70°F heat, 75°F cool (std) ☐
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☐
- Other _____ ☐

Air Changes/hour _____
100% Make-up Air ☐
Recirculated Air ☐
Space air pressure with respect to adjacent spaces (select only one)
- Neutral Air Pressure ☐
- Positive Air Pressure ☐
- Negative Air Pressure ☐

Air Filtration/Supply ☐
Air Filtration/Exhaust ☐

HOODS (list number req'd)
Chemical Fume Hood _____
Radioisotope Hood _____
Laminar Flow Hood
Biological Safety Cabinet _____
Snorkel _____
Canopy Hood _____
Low Slotted Exhaust _____
Other _____ _____

LABORATORY EQUIPMENT
Vibration Sensitive ☒
Light Sensitive ☐
Vibration Producing ☐
Heat Producing ☒
Noise Producing ☒

CHEMICALS
Chemical Waste Storage ☐
Biological Storage ☐
Chemical Storage ☐

MOVEABLE EQUIPMENT
Fire Extinguisher 1
Lab First Aid Kit 1
Heavy Optical Benches 3
Laser System 1

PLUMBING
Laboratory Gas (LG) ☐
Laboratory Vacuum (LV) ☐
Laboratory Air (LA) ☐
- Pressure: _____
- Dewpoint: _____

Compressed Air, 100 psi (A) ☐
Potable Hot Water (HW) ☒
Potable Cold Water (CW) ☒
High Purity Water (DI) ☐
Process Cooling Water 60°F ☒
- Flow (gpm): _____
- Pressure (psi): _____

Steam/Condensate Return ☒
Carbon Dioxide (CO_2) ☐
Nitrogen Gas (N_2) ☐
Other _____ ☐
Cylinder Gases
- Inert ☐
- Flammable ☐
- Toxic ☐

Floor Drain (FD) ☒
1-Countertop Sink w/hands-free operation ☒
Safety Shower/Eyewash (SS) ☒
Washdown hose/collection drain ☒

ELECTRICAL
110V, 20A, 1 Phase ☐
208V, 30A, 1 Phase (2 req'd) ☒
208V, 30A, 3 Phase ☒
480V, 100A, 3 Phase ☒
Isolated Ground Outlet ☐
Standby Power (2-208V, 1 Phase & 2-120V, 1 Phase) ☒
UPS (OFOI) ☐
Phone _____
Data _____
In Use Light ☐
Task Lighting ☐
Lighting Level
- 100 fc at bench/desk ☐
- 75 fc at bench/desk ☒
- Other _____ ☐

Safe Light (always on) ☐
Special Lighting ☐
Dimmable ☐
Zoned Lighting ☐
Occupant Sensor ☒
Projection Equipment
- Overhead ☐
- Portable ☐

Other _____ ☐

REMARKS: The sodium iodide staining process leaves a permanent yellow stain that can be tracked into other areas. Provide system to allow for room washdown and containment of waste water.

SPACE CONSIDERATIONS

A. Space Relationship:

- Connected to biological research laboratories

B. Visual Relationship:

- If entered from hall, door shall have a vision panel

[Insert diagram here]

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Research: Graduate Student Office Suite (Computational)	**ASSIGNABLE SF:**	600
FUNCTION:	Computational Research; heavy computer use	**NO. SPACES REQUIRED:**	10

UTILIZATION

Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants 8/space

ARCHITECTURAL

Floor
- VCT ☒
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☒

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☒
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer 8
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard yes
- Projection Screen _____
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Desk/Chair 8
- File Cabinet yes
- Bookcases yes
- 10' meeting table w/chairs 1
- HDTV monitor in meeting space 1

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (1/station + 2 in meeting space) ☒
- Data (1/station + 2 in meeting space) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☒
  - Dimmable ☒
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- Other _____ ☐

REMARKS: this suite will include a meeting space for researchers to gather for team meetings

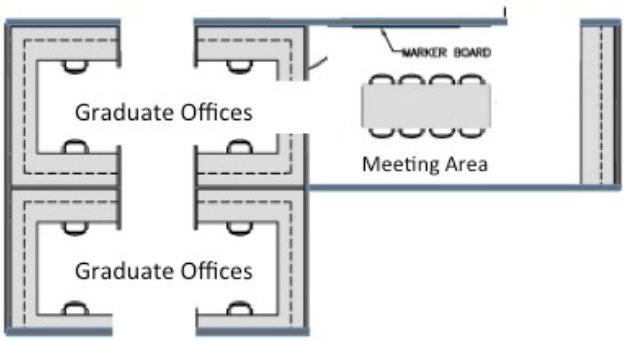
SPACE CONSIDERATIONS

A. Space Relationship:

- Direct access from circulation (public) corridor
- Convenient to, but physically separated from, experimental laboratories
- Adjacent to computational researchers in same area

B. Visual Relationship:

- Must see into laboratory
- See into meeting space



Note: This is a rough sketch of how the space might be organized. Large research groups might have more than one of these computational suites.

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Research: Graduate Student Office (Experimental)	**ASSIGNABLE SF:**	200
FUNCTION:	experimental-focused graduates	**NO. SPACES REQUIRED:**	56

UTILIZATION

Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants 4/space

ARCHITECTURAL

Floor
- VCT ☒
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☒
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☒
- Other _____ ☐

Base
- Resilient ☐
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☐
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight (borrowed) ☒

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☐
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer 4
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard _____
- Projection Screen _____
- Other _____ _____
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Desk/Chair 4
- File Cabinet yes
- Bookcase yes

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☐
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (1 per station) ☒
- Data (2 per station) ☒
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☐
  - Dimmable ☐
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Convenient to, but physically separated from, experimental laboratory
- Adjacent to researchers in same area
- Near to small meeting room

B. Visual Relationship:

- Must have visual control of laboratory

Note: This is a rough sketch of how the space might be organized. Large research groups might have more than one of these computational suites.

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME: Research: Research Storage **ASSIGNABLE SF:** 1,000
FUNCTION: **NO. SPACES REQUIRED:**

UTILIZATION
Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants 0

ARCHITECTURAL
Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Wood ☐
- Other sealed concrete ☒

Partitions
- Gyp Board, Painted ☒
- Glass ☐
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☒
- Acoustical Tile ☐
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) >3'
- Wood ☐
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☐

Privacy
- Visual ☒
- Acoustical ☐

Security
- Lockset ☒
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL
Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☐
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION
- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)
- Computer _____
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard _____
- Projection Screen _____
- Other _____ _____

Window Shades
- Black-out Shades ☐
- Solar Shades ☐

- Desk/Chair _____
- File Cabinet _____
- Other _____ _____

PLUMBING
- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL
- Standard Office ☒

Special Service
- 110V, 20A, 1 Phase ☐
- 208V, 30A, 1 Phase ☐
- 208V, 30A, 3 Phase ☐
- 480V, 100A, 3 Phase ☐
- Isolated Ground Outlet ☐
- UPS (OFOI) ☐

- Phone (2 outlets standard) ☐
- Data (2 outlets standard) ☐

Lighting
- Level
  - Office standard ☒
  - Other _____ ☐
- Task Lighting ☐
- Safe Light (always on) ☐
- Special Lighting ☐
- Zoned Lighting ☐
- Dimmable ☐
- Occupant Sensor ☐

Projection Equipment
- Overhead ☐
- Portable ☐

Video Conferencing
- Receive ☐
- Broadcast ☐

Projection Screen
- Motorized ☐
- Pull-down ☐

Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Locate in lowest level
- Near to freight elevator

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Research: Research Shop	**ASSIGNABLE SF:**	1,000
FUNCTION:	machine shop functions	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants 1permanent + 4-10 students

ARCHITECTURAL

Floor
- VCT (Chemical Resistant) ☐
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Sealed Concrete ☒
- Other _____ ☐

Partitions
- Gyp Board, Epoxy Paint ☐
- Gyp Board, Painted ☐
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐

Ceiling
- Open ☒
- Acoustical Tile ☐
- Gyp Board, Epoxy Paint ☐
- Height _____

Doors
- Size (list req'd width) >3'
- Light Tight Rotating Door ☐
- Vision Panel ☐

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☒

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base ☒
- Wall ☒

FURNITURE

Window Shades
- Black-out Shades ☐
- Solar Shades ☐

Desk/Chair _____
Other _____ _____
Screen
- Motorized ☐
- Pull-down ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Other _____ ☐

Air Changes/hour _____
100% Make-up Air ☐
Recirculated Air ☐
Space air pressure with respect to adjacent spaces (select only one)
- Neutral Air Pressure ☐
- Positive Air Pressure ☐
- Negative Air Pressure ☐

Air Filtration/Supply ☐
Air Filtration/Exhaust ☐

HOODS (list number req'd)

Chemical Fume Hood _____
Radioisotope Hood _____
Laminar Flow Hood _____
Biological Safety Cabinet _____
Snorkel _____
Canopy Hood _____
Low Slotted Exhaust _____
Exhaust required for each piece of equipment yes

LABORATORY EQUIPMENT

Vibration Sensitive ☐
Light Sensitive ☐
Vibration Producing ☒
Heat Producing ☒
Noise Producing ☒

CHEMICALS

Bases ☐
Acids ☐
Solvents ☐
Chemical Waste Storage ☐
Biological Storage ☐
Chemical Storage ☐

MOVEABLE EQUIPMENT

Computer 1
Fire Extinguisher 1
Laboratory First Aid Kit 1
Lathe 2
Drill Press 1
Milling Machine 1
Belt Sander 2
Jig Saw 1
Band Saw 1
Welding/Soldering station 1
Various hand tools yes

PLUMBING

Laboratory Gas (LG) ☐
Laboratory Vacuum (LV) ☐
Laboratory Air (LA) ☐
- Pressure: _____
- Dewpoint: _____

Compressed Air, 100 psi (A) ☐
Potable Hot Water (HW) ☐
Potable Cold Water (CW) ☐
High Purity Water (DI) ☐
Process Cooling Water 60°F ☒
- Flow (gpm): _____
- Pressure (psi): _____

Steam/Condensate Return ☐
Carbon Dioxide (CO_2) ☐
Nitrogen Gas (N_2) ☐
Other _____ ☐

Cylinder Gases
- Inert ☐
- Flammable ☐
- Toxic ☐

Floor Drain (FD) ☒
Floor Sink (FS) ☐
Safety Shower/Eyewash (SS) ☒
Eye Wash (EW) ☐

ELECTRICAL

110V, 20A, 1 Phase ☒
208V, 30A, 1 Phase (2 req'd) ☒
208V, 30A, 3 Phase ☐
480V, 100A, 3 Phase ☐
Isolated Ground Outlet ☐
Standby Power 208V, 30A, 1 Phase (2 req'd) ☒
Standby Power 120V, 30A, 1 Phase (2 req'd) ☒
UPS (OFOI) ☐
Phone yes
Data yes
In Use Light ☐
Task Lighting ☒

Lighting Level
- 100 fc at bench/desk ☐
- 75 fc at bench/desk ☐
- Other standard for shop ☒

Safe Light (always on) ☐
Special Lighting ☐
Dimmable ☐
Zoned Lighting ☒
Occupant Sensor ☒
Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Near to BME Teaching Lab

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Support: Central Service	**ASSIGNABLE SF:**	250
FUNCTION:	temporary storage of incoming/outgoing materials	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 6 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 0

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Wood ☐
- Other Sealed Concrete ☒

Partitions
- Gyp Board, Painted ☒
- Glass ☐
- Other _____ ☐

Base
- Resilient ☐
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☒
- Acoustical Tile ☐
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☐
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☐
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☐
- Uncontrolled ☒
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☐
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☒
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer _____
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard _____
- Projection Screen _____
- Other _____ _____
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Desk/Chair _____
- File Cabinet _____
- Gas cylinder storage racks for empty cylinders yes
- Lockable Gas cylinders cage(s) for full cylinders yes

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☐
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☐
- Data (2 outlets standard) ☐
- Lighting
  - Level
    - Office standard ☐
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☐
  - Dimmable ☐
  - Occupant Sensor ☐
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Adjacent to Loading Dock (direct access)
- Accessible to corridor/freight elevator for ease of moving material

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Support: Mail Room	**ASSIGNABLE SF:**	150
FUNCTION:	central mail collection/drop-off area	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 7 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 1 non-perm

ARCHITECTURAL

Floor	
VCT	☒
Welded Seam Sheet Vinyl	☐
Epoxy	☐
Carpet	☐
Wood	☐
Other	☐
Partitions	
Gyp Board, Painted	☒
Glass	☐
Other _____	☐
Base	
Resilient	☐
Integral w/floor	☐
Wood	☐
Ceiling	
Open	☐
Acoustical Tile	☒
Gyp Board, Painted	☐
Other _____	☐
Height	_____
Doors	
Size (if ≠3' width)	_____
Wood	☐
Metal	☐
Vision Panel	☐
Sidelite	☐
Natural Daylight	☐
Privacy	
Visual	☐
Acoustical	☐
Security	
Lockset	☒
Special Measures	☐
Casework	
Base	☐
Wall	☐

MECHANICAL

Temperature	
70°F heat, 75°F cool (std)	☒
Other _____	☐
Humidity Control	
Approx. 50% ± 25%	☒
Uncontrolled	☐
Other _____	☐
Air Changes/hour	_____
100% Make-up Air	☐
Recirculated Air	☒
Air Pressure Positive	☐
Air Pressure Negative	☐
Air Filtration/Supply	☐
Air Filtration/Exhaust	☐
Other _____	☐

SPECIAL FUNCTION CONSIDERATION

Vibration Sensitive	☐
Light Sensitive	☐
Vibration Producing	☐
Heat Producing	☐
Noise Producing	☐
Acoustical Controls required	☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

Computer	_____
Stand-alone Printer	_____
Shredder	_____
Multi-function Printer/Copier	_____
Whiteboard	_____
Projection Screen	_____
Window Shades	
Black-out Shades	☐
Solar Shades	☐
Storage for mail-related items	yes
Mail carts	2
mail bins storage	yes
6' work table	1

PLUMBING

Sink/w drain	☐
Potable Hot Water (HW)	☐
Potable Cold Water (CW)	☐
Special Connections	☐
Hydration Station	☐
Floor Drain (FD)	☐

ELECTRICAL

Standard Office	☒
Special Service	
110V, 20A, 1 Phase	☐
208V, 30A, 1 Phase	☐
208V, 30A, 3 Phase	☐
480V, 100A, 3 Phase	☐
Isolated Ground Outlet	☐
UPS (OFOI)	☐
Phone (2 outlets standard)	☐
Data (2 outlets standard)	☐
Lighting	
Level	
Office standard	☒
Other _____	☐
Task Lighting	☐
Safe Light (always on)	☐
Special Lighting	☐
Zoned Lighting	☐
Dimmable	☐
Occupant Sensor	☒
Projection Equipment	
Overhead	☐
Portable	☐
Video Conferencing	
Receive	☐
Broadcast	☐
Projection Screen	
Motorized	☐
Pull-down	☐
Other _____	☐

REMARKS: this door will be cored with a "mailroom" core

SPACE CONSIDERATIONS

A. Space Relationship:

- Adjacent/near to Loading Dock

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Support: File Room	**ASSIGNABLE SF:**	115
FUNCTION:	general file storage for required data	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 8 AM to 5 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 0

ARCHITECTURAL

Floor
- VCT ☒
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☐
- Other _____ ☐

Base
- Resilient ☐
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☐
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☐
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☒
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer _____
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard _____
- Projection Screen _____
- Other _____ _____
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Desk/Chair _____
- File Cabinet yes
- Other _____ _____

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☐
- Data (2 outlets standard) ☐
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☐
  - Dimmable ☐
  - Occupant Sensor ☒
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- None

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Support: Loading Dock	**ASSIGNABLE SF:**	500
FUNCTION:	box truck deliveries	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From 6 AM to 6 PM
Hours of Equipment Operation
From _____ to _____
Number Occupants 0

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Wood ☐
- Other Concrete ☒

Partitions
- Gyp Board, Painted ☒
- Glass ☐
- Other _____ ☐

Base
- Resilient ☐
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☒
- Acoustical Tile ☐
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☐
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☐

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☐
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☐
- Uncontrolled ☒
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☐
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☒
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer _____
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard _____
- Projection Screen _____
- Other _____ _____

Window Shades
- Black-out Shades ☐
- Solar Shades ☐

- Desk/Chair _____
- File Cabinet _____
- Other _____ _____

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒

Special Service
- 110V, 20A, 1 Phase ☐
- 208V, 30A, 1 Phase ☐
- 208V, 30A, 3 Phase ☐
- 480V, 100A, 3 Phase ☐
- Isolated Ground Outlet ☐
- UPS (OFOI) ☐

- Phone (2 outlets standard) ☐
- Data (2 outlets standard) ☐

Lighting
- Level
  - Office standard ☐
  - Other _____ ☐
- Task Lighting ☐
- Safe Light (always on) ☐
- Special Lighting ☐
- Zoned Lighting ☐
- Dimmable ☐
- Occupant Sensor ☐

Projection Equipment
- Overhead ☐
- Portable ☐

Video Conferencing
- Receive ☐
- Broadcast ☐

Projection Screen
- Motorized ☐
- Pull-down ☐

Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Connected to Central Service

B. Visual Relationship:

- Loading dock area should be a clean, visually unobtrusive element when visible from other buildings or public ways.

