Predesign Study

Eastern Washington University
Science Building Renovation

Prepared for:
State of Washington Office of Financial Management

By:
Eastern Washington University | Construction and Planning Services
in cooperation with Integrus Architecture

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integrus ARCHITECTURE

Section 1 | Executive Summary

Section 2 | Project Analysis

2.1 Discussion of Operational Needs
2.2 Discussion of Alternatives
2.3 Discussion of Selected Alternative
2.4 Summary of LCCA Results Using the LCCT
2.5 Identification of Issues
2.6 Prior Planning and History
2.7 Stakeholders
2.8 Project Description
2.9 Implementation Approach
2.10 Project Management
2.11 Schedule

Section 3 | Program Analysis

3.1 Assumptions
3.2 Functions and FTEs
3.3 Spatial Relationships Between the Facility and Site
3.4 Interrelationships and Adjacencies of Functions
3.5 Major Equipment
3.6 Future Needs and Flexibility/Special Systems Such as Environmental, Information Technology, etc.
3.7 Sustainability, Energy Use and Greenhouse Gas Emissions Reduction
3.8 Applicable Codes and Regulations

Section 4 | Site Analysis

4.1 Potential Sites
4.2 Building Footprint
4.3 Site Considerations Such as Physical, Regulatory and Access Issues
4.4 Acquisition Process

Section 5 | Project Budget Analysis

5.1 Assumptions
5.2 Detailed Estimates
5.3 Funding Sources
5.4 Project Cost Estimate
5.5 Summary of LCCA Results Using the LCCT
5.6 Funding Methods
5.7 Sign-off by Agency

Section 6 | Master Plan and Policy Coordination

6.1 Impacts to Existing Plans
6.2 Adherence to Significant State Policies

Section 7 | Facility Operations and Maintenance Requirements

7.1 Assumptions
7.2 Operating Costs in Table Form
7.3 Staffing Plan (Capital and Operating)

Section 8 | Project Drawings and Diagrams

8.1 Site Plans
8.2 Building Plans
8.3 Building Volumes
8.4 Elevations

Section 9 | Appendices

A Predesign Checklist
B Program Space Summary
C Room Diagrams and Data Sheets
D Project Budget Unit Cost Detail
E Sustainable Design Scorecard
F A Letter from DAHP on the Impact of Potential Sites on Cultural Resources
G Executive Report from the Life Cycle Cost Analysis
H Mechanical Building Assessment
I Electrical Building Assessment
J Project Schedule

section 1.0
executive summary

1.0 Executive Summary

1.1 Authority

This Predesign Study was authorized by and contracted through Eastern Washington University. This document has been prepared utilizing the format recommended in the July 2014 Predesign Manual developed by the Office of Financial Management, State of Washington.

The Eastern Washington University Project Request was completed in August 2014. The Science Building Renovation would be a major capital project for Eastern Washington University. All departments have taken a critical look at their current spaces through the predesign process, and what spaces need to be developed in order to best serve the students, the College, and the State.

1.2 Project History

In 1960, Eastern Washington University constructed a science building to accommodate a variety of science programs. The two story building was originally comprised of three wings-to the West, North, and East. Offices were designed to be grouped toward the north side of the building while classrooms and labs were dispersed throughout each wing. Over the years, the building has seen as series of remodels, the most significant of which was in 1988 where a south wing was constructed creating a link between the West and East wings and defined a central courtyard. Additional remodels in 1991 and 1993 saw modifications to interior spaces to upgrade labs and classrooms with new mechanical systems for these spaces as well as exterior window upgrades.

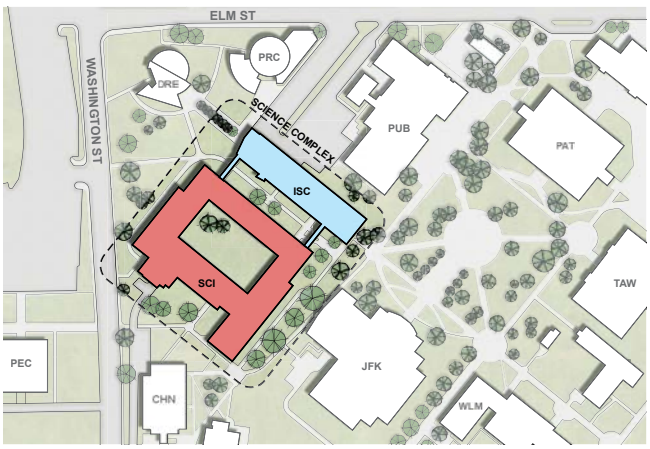
1.3 Facility Needs

The EWU Science program no longer functions in its current state. The Science Building has inadequate capacity to accommodate the operational and programmatic shortcomings associated with housing the current science program. The Science Building itself contains over 400 accessibility deficiencies, health and safety issues, HVAC/ Electrical problems, and overall building condition concerns such as the cost of maintenance repairs to keep it running and inefficient energy usage.

Taking no action to renovate the Science building stifles Eastern Washington University's ability to meet their strategic goals, the State's ability to address the growing demand within our higher education system specifically in STEM related fields, and promotes ongoing health, safety, welfare, maintenance, and repair issues on the campus.

Currently, a design for a separate Interdisciplinary Science Center (ISC Building) is in process which will be connected to the existing Science Building via sky bridges on multiple levels. Several spaces currently in the Science Building are being relocated to the new ISC building. The vacated spaces in the Science Building provide the opportunity for the needed program growth in the Chemistry, Biology, Physics, and Geology departments. The majority of the science program however, still remains in the existing Science building. This area needs to be renovated to take strategic advantage of the areas vacated for growth and to resolve the numerous deficiencies with the current Science Building.

EWU Campus Map, Science Building (shown in red) and new ISC Building (shown in blue)



1.4 Proposed Solution

The following request reflects efforts to increase instructional productivity, leverage existing square footage, optimize the use of existing facilities, and create the potential for collaboration between students and academic departments.

The Science Building Renovation project will directly foster excellence in learning by improving and expanding research and teaching facilities, thereby increasing opportunities for undergraduate and graduate student research. Additionally, the project fosters individual student-faculty interaction through the incorporation of collaboration/ informal learning spaces, and through the building's connection to the adjacent Interdisciplinary Science Center (ISC).

The project has the following goals:

- Meet EWU's and the Science Programs projected growth in STEM and Healthcare related professions.
- Address a shortage of suitable classroom, office, research and lab space within the science department and create student interaction/ collaborative spaces throughout the new Science Renovation project.
- Relocate programmatic space from the basement to the main level where it meets ADA requirements and can be available to all students.
- Reduce energy consumption and resolve current issues and inefficiencies in the mechanical and electrical configuration. Teaching, research and lab support spaces need to be updated to meet current programmatic needs.
- Encourage collaboration and synergy across departments, promote increased flow and movement between the Science Building Renovation and new ISC Building.

1.5 Section 2 - Project Analysis

The mission of Eastern Washington University is to "expand opportunities for personal transformation through excellence in learning." Based on the core themes derived from the mission statement, a series of project goals with objectives were identified based on University goals. The Science Renovation will address each of these goals:

- Goal 1: Student Success (Improve retention and graduation rates, provide greater access to support services, support EWU faculty and staff teaching capacities)
- Goal 2: Innovation and Opportunity (Create EWU Virtual Campus, support research programs at all levels faculty, graduate and undergraduate)
- Goal 3: Community Engagement (Strengthen student, staff and faculty participation in community-based activities, play a larger role in the scientific community, Strengthen existing and create new relationships outside of EWU)

Increasing student populations, more interest in STEM related fields, and a greater regional demand for graduates within STEM and healthcare fields have put pressure on science program growth to fulfill the basic and advanced science courses - especially biology, chemistry, physics, and geology classes - which are prerequisites to completing degree requirements. Given the current facilities available, EWU will not be able to meet the increased demand for either quality or quantity of science classes available. These inadequacies can be addressed through the renovation of the existing Science building.

The following is a proposed project schedule for the facility that is based upon the assumption that funds will be available for design by July 1, 2017 and construction for Phase I by July 1, 2019. A study of the potential budget impacts was undertaken during the predesign process which found that a capital budget request of a single phase renovation and a two phase renovation in a single biennia were too large as a single request. As a result, the project phases are proposed to be funded in two separate biennia, allowing the project to move forward with two smaller capital budget requests.

Phase I	Project Schedule - Phase I		
	Activity	**Start Date**	**Completion Date**
	Predesign Study	January 2016	July 2016
	Design (SD, DD, & CD's)	February 2018	June 2019
	Bid	July 2019	August 2019
	Construction (16 months)	September 2019	
	50% Construction Completion	May 2020	
	Substantial Completion	January 2021	
	Occupancy	January 2021	
	Final Contract Closeout		February 2021

Phase II	Project Schedule - Phase II		
	Activity	**Start Date**	**Completion Date**
	Design (SD & DD)	February 2018	January 2019
	Program Verification	November 2020	January 2021
	Design (Construction Documents)	January 2021	July 2021
	Bid	July 2021	August 2021
	Construction (16 months)	January 2021	
	50% Construction Completion	May 2022	
	Substantial Completion	January 2023	
	Occupancy	January 2023	
	Final Contract Closeout		February 2023

See Appendix J for a graphic version of the project schedule.

In order to have a comprehensive understanding of the project, it is important that the entire building is studied initially to vet program locations and systems needs. For this reason, it is important to provide design funding through Design Development for Phase I and Phase II in the initial Phase I budget request.

1.6 Section 3 - Program Analysis

The program of the Science Building Renovation is interwoven with the program of a new facility currently under design called the Interdisciplinary Science Center (ISC). Many of the teaching laboratories within the current Science Building will be vacated as these spaces move to the new ISC building. The vacated area within the Science Building will then be used to accommodate the additional research laboratories, classrooms, and offices needed to support the Chemistry/Biochemistry, Physics, Biology and Geology programs.

A detailed summary of the required program as well as room diagrams and data sheets for each space are included in Section 9, Appendicies B and C. These documents provide specific program requirements for each type of space within the Science Building Renovation and help validate that the program fits the amount of space allotted for each individual room. The space summary is separated by departmental needs Chemistry/Biochemistry, Physics, Biology, Geology, and Shared Facilities. There is 102,022 square feet of total assignable programed space. As the project is phased, only 73,498 gross square feet is proposed to be rennovated in Phase I.

1.7 Section 4 - Site Analysis

This predesign seeks to renovate the existing Science Building, which is thought of as the second half of the Science Complex project. As this is a renovation project and there are inherent benefits to locating all of the biology, chemistry, geology, and physics programs in a single location, no additional potential sites were considered for the project.

The Science Building is located on the western side of campus bordering Washington Street and just south of Dressler and Pearce Hall. The building's footprint is 148,149 gross square feet in size and stands two to three stories tall relative to the surrounding grade. Only minor modifications to the building's footprint are anticipated including changes to the loading dock area, the addition of a small area to expand chiller capacity, and a renovation of the exterior courtyard that lies within the bounds of the existing building. However, the general footprint of the building will otherwise remain the same.

1.8 Section 5 - Budget Analysis

The College is requesting $51,344,000.00 in State Capital funds for the total project cost for Phase I and $52,693,000 for Phase II. See Section 5, "Project Budget Analysis" for a detailed breakdown of costs.

1.9 Section 6 - Master Plan and Policy Coordination

In 2014, EWU adopted a comprehensive master plan for the campus. The renovation of the Science Building shifts the location of the Science Complex from the proposed location along the southeast edge of campus to the northwest edge of campus. This location promotes the improvement of the campus open spaces in this quadrant and creates an opportunity for a science commons along the northwest edge, an area identified in the campus master plan as a key zone of opportunity for improvement.

The Master Plan indicates that with the expected annual enrollment increase of 2% and the state benchmark of 197 GSF per FTE, an additional 406,500 GSF may be required on the Cheney campus by the year 2023. The square footage added to the campus with the addition of the Interdisciplinary Science Center (ISC) contributes to accommodating this expected growth.

1.10 Section 7 - Facility Operations & Maintenance

According to the recent and projected M&O funding rates for Washington State Universities, the anticipated annual impact on the college's operating and maintenance budget is $12.13 per net new area (gsf) projected to 2020. The total annual operating budget for the existing Science Building currently is $1,416,306 and is projected to rise to $1,797,047 by June of 2020 if the remodel is not completed. The Science Renovation project will reduce energy consumption by around 50% when both phases are complete and the new systems will require less maintenance, reducing the cost of utilities and maintenance staff.

section 2.0
project analysis

2.0 Project Analysis

2.1 Discussion of Operational Needs

Demand for Science Programs Increasing

Recently, Eastern Washington University (EWU) has seen twelve percent growth in student population; within the next ten years, another twenty percent growth in student population is expected. The combined increases in student population, as well as an increased interest in STEM fields, has led to a disproportionate number of students seeking degrees in the sciences (20.6% growth in three years) when compared to past trends.

Additionally, regional demand for students in STEM (Science, Technology, Engineering, and Math) related fields has also increased, especially in the engineering, computer science, environmental, and healthcare fields. The growth of healthcare in the Spokane region will mean that a larger number of students will seek related degrees to fill the increased need. Increasing numbers of pre-med students have pushed the need for chemistry and biology courses. Growth in accredited mechanical and electrical engineering programs put pressure on prerequisite chemistry and physics classes.

Increasing student populations, more interest in STEM related fields, and a greater regional demand for graduates within STEM and healthcare fields have put pressure on science program growth to fulfill the basic and advanced science courses - especially biology, chemistry, physics, and geology classes - which are prerequisites to completing degree requirements. Given the current facilities available, EWU will not be able to meet the increased demand for either quality or quantity of science classes available.

Inadequate Capacity and Amenities within the Science Building

The existing science building is the only building currently on the EWU campus capable of supporting chemistry, physics, biology, and geology teaching and research. Lower division chemistry, general biology, anatomy, and physiology courses are at, or beyond the capacity of the space available in the teaching laboratories of the Science Building. Many introductory classes are currently offered as lecture only, without a laboratory component, due to lack of space. Existing labs are currently insufficient in size to accommodate the increased number of students per section. Additionally, research lab space is not able to serve the research needs required to add faculty or address the requirements of the various science majors. Key program areas like the Vivarium, Greenhouse, and Aquatics labs lack space to accommodate student research projects. The program also lacks an inorganic/ physical chemistry and an analytical chemistry teaching lab, which are key program components in the degree field. In addition to needing teaching laboratory space, there is also a great need for adjacent support space, including preparation space for teaching labs and equipment storage. Utilization rates for teaching labs is reduced as lab support storage occurs within the classrooms and more time is required to prepare the lab for each class.

Science Building's Condition Inhibits EWU's Ability to Meet Strategic Goals

The Science building has significant deficiencies that contradict the University's mission to provide "an excellent student-centered learning environment" through "exceptional facilities." In its current state, the Science Building cannot support the region's growing needs for STEM and healthcare degrees, thereby reducing EWU's capacity and ability to "build upon the region's assets and offer a broad range of choices as appropriate to the needs of the University's students and the region." The building's deficiencies are numerous including:

- Accessibility Violations – Over 400 separate accessibility deficiencies were found in the existing Science Building during a comprehensive, campus-wide survey. While most of the deficiencies are related to laboratory benches and sinks, doors, and restrooms, there are also large aquatics tanks located in a basement without elevator access or adequate circulation space.

Several classroom spaces have accessibility issues.

- Health and Safety Issues – Health and safety problems are rampant throughout the building including chemical storage without adequate ventilation and spill containment, an inability to isolate gas burners in labs, and a lack of adequate distribution for inert gasses. Some fume hoods are not ventilated at night, some do not maintain acceptable face velocity, and pressures cannot be maintained in the labs during set back modes risking contamination to non-lab spaces.

Mechanical systems on the roof show individual fume hood exhausting.

- HVAC Problems – Science buildings typically have much higher ventilation requirements due to the use of fume hoods and other devices designed to keep students, faculty and staff safe from the potential of harmful exposure of science related materials. However, compared to modern science facilities, the EWU Science Building is very inefficient, requiring twice the amount of energy to operate the building. Systems are 25-30 years old and beyond the normally expected service life. The Science Building contains noisy and inefficient heating, ventilating and air conditioning (HVAC) systems which cannot cope with the demands of air pressure differentials and air change rates required for the science activities that occur in the building. Air intakes are located at grade, drawing debris and insects into the inhabited areas of the building. HVAC systems vibrate the building's structure, radiating noise throughout teaching spaces; noise levels in some labs were so high, they exceeded the acceptable decibel level for instruction. Inadequate air flow, cooling, and humidification from the mechanical system prevents spaces such as the Vivarium from utilizing modern ventilated cages which would protect animal health. It is anticipated that the new programmed uses in the science building will require less than half of the current exhaust currently provided in the facility so equipment replacement and upgraded control systems will significantly improve the energy performance of this building. Reprogramming the uses within the building will result in modifications to most of the above ceiling mechanical systems such as ductwork, branch piping and air terminal units. Current use of individual exhaust fans for each fume hood has created numerous roof penetrations which have contributed to leaks in the building. Past roof leaks have impacted the use of teaching and research spaces until they can be restored and have increased the maintenance costs of the building.

- Lack of Student Space – The existing Science Building has none of the non-classroom space that would "create an environment where students succeed at their highest level" as seen in the University's strategic plan. Open computer labs are few in number and are a highly sought after resource for students. Informal student gathering spaces which promote collaboration and study are completely absent from the building. Reasonable corridor widths, which could ordinarily provide areas of informal student use, have been retrofitted with obtrusive duct shafts and display scientific collections - both uses which inhibit the ability to utilize the space for gathering and create overcrowding conditions during the transition time between classes.
- Building Condition – The current physical condition of the Science Building ranks well below that of EWU's peer institutions and it's age is more than double that of buildings at peer institutions. This puts EWU at a competitive disadvantage in the current educational market.
- Cost of Maintenance and Repairs – Average maintenance and repair costs for the existing Science Building are over $366,000 per year, not including grounds and custodial services. In addition to this number, almost $400,000 is spent from the capital minor works accounts for facility preservation, health and safety code compliance and backlog reduction. This equates to around $9.56 per square foot per year which is nearly six times the cost per square foot of maintenance and repairs for the five year old Computing & Engineering Science Building at $1.68 per square foot per year. Deferral of critical maintenance and repair may happen simply due to the cumulative effect on the annual operating budget, which will then lead to further deterioration of the building.
- Cost of Energy – The existing Science Building is currently the largest energy user on the campus at EWU at 13.7% of the total campus energy used which is large considering the building only accounts for 5.4% of the total campus square footage. While it is normal for science buildings to have a large use of campus energy, renovating the existing Science Building would have a very positive impact on campus energy costs.
- Technology Deficiencies – The current building is inadequate

Student informal gathering spaces are very limited. During class change times, these spaces are unusable.

Several spaces in the existing building show evidence of water damage.

for supporting the technology needs of EWU. Some of these issues are inherent in the design of a building that could not predict network connectivity. Access to cable infrastructure is more difficult than a modern lab building limiting the flexibility to make quick changes. Research labs are heavily data driven and the importance of integrating technology into research is only increasing.

- Electrical Issues - Due to the age of the existing electrical distribution equipment in the existing Science Building, it has become difficult to obtain parts. Additionally, safety standards have changed in the 25 years since the existing equipment was installed and improvements have been made since that time. Some locations in below grade mechanical rooms show signs of water damage and some of the original 1960 service equipment still in use is no longer safe to service. Replacement of the distribution system, lighting systems, audio visual, communications, and emergency distribution systems are required. Fire alarm systems will need to be modified to accommodate the renovated space needs. Also, the existing emergency generator does not meet the current National Electric Code for separation of emergency and standby loads, thereby requiring modification to the system.
- Structural Issues - Several items were in an ASCE 41-13 Seismic Evaluation and Retrofit of Existing Buildings Tier 1 Analysis. It is recommended that the following deficiencies be corrected with a significant renovation:
  - The structural walls parallel to the roof framing are not properly attached to the roof diaphragms. Historical data shows that improperly anchored walls can fall away from a building during an earthquake.
  - Several of the interior shear walls do not extend the full width of the building, and drag struts should be added to the roof to collect and deliver lateral forces from the roof diaphragm to the shear walls.
  - Proper drag struts should be added to the roof diaphragm around openings/discontinuities at the planetarium, and around the mechanical penthouse.
  - The original building currently has two seismic joints which are approximately 2" wide. This gap does not meet recommended building separation. Further analysis is necessary, but the joint may need to be widened to prevent the buildings from pounding on one another during an earthquake.
  - As this is a science building, there may be piping containing flammable materials. Any such piping must be properly anchored and braced.
  - Any equipment used to power or control life safety systems must be properly anchored or braced.

2.2 Discussion of Alternatives

This predesign study considered four possible alternatives. Each of these alternatives were based on the fact that funding has been provided for the adjacent Interdisciplinary Science Building (ISC), currently under design to the north of the existing science building. Classroom and lab spaces moving into the ISC will provide vacant space within the existing building that can accommodate student population and program growth, increase the number and size of teaching and research labs, and bring the building up to current standards with renovation. The sensitive nature of the research conducted within the building requires that the disturbance associated with a major renovation project be minimal. Research experiments currnetly being conducted can not afford significant down time or complex moves. As a result, most of the alternatives studied focused on phasing as it relates to the existing science renovation. The alternatives studied were as follows:

Alternative I: Single Phase Renovation of the Existing Science Building

A single-phase renovation of the building has several advantages. First, overall costs are reduced as the Contractor can efficiently sequence construction and is not responsible for maintaining a building that is simultaneously operating while under construction. Mechanical system tie-ins can be conducted without consideration of disruption to occupants or research. The efficiency of construction sequencing results in a reduced construction schedule so the building can be occupied more quickly; occupants are only required to move out of their existing spaces and then back into their newly renovated space.

In renovating the Science Building, a clean separation could be established at the northern connection to the Interdisciplinary Science Center (ISC). This separation would allow the Contractor access the perimeter of the building, simplifying site logistics, while isolating the renovation work from the ISC.

Potential two phase renovation approach.

However, a major impediment to utilizing this alternative is the availability of adequate surge space on campus with the necessary infrastructure and services to accommodate research laboratories. **As the existing Science Building is the only building on campus capable of supporting chemistry, physics, biology, and geology research - this alternative - while the most cost effective and timely, is not a viable option.**

Phasing Approach	Esc. MACC	Esc. Total Project	Construction Duration	Final Occupancy
One-phase (Single Biennium)	$59,380,000	$96,479,000	20 months	July 2021

Alternative II: Two-Phase Renovation of the Existing Science Building (Funded In a Single Biennium)

A two-phase renovation of the existing building allows approximately half of the existing program space to remain in operation while the second half of the building is under construction. The construction of the Interdisciplinary Science Center (ISC) will provide much needed classroom and teaching labs for biology, chemistry, physics, and geology. Assuming that construction of the ISC is complete prior to renovation of the existing science building, classroom and some of the teaching laboratory spaces would be relocated into the new building. The remaining classroom, teaching lab, and office spaces could be relocated to a

number of different places on campus. These two shifts would provide enough space within the building to accommodate a two-phased construction approach. Effectively the remaining research labs within the building would remain in operation while the second half of the building is under construction. However, a longer construction schedule and additional design time would be required for a two-phased approach as well as increased construction cost when compared to a single phase approach. These factors, as well as the unknown nature of renovation work, make an alternative project delivery method, such as GC/CM, attractive in mitigating schedule and cost impacts. **Given the constraints associated with surging research space, Alternative II better addresses the complex timing and sequencing required to minimize research disruption when an alternative delivery method is utilized, however, the costs associated with trying to fund this alternative in a single biennium make the size of the funding request difficult.**

Phasing Approach	Esc. MACC	Esc. Total Project	Construction Duration	Final Occupancy
Two-phase (Single Biennium)	$61,012,486	$98, 915,000	28 months	March 2022

Alternative III: Two-Phase Renovation of the Existing Science Building (Funded In Multiple Biennia)

For this alternative, the approach is the same as the two-phase renovation, but project funding is being explored differently. A study of the potential budget impacts was undertaken during the predesign process which found that a capital budget request of a single phase renovation and a two phase renovation in a single biennia were too large as a single request. As a result, the project phases are proposed to be funded in two separate biennia. **This phased method of construction and funding over multiple biennia allows the project to move forward with two smaller capital budget requests.**

Phasing Approach	Esc. MACC	Esc. Total Project	Construction Duration	Final Occupancy
Phase 1	$ 32,989,005	$ 51,344,000	16 months	January 2021
Phase 2	$ 35,053,230	$ 52,693,000	16 months	January 2023
TOTAL	$ 68,042,235	$ 104,037,000	(See schedule)	

In order to have a comprehensive understanding of the project, it is important that the entire building is studied initially to vet program locations and systems needs. For this reason it is important to provide design funding through Design Development for Phase I and Phase II in the initial Phase I budget request. Also, by designing both phases of the project at once, efficiencies are gained for Phase II allowing for a smaller design budget request to complete construction documents. For a graphic representation of the time line, see appendix J for project schedule.

Alternative IV: No Action

This option will have a detrimental impact on the University and the region. The biology, chemistry, physics, and geology will not be able to address growing enrollment or demand. Student success in the building as it currently remains after spaces have been vacated to the new ISC could not be guaranteed. In addition, the University would not be able to offer the prerequisites needed to pursue careers in healthcare and address the immediate needs of the Spokane region.

Heath, safety, and code issues would continue to be a problem. Additionally, inadequate technology and HVAC accommodations, and a lack of student spaces would not be available within the building. Continual high maintenance repair costs will continue to be an issue, adding to the backlog of deferrals which tax the staff and available resources on campus.
Taking no action to renovate the Science building stifles Eastern Washington University's ability to meet their strategic goals, the State's ability to address the growing demand within our higher education system, and promotes ongoing health, safety, welfare, maintenance, and repair issues on the campus.

2.3 Discussion of Selected Alternative

Given the unique space needs associated with surging active research laboratories, Alternative III, a two-phase approach (funded in multiple biennia), best addresses the complex timing and sequencing to minimize disruption in addition reducing the capital budget request.

2.4 Summary of LCCA Results Using the LCCT

Please see section 5.5 for discussion of the LCCA.

2.5 Identification of Issues

Systems and Services

The Science Renovation has access to an extensive series of existing underground tunnels which currently provide mechanical systems to address the building's heating and cooling systems.

- Classroom and laboratory technology systems;
- Access to technology for students;
- Campus facilities scheduling;
- Campus utility systems;
- Building grounds maintenance and repair; and
- Technical support and organizational systems.

2.6 Prior Planning and History

Funding was requested by EWU for a Chemistry/Biochemistry and Physics building (Science I) in 2010. This building was ranked first priority in its category, but did not receive funding. The report was then resubmitted in 2012, did not receive funding, and then was resubmitted again in 2014.

Meanwhile, in July of 2012, EWU submitted a Replacement Capital Project Request to the state seeking predesign funding for a building housing Biology / Geology; funding was appropriated for the 2013-2015 biennium for this request. Through the detailed programming and cost analysis of the predesign study, it was determined that Alternative IV, the Interdisciplinary Science Center (ISC), in the Chemistry / Physics predesign would be the option moving forward in terms of funding. This option provided an addition to the north of the existing Science building which included teaching laboratories and classrooms for chemistry, physics, biology, and geology.

Thought of as the second half of the Science complex on the Eastern Washington University campus, this predesign request seeks to complete the renovation of the existing Science Building in two phases. Working in tandem with the programmatic functions and layout of the ISC, the Science Renovation will house classrooms, research laboratories, teaching laboratories, administration, and offices for the chemistry, biology, physics, and geology programs. It is critical that the Science renovation receives State capital funding as the project provides additional space needed to meet the growing demands for STEM and healthcare based degrees.

2.7 Stakeholders

The affected groups include EWU faculty and students, citizens of the State of Washington, regional / national agencies, and organizations. The chemistry, physics, biology, and geology departments are affected by not having the ability to utilize the remodeled space.

Committees established by EWU to provide guidance and direction for the project include:

- Executive Committee - University president, provost, chief information officer, vice president of business and finance, associate vice president of facilities and planning, and the dean of the College of Science, Technology, Engineering, and Mathematics.

- Project Delivery Team - Dean of the College of STEM, associate vice president of facilities and planning and senior project manager.
- Building Team - Dean of the College of STEM, department representatives from Chemistry / Biochemistry, Physics, Biology, Geology, construction and planning representatives.

2.8 Project Description

2.8.1 Agency Information

Agency Name	Eastern Washington University
Agency Code	370
Project Number	30000507
Project Title	Science Renovation
Agency Contact	Shawn King, Associate Vice President of Facilities and Planning sking@mail.ewu.edu Eastern Washington University 101 Rozell Cheney, WA 99004 P: (509) 359-6878

2.8.2 Mission

The Science Renovation project supports and reinforces the mission statement of Eastern Washington University:
The mission of Eastern Washington University is to expand opportunities for personal transformation through excellence in learning. Eastern Washington University will achieve this mission by:

- Fostering excellence in learning through quality academic programs, undergraduate and graduate student research and individual student-faculty interaction;
- Creating environments for personal transformation that enrich the lives of individuals, families communities and society at large;
- Expanding opportunity for all students by providing critical access to first generation students, undeserved populations, place-bound students, and other students who may not have the opportunity for higher education;
- Developing faculty and staff by growing and strengthening an intellectual community and supporting professional development

The Science Renovation project will directly foster excellence in learning by improving and expanding research and teaching facilities within STEM programs, thereby increasing opportunities for undergraduate and graduate student research. Additionally, the project fosters individual student-faculty interaction through the incorporation of collaboration/informal learning spaces, and through the building's connection to the adjacent Interdisciplinary Science Center (ISC).

2.8.3 Goals

Based on the core themes derived from the mission statement, a series of project goals with objectives were identified based on University goals. The Science Renovation will address each of these goals.

Goal 1: Student Success.

Strategy 1: Improve retention and graduation rates.

- Provide appropriate sizes and numbers of classrooms that allow time for more personalized instruction to aid student success.

Strategy 2: Create greater access to, and increased utilization of, student support services.

- The Science Renovation will increase access to and visibility of teaching assistants for students.

Strategy 3: Support EWU faculty and staff in their ability to foster student success.

- Provide more opportunities for student interaction, immersion and integration, which would foster successful student learning.
- The Science Renovation will provide increased research laboratory space and will be equipped with up to date information technology and audio-video capabilities, allowing opportunities for higher levels of student engagement and facilitating active learning. Spaces that are currently lacking in the existing building would be included in the program of the remodel.

Strategy 4: Expand campus wide commitment to student success.

- The new Science Renovation will create more teaching, learning, and research space and increases the visibility of the Sciences on campus.

Goal 2: Innovation and Opportunity.

Strategy 1: Create the EWU Virtual campus, which will provide a premier learning environment for place-bound students and professionals seeking to improve their skills and their own potential for promotion within the workplace.

- Flexibility of space will be built into the renovated spaces in the Science Building to provide the ability for distance learning teaching; technology upgrades will be incorporated into the building to make this possible. The Science Renovation will be equipped throughout with a building-wide wireless system. Each teaching lab will have the most current information technology and audio-video systems.

Strategy 2: Enhance and support faculty research programs by increasing the participation of undergraduate and graduate students as well as departments and community partners.

- The Science Renovation project would provide increased research space to allow faculty to more readily support integration of student research into all of the science programs. Increased introductory teaching lab spaces would allow better access to science courses for freshmen. More research spaces would allow the opportunity for space to conduct instruction with community partners.

Goal 3: Community Engagement.

Strategy 1: Strengthen student, staff and faculty participation in community-based activities.

- Science Renovation will provide the technology and space upgrades needed to host more community based activities from public / private partnerships, and to hosting local schools for learning sessions.

Strategy 2: Increase the presence and involvement of EWU leadership in the community.

- Through the renovation of the facility, EWU has the opportunity to play a larger role in the scientific community through faculty research programs and development of science related degree graduates.

Strategy 3: Strengthen existing relationships and create new relationships with external groups.

- Additional meeting, collaboration, and research space is provided in the project to serve as meeting space for external groups.

2.8.4 Legislative or Executive Intent

In accordance with ESSB 5509 adopted by Washington State, and effective as of July 24, 2005, the Science Renovation will be designed to incorporate Green Building Practices. Specifically, design and construction will achieve LEED Silver Certification at a minimum level.

By utilizing a previously developed site, the project complies with the Growth Management Act of 1990.

New mechanical systems will comply with the State's policy on indoor air quality and the Clean Air Act of 1991.

The project complies with ESSB 5560 and RCW 70.235.070, the Greenhouse Gas Emissions plan.

Life Cycle Cost Analysis is being conducted utilizing the Washington State LCCT tool in accordance with Executive Order 13-03 and ESSB 5035.

2.9 Implementation Approach

Organization and administration of work performed by outside design consultants and public works contractors is managed by EWU project managers. They follow projects from conception through construction and work closely with the clients, project architects, designers, and consultants to ensure projects are delivered on time and within budget.

The following individuals in the Construction and Planning office will oversee the Science Renovation project:

Shawn King	Associate Vice President
Jim Moeller	Senior Project Manager

Agency Responsibilities

- Establish and monitor the budget for the design and construction.
- Contract the A/E team and general contractor.
- Provide guidance related to programmatic issues and priorities for use of available funds.
- Review design documents throughout the design phase and construction progress during the construction phase.
- Receive/review/approve payment requests from the A/E team and the general contractor as the fiscal agent.
- Obtain necessary bid/purchase documents and acquire FF&E materials and monitor installation and operation along with appropriate consultants.
- Work with the A/E team and appropriate consultants to commission the facility and move occupants into it upon project completion.

Costs associated with the University's management for the design and construction is included in the Project Budget Analysis section of this report.

A/E Team

- Be responsible for interpreting the program for the building and establishing the appropriate scope of work.
- Produce the design documents and submit them in progressive packages at Schematic Design, Design Development, and Construction Document phases.
- Provide cost estimates at the end of each design phase to compare to the established budget and make necessary design changes to remain within it.

- Issue bidding documents to potential general contractors and interpret contract requirements to assist them in preparing their bids.
- During construction, organize periodic progress meetings, answer contractor questions to clarify contract requirements, prepare and issue contract modifications (FA, COP, CO) and review payment applications.
- Make periodic visits to the construction site and issue verbal instructions to the contractor as appropriate.
- Prepare a punchlist at the end of the project and ensure that corrections are made.
- Assist with the commissioning activities and prepare final record documents to be retained as a permanent record of the project.

2.10 Project Management

2.10.1 Management Organization

The Construction and Planning office at EWU will manage both the design and construction of this project. Organization management will be handled by the Associate Vice President for Facilities and Planning. Construction and Planning reviews programming; cost estimating; pre-design; design and construction services for building alterations, new construction, and grounds improvements for the Cheney campus.

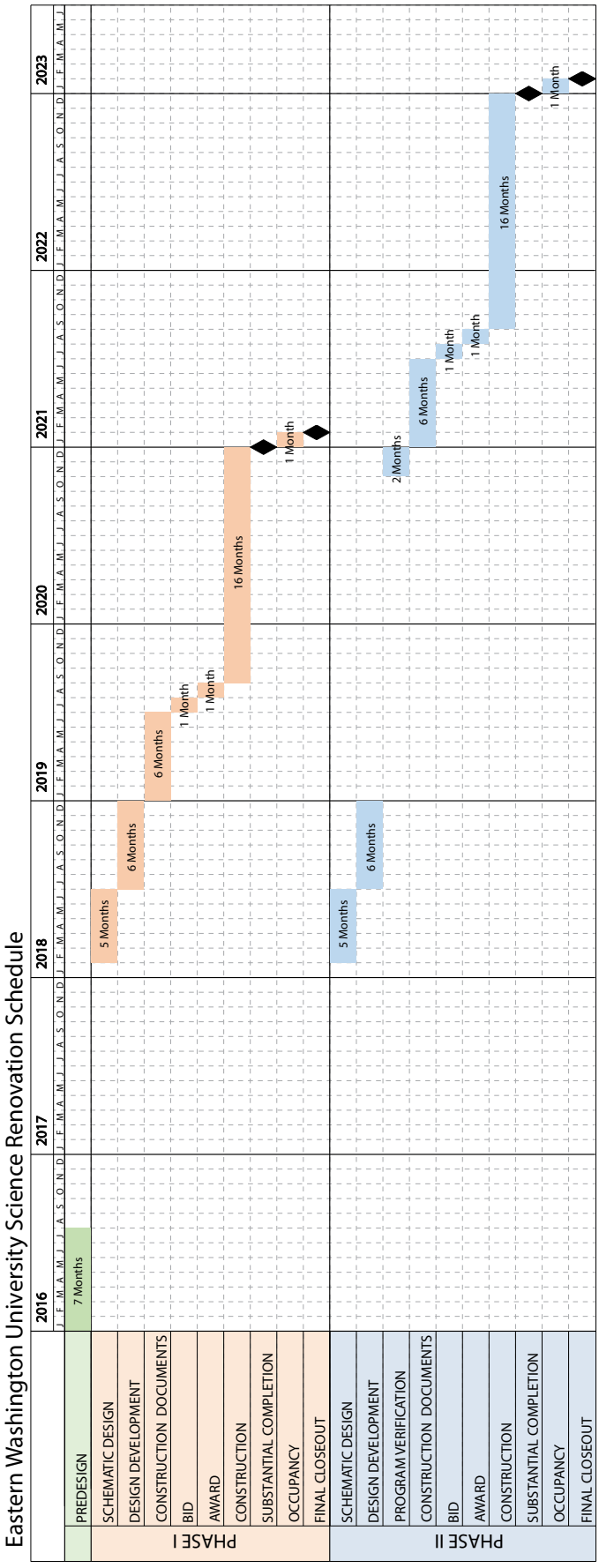
2.10.2 Methods of Delivery

Eastern Washington University proposes the use of the Design / Bid / Build method to accomplish this project. The project will be phased construction with part of the building being occupied during construction.

2.11 Schedule

The following milestones have been identified for the completion of the EWU Science Renovation Project:

The schedule represents the approach for Alternative III: Two- Phase Renovation of the Existing Science Building (Funded In Multiple Biennia). Please see adjacent page.


Eastern Washington University Science Renovation Schedule
2016
2017
2018
2019
2020
2021
2022
2023
PREDESIGN
7 Months
PHASE I
SCHEMATIC DESIGN
5 Months
DESIGN DEVELOPMENT
6 Months
CONSTRUCTION DOCUMENTS
6 Months
BID
1 Month
AWARD
1 Month
CONSTRUCTION
16 Months
SUBSTANTIAL COMPLETION
OCCUPANCY
1 Month
FINAL CLOSEOUT
PHASE II
SCHEMATIC DESIGN
5 Months
DESIGN DEVELOPMENT
6 Months
PROGRAM VERIFICATION
2 Months
CONSTRUCTION DOCUMENTS
6 Months
BID
1 Month
AWARD
1 Month
CONSTRUCTION
16 Months
SUBSTANTIAL COMPLETION
OCCUPANCY
1 Month
FINAL CLOSEOUT

section 3.0
program analysis

3.0 Program Analysis

3.1 Assumptions

The design process is initiated in the predesign phase and continues through construction and owner occupancy. Programming is the phase where a project's goals and program requirements are defined and initial project understanding determined. This sets the foundation for the project scope and budget which is carried through the remainder of the project. In exploring and defining the needs of the Science Building Renovation, the following assumptions were made:

- EWU expects a twenty percent growth of student population by 2024.
- There will be an increased need for teaching labs and classrooms with demonstration capabilities for both majors and non-majors seeking STEM related courses.
- The combined increases in student population, as well as an increased interest in STEM fields, has led to a disproportionate number of students seeking degrees in the sciences (20.6% growth in three years) when compared to past trends.
- Research laboratory space will be at a premium as students need access to research laboratories to complete their mandatory capstone projects. This need for space is additionally compounded by the expectation that science faculty be involved in the non-teaching scholarly research.
- Shared use of space will be planned whenever possible. A number of spaces will be joint use, meaning priority of the space is given to one department but it is available to all when not otherwise scheduled.

3.1.2 Programming Standards

Whenever possible the standards developed in DES's Space Allocation Guidelines and the State Facilities Evaluation and Planning Guide (FEPG) were used. Both standards contain space planning guidelines and standards for translating educational programs and support services to a set of physical facility requirements. It is intended to allow consistent and objective evaluation of space use and space planning at four year colleges and universities.

3.2 Functions and FTEs

3.2.1 Function of Spaces

The Science Building Renovation project program consists of four different departments: Chemistry/ Biochemistry, Physics, Biology, and Geology. Though diverse in their teaching requirements, all department have been designed around a baseline planning module. Though the plan is restricted in part through the constraints of the existing building shell and shear walls at the central corridors, the standard module created and utilized was based on industry standards and the applicability of the types of laboratories and classrooms needed in the Science Renovation project. The following is a brief description of these spaces:

- **Laboratory Module:** The Science Renovation Project utilizes a laboratory module that is 30'-0" x 10'-8" (interior dimension) for a total of 320 square feet. This module will provide adequate bench, equipment, and circulation space required for technical work stations, instruments and procedures.
- **Classrooms:** A variety of classroom types will be provided. The 40 and 60 seat classrooms will be equipped with moveable tables and chairs. The 80 seat classroom will be equipped with tablet arm chairs and be tiered to provide better viewing. The existing building's corridor walls are structural; the location of these walls dictates the maximum number of usable seats and the allowable classroom depth.
- **Class Laboratories:** Preliminary areas for teaching laboratories were assigned based on information developed by Research Facilities Design (laboratory consultants) from similar universities and discussions with the design committee. Room areas were rounded to the nearest laboratory module.
- **Research Laboratories:** Square footage estimates were based on an allowance of 1.5 lab modules (480 SF) per researcher

from criteria developed by Research Facilities Design based on similar university laboratory setups and discussions with design committee.

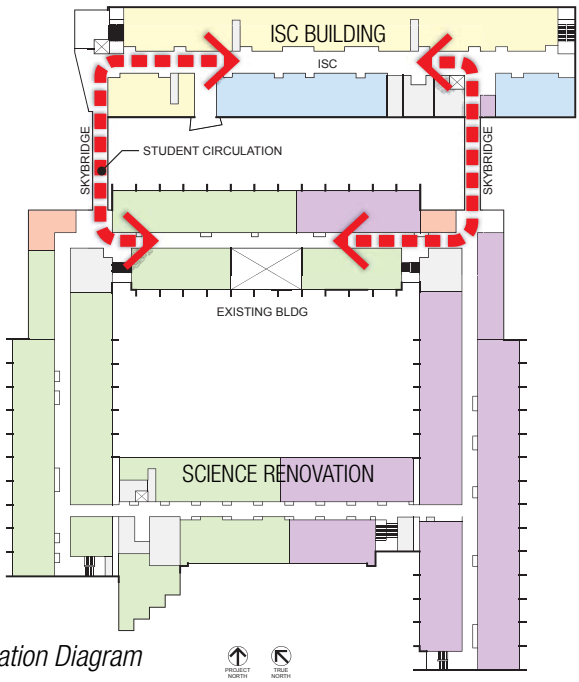
- **Laboratory Service:** Program size in the lab support space was based on a comparison of existing spaces and needs identified. Support space areas were rounded to the nearest laboratory module or fraction of module.
- **Computer Laboratory:** For the computer lab space, the FEPG recommended 60 ASF per work station for computers in the walk-in computer lab. Flat screen monitors take up less space than we accounted for in the FEPG standard and as a result, 40 ASF per station was determined to be acceptable for the computer lab.
- **Offices:** Recommendations made in the FEPG were used to determine square footage needs. A single conference room was sized to accommodate 30 occupants. Other locations on campus can accommodate larger group meetings.
- **Planetarium:** The program for the planetarium was based off EWU's desire to provide a 55 person viewing area where reclining fixed seats could view projected images onto a domed ceiling. This space also needs to accommodate projection equipment, server rack, and controls for the system.

Note: Sizes of spaces shown in the program are validated by the development of space diagrams located in Appendix C -Room Diagrams and Data Sheets of this report.

3.2.1 Space Needs Assessment

The comprehensive plan for programming of the Science Building Renovation is interwoven with the program of a new facility currently under design called the Interdisciplinary Science Center (ISC). Both buildings will house program for Chemistry/ Biochemistry, Physics, Biology and Geology. Attached to the Science Building Renovation via sky bridges on multiple levels, the ISC will contain a large number of teaching laboratories where as the Science Building will contain more research laboratories, classrooms, and offices.

The design of the ISC project is proposed as part of a larger plan to create a circulation loop between the two buildings where the North wing of the Science Renovation project becomes part of a high traffic corridor loop. Most of the public spaces such as classrooms and teaching labs would be located in the North wing. This leaves the remainder of the existing Science building to be more research intensive with upper division teaching labs, research labs, lab support, and offices. The goal is to make the transition between the two buildings as seamless as possible.



Level 2-Circulation Diagram

The addition of the ISC project takes some of the burden off the current Science Building as it was unable to accommodate the increase in research laboratories needed to address the increased demand for sciences courses due to enrollment growth. Many of the teaching laboratories within the existing Science Building will be vacated as these spaces move to the new ISC building. The area within the Science Building that is vacated will then be used to accommodate the additional teaching and research labs, plus office space. The following are diagrams show current allocation of program within the Science Building that is being retained by the affected programs; the white shows areas that have been vacated that will allow for much needed expansion of

Level 1 -Floor Plan

Level 2-Floor Plan

each program. Issues exist however around the usability of the Science Building in its current configuration. To date there are many significant deficiencies including:

- High cost of energy, maintenance and repairs; the Science Building uses double the amount of energy needed for modern day counterparts
- A lack of dedicated student space
- Health, safety and accessibility violations
- HVAC systems do not meet current needs nor provide capacity for growth

The existing room layout is not compatible with the needs of the revised program. Floor-to-floor heights are limited and clear ceiling space (needed for lab spaces) for large ductwork, laboratory plumbing, and electrical cannot be accommodated without a complete interior renovation.

A detailed summary of the required program is included in Section 9, Appendix B of this document. The program space summary is separated by departmental needs 1.0 Chemistry/Biochemistry, 2.0 Physics, 3.0 Biology, 4.0 Geology, and 5.0 Shared Facilities. The summary of these spaces (by department) is attached in Appendix B and shown below. The current science building is 148,149 GSF. There is 102,022 square feet of total assignable programmed space.

Eastern Washington University Sciences - Science Renovation Predesign

PROGRAM SPACE SUMMARY

Summary

1-Jun-16

Department/ Building	Type of Space									Total Science
	Teaching Lab	Research Lab	Lab Support	Vivarium	Green-House	Office	Class-rooms	Open Facilities	Other	
	All areas are Assignable Square Feet (ASF) unless noted otherwise									
1.0 Chemistry/Biochemistry										
Science Bldg	6,400	7,680	5,187	0	0	3,465	0	0	0	22,732
2.0 Physics										
Science Bldg	640	1,860	640	0	0	2,025	0	0	1,120	6,285
3.0 Biology										
Science Bldg	3,840	15,358	7,955	4,590	1,980	5,615	0	0	0	39,338
4.0 Geology										
Science Bldg	5,760	3,200	2,738	0	0	3,075	0	0	0	14,773
5.0 Shared Facilities										
Science Bldg	0	0	720	0	0	0	11,314	5,185	1,675	18,894
Combined Sciences										
Total All Sciences	49,640	24,900	24,420	4,590	1,980	16,295	15,460	8,040	1,940	
Interdisciplinary Sci Ctr	35,560	0	8,940	0	0	760	2,520	3,860	1,030	
Science Bldg	16,640	28,098	17,240	4,590	1,980	14,180	11,314	5,185	2,795	102,022
Unconfirmed Spaces										0
Total Programmed Assignable Area (ASF)										**102,022**
Phase I (GSF)										**73,498**
Phase II (GSF)										**73,498**
Available Building Gross Area (GSF)										148,149

Per the state OFM Predesign manual, a space planning layout efficiency factor target of 80% or greater is cited for the allocation of assignable square feet; however this is an existing building that is being renovated and may have limitations due to existing structure. Additionally, Science Buildings have an unusually high amount of spaces that constitute "non-assignable" functions. This includes typical areas such as mechanical rooms, electrical rooms,telecom rooms, toilet rooms, elevator and elevator machine rooms and custodial closets but also a large amount of spaces devoted to laboratory support such as compressed air, vacuum, and purified water which increase the size of HVAC needs and corresponding ductwork, piping, Mechanical chases, etc.

Every effort will be made in the design process to maximize the amount of programmable space within the existing building footprint.

3.2.2 Room Diagrams and Data Sheets

Detailed preliminary room diagrams and data sheets for each space are included in Section 9, Appendix C. These documents provide specific program requirements for each type of space within the Science Building Renovation and help validate that the program fits the amount of space allotted for each individual room. The descriptions were provided by the Predesign Committee and the facility's primary users. Each space description includes the following types of information:

- Name, size and number of spaces in this configuration.
- Purpose of the space as well as its expected function.
- Essential adjacencies based upon functional relationships.
- Number of occupants and hours of operation.
- Required furniture and equipment within the space.
- Special requirements for casework, media, power and communications, lighting, acoustics, HVAC, security or finishes.

3.2.3 Existing Facilities Inventory

Constructed in 1962, and added on to in 1989, the existing 148,149 gross square foot Science Building is the only facility on the Eastern Washington University campus capable of housing the research needs of the institution. The current physical condition of the Science Building ranks well below that of EWU's peer institutions and its age is more than double that of buildings at peer institutions. The 2015 State Facility Inventory System rates the existing Science Building's condition as " (4) Limited Functionality." This appears to be accurately coded given the significant issues with worn-out systems that require limited facility manpower to be scheduled to react to systems that are performing poorly or not at all. Facilities spends a significant amount of time procuring parts and services due to the high number of emergencies with weekly reportings.

The Science Building is not registered as an historic building.

3.3 Spatial Relationships Between the Facility and Site

A great building is measured by its responsiveness to the program goals, aesthetics, budget, site influences, context and ultimately how the building functions for its users. The location on the site and within the larger campus context is ideal.

The proposed Science Building Renovation project will require minimal changes to the existing footprint with the exception of modification to the loading dock area, air intake, and a small structure to house additional cooling capacity. The new ISC being designed (to the North) will connect via a series of sky bridges across the pedestrian access spine. A new courtyard will be created on the north side of the building providing opportunities for a protected courtyard and areas for student collaboration and interaction within a dynamic exterior setting.

3.4 Interrelationships and Adjacencies of Functions

Critical program adjacencies are noted in the room diagrams and descriptions. Generally individual programs are grouped on the same floor and within the same wing whenever possible. Shared spaces are dispersed throughout to allow for easy access. See Section 8 Project Drawings/ Diagrams for proposed plan option.

Circulation - One of the most critical elements in the design of a Science facility is providing adequate circulation both within and outside of programmable space. There are many functions such as material delivery of chemicals, supplies and equipment and corresponding refuse disposal that require easy access and adequate widths for safety.

Multiple features within the design of the building need to be considered such that occupant egress from each lab and lab support space has a clear uncomplicated path to an exterior at grade exit. Some of the types of features that should be considered area:

- Providing at least one door opening within each lab space that has a clear width of 54". Often times this is accommodated through a 3'-0" door and 18" active leaf.
- Doorways into corridors should be recessed into alcoves to not impede exiting and doors to lab spaces should swing out in the direction of exiting.
- Fume hood locations within laboratory spaces should be coordinated to avoid exiting in front of fume hoods.

Collaborative Spaces - Learning occurs everywhere, not just within the walls of a classroom. Creating areas for student breakout, study, and interaction is key to the success of any project and is more pronounced in the study of science. The Science Building Renovation project will incorporate collaborative spaces through out. These spaces foster synergies between research labs and classrooms, between departments, and throughout the multiple levels of the building. These breakout areas can be both formal and informal. Whether it be conference rooms and student lounges or casual meet up and breakout areas, these areas serve to foster collaboration and socialization. This is especially important in a campus where 80 percent of EWU students commute from off campus.

Vibration Control - Ideally building structure should be designed to minimize floor vibrations; however, in this case we are reusing the existing Science Building structure. Much of the research equipment that will be used in the Science Renovation project is sensitive to vibration. The most common sources of vibration are from walking and mechanical equipment. Detailed attention should be paid during the design to minimize foot traffic vibrations on elevated slabs by limiting heavy traffic areas to between shear walls and along column lines. Labs will focus on placement of sensitive equipment near columns to decrease any vibration translation at mid spans. Air handling equipment, duct work, supply and exhaust air fans, compressors, pumps, and other noise and vibration producing equipment will be located in mechanical rooms with protective wall construction or will be isolated from supporting structure with resilient mounts.

Accessibility - Accessibility should be inherent in the design of any new building. All spaces should incorporate ADA guidelines and the principals of universal design. Specific consideration should be give to the following options:

- Each lab space should have an accessible workstation and fume hood based on code requirements. These stations should be close to safety showers and eye washes.
- All doors per code require 18" clearance on the pull side and 12" on the push side opposite the door hinges
- Adjustable work surfaces provide the ultimate flexibility for wheelchair clearance of 30"-34" and can be modified to accommodate the individual user.
- Aisle widths, clearances, and 5'-0" turning radius should be incorporated into each space.
- Laboratory service equipment, controls and equipment controls should have easy handles for operation and within easy reach for operation.

3.5 Major Equipment

3.5.1 Energy Use

With an energy use index exceeding 400 kbtuh/sqft, the Science Building uses twice the amount of energy of a new lab building constructed to current standards. A renovation that focuses on lighting, variable air volume exhaust systems with heat recovery, set-back of airflows based upon occupancy, and reduced fume hood exhaust through use of variable air volume controls should result in at least a 50% energy savings.

Reduction in energy use will also free capacity in the campus electrical, steam and chilled water distribution systems to support future campus needs.

3.5.2 Mechanical Existing Conditions and System Needs

The systems within the building were installed in the late 1980's and early 1990's. The majority of the equipment in the building has exceeded its normal service life and items noted in the mechanical condition assessment require repairs.

The existing facility has many problems with the ventilation systems that have the potential of compromising the safety of the faculty and students working in the labs. Some fume hoods are not ventilated at night, some do not maintain acceptable face velocity and pressures cannot be maintained in the labs during set-back modes risking contamination to non-lab spaces. Noise and vibrations from the mechanical systems in many areas also makes teaching difficult.

It is anticipated that the new programmed uses in the science building will require less than half of the current exhaust currently provided in the facility so equipment replacement and upgraded control systems will significantly improve the energy performance of this building.

Reprogramming of the uses within the building will result in modifications to most of the above ceiling mechanical systems such as ductwork, branch piping and air terminal units.

For the reasons noted above, the building systems should be replaced with any significant renovation. See attached Building Assessment located in Section 9, Appendix H.

3.5.3 Electrical Existing Conditions and System Needs

Existing electrical distribution equipment is approximately 25-years old. The age of the existing equipment makes it difficult to obtain parts for service. Additionally, newer equipment is manufactured with higher safety standards. Equipment within damp environments, such as below grade Mechanical rooms, has visual water damage. A portion of the original 1960 electrical service equipment is still in use in the basement of the north wing. This equipment is no longer safe to work on and is not serviceable. For the aforementioned reasons, a complete replacement of the electrical distribution system is recommended during the building renovation. Service feeders and transformers are anticipated to remain for reuse.

Existing emergency generator does not meet current national electrical code for separation of NEC 700 emergency and NEC 702 standby loads. Modifications to the generator and emergency distribution system are required.

Existing lighting and lighting control systems do not meet current energy codes and will require replacement.

Low voltage systems including communications, security and audio/visual do not meet current EWU campus standards and will require replacement. Fire alarm systems will be modified to accommodate the renovated space needs. See attached Building Assessment located in Section 9, Appendix I.

3.6 Future Needs and Flexibility/Special Systems Such as Environmental, Information Technology, etc.

Flexibility, and specifically adaptability, is key to any building's future needs. Technology and systems constantly evolve requiring facilities to keep up to stay cutting edge. This is especially true in the design of a science building where the building must be able to adapt to change of both technological advancement but also with scientific and safety equipment upgrades.

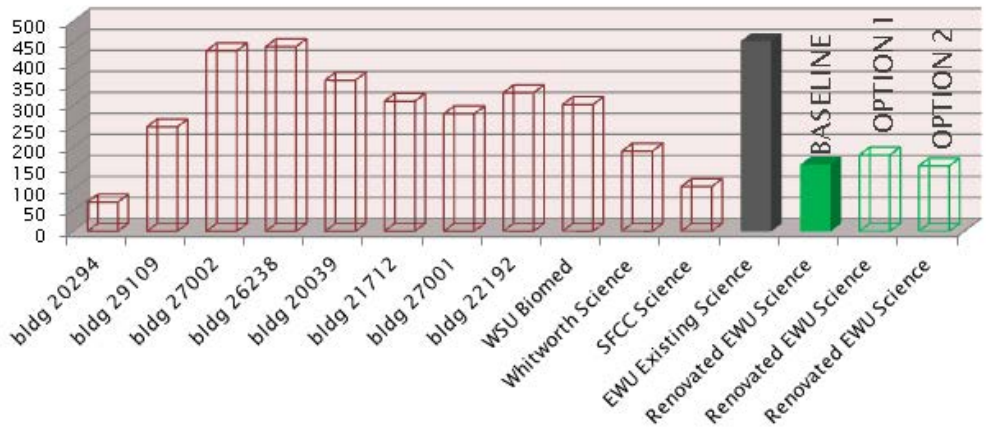
Creating flexibility in the design of elements such as :

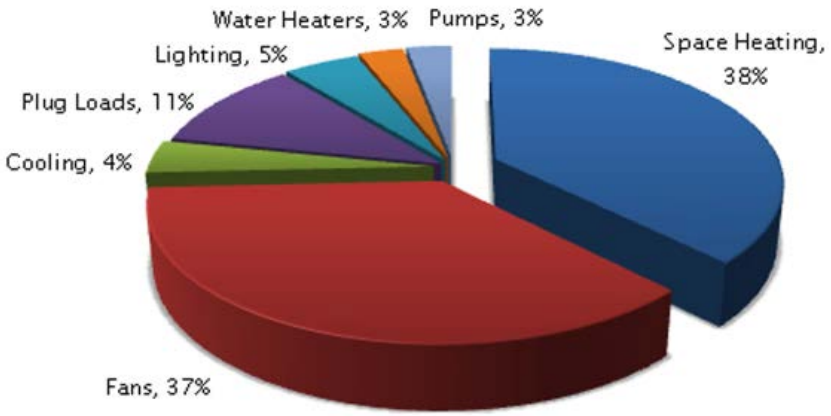
- Create non-structural interior portions that can be deconstructed and relocated if room size needs change.
- Select building systems that are easily maintained, adaptable and accessible. Adequate pathways that are easily accessible for additional cabling, Sizing electrical power capacity for future equipment, open to structure corridors.
- Four sided classrooms with multiple teaching walls.
- Select of moveable furniture and equipment that can be easily modified or stacked for storage.
- Provide capacity for future modifications to special systems such as voice, data, and video communications.
- Wireless internet access should be provided throughout the building.

3.7 Sustainability, Energy Use and Greenhouse Gas Emissions Reduction

Energy use has been at the forefront of discussions throughout the predesign. The existing Science Building is nearly 50 years old. Though it has gone through a series of envelope upgrades, it currently utilizes 14% of the campus steam load and 12.9% of the campus electrical loads yet only represents less than 5.4% of the campus building area.

- Science facilities have high energy utilization rates and can use 8-10 times the amount of energy required for a traditional classroom or office building. There are two primary reasons for this high energy use. First, science facilities have extra-ordinarily high exhaust rates for fume hoods that is required 24 hours a day for health and safety requirements. All air that is exhausted from the building must be reintroduced as fresh air and heated or cooled for human comfort. The heating energy and fan energy to condition and circulate this air is very high. Second, science facilities have higher electrical process loads due to quantity of equipment in the lab spaces. The equipment uses large amounts of electricity and also creates higher than normal cooling loads and fan energy in these spaces.
- The Science Building was benchmarked against other science facilities in the same climate zone as well as recently constructed peer facilities at Whitworth University, Spokane Falls Community College and Washington State University. Benchmarking indicated that the existing Science facility is operating at about twice the energy of these recently constructed peer facilities. The existing Science Facility has an energy use index (EUI) that exceeds 400 kbtuh/sqft/year.





- Understanding energy use is the key to development of sustainable strategies. Energy modeling software in this pre-design phase anticipated how energy is to be used in this Science building. As energy efficiency strategies were developed, areas of highest energy use were targeted and recommended for the system solutions recommended in this pre-design.
- A renovation of this building that meets the requirements of current energy codes and upgrades the building systems should result in an EUI in the range of 160-175 kbtuh/sqft/yr resulting in a facility that operates at less than half of its current energy use.

Under RCW 39.35D the Science Building Renovation will be designed to meet or exceed Leadership in Energy and Environmental Design (LEED) certification level Silver or higher. The LEED NC 3.0 scorecard has been included in Section 9, Appendix E.

3.7.1 Greenhouse Gas Emissions Reduction

Reducing Greenhouse Gas Emissions

There are two mandates that EWU is subject to regarding greenhouse gas emissions. The first is state law RCW 70.235 and the second is the American College & University President's Climate Commitment.

In the Revised Code of Washington RCW 70.235 "Limiting Greenhouse Gas Emissions", all state agencies are required to reduce greenhouse gas emissions as follows:

- By July 1, 2020, to 15% below 2005 levels
- By 2035, to 35% below 2005 levels
- By 2050, to the greater of 57.5% below 2005 levels or 70% below state government emissions for that year.

EWU has committed as a signatory to the American College & University President's Climate Commitment (ACUPCC) which provides support and a framework for universities to implement plans in the pursuit of climate neutrality. Higher education institutions have a unique responsibility in that they are role models for the communities they serve through the development of social, economic and technological solutions to reverse global warming and help create a thriving, civil and sustainable society. ACUPCC institutions have agreed to take steps to reduce greenhouse gas emissions as part of their commitment.

Part of the strategy that EWU has toward reducing greenhouse gas emissions is to reduce fossil fuel usage for building energy and power. Energy conserving HVAC and electrical systems in the Science Renovation are the best way for the project to achieve the goal of reducing campus usage of fossil fuels. Because science buildings are typically the greatest energy users on campus, and the existing science building utilizes TWICE the amount of energy as modern day counterparts, making the building systems more energy efficient is especially significant.

3.8 Applicable Codes and Standards

General

- EWU Facility Design Guidelines and Construction Standards
- International Building Code (IBC)
- International Fire Code (IFC)
- Americans with Disabilities Act (ADA)
- Local Codes and Ordinances
- Underwriters Laboratories (UL)
- Regulations of the State Fire Marshal

Mechanical

- International Mechanical Code
- Uniform Plumbing Code
- Washington State Energy Code
- Washing State Boiler and Unfired Pressure Vessel Code
- American Gas Association (AGA)
- ASHRAE Standard 55- Thermal Comfort
- ASHRAE Standard 62- Ventilation
- The National Fire Protection Association (NFPA)
- The National Fire Protection Association (NFPA)

Electrical

- National Electrical Code (NFPA 70)
- Washington State Department of Labor and Industries
- Washington Administrative Code
- Washington State Energy Code
- Illuminating Engineers Society of North America (IESNA)

3.8.2 Building Code

Code Review Checklist
2015 International Codes

Name of Project:	Eastern Washington University Science Renovation
Location of Project:	Eastern Washington University, Cheney, Washington
Integrus Project No.:	21534.01
Date of Review:	June 1, 2016
Phase of Code Review:	Pre-Design

APPLICABLE BUILDING CODES

Code Type	National Standard	WA Law Reference
Building	2015 International Building Code (IBC) and Washington State Amendments	WAC 51-50
Accessibility	ICC A117.1-2003 Accessible and Usable Buildings and Facilities	WAC 51-50
Mechanical	2015 International Mechanical Code	WAC 51-52
Fire	2015 International Fire Code	WAC 51-54
Plumbing	2015 Uniform Plumbing Code	WAC 51-56 and 51-57
Electrical	National Electrical Code, NFPA 70	RCW Chapter 28 and 29
Energy	Washington State Energy Code	WAC 51-11
Indoor Air Quality	Washington State Ventilation and Indoor Air Quality Code	WAC 51-13
Elevator	ANSI/ASME A17-1	WAC 296-96
Civil		WSDOT 2000
Fire Sprinklers	NFPA 13	
Fire Alarm (907)g	NFPA 72	

EXISTING BUILDING SPECIFICS

1. Existing Building Area — 138,462 Gross Sq. Ft.
2. Existing Building Height — 3 Stories (42 feet High)
3. Existing Occupancy Classification — Assembly Group B
4. Existing Building Classification — Type II-B Construction (Fully Sprinkled)

USE AND OCCUPANCY CLASSIFICATION(S)

IBC Chapter 3: Use and Occupancy Classification

1. The Eastern Washington University, Science Renovation will contain A-3, B, S-1 and possibly H-2 or H-3 Occupancy Group designations. Uses include educational classrooms, research / teaching labs, vivarium, faculty offices, storage rooms and incidental use areas.
2. **Assembly Group A-3 –** Conference rooms and classrooms with an occupancy load greater than 50 will be classified as Group A-3, defined as: "A building or portion of a building having an assembly room with an occupant load of less than 300 without a legitimate stage, including such buildings used for education purposes and not classed as Group B or E Occupancies." 303.1.1 states "A room or space used for assembly purposes with an occupant load of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy."
3. **Assembly Group B –** The balance of the facility will be classified as Group B, defined as: "The use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including the storage of records." Group B occupancies are inclusive of educational occupancies for students above the 12th grade.

4. **Storage Group S-1 –** Storage Group S occupancy includes, among others the use of a building or structure, or portion thereof, for storage that is not classified as a hazardous occupancy.
5. **Hazard Group H -** Hazardous chemical storage in excess of those quantities outlined in the code.

OCCUPANCY SEPARATIONS

IBC Chapter 5, Section 508: Mixed Use and Occupancy

1. An occupancy separation of 1-hour is required between A-3, B and S-1 occupancies per Table 508.4 when the building is equipped throughout with an automatic sprinkler system.
2. Different occupancies within the same building do not have to be separated by fire resistive rated assemblies if the building complies throughout with the more restrictive code requirements for minimum construction type and fire protection systems. The EWU Science Renovation will utilize the B occupancy group for areas in building height and occupancy group calculations. This is not the most restrictive and a 1 hour separation will be required between A-3 and S-1 occupancies.

TYPE OF CONSTRUCTION

IBC Chapter 5: Allowable Building Heights, Stories and Areas (Tables 504.3, 504.4 and 506.2)

1. Type II-B (New Building Construction)

BUILDING HEIGHTS AND AREAS

IBC Chapter 5: General Building Heights and Areas

1. The EWU Science Renovation will comprise approximately 138,462 gross square feet. Therefore, the allowable height, stories and area, permissible are outlined below per occupancy. Area increases and maximum square footage for Type II-B Construction based on Occupancy Group are formulated below per Section 506.2.4 and equations per Section 506.3.3 for the building.

Occupancy	Basic Allowable Area/Floor	Increased Allowable Area/Floor*	Allowable Building Height
A-3	9,500 SF	35,625 SF	3 stories (75 feet)
B	23,000 SF	86,250 SF	4 stories (75 feet)
S-1	17,500 SF	65,625 SF	3 stories (75 feet)

* *Includes 200% increase for "Automatic Sprinkler" for buildings with more than one-story above the grade plane (Section 506.2). Includes 75% increase for "Frontage"(Section 506.2.3.)*

2. This EWU Science Renovation will use the B Occupancy Group for areas in building height and occupancy group calculations while maintaining construction Type II-B for the existing construction as follows:

$$I_f = \left[\frac{F}{P} - 0.25\right]\frac{W}{30}$$

$$I_f = \left[\frac{1{,}460\ ft}{1{,}460\ ft} - 0.25\right]\frac{30}{30} = .75$$

$$A_a = A_t + (A_t)(I_f) + (A_t)(I_s)$$

$$A_a = 23{,}000 + (23{,}000)(.75) + (23{,}000)(3)$$

$$A_a = 86{,}250 \ \ SF\ per\ floor$$

The maximum building area shall be determined per Section 506.2.3. For buildings with 3 or more stories above the grade plane, multiply (Aa)(3 stories).

(86,250 SF / floor)(3 stories) = 258,750 Total Building Square Feet

Where

Aa	=	Allowable area per floor (square feet).
At	=	Tabular area per floor in accordance with Table 506.2 (square feet).
If	=	Area increase due to frontage (percent) as calculated in accordance with Section 506.3.3.
Is	=	Area increase due to sprinkler protection (percent) as calculated.
F	=	Building perimeter which fronts on a public way or open space having 20 feet open minimum width (feet).
P	=	Perimeter of entire building (feet).
W	=	Width of public way or open space (feet) in accordance with Section 506.3.2.

Allowable Area per Floor 86,250 SF
Allowable Building Area 258,750 SF

FIRE RESISTANCE REQUIREMENTS

IBC Chapter 6: Types of Construction (Table 601)

Building Element	Fire Resistance Rating
Structural Frame	0 hr
Bearing walls – Exterior	0 hr
Bearing walls – Interior	0 hr
Non bearing – Exterior walls / Partition (Table 601)	0 hr
Non bearing – Interior walls / Partition	0 hr
Floors (including Beams & Joists)	0 hr
Roofs (including Beams & Joists)	0 hr
Shaft Enclosures (713.4)*	1 hr (when connecting less than 4 stories)

** (Section 712.1.9) Two-story openings. Two-story openings shall be permitted as outlined in Section 712.1.9.*

SHAFT ENCLOSURES

IBC Chapter 7: Fire and Smoke Protection Features

1. The provisions of this section shall apply to shafts required to protect openings and penetrations through floor / ceiling and roof / ceiling assemblies. Interior exit stairways and ramps shall be protected in accordance with the requirements of Section 1023 (Section 713.1).
2. Shaft enclosures shall have a fire resistive rating of not less than 2 hours when connecting four or more stories and not less than 1 hour when connecting less than four stories (Section 713.4). Two-story openings in other than Groups I-2 and I-3 shall be permitted as outlined in Section 712.1.9.
3. Floor openings between stories created by exit access stairways shall be enclosed. The following exceptions apply:
    - In other than Groups I-2 and I-3 occupancies, exit access stairways that serve, or atmospherically communicate between only two stories are not required to be enclosed (Section 1019.3, Exception 1).

OCCUPANT LOAD

IBC Chapter 10: Means of Egress

1. The Maximum Floor Area Allowances per Occupant are detailed in the IBC (Table 1004.1.2.) as follows:

Occupancy	Floor Area in SF per occupant
Assembly Without Fixed Seats:	
Concentrated (Chair Only-Not Fixed)	7 net
Un-Concentrated (Table and Chairs)	15 net
Business Areas	100 gross
Classroom Area	20 net
Shops & Vocational Room Areas	50 net
Accessory Storage Areas – Mechanical	300 gross

2. Utilizing the occupant loads above the occupancy load for the EWU Science Renovation is as follows:

3rd floor mech.	(4,340 SF)	15 occupants
2nd floor	(67,425 SF)	781 occupants
1st floor	(66,697 SF)	1,575 occupants
Total	=	2,371 occupants

NUMBER OF EXITS REQUIRED

IBC Chapter 10: Means of Egress

1. All spaces within each story shall have access to the minimum number of exits as specified in (Section 1006.3.1) as follows:

1 - 50	=	1 exit min
50 - 501	=	2 exits min
501 - 1,000	=	3 exits min
Above 1,000	=	4 exits min

3rd floor mech.	15 occupants	1 exit required
2nd floor	781 occupants	3 exits required
1st floor	1,575 occupants	4 exits required

2. If only 2 exits are required, they shall be placed a distance apart not less than 1/2 the maximum diagonal dimension of the area measured in a straight line. For a building with a automatic sprinkler system the distance apart from each exit shall not be less than 1/3 the length of the maximum overall diagonal dimensions of the area served. (Section 1007.1.1)
3. If there are 3 exits or more, at least 2 exits doors shall be placed a distance apart not less than 1/2 the maximum diagonal dimension of the area measured in a straight line. Exception: For a building with a automatic sprinkler system the distance apart from each exit shall not be less than 1/3 the length of the maximum overall diagonal dimensions of the area served. (Section 1007.1.2)
4. Two exit access doorways are required in boiler, incinerator and furnace rooms where the area is over 500 square feet and any fuel-fired equipment exceeds 400,000 British thermal units (Btu) (422,000 KJ) input capacity. Where two exit access doorways are required, one is permitted to be a fixed ladder or an alternating tread device. Exit access doorways shall be separated by a horizontal distance equal to one-half the length of the maximum overall diagonal dimension of the room. (Section 1006.2.2.1)

MEANS OF EGRESS

IBC Chapter 10: Means of Egress

1. The total width of means of egress in inches shall not be less than the total occupant load served by the means of egress

multiplied by 0.3 inches per occupant for stairways (Section 1005.3.1) and by 0.2 inches per occupant for other egress components (Section 1005.3.2). The egress factor can be reduced to .2 inches per occupant for stairways and .15 for other egress components in building equipped throughout with an automatic sprinkler system per exception 1.

