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UTAH VALLEY UNIVERSITY SCIENCE BUILDING ADDITION

[PROGRAM]

DFCM PROJECT NO. 09131750

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Approvals

Utah Valley University Science Building Addition Program
DFCM Project No. 09131750

We have reviewed the Science Building Addition Program and warrant that it adequately represents our request for a facility to fulfill our mission and programmatic needs. All appropriate parties representing the University have reviewed it for completeness and accuracy.

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Executive Summary 01

Project Summary

Utah Valley University is expected to maintain its past high rate of enrollment growth for at least the next ten to fifteen years, with the possibility of becoming Utah's largest institution of higher learning. With just over 2 million total building gross square feet, UVU has 121.5 SF / student, the lowest of Utah's nine state institutions and one of the lowest in the country. In order to mitigate this situation of anticipated high growth and a severe shortage of built space, the University is planning an addition to its existing science building.

UVU's existing 80,000 gross square foot Pope Science Building was constructed in 1989 as an entry-level science course building. The building's current student load is four times that of the year of construction. With UVU's achievement of university status in 2008, the number of students taking science courses is expected to increase at a rate even higher than that of its general enrollment. There is a great need for expanded science facilities, in particular laboratory space.

The University is also experiencing a shortage in general classroom space, with utilization rates well above average and associated difficulties in the scheduling of courses.

The UVU Science Building Addition will add approximately 160,000 gross square feet to the existing Pope Science Building. The addition will help to alleviate the shortages in both the science laboratory and general classroom categories by providing the components below, listed with their net area amounts:

Space Type	NSF
Laboratories & Related Support Space	69,000 NSF
General Classrooms	21,000 NSF
Faculty / Administrative Offices	9,000 NSF
Student / Building Support Spaces	5,500 NSF

The anticipated construction cost for the Science Building Addition is $40.8 million.

The project is expected to bid in April of 2010, with University move-in and use of the building in November, 2011.

Project Vision Statement

The Utah Valley University Science Building Addition will be...

FLEXIBLE / VERSATILITY

A project that:

- Creates flexible and versatile laboratory spaces that promote group collaboration and facilitate interdisciplinary work, while enhancing future options for changing programs, curricula, technology, and equipment.

- Develops an open and flexible facility that promotes student / faculty interaction, is inviting and welcoming, easily accommodates future modification, and provides line-of-sight understanding and clear orientation for building users.

- Designs engaging, modular and flexible classrooms that empower the essence of teaching by facilitating collaborative learning and problem solving.

EXTERIOR DESIGN / IMAGE

A project that:

- Conveys the excitement of science and the outstanding quality of science education at Utah Valley University through an architectural design that reflects the character and image of the UVU College of Science and Health.

- Pays tribute to the architectural history of campus by respecting the existing campus image, while developing a unique and complementary architectural character and style.

- Includes native materials and products that highlight the natural geological features of Utah.

- Incorporates natural light and campus views into the design through use of large exterior windows and skylights.

- Considers a walkable portion of the roof structure and surface that allows the building to be used as a tool for scientific experimentation that includes solar research.

INTERIOR DESIGN / IMAGE

A project that:

- Creates open spaces within the facility with high ceilings, properly-sized hallways, and wide stairwells.
- Includes an iconic central space or atrium with a central feature of excitement, interest, and invitation.
- Recognizes students as the central focus of this facility and the teaching that occurs here, by providing student-centered study/reading lounges and collaborative study spaces with ample natural light and the flexibility to serve as informal teaching spaces.
- Incorporates a variety of spaces for display and communication, in order to generate interest, excitement, and understanding of the curricula, programs and services offered by the College of Science and Health.
- Uses transparency to showcase the programs and opportunities available to science students, and to attract new interested individuals to the College of Science and Health programs.
- Infuses the facility with appropriate levels of natural and artificial light, with an emphasis on providing an environment that is warm, friendly, comfortable, energy efficient, and connected to the natural surroundings.
- Engages visitors through hands-on and protected exhibits, art, and demonstrations, located in spaces that enhance the participants' experience.

- Generates unexpected opportunities for learning and interaction by means of interior finishes such as writable wall surfaces.

- Organizes the interior spaces so similar disciplines can be located around and adjacent to common / shared spaces.

- Creates an indoor environment that includes opportunities for plants and greenery.

PROGRAMS

A project that:

- Offers a variety of computer rooms, including shared computer labs for student use, computer rooms for specific labs, and computer rooms that can be controlled and scheduled by individual departments for their students and curricula.

- Locates areas for student study that are flexible and varied, which might include science resource materials.

- Allocates sufficient storage space, including locakable storage for departments, labs, staff, and faculty.

- Recognizes stockroom needs in general, as well as for specific departmental needs.

- Locates conference rooms of varying sizes and quantities throughout the building and considers that some of those rooms should be controlled and scheduled by departments.

- Accommodates faculty and staff needs for lounges, shower areas, a lunch room, and deck access from office suites.

- Properly sizes faculty offices and locates them in close proximity to labs, classrooms, and student spaces for greater faculty/ student interaction.
- Creates simplified functionality in all spaces for easier use and convenience such as restrooms with visual privacy but no doors.
- Provides a variety of lecture spaces including auditoria of sufficient capacity and state of the art technology.
- Allocates sufficient space for faculty and staff work rooms which will include copy area, printer space, and layout areas that are all easily accessible.
- Includes an appropriate greenhouse and an herbarium with appropriate space.
- Creates information services at building entries.
- Includes a variety of classrooms: tiered, flat, and some combination classrooms with both flat and tiered spaces. These classrooms should have multi-media capacity.
- Plans for a variety of spaces that are neither classroom nor labs, for specialized use.
- Conveniently locates a small food service component within the building.
- Creates space where exciting science displays, exhibits, and apparatus can be showcased to generate excitement and interest in the college programs and offerings.
- Provides secure space where students can store their articles while in lab.

TECHNOLOGY

A project that:

- Ensures all teaching spaces have "smart" technology that is user friendly and flexible for future upgrades.
- Installs information technology and data infrastructure that has server / IDF rooms that stack, cable tray throughout the building, wireless connectivity, and a 10 gigabyte network for data transfer.
- Designs teaching spaces to accommodate both electronic media and white board communication at the same time without interfering with one another.
- Promotes the building as a teaching tool by creating a real time graphic display of the building's energy usage, while promoting sustainability and the directive to achieve a LEED Silver rating for the building.
- Develops a technologically appropriate media lab for recording student teaching efforts without disturbing the students.

SUSTAINABILITY

A project that:

- Promotes environmental consciousness and responsibility, using the building as a tool for sustainability and a representation of campus commitment to sustainability.
- Wisely controls water usage through such techniques and practices as a water-wise landscape, waterless urinals, and low flow plumbing fixtures.
- Incorporates photovoltaic technology into the building/project as a renewable energy resource.

- Considers long-term life-cycle effects of the building's operation, including management of the material stream of purchasing, using, and recycling materials within the College of Science and Health.

OPERATIONS / MAINTENANCE

A project that:

- Designs the utility infrastructure to carefully analyze building needs for chilled water, air handling, and electrical service. The project will tie these needs into the campus systems with appropriate upgrades to serve this building as well as potential future buildings in this area of campus.

CAMPUS CONTEXT / MASTER PLAN

A project that:

- Carefully considers the site for the science building addition to determine the most appropriate location.

- Analyzes accessibility needs from a vehicular and pedestrian perspective with consideration for convenience, safety and utility.

CAMPUS CONTEXT / MASTER PLAN

A project that:

- Accommodates equipment delivery and service by maintaining upper floor elevator access, appropriately sized doors, and adequate dock access.

- Locates shared equipment in central locations for easy access and use by multiple user groups. Such areas might include a central equipment room and an instrument suite.

- Includes a variety of freezers with varying temperature capacities.
- Ensures that appropriate quantities and types of hoods are provided in lab locations.
- Utilizes a high speed data network to serve the building.
- Places whiteboards in lab spaces.

SAFETY / SECURITY

A project that:

- Secures building users' safety through creation of labs and spaces that meet industry and educational safety standards.
- Recognizes the need to properly handle, store, and dispose of agents that pose threats to safety and to the environment.
- Installs accessible emergency shut off valves and switches to stop utility feeds when an accident has occurred that would jeopardize safety with utilities in service.
- Appropriately secures designated spaces by means of electronic lock systems.
- Provides a safe path of travel at night by installing appropriate levels of lighting around the exterior of the building.

CAMPUS COMMUNITY / CULTURE

A project that:

- Presents a university quality building in every respect that engages students, faculty, and staff in an intellectually stimulating and motivating facility.
- Facilitates interaction with a design that brings departments together and encourages interdisciplinary collaboration.
- Utilizes art and interior design of the spaces to encourage scientific thought and imagination.

PROJECT PROCESS

A project that:

- Is based upon the best thinking, ideas, and needs in university science educational facilities as presented by faculty during the programming and design process. This thinking will be supplemented with design expertise and quality ideas from peer institutional facilities.

CAMPUS INFRASTRUCTURE

A project that:

- Develops design solutions that limit energy load factors on the infrastructure and provide an energy-efficient life-cycle operation.
- Ties new infrastructure systems into the existing campus energy management system.
- Appropriately designs all spaces to accommodate the intended purpose and use, including such considerations as higher-strength floor design where needed.

FUNCTIONALITY

A project that:

- Increases building functionality through adjacencies that make sense.

- Designs accessibility into the facility to allow ease of material transport into, out of and within the building.

- Considers classroom needs and functionality for demonstrations and experimentation with sound isolation and safety management built into the design.

LABS

A project that:

- Provides a variety of lab spaces relevant to today's curricula, and flexible enough to serve the curricula of the future through easy modification and upgrade.

- Designs centralized, shared spaces and utilities for economies of scale, ease of access, and consolidation of services. These common spaces and utilities may include but are not limited to:
- Central stockroom for general equipment checkout which should include:
  - Chemical vaults with separate air
  - Adequate stacks, refrigerators, and acid storage cabinets
  - Dirty work area
- Consolidated instrumentation lab and instrumentation storage
- Centralized utilities including:
  - De-ionized water
  - Vacuum
  - Gas
  - Air

- Appropriate drain design for chemical waste, emergency shower areas, and eye wash stations
- Radiation facilities that qualify for a site license with
- Bio-hazard license
- Semi-Clean instrument lab
- Imaging and microscopy lab core with appropriate vibration criteria
- Lab core with autoclave, storage, and chemical hoods

- Incorporates the following characteristics into the lab spaces:
  - Views into the labs from corridors and hallways
  - Open labs
  - Natural light from exterior windows or skylights
  - Appropriately sized for expected student loads and curricula
  - Expandable
  - Functionally designed, not just and assemblage of tables
  - Flexible for current and future needs
  - Designed for teaching with spaces for instruments and prep areas
  - Includes space for lab managers near the labs without being in the labs to allow for privacy in working

- May include a space for a small animal vivarium.

- Properly ventilates spaces with general HVAC systems and specialized systems where needed, including appropriately designed hoods of sufficient quantity to serve the curricula.

- Provides adequate storage for specimens and equipment within the labs and classrooms.

- Includes science education lab and prep areas for appropriate equipment and material storage.

Site 02

A. Science Building Addition

Architectural Narrative

Campus History

The first buildings of Utah Valley University were occupied on the current campus during the 1976-1977 school year. The original purchase of 185 acres allowed what was then Utah Technical College at Provo to move a portion of the programs into more accommodating facilities on a then-spacious campus.

Since that time the number of campus facilities has increased and the institution has changed; first to Utah Valley Community College, then to Utah Valley State College, and on July 1, 2008, it became Utah Valley University.

While the location, mission, and role of the institution have changed over time, the need for new facilities remains high, with one of the lowest ratios of square feet of facilities per student in the country (121.55 SF per student). Nearly 27,000 students began the 2008 academic year with a 28% growth increase expected over the next eleven years. This will continue to put pressure on already highly utilized existing facilities.

The main campus is currently comprised of 224 acres and 2,025,664 SF of facilities. The majority of these facilities are organized along a campus mall; a 30 foot wide corridor system that runs from the Gunther Technology and Computer Science / Engineering Buildings on the upper east side of campus, to the Administration building in the southwest sector of campus, to the McKay Events Center on the west, and to the new Digital Learning Center on the north.

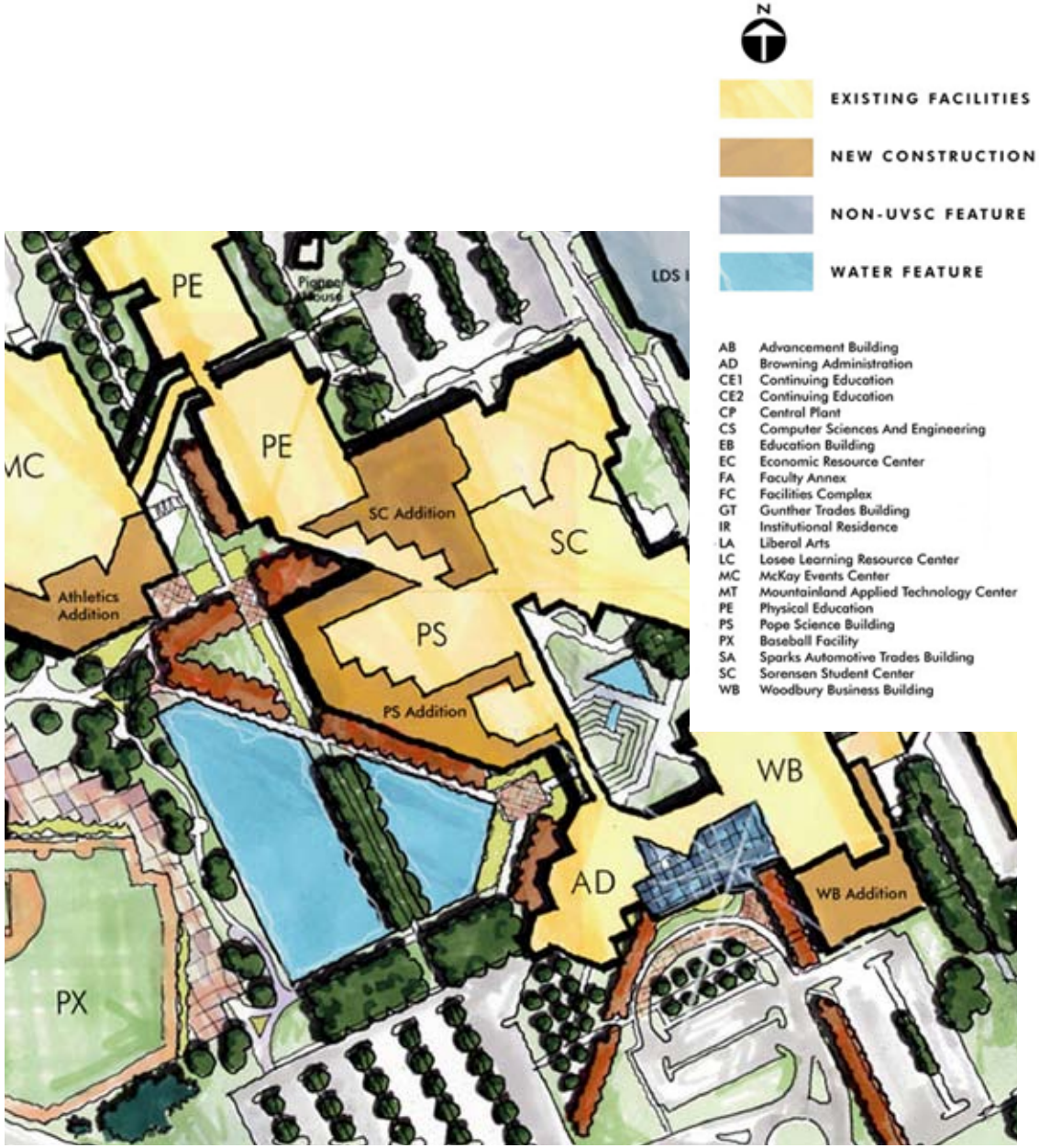
In addition to the main campus, UVU has multiple campus locations which include: the Wasatch campus in Heber City; the Provo Airport Campus, Canyon Park Building L; UVU West on Geneva Road; UVU North at Lehi Junior High; UVU South at Spanish Fork High School; and the Mountainland Applied Technology College.