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Support: Janitor Break Room	**ASSIGNABLE SF:**	250
FUNCTION:	space for custodians to gather, eat lunch, etc.	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants 5

ARCHITECTURAL

Floor
- VCT ☒
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☐
- Other _____ ☐

Base
- Resilient ☒
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☐
- Acoustical Tile ☒
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☐
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☐

Privacy
- Visual ☒
- Acoustical ☐

Security
- Lockset ☒
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☒
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer 1
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard _____
- Projection Screen _____

Window Shades
- Black-out Shades ☐
- Solar Shades ☐

- Street locker 6
- Refrigerator 1
- Microwave 1
- Desk/Chair 1
- File Cabinet 1
- table/w/5 chairs 1

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒

Special Service
- 110V, 20A, 1 Phase ☒
- 208V, 30A, 1 Phase ☐
- 208V, 30A, 3 Phase ☐
- 480V, 100A, 3 Phase ☐
- Isolated Ground Outlet ☐
- UPS (OFOI) ☐

- Phone (2 outlets standard) ☒
- Data (2 outlets standard) ☒

Lighting
- Level
  - Office standard ☒
  - Other _____ ☐
- Task Lighting ☐
- Safe Light (always on) ☐
- Special Lighting ☐
- Zoned Lighting ☐
- Dimmable ☐
- Occupant Sensor ☒

Projection Equipment
- Overhead ☐
- Portable ☐

Video Conferencing
- Receive ☐
- Broadcast ☐

Projection Screen
- Motorized ☐
- Pull-down ☐

Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Near to Central Service
- Adjacent to Janitor Main Equipment Room

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Support: Janitor Main Equipment Room	**ASSIGNABLE SF:**	250
FUNCTION:	storage of req'd PM materials, custodial cleaning machines	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From _____ to _____
Number Occupants 0

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Wood ☐
- Other sealed concrete ☒

Partitions
- Gyp Board, Painted ☒
- Glass ☐
- Other _____ ☐

Base
- Resilient ☐
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☒
- Acoustical Tile ☐
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☐

Privacy
- Visual ☒
- Acoustical ☐

Security
- Lockset ☒
- Special Measures ☐

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☒
- Other _____ ☐

Humidity Control
- Approx. 50% ± 25% ☐
- Uncontrolled ☐
- Other _____ ☐

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☐
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☐
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer _____
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard _____
- Projection Screen _____
- Other _____ _____
- Window Shades
  - Black-out Shades ☐
  - Solar Shades ☐
- Desk/Chair _____
- File Cabinet _____
- Specialized Storage cabinets/racks for the efficient storage of materials and equipment yes

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☒
- Special Service
  - 110V, 20A, 1 Phase ☐
  - 208V, 30A, 1 Phase ☐
  - 208V, 30A, 3 Phase ☐
  - 480V, 100A, 3 Phase ☐
  - Isolated Ground Outlet ☐
  - UPS (OFOI) ☐
- Phone (2 outlets standard) ☐
- Data (2 outlets standard) ☐
- Lighting
  - Level
    - Office standard ☒
    - Other _____ ☐
  - Task Lighting ☐
  - Safe Light (always on) ☐
  - Special Lighting ☐
  - Zoned Lighting ☐
  - Dimmable ☐
  - Occupant Sensor ☐
- Projection Equipment
  - Overhead ☐
  - Portable ☐
- Video Conferencing
  - Receive ☐
  - Broadcast ☐
- Projection Screen
  - Motorized ☐
  - Pull-down ☐
- Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- Adjacent to Janitorial Break Room

B. Visual Relationship:

- None

DETAILED SPACE DESCRIPTIONS and REQUIREMENTS

SPACE NAME:	Support: Telecommunications Closet	**ASSIGNABLE SF:**	200
FUNCTION:	housing telecom equipment in a secure space	**NO. SPACES REQUIRED:**	1

UTILIZATION

Hours of typical Occupancy
From _____ to _____
Hours of Equipment Operation
From 24/7 operation
Number Occupants 0

ARCHITECTURAL

Floor
- VCT ☐
- Welded Seam Sheet Vinyl ☐
- Epoxy ☐
- Carpet ☐
- Wood ☐
- Other ☐

Partitions
- Gyp Board, Painted ☒
- Glass ☐
- Other _____ ☐

Base
- Resilient ☐
- Integral w/floor ☐
- Wood ☐

Ceiling
- Open ☒
- Acoustical Tile ☐
- Gyp Board, Painted ☐
- Other _____ ☐
- Height _____

Doors
- Size (if ≠3' width) _____
- Wood ☒
- Metal ☐
- Vision Panel ☐
- Sidelite ☐

Natural Daylight ☐

Privacy
- Visual ☐
- Acoustical ☒

Security
- Lockset ☒
- Special Measures ☒

Casework
- Base ☐
- Wall ☐

MECHANICAL

Temperature
- 70°F heat, 75°F cool (std) ☐
- Separate air conditioning system ☒

Humidity Control
- Approx. 50% ± 25% ☐
- Uncontrolled ☐
- Other _____ ☒

Air Changes/hour _____
- 100% Make-up Air ☐
- Recirculated Air ☒
- Air Pressure Positive ☐
- Air Pressure Negative ☐
- Air Filtration/Supply ☐
- Air Filtration/Exhaust ☐
- Other _____ ☐

SPECIAL FUNCTION CONSIDERATION

- Vibration Sensitive ☐
- Light Sensitive ☐
- Vibration Producing ☐
- Heat Producing ☒
- Noise Producing ☐
- Acoustical Controls required ☐

MOVEABLE EQUIPMENT/FURNITURE (list number required)

- Computer _____
- Stand-alone Printer _____
- Shredder _____
- Multi-function Printer/Copier _____
- Whiteboard _____
- Projection Screen _____
- Other _____ _____

Window Shades
- Black-out Shades ☐
- Solar Shades ☐

- Desk/Chair _____
- File Cabinet _____
- Other _____ _____

PLUMBING

- Sink/w drain ☐
- Potable Hot Water (HW) ☐
- Potable Cold Water (CW) ☐
- Special Connections ☐
- Hydration Station ☐
- Floor Drain (FD) ☐

ELECTRICAL

- Standard Office ☐

Special Service
- 110V, 20A, 1 Phase ☐
- 208V, 30A, 1 Phase ☐
- 208V, 30A, 3 Phase ☐
- 480V, 100A, 3 Phase ☐
- Isolated Ground Outlet ☐
- UPS (OFOI) ☐

- Phone (2 outlets standard) ☐
- Data (2 outlets standard) ☐

Lighting
- Level
  - Office standard ☒
  - Other _____ ☐
- Task Lighting ☐
- Safe Light (always on) ☐
- Special Lighting ☐
- Zoned Lighting ☐
- Dimmable ☐
- Occupant Sensor ☒

Projection Equipment
- Overhead ☐
- Portable ☐

Video Conferencing
- Receive ☐
- Broadcast ☐

Projection Screen
- Motorized ☐
- Pull-down ☐

Other _____ ☐

REMARKS:

SPACE CONSIDERATIONS

A. Space Relationship:

- None

B. Visual Relationship:

- None

SITE CONSIDERATIONS

SITE

The site for the proposed Chemical Engineering / Biomedical Engineering Building is currently occupied by Fenske Laboratory along Shortlidge Road, north of Chemistry Building. The existing building will be demolished to allow for construction of the new building. The open space north of the project site, between Fenske and Ferguson Buildings, contains an open informal landscape area that includes several significant specimen trees including Metasequoia, Hawthorne, American Sweetgum, Red Pine and Limber Pine varieties. This open space is an important component of a new campus greenway that is master planned for this section of campus. In addition to being in close proximity to many of the University's life and materials science laboratories, the site is also near the Eisenhower Auditorium and the Eisenhower Parking Deck.

PEDESTRIAN AND VEHICULAR ACCESS AND PARKING

Pedestrian access is available from all directions, with primarily corridors along Shortlidge Road to the east and a major pedestrian corridor to the west of the building.

Vehicular access to the site is from Shortlidge Road, with a service drive along the southern edge of the site that is shared with Chemistry Building.

Parking will be considered for service and ADA spaces as determined by the project requirements.

ZONING AND PERMITTING

The site is located in State College Borough and is regulated by the University Planned District (UPD) zoning. It is within UPD Subdistrict 5, and must adhere to all applicable restrictions pertaining to this ordinance (notably a 90' height limitation).

UTILITY REQUIREMENTS

Refer to Appendix C: Building Systems and Utilities Scoping Document, section *33 00 00 Utilities*

SPECIAL SITE CONSIDERATIONS

The parking lot to the north, at the corner of Shortlidge and Curtin Roads, has been identified as a site for the construction of a new classroom building.

Landscape and site improvements will be fit with the design of the surrounding context and be consistent with established University landscape standards.

BUDGET INFORMATION

ESTIMATED PROJECT BUDGET

Project Name:		**Chemical Engr / Biomedical Engr Bldg - New Construction to Program**						
Date:		10/13/2014						
				*** new construction to program size (188,300 GSF)**				
Estimated Milestones								
			Start	Finish				
	Programming		Jan 2014	Sept 2014				
	Design:		March 2015	Dec 2016				
	Construction:		Jan 2017	Dec 2018				
Funding Sources								
	State (DGS)							
	Tuition CIP							
	President's Faciliyt Initiative			$90,000,000				
	Tuition Supported Borrowing (TSB)							
	Education & General Borrowing			$50,000,000				
	Gifts			$10,000,000				
	Operating Budget - specify							
	Reserves							
	Special State - specify							
	Other - specify							
	DGS Support Cost							
			Total	$150,000,000				
Budget								
	Building:							
	A. Basement			$9,100,000				
	B. 1st thru 6th\ floors			$72,026,500				
	C. Penthouse			$2,750,000				
		Total		$83,876,500				
Current Estimate				Units		Unit Costs		Total
1. Building								
A.	Current Year Total Estimated Costs			188,300	sf	$445	$/sf	$83,876,500
B.	*Building Construction Inflation*			4	yrs@	4.0	%	$13,420,240
	Est. Building Construction Costs @ Bid			188,300	sf	516.71	$/sf	$97,296,740
			Building Contingency			10.0	%	$9,729,674
			Building Total					$107,026,414

2.	Site Development							
	A.	Masterplan Issues			0.3	%	$209,691
	B.	*Masterplan Issues Inflation*	4	yrs@	4.0	%	$33,551
	C.	Roads, Paving, Sidewalks			-	%	$185,640
	D.	*Roads, Paving, Sidewalks Inflation*	4	yrs@	4.0	%	$29,702
	E.	Landscaping			-	%	$185,640
	F.	*Landscaping Inflation*	4	yrs@	4.0	%	$29,702
	G.	Misc -					$0
	H.	*Misc Inflation*	4	yrs@	4.0	%	$0
		Estimated Site Development Costs @ Bid					$673,927
3.	Utilities (beyond the 5' line)						
	A.	Utilities					$1,227,000
	B.	*Utilities Inflation*	4	yrs@	4.0	%	$196,320
		Estimated Utilities Costs @ Bid					$1,423,320
		Site Development & Utilities Contingency			10.0	%	$209,725
		Site Development & Utilities Total					$2,306,971
4.	Parking						
	A.	New Spaces - 20	20	sp	$ 5,000		$100,000
	B	Misc					
	C.	*Parking Inflation*	4	yrs@	4.0	%	$16,000
		Estimated Parking Costs @ Bid					$116,000
		Estimated Parking Costs w/ Contingency					$121,800
5.	PSU Construction Related Activities						
6.	Special Construction Features						
	A.	Hazardous Mat'l Abatement & Demo of Fenske	90,000	sf	$15		$1,350,000
	B.	Misc 2					
	C.	Misc 3					
	D.	Misc 4					
	E.	Misc 5					
		PSU Construction & Special Construction (incl. inflation)					$1,579,309
		PSU Construction & Special Construction Contingency			10.0	%	$157,931
		PSU Construction & Special Construction Total					$1,737,240
		Total Est. Construction Costs (w/ infl & cont)	188,300	sf	590.5068	$/sf	$111,192,425

7.	Soft Costs						
	A.	Professional					
		Fees			10.0	%	$10,041,537
		Reimbursables					$250,000
		Design Contingency			4.0	%	$401,661
	B.	Survey					$40,000
	C.	Geotechnical Analysis					$50,000
	D.	CM Pre-GMP Fee					$200,000
	E.	Development or Developer's Fee					
	F.	Construction Management Fees & Staff Costs			13.0	%	$13,053,998
	G.	Permits/L&I/UCC Inspections					
	H.	Commissioning Fees			0.5	%	$502,077
					Sub-Total		$24,539,273
		PSU In-house Soft Costs					
	I.	Start-up & Training					$50,000
	J.	Codes					$25,000
	K.	OPP Inspection					$350,000
	L.	Commissioning					$75,000
	M.	Moving Costs					$350,000
	N.	Travel/Meals/Meetings					$10,000
	O.	Printing/Postage/Advertising					$10,000
	P.	Swing Space					$2,100,000
					Sub-Total		$2,970,000
8.	Project Contingency				INCLUDED IN ABOVE LINE ITEMS		
		Total Estimated Soft Costs	25	%	146.0928	$/sf	$27,509,273
	Total Estimated Project Costs (w/o FF&E)		188,300	sf	736.5996	$/sf	$138,701,698
9.	FF&E						
	A.	Design Fees (as a % of the Prof Fee)			7.0	%	$702,908
	B.	FF&E			8.0	%	$8,033,230
	C.	Janitorial Equipment			0.3	%	$333,577
	D.	Telecommunications Electronics			1.0	%	$1,111,924
	E.	AV Equipment			1.0	%	$1,111,924
	F.	Misc 1					
	G.	Misc 2					
	H.	Misc 3					
	Total FF&E Costs						$11,293,563
	Total Estimated Project Costs (w/FF&E)		188,300	sf	796.58	$/sf	$149,995,261
	Current surplus/(deficit):						$4,739

Notes:

1. swing space needed for current program and research
2. create 20 new parking spaces
3. demo 90,000 SF of existing bldg (new building is 188,300 GSF)
4. asbestos abatement of Fenske in entirety

PROJECT SCHEDULE

MILESTONE SCHEDULE – CHEMICAL ENGINEERING / BIOMEDICAL ENGINEERING

	Start	Finish
Programming	4/1/14	10/8/14
Architect Selection	11/3/14	3/15/15
Verify Program	3/15/15	6/1/15
Design	6/1/15	1/31/17
BOT Approval		3/15/17
Construction	4/1/17	3/31/19
Commissioning & Move-in	4/1/19	5/31/19
Project Complete		5/31/19

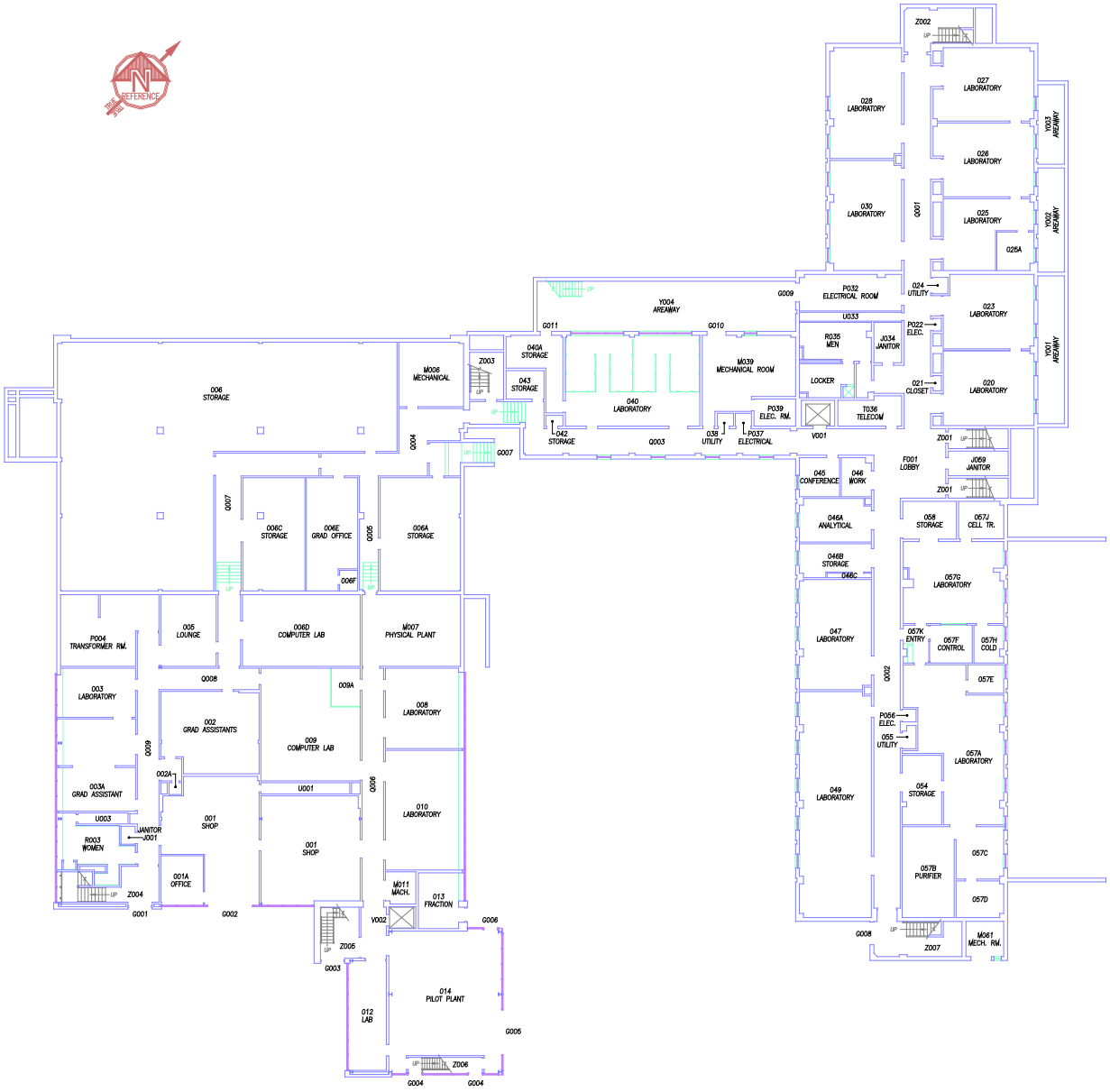
APPENDICES

Appendix A: Site Plan with Utilities

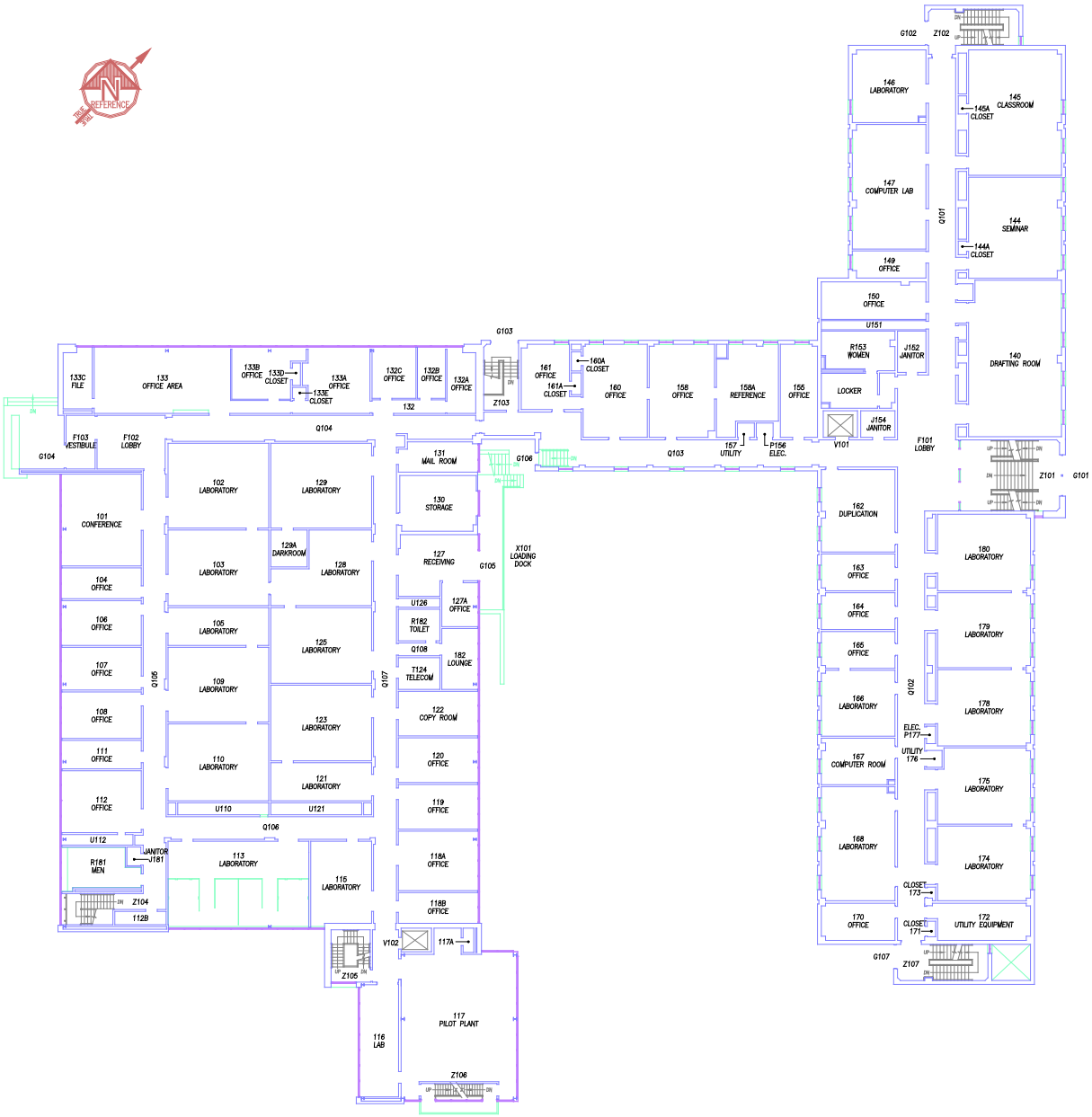
Drawing is available in .pdf upon request.