2. Where exits serve more than one floor, only the occupant load of each floor considered individually shall be used in computing the required capacity of the exits at that floor, provided that the exit capacity shall not decrease in the direction of egress travel. (Section 1004.1.1.3)

Stairways:

.2 (781 occupants – Second Floor) =156"/12 = 13 feet total stair width required.
23 feet existing stair width.

Capacity of Exit Doors:

Typical clear width of a 36" door is 32" measured from the face of door to the stop with the door open 90 degrees, (Section 1010.1.1).

- 32"/.15 per occupant = 213 occupants at every 3'-0" doorway.
- 68"/.15 per occupant = 453 occupants at every 6'-0" doorway.

First Floor Exit Components:

.15 (1575 occupants) = 236"/12 = 20 feet total width required at First Floor exit components.

36 feet exit doors exist at the first floor.

Corridors:

Typical corridor widths in the existing building are 10 feet.

3. Corridor fire-resistance rating

   Occupancy Group A, Group B and Group S - greater than occupant load of 30, w/o sprinkler system, the corridor = 1 hour with sprinkler system, the corridor = 0 hour. (Table 1020.1).

4. The common path of egress travel, that portion of exit access (portion of a means of egress system that leads from an occupied portion of a building to an exit which the occupants are required to traverse before two separate and distinct paths of egress travel to exits are available shall not exceed 100 feet for occupancy Group B or Group S and 75 feet for Group A, providing there is an automatic sprinkler system, (Table 1006.2.1).
5. For occupancy Group A and Group S - the travel distance to exit shall not exceed 200 ft. or 250 ft. in a building with an automatic sprinkler system, (Table 1017.2).
6. For occupancy Group B - the travel distance to exit shall not exceed 200 ft. or 300 ft. in a building with an automatic sprinkler system, (Table 1017.2).

STAIRWAYS
IBC Chapter 10: Means of Egress

1. Minimum clear width for enclosure exit stairway considered as part of the accessible means of egress is 48" (Section 1009.3). Maximum rise is 7", minimum tread is 11". (Section 1011.5.2)
2. Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 713. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. In other than Groups I-2 and I-3 occupancies, exit access stairways that serve, or atmospherically communicate between only two stories are not required to be enclosed (Section 1019.3, Exception 1).
3. Areas of refuge are not required at exit stairways as in buildings equipped throughout with an automatic sprinkler system. (1009.3, Exception 5)

4. The minimum clear width for stairways not considered a means of egress is 44". Stairway for an occupancy load of 50 or less shall have a minimum width of no less than 36". (Section 1011.2, Exception 1)
5. Stairway shall have a minimum headroom clearance of 80". (Section 1011.3)
6. There shall be a floor or landing at the top and bottom of each stairway. The width of landings shall not be less than the width of stairways they serve. Every landing shall have a minimum dimension measured in the direction of travel equal to the width of the stairway. Such dimension need not exceed 48 where the stairway has a straight run. (Section 1011.6)
7. A flight of stairs shall not have a vertical rise greater than 12 feet. (Section 1011.8)
8. Handrails shall be uniform and not less than 34" high and no more than 38". The clear space between a handrail and a wall is minimum 1.5". (Section 1014.2)

ACCESSIBILITY

IBC Chapter 11: Accessibility

1. As of July 1, 2005, the amended WAC 51-50 has adopted ICC A117.1-2003 Accessible and Usable Buildings and Facilities as the governing accessibility regulation in Washington State, including Appendix E of the IBC.
2. An accessible route of travel shall be provided to all public portions of the building, to accessible building entrances and between the building and the public way. (Section 1104)
3. The primary entry and all other entrances to a building located within 6" of grade shall be accessible and shall be identified by the International Symbol of Accessibility. At least 60% of all public entrances, or a number equal to the number of required exits, whichever is greater, shall be provided. (Section 1105.1 & Washington Administration Code, WAC)

MISCELLANEOUS REQUIREMENTS

1. Elevator machine rooms shall be enclosed with construction having a fire-resistive rating not less than the required rating of the hoist-way enclosure served by the machinery. Openings need the same protection as hoist-way doors. (Section 3005.4)

PLUMBING FIXTURE REQUIREMENTS

IBC Chapter 29: Plumbing Systems

1. Based on Washington State Amendments Chapter 51-50 WAC, Table 2902.1
2. Plumbing Facilities to be distributed equally, 50% male/50% female
3. Drinking fountains at multi-story buildings shall be provided on each floor having more than 30 occupants in schools, dormitories, auditoriums, theatres, offices and public buildings. (Section 290.5)
4. Drinking Fountains, 50% to be accessible, at least one to be mounted at standard height. (Section 1109.5)
5. Minimum Number of Plumbing Fixture Requirement (Table 2902.1 WAC)

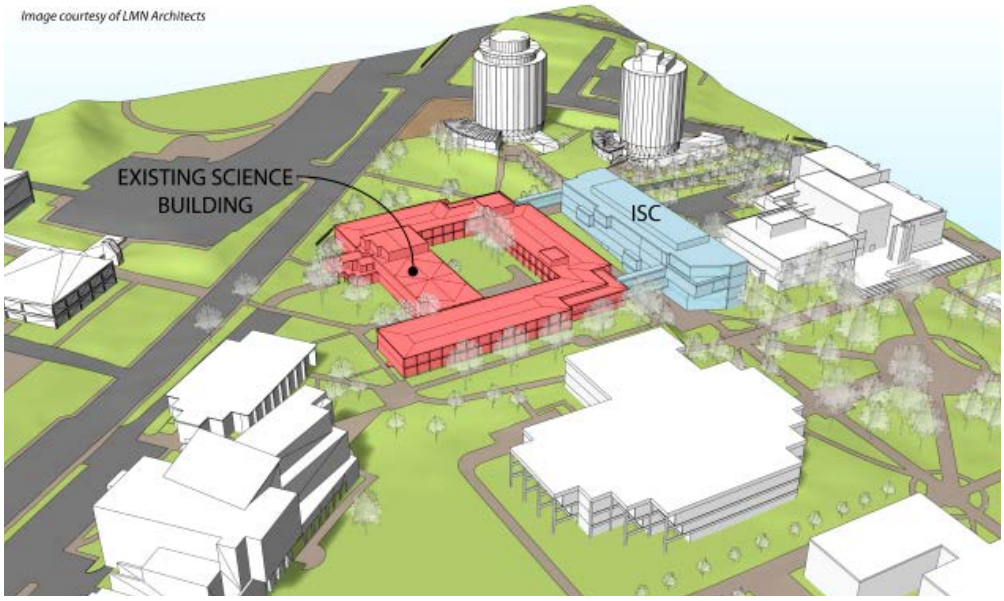
section 4.0
site analysis

4.0 Site Analysis

4.1 Potential Sites

4.1.1 Potential Sites Considered for the Project

This report constitutes the fourth request in a series of predesign studies for a Science Building on the Eastern Washington University campus, each of which extensively analyzed up to six various sites for the project. Within each site multiple program configurations were considered as well to maximize efficiencies without compromise to program within a feasible budget. In July 2012, EWU submitted a Replacement Capital Project Request to the state seeking predesign funding for a building housing Chemistry and Physics. Funding was appropriated for the 2013-2015 biennium for this request in the form of an addition to the Existing Science Building. The Interdisciplinary Science Center (ISC) is now currently under design and houses teaching laboratories and classrooms for chemistry, physics, biology, and geology departments.



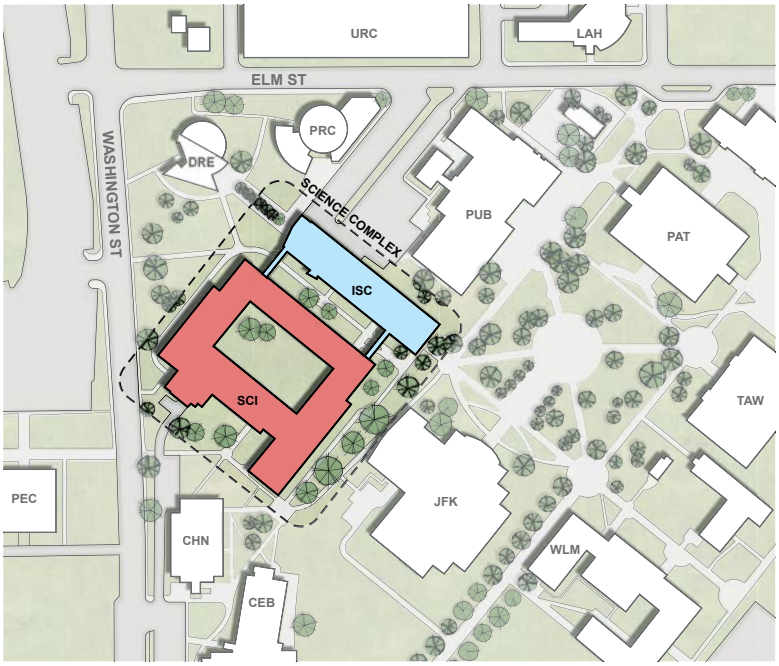
This predesign seeks to renovate the existing Science Building, which is thought of as the second half of the Science complex project. This is a renovation project with inherent benefits to locating all of the biology, chemistry, geology, and physics programs in a single location.

As it is renovation, and connected to the ISC Building, no additional potential sites were considered for the project.

4.2 Building Footprint

The Science Building is located on the western side of campus bordering Washington Street and just south of Dressler and Pearce Hall. The building's footprint is 148,149 gross square feet in size and stands two to three stories tall relative to the surrounding grade.

Minor modifications to the building's footprint are anticipated including changes to the loading dock area, the addition of a small area to expand chiller capacity, and a renovation of the exterior courtyard that lies within the bounds of the existing building. However, the general footprint of the building will otherwise remain the same. A new building addition being designed to the north, the Interdisciplinary Science Center, will connect to the existing Science Building via a series of sky bridges that create pedestrian access spines between the buildings.



Site plan showing new "Science Complex".

4.3 Site Considerations Such as Physical, Regulatory and Access Issues

4.3.1 Physical Issues

Ownership: The site is within the boundary of Eastern Washington University's campus in Cheney, Washington. As such, the property is owned by the State of Washington.

Boundaries: The Science Building is bordered by Washington Street to the west, Cheney Hall to the south, and the JFK Library to the east. North of the building is currently a major pedestrian access spine which runs East / West as serves as the campus "mall."

Zoning/Local Ordinances: Zoning and local land use regulations are not expected to impact the existing site. The City of Cheney designates the university campus with a zone called "P" for Public. The zoning code for the City does not have any specific restrictions for buildings contained within a P zone. EWU discusses each project with the City of Cheney in order to include them in the building and planning process.

Adjacent Buildings and Site Features: The Interdisciplinary Science Center (ISC) is currently under design and will be constructed to the North of the existing Science Building. The existing campus mall, which conveys a heavy volume of daily foot traffic, as well as serving as a ceremonial space on campus, will be routed between the ISC and the Science Building as part of that project.

Topography: A change in elevation to the northwest provides views to the roof of the building and the exposed mechanical equipment located above. The north side of the building slopes down moderately from West to East which necessitates an access change at the north entries.

Environmentally Sensitive Conditions: The existing site is not known to contain any environmentally sensitive conditions. Shorelines, wetlands, endangered species, flood zones, and contaminated soils are not present at the site.

Utility Provisions: Existing underground utility tunnels serve the building with campus steam, chilled water, domestic water.

These tunnels will be re-used and utility pathway preserved. Additional cooling provisions and revisions to the building's air intake will be revised as part of this project.

Temporary classroom space will be provided on campus to house the programs displaced during the construction process. Construction lay down areas will be provided within the surrounding campus context. The existing courtyard at the Science Building provides needed space for the contractor to locate materials and other resources.

Construction Lay-Down Areas: Given the project's location within the heart of the Eastern Washington University campus, construction lay-down must be considered and carefully strategized. It is anticipated that the courtyard within the building will be used during construction for storage and laydown. Damage incurred to the landscaping and sitework will be repaired during the later renovation of the courtyard.

Department of Archeology and Historic Preservation (DAHP): As the building is more than 45 years old, an initial application for review (EZ-1 and EZ-2) was filed with the DAHP. The result of the DAHP findings is that the property is not currently listed in the Washington Heritage Register nor National Register of Historic Places. DAHP determined the Science Building is not eligible for the National Register of Historic Places. See Appendix F for official letter.

Parking/Service Access: The site has service access to Elm Street via Parking lot P-10. Parking for the building is served by the campus parking network. No additional parking is anticipated as a result of this project.

4.3.2 Local Jurisdiction/Zoning Requirements

The Science Building is located within the confines of the Eastern Washington University campus within Cheney, Washington. As such, the project is subject to the governing codes of the City of Cheney. During design, the AE team, and EWU, anticipates proactively engaging the City to ensure that the plans are in compliance.

The City of Cheney designates that the Eastern Washington University campus, and the project site, are zoned with a unique "P" (Public) designation. There are no specific restrictions on the use of property within the P zone.

4.3.3 Civil and Mechanical

The utility infrastructure for fire, water, sewer, steam, and chilled water presently exists and the existing Science Facility and has sufficient capacity to meet the long term needs of the renovated facility.

- High pressure steam (6") and pumped condensate (2.5") enter the building through an existing steam tunnel from Washington Street. Steam services the building heating, potable and non-potable water heaters, snow melt, humidifiers, and lab equipment such as autoclaves.
- The building has a 3" low pressure gas service from the local Utility Avista. This service will be maintained but the meter may require relocation if the loading dock is expanded. Gas services the lab gas outlets and possibly cage washing water heaters.
- The roof drainage terminates the south side of the building and exits the site with 10" and 8" drain lines.
- The building has numerous sanitary sewer connections. The sanitary sewer leaves the site with a 6" pipe located to the NE and a 6" pipe to the south.
- Process Waste. The south mechanical room, east tunnel, and south mechanical room each have acid neutralization systems where the water is treated before it is connected to the sanitary sewer. The south and west connections and pumped via sewage ejectors.
- The building has a 4" water service that enters the south side of the facility. This service will be maintained.
- The building has a 6" fire service that enters the south side of the facility. This service will be maintained.

4.3.2 Electrical

The utility infrastructure for electrical and communication presently exists at the existing Science Facility. Summary of the services and recommended improvements are as follows:

- Campus Electrical: The existing building receives power from the existing campus 13.2KV primary electrical distribution system. Existing 13.2KV Switch #19 is fed from the campus primary electrical distribution system feeders 1B and 2B. Existing 13.2KV Switch #19 currently serves both services to the existing building as well as Cheney Hall. These services will be maintained.
- Building Normal Electrical Service: The existing electrical services consist of (1) 1500KVA, 480/277V outdoor pad mount transformer and (1) 1000KVA, 480/277V outdoor pad mount transformer. These services will be maintained.
- NEC Article 700 Emergency Electrical Service: The existing emergency electrical distribution system consists of (1) 90KW, 480/277V engine driven propane fueled generator. An additional generator or replacement generator is anticipated to support both building emergency and standby loads.
- Communications: Communication service is provided to the building from the EWU owned data/com distribution system. Fiber optic cabling is routed throughout the EWU Campus via a system of cable tray that is located within the existing campus utility tunnel system. New fiber to the building is anticipated for communications service. Existing pathways will be reused.

4.3.2 Regulatory

Building design will be subject to the requirements of the local jurisdiction - City of Cheney Building Department. The building code enforced at the time of this Predesign is the 2015 International Building Code and companion International Codes including Mechanical and Electrical Codes. Washington State code amendments supersede these codes where applicable. Coordination with the City of Cheney will begin during the Schematic Design phase of the project.

The site is compatible with SEPA and LEED requirements. Additionally, the building capitalizes on re-use of the existing shell instead of developing a virgin site. Please see the appendix for the LEED scorecard.

4.3.3 Access Issues

Access to the site is most easily achieved from the south were a secondary road from Washington Street connects to the loading dock. The north side of the building will have very limited access after the addition to the building is complete. East and west sides of the building can be accessed by sidewalks which run the length of the building. Also, there is an interior courtyard which can be accessed through an opening at the south through the 1988 addition. The parking lot located to the north of the project will have limited access once the new addition to the Science Building is under construction, however, there is another parking lot directly to the west of the existing Science Building across Washington Street.

4.4 Acquisition Process

Eastern Washington University currently owns the existing Science Building and property.

4.5 Photos

See following pages.

North Entry

East

South

West

Northwest

section 5.0
project budget analysis

5.0 PROJECT BUDGET ANALYSIS

5.1 Assumptions

5.1.1 Scope

Eastern Washington University requests State capital funds to renovate the Science Building on the Eastern Washington University campus in Cheney, Washington. The renovated building will be designed for an expected life of 50+ years and will improve the quality and quantity of teaching and research labs, and associated support spaces, to meet the growing demand for Science majors within the region.

Once complete the renovated building will be connected to, and work in concert, with the Interdisciplinary Science Center (ISC) which is currently under design. Together the two buildings will provide a science complex on the Eastern Washington University campus where faculty, staff, and students seamlessly move between the buildings.

Description of existing program facilities, proposed alternatives, and economic trade offs are discussed in Section 2.0 of this document.

5.1.2 Assumptions

In framing the project, the following assumptions have been made which affect the calculation of project costs:

- The project will be delivered using Design-Bid Build.
- Assuming the project is completed in multiple phases, construction will be 16 months in duration for Phase I and will commence in Summer of 2019. Construction for Phase II will be 16 months and will commence in Summer of 2021. If construction cannot commence on this timeline, additional escalation costs should be factored into the overall project cost.
- Construction of the Interdisciplinary Science Center (ISC) will be complete, and the skywalk connections between the buildings in place prior to renovation of the Science Building.
- In accordance with Washington State standards, the building will attain LEED Silver Certification as a minimum.
- The building will be designed to comply with the codes and standards outlined in Section 3.0 of this document.
- The existing loading dock location will be maintained as it serves both the renovated Science Building and the ISC. Additional capacity and/or revised grading at the loading dock is anticipated.
- Minimal sitework and landscaping will occur around the perimeter of the building. The interior courtyard will be renovated with new landscaping and pedestrian paths.
- Existing utility tunnels beneath the building will provide campus steam, electrical, and telecommunications services to the building. Chilled water will come from the central plant. Redundant cooling will be needed at the IT rooms and Vivarium space.
- Mechanical, plumbing, and electrical systems within the building are at the end of their useful lives and will be replaced as part of this project in accordance with building codes, sustainability goals, and campus standards.
- Costs include abatement of hazardous materials including asbestos, lead paint, and PcBs.
- Materials selected for construction will exhibit a balance between utility, durability, economy, aesthetics, and curb appeal. In addition, the palette of materials should harmonize with those of the ISC to provide a seamless transition between the two buildings.
- Materials, products and equipment should follow the established campus standards where appropriate in order to maximize efficiency in maintenance.
- The building will be fully sprinklered.

- This project does not include the construction of additional parking lots. The existing P-9 parking lot to the west and P-10 parking lot to the north will continue to serve the building with accessible stalls.

5.2 Detailed Estimates

Pursuant with the assumptions noted in Section 5.1.1, the following outline specifications were created. These specifications provide the basis of the construction cost estimate for the project.

A - Substructure

A10 Foundations

A1010 Foundations

- Minimal work to existing foundations is anticipated as this is a renovation project preserving the majority of existing foundations, walls, floors, and roof structure. Some modifications may be required at the loading dock to increase its size and make this area more functional for the users. Any new work needs to be performed in accordance with ACI 301. Meet requirements of Concrete Mix Design Table. Capacities to be based on geotechnical report. Dampproofing to be provided at exterior surfaces below grade foundation walls.
- Reinforced concrete continuous strip footings and foundation walls. Reinforced concrete isolated footings.
- Utilize pre-mixed concrete for footings Mix designs, appropriate for condition of installation.

A4010 Slabs-on-Grade

- Pre-mixed concrete for walls and slabs on grade. Mix designs, appropriate for condition of installation. Work performed in accordance with ACI 301.
- Standard Interior Slab-on-Grade (See Foundation Plan for extent): 4 inch thick reinforced concrete slab on grade, typical.
- Slab reinforcement #3 bars at 16 inches on center, each way. 15 mil vapor retarder over 4 inch layer of capillary break over compacted subgrade.

B - Shell

B10 Superstructure

B1010 Floor Construction

- Repair of concrete and patching and repair of damaged or deteriorated concrete using cementitious and epoxy repair materials. Basic repair or concrete reinforcement. Work performed in accordance with ACI 301. Epoxy materials by BASF, Euclid, Sika, L & M, Simpson Strong Tie or Hilti. Cementitious Mortar Materials by Euclid, L & M, Sika, W.R. Grace or RAECO.
- Form materials, water stops and accessories, required for cast in place concrete and to maintain structural integrity until stripping. Provide ICC reports for each product where ICC approval is required. Work performed in accordance with ACI 301.
- Reinforcing steel and required supports for cast in place concrete. Deformed billet steel bars - ASTM A615, 60 ksi yield strength.
- Surface finishing of concrete floor slabs. Initial and final curing of concrete surfaces. Work performed in accordance with ACI 301. Concrete finish requirements and locations. Typical gray concrete for substrate and exposed finish in custodial area, storage rooms, M & E rooms, hardener sealer. FF and FL tolerances identified per finish and location in accordance with ASTM E1155.
- ASTM A653, SS Grade 33 structural quality, minimum yield 38 ksi, with G60 galvanized coating. Fluted or cellular. Composite where indicated or detailed.

- Fire-resistive sealants and barrier products for use to close off penetrations of fire-rated floor and wall assemblies. Products keyed to UL., IBC. or Gypsum Association tested assemblies.

B1020 Roof Construction

- ASTM A653, SS Grade 33 structural quality, minimum yield 38 ksi, with G60 galvanized coating.
- Spray or trowel-applied for protection of structural steel framing and roof deck in fire-rated assemblies. W.R. Grace "Monokote MK-6," Isolotek International "Blaze-Shield" or approved equal. Intumescent fireproofing, if required, at exposed structural steel.

B1080 Stairs

- ASTM A36 steel rolled sections, ASTM A500 or A501 tubular steel. 12 or 14 ga. steel sheet formed pans and metal decking for concrete fill under section 03 30 00 - Cast-In- Place Concrete.
- Steel pipe fabrications, ASTM A53, Grade B, Schedule 40 or XS. Fittings and related fasteners and welding requirements. Painted guardrail balusters and handrails in utility areas. Custom designed stainless steel, aluminum or glass in public areas.

B20 Exterior Vertical Enclosures

B2010 and B2020 Exterior Walls and Windows

- ASTM A570/ASTM A992 steel rolled sections or A500b tubular steel sections, wide flange beams and tubular columns, anchors and erection. Welding products and qualifications. Installation of Type N Grout specified in Section 03 60 00 - Grouting.
- Open-web steel joists, bridging, seats and anchors.
- Structural steel studs, joists and tracks for load-bearing construction. ASTM A446, Grade A steel, galvanized at exterior walls or soffits, prime-painted at interior locations. Gypsum sheathing; ½ inch thick, ASTM C79. Asphalt impregnated building paper, ASTM D226, Type 1. Fasteners and accessories.
- Fire-retardant treated wood wall blocking for wall-hung construction. Preservative treated wood for roof nailers and curbs.
- ASTM C1177 or C1278, fire-resistant (Type "X"), water-resistant exterior gypsum sheathing board composed of a proprietary, water-resistant core with glass mat facings or a composite gypsum/cellulose fiber core with gypsum and water-resistant additives and no facings; 5/8 inch thick x 48 inch wide sheets; Georgia-Pacific DensGlass Gold® Fireguard®, CertainTeed GlasRoc Type X®, USG "Fiberock" Brand sheathing with "Aqua-Tough", or approved equal.
- Thermally-isolated extruded aluminum storefront with fixed sash and swinging aluminum doors; anodized finish; glazed with low-E insulating glazing specified in Section 08 80 00. Products by Oldcastle, U.S. Aluminum, EFCO or approved equal.
- Exterior - 1" insulating panels, clear exterior and interior panes, low E (emissivity) film coated, tempered or laminated where safety glass is required, and float glass elsewhere. Spray-applied silane-type coating on exterior brick, CMU or concrete masonry for prevention of moisture penetration.
- Spray-applied silane-type coating on exterior brick, CMU or concrete masonry for prevention of moisture penetration.
- Rigid polystyrene or polyisocyanurate boards for perimeter foundation wall, exterior walls behind GWB and in cavity wall construction; R10 perimeter foundation wall insulation, R19 wall insulation minimum.
- For exterior stud wall and soffit construction; fiberglass; unfaced; R21 thermal value typical.
- Sheet and sealant vapor and air barrier for above grade surfaces. Reinforced polyethelene or polyester/fiberglass film; Griffolyn Type 65, Lamtec WMP-30 or Raven RUFCO 300, or approved equal. Section includes adhesives and tapes required for installation.
- Pre-manufactured grout, non-shrink for structural bearing and guardrail post sleeves. Field mixed grout for non-structural penetrations. Grouting of hollow steel frames in masonry construction.

- Field-mixed mortar and grout for masonry installations. ASTM C270, Type S mortar and ASTM C476, Type N coarse grout for unit masonry cells with reinforcement.
- Fire-resistive sealants and barrier products for use to close off penetrations of fire-rated floor and wall assemblies. Products keyed to UL., IBC. or Gypsum Association tested assemblies.
- Interior and exterior joint sealants and backing for various applications; acrylic latex for interior work, including mildew-resistant and acoustical types; silicones and butyl formulations for exterior uses.

B2050 Exterior Doors and Grilles

- Standard Steel Frames; Exterior: SDI-100 Level 4, 0.067 inch thickness (14 ga.) steel galvanized to ASTM A525 G60 coating.
- SDI-100, Level 3, Model 2, 0.053 inch thickness (16 ga.) door faces; insulated with polyurethane or polystyrene foam; galvanized G60 coating. Fire-rated and non-rated.
- Commercial and/or institutional grade builder's hardware; BHMA standard, fire-rated and non-rated, with modifications where required to meet ADA and Washington State design for the disabled; mortised locksets with lever handles; reduced pressure closers; automatic door operators at entries; heavy-duty or continuous hinges; integration with building security system and access control system.

B2080 Exterior Wall Appurtenances

- Shop fabricated assemblies, embeds, ladders and stair nosings. Galvanized for exterior exposures and prime-painted for interior locations and installation in concrete. Anchors, fasteners and welding. Sunshade framing at exterior windows when not provided by window/storefront or curtain wall manufacturer.

B30 Exterior Horizontal Enclosures

B3010 Roofing

- Reglets and counterflashing; Fry "Springlok"® system or equal. Custom fabricated sheet metal work, galvanized steel or aluminum. Coping PVF coated to match brick color.
- Spray or trowel-applied for protection of structural steel framing and roof deck in fire-rated assemblies. W.R. Grace "Monokote MK-6," Isolotek International "Blaze-Shield" or approved equal. Intumescent fireproofing, if required, at exposed structural steel.

B3060 Horizontal Openings

- Roof hatches by Babcock-Davis, Bilco, Nystrom or approved equal. With telescoping safety post and guardrail at roof level. Model LU-1LadderUp® by Bilco and Bil-Guard® by Bilco respectively, or approved equal.

C - Interiors

C10 Interior Construction

C1010 Interior Partitions and Windows

- Steel stud and track framing for fire-rated and non-rated interior partitions and furring, and drywall ceilings; ASTM A653 steel studs and tracks, "C" shaped, pre-punched webs for mechanical and electrical, minimum 20 gauge, G60 galvanized finish; ASTM C754 cold-rolled channels, 16 gauge, G90 galvanized finish; ASTM C645 furring channels, 26 gauge, G60 galvanized finish.
- For interior partitions, fiberglass sound attenuation batts or for fire-rated walls, mineral wool batts or blankets, 3 inches thick, unfaced, friction-fit.

- 5/8" Type "X" gypsum wallboard and cementitious backer units; trim and joints, fasteners and accessories; finishing to a Level 4 per Gypsum Association GA-216.
- Translucent/obscure glazing in areas requiring visual privacy. Fire-rated glazing where permitted by the building code.

C1030 Interior Doors

- Standard Steel Frames; . Interior: SDI-100 Level 3, 0.053 inch thickness (16 ga.) steel, prime painted.
- Solid core construction; composite wood panel at non-rated and mineral fiber board at rated door construction. Hardwood veneer for stain and clear finish except paint grade at utility areas.
- Access Doors and Frames; Milcor, J.L. Industries, Karp Associates, Nystrom or approved equal.
- Commercial and/or institutional grade builder's hardware; BHMA standard, fire-rated and non-rated, with modifications where required to meet ADA and Washington State design for the disabled; mortised locksets with lever handles; reduced pressure closers; automatic door operators at entries; heavy-duty or continuous hinges; integration with building security system and access control system.

C1090 Interior Specialties

- Porcelain enamel on steel surfaces in aluminum frames, fixed assemblies; wall mounted liquid markerboards and cork core, fabric-covered tackboards.
- Interior and Exterior Signage: Aluminum-framed plastic plaques with raised white lettering and Grade 2 braille text; fixed text strip; products by Andco, APCO, ASI, Vomar or approved equal; wall-mounted with stand-offs, individual brushed aluminum letter on exterior walls.
- Hollow steel panel construction, floor-mounted, top rail-braced, powder-coated finish, accessible hardware, with integrated accessories.
- High-impact stainless steel or aluminum corner guards, with retainer clips; to 4 feet high at exposed, vulnerable wall corners in high-traffic areas. Products by Balco, MM Systems, Construction Specialties or approved equal.
- Stainless steel and plated metal dispensers, receptacles, grab bars, mirrors and holders. Products by Bobrick, Bradley, McKinney Parker, ASI or approved equal.
- Fall protection utilizing a steel tie down system consisting of anchor pedestals, tensioned catenary cable, shock absorbing lanyard and safety harness. Products by Guardian Metal Products or approved equal.
- Fire extinguishers: Dry chemical (A,B) type; 10 lb. capacity. Steel, fire-rated cabinets, fully and semi-recessed. Products by J.L. Industries, Larsen's Mfg. Co. and Potter-Roemer.
- Solid vinyl slats, rotating and traversing on exterior windows and interior relites where required for light control or visual isolation. Levolor, Louver Drape, Bali Graber or approved equal.

C20 Interior Finishes

C2010 Wall Finishes

- Low-gloss, dry erase surface adhesively-applied over entire wall areas for writing and projecting in classrooms and other instructional spaces; Walltalkers® erase•rite® or approved equal.
- Pre-fabricated panels consisting of dense fiberglass board with resin edges and fabric or vinyl wrapped on the exposed face, for acoustical reverberation control and sound isolation. In classrooms and other quiet areas.

- Fabric covered, rigid fiberglass tack panels adhesively applied to walls or mechanically mounted in panels. On one or more walls in offices and display areas.

- Primer and finish coats, latex base, gloss, semi-gloss and flat enamel finish. Water-based epoxy paints in toilets, and similar areas where frequent cleaning and an impervious surface are required.
- Glazed ceramic wall tile thinset on cementitious backer units in toilet rooms.

C2020 Interior Fabrications

- Hardwood, softwood and composite wood window sills, bookshelves, miscellaneous trim, etc. as detailed and/or specified.
- Custom designed plastic laminate-faced casework conforming to AWI Custom grade standards; CS236 particle board construction with average 45-48 pounds per cubic ft. density; NEMA LD3 plastic laminates, HGS and VGS grades on exposed surfaces, melamine cabinet liner on interior surfaces; ANSI/BHMA A156-9 cabinet hardware.
- Composite decorative sheet consisting of natural quartz crystals in a proprietary binder, typically 3 millimeters thick for horizontal applications and 2 millimeters thick for vertical applications; DuPont Zodiac®, Cambria® or Cosentino Silestone®, or approved equal.

C2030 Flooring

- Porcelain floor tile and/ or ceramic mosaic floor tile (matte or abrasive finish) in toilet rooms. Installed over Portland Cement setting bed.
- Commercial grade vinyl composition tile in utility areas and elsewhere as scheduled, sheet vinyl or linoleum in corridors and areas requiring minimal joints in flooring for cleaning.
- 24 inch x 24 inch modular carpet tiles, nylon with synthetic back for direct glue-down installation or self-adhered.
- Vinyl-filled aluminum tread rails set in a recessed extruded aluminum frame; products by Construction Specialities, Inc. “Pedimat”or Arden Architectural Specialties “Quietflex”, or approved equal.

C2050 Ceiling Finishes

- 9/16 inch wide grid system in public areas, standard 15/16 inch wide grid in utility areas. Mid-range (cost) ceiling tile, rated and non-rated, white in color. Suspension grids and seismic bracing.

D - Services

D10 Conveying

D1010 Vertical Conveying Systems

- Holed, hydraulic-type, 4-stop, 3,500 lb. net capacity, 125 fpm speed, accessible cab features. Otis, Kone, Thyssen Krupp or U.S. Elevator.

D1080 Operable Access Systems

- Garaventa Genesis Vertical Lift #GVL-SW-41, 750 pound operating load, 0.75 H.P. motor, 208VAC, 60 Hz; 24 VDC operating controls; 9 fpm travel speed; or approved equal by Lift-Avator or Savaria.

D20 Plumbing

D2000 General Plumbing Requirements

- Gauges and Meters: Provide temperature and pressure gauges at plumbing equipment.
- Supports, Anchors, Curbs, Seals and Flashings: Provide pipe hangers, sleeves and plates, equipment stands, housekeeping pads, curbs, seals and caulking, and flashing for finished plumbing systems.

- Vibration Isolation: Furnish and install vibration isolation mountings for all plumbing pumps, compressors, and any other motorized equipment installed under this contract.
- Piping Insulation: Insulate domestic hot and cold water and rainwater piping systems including pipe fittings and roof drain sumps.
- Mechanical Identification: All plumbing valves, equipment, and access doors and panels shall be tagged for identification. Piping systems shall be labeled and color-coded with a color banding system.
- Plumbing Equipment: Provide floor cleanouts, wall cleanouts, trap primers, water hammer arrestors, floor drains, backflow preventers, water heaters, water heater storage tanks, and domestic water circulating pumps. Hose bibs shall be provided at each bank of lavatories and around the building perimeter.

D2010 Plumbing Fixtures

- Restroom wall hung water closets, urinals and lavatories will be constructed of commercial grade vitreous china. Lavatory traps and supplies will be insulated per accessibility requirements.
- Hands free sensor operated electric faucets with integral thermostatic mixing controls will be provided on toilet room lavatories. Sensor operated electric flush valves will be used for water closets and urinals.
- Non-Lab sinks will be stainless steel, with single lever faucets of cast brass construction. Custodial sinks will be provided with wall faucet and lever handles.
- Emergency showers and eyewash stations within the laboratories, as provided under division 11, will be serviced from a centralized tempered water system that delivers potable tepid water between 60 and 95 degrees to the safety stations.
- Laboratory fume hoods and other air containment units, as provided under division 11, will be pre-piped with utility connections at the top and rear of hood.
- Water Conservation - The following items will be reviewed by the design team and Eastern Washington University for Water Conservation and Long Term Campus Standardization /Maintenance considerations; dual flush (1.6/1.0 GPF) water closets, ultra-low flow water closets (1.28 GPF), pint flow urinals, and 1.5 GPM showers, lavatory faucets to deliver 0.5 GPM.

D2020 Domestic Water Distribution:

- Domestic cold water and 120°F hot water distribution systems will be provided throughout the building.
- A hot water recirculation system controlled through the campus energy management system (EMS) will be provided and distributed at low velocities, using “in-line” all-bronze circulating pumps.
- Water heaters will be instantaneous steam to hot water, utilizing campus steam and heat exchangers.
- Double check valve backflow prevention assemblies will be provided for the system.
- Valves will be provided at all branch take-offs to individual fixture groups, and zone valves will also be provided. Balancing valves will be placed in return loops at connections of the hot water piping.
- Materials:
  - Water Piping: Copper type L

D 2030 Sanitary Waste and Vent System:

- A gravity sanitary drainage system will be provided to serve all plumbing fixtures and equipment (see also Lab Waste and Vent System) under lab plumbing systems.
- Materials:
  - Drain, Waste, Vent Piping (above grade) : Cast Iron

- Waste Piping (below grade): PVC, ABS, or Cast Iron

D2040 Rainwater Drainage:

- Gravity primary and overflow storm drainage systems will be provided to serve the roof levels with each system piped separately outside of the building. Rain leaders will be located within the heated portion of the building to prevent freezing of the pipe and will be insulated to prevent condensation from developing on the pipe. Overflow drains will terminate at grade level on splash blocks.
- The east, west and north areas of the building have mostly original (1960) roof drain system (primary piping and drainage). The overflow drainage system was added with the renovation in the 1990's. The piping and drains installed in 1960 should be replaced.
- Materials:
  - Storm Drain Piping (above grade): Cast Iron
  - Storm Drain Piping (below grade): PVC, ABS, Cast Iron

D2090 Laboratory Plumbing Systems:

- Compressed Air System: The existing central compressed air system with duplex compressors for redundancy, air drier and receiver will remain in use to service the renovated building. The air receiver will be replaced to minimize rapid cycling of the compressor. The system delivers 80-100 psig air to each lab with each lab containing a pressure regulating valve. Areas requiring non-lab quality compressed air at 100 psig will be piped direct from the receiver to the associated labs.
- Lab Vacuum System: The existing central vacuum system will remain in use to service the renovated building.
- Lab Natural Gas System: The existing gas service will be retained and gas will be piped to the labs from the building gas service at low pressure (4-7" WC). Each lab space will be equipped with an accessible local emergency gas shut-off valve.
- Lab Specialty Gas Systems: Specialty gases such as nitrogen will be provided from owner furnished cylinders that are piped to the lab outlets.
- Industrial Water Systems: Cold and 120°F hot non-potable water distribution systems will be provided throughout the building to selected equipment and lab faucets. The systems will be isolated from the domestic water system with a double check backflow preventer assembly. Hot water heaters will be semi-instantaneous with hot water generated from campus steam.
- Industrial Hot Water Recirculation System: A recirculation system will be provided and distributed at low velocities to ensure fixtures and equipment requiring hot water will have hot water readily available through the use of "in-line" all-bronze circulating pumps.
- Tempered Water System: Potable cold water will be tempered by mixing domestic cold water and domestic hot water at a master mixing valve located in the mechanical room to deliver tempered water to the emergency showers and eyewashes stations throughout the building.
- Lab and Animal Waste and Lab Vent System: Laboratory sinks in case work, chemical fume hood cup sinks and floor drains in chemical use areas will be piped in a dedicated waste system that will allow for future monitoring by regulatory authorities for possible discharges. Outside the building, after the monitoring point, the lab waste system will combine with the building sanitary sewer. Waste and vent piping will be chemical resistant.
- Snow Melt System: A hydronic snowmelt system will be provided for exterior walkways at main entrances and site stairs that are difficult to access with mechanical snow removal equipment. Heat for the snowmelt system will be generated from a steam to hot water heat exchanger connected to the campus steam/condensate system.
- Pure Water System: The existing central pure water system will be retained to provide pure water to designated outlets in the labs. The system will be pumped and will have a fully recirculating system. High purity water will be generated from owner

furnished local "polishers" in the individual labs.

- Greenhouse RO System: Water for the greenhouses will be specially treated with carbon filters and a reverse osmosis unit.
- Vivarium (non aquatic) RO Water System: A purified water system will be provided for animal water and the rinsing phase of cage washing. The system will include a storage tank, a reverse osmosis unit, bacterial treatment (such as chlorination, ozonation or acidifying) and re-pressurization pumps but will not have deionization post-treatment process. An automated drinking water system will be considered. An automated water system would consist of stainless steel piping, PVDF recoil hoses for connection to the rack water, and automated flushing.
- Aquarium Water System: Water for the large fish tank system will be treated with carbon filters to remove the chlorine. It is assumed that the tank system (tanks, pumps, filters, chillers etc.) will be Owner furnished.
- Process Cooling System: A dedicated distribution piping loop from the heat recovery chillers will be piped through the facility to provide cooling water to lab research equipment such as environmental growth chambers, low temperature freezers and other process loads. The loop will be provided with dual pumps for redundancy.
- Process Steam: Process steam will be piped to autoclaves, cage washing and other lab equipment. Process steam will be obtained from the campus steam system.
- Zone Valves: Each plumbing system serving the laboratory module will be isolated by zone valves, to facilitate service and maintenance.
- Materials:
  - Compressed Air Piping: Copper
  - Lab Air Piping: Copper
  - Lab Vacuum Piping: Copper
  - Lab Natural Gas Piping: Black steel
  - Lab Specialty Gas Piping: Copper or as required.
  - Pure Water Piping: High purity polypropylene or PVDF (in return air plenums)
  - Industrial Hot/Cold Water/Tempered Water Piping: Copper
  - Lab Waste Piping: Polypropylene
  - Snowmelt Piping (buried in slab): Polypropylene
  - Process Cooling: Steel or copper

D30 HVAC

D3000 General HVAC Requirements

- Design Conditions:
  - Ventilation Requirements: Labs with chemical use will be ventilated 24 hours per day with a minimum of 6 air changes per hour in occupied mode and 4 air changes per hour in unoccupied mode in accordance with the detailed space requirements. Ventilation rates may exceed 6 air changes per hour when dictated by process exhaust or space cooling needs. Vivarium areas may require ventilation rates of 15 air changes per hour depending upon species and caging methods.
  - Acoustic Considerations: Acoustic isolation of the following mechanical systems will be included; vacuum pumps, air compressors, and chillers. Limiting duct velocities through ductwork, terminal units and air inlets/outlets to achieve space NC, use of sound attenuators in the duct systems, and vibration isolation of mechanical equipment with spring isolators and flexible connections will also be employed.
- Outdoor Design Conditions:

  - Heating systems will be sized for the ASHRAE median of extremes for Cheney, Washington which is -9°F. Cooling systems will be sized for the ASHRAE 0.1% design condition temperature for Cheney, Washington which is 99°F dry bulb and 69°F wet bulb.
- Indoor Design Conditions:
  - When occupied, non animal laboratories and support spaces will be maintained between 68 and 72°F, laboratory equipment rooms will be maintained between 68 and 75°F and office spaces will be maintained between 68 and 75°F. Communication rooms will control to 68-75°F 24 hours per day, 7 days per week. Mechanical and electrical spaces will control to 55-85°F.
  - Spaces with rodents, reptiles, or birds will be designed to operate between 65 and 80°F depending upon species with humidity ranges between 40 and 70% RH with individual zone level humidity control. Food and bedding storage will be maintained between 65 and 70 °F.
  - Aquarium space temperature and space humidity will be designed to correlate with the tank water temperature to minimize large amounts of condensation on the tanks.
  - The greenhouse will be provided with packaged heating and cooling systems. Supplemental humidification will provide winter humidification that is not available from the greenhouse manufacturer.

D3010 Energy Supply

- The campus has a central chilled water plant and steam plant that distributes chilled water and high pressure steam to the buildings on campus through an underground tunnel system. The cooling and heating load will reduce with the renovation of the science building. Existing branch piping in existing tunnels feeding the building is sufficiently sized for the renovation.
- The building has a natural gas service. Natural gas will be used for the lab gas outlets and possibly the vivarium water heater feeding cage washing.
- Electrical service to the EWU Campus primary distribution system is provided by the City of Cheney

D3020 Heat Generation

- Heat will be provided from steam convertor(s) that generate hot water from campus steam. System will have two pumps piped in parallel for redundancy.
- Materials:
  - Hydronic piping-Copper type L or schedule 40 black steel.
  - Steam and Condensate Piping-Black steel, schedule 40 or schedule 80 to suit pressure and service.

D3020 Refrigeration

- The primary cooling source will be chilled water supplied from the campus central chilled water plant.
- A heat recovery chiller will provide cooling for the vivarium and IT closets. Back up to the heat recovery chiller will be campus chilled water. Heat recovered from the chiller will be rejected to the building heating system or domestic water system.
- Materials: Chilled Water Piping-Copper type L or schedule 40 steel.

D3040 HVAC Distribution

- Lab Supply: Lab areas that require 100% outside air and 24 hour ventilation will be serviced from dedicated supply systems. Existing air handlers will be retrofitted with the coils and fan wall systems. Fan wall systems will provide redundancy in the event of the loss of a fan.

- Lab Exhaust: Exhaust will be manifolded to a central exhaust system consisting of multiple fans with N+1 redundancy that automatically adjust exhaust air volumes from the lab spaces based upon lab occupancy, fume hood demand and cooling needs. Laboratory fume exhaust needs will be provided via dilution type up-blast laboratory exhaust fans. Stack height and location will be determined in conjunction with the wind consultant. Coils in the lab exhaust system will capture waste heat from the exhaust air stream. Waste energy from the exhaust conditioned air will be piped to coils in the make-up air units to preheat or pre-cool the outside air introduced into the building.
- Lab Air Distribution: Make-up in the labs will track the lab exhaust fans minus an offset for space pressurization control. Terminal units in the labs will be variable air volume type with chilled beam induction units.
- Vivarium Air Systems: The vivarium will be serviced by dedicated, fully redundant, 100% outside air systems that operate 24 hours per day to maintain fixed temperature and pressure relationships required in the animal holding, procedure, and cage washing areas. The system will be the same as provided for the lab make up air except that the air supply shall be filtered with 95% efficient filters and the unit and zones will have humidifiers. Diffusers in the vivarium and support areas shall be stainless steel. Procedure rooms shall have laminar airflow distribution.
- Aquarium Air Systems: The large fish tank spaces will be supported with an independent fan system equipped with dehumidification controls to minimize condensation on the large tanks and piping.
- Greenhouse Air Systems: The greenhouses will include heating and cooling systems provided by the greenhouse manufacturer and integrated into the greenhouse construction. Supplemental humidification will be provided to maintain humidity levels in the dry winter months.
- Office Areas: Non-lab teaching and classroom areas will be serviced with dedicated outside air systems (DOAS) with outside air supplied from the 100% lab air systems. Terminal units in will be variable air volume type with chilled beam induction units for cooling. Air will be regulated to shut off in the unoccupied mode.
- Materials:
  - Supply/return and non fume hood exhaust ductwork: Galvanized steel
  - Chemical fume hood exhaust ductwork: Stainless steel.

D3060 HVAC Instrumentation and Controls

- Direct Digital Control (DDC): The project will utilize a Direct Digital Control (DDC) for the control of the HVAC systems, providing for heating and cooling control, peak load demand limiting, and start/stop optimization. Damper and valve actuators will be electronic.
- Energy Management System (EMS): The EMS controls will be compatible with EWU's campus BACnet system, and interface and communicate with this network and front end operator's terminal for the purpose of remote operation and maintenance. The EMS will include metering and trending of building energy consumption by energy supply and end use.
- Chemical Fume Hood Controls: Specialty control devices for the lab environment will be provided for the operation of the chemical fume hood exhaust and make-up air, to assure the high reliability required for life safety and energy management. The system will include; make-up air valves, chemical resistant fume hood exhaust valves, general exhaust valves, fume hood face velocity sensors, and software integrated with the EMS.
- Vivarium Environmental Monitoring and Control System: In addition to EMS control, a dedicated environmental monitoring system would be independent of the facility EMS system and would consist of controls for monitoring of temperature, humidity, lighting, airflow, and electric door locks. System would collect data for research and produce standardized reports to satisfy regulatory requirements.

D40 Fire Protection

D4010 Fire Suppression

- General System: The fire department pump connection will be mounted on the exterior of the building. Double check valve backflow prevention assemblies will be provided for the fire systems in the utility room. Fire department connections, post indicator valve, and backflow prevention will be in accordance with the City of Cheney requirements. The fire system will be divided into multiple zones by floor for identification and annunciation at the central fire alarm panel.
- Sprinklers: Sprinklers will generally be wet pipe type. Areas subject to freezing will be protected with a dry pipe system. Hazardous waste chemical storage rooms will be protected with a dry chemical system.
- Sprinkler Densities: The building light hazard areas (office, lecture rooms, circulation spaces) will be sprinklered to light hazard requirements. Electrical, mechanical and non-chemical use labs will be sprinklered to ordinary hazard group 1 requirements. Chemical use labs and other higher hazard areas will be sprinklered to ordinary hazard group 2 requirements.
- Standpipe: A fire protection standpipe will not be required as the highest occupied level of the building will not exceed 30 feet above grade
- Fire extinguishers: Dry chemical (A,B) type; 10 lb. capacity. Steel, fire-rated cabinets, fully and semi-recessed. Products by J.L. Industries, Larsen's Mfg. Co. and Potter-Roemer.

D50 Electrical Systems General

D5010 Service and Distribution

- General System: Existing building is served from (2)480/277V pad mounted transformers which are planned to remain. The building electrical service and distribution will be designed to provide separation of lighting, mechanical and computer equipment loads. Lab and special equipment power distribution will be separate from general building power panels. Multi- stage surge suppression shall be provided by installing transient voltage surge suppressors at the main switchboard, distribution switchboards and appropriate panelboard locations.
- Switchboards: Switchboards shall be free-standing dead-front style. Main devices shall be equipped with ground fault protection where required by code. Distribution devices shall be factory-installed, group-mounted circuit breakers. Each main switchboard will have owner metering per EWU campus standards and integral TVSS protection. Switchboard shall be mounted on a 2" concrete housekeeping curb. All bus bars shall be copper.
- Panelboards: Circuit breaker panelboards shall be provided throughout the building as required to adequately serve the associated building loads. Lab spaces will typically receive dedicated power panels located at each lab or lab module. Panelboards shall be dead-front circuit breaker type with proper interrupting capacity. All panelboards shall be provided with 42 available circuits. All bus bars shall be copper. Panelboard sub-metering will be provided per energy code requirements.
- Mechanical Equipment: Refer to mechanical section for proposed mechanical systems and possible equipment. Motor starters and disconnects will be located in close proximity to each associated piece of mechanical equipment. Motor control centers will be utilized when several pieces of mechanical equipment which require motor starters are located in close proximity to one another. Variable frequency drives will be provided by the mechanical contractor and installed by electrical contractor for various pieces of mechanical equipment.
- Disconnect Switches: Safety switches shall be heavy duty type with interlocking door and spring loaded contacts. Safety switches used as motor disconnects shall be fused. Outdoor safety switches shall be NEMA 3R.
- Motor Controllers: Motor controllers shall be magnetic motor starters with fused control power transformers, pilot lights, HOA controls and auxiliary contacts as required for control functions.
- Engine/Generator: Emergency and standby power generation shall be provided by means of engine driven propane fueled generator sets. Generators shall be sized to supply necessary loads. Generators shall include a weather proof sound

attenuating enclosure for outdoor installation. Generators shall be provided with concrete pad that elevates the generator skid a minimum of 6-inches above adjacent grades and finishes for ease of access to oil & coolant drain lines. Operation of generators will be monitored on a multi function system designed to report most normal failures such as low cooling fluid temperature, low starting batteries, overcrank, overload, high water temperature, etc.

- Automatic Transfer Switch: The automatic transfer switches shall be 4-pole, switched neutral, open transition type.
- Grounding: Grounding materials shall be copper, except ground rods shall be copper-clad steel. Grounding electrode shall be provided per code requirements. Equipment grounding conductors shall be run with all feeders and branch circuits. Equipment ground bars shall be provided within all electrical rooms and communications rooms.

D5020 Lighting and Branch Wiring

- General System: Lighting throughout the interior building spaces will respond to the primary use of each space while maintaining a level of flexibility to react to the future use of each space. Uniform ambient lighting will establish a basic minimum lighting level throughout each individual space with task, display and accent lighting used to establish contrast and interest. Specific attention will be given to the lighting for areas with computer workstations and projectors in order to minimize glare and conflict. Interior and exterior building lighting will be LED type.
- Lighting Performance: Lighting system design foot candle levels will be in accordance with IES standards and EWU standards. In general, areas within the building and on the site will be illuminated to the following target light levels and lighting power densities:

Space type	Target Illumination (FC)	ASHRAE 90.1 2007 LPD (w/sf) (LEED baseline)	2015 WA Energy Code Allowed LPD (w/sf)	Target LPD (w/sf)
Lab/Lab Support	75	1.4	1.02	1
Lab Storage	10-20	0.8	0.5	0.5
Class	30-50	1.4	1	0.7
Study/seating	20-30	1.2	0.74	0.7
Hall/stairs	10-15	0.6	0.55	0.5
MEP Utility	10-20	1.5	0.76	0.76
Restrooms	10-15	0.9	0.78	0.78
Office	30-50	1.1	0.89	0.89
Exterior Entry	5	NA	NA	NA
Exterior Paths	2	NA	NA	NA
Parking Areas	1	NA	NA	NA
Overall Building LPD		1.2	1.01	0.85

Notes:

1. *Lab/Lab support Illumination are at the benchtop.*
2. *Lab storage illumination.*
3. *Other spaces illumination from IES Handbook.*

- Specialty Lighting: Fully enclosed and gasketed lighting will be utilized within specific dirty areas where air born dust from Lab procedures is anticipated. Lighting with impact resistant lenses will also be considered for higher abuse areas.
- Exit Lighting: LED type with integral battery backup. Emergency egress lighting will be provided throughout the path of egress, and will be supplied with generator power for backup in the event of a failure on the normal power system.

- Exterior Lighting: Selected to match the architectural building exterior and EWU campus standards. Exterior entry lighting which illuminates the path of egress will be supplied with generator power to provide illumination in the event of a failure on the normal power system. Exterior lighting will utilize full cut off LED type light fixtures in order to avoid light trespass and meet associated dark sky lighting requirements.
- Lighting Controls: Furnish and install a complete system for the control of lighting and other equipment. The lighting control system specified in this section shall provide time-based, sensor-based (both occupancy and daylight), and manual lighting control. All system devices shall be networked together enabling digital communication and shall be individually addressable. Lighting controls shall be provided with interface to Division 23 EMCS. Standard of design shall be Nlight (Acuity Brands).
- General Branch Wiring: Provide complete raceway and wiring systems in conformance with code requirements and campus standards.
- Conduit: Galvanized steel metal conduit shall be used inside building. Non-metallic conduit shall be used underground, except at transitions. Metal conduit shall be rigid metal conduit, intermediate metal conduit, electrical metallic tubing, or flexible metal conduit. Non-metallic conduit shall be schedule 40 PVC. Conduit shall be concealed wherever possible. Minimum conduit size is 3/4" for building work and 1" for site work. Conduits installed within utility tunnels shall be rigid metal conduit.
- Building Wire: All wiring shall be copper, minimum size #12 AWG. Minimum wire size #10 AWG for site lighting circuits. All feeder conductors shall be installed in conduit. Aluminum conductors are not allowed on the EWU campus. Dedicated neutrals shall be provided for all multi-wire branch circuits. All 480/277V and 208/120V building wire shall be color coded in accordance with EWU campus standards.
- Wiring Devices: Switches and receptacles outlets shall be specification grade. GFI type outlets shall be provided where outlets are mounted within 6 feet of a sink. Trim plates shall be color coordinated with architect.

D5030 Communication and Security

- Communications Building Distribution: A complete communications distribution pathway and cabling system will be provided by the contractor in accordance with the EWU construction standards. Pathways, cabling, outlets, racks and passive equipment will be provided by the contractor. Active equipment will be provided by EWU. Communications rooms will be located throughout the facility in accordance with EIA/TIA 568 and 569. Existing MDF and IDF rooms are present and planned to be maintained. Horizontal station cable pathways will be provided and routed to the communications rooms located on each floor. Each communications room shall be provided with a dedicated 120/208V standby power panelboard and an equipment ground bar. Communications riser cabling and pathways will be provided from the entrance location to the communications room on each floor. Cable trays will be installed down corridors with conduits provided at hard (inaccessible) ceilings and were wall and floor penetrations are required. Open cabling with j-hook supports shall be permitted in unfinished areas or where concealed above accessible ceilings.
- Communication Outlet Distribution: Communications devices will typically be located at instructor's podiums, ceiling mounted projector locations, computer work stations, lab benches and required student locations.
- Wireless Access (WiFi): WiFi system pathways, cabling and outlets will be provided by the contractor. Required locations for WiFi network routers will be closely coordinated with EWU. All WiFi network routers will be provided and installed by EWU.
- Closed Circuit Television (CCTV) System: CCTV System pathways and cabling will be provided by the contractor. Required locations for CCTV devices will be closely coordinated with EWU. All CCTV cameras, power supplies and active electronic equipment will be provided and installed by EWU.
- Access Control System: A complete access control system will be provided by the contractor. Required locations for miscellaneous access control devices will be closely coordinated with EWU. Typical spaces which will include access controls are exterior entries, classrooms, labs, lab storage, office suites, mechanical, electrical, communications roof and janitorial.
- Video Surveillance (CCTV): CCTV system cabling and pathways will be provided by the contractor. Required locations for CCTV devices will be closely coordinated with EWU. Typical spaces which will include CCTV devices are all building

entrances, lobbies, circulation areas and building exterior. All CCTV cameras, power supplies and active electronic equipment will be provided and installed by EWU.

D5090 Other Electrical Systems

- Audio / Video Systems: AV system pathways, data cabling and data outlets will be provided by the contractor. Required locations for AV devices and equipment will be closely coordinated with EWU, but will typically include classrooms and teaching labs. Video projectors, sound reinforcement systems, audio cabling video cabling, control cabling and all passive/ active electronic AV equipment will be furnished and installed by EWU.
- Fire Alarm: A complete battery backed addressable fire alarm system with manual pull stations, automatic detection and ADA compliant speaker/strobes will be provided throughout the facility. New system devices and equipment shall be an extension of the existing building system (Edwards EST-3). All fire alarm wiring shall be installed in conduit.
- Clock System: Clock System pathways, cabling and outlets will be provided by the contractor. Required locations for clocks will be closely coordinated with EWU. All clocks and clock equipment will be provided and installed by EWU.
- Community Antenna Television (CATV) System: CATV system pathways, cabling and outlets will be provided by the contractor. Required locations for CATV will be closely coordinated with EWU. All CATV distribution equipment will be provided and installed by EWU.
- Room Scheduling: Room Scheduling System pathways, cabling, outlets and passive equipment will be provided by the contractor. Required locations for room scheduling will be closely coordinated with EWU. All room scheduling displays and active equipment will be provided and installed by EWU.
- Distribution Antenna System (DAS): DAS system for emergency responder radio use is not planned for the building. This plan is in conformance with EWU standard approach for new construction projects.

E - Equipment and Furnishings

E10 Equipment

E1010 Fume Hoods and other Containment Units:

- Bench-Mounted Chemical Fume Hoods: shall be restricted bypass type / variable air volume (VAV) extraction at 80 fpm (0.51 m/s) face velocity with a vertical rising sash. Exhaust air volume shall be based on 18” open sash position. Fume hood work surface shall be dished epoxy resin.
- Fume Extractor Arms (Snorkels): shall be a 3 inch (75 mm) diameter, hinged, self supporting air extractor arm assembly with 14” diameter clear acrylic hood.
- Biological Safety Cabinets: shall be Class II, Type A2. Cabinets shall be designed to operate with an intake air velocity of 100 fpm (0.5 m/s), recirculating the air through the supply HEPA filter into the work area.
- Laminar Flow Hoods shall be equipped with supply HEPA filter and reusable prefilter to maintain Class 100 standard at work area.
- Canopy Hood shall be an exhausted stainless steel canopy enclosure with all hangers and miscellaneous hardware, including damp location light fixture.

E1020 Laboratory Service Fittings and Fixtures

- Service fittings shall be chromium plated with an acid- and solvent-resistant, clear epoxy coat finish specifically designed for laboratory use. All service fittings shall be of the tapered body design with four arm handles, except for ADA accessible fittings which shall have lever handles as described below.

- High purity water valves shall be chromium plated cast brass with polypropylene liner. Valve stem and bonnet shall be brass.
- Fittings and fixtures designated to be accessible to persons with disabilities (ADA) with operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2 N), maximum.
- Safety station shall be barrier-free with emergency shower actuation valve in stainless steel cabinet for recess mounting and wall-mounted eyewash with stainless steel skirt.
- Hand held eye wash shall be dual-purpose eye wash/drench hose, deck mounted.
- Cup Sinks shall be epoxy, to be set flush with work surface, except for any cup sinks at fume hoods which shall have ¼" raised rim.
- Laboratory sinks shall be epoxy for drop-in installation in work surfaces.
- Stainless steel sinks shall be integral one piece construction with stainless steel work surface. 18 gauge (1.3 mm thick) steel unless otherwise noted.
- Scrub-up sink shall be wall mounted 14 gauge (2.0 mm thick) Type 304 stainless steel sink with knee action control and HWCW mixing valve.

E1030 Laboratory Sterilizers and Washers

- Laboratory Glassware Washers shall be tall, floor mounted, front loading single door units programmable for multiple wash cycle and drying cycle duration, with purified water rinse capability. Unit shall have mounting hardware and finish pieces for mounting through architectural wall.
- Laboratory Medium Steam Sterilizers shall be prevacuum/gravity models with interior chamber dimensions of 20: x 36" x 48". Steam source should be provided to operate all sterilizers and Cage/Bottle Washer. Freestanding single door unit shall be cabinet enclosed. Recessed single door unit shall have mounting hardware and finish pieces for mounting though architectural wall. Pass-through double door unit shall have mounting hardware and finish pieces for mounting one end through an architectural wall.
- Cage/Bottle Washer shall be tall, floor mounted pass through double door unit, programmable for multiple wash cycle and drying cycle duration, with purified water rinse capability and multiple wash/rinse agent capability.

E1040 Controlled Environment Rooms

- Controlled temperature rooms shall be of modular, "sandwich panel", construction. Each panel shall consist of interior and exterior metal skins with a solid core of insulation and shall incorporate an integral mechanical method of fastening and sealing the joints to provide a vapor tight seal. Construction shall allow disassembly for possible relocation or expansion at a later date. Each controlled environment room shall be complete with all necessary environmental conditioning controls, heating, refrigeration and air conditioning systems, lighting systems and all necessary mechanical and electrical components to provide the environmental conditions herein specified and as shown on the construction documents.
- Door shall have insulated vision panel with insulated door, and insulated entry ramp.
- All instruments, controls and major electrical components shall be located in surface mount control console. Provide LCD color touchscreen microprocessor based temperature and humidity (where applicable) controller with real-time and archive trending. Each room shall be provided with reset type personnel emergency alarm with electrically powered audible and visual alarm system.
- Environmental conditioning system consisting of blower(s), evaporator coil(s), heaters, humidifier (as required), refrigeration piping system and drain pans, shall be housed in modular enclosure(s) suspended from the room ceiling and shall be factory prewired to the control cabinet.
- Refrigerant: Utilize non-ozone depleting refrigerants R-134a, R-404A, or approved equal; CFC type refrigerant shall not be

acceptable.

- Operation: Each system shall be designed and furnished in such a manner as to allow the motor compressor to operate continuously with a modulating bypass system to maintain specified temperature ranges.
- Defrost: System shall incorporate an automatic defrost system.
- Refrigerant Piping: All refrigeration piping required shall be furnished and installed by the controlled temperature room contractor. Provide ACR type, hard drawn, cleaned and capped Type L copper tubing with silver brazed joints.
- Compressor-Condensing Unit: Compressor-condensing unit to be complete in all respect including base and cabinet and all associated piping, components, safeties and controls. Compressor shall be a hermetic or semi-hermetic unit designed for on-site maintenance with integral suction and discharge refrigerant service isolation valves. Condenser shall be top-of-room mounted water-cooled or remotely located air cooled as indicated in Controlled Environment Room equipment schedule in Laboratory Furnishings drawings.
- Ventilation: provide make-up air from the laboratory space at the rate of 0.25 CFM per square foot (4.57 m^3/h per square meter) unless otherwise indicated on the drawings. No ventilation air provisions shall be made for freezer rooms operating at or below 0°C.

E1060 Residential Equipment

- Appliances for food preparation/storage and washing. Refrigerator/freezer, dishwasher, microwave units by Whirlpool, White Westinghouse or General Electric.

E1090 Other Equipment

- Standard and video formats as necessary, recessed mounting, washable matte finish screen surface; manual and electric models. Draper Access/Series V, motorized tab tensioned screens with low voltage controls, NTSC video (4:3) format, or approved equal by Da-lite.
- Video projector mounting bracket and related attachment components provided by Chief Manufacturing (RPA Series)

E20 Furnishings

E2010 Laboratory Casework And Other Furnishings

- Wood casework shall comply with all requirements of AWI Section 400 Custom Grade architectural cabinets. Lumber shall be plain sawn maple; veneer shall be plain sliced maple. Wood casework shall be flush overlay design.
- Metal casework shall be of modern design and shall be constructed in accordance with the recommended practices of the Scientific Equipment and Furniture Association. All units shall be of flush overlay construction. Door and drawer heads shall be of welded, double walled steel construction, 3/4" (18 mm) thick, filled with sound deadening material.
- Corrosive Storage cabinets shall be vented with corrosion resistant liner designed and labeled specifically for the storage of acids and other corrosive substances, to meet code requirements
- Flammable Liquid/Solvent Storage cabinets shall be metal designed and labeled specifically for the storage of flammable liquids and other volatile substances, to meet code requirements.
- Ventilated Storage Cabinets shall have perforated metal adjustable shelving, vent louvers inset on the lower portion of the door, and a 2" diameter PVC connection to the building exhaust system.
- Laboratory work surfaces shall be 1" thick chemically resistant modified epoxy resin.
- Stainless steel work surfaces shall be 16 gauge (1.6 mm thick), type 304, #4 finish with heavy mastic coating underside and perimeter timber fixing frame.
- Adjustable reagent shelves shall be ¾ inch thick, 7-ply shop sanded exterior grade veneer plywood shelving with K+ face

veneers with chemical resistant plastic laminate on all surfaces on book-end brackets mounted on double-slotted 2 inch x 2 inch fully welded square steel tube support frame. All shelves shall have 1-1/2" high safety edging.

- Adjustable wall shelves shall be ¾ inch thick, 7-ply shop sanded exterior grade veneer plywood shelving with K+ face veneers with chemical resistant plastic laminate on all surfaces on book-end brackets mounted on double-slotted standards. All shelves shall have 1-1/2" high safety edging.
- Heavy-duty shelving shall be 1 inch thick, 7-ply hardwood plywood with chemical resistant plastic laminate on all surfaces and edges on heavy-duty shelf standards and brackets. All shelves shall have 1-1/2" high safety edging.
- Stainless steel shelving shall be Super Erecta stainless steel shelf system, post supported, floor mounted or wall mounted, and floor mounted high density configuration, and shall include all accessories required for function.
- Open industrial metal shelf units shall be premium grade 20 gauge steel shelf units comprised of 5 shelves adjustable on 1" increments, 85" high 14 gauge angle post supports, and side and rear cross-bracing.
- Cylinder Restraints shall be fabricated with Unistrut, Powerstrut or equal.
- Overhead service carriers shall be fabricated with unistrut channels supported from structure above at 48" on center maximum and include a 14 gauge metal channel at bottom for mounting of piped services and electrical raceways.
- Pipe drop enclosures shall be an 18 gauge galvanized steel sheet enclosure with removable cover panels and epoxy paint finish.
- Drying racks shall have a stainless steel body with white polypropylene pegs and integral drain trough with welded stainless steel trough ends.
- Blackout curtain shall be flame-retardant or made of non-combustible materials, with front and rear light-trap valances of the same material as the curtain. Curtain track shall be satin anodized extruded aluminum, with two-wheel roller assemblies.
- Surgical light fixture shall be wall mounted articulating arm adjustable examination light.

F - Special Construction and Demolition

F30 Demolition

F3030 Selective Demolition

- Minor demolition as required to accommodate new construction and/or to remove obstacles or penetrate barriers; includes cutting and patching, and repair of accidental damage.

G - Sitework

G10 Site Preparation

G1010 Site Clearing

- Clearing, grubbing and rough grading.

G20 Site Improvements

G2020 Parking Lots

- Painted striping in parking areas, truncated cones and other devices for visually impaired.

G2030 Pedestrian Plazas and Walkways

- Site sidewalks, aprons and curbs.

G20 Site Improvements

G2080 Landscaping

- Underground piping, valves and heads; electronic controller.
- Topsoil, soil enriching additives and enhancements.
- Finish grading, materials and accessories.
- Kentucky Bluegrass and Fescue blend seed, maintenance care for first year.
- Kentucky Bluegrass sod, soil amendments and lawn maintenance for first year.
- Dry land, native varieties requiring minimum maintenance.

G4010 Electrical Distribution

- Campus Medium Voltage System: The EWU Campus currently receives electrical utility power via two separate 13.2KV electrical service feeders from the City of Cheney. These two 13.2KV electrical service feeders are terminated within the EWU Rozell Substation at Campus Switchgear Bus #1 and Campus Switchgear Bus #2. Four separate 13.2KV campus feeders are routed from the Campus Switchgear to a system of 13.2KV switches located throughout the EWU campus in order to provide increased redundancy and flexibility to the campus electrical distribution system. Existing campus feeders 1B and 2B service the existing building and will be maintained.

G4020 Site Lighting

- Site lighting will be selected in conformance with EWU campus standards, and will utilize full cut off LED type fixtures in order to avoid light trespass and meet associated dark sky lighting requirements. Site lighting which illuminates the path of egress will be supplied with power from the emergency generator system in the event of a failure on the normal power system. Exterior lighting poles shall be provided with hinged bases to allow poles to be placed in a horizontal position for maintenance.

G4030 Site Communication/Data

- Communication service is provided to each building on the EWU Campus from the EWU owned data/com distribution system. Fiber optic cabling is routed throughout the EWU Campus via a system of cable tray that is located within the existing campus utility tunnel system. Building communications service pathways and cabling will be provided and installed by the contractor. Building service pathways will be routed from the existing campus utility tunnel system into the main telecom room. Communications cabling will be provided from the nearest demarcation point as directed by EWU.

G4090 Other Site Electrical Utilities

- CATV Service: Building CATV service pathways will be provided and installed by the contractor. Building service pathways will be routed from the existing campus utility tunnel system or designated service point into the main telecom room.

5.3 Funding Sources

Eastern Washington University requests state funds of $51,344,000 for total project cost for Phase 1.

To complete the Science Building Renovation Eastern will be asking in the for $52,693,000 total project cost for Phase 2 . There are no private sources of funding on the project.

5.4 Project Cost Estimate

Maximum Allowable Construction Cost (MACC) for Phase 1 escalated through midpoint of construction, (May 2020) is $32,989,005. The Maximum Allowable Construction Cost (MACC) for Phase 2 escalated through midpoint of construction, (May 2022) is $35,053,230.

5.5 Summary of LCCA Results Using the LCCT

5.5.1 Benefit and Life Cycle Cost Analysis Summary

The University has previously undergone significant efforts to study viable options to support the long term needs of the Science Department and determined that the most viable option moving forward is a renovation of the Existing Science Facility. Since a renovation has been predetermined, the building orientation and massing and building structure elements remain constant in all the LCCA alternatives.

Baseline Alternative:
In summary, this option examines the use of dedicated outside air systems (DOAS) with heat recovery to service the entire building and chilled beams in all areas except the labs with most concentrated exhaust.

- This option provides mechanical systems that upgrade existing 100% outside air units that are approximately 25 years old. This options retains and reuses existing mechanical room construction.
- Existing 100% outside air handling units will be rebuilt with new fans, motors, controls, coils and filter banks. Units will be utilize existing casing construction but capacities will be reduced by over 50%. These dedicated outside air systems (DOAS) systems will service both lab and non-lab spaces. The units will remain operational for the labs 24 hours per day with reduced airflow in the non-occupied modes but airflow to the non lab areas will be shut-off during unoccupied periods.
- Chilled beam air terminal units will be provided in all spaces where space airflow is not dictated by fume hood exhaust needs.

- The existing building is served by approximately 90 process exhaust fans and 7 general exhaust fans. Currently the general exhaust has heat recovery integrated. The exhaust fans have exceeded their useful life, transmit significant vibration to the structure, and are not suited to maintaining laboratory or building pressurization in the un-occupied modes. This option proposes to replace the process fans with a central manifolded system that integrates both general exhaust and fume exhausts and recovers heat from the exhaust to preheat the air at the lab supply air units.
- Primary Building heating will be campus steam. Steam currently exists at the building and is sufficiently sized for building heat, domestic water and building humidification.
- Primary Building Cooling will be campus chilled water. Chilled water exists at the building and is sufficiently sized.
- Secondary Cooling: A chiller will be provided for back-up campus cooling for the vivarium to provide cooling to the vivarium and lab process equipment loads when the campus chilled water plan has shutdown. Chiller will be heat recovery type and rejected heat will be rejected to the building heating loop.
- Due to extent of patching on the roof for demolition of the existing exhaust fans, this option assumes new roof insulation to meet current 2015 energy code values (U=0.027) and roofing membrane.