Campus Master Plan

The Campus Master Plan, completed in 2005, recognizes the need for new campus facilities and gives recommendations and guidelines for new facility locations on the campus. The plan also

reviews campus pedestrian and vehicular circulation, campus parking, campus entry and identity, as well as campus capacity.

The master plan defines the campus architectural style as modernist with new facilities following stylistic principles established in early campus buildings. Although architectural style guidelines are unwritten, campus administrators encourage new facilities to follow the principles established over the years: connection to the campus spine; a 30'x30' planning module; masonry infill within a concrete frame; and a 15' floor-to-floor height. The Pope Science Building, home to the College of Science and Health, is identified in the master plan as a facility that will be expanded, with recommendations for where that expansion could be located. As seen on the attached vignette from the master plan, the recommendation is to locate the new addition immediately adjacent to the existing Pope Science Building on the north, west, and south sides. *(Figure 1.)*



(Figure 1 - Master Plan Showing Possible Expansion.)

This recommendation did not take into account current administrative strategies for reinforcing and encouraging student body activity at the center of campus. Nor did the master plan consider locations of campus utilities in making these recommendations. Later sections of this program will address those concerns.

The master plan recommends that vehicular circulation and access be located at the perimeter of campus, reinforcing the current traffic patterns. Parking remains at the perimeter of campus. Additional parking will not be required as part of the Science Building expansion.

Pedestrian access on campus is via the indoor mall spine that interconnects most campus facilities, as well as exterior walkways and paths.

Location of Science Building Addition

During the programming process, the design team was encouraged to investigate campus-wide opportunities for the location of the Science Building addition. After due consideration of those opportunities, the following issues became primary drivers for the location recommendation:

- There is a strong desire to encourage student activity at the "center" of campus and to bring student focus back to that center. Location of the science building addition was seen as a strategic method of bringing students back to the center of campus.

- Dividing the science programs into separate buildings that might be at different locations on campus was seen as detrimental to the function of the College of Science and Health as an integrated entity. There is great value in the various science specialties reinforcing and strengthening each other. The curricula are interrelated and contiguous facilities were seen as critical in maintaining that strength.

- The various science programs share various scientific equipment, chemical stores, and demonstration tools. It was viewed as counterproductive to have this equipment and these materials duplicated and housed in separate locations on campus.

The preferred location of the Science Building Addition is immediately adjacent to the existing Pope Science Building.

The following discussion of the location of the new addition on site outlines major considerations and issues. More detailed discussion and elaboration of some of these issues and considerations will be found in later sections of this site narrative.

In evaluating suitability of the immediate surroundings for the addition, locations of existing site utilities will be a significant influence on the decision. While underground utilities surround the existing building, major water, sanitary sewer, and storm sewer lines run just north of the Pope Science Building. *See the accompanying site survey completed by Great Basin Engineers.* Costs to relocate or replace these utilities are to be considered part of the project construction cost.

Located to the south and west of the existing building are two irrigation ponds that store water used to irrigate the entire campus *(Figure 2)*. While disturbing or relocating these ponds is not recommended due to their strategic function, cost of relocation, unavailability of funding, and recent upgrades to the irrigation system, any modification to them must maintain their capacity and integrity. The funding to modify the ponds must come from the project construction budget.

Figure 2 - View of Irrigation Ponds from North

Figure 3 - View of Irrigation Pump Vault from the East

Figure 4 - View of the Environmental Science Building Looking North

Figure 5 - View of the Environmental Science Building Looking Southeast from Ground Level

The major pump house for the irrigation system is also located west of the existing building in an underground vault *(Figure 3)*. While relocating this facility is not recommended, designs that relocate the pump facility must pay for such costs from project construction funds.

Associated with the irrigation ponds and pump facility are numerous major irrigation lines that distribute the irrigation water to all parts of campus. Again, refer to the site survey by Great Basin Engineers that accompanies this program. The irrigation system must be maintained in service at all times during the irrigation season. Relocation or replacement of these irrigation lines and systems must be funded from the project construction budget.

Immediately south of the Pope Science Building is the Environmental Technology Building *(Figure 4 & Figure 5)*. Built in the 1980's, this single-story facility houses the Environmental Technology Management program. With the science building addition, this program will be accommodated in the new and remodeled facilities. With finite campus acreage, a single-story facility is not an efficient use of valuable land and facility resources. This facility may be demolished to make space for the new addition. Cost of the demolition must be funded with project construction funding.

South of the Environmental Technology Building is a drainage channel that carries water from central campus locations, as well as roof drainage and site drainage, into the irrigation ponds. This channel should be maintained or replaced, but cannot be abandoned. Near this water channel is a pad that serves as access to the fountain feature and performance amphitheater located east of the Hall of Flags. This access needs to be maintained.

If the Environmental Technology Building is not demolished as part of the project, converting it into four new general classrooms for the campus should be part of the project design as an additive alternate based on funding availability.

Fire Department access around the building as well as service and emergency vehicle access to the dock area must be provided.

It is desired that pedestrian access to the main concourse mall be established. Refer to the code discussion in this program for exiting implications related to this mall access.

It is desired that views from the Hall of Flags be maintained as much as possible. Views from the existing Pope Science Building are important and maintaining them is a strong consideration. Views from the new addition must also be appropriate. It is hoped that the new views will avoid rooftop vistas of existing facilities (McKay Events, Physical Education, Browning Administration, etc.) Another important view consideration is the image and view of the science facility from the I-15 and University Parkway corridors.

Maintaining the corridor that runs between the McKay Events center and the Physical Education Building is considered important to the campus. At minimum, a visual corridor is to be maintained.

Natural light within the new addition as well as the existing facility is important to the College of Science.

Fresh air intake as well as exhaust air pathways from the Pope Science Building must be maintained without creating problems for air intake and exhaust in the new addition.

Emergency power generators that serve the Pope Science Building, the Environmental Technology Building, and the Browning Administration Building are located adjacent to the Pope Science Building and the Environmental Technology Building. Maintaining emergency service is critical to the safety of the facilities. A greater discussion of this item is available in the electrical narrative.

The height of the new addition will be important to the image of the campus. Consideration should be given to the height of the existing surrounding facilities and how a higher addition might affect those existing facilities as well as the campus character.

As will be seen from a review of the room diagrams and room descriptions, the College of Science wants to maintain various adjacencies that will provide greater collaborative opportunities to the faculty and students. Larger floor plates on fewer floors is seen as a means to achieve the desired adjacencies. This might also be a means of achieving greater efficiency in net to gross ratios within the new addition.

The buildable area immediately adjacent to the existing Pope Science Building is limited due to surrounding infrastructure and buildings.

In consideration of the above issues, the programming team has developed four alternate floor

plates with their implied heights / number of stories necessary to achieve the required program area. These four schemes are shown on the following figures.

Each of these site plans and floor plan schemes addresses the issues raised above to a greater or lesser degree. It is not the intent of the program team to dictate a solution, just to show four possibilities. There are numerous possibilities and the successful design team must work with the University and College of Science to achieve the greatest utility, functionality, and aesthetically pleasing design solution. *(Figures 6a-d)*.

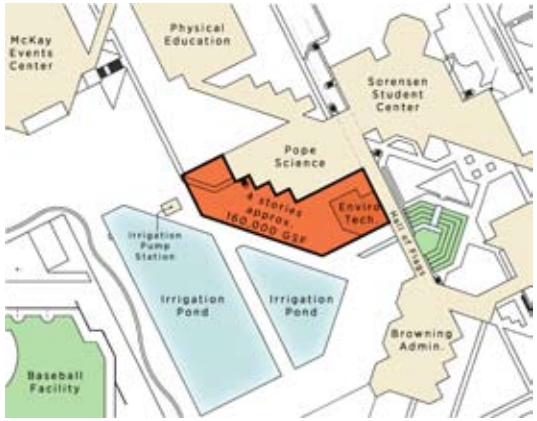


Figure 6a - Option 1

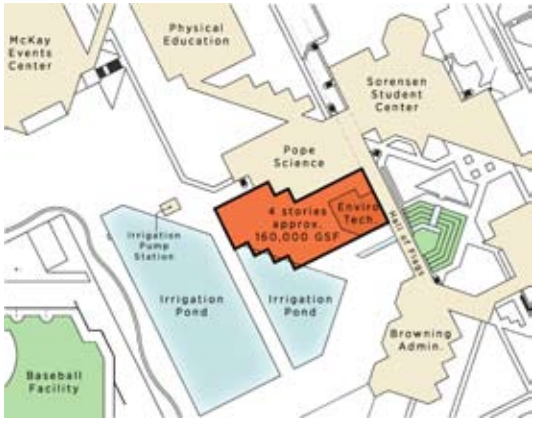


Figure 6b - Option 2

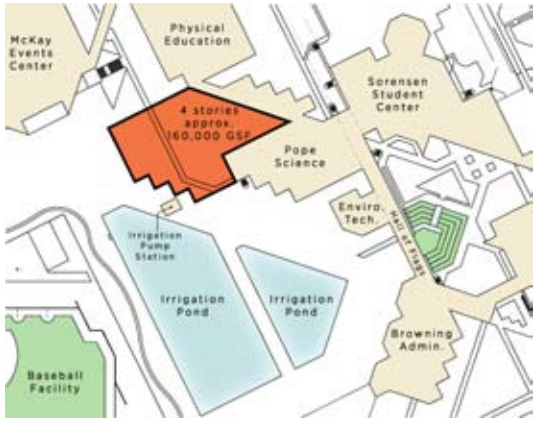


Figure 6c - Option 3

Figure 6d - Option 4

Figure 7 - View of the Pope Science Building Looking to the Southeast.

Figure 8 - View of the Pope Science Building Looking Northeast Showing Mechanical Louvers.

Figure 9 - View of a Deck on the Pope Science Building Looking Northwest to the Physical Education Building and the McKay Events Center.

Figure 10 - View of the Center Atrium Looking East Towards the Mall Concourse and the Foucault Pendulum.

Figure 11 - Deck Above the Mall Concourse at the Third Floor Entry to the Pope Science Building.

Existing Building Description

The Existing Pope Science Building is located at the west center of campus. It is west of the Student Center, north of the Administration Building, south of the Physical Education Building, and southeast of the McKay events center. It is a three-story facility connected to the main pedestrian mall spine via a large atrium housing a Foucault pendulum and taxidermy displays.

Its architectural aesthetic is the campus modernist style evident in the majority of campus facilities with a structural concrete framework. Exterior walls are red masonry infill, with dark bronze tinted glass in dark bronze aluminum frames. Several accessible decks are located on different levels around the east, west and south sides of the building.

It is accessed from entries off the main mall circulation spine on its east end. It can also be accessed from the deck above the mall spine at its top level. At the lower level, it can be accessed from exterior doors on the west side.

Major mechanical air intakes and exhaust are located on the southwest corner of the building at several levels. It will important to maintain proper air flow to and from these locations since the existing HVAC systems will remain. The new addition will not rely upon these existing air handling systems, but will have its own air handling systems.

Exhaust hoods terminate in major black painted vents on the roof. Some of them are ducted interior to the building and some are ducted on the exterior north side of the building.

The existing building is constructed on the 30' x 30' module prevalent across campus. The floor to floor height is 15'. It will be important to maintain floor to floor connections between the new addition and the existing building *(Figures 7 - 11)*.

Orientation and Views

The existing building is oriented with its major axis in an east-west direction. The major pedestrian mall spine cuts diagonally across the east side of the existing building and then heads directly south from the science building to the administration building.

The new addition is expected to attach to the portion of the mall concourse either from the Hall of Flags or the portion immediately north of the existing Pope Science Building. It is also expected that the new addition will connect to one or more facades of the existing building. *See the architectural conceptual site plans.*

The new addition has several possible orientations within the developable portion of campus designated for it. This will give several challenges and opportunities related to daylighting, heat gain, and solar orientation.

As a result of the tight area available for the building footprint, it is expected that the new facility will likely be at least three stories in height. Designs with more stories may be considered. With major subsurface water at this portion of campus (see the attached geotechnical study), construction of a basement in the facility is not advised. With these considerations in mind, and given the fact that the existing facility is only three stories above grade, any new addition higher than three stories might offer 360 degree views and day lighting opportunities at the top floor. Although these views may be compromised by having to look over exisiting rooftops.
Views from the site to the surrounding geography are significant and there is a strong desire to have as much visual connection to the exterior as possible. The views include:

- Views of the Wasatch Range to the northeast, east, and southeast.
- Views of the landscape, ponds, and baseball complex to the west.
- Views to Utah Lake to the west.
- Views of the administration building to the south.
- Views of the Physical Education Building and McKay Events Center to the north.
- Views of other campus buildings to the east.

(Figures 12 - 14.)

Views to the campus are also significant. The new science building addition will be clearly seen from the I-15 corridor as well as from the University Parkway.

Also, the science building addition will be seen from other campus buildings, walkways, and green spaces, especially those to the north, east, and south of the site.

As the addition is made, the views from the Hall of Flags concourse / pedestrian mall spine should be maintained as much as possible.

Figure 12 - View of the Mountain Landscape Looking into the Northeast.

Figure 13 - View of the Pope Science Building Looking Northeast Across the Irrigation Ponds with Mt. Timpanogos in the Background.

Figure 14 - View of the Pope Science Building Looking East Across the Irrigation Ponds with Y Mount in the Background.

Access

Due to its central location on campus, the science building complex is accessible from many different directions. Major indoor access through the pedestrian mall spine will be from the north, east, and south. Exterior pedestrian access from the north is on paved walkways. Exterior access from the south and west is via turf stone pathways that run around and between the irrigation ponds.

As an expansion of the existing science building, the new addition will need to create pedestrian access from the existing building. As well, existing exiting must be maintained and protected.

Vehicular access to the new facility will be limited to service and emergency vehicles. Currently there is no parking immediately adjacent to the facility and after the addition, none is anticipated. Currently service vehicles come from the north on a paved walkway that goes under a pedestrian bridge that is part of the mall spine to the McKay Events Center. See the architectural conceptual site plan as well as the attached photo. *(Figure 15a-c & Figure 16)*.

Figure 15a - Campus Circulation

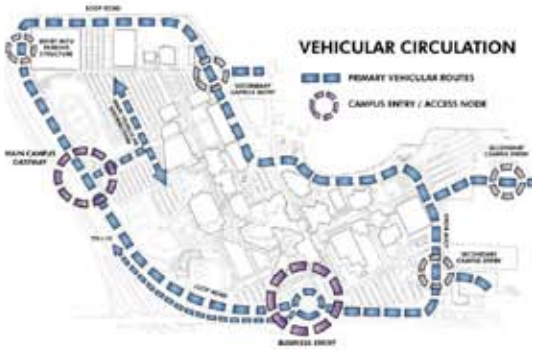


Figure 15b - Campus Circulation

Figure 15c - Campus Circulation

Service vehicles also access the site via a "turf stone" paved path from the south, between the irrigation ponds. See site plan and attached photo. *(Figure 17)*.