Appendix B: Existing Building Plans

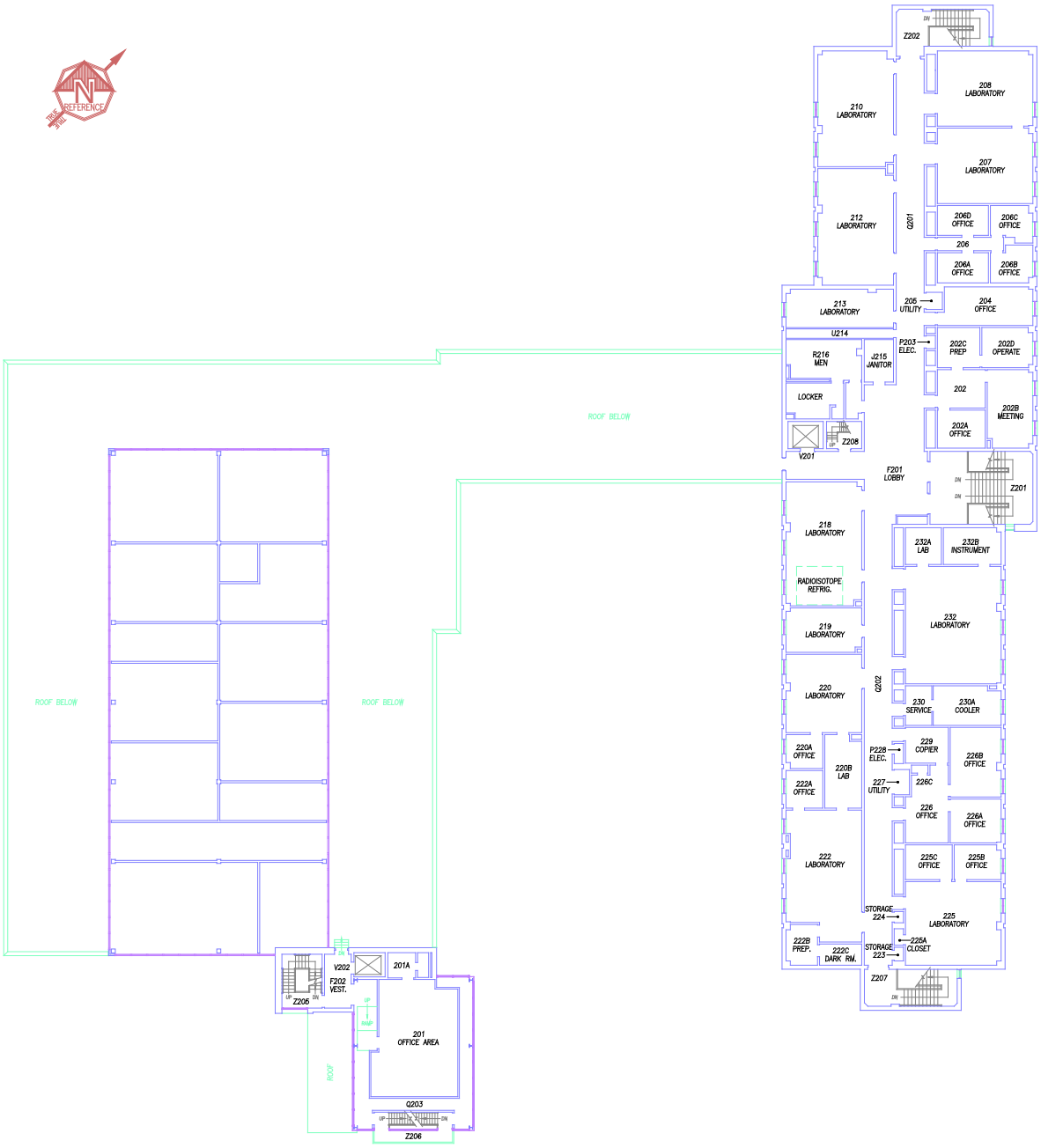
Drawings are available in .pdf upon request.



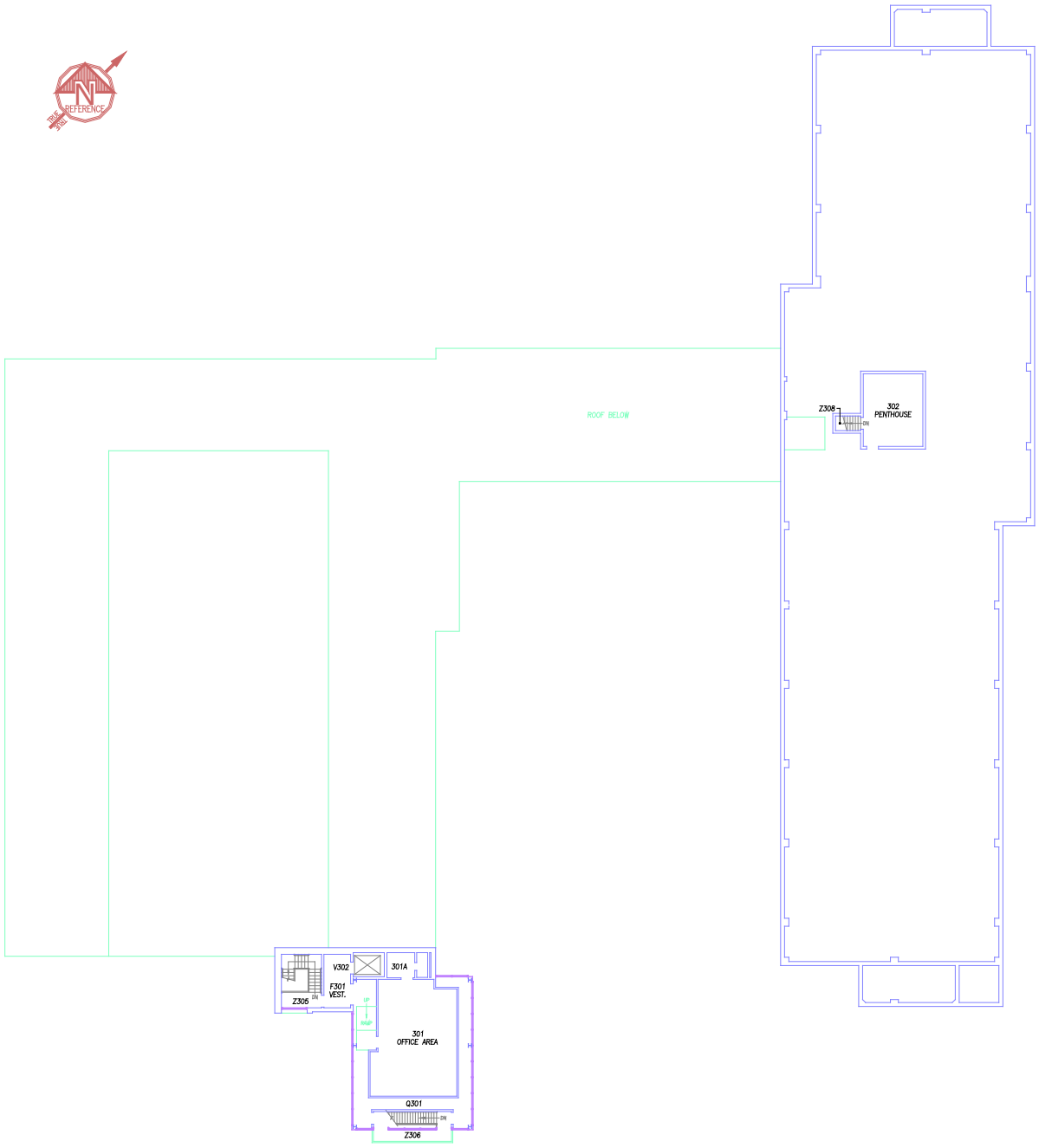
Fenske Lab - Existing Ground Floor



Fenske Lab - Existing First Floor



Fenske Lab - Existing Second Floor



Fenske Lab - Existing Third Floor

Appendix C: Building Systems and Utilities Scoping Document

SCOPING DOCUMENT

Chemical Engineering/Biomedical Engineering Building
PSU BLDG. #

DATE: August 8, 2014

FROM: Raymond H. Alexander – Engineering Services

This memo describes building systems and utility requirements for the complete renovation/addition of the Chemical Engineering / Biomedical Engineering Building at the University Park Campus. A summary of the project goals are as follows:

- Achieve a renewed, high-performance facility
- Attain at a minimum LEED Certified Level
- Replace/upgrade the MEP building systems
- Architectural renovations and additions as defined separately

Existing Building Information Resources:

OPP Plan Room 113 and Facilities Information System
ISES Facility Condition Analysis Report

GENERAL PROJECT REQUIREMENTS

Design and Construction Standards:

All aspects of the design must conform to the University's Design Standards, which can be found on the OPP website (http://www.opp.psu.edu/planning-construction/design_and_construction_standards/standards-and-forms).

The Design Professional team shall coordinate efforts in an iterative process to apply holistic, sustainable design principles to the renovated spaces. The design shall meet the architectural functional and aesthetic objectives, help achieve comfortable and pleasing indoor environmental conditions with effective combined use of passive elements, and be purposefully integrated with the HVAC and lighting systems so that all work effectively together to minimize dependence on non-renewable energy use and associated ownership and operating costs for the life of the building.

Energy Conservation:

The University's overall energy performance objective is that all facilities shall achieve a minimum of 30% energy savings over the latest version of the ASHRAE 90.1 standard as defined in 01 81 13 Sustainable Design

Requirements. The Design Professional shall strive to obtain that result by combining innovative design along with applying the latest version of ASHRAE Standard 189.1 Standard for the Design of High-Performance Green Buildings to the project. This standard contains advanced, high-performance building prescriptive compliance methods recognized and accepted within the industry. However, the following exceptions shall typically apply:

- Typically on-site renewable energy (solar – photo-voltaic) has been difficult to justify economically and is not mandatory, but allow provisions for add in the future.
- Electrical sub-metering, except where required by billing
- Air to Air Energy recovery requirements to be validated by engineering analysis.

The simplest and most effective method of energy conservation is to turn things off when not in use. To this end, spaces with similar occupancy schedules should be grouped together, to the extent possible, on the same HVAC system, to accommodate unoccupied shutdown.

Design for Completeness:

All projects are expected to be complete at their conclusion, meaning that the project generates no need for additional efforts beyond the planned scope. Above all, the campus maintenance staff is not available to complete projects or provide remedies to problems caused by the project.

Other General Design Resources:

Whole Building Design Guide

http://www.wbdg.org/design/design_disciplines.php

The following OPP Engineering Services resources page lists useful links and references for additional generally recognized, industry-wide design guidance: http://www.opp.psu.edu/about-opp/divisions/ee/engineering/eng-resources/bldg-mech

ENVELOPE

Part of the objective of the renewal is to improve occupant comfort and minimize dependence on non-renewable energy use and associated owning and operating costs for the life of the building. Therefore the intent is to upgrade the thermal envelope wherever practical and cost effective.

The consultant shall evaluate the existing thermal envelope and provide a Building Envelope Compliance Report that summarizes the areas and thermal performance values of the envelope components for the existing and the proposed improvements. The analysis shall include preliminary, simplified "shoebox model" heating and cooling energy calculations of just the Building Envelope to show quantified energy reduction for that component relative to achieving the high-performance building goals in our Performance Requirements in the Standards. If there are innovative and cost effective methods to improve the thermal envelope and/or install an effective vapor barrier, and reduce infiltration, they should be included in the analysis report and reviewed by the team. Also, the analysis shall seek to identify and recommend cost-effective ways to correct localized problematic conditions of major sources of infiltration or thermal bridging that can lead to either discomfort or long-term moisture migration, condensation, mold, and related deterioration to building assemblies.

Any new additions or renovations that involve exterior envelope work, including new doors and fenestration, shall at a minimum comply with the prescriptive values listed in latest version of ASHRAE Standard 189.1 Standard for the Design of High-Performance Green Buildings. See excerpt of Table A-5 at the end of this section.

The U-factors for windows shall be rated over the entire window assembly, not just the center of glass. Window rating shall be certified and labeled by the National Fenestration Rating Council (NFRC). Insulated assemblies shall include thermally broken insulated spacers between the panes and window frames. Also, provide superior installation details of the new doors and windows to avoid air infiltration and water incursion. As well, consideration should be given to using fritted glass to further reduce heat gain.

If the program needs of the project demand winter humidification, then any existing building envelope needs to be carefully evaluated and probably improved. That may involve adding adequate insulation, correcting thermal bridging, and installation of a vapor barrier on the warm side as necessary to prevent long-term problems with moisture migration and condensation within old, poorly insulated structures. Failure to do so can lead to serious problems with mold, mildew, corrosion, or possible damage to masonry construction due to condensation and freeze/thaw cycles and spalling of their surfaces.

ASHRAE Standard 189.1 Standard for the Design of High-Performance Green Buildings

TABLE A-5 (Supersedes Table 5.5-5 in ANSI/ASHRAE/IESNA Standard 90.1) Building Envelope Requirements for Climate Zone 5 (A, B, C) (I-P)

	Nonresidential		Semiheated	
	Assembly	**Insulation**	**Assembly**	**Insulation**
Opaque Elements	**Max.**	**Min. R-Value**	**Max.**	**Min.R-Value**
Roofs				
Insulation Entirely above Deck	U-0.039	R-25.0 ci	U-0.093	R-10.0 ci
Metal Building	U-0.035	R-19.0 + R-11.0 Ls	U-0.068	R-13.0 +R- 19.0
Attic and Other	U-0.021	R-49.0	U-0.034	R-30.0
Walls, Above Grade				
Mass	U-0.080	R-13.3 ci	U-0.123	R-7.6 ci
Metal Building	U-0.052	R-13.0 + R-13.0 ci	U-0.079	R-13.0 + R-6.5 ci
Steel Framed	U-0.055	R-13.0 + R-10.0 ci	U-0.084	R-13.0 + R-3.8 ci
Wood Framed and Other	U-0.051	R-13.0 + R-7.5 ci	U-0.064	R-13.0 + R-3.8 ci
Wall, Below Grade				
Below Grade Wall	C-0.092	R-10.0 ci	C-0.119	R-7.5 ci
Floors				
Mass	U-0.064	R-12.5 ci	U-0.107	R-6.3 ci

	Steel Joist	U-0.032	R-38.0	U-0.038	R-30.0
	Wood Framed and Other	U-0.026	R-30.0 + R-7.5 ci	U-0.033	R-30.0
Slab-On-Grade Floors					
	Unheated	F-0.540	R-10 for 24 in.	F-0.540	R-10 for 24 in.
	Heated	F-0.440	R-15.0 for 36 in. + R-5 ci below	F-0.900	R-10 for 24 in.
Opaque Doors					
	Swinging	U-0.400		U-0.600	
	Non-Swinging	U-0.400		U-0.500	
		Assembly	**Assembly**	**Assembly**	**Assembly**
	Fenestration	**Max. U**	**Max. SHGC**	**Max. U**	**Max. SHGC**
Vertical Fenestration,0%–40% of Wall					
	Nonmetal framing: all[b] Metal fr: curtainwall/storefront[c] Metal framing: entrance door[c] Metal framing: all other[c]	U-0.25 U-0.35 U-0.70 U-0.45	SHGC-0.35 all	U-0.55 U-0.60 U-0.80 U-0.65	SHGC-NR all
Skylight with Curb, Glass,% of Roof					
	0%–2.0%	U_{all}-0.67	$SHGC_{all}$-0.36	U_{all}-1.98	$SHGC_{all}$-NR
	2.1%–5.0%	U_{all}-0.67	$SHGC_{all}$-0.36	U_{all}-1.98	$SHGC_{all}$-NR
Skylight with Curb, Plastic,% of Roof					
	0-2%–0%	U_{all}-0.69	$SHGC_{all}$-0.34	U_{all}-1.90	$SHGC_{all}$-NR
	2.1%–5.0%	U_{all}-0.69	$SHGC_{all}$-0.34	U_{all}-1.90	$SHGC_{all}$-NR
Skylight without Curb, All,% of Roof					
	0%–2.0%	U_{all}-0.45	$SHGC_{all}$-0.36	U_{all}-1.36	$SHGC_{all}$-NR
	2.1%–5.0%	U_{all}-0.45	$SHGC_{all}$-0.36	U_{all}-1.36	$SHGC_{all}$-NR

21 00 00 FIRE SUPPRESSION

Contact: Steven Triebold, Fire Protection Engineer, sgt4@psu.edu, Phone: (814) 865-6391

Properly installed and maintained sprinkler systems are proven life safety systems and greatly reduce the fire loss potential. Therefore the general intent is to have modern fire suppression systems installed in all new and renewed facilities as determined by a fire hazard evaluation and recommendations from the University's Fire

Protection Engineer in the Department of Environmental Health and Safety - Fire Protection & Prevention. http://www.ehs.psu.edu/occhealth/fire.cfm

A combined automatic fire sprinkler and standpipe system should be installed throughout the Building for the protection of the building and its occupants as part of this project. The systems shall be designed and installed in accordance with FM Global Design Standards and the appropriate National Fire Protection Association (NFPA) Standard.