Alternate No. 1:

- In summary, this options examines 100% outside air systems in the labs in the labs (without chilled beam air terminal units) and VAV air handling units in the non lab areas.

- This option shares may of the same aspects of the baseline alternative with the following exceptions:
- Existing 100% outside air handling units supplying the lab functions will be rebuilt similar to the baseline with heat recvoery. These all air systems would not use chilled beam terminal units and would be conventional all air systems. The units will remain operational for the labs 24 hours per day with reduced airflow in the non-occupied modes. This system will use approximately 30% more airflow in the labs over the chilled beam system in the cooling mode.
- Supplemental air systems will be provided for the non lab uses in the non-lab wing. This system would be a conventional variable air volume air handling unit with heating, cooling coils and economizer cooling. The system would have perimeter hydronic heating and could be shut down during unoccupied periods. This air system will require construction of an additional fan room to support the air handling unit equipment.

Alternate No. 2:

- This option uses the baseline DOAS air handling system with chilled beam terminal units but investigates improving the thermal performance of the existing building envelope.
- Existing Wall systems have insulation values between U=0.08 and 0.12. This option would improve the thermal efficiency to code minimum values of U=0.05.
- Existing glazing systems have an insulation value no greater than 0.6. This option would improve the thermal efficiency to code minimum of U=0.38.

5.5.2 LCCA Results

The Life Cycle Costs Analysis (LCCA) was completed using the Life Cycle Cost Tool (LCCT) excel spreadsheets issued with the July 2014 State of Washington Predesign Manual. The design team worked collaboratively to estimate construction costs of the three items with associated energy performance and maintenance of the systems studied. The tool computes the total economic life cycle costs (LCC) of the system options as well as the Societal Life Cycle Costs which considers the tons of CO2 production over the 50 year study period. The following information is also included in the appendix for reference.

Office of Financial Management Olympia, Washington – Version: 2015-G
Life Cycle COST Analysis Tool Executive Report

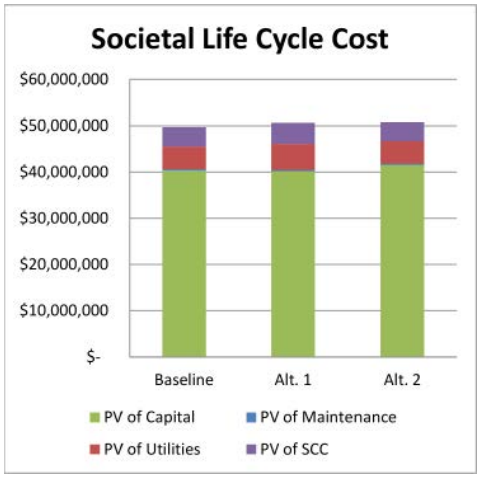
Project Information	
Project:	EWU Science Remodel - Phase 1
Address:	Science Building, Cheney, 99004
Company:	Roen Associates
Contact:	Jeff Weaver
Contact Phone:	(509) 838-8688
Contact Email:	jeffw@roenassociates.com

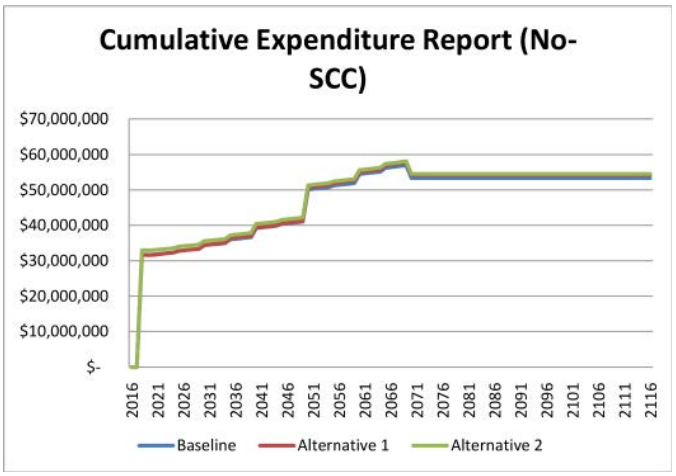
Key Analysis Variables		**Building Characteristics**	
Study Period (years)	54	Gross (Sq.Ft)	73,498
Nominal Discount Rate	3.81%	Useable (Sq.Ft)	50,787
Maintenance Escalation	1.00%	Space Efficiency	69.1%
Zero Year (Current Year)	2016	Project Phase	0
Construction Years	4	Building Type	0

Life Cycle Cost Analysis	**BEST**		
Alternative	Baseline	Alt. 1	Alt. 2
1st Construction Costs	$ 30,869,972	$ 30,753,213	$ 32,078,027
PV of Capital Costs	$ 40,316,900	$ 40,171,533	$ 41,524,956
PV of Maintenance Costs	$ 299,002	$ 287,988	$ 299,002
PV of Utility Costs	$ 4,936,907	$ 5,633,051	$ 4,877,356
Total Life Cycle Cost (LCC)	**$ 45,552,810**	**$ 46,092,572**	**$ 46,701,314**
Net Present Savings (NPS)	**N/A**	**$ (539,763)**	**$ (1,148,505)**

Societal LCC takes into consideration the social cost of carbon dioxide emissions caused by operational energy consumption

Societal Life Cycle Cost	**BEST**		
Alternative	Baseline	Alt. 1	Alt. 2
Tons of CO2e over Study Period	60,470	66,926	59,666
Present Social Cost of Carbon (SCC)	$ 4,150,732	$ 4,593,909	$ 4,095,585
Total LCC with SCC	**$ 49,703,542**	**$ 50,686,481**	**$ 50,796,899**
NPS with SCC	**N/A**	**$ (982,939)**	**$ (1,093,357)**





5.5.3 LCCA Recommendations

Alternate 2 is the recommended option. This option combines the high efficiency DOAS systems studied in the baseline and upgrades the envelope to current energy code requirements. The exterior wall systems will undergo significant demolition to remove and install casework, electrical and plumbing so upgrade of the envelope systems would ideally occur with this project It is anticipated that this building will not have another significant capital project for another 50 years and it important that building components be upgraded to current standards for air tightness and efficiency.

This option utilizes mechanical systems with the lowest cycle costs and results in over 50% reduction in energy costs over existing conditions and 15% less energy than alternate #2 systems.

5.6 Funding Methods

Escalated project cost has been calculated utilizing the State of Washington's "Agency/Institution Project Cost Summary," C-100. See Section 9, Appendix D for additional information and break down of anticipated construction costs for the project.

5.7 Sign-Off by Agency

In submitting this report, Eastern Washington University endorses the accuracy of this Predesign Study.

section 6.0
master plan and policy coordination

6.0 MASTER PLAN AND POLICY COORDINATION

6.1 Impacts to the Master Plan

6.1.1 Adherence to 2014 Comprehensive Campus Master Plan

In 2014 Eastern Washington University adopted a comprehensive master plan for the campus. The Science Building Renovation directly supports the following goals and vision within the 2014 master plan:

- Support and expand student access to opportunity and personal transformation
- Enhance flexibility in response to changes in technology, pedagogy and student demographics
- Align facilities with academic purpose and needs of the campus
- Accommodate growth of programs
- Utilize visibility and outreach to strengthen the relationship between EWU and the surrounding community

6.1.2 Key Planning Considerations of the Campus Master Plan

The Science Building Renovation addresses the following consideration within the campus master plan:

- Improves the condition of the northwest campus corner with a potential for a new campus gateway at the corner of Washington and Elm streets and strengthened connections to Pearce and Dressler halls and the Pence Union Building.
- Enhances the character of the northwest edge of campus with improvements to pedestrian circulation and open spaces. Promotes the connection between the East and West campuses with a well defined pedestrian corridor.
- Responds to anticipated FTE and growth: The Master Plan indicates that with the expected annual enrollment increase of 2% and the state benchmark of 197 GSF per FTE, an additional 406,500 GSF may be required on the Cheney campus by the year 2023. The square footage added to the campus with the addition of the Interdisciplinary Science Center (ISC) contributes to accommodating this expected growth.

6.1.3 Master Plan Implementation

The Science Building Renovation coordinates with the five key planning principles outlined in the comprehensive plan:

- *Carefully evaluate each project with regard to renovation vs. replacement opportunities;* the renovation to the existing Science Building is necessary to meet the existing needs of the departments remaining in the Science Building. Previous predesign requests to replace the project have not received funding.
- *Locate and size all new or replacement buildings to optimize site utilization;* the Science Building Renovation will complete a synergistic Science Complex with the addition of the Interdisciplinary Science Center immediately adjacent to and linked to the Science Building.
- *Improve the overall character of the campus with the implementation of each project;* utilizing the existing Science Building location enhances the creation and identity of a Science Complex on the campus. The location along a main campus pedestrian corridor places the building in a prominent and active location on the campus.
- *Create and follow a framework that welcomes neighbors and accommodates future expansion beyond existing boundaries;* the integration of the city grid into the campus welcomes neighbors and inherently allows for future expansion.
- *Reinforce and improve the overall cohesion of campus, specifically linkages across Washington Street, whenever possible;* the location of the Science Complex along Washington Street creates an opportunity for a new gateway on the northwest side of the campus, at the corner of Washington and Elm streets.

6.1.4 EWU's Ten Year Capital Plan

The Science Building Renovation will address deficiencies in the existing Science Building and will meet the science teaching and research needs through improvements in the performance and energy efficiency of the building. With the addition of the Interdisciplinary Science Center (ISC) it will ensure that the science programs are able to operate as models of the University's commitment to sustainable communities and environmental stewardship in congruence with the Ten Year Capital Plan.

6.1.5 Science Building Renovation Impacts on the Comprehensive Master Plan

The renovation of the Science Building shifts the location of the Science Complex from the proposed location along the southeast edge of campus to the northwest edge of campus. This location promotes the improvement of the campus open spaces in this quadrant and creates an opportunity for a science commons along the northwest edge, an area identified in the campus master plan as a key zone of opportunity for improvement. Additionally, the Science Building Renovation will enhance the campus built environment in the following ways:

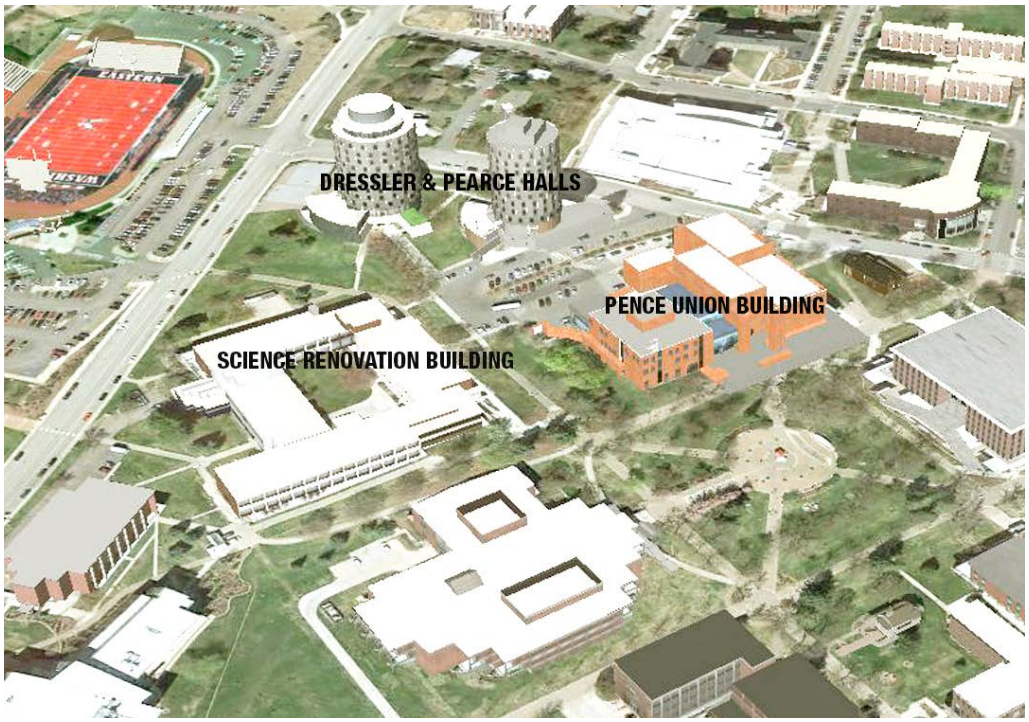
- Preserve existing campus open space by utilizing an existing building site
- Implement barrier free, universal design that is accessible to all users
- Encourage environmentally conscious building design and technologies
- Enhance building organization to achieve flexibility and adaptability
- Make use of materials and systems that are functionally appropriate, durable and easily maintained

2014 Comprehensive Master Plan Diagram

6.2 Adherence to Significant State Policies

- The proposed project will comply with ESSB 5509 of the State of Washington by achieving a minimum of LEED Silver Certification, see proposed LEED Scorecard in Section 9 Appendix E
- The project complies with the Growth Management Act of 1990
- Washington State's policy on indoor air quality and the Clean Air Act of 1991
- WA State 39.35 RCW Energy conservation in the design of public facilities and State Environmental Policy Act
- WA State 70.235 RCW Limiting greenhouse gas emissions

- Washington State Growth Management Act of 1990
- Life Cycle Cost analysis is being conducted utilizing the WA State LCCT tool in accordance with Executive Order 13-03 and ESSB 5035



Existing Science Building Aerial Photograph

section 7.0
facility operations and maintenance requirements

7.0 FACILITY OPERATIONS AND MAINTENANCE REQUIREMENTS

7.1 Assumptions

7.1.1 Operating Impacts During Design/Construction

The following is an estimate of operations and maintenance for the existing Science Building and are based on EWU's annual costs per gross square foot for FY14. Costs are escalated at an inflation rate of 4.0% per year.

7.1.2 Operating Budget Impacts When Project is Complete

According to the recent and projected M&O funding rates for Washington State Universities, the anticipated annual impact on the college's operating and maintenance budget is $12.13 per net new area (gsf) projected to 2020.

The total annual operating budget for the existing Science Building currently is $1,416,306 and is projected to rise to $1,797,047 by June of 2020 if the remodel is not completed. The Science Renovation project will reduce energy consumption by around 50% when complete and the new systems will require less maintenance, reducing the cost of utilities and maintenance staff.

The remodel of the current Science Building maintains 148,149 gross square feet of the existing building and repurposes it.

7.2 Operating Costs in Table Form

Component:	**OPERATING COSTS (FY 2014) GSF/YR**	**PROJECTED COSTS (FY 2020) GSF/YR**
091 - Utilities	$2.71	$3.44
092 - Building & Utilities Maint.	$1.75	$2.22
093 - Custodial & Grounds Services	$2.56	$3.25
094 - Ops & Maint. Support	$2.54	$3.22
TOTAL	$9.56	$12.13

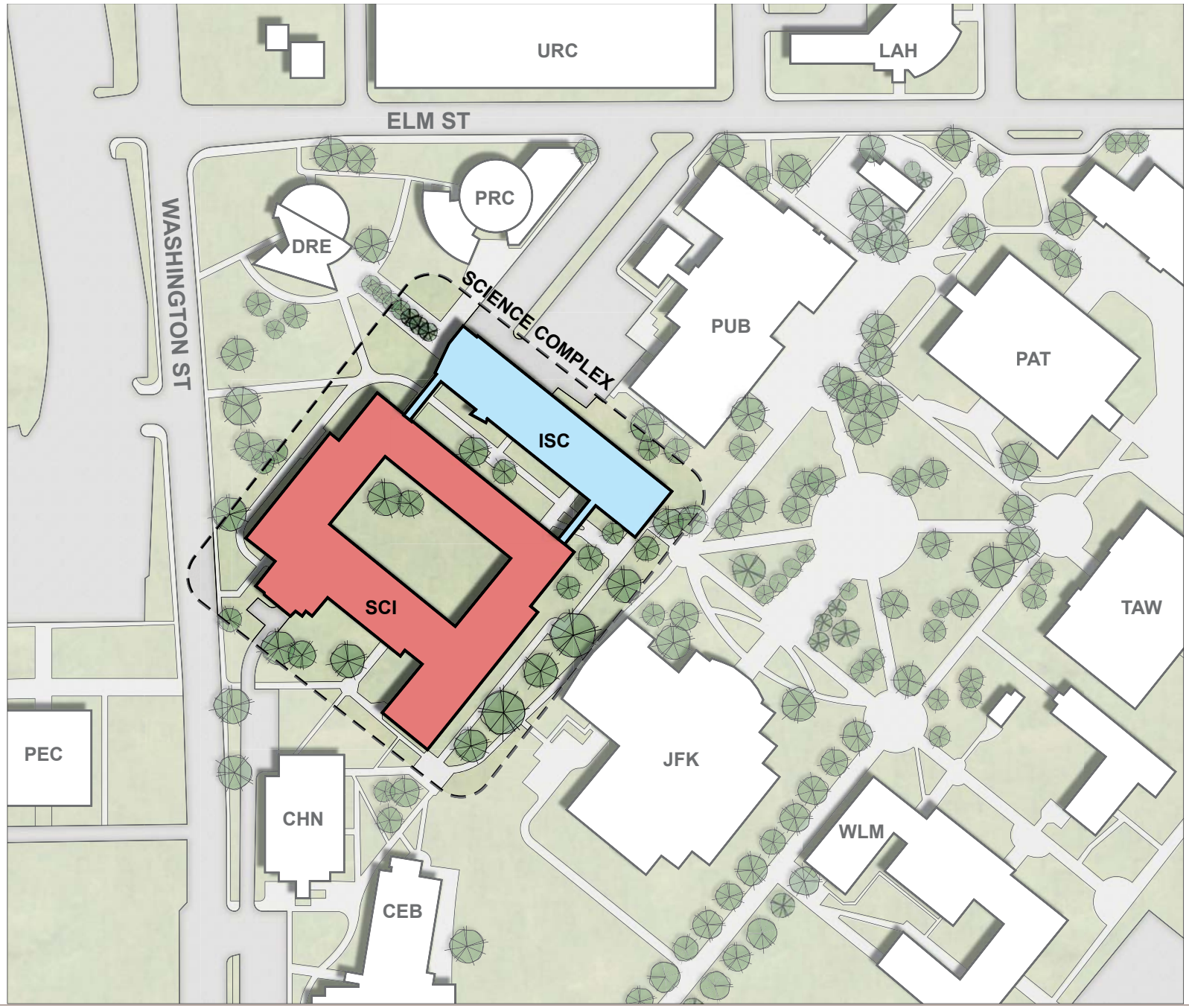
Based on a square footage of 148,149, the total cost breakdown is as follows:

Component:	**OPERATING COSTS (FY 2014)**	**COST JUNE 2020**	**COST JUNE 2025**
TOTAL OPERATING COSTS	$1,416,306	$1,797,047	$2,189,150

7.3 Staffing Plan (Capital and Operating)

The Science Renovation project will result in an in a reduction of utility and maintenance costs should the project be funded. The costs for custodial staff and operations and maintenance support are shown to increase significantly as time moves forward.

section 8.0
project drawings and diagrams


URC
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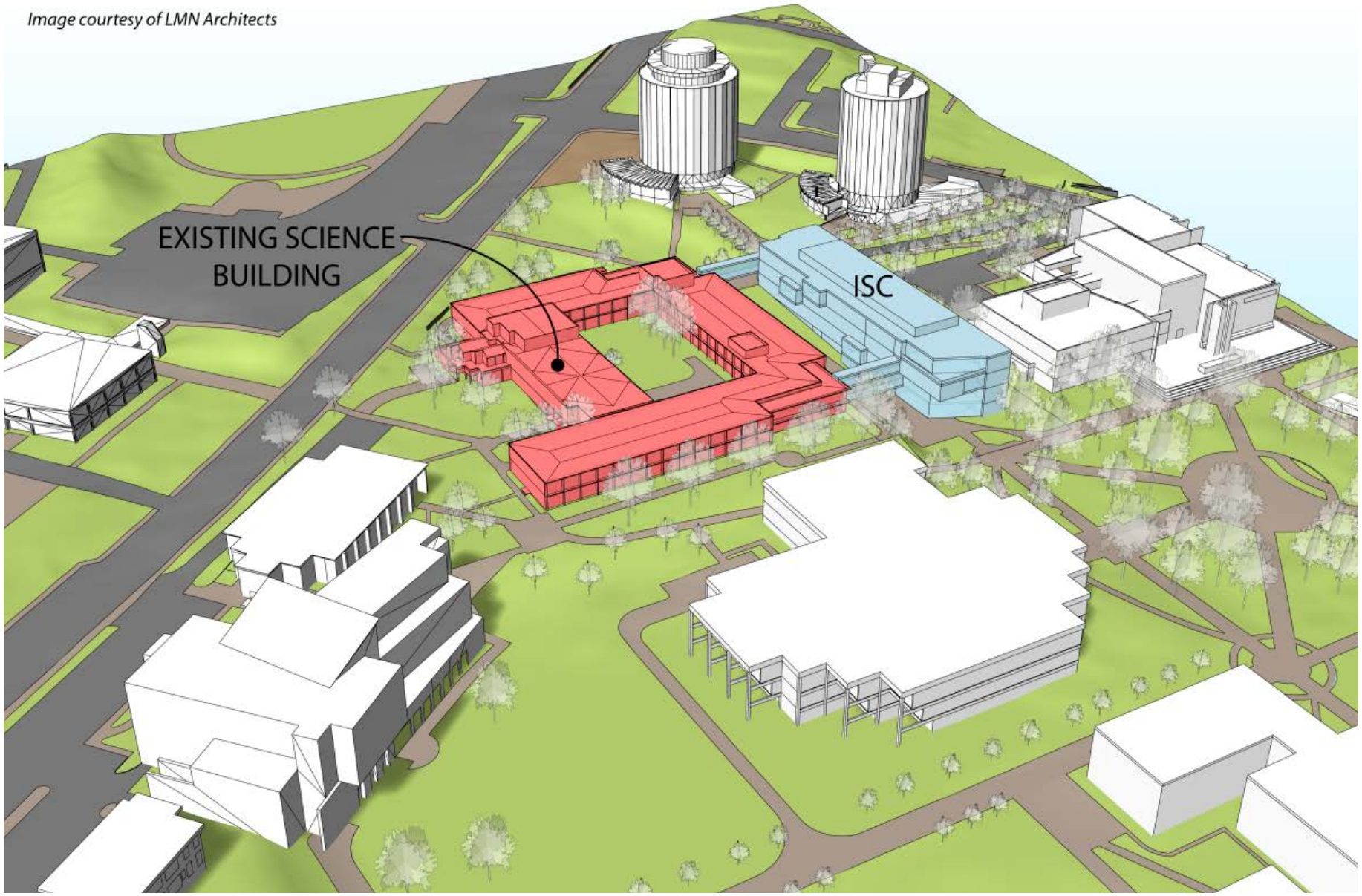
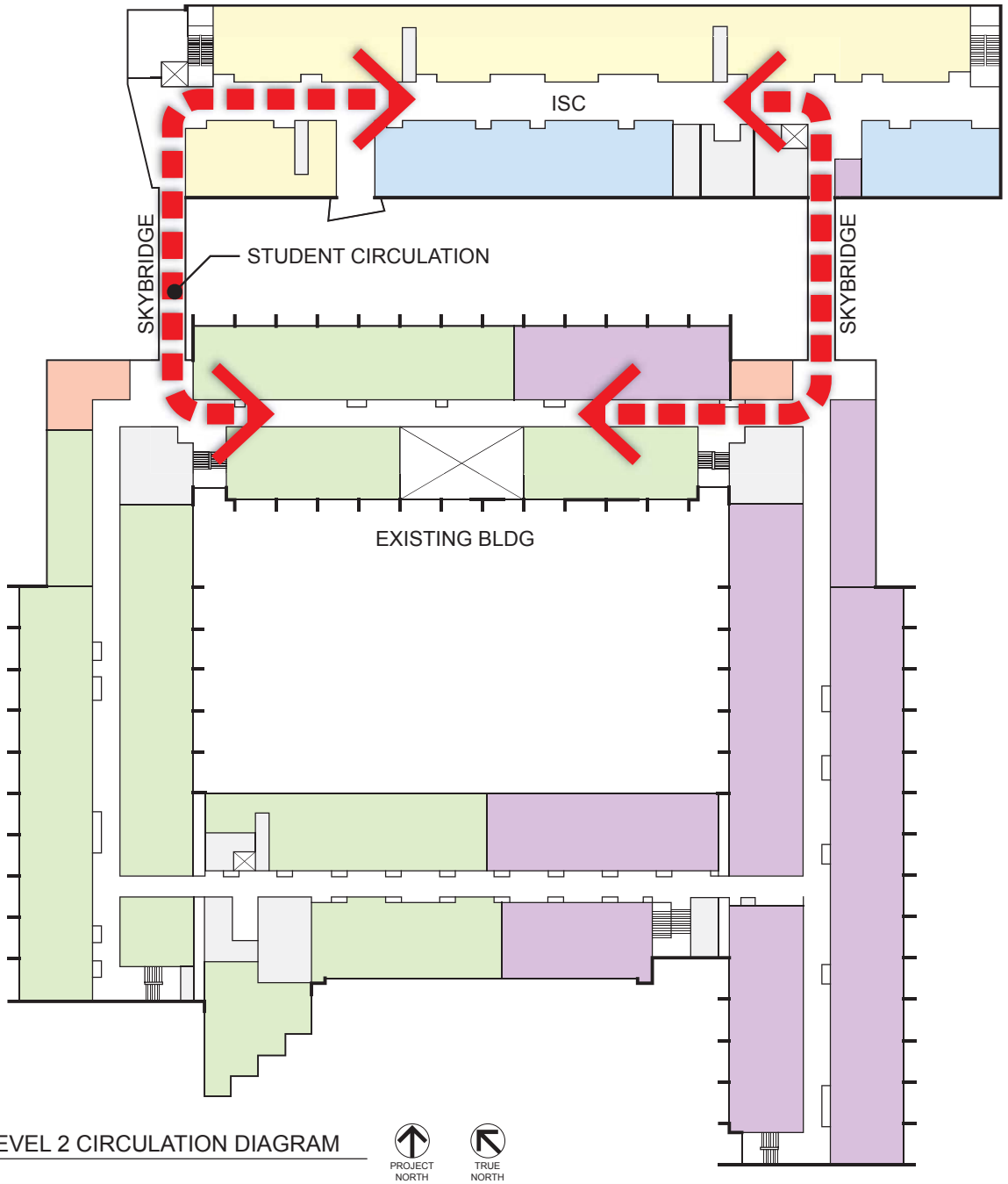
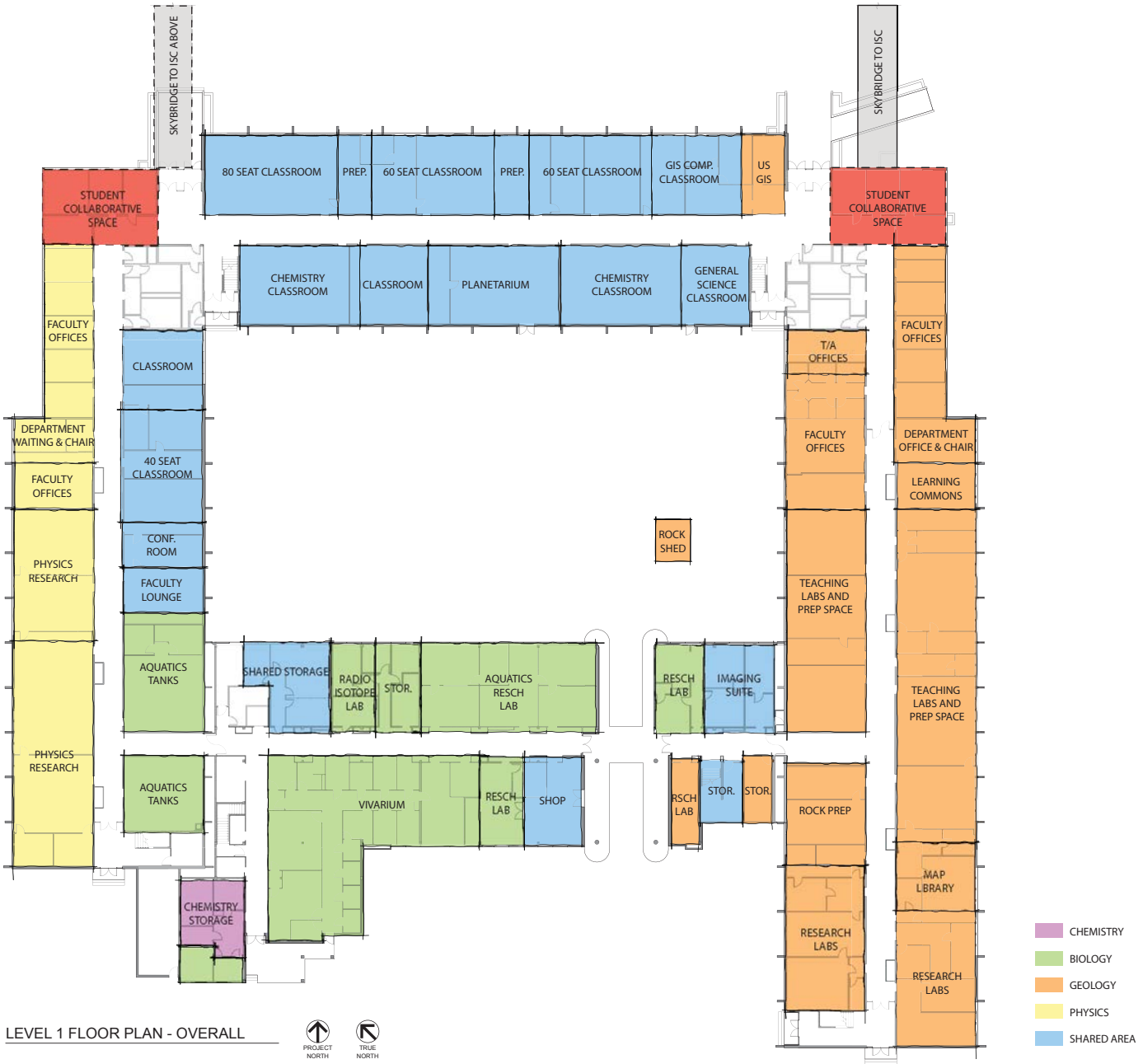
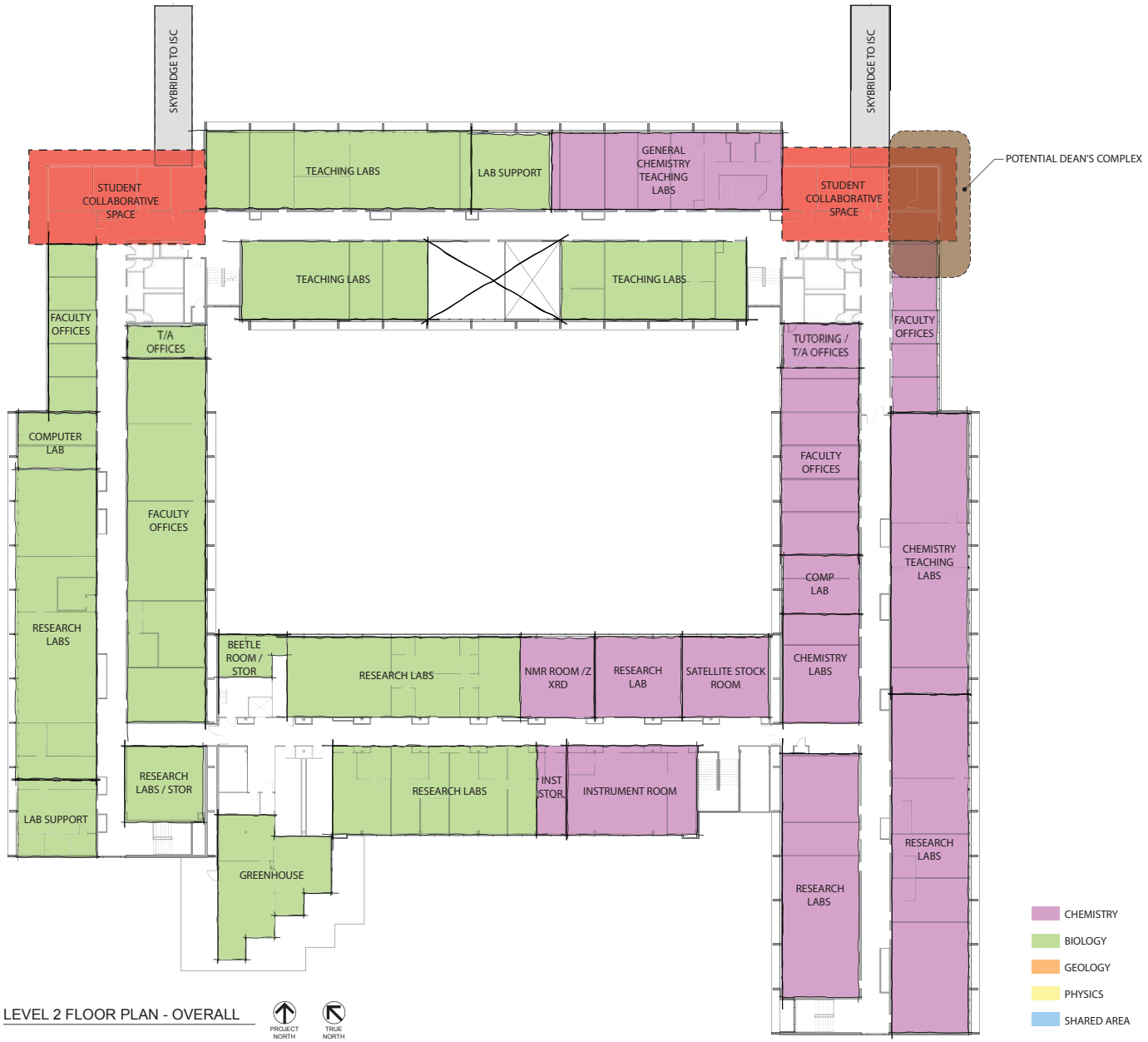


Image courtesy of LMN Architects
EXISTING SCIENCE BUILDING
ISC



LEVEL 2 CIRCULATION DIAGRAM


SKYBRIDGE TO ISC ABOVE
SKYBRIDGE TO ISC
80 SEAT CLASSROOM
PREP.
60 SEAT CLASSROOM
PREP.
60 SEAT CLASSROOM
GIS COMP. CLASSROOM
US GIS
STUDENT COLLABORATIVE SPACE
STUDENT COLLABORATIVE SPACE
CHEMISTRY CLASSROOM
CLASSROOM
PLANETARIUM
CHEMISTRY CLASSROOM
GENERAL SCIENCE CLASSROOM
FACULTY OFFICES
CLASSROOM
T/A OFFICES
FACULTY OFFICES
DEPARTMENT WAITING & CHAIR
40 SEAT CLASSROOM
FACULTY OFFICES
DEPARTMENT OFFICE & CHAIR
LEARNING COMMONS
CONF. ROOM
ROCK SHED
PHYSICS RESEARCH
FACULTY LOUNGE
TEACHING LABS AND PREP SPACE
AQUATICS TANKS
SHARED STORAGE
RADIO ISOTOPE LAB
STOR.
AQUATICS RESCH LAB
RESCH LAB
IMAGING SUITE
TEACHING LABS AND PREP SPACE
PHYSICS RESEARCH
AQUATICS TANKS
VIVARIUM
RESCH LAB
SHOP
RSCH LAB
STOR.
STOR.
ROCK PREP
MAP LIBRARY
CHEMISTRY STORAGE
RESEARCH LABS
RESEARCH LABS
CHEMISTRY
BIOLOGY
GEOLOGY
PHYSICS
SHARED AREA
LEVEL 1 FLOOR PLAN - OVERALL
PROJECT NORTH
TRUE NORTH


SKYBRIDGE TO ISC
SKYBRIDGE TO ISC
STUDENT COLLABORATIVE SPACE
TEACHING LABS
LAB SUPPORT
GENERAL CHEMISTRY TEACHING LABS
STUDENT COLLABORATIVE SPACE
POTENTIAL DEAN'S COMPLEX
TEACHING LABS
TEACHING LABS
FACULTY OFFICES
T/A OFFICES
TUTORING / T/A OFFICES
FACULTY OFFICES
COMPUTER LAB
FACULTY OFFICES
FACULTY OFFICES
CHEMISTRY TEACHING LABS
RESEARCH LABS
COMP LAB
BEETLE ROOM / STOR
RESEARCH LABS
NMR ROOM /Z XRD
RESEARCH LAB
SATELLITE STOCK ROOM
CHEMISTRY LABS
RESEARCH LABS / STOR
RESEARCH LABS
INST STOR
INSTRUMENT ROOM
LAB SUPPORT
GREENHOUSE
RESEARCH LABS
RESEARCH LABS
CHEMISTRY
BIOLOGY
GEOLOGY
PHYSICS
SHARED AREA
LEVEL 2 FLOOR PLAN - OVERALL
PROJECT NORTH
TRUE NORTH

section 9.0
appendices

appendix a
predesign checklist

APPENDIX A

PREDESIGN CHECKLIST

The predesign checklist should be completed by the agency and included with the predesign. Are the following in the predesign? If not, the item should be noted "not applicable."

☒ Executive Summary

☒ Project Analysis
- Discussion of operational needs
- Discussion of alternatives
- Summary of LCCA results using the LCCT

X
- Discussion of selected alternative
- Identification of issues
- Prior planning and history
- Stakeholders
- Project description
- Implementation approach
- Project management
- Schedule

☒ Program Analysis
- Assumptions
- Functions and FTEs
- Spatial relationships between the facility and site
- Interrelationships and adjacencies of functions
- Major equipment
- Special systems such as environmental, information technology, etc.
- Future needs and flexibility
- Sustainability, energy use and greenhouse gas emissions reduction
- Applicable codes and regulations

☒ Site Analysis
- Potential sites
- Building footprint
- Site considerations such as physical, regulatory and access issues
- Acquisition process

☒ Project Budget Analysis
- Assumptions
- Detailed estimates
- Funding sources
- Project cost estimate
- Funding methods
- Sign-off by agency

☒ Master Plan and Policy Coordination
- Impacts to existing plans
- Adherence to significant state policies

☒ Facility Operations and Maintenance Requirements
- Assumptions
- Operating costs in table form
- Staffing plan (capital and operating)

☒ Project Drawings/Diagrams
- Site plans
- Building plans
- Building volumes
- Elevations

☒ Appendix
- Predesign checklist
- Project budget unit cost detail
- Sustainable design charette summary
- Copy of policies adopted in accordance with RCW 70.235.020 on the state's limits on the emissions of greenhouse gases
- A letter from DAHP on the impact of potential sites on cultural resources
- Additional information as needed
- Executive report from the life cycle cost analysis

appendix b
program space summary

Eastern Washington University Sciences - Science Renovation Predesign

PROGRAM SPACE SUMMARY

Summary

1-Jun-16

Department/ Building	Type of Space									**Total Science**
	Teaching Lab	Research Lab	Lab Support	Vivarium	Green-House	Office	Class-rooms	Open Facilities	Other	
	All areas are Assignable Square Feet (ASF) unless noted otherwise									
1.0 Chemistry/Biochemistry										
Science Bldg	6,400	7,680	5,187	0	0	3,465	0	0	0	22,732
2.0 Physics										
Science Bldg	640	1,860	640	0	0	2,025	0	0	1,120	6,285
3.0 Biology										
Science Bldg	3,840	15,358	7,955	4,590	1,980	5,615	0	0	0	39,338
4.0 Geology										
Science Bldg	5,760	3,200	2,738	0	0	3,075	0	0	0	14,773
5.0 Shared Facilities										
Science Bldg	0	0	720	0	0	0	11,314	5,185	1,675	18,894
Combined Sciences										
Total All Sciences	49,640	24,900	24,420	4,590	1,980	16,295	15,460	8,040	1,940	
Interdisciplinary Sci Ctr	35,560	0	8,940	0	0	760	2,520	3,860	1,030	
Science Bldg	16,640	28,098	17,240	4,590	1,980	14,180	11,314	5,185	2,795	102,022
Unconfirmed Spaces										0
Total Programmed Assignable Area (ASF)										**102,022**
Available Building Gross Area (GSF)										148,149

Eastern Washington University Sciences - Science Renovation Predesign

PROGRAM SPACE SUMMARY

Chemistry/Biochemistry

Space ID	Space Name	Occ's/Space	ASF	No.	Total ASF	Total by Bldg	Notes
TEACHING LABORATORY							
1.01	Inorganic/Physical Chemistry	24	1,280	1	1,280		
1.02	Analytical Chemistry	24	1,280	2	2,560		
1.03	General Chemistry		1,280	2	2,560	6,400	
Subtotal Teaching Laboratories				**12**	**6,400**		
RESEARCH LABORATORY							
1.04	Research (2-mod Physical /Analytical)		640	3	1,920		
1.05	Research (2-mod Synthetic)		640	2	1,280		
1.06	Research (4-mod Synthetic)		1,280	2	2,560		
1.07	Research (3 mod Biochemistry/Forensics)		960	2	1,920	7,680	
Subtotal Research Laboratories				**9**	**7,680**		
LAB SUPPORT							
1.08	Satellite Stock Room		960	1	960		Req'd for 2-Bldg approach
1.09	Hazardous Chemical Storage: Solvents		107	1	107		
1.10	Hazardous Chemical Storage: Organics		107	1	107		
1.11	Hazardous Chemical Storage: Inorganics		106	1	106		
1.12	Instrument Room		1,280	1	1,280		With physical & analytical teaching labs
1.13	Instrument Storage		320	1	320		With instrument room
1.14	NMR Room		480	1	480		With instrument room
1.15	Balance Room		320	1	320		Adjoining organic/analytic teaching
1.16	XRD Room		240	1	240		With Dr. Manson research lab
1.17	Upper Division/ Research Prep Room		320	1	320		With haz chem storage rooms
1.18	Nitrogen Room*		80	1	80		Serves analytical lab & instrument room
1.19	Server Room		200	1	200		With Dr. Houndonougbo research lab & serves physical chem teaching lab
1.20	Computer Lab		545	1	545		
1.21	Computer Lab Support		122	1	122	5,187	Server closet?
Subtotal Lab Support				**20**	**5,187**		
FACULTY/STAFF OFFICE							
6.1	Faculty Office - Chair	1	175	1	175		
6.2	Faculty Office	1	140	16	2,240		
6.3	Departmental Office/ Waiting	1	350	1	350		
6.4	Teaching Assistant Office	6	140	2	280		12 total stations
6.5	Tutoring Office	1	280	1	280		
6.7	Work Room		140	1	140	3,465	
	* Space Requirements and Diagrams not included.						
Subtotal Office				**24**	**3,465**		

Total Chemistry/Biochemistry Area	**22,732**	22,732

Eastern Washington University Sciences - Science Renovation Predesign

PROGRAM SPACE SUMMARY

Physics

Space ID	Space Name	Occ's/ Space	ASF	No.	Total ASF	Total by Bldg	Notes
TEACHING LABORATORY							
2.01	Quantum Mechanics Lab	20	640	1	640	640	
Subtotal Teaching Laboratories				**5**	**640**		
RESEARCH LABORATORY							
2.02	Physics Research (Experimental)		480	3	1,440		
2.03	Physics Research (Computational)		420	1	420	1,860	
Subtotal Research Laboratories				**4**	**1,860**		
LAB SUPPORT							
2.04	Physics Lecture Demo Storage / Workroom		640	1	640	640	adjacent general physics lab
Subtotal Lab Support				**5**	**640**		
OTHER							
2.05	Planetarium	55	1,120	1	1,120	1,120	
Subtotal Other				**1**	**1,120**		
FACULTY/STAFF OFFICE							
6.1	Faculty Office - Chair	1	175	1	175		
6.2	Faculty Office	1	140	6	840		
6.3	Departmental Office/ Waiting	1	250	1	250		
6.5	Tutoring Office	1	280	1	280		
6.8	Reading Room		480	1	480	2,025	
Subtotal Office				**11**	**2,025**		

Total Physics Area **6,285** 6,285

Eastern Washington University Sciences - Science Renovation Predesign

PROGRAM SPACE SUMMARY

Biology

Space ID	Space Name	Occs/Space	ASF	No.	Total ASF	Total by Bldg	Notes
TEACHING LABORATORY							
3.01	Plant Sciences	24	960	1	960		
3.02	Ecology	24	960	1	960		
3.03	Vertebrate	24	960	1	960		
3.04	Invertebrate	24	960	1	960	3,840	Near ecology & plant science
Subtotal Teaching Laboratories				**14**	**3,840**		
RESEARCH LABORATORY							
3.05	Research Laboratory (480 sf avg size)		533	24	12,792		21 Rooms existing. Additional number confirmed, 5/11/16
3.06	Aquatics - Large Tanks		960	1	960		Shared lab
3.07	Aquatics - Small Tanks		1,440	1	1,440		Shared lab suite with cold room
3.08	Radio Isotope Lab*		166	1	166	15,358	Necessary for Univ. requirement
Subtotal Research Laboratories				**27**	**15,358**		
LABORATORY SUPPORT							
3.09	Herbarium Collections		414	1	414		With ecology/plant sci teaching lab Space from Radio Isotope Lab
3.10	Herbarium Work Room		320	1	320		With ecology/plant sci teaching lab
3.11	Ecology/Plant Sciences Prep		320	1	320		With ecology/plant sci teaching lab
3.12	Vert/Invert Prep		296	1	296		Adjoining vert/invert teaching lab Space from radio isotope lab
3.13	Vert/Invert Collections		430	1	430		With vert/invert teaching lab
3.14	Fluorescence Microscopy		160	1	160		With micro/molecular/cellular labs
3.15	Media Prep/Storage		320	1	320		With micro/molecular/cellular labs
3.16	Media Pouring		80	1	80		With micro/molecular/cellular labs
3.17	Glasswash/Autoclave		480	1	480		With micro/molecular/cellular labs
3.18	Cold Rooms		80	4	320		With micro/molecular/cellular labs
3.19	Micro/Molecular Equipment		320	1	320		With micro/molecular/cellular labs
3.20	Dry Media Storage		80	1	80		With micro/molecular/cellular labs
3.21	Mud Room		80	1	80		Adjacent to loading dock
3.22	Field Equipment Storage		240	1	240		With mud room
3.23	Stock:Glassware/Consumables		640	1	640		With teaching labs
3.24	Stock: Chemical Storage		160	1	160		With teaching labs
3.25	Stock: Prep		280	1	280		With teaching labs
3.26	Stock: Secure Storage		160	1	160		With teaching labs
3.27	Stock: Instrument Storage/Repair		160	1	160		With teaching labs
3.28	Stock: AV Storage*		80	1	80		With teaching labs
3.29	Growth Room Suite		1,280	1	1,280		4 rooms; adjacent research labs
3.30	Beetle Room		120	1	120		Locate away from animal labs
3.31	Bulk Chemical Storage		160	1	160		Locate on ground floor
3.32	Wood Shop Prep. Lab*		510	1	510		
3.33	Computer Lab		545	1	545	7,955	
Subtotal Lab Support				**33**	**7,955**		

VIVARIUM

3.34	Holding Room		180	4	720		9 Existing Rooms
3.35	Project Room		120	4	480		Existing Tecniplast ventilated cages
3.36	Project Room		180	2	360		
3.37	Surgery		180	1	180		4' BSC with exhaust
	Surgery Scrub		120	1	120		
3.39	Feed Storage/Cold Room		80	1	80		
3.40	Bedding Storage		160	1	160		
3.41	Clean Storage		400	1	400		
3.42	Cage & Rack Cleaning		400	1	400		Dump station
3.43	Vivarium General Storage		200	1	200		
3.44	Staff Restroom/Shower*		90	1	90		
3.45	Animal Receiving		200	1	200		
3.46	Vestibule*		120	2	240		
3.47	Bottle Filling*		60	1	60		
3.48	Internal Circulation*		900	1	900	4,590	Hall access 7' min.
Subtotal Vivarium				**23**	**4,590**		

GREENHOUSE

3.49	Prep Room (Headhouse)		480	1	480		
3.50	Botany Teaching Collection		450	2	900		
3.51	Student Project Area		600	1	600	1,980	
Subtotal Greenhouse				**4**	**1,980**		

FACULTY/STAFF OFFICE

6.1	Faculty Office - Chair	1	175	1	175		
6.2	Faculty Office	1	140	25	3,500		21 Existing Rooms
6.3	Departmental Office/Waiting	2	500	1	500		
6.2	Operations Manager Office	1	140	1	140		
6.6	Technician Office	1	120	1	120		With vivarium
6.4	Graduate/Teaching Assistant Office	4	140	6	840		24 total stations
6.7	Work Room		200	1	200		
6.9	Storage		140	1	140	5,615	
	* Space Requirements and Diagrams not included.						
Subtotal Office				**39**	**5,615**		

Total Biology Area	**39,338**	39,338

Eastern Washington University Sciences - Science Renovation Predesign

PROGRAM SPACE SUMMARY

Geology

Space ID	Space Name	Occ's/ Space	ASF	No.	Total ASF	Total by Bldg	Notes
TEACHING LABORATORY							
4.01	Introductory Geology	32	1,280	2	2,560		Open lab
4.02	Physical Geology	32	1,600	1	1,600		
4.03	Surficial Geology	32	1,600	1	1,600	5,760	Paired with Physical
Subtotal Teaching Laboratories				**10**	**5,760**		
RESEARCH LABORATORY							
4.04	Research Lab/ Project Room		640	1	640		With hood
4.05	Research Lab		320	7	2,240		
4.06	USGS GIS Mapping		320	1	320	3,200	
Subtotal Research Laboratories				**9**	**3,200**		
LAB SUPPORT							
4.07	Lab Prep/Storage		320	1	320		Between Intro labs
4.08	Lab Prep/Storage		320	1	320		Between Physical & Surficial
4.09	Rock Prep Lab - Entry/Prep		360	1	360		Thin section area with slot exhaust
4.10	Rock Prep Lab - Sawing		215	1	215		
4.11	Rock Prep Lab - Weighing		120	1	120		With fume hood
4.12	Rock Prep Lab - Polishing		210	1	210		
4.13	Map Library		640	1	640		
4.14	Field Equipment		320	1	320		
4.15	Storage*		233	1	233	2,738	
Subtotal Lab Support				**16**	**2,738**		
FACULTY/STAFF OFFICE							
6.1	Faculty Office - Chair	1	175	1	175		
6.2	Faculty Office	1	140	11	1,540		
6.3	Departmental Office/ Waiting	1	350	1	350		Includes secretary workstation
6.6	GIS Technician Office	1	120	1	120		Adjacent computer lab
6.4	Teaching Assistant Office	20	750	1	750		20 carrels & 2 mtg rooms
6.7	Work Room		140	1	140	3,075	
	* Space Requirements and Diagrams not included.						
Subtotal Office				**17**	**3,075**		

Total Geology Area	**14,773**	14,773

Eastern Washington University Sciences - Science Renovation Predesign

PROGRAM SPACE SUMMARY

Shared Facilities

Space ID	Space Name	Occ's/Space	ASF	No.	Total ASF	Total by Bldg	Notes
CLASSROOMS							
5.01	80-Seat Classroom	80	1,760	1	1,760		Room 201 currently seats 87
5.02	60-Seat Classroom	60	1,440	2	2,880		
5.03	40-Seat Classroom	40	1,000	1	1,000		Seats 45
5.04	GIS Computer Classroom	24	960	1	960		Geology request
5.05	Prep Room for Large Classrooms		320	1	320		Includes fume hood
5.06	Vestibules/Storage for Large Classroom*		160	2	320		
5.07	General Science Classroom		665	1	665		
5.08	General Science Classroom		1,414	1	1,414		
5.09	General Science Classroom		547	1	547		
5.10	Classroom		724	1	724		Was listed as Student Lounge
5.11	Classroom		724	1	724	11,314	
Subtotal Classrooms				**15**	**11,314**		
LAB SUPPORT							
5.12	Imaging Suite - Entry		160	1	160		
5.13	Imaging Suite - Instrument Room		280	1	280		
5.14	Imaging Suite - Instrument Room		280	1	280	720	
Subtotal Lab Support				**2**	**720**		
OPEN FACILITIES							
5.15	Student Study		2,500	1	2,500		
5.16	Faculty Lounge		400	1	400		
5.17	Open Computer Lab	24	1,280	1	1,280		
5.18	Learning Commons*	10	480	1	480		From Geology
5.19	Conference Room	30	525	1	525	5,185	
Subtotal Open Facilities				**9**	**5,185**		
OTHER SERVICE FACILITIES							
5.20	Hazardous Waste Storage		120	1	120		
5.21	Cylinder Storage		150	1	150		
5.22	Deans Office		250	1	250		
5.23	Associate Dean Office		175	1	175		
5.24	Staff Office		140	1	140		
5.25	Waiting		300	1	300		
5.26	Work Room		240	1	240		
5.27	Conference Room		300	1	300	1,675	
	* Space Requirements and Diagrams not included.						
Subtotal Other Facilities				**7**	**1,675**		

Total Shared Facilities Area **18,894**

appendix c
room diagrams and data sheets

DETAILED SPACE REQUIREMENTS

Eastern Washington University Science Renovation

Research Facilities Design

Cheney, Washington

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY

SPACE NAME: INORGANIC / PHYSICAL CHEMISTRY

SPACE ID NO: 1.01

OCCUPANCY: 24

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	Note 1
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	Note 2
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	■
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	Note 3
Zoned Lighting	Note 3
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

1. (4) 6' Chemical fume hoods
2. (1) OFOI glove box with vacuum pump exhaust
3. Suitable for A/V presentations and experimental "black-out"

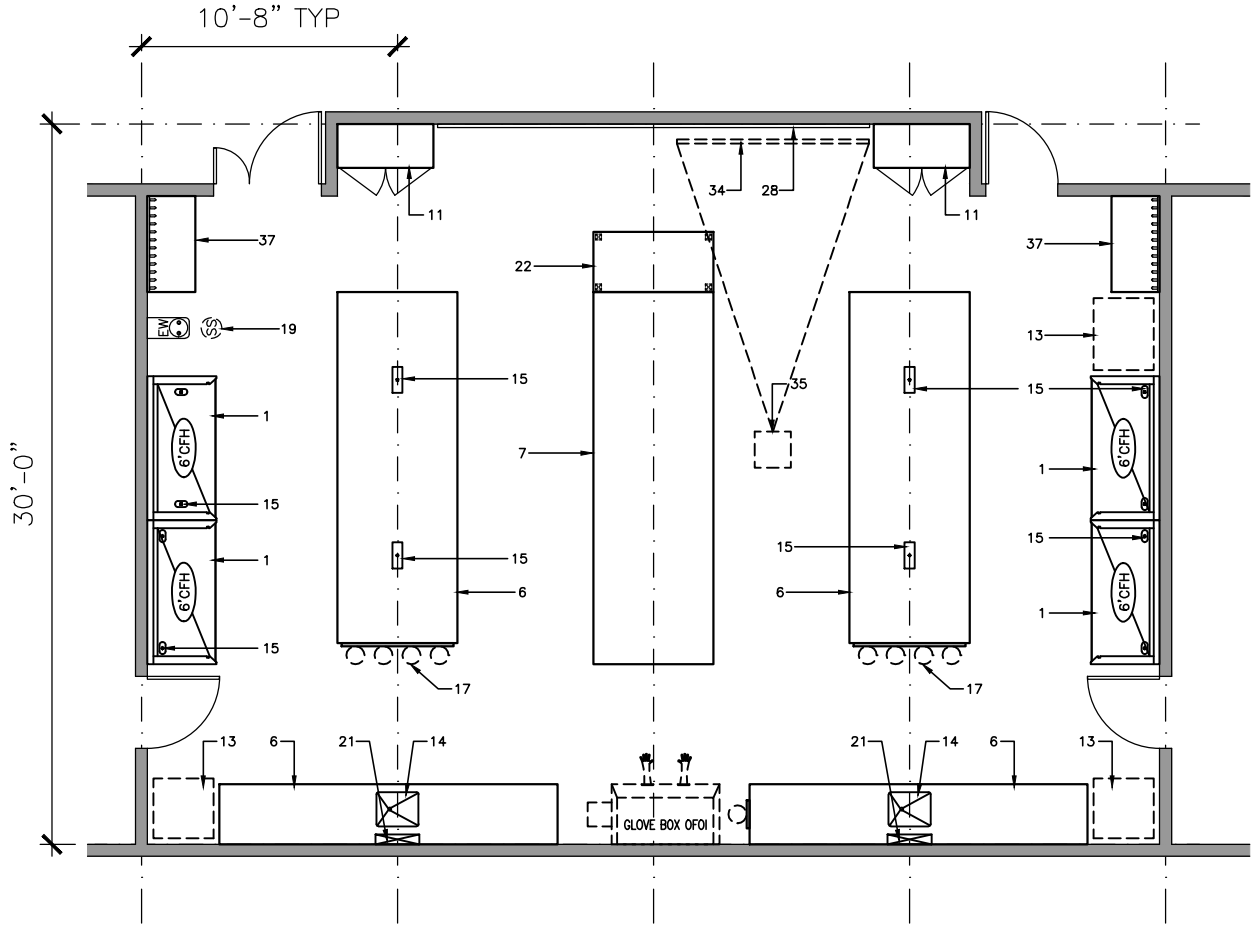
SPACE DIAGRAM
Eastern Washington University Science Renovation

Research Facilities Design
Cheney, Washington

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY
SPACE NAME: INORGANIC/PHYSICAL CHEMISTRY

SPACE ID NO.: 1.01
AREA NSF: 1,280

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY — **SPACE ID NO: 1.02**
SPACE NAME: ANALYTICAL CHEMISTRY — **OCCUPANCY: 24**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

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

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	Note 2
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	Note 3
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	Note 4
Zoned Lighting	Note 4
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

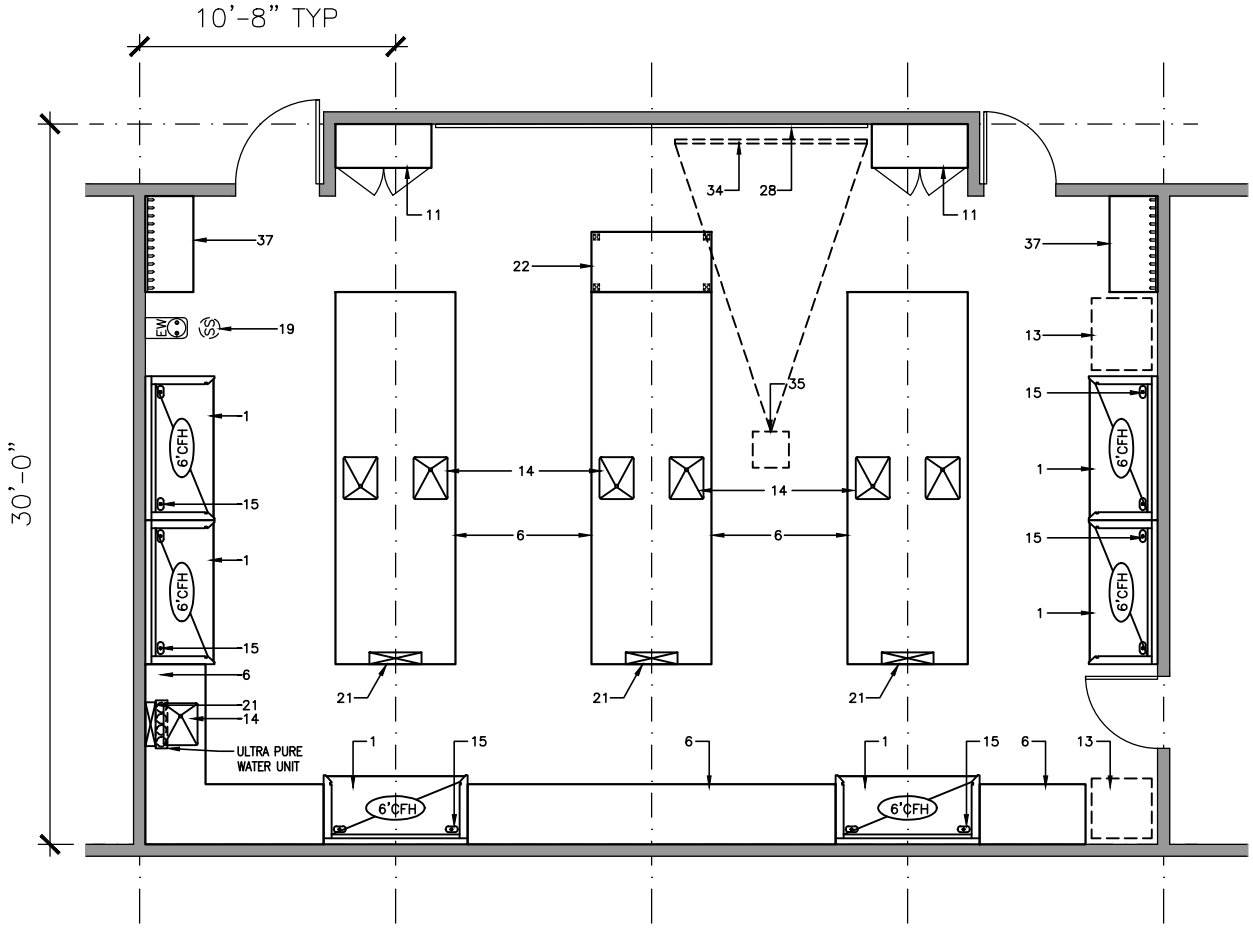
REMARKS:

1. (6) 6' Chemical fume hoods
2. Type I water purifier (owner furnished)
3. N_2 piped to fume hoods from tank farm
4. Suitable for A/V presentations

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY
SPACE NAME: ANALYTICAL CHEMISTRY

SPACE ID NO.: 1.02
AREA NSF: 1,280

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY — **SPACE ID NO: 1.03**
SPACE NAME: GENERAL CHEMISTRY — **OCCUPANCY: 24**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

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

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	Note 2
Zoned Lighting	Note 2
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

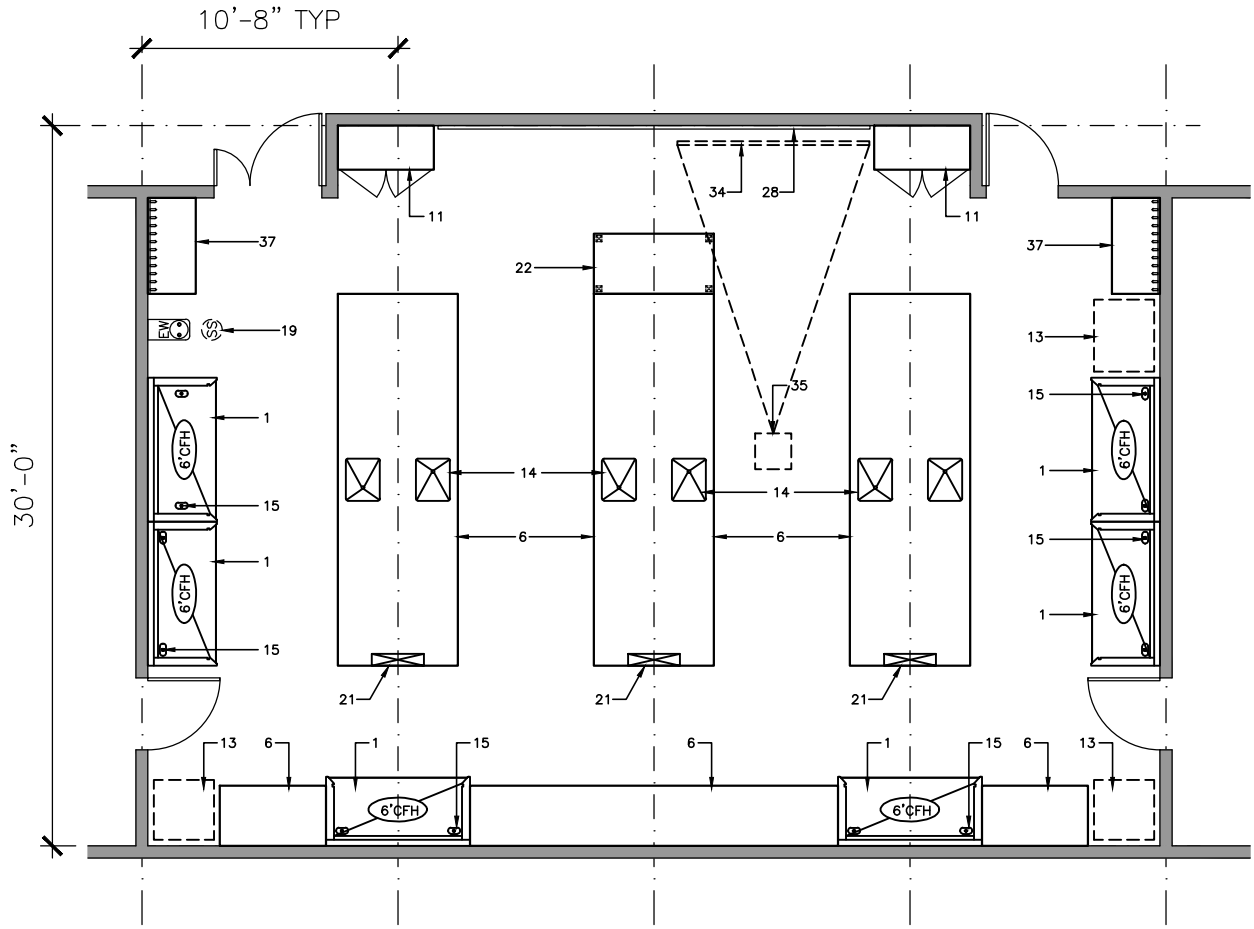
REMARKS:

1. (6) 6' Chemical fume hoods
2. Suitable for A/V presentations

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY
SPACE NAME: GENERAL CHEMISTRY

SPACE ID NO.: 1.03
AREA NSF: 1,280

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY — **SPACE ID NO: 1.04**
SPACE NAME: RESEARCH LAB (PHYSICAL/ANALYTICAL) — **OCCUPANCY: 5-6**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	Note 1
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	■
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	■
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	■
Zoned Lighting	■
Other	

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

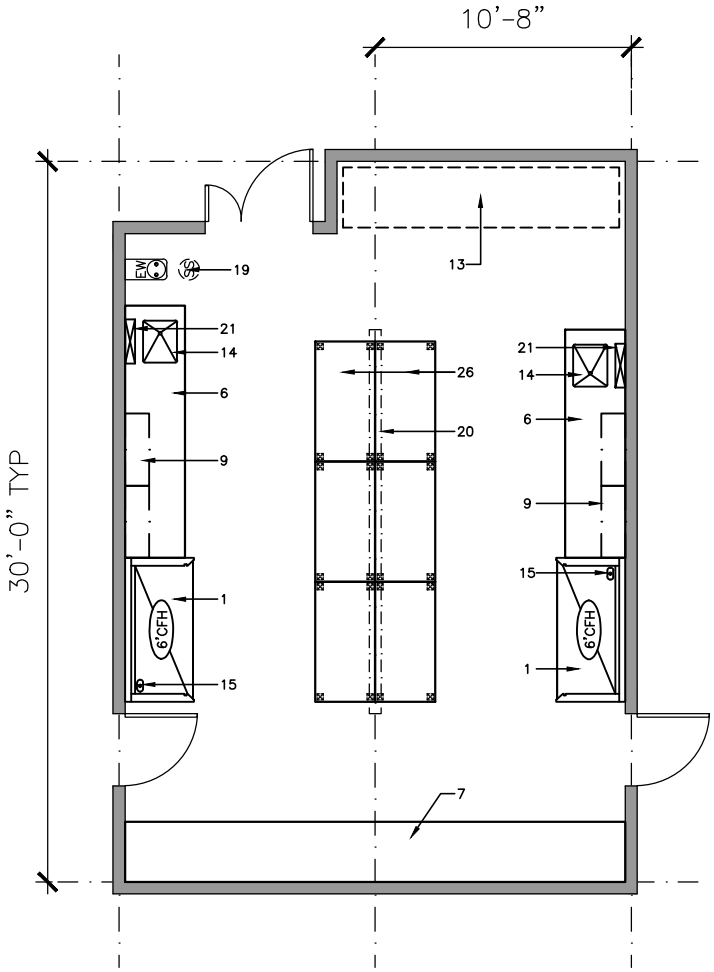
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

1. (2) 6' Chemical fume hoods

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY **SPACE ID NO.:** 1.04
SPACE NAME: RESEARCH LABORATORY (PHYSICAL/ANALYTICAL) **AREA NSF:** 640

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY — **SPACE ID NO: 1.05**
SPACE NAME: RESEARCH LABORATORY (SYNTHETIC) — **OCCUPANCY: 5-6**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	Note 1
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	Note 2
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	■
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

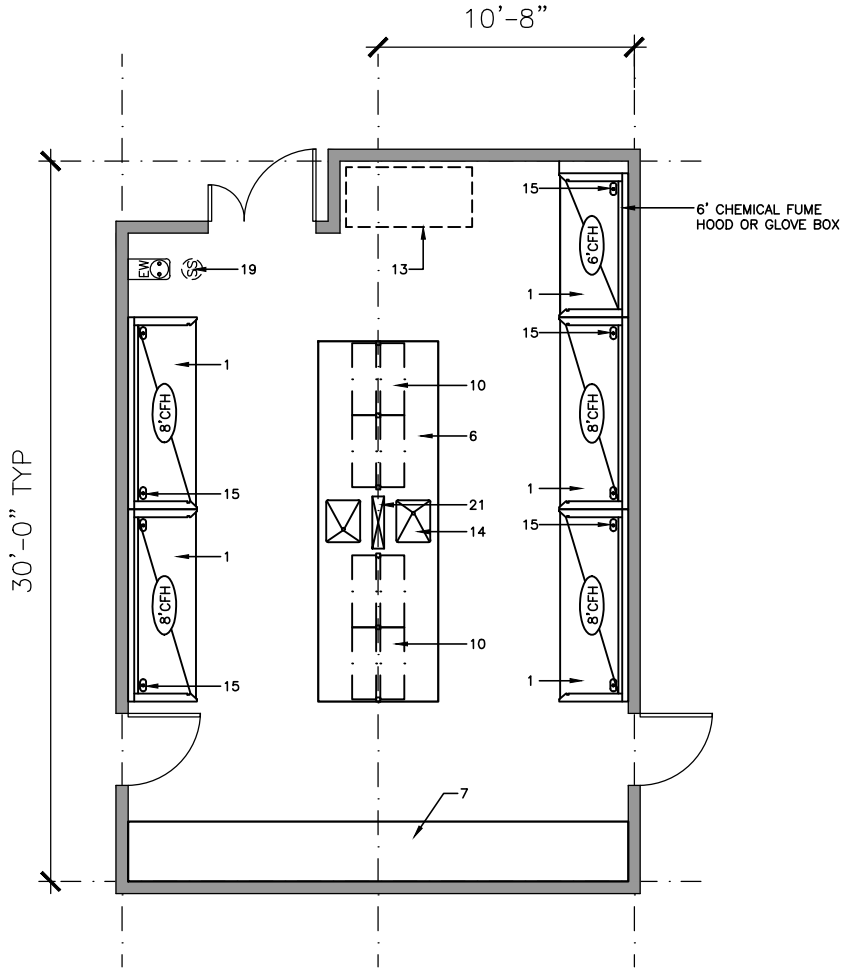
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

1. (4) 8' Chemical fume hoods
2. (1) OFOI glove box with vacuum pump exhaust

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY **SPACE ID NO.:** 1.05
SPACE NAME: RESEARCH LABORATORY (SYNTHETIC) **AREA NSF:** 640

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY — **SPACE ID NO: 1.06**
SPACE NAME: RESEARCH LABORATORY (SYNTHETIC) — **OCCUPANCY: 10-12**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	Note 1
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	Note 2
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	■
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

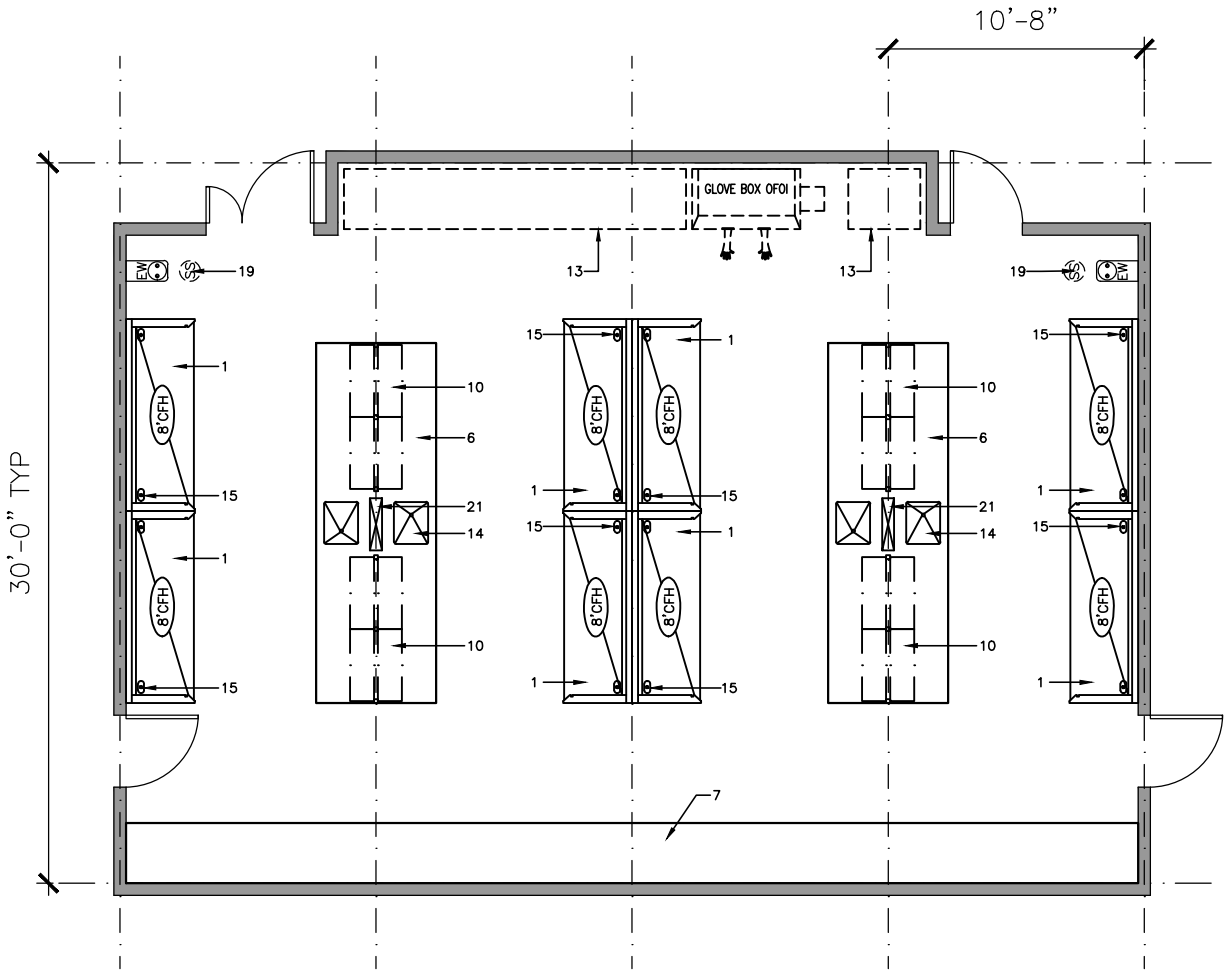
REMARKS:

1. (8) 8' Chemical fume hoods
2. (1) OFOI glove box with vacuum pump exhaust

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY
SPACE NAME: RESEARCH LABORATORY (SYNTHETIC)

SPACE ID NO.: 1.06
AREA NSF: 1,280

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY — **SPACE ID NO: 1.07**
SPACE NAME: RESEARCH LABORATORY (BIOCHEMISTRY/FORENSICS) — **OCCUPANCY: 6-8**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

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

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	■
Zoned Lighting	■
Other	

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

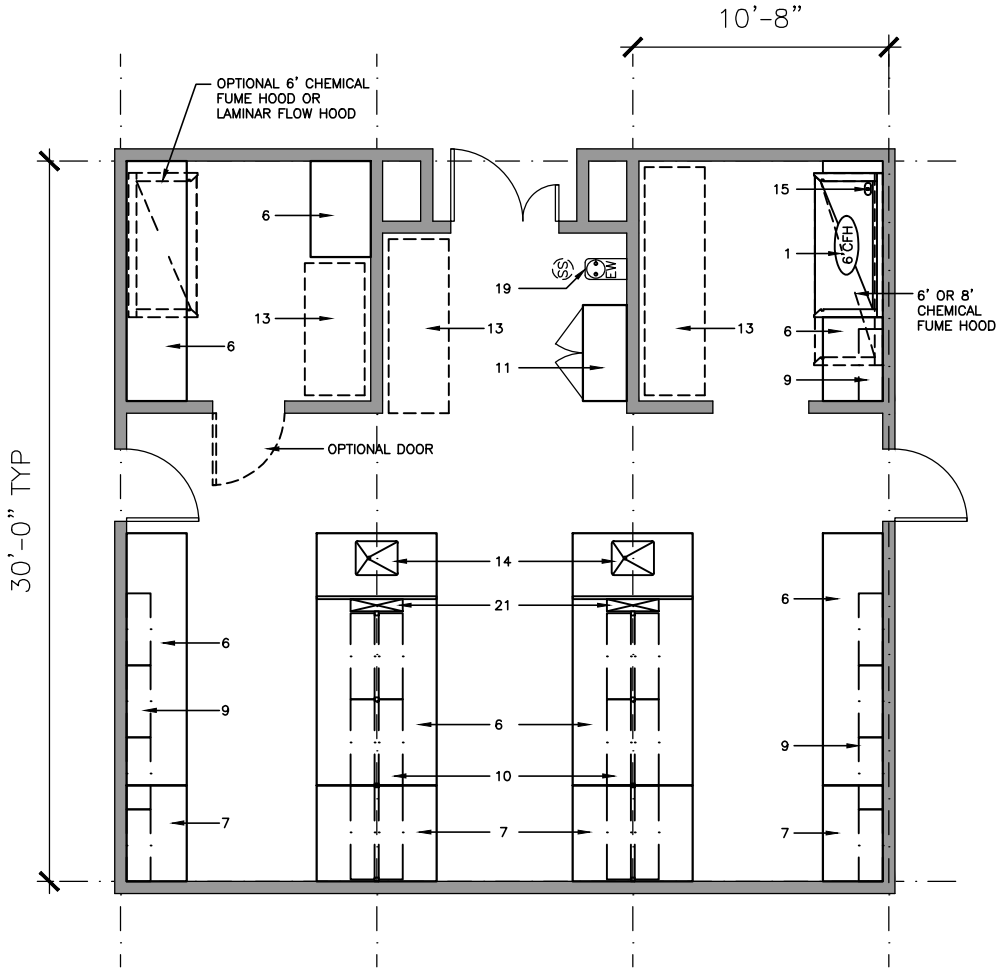
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

1. (2) 6' or 8' Chemical fume hoods.