It may also be possible to access the site with service and emergency vehicles from the west. The addition must accommodate vehicular service and emergency vehicles.

Figure 16 - View of Access Pathway Looking North to the Pedestrian Connector to the McKay Events Center.

Figure 17 - View of Access Pathway Looking South Towards the Irrigation Ponds.

Utilities

Major utilities will come from several sources to the new science addition. As well, existing utility feeds need to be maintained to the existing building during construction.

Most campus utilities will come from the mall spine corridor system which also supplies utilities throughout campus. Ties into existing lines will need to be made while keeping down time to a minimum. It is suggested that these service connections be made during campus breaks or holidays when the campus is not heavily occupied.

Chilled water and low temperature hot water will be provided by the campus from the central plant. A study accompanies this program outlining recommendations for central plant upgrades to ensure adequate hot and chilled water to the existing and future campus facilities.

Electrical service will come from a campus loop system. A study of campus electrical capacity and recommendations to assure adequate electrical service to existing and future facilities accompanies this program. An existing generator is located along the southwest flank of the existing facility. It serves the Administration Building as well as the Pope Science Building. If the Environmental Technology Building is demolished and the new addition is located on the south side of the Pope Science Building, this generator will need to be relocated in order to maintain service access to the generator and to maintain emergency electrical service to the existing buildings.

The existing building transformer is located in a vault within the building. A determination is necessary as to the location of the new transformer for the addition. At present the recommendation is to locate it in a vault in the interior of the new facility. This will allow reasonable access of main feeders from within the spine area into the transformer area.

A new emergency generator will be required to service the new addition. The location should be determined in conjunction with the architectural design of the facility.

A major 8” water line runs immediately north of the Pope Science Building. This will allow adequate water service into the new addition.

A 24” diameter storm sewer line runs immediately north of the Pope Science Building and will allow roof drainage and other site related drainage to be piped into the storm sewer system.

A 10” diameter sanitary sewer line runs immediately north of the Pope Science Building. This will accommodate non-chemically contaminated waste. It will be important to design chemical waste collection for compounds and chemicals that cannot be introduced directly into the sewer system. A dilution system will be necessary.

Due to the proximity of the large irrigation pump vault, major irrigation feed lines run close to the Pope Science Building. It is possible that some of these lines will need to be relocated away from the new addition. This work should be done in late fall or early spring to avoid compromising the irrigation of campus turf and other plantings.

Parameters and Design Restrictions

The existing campus is unified in its design character and image. The material palette while not specifically codified is represented in the existing buildings. It will be important for the new facility to maintain the campus identity while at the same time creating a distinct image for the College of Science and Health that portrays academic excellence in the sciences and generates excitement for science. Within the design parameters, the building must be able to incorporate natural lighting and provide ample views for the occupants to the surrounding views, landscapes, and facilities. Since the new addition will be clearly visible from the major public transportation corridors it will be important for the design to represent Utah Valley University to the world as well.

Maintaining connections to the existing building floor plates from the new floor plates will be important to create a continuous and unified science complex.

As noted above, there is limited space available for the new addition footprint. Careful location of the new addition on site will be important. The location must consider its effect on the campus utilities and infrastructure that run around and through the site.

Maintaining operations in the Pope Science Center during the construction of the new addition will be important. The educational operations and curricula delivery cannot be interrupted for the construction.

The design for the addition must accommodate service vehicles for deliveries and garbage removal. Fire truck access must be accommodated as required by code. Other emergency vehicles must be accommodated as well.

It is the preference of campus facilities leadership that the irrigation ponds remain undisturbed. The campus has no money to repair or relocate them and the project costs may not be sufficient to cover the costs of pond remodeling or relocation. Any modification of the ponds required by the new design must maintain the pond capacity and must be funded from the project construction budget.

Intake and exhaust air from the existing Pope Science Building must be maintained.

LEED certification at a Silver level is mandated by the State. Site design can have an affect on achievement of that certification.

The existing facility was designed and constructed in the 1980's. It is unknown whether the structural design accommodates today's seismic standards. It is therefore recommended that connections of the new facility to the old be by means of seismically designed expansion joints and connections.

It is also inappropriate to assume that the new facility can be built on top of existing open deck areas or roof top areas. There is nothing in the existing documentation to suggest that the original design was built to accommodate such loads and that even if it were designed for such, the seismic codes have changed. There is no funding and no intention of upgrading the Pope Science Building to today's structural standards at this time.

As noted previously, the existing Environmental Technology Building can be demolished to provide adequate space for the new addition footprint.

The existing emergency generator serving the Pope Science Building also serves the Administration Building. Emergency power to the Administration Building must be maintained.

A significant amount of power from the Pope Science Building is used to operate the irrigation pumps just west of the building. Power to these pumps needs to be maintained during the irrigations season.

Project Site Needs

Many project site needs have been listed in the narrative sections above.

Service, fire and emergency vehicle access have been noted above.

As noted above, no new campus parking will be needed in association with this project.

In addition to these needs it should be noted that a greenhouse will be needed as part of the Botany program of the College of Science and Health. While it might be possible to locate the greenhouse on the roof of the new addition, it is the preference of the college administration and faculty that the greenhouse facilities be located on the ground level with adequate day light opportunities.

In keeping with existing campus plantings, at a minimum, the landscape should be replaced to match the surrounding landscape of turf, trees and low shrubs. It is suggested that the landscape architect work with the campus facilities group to develop a more sustainable landscape architecture using native plants, low water plantings, and perhaps a xeriscaped landscape to substitute for the status quo.

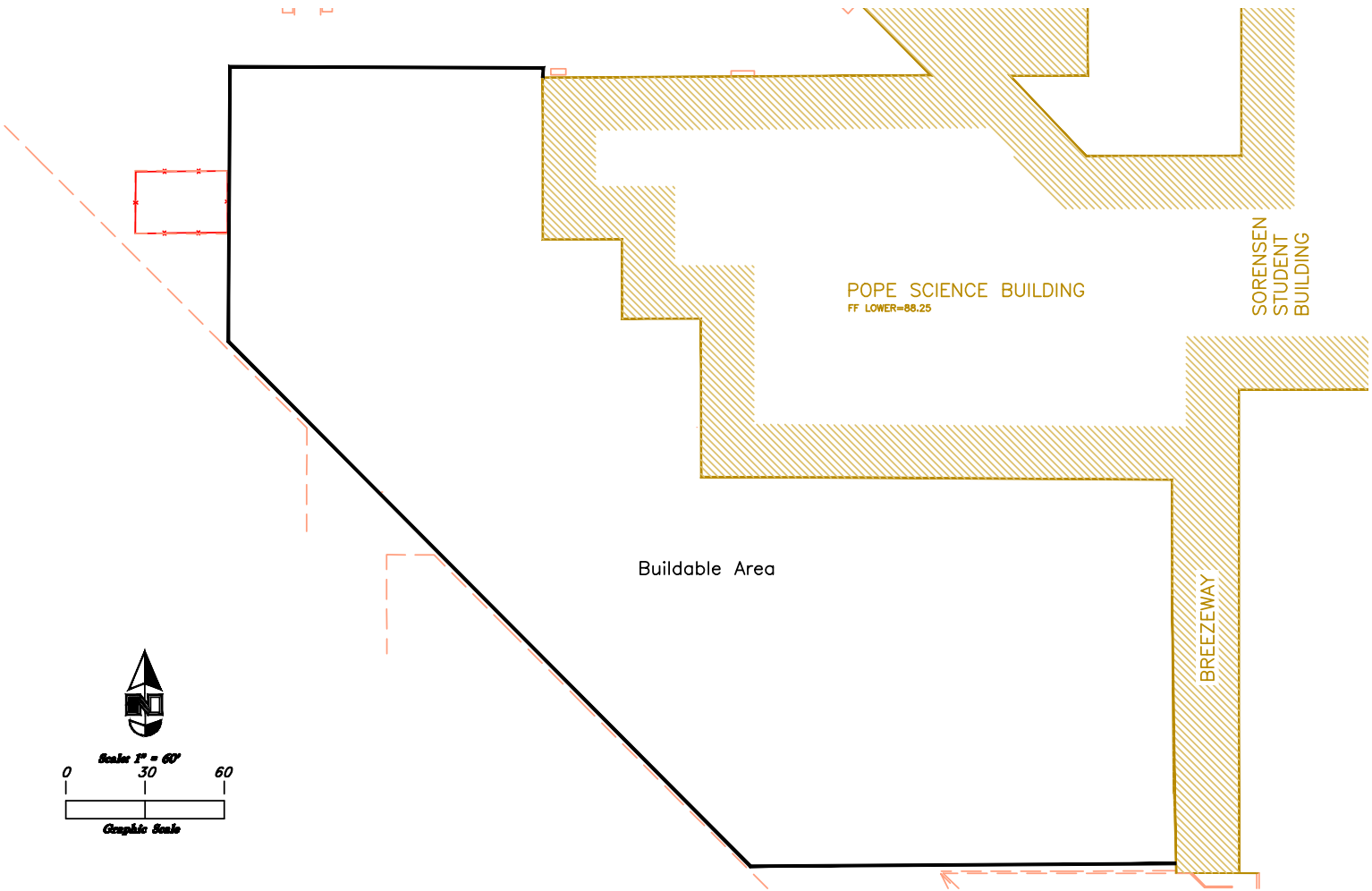


Figure Option 1, Civil 1

Site 02

B. Science Building Addition

Civil Narrative (Option 1)

Site

The site is effectively bounded on the north of the existing Science Building by several utilities, on the west by the existing irrigation pond and irrigation pump structure, and south by the irrigation canal, staging area, and Administration Building. There is additional open space to the north of the existing Science building but its use would require that several utilities that all serve the campus to the east be relocated: an existing 24-inch storm drain, 8-inch and 10-inch sanitary sewer, 8-inch water line, and 6-inch irrigation. The irrigation pump structure can be relocated but this is not recommended but is available to the design team. This leaves an available building site of roughly triangular shape for the proposed building. *Figure Option 1, Civil 1* shows the buildable area for this site based on the constraints indicated above.

Grading

The proposed building will have the same level 0, 1, 2 etc. elevations as the existing Science Building. Except at doors and other at finish floor connections, the finish site grade will be about 6-inches below level 0 finish floor elevation.

The grading will slope generally towards the west and south towards the irrigation pond. All of the sidewalks and other at grade connections will slope away from the building. This will require some re-grading of the walks and soil near the building. *Figure Option 1, Civil 2* shows the existing contours for this area. A full size topographical survey with spot elevations is provided in the appendix.

Utility Lines

There are several utility lines that must be removed and relocated in order for the construction of the building to take place. *Figure Option 1, Civil 3* shows the existing utilities to remain, building demolition, and utility demolition. A full size survey of the existing utilities with flow line elevations is provided in the appendix.

Sanitary Sewer

Figure Option 1, Civil 3 shows the removal of the sewer line that serves the Environmental Technology Building. It also shows the removal of the sewer line just north of the proposed building. This line

can be left in place at the discretion of the design team if the bottom of the footings and foundations for this area are set even with the bottom of the sewer so that the footings do not crush the sewer line. This option is not recommended but is available to the design team. The proposed sewer connection and relocation of the north sewer line is shown on *Figure Option 1, Civil 4*. The new sewer lines are proposed to be PVC pipe with a minimum pipe size of 6-inches and larger to match the existing sewer lines.

Ground Water

Based on the level of water in the irrigation ponds, the water found at other sites along the campus, and past experience, it is expected that ground water will be found several feet below grade. This may require a foundation drain to be installed to pipe ground water away from the foundation systems. The geotechnical report should be consulted for specific recommendations dealing with ground water as part of the design process.

Storm Drain

Figure option 1, Civil 3 shows the removal of the storm drain from the Environmental Technology Building. It also shows the removal of the storm drain under the proposed building foot print. The proposed roof drain connection to the irrigation pond is shown on *Figure Option 1, Civil 4*. It will be at the same location as the roof drain connection from the Environmental Technology Building. The proposed roof drain connection will be 8-inch PVC.

Culinary/Fire Water

Figure Option 1, Civil 3 shows the removal of several water lines under the building footprint. These lines will be replaced with 8-inch C-900 PVC water mains and is shown on *Figure Option 1, Civil 4.*

Irrigation Water

Figure Option 1, Civil 3 shows the removal of several irrigation water lines under the building footprint. The relocated irrigation water lines are planned to be 8-inch C-900 PVC lines and are shown on *Figure Option 1, Civil 4*. The irrigation vault provides irrigation water for all of campus. As such, it is critical that any disruption to the irrigation system be very minimal. The irrigation water relocation and replacement must be done off season or in such a manner that the rest of campus is not deprived of irrigation water for more than a few hours.

Irrigation Maxicom Controller

Figure Option 1, Civil 3 shows the removal of several maxicom Irrigation Controller lines. The new lines will be the same as the existing lines and are shown on Figure Option 1, Civil 4. The irrigation controller relocation and replacement must be done off season or in such a manner that the rest of campus is not deprived of irrigation water for more than a few hours.

Electrical Lines

There are several electrical lines that feed the irrigation pumps in the irrigation vault that must be removed and relocated. These are discussed in the electrical section. The removal of these lines is shown on Figure Option 1, Civil 3. The electrical relocation and replacement must be done off season or in such a manner that the campus is not deprived of irrigation water for more than a few hours.