The standpipe hose connections shall be 2 ½" hose valves with threaded 2 ½" to 1 ½" reducers. All hose connections shall be provided with National Standard Hose Thread.

22 00 00 PLUMBING

Contact: Building Operations Engineer, Ray Alexander, Phone: 814-360-9962

In general, plumbing systems, materials, and fixtures shall comply with the University design standards and ASHRAE 189.1, Chapter 6: Water Use Efficiency.

Plumbing fixtures shall be low consumption type. Urinals shall be pint flush. Women's water closets shall be dual flush type.

The condition of all service piping within the building that is being considered for re-use must be determined by the consultant, with findings presented in writing to the PSU Project Manager. Piping that is determined to be deficient shall be removed.

Any existing cross-connections between sanitary sewer and storm drainage systems shall be identified and corrected. Contact Larry Fennessey – Stormwater Utility Systems Engineer, (814) 863-8743, laf8@psu.edu, to request detailed test reports done by an independent agency (Nalco) that are available for most University facilities.

The project should provide a non-potable/water re-use piping system to take advantage of re-use water for toilet and urinal flushing. System should be designed for minimal tie in/switch over of re-use water in the future.

23 00 00 HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

Contact: i - Building Operations Engineer, Ray Alexander, Phone: 814-360-9962

GENERAL REQUIREMENTS

The existing systems are inefficient, outdated, and well past the end of their service lives. The systems suffer from IAQ issues, and there are frequent component failures. They will not be adaptable for re-use. Therefore, under this renewal project, the existing HVAC systems are intended to be demolished with the exception of the Chilled Water system which is new.

The new HVAC system and envelope improvements shall be integrated and designed to comply with the thermal comfort criteria in **ANSI/ASHRAE Standard 55 - Thermal Environmental Conditions for Human Occupancy**.

The new HVAC systems shall at a minimum comply with the associated mandatory and prescriptive requirements in **ASHRAE 189.1** for Energy Efficiency and Indoor Environmental Quality.

New HVAC systems shall be quiet, economical and easy to operate and maintain. Components requiring service or adjustment shall be located such that they are readably accessible and not buried where extraordinary means are

required to access them. Variable flow fan and pump systems shall be used. Main ducts, piping mains, VAV terminals and other HVAC equipment requiring periodic maintenance shall be located to minimize disruption to normally occupied spaces. In addition, care shall be taken to prevent any HVAC equipment from being located above or near spaces where noise is of particular concern.

In general OPP prefers centralized hydronic heating and cooling plants and distribution systems. Hydronic systems shall comply with requirements in 23 20 00 HVAC PIPING AND PUMPS.

Hot water baseboard perimeter radiant heat shall be provided for those conference rooms and offices located along the building perimeter. Each perimeter heat zone shall contain a dedicated control valve. Heating from above is not acceptable in these locations.

All occupied areas shall be provided with mechanical ventilation to meet the current building code and ASHRAE Standard 62, including those spaces with operable windows. Design mechanical ventilation quantities shall not be reduced by the presence of operable windows. Demand based ventilation control strategies shall be used to vary outside air quantity to maintain allowable CO2 or VOC levels. Economizer operation shall also be provided to allow the use of outside air for cooling. Air handlers shall have mixing and blending devices/sections and adequate length to prevent air stratification and nuisance tripping of freezestats.

Summer dehumidification shall be accomplished using methods that will minimize or eliminate the need for simultaneous heating and cooling.

Equipment that requires chilled water for cooling in the winter shall not be used, unless approved by the Office of Physical Plant, Engineering Services.

For General Purpose Classroom and departmentally or college controlled classroom components and requirements refer to CLASSROOM & TECHNOLOGY DESIGN & CONSTRUCTION MINIMUM REQUIREMENTS, **DIVISION 20.00.00 PLUMBING, HVAC, FIRE SPRINKLING SYSTEMS, ETC.**

To the greatest extent possible, mechanical equipment shall be located indoors to maximize useful service life and for safety and ease of maintenance staff, particularly during adverse weather conditions. Indoor mechanical space will be needed to accommodate new air handlers, pumps, heat exchangers, and other equipment. Mechanical space must be incorporated into the building programming during the schematic design phase of the project. Adequate service space shall be provided around and within air handlers to allow for proper maintenance of the equipment, including coil pull space.

Spaces such as server rooms or telecommunication equipment rooms shall have dedicated cooling equipment. Equipment selection shall be approved by the Office of Physical Plant, Engineering Services.

Define and keep separate special use zones with continuous process cooling loads such as main TNS and College Server rooms or audio-visual closets with high load densities that require independent cooling systems to accommodate unoccupied shutdown of central systems.

The simplest and most effective method of energy conservation is to turn things off when not in use. To this end, spaces with similar occupancy schedules should be grouped together, to the extent possible, on the same HVAC system, to accommodate unoccupied shutdown.

Any domestic makeup water connections to HVAC systems shall be individually sub-metered, configured to communicate water consumption data to a meter data management system. At a minimum, meters shall provide daily data and shall record hourly consumption of water. The meter data management system shall be capable of electronically storing water meter, monitoring systems, and submeter data and creating user reports showing

calculated hourly, daily, monthly, and annual water consumption for each measurement device and submeter and provide alarming notification capabilities as needed. This is primarily for the purposes of monitoring flow into closed loops to provide quick detection of abnormal conditions and to support the requirements of the Water Use Efficiency Plan for Operation in ASHRAE 189.1.

HEATING

Heating hot water shall be distributed to the renovated building provided via steam to hot water heat exchangers served from campus steam. Refer to Utilities section - Campus Steam for more details. Converters shall be shell and tube type complying with specific requirements in the OPP Design Standards.

Two converters, and multiple pump systems shall be provided to allow for back-up and the operation of different water temperatures, different systems, and different building areas as appropriate.

The new hot water system shall serve new heating coils in air handling equipment, reheat coils on VAV boxes, new perimeter radiation, and new terminal heating devices. Heating control valves shall be 2-way, proportional.

Heating pumps shall be provided with variable frequency drives (VFD's) to accomplish flow variation in the system. Be sure to incorporate PSU's standards for VFD driven motor grounding rings. Heating coils utilizing steam directly shall not be used.

The heating hot water system shall be designed to utilize a maximum of 140 degree water such that this system may be supplemented with a solar thermal system or other heat recovery source in the future.

CHILLED WATER COOLING

Campus Chilled Water connection

The building will be cooled using campus chilled water generated at the central chiller plants. New chilled water piping shall be routed from the central chilled water mains into the mechanical room of the building. The piping connection to the campus chilled water system shall follow the University's connection detail, available from the Office of Physical Plant, Engineering Services. The building shall contain "booster" chilled water pumps. A winter cooling pump and full size bypass line and meter shall be installed per the University's standard connection detail. Refer to the 'Utility Metering' section below.

Building chilled water piping shall be distributed from the mechanical room throughout the building. Chilled water control valves shall be 2-way, proportional. Secondary chilled water pumps shall be provided with variable frequency drives (VFD's) to reduce pumping energy during periods of low cooling loads.

In general, equipment that requires chilled water produced by mechanical refrigeration for cooling in the winter shall not be used, unless approved by the Office of Physical Plant, Engineering Services.

If any spaces in the building are critical enough to require redundant cooling sources, the back-up cooling system shall be closely coordinated with the University and approved by the Office of Physical Plant, Engineering Services during the building design. **Do not use residential / light commercial grade ductless split systems for high-density, continuous cooling applications such as server rooms/telecomm closets.** They wear out too quickly. Use more robust computer room type equipment engineered for those purposes.

Equipment and processes must not utilize domestic water in a 'once-through' cooling manner. Mechanical process cooling systems must be provided to serve any process load. For more information related to chilled water, refer to the utility section of this document.

VENTILATION AND AIR CONDITIONING

All occupied areas shall be provided with mechanical ventilation to meet the current building code and **ASHRAE Standard 62**, including those spaces with operable windows. Design mechanical ventilation quantities shall not be reduced by the presence of operable windows. Demand based ventilation control strategies shall be used to vary outside air quantity to maintain allowable CO2 or VOC levels.

The total allowable fan power limitation for each system shall be 10% less than the limits set by ASHRAE 90.1 or the current International Energy Conservation Code (whichever is more stringent), or as otherwise modified by most current edition of ASHRAE Standard 189.1.

Central variable air volume (VAV) air handling systems are strongly preferred for new heating, ventilating, and air conditioning and are to be used wherever possible. Economizer operation shall be provided to allow the use of outside air for cooling. Air handlers shall have effective return-outside air mixing and blending devices/sections and adequate length to prevent air stratification and nuisance tripping of freezestats.

A dedicated terminal and thermostat shall be provided for each zone. Spaces shall not be "ganged together" on a single VAV terminal without prior approval from the Office of Physical Plant, Engineering Services. Supply VAV terminals shall be provided with hot water heating coils for winter heating and summer reheat control. Hot water baseboard perimeter radiant heat shall be provided throughout the renovated building, and shall be zoned to match terminal unit zoning. Each perimeter heat zone shall contain a dedicated control valve. Each terminal reheat coil shall contain a dedicated control valve.

Traditional fan coil unit applications typically are poor at maintaining acceptable indoor humidity levels in spaces with latent loads, especially from unconditioned minimum ventilation air. Therefore, the minimum ventilation for areas served by fan coil units shall be provided by Dedicated Outdoor Air Systems that include air to air heat recovery, tempering heating coils, and mechanical dehumidification cooling coils. For a predominately office type application, the fresh air ventilation flows and associated ductwork for a dedicated outdoor air system serving fan coils that handle the space heating and cooling will likely be in the range of 10-20% of the size typically needed for central VAV. Fan coil units shall include high efficiency fan motors (ECM type) with variable speeds that can be automatically controlled to match load requirements in order to minimize fan noise, maximize fan energy and maximize potential for dehumidification during part load cooling operation.

Passive radiant cooling panels typically very large surface areas to meet cooling loads and thus often become impractical to apply. Both passive and active chilled beam systems also require very reliable means of adequate dehumidification of the ventilation system and more complex control and failsafe features to avoid condensation. Furthermore, to get effective total cooling, active chilled beam systems typically require more preconditioned/dehumidified airflow than the absolute minimum required to satisfy ventilation requirements. Therefore the supply air system size typically will be in the range of 30-40% of a comparable central VAV system. Due to those reasons and other reliability, operations, and maintenance concerns, the recommendation would be to not apply them on this project.

For applications requiring cooling/dehumidification of high latent loads and reheat within the air handling unit such as Dedicated Outdoor Air Systems or high occupant assembly spaces, use technologies to avoid or minimize

use of mechanical cooling and simultaneous addition of heating and cooling energy. Options include wrap-around dehumidification heat pipe cooling coil assemblies, cross flow heat exchangers, or energy wheels.

Laboratory Ventilation

General:

Ensure needs of scientific research and life safety are satisfactorily met.

- Review all design parameters with the scientific staff and PSU Environmental Health and Safety.
- Establish the desirable operating conditions (temperature, humidity, rate of change, pressure relationships, air quality) and determine limits that should not be exceeded and define in the construction documents so contractors and Commissioning Agency and operating staff clearly understand intent and initial settings on room-by-room basis.
- For areas requiring variable temperature or humidity, these parameters must be carefully reviewed with the users to establish a clear understanding of expected operating conditions and system performance.
- Determine need for standby equipment and emergency power to achieve system reliability and life safety.
- Determine and define alarming requirements.

Mechanical Infrastructure serving laboratory spaces shall be flexible and adaptable.

- Research objectives frequently require changes in laboratory operations and programs. Thus, laboratories must be flexible and adaptable, able to accommodate these changes without significant modifications to the infrastructure.
- Therefore the utilities and distribution infrastructure system design shall be flexible enough to supply ample cooling to support the addition of heat-producing equipment without requiring modifications to the central HVAC system.
- Adaptable designs shall allow programmatic research changes that require modifications to the laboratory's infrastructure within the limits of the individual laboratory area and/or interstitial and utility corridors.

In general, the basic design of laboratory spaces shall be in accordance with the guidelines in the current edition of the **ASHRAE Applications Handbook** including, but not necessarily limited to, the chapters for Educational Facilities and Laboratories.

Comply with ANSI/AIHA Z9.5-(current) Laboratory Ventilation.

Coordinate and review all laboratory designs with PSU Environmental Health and Safety http://www.ehs.psu.edu/

Laboratory Safety

Contact: Kate Lumley-Sapanski, kxl3@psu.edu 814-865-6391

http://www.ehs.psu.edu/occhealth/labsafety.cfm

- Work with representatives of University's scientific staff and PSU EH&S to perform a hazard assessment to determine risk level for each lab application.
- Use definitions and associated occupied/unoccupied minimum lab ventilation rates being developed within PSU Environmental Health and Safety "Lab Banding" guidelines. Minimum ventilation rates

shall be established and clearly defined/scheduled on the construction documents on a room-by-room basis considering the hazard level of materials expected to be used in the room and the operation and procedures to be performed.

Other Laboratory Design Resources:

- National Institute of Building Sciences (NIBS) - Whole Building Design Guide - Research Facilities
- A **Design Guide for Energy-Efficient Research Laboratories** - Version 4.0 http://ateam.lbl.gov/Design-Guide/index.htm

Typical OPP Energy Saving Strategies and Preferences:

Laboratory spaces typically use far more energy and water than most typical office or classroom spaces. Therefore, as part of meeting the Performance Requirements and Sustainability goals of the University, careful attention must be given to the design, construction and continued operation of Laboratory spaces. Refer to the U.S. EPA and DOE sponsored Labs for the 21st Century (Labs21) Tool Kit, including the Best Practices Guides. Apply them to best fit each specific project scope giving consideration to the University's local operating staff to achieve high performance and the lowest long term total life cycle costs.

Be careful to define and segregate non-hazard type, classroom-use "teaching labs" or physics "dry labs" that do not have hazardous or noxious contaminants and thus do not require fume hoods and may allow recirculation from actual "wet lab" spaces that do have requirements for fume hoods that require 100% exhaust and 100% outside air makeup.

Work with representatives of scientific staff to minimize use of hoods while still meeting their needs. Eliminate / decommission unnecessary existing hoods wherever practical. Use local / snorkel exhaust devices strategically to capture applicable noxious, non-hazardous odors as close to source as possible to maintain overall high indoor air quality while keeping general lab ventilation rates as low as practical.

Laboratory fume hoods shall be the current state of the art, high-performance designs to achieve optimal fume capture with minimal airflow requirements. The design of lab ventilation and fume hood systems shall be carefully integrated to strive to continuously and optimally match the general minimum ventilation rates (during occupied and unoccupied periods wherever applicable) and specific exhaust hood and makeup air and pressure relationships needed to maintain a healthy and safe work environment for the occupants. Refer to Labs 21 Best Practice Guides Optimizing Laboratory Ventilation Rates. Generally, in applications with multiple hoods, fume hoods shall be variable air flow type, based on sash position. Some exceptions may apply but review with OPP Engineering Services and EH&S.

Fume Hood Guidelines received from EH&S dated 11/22/2011. *Note: Review and confirm most current requirements with EH&S during the Design Phase.*

The following shall be included with regards to low flow/high performance hoods:

- Low Flow or Velocity Hoods - At a 12" vertical sash height, the minimum face velocity should be 60 fpm.
- Existing hoods shall not be adapted to function as low flow hoods. Low flow/velocity hoods shall be purchased as hoods designed for low flow operation.

Other considerations for fume hoods:

- Fume hoods should not be situated directly opposite normally occupied work stations.

- Air distribution devices shall be carefully located within the laboratory to avoid turbulence and cross currents at the fume hood face that can negatively affect the fume capturing performance of the fume hood.
- Note: The 2008 National Institutes of Health (NIH) Design Requirements Manual for Biomedical Laboratories and Animal Research Facilities (DRM), formerly called the NIH Design Policy and Guidelines, is the only detailed design requirements and guidance manual for biomedical research laboratory and animal research facilities in the U.S. Compliance to the DRM, which promulgates minimum performance design standards for NIH owned and leased new buildings and renovated facilities, ensures that those facilities will be of the highest quality to support Biomedical research.
- The DRM requirement that fume hood face velocity never falls below 80 feet per minute applied to buildings that are constructed using NIH funding, and also applied to NIH funded renovations if the entire building is gutted, or if more than 50% of the building is renovated.

The architectural and engineering design of labs shall segregate equipment and process cooling loads wherever possible from the ventilation requirements so that the heat gain from the equipment can be cooled separately with process cooling systems and/or recirculating space cooling equipment in lieu of 100% makeup air systems. Consult with scientific staff to inform and guide them to select water-cooled process equipment in lieu of air-cooled units that reject heat to lab space whenever possible.

Apply variable air volume to exhaust and supply air makeup systems to the fullest extent practical within the project constraints.

In applications with multiple exhaust devices, generally connect into a common manifold exhaust system with the recommended better multiple fan lead/lag/standby assembly (3 fans each @ 50% maximum capacity) to achieve the benefits listed below (see Labs 21 Toolkit, Manifolding Laboratory Exhaust Systems):

- Ability to take advantage of exhaust system diversity and fume dilution
- Ability to provide a redundant exhaust system by adding one spare fan per manifold and thus increasing personnel safety (lab user's and maintenance staff)
- Opportunity for energy recovery
- Design Flexibility and adaptability
- Fewer pieces of equipment to operate and maintain
- Centralized locations for exhaust discharge
- Fewer roof penetrations and exhaust stacks
- Lower ductwork cost

Laboratory exhaust air systems shall be designed to minimize pressure drops through each component, fitting, and the total system to minimize associated fan energy. This is especially important for manifolded systems. Refer to Labs 21 Best Practice Guides Low-Pressure-Drop HVAC Design for Laboratories.

- Review and optimize exhaust device selection for lowest pressure drop with lab consultant (as applicable). Be careful to not allow hoods or snorkels with high individual pressure drops that end up causing the whole system to have to operate at the higher pressure, which can have a huge impact on the fan energy.
- Minimize length of duct runs and number of elbows, transitions, fittings and abrupt changes and combinations of all of the above that contribute to high pressure drops.

Apply Air to Air Energy Recovery equipment in safest and most cost-effective manner:

General lab exhaust: Enthalpy wheels are typically recommended to maximum total energy recovery from non-contaminated/non-hazardous general lab exhaust airstreams.