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY **SPACE ID NO.:** 1.07
SPACE NAME: RESEARCH LABORATORY (BIOCHEMISTRY/FORENSICS) **AREA NSF:** 960

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY — **SPACE ID NO: 1.08A**
SPACE NAME: SATELLITE STOCKROOM: GLASSWARE/CONSUMABLES — **OCCUPANCY: 3-4**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

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

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	■
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

1. (1) 6' Chemical fume hood

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY — **SPACE ID NO: 1.08B**
SPACE NAME: SATELLITE STOCKROOM: CHEMICAL STORAGE — **OCCUPANCY: 3-4**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

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

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	■
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

1. (1) 6' Chemical fume hood

DETAILED SPACE REQUIREMENTS

Eastern Washington University Science Renovation

Research Facilities Design

Cheney, Washington

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY

SPACE NAME: SATELLITE STOCKROOM: PREP ROOM

SPACE ID NO: 1.08C

OCCUPANCY: 3-4

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

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

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	■
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

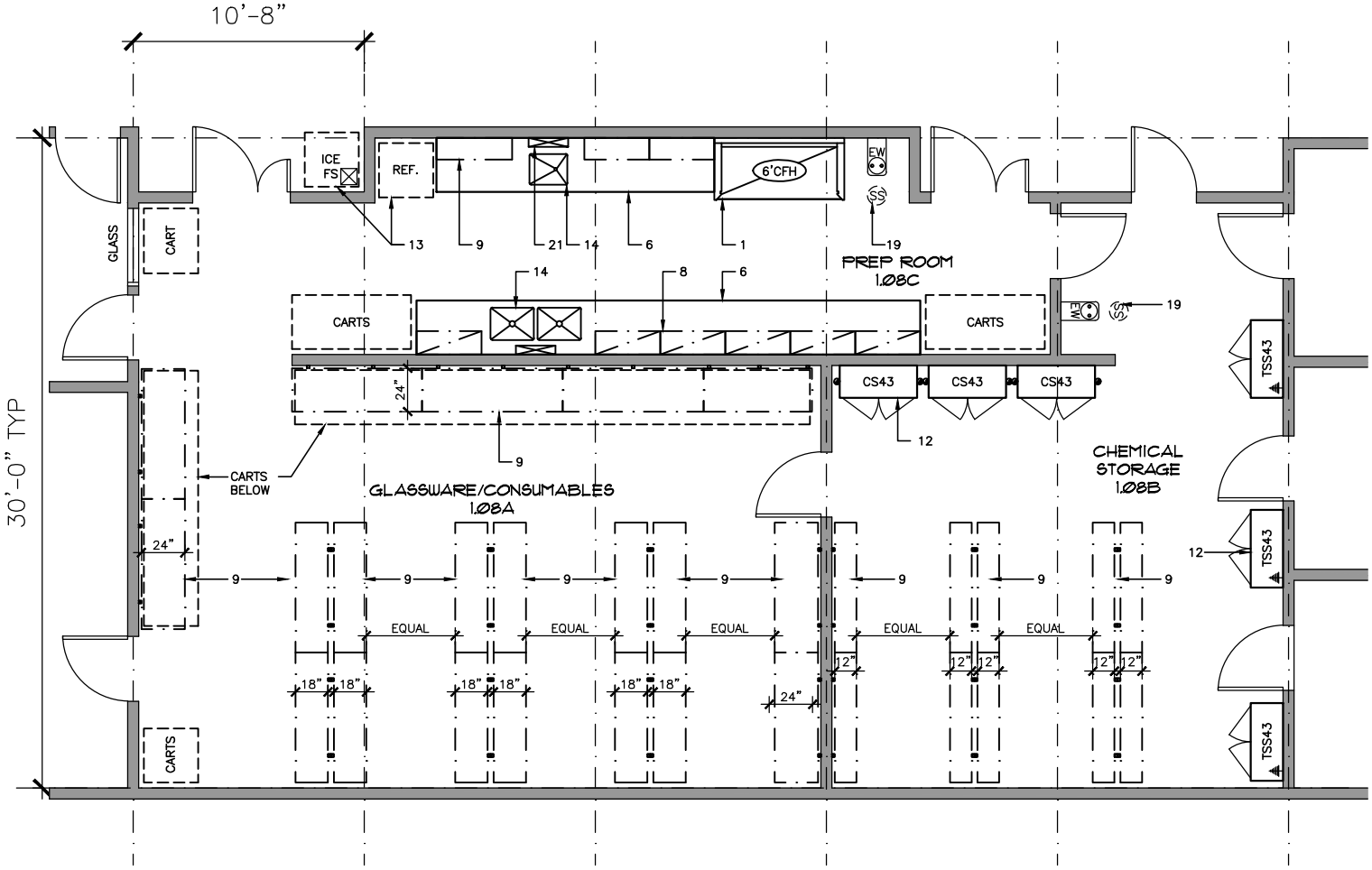
1. (1) 6' Chemical fume hood

SPACE DIAGRAM | **Research Facilities Design**
Eastern Washington University Science Renovation | *Cheney, Washington*

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY
SPACE NAME: SATELLITE STOCKROOM SUITE

SPACE ID NO.: 1.08A-C
AREA NSF: 1,600

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY **SPACE ID NO: 1.09**
SPACE NAME: HAZARDOUS CHEMICAL STORAGE: SOLVENTS **OCCUPANCY:**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	10
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	■
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY **SPACE ID NO: 1.10**
SPACE NAME: HAZARDOUS CHEMICAL STORAGE: ORGANICS **OCCUPANCY:**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	10
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	■
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY **SPACE ID NO: 1.11**
SPACE NAME: HAZARDOUS CHEMICAL STORAGE: INORGANICS **OCCUPANCY:**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	10
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

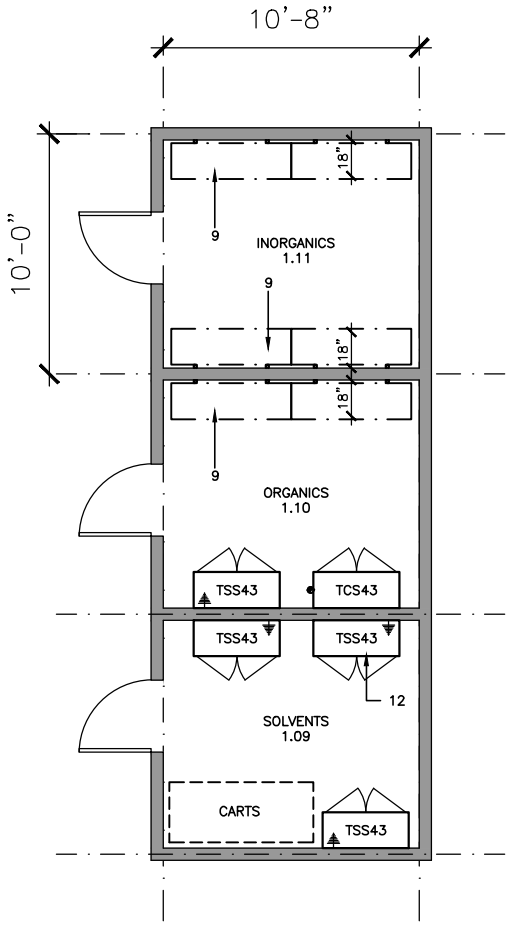
ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	■
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY
SPACE NAME: HAZARDOUS CHEMICAL STORAGE
SOLVENTS, ORGANICS, INORGANICS

SPACE ID NO.: 1.09 - 1.11
AREA NSF: 107 EACH

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY — **SPACE ID NO: 1.12**
SPACE NAME: INSTRUMENT ROOM — **OCCUPANCY: 24**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	Note 1
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	■
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	Note 2
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	■
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	Note 3
Cylinder Gases	■
Inert	■
Flammable	■
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	■
Zoned Lighting	■
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

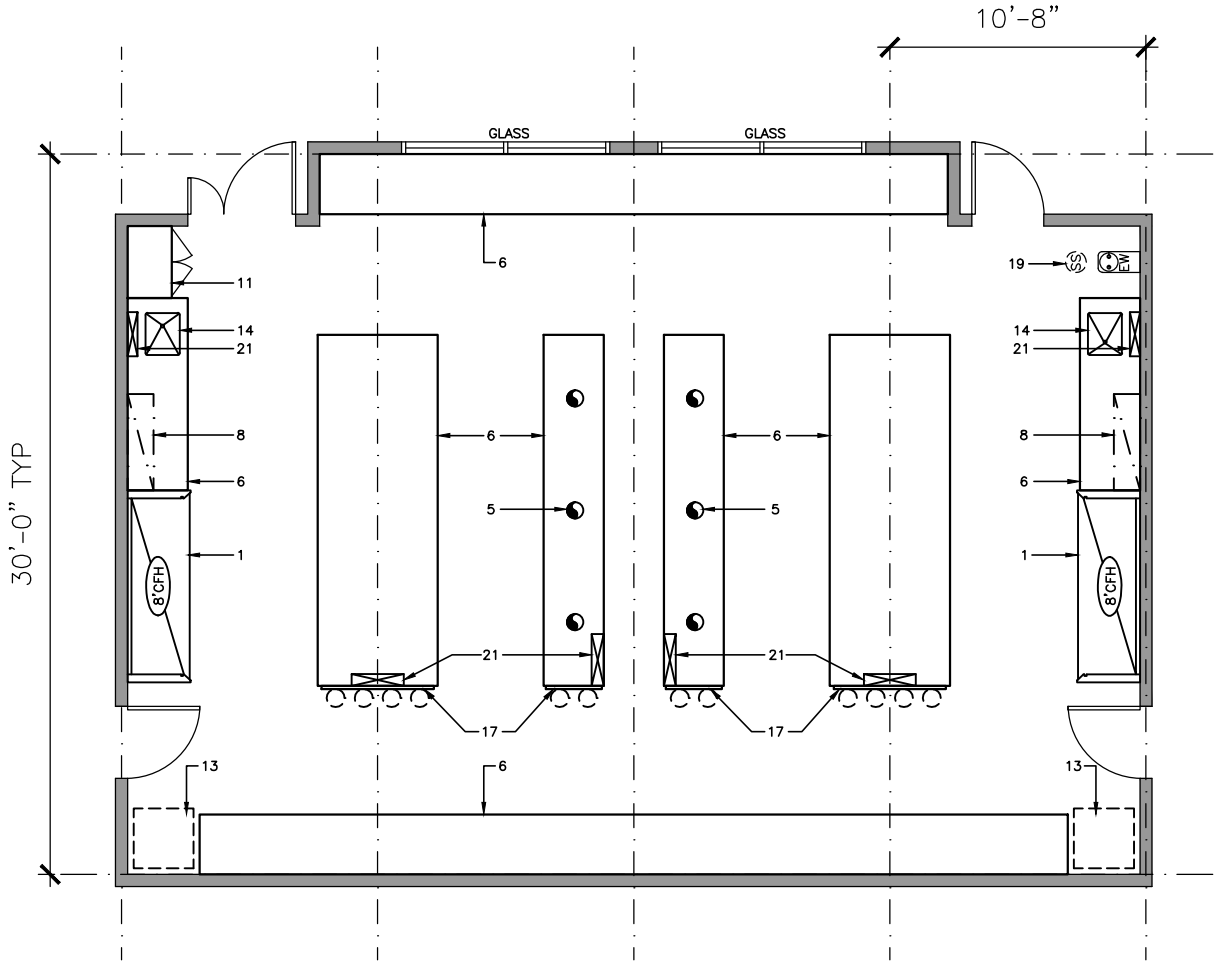
REMARKS:

1. (2) 8' Chemical fume hoods
2. Exhaust for vacuum pump venting at each island bench
3. N_2 piped from tank farm

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY
SPACE NAME: INSTRUMENT ROOM

SPACE ID NO.: 1.12
AREA NSF: 1,280

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY — **SPACE ID NO: 1.13**
SPACE NAME: INSTRUMENT STORAGE — **OCCUPANCY: 10**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	■
Zoned Lighting	■
Other	

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

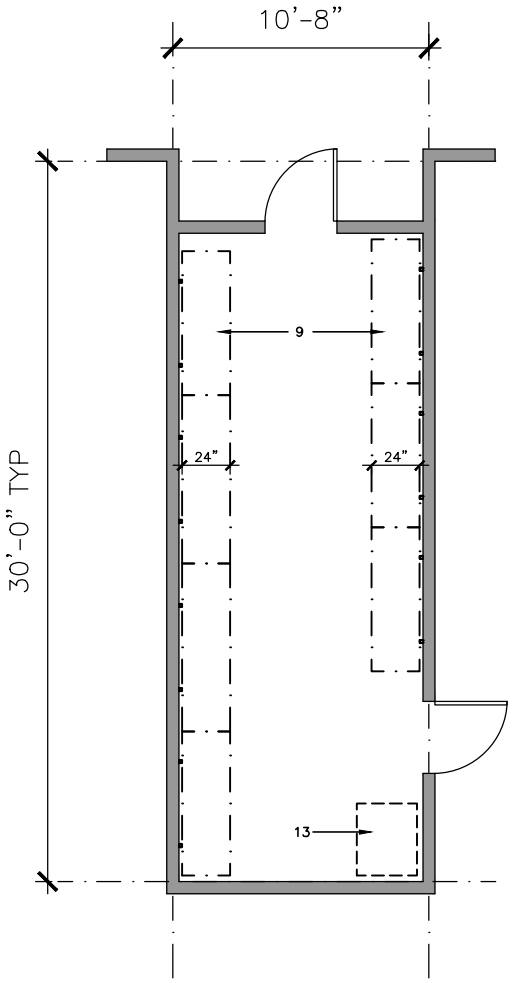
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

REMARKS:

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY
SPACE NAME: INSTRUMENT STORAGE

SPACE ID NO.: 1.13
AREA NSF: 320

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY
SPACE NAME: NMR ROOM
SPACE ID NO: 1.14
OCCUPANCY: 10

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	■
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	■
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	■
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	11'-6"
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

REMARKS:

1. Oxygen sensors and quench exhaust required
2. N_2 Generator required in adjacent, acoustically treated closet

- (1) 300-400 MHz NMR for teaching - to be located in new Interdisciplinary Science Building
- (1) 500 MHz NMR for research - to be located in existing Science Building

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY
SPACE NAME: NMR ROOM

SPACE ID NO.: 1.14
AREA NSF: 480

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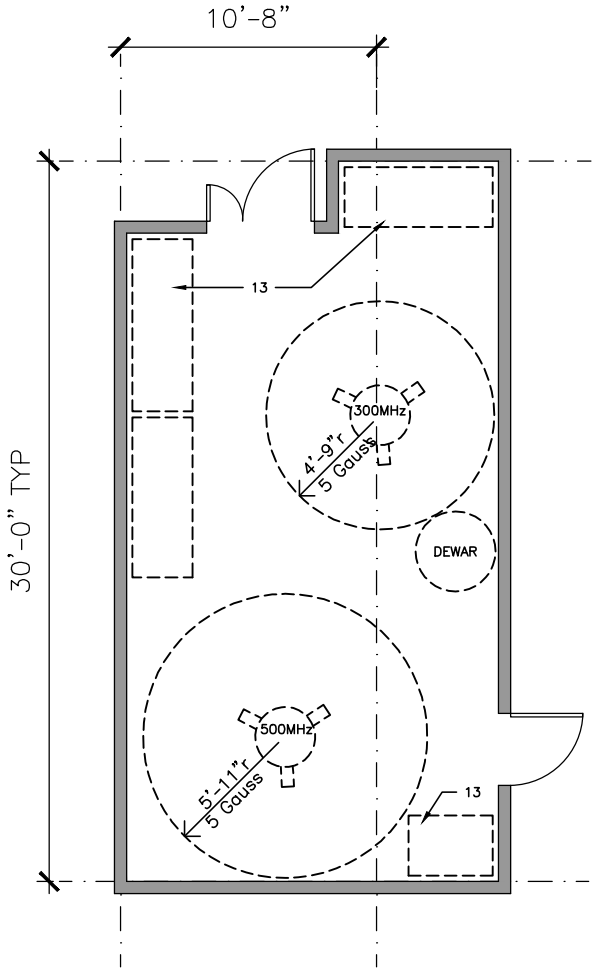


0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY — **SPACE ID NO: 1.15**
SPACE NAME: BALANCE ROOM — **OCCUPANCY: 10-12**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide ($C0_2$)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	■
Other	

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

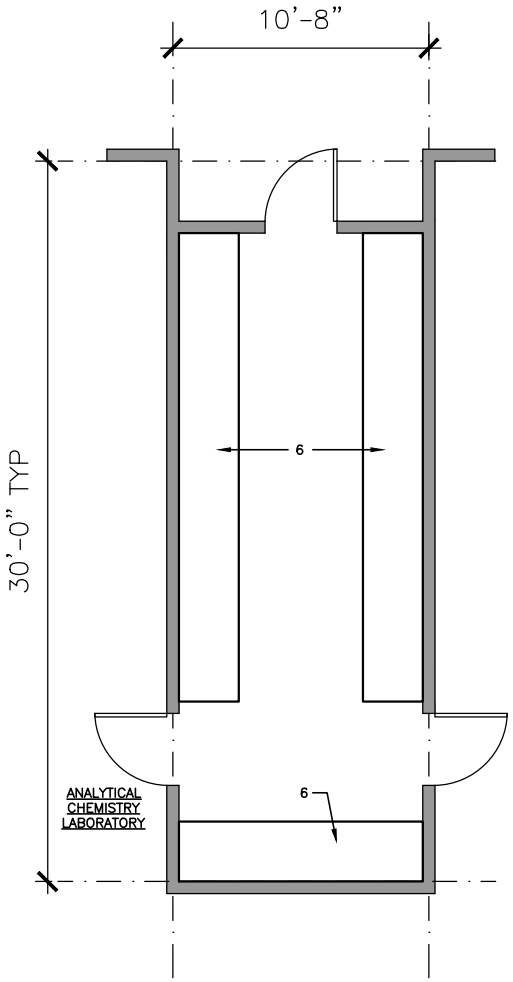
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

1. Low velocity supply air required

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY **SPACE ID NO.:** 1.15
SPACE NAME: BALANCE ROOM **AREA NSF:** 320

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY — **SPACE ID NO: 1.16**
SPACE NAME: XRD ROOM — **OCCUPANCY: 2-3**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	
Maintain <65°F	■
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	■
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	■
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	■
Task Lighting	■
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

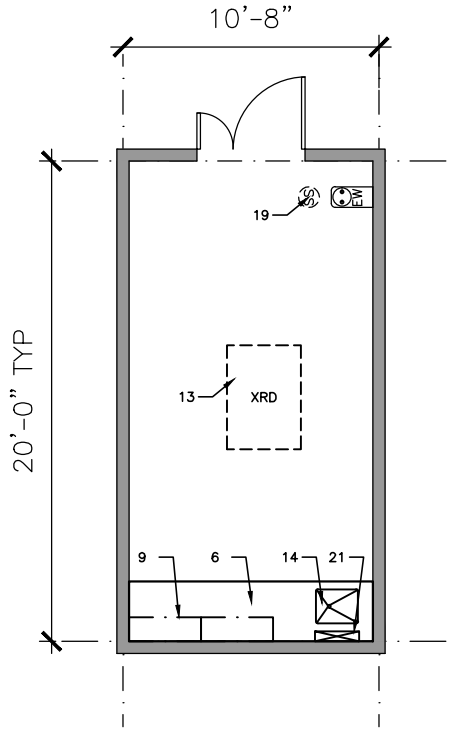
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY
SPACE NAME: XRD ROOM

SPACE ID NO.: 1.16
AREA NSF: 240

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
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25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: CHEMISTRY / BIOCHEMISTRY — **SPACE ID NO: 1.17**
SPACE NAME: UPPER DIVISION / RESEARCH PREP ROOM — **OCCUPANCY: 1-2**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

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

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	■
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

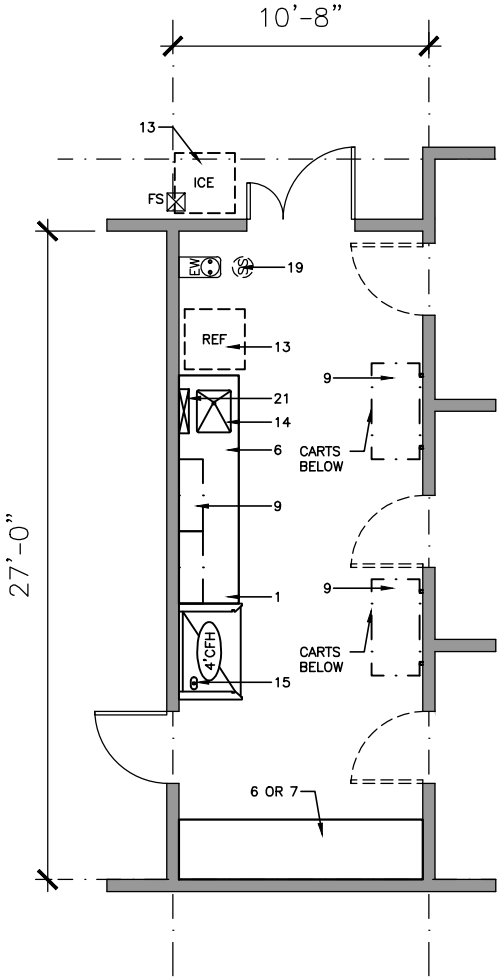
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

1. (1) 4'-0" Chemical fume hood

DEPARTMENT: CHEMISTRY/BIOCHEMISTRY **SPACE ID NO.:** 1.17
SPACE NAME: UPPER DIVISION / RESEARCH PREP ROOM **AREA NSF:** 320

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

Department:	Chemistry
Space ID:	1.19
Space Name:	Server Room
Occupants/space:	n/a
ASF:	200
No of spaces:	1

GENERAL:

Function	Informatics research support
Adjacencies	Inorganic/Physical Chemistry Teaching Lab and associated Research Lab
Ceiling Height	9’
Windows	None
Daylight Control	None
Lighting	Ambient well lit, motion sensor control

FINISHES:

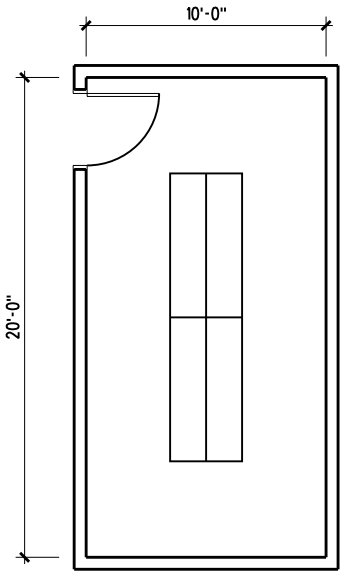
Floor	Vinyl dissipating tile
Base	Resilient
Walls	Painted GWB
Ceiling	None

UTILITIES:

Plumbing	None
Electrical	tbd
Floor Boxes	None
Data/Telecom	tbd
Audio-Visual	None
HVAC/Controls	Room cooling

EQUIPMENT:

Fixed	Overhead cable tray serving owner furnished server racks.
Moveable	None



Department:	Chemistry/Biochemistry
Space ID:	1.20
Space Name:	Computer Lab
Occupants/space:	16
ASF:	545
No of spaces:	1

GENERAL:

Function	Student projects and study
Adjacencies	Teaching and research labs
Ceiling Height	12’
Windows	Exterior with interior relites
Daylight Control	Blinds
Lighting	Ambient lighting, motion sensor control

FINISHES:

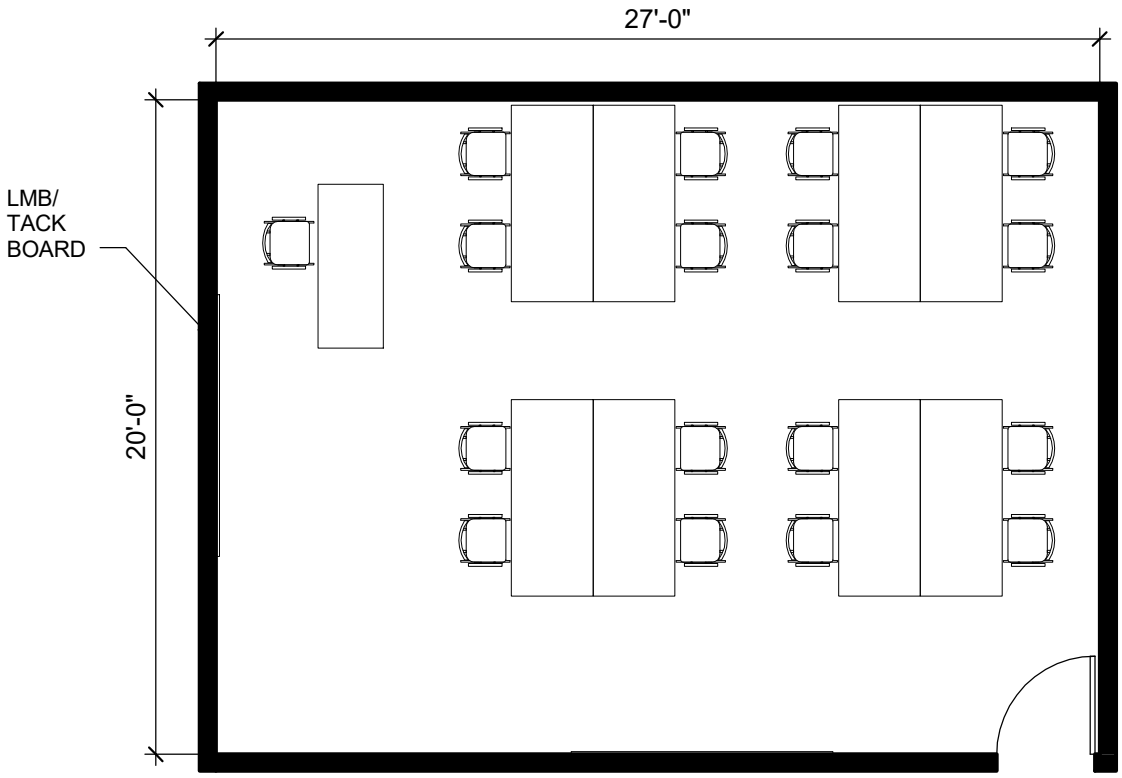
Floor	Carpet
Base	Resilient
Walls	Painted GWB and acoustical wall panels
Ceiling	ACT and GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	Sliding whiteboard and tack board
Moveable	Owner-furnished tables, chairs and lectern



1.20 COMPUTER LAB

0 1 2 4 8 16

Department:	Chemistry/Biochemistry
Space ID:	1.21
Space Name:	Computer Lab Support
Occupants/space:	1
ASF:	122
No of spaces:	1

GENERAL:

Function	Support
Adjacencies	Computer Lab
Ceiling Height	9’
Windows	None
Daylight Control	None
Lighting	Ambient lighting, motion sensor control

FINISHES:

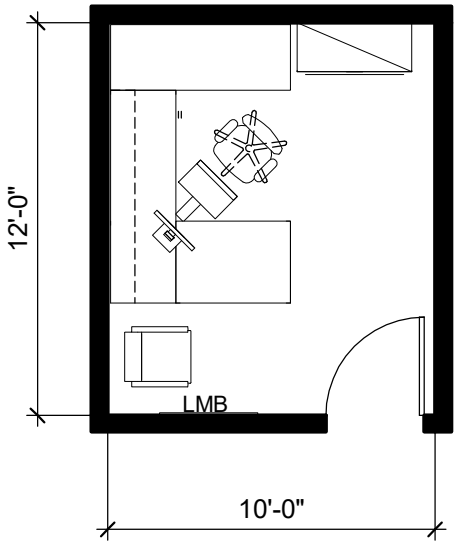
Floor	Resilient
Base	Resilient
Walls	Painted GWB
Ceiling	ACT or GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	No
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	White board
Moveable	Owner-furnished desk, chair and file



1.21 COMPUTER LAB SUPPORT

0 1 2 4 8 16

DETAILED SPACE REQUIREMENTS

Eastern Washington University Science Renovation

Research Facilities Design

Cheney, Washington

DEPARTMENT: PHYSICS

SPACE NAME: QUANTUM MECHANICS LAB

SPACE ID NO: 2.01

OCCUPANCY: 20

UTILIZATION

Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL

Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	
Air Recirculation	■
Air Pressure Positive	
Air Pressure Negative	
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS

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

LABORATORY EQUIPMENT

Vibration Sensitive	
Light Sensitive	
Vibration Producing	
Heat Producing	
Noise Producing	

PLUMBING

Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	■
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL

110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	Note 1
Zoned Lighting	Note 1
Other	

CHEMICALS

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

ARCHITECTURAL

Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	■
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

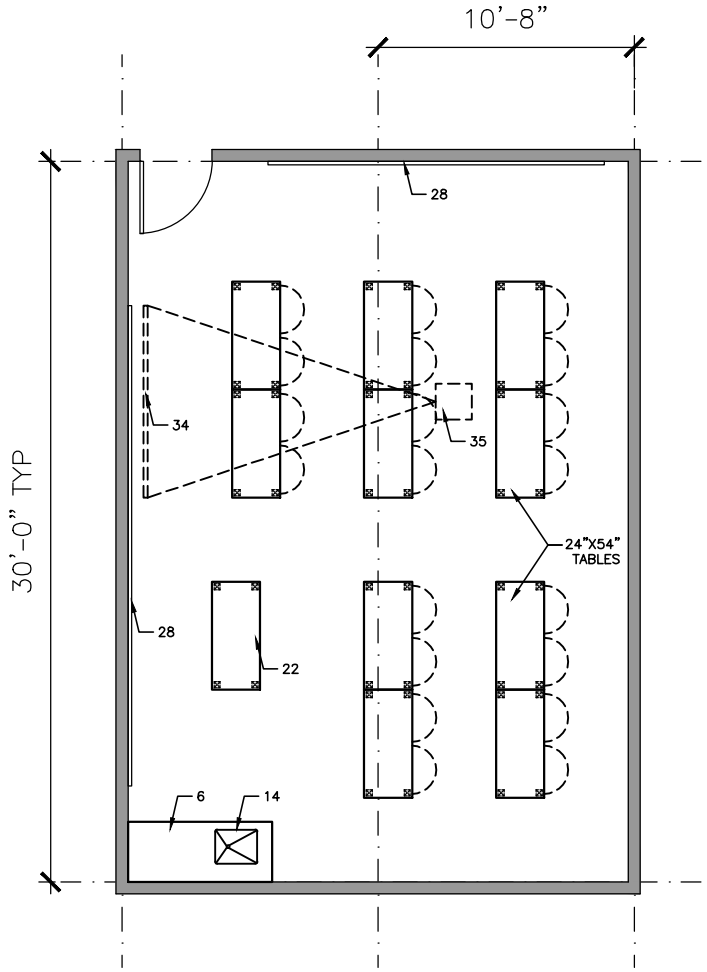
REMARKS:

1. Suitable for A/V presentations

DEPARTMENT: PHYSICS
SPACE NAME: QUANTUM MECHANICS LAB

SPACE ID NO.: 2.01
AREA NSF: 640

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: PHYSICS — **SPACE ID NO: 2.02**
SPACE NAME: PHYSICS RESEARCH (EXPERIMENTAL) — **OCCUPANCY: 3-4**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	
Air Recirculation	■
Air Pressure Positive	
Air Pressure Negative	
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	■
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide ($C0_2$)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	■
Zoned Lighting	
Other	

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

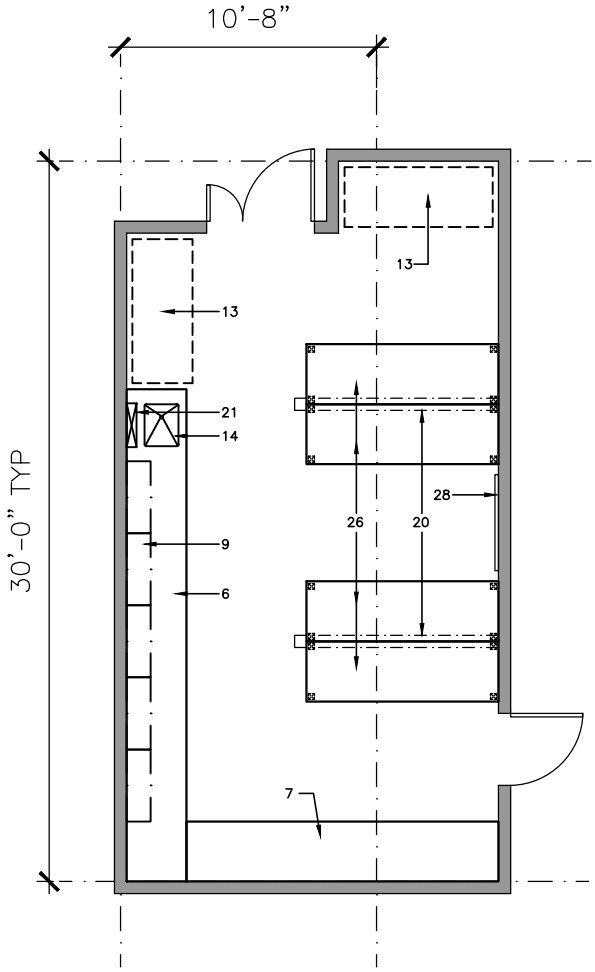
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	■
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

DEPARTMENT: PHYSICS
SPACE NAME: PHYSICS RESEARCH (EXPERIMENTAL)

SPACE ID NO.: 2.02
AREA NSF: 480

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: PHYSICS — **SPACE ID NO: 2.03**
SPACE NAME: PHYSICS RESEARCH (COMPUTATIONAL) — **OCCUPANCY: 1-2**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	
Air Recirculation	■
Air Pressure Positive	
Air Pressure Negative	
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	■
Zoned Lighting	
Other	

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

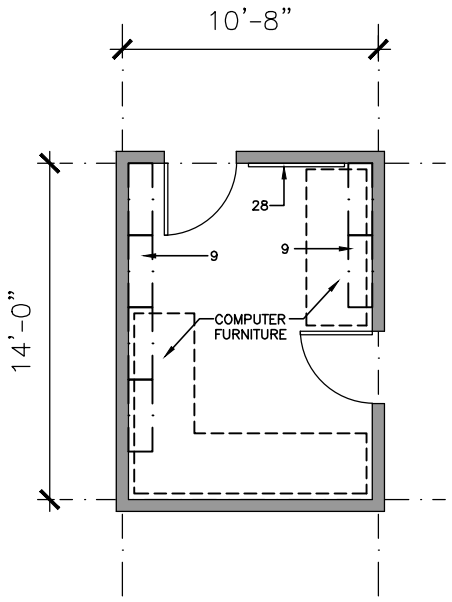
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	■
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

DEPARTMENT: PHYSICS
SPACE NAME: PHYSICS RESEARCH (COMPUTATIONAL)

SPACE ID NO.: 2.03
AREA NSF: 140

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: PHYSICS — **SPACE ID NO: 2.04**
SPACE NAME: PHYSICS LECTURE DEMO STORAGE — **OCCUPANCY: 1**

UTILIZATION

Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL

Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	
Air Recirculation	■
Air Pressure Positive	
Air Pressure Negative	
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS

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

LABORATORY EQUIPMENT

Vibration Sensitive	
Light Sensitive	
Vibration Producing	
Heat Producing	
Noise Producing	

PLUMBING

Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide ($C0_2$)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL

110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	■
Zoned Lighting	
Other	

CHEMICALS

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

ARCHITECTURAL

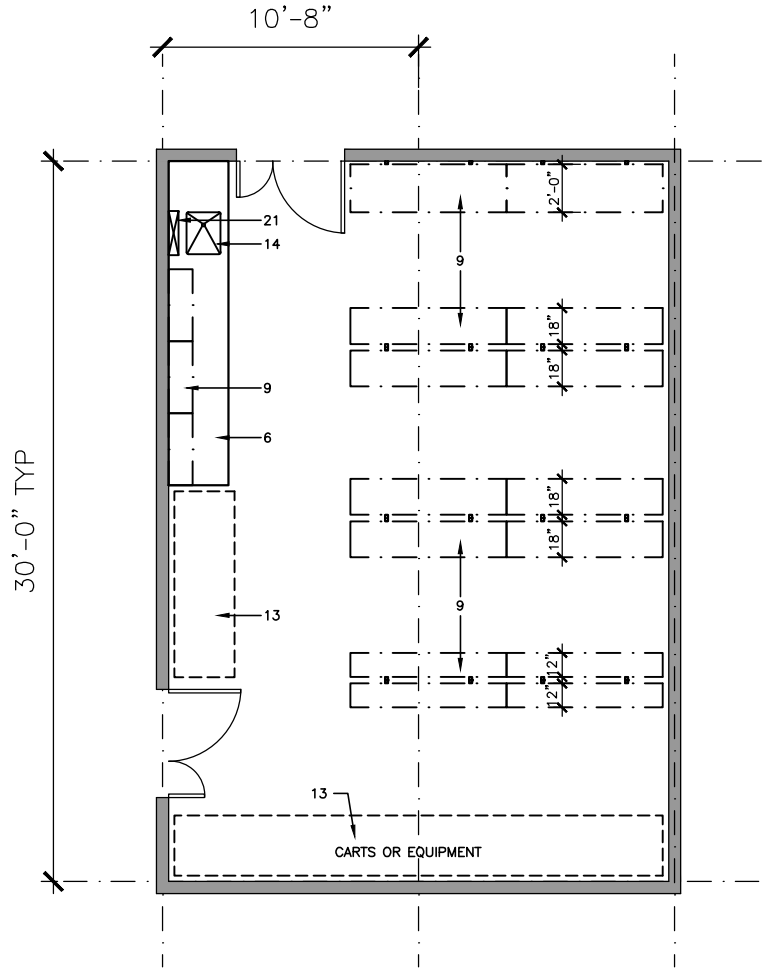
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	■
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

DEPARTMENT: PHYSICS
SPACE NAME: PHYSICS LECTURE DEMO STORAGE

SPACE ID NO.: 2.04
AREA NSF: 640

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

Department:	Physics
Space ID:	2.05
Space Name:	Planetarium
Occupants/space:	55
ASF:	1,120
No of spaces:	1

GENERAL:

Function	Auditorium classroom for digitally-based projection on a dome shaped screen
Adjacencies	Control room and projection gallery
Ceiling Height	Varies
Windows	No exterior windows. Interior viewing window from control room
Daylight Control	None
Lighting	Dimmable lighting, dome wash lights to illuminate dome screen. Aisle lights at seating rows and spot lights at instructor lectern area

FINISHES:

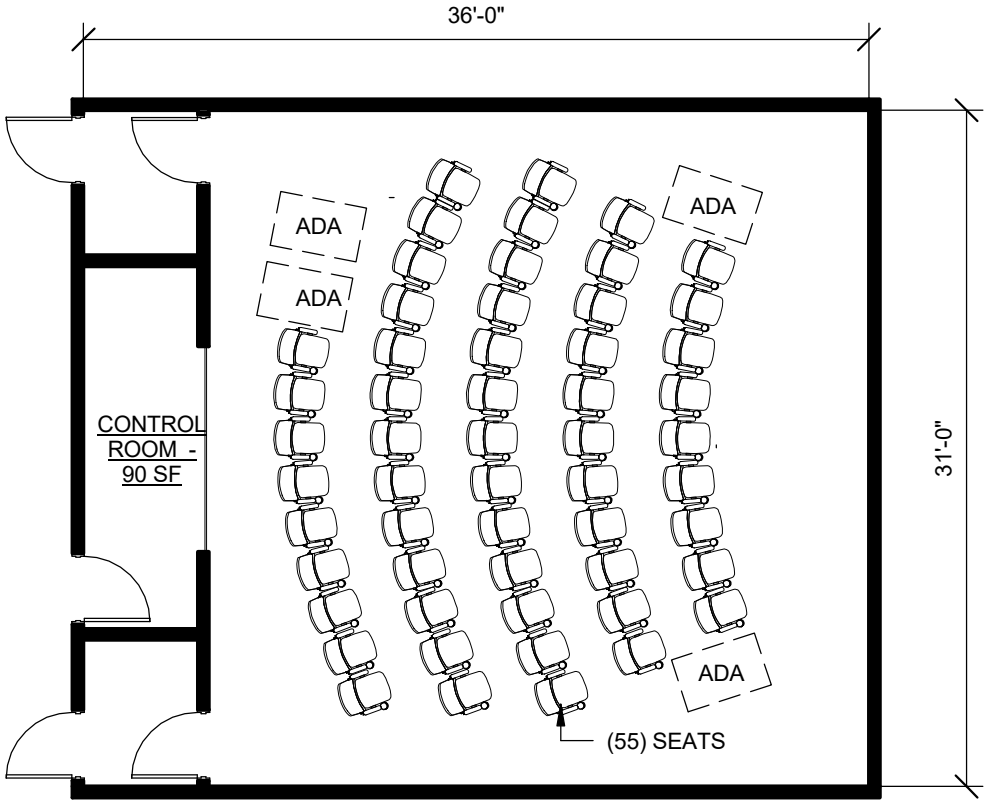
Floor	Carpet with pad
Base	Resilient
Walls	Sound absorbing panels wrapped with high impact, dark colored, non-reflective fabric
Ceiling	Spherical perforated ceiling panels at dome

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations. Convenience receptacles at seat locations for student use. Power and data connections for instructor use
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Audio to permit all types of voice, sound and music
HVAC/Controls	Air diffusion through ceiling panel perforations to keep ceiling free of dust

EQUIPMENT:

Fixed	55 adjustable auditorium-style seats
Moveable	Portable lectern for instructor



2.05 PLANETARIUM

DETAILED SPACE REQUIREMENTS

Eastern Washington University Science Renovation

Research Facilities Design

Cheney, Washington

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.01**

SPACE NAME: PLANT SCIENCES — **OCCUPANCY: 24**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

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

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	Note 2
Zoned Lighting	Note 2
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

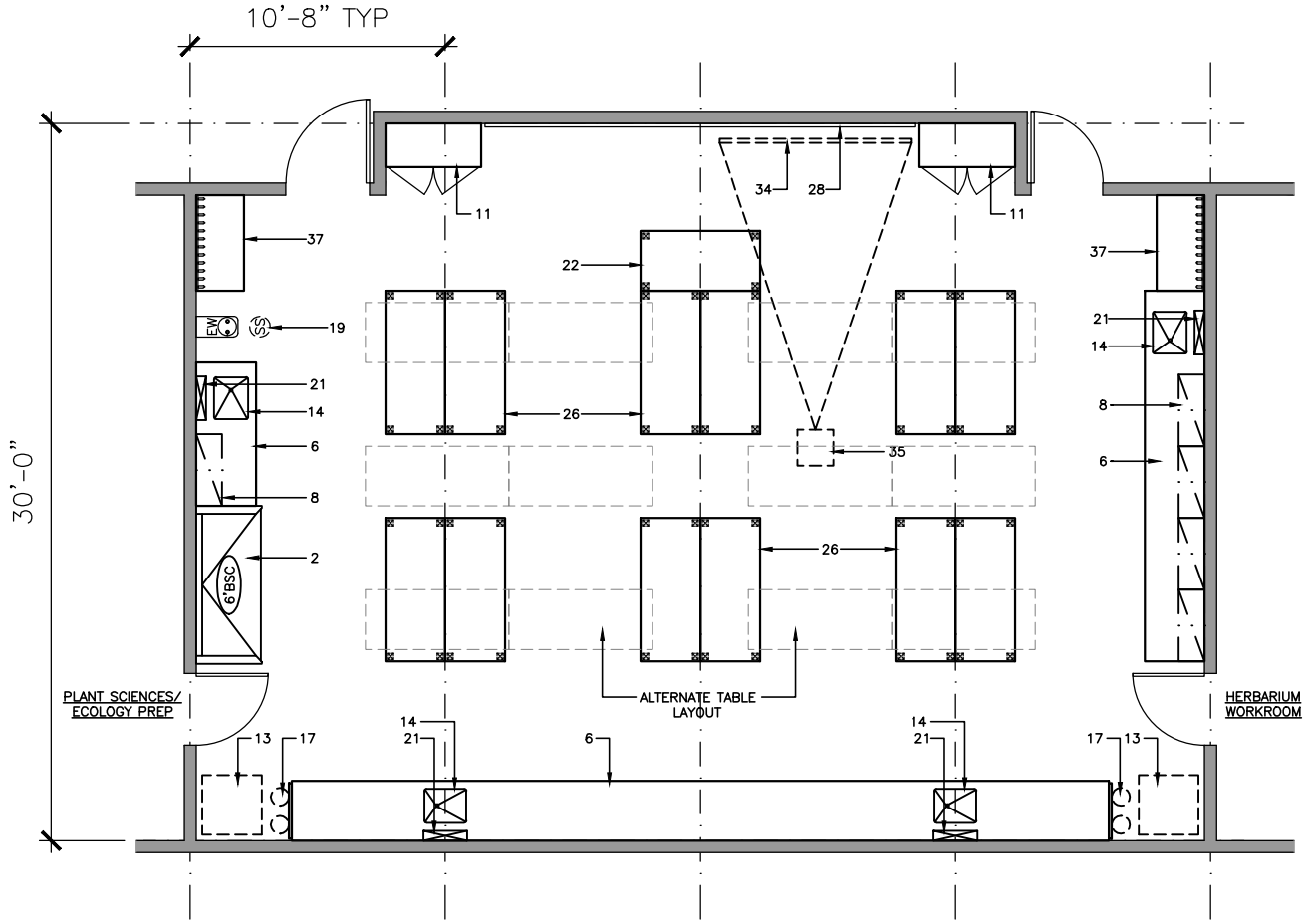
REMARKS:

1. (1) 6' BSC - recirculating
2. Suitable for A/V presentations

DEPARTMENT: BIOLOGY
SPACE NAME: PLANT SCIENCES

SPACE ID NO.: 3.01
AREA NSF: 1,280

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DETAILED SPACE REQUIREMENTS

Eastern Washington University Science Renovation

Research Facilities Design

Cheney, Washington

DEPARTMENT: BIOLOGY

SPACE NAME: ECOLOGY

SPACE ID NO: 3.02

OCCUPANCY: 24

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	Note 1
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	Note 2
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	■
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	■
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	Note 3
Zoned Lighting	Note 3
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

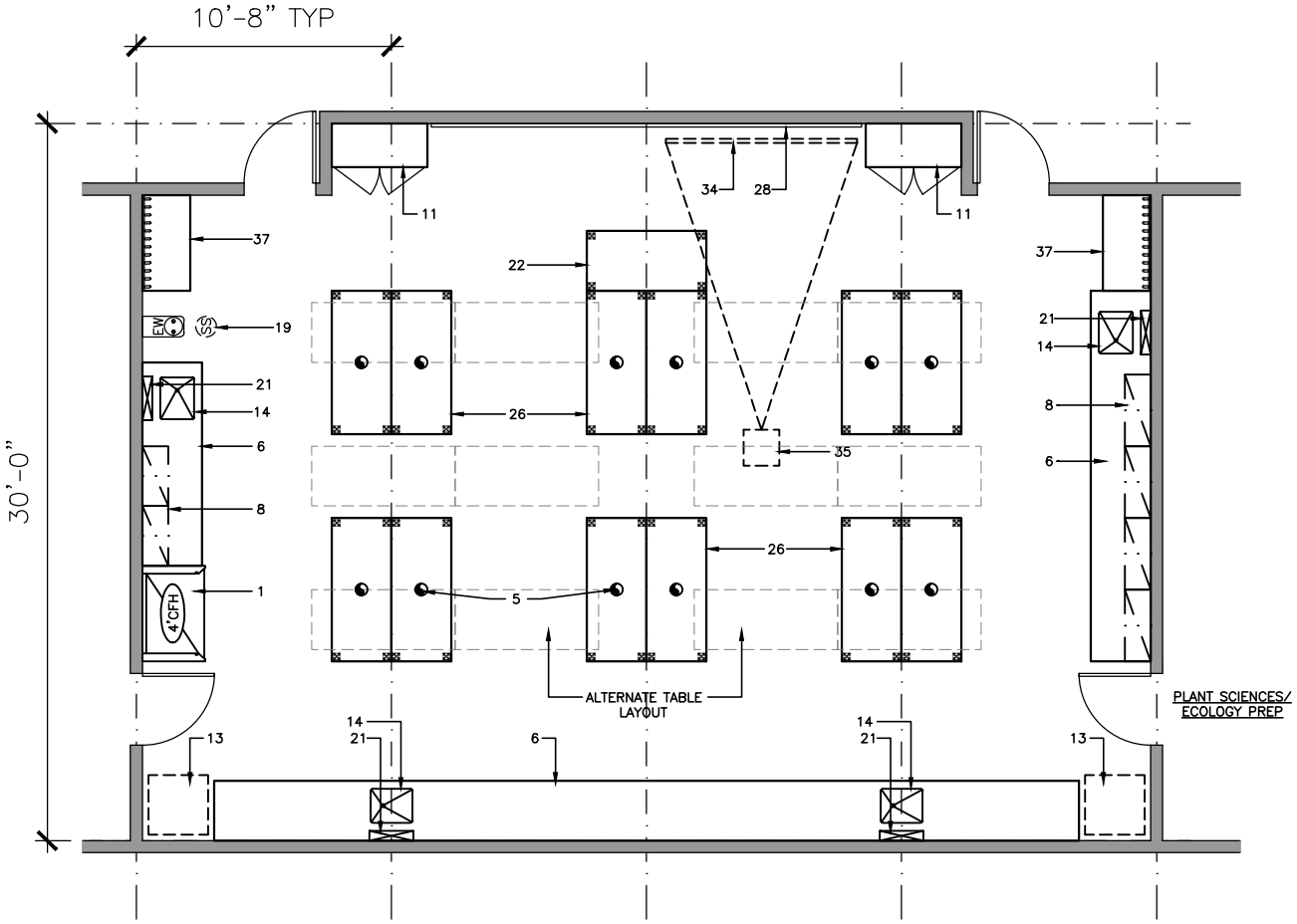
1. (1) 4' Chemical fume hood
2. Snorkels over student tables (12)
3. Suitable for A/V presentations

SPACE DIAGRAM | **Research Facilities Design**
Eastern Washington University Science Renovation | *Cheney, Washington*

DEPARTMENT: BIOLOGY
SPACE NAME: ECOLOGY

SPACE ID NO.: 3.02
AREA NSF: 1,280

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DETAILED SPACE REQUIREMENTS

Eastern Washington University Science Renovation

Research Facilities Design

Cheney, Washington

DEPARTMENT: BIOLOGY

SPACE NAME: VERTEBRATE

SPACE ID NO: 3.03

OCCUPANCY: 24

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	■
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	Note 1
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	■
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	Note 2
Zoned Lighting	Note 2
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

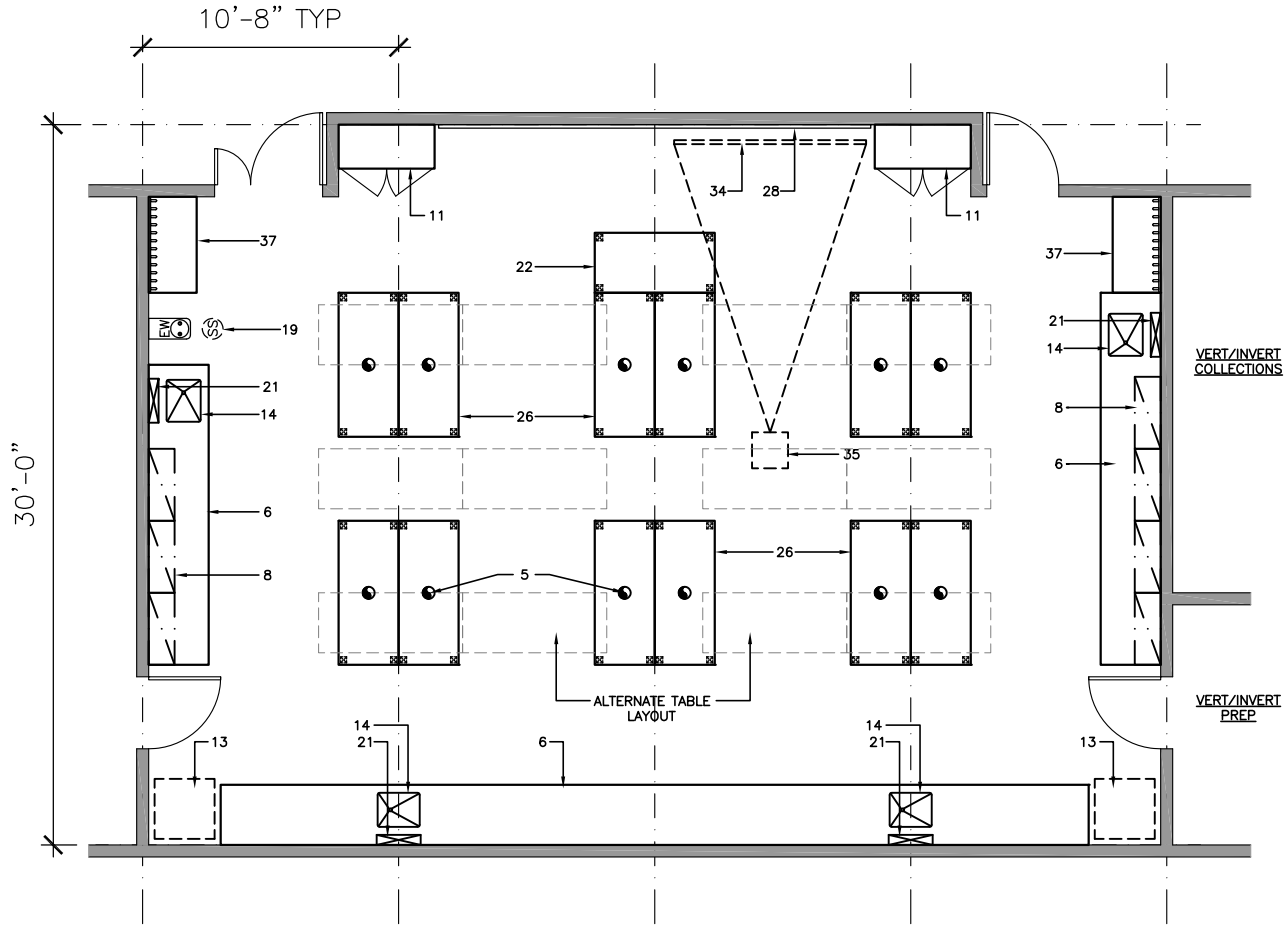
REMARKS:

1. Snorkels over student tables (12)
2. Suitable for A/V presentations

DEPARTMENT: BIOLOGY
SPACE NAME: VERTEBRATE

SPACE ID NO.: 3.03
AREA NSF: 1,280

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DETAILED SPACE REQUIREMENTS

Eastern Washington University Science Renovation

Research Facilities Design

Cheney, Washington

DEPARTMENT: BIOLOGY

SPACE NAME: INVERTEBRATE

SPACE ID NO: 3.04

OCCUPANCY: 24

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	■
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	Note 1
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	■
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	Note 2
Zoned Lighting	Note 2
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

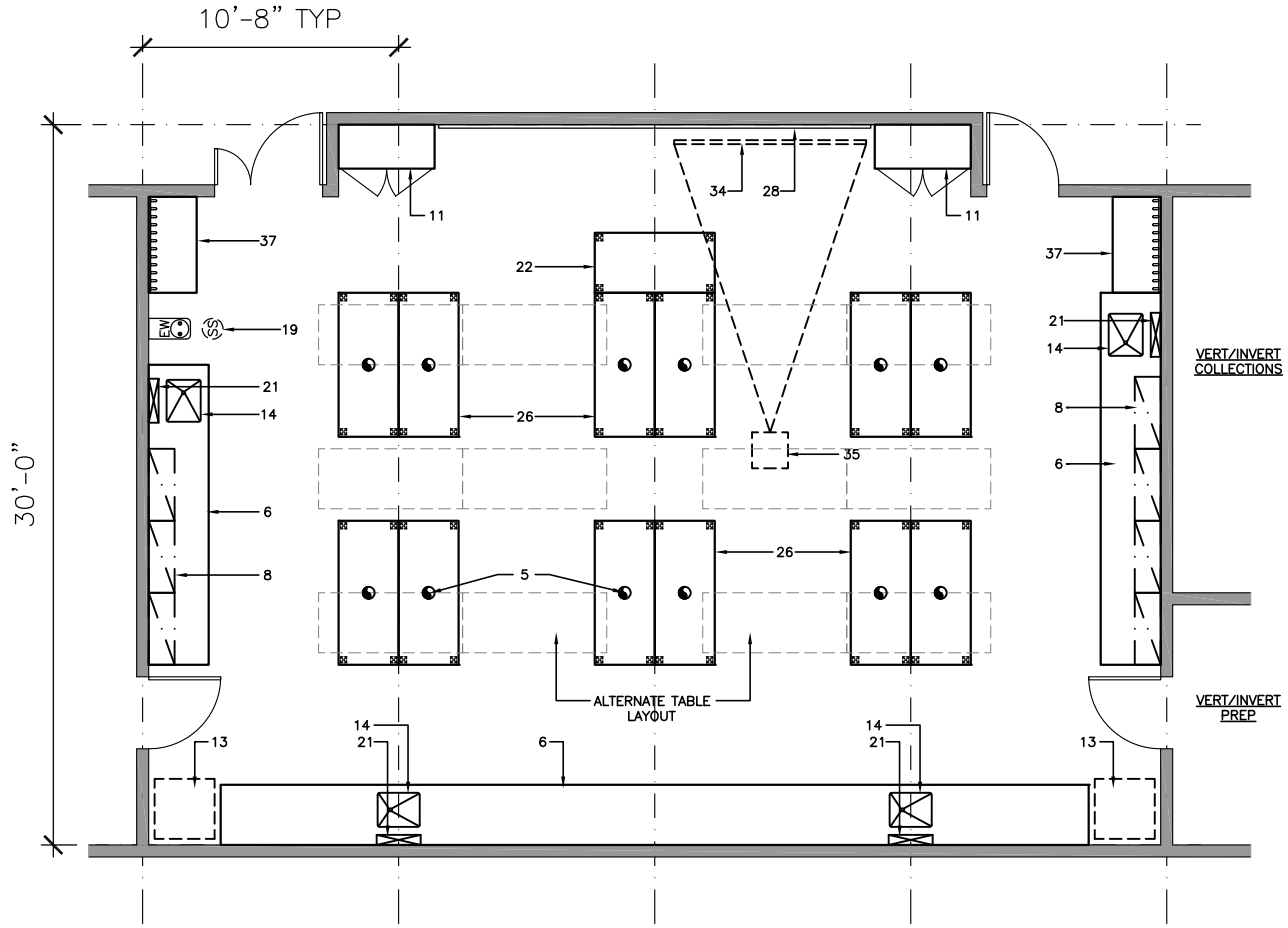
REMARKS:

1. Snorkels over student tables (12)
2. Suitable for A/V presentations

DEPARTMENT: BIOLOGY
SPACE NAME: INVERTEBRATE

SPACE ID NO.: 3.04
AREA NSF: 1,280

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DETAILED SPACE REQUIREMENTS

Eastern Washington University Science Renovation

Research Facilities Design

Cheney, Washington

DEPARTMENT: BIOLOGY

SPACE NAME: RESEARCH LABORATORY

SPACE ID NO: 3.05

OCCUPANCY: 4-6

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	Note 1
Radioisotope Hood	
Laminar Flow Hood	■
Biological Safety Cabinet	■
Snorkel	■
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	■
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

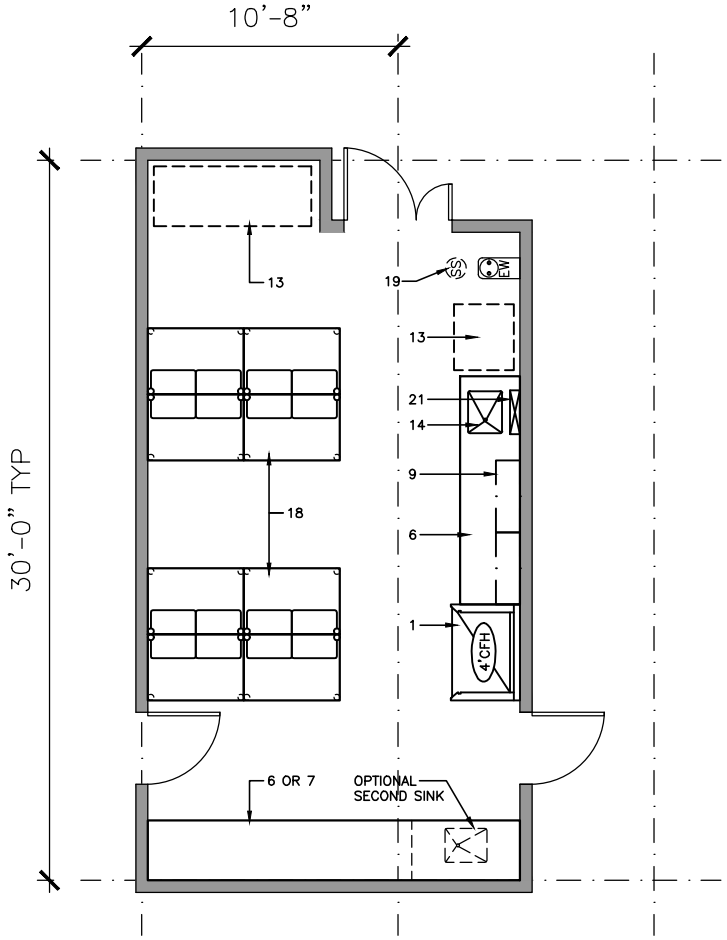
REMARKS:

1. Assume (1) 4' chemical fume hood per each 1-1/2 module increment.

DEPARTMENT: BIOLOGY
SPACE NAME: RESEARCH LABORATORY

SPACE ID NO.: 3.05
AREA NSF: 480

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.06**
SPACE NAME: AQUATICS (LARGE TANKS) — **OCCUPANCY: 12**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	■
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	■
Zoned Lighting	
Other	

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

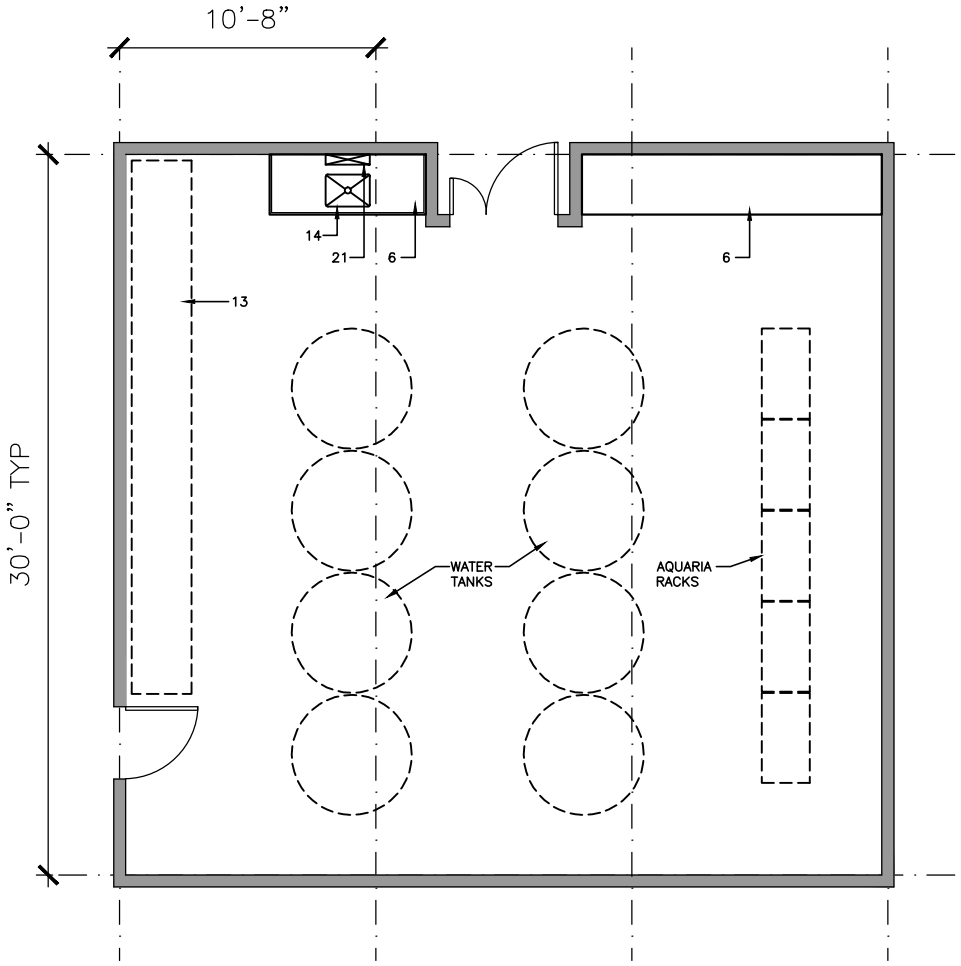
ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	■
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

DEPARTMENT: BIOLOGY
SPACE NAME: AQUATICS - LARGE TANKS

SPACE ID NO.: 3.06
AREA NSF: 960

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.07**
SPACE NAME: AQUATICS (SMALL TANKS) — **OCCUPANCY: 12**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	Note 1
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	■
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	■
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	■
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

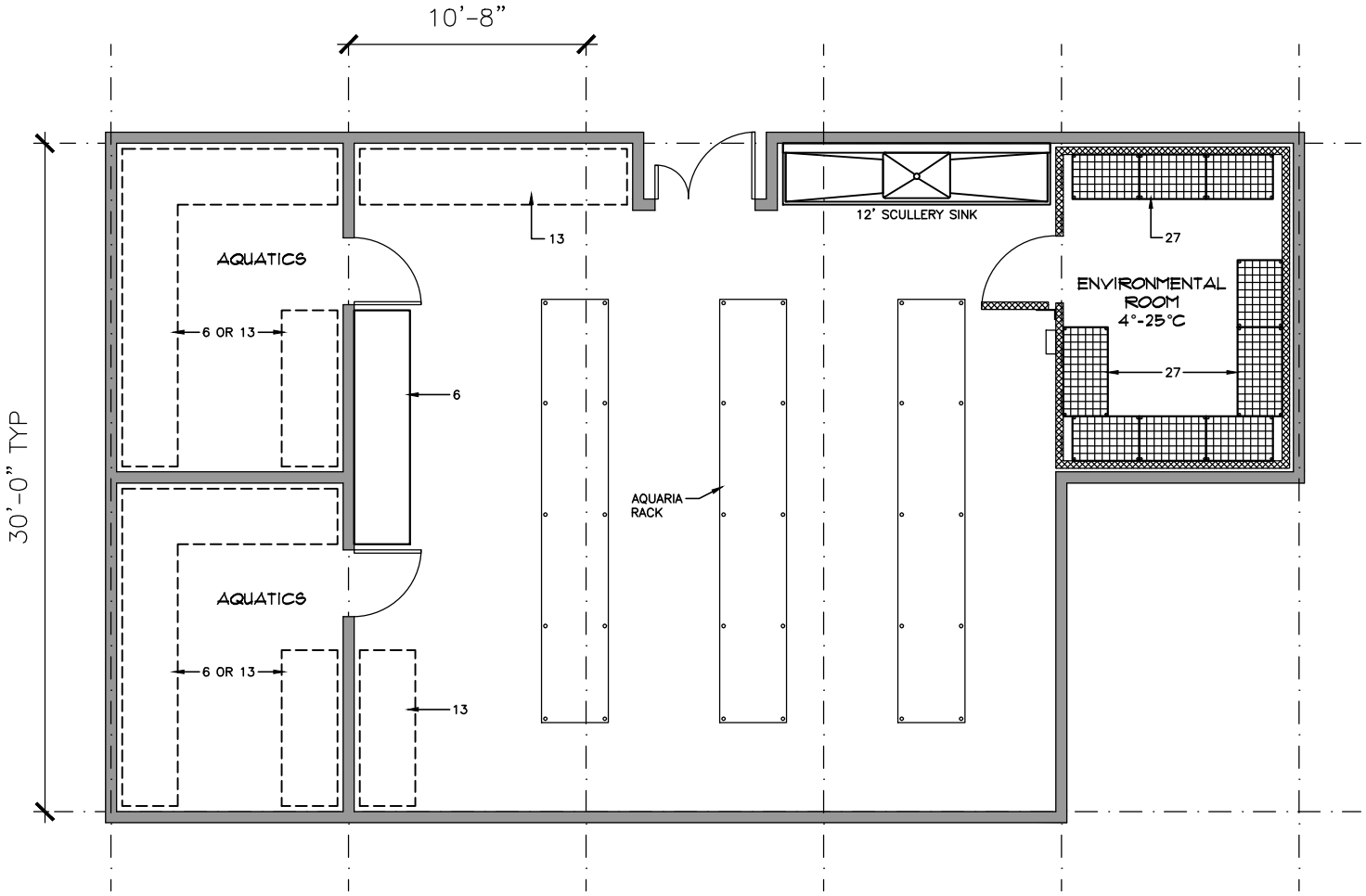
1. 4°C - 25°C +/- 1°C at walk-in Environmental Room

SPACE DIAGRAM | **Research Facilities Design**
Eastern Washington University Science Renovation | *Cheney, Washington*

DEPARTMENT: BIOLOGY
SPACE NAME: AQUATICS - SMALL TANKS

SPACE ID NO.: 3.07
AREA NSF: 1,440

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DETAILED SPACE REQUIREMENTS

Research Facilities Design

Eastern Washington University Science Renovation

Cheney, Washington

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.09**

SPACE NAME: HERBARIUM COLLECTIONS — **OCCUPANCY: 1-2**

UTILIZATION

Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL

Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS

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

LABORATORY EQUIPMENT

Vibration Sensitive	
Light Sensitive	
Vibration Producing	
Heat Producing	
Noise Producing	

PLUMBING

Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL

110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

CHEMICALS

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

ARCHITECTURAL

Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

REMARKS:

1. All wall penetrations sealed for fumigation

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.10**
SPACE NAME: HERBARIUM WORK ROOM — **OCCUPANCY: 2-3**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	■
Uncontrolled	
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	■
Air Pressure Negative	
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	■
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

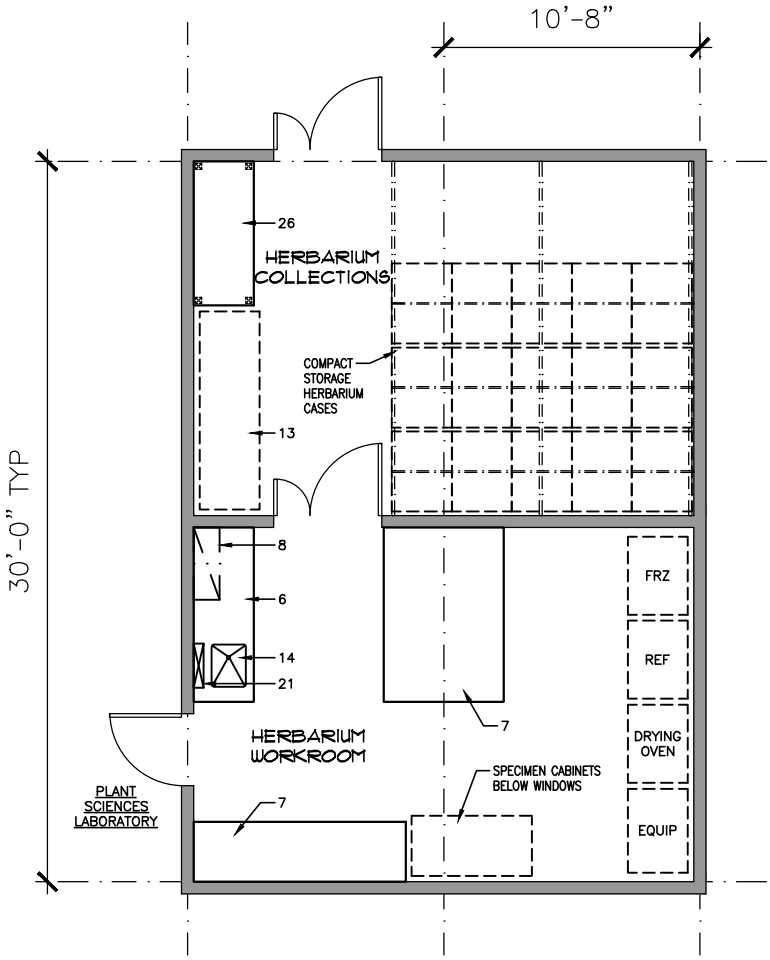
REMARKS:

- Drying oven (flr.)
- Freezer
- Refrigerator
- Plant presses (b.t.)