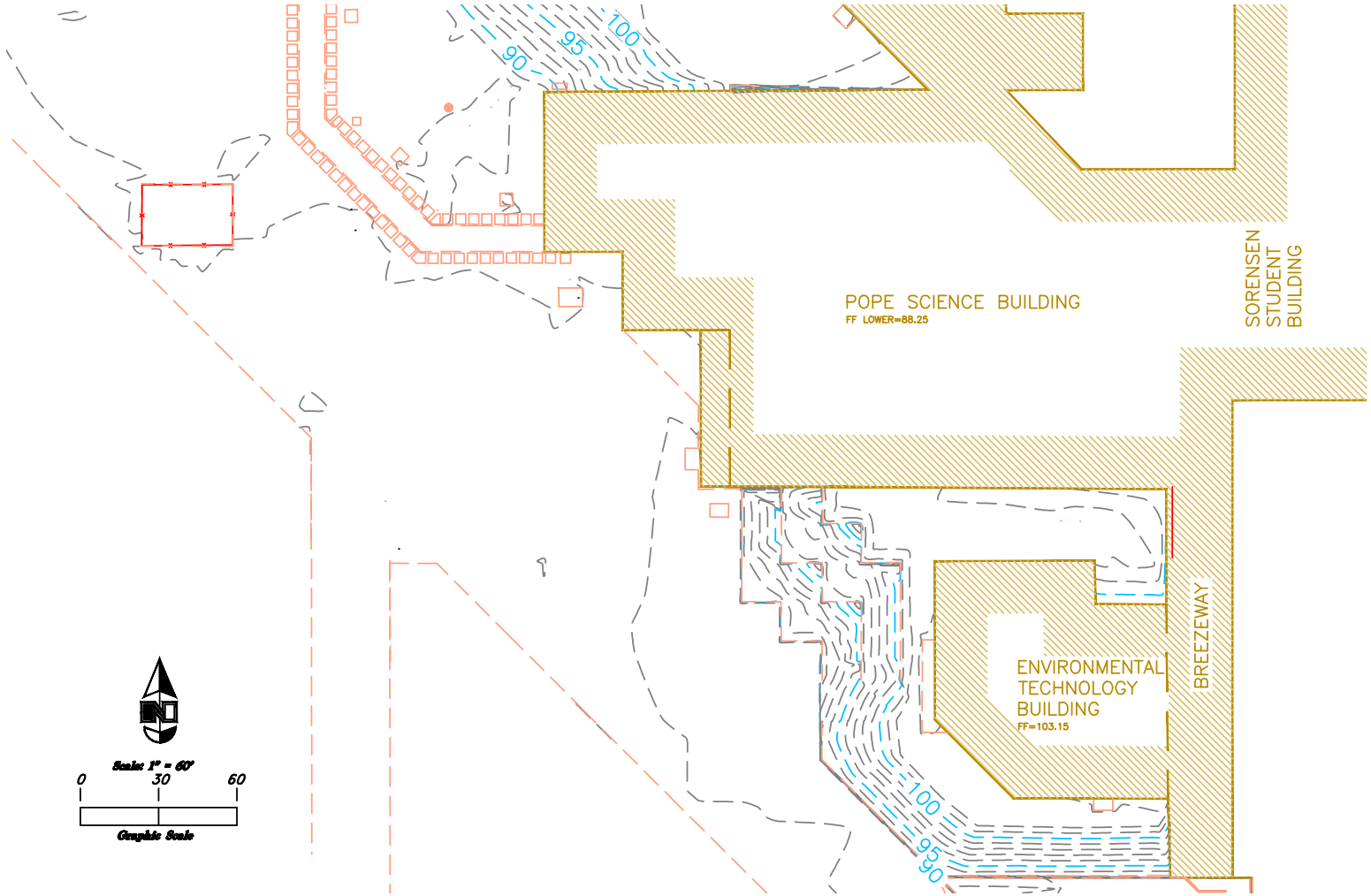


Figure Option 1, Civil 2

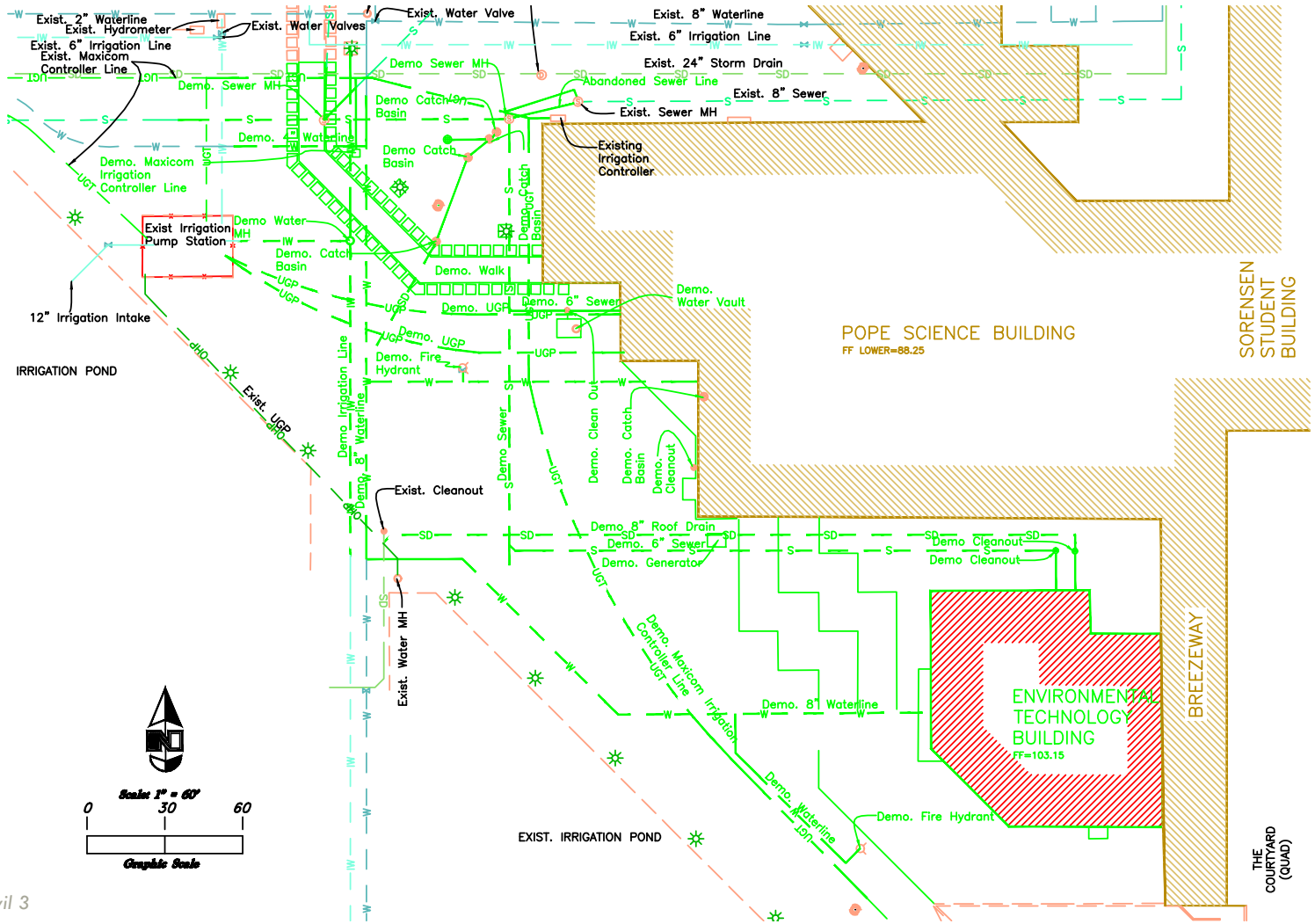


Figure Option 1, Civil 3

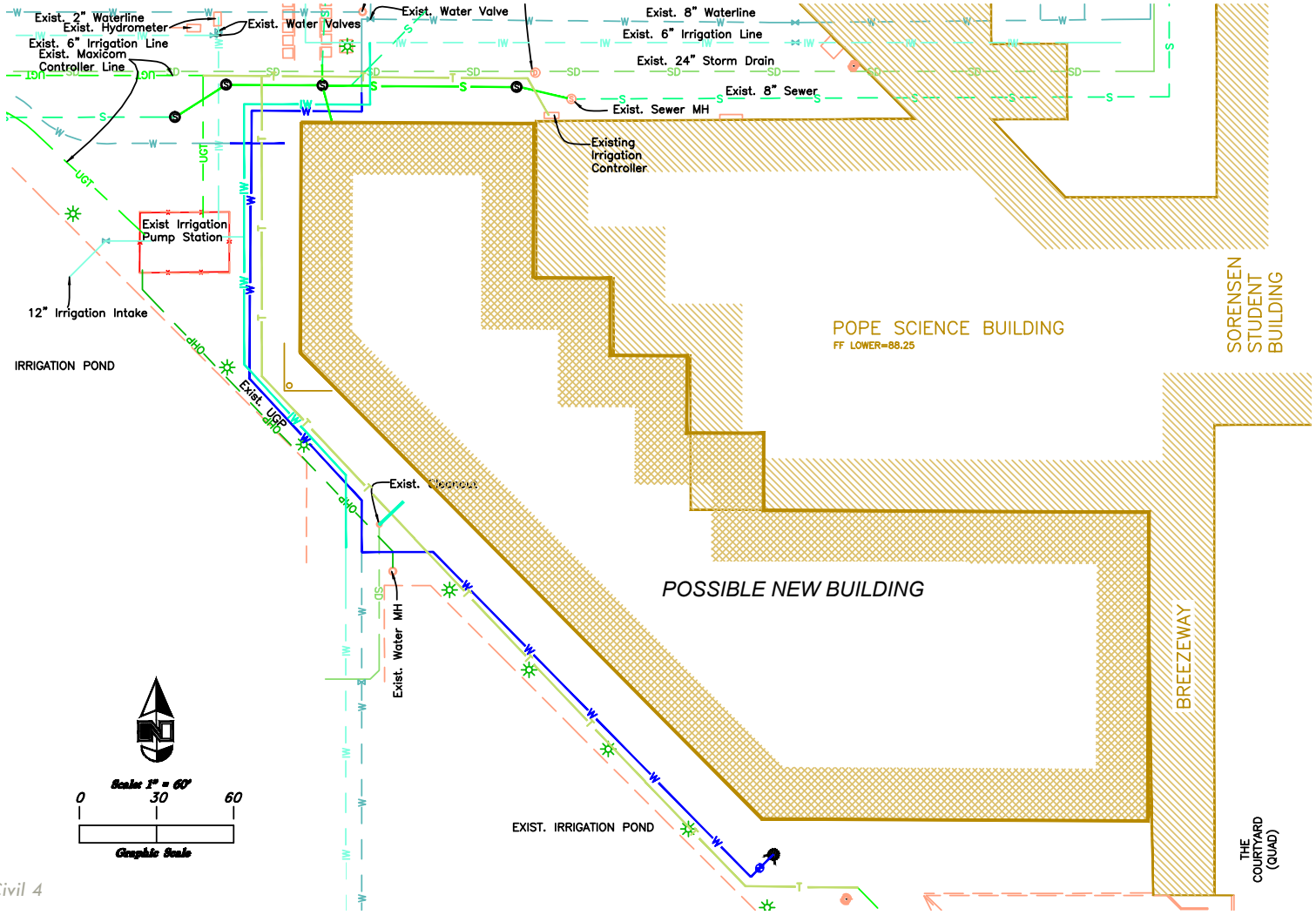


Figure Option 1, Civil 4

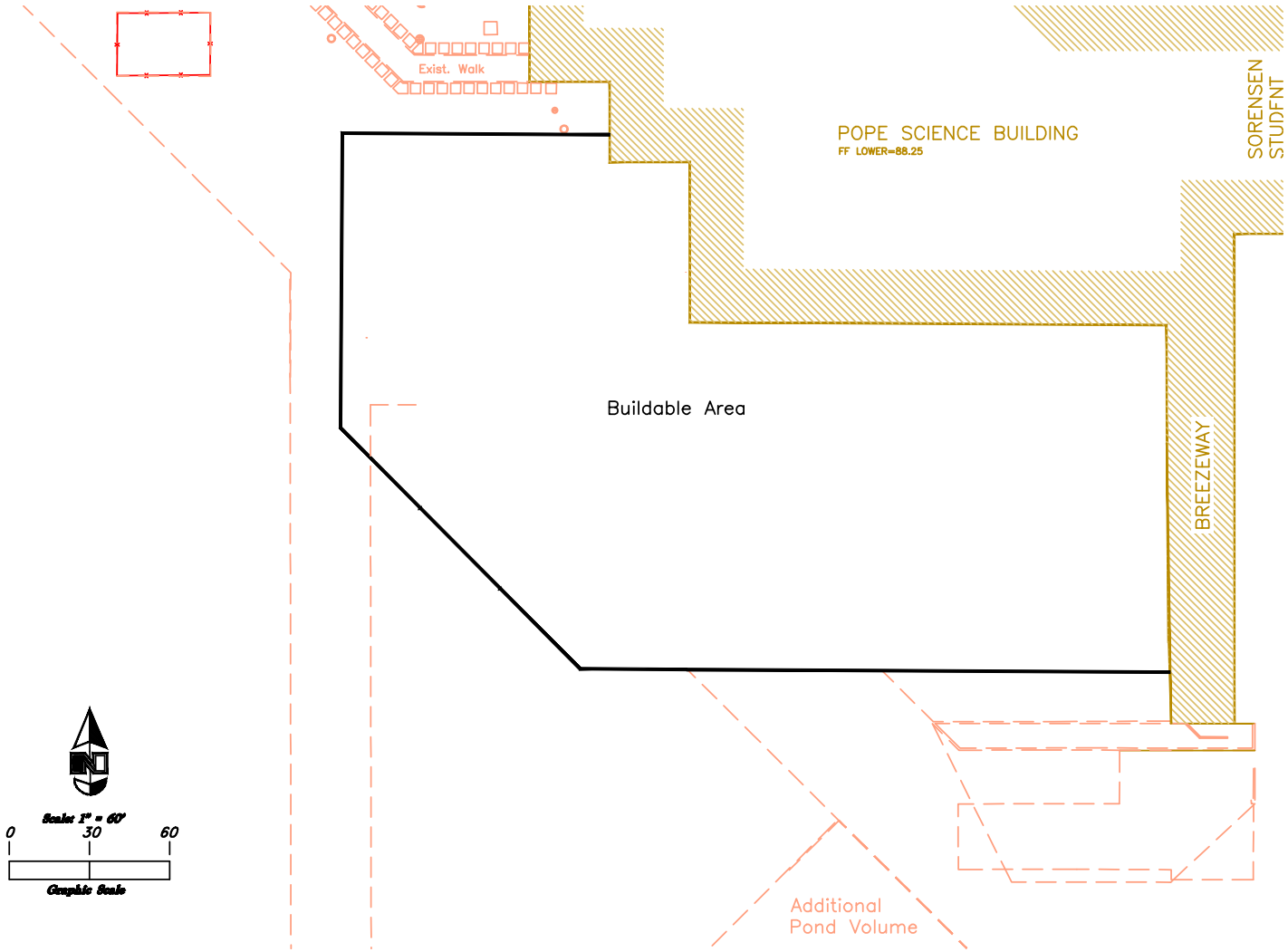


Figure Option 2, Civil 1

Site 02

B. Science Building Addition

Civil Narrative (Option 2)

Site

The site is bounded by some of the jogs in the existing Science Building on the north, by the path between the two irrigation ponds on the west and by the irrigation pond on the southwest. It will be necessary to revise the irrigation ponds to keep the same volume. This can be done by adding volume to the southeast or by increasing the depth of the irrigation pond. *Figure Option 2, Civil 1* shows the buildable area for this site based on the constraints indicated above.

Grading

The proposed building will have the same level 0, 1, 2 etc. elevations as the existing Science Building. Except at doors and other at finish floor connections, the finish site grade will be about 6-inches below level 0 finish floor elevation. The grading will slope generally towards the west and south towards the irrigation pond. All of the sidewalks and other at grade connections will slope away from the building. This will require some re-grading of the walks and soil near the building. Figure Option 2, Civil 2 shows the existing contours for this area. A full size topographical survey with spot elevations is provided in the appendix. Part of the building and associated utilities will encroach into the smaller irrigation pond. This will require that a corresponding volume be provided in the two ponds either by increasing the depth of the pond(s) or by adding area to the pond(s). It will be necessary to supplement the topographical information showing the areas where the irrigation ponds will be increased. It is also probable that additional survey showing the depths of the ponds and slopes of the ponds may be required to verify that the pond volume remains the same after they are reconfigured. If the pond(s) are increased in depth, care must be taken to make sure that the design still works with the intake for the irrigation pump structure.

Utility Lines

There are several utility lines that must be removed and relocated in order for the construction of the building to take place. Figure Option 2, Civil 3 shows the existing utilities to remain, building demolition, and utility demolition. A full size survey of the existing utilities with flow line elevations is provided in the appendix.

Sanitary Sewer

Figure Option 2, Civil 3 shows the removal of the sewer line that serves the Environmental Technology Building. The proposed sewer connection and relocation of the north sewer line is shown on *Figure Option 2, Civil 4*. The new sewer lines are proposed to be PVC pipe with a minimum pipe size of 6-inches and larger to match the existing sewer lines.