Fume Hood Exhaust: Glycol Runaround or plate type (separated airstreams so no chance of cross contamination) are recommended where applicable and cost effective depending on capacity and frequency of use. A ducted bypass around these coils is required for filter changing.

Apply space occupancy sensors to achieve demand based minimum ventilation strategies applicable to laboratories. Disable in control settings of individual lab spaces defined to not allow reductions due to risk type.

Avoid use of independent LONworks LAB controller that requires a gateway interface to BACnet BAS. Preference is for direct control.

25 00 00 INTEGRATED AUTOMATION (BUILDING AUTOMATION SYSTEM – BAS)

Contact: Robert Mulhollem Jr, P.E., rem26@psu.edu, Manager Facility Automation Services: Phone (814) 863-7220

All aspects of the BAS shall be closely coordinated with the University and approved by the Office of Physical Plant, Engineering Services and Facility Automation Services during the building design.

The building automation system (BAS) shall be direct digital control (DDC), and shall communicate at the building level using BACnet protocol. The BAS shall be competitively bid for this project. Automated Logic Corporation, Delta Controls, Inc. and Siemens Industry, Inc., are the only approved automation control systems. The BAS shall provide Direct Digital Control (DDC), monitored and adjusted by the University's Automated Logic WebCTRL, Delta enteliWeb or Siemens Desigo software at University Park, all via Microsoft Internet-Explorer, the thin-client user interface. The University's standard BAS guide specification shall be used and edited as appropriate; no other BAS specification is acceptable.

The project shall include installation of a backbone connection to the telecommunications fiber network for use by the Utility Fiber Network. Fiber strands will be allocated by Telephone and Networking Services (TNS) to the Office of Physical Plant (OPP) for this use. All necessary electronics will be installed by OPP/CCS at the Telecomm closet in the building. The estimated cost of the work by OPP/CCS for the connection, including hardware, is $7,500. This cost should be included in the building construction estimate.

The BAS shall monitor, trend and report utility consumption data; refer to the 'Energy Metering' section below.

All third party equipment that is supplied with an on board controller, such as VFDs, etc., shall be specified to have a BACnet interface supplied by the equipment manufacturer.

The Consulting Engineer shall utilize the most current control sequence guidelines in use by OPP. Coordinate to obtain most current version with Office of Physical Plant/FAS Group and develop the sequences accordingly for this project. Systems shall utilize the following strategies at a minimum to reduce energy consumption:

- Optimized Start/Stop - Enabling systems based on zone level requests to run
- Temperature setpoints reset from occ/unocc schedule and occ override button on thermostat.
- Scheduled occupancy based control of ventilation air (off during unoccupied periods)
- Demand based control of ventilation air during occupied periods
- Continuous monitoring of key functions with alarms to indicate when poor operating conditions are occurring regularly.
- Pump VFD speed control with automatic optimized DP reset and supply water temperature reset.
- VAV AHU's: minimum OA measuring, economizer, fan static pressure setpoint reset, supply air temperature set point reset

EUMS and Coordination with UTILITY METERING

Contact: Michael I. Prinkey, P.E., mip103@psu.edu - Senior Energy Program Engineer, (814) 863-4091

The BAS shall provide interval trend data to the campus Enterprise Utility Management System (EUMS) via Bacnet communication; refer to the 'Utility Metering' section below.

The Emergency and Demand Response control strategies in the EUMS shall be extended to any new or reused HVAC equipment that is part of this renovation project. Refer to the Enterprise Utility Management System (EUMS) Equipment Control Strategies

All building utility services serving the building shall be metered. The meters are furnished by others. The BAS vendor shall be responsible to ensure all utility meters are connected to building BAS and ensure that they are programmed and communicating properly to campus utility monitoring system. The BAS system shall monitor, trend, and archive all data associated with each of the utility meters; generate user definable alarms for measured consumption and demand; and shall transmit data to the campus Enterprise Utility Management System. The exception is the electrical metering – refer to details in UTILITY METERING section.

26 00 00 ELECTRICAL

Contacts:
Charles C. Dobbins, P.E., ccd10@psu.edu - Senior Electrical Engineer, (814) 865-1583
Richard S. Harris, P.E., rsh3@psu.edu – Utility Electrical Engineer (814) 863-8742
W. Blair Malcom, P.E., wbm101@psu.edu – Electrical Engineer (814) 867-1837
Cyle D. Vogt, E.I.T., cdv5002@psu.edu – Electrical Engineer (814) 867-5622

SERVICE ENTRANCE EQUIPMENT

Replace the entire main service entrance. Size and nature of building load will determine whether 480VAC or 208VAC should be utilized. This includes new switchgear as well as the exterior foundation-mount transformers. Locate space for the new transformers as well as new electrical rooms for the main service switchgear and the emergency electrical system equipment.

Service entrance equipment shall include a lineup of low-voltage double ended drawout type switchgear with automatic main-tie-main. Service entrance equipment shall have front and rear access. Provide a separate room for this equipment with dedicated environmental control (not necessarily mechanical cooling, but outside air and fan as necessary).

The emergency and life safety systems shall be located in a separate dedicated electrical room. However, PSU requests that the emergency and life safety systems to be located in a separate dedicated electrical room regardless of requirement above.

Metering shall be installed as part of the Service Entrance Equipment. Refer to the University's DCS (Design and Construction Standards) and coordinate with the Electrical Utility Engineer for metering requirements. Install data connection from the meter provision location tied directly to the BAS Network switch to transmit information to the PSU metering Server. The meter will be provided by PSU; CTs, PTs and shorting blocks and all other necessary equipment to provide a working meter shall be the responsibility of the Contractor.

Surge protection shall be installed on the service entrance equipment and on power panels one level downstream. All lab equipment power panels and computer lab power panels shall have integral surge protection.

DISTRIBUTION EQUIPMENT

Provide large step-down transformer to 208Y/120VAC in the Main Electrical room and distribute from there, if 480VAC is used. All existing feeders, distribution panels, panel boards, and branch circuit wiring shall be replaced. Most of the existing wiring is beyond its intended service life and is at risk for failure. Provide new electrical devices, switches and receptacles. Distribution panels shall be used for groupings of 400A-800A of load. Mechanical equipment and lighting should be fed at the highest voltage available, to the extent practicable.

A centrally located main building riser is required from the electrical room to all floors, including the roof or penthouse.

ELEVATOR

If an elevator is proposed, consult with OPP Engineering Services for power feed requirements.

LIGHTING

Luminaries shall be LED. Interior luminaire color temperature shall be 4000K, with a CRI of 80+, and a minimum efficiency of 90 lumens/watt. Exterior color temperature shall be 4000K, with a CRI of 70+, and a minimum efficiency of 100 lumens/watt. Minimum L_{85} fixture life shall be 50,000 hours.

Labs shall utilize pendant-mount direct/indirect luminaires (80% down/20% up, or similar). Offices shall utilize pendant-mount indirect/direct luminaires (80% up/20% down, or similar). Direct lighting shall typically be 2x2 volumetric luminaires.

Provide building-wide interconnected digital lighting control system for all spaces using Cooper Fifthlight, Sensor Switch nLight, Watt Stopper DLM, or Lutron Energi-Node. Require HVAC output relay so that the BAS can monitor rooms for occupancy and set back temperatures accordingly. Stairway luminaires shall utilize fixture-mount sensors with dimming driver or a sensor per landing, daylight harvest if windows are installed. Daylight harvesting shall be accomplished with 0-10V controlled dimming drivers, 5%-100% output. Consultant shall investigate the use of exterior shading devices (to minimize direct glare and solar heat gain), interior light shelves, and skylights or (preferably) north-facing clerestories.

Exterior decorative luminaires shall be refurbished and re-installed. Lamp source shall be LED, discuss with Engineering Services whether to use medium-base or permanently installed source. Replace exterior “wallpack” luminaires with LED.

Refer to Design and Construction Standards for further requirements.

ELECTRICAL UTILITIES

The building shall have a separate life safety electrical system and will be fed from the campus loop emergency cable. Size of standby service shall determine need for onsite generation. Generators 500kW and above shall have extended paralleling switchgear and controls.

Provide procurement and installation for one additional automatic S&C switch.

ELECTRIC WELDING

Electric welder installations require special consideration and must be reviewed by Engineering Services.

27 00 00 COMMUNICATIONS

Refer to the PSU TNS (Office of Telecommunications and Network Services) Minimum Standards for Telecommunications Facilities for requirements.

Contact: http://www.tns.its.psu.edu/Contact.html

A new duct bank with 4-5" conduits will be extended to the building from the closest existing manhole. Although the precise cost is dependant on exactly how the building is designed, the manhole is so close the cost of the duct bank should not exceed $15,000 maximum.

New Copper - Telephone Circuit Services - Will be extended from the closest existing telecom manhole. Approximate cost $2,000

New Fiber - Telephone, data and CATV services - will be extended from the Building. 24 Multi mode and 48 single mode fiber. Approximate cost $15,000.

All projects have been including funds for telephone and data equipment to occupy the building. The estimated costs for that equipment are:

Telephone System - $50,000
Data System - $80,000
CATV (Cable TV System) - $5,000
Wireless Data System - $70,000

The cost of internal building telecom wiring is assumed to be included in the construction estimate. Telephone and data port locations must be coordinated with the users and Telecommunications and Network Services during the design phase of the project.

28 00 00 ELECTRONIC SAFETY AND SECURITY

Penn State requires security access control on all new and renovated buildings. Refer to Penn State's Policy AD65 ELECTRONIC SECURITY AND ACCESS SYSTEMS and SECURITY ACCESS CONTROL SPECIFICATIONS. Contact Denny Hackenberg at drh241@psu.edu for guidance on applying these to the project. The Physical Security Unit of University Police & Public Safety needs to be involved with the Design Project Development Team throughout the design process.

Access Controls: (Software House/Sensirmatic iStar)

Electronic Access Controls will be required in order for project to be Policy AD-65 compliant. Access controls will include, but not be limited to, all perimeter doors & telecom doors. A Security Assessment will be performed in order to determine if additional access control measures are required.

Surveillance: (American Dynamics VideoEdge)

Surveillance cameras will be required in order for project to be Policy AD-65 compliant. Surveillance cameras will be required on all perimeter doors equipped for card access or electronic access control. Cameras will cover both ingress and egress. A Security Assessment will be performed in order to determine if additional electronic surveillance is required.

Other Electronic Security:

A Security Assessment will determine if there is a requirement for other electronic security such as; intrusion alarm, duress alarm, device tamper alarms, etc.

28 31 00 FIRE DETECTION AND ALARM

Design Professional shall review and coordinate new fire alarm system to be compatible with any existing Fire Alarm Control System available at the local campus. New system shall meet the requirements in 28 31 00 FIRE DETECTION AND ALARM.

For fire alarm related inquiries please contact PSU Physical Security Director, Scotty Eble at (814) 863-2329.

A Siemens XLS fire alarm panel will need to be provided with Leased Line tie to Telecom Bldg. Provide partial detection for building, (assuming there will be full sprinkler coverage). Confirm specific areas to be detected with ACES, but include the following:

a) Corridors.
b) Mechanical and Electrical rooms. Mechanical rooms may require heat detection rather than smoke, due to the cleanliness of the environment
c) Telecommunications rooms
d) Storage rooms
e) Kitchens
f) Janitor Closets
g) Stairwells

University Park systems shall be compatible with, and able to report to and be controlled by, the Siemens NCC-WAN Fire Command Center used by University Police Services.

33 00 00 UTILITIES

All new construction or renovation projects which necessitate modification of or an addition to existing utility systems must be coordinated with and approved by Engineering Services in the Utilities Division of OPP.

Utility maps are available from Engineering Services. Contact: Francis R. Raymond II, frr1@psu.edu - Mapping Coordinator, (814) 863-3151.

Any expansion or renovation of conditioned space must include an assessment of the adequacy of the utilities infrastructure.

The Utility Demand and Consumption form (See 00 51 00 Miscellaneous Forms) shall be completed by the Professional for every project. The information will be used to evaluate the impact on the existing distribution systems, and to request operating funds for the facility. The consumption data should be estimated as accurately as possible, and provided with the final design submission.

DOMESTIC WATER AND FIRE SERVICE

Contact: James K. Baird, P.E., jkb125@psu.edu - Utility Systems Engineer – Water, (814) 863-5536

Domestic Water and Fire Service: The new building will be serviced by a new common service line for both domestic and fire service water from the existing 10-inch ductile water line on the south side of the building. The existing service is old cast iron pipe and should be replaced as part of the project. It is anticipated that the building will be fully sprinkler. The fire service demand and domestic demand has not been estimated at this point to determine the new service line size. The ten inch service main should be able to supply the required volume of water to the building. The domestic service will be required to have Neptune compound water meter and strainer, and two Apollo/Conbraco Reduced Pressure Principal Backflow Preventers in parallel to prevent interruption of service to the building during testing and servicing of the devices. Currently, T-Clarity Radio Readers are used on the water meter, and would require two readers. However, it is recommended the meters be integrated into the real time data entering into the utility meter billing system and building automation system.

The water pressure in the Fenske Building's domestic water service at the inlets of the backflow preventers (old side of building) were last recorded on July 30, 2013 at 64 psig, and at the inlets of the backflow preventers (new side of building) were last recorded on March 3, 2014 at 55 psig. The building's domestic water pressure requirements will need to be evaluated to determine if a booster pump(s) is/are required for the building's domestic water service. The fire service will be required to have an Ames Fire & Waterworks Model 3000SS brand double check backflow preventers. The building's fire service pressure requirements will need to be evaluated to determine if a booster pump(s) is/are required for the building's fire service.

A budgetary cost estimate for the materials and installation of a new water service line, new water meter, and backflow preventers on both the domestic and fire protection services is $150,000. This cost estimate includes the piping from the water service to the water meter and backflow preventers; it does not any costs for fire monitoring alarms associated with the fire protection system or for booster pumps on the domestic and fire protection services.

SANITARY SEWER

Contact: John W. Gaudlip, P.E., jwg3@psu.edu - Utility Systems Engineer – Wastewater, (814) 863-8741

It appears that the proposed new building foot-print sets over an existing parking area on the south side. There is an existing sanitary sewer from Ferguson Building to the north that passes through Fenske. On the south side of Fenske it exits near SAMH439, other lines connect to that manhole then exits to the south. Consideration should be given to re-routing the line from Ferguson and cleaning up the piping on the south. SAMH439 would have to eliminated in order not have it in the new basement area.

We are currently studying potential customers of re-use water that could be available in the future on campus. A new wastewater treatment plant will be built in about 4 or 5 years that will produce Class A effluent water. Re-use piping (purple pipe) has been installed on the north side of Park Avenue and will be extended south on Shortlidge Road. We encourage this building project to be designed to be able to utilize this re-use water for cooling, and other non-potable water demands when it becomes available.

PaDEP Sewer Planning would have to be completed before the new building could hook to the sanitary sewer. Estimated flows from the new building would be required in order to complete the PaDEP forms. These forms are normally completed by the site designer and submitted through E.S.

STORM DRAINAGE

Contact: Lawrence A. Fennessey, Ph.D., P.E., laf8@psu.edu - Utility Systems Engineer – Stormwater, (814) 863-8743

http://www.opp.psu.edu/services/stormwater

The site proposes to replace a portion of the existing building that drains to the duck pond/Thompson Run (HQ-CWF) via the Shortlidge Road storm drain system. Thompson Run is now defined as an impaired stream by PaDEP, and therefore no waivers of stormwater criteria will be permissible. Stormwater controls will be required for peak runoff control, recharge and water quality criteria per the Borough's Act 167 Plan, and the PaDEP 2-year volume control and backwards 20% imperviousness rule will apply. However, as long as there is a reduction of imperviousness close to 20% of the existing site, no stormwater should be required other than conveyance connections.

The area to the north of the existing building currently has limited storm drains due to trees and other utilities and a minor storm line travels under the building. Storm drains from north to south will need to be replaced and upgraded. A utility corridor should be provided between the old and new building. Additionally, runoff must be carefully controlled on the south side of the building with adequate grade control to prevent flooding of the Chemistry Building, which was a persistent problem in the past.

The design team civil engineer is to set up a pre-design / sketch plan meeting with Engineering Services.

NATURAL GAS

Contact: William F. Serencsits, P.E., wfs1@psu.edu - Utility Systems Engineer (Gas and Steam), (814) 863-3152

There is a 2 inch 5 psig university owned gas main located north of the existing Fenske building, any new gas service for the new building should come from this main. The design professional shall provide the load and pressure requirements to Engineering Services and the meter and regulator set will be sized and provided to the contractor for installation. The contractor performing the piping installation must be certified to the guidelines outlined in the design and construction standards.

Columbia Gas of PA has a high pressure gas pipeline that passes through the University Park campus. Contact Engineering Services for precise location requirements. Earth moving, demolition and construction activities for this project are subject to U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration regulations and related Columbia Gas of PA requirements due to the proximity to this pipeline. The Design Professional shall coordinate all project requirements directly with Columbia Gas of PA. Contact Engineering Services for further information.

CAMPUS CHILLED WATER COOLING

Contact: Glenn A. Lelko, P.E., gal8@psu.edu – Utility Systems Engineer, Campus Chilled Water, (814) 863-7805

A portion of the existing Fenske Lab facility is currently served by campus chilled water. An existing 8" connection to the 18" main is located under the service drive between Fenske and Chemistry Building. The existing campus chilled water building service enters the existing Fenske building at the south east corner of the glass tower. The new Chemical Engineering facility will reuse this 8" connection. The approximate construction cost of the new building service entrance is $75,000.

CAMPUS STEAM

Contact: William F. Serencsits, P.E., wfs1@psu.edu - Utility Systems Engineer (Gas and Steam) (814) 863-3152

The existing high and low pressure steam, condensate return, and compressed air piping will need to be replaced with new service lines from the utility tunnel north of the existing building. The design professional shall provide the high and low pressure steam loads to Engineering Services and the steam meters will be sized and provided for the project. The contractor will be provided with the orifice plate flanges and directed where the flanges will be installed. The associated transmitter will be installed by the University and the power for the transmitter will come from the building automation system and installed by that contractor.

The utility piping system for steam, condensate, and compressed air will be determined by Engineering Services, all utilities will have an isolation valve inside the building wall.

Refer to 33 63 00 STEAM ENERGY DISTRIBUTION for steam system characteristics and standards at University Park.

All steam condensate shall be returned to the campus steam plant. Condensate return pumps shall be air pressure powered, using compressed air from the campus system.

UTILITY METERING

Contact: Michael I. Prinkey, P.E., mip103@psu.edu - Senior Energy Program Engineer, (814) 863-4091

All building utility services serving the building shall be metered. Where utilities are added or modified under this project, metering shall be provided as described below. The design consultant shall contact the Office of Physical Plant, Engineering Services, for specific meter requirements. Each metering system shall be fully functional and performing as intended through the BAS and campus EUMS prior to using the associated utility.