DEPARTMENT: BIOLOGY
SPACE NAME: HERBARIUM COLLECTIONS / HERBARIUM WORK ROOM

SPACE ID NO.: 3.09 - 3.10
AREA NSF: 320 / 320

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.11**
SPACE NAME: ECOLOGY /PLANT SCIENCES PREP ROOM — **OCCUPANCY: 1-2**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	Note 1
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	■
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

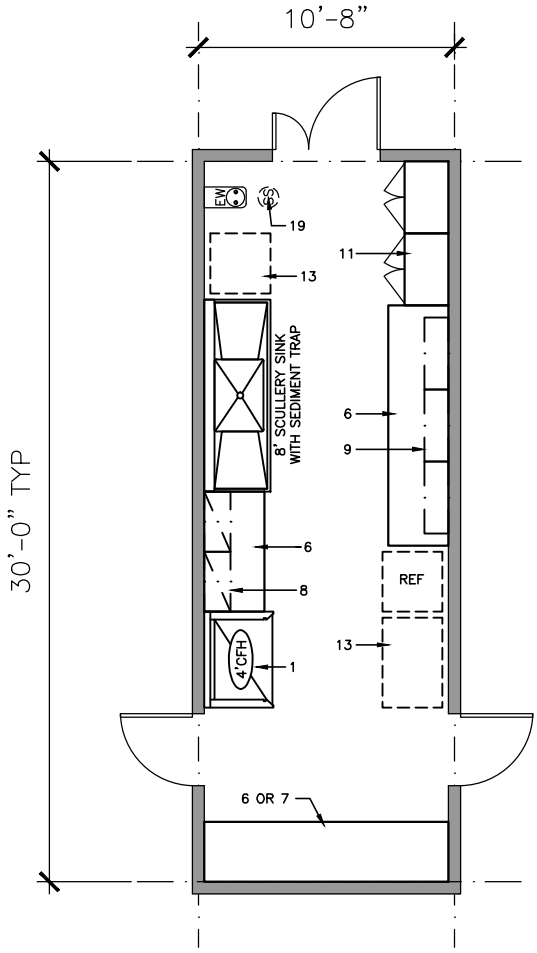
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

REMARKS:

1. (1) 4' Chemical fume hood

DEPARTMENT: BIOLOGY — **SPACE ID NO.:** 3.11
SPACE NAME: ECOLOGY / PLANT SCIENCES PREP — **AREA NSF:** 320

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DETAILED SPACE REQUIREMENTS

Eastern Washington University Science Renovation

Research Facilities Design

Cheney, Washington

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.12**

SPACE NAME: VERTEBRATE / INVERTEBRATE PREP — **OCCUPANCY: 1-2**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

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

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	Note 2
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

REMARKS:

1. (1) 4' Chemical fume hood
2. May use safety shower/eyewash in teaching laboratory

DEPARTMENT: BIOLOGY — **SPACE ID NO. 3.13**
SPACE NAME: VERTEBRATE / INVERTEBRATE COLLECTIONS — **OCCUPANCY:**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide ($C0_2$)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

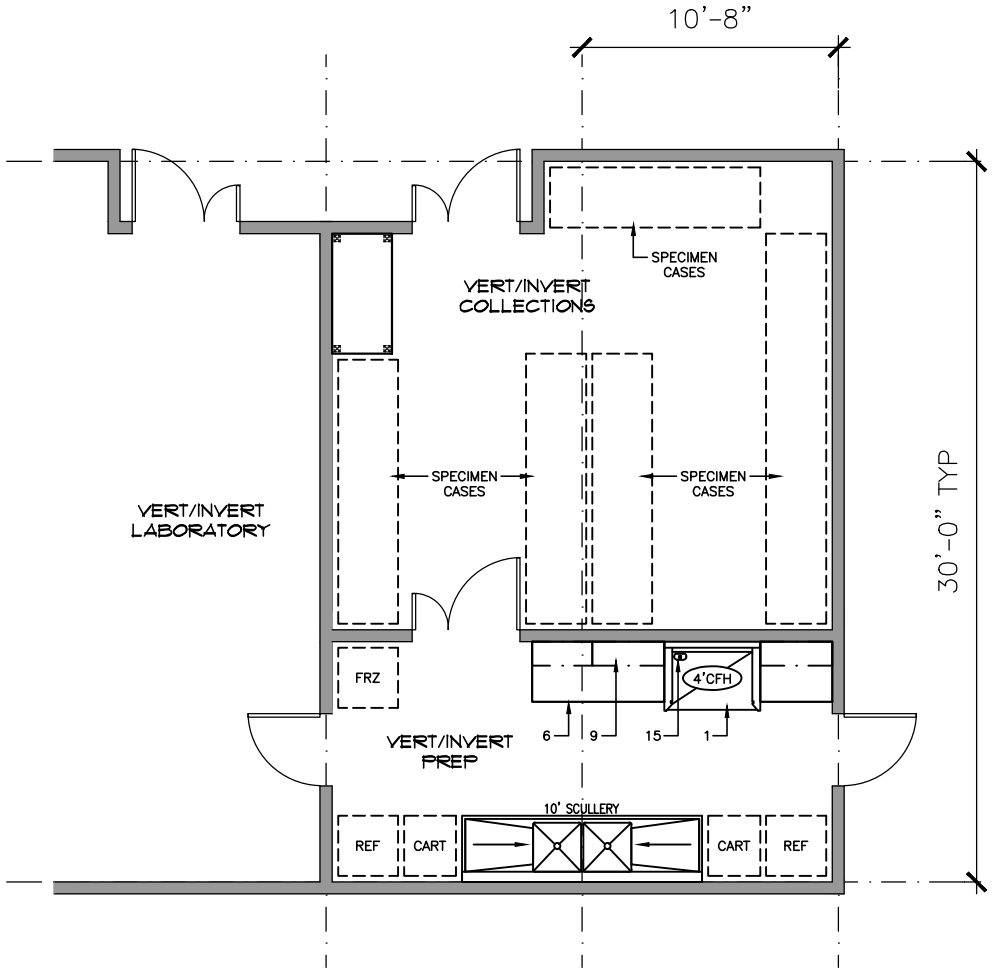
REMARKS:

1. All wall penetrations sealed for fumigation

DEPARTMENT: BIOLOGY
SPACE NAME: VERTEBRATE/INVERTEBRATE PREP/COLLECTIONS

SPACE ID NO.: 3.12 - 3.13
AREA NSF: 210 / 430

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.14**
SPACE NAME: FLUORESCENCE MICROSCOPY — **OCCUPANCY: 2-3**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	4
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	■
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

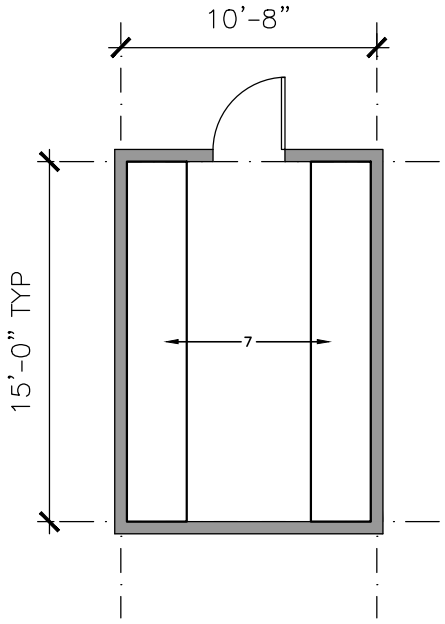
REMARKS:

- Need dimmable lighting

DEPARTMENT: BIOLOGY
SPACE NAME: FLOURESCENCE MICROSCOPY

SPACE ID NO.: 3.14
AREA NSF: 160

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.15-3.16**
SPACE NAME: MEDIA PREP / STORAGE & MEDIA POURING — **OCCUPANCY: 2**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	Note 1.
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	■
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

REMARKS:

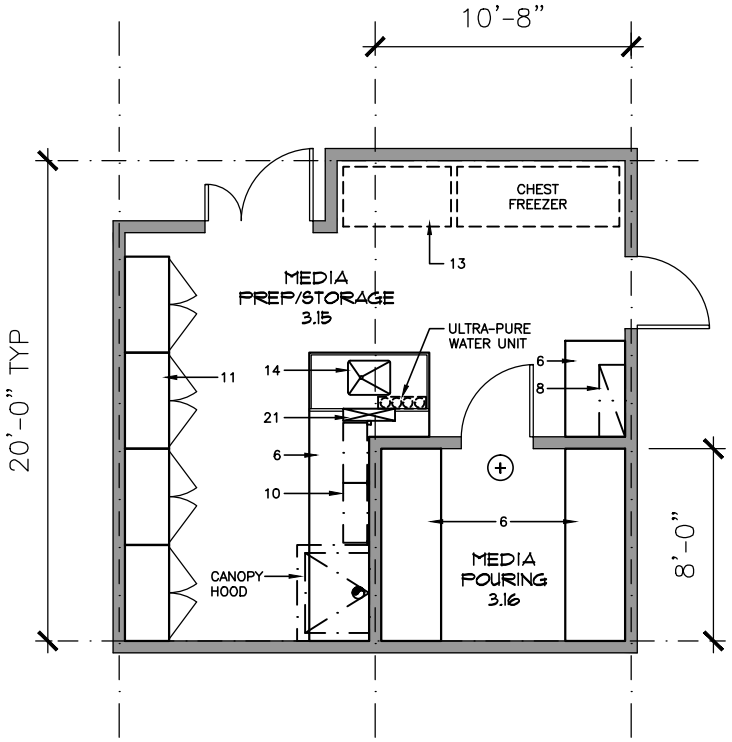
- -80°C Chest Freezer

1. Over fermenter

DEPARTMENT: BIOLOGY
SPACE NAME: MEDIA PREP/STORAGE & MEDIA POURING

SPACE ID NO.: 3.15 - 3.16
AREA NSF: 320 / 80

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.17**
SPACE NAME: GLASSWASH / AUTOCLAVE — **OCCUPANCY: 2**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	8
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	■
Low Slotted Exhaust	
Equipment Exhaust	■
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	■
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	■
Condensate Return	■
Carbon Dioxide ($C0_2$)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	■
Floor Sink (FS)	■
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	■

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	■
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	
Gyp Board, Epoxy Paint	■
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

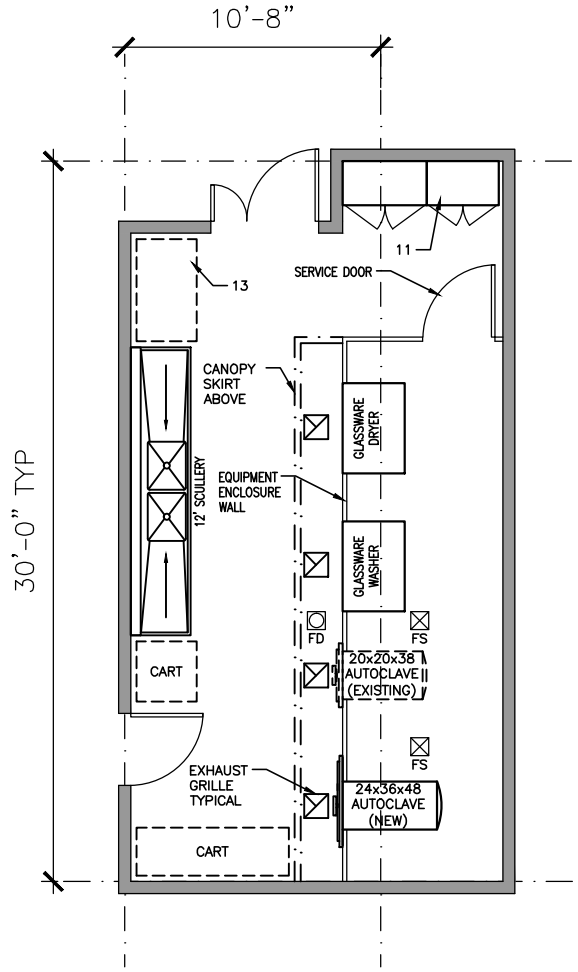
REMARKS:

- (1) Glassware washer
- (1) Glassware dryer
- Autoclaves: (1) 20" x 20" x 38" Sterilizer, (1) 24" x 36" x 48" Sterilizer

DEPARTMENT: BIOLOGY
SPACE NAME: GLASSWASH/AUTOCLAVE

SPACE ID NO.: 3.17
AREA NSF: 480

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.18**
SPACE NAME: COLD ROOMS — **OCCUPANCY: NA**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	
24 hours/day	■

MECHANICAL	
Temperature	
68°-75° ± 2°F	
4°C	■
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	
Air Recirculation	■
Air Pressure Positive	
Air Pressure Negative	
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	■
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	■
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	■
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	■
Other	Note 1
Base	
4" Resilient	
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	■
Epoxy/Fiberglass System	
Other	Note 1
Ceiling	
Open	■
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	Note 1
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

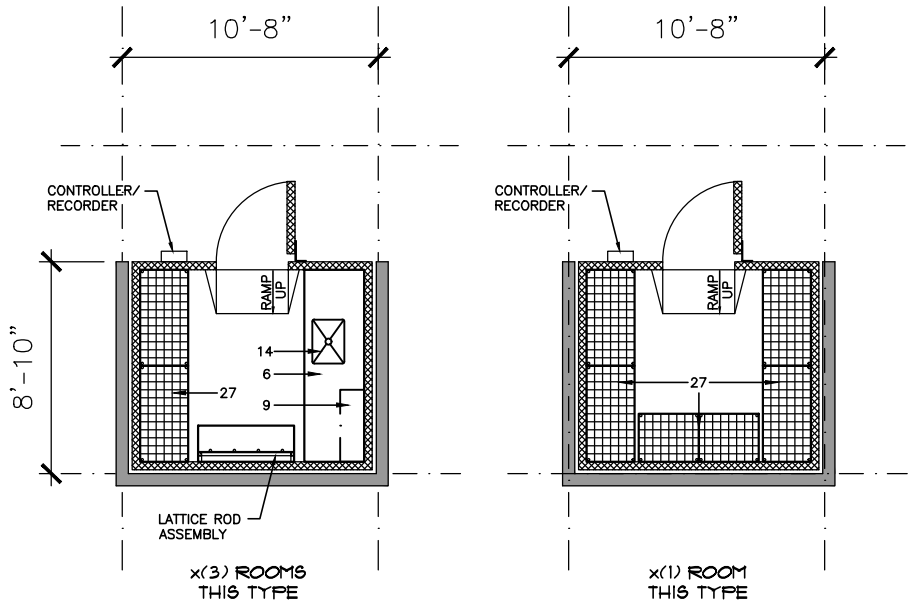
REMARKS:

1. Walls, floor, ceiling and door are prefabricated, panelized system. Provide 2" slab recess for ADA accessibility.

DEPARTMENT: BIOLOGY
SPACE NAME: COLD ROOMS

SPACE ID NO.: 3.18
AREA NSF: 80 EACH

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.19**
SPACE NAME: MICRO / MOLECULAR EQUIPMENT — **OCCUPANCY: 1-2**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	4
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	■
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	Note 1
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9'min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

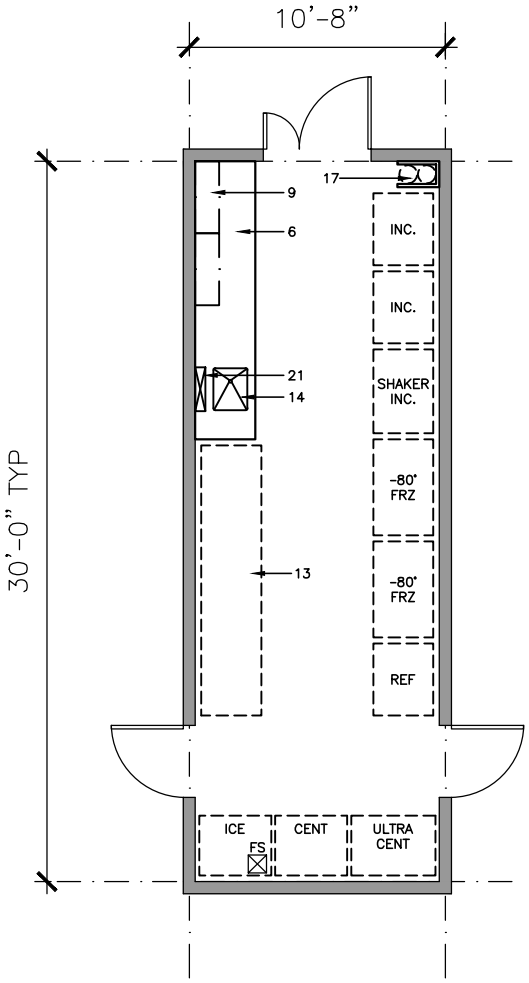
REMARKS:

1. Ice machine

• PCR Laminar flow hood (OFOI)

DEPARTMENT: BIOLOGY **SPACE ID NO.:** 3.19
SPACE NAME: MICRO/MOLECULAR EQUIPMENT **AREA NSF:** 320

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.20**
SPACE NAME: DRY MEDIA STORAGE — **OCCUPANCY: NA**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	4
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

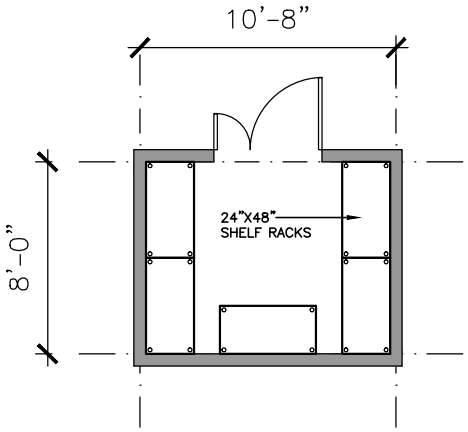
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

REMARKS:

DEPARTMENT: BIOLOGY
SPACE NAME: DRY MEDIA STORAGE

SPACE ID NO.: 3.20
AREA NSF: 80

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DETAILED SPACE REQUIREMENTS

Eastern Washington University Science Renovation

Research Facilities Design

Cheney, Washington

DEPARTMENT: BIOLOGY

SPACE NAME: MUD ROOM

SPACE ID NO: 3.21

OCCUPANCY: NA

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide ($C0_2$)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	Note 1
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	■
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	■
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

REMARKS:

1. Floor drain with sediment trap

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.22**
SPACE NAME: FIELD EQUIPMENT STORAGE — **OCCUPANCY: NA**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	Note 1
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	■
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	■
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

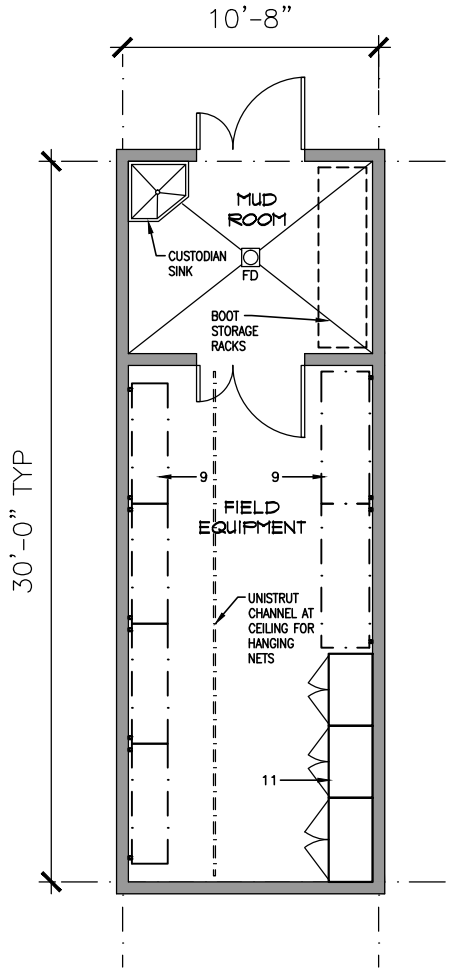
REMARKS:

1. Floor drain with sediment trap

DEPARTMENT: BIOLOGY
SPACE NAME: MUD ROOM/FIELD EQUIPMENT ROOM

SPACE ID NO.: 3.21 - 3.22
AREA NSF: 80 / 240

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.23-3.26**
SPACE NAME: BIOLOGY STOCKROOM SUITE — **OCCUPANCY: 2-3**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

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

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	■
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

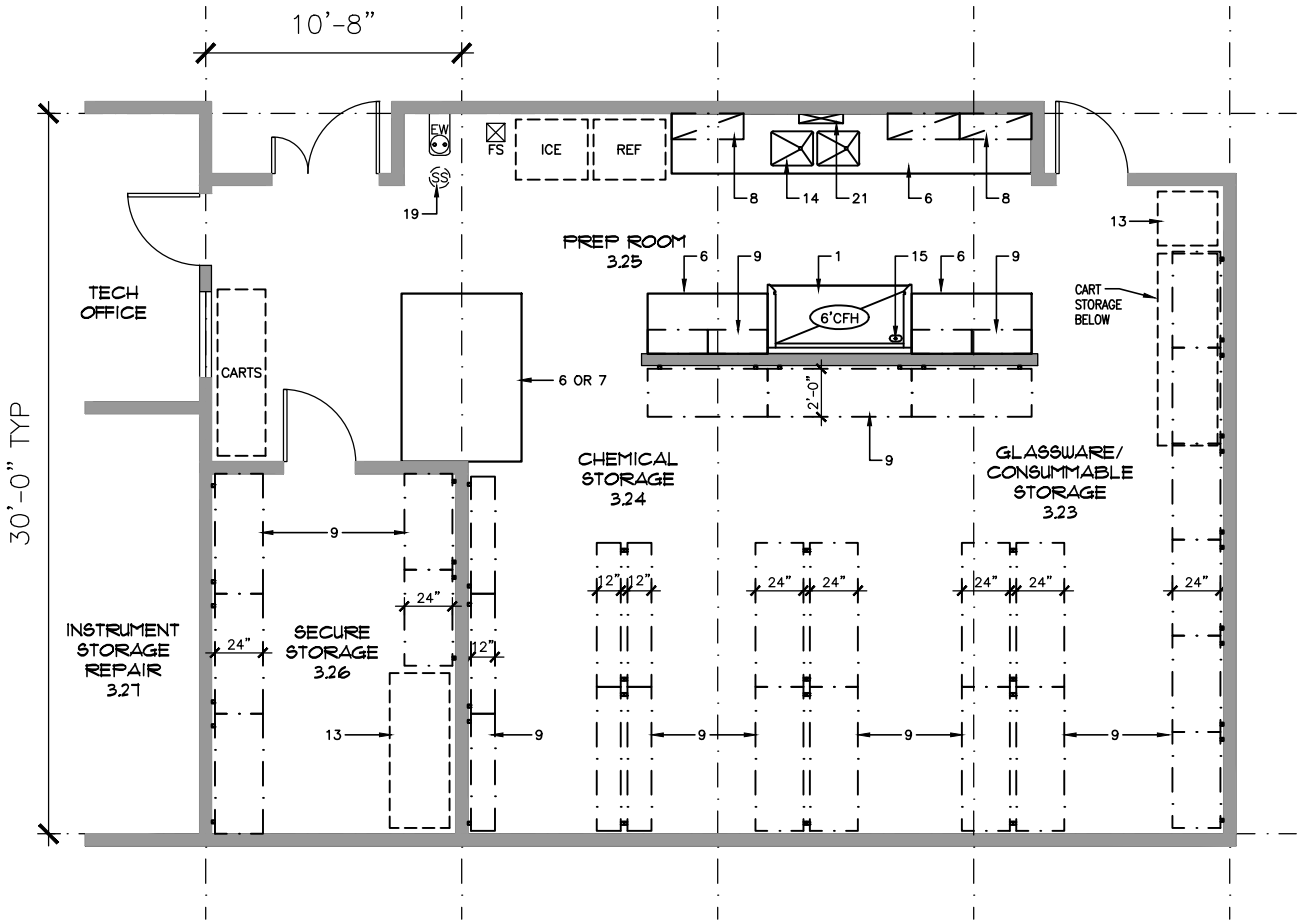
1. (1) 6' Chemical fume hood

SPACE DIAGRAM | **Research Facilities Design**
Eastern Washington University Science Renovation | *Cheney, Washington*

DEPARTMENT: BIOLOGY
SPACE NAME: BIOLOGY STOCK SUITE

SPACE ID NO.: 3.23 - 3.26
AREA NSF: 1,280 TOTAL

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.27**
SPACE NAME: INSTRUMENT STORAGE / REPAIR — **OCCUPANCY: 1**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	■
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

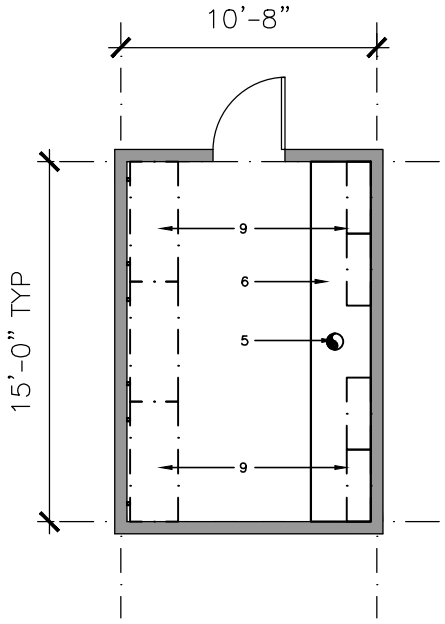
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

REMARKS:

DEPARTMENT: BIOLOGY
SPACE NAME: INSTRUMENT STORAGE/REPAIR

SPACE ID NO.: 3.27
AREA NSF: 160

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DETAILED SPACE REQUIREMENTS

Research Facilities Design

Eastern Washington University Science Renovation

Cheney, Washington

DEPARTMENT: BIOLOGY **SPACE ID NO: 3.29**

SPACE NAME: GROWTH ROOM SUITE **OCCUPANCY: 3-4**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	■
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	■
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	■
Purified Water (PW)	■
Cooling Water (CHW S/R)	■
Steam	■
Condensate Return	■
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	■
Inert	■
Flammable	
Toxic	
Floor Drain (FD)	■
Floor Sink (FS)	■
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	■
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

REMARKS:

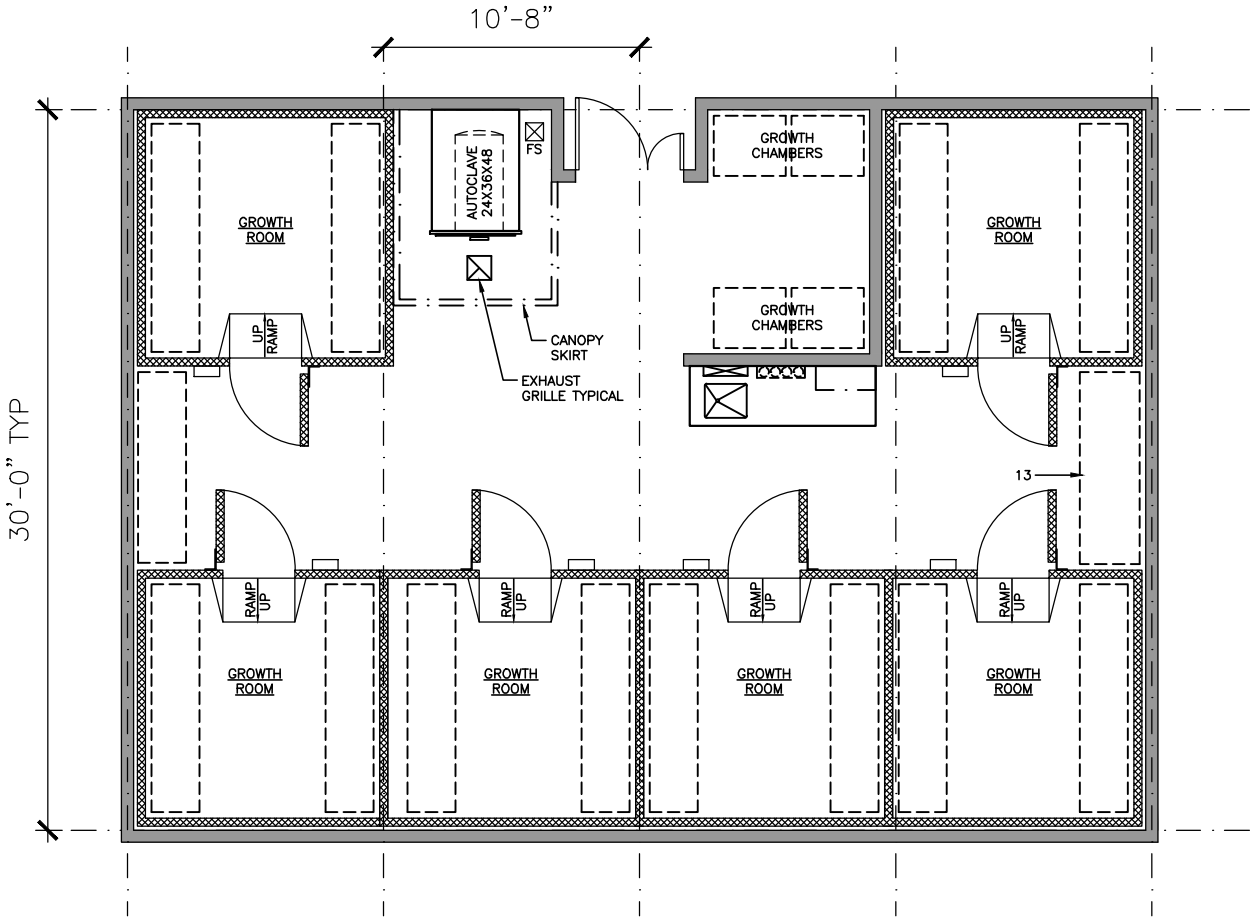
1. Provisions for water cooled units and CO2 backup
- (2) Walk-in rooms @ 4°C - 20°C ± 1°C

- (2) Walk-in rooms @ 15°C - 30°C ± 1°C
- Humidity setpoint and range for each Growth Room TBD by faculty during design.

DEPARTMENT: BIOLOGY
SPACE NAME: GROWTH ROOM/CHAMBER SUITE

SPACE ID NO.: 3.29
AREA NSF: 1,280

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.30**
SPACE NAME: BEETLE ROOM — **OCCUPANCY: 1**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	Note 1
Other	
Humidity	■
Uncontrolled	
Other	
Minimum Air Changes/Hour	10
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	■
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	■
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	
Gyp Board, Epoxy Paint	■
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

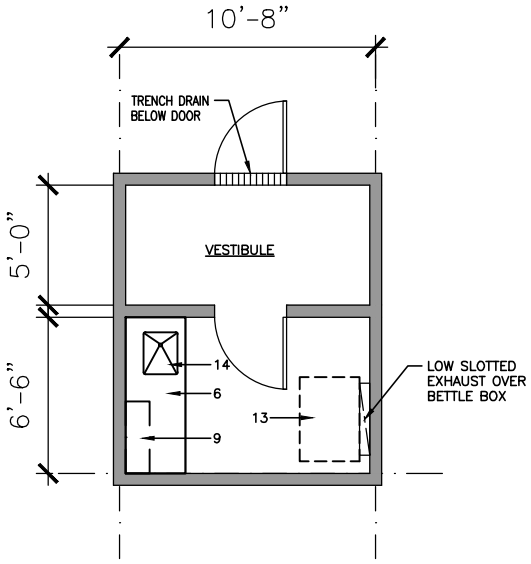
REMARKS:

1. Maintain temperature in range of 75-78°F

DEPARTMENT: BIOLOGY
SPACE NAME: BEETLE ROOM

SPACE ID NO.: 3.30
AREA NSF: 120

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.31**
SPACE NAME: BULK CHEMICAL STORAGE — **OCCUPANCY: NA**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	10
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

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

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

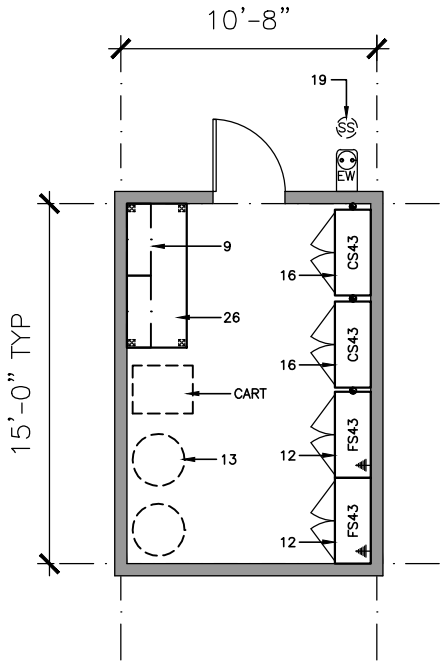
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

REMARKS:

1. Exhausted chemical storage

DEPARTMENT: BIOLOGY — **SPACE ID NO.:** 3.31
SPACE NAME: BULK CHEMICAL STORAGE — **AREA NSF:** 160

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

Department:	Biology
Space ID:	3.33
Space Name:	Computer Lab
Occupants/space:	16
ASF:	545
No of spaces:	1

GENERAL:

Function	Student projects and study
Adjacencies	Teaching and research labs
Ceiling Height	12’
Windows	Exterior with interior relites
Daylight Control	Blinds
Lighting	Ambient lighting, motion sensor control

FINISHES:

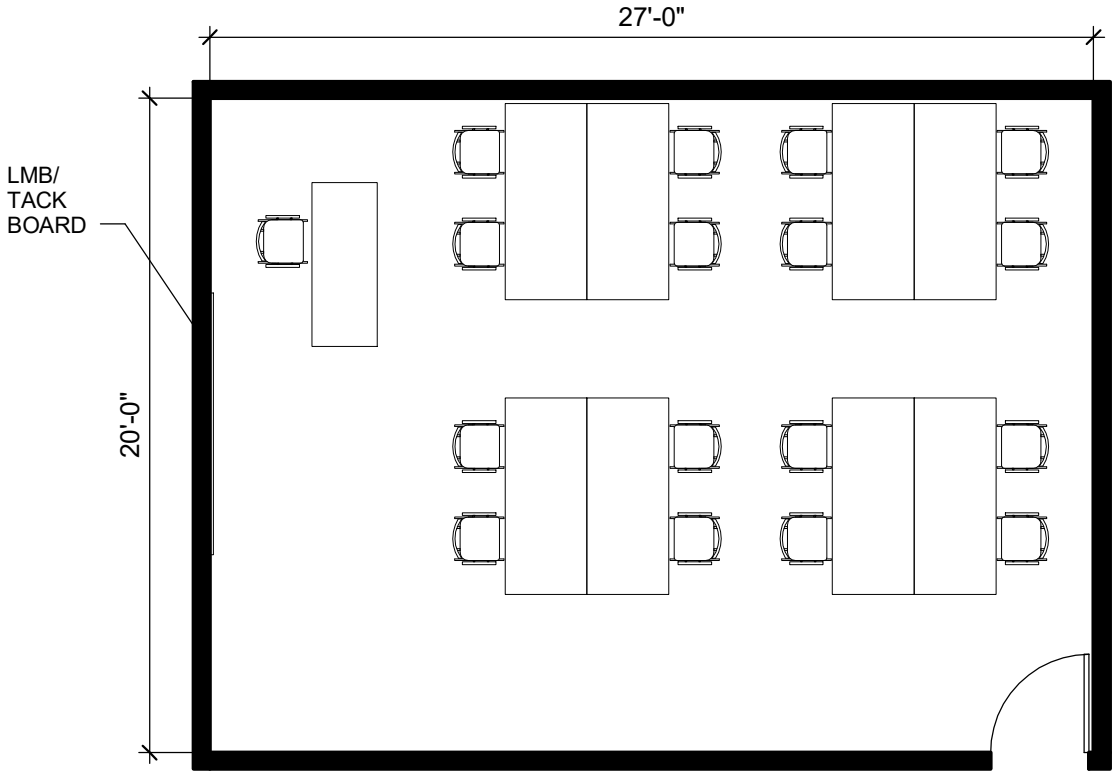
Floor	Carpet
Base	Resilient
Walls	Painted GWB and acoustical wall panels
Ceiling	ACT and GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	Sliding whiteboard and tack board
Moveable	Owner-furnished tables, chairs and lectern



3.33 COMPUTER LAB

0 1 2 4 8 16

DEPARTMENT: BIOLOGY - VIVARIUM SUITE — **SPACE ID NO: 3.34**
SPACE NAME: HOLDING ROOMS — **OCCUPANCY: NA**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	
24 hours/day	■

MECHANICAL	
Temperature	
68°-75° ± 2°F	Note 1
Other	
Humidity	
Uncontrolled	
Other	Note 1
Minimum Air Changes/Hour	10
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	■
Potable Cold Water (CW)	■
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	Note 2
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	Note 3
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	
Safe light	
Special Lighting	Note 4
Darkenable	■
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	
Epoxy/Fiberglass System	■
Other	
Ceiling	
Open	
Acoustic Tile	
Gyp Board, Epoxy Paint	■
Height	9' min
Doors	
3'-6" x 7'	■
3' x 7'	
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	Note 5
Natural Daylight	

REMARKS:

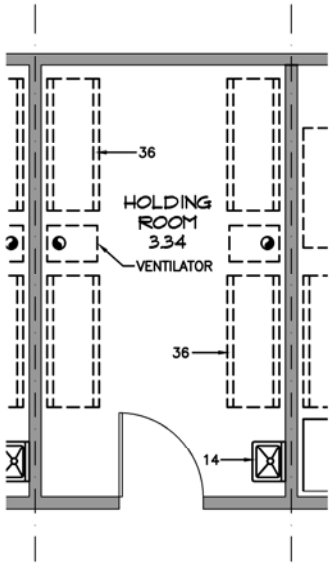
1. Maintain 40-80% RH +/- 5%. Provide separate temperature and humidity control for each Holding Room.
2. Floor drain with sealed cap.
3. Waterproof electrical receptacles mounted at +48" on standby power.
4. Lighting on separate programmable diurnal timer for each Holding Room @ 30 fc with step-up lighting to 70fc for housekeeping.
5. Viewing window with light-tight hinged cover.

* Ventilated cage racks - Techniplast "Greenline Plus". (4) racks per Holding Room.

DEPARTMENT: BIOLOGY - VIVARIUM SUITE
SPACE NAME: HOLDING ROOMS

SPACE ID NO.: 3.34
AREA NSF: 180

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY - VIVARIUM SUITE — **SPACE ID NO: 3.35-3.36**
SPACE NAME: PROJECT ROOMS — **OCCUPANCY: 2-4**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	
24 hours/day	■

MECHANICAL	
Temperature	
68°-75° ± 2°F	Note 1
Other	
Humidity	
Uncontrolled	
Other	Note 1
Minimum Air Changes/Hour	10
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	■
Potable Cold Water (CW)	■
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	Note 2
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	Note 3
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	
Safe light	
Special Lighting	Note 4
Darkenable	■
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	
Epoxy/Fiberglass System	■
Other	
Ceiling	
Open	
Acoustic Tile	
Gyp Board, Epoxy Paint	■
Height	9' min
Doors	
3'-6" x 7'	■
3' x 7'	
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	Note 5
Natural Daylight	

REMARKS:

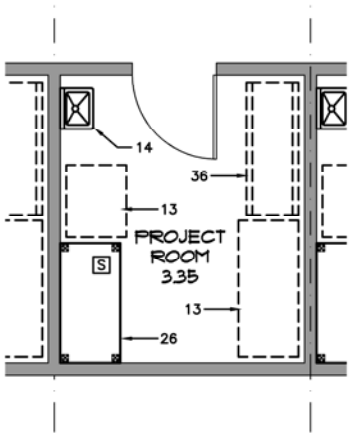
1. Maintain 40-60% RH +/- 5%. Provide separate temperature and humidity control for each Project Room.
2. Floor drain with sealed cap.
3. Waterproof electrical receptacles mounted at +48"
4. Lighting on separate programmable diurnal timer for each Project Room @ 30 fc with step-up lighting to 70fc for housekeeping.
5. Viewing window with light-tight hinged cover.

* Standard cages & racks.

DEPARTMENT: BIOLOGY - VIVARIUM SUITE
SPACE NAME: PROJECT ROOM (SMALL)

SPACE ID NO.: 3.35
AREA NSF: 120

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



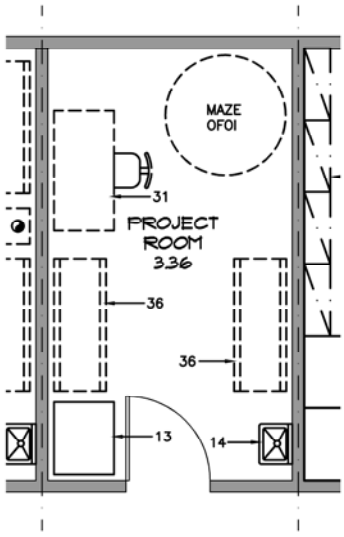
FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY - VIVARIUM SUITE
SPACE NAME: PROJECT ROOM (LARGE)

SPACE ID NO.: 3.36
AREA NSF: 180

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DETAILED SPACE REQUIREMENTS

Eastern Washington University Science Renovation

Research Facilities Design

Cheney, Washington

DEPARTMENT: BIOLOGY - VIVARIUM SUITE

SPACE NAME: SURGERY

SPACE ID NO: 3.37

OCCUPANCY: 2-4

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	
24 hours/day	■

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	
Other	40-60%
Minimum Air Changes/Hour	10
Air Recirculation	
Air Pressure Positive	■
Air Pressure Negative	
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	Note 1
Snorkel	■
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	■
Potable Cold Water (CW)	■
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	Note 2
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	
Epoxy/Fiberglass System	■
Other	
Ceiling	
Open	
Acoustic Tile	
Gyp Board, Epoxy Paint	■
Height	9' min
Doors	
3'-6" x 7'	■
3' x 7'	
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

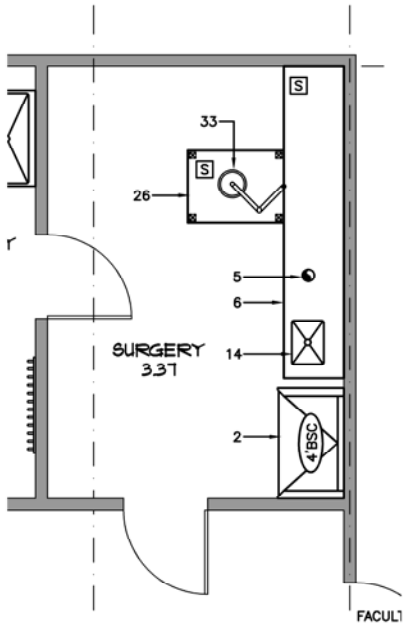
REMARKS:

1. (1) 4' Class II Biological Safety Cabinet (exhausted).
2. Surgery light.

DEPARTMENT: BIOLOGY - VIVARIUM SUITE
SPACE NAME: SURGERY

SPACE ID NO.: 3.37
AREA NSF: 180

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY - VIVARIUM SUITE — **SPACE ID NO: 3.38**
SPACE NAME: SURGERY SCRUB ROOM — **OCCUPANCY: 2**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	
Other	40-60%
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	■
Potable Cold Water (CW)	■
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	
Epoxy/Fiberglass System	■
Other	
Ceiling	
Open	
Acoustic Tile	
Gyp Board, Epoxy Paint	■
Height	9' min
Doors	
3'-6" x 7'	■
3' x 7'	
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

REMARKS:

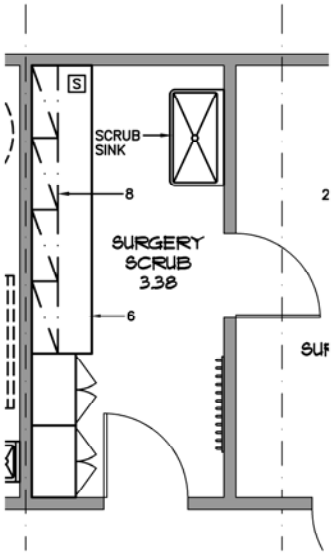
1. Hands-free scrub sink.

SPACE DIAGRAM | **Research Facilities Design**
Eastern Washington University Science Renovation | *Cheney, Washington*

DEPARTMENT: BIOLOGY - VIVARIUM SUITE
SPACE NAME: SURGERY SCRUB

SPACE ID NO.: 3.38
AREA NSF: 120

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY - VIVARIUM SUITE — **SPACE ID NO: 3.39**
SPACE NAME: FEED STORAGE/COLD ROOM — **OCCUPANCY: NA**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	
24 hours/day	■

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	Note 1
Humidity	
Uncontrolled	
Other	<70%
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	■
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	■
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	
Epoxy/Fiberglass System	■
Other	
Ceiling	
Open	
Acoustic Tile	
Gyp Board, Epoxy Paint	■
Height	9' min
Doors	
3'-6" x 7'	■
3' x 7'	
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

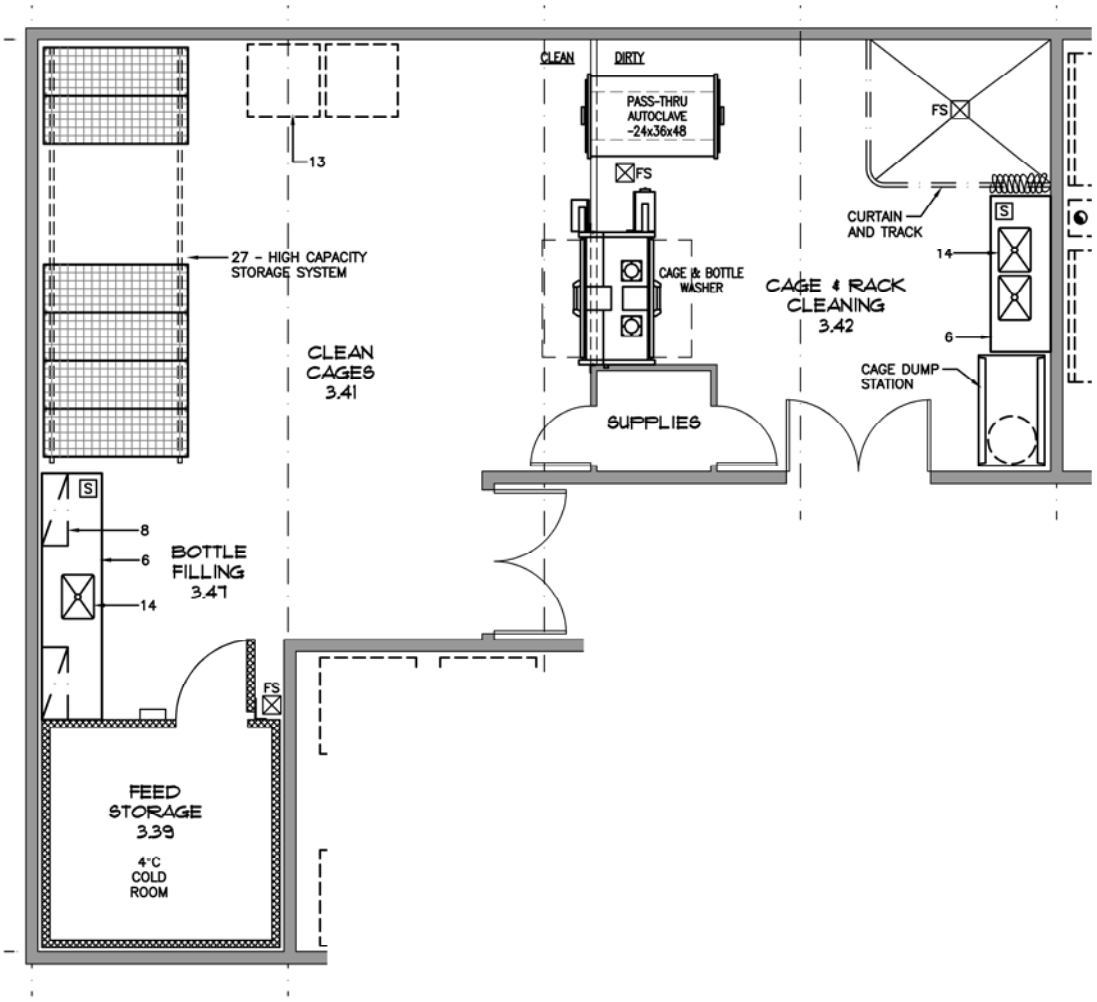
REMARKS:

1. 4 degrees C. at small Cold Room within Feed/Bedding Storage Room

DEPARTMENT: BIOLOGY - VIVARIUM SUITE
SPACE NAME: FEED STORAGE / COLD ROOM, CLEAN CAGES, CAGE & RACK CLEANING, BOTTLE FILLING

SPACE ID NO.: 3.39, 3.41 3.42
AREA NSF: 940

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY - VIVARIUM SUITE — **SPACE ID NO: 3.40**
SPACE NAME: BEDDING STORAGE — **OCCUPANCY: NA**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	
24 hours/day	■

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	
Other	<70%
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	■
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	■
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

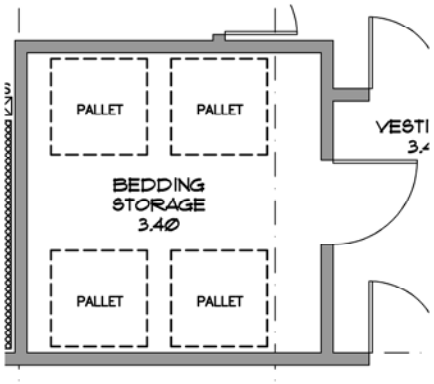
ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	
Epoxy/Fiberglass System	■
Other	
Ceiling	
Open	
Acoustic Tile	
Gyp Board, Epoxy Paint	■
Height	9' min
Doors	
3'-6" x 7'	■
3' x 7'	
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

DEPARTMENT: BIOLOGY - VIVARIUM SUITE
SPACE NAME: BEDDING STORAGE

SPACE ID NO.: 3.40
AREA NSF: 160

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY - VIVARIUM SUITE — **SPACE ID NO: 3.41**
SPACE NAME: CLEAN STORAGE — **OCCUPANCY: NA**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	■
Air Pressure Negative	
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

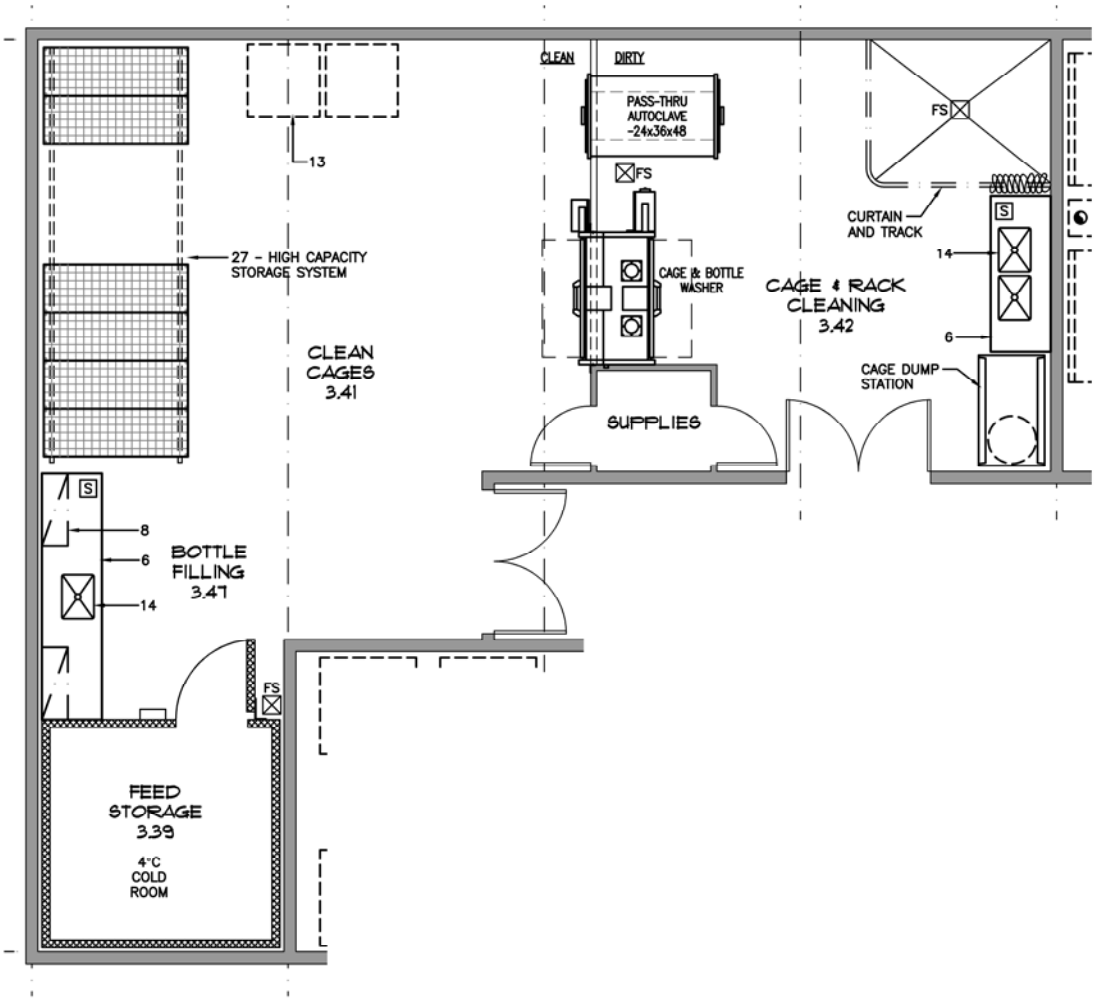
ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	
Epoxy/Fiberglass System	■
Other	
Ceiling	
Open	
Acoustic Tile	
Gyp Board, Epoxy Paint	■
Height	9' min
Doors	
3'-6" x 7'	■
3' x 7'	
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

DEPARTMENT: BIOLOGY - VIVARIUM SUITE
SPACE NAME: FEED STORAGE / COLD ROOM, CLEAN CAGES, CAGE & RACK CLEANING, BOTTLE FILLING

SPACE ID NO.: 3.39, 3.41 3.42
AREA NSF: 940

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY - VIVARIUM SUITE — **SPACE ID NO: 3.42**
SPACE NAME: CAGE & RACK CLEANING — **OCCUPANCY: 2-4**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	10
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	■
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	■
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	■
Purified Water (PW)	■
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	■
Floor Sink (FS)	■
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	■
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	
Epoxy/Fiberglass System	■
Other	
Ceiling	
Open	
Acoustic Tile	
Gyp Board, Epoxy Paint	■
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	Double
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

DEPARTMENT: BIOLOGY - VIVARIUM SUITE
SPACE NAME: FEED STORAGE / COLD ROOM, CLEAN CAGES, CAGE & RACK CLEANING, BOTTLE FILLING

SPACE ID NO.: 3.39, 3.41 3.42
AREA NSF: 940

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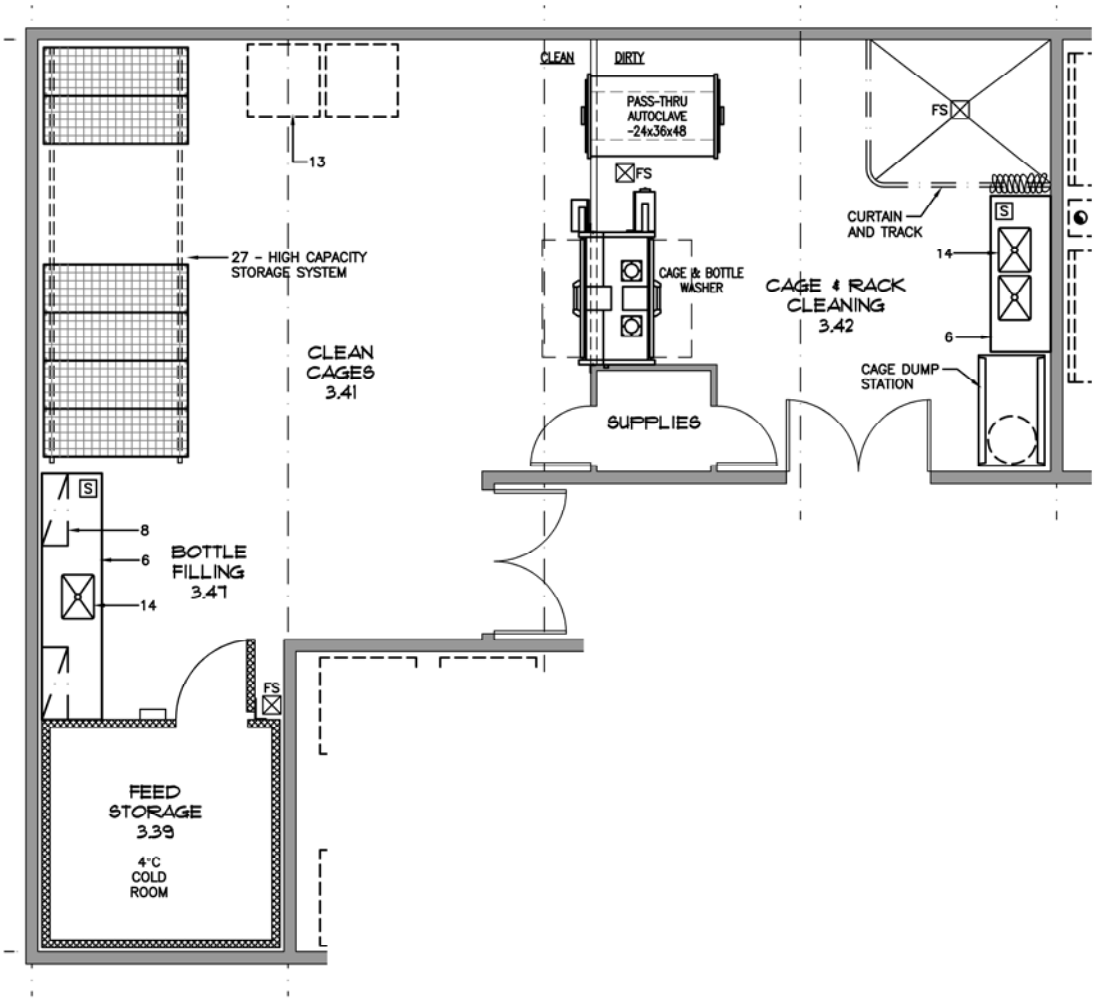


FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DETAILED SPACE REQUIREMENTS

Eastern Washington University Science Renovation

Research Facilities Design

Cheney, Washington

DEPARTMENT: BIOLOGY - VIVARIUM SUITE

SPACE ID NO: 3.43

SPACE NAME: VIVARIUM GENERAL STORAGE

OCCUPANCY: NA

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

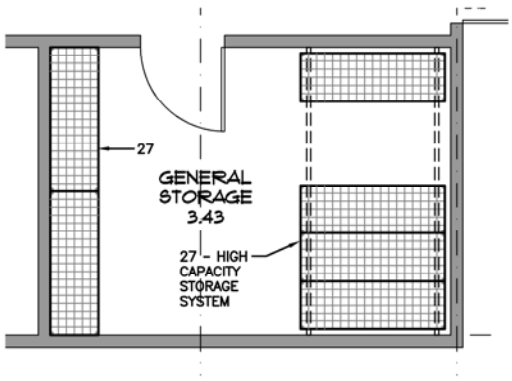
ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	
Epoxy/Fiberglass System	■
Other	
Ceiling	
Open	
Acoustic Tile	
Gyp Board, Epoxy Paint	■
Height	9' min
Doors	
3'-6" x 7'	■
3' x 7'	
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

DEPARTMENT: BIOLOGY - VIVARIUM SUITE
SPACE NAME: VIVARIUM GENERAL STORAGE

SPACE ID NO.: 3.43
AREA NSF: 200

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY - VIVARIUM SUITE — **SPACE ID NO: 3.45**
SPACE NAME: ANIMAL RECEIVING — **OCCUPANCY: 1**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	10
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	■
Potable Cold Water (CW)	■
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	Note 2
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	Note 3
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	
Safe light	
Special Lighting	Note 4
Darkenable	■
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	■
Sealed Concrete	
Other	
Base	
4" Resilient	
Integral w/floor	■
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	
Epoxy/Fiberglass System	■
Other	
Ceiling	
Open	
Acoustic Tile	
Gyp Board, Epoxy Paint	■
Height	9' min
Doors	
3'-6" x 7'	■
3' x 7'	
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	Note 5
Natural Daylight	

REMARKS:

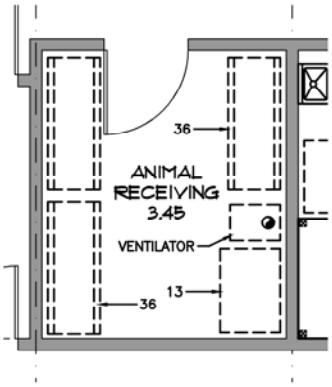
1. Maintain 40-60% RH +/- 5%. Provide separate temperature and humidity control for each Project Room.
2. Floor drain with sealed cap.
3. Waterproof electrical receptacles mounted at +48"
4. Lighting on separate programmable diurnal timer for each Project Room @ 30 fc with step-up lighting to 70fc for housekeeping.
5. Viewing window with light-tight hinged cover.

* Standard cages & racks.

DEPARTMENT: BIOLOGY - VIVARIUM SUITE
SPACE NAME: ANIMAL RECEIVING

SPACE ID NO.: 3.45
AREA NSF: 120

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

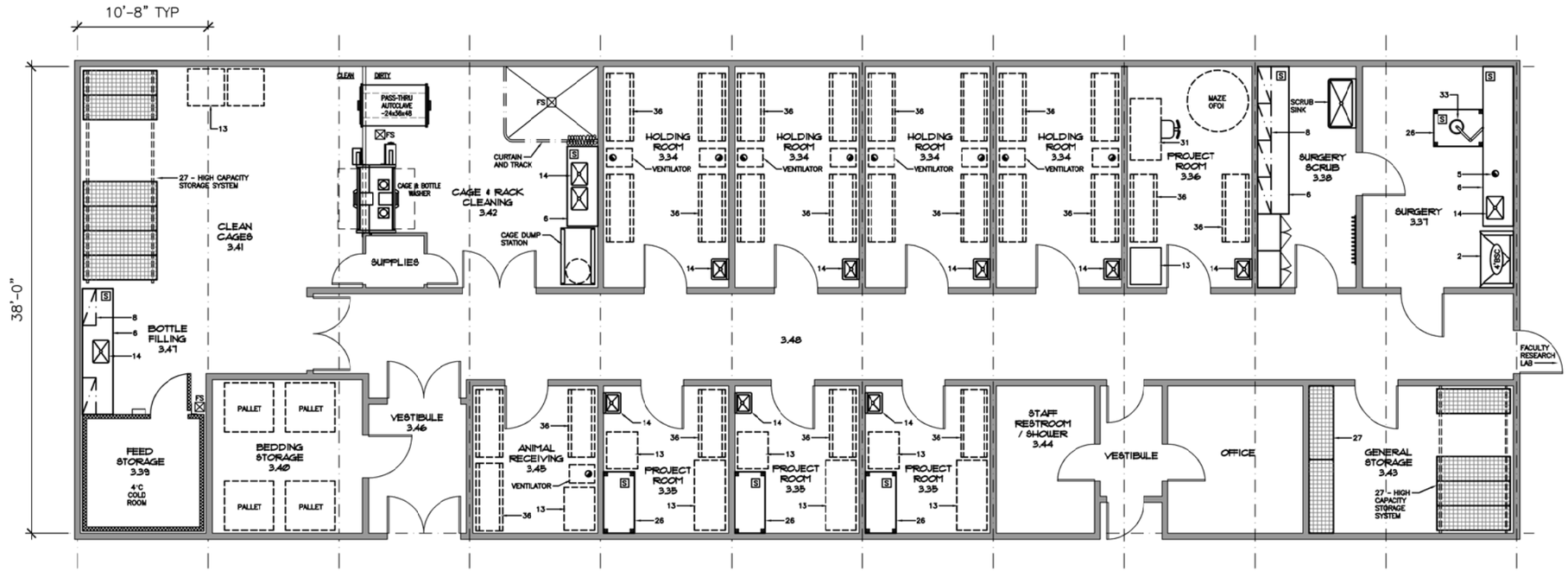
SPACE DIAGRAM
Eastern Washington University Science Renovation

Research Facilities Design
Cheney, Washington

DEPARTMENT: BIOLOGY
SPACE NAME: VIVARIUM SUITE

SPACE ID NO.: 3.34 - 3.48
AREA NSF: 4,160

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 2' 4' 8' 16'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Laminar Flow Hood
4. Slot Exhaust
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Flexible Bench System
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. Cage Rack
37. Coat/Book Bag Storage Unit

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.49**
SPACE NAME: GREENHOUSE - PREP ROOM (HEADHOUSE) — **OCCUPANCY: 2-4**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	■
Potable Cold Water (CW)	■
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	Note 1
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	■

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	■
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	■
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	9' min
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

1. Floor drain with sediment trap.
2. Sink with sediment trap.

DEPARTMENT: BIOLOGY — **SPACE ID NO: 3.50**
SPACE NAME: GREENHOUSE - BOTANY TEACHING COLLECTION — **OCCUPANCY:**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	
24 hours/day	■

MECHANICAL	
Temperature	
68°-75° ± 2°F	
Other	Note 1
Humidity	
Uncontrolled	
Other	Note 2
Minimum Air Changes/Hour	
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	■
Potable Cold Water (CW)	■
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	Note 3
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	
Safe light	
Special Lighting	Note 4
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	■
Other	
Base	
4" Resilient	
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	Note 5
Ceiling	
Other	Note 5
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	
Doors	
3'-6" x 7'	■
3' x 7'	
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

1. Maintain temperature greater than 70 degrees F. and less than 85 degrees F.
2. Misting system for humidity control as required to maintain minimum 50% RH.
3. Floor drain with sediment bucket.
4. Plant growth lighting on diurnal timers.
5. Glass or polycarbonate wall and roof panels - TBD.