Ground Water

Based on the level of water in the irrigation ponds, the water found at other sites along the campus, and past experience, it is expected that ground water will be found several feet below grade. This may require a foundation drain to be installed to pipe ground water away from the foundation systems. The geotechnical report should be consulted for specific recommendations dealing with ground water as part of the design process.

Storm Drain

Figure Option 2, Civil 3 shows the removal of the storm drain from the Environmental Technology Building. It also shows the removal of the storm drain under the proposed building foot print. The proposed roof drain connection to the irrigation pond is shown on *Figure Option 2, Civil 4*. It will be near the location as the roof drain connection from the Environmental Technology Building. The proposed roof drain connection will be 8-inch PVC.

Culinary/Fire Water

Figure Option 2, Civil 3 shows the removal of several water lines under the building footprint. These lines will be replaced with 8-inch C-900 PVC water mains and is shown on *Figure Option 2, Civil 4*.

Irrigation Water

Figure Option 2, Civil 3 shows the removal of several irrigation water lines under the building footprint. The relocated irrigation water lines are planned to be 8-inch C-900 PVC lines and are shown on *Figure Option 2, Civil 4*. The irrigation vault provides irrigation water for all of campus. As such, it is critical that any disruption to the irrigation system be very minimal. The irrigation water relocation and replacement must be done off season or in such a manner that the rest of campus is not deprived of irrigation water for more than a few hours.

Irrigation Maxicom Controller

Figure Option 2, Civil 3 shows the removal of several maxicom Irrigation Controller lines. The new lines will be the same as the existing lines and are shown on *Figure Option 2, Civil 4*. The irrigation controller relocation and replacement must be done off season or in such a manner that the rest of campus is not deprived of irrigation water for more than a few hours.

Electrical Lines

There are several electrical lines that must be removed and relocated. These are discussed in the electrical section. The removal of these lines is shown on *Figure Option 2, Civil 3*. The electrical relocation and replacement must be done off season or in such a manner that the campus is not deprived of irrigation water for more than a few hours.

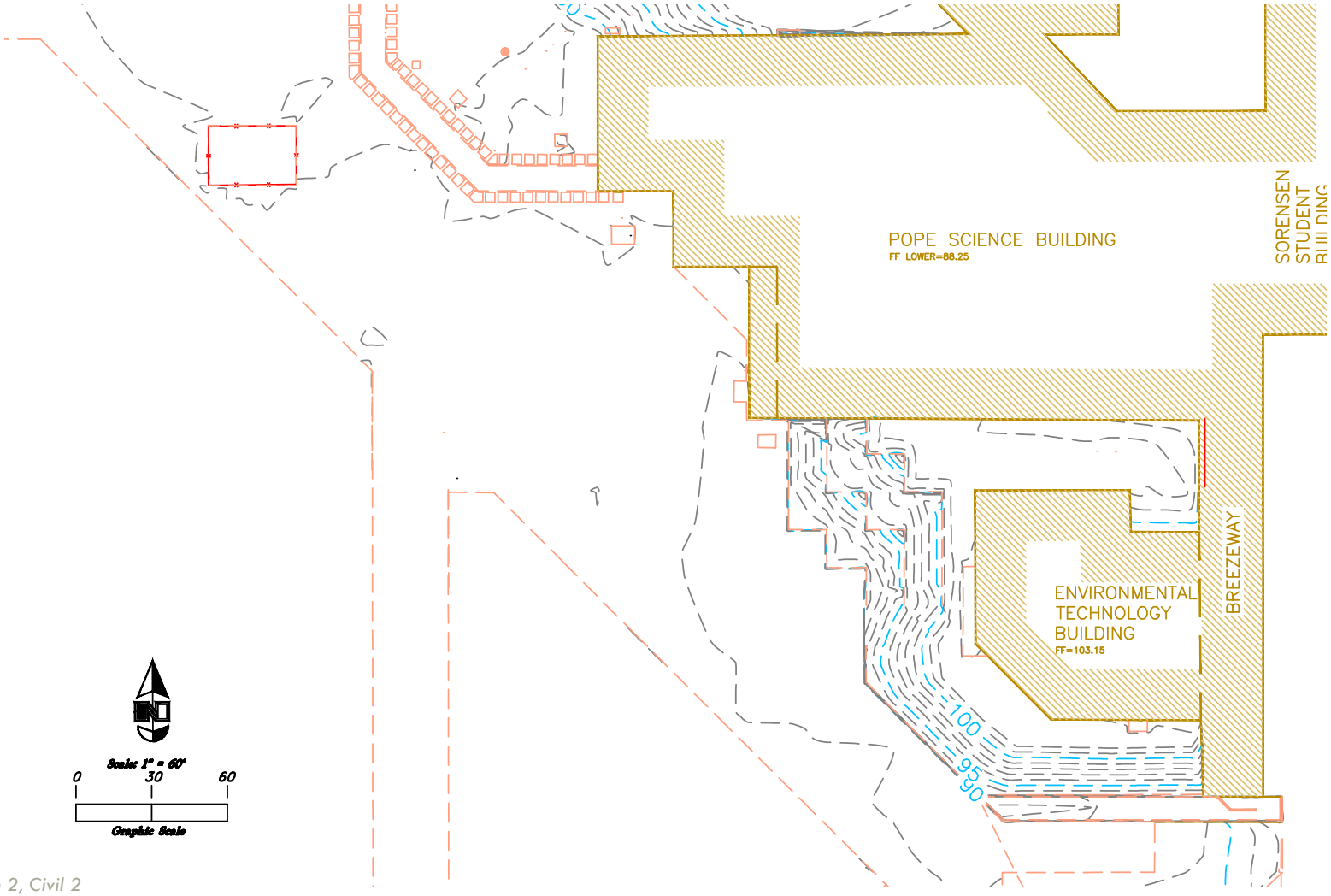


Figure Option 2, Civil 2

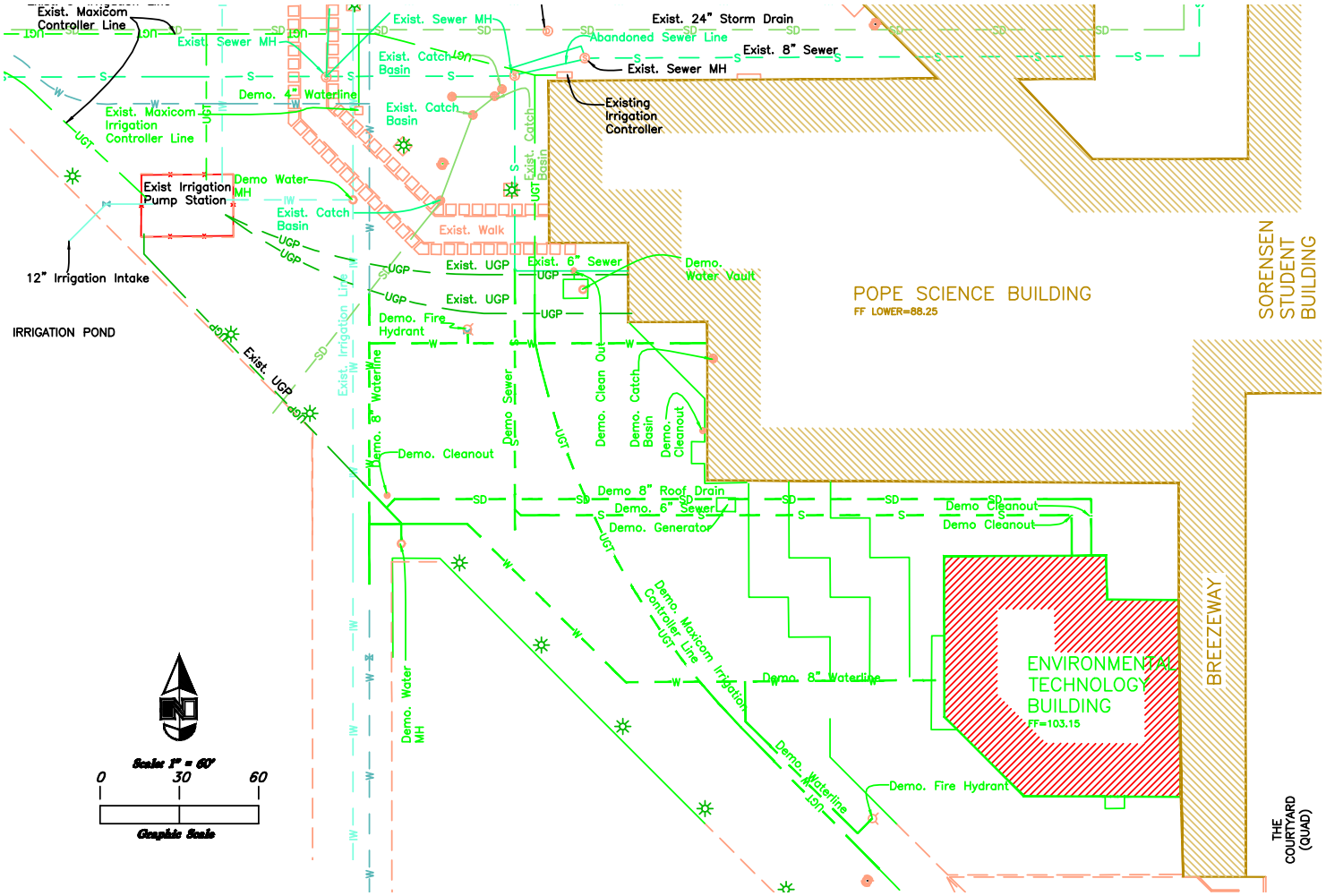


Figure Option 2, Civil 3

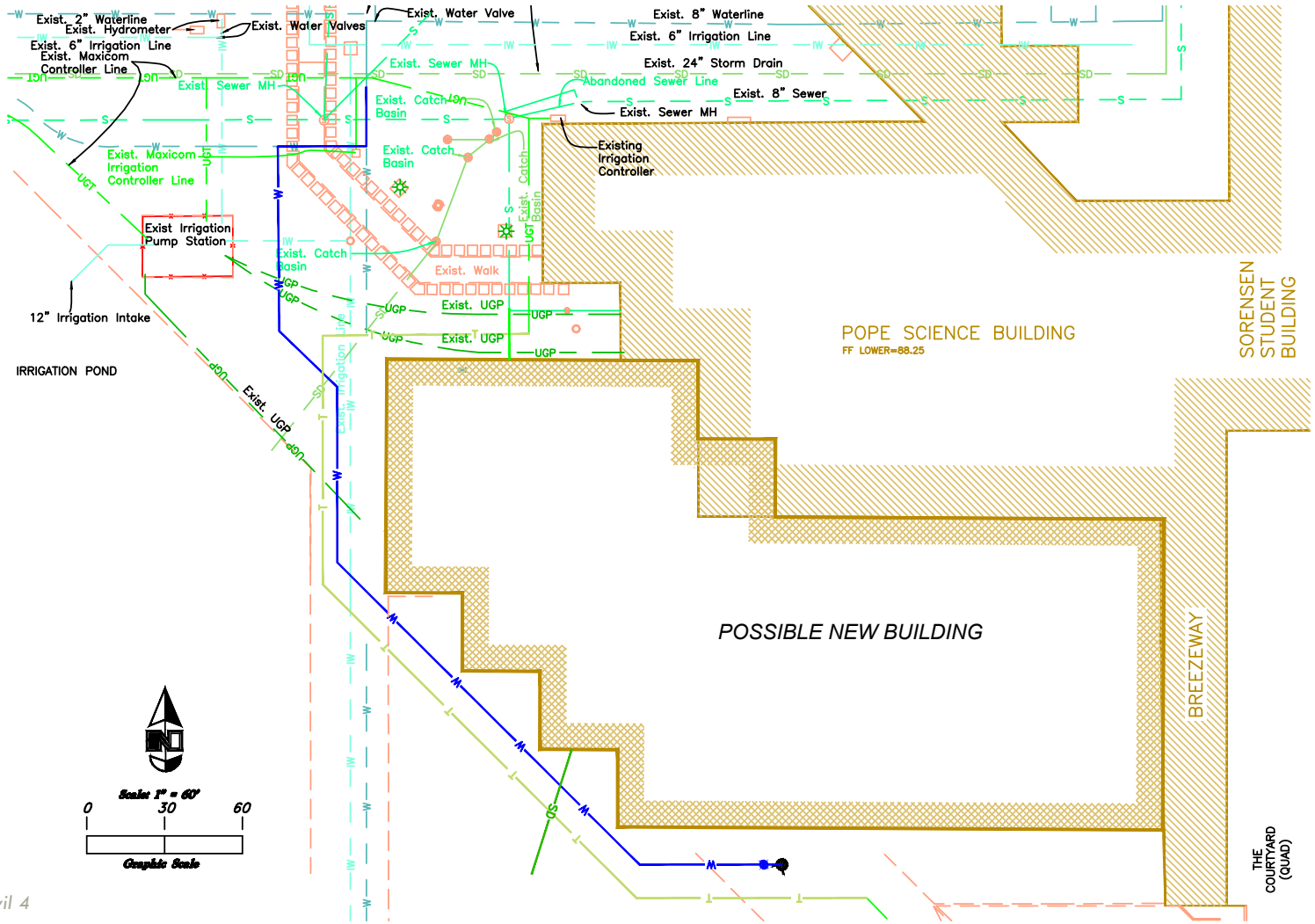


Figure Option 2, Civil 4

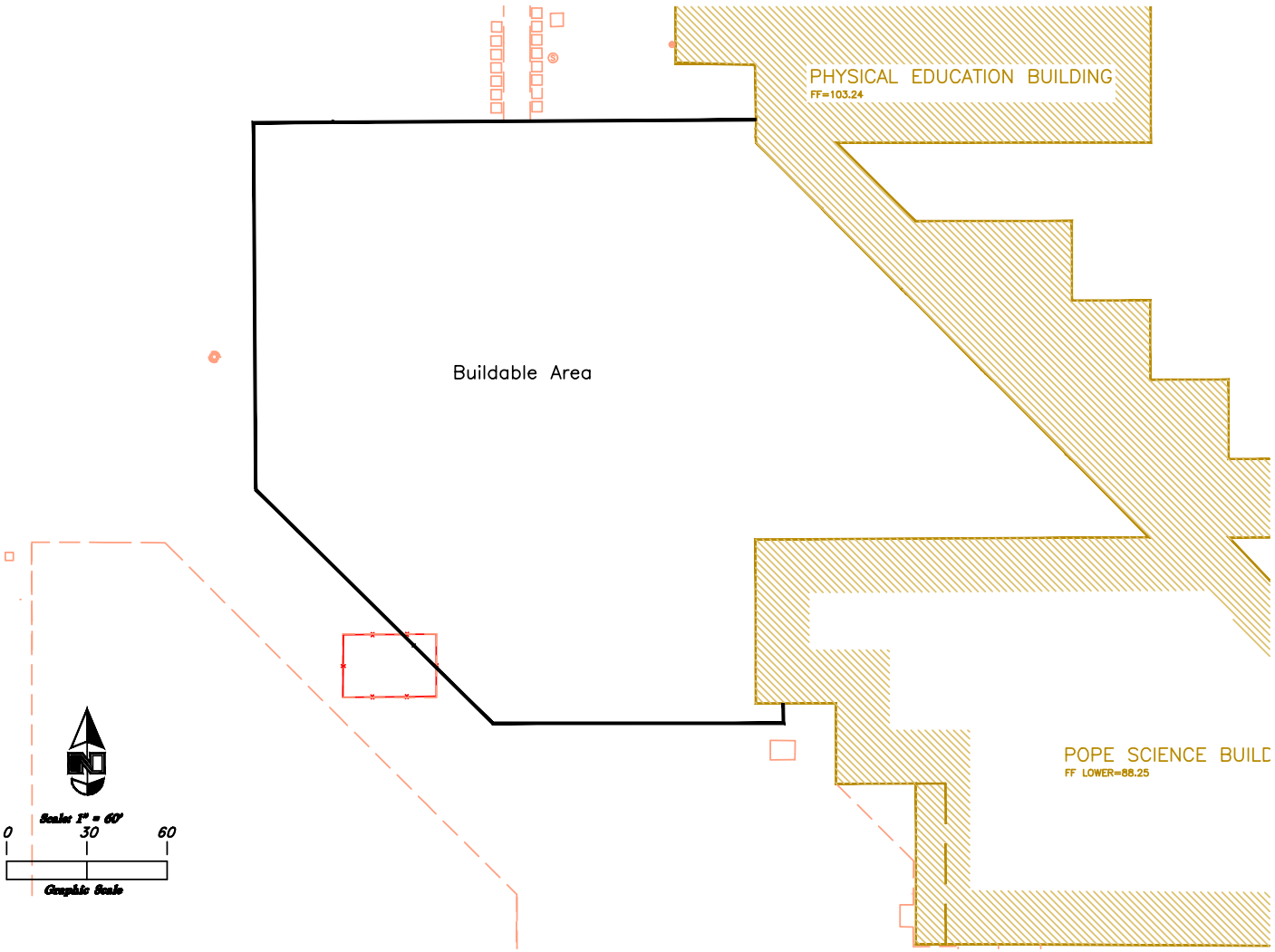


Figure Option 3, Civil 1

Site 02

B. Science Building Addition

Civil Narrative (Option 3)

Site

The site is bounded by the hall way on the north-east, by the existing Science Building on the south, and by the irrigation pump station on the south-west. Great care must be taken to make sure that the building does not cause problems with the irrigation structure. *Figure Option 3, Civil 1* shows the buildable area for this site based on the constraints indicated above.