Include Domestic water metering for flow and consumption. A separate pressure sensor shall be provided to sense building service pressure. The domestic water service inside of the building shall typically include a properly sized Neptune Compound Water Meter with corresponding strainer, meter/strainer full port isolation valves, a meter bypass line with a full port valve, and properly sized reduced pressure principal backflow preventer(s) with corresponding y-strainer(s).

Include Chilled water metering for monitoring flow and tonnage of chilled water into the building. Chilled water meters shall be Rosemount model 8705PSA, and shall be furnished by the University and installed by the Contractor. Temperature sensors shall be matched RTD's , and shall be provided by the BAS Contractor. The BAS system shall monitor, trend, and archive all data associated with chilled water metering, and shall transmit data to the campus Enterprise Utility Management System.

Steam meters shall be selected and sized by Engineering Services. The professional shall provide building steam load to Engineering Services for steam meter sizing. Steam meters shall be provided and installed by Utility Services. Contractor shall install orifice flanges supplied by Utility Services. Location of orifice flanges shall be specified by Engineering Services. The Professional shall provide for and indicate an adequate straight run of pipe on drawings for an orifice meter installation. Utility Services shall install the meter transmitter. Contractor shall provide and connect power to the transmitter from the building BAS system.

Gas Metering: Check with Mike Prinkey and Bill Serencsits for current requirements.

Electrical metering for monitoring building power conditions and consumption is to be included in the Service Entrance Equipment as described in Div 26 – Electrical.

Environmental Compliance Document

If there are any questions, please contact Steve Weyandt, Phone 814-867-1308.

The project is responsible for:

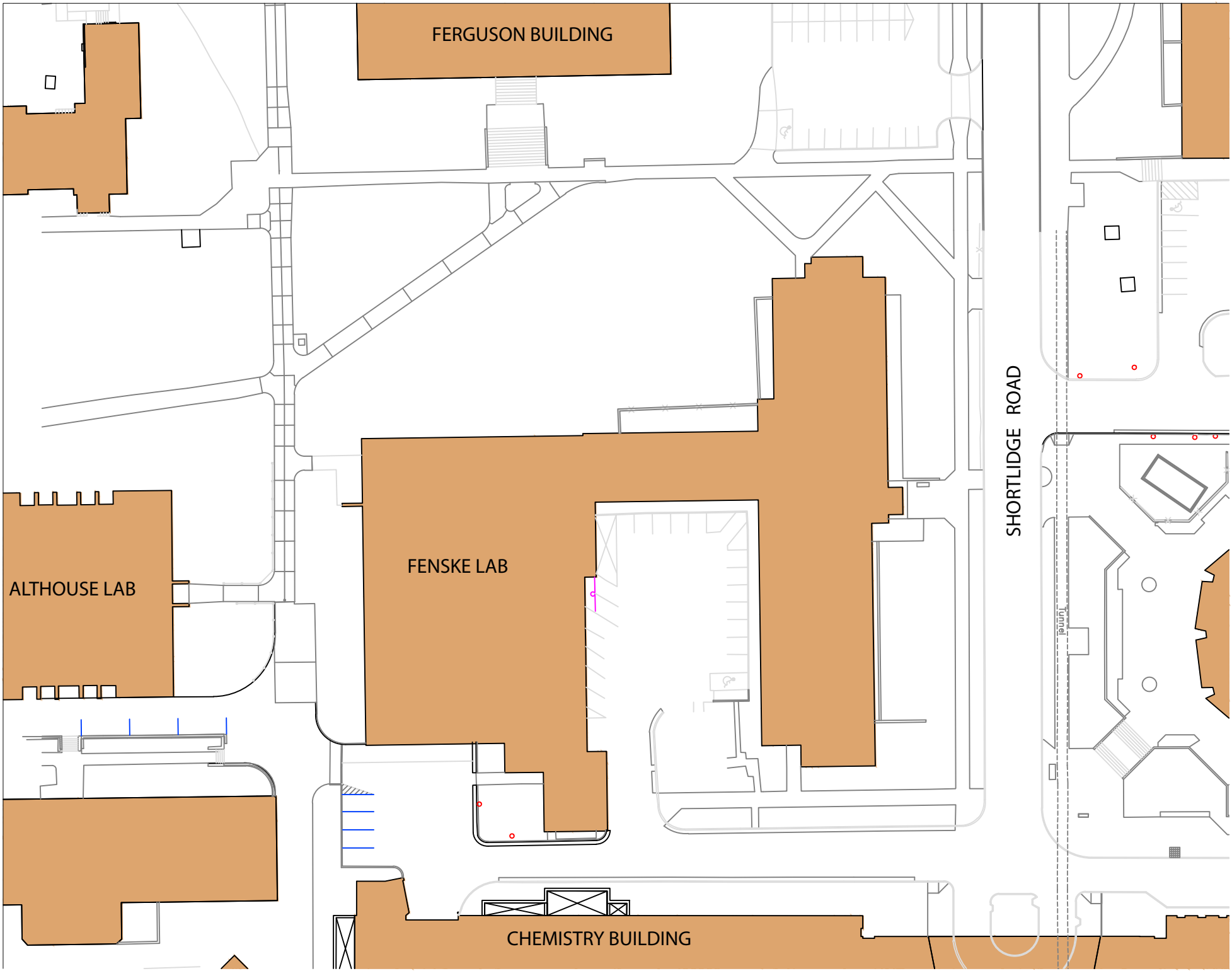
1. Submitting an Environmental Compliance Checklist to the Manager, Engineering Services.

2. NPDES (Construction Permit). This project CURRENTLY lies within boundaries of the Central Campus NDPES Permit and as such any earth disturbance > 5000 ft2 must have the E&S Plan and PCSM Plan included in the permit as a minor modification. It is anticipated the Central Permit will be eliminated prior to construction: at that time should earth disturbance > 1.0 Acre, the project will need to obtain an NPDES permit. Engineering Services will advise of the Permit status in advance.

3. Air Quality:

    a. On January 13, 2014, the PA DEP issued Plan Approval No. 14-00003F to allow for modifications to the West Campus Steam Plant (WCSP). This Plan Approval imposed certain conditions requiring the University to quantify the effects that changes to the steam system will have on emissions from the WCSP. The project must supply an estimate of the magnitude of such changes on steam demand associated with this project. Please note these Conditions affect all future changes to steam consuming projects. Contact Engineering Services for further information on this issue.

    b. The project will need to prepare a Request for Determinations to the Department of Environmental Protection for any new air emission sources or changes in steam use. Contact Engineering Services for discussion & guidance.


FERGUSON BUILDING
ALTHOUSE LAB
FENSKE LAB
SHORTLIDGE ROAD
tunnel
CHEMISTRY BUILDING

PENNSTATE

NON-BINDING ARCHITECT AND ENGINEER FEE SCHEDULE

Project: Chemical/Biomedical Engineering Building,
University Park

Firm Name: _____

	Hours	Fee
Programming/Site Analysis (confirmation)		
Schematics		
Design Development		
Construction Documents		
Bids		
Construction Administration		
Subtotal		
Reimbursements (allowance)		
Total		

Please include a listing of your billable rates that will be used for this project.

Please return completed form by January 27, 2015 @ Noon to:

David Zehngut
University Architect
The Pennsylvania State University
200 Physical Plant Building
University Park, PA 16802-1118
Phone (814) 863-3158, E-mail: dxz3@psu.edu

Note: Include any costs for consultants within amounts listed, not separately.

Form of Agreement 1-P

THE PENNSYLVANIA STATE UNIVERSITY

OWNER AND PROFESSIONAL

AGREEMENT

THIS AGREEMENT made this _____ day of _____

in the year Two Thousand _____, by and between THE PENNSYLVANIA STATE UNIVERSITY, a non-profit corporation and an instrumentality of the Commonwealth of Pennsylvania, having its principal offices at University Park, Centre County, created and existing under the laws of the Commonwealth of Pennsylvania, hereinafter called the "Owner," and

_____

_____

_____

hereinafter called the "Professional," for the following Project:

_____

_____

PSU Project No. _____.

(Title of Project should match the documents, must include project number)

In consideration of the promises set forth herein, and with intent to be legally bound, the parties agree to the terms set forth within this Agreement.

TABLE OF CONTENTS

12.10 Amendments

ARTICLE 13: SCHEDULE OF EXHIBITS

DEFINITIONS:

Contract Documents consist of the General Conditions of the Contract, Drawings, Specifications, Addenda issued prior to receipt of Trade Contract bids, Form of Proposal, other documents listed in the Agreement and those modifications to the Contract as follows: Owner's written authorization to the Contractor for changes to the Scope of Work, a Change Order, and a written order for a minor change in the Work issued by the Professional.

Contractor means the person or entity retained by the Owner to perform Work for the project and includes the Contractor's Representative.

Construction Budget means the project construction cost limit established by the Owner.

Construction Cost Estimate means a detailed breakdown of all costs associated with the scope of work required to meet the project requirements projected to the mid-point of construction.

Final Completion means the point at which the project is fully completed in accordance with the Contract Documents (this includes *all* physical/construction obligations, administrative obligations, and punch list obligations).

The **Owner** is The Pennsylvania State University, a non-profit corporation created and existing under the laws of the Commonwealth of Pennsylvania, and an instrumentality of the Commonwealth of Pennsylvania; this term shall include the Owner and/or the Owner's authorized representative.

The **Pennsylvania State University Design and Construction Standards** means those design and construction standards as set forth at: http://www.opp.psu.edu/planning-construction/design_and_construction_standards/standards-and-forms.

The **Professional** is the person lawfully licensed to practice architecture or engineering, or the firm employed to provide architectural or engineering services, for the referenced project. The term "Professional" shall mean the Professional or the Professional's authorized representative.

The **Project** shall comprise the Work defined by the Contract Documents and may include work by the Owner or other Separate Contractors, Trade Contractors, Sub-Trade Contractors or the Professional.

The **Scope of Work** means the work reasonably contemplated, required, implied, or reasonably inferable by the Contract Documents or normal standards of the building trades, whether or not explicitly contained in the Contract Documents.

Services means the services provided by the Professional and/or by consultants retained by the Professional for the Project.

Substantial Completion shall mean that stage in the progression of the Work when the Work is sufficiently complete in accordance with this Contract that the Owner can enjoy beneficial use or occupancy of the Work and can utilize the Work for its intended purpose.

Work means the construction and services necessary or incidental to fulfill the Contractor's or Professional's obligations for the Project in conformance with the agreement between the Owner and Contractor or the Owner and Professional.

ARTICLE 1: PROFESSIONAL'S RESPONSIBILTIES

1.1 General Responsibilities

1.1.1 The Professional shall furnish or provide the architectural and engineering services as outlined herein, and any other relevant data, specifications or documents, as necessary for a complete project. The Professional shall expeditiously perform said services in a manner consistent with professional skill, care, and the orderly progress of the work. In carrying out all obligations pursuant to this Agreement, including the furnishing of Construction Documents, the Professional shall in all respects conform to the applicable professional standard of care.

1.1.2 By executing this Agreement, the Professional represents to the Owner that the Professional possesses the requisite skill, expertise, and credentials to perform the required services, and that Professional is licensed to practice by all public entities having jurisdiction over the Professional and the Project. The Professional further represents to the Owner that the Professional will maintain all necessary licenses, permits, or other authorizations necessary to act as Professional for the Project until the Professional's remaining duties hereunder have been satisfied. The Professional assumes full responsibility to the Owner for the negligent acts and omissions of the Professional's consultants or others employed or retained by the Professional in connection with the Project.

1.1.3 Execution of this Agreement by the Professional constitutes a representation that the Professional has become familiar with the Project site and the local conditions under which the Project is to be implemented.

1.1.4 The Professional shall provide the services required by this agreement in conformance with the most recent project schedule approved by the Owner.

1.1.5 The Professional shall provide Professional Services, per Exhibit A and per this agreement, in accordance with The Pennsylvania State University Design and Construction Standards referenced in Exhibit C.

1.1.6 The Professional is responsible for additional submission and presentation requirements as outlined for Board of Trustee approval or other administrative approval.

1.1.7 If a Construction Manager is hired by the Owner it will be the responsibility of the Professional to collaborate and work in concert with the Construction Manager throughout the duration of the project. Furthermore, the Professional shall reconcile all cost estimates with the Construction Manager.

1.1.8 (OPTIONAL) Payment of the Professional's fees, as per in Article 9, is contingent upon completion of the documents per the attached schedule. (NOTE: Attach Schedule as Exhibit D if schedule has been developed.)

1.1.9 (OPTIONAL) Adherence to Time Schedule. The Professional shall strictly adhere to submission schedules as set forth in this Agreement. Should the Professional become aware that he will be unable to meet any of the dates set forth in this Agreement, the Professional shall immediately notify the Owner in writing.

- The Professional shall include in the notice the reason(s) for the Professional's inability to meet the date(s) and a request that the Owner amend the time schedule.
- The Owner shall review the Professional's notice and determine whether or not to amend the time schedule.

If the Owner determines that the delay is **due to the fault of the Professional**, the Owner may amend the schedule and direct the Professional to expeditiously proceed with the design of the project, in which case **the Owner may hold the Professional responsible for any costs attributable to the delay**, or terminate the Agreement for default of the Professional, in accordance with the provisions of this Agreement.

If the Owner determines that the delay is not due to the fault of the Professional, the Owner may amend the time schedule. The Professional agrees that such an amendment of the time schedule is his

exclusive remedy for a delay and that he may not make any claims against the Owner for increased costs due to the delay.

1.1.10 Building Information Modeling (BIM). The project will be designed, constructed, and operated using Building Information Modeling (BIM). The BIM project scope is defined in The Pennsylvania State University Office of Physical Plant BIM Contract Addendum (BIM Addendum). This addendum applies to all projects exceeding a Total Project Cost of $5 Million new construction, substantial renovation, or as directed by the Office of Physical Plant Project Manager. On qualifying projects, professionals shall use BIM application(s) and software to develop project designs and assist in the coordination of construction.

The Pennsylvania State University is committed to utilizing BIM technologies and processes to execute the design, construction, and operations of its new High Performance buildings and the updating of all existing structures and infrastructure. The intent is to achieve the following goals: facilitate a collaborative project environment between all project stakeholders beginning at project conception through facility operations; improve facility system coordination to streamline design and constructions processes and minimize change orders; deliver a better overall facility design, visualize construction processes, avoid field conflicts, develop building life cycle costs, accurately project cost estimates, and seamlessly transition into facilities operations; develop high performance buildings in accordance to The Pennsylvania State University sustainability goals; incorporate the Record Model and As-Built Models, including infrastructure and building systems, into the existing Enterprise Asset Management system (EAM) to create an As-Maintained Facilities Management Model; and establish a technology platform and provide continuous support to incorporate future technologies into existing processes.

The Professional shall provide all deliverables in compliance with the BIM Addendum at stages described in the BIM Plan. The BIM Model is an instrument of service and is considered to be a component of Design and Construction Documents governed by Article 7 of this Agreement and within the BIM Addendum, without exception.

The Professional shall lead the development of a project specific BIM Execution Plan (BIM Plan), documenting the collaborative process in which BIM will be implemented throughout the life cycle of the project, during the design phase. An initial BIM Plan shall include the Professional's requirements identified in the BIM Addendum and the Office of Physical Plant Plan Template. It shall be submitted for approval by The Pennsylvania State University prior to the contract execution. A collaborative BIM Plan shall be developed with the Contractor/CM prior to completion of the schematic design phase. In the event that a Contractor is not procured for preconstruction services, the Professional Team and Owner shall develop the collaborative BIM Plan. The BIM Plan shall be revisited with the entire project team prior to Construction and submitted to the Office of Physical Plant for final approval. Payment may be held at each development phase until the BIM Plan is approved.

All costs associated with BIM, including model updates during construction, shall be included in the base contract price (contract Article 9.1.1). A breakdown of any cost associated with the implementation of BIM must be disclosed in the BIM Addendum.

Any questions or variations from this language shall be submitted in writing and agreed upon with the Office of Physical Plant BIM Manager or Manager of Design Services.

1.1.11 Contractor Design-Assist. The Owner anticipates utilizing contractor/vendor design-assist on some aspects of the project. If utilized, the Professional will assume the responsibility for incorporation of the design assist information into the overall design.

1.1.12 (OPTIONAL, If there is a cost impact for not meeting the LEED certification level, it should be outlined as a penalty in this section.) LEED Responsibility for Project. The Professional shall ensure that the LEED target certification level for the project is achieved. The Professional shall be primarily responsible for identifying the listing of credits to be achieved during the project in an effort to meet the certification level. The Professional shall also be responsible for preparing all documentation required for

submission. The Professional shall use as a guide The Pennsylvania State University LEED Policy to be provided by the Owner.

1.2 Schematic Phase

The Professional shall review and comply with the Project program and The Pennsylvania State University Design and Construction Standards, both as furnished by the Owner, and shall conduct appropriate visits to the Project site. The Professional shall then provide to Owner a preliminary evaluation of the program and schedule and a preliminary construction cost estimate. The Professional shall review with the Owner alternative approaches to project design and construction, as may be required.

After the Owner has approved the Project scope, cost estimate and schedule as submitted by the Professional, the Professional shall prepare and submit to the Owner, for approval, Schematic Design Documents and any other documents required by the Owner. Refer to the Design Phase Submittal Requirements document available on the Office of Physical Plant web page for a listing of submission requirements for the Schematic Phase.

Following approval of Schematic Design Documents and any other documents required at such phase by the Owner, The Professional shall submit a Construction Cost Estimate. The estimate shall be determined by the Professional using the most accurate means available.

1.3 Design Development Phase

After approval by the Owner of the Schematic Design Documents, and any Owner-authorized changes in Project scope or construction budget, the Professional shall prepare and submit, for approval by Owner and any government authorities, Design Development drawings and any other documents required by the Owner for said approval. These drawings and other documents shall fix building size, delineate and describe the various construction materials to be used, and indicate the structural, mechanical, and electrical systems upon which the design is based. Refer to the Design Phase Submittal Requirements document available on the Office of Physical Plant web page for a listing of submission requirements for the Design Development Phase (noted as Preliminary and Design Phase in the document).

The Professional shall provide an update of the Construction Cost Estimate and schedule and advise the Owner immediately of any adjustments.

1.4 Construction Document Phase

After approval by the Owner of the Design Development Phase documents, and any further Owner-authorized changes in Project scope or construction budget, the Professional shall prepare and submit to the Owner, for approval, Construction Drawings and Specifications/Project Manual (hereinafter referred to as the "Construction Documents") required by the Owner for said approval. These Construction Documents shall delineate, detail, and completely specify all materials and equipment required to fully complete construction of the Project in every respect, consistent with current standards of the profession. The Construction Documents shall completely describe all work necessary to bid and construct the Project. Refer to the Design Phase Submittal Requirements document dated August 2006 (or any subsequent updates), available on the Office of Physical Plant web page, for a listing of submission requirements for the Construction Document Phase.