DETAILED SPACE REQUIREMENTS

Research Facilities Design

Eastern Washington University Science Renovation

Cheney, Washington

DEPARTMENT: BIOLOGY **SPACE ID NO: 3.51**

SPACE NAME: GREENHOUSE - STUDENT PROJECT AREA **OCCUPANCY:**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	
24 hours/day	■

MECHANICAL	
Temperature	
68°-75° ± 2°F	
Other	Note 1
Humidity	
Uncontrolled	
Other	Note 2
Minimum Air Changes/Hour	
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	■
Potable Cold Water (CW)	■
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	Note 3
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	
Safe light	
Special Lighting	Note 4
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	■
Other	
Base	
4" Resilient	
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	Note 5
Ceiling	
Other	Note 5
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	
Doors	
3'-6" x 7'	■
3' x 7'	
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

1. Maintain temperature greater than 70 degrees F. and less than 85 degrees F.
2. Misting system for humidity control as required.
3. Floor drain with sediment bucket.
4. Plant growth lighting on diurnal timers.
5. Glass or polycarbonate wall and roof panels - TBD.

DEPARTMENT: GEOLOGY — **SPACE ID NO: 4.01**
SPACE NAME: INTRODUCTORY GEOLOGY — **OCCUPANTS: 32**

UTILIZATION	
Hours of Use	
8 hours/day	■
14 hours/day	
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtr.	
Additional Exhaust Air Filtr.	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (DI/RO)	
Chilled Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	Note 1.
Zoned Lighting	Note 1.
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Vinyl	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

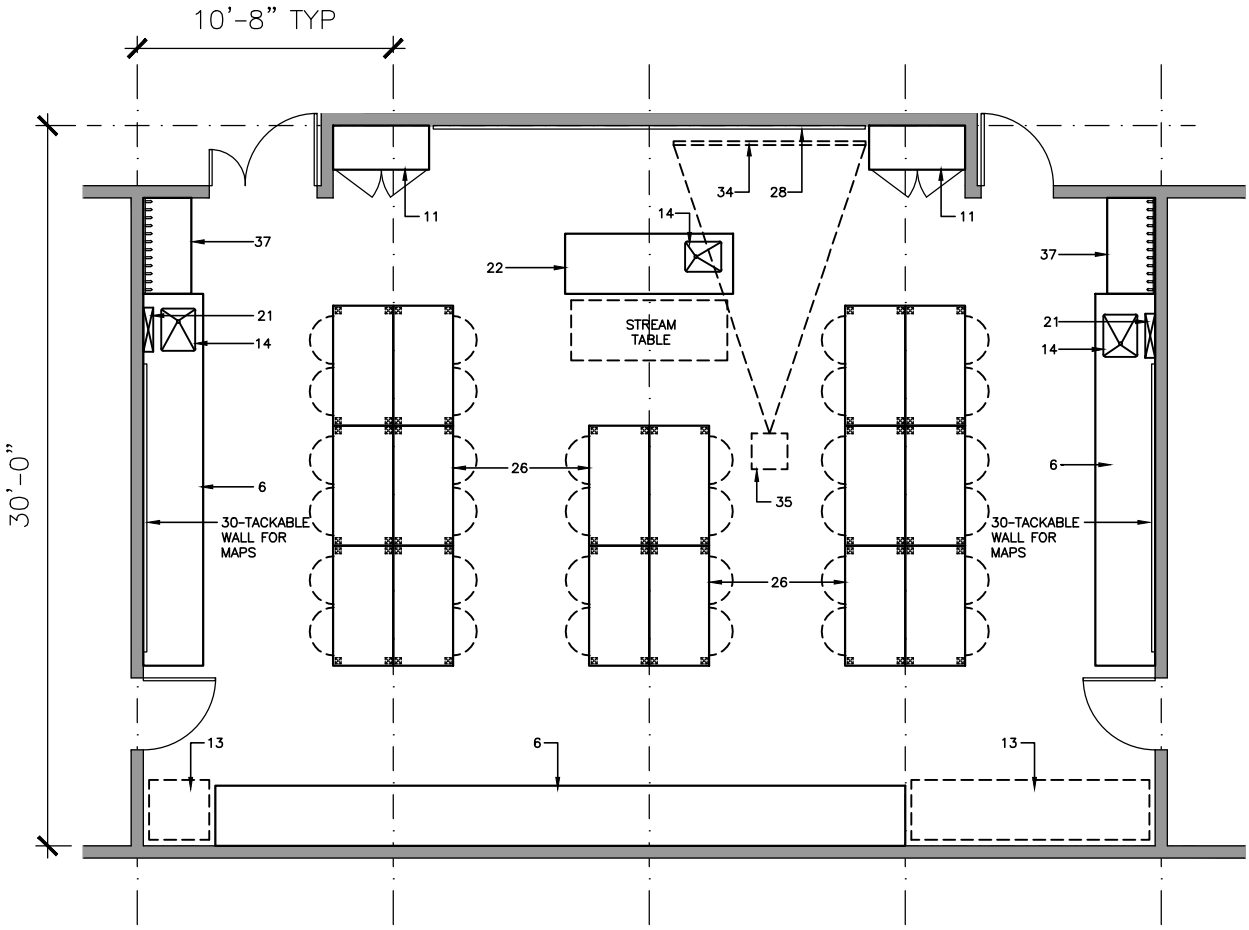
REMARKS:

1. Suitable for A/V presentations.
3. Associated with Prep/Storage Room 4.07

DEPARTMENT: GEOLOGY
SPACE NAME: INTRODUCTORY GEOLOGY

SPACE ID NO.: 4.01
AREA NSF: 1,280

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: GEOLOGY — **SPACE ID NO: 4.02**
SPACE NAME: PHYSICAL GEOLOGY — **OCCUPANTS: 32**

UTILIZATION	
Hours of Use	
8 hours/day	■
14 hours/day	
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtr.	
Additional Exhaust Air Filtr.	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (DI/RO)	
Chilled Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	Note 1.
Zoned Lighting	Note 1.
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Vinyl	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

1. Suitable for A/V presentations.
2. Paired with Surficial Geology Room 4.03 and associated with Prep/Storage Room 4.08

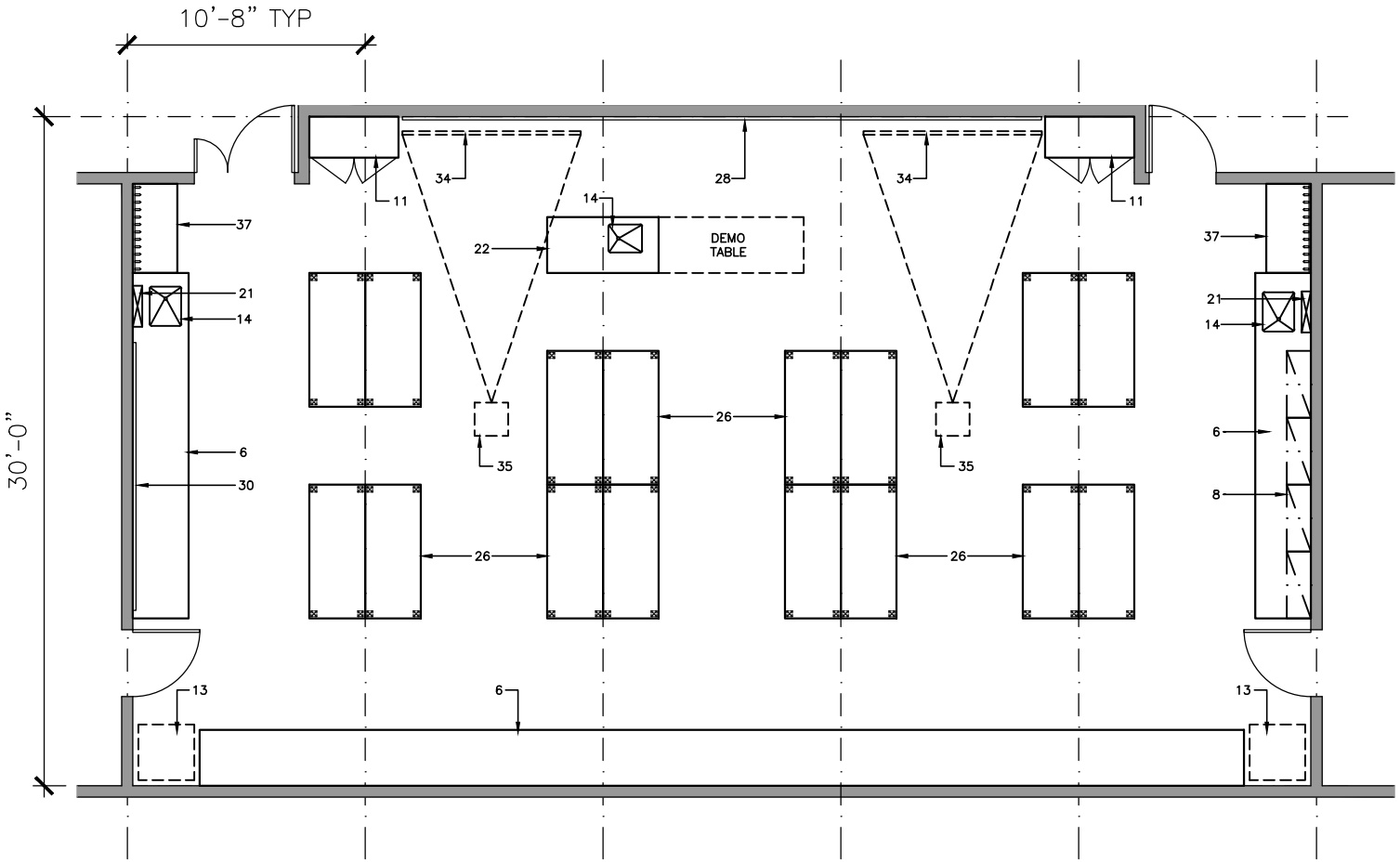
SPACE DIAGRAM
Eastern Washington University Science Renovation

Research Facilities Design
Cheney, Washington

DEPARTMENT: GEOLOGY
SPACE NAME: PHYSICAL GEOLOGY

SPACE ID NO.: 4.02
AREA NSF: 1,600

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: GEOLOGY — **SPACE ID NO: 4.03**
SPACE NAME: SURFICIAL GEOLOGY — **OCCUPANTS: 32**

UTILIZATION	
Hours of Use	
8 hours/day	■
14 hours/day	
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtr.	
Additional Exhaust Air Filtr.	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (DI/RO)	
Chilled Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	Note 1.
Zoned Lighting	Note 1.
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Vinyl	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

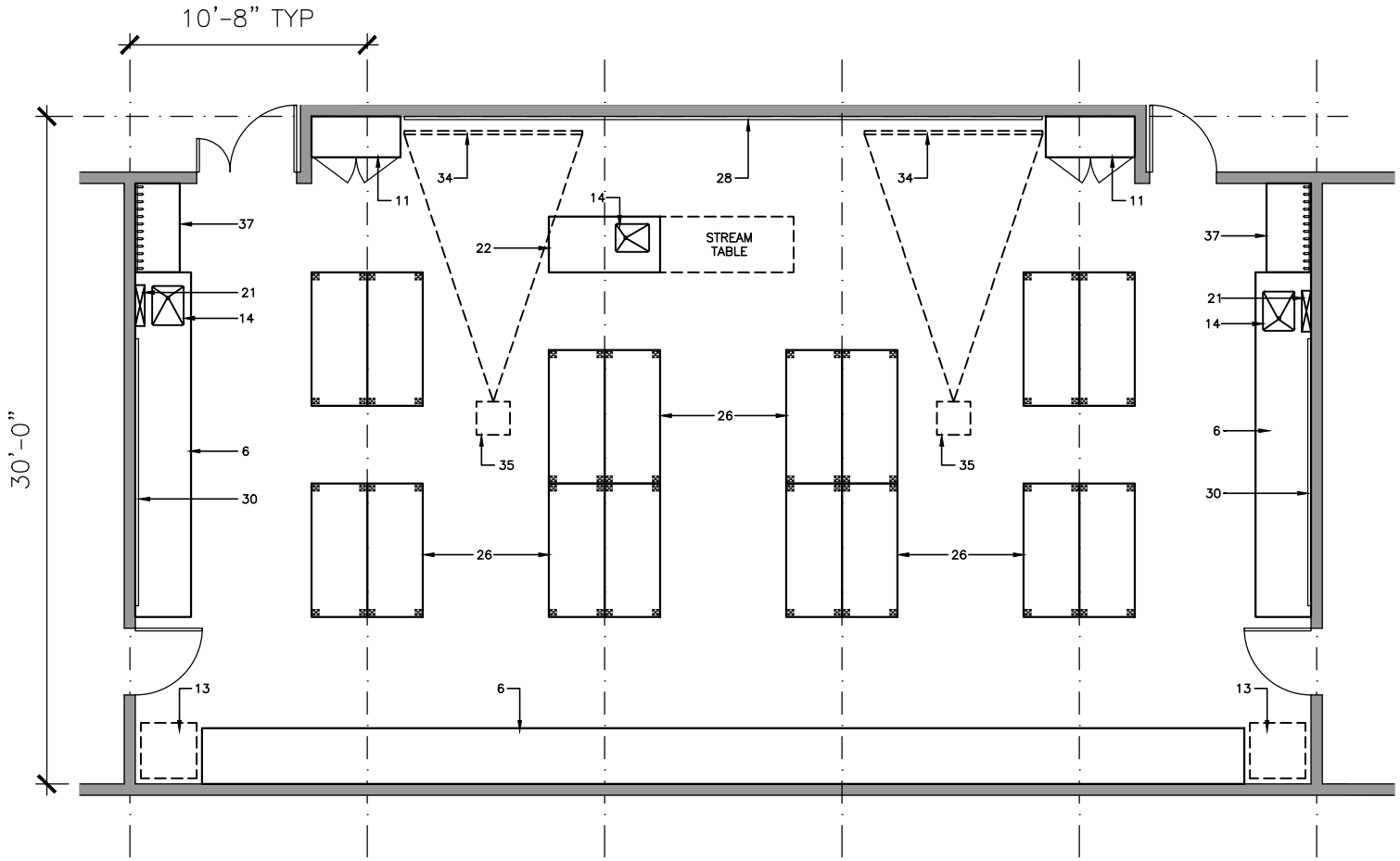
REMARKS:

1. Suitable for A/V presentations.
2. Paired with Physical Geology Room 4.02 and associated with Prep/Storage Room 4.08

DEPARTMENT: GEOLOGY
SPACE NAME: SURFICIAL GEOLOGY

SPACE ID NO.: 4.03
AREA NSF: 1,600

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: GEOLOGY — **SPACE ID NO: 4.04**
SPACE NAME: RESEARCH LAB / PROJECT ROOM — **OCCUPANTS: 8**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtr.	
Additional Exhaust Air Filtr.	

HOODS	
Chemical Fume Hood	Note 1.
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (DI/RO)	■
Chilled Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	■
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Vinyl	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

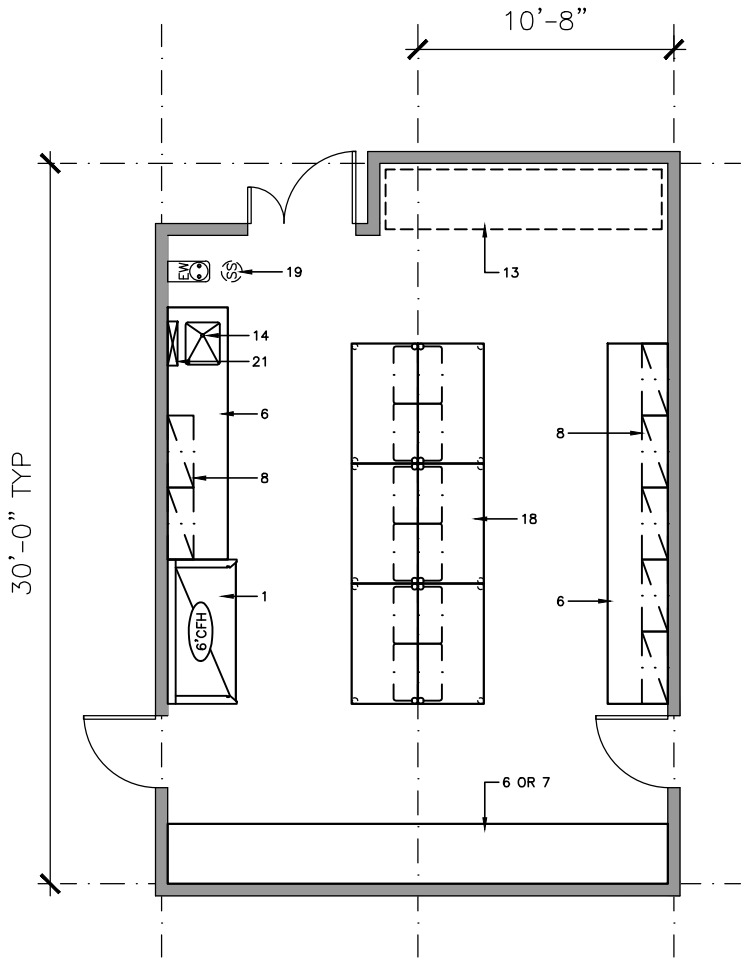
REMARKS:

1. (1) 6' chemical fume hood.

SPACE DIAGRAM | **Research Facilities Design**
Eastern Washington University Science Renovation | *Cheney, Washington*

DEPARTMENT: GEOLOGY | **SPACE ID NO.:** 4.04
SPACE NAME: RESEARCH LAB / PROJECT ROOM | **AREA NSF:** 640

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: GEOLOGY — **SPACE ID NO: 4.05**
SPACE NAME: RESEARCH LAB — **OCCUPANTS: 4**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtr.	
Additional Exhaust Air Filtr.	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (DI/RO)	■
Chilled Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	■
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

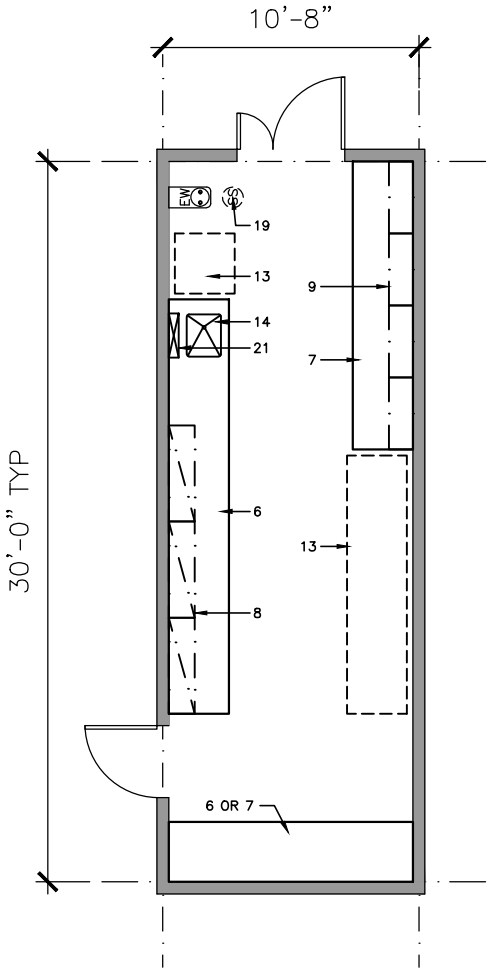
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Vinyl	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	■

REMARKS:

DEPARTMENT: GEOLOGY
SPACE NAME: RESEARCH LAB

SPACE ID NO.: 4.05
AREA NSF: 320

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

Department:	Geology
Space ID:	4.06
Space Name:	USGS GIS Mapping
Occupants/space:	12
ASF:	320
No of spaces:	1

GENERAL:

Function	Student projects and study
Adjacencies	Map Library
Ceiling Height	12’
Windows	Exterior with interior relites
Daylight Control	Blinds
Lighting	Ambient lighting, motion sensor control

FINISHES:

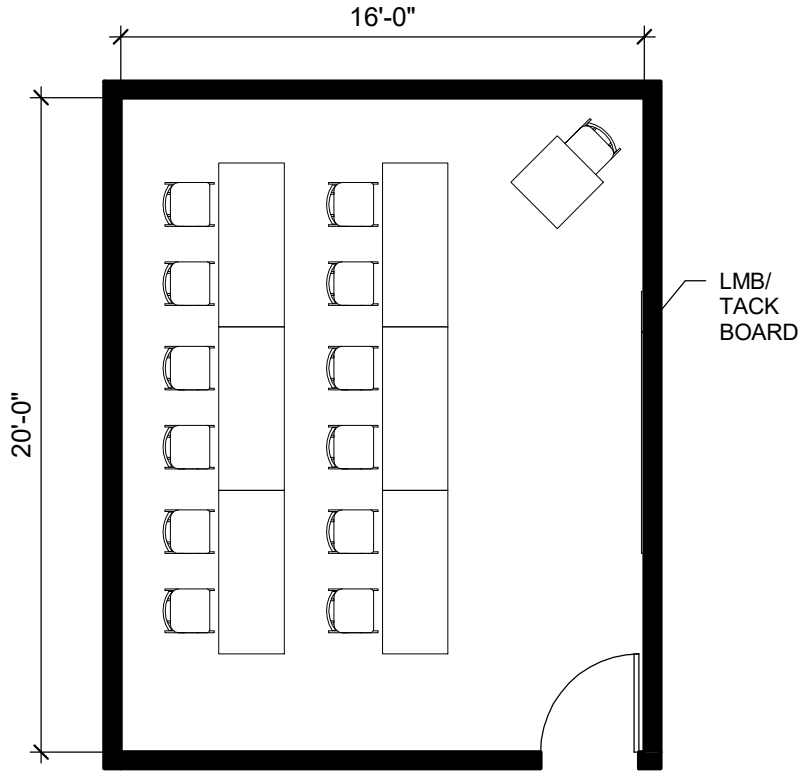
Floor	Carpet
Base	Resilient
Walls	Painted GWB and acoustical wall panels
Ceiling	ACT and GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	Sliding whiteboard and tack board
Moveable	Owner-furnished tables, chairs and lectern



4.06 USGS GIS MAPPING

0 1 2 4 8 16

DEPARTMENT: GEOLOGY — **SPACE ID NO: 4.07**
SPACE NAME: LAB PREP / STORAGE (INTRO.) — **OCCUPANTS: 2**

UTILIZATION	
Hours of Use	
8 hours/day	■
14 hours/day	
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtr.	
Additional Exhaust Air Filtr.	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (DI/RO)	
Chilled Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

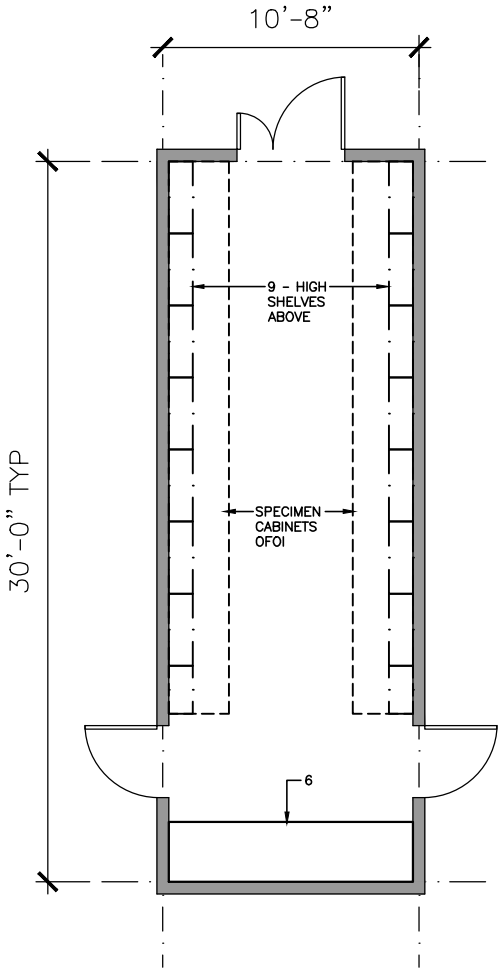
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Vinyl	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

DEPARTMENT: GEOLOGY
SPACE NAME: LAB PREP / STORAGE (INTRO)

SPACE ID NO.: 4.07
AREA NSF: 320

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: GEOLOGY — **SPACE ID NO: 4.08**
SPACE NAME: LAB PREP / STORAGE (PHYSICAL & SURFICIAL) — **OCCUPANTS: 2**

UTILIZATION	
Hours of Use	
8 hours/day	■
14 hours/day	
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtr.	
Additional Exhaust Air Filtr.	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (DI/RO)	
Chilled Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	■
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

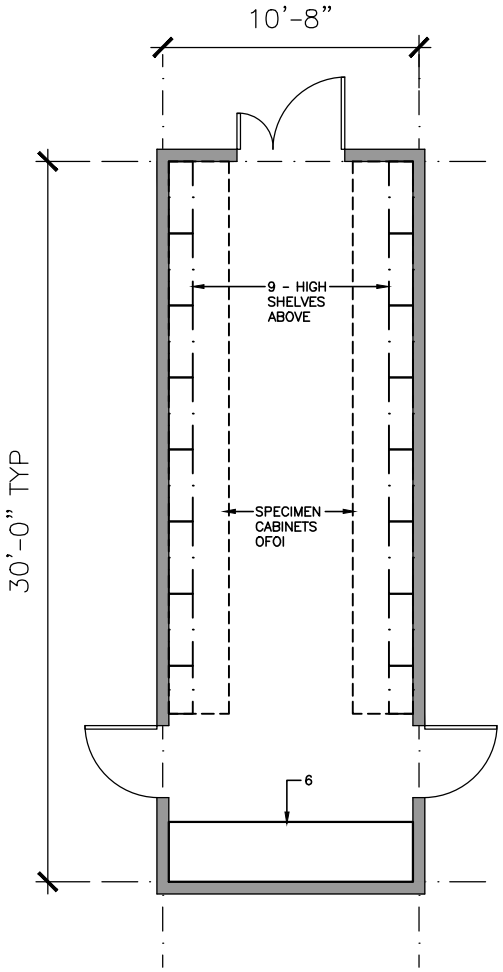
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Vinyl	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

DEPARTMENT: GEOLOGY
SPACE NAME: LAB PREP / STORAGE (PHYSICAL & SURFICIAL)

SPACE ID NO.: 4.08
AREA NSF: 320

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: GEOLOGY — **SPACE ID NO: 4.09**
SPACE NAME: ROCK PREP - ENTRY / PREP — **OCCUPANTS:**

UTILIZATION	
Hours of Use	
8 hours/day	■
14 hours/day	
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtr.	
Additional Exhaust Air Filtr.	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	Note 1
Low Slotted Exhaust	Note 2
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (DI/RO)	
Chilled Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Vinyl	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

1. Over muffle furnace.
2. At thin-section gluing bench.

DEPARTMENT: GEOLOGY — **SPACE ID NO: 4.10**
SPACE NAME: ROCK PREP - SAWING — **OCCUPANTS:**

UTILIZATION	
Hours of Use	
8 hours/day	■
14 hours/day	
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtr.	
Additional Exhaust Air Filtr.	

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

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (DI/RO)	■
Chilled Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	■
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	■

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Vinyl	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

1. Behind rock saws (floor-mounted and benchtop saws).

DEPARTMENT: GEOLOGY — **SPACE ID NO: 4.11**
SPACE NAME: ROCK PREP - WEIGHING — **OCCUPANTS:**

UTILIZATION	
Hours of Use	
8 hours/day	■
14 hours/day	
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtr.	
Additional Exhaust Air Filtr.	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (DI/RO)	■
Chilled Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	■

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Vinyl	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

DEPARTMENT: GEOLOGY — **SPACE ID NO: 4.12**
SPACE NAME: ROCK PREP - POLISHING — **OCCUPANTS:**

UTILIZATION	
Hours of Use	
8 hours/day	■
14 hours/day	
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtr.	
Additional Exhaust Air Filtr.	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	Note 1.
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	■
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (DI/RO)	■
Chilled Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	■

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

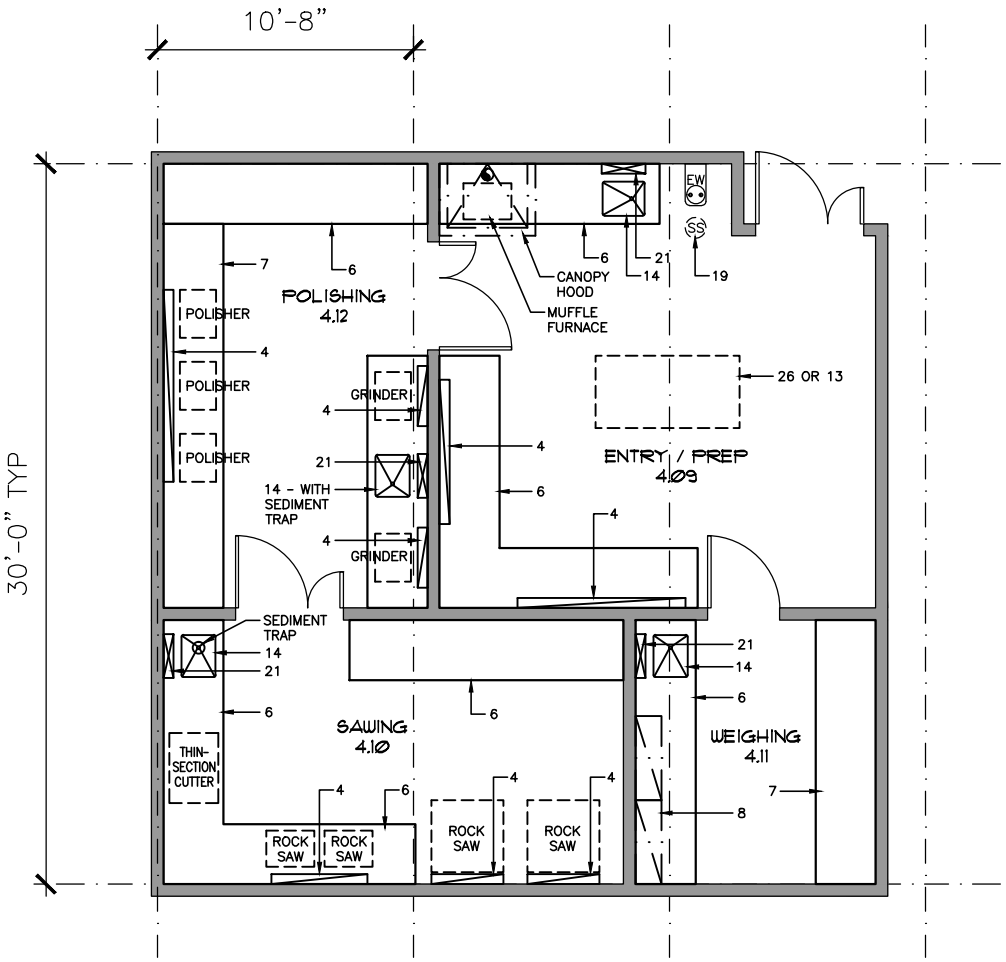
ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Vinyl	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	■
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:
1. At polishers and grinders.

DEPARTMENT: GEOLOGY
SPACE NAME: ROCK PREP SUITE

SPACE ID NO.: 4.09 - 4.12
AREA NSF: 905

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

Department:	Geology
Space ID:	4.13
Space Name:	Map Library
Occupants/space:	
ASF:	640
No of spaces:	1

GENERAL:

Function	Library
Adjacencies	Geology Department
Ceiling Height	12’
Windows	None
Daylight Control	None
Lighting	Ambient lighting, motion sensor control

FINISHES:

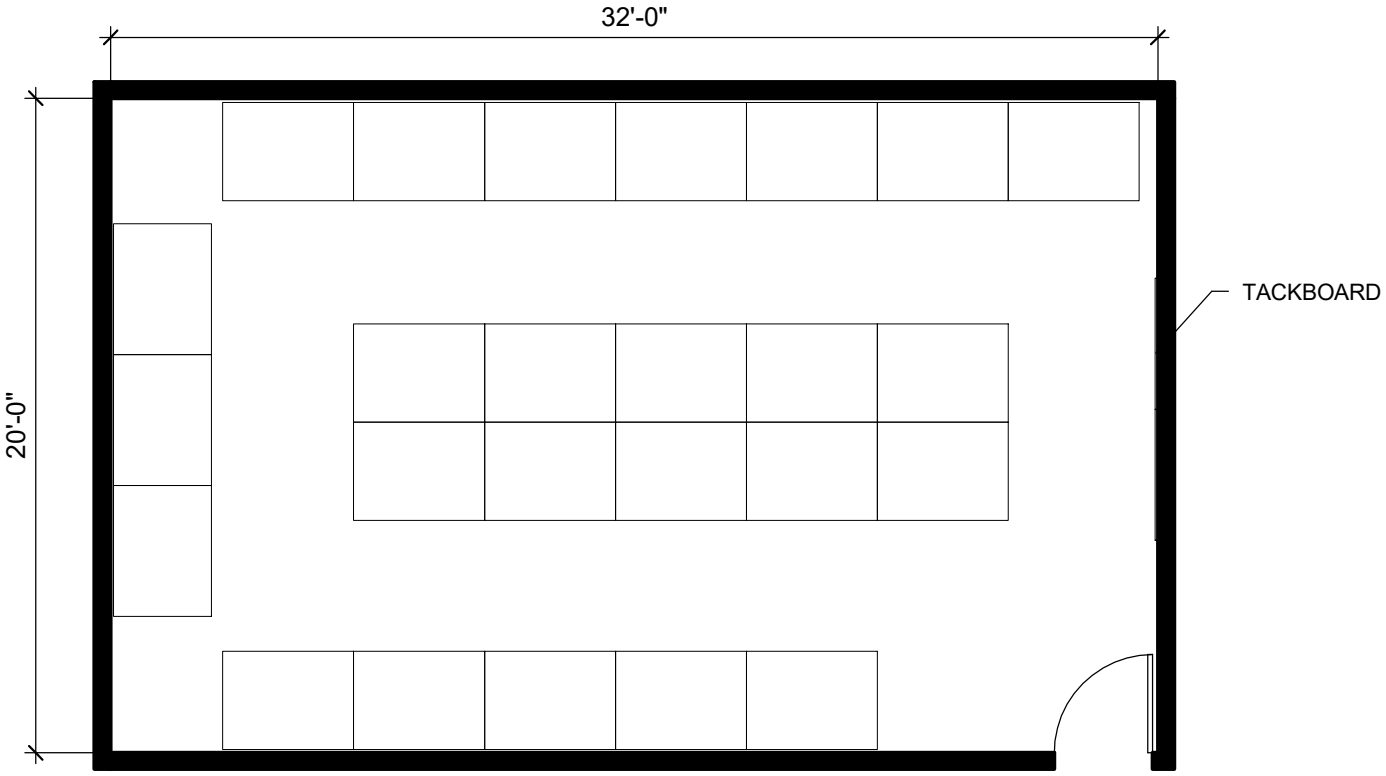
Floor	Resilient/Concrete
Base	Resilient
Walls	Painted GWB
Ceiling	ACT/GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	No
Data/Telecom	Yes
Audio-Visual	No
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	Tack board
Moveable	Owner-furnished map files



4.13 MAP LIBRARY

0 1 2 4 8 16

DEPARTMENT: GEOLOGY — **SPACE ID NO: 4.14**
SPACE NAME: FIELD EQUIPMENT STORAGE — **OCCUPANTS:**

UTILIZATION	
Hours of Use	
8 hours/day	■
14 hours/day	
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtr.	
Additional Exhaust Air Filtr.	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	■
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (DI/RO)	
Chilled Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	■
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	■
In Use Light	
Task Lighting	■
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	■
Other	
Base	
4" Vinyl	
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	■
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

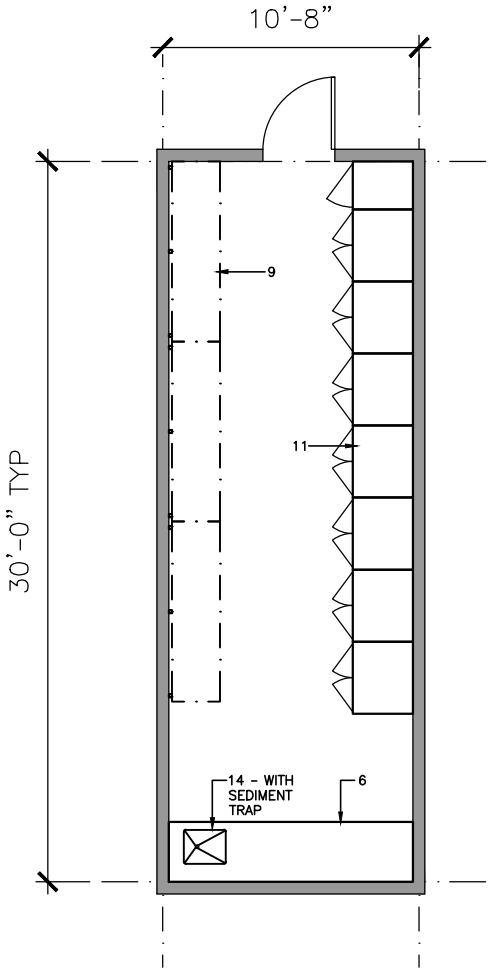
REMARKS:

1. Large sink with sediment trap.

DEPARTMENT: GEOLOGY
SPACE NAME: FIELD EQUIPMENT

SPACE ID NO.: 4.14
AREA NSF: 320

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

Department:	Shared
Space ID:	5.01
Space Name:	80 - Seat Classroom (Tiered Seating)
Occupants/space:	80
ASF:	1,760
No of spaces:	1

GENERAL:

Function	Chemistry and physics lectures
Adjacencies	Other classrooms
Ceiling Height	Varies
Windows	Yes
Daylight Control	Yes
Lighting	Indirect/direct, motion sensor control

FINISHES:

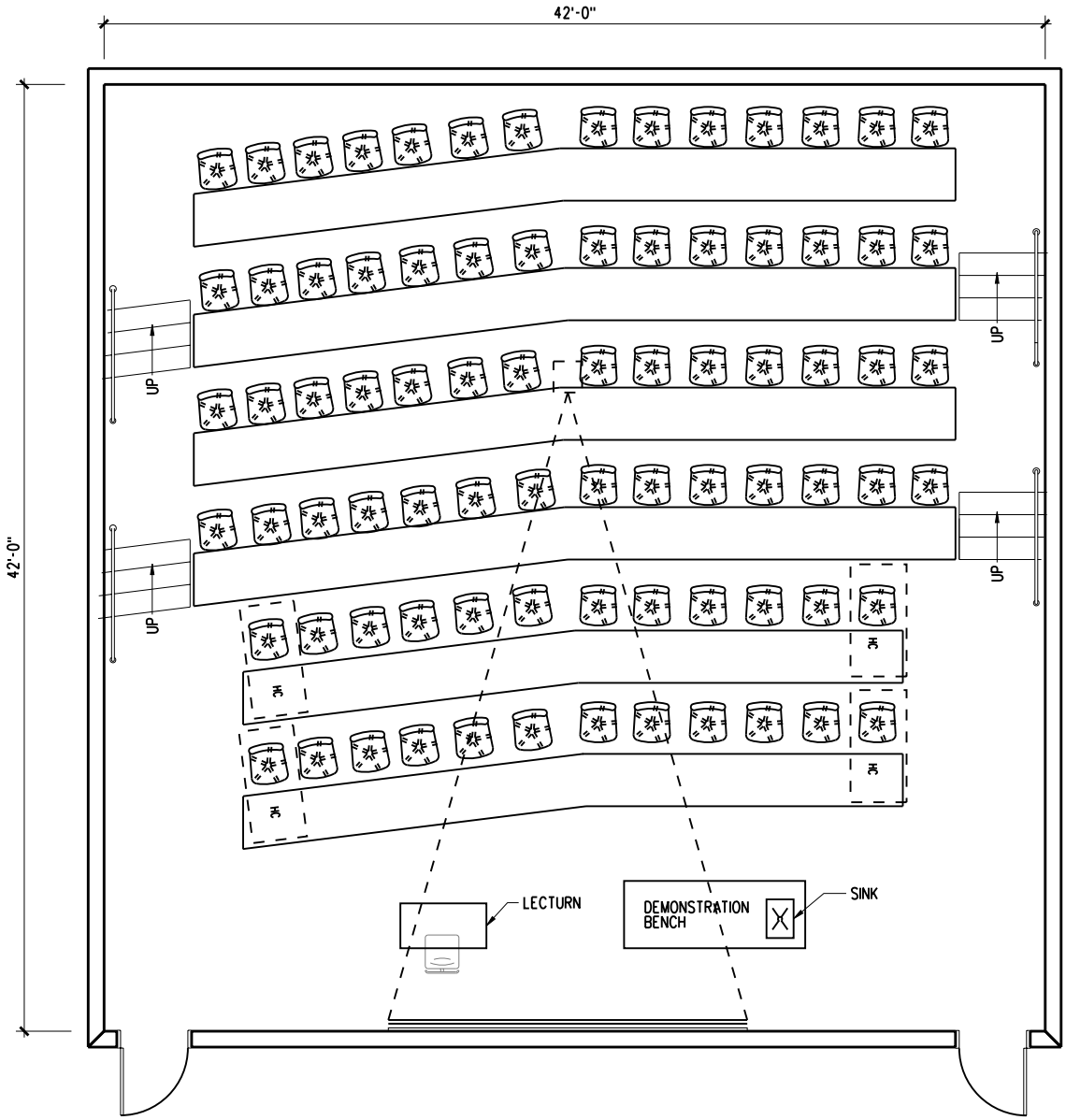
Floor	Carpet
Base	Resilient
Walls	Painted GWB, acoustic treatment
Ceiling	Painted GWB/ACT

UTILITIES:

Plumbing	Sink, lab gas, vacuum and air
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand controlled

EQUIPMENT:

Fixed	Sliding whiteboard, projection screen, demonstration bench with sink, tables
Moveable	Owner-furnished podium and chairs



5.01 80 - SEAT CLASSROOM (TIERED SEATING)

0 2' 4' 8' 12'

Department:	Shared
Space ID:	5.02
Space Name:	60 - Seat Classroom
Occupants/space:	60
ASF:	1,440
No of spaces:	2

GENERAL:

Function	Chemistry and physics lectures
Adjacencies	Other classrooms
Ceiling Height	12’
Windows	Yes
Daylight Control	Yes
Lighting	Indirect/direct, motion sensor control

FINISHES:

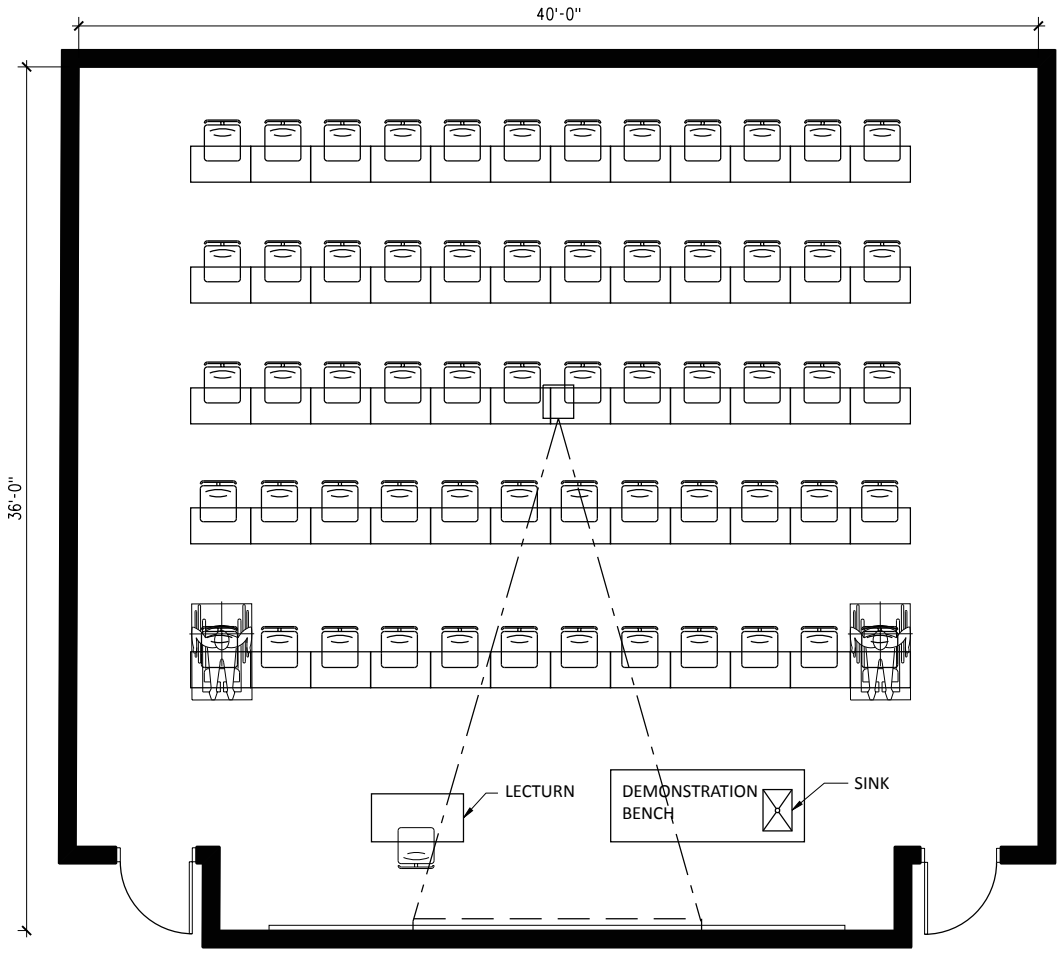
Floor	Carpet
Base	Resilient
Walls	Painted GWB, acoustic treatment
Ceiling	Painted GWB/ACT

UTILITIES:

Plumbing	Sink, lab gas, vacuum and air
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand controlled

EQUIPMENT:

Fixed	Sliding whiteboard, projection screen, demonstration bench with sink, tables
Moveable	Owner-furnished podium, tables and chairs



5.02 60 - Seat Classroom

0 2' 4' 8' 12'

Department:	Shared
Space ID:	5.03
Space Name:	Classroom - Small
Occupants/space:	40
ASF:	1,000
No of spaces:	1

GENERAL:

Function	Biology, Chemistry, Physics and Geology Lectures
Adjacencies	Other Classrooms
Ceiling Height	12’
Windows	Yes
Daylight Control	Yes
Lighting	Indirect/Direct, motion sensor control

FINISHES:

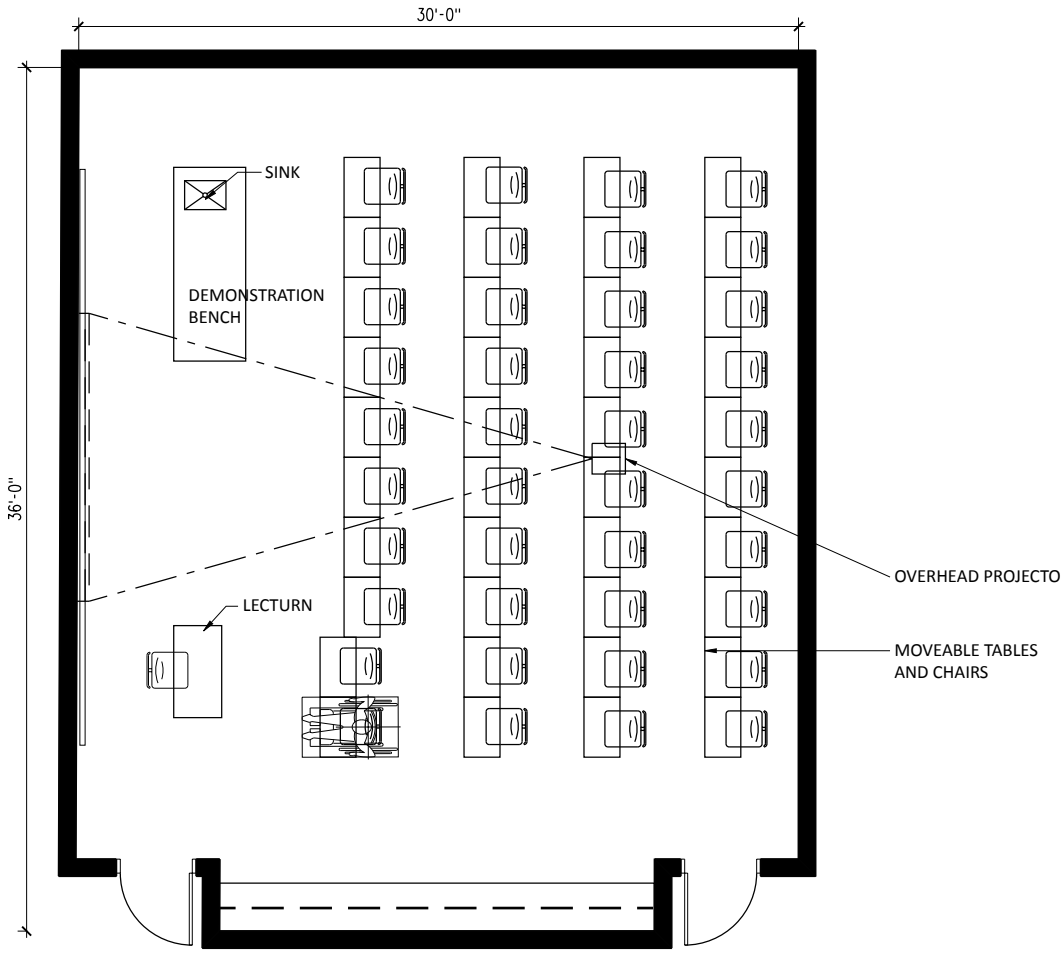
Floor	Carpet
Base	Resilient
Walls	Painted GWB, acoustic treatment
Ceiling	Painted GWB/ACT

UTILITIES:

Plumbing	Sink, lab gas, vacuum and air
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand controlled

EQUIPMENT:

Fixed	Sliding whiteboard, projection screen, demonstration bench with sink, tables
Moveable	Owner-furnished podium, tables and chairs



5.03 - CLASSROOM - SMALL

0 2' 4' 8' 12'

Department:	Shared Facilities
Space ID:	5.04
Space Name:	GIS Computer Classroom
Occupants/space:	24
ASF:	960
No of spaces:	1

GENERAL:

Function	Student projects and study
Adjacencies	Teaching and research labs
Ceiling Height	12’
Windows	Exterior with interior relites
Daylight Control	Blinds
Lighting	Ambient lighting, motion sensor control

FINISHES:

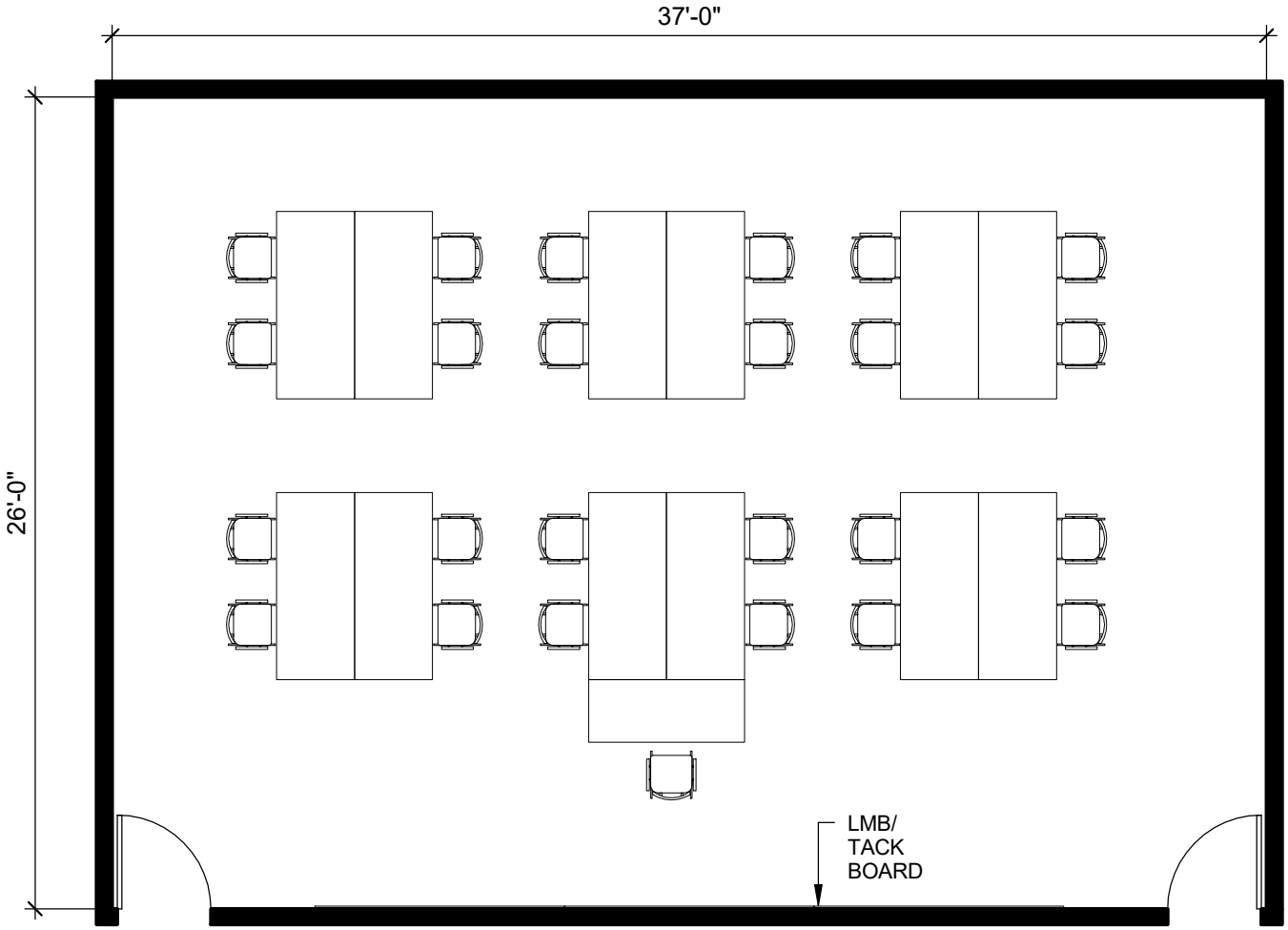
Floor	Carpet
Base	Resilient
Walls	Painted GWB
Ceiling	ACT and GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	Sliding whiteboard and tack board
Moveable	Owner-furnished tables, chairs and lectern



5.04 GIS COMPUTER CLASSROOM

0 1 2 4 8 16

DEPARTMENT: SHARED FACILITIES — **SPACE ID NO: 5.05**
SPACE NAME: PREP ROOM FOR LARGE CLASSROOMs — **OCCUPANCY: 1**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

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

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

PLUMBING	
Laboratory Gas (LG)	■
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	■
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

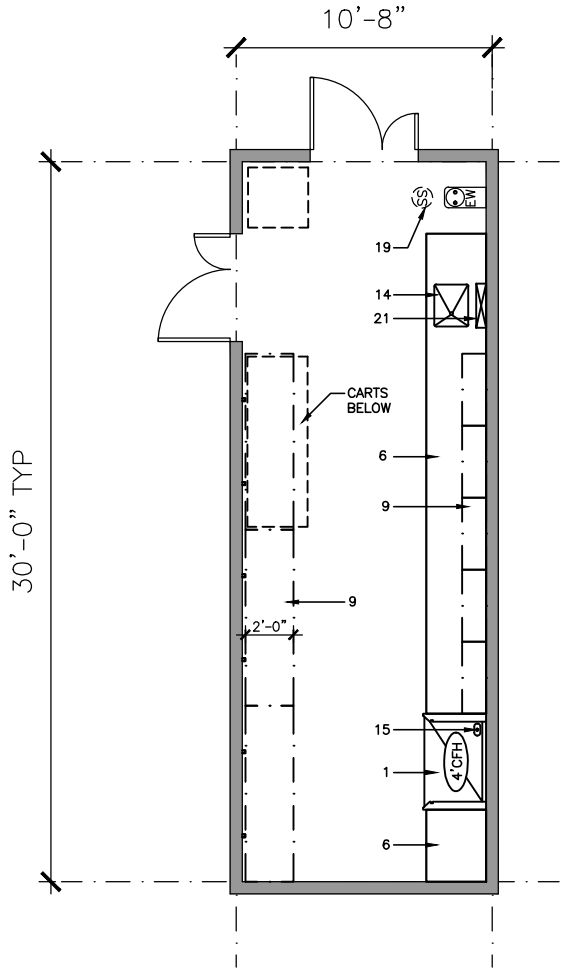
REMARKS:

1. (1) 4' Chemical fume hood

DEPARTMENT: SHARED FACILITIES
SPACE NAME: PREP ROOM FOR LARGE CLASSROOM

SPACE ID NO.: 5.05
AREA NSF: 320

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

Department:	Shared Facilities
Space ID:	5.07
Space Name:	Science Classroom
Occupants/space:	38
ASF:	665
No of spaces:	1

GENERAL:

Function	Student projects and study
Adjacencies	Teaching and research labs
Ceiling Height	12’
Windows	Yes
Daylight Control	Yes
Lighting	Indirect/direct, motion sensor control

FINISHES:

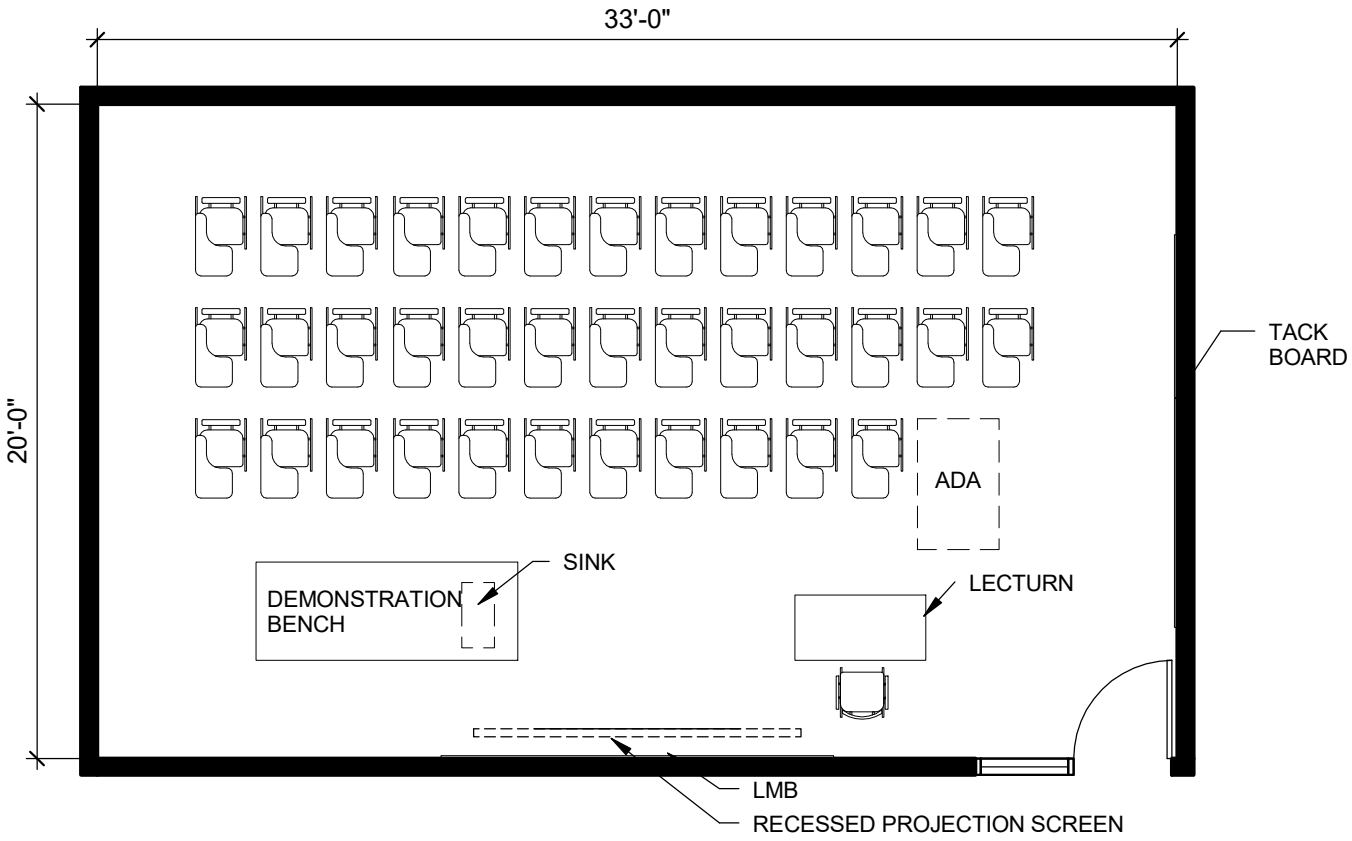
Floor	Carpet
Base	Resilient
Walls	Painted GWB
Ceiling	ACT/GWB

UTILITIES:

Plumbing	Sink, lab gas, vacuum and air
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	Sliding whiteboard, projection screen, demonstration bench with sink and tack board
Moveable	Owner-furnished tablet arm chairs, instructor stool and lectern



5.07 SCIENCE CLASSROOM

0 1 2 4 8 16

Department:	Shared Facilities
Space ID:	5.08
Space Name:	Science Classroom (option A)
Occupants/space:	70
ASF:	1,414
No of spaces:	1

GENERAL:

Function	Student projects and study
Adjacencies	Other Classrooms
Ceiling Height	12’
Windows	Yes
Daylight Control	Yes
Lighting	Indirect/direct, motion sensor control

FINISHES:

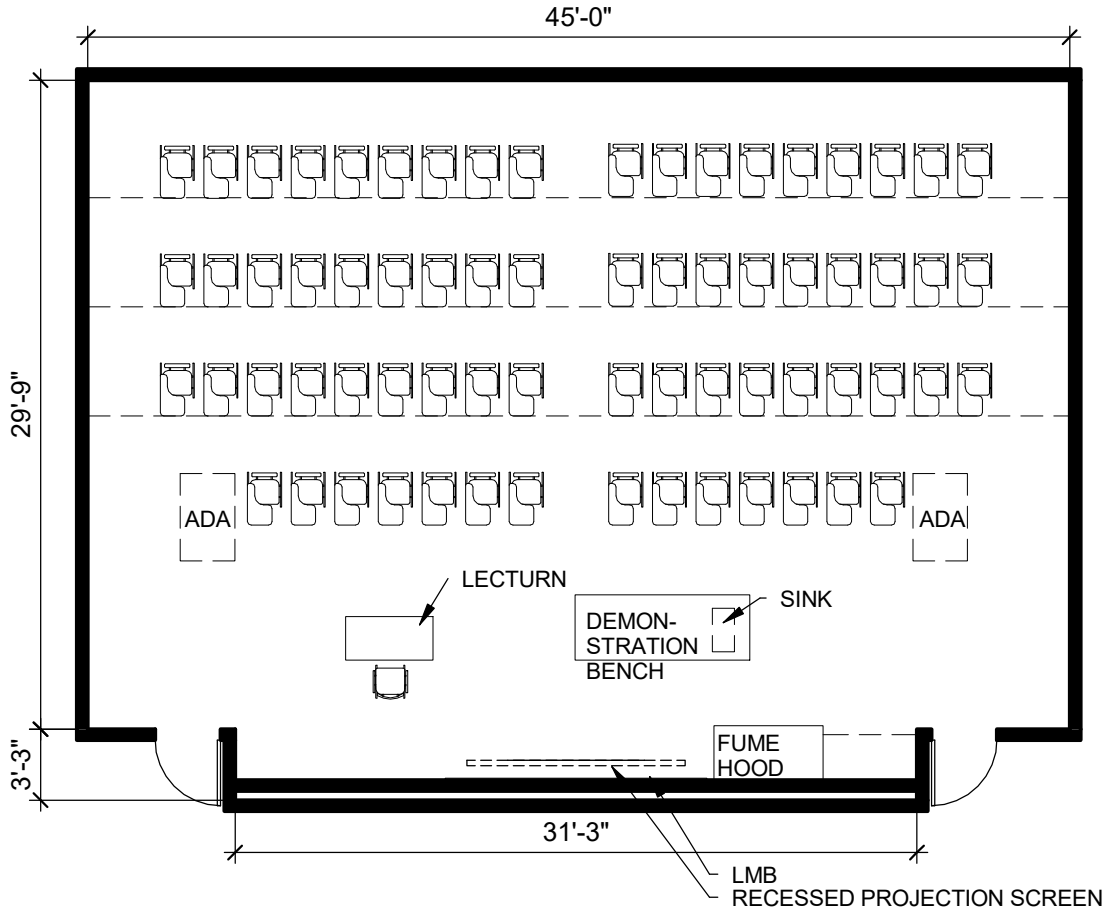
Floor	Carpet
Base	Resilient
Walls	Painted GWB, acoustic treatment
Ceiling	ACT/GWB

UTILITIES:

Plumbing	Sink, lab gas, vacuum and air
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	Sliding whiteboard, projection screen, demonstration bench with sink
Moveable	Owner-furnished tablet arm chairs, instructor stool and lectern



5.08A SCIENCE CLASSROOM A

0 2 4 8 16 24

Department:	Shared Facilities
Space ID:	5.08
Space Name:	Science Classroom (option B)
Occupants/space:	54
ASF:	1,414
No of spaces:	1

GENERAL:

Function	Student projects and study
Adjacencies	Other Classrooms
Ceiling Height	12’
Windows	Yes
Daylight Control	Yes
Lighting	Indirect/direct, motion sensor control

FINISHES:

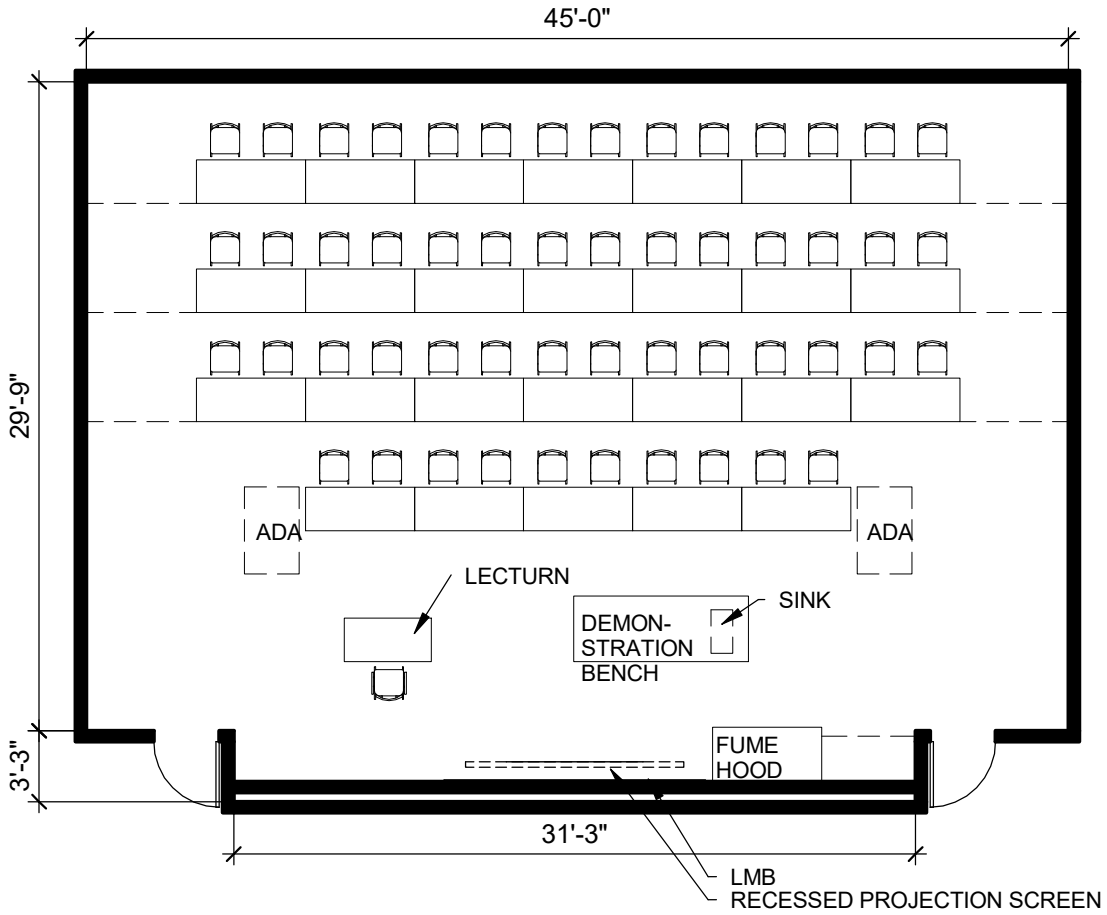
Floor	Carpet
Base	Resilient
Walls	Painted GWB, acoustic treatment
Ceiling	ACT/GWB

UTILITIES:

Plumbing	Sink, lab gas, vacuum and air
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	Sliding whiteboard, projection screen, demonstration bench with sink, tables
Moveable	Owner-furnished chairs, instructor stool and lecturn



5.08B SCIENCE CLASSROOM B

0 2 4 8 16 24

Department:	Shared Facilities
Space ID:	5.09
Space Name:	General Science Classroom
Occupants/space:	30
ASF:	545
No of spaces:	1

GENERAL:

Function	Student projects and study
Adjacencies	Other classrooms
Ceiling Height	12’
Windows	Yes
Daylight Control	Yes
Lighting	Ambient lighting, motion sensor control

FINISHES:

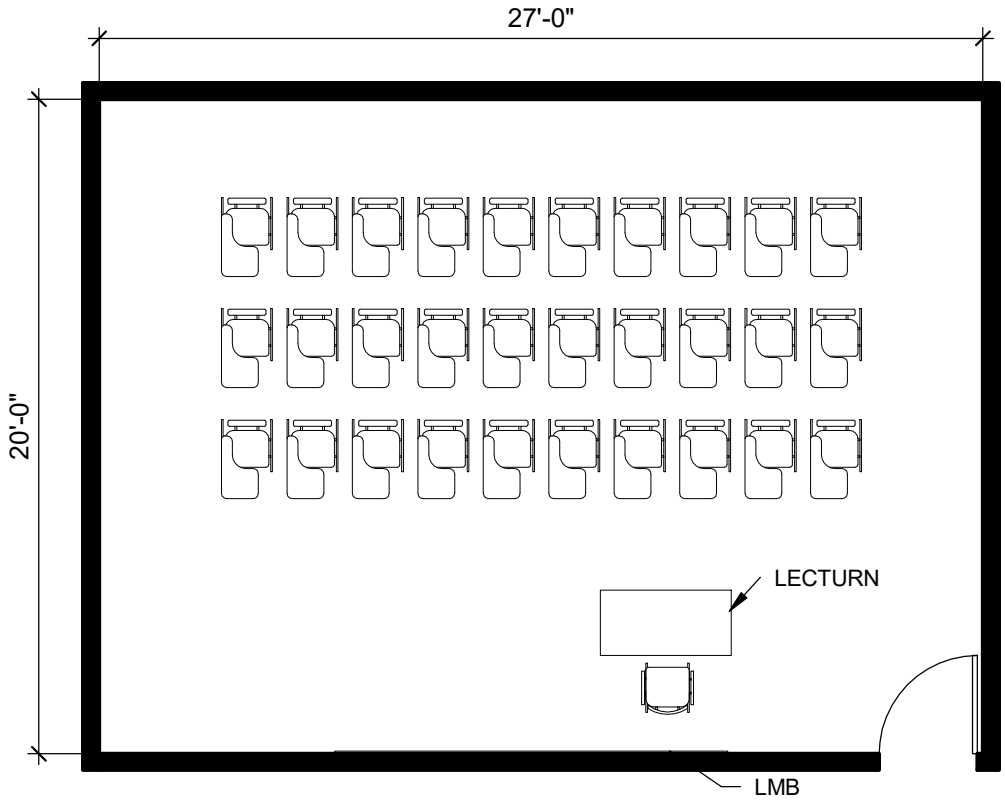
Floor	Carpet
Base	Resilient
Walls	Painted GWB
Ceiling	ACT/GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	Sliding whiteboard and tack board
Moveable	Owner-furnished tablet arm chairs, instructor stool and lectern



5.09 GENERAL SCIENCE CLASSROOM

0 1 2 4 8 16

Department:	Shared Facilities
Space ID:	5.10
Space Name:	Classroom
Occupants/space:	24
ASF:	724
No of spaces:	1

GENERAL:

Function	Student projects and study
Adjacencies	Other classrooms
Ceiling Height	12’
Windows	Yes
Daylight Control	Yes
Lighting	Ambient lighting, motion sensor control

FINISHES:

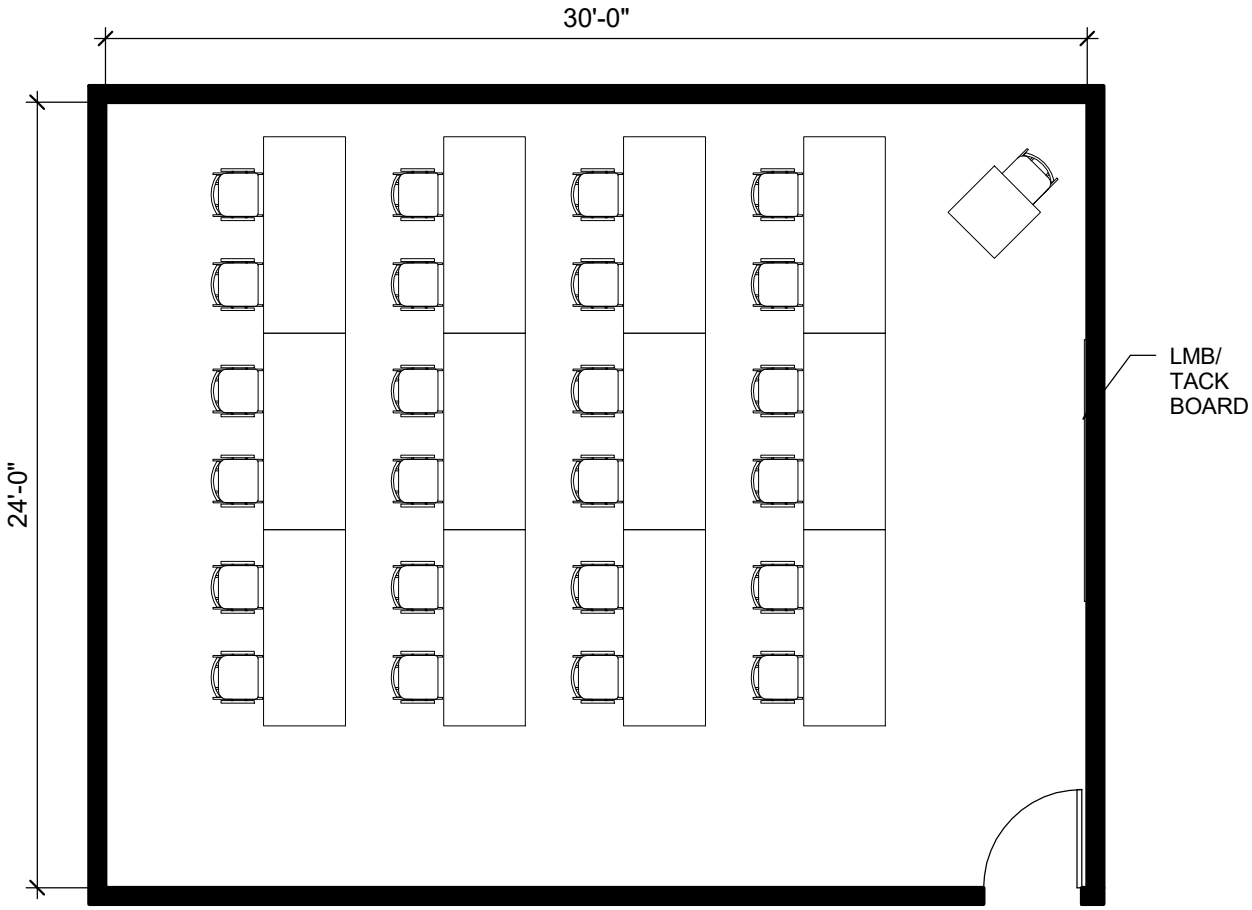
Floor	Carpet
Base	Resilient
Walls	Painted GWB
Ceiling	ACT/GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	Sliding whiteboard and tack board
Moveable	Owner-furnished tables, chairs, instructor stool and lectern



5.10 CLASSROOM

0 1 2 4 8 16

Department:	Shared Facilities
Space ID:	5.11
Space Name:	Classroom
Occupants/space:	24
ASF:	724
No of spaces:	1

GENERAL:

Function	Student projects and study
Adjacencies	Other classrooms
Ceiling Height	12’
Windows	Yes
Daylight Control	Yes
Lighting	Ambient lighting, motion sensor control

FINISHES:

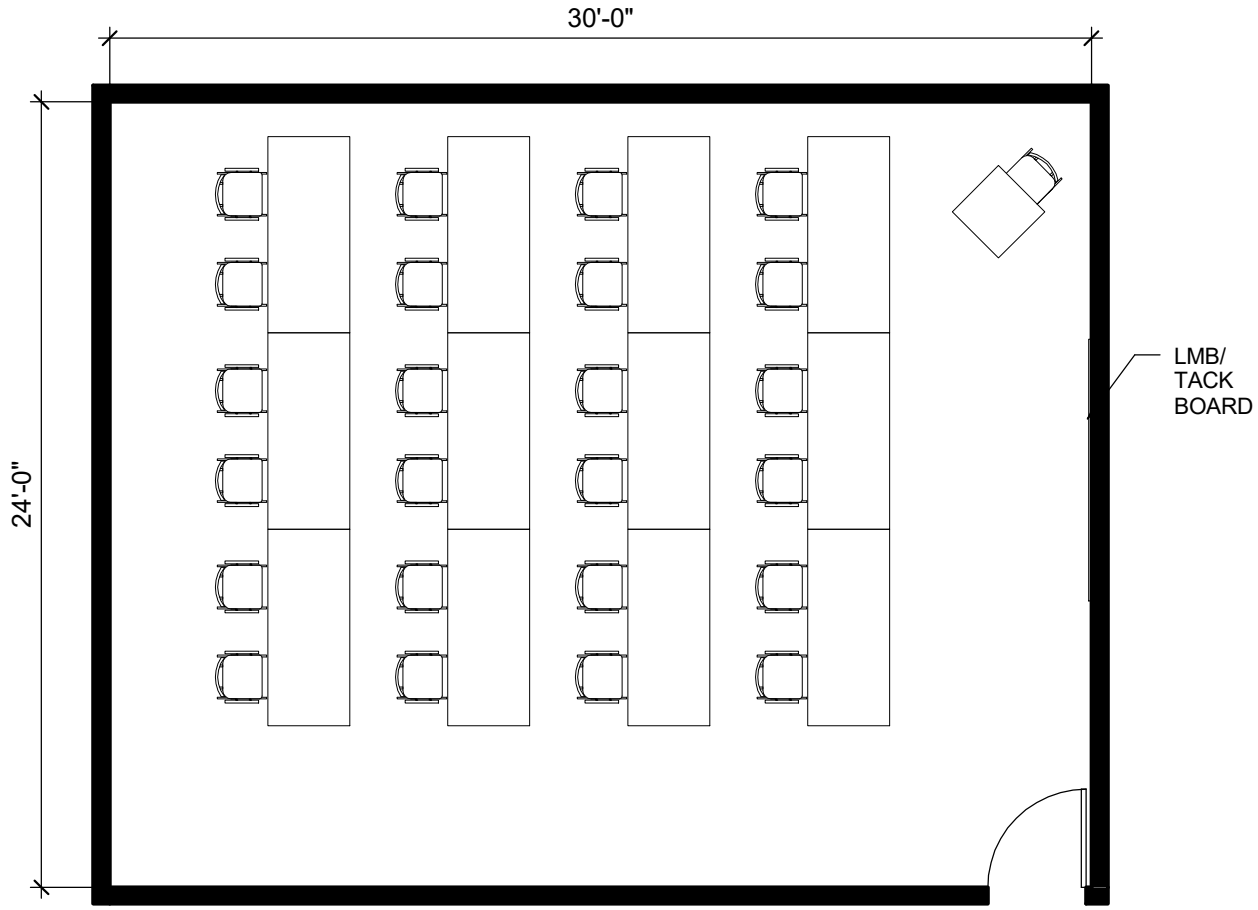
Floor	Carpet
Base	Resilient
Walls	Painted GWB
Ceiling	ACT/GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	Sliding whiteboard and tack board
Moveable	Owner-furnished tables, chairs, instructor stool and lectern



5.11 CLASSROOM

0 1 2 4 8 16

DEPARTMENT: SHARED FACILITIES — **SPACE ID NO: 5.12, 5.13 & 5.14**
SPACE NAME: IMAGING SUITE — **OCCUPANTS:**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtr.	
Additional Exhaust Air Filtr.	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (DI/RO)	■
Chilled Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	■
208V, 30A, 3 Phase	■
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	■
UPS (OFOI)	■
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	■
Zoned Lighting	■
Other	

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

ARCHITECTURAL	
Floor	
Resilient Tile	■
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	
Other	
Base	
4" Vinyl	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	■
Gyp Board, Paint	
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	
Acoustic Tile	■
Gyp Board, Epoxy Paint	
Height	9' min.
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	■
Light Tight Rotating Door	
Vision Panel	■
Natural Daylight	

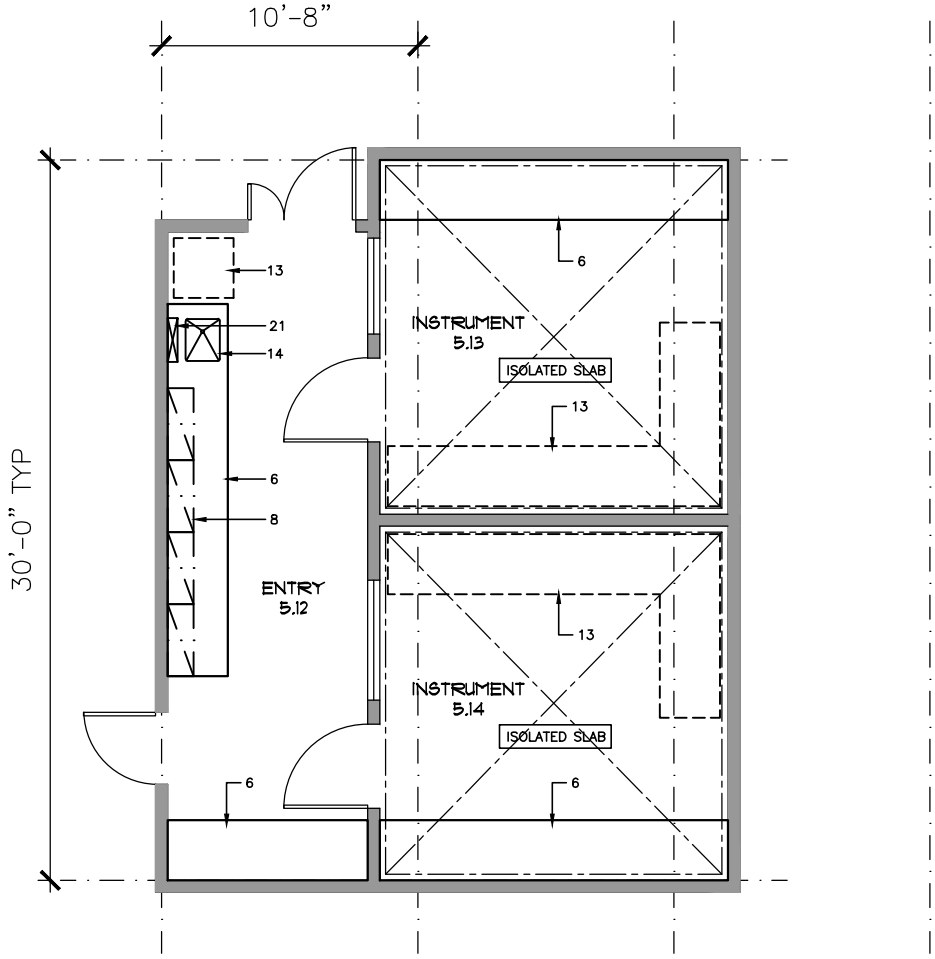
REMARKS:

1. Isolated slab at each Instrument Room 5.13 & 5.14.

DEPARTMENT: SHARED FACILITIES
SPACE NAME: IMAGING SUITE

SPACE ID NO.: 5.12 - 5.14
AREA NSF: 720

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

Department:	Shared Facilities
Space ID:	5.15
Space Name:	Student Study
Occupants/space:	
ASF:	2,500
No of spaces:	

GENERAL:

Function	Student projects and study
Adjacencies	Dispersed throughout building
Ceiling Height	Varies
Windows	
Daylight Control	
Lighting	Varies

FINISHES:

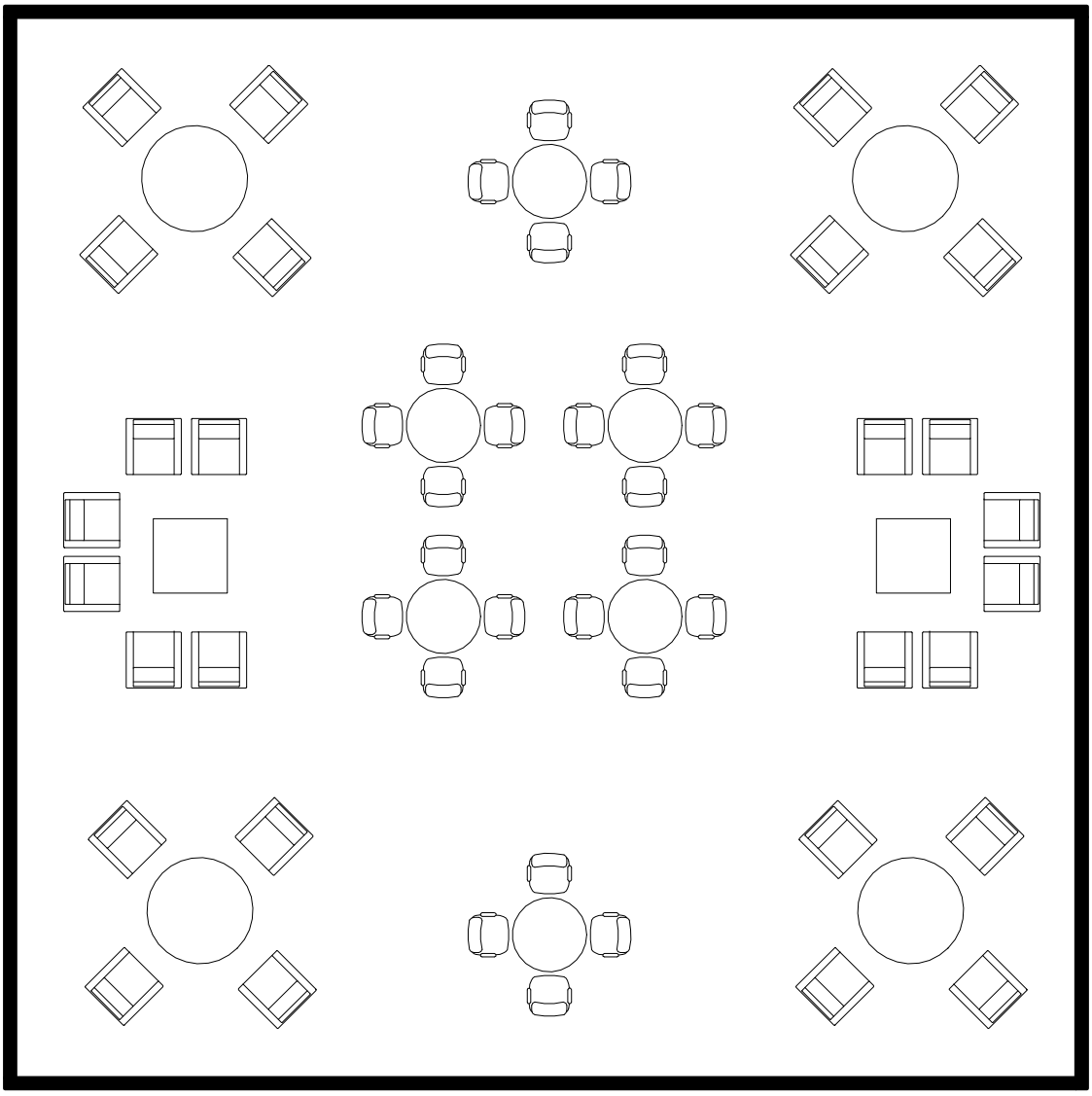
Floor	Varies
Base	Varies
Walls	Varies
Ceiling	Varies

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	Varies
Moveable	Owner-furnished tables, chairs & benches



5.15 STUDENT STUDY

Department:	Shared
Space ID:	5.16
Space Name:	Faculty Lounge
Occupants/space:	n/a
ASF:	400
No of spaces:	1

GENERAL:

Function	Interactive
Adjacencies	Centrally located
Ceiling Height	10’
Windows	Exterior with interior relites
Daylight Control	Blinds
Lighting	Ambient lighting, motion sensor control

FINISHES:

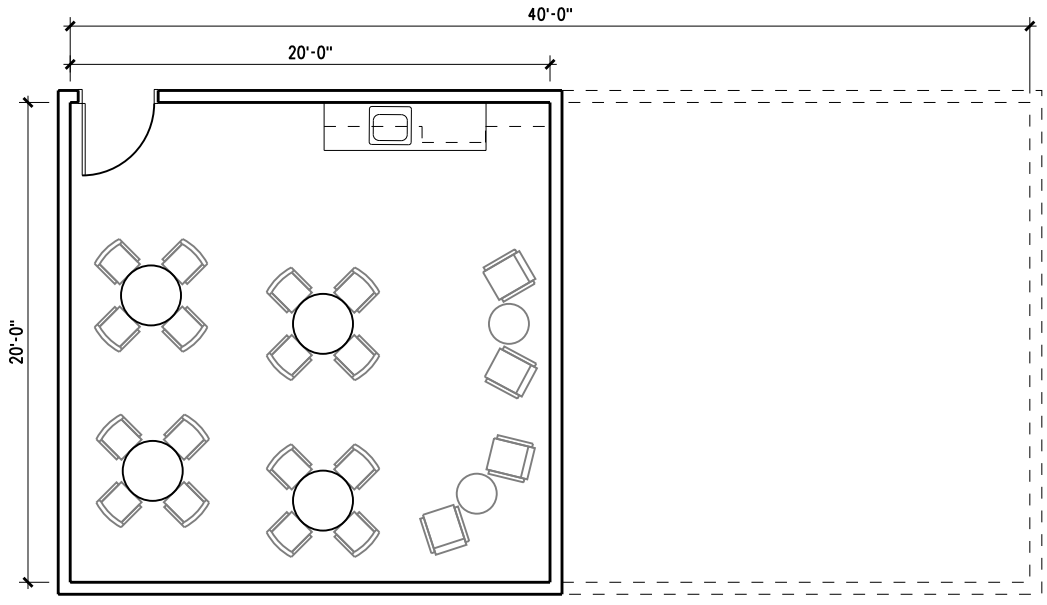
Floor	Carpet
Base	Resilient
Walls	Painted GWB and acoustic wall panels
Ceiling	ACT and GWB

UTILITIES:

Plumbing	Yes
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	None
HVAC/Controls	Yes

EQUIPMENT:

Fixed	Casework, sink, tackboard/whiteboard
Moveable	Owner-furnished microwave and refrigerator



4.24 FACULTY LOUNGE 400 ASF

Department:	Shared
Space ID:	5.17
Space Name:	Open Computer Lab
Occupants/space:	24
ASF:	1,280
No of spaces:	1

GENERAL:

Function	Student projects and study
Adjacencies	Centrally located
Ceiling Height	12’
Windows	Exterior with interior relites
Daylight Control	Blinds
Lighting	Ambient lighting, motion sensor control

FINISHES:

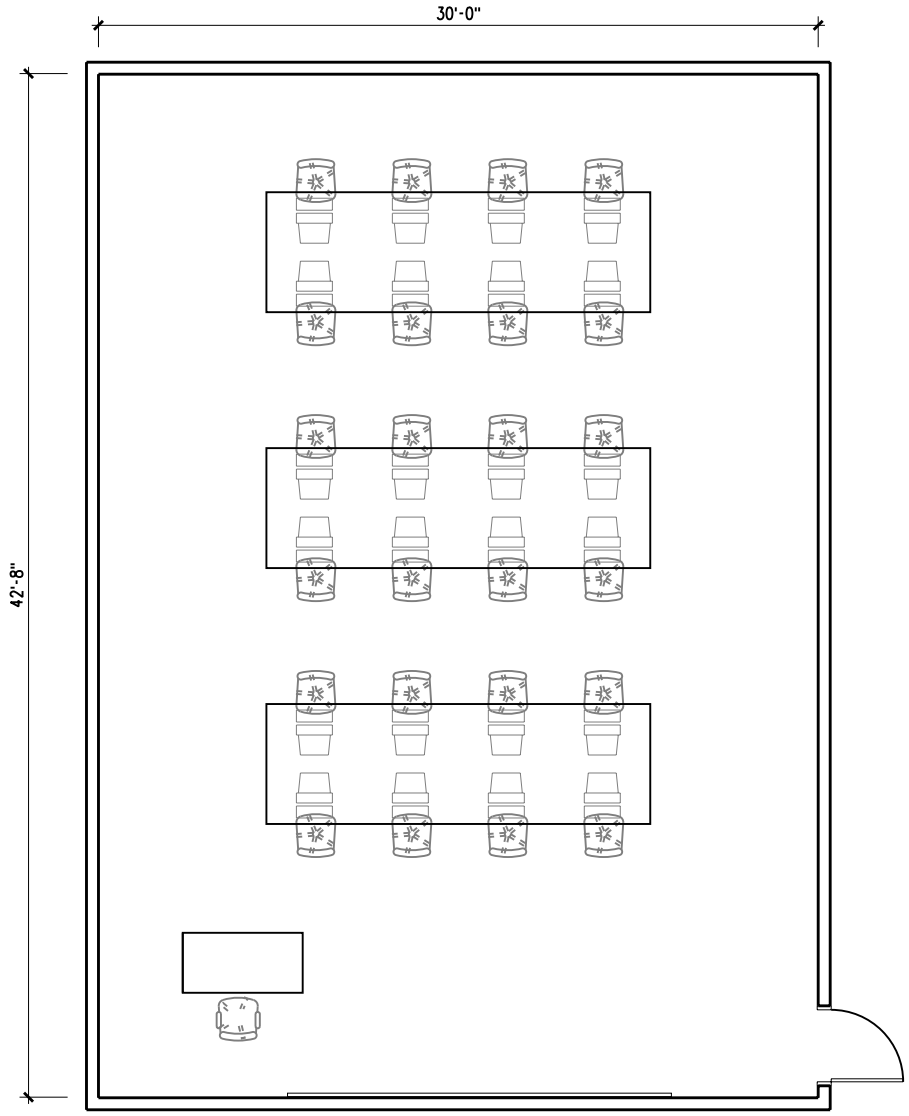
Floor	Carpet
Base	Resilient
Walls	Painted GWB and acoustic wall panels
Ceiling	ACT and GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand controlled

EQUIPMENT:

Fixed	Sliding whiteboard and tackboard
Moveable	Owner-furnished carrels, tables and chairs



5.17 OPEN COMPUTER LAB

Department:	Shared Facilities
Space ID:	5.19
Space Name:	Conference Room
Occupants/space:	30
ASF:	525
No of spaces:	1

GENERAL:

Function	Department Support
Adjacencies	Dean's Suite
Ceiling Height	10'
Windows	Exterior with interior relites
Daylight Control	Blinds, room darkening and blackout
Lighting	Indirect with focused lighting, motion sensor control

FINISHES:

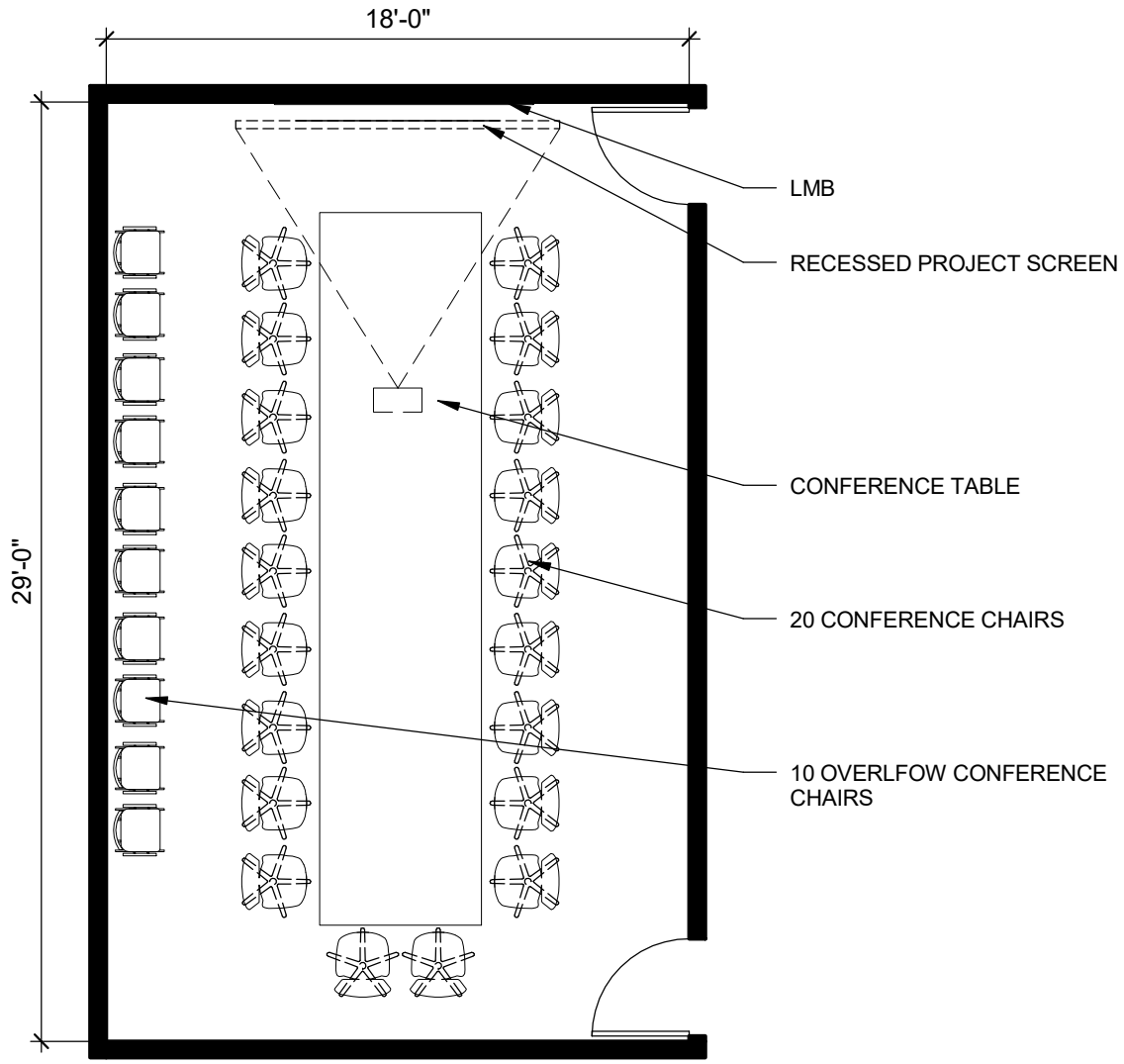
Floor	Carpet
Base	Resilient
Walls	Painted GWB, wood wainscot and chair rail and acoustical wall panels
Ceiling	ACT and GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Controlled ventilation, operable windows

EQUIPMENT:

Fixed	Projector screen and ceiling mounted projector support, white board
Moveable	Owner-furnished conference table and seating, AV rack and projector



5.19 CONFERENCE ROOM

0 1 2 4 8 16

DEPARTMENT: SHARED FACILITIES — **SPACE ID NO: 5.20**
SPACE NAME: HAZARDOUS WASTE STORAGE — **OCCUPANCY:**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	■
Industrial Cold Water (ICW)	■
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide (CO_2)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	■
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	■
Data	■
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

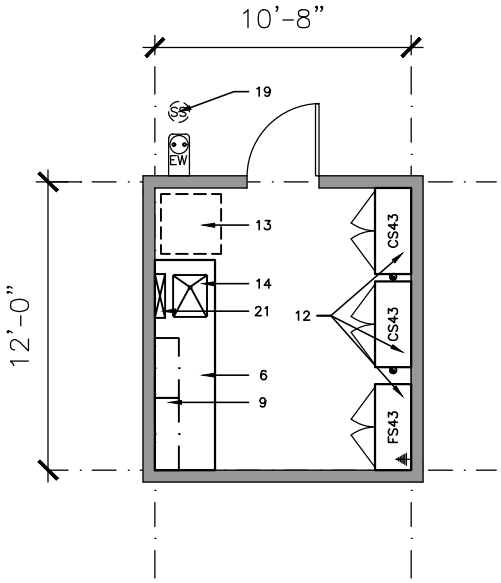
ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	■
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	■
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	■
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

DEPARTMENT: SHARED FACILITIES
SPACE NAME: HAZARDOUS WASTE STORAGE

SPACE ID NO.: 5.20
AREA NSF: 120

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
22. Moveable Demonstration Bench
23. Glassware Washer
24. Glassware Dryer
25. Autoclave
26. Moveable Laboratory Table
27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

DEPARTMENT: SHARED FACILITIES — **SPACE ID NO: 5.21**
SPACE NAME: CYLINDER STORAGE — **OCCUPANCY:**

UTILIZATION	
Hours of Use	
8 hours/day	
14 hours/day	■
24 hours/day	

MECHANICAL	
Temperature	
68°-75° ± 2°F	■
Other	
Humidity	
Uncontrolled	■
Other	
Minimum Air Changes/Hour	6
Air Recirculation	
Air Pressure Positive	
Air Pressure Negative	■
Additional Supply Air Filtration	
Additional Exhaust Air Filtration	

HOODS	
Chemical Fume Hood	
Radioisotope Hood	
Laminar Flow Hood	
Biological Safety Cabinet	
Snorkel	
Canopy Hood	
Low Slotted Exhaust	
Equipment Exhaust	
Other	

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

PLUMBING	
Laboratory Gas (LG)	
Laboratory Vacuum (LV)	
Laboratory Air (LA)	
Compressed Air, 100 psi (A)	
Industrial Hot Water (IHW)	
Industrial Cold Water (ICW)	
Potable Hot Water (HW)	
Potable Cold Water (CW)	
Purified Water (PW)	
Cooling Water (CHW S/R)	
Steam	
Condensate Return	
Carbon Dioxide ($C0_2$)	
Nitrogen Gas (N_2)	
Cylinder Gases	
Inert	
Flammable	
Toxic	
Floor Drain (FD)	
Floor Sink (FS)	
Safety Shower/Eyewash (SS)	
Drench Hose (DH)	

ELECTRICAL	
110V, 20A, 1 Phase	■
208V, 30A, 1 Phase	
208V, 30A, 3 Phase	
480V, 100A, 3 Phase	
Isolated Ground Outlet	
Emergency Power	
UPS (OFOI)	
Phone	
Data	
In Use Light	
Task Lighting	
Lighting Level	
100 fc at bench/desk	
75 fc at bench/desk	■
Safe light	
Special Lighting	
Darkenable	
Zoned Lighting	
Other	

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

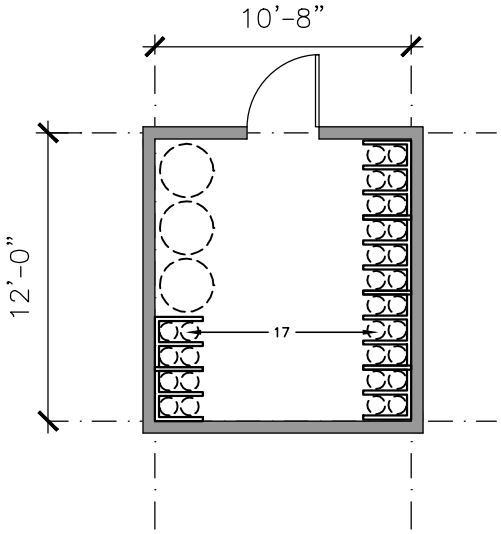
ARCHITECTURAL	
Floor	
Resilient Tile	
Welded Seam Sheet Vinyl	
Epoxy	
Sealed Concrete	■
Other	
Base	
4" Resilient	■
Integral w/floor	
Partitions	
Gyp Board, Epoxy Paint	
Gyp Board, Paint	■
Epoxy/Fiberglass System	
Other	
Ceiling	
Open	■
Acoustic Tile	
Gyp Board, Epoxy Paint	
Height	
Doors	
3'-6" x 7'	
3' x 7'	■
1'-6" x 7'	
Light Tight Rotating Door	
Vision Panel	
Natural Daylight	

REMARKS:

DEPARTMENT: SHARED FACILITIES
SPACE NAME: CYLINDER STORAGE

SPACE ID NO.: 5.21
AREA NSF: 120

This diagram is conceptual and is provided only to indicate required furnishings, equipment, and general room proportions. The actual room design may change.



0 1' 2' 4' 8'

FURNISHINGS

1. Chemical Fume Hood
2. Biological Safety Cabinet
3. Radioisotope Hood
4. Vented Workstation
5. Snorkel Exhaust
6. Laboratory Bench, Standing Height
7. Laboratory Bench, Sitting Height
8. Wall Cabinet
9. Adjustable Shelves
10. Reagent Shelves
11. Tall Storage Cabinet
12. Flammable / Corrosive Storage
13. Equipment Space
14. Laboratory Sink
15. Cupsink
16. Corrosives Storage Cabinet
17. Cylinder Rack
18. Gas Cabinet
19. Safety Shower/Eyewash
20. Overhead Service Carrier
21. Pipe Drop Enclosure
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27. Wire Shelving Units
28. White Markerboard
29. Black Chalkboard
30. Tackboard
31. Desk
32. Balance Table
33. Procedure Light
34. A/V Screen
35. Multi-Media Projector (Ceiling Mount)
36. File Cabinet
37. Coat/Book Bag Storage Unit

Department:	Dean's Suite
Space ID:	5.22
	5.23
	5.24
	5.25
	5.26
	5.27
Space Name:	Dean's Office
	Associate Dean Office
	Staff Office
	Waiting
	Work Room
	Conference Room
Occupants/space:	30
ASF:	525
No of spaces:	1

GENERAL:

Function	Department Support
Adjacencies	Dean's Suite
Ceiling Height	10'
Windows	Exterior with interior relites
Daylight Control	Blinds, room darkening and blackout (in Conference Room)
Lighting	Indirect with focused lighting, motion sensor control

FINISHES:

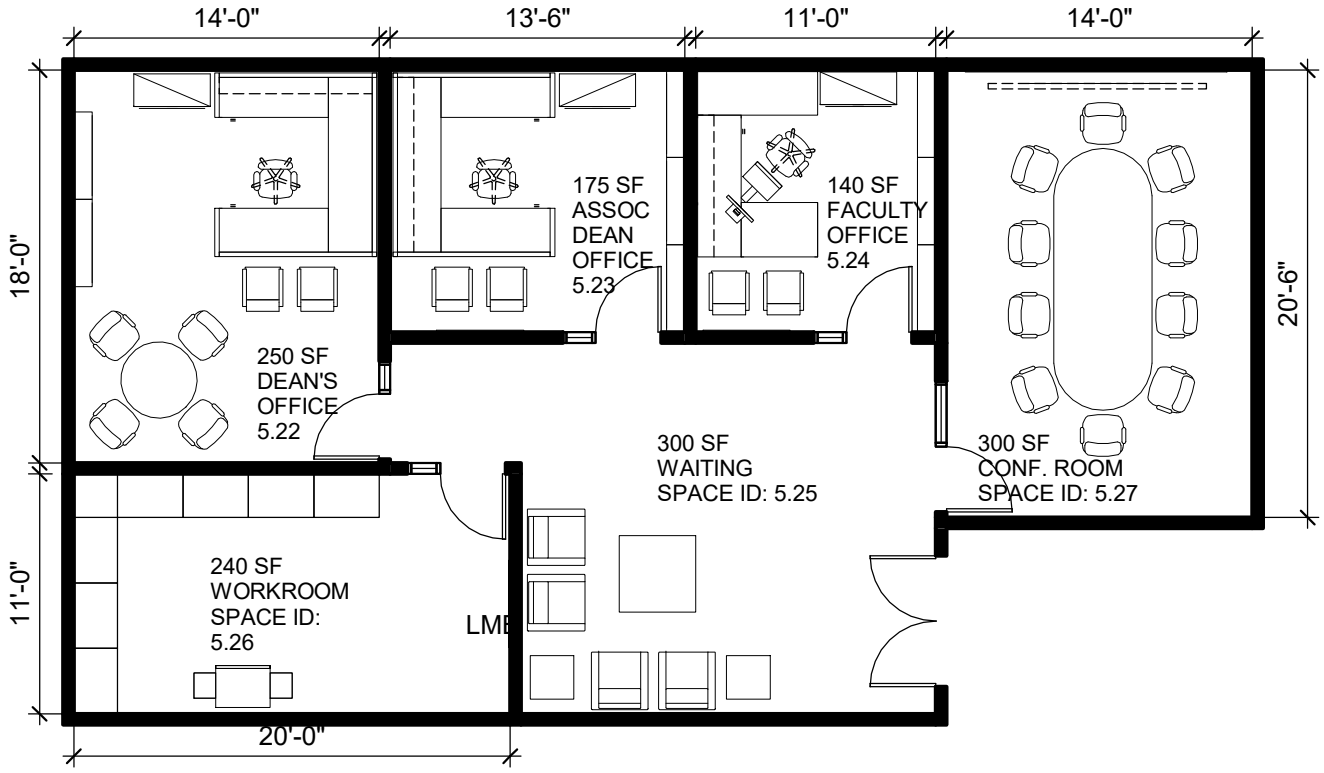
Floor	Carpet
Base	Resilient
Walls	Painted GWB, wood wainscot and chair rail and acoustical wall panels (in Conference Room)
Ceiling	ACT and GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Controlled

EQUIPMENT:

Fixed	Projector screen and ceiling mounted projector support, white board
Moveable	Owner-furnished desks, chairs, lounge furniture, conference table and seating, AV rack and projector



5.22 DEAN'S SUITE

Department:	Chemistry	Physics	Geology	Biology
Space ID:	6.1	6.1	6.1	6.1
Space Name:	Faculty Office Chair	Faculty Office Chair	Faculty Office Chair	Faculty Office Chair
Occupants/space:	1	1	1	1
ASF:	175	175	175	175
No of spaces:	1	1	1	1

GENERAL:

Function	Department head offices
Adjacencies	Departmental office/waiting, workroom and conference
Ceiling Height	10’
Windows	Exterior with interior relites
Daylight Control	Blinds
Lighting	Ambient office levels, motion sensor control

FINISHES:

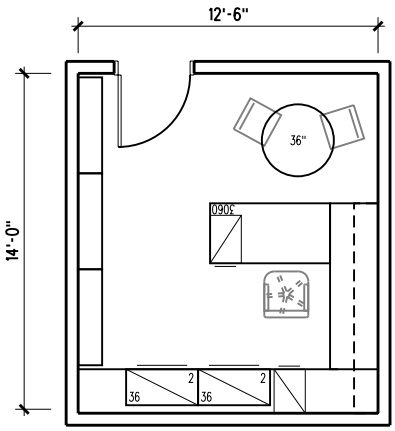
Floor	Carpet
Base	Resilient
Walls	Painted GWB
Ceiling	ACT

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	None
Data/Telecom	Yes
Audio-Visual	None
HVAC/Controls	Demand controlled ventilation, operable windows

EQUIPMENT:

Fixed	Built-in book shelves, tack/white board, coat hooks
Moveable	Owner-furnished desk, credenza, filing cabinets, meeting table & chairs



Department:	Chemistry	Physics	Geology	Biology
Space ID:	6.2	6.2	6.2	6.2
Space Name:	Faculty Office	Faculty Office	Faculty Office	Faculty Office
Occupants/space:	1	1	1	1
ASF:	140	140	140	140
No of spaces:	16	6	11	25

GENERAL:

Function	**Faculty and staff offices**
Adjacencies	**Departmental office/waiting, workroom and conference**
Ceiling Height	**10’**
Windows	**Operable exterior and interior relites**
Daylight Control	**Blinds**
Lighting	**Ambient office levels, motion sensor control**

FINISHES:

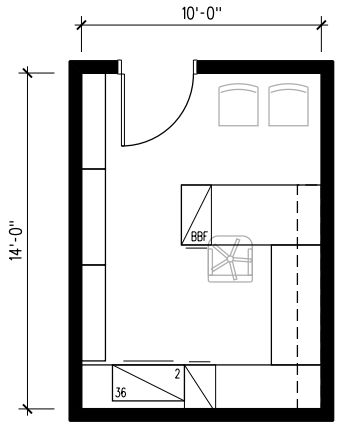
Floor	**Carpet**
Base	**Resilient**
Walls	**Painted GWB**
Ceiling	**ACT**

UTILITIES:

Plumbing	**None**
Electrical	**Duplex at selected locations**
Floor Boxes	**None**
Data/Telecom	**Yes**
Audio-Visual	**None**
HVAC/Controls	**Demand controlled ventilation, operable windows**

EQUIPMENT:

Fixed	**Built-in book shelves, tack/white board, coat hooks**
Moveable	**Owner-furnished desk, credenza, filing cabinets, chairs**



Department:	Biology
Space ID:	6.2
Space Name:	Operations Mgr. Office
Occupants/space:	1
ASF:	140
No of spaces:	1

GENERAL:

Function	**Faculty and staff offices**
Adjacencies	**Departmental office/waiting, workroom and conference**
Ceiling Height	**10’**
Windows	**Operable exterior and interior relites**
Daylight Control	**Blinds**
Lighting	**Ambient office levels, motion sensor control**

FINISHES:

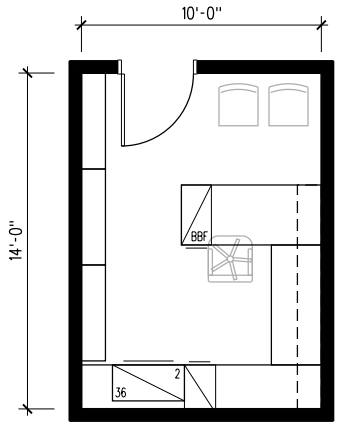
Floor	**Carpet**
Base	**Resilient**
Walls	**Painted GWB**
Ceiling	**ACT**

UTILITIES:

Plumbing	**None**
Electrical	**Duplex at selected locations**
Floor Boxes	**None**
Data/Telecom	**Yes**
Audio-Visual	**None**
HVAC/Controls	**Demand controlled ventilation, operable windows**

EQUIPMENT:

Fixed	**Built-in book shelves, tack/white board, coat hooks**
Moveable	**Owner-furnished desk, credenza, filing cabinets, chairs**



Department:	Chemistry	Physics	Geology
Space ID:	6.3	6.3	6.3
Space Name:	Dept. Office Waiting	Dept. Office Waiting	Dept. Office Waiting
Occupants/space:	1	1	1
ASF:	350	250	350
No of spaces:	1	1	1

GENERAL:

Function	Faculty and student support
Adjacencies	Workroom
Ceiling Height	10’
Windows	Exterior and interior relites
Daylight Control	Blinds
Lighting	Ambient office levels, motion sensor control

FINISHES:

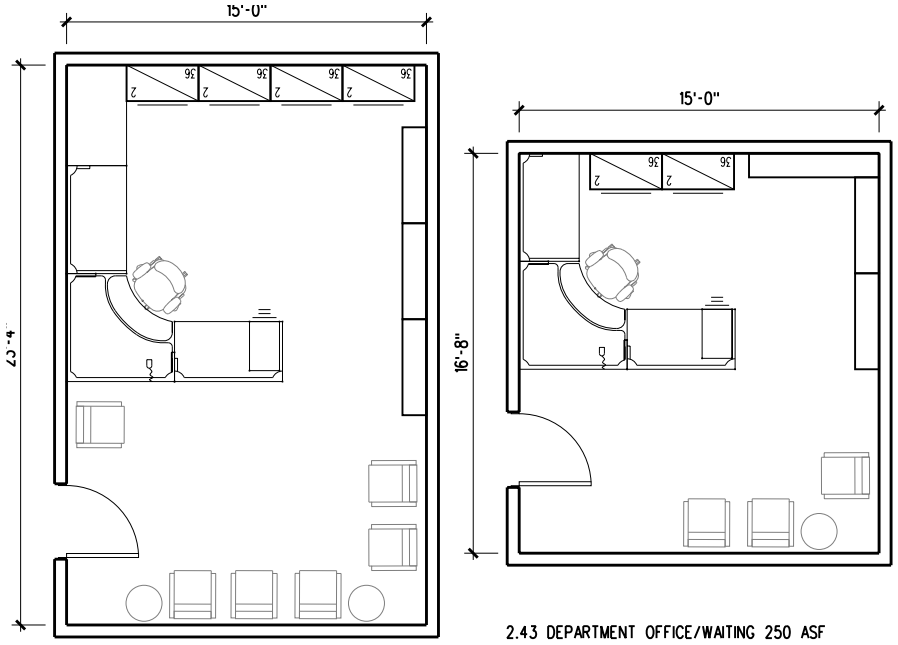
Floor	Carpet
Base	Resilient
Walls	Painted GWB
Ceiling	ACT

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	None
Data/Telecom	Yes
Audio-Visual	None
HVAC/Controls	Demand controlled ventilation

EQUIPMENT:

Fixed	None
Moveable	Owner-furnished desks, credenzas, filing cabinets, chairs, shelves



1.53 DEPARTMENT OFFICE/WAITING 350 ASF

2.43 DEPARTMENT OFFICE/WAITING 250 ASF

Department:	**Biology**
Space ID:	6.3
Space Name:	**Departmental Office/Waiting**
Occupants/space:	**2**
ASF:	**500**
No of spaces:	**1**

GENERAL:

Function	**Faculty and student support**
Adjacencies	**Workroom**
Ceiling Height	**10’**
Windows	**Exterior and interior relites**
Daylight Control	**Blinds**
Lighting	**Ambient office levels, motion sensor control**

FINISHES:

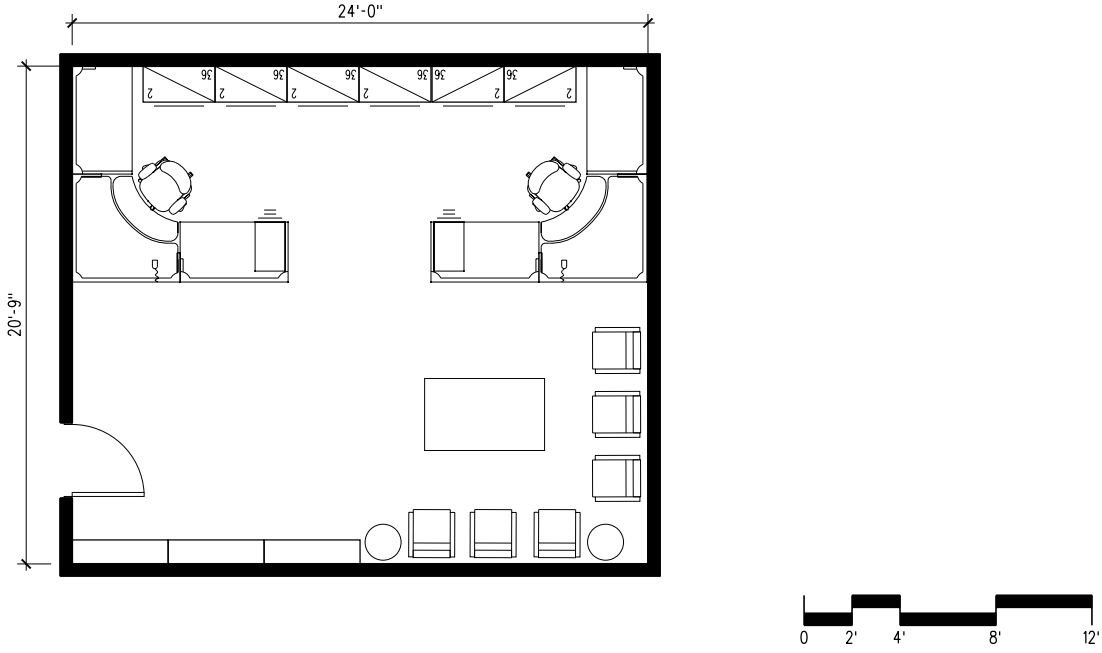
Floor	**Carpet**
Base	**Resilient**
Walls	**Painted GWB**
Ceiling	**ACT**

UTILITIES:

Plumbing	**None**
Electrical	**Duplex at selected locations**
Floor Boxes	**None**
Data/Telecom	**Yes**
Audio-Visual	**None**
HVAC/Controls	**Demand controlled ventilation**

EQUIPMENT:

Fixed	**None**
Moveable	**Owner-furnished desks, credenzas, filing cabinets, chairs, shelves**



Department:	Chemistry
Space ID:	6.4
Space Name:	Teaching Assistant Office
Occupants/space:	6
ASF:	140
No of spaces:	2

GENERAL:

Function	Student work stations
Adjacencies	Teaching and research labs
Ceiling Height	10’
Windows	Relites, exterior window optimal
Daylight Control	Blinds
Lighting	Ambient office levels, motion sensor control

FINISHES:

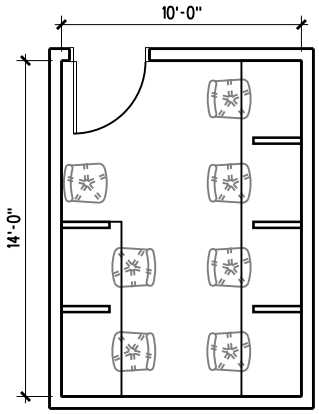
Floor	Carpet
Base	Resilient
Walls	Painted GWB
Ceiling	ACT

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	None
Data/Telecom	Yes
Audio-Visual	None
HVAC/Controls	Demand controlled ventilation, operable windows

EQUIPMENT:

Fixed	Tack/white board, coat hooks
Moveable	Owner-furnished carrels and chairs



Department:	Geology
Space ID:	6.4
Space Name:	Teaching Assistant Office
Occupants/space:	20
ASF:	750
No of spaces:	1

GENERAL:

Function	Student projects and study
Adjacencies	Teaching and research labs
Ceiling Height	12’
Windows	Exterior with interior relites
Daylight Control	Blinds
Lighting	Ambient lighting, motion sensor control

FINISHES:

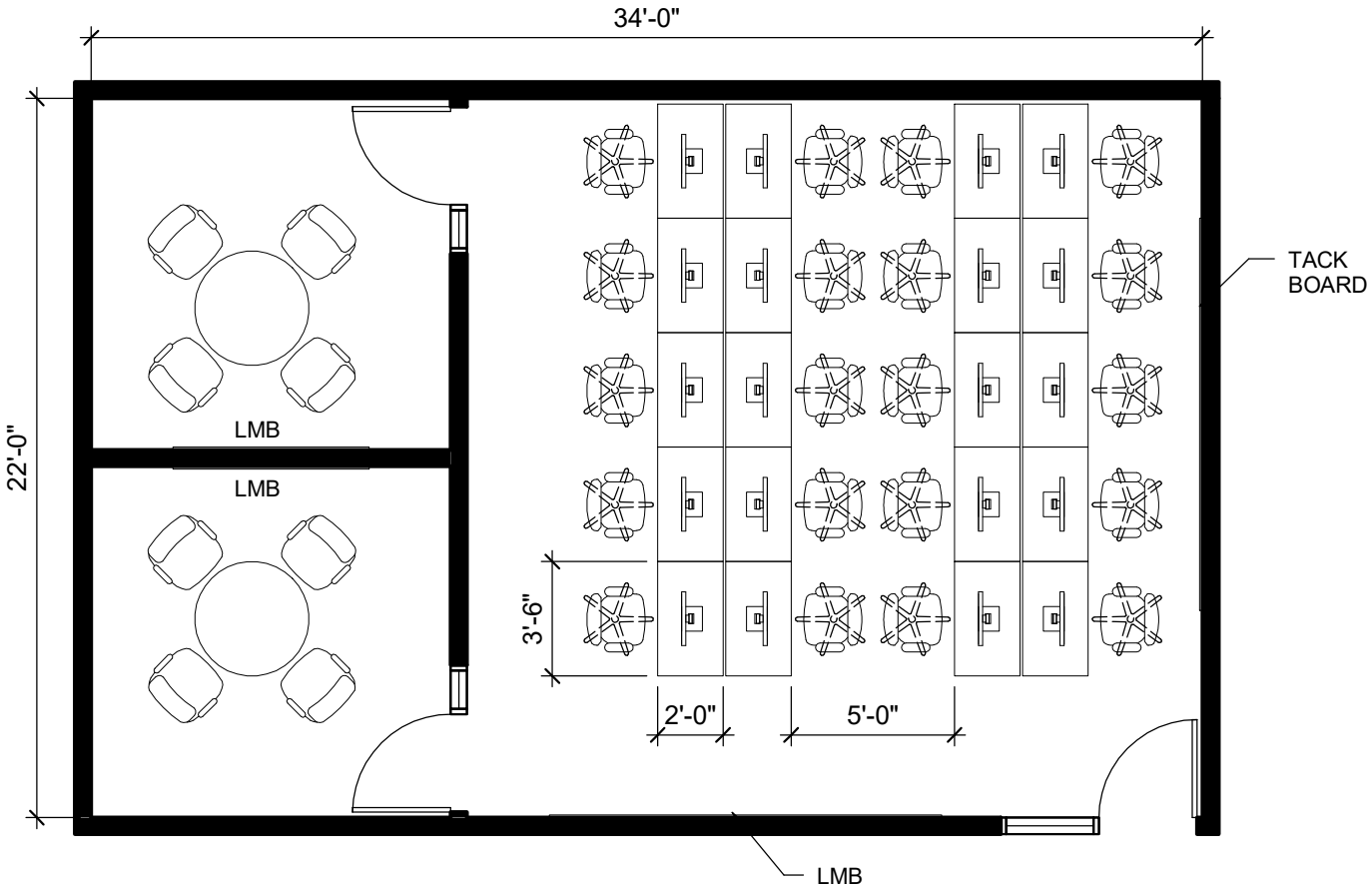
Floor	Carpet
Base	Resilient
Walls	Painted GWB
Ceiling	ACT and GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	Yes
Data/Telecom	Yes
Audio-Visual	Yes
HVAC/Controls	Demand Control

EQUIPMENT:

Fixed	Sliding whiteboard and tack board
Moveable	Owner-furnished carrels, chairs and conference room tables



6.4 TEACHING ASSISTANT OFFICE

0 1 2 4 8 16

Department:	**Biology**
Space ID:	6.4
Space Name:	**Graduate/Teaching Assistant Office**
Occupants/space:	**4**
ASF:	**140**
No of spaces:	**6**

GENERAL:

Function	**Student work stations**
Adjacencies	**Teaching and research labs**
Ceiling Height	**10’**
Windows	**Relites, exterior window optimal**
Daylight Control	**Blinds**
Lighting	**Ambient office levels, motion sensor control**

FINISHES:

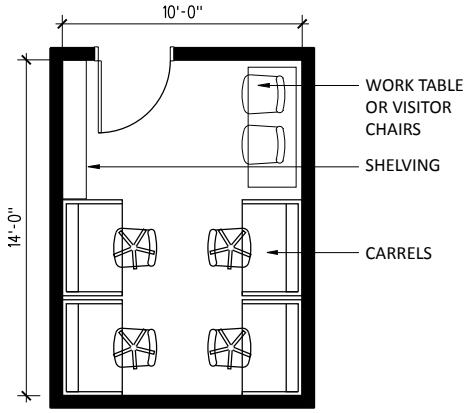
Floor	**Carpet**
Base	**Resilient**
Walls	**Painted GWB**
Ceiling	**ACT**

UTILITIES:

Plumbing	**None**
Electrical	**Duplex at selected locations**
Floor Boxes	**None**
Data/Telecom	**Yes**
Audio-Visual	**None**
HVAC/Controls	**Demand controlled ventilation, operable windows**

EQUIPMENT:

Fixed	**Tack/white board, coat hooks**
Moveable	**Owner-furnished carrels and chairs**



Department:	Chemistry	Physics
Space ID:	6.5	6.5
Space Name:	Tutoring Office	Tutoring Office
Occupants/space:	12	12
ASF:	280	280
No of spaces:	1	1

GENERAL:

Function	Tutoring
Adjacencies	Teaching and research labs
Ceiling Height	10’
Windows	Relites, exterior window optimal
Daylight Control	Blinds
Lighting	Ambient office levels, motion sensor control

FINISHES:

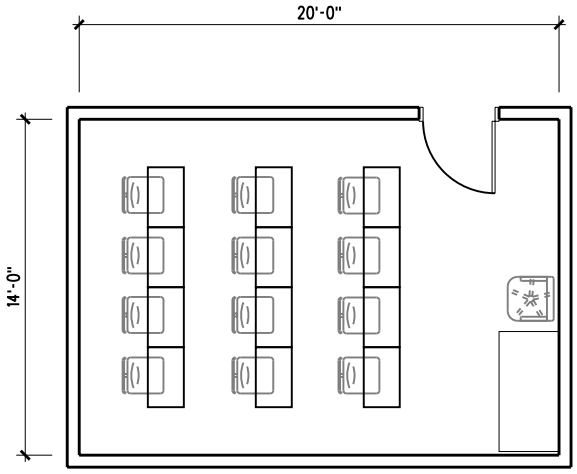
Floor	Carpet
Base	Resilient
Walls	Painted GWB
Ceiling	ACT

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	None
Data/Telecom	Yes
Audio-Visual	None
HVAC/Controls	Demand controlled ventilation

EQUIPMENT:

Fixed	Tack/white board, coat hooks
Moveable	Owner-furnished tables and chairs



Department:	Biology	Geology
Space ID:	6.6	6.6
Space Name:	Technician Office	GIS Technician Office
Occupants/space:	1	1
ASF:	120	120
No of spaces:	1	1

GENERAL:

Function	**Staff office**
Adjacencies	**Stock rooms, prep rooms, teaching labs**
Ceiling Height	**10’**
Windows	**Window into stock room**
Daylight Control	**None**
Lighting	**Ambient office levels, motion sensor control**

FINISHES:

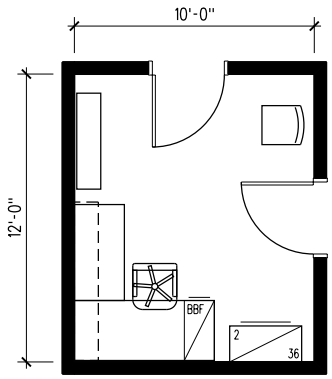
Floor	**Resilient**
Base	**Resilient**
Walls	**Painted GWB**
Ceiling	**ACT**

UTILITIES:

Plumbing	**None**
Electrical	**Duplex at selected locations**
Floor Boxes	**None**
Data/Telecom	**Yes**
Audio-Visual	**None**
HVAC/Controls	**Demand controlled ventilation**

EQUIPMENT:

Fixed	**Tack/white board, coat hooks**
Moveable	**Owner-furnished desk, credenza, filing cabinets, chairs**



Department:	Biology	Chemistry	Geology
Space ID:	6.7	6.7	6.7
Space Name:	Work Room	Work Room	Work Room
Occupants/space:	n/a	n/a	n/a
ASF:	200	140	140
No of spaces:	1	1	1

GENERAL:

Function	**Office support**
Adjacencies	**Department Office/Waiting**
Ceiling Height	**10’**
Windows	**Optimal but not required, relites**
Daylight Control	**As needed**
Lighting	**Ambient office levels, motion sensor control**

FINISHES:

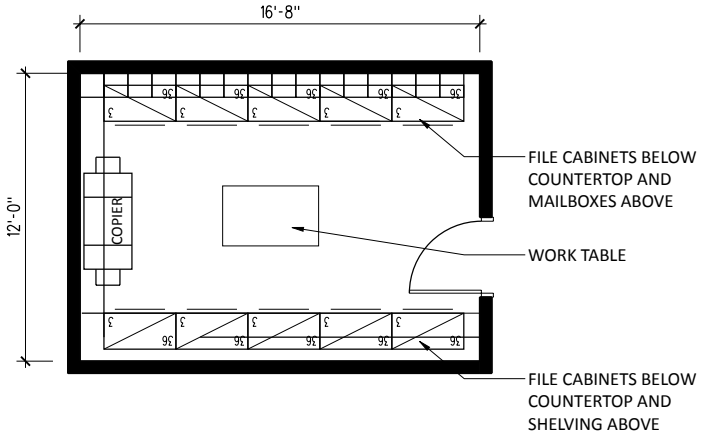
Floor	**Resilient**
Base	**Resilient**
Walls	**Painted GWB**
Ceiling	**ACT**

UTILITIES:

Plumbing	**None**
Electrical	**Duplex at selected locations**
Floor Boxes	**None**
Data/Telecom	**Yes**
Audio-Visual	**None**
HVAC/Controls	**Demand controlled ventilation**

EQUIPMENT:

Fixed	**Built-in casework, shelving, mailboxes, tack/white board**
Moveable	**Owner-furnished file cabinets, table**



Department:	Physics
Space ID:	6.8
Space Name:	Reading Room
Occupants/space:	10
ASF:	480
No of spaces:	1

GENERAL:

Function	Quiet study space with reference books
Adjacencies	Teaching Labs
Ceiling Height	10’
Windows	Exterior with interior relites
Daylight Control	Blinds
Lighting	Indirect with focused lighting, motion sensor control

FINISHES:

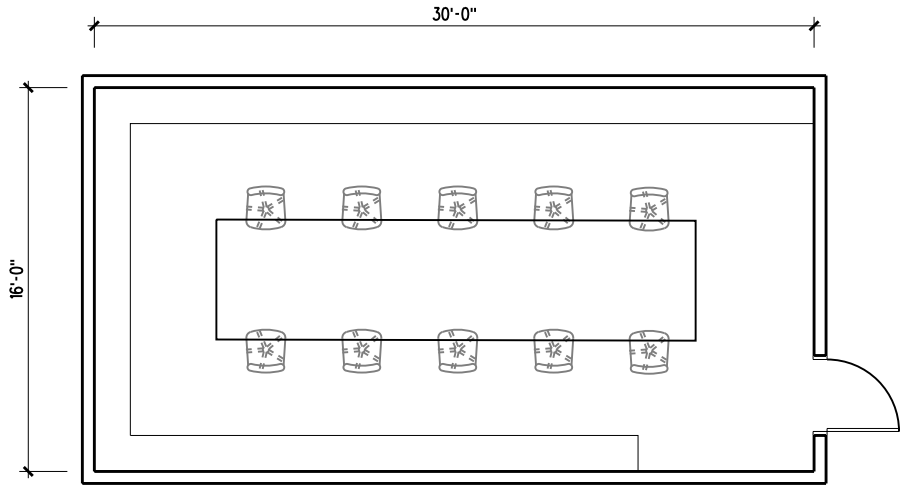
Floor	Carpet
Base	Resilient
Walls	Painted GWB
Ceiling	ACT and GWB

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	No
Data/Telecom	No
Audio-Visual	No
HVAC/Controls	Demand controlled

EQUIPMENT:

Fixed	Tackboard/white board
Moveable	Owner-furnished table, chairs and shelving



Department:	Biology
Space ID:	6.9
Space Name:	Storage
Occupants/space:	n/a
ASF:	140
No of spaces:	1

GENERAL:

Function	Storage
Adjacencies	n/a
Ceiling Height	9’
Windows	None
Daylight Control	None
Lighting	General purpose, motion sensor control

FINISHES:

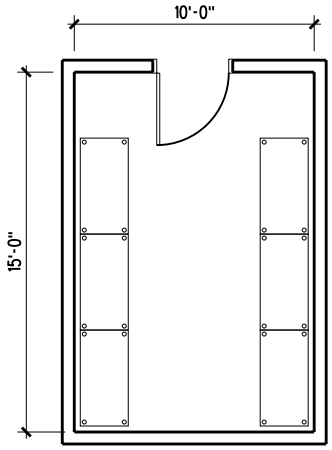
Floor	Resilient
Base	Resilient
Walls	Painted GWB
Ceiling	ACT

UTILITIES:

Plumbing	None
Electrical	Duplex at selected locations
Floor Boxes	None
Data/Telecom	None
Audio-Visual	None
HVAC/Controls	Yes

EQUIPMENT:

Fixed	None
Moveable	Owner-furnished shelving or none



appendix d
project budget unit cost detail

STATE OF WASHINGTON
AGENCY / INSTITUTION PROJECT COST SUMMARY

Agency	Eastern Washington University
Project Name	Science Renovation - Phase 1
OFM Project Number	

Contact Information	
Name	Jeff Weaver / Roen Associates
Phone Number	(509)838-8688
Email	jeffw@roenassociates.com

Statistics			
Gross Square Feet	73,498	MACC per Square Foot	$400
Usable Square Feet	50,787	Escalated MACC per Square Foot	$449
Space Efficiency	69.1%	A/E Fee Class	A
Construction Type	Laboratories (Research)	A/E Fee Percentage	10.82%
Remodel	Yes	Projected Life of Asset (Years)	50
Additional Project Details			
Alternative Public Works Project	No	Art Requirement Applies	Yes
Inflation Rate	3.08%	Higher Ed Institution	Yes
Sales Tax Rate %	8.70%	Location Used for Tax Rate	3,202
Contingency Rate	9%		
Base Month	July-16		
Project Administered By	Agency		

Schedule			
Predesign Start	January-16	Predesign End	July-16
Design Start	January-18	Design End	June-19
Construction Start	September-19	Construction End	January-21
Construction Duration	16 Months		

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Project Cost Estimate

Total Project	**$45,922,002**	Total Project Escalated	**$51,344,039**
		Rounded Escalated Total	**$51,344,000**

STATE OF WASHINGTON
AGENCY / INSTITUTION PROJECT COST SUMMARY

Agency	Eastern Washington University	
Project Name	Science Renovation - Phase 1	
OFM Project Number		

Cost Estimate Summary

Acquisition			
Acquisition Subtotal	**$0**	**Acquisition Subtotal Escalated**	**$0**

Consultant Services			
Predesign Services	$231,457		
A/E Basic Design Services	$2,394,846		
Extra Services	$1,270,000		
Other Services	$2,529,632		
Design Services Contingency	$578,334		
Consultant Services Subtotal	**$7,004,269**	**Consultant Services Subtotal Escalated**	**$7,653,255**

Construction			
Construction Contingencies	$2,643,076	Construction Contingencies Escalated	$2,969,496
Maximum Allowable Construction Cost (MACC)	$29,367,508	Maximum Allowable Construction Cost (MACC) Escalated	$32,989,005
Sales Tax	$2,784,921	Sales Tax Escalated	$3,128,390
Construction Subtotal	**$34,942,342**	**Construction Subtotal Escalated**	**$39,251,863**

Equipment			
Equipment	$1,836,000		
Sales Tax	$159,732		
Non-Taxable Items	$0		
Equipment Subtotal	**$1,995,732**	**Equipment Subtotal Escalated**	**$2,242,205**

Artwork			
Artwork Subtotal	**$164,945**	**Artwork Subtotal Escalated**	**$164,945**

Agency Project Administration			
Agency Project Administration Subtotal	$1,502,302		
DES Additional Services Subtotal	$0		
Other Project Admin Costs	$0		
Project Administration Subtotal	**$1,502,302**	**Project Administation Subtotal Escalated**	**$1,687,836**

Other Costs			
Other Costs Subtotal	**$312,412**	**Other Costs Subtotal Escalated**	**$343,935**

Project Cost Estimate

Total Project	**$45,922,002**	Total Project Escalated	**$51,344,039**
		Rounded Escalated Total	**$51,344,000**

Cost Estimate Details

Acquisition Costs					
Item	**Base Amount**		**Escalation Factor**	**Escalated Cost**	**Notes**
Purchase/Lease					
Appraisal and Closing					
Right of Way					
Demolition					
Pre-Site Development					
Other					
Insert Row Here					
ACQUISITION TOTAL	**$0**		**NA**	**$0**	

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Cost Estimate Details

Consultant Services				
Item	**Base Amount**	**Escalation Factor**	**Escalated Cost**	**Notes**
1) Pre-Schematic Design Services				
Programming/Site Analysis				
Environmental Analysis				
Predesign Study	$231,457			
Other				
Insert Row Here				
Sub TOTAL	**$231,457**	**1.0467**	**$242,267**	Escalated to Design Start
2) Construction Documents				
A/E Basic Design Services	$2,389,846			69% of A/E Basic Services
Specialized Design Consulting	$5,000			
Insert Row Here				
Sub TOTAL	**$2,394,846**	**1.0694**	**$2,561,049**	Escalated to Mid-Design
3) Extra Services				
Civil Design (Above Basic Svcs)	$150,000			
Geotechnical Investigation	$15,000			
Commissioning	$150,000			
Site Survey	$15,000			
Testing	$150,000			
LEED Services	$100,000			
Voice/Data Consultant	$95,000			
Value Engineering	$80,000			
Constructability Review	$80,000			
Environmental Mitigation (EIS)	$40,000			
Landscape Consultant	$45,000			
ELCCA	$60,000			
LCCA	$80,000			
Laboratory Consulting	$180,000			
Record Drawings	$30,000			
Sub TOTAL	**$1,270,000**	**1.0694**	**$1,358,138**	Escalated to Mid-Design
4) Other Services				
Bid/Construction/Closeout	$1,073,699			31% of A/E Basic Services
HVAC Balancing	$50,000			
Staffing				
Phasing Masterplan	$665,968			
Utility / Infrastructure Phasing	$739,965			
Sub TOTAL	**$2,529,632**	**1.1235**	**$2,842,042**	Escalated to Mid-Const.
5) Design Services Contingency				
Design Services Contingency	$578,334			
Other				
Insert Row Here				
Sub TOTAL	**$578,334**	**1.1235**	**$649,759**	Escalated to Mid-Const.
CONSULTANT SERVICES TOTAL	**$7,004,269**		**$7,653,255**	

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Cost Estimate Details

Construction Contracts				
Item	**Base Amount**	**Escalation Factor**	**Escalated Cost**	**Notes**
1) Site Work				
G10 - Site Preparation	$29,300			
G20 - Site Improvements	$99,034			
G30 - Site Mechanical Utilities	$0			
G40 - Site Electrical Utilities	$110,240			
G60 - Other Site Construction	$0			
Other	$0			
Insert Row Here	$0			
Sub TOTAL	**$238,574**	**1.1009**	**$262,647**	
2) Related Project Costs				
Offsite Improvements	$0			
City Utilities Relocation	$0			
Parking Mitigation	$0			
Stormwater Retention/Detention	$0			
Other	$0			
Insert Row Here	$0			
Sub TOTAL	**$0**	**1.1009**	**$0**	
3) Facility Construction				
A10 - Foundations	$39,706			
A20 - Basement Construction	$0			
B10 - Superstructure	$338,326			
B20 - Exterior Closure	$386,096			
B30 - Roofing	$939,263			
C10 - Interior Construction	$2,085,216			
C20 - Stairs	$88,964			
C30 - Interior Finishes	$1,941,469			
D10 - Conveying	$137,800			
D20 - Plumbing Systems	$1,879,671			
D30 - HVAC Systems	$5,422,361			
D40 - Fire Protection Systems	$301,989			
D50 - Electrical Systems	$4,189,120			
F10 - Special Construction	$388,376			
F20 - Selective Demolition	$925,042			
General Conditions	$1,389,024			
E20 - CFCI Lab Casework/Casework/Blinds	$3,840,151			
Insulate Exterior Walls 1960 Structure	$276,830			
Replace Exterior Storefront System	$829,147			
E10 - CFCI Kitchen/AV Equipment	$44,096			
Design/Estimating Contingency @ 15%	$3,686,287			
Sub TOTAL	**$29,128,934**	**1.1235**	**$32,726,358**	
4) Maximum Allowable Construction Cost				
MACC Sub TOTAL	**$29,367,508**		**$32,989,005**	

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7) Construction Contingency				
Allowance for Change Orders	$2,643,076			
Other				
Insert Row Here				
Sub TOTAL	**$2,643,076**	**1.1235**	**$2,969,496**	
8) Non-Taxable Items				
Building Permits at 0.5%	$146,838			
Insert Row Here				
Sub TOTAL	**$146,838**	**1.1235**	**$164,972**	
Sales Tax				
Sub TOTAL	**$2,784,921**		**$3,128,390**	
CONSTRUCTION CONTRACTS TOTAL	**$34,942,342**		**$39,251,863**	

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Cost Estimate Details

Equipment				
Item	**Base Amount**	**Escalation Factor**	**Escalated Cost**	**Notes**
E10 - Equipment	$711,000			
E20 - Furnishings	$1,125,000			
F10 - Special Construction				
Other				
Insert Row Here				
Sub TOTAL	**$1,836,000**	**1.1235**	**$2,062,746**	
1) Non Taxable Items				
Other				
Insert Row Here				
Sub TOTAL	**$0**	**1.1235**	**$0**	
Sales Tax				
Sub TOTAL	**$159,732**		**$179,459**	
EQUIPMENT TOTAL	**$1,995,732**		**$2,242,205**	