Grading

The proposed building will have the same level 0, 1, 2 etc. elevations as the existing Science Building. Except at doors and other at finish floor connections, the finish site grade will be about 6-inches below level 0 finish floor elevation. The grading will slope generally towards the west and south towards the irrigation pond. All of the side-walks and other at grade connections will slope away from the building. This will require some re-grading of the walks and soil near the building. *Figure Option 3, Civil 2* shows the existing contours for this area. A full size topographical survey with spot elevations is provided in the appendix.

Utility Lines

There are several utility lines that must be re-moved and relocated in order for the construction of the building to take place. *Figure Option 3, Civil 3* shows the existing utilities to remain and utility demolition. A full size survey of the existing utilities with flow line elevations is provided in the appendix. As shown the building is placed above all of the utilities just north of the existing Pope Science Building. These utilities will need to be placed into a single tunnel or into individual casings placed under the building. If placed into a single tunnel, the storm drain and sanitary sewer will need to be constructed of HDPE NSF grade pipe to assure that these lines do not leak and contaminate the culinary water lines that will be in close proximity. Approval of this may be required by the Division of Drinking Water prior to construction taking place. Other utilities will be relocated and routed around the proposed build-ing footprint.

Utility Tunnel

Several utilities will be placed in the utility tunnel. This will require that the tunnel be large enough to place the 24-inch storm drain and 8-inch sewer lines. Both of these lines are at slope and will require that grade be maintained. The other two utilities are culinary water and irrigation water. These two pipes are pressurized and can follow the grade of the tunnel without adverse affect to pressure. The tunnel construction must be coordinated with the raft footing that will be necessary for the building construction. It is preferable to not have the tunnel break the raft footing.

Sanitary Sewer

Figure Option 3, Civil 3 shows the removal of part of the sewer line that serves the Environmental Technology Building. The proposed sewer connection and relocation of the north sewer lines are shown on *Figure Option 3, Civil 4*. Other than the sewer line in the tunnel, the new sewer lines are proposed to be PVC pipe with a minimum pipe size of 6-inches and larger to match the existing sewer lines. The sewer line in the tunnel is proposed to be HDPE NSF grade pipe.

Ground Water

Based on the level of water in the irrigation ponds, the water found at other sites along the campus, and past experience, it is expected that ground water will be found several feet below grade. This may require a foundation drain to be installed to pipe ground water away from the foundation systems. The geotechnical report should be consulted for specific recommendations dealing with ground water as part of the design process.

Storm Drain

Figure Option 3, Civil 3 shows the removal of the storm drain from under the building foot print. The proposed roof drain connection to the irrigation pond is shown on *Figure Option 3, Civil 4*. It will be from the south of the building and will go to the large irrigation pond and will be 8-inch PVC. The storm drain that will be in the tunnel will be HDPE NSF rated pipe.

Culinary/Fire Water

Figure Option 3, Civil 3 shows the removal of several water lines under the building footprint. These lines will be replaced with 8-inch C-900 PVC water mains and is shown on *Figure Option 3, Civil 4*.

Irrigation Water

Figure Option 3, Civil 3 shows the removal of several irrigation water lines under the building footprint. The relocated irrigation water lines are planned to be 8-inch C-900 PVC lines and are shown on *Figure Option 3, Civil 4*. The irrigation vault provides irrigation water for all of campus. As such, it is critical that any disruption to the irrigation system be very minimal. The irrigation water line relocation and replacement must be done off season or in such a manner that the rest of campus is not deprived of irrigation water for more than a few hours. The construction will be very close to the irrigation pond border. If part of the irrigation pond is taken out of service for the construction of the building or utilities, the pond volume that is removed must be replaced prior to taking part of the pond or the work must be done during the irrigation off season so that full volume is available during the irrigation season.

Irrigation Maxicom Controller

Figure Option 3, Civil 3 shows the removal of several maxicom Irrigation Controller lines. The new lines will be the same as the existing lines and are shown on *Figure Option 3, Civil 4*. The irrigation controller relocation and replacement must be

done off season or in such a manner that the rest of campus is not deprived of irrigation water for more than a few hours.

Electrical Lines

There are several electrical lines that must be removed and relocated. These are discussed in the electrical section. The removal of these lines is shown on *Figure Option 3, Civil 3*. The electrical relocation and replacement must be done off season or in such a manner that the campus is not deprived of irrigation water for more than a few hours.