Any review and approval by the Owner of the Construction Documents shall not be deemed to diminish the Professional's obligations under this Agreement.

The Professional shall provide an update of the Construction Cost Estimate and schedule and shall advise the Owner immediately of any adjustments.

The Professional shall be responsible for completing all of the appropriate planning modules, soil and erosion control plans, and other documents which may be required.

The Professional shall be responsible for obtaining, on behalf of the Owner, whatever approvals are necessary to connect to non-Owner-owned utility lines.

The Professional shall coordinate the Construction Documents for all of the Separate Prime Contracts or trade packages, as required, and shall employ all reasonable and necessary efforts to prevent omissions, conflicts, overlaps, or duplications of any items of work or materials on the Project.

The Professional shall coordinate the services of all design consultants for the Project, including those retained by the Owner.

1.5 Bidding Phase

After approval by the Owner of the Construction Documents, the Professional shall prepare and distribute all necessary bidding correspondence and documents, evaluate bid proposals, attend pre-bid or pre-award meetings, clarify the scope or intent of the Construction Documents, evaluate proposed subcontractors, and assist in the preparation of construction contracts.

1.6 Construction Phase

The Professional shall issue a set of construction documents that incorporate all bidding documents and revisions per addenda prior to the start of construction.

The Professional's responsibility under this Agreement for Construction Phase services commences with the execution of the Contract(s) between the Contractor(s) and the Owner and terminates no earlier than the expiration of the Contractor's one-year guarantee period against defective materials, equipment, and/or workmanship. This paragraph is not intended to, and shall not be construed as, affecting in any way the calculation of any applicable legal statutes of limitation.

Administration, by the Professional, of the construction contract(s) shall be as outlined below and in accordance with the General Conditions of the Contract for Construction. The Professional agrees to perform all of its obligations under this Agreement consistent with said General Conditions. The extent of the Professional's duties and responsibilities and the limitations of its authority as specified thereunder shall not be modified without written agreement between the Owner and the Professional.

The Professional shall not be responsible for the Contractor's construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the work. However, if the Professional has actual knowledge of safety violations, the Professional shall immediately alert the relevant Contractor or Subcontractor and shall give prompt written notice to the Owner.

The Professional shall not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Professional shall not be deemed to have control over or charge of acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons performing portions of the Work. However, the Professional shall provide all required assistance to the Contractor, Subcontractors and/or agents and employees in order to facilitate the appropriate and timely performance of the Work. Furthermore, Professional is responsible for notifying the Owner and the Contractor of the Contractor's failure to carry out the Work in accordance with the Contract Documents upon observing such failure by the Contractor.

1.6.1 Schedule of Values. Upon receipt, the Professional shall carefully review and examine the Contractor's Schedule of Values, together with any supporting documentation or data which the Owner or the Professional may require from the Contractor. The purpose of such review and examination will be to protect the Owner from an unbalanced Schedule of Values which allocates greater value to certain elements of the Work than is indicated by such supporting documentation or data or than is reasonable under the circumstances. If the Schedule of Values is found to be inappropriate, or if the supporting documentation or data is deemed to be inadequate, and unless the Owner directs the Professional to the contrary in writing, the Schedule of Values shall be returned to the Contractor for revision or supporting documentation or data. After making such examination, if the Schedule of Values is found to be

appropriate as submitted or, if necessary, as revised, the Professional shall sign the Schedule of Values thereby indicating the Professional's informed belief that the Schedule of Values constitutes a reasonable, balanced basis for payment of the Contract Price to the Contractor. The Professional shall not sign such Schedule of Values in the absence of such belief unless directed to do so, in writing, by the Owner. The Professional shall provide the Owner with a signed copy of the Schedule of Values after approval.

1.6.2 Access to Work. The Professional and its authorized representatives shall have full and safe access to the work at all times.

1.6.3 Visits to the Site/Inspection. The Professional and any consultants retained by the Professional, or an authorized and qualified representative, shall visit the Project periodically as required by the Owner during periods of active construction in order to review the progress of the work, and take such actions as are necessary or appropriate to achieve the requirements of the Construction Documents in the work of the responsible Contractors, including advising the Owner's representatives as to particular matters of concern. It shall also be the duty of the Professional to have its Consultants visit the site periodically as required during their respective Phases of the work, at such intervals as may reasonably be deemed necessary by the Owner and the Professional, to review their respective Phases of the work in order to achieve the requirements of the Construction Documents.

The purpose of such site visits and reviews will be to determine the quality, quantity, and progress of the Work in comparison with the requirements of the Construction Documents. In making such reviews, the Professional shall exercise care to protect the Owner from defects or deficiencies in the Work, from unexcused delays in the schedule, and from overpayment to the Contractor. Following each such review, the Professional shall submit a written report within (5) calendar days of such review, together with any appropriate comments or recommendations, to the Owner.

Whenever, in the Professional's opinion, it is necessary or advisable, the Professional shall require special inspection or testing of the Work in accordance with the provisions of the Construction Documents whether or not such Work is fabricated, installed, or completed. The Professional shall advise the Owner of all such occurrences requiring special inspection or testing of the Work and shall obtain prior approval from Owner before any funds are committed for inspection, beyond what has already been budgeted.

1.6.4 Approval of Payment to Contractors. Based on the Professional's review of the Project, the Professional will recommend, within seven (7) calendar days after receipt, approval or rejection of payment on the Application-Certificate of Payment. Approval of the Certificate of Payment shall constitute a representation by the Professional to the Owner that the work has progressed to the point indicated on the Application, and that to the best of the Professional's knowledge, information, and belief, the quality of the work is in accordance with the Contract Documents.

The Professional shall make recommendations to the Owner for the withholding of any payment, or portion thereof, due to inadequate progress and/or performance of the Contract.

The Professional agrees that time is of the essence with respect to this provision.

1.6.5 Interpreter. The Professional will be, in the first instance, the interpreter of the requirements of the Contract Documents. The Professional will, within a reasonable time as determined by the Owner, render such interpretation as it may deem necessary for the proper execution or Progress of the Work. All interpretations by the Professional shall be defined in writing and/or by drawing and shall be consistent with the intent of the Contract Documents.

In addition to the above, the Professional shall be required to attend, at the determination of the Owner, any and all Project site conferences dealing with interpretation of the Contract Documents.

The Professional's decisions, with Owner's prior approval, shall in matters relating to aesthetic effect be final if consistent with the intent of the Construction Documents.

1.6.6 Review of Contractor's Shop Drawings and Materials. The Professional shall review, approve, and process, subject to the right of review by the Owner, Shop Drawings to ensure compliance with the Contract Documents and all product data, samples, materials, and other submissions of the Contractor required by the Contract Documents for conformity to and in harmony with the design concept of the Project and for compliance with the requirements of the Contract Documents. The Professional shall not approve any substitution of specified materials and/or equipment without first obtaining the Owner's consent. Approval by the Professional of the Contractor's submittal shall constitute the Professional's representation in accordance with Article 5 of the General Conditions of the Contract for Construction to the Owner that such submittal is in conformance with the Contract Documents.

When the Contractor is required by the Contract Documents to provide professional certification of performance characteristics of materials, systems, or equipment, the Professional shall be entitled to rely upon such certification to establish that the materials, systems, or equipment will meet performance criteria required by the Contract Documents.

Based on the priorities of the construction schedule, the Prime Contractor(s) shall submit a shop drawing submittal schedule on or before the Second Regular Job Conference. The Professional shall review and check the shop drawing submittal schedule within fourteen (14) calendar days of receipt from the Contractor.

The Professional shall return the approved shop drawings, or detailed notation for resubmission, if required, within fourteen (14) calendar days after receipt from the Contractor unless mutually agreed otherwise by the Professional, Owner, and Contractor. The Professional shall act on any resubmissions within seven (7) calendar days of receipt thereof unless mutually agreed otherwise by the Professional, Owner, and Contractor. A detailed log shall be maintained by the Professional as to time of receipt of the shop drawings and time of return, with adequate notes as to their disposition.

Refer to 1.6.12 for electronic scanning and submission requirement of approved project shop drawings at the completion of the project.

The Professional is responsible to incorporate into the shop drawings comments by the Owner or Owner’s authorized representative prior to the shop drawings being returned to the Contractor.

The Professional agrees that time is of the essence of this provision.

1.6.7 Job Conference Reports. The Professional shall take and retain a verbatim record of the biweekly Job Conference meetings and shall prepare and distribute summary minutes in a format approved by the Owner of each meeting within five (5) calendar days to the Owner, the Contractors, and all other interested parties.

1.6.8 Change Orders. The Professional shall review all Change Order requests within seven (7) calendar days and shall advise Owner, in writing, with respect to the necessity or advisability of same. The Professional shall also determine whether the cost is fair and reasonable for the additional work associated with the Change Order. In so doing, Professional shall provide all pertinent documents and data to the Owner, who shall make all decisions regarding approval or rejection of Change Order requests. The Professional shall maintain an appropriate Change Order log. The Professional may, after consultation with the Owner, authorize minor changes in the Work which do not involve an adjustment in the Contract sum or an extension of the Contract time and which are consistent with the intent of the Contract Documents.

1.6.9 Rejection of Work. The Professional is authorized and obligated to reject work which does not conform to the Contract Documents and shall immediately notify the Owner to stop a Contractor's work whenever, in the Professional's reasonable opinion, such action is necessary for the proper performance of the Construction Contract Work. The Professional shall not be liable to the Owner for the consequences of any recommendation made by the Professional in good faith, and in the exercise of due care in recommending to stop or not to stop the work.

1.6.10 Substantial Completion, Final, and One-Year Guarantee Inspections. The Professional and its consultants shall participate in Substantial Completion and Final Inspections to affix the dates of Substantial and Final Completion and shall concur in the report of Final Completion to the Owner prior to approving the Contractor's application for Final Payment. The Professional shall produce the punch list document and provide follow-up to ensure all items are completed to the satisfaction of the Owner. The Professional shall also acquire for Owner the Certificate of Occupancy.

The Professional and its consultants shall participate in an inspection prior to the expiration of the one (1) year guarantee period against defective materials, equipment, and/or workmanship to determine any defects in materials, equipment, and/or workmanship since the date of Substantial Completion. The Professional shall produce the (1) year guarantee period punch list document for distribution to the Contractor(s) and provide follow-up to ensure all items are completed to the satisfaction of the Owner.

1.6.11 Operations and Maintenance Data. At the time of Substantial Completion of the Project, the Professional shall review and approve all required close-out documentation required per the Specifications including, but not limited to, manufacturers' operating instructions, maintenance instructions, certificates, warranties, guaranties, and other pertinent operating and maintenance data.

The Professional shall electronically scan all reviewed and approved Operation and Maintenance data being returned to the Contractor and provide a complete set of Operation and Maintenance data for the Project in electronic .pdf format (organized by building system) to the Owner within (1) month after receipt from the Contractor.

1.6.12 Record Drawings. At the time of Final Completion of the Project, the Professional shall collect from the Prime Contractor(s) their complete sets of as-built drawings and will, within 30 days after receipt from the Contractors, transpose all the changes recorded by the Contractors, onto a full set of reproducible drawings which shall become the record (as-built) drawings of the Project. The record drawings must also be put on electronic media compatible with the Owner's ACAD system. The Professional shall submit the as-built drawing set to the Owner in both ACAD dwg format and electronic pdf format (if project is utilizing Building Information Modeling an additional record drawing format shall be required and approved by the Owner).

The Professional shall electronically scan all approved shop drawings being returned to the Contractor and provide a complete set of the approved shop drawings for the Project in electronic pdf format (organized by CSI division) to the Owner within (1) month after Substantial Completion of the project.

1.6.13 Corrections. The Professional shall, without additional compensation, promptly correct any errors, omissions, deficiencies, or conflicts in its work product.

1.6.14 Errors and Omissions. If it becomes necessary during the course of construction to issue change orders which increase the cost of the Project because of the Professional's failure to produce proper and coordinated specifications and drawings, the Professional shall be assessed as follows:

1.6.14.1 Omission Change Order: A change order will be considered to be an omission change order when the additional work is necessitated by the Professional's omission of required elements or specifications in the Construction Documents, and where no work must be removed or replaced in order to carry out the change order. In such cases, the Professional shall be assessed in an amount equal to the difference between the amount of the change order and what the Owner would have paid had the omission not occurred, plus administrative costs incurred by the Owner.

1.6.14.2 Error Change Order. A change order will be considered to be an error change order when the additional work is necessitated by a failure of the Professional to conform to the applicable professional standard of care, resulting in an error which may be rectified only by removal and/or replacement of work which has been performed. In such cases, the Professional shall be assessed in an amount equal to the difference between the amount of the change order and what the Owner would have paid had the error not occurred.

At the completion of the project, the parties shall exercise good faith in seeking to amicably resolve any disputes that may exist regarding change orders. In the event that the parties are unable to reach an amicable resolution, the dispute resolution provision of Article 12.1 shall apply.

ARTICLE 2: ADDITIONAL RESPONSIBILITIES OF PROFESSIONAL

2.1 Compliance

The Professional is responsible for the compliance of the Construction Documents with all applicable permits, laws, regulations, and ordinances of all commissions, agencies and governments, federal, state and local, insofar as they are applicable to, and have jurisdiction over, the Project. The Professional shall make all required submittals with the advance knowledge of the Owner to, and shall obtain all required approvals from, the applicable agency in a timely manner so as not to cause delays to the Project. The Professional shall also attend all hearings/meetings required for securing necessary approvals and permits.

The Professional shall be responsible for producing a submission document set for approval by Labor and Industry as required by the Commonwealth of Pennsylvania to obtain the necessary building permit. The Professional shall also be responsible for additional submissions as required by the Labor and Industry Building permit processes and procedures throughout the project design and construction.

2.2 Cooperation With Local Bodies

During the design of the Project, the Professional shall keep informed and comply with the requirements of all local zoning, planning, and supervisory bodies. Should these requirements substantially increase the cost of the Project, or should any required approvals be withheld by the local bodies, the Professional shall immediately notify the Owner.

2.3 Proprietary Items, Copyrights, Patents

The Professional shall not include in the design of the Project unless directed by the Owner any equipment, material, or mode of construction which is proprietary or which contains a copyright or patent right relating to designs, plans, drawings, or specifications, unless the equipment, material, or mode of construction is different and fairly considered superior in quality and performance. If the Professional includes in the design of the Project any equipment, material, or mode of construction which is proprietary, it shall have prior approval by the Owner and it shall only be because the item is different and fairly considered superior in quality and performance, and not for the purpose of preventing or restricting competitive bidding. Professional may not knowingly list as acceptable any item which cannot comply with the Steel Products Procurement Act.

ARTICLE 3: OPTIONAL ADDITIONAL SERVICES

Unless required by the Project Scope, the services performed by the Professional, Professional's employees, and Professional's consultants as outlined in this Article are not included in Basic Services and shall be paid for by the Owner as provided in this Agreement in addition to the compensation for Basic Services.

None of these services shall be provided by the Professional, whether they are requested by the Owner or required due to circumstances unknown at the time of the execution of the Agreement, until approval in writing has been given by the Owner.

3.1 Project Representation

If more extensive representation at the site by the Professional is required by the Owner than is provided for under Basic Services, Paragraph 1.6, Construction Phase, the Professional shall provide one or more Project representatives to assist in carrying out such additional on-site representation.

Additional Project representative(s) shall be selected, employed, and directed by the Professional with the approval of the Owner, and the Professional shall be compensated therefore as mutually agreed, in advance, between the Owner and the Professional. Such supplemental agreement letter shall also delineate the duties and responsibilities of the additional Project representative(s).

3.2 Revisions to Approved Drawings and Specifications Prior to Construction Phase

3.2.1 Making revisions to the drawings and specifications requested by the Owner subsequent to the Owner's approval of the Construction Documents as outlined in Paragraph 1.4, Construction Document Phase, unless required to keep the estimated Construction Costs within the amount budgeted for same.

3.2.2 Making revisions to the drawings and specifications required by the enactment or revisions of codes, laws, or regulations subsequent to the completion of the Construction Documents as approved by the Owner.

3.3 Preplanning

Providing special analysis of the Owner's needs such as selection, planning, and development of the site; economic, demographic, and/or financial feasibility; preliminary design criteria and budget estimates; or other special studies except as herein provided as part of Basic Services.

3.4 Specialized Consultants

Providing unusual or specialized Consultant services other than those consistent with the inherent requirements of the Project scope and required to meet the functional needs of the Project.

3.5 Surveys

Providing a complete topographic survey and/or related aerial photography, ground control, photogrammetric plotting, property boundary survey, and the preparation of a metes and bounds legal description and a related plot.

3.6 Special Studies

Providing services related to the preparation of Environmental Assessments and/or Environmental Impact Statements, Energy Impact Statements, Analysis, or Feasibility Studies as may be required by local, state or federal government agencies, provided such services are in addition to the Project scope requirements.

3.7 Other Services

Providing services mutually agreed to that are not otherwise included in this Agreement.

ARTICLE 4: INDEMNIFICATION

To the fullest extent permitted by law, The Professional shall indemnify and hold harmless the Owner and the Owner's respective officers, directors, agents, servants, and employees from and against any and all liability, claims, losses, costs, expenses or damages, including reasonable attorneys' fees, costs and expenses, for property damage, bodily injury or death, that may arise as a result of the failure of the Professional or Professional's agents, employees or consultants, to comply with the applicable professional standards of care in rendering services in connection with this Agreement. Nothing in this indemnity section shall be construed to limit the insurance obligations agreed to herein.

ARTICLE 5: OWNER'S RESPONSIBILITIES

5.1 Basic Information

The Owner shall provide the Professional all information available at the time regarding requirements for the Project. Such information shall include:

5.1.1 A Project Program setting forth the Owner's objectives, space requirements and relationships, special equipment, and systems and site requirements.

5.1.2 A Project Budget including the amount allocated for the Construction Cost and all other anticipated costs and expenses.

5.1.3 A Project Schedule setting forth the times allotted for the Design and Construction Phases of the Project.

If the information furnished is not sufficient for the process of initiation of design solutions, the Professional shall notify the Owner immediately.

5.2 Surveys

The Owner shall furnish to the Professional, as available, surveys describing (as applicable) grades and lines of streets, alleys and pavements; the location of all rights-of-way restrictions, easements, encroachments, zoning classification, boundaries and contours of the site; location, dimensions and other necessary data pertaining to any existing buildings, other improvements and trees; information concerning existing utilities throughout the site, including inverts and depth; and shall establish a Project benchmark.