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Cost Estimate Details

Artwork					
Item	**Base Amount**		**Escalation Factor**	**Escalated Cost**	**Notes**
Project Artwork	$0				0.5% of Escalated MACC for new construction
Higher Ed Artwork	$164,945				0.5% of Escalated MACC for new and renewal construction
Other					
Insert Row Here					
ARTWORK TOTAL	**$164,945**		**NA**	**$164,945**	

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Cost Estimate Details

Project Management					
Item	**Base Amount**		**Escalation Factor**	**Escalated Cost**	**Notes**
Agency Project Management	$1,502,302				
Additional Services					
Other					
Insert Row Here					
PROJECT MANAGEMENT TOTAL	**$1,502,302**		**1.1235**	**$1,687,836**	

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Cost Estimate Details

Other Costs					
Item	**Base Amount**		**Escalation Factor**	**Escalated Cost**	**Notes**
Mitigation Costs					
Hazardous Material Remediation/Removal	$300,000				
Historic and Archeological Mitigation					
Other					
In Plant Services	$11,412				
Hazmat Testing	$1,000				
Insert Row Here					
OTHER COSTS TOTAL	**$312,412**		**1.1009**	**$343,935**	

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C-100(2014)
Additional Notes

Tab A. Acquisition
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Tab B. Consultant Services
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Tab C. Construction Contracts
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Tab D. Equipment
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Tab E. Artwork
Insert Row Here

Tab F. Project Management
Insert Row Here

Tab G. Other Costs
Insert Row Here

STATE OF WASHINGTON
AGENCY / INSTITUTION PROJECT COST SUMMARY

Agency	Eastern Washington University
Project Name	Science Renovation - Phase 2
OFM Project Number	

Contact Information	
Name	Jeff Weaver / Roen Associates
Phone Number	(509)838-8688
Email	jeffw@roenassociates.com

Statistics			
Gross Square Feet	73,498	MACC per Square Foot	$400
Usable Square Feet	50,787	Escalated MACC per Square Foot	$477
Space Efficiency	69.1%	A/E Fee Class	A
Construction Type	Laboratories (Research)	A/E Fee Percentage	10.82%
Remodel	Yes	Projected Life of Asset (Years)	50
Additional Project Details			
Alternative Public Works Project	No	Art Requirement Applies	Yes
Inflation Rate	3.08%	Higher Ed Institution	Yes
Sales Tax Rate %	8.70%	Location Used for Tax Rate	3,202
Contingency Rate	9%		
Base Month	July-16		
Project Administered By	Agency		

Schedule			
Predesign Start	January-16	Predesign End	July-16
Design Start	July-20	Design End	June-21
Construction Start	September-21	Construction End	January-23
Construction Duration	16 Months		

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Project Cost Estimate

Total Project	**$44,341,316**	Total Project Escalated	**$52,692,852**
		Rounded Escalated Total	**$52,693,000**

STATE OF WASHINGTON AGENCY / INSTITUTION PROJECT COST SUMMARY		
Agency	Eastern Washington University	
Project Name	Science Renovation - Phase 2	
OFM Project Number		

Cost Estimate Summary

Acquisition			
Acquisition Subtotal	**$0**	**Acquisition Subtotal Escalated**	**$0**

Consultant Services			
Predesign Services	$231,457		
A/E Basic Design Services	$2,394,846		
Extra Services	$1,270,000		
Other Services	$1,123,699		
Design Services Contingency	$451,800		
Consultant Services Subtotal	**$5,471,802**	**Consultant Services Subtotal Escalated**	**$6,338,054**

Construction			
Construction Contingencies	$2,643,076	Construction Contingencies Escalated	$3,155,304
Maximum Allowable Construction Cost (MACC)	$29,367,508	Maximum Allowable Construction Cost (MACC) Escalated	$35,053,230
Sales Tax	$2,784,921	Sales Tax Escalated	$3,324,143
Construction Subtotal	**$34,942,342**	**Construction Subtotal Escalated**	**$41,707,972**

Equipment			
Equipment	$1,836,000		
Sales Tax	$159,732		
Non-Taxable Items	$0		
Equipment Subtotal	**$1,995,732**	**Equipment Subtotal Escalated**	**$2,382,506**

Artwork			
Artwork Subtotal	**$175,266**	**Artwork Subtotal Escalated**	**$175,266**

Agency Project Administration			
Agency Project Administration Subtotal	$1,443,761		
DES Additional Services Subtotal	$0		
Other Project Admin Costs	$0		
Project Administration Subtotal	**$1,443,761**	**Project Administation Subtotal Escalated**	**$1,723,563**

Other Costs			
Other Costs Subtotal	**$312,412**	**Other Costs Subtotal Escalated**	**$365,491**

Project Cost Estimate			
Total Project	**$44,341,316**	Total Project Escalated	**$52,692,852**
		Rounded Escalated Total	**$52,693,000**

Cost Estimate Details

Acquisition Costs					
Item	**Base Amount**		**Escalation Factor**	**Escalated Cost**	**Notes**
Purchase/Lease					
Appraisal and Closing					
Right of Way					
Demolition					
Pre-Site Development					
Other					
Insert Row Here					
ACQUISITION TOTAL	**$0**		**NA**	**$0**	

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Cost Estimate Details

Consultant Services				
Item	**Base Amount**	**Escalation Factor**	**Escalated Cost**	**Notes**
1) Pre-Schematic Design Services				
Programming/Site Analysis				
Environmental Analysis				
Predesign Study	$231,457			
Other				
Insert Row Here				
Sub TOTAL	**$231,457**	**1.1291**	**$261,339**	Escalated to Design Start
2) Construction Documents				
A/E Basic Design Services	$2,389,846			69% of A/E Basic Services
Specialized Design Consulting	$5,000			
Insert Row Here				
Sub TOTAL	**$2,394,846**	**1.1449**	**$2,741,860**	Escalated to Mid-Design
3) Extra Services				
Civil Design (Above Basic Svcs)	$150,000			
Geotechnical Investigation	$15,000			
Commissioning	$150,000			
Site Survey	$15,000			
Testing	$150,000			
LEED Services	$100,000			
Voice/Data Consultant	$95,000			
Value Engineering	$80,000			
Constructability Review	$80,000			
Environmental Mitigation (EIS)	$40,000			
Landscape Consultant	$45,000			
ELCCA	$60,000			
LCCA	$80,000			
Laboratory Consulting	$180,000			
Record Drawings	$30,000			
Sub TOTAL	**$1,270,000**	**1.1449**	**$1,454,023**	Escalated to Mid-Design
4) Other Services				
Bid/Construction/Closeout	$1,073,699			31% of A/E Basic Services
HVAC Balancing	$50,000			
Staffing				
Other				
Insert Row Here				
Sub TOTAL	**$1,123,699**	**1.1938**	**$1,341,472**	Escalated to Mid-Const.
5) Design Services Contingency				
Design Services Contingency	$451,800			
Other				
Insert Row Here				
Sub TOTAL	**$451,800**	**1.1938**	**$539,360**	Escalated to Mid-Const.
CONSULTANT SERVICES TOTAL	**$5,471,802**		**$6,338,054**	

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Cost Estimate Details

Construction Contracts				
Item	**Base Amount**	**Escalation Factor**	**Escalated Cost**	**Notes**
1) Site Work				
G10 - Site Preparation	$29,300			
G20 - Site Improvements	$99,034			
G30 - Site Mechanical Utilities	$0			
G40 - Site Electrical Utilities	$110,240			
G60 - Other Site Construction	$0			
Other	$0			
Insert Row Here	$0			
Sub TOTAL	**$238,574**	**1.1699**	**$279,108**	
2) Related Project Costs				
Offsite Improvements	$0			
City Utilities Relocation	$0			
Parking Mitigation	$0			
Stormwater Retention/Detention	$0			
Other	$0			
Insert Row Here	$0			
Sub TOTAL	**$0**	**1.1699**	**$0**	
3) Facility Construction				
A10 - Foundations	$39,706			
A20 - Basement Construction	$0			
B10 - Superstructure	$338,326			
B20 - Exterior Closure	$386,096			
B30 - Roofing	$939,263			
C10 - Interior Construction	$2,085,216			
C20 - Stairs	$88,964			
C30 - Interior Finishes	$1,941,469			
D10 - Conveying	$137,800			
D20 - Plumbing Systems	$1,879,671			
D30 - HVAC Systems	$5,422,361			
D40 - Fire Protection Systems	$301,989			
D50 - Electrical Systems	$4,189,120			
F10 - Special Construction	$388,376			
F20 - Selective Demolition	$925,042			
General Conditions	$1,389,024			
E20 - CFCI Lab Casework/Casework/Blinds	$3,840,151			
Insulate Exterior Walls 1960 Structure	$276,830			
Replace Exterior Storefront System	$829,147			
E10 - CFCI Kitchen/AV Equipment	$44,096			
Design/Estimating Contingency @ 15%	$3,686,287			
Sub TOTAL	**$29,128,934**	**1.1938**	**$34,774,122**	
4) Maximum Allowable Construction Cost				
MACC Sub TOTAL	**$29,367,508**		**$35,053,230**	

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7) Construction Contingency				
Allowance for Change Orders	$2,643,076			
Other				
Insert Row Here				
Sub TOTAL	**$2,643,076**	**1.1938**	**$3,155,304**	
8) Non-Taxable Items				
Building Permits at 0.5%	$146,838			
Insert Row Here				
Sub TOTAL	**$146,838**	**1.1938**	**$175,295**	
Sales Tax				
Sub TOTAL	**$2,784,921**		**$3,324,143**	
CONSTRUCTION CONTRACTS TOTAL	**$34,942,342**		**$41,707,972**	

Green cells must be filled in by user

Cost Estimate Details

Equipment				
Item	**Base Amount**	**Escalation Factor**	**Escalated Cost**	**Notes**
E10 - Equipment	$711,000			
E20 - Furnishings	$1,125,000			
F10 - Special Construction				
Other				
Insert Row Here				
Sub TOTAL	**$1,836,000**	**1.1938**	**$2,191,817**	
1) Non Taxable Items				
Other				
Insert Row Here				
Sub TOTAL	**$0**	**1.1938**	**$0**	
Sales Tax				
Sub TOTAL	**$159,732**		**$190,689**	
EQUIPMENT TOTAL	**$1,995,732**		**$2,382,506**	

Green cells must be filled in by user

Cost Estimate Details

Artwork					
Item	**Base Amount**		**Escalation Factor**	**Escalated Cost**	**Notes**
Project Artwork	$0				0.5% of Escalated MACC for new construction
Higher Ed Artwork	$175,266				0.5% of Escalated MACC for new and renewal construction
Other					
Insert Row Here					
ARTWORK TOTAL	**$175,266**		**NA**	**$175,266**	

Green cells must be filled in by user

Cost Estimate Details

Project Management					
Item	**Base Amount**		**Escalation Factor**	**Escalated Cost**	**Notes**
Agency Project Management	$1,443,761				
Additional Services					
Other					
Insert Row Here					
PROJECT MANAGEMENT TOTAL	**$1,443,761**		**1.1938**	**$1,723,563**	

Green cells must be filled in by user

Cost Estimate Details

Other Costs					
Item	**Base Amount**		**Escalation Factor**	**Escalated Cost**	**Notes**
Mitigation Costs					
Hazardous Material Remediation/Removal	$300,000				
Historic and Archeological Mitigation					
Other					
In Plant Services	$11,412				
Hazmat Testing	$1,000				
Insert Row Here					
OTHER COSTS TOTAL	**$312,412**		**1.1699**	**$365,491**	

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C-100(2014)
Additional Notes

Tab A. Acquisition
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Tab B. Consultant Services
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Tab C. Construction Contracts
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Tab D. Equipment
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Tab E. Artwork
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Tab F. Project Management
Insert Row Here

Tab G. Other Costs
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Roen Associates
911 Western Avenue, Suite 204
Seattle, WA 98104-1031

EWU Science
Pre-Design Estimate
Integrus Architects

ROEN ASSOCIATES

Project Owner:	**Eastern Washington University**	Architect:	Integrus
Project Name:	**Science 1 Renovation Predesign**	Duration:	28
Project Location:	Cheney, WA	Project GSF:	146,996
Start Date:	September 2019	Site GSF:	
Estimate Date:	May 31, 2016		

ESTIMATE SUMMARY							50.00%	50.00%	
No.	Description	Renovation - Two Phase	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost		Phase 1	Phase 2
A10	Foundations		146,996	BGSF	$0.49	$72,035	$79,411	**$39,706**	**$39,706**
A20	Basement Construction		146,996	BGSF	$0.00	$0	$0	**$0**	**$0**
B10	Superstructure		146,996	BGSF	$4.18	$613,799	$676,652	**$338,326**	**$338,326**
B20	Exterior Enclosure		146,996	BGSF	$4.77	$700,464	$772,192	**$386,096**	**$386,096**
B30	Roofing		146,996	BGSF	$11.59	$1,704,033	$1,878,526	**$939,263**	**$939,263**
C10	Interior Construction		146,996	BGSF	$25.74	$3,783,048	$4,170,432	**$2,085,216**	**$2,085,216**
C20	Stairs		146,996	BGSF	$1.10	$161,400	$177,927	**$88,964**	**$88,964**
C30	Interior Finishes		146,996	BGSF	$23.96	$3,522,259	$3,882,938	**$1,941,469**	**$1,941,469**
D10	Conveying Systems		146,996	BGSF	$1.70	$250,000	$275,600	**$137,800**	**$137,800**
D20	Plumbing		146,996	BGSF	$23.20	$3,410,144	$3,759,343	**$1,879,671**	**$1,879,671**
D30	HVAC		146,996	BGSF	$66.92	$9,837,375	$10,844,722	**$5,422,361**	**$5,422,361**
D40	Fire Protection		146,996	BGSF	$3.73	$547,875	$603,977	**$301,989**	**$301,989**
D50	Electrical		146,996	BGSF	$51.70	$7,600,000	$8,378,240	**$4,189,120**	**$4,189,120**
E10	Equipment		146,996	BGSF	$0.54	$80,000	$88,192	**$44,096**	**$44,096**
E20	Casework & Furnishings		146,996	BGSF	$47.40	$6,966,893	$7,680,303	**$3,840,151**	**$3,840,151**
F10	Special Construction		146,996	BGSF	$4.79	$704,600	$776,751	**$388,376**	**$388,376**
F20	Selective Demolition		146,996	BGSF	$11.42	$1,678,233	$1,850,084	**$925,042**	**$925,042**
	Building Construction Subtotal					**$41,632,158**		**$0**	**$0**
G10	Site Preparation		146,996	BGSF	$0.36	$53,157	$58,600	**$29,300**	**$29,300**
G20	Site Improvements		146,996	BGSF	$1.22	$179,670	$198,068	**$99,034**	**$99,034**
G30	Site Civil / Mechanical Utilities		146,996	BGSF	$0.00	$0	$0	**$0**	**$0**
G40	Site Electrical Utilities		146,996	BGSF	$1.36	$200,000	$220,480	**$110,240**	**$110,240**
G90	Other Site Construction		146,996	BGSF	$0.00	$0	$0	**$0**	**$0**
	Sitework Subtotal					**$432,827**		**$0**	**$0**
Z10	General Requirements		146,996	BGSF	$17.14	$2,520,000	$2,778,048	**$1,389,024**	**$1,389,024**
	Estimate Subtotal					**$44,584,985**		**$0**	**$0**
	Design / Estimating Contingency				15.00%	$6,687,748	$7,372,573	**$3,686,287**	**$3,686,287**
	Subtotal					$51,272,733	$56,523,061	$28,261,530	$28,261,530
	Two Single Phases Premium				4.00%	$2,050,909			$56,523,061
	Subtotal					$53,323,642			
	GC Fee @ 7.5%				6.00%	$3,199,419			
	Subtotal					$56,523,061			
	Escalation not included - (in C100 Form)				0.000%	$0			
	CONSTRUCTION COSTS ESTIMATE GRAND TOTAL		146,996	BGSF	$384.52	**$56,523,061**			

Estimate excludes soft costs such as design fees, permits, testing / inspections, construction change order contingencies, loose fixtures / furnishings and sales tax.

Escalated Escalated

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Seattle, WA 98104-1031

EWU Science
Pre-Design Estimate
Integrus Architects

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No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost			1.123316456 Phase 1	1.193605872 Phase 2
A10	**FOUNDATIONS**								
	Slabs								
	Slab infill at previous Auditorium	1,435	sf	15.00	$21,525	$23,729	$27,288.53	$15,326.83	$16,285.88
	Gravel Fill	135	cy	40.00	$5,400	$5,953	$6,845.90	$3,845.06	$4,085.66
	Infill slabs at abandoned Mech Openings (17@3x6)	306	sf	10.00	$3,060	$3,373	$3,879.35	$2,178.87	$2,315.20
	Structural supports / deck / dowel & reinforce	306	sf	25.00	$7,650	$8,433	$9,698.36	$5,447.17	$5,788.01
	Poubacks at mech trenches, incl dowels	1,000	sf	10.00	$10,000	$11,024	$12,677.60	$7,120.48	$7,566.03
	Foundation at Mechanical Screenwall				$0	$0	$0.00	$0.00	$0.00
	Footings	12	cy	450.00	$5,400	$5,953	$6,845.90	$3,845.06	$4,085.66
	Wall (2' stem)	200	sf	35.00	$7,000	$7,717	$8,874.32	$4,984.33	$5,296.22
	Walls in Tunnel if shafts are relocated				$0	$0	$0.00	$0.00	$0.00
	8" walls. Reinforced, and doweled to existing (10@4x6)	240	sf	50.00	$12,000	$13,229	$15,213.12	$8,544.57	$9,079.23
								$0.00	$0.00
	SUBTOTAL FOUNDATIONS	**146,996**	**BGSF**	**$0.49**	**$72,035**			$0.00	$0.00
								$0.00	$0.00
A20	**BASEMENT CONSTRUCTION**							$0.00	$0.00
	None							$0.00	$0.00
								$0.00	$0.00
	SUBTOTAL BASEMENT CONSTRUCTION	**146,996**	**BGSF**	**$0.00**	**$0**			$0.00	$0.00
								$0.00	$0.00
B10	**SUPERSTRUCTURE**							$0.00	$0.00
	Seismic Upgrade Allowance / Brace Parapets	146,100	BGSF	4.00	$584,400	$644,243	$740,878.94	$370,439	$416,120.75	$442,158.73
	Fireproofing					$0	$0.00	$0	$0.00	$0.00
	Allowance to Patch Existing	146,996	ls	0.20	$29,399	$32,410	$37,271.13	$18,636	$20,933.64	$22,243.52
								$0	$0.00	$0.00
	SUBTOTAL SUPERSTRUCTURE	**146,996**	**BGSF**	**$4.18**	**$613,799**			$0	$0.00	$0.00
								$0	$0.00	$0.00
B20	**EXTERIOR ENCLOSURE**							$0	$0.00	$0.00
	Exterior Wall Construction							$0	$0.00	$0.00
	New Screenwall - Concrete Construction (100' x 10')	1,000	sf	45.00	$45,000	$49,608	$57,049.20	$28,525	$32,042.15	$34,047.13
	Allowance for finishes on wall	1,000	sf	35.00	$35,000	$38,584	$44,371.60	$22,186	$24,921.67	$26,481.10
	New Veneer					$0	$0.00	$0	$0.00	$0.00
	New veneer where purple tile was removed	5,000	sf	45.00	$225,000	$248,040	$285,246.00	$142,623	$160,210.76	$170,235.65
	Exterior Soffits					$0	$0.00	$0	$0.00	$0.00
	New Finish at Soffits and Drive thru	3,200	sf	20.00	$64,000	$70,554	$81,136.64	$40,568	$45,571.06	$48,422.58
	Pressure wash and repaint conc overhangs	8,000	sf	6.00	$48,000	$52,915	$60,852.48	$30,426	$34,178.30	$36,316.94
	Existing Brick Veneer					$0	$0.00	$0	$0.00	$0.00

Roen Associates
911 Western Avenue, Suite 204
Seattle, WA 98104-1031

EWU Science
Pre-Design Estimate
Integrus Architects

ROEN ASSOCIATES

No.	Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost				1.123316456 Phase 1	1.193605872 Phase 2
	Clean and reseal	36,428	sf	3.00	$109,284	$120,475	$138,545.88	$69,273	$77,815.44	$82,684.59
	Recaulk exterior - allowance	146,100	sf	0.30	$43,830	$48,318	$55,565.92	$27,783	$31,209.06	$33,161.90
	Sun Control Devices					$0	$0.00	$0	$0.00	$0.00
	Exterior Sunshades at South Elevation	380	sf	55.00	$20,900	$23,040	$26,496.18	$13,248	$14,881.80	$15,813.00
	Exterior Windows					$0	$0.00	$0	$0.00	$0.00
	see alternate number			-	$0	$0	$0.00	$0	$0.00	$0.00
	Exterior Doors					$0	$0.00	$0	$0.00	$0.00
	Aluminum Entry Door, HW, Complete - Double	23	ea	3,500.00	$80,500	$88,743	$102,054.68	$51,027	$57,319.85	$60,906.53
	Auto Operators	4	ea	4,000.00	$16,000	$17,638	$20,284.16	$10,142	$11,392.77	$12,105.65
	HM Dr, HM Frame, HW, Complete - Double	7	ea	1,850.00	$12,950	$14,276	$16,417.49	$8,209	$9,221.02	$9,798.01
								$0	$0.00	$0.00
	SUBTOTAL EXTERIOR ENCLOSURE	**146,996**	**BGSF**	**$4.77**	**$700,464**			$0	$0.00	$0.00
								$0	$0.00	$0.00
B30	**ROOFING**							$0	$0.00	$0.00
	Roof Coverings							$0	$0.00	$0.00
	Membrane Roof Assembly w/ Insulation	74,739	sf	15.00	$1,121,085	$1,235,884	$1,421,266.72	$710,633	$798,266.15	$848,216.15
	Misc. Flashing & Blocking	20	%	1,121,085	$168,163	$185,383	$213,190.01	$106,595	$119,739.92	$127,232.42
	Wood Nailers at Perimeter	2,557	lf	5.00	$12,785	$14,094	$16,208.31	$8,104	$9,103.53	$9,673.17
	Roof Accessories					$0	$0.00	$0	$0.00	$0.00
	Misc. Roof Accessories (Hatch, Ladders, etc…)	1	lsum	20,000	$20,000	$22,048	$25,355.20	$12,678	$14,240.96	$15,132.06
	Fall Protection Allowance	1	ls	25,000	$25,000	$27,560	$31,694.00	$15,847	$17,801.20	$18,915.07
	Screen Walls				$0	$0	$0.00	$0	$0.00	$0.00
	Mechanical Screen Enclosures	6,700	sf	50.00	$335,000	$369,304	$424,699.60	$212,350	$238,536.02	$253,461.97
	Structural Supports to Roof Allowance	110	ea	$200.00	$22,000	$24,253	$27,890.72	$13,945	$15,665.05	$16,645.26
								$0	$0.00	$0.00
	SUBTOTAL ROOFING	**146,996**	**BGSF**	**$11.59**	**$1,704,033**			$0	$0.00	$0.00
								$0	$0.00	$0.00
C10	**INTERIOR CONSTRUCTION**							$0	$0.00	$0.00
	Partitions & Interior Glazing							$0	$0.00	$0.00
	Mix of 4" and 6" metal stud partitions with avg 3 sheets 5/8" type x, sound batts, sound sealant, up to 12'	85,104	sf	16.00	$1,361,664	$1,501,098	$1,726,263.15	$863,132	$969,569.90	$1,030,238.92
	At interior of corridor walls - 4" metal stud with 1 layer 5/8 type x	40,400	sf	15.00	$606,000	$668,054	$768,262.56	$384,131	$431,500.99	$458,501.35
	Partition to Ext Window Interface - allowance	80	ea	600.00	$48,000	$52,915	$60,852.48	$30,426	$34,178.30	$36,316.94
	Infills at Old Corridor wall openings (50@22 sf)	1,100	sf	18.00	$19,800	$21,828	$25,101.65	$12,551	$14,098.55	$14,980.74
	New shaft walls at relocated locations	2,880	sf	18.00	$51,840	$57,148	$65,720.68	$32,860	$36,912.56	$39,222.29
	Replace Gyp at Ext 1988 addition	14,167	sf	4.50	$63,752	$70,280	$80,821.60	$40,411	$45,394.12	$48,234.57
	Hat track and 1 layer 5/8" type x at corridor	40,400	sf	15.00	$606,000	$668,054	$768,262.56	$384,131	$431,500.99	$458,501.35

Roen Associates
911 Western Avenue, Suite 204
Seattle, WA 98104-1031

EWU Science
Pre-Design Estimate
Integrus Architects

DETAILED ESTIMATE									1.123316456	1.193605872
No.	Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost				Phase 1	Phase 2
	Interior Sealants	146,996	gsf	0.15	$22,049	$24,307	$27,953.35	$13,977	$15,700.23	$16,682.64
	Interior Doors, Frames, Hardware					$0	$0.00	$0	$0.00	$0.00
	Assume equal number to demo qty	339	ea	1,800.00	$610,200	$672,684	$773,587.15	$386,794	$434,491.59	$461,679.08
	Relite allowance - use 4x4 with safety glass	50	ea	750.00	$37,500	$41,340	$47,541.00	$23,771	$26,701.79	$28,372.61
	Fittings / Specialties					$0	$0.00	$0	$0.00	$0.00
	Toilet Accessories - assume hand dryers all locations					$0	$0.00	$0	$0.00	$0.00
	Restrooms - South - large	1	ea	20,000.00	$20,000	$22,048	$25,355.20	$12,678	$14,240.96	$15,132.06
	Restrooms - North - Medium	4	ea	12,500.00	$50,000	$55,120	$63,388.00	$31,694	$35,602.39	$37,830.14
	Restrooms - North/South - small	2	ea	5,000.00	$10,000	$11,024	$12,677.60	$6,339	$7,120.48	$7,566.03
	Misc accessories at sink locations	30	ea	300.00	$9,000	$9,922	$11,409.84	$5,705	$6,408.43	$6,809.43
	Janitorial Accessories	5	ea	2,000.00	$10,000	$11,024	$12,677.60	$6,339	$7,120.48	$7,566.03
	Signage	146,996	gsf	0.75	$110,247	$121,536	$139,766.74	$69,883	$78,501.14	$83,413.20
	Misc. Specialties Allowance (FECs, Corner Guards, etc...)	146,996	gsf	1.00	$146,996	$162,048	$186,355.65	$93,178	$104,668.18	$111,217.60
								$0	$0.00	$0.00
	SUBTOTAL INTERIOR CONSTRUCTION	**146,996**	**BGSF**	**$25.74**	**$3,783,048**			$0	$0.00	$0.00
								$0	$0.00	$0.00
C20	**STAIRS**							$0	$0.00	$0.00
	Stair Construction					$0	$0.00	$0	$0.00	$0.00
	No new stairs				$0	$0	$0.00	$0	$0.00	$0.00
	Stair Railings					$0	$0.00	$0	$0.00	$0.00
	Wall Rails at Stairs	566	lf	125.00	$70,750	$77,995	$89,694.02	$44,847	$50,377.38	$53,529.65
	Handrails at Stairs	518	lf	175.00	$90,650	$99,933	$114,922.44	$57,461	$64,547.14	$68,586.05
								$0	$0.00	$0.00
	SUBTOTAL STAIRS	**146,996**	**BGSF**	**$1.10**	**$161,400**			$0	$0.00	$0.00
								$0	$0.00	$0.00
C30	**INTERIOR FINISHES**							$0	$0.00	$0.00
	Wall / Floor / Ceiling Finishes							$0	$0.00	$0.00
	Painting	146,996	gsf	3.00	$440,988	$486,145	$559,066.95	$279,533	$314,004.55	$333,652.80
	Wall Finishes				$0	$0	$0.00	$0	$0.00	$0.00
	Ceramic Tile on walls	5,000	sf	10.00	$50,000	$55,120	$63,388.00	$31,694	$35,602.39	$37,830.14
	Wood paneling - allowance	5,000	sf	50.00	$250,000	$275,600	$316,940.00	$158,470	$178,011.96	$189,150.72
	Acoustic panels - allowance	3,000	sf	25.00	$75,000	$82,680	$95,082.00	$47,541	$53,403.59	$56,745.22
	FRP - in custodian rooms	160	sf	6.00	$960	$1,058	$1,217.05	$609	$683.57	$726.34
	Ceilings		sf		$0	$0	$0.00	$0	$0.00	$0.00
	Acoustic Ceiling	144,496	sf	4.50	$650,232	$716,816	$824,338.12	$412,169	$462,996.29	$491,967.41
	Gyp Ceiling on metal framing	2,500	sf	8.00	$20,000	$22,048	$25,355.20	$12,678	$14,240.96	$15,132.06
	Soffits and Furr downs	29,399	sf	15.00	$440,988	$486,145	$559,066.95	$279,533	$314,004.55	$333,652.80
	Flooring				$0	$0	$0.00	$0	$0.00	$0.00

Roen Associates
911 Western Avenue, Suite 204
Seattle, WA 98104-1031

EWU Science
Pre-Design Estimate
Integrus Architects

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No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost				1.123316456 Phase 1	1.193605872 Phase 2
	Average - Resilient, epoxy, sealer -	120,138	sf	9.00	$1,081,242	$1,191,961	$1,370,755.36	$685,378	$769,896.03	$818,070.82
	Terrazzo Infills	306	sf	75.00	$22,950	$25,300	$29,095.09	$14,548	$16,341.50	$17,364.04
	Terrazzo clean, misc patch	23,558	sf	3.00	$70,674	$77,911	$89,597.67	$44,799	$50,323.27	$53,472.15
	Ceramic Tile, incl base	2,500	sf	15.00	$37,500	$41,340	$47,541.00	$23,771	$26,701.79	$28,372.61
	Entry Mats	800	sf	22.00	$17,600	$19,402	$22,312.58	$11,156	$12,532.04	$13,316.21
	Floor Prep Allowance	120,138	sf	2.50	$300,345	$331,100	$380,765.38	$190,383	$213,860.01	$227,241.90
	Base				$0	$0	$0.00	$0	$0.00	$0.00
	Rubber Base	25,512	lf	2.50	$63,780	$70,311	$80,857.73	$40,429	$45,414.41	$48,256.13
								$0	$0.00	$0.00
	SUBTOTAL INTERIOR FINISHES	**146,996**	**BGSF**	**$23.96**	**$3,522,259**			$0	$0.00	$0.00
								$0	$0.00	$0.00
D10	**CONVEYING SYSTEMS**							$0	$0.00	$0.00
	Elevators & Lifts							$0	$0.00	$0.00
	Replacement Hydraulic Elevators	2	ea	125,000	$250,000	$275,600	$316,940.00	$158,470	$178,011.96	$189,150.72
								$0	$0.00	$0.00
	SUBTOTAL CONVEYING SYSTEMS	**146,996**	**BGSF**	**$1.70**	**$250,000**			$0	$0.00	$0.00
								$0	$0.00	$0.00
D20	**PLUMBING**							$0	$0.00	$0.00
	Plumbing							$0	$0.00	$0.00
	Plumbing	146,996	gsf	$23.20	$3,410,144	$3,759,343	$4,323,244.16	$2,161,622	$2,428,185.65	$2,580,124.81
								$0	$0.00	$0.00
	SUBTOTAL PLUMBING	**146,996**	**BGSF**	**$23.20**	**$3,410,144**			$0	$0.00	$0.00
								$0	$0.00	$0.00
D30	**HVAC**							$0	$0.00	$0.00
	HVAC							$0	$0.00	$0.00
	HVAC	146,996	gsf	66.92	$9,837,375	$10,844,722	$12,471,430.53	$6,235,715	$7,004,681.57	$7,442,986.36
								$0	$0.00	$0.00
	SUBTOTAL HVAC	**146,996**	**BGSF**	**$66.92**	**$9,837,375**			$0	$0.00	$0.00
								$0	$0.00	$0.00
D40	**FIRE PROTECTION**							$0	$0.00	$0.00
	Fire Protection							$0	$0.00	$0.00
	Sprinkler System	146,996	gsf	3.73	$547,875	$603,977	$694,574.01	$347,287	$390,113.21	$414,523.81
								$0	$0.00	$0.00
	SUBTOTAL FIRE PROTECTION	**146,996**	**BGSF**	**$3.73**	**$547,875**			$0	$0.00	$0.00
								$0	$0.00	$0.00
D50	**ELECTRICAL**							$0	$0.00	$0.00
	Electrical							$0	$0.00	$0.00

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Seattle, WA 98104-1031

EWU Science
Pre-Design Estimate
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No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost				1.123316456 Phase 1	1.193605872 Phase 2
	Electrical System	146,100	gsf	52.02	$7,600,000	$8,378,240	$9,634,976.00	$4,817,488	$5,411,563.55	$5,750,181.97
								$0	$0.00	$0.00
	SUBTOTAL ELECTRICAL	**146,996**	**BGSF**	**$51.70**	**$7,600,000**			$0	$0.00	$0.00
								$0	$0.00	$0.00
E10	**EQUIPMENT**							$0	$0.00	$0.00
	Kitchen Equipment							$0	$0.00	$0.00
	Residential Appliances	50	ea	1,000	$50,000	$55,120	$63,388.00	$31,694	$35,602.39	$37,830.14
	AV Equipment				$0	$0	$0.00	$0	$0.00	$0.00
	Projection Screens	50	ea	350.00	$17,500	$19,292	$22,185.80	$11,093	$12,460.84	$13,240.55
	Projector Mounts	50	ea	250.00	$12,500	$13,780	$15,847.00	$7,924	$8,900.60	$9,457.54
								$0	$0.00	$0.00
	SUBTOTAL EQUIPMENT	**146,996**	**BGSF**	**$0.54**	**$80,000**			$0	$0.00	$0.00
								$0	$0.00	$0.00
E20	**CASEWORK & FURNISHINGS**							$0	$0.00	$0.00
	Fixed Casework							$0	$0.00	$0.00
	New window sills at exterior windows	2,965	lf	35.00	$103,775	$114,402	$131,561.79	$65,781	$73,892.76	$78,516.46
	Casework in Lab and support areas (68818 sf)	68,818	sf	90.00	$6,193,620	$6,827,847	$7,852,023.69	$3,926,012	$4,410,153.71	$4,686,110.79
	Other Casework -				$0	$0	$0.00	$0	$0.00	$0.00
	Vanities	100	lf	100.00	$10,000	$11,024	$12,677.60	$6,339	$7,120.48	$7,566.03
	Base Cabinets	200	lf	300.00	$60,000	$66,144	$76,065.60	$38,033	$42,722.87	$45,396.17
	Upper Cabinets	200	lf	200.00	$40,000	$44,096	$50,710.40	$25,355	$28,481.91	$30,264.12
	Full Height Cabinets	160	lf	450.00	$72,000	$79,373	$91,278.72	$45,639	$51,267.44	$54,475.41
	Counter Tops	20	lf	50.00	$1,000	$1,102	$1,267.76	$634	$712.05	$756.60
	Shelving	200	lf	50.00	$10,000	$11,024	$12,677.60	$6,339	$7,120.48	$7,566.03
	Rod and Shelf	20	lf	80.00	$1,600	$1,764	$2,028.42	$1,014	$1,139.28	$1,210.56
	Transaction Tops	20	lf	200.00	$4,000	$4,410	$5,071.04	$2,536	$2,848.19	$3,026.41
	Window Treatment						$0.00	$0	$0.00	$0.00
	Total Qty windows - 25% blackout and 75% horiz blinds -	26,161	sf	18.00	$470,898	$519,118	$596,985.65	$298,493	$335,301.90	$356,282.79
	Moveable Furnishings - Excluded						$0.00	$0	$0.00	$0.00
	None			-	$0		$0.00	$0	$0.00	$0.00
								$0	$0.00	$0.00
	SUBTOTAL FURNISHINGS	**146,996**	**BGSF**	**$47.40**	**$6,966,893**			$0	$0.00	$0.00
								$0	$0.00	$0.00
F10	**SPECIAL CONSTRUCTION**							$0	$0.00	$0.00
	Special Facilities							$0	$0.00	$0.00
	Upgrade / Remodel Greenhouse Structure	1,426	sf	100.00	$142,600	$157,202	$180,782.58	$90,391	$101,538.02	$107,891.57
	Additional footage of greenhouse to get to 2000 sf	574	sf	500.00	$287,000	$316,389	$363,847.12	$181,924	$204,357.73	$217,145.03

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EWU Science
Pre-Design Estimate
Integrus Architects

ROEN ASSOCIATES

No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost				1.123316456 Phase 1	1.193605872 Phase 2
	Planetarium Dome (incl 50K for seating…)	1	ls	275,000	$275,000	$303,160	$348,634.00	$174,317	$195,813.15	$208,065.79
								$0	$0.00	$0.00
	SUBTOTAL SPECIAL CONSTRUCTION	**146,996**	**BGSF**	**$4.79**	**$704,600**			$0	$0.00	$0.00
								$0	$0.00	$0.00
F20	**SELECTIVE BUILDING DEMOLITION**							$0	$0.00	$0.00
	Building Interior Demolition							$0	$0.00	$0.00
	Floor Coverings	108,737	sf	1.10	$119,611	$131,859	$151,637.66	$75,819	$85,168.54	$90,497.80
	Ceilings	134,212	sf	1.50	$201,318	$221,933	$255,222.91	$127,611	$143,348.05	$152,317.78
	Gyp Soffits (allow)	20,000	sf	1.50	$30,000	$33,072	$38,032.80	$19,016	$21,361.44	$22,698.09
	Plaster Partitions	48,600	sf	1.75	$85,050	$93,759	$107,822.99	$53,911	$60,559.67	$64,349.08
	Gyp Partitions	36,504	sf	1.25	$45,630	$50,303	$57,847.89	$28,924	$32,490.74	$34,523.79
	Gyp at Ext Walls 1988 addition	14,167	sf	1.00	$14,167	$15,618	$17,960.36	$8,980	$10,087.58	$10,718.79
	Plaster at Exterior Walls	19,672	sf	1.50	$29,508	$32,530	$37,409.06	$18,705	$21,011.11	$22,325.84
	Ceramic Tile on Walls	3,684	sf	1.50	$5,526	$6,092	$7,005.64	$3,503	$3,934.78	$4,180.99
	Ceramic Tile on Floors	1,917	sf	1.50	$2,876	$3,170	$3,645.44	$1,823	$2,047.49	$2,175.61
	Ceramic Wainscot Corridor Walls	41,952	sf	1.75	$73,416	$80,934	$93,073.87	$46,537	$52,275.70	$55,546.76
	Exterior Tile on Walls	5,000	sf	1.50	$7,500	$8,268	$9,508.20	$4,754	$5,340.36	$5,674.52
	Remove Exterior Sunshades on South Elevation	190	lf	30.00	$5,700	$6,284	$7,226.23	$3,613	$4,058.67	$4,312.64
	Wall Rails at Stairs	566	lf	10.00	$5,660	$6,240	$7,175.52	$3,588	$4,030.19	$4,282.37
	Handrails at Stairs	518	lf	10.00	$5,180	$5,710	$6,567.00	$3,283	$3,688.41	$3,919.20
	Lab Hoods - estimated quantity	80	ea	150.00	$12,000	$13,229	$15,213.12	$7,607	$8,544.57	$9,079.23
	Doors / Frames	339	ea	50.00	$16,950	$18,686	$21,488.53	$10,744	$12,069.21	$12,824.42
	Terrazzo Patch/Clean/seal (No infills)	23,558	sf	3.00	$70,674	$77,911	$89,597.67	$44,799	$50,323.27	$53,472.15
	Risers at Tiered Floors (2x and Plywood)	2,972	sf	2.25	$6,687	$7,372	$8,477.51	$4,239	$4,761.46	$5,059.40
	Sawcut new openings into mech tunnels(17@3x6)	306	lf	30.00	$9,180	$10,120	$11,638.04	$5,819	$6,536.60	$6,945.61
	Remove Concrete	306	sf	20.00	$6,120	$6,747	$7,758.69	$3,879	$4,357.73	$4,630.41
	Casework / Lab Furniture	9,162	lf	15.00	$137,430	$151,503	$174,228.26	$87,114	$97,856.73	$103,979.94
	Toilet Partitions	25	ea	25.00	$625	$689	$792.35	$396	$445.03	$472.88
	Specialties	146,996	sf	0.15	$22,049	$24,307	$27,953.35	$13,977	$15,700.23	$16,682.64
	Window Blinds (use ext window sf)	26,161	sf	0.75	$19,621	$21,630	$24,874.40	$12,437	$13,970.91	$14,845.12
	Misc MEP Sawcut / Slab Removal Allowance	1,000	sf	25.00	$25,000	$27,560	$31,694.00	$15,847	$17,801.20	$18,915.07
	Mechanica lDemo Allowance	1	allow	317,600	$317,600	$350,122	$402,640.58	$201,320	$226,146.39	$240,297.08
	Electrical lDemo Allowance	1	allow	110,000	$110,000	$121,264	$139,453.60	$69,727	$78,325.26	$83,226.32
	Planetarium Dome - demo existing	1	ea	10,000.00	$10,000	$11,024	$12,677.60	$6,339	$7,120.48	$7,566.03
	Sawcut Demo L2 Slab to move Planetariun to L1	1,233	sf	20.00	$24,660	$27,185	$31,262.96	$15,631	$17,559.10	$18,657.83
	Sawcut new door openings in shear walls @22 lf	50	ea	500.00	$25,000	$27,560	$31,694.00	$15,847	$17,801.20	$18,915.07
	Remove and dispose of concrete	1,100	sf	15.00	$16,500	$18,190	$20,918.04	$10,459	$11,748.79	$12,483.95
	Misc demolition	146,996	sf	1.00	$146,996	$162,048	$186,355.65	$93,178	$104,668.18	$111,217.60

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No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost				1.123316456 Phase 1	1.193605872 Phase 2
	Demo elevators for replacement	2	ea	20,000.00	$40,000	$44,096	$50,710.40	$25,355	$28,481.91	$30,264.12
	Temp Partitions for two phases	1	ls	30,000.00	$30,000	$33,072	$38,032.80	$19,016	$21,361.44	$22,698.09
	Hazardous Components Abatement - PLUGS				$0			$0	$0.00	$0.00
	Asbestos				$0			$0	$0.00	$0.00
	Lead				$0			$0	$0.00	$0.00
	Lighting Ballasts				$0			$0	$0.00	$0.00
				-	$0			$0	$0.00	$0.00
								$0	$0.00	$0.00
	SUBTOTAL SELECTIVE BUILDING DEMOLITION	**146,996**	**BGSF**	**$11.42**	**$1,678,233**			$0	$0.00	$0.00
								$0	$0.00	$0.00
G10	**SITE PREPARATION**							$0	$0.00	$0.00
	Demo Courtyard Area		sf		$0	$0	$0.00	$0	$0.00	$0.00
	Sidewalks	5,794	sf	1.25	$7,243	$7,984	$9,181.75	$4,591	$5,157.01	$5,479.70
	Lawn / shrubs	15,886	sf	0.75	$11,915	$13,135	$15,104.73	$7,552	$8,483.69	$9,014.55
	Trees	6	ea	1,500.00	$9,000	$9,922	$11,409.84	$5,705	$6,408.43	$6,809.43
	Demo at Loading Dock Area - Allowance	2,500	sf	10.00	$25,000	$27,560	$31,694.00	$15,847	$17,801.20	$18,915.07
								$0	$0.00	$0.00
	SUBTOTAL SITE PREPARATION	**146,996**	**BGSF**	**$0.36**	**$53,157**			$0	$0.00	$0.00
								$0	$0.00	$0.00
G20	**SITE IMPROVEMENTS**							$0	$0.00	$0.00
	Landscape and irrigation				$0	$0	$0.00	$0	$0.00	$0.00
	Landscape / Lawn	15,846	sf	3.00	$47,538	$52,406	$60,266.77	$30,133	$33,849.33	$35,967.39
	Irrigation	15,846	sf	2.00	$31,692	$34,937	$40,177.85	$20,089	$22,566.22	$23,978.26
	Site Furnishings allowance	1	ls	5,000.00	$5,000	$5,512	$6,338.80	$3,169	$3,560.24	$3,783.01
	Hardscape	5,794	sf	10.00	$57,940	$63,873	$73,454.01	$36,727	$41,256.05	$43,837.57
	Loading Dock Area - paving / hardscape	2,500	sf	$15.00	37500	$41,340	$47,541.00	$23,771	$26,701.79	$28,372.61
								$0	$0.00	$0.00
	SUBTOTAL SITE IMPROVEMENTS	**146,996**	**BGSF**	**$1.22**	**$179,670**			$0	$0.00	$0.00
								$0	$0.00	$0.00
G30	**SITE CIVIL / MECHANICAL UTILITIES**							$0	$0.00	$0.00
								$0	$0.00	$0.00
	None Required		ls		$0		$0.00	$0	$0.00	$0.00
								$0	$0.00	$0.00
	SUBTOTAL SITE CIVIL / MECHANICAL UTILITES	**146,996**	**BGSF**	**$0.00**	**$0**			$0	$0.00	$0.00
								$0	$0.00	$0.00
G40	**SITE ELECTRICAL UTILITIES**							$0	$0.00	$0.00
	Electrical Distribution, Site Lighting							$0	$0.00	$0.00

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EWU Science
Pre-Design Estimate
Integrus Architects

ROEN ASSOCIATES

	DETAILED ESTIMATE		Unit of	Unit	Total Estimated				1.123316456	1.193605872
No.	Description	Quantity	Measure	Cost	Cost				Phase 1	Phase 2
	Electrical Site Utilities	1	ls	150,000	$150,000	$165,360	$190,164.00	$95,082	$106,807.18	$113,490.43
	Site Lighting - Courtyard Allowance	1	ls	50,000	$50,000	$55,120	$63,388.00	$31,694	$35,602.39	$37,830.14
								$0	$0.00	$0.00
	SUBTOTAL SITE ELECTRICAL UTILITIES	**146,996**	**BGSF**	**$1.36**	**$200,000**			$0	$0.00	$0.00
								$0	$0.00	$0.00
G90	**OTHER SITE CONSTRUCTION**							$0	$0.00	$0.00
	Other Site Construction							$0	$0.00	$0.00
								$0	$0.00	$0.00
								$0	$0.00	$0.00
	SUBTOTAL OTHER SITE CONSTRUCTION	**146,996**	**BGSF**	**$0.00**	**$0**			$0	$0.00	$0.00
								$0	$0.00	$0.00
Z10	**GENERAL REQUIREMENTS**							$0	$0.00	$0.00
	General Conditions	28	MO	$90,000	$2,520,000	$2,778,048	$3,194,755.20	$1,597,378	$1,794,360.54	$1,906,639.28
								$0	$0.00	$0.00
	SUBTOTAL GENERAL REQUIREMENTS	**146,996**	**BGSF**	**$17.14**	**$2,520,000**					
									Baseline	

Detailed Estimate	$49,150,488	$56,523,061	$28,261,530	$31,746,642	$33,733,129
Cost Summary Sheet	1.15		windows	931394	989674.7281
Difference	$56,523,060.84		ext walls	310968	330425.9136
		add windows and ext walls		$32,989,004	$35,053,229
				Alt #2	

appendix e
sustainable design scorecard

LEED v4 for BD+C: New Construction and Major Renovation -DRAFT

Project Checklist

Project Name: Eastern Washington University Science Renovation
Date: 1-Jun-16

Y	?	N			
	1		Credit	Integrative Process	1

4	3	9	Location and Transportation		16
		0	Credit	LEED for Neighborhood Development Location	16
1			Credit	Sensitive Land Protection	1
		2	Credit	High Priority Site	2
1	1	3	Credit	Surrounding Density and Diverse Uses	5
1		4	Credit	Access to Quality Transit	5
	1		Credit	Bicycle Facilities	1
1			Credit	Reduced Parking Footprint	1
	1		Credit	Green Vehicles	1

8	2	0	Sustainable Sites		10
Y			Prereq	Construction Activity Pollution Prevention	Required
1			Credit	Site Assessment	1
2			Credit	Site Development - Protect or Restore Habitat	2
1			Credit	Open Space	1
2	1		Credit	Rainwater Management	3
2			Credit	Heat Island Reduction	2
	1		Credit	Light Pollution Reduction	1

4	2	2	Water Efficiency		11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
1	1		Credit	Outdoor Water Use Reduction	2
2	1		Credit	Indoor Water Use Reduction	6
		2	Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

10	10	5	Energy and Atmosphere		33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
	6		Credit	Enhanced Commissioning	6
8	2		Credit	Optimize Energy Performance	18
1			Credit	Advanced Energy Metering	1
1	1		Credit	Demand Response	2
		3	Credit	Renewable Energy Production	3
	1		Credit	Enhanced Refrigerant Management	1
		2	Credit	Green Power and Carbon Offsets	2

11	0	0	Materials and Resources		13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
3			Credit	Building Life-Cycle Impact Reduction	5
2			Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
2			Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
2			Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

11	2	1	Indoor Environmental Quality		16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
2			Credit	Enhanced Indoor Air Quality Strategies	2
3			Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
2			Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
2			Credit	Interior Lighting	2
		1	Credit	Daylight	3
	1		Credit	Quality Views	1
	1		Credit	Acoustic Performance	1

5	1	0	Innovation		6
4	1		Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

3	1	0	Regional Priority		4
	1		Credit	Regional Priority: { Demand Response	1
1			Credit	Regional Priority: { Construction Indoor Air Quality Management Plan	1
1			Credit	Regional Priority: { Building Product D&O- Enviromental Product Declarations	1
1			Credit	Regional Priority: { Building Product D&O- Sourcing of Raw Materials	1

Indoor Water use reduction (Alternate Option)

56	22	17	TOTALS	Possible Points:	110

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

appendix f
department of archeology and historic preservation coordination

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

May 31, 2016

Mr. James Moeller
Facilities and Planning
Eastern Washington University
101 Rozwell
Cheney, WA 99004-2446

In future correspondence please refer to:
Project Tracking Code: 2016-05-03729
Property: Science Building Renovation
Re: NOT Eligible

Dear Mr. Moeller:

Thank you for contacting the Washington State Historic Preservation Officer (SHPO) and Department of Archaeology and Historic Preservation (DAHP). The above referenced property has been reviewed on behalf of the SHPO under provisions of Governor's Executive Order 05-05. Our review is based upon documentation contained in your communication.

Research indicates that this property is not currently listed in the Washington Heritage Register or National Register of Historic Places. As a result of our review, we concur with your determination that the Science Building is NOT ELIGIBLE for the National Register of Historic Places under criterion C.

As a result of our concurrence, further contact with DAHP on this matter is not necessary. However, if new information on the property becomes available and if the project scope of work, or location changes significantly, please resume consultation as our assessment may be revised. Also, if any archaeological resources are uncovered during construction, please halt work immediately in the area of discovery and contact the appropriate Native American Tribes and DAHP for further consultation.

Thank you for the opportunity to review and comment. Should you have any questions, please feel free to contact me.

Sincerely,

Russell Holter
Project Compliance Reviewer
(360) 586-3533
russell.holter@dahp.wa.gov

appendix g
executive report from the life cycle cost analysis

Office of Financial Management
Olympia, Washington - Version: 2015-G
Life Cycle Cost Analysis Tool

Executive Report

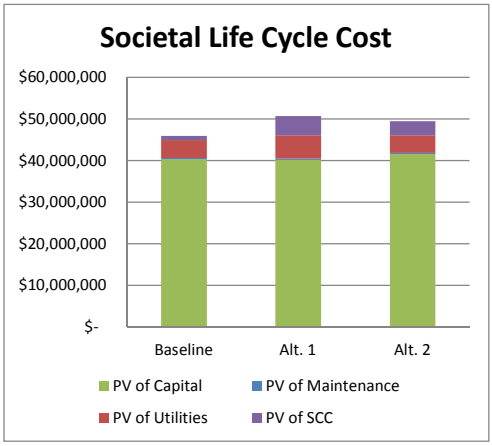
Project Information	
Project:	EWU Science Remodel - Phase 1
Address:	Science Building, Cheney, 99004
Company:	Roen Associates
Contact:	Jeff Weaver
Contact Phone:	(509) 838-8688
Contact Email:	jeffw@roenassociates.com

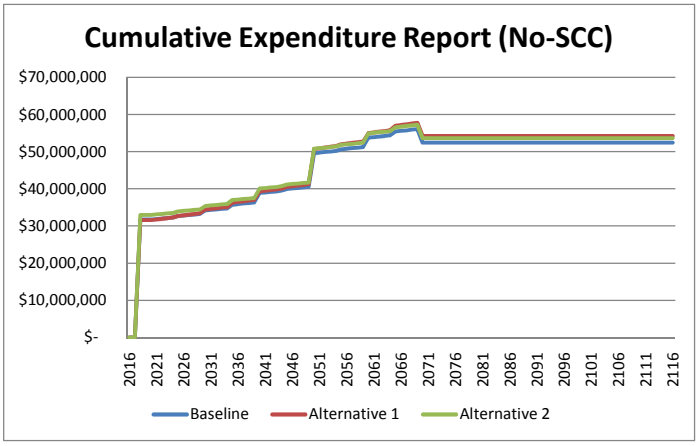
Key Analysis Variables		Building Characteristics	
Study Period (years)	54	Gross (Sq.Ft)	73,498
Nominal Discount Rate	3.81%	Useable (Sq.Ft)	50,787
Maintenance Escalation	1.00%	Space Efficiency	69.1%
Zero Year (Current Year)	2016	Project Phase	0
Construction Years	4	Building Type	0

Life Cycle Cost Analysis	BEST		
Alternative	Baseline	Alt. 1	Alt. 2
1st Construction Costs	$ 30,869,972	$ 30,753,213	$ 32,078,027
PV of Capital Costs	$ 40,316,900	$ 40,171,533	$ 41,524,956
PV of Maintenance Costs	$ 299,002	$ 287,988	$ 299,002
PV of Utility Costs	$ 4,336,805	$ 5,633,018	$ 4,271,773
Total Life Cycle Cost (LCC)	**$ 44,952,707**	**$ 46,092,539**	**$ 46,095,731**
Net Present Savings (NPS)	**N/A**	**$ (1,139,832)**	**$ (1,143,024)**

Societal LCC takes into consideration the social cost of carbon dioxide emissions caused by operational energy consumption

Societal Life Cycle Cost	BEST		
Alternative	Baseline	Alt. 1	Alt. 2
Tons of CO2e over Study Period	14,647	66,926	49,162
Present Social Cost of Carbon (SCC)	$ 1,005,378	$ 4,593,889	$ 3,374,577
Total LCC with SCC	**$ 45,958,085**	**$ 50,686,428**	**$ 49,470,308**
NPS with SCC	**N/A**	**$ (4,728,343)**	**$ (3,512,223)**





Baseline Short Description
Building Renovation with high efficiency dedicated outside air systems (DOAS) and chilled beam terminal units
Alternative 1 Short Description
Building Renovation with traditional VAV systems
Alternative 2 Short Description
Building Renovation with high efficiency dedicated outside air systems (DOAS) and chilled beam terminal units and improved wall and glazing insulation to code minimum.

appendix h
mechanical building assessment

James W. Moore, PE / Brandon D. Enevold, PE / Kjersten E. Kuhta, PE
Dylan J. Cunningham, PE / Jacob L. Deering, PE / Joel R. Enevold, PE

CONDITIONS ASSESSMENT REPORT

DATE:	May 22, 2016
PROJECT:	Eastern Washington University Science Building
PROJECT #:	2016.100
DEPARTMENT:	Mechanical
MW REP:	Kjersten Kuhta, PE Jim Moore, PE
TO:	File
CC:	Integrus
VISITED DATE:	April 7, 2016
REASON:	Facility Assessment Meeting with Mechanical Operations and Maintenance Staff

General Notes

1. The original facility was designed in 1960. In the late 1980s and early 1990s the building had a series of renovations that entirely replaced the building mechanical, plumbing, and fire protection systems.
2. Phase I, II and III in the notes below refer the phases of renovation that occurred in the late 1980s and early 1990s. Phase I consists of the south wing addition and utility services to the building. Phase II consists of a renovation of the east and west wings and mechanical rooms/air systems to service these wings. Phase III consists of a renovation of the north wing.

Overview of Existing Conditions

1. The building has the highest energy use of any building on campus with an energy use exceeding 400 kbtuh/sqft/year. While energy use in science facilities is expected to be high, recently installed science buildings are operating at about half of this number. The large energy consumption is primarily due to the system/equipment types commonly used at the time of installation and the outdated energy management system controls. A controls replacement currently being installed will be limited in its effectiveness until some of the equipment is replaced.
2. The building heating and cooling sources are campus steam and chilled water. These services are adequately sized to service the buildings future needs. The vivarium requires a redundant cooling source that would also service the IT rooms. These spaces are not able to maintain temperatures in the spring/fall seasons on unseasonably warm days when the chilled water plant has shut down for the season.
3. The building lab supply air is provided from three 100% outside air handling units with steam preheat coils and chilled water cooling coils. The total capacity for the fan systems is 213,000 cfm. When the Interdisciplinary Science building is constructed and many programs depart the building, the facilities new lab uses will require less than half of the ventilation air that is currently required to support the existing lab facility.

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4. The vivarium systems require replacement to achieve increased size of the vivarium and minimum air change requirements required for the animal environments. Humidification requires replacement as well to meet the humidification criteria.
5. Currently the building is serviced by approximately 90 exhaust fans located on the roof. In places, these fan transmit vibration to the building structure which causes problems for teaching and research. Most of these fans serve individual hoods. Heat recovery cannot practically be applied to this air system and a manifolded central exhaust system is recommend for all but wet acid hoods and radioisotope hoods. A manifolded system will have inherent flexibility for fume hood growth and will allow heat recovery from the exhaust air stream.
6. Many of the fume hood face velocity monitors indicate velocities well above or below the recommended 80-100 FPM face velocity that is required for safe operation of the hoods. The only method to correct the airflow is to rebalance the fans at the sheaves since the fans are not equipped with variable speed controls. Fans without face velocity monitors should have them added.
7. Fume hood fan on/off control is achieved through individual local switches controlled by the users. Fans are constant volume bypass style hoods and operate at 100% of air volume when the fan switch is enabled. It is not recommended that fans be turned off when chemicals are actively stored in the lab. A fume hood fan and control upgrade is recommended for both safety concerns and energy conservation.
8. General exhaust routes to 4-5 general exhaust fans which are equipped with heat recovery.
9. In night mode, the general exhaust fans operate at reduced speed but do not have fan airflow tracking and some motors have failed. This causes extreme pressure problems in the building such that exterior doors fail to fully close and labs lose their required pressurization. This is both an energy and safety concern.
10. The facility has limited floor to floor heights for ductwork and piping and cable tray required to service the lab spaces. This will require careful coordination of piping and ductwork in the building. It is likely that some of the ductwork for the exhaust systems will need to remain on the roof.
11. The supply ductwork was built to robust standards. If conducive to the new uses and building layouts, the ductwork may be reused.
12. Mechanical noise is imparted from the mechanical systems to the teaching rooms making teaching difficult and compromised. The renovation should be designed to improve acoustical quality in teaching spaces to current teaching standards.
13. Currently the water service is located in the underground basement. The building type requires the industrial water service feeding the labs to be isolated from the campus domestic water system with reduced pressure back backflow prevention devices. These devices are prohibited from code from being located in basements or other spaces that can be submerged in water. It is recommended that the water service feeding the labs be located to a grade level mechanical room.
14. The air intakes for the basement west and east fan rooms consist of a concrete shaft ducted to grade with a grate at the top. The grate presently allows leaves and other debris into the mechanical room and air system equipment. It is recommended that the grates be removed and the shaft be extended above grade level and new air louvers with screened intakes be installed.
15. It is expected that by the time that construction begins, the systems will be between 25 and 30 years old and beyond their normally expected service life. The following are anticipated service life for mechanical systems (source: ASHRAE Applications Handbook)

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a. VAV boxes–20 years
b. Ductwork–30 years
c. Fans–20 years
d. Coils–20 years
e. Heat Exchanger–24 years
f. Insulation–20 to 24 years
g. Pumps–15 to 20 years
h. Motors and Motor Controls–17–18 years
i. Temperature Controls–15 years
j. Valve Actuators–10 years

16. Due to age of equipment and need for energy conservation improvements most equipment should be replaced.

Operation's Staff meeting (HVAC and Plumbing)

1. When campus cooling is shut down for the winter season, the animal areas within the vivarium can get too warm on unseasonably warm days. Standalone cooling is needed.
2. Chilled water piping is in good condition.
3. Chilled water coils in the air handlers do not drain well.
4. The building entrance (IT room) also suffer in shoulder months for cooling.
5. One of the general building exhaust fan is not operable (EF–33). This contributes to building pressurization problems. The fan needs new conductors from the MCC.
6. The air distribution systems are too noisy for teaching. This is particularly problematic in the first floor areas near the west and east fan rooms.
7. There is a desire by the operational staff to consolidate lab functions in the building so that fans serving non lab areas can be shut off during unoccupied modes. Consolidating lab piping also makes lab pipe routing through the facility more cost efficient.
8. The pure water system maintenance is contracted with King Soft Water. Most of the Marquest faucets in need of replacement have been replaced. Approximately 20 faucets requiring replacement that are integral with the backsplash have not been able to be changed.
9. The air compressors are newer and in good condition. A new receiver is needed for turndown to prevent the compressors from cycling too frequently.
10. The vacuum system is original and needs to be replaced.
11. The lab process waste is piped through charcoal or lime traps for PH control and then discharged to the sanitary sewer. The lab process waste system is equipped with a diverting tank is not used except to clean strainers. Conductivity sensors, alarms and controls need to be replaced. Campus contact Steve Schmedding at EWU should be consulted if waste volume, pH or temperatures should be monitored before discharge to the sanitary sewer.
12. The domestic hot water heater was overhauled 4 years ago. The industrial water heater feeding the labs is original. Electric booster heaters are used for the cage washing operation. The facility staff prefers gas water heaters for cage washing.
13. Steam and condensate pipe is good condition. The building has schedule 40 steam pipe and schedule 80 condensate pipe. EWU expressed concerns about schedule 40 steam supply. The building has not had a lot of piping issues except for traps.
14. The Fisher steam PRV valves are original and need replacement. The safety relief valves are not tested so condition is not known.

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15. The hydronic system serving the south wing has dirt and debris in the system creating problems with control valves and equipment. Hydronic expansion joints between building joints have failures with rubber gaskets. The expansion joints are difficult to access and repair.
16. Workmanship and quality in phase I is worse.
17. Not all labs have gas shut off valves (phase I). EWU would prefer solenoid valve-timers to shut off gas to the labs after a predetermined time and gas detectors in the building to detect a gas leak.
18. The roof has leakage problems at mechanical duct penetrations but the roof drain system seems to work well as long as drains are regularly cleaned.
19. The phase I penthouse has a sloping floor that does not slope to the floor drains. In the event of a pipe leak, the water pools at the outside walls.
20. The eyewash and shower stations alarm the fire alarm system upon detection of flow. This has been a city requirement-possibly from Tom Postalwaite who in the past contracted with the City of Cheney for plan review. The design team should talk to John Henry and City of Cheney to determine if this is still a requirement.
21. There is concern about the entrance velocity of ground level air handling unit building air intakes that have a lot of debris carry over. The penthouse louvers have problems with hoarfrost that is removed with a broom during hoarfrost conditions.
22. Building has a lighter weight structure that has footfall vibration that translates through the building.
23. New snowmelt is being added this year at NE corner of the building.
24. The condition of the domestic hot and cold water piping has been good. Piping is copper. Solenoid valves for automatic sinks are not accessible (behind tile) and should be replaced.
25. Lab water quality in phase I is a problem in the SE corner. When the water is not used for a while, the water is the color of mud. The facilities group questions if this due to lack of circulation.
26. Taco pumps are not acceptable.
27. Fans do not have soft starts or drives so it is hard on the belts. Air balancing is difficult because fans are remote from fume hood monitors.
28. The glycol heat recovery system has not been monitored for its pH, inhibitor level, or concentration.
29. Rooftop equipment near roof edges requires safety rails for service.
30. The building sanitary waste and vent system has not had any problems.
31. The main mechanical room in phase I picks up the fish waste water and this is pumped waste. The pumps are not designed well for solid waste such as rags, feminine products, or fish and needs a grinder. One pump has been replaced and one has not. Pump failure has flooded the basement mechanical room so a lot of the drywall has been removed.
32. The existing air handler internal components need to be replaced. Dampers, coils, fans, etc.
33. Drives on the fans are at the end of useful life-particularly the ones in the MCC.
34. Air handling unit ductwork is built for 6" pressure. Minimum duct gauge throughout is 20 gauge. Ductwork is very stout.
35. AHU-1 does not have a VFD. Cone damper does not work. System does not meet static pressure requirements and is short of air or ducts are too small.

<u>Operation's Staff Meeting (Energy Management Control System)</u>

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1. The building energy management system control (EMCS) are original to the renovations (Staefa brand) and are being replaced with Automated Logic in an ESCO contract. All Staefa controllers are being replaced-even at the terminal unit level.
2. Some fume hoods do not have face velocity monitors.
3. Alerton and Delta are current approved vendors for the EMCS system. Automated Logic is in the proving phase. Delta is not local and has good equipment but is not always available for local support.
4. The dead band between the heating and cooling set point has been quite tight (1/2 degree) causing actuators to cycle quite quickly. New Belimo actuators are failing quite rapidly on the reheat systems.
5. The vivarium humidification is not working well.
6. Animal areas need backup cooling/independent cooling and backup power. The animals require consistent temperatures between 72 and 74 degrees.
7. Animal areas needs secured access. Intrusion alarms during off hours are responded to by the Police.
8. The current control system does not have trending/reporting set up for purposes of the research.
9. EWU would like LCD displays in animal areas.
10. Reroofing is deadly to the animals. This needs to be considered when air intakes are located.
11. Most problems with heating and cooling are due to failed actuators.
12. The face and bypass steam heating coils in the air handlers have been deteriorating with many tubes taken out of service.
13. Freeze stat shutdown in the air systems feeding the animal area can be devastating to the animals and cause safety problems in the lab areas. The staff suggested more pick up points on non 100% outside air systems to warn in advance of a freeze stat issue.
14. Currently the VFD's on the general exhaust and lab supply systems turn down to 50% airflow at nights/weekends. These spaces do not have temperature setback which is too cumbersome through the Staefa system.
15. The building does not currently have airflow monitoring making fan tracking a problem. Building pressurization will not improve without repair of the general exhaust fan and fan tracking.
16. MCC and equipment labels do not consistently match.
17. Currently, fan status is not reported to the EMCS. The system does not have airflow or fan tracking.
18. Currently some spaces have room DP sensors but no visibility through the building automation system.
19. The building control system needs to have complete visibility to the lab air system (if used).
20. Metering at the AHU level may be worthwhile. Belimo currently has some energy valves with this feature incorporated. Virtual meters could also be employed through programming of the control system. Energy use is helpful to the operation's staff for use in determining if scheduling changes achieve energy savings and also provides costs per hour to operate the lab systems.
21. Provide gas shutdown from the fire alarm system that is monitored by the BAS.

<u>Attendance in Operation's Staff Meeting:</u>

1. Kjersten Kuhta, MW Consulting Engineers

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2. Jim Moore, MW Consulting Engineers
3. Jim Moeller, EWU
4. Gum Carlson, EWU HVAC, 359-6006, gcarlson@ewu.edu
5. Robert Heston, EWU Plumbing, 359-6381, rheston@ewu.edu
6. Todd Wilsey, EWU EMS, 359-7454, twilsey@ewu.edu
7. Tom Chasse, EWU EMS, 359-7451, tchasse@ewu.edu
8. Mark Lindsay, EWU EMS, 359-6465, mlindsay@ewu.edu

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appendix i
electrical building assessment

MW CONSULTING ENGINEERS

James W. Moore, PE / Brandon D. Enevold, PE / Kjersten E. Kuhta, PE
Dylan J. Cunningham, PE / Jacob L. Deering, PE / Joel R. Enevold, PE

CONDITIONS ASSESSMENT REPORT

DATE:	May 26, 2016
PROJECT:	Eastern Washington University Science Building
PROJECT #:	2016.100
DEPARTMENT:	Electrical
MW REP:	Joel Enevold, PE
TO:	File
CC:	Integrus
VISITED DATE:	March 24, 2016
REASON:	Facility Assessment

General Notes

1. The original facility was designed in 1960. In the late 1980's and early 1990's the building had a series of renovations that replaced a majority of the building electrical, lighting and low voltage systems.
2. Phase I, II and III in the notes below refer the phases of renovation that occurred in the late 1980's and early 1990's. Phase I consists of the south wing addition and utility services to the building. Phase II consists of a renovation of the east and west wings and electrical systems to service these wings. Phase III consisted of renovation of the north wing.

Overview of Existing Conditions

1. Campus power and communication services for the building are connected to campus systems from the existing utility tunnels. The building is served by (1) 1500KVA 480Y/277V pad mount transformer #9 and (1) 1000KVA 480Y/277V pad mount transformer #9A. Both transformers are serviced from existing campus feeders 1B & 2B. Transformer #9 serves the north and south wings. Transformer #9A serves the east and west wings, which includes the below grade mechanical rooms.
2. During the Phase I construction, the original 1960 science building main service switchboard was refed from the south wing addition service. A 500KVA dry-type transformer is located in a below grade vault at the northeast building corner for this connection. The feeder is routed partially through the first floor ceiling space and the building tunnel system for this connection. The existing north wing switchboard is original to the 1960 construction and will require replacement. This switchboard is rated for 4000A, 208Y/120V with a 1600A fused main.
3. The building communications service and distribution appear to have received improvements in 2008. A full replacement of the building service and riser communications cabling is anticipated to meet current EWU OIT campus standards. Conduit pathways would be reused where feasible. The use of Passive Optical Fiber should be considered for communications in this building.

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4. The existing building distribution system is comprised of (1) 2000A, 480/277V Main Switchboard and (1) 1600A, 480/277 Main Switchboard. Each main switchboard serves individual 480V and 208V branch circuit panelboards throughout the building. The Main Switchboards are original to the 90's renovations. The existing branch circuit panelboards are also original to the building construction. The 480V distribution system supplies power to all lighting and mechanical loads throughout the building. The 208V distribution system supplies power to all general purpose and receptacle loads throughout the building.
5. There was noticeable water damage to the walls of the Phase I basement electrical room 004. Reconstruction of room walls with appropriate fire ratings will be required. New panic exit hardware shall also be planned for this room.
6. An existing 90KW propane gas generator serves emergency loads throughout the building and is located southwest of the building in the electrical service yard. The existing emergency generator system appears to mix NEC 700 emergency loads with NEC 702 standby loads. Revisions to the generator and generator distribution system will be required.
7. In general, the building electrical systems have an estimated 5-10 years of remaining service life. As a result, it is expected that renovated areas of this building will require replacement of the electrical distribution system. Reuse of existing feeders and branch circuitry would be considered where equipment locations are not impacted.
8. General lighting throughout the building is recessed and surface mounted fluorescent. Original incandescent lamps have been retrofitted with compact fluorescent lamps in most areas. Lighting controls consist of central lighting contactors for lobbies/halls and manual switches at room entries. Exterior and site lighting is controlled via central lighting contactors. Egress and Exit lighting is provided from the emergency generator. It is expected that all Exit lighting will need to be replaced and supplemented to meet applicable codes.
9. The existing general building lighting system has limited remaining service life and will be replaced to meet current energy code and lighting illumination standards. It is anticipated that lighting improvements would include the replacement of all existing conduit, wiring, controls and fixtures.
10. The communications cabling and equipment does not meet current EWU campus standards. As a result, the renovation of the building shall include improvements to the communications system devices, cabling and equipment. Existing pathways should be suitable for re-use where equipment or device locations remain unchanged. The use of Passive Optical Fiber should be considered for communications in this building.
11. The existing fire alarm system was upgraded in 2007 and meets current EWU campus standards. System layouts will require modifications to accommodate renovated spaces.
12. Access controls throughout the building consist of manual keys. New automated electronic access controls should be provided throughout the building per EWU campus standards.
13. Video surveillance systems did not appear to be present in the building. New video surveillance systems should be provided throughout the building per EWU campus standards.
14. Limited audio visual systems were present throughout the building and did not appear to meet current EWU campus standards. New systems should be planned per EWU campus standards.

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Operation's Staff Comments (Electrical)

1. Existing Variable Frequency Drives (VFD's) are not located within proximity of the equipment served. New VFD equipment shall be located at the equipment for improved maintenance and operation.
2. There are no reported failures of existing distribution equipment or branch panels.
3. Existing lighting panels are located in hallway corners and adjacent to shafts. This location makes the lighting panels hard to access for new work. Consider relocation of panels for better access or the addition of new pathways for future use.

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appendix j
project schedule

Eastern Washington University Science Renovation Schedule