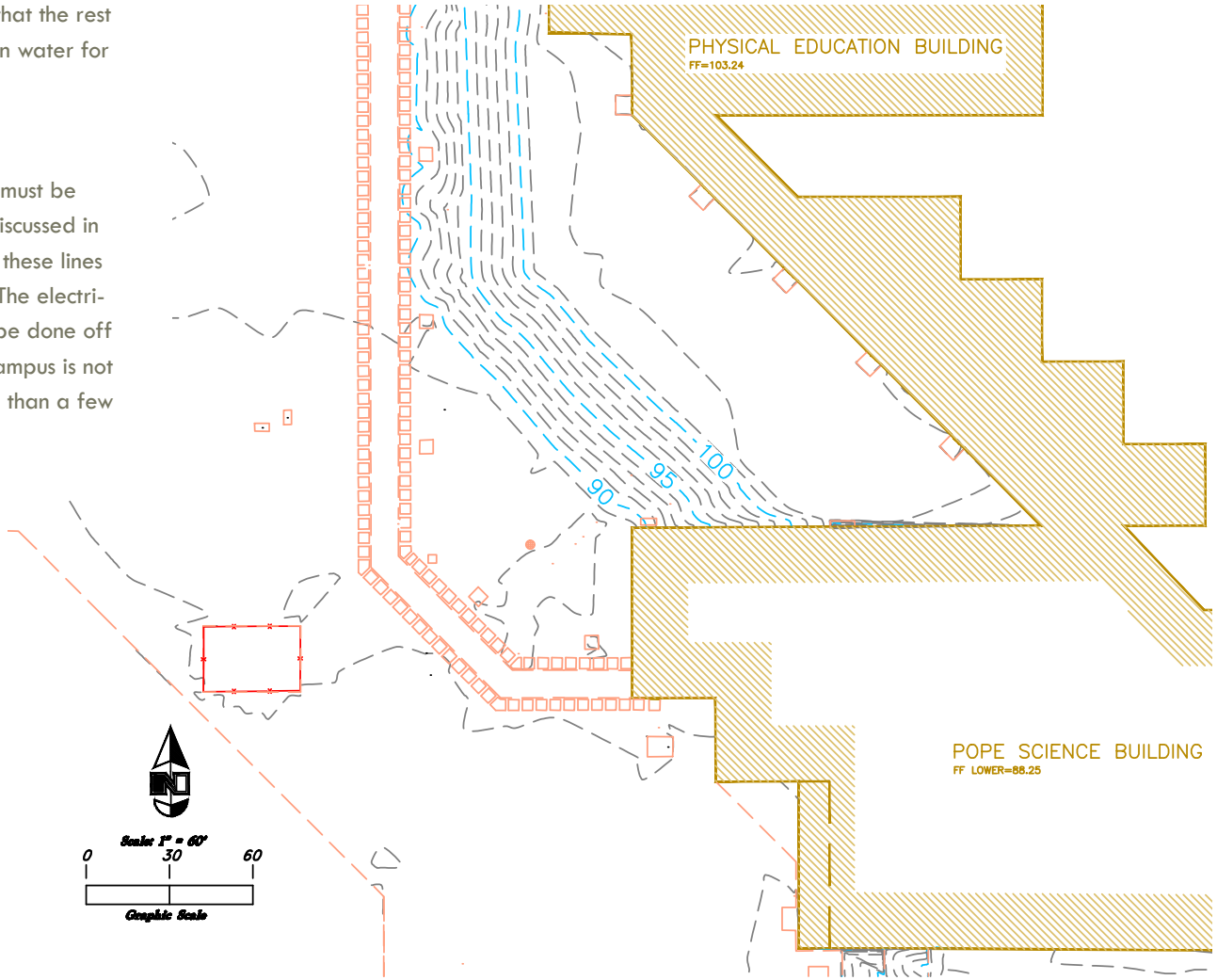


Figure Option 3, Civil 2

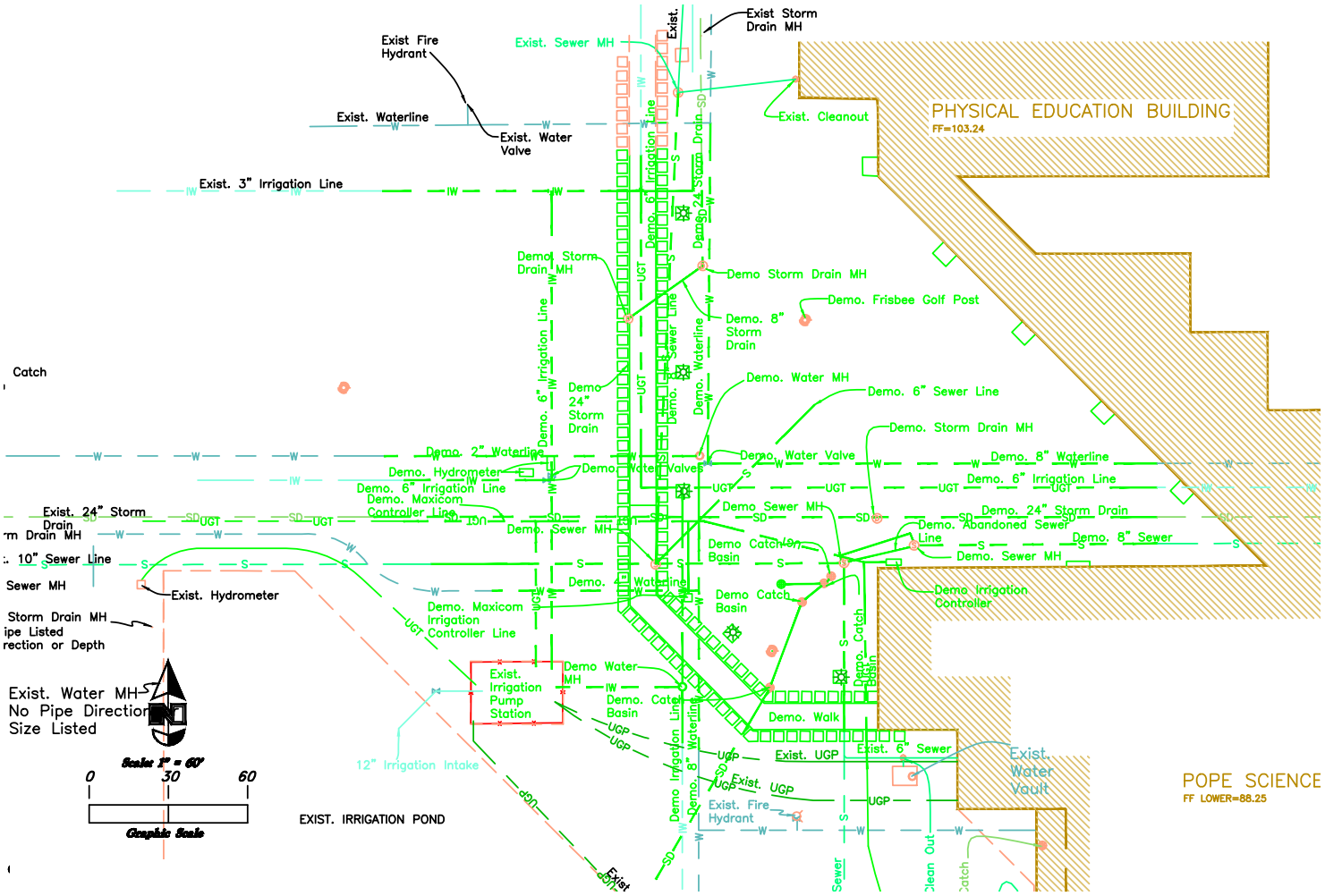


Figure Option 3, Civil 3

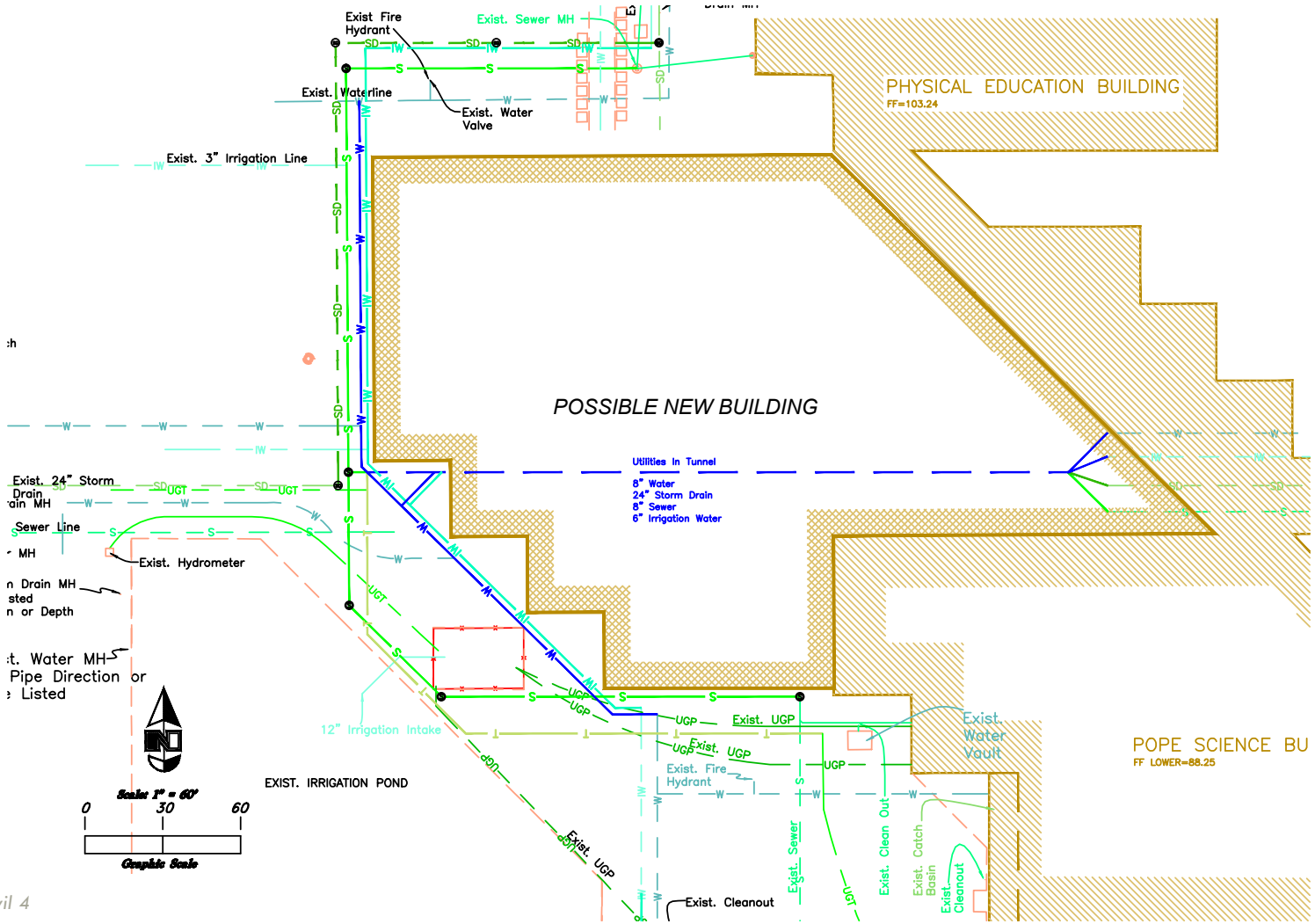


Figure Option 3, Civil 4

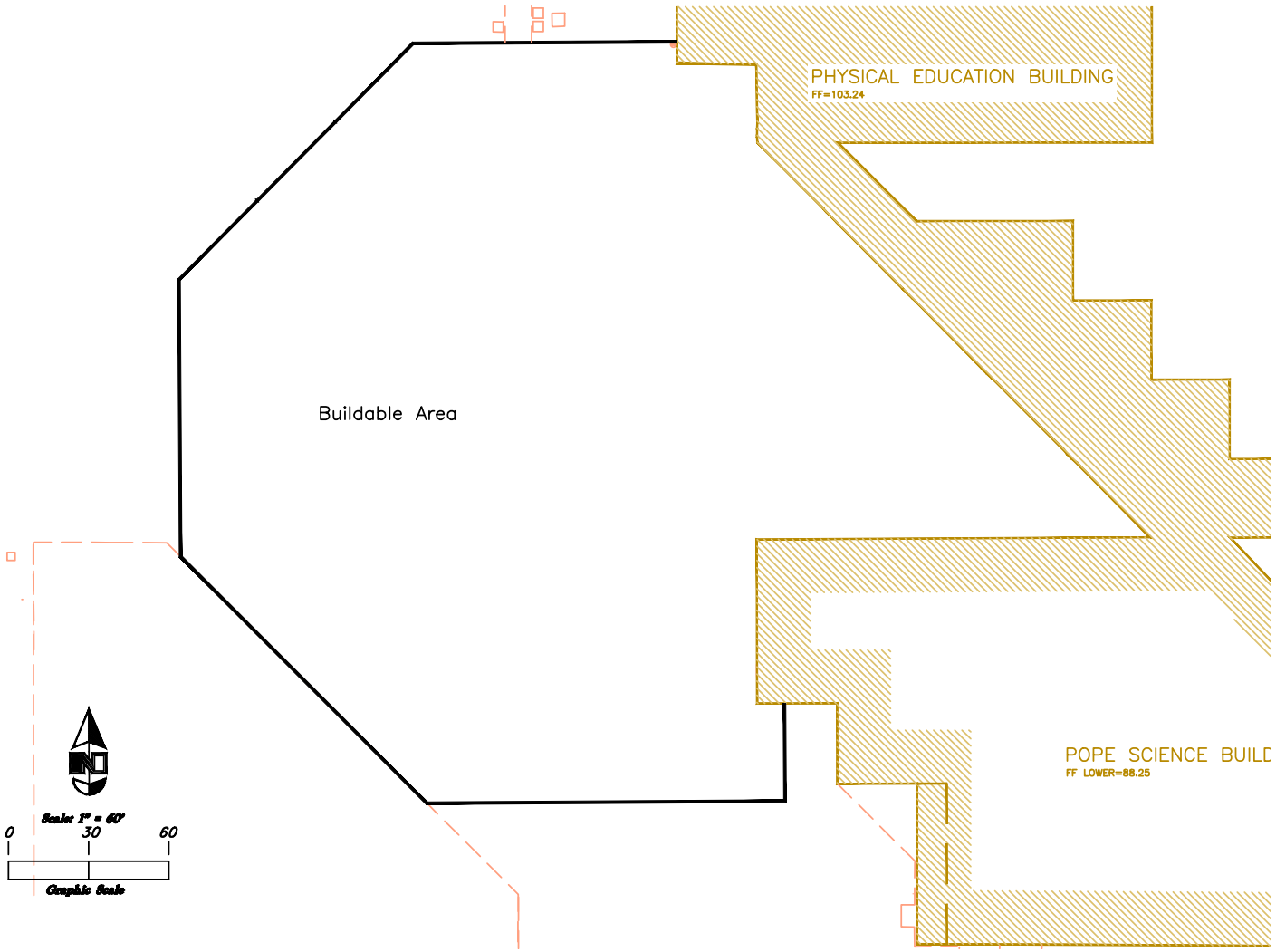


Figure Option 4, Civil 1

Site 02

B. Science Building Addition

Civil Narrative (Option 4)

Site

The site is bounded by the hall way on the north-east, by a nook in the Physical Education Building, by the existing Science Building on the south, and by the large irrigation pond on the southwest. *Figure Option 4, Civil 1* shows the buildable area for this site based on the constraints indicated to the left.

Grading

The proposed building will have the same level 0, 1, 2 etc. elevations as the existing Science Building. Except at doors and other at finish floor connections, the finish site grade will be about 6-inches below level 0 finish floor elevation. The grading will slope generally towards the west and south towards the irrigation pond. All of the side-walks and other at grade connections will slope away from the building. This will require some re-grading of the walks and soil near the building. *Figure Option 4, Civil 2* shows the existing contours for this area. A full size topographical survey with spot elevations is provided in the appendix. If the building grows any more than shown, it may be necessary to supplement the topographical information provided to show existing conditions at the far north and west of the site. If utility con-struction will be relocated to the west of the large pond, this area will also need to be surveyed.

Utility Lines

There are several utility lines that must be re-moved and relocated in order for the construction of the building to take place. *Figure Option 4, Civil 3* shows the existing utilities to remain and utility demolition. A full size survey of the existing utilities with flow line elevations is provided in the appendix. As shown the building is placed above all of the utilities just north of the existing Pope Science Building. These utilities will need to be placed into a single tunnel or into individual casings placed under the building. If placed into a single tunnel, the storm drain and sanitary sewer will need to be constructed of HDPE NSF grade pipe to assure that these lines do not leak and contaminate the culinary water lines that will be in close proximity. Approval of this may be required by the Division of Drinking Water prior

to construction taking place. Other utilities will be relocated and routed around the proposed building footprint.

Utility Tunnel

Several utilities will be placed in the utility tunnel. This will require that the tunnel be large enough to place the 24-inch storm drain and 8-inch sewer lines. Both of these lines are at slope and will require that grade be maintained. The other two utilities are culinary water and irrigation water. These two pipes are pressurized and can follow the grade of the tunnel without adverse affect to pressure. The tunnel construction must be coordinated with the raft footing that will be necessary for the building construction. It is preferable to not have the tunnel break the raft footing.

Sanitary Sewer

Figure Option 4, Civil 3 shows the removal of part of the sewer line that serves the Environmental Technology Building. The proposed sewer connection and relocation of the north sewer lines are shown on *Figure Option 4, Civil 4*. Other than the sewer line in the tunnel, the new sewer lines are proposed to be PVC pipe with a minimum pipe size of 6-inches and larger to match the existing sewer lines. The sewer line in the tunnel is proposed to be HDPE NSF grade pipe.

Ground Water

Based on the level of water in the irrigation ponds, the water found at other sites along the campus, and past experience, it is expected that ground water will be found several feet below grade. This may require a foundation drain to be installed to pipe ground water away from the foundation systems. The geotechnical report should be consulted for specific recommendations dealing with ground water as part of the design process.

Storm Drain

Figure Option 4, Civil 3 shows the removal of the storm drain from under the building foot print. The proposed roof drain connection to the irrigation pond is shown on *Figure Option 4, Civil 4*. It will be from the south of the building and will go to the large irrigation pond and will be 8-inch PVC. The storm drain that is in the tunnel will be HDPE NSF rated pipe.

Culinary/Fire Water

Figure Option 4, Civil 3 shows the removal of several water lines under the building footprint. These lines will be replaced with 8-inch C-900 PVC water mains and is shown on *Figure Option 4, Civil 4.*

Irrigation Water

Figure Option 4, Civil 3 shows the removal of several irrigation water lines under the building footprint. *Civil 3* also shows the removal of the irrigation vault. This vault must be relocated and connected to the irrigation ponds and to the pressure irrigation lines. The relocated irrigation water lines are planned to be 8-inch C-900 PVC lines and are shown on *Figure Option 4, Civil* 4. The irrigation vault provides irrigation water for all of campus. As such, it is critical that any disruption to the irrigation system be very minimal. The irrigation water relocation and replacement and irrigation vault removal and replacement must be done off season or in such a manner that the rest of campus is not deprived of irrigation water for more than a few hours. If done off season, some of the various pumps and other pieces of equipment may be reused. Further study of the possible reuse of some of the pump structure pieces is recommended if the vault work is done off season. If done during the irrigation season, a complete functional irrigation system must be ready before the existing system can be removed from service.

Irrigation Maxicom Controller

Figure Option 4, Civil 3 shows the removal of several maxicom Irrigation Controller lines. The new lines will be the same as the existing lines and are shown on *Figure Option 4, Civil 4*. The irrigation controller relocation and replacement must be done off season or in such a manner that the rest of campus is not deprived of irrigation water for more than a few hours.

Electrical Lines

There are several electrical lines that must be removed and relocated. These are discussed in the electrical section. The removal of these lines is shown on *Figure Option 4, Civil 3*. The electrical relocation and replacement must be done off season or in such a manner that the campus is not deprived of irrigation water for more than a few hours.