5.3 Geotechnical Engineering Services

The Owner shall pay the costs of all geotechnical engineering services required for the Project and requested by the Professional and Owner. Such services shall include, but are not limited to, tests borings, samples, field and laboratory reports, final soil reports and logs, and foundation engineering evaluations and recommendations.

5.4 Miscellaneous Tests, Inspections, and Reports

The Owner shall furnish, at the Owner's expense, air and water pollution, hazardous material, environmental, and any other miscellaneous laboratory tests, inspections, and reports as may be required.

5.5 Approval or Disapproval of Design Work

Any approval or failure of the Owner to disapprove or reject design work submitted by the Professional shall not constitute an acceptance of the work such as to relieve the Professional of his full responsibility to the Owner for the proper and professional performance of all design work on the Project.

5.6 Owner Response

The Owner shall act with reasonable promptness on all submissions from the Professional, which require action by the Owner, in order to avoid unreasonable delay in the progression of the Project through the various Phases outlined in Article 1.

5.7 Notice of Nonconformance

The Owner shall notify the Professional immediately if the Owner becomes or is made aware of any fault or defect in the Project or nonconformance by any party with the Contract Documents.

5.8 Copies of Owner’s Documents

The Owner shall supply the Professional with copies of the Owner's Form of Agreement between Owner and Contractor and General Conditions of the Contract for Construction for inclusion, by the Professional,

in the Bidding Documents. It shall be the Professional's responsibility to access, review, and implement The Pennsylvania State University Design and Construction Standards information provided by the Owner on the Office of Physical Plant web page. Refer to web page content listing in Exhibit C.

5.9 (OPTIONAL) Preconstruction Services

The Owner intends to independently retain a Construction Management firm to provide preconstruction and construction services. The Professional will assist the Owner in reviewing proposals and allow for two full days of meetings to interview and rank prospective construction management firms.

ARTICLE 6: CONSTRUCTION COST

6.1 Project Cost Determination

The Construction Cost for all work described in the Construction Documents, as approved by the Owner shall be determined as outlined below, with precedence in the order listed:

6.1.1 For completed construction, the total cost to the Owner for such construction work less the amount of any change order work necessary because of errors or omissions on the part of the Professional as defined in Subparagraph 1.6.14 Errors and Omissions.

6.1.2 If the Project is not constructed, the sum of the lowest bona fide bids(s) received for all of the work, providing said bids do not exceed the fixed limitation of Construction as defined in Paragraph 9.1.4 or as amended by written agreement by the Owner and Professional as the basis for design. If such bids exceed the limitation previously agreed upon, said limitation shall become the basis of cost.

6.1.3 If bids are not received, the latest Construction Cost Estimate prepared by the Professional, provided such estimate does not exceed the fixed limitation of construction as defined in Paragraph 9.1.4 or as amended by written agreement by the Owner and Professional as the basis for design.

6.2 Notification

It shall be the Professional's responsibility to promptly notify the Owner if, in the Professional's opinion, the Project cannot be designed and constructed within the fixed limitation on the cost of construction as authorized by the Owner. It is the Professional's responsibility to so notify the Owner as soon as such a situation becomes, or should have become, apparent to the Professional.

6.3 Owner Options

If, without written acknowledgment by the Owner, the Professional permits the Construction Contracts to be bid, and if the fixed limitation on the cost of Construction is exceeded by the lowest bona fide bid(s) or negotiated proposal, the Owner may: (1) give written approval of an increase in such fixed limit; (2) authorize rebidding or renegotiating of the Project; (3) terminate the Project and this Agreement in accordance herewith; or (4) cooperate in revising the Project scope or quality, or both, as required to reduce the construction cost. In the case of (4), the Professional, without additional charge to the Owner, shall consult with the Owner and shall revise and modify the Construction Documents as necessary to achieve compliance with the fixed limitation on construction cost. Absent negligence on the part of the Professional in making its estimates of probable construction cost, such modifications and revisions shall be the limit of the Professional's responsibility arising from the establishment of such fixed limitation of construction costs, and having done so, the Professional shall be entitled to compensation for all other services performed, in accordance with this Agreement.

If, after notification to the Owner by the Professional that the Project cannot be designed and constructed within the fixed limitation on the cost of construction, the Professional is by written authorization by the Owner instructed to proceed without a change in the Project program, design, or in the fixed limitation on the cost of construction, the Professional shall not be responsible for the cost of any subsequent redesign.

ARTICLE 7: OWNERSHIP AND USE OF DOCUMENTS

All preliminary studies, Construction Documents, as-built documents, record drawings, special requirements, cost estimates, building information models and all other data compiled by the Professional under this Agreement shall become the property of the Owner and may be used for any purpose desired by the Owner except to use for the construction of an identical facility not covered by this Agreement. The Professional shall not be liable for any reuse of these documents by the Owner.

ARTICLE 8: PROFESSIONAL'S EXPENSES

8.1 Billable Hourly Rates

8.1.1 Direct personnel expense is defined as the direct salaries of the principals, associates, and employees of the firm who are assigned to and are productively engaged on the Project, including clerical employees.

8.1.2 Billable hourly rates for this project are included in the personnel listing in Exhibit B. Billable hourly rates shall be the direct personnel expense rate for any principal's time and a multiple of a maximum of (2.5) the direct personnel expense per hour for the Professional's employees which shall include mandatory and customary benefits such as employment taxes, statutory employee benefits, insurance, sick leave, holidays, vacations, pensions, and similar contributions and benefits.

8.1.3 The billable hourly rates set forth in Exhibit B may be adjusted annually, subject to the Owner's approval, in accordance with generally accepted salary review practices of the profession. Payroll certification shall be provided by the Professional to the Owner upon demand.

8.2 Reimbursable Expenses

Reimbursable expenses are in addition to compensation for Basic and Additional Services and include those expenses as follows for which the Professional shall be reimbursed a not-to-exceed amount for his direct "out-of-pocket" costs (no mark-up allowed on reimbursable expenses). Reimbursable expenses shall be submitted with supporting documentation, which shall include detailed, itemized receipts. Where requested or authorized by the Owner, the following shall be reimbursable:

8.2.1 Out-of-town and out-of-state travel expenses and any necessary fee or permit payment required and paid to any governing body or authority having jurisdiction over the Project. Air travel expenses shall be approved in advance by the Owner. Maximum individual per diem expenses for travel to the job site shall be based on the Owner’s allowable per diem for lodging and meals for that location.

8.2.2 Expense of reproductions including reproductions of record drawings, postage and handling of Drawings, Specifications, and other documents including the preparation and distribution of all necessary bidding correspondence and documents, receipt of bid proposals, and construction contract preparation. Reproductions made for the Professional’s own use or review shall not be included.

8.2.3 Expense of renderings, models, mock-ups requested by the Owner, and/or discs for electronic format submissions of record drawings.

8.2.4 Expenses of specialized consultants identified as optional additional services in Article 3 of this Agreement.

8.2.5 Reimbursable expenses for individual travel, meals, and lodging expenses are limited to individuals under the direct employ of the Professional or their approved consultants.

8.3 Cost for Consultants (consultants not included in the Basic Services proposal/procured after award)

The Professional shall be reimbursed on a multiple of one and one-tenth (1.1) times the amounts billed to the Professional for such services.

ARTICLE 9: COMPENSATION AND PAYMENT

9.1 Compensation and Payment

9.1.1 The Owner agrees to pay the Professional as compensation for those Basic Services described in Article 1, Article 2, and any other agreed upon services described in Article 3: (Insert information in appropriate option below.)

(Option #1) __% of the authorized and approved Construction Cost as defined in Article 6.

(Option #2) an amount not to exceed _____ Dollars ($_____) for the Professional's Personnel Expense as defined in Paragraph 8.1 and cost for Consultants.

(Option #3) a fixed sum of _____ Dollars ($_____).

9.1.2 Payment for Basic Services will be made monthly by the Owner in proportion to the service actually performed, but not to exceed the following percentages at the completion of each Phase.

Schematic Phase	15%
Design Development Phase	20%
Construction Document Phase	35%
Bidding Phase	5%
Construction Phase/Close-Out	25%

The close-out portion of the project refers to the development of the punch list and required follow-up, the submission of the as-built documents and other close-out document requirements, ongoing commissioning support, ongoing support of design-related project issues, and the performance of the (1) year bond inspection and punch-list development.

9.1.3 Reimbursable Expenses

The Owner agrees to pay the Professional as compensation for the Professional's Reimbursable Expenses, as defined in Paragraph 8.2, an amount not to exceed _____ Dollars ($_____).

9.1.4 The fixed limitation on the cost of construction as defined by this Agreement shall be _____ Dollars ($_____).

9.2 Optional Additional Services Compensation

If approved, the Owner agrees to compensate the Professional for Optional Additional Services beyond Basic Services, as defined in Article 3 in accordance with the rates defined in Exhibit B and as approved by the Owner.

9.3 Payment Procedures

9.3.1 Payments are due and payable forty-five (45) days from the date that the Professional's invoice is approved by the Owner.

9.3.2 Submission of the Professional's invoice for final payment and reimbursement shall further constitute the Professional's representation to the Owner that, upon receipt from the Owner of the amount invoiced, all obligations of the Professional to others, including its consultants, incurred in connection with the Project will be paid in full.

9.3.3 Documentation accurately reflecting the time expended by the Professional and its personnel and records of Reimbursable Expenses shall be maintained by the Professional and shall be available to the Owner for review and copying upon request.

9.4 Owner's Right to Withhold Payment

In the event that the Owner becomes credibly informed that any representation of the Professional provided pursuant to Articles 8 or 9 is wholly or partially inaccurate, the Owner may withhold payment of sums then or in the future otherwise due to the Professional until the inaccuracy, and the cause thereof, is corrected to the Owner's reasonable satisfaction.

ARTICLE 10: INSURANCE

10.1 Professional Liability Insurance

The Professional shall secure and maintain, at its sole cost and expense, Professional Liability Insurance to protect against loss resulting from design errors and omissions, failure to coordinate the Construction Documents of the Project, and failure to execute the construction administration duties for the Project.

10.1.1 Unless otherwise specifically provided in this Agreement, the Professional shall secure and maintain Professional Liability Insurance with limits not less than $1,000,000, or the total of the Professional's fee, whichever is greater.

10.1.2 The Professional shall secure and maintain Professional Liability Insurance, as required above, up to and including one year after the date of the (1) year guarantee inspection of the contracts under the Project.

10.2 General Liability Insurance

The Professional shall secure and maintain, at its sole cost and expense, adequate General Liability Insurance to protect the Owner and the Owner's respective officers, agents, servants, and employees against claims arising out of the Professional's services during the design and construction of the Project for damages in law or equity for property damage and bodily injury, including wrongful death. The Owner shall be named as an additional insured in the policy, and the Professional shall submit a Certificate of Insurance to the Owner prior to execution of the Agreement. The limits of coverage shall be not less than $1,000,000. The Professional is required to secure and maintain General Liability Insurance, up to and including one year after the date of the (1) year guarantee inspection of the contracts under the Project.

10.3 Certificate of Insurance

The Professional shall furnish to the Owner annually, unless otherwise requested, during the active terms of this Agreement, a Certificate from an Insurance Carrier authorized to do business in Pennsylvania indicating: (1) the existence of the insurance required under this Article; (2) the amount of the deductible; and (3) the amount of coverage of such insurance. The Professional shall submit a Certificate of Insurance covering the Professional Liability Insurance requirement up to and including one year after the date of the (1) year guarantee inspection of the contracts under the Project.

10.4 Failure to Comply with Insurance Requirements

During any period in which the Professional is not in compliance with the terms of this Article, no compensation shall be paid by the Owner to the Professional.

ARTICLE 11: TERMINATION, ABANDONMENT, SUSPENSION, REACTIVATION

11.1 Termination by Owner

The Owner shall have the right at any time, for any reason, to terminate this Agreement upon not less than seven (7) calendar days' written notice to the Professional. The Professional shall comply with all reasonable instructions of the Owner then or subsequently given relating to such termination, including but not limited to: instructions concerning delivery of drawings, sketches, and other architectural/engineering data to the Owner; discontinuance of the work on outstanding contracts; and furnishing to the Owner information concerning all action to be taken respecting outstanding agreements with consultants, contracts, awards, orders, or other matters.

Copies of Construction Documents and any other materials in existence as of the date of termination will be furnished to the Owner as requested.

11.2 Compensation in the Event of Termination

In the event of termination, the Professional shall be compensated for its services to the termination date based upon services performed on any Phase to the termination date in accordance with the Compensation and Payment schedule contained herein at Article 9.1.2.

Such compensation shall be the Professional's sole and exclusive remedy for termination.

11.3 Suspension of Work

The Owner may, at any time, direct the Professional to suspend all work on the Project, or on any part thereof, pending receipt of further notice from the Owner. In all such cases the Owner and the Professional shall agree upon an appropriate phasing-out of the work in such a manner that the work may be resumed with a minimum of added cost to the Owner, but in no event shall the work be continued beyond the completion of the Phase in which it then is. The Professional shall be compensated as if the Agreement had been terminated at the completion of the agreed Phase. If work is suspended during the Construction Phase, compensation shall be paid for all Professional services provided to the date of suspension, but no additional compensation shall be paid during the period of suspension.

11.4 Reactivation Compensation

When a Project has been suspended or terminated for a longer time than six (6) months and is subsequently reactivated using the same Professional, the Owner and the Professional shall agree, prior to the beginning of the reactivation work, upon a lump sum, or other basis, of reimbursement to the Professional for its extra start-up costs occasioned as a result of the work having been suspended or terminated.

ARTICLE 12: MISCELLANEOUS PROVISIONS

12.1 Dispute Resolution / Applicable Law

After Final Completion of the Project, any and all claims, disputes or controversies arising under, out of, or in connection with this Agreement, which the parties shall be unable to resolve within sixty (60) days of the time when the issue is first raised with the other party, shall be mediated in good faith. The party raising such dispute shall promptly advise the other party of such claim, dispute or controversy, in writing, describing in reasonable detail the nature of such dispute. By not later than five (5) business days after the recipient has received such notice of dispute, each party shall have selected for itself a representative who shall have the authority to bind such party, and shall additionally have advised the other party in writing of the name and title of such representative. By not later than ten (10) business days after the date of such notice of dispute, the parties shall mutually select a Pennsylvania-based mediator, and such representatives shall schedule a date for mediation, not to exceed one (1) day in length, and less where applicable. The mediation session shall take place on the University Park Campus of The Pennsylvania State University, or upon the campus where the Work was performed, at the option of the Owner. The parties shall enter into good faith mediation and shall share the costs equally.

If the representatives of the parties have not been able to resolve the dispute within fifteen (15) business days after such mediation hearing, the parties shall have the right to pursue any other remedies legally available to resolve such dispute in the Court of Common Pleas of Centre County, Pennsylvania, jurisdiction to which the parties to this Agreement hereby irrevocably consent and submit.

Notwithstanding the foregoing, nothing in this clause shall be construed to waive any rights or timely performance of any obligations existing under this Agreement.

In all respects, this Agreement shall be interpreted and construed in accordance with the internal laws (and not the law of conflicts) of the Commonwealth of Pennsylvania.

12.2 Successors and Assigns

This Agreement shall be binding on the successors and assigns of the parties hereto.

12.3 Assignment

Neither the Owner nor the Professional shall assign, sublet, or in any manner transfer any right, duty, or obligation under this Agreement without prior written consent of the other party.

12.4 Extent of Agreement

This Agreement, including any and all schedules, proposals and/or terms and conditions attached hereto, represent the entire and integrated agreement between the Owner and the Professional and supersedes all prior negotiations, representations, or agreements, either written or oral. This Agreement may be amended only by written instrument signed by both the Owner and the Professional. In the event of a conflict between the provisions of this Agreement and those of any other document, including any that are attached hereto, the provisions of this Agreement shall prevail.

12.5 Third Party

Nothing contained in this Agreement shall create a contractual relationship with or a cause of action in favor of a third party against either the Owner or the Professional.

12.6 Hazardous Material

Unless otherwise provided in this Agreement, the Professional and its consultants shall have no responsibility for the discovery, presence, handling, removal, or disposal of, or exposure of persons to hazardous materials in any form at the Project site, including but not limited to asbestos, asbestos products, polychlorinated biphenyl (PCB), or other toxic material.

If the Professional encounters or suspects hazardous or toxic material, the Professional shall advise the Owner immediately.

12.7 Promotional Material

The Professional shall not issue or disclose to third parties any information relating to the Project without prior consent of the Owner, except to the extent necessary to coordinate the Work with the Owner’s agent, Contractors, Subcontractors, etc. The Professional may, with written consent of the Owner, include design representation of the Project, including interior and exterior photographs, among the Professional's promotional and professional materials.

12.8 Terms/General Conditions

Terms contained in this Agreement and which are not defined herein shall have the same meaning as those in the Owner's Form of Agreement between Owner and Contractor and the Owner's General Conditions of the Contract for Construction, current as of the date of this Agreement.

12.9 Background Check Policy

The Professional confirms that all employees (including the employees of any subconsultants/subcontractors) assigned to this project, and who conducted their work on Penn State premises, have had background checks that meet or exceed the University's standards for the type of work being performed. All background checks should be in accordance with the background check process for third-party employees outlined in Penn State Policy HR99 Background Check Process (http://guru.psu.edu/policies/OHR/hr99.html).

12.10 Amendments

If any amendment to this Agreement includes additional Design Services, such additional Design Services shall be in accordance with The Pennsylvania State University Design and Construction Standards that are current as of the date of execution of the Amendment, unless otherwise agreed to by the Owner in writing. The Pennsylvania State University Design and Construction Standards can be found within the Office of Physical Plant web page (www.opp.psu.edu).

ARTICLE 13: SCHEDULE OF EXHIBITS

The attached Exhibits are part of this agreement:

Exhibit A: Professional's proposal dated _____ (Professional's proposal, or some portion thereof, is attached hereto for the sole purpose of describing the scope of work that is to be completed pursuant to this Agreement. The parties agree that any additional terms or conditions that may appear within the attached proposal, or portion thereof, shall not bind the parties, shall not become a part of this Agreement, and shall not be incorporated within this Agreement).

Exhibit B: Professional's Billable Hourly Rates.

Exhibit C: The Pennsylvania State University Design and Construction Standards listing (screen print from the Office of Physical Plant web page).

(OPTIONAL) Exhibit D: Project Schedule (including design submission dates).

THE PENNSYLVANIA STATE UNIVERSITY
OWNER

_____ _____
Title ATTEST, Secretary

(PROFESSIONAL COMPANY NAME)
PROFESSIONAL

_____ _____
Signature ATTEST, Secretary

Name:_____
(print name of person signing above)

Title:_____
(print title of person signing above)

Federal ID Number:_____

Attachments