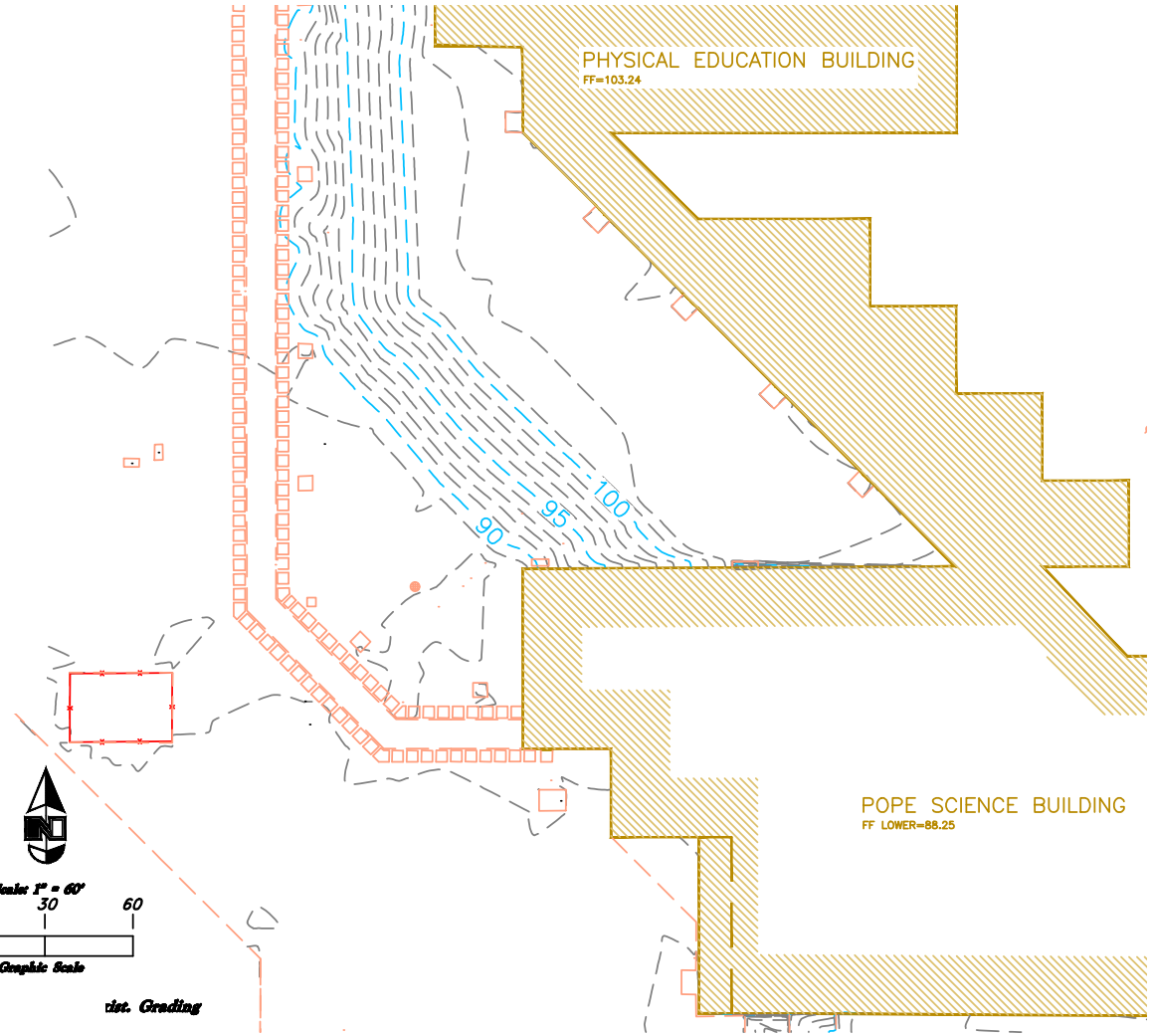


Figure Option 4, Civil 2

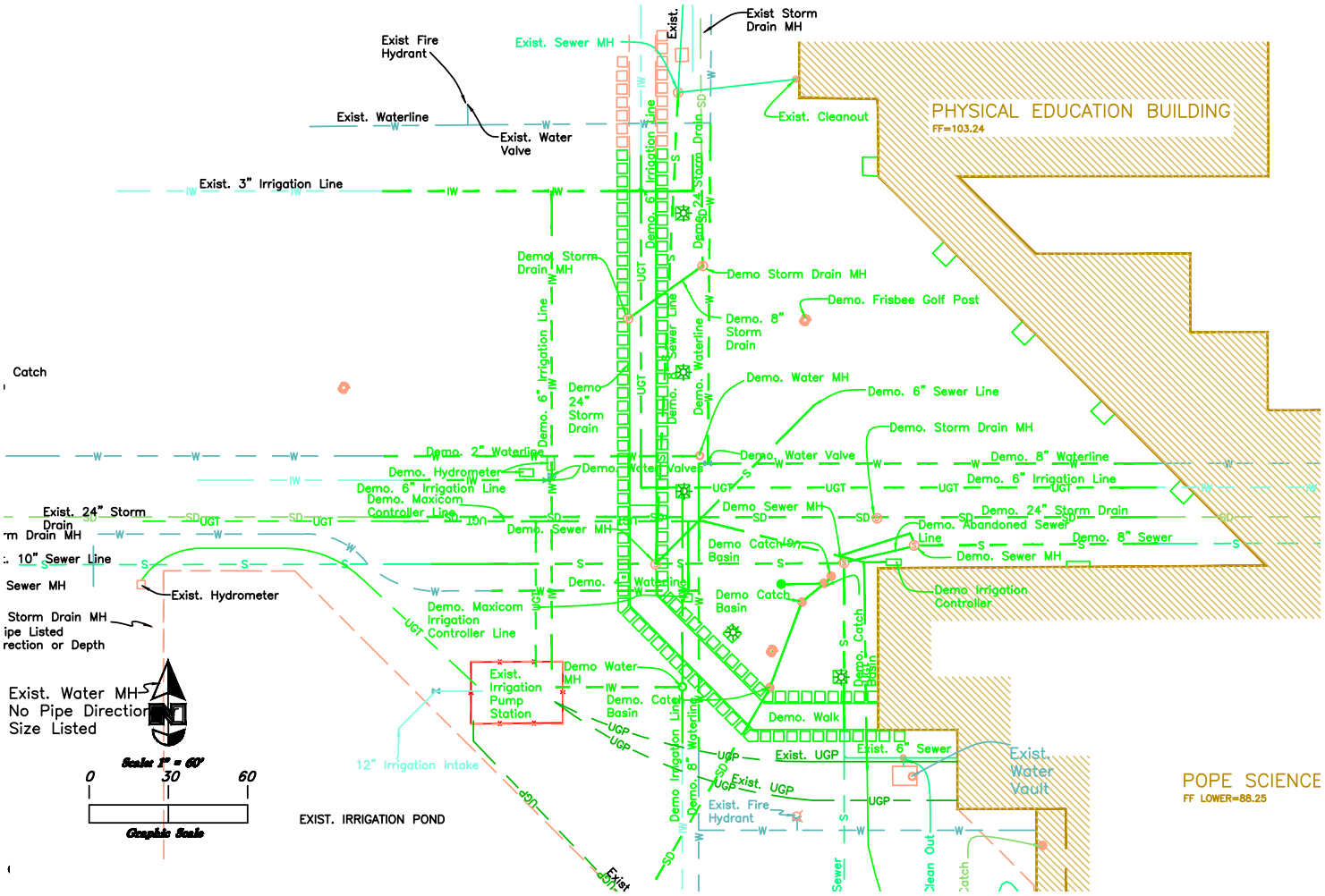


Figure Option 4, Civil 3

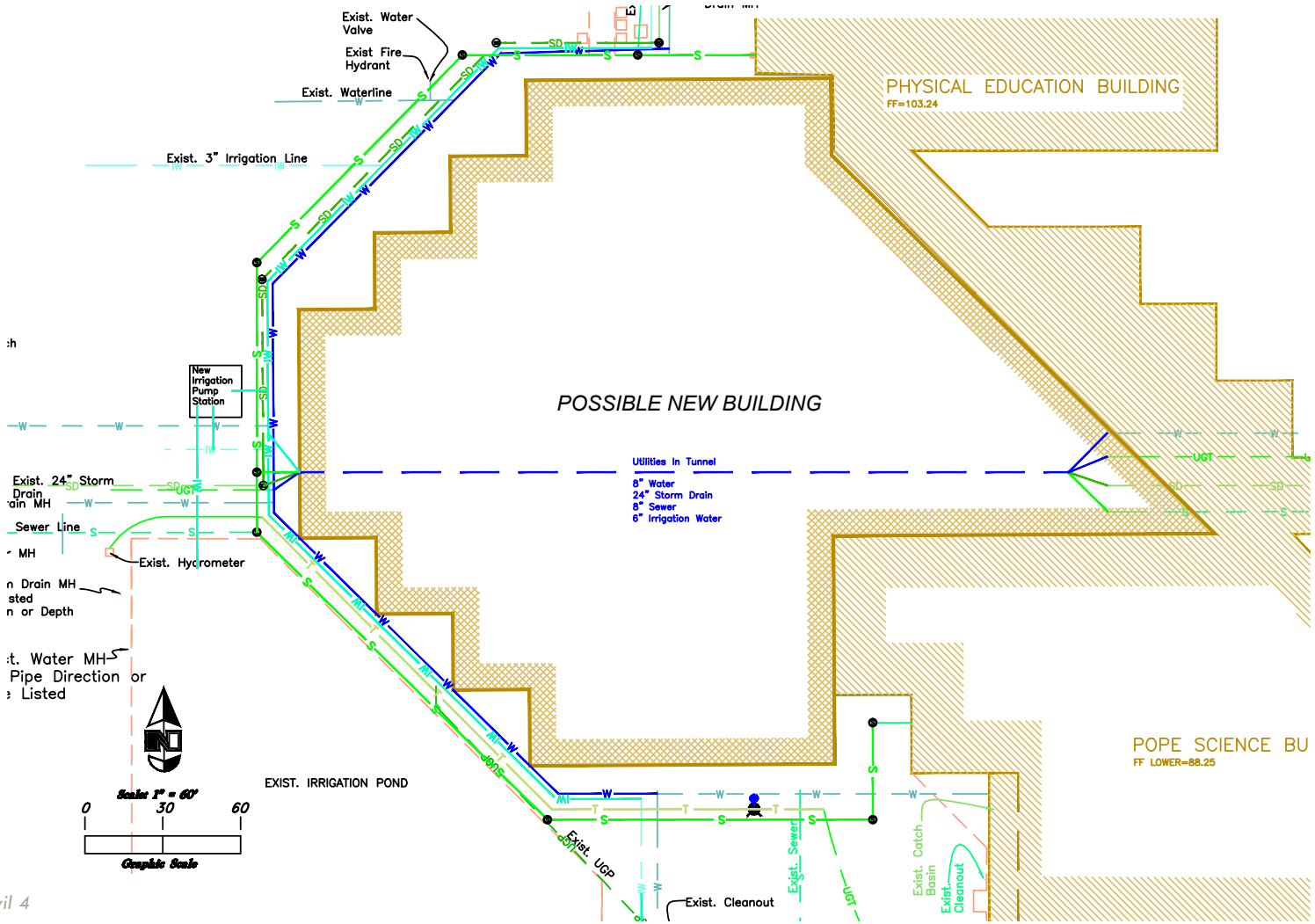


Figure Option 4, Civil 4

Site 02

C. Central Plant

Mechanical / Plumbing Narrative

In order to accommodate imminent growth on the campus and simultaneously meet the high standard for energy efficiency set by the existing central plant equipment, several options for adding source equipment to the campus central plants are being considered.

Introduction

Two existing central plants serve the campus with heating and cooling water. The central plant is located near the Student Services Building, and houses two heat recovery chillers, two variable speed cooling-only chillers, and two gas-fired boilers. The heat recovery chillers are connected to two wells that, in addition to the buildings being served, serve as heat sources/sinks. Two cooling towers located on the roof of the building also serve to reject heat.

The second existing central plant is the east plant, located in the Computer Sciences and Engineering building. This plant houses two centrifugal cooling-only chillers and two gas-fired boilers. A cooling tower located near the loading dock is used to reject heat.

The central plant system is currently configured to operate its most efficient source equipment first to meet heating and cooling demands, and to operate the remaining equipment to help handle peak loads and to act as back-up in the event of equipment failure. The heat recovery chillers are operated as the preferred source of heat for the campus, and the variable speed cooling-only chillers are operated as the preferred source of cooling during the summer months.

UVU maintenance staff have indicated the cooling load of the existing campus can be handled by running the four chillers in the central plant, and the heating demand can be handled by the two heat recovery chillers in the central plant with minimal help from the gas-fired boilers in the east plant. The chillers in the east plant currently serve as redundant back-up chillers.

Options

Options to be considered for increasing heating and cooling capacity of the central plants include:

1. *Adding a chiller and boiler to the existing east plant.*
2. *Adding a heat recovery chiller to the existing central plant.*
3. *Construct a new central plant to the north.*

Option 1:

Adding a chiller and boiler to the existing east plant would be fairly simple as piping inside the plant was designed to accommodate a third chiller and boiler. The addition of a new chiller would also require a new cooling tower that could be installed next to the existing cooling tower outside near the loading dock.

While adding chillers and boilers to the east plant is a straight-forward way to add heating and cooling capacity and would help cover the loads associated with the science building addition, there remains little space for other buildings to be constructed on the east campus. The majority of new construction is anticipated to occur on the north and west sides of the campus, farthest away from the existing east plant. Much of the existing chilled and heating water distribution piping between the east plant and the Liberal Arts building to the north is 10" diameter, and are capable of flow rates of approximately 2,500 gallons per minute (gpm). Adding the design flow rates of the existing buildings north of the central plant results in a flow greater than 2,500 gpm, which indicates the existing piping is not adequately sized to handle large increases in flow. Replacing the existing distribution piping to the north with larger diameter piping may be possible, but would still result in very long piping lengths and associated friction losses if the system were to be extended to new buildings at the north and west ends of campus.

Option 2:

Adding a heat recovery chiller to the central plant could be achieved by removing one or both of the existing gas-fired boilers from the central plant. The new heat recovery chiller could be located in the space previously occupied by the boilers.

The heat recovery chillers are the most efficient means currently available on campus for generating heating water. However, there is some concern that well water temperatures have been increasing over the years while the heat recovery chillers were the primary source for both heating and cooling. The central plant was originally configured to run three heat recovery chillers simultaneously, so there is adequate well water flow for this option. But there is a concern that well water temperatures will not be stable if three units use the wells for heat sources/sinks. If the heat recovery chillers are used primarily for generating heating water, the well water temperatures could decrease, possibly to a point that diminishes the ability of the plant to generate heating water.

It should be noted that the original control strategy for operating the heat recovery chillers during winter months included a command to set all buildings in minimum outside air mode, in lieu of air-side economizer. Assuming large areas of the buildings were always requiring cooling, setting the buildings in minimum outside air mode would increase the demand for chilled water as the air handlers would continue to provide cold supply air to the buildings. The heat recovery chillers would then use the warm flow of returning chilled water to generate heating water. While it is not known if this control feature is present in all buildings, it demonstrates that well water could be supplemented with building waste heat to generate heating water for the campus. It is not known at this time how much this building waste heat could offset decreased well water temperatures that could result from operating three heat recovery chillers to generate heating water.

Another concern with increasing the central plant heating and cooling capacity to serve new buildings at the west and north ends of campus is the limited flow carrying capacity of the existing 10" piping as described in Item 1 above. Adding capacity to the central plant would help cover the loads in the science building addition, but would not be as well suited for the majority of new construction expected in the future.

A third heat recovery chiller installed in the central plant could act as a redundant unit that would operate if one of the other heat recovery chillers failed. It could also be operated in place of the gas-fired boilers in the east plant to cover peak heating water loads on the coldest days. This would limit the run-time of three heat recovery chillers, minimizing the concerns about impacting well water temperatures. Note that the two existing heat recovery chillers are currently being renovated and will have a 5-year compressor warranty when the work is complete. It is unlikely they will be failing anytime soon.

The addition of a third heat recovery chiller to the central plant appears to have the lowest construction cost of the three proposed options.

Option 3:

A north plant could be configured with high efficiency cooling-only chillers, cooling towers, condensing boilers, and space for future installation of additional boilers, towers, and chillers.

While the heat recovery chillers are the most efficient means of generating heating water currently available on campus, it does not appear to be feasible to expand this capability to other HVAC plants on campus due to the limited capacity of the existing wells. Based on this assumption, boilers will be required to provide heat to meet the needs of future buildings on campus. Condensing boilers are well suited to work with the existing heating water system because it operates at relatively low return water temperatures. Low water temperatures entering the condensing boilers allow them to operate at higher thermal efficiencies. They are also capable of producing relatively low temperature heating water without the need for a primary/secondary pumping and piping system, which could simplify plant operation.

Constructing a new plant to the north of the central plant has the advantage of locating the source equipment nearest the area of campus where the majority of future construction will occur, resulting in the lowest distribution losses of the three options being considered. Note that 12" diameter heating and chilled water piping was installed in the Digital Learning Center to accommodate future expansion of the heating and cooling distribution systems. The north plant should be located so it could connect to these 12" pipes, and not to the existing 10" pipes in the Liberal Arts building. Constructing a north plant at this point in time would reduce demand on the east and central plants, which are better located to serve the science building addition. A north plant would better serve the Digital Learning Center, which reportedly does not always receive adequate heating water.

Constructing a north central plant also provides an opportunity for considering systems to reduce peak electrical demand charges during the cooling season. One option that has been proposed in past studies is thermal storage. The potential for ground source heat transfer has also been considered by UVU, but the area required for the ground loops was found to be excessive. Any peak electrical demand reduction strategy designed into a future north plant would be of immediate benefit to the existing campus, even

before new buildings are constructed to the west and north, because of its potential for further reducing operating costs.
Construction of a north plant has the highest cost of the three proposed options.

Recommendation

If funds are available, design and construction of a new north plant will have the greatest long-term benefit for the University.

Site 02

D. Campus Electrical Infrastructure

Electrical Narrative

Existing Condition

Site Power Service & Distribution

Power service consists of a medium voltage loop from the chiller plant, at 12470 volt, and is run from building to building in rigid conduit in the ceiling of the walkways.

Loop conductor size is generally at least 4/0 EPR, radiating from the central plant fused switchgear. Each building typically has an internal vault, with individual transformer banks within the vault. A few buildings have padmounted switches within the vault, but typically there are no switches located outside open to the weather. A couple of buildings, including the Sorenson Center and the Digital Learning Center, locate padmounted transformers outside, preferably screened from the public view.

The Central Loop currently feeds all the buildings on the central, and north sides of campus. With the recent growth on the north side of campus, including the Digital Learning Center, there is some concern that there is not enough capacity on the loop for a new science building. There were recent energy upgrades on several buildings to help provide capacity for the new Digital Learning Center.

Load	Date of Max Demand	Demand Reading
Substation Campus Load	Sept 2007	5750 kW
Substation Campus Load	Sept 2008	5626 kW

The buildings are not currently individually metered. However, knowing the type of facility, approximate age of the facility and the peak load on the entire campus some rough idea of the current load can determine whether there is existing capacity for a new facility. The Calculated rough load is not necessarily accurate, it is recommended that actual loads be field measured in a peak timeframe in order to ensure accuracy.

In looking at the total percent of load versus square footage, the Central Loop has approximately 977,542 square feet out of 1,654,115 total square feet of building space on the new substation. This equals approximately 59.1% of what the total load may be on the loop if all buildings drew equal watts/square foot. In reality, since the chiller plant may take a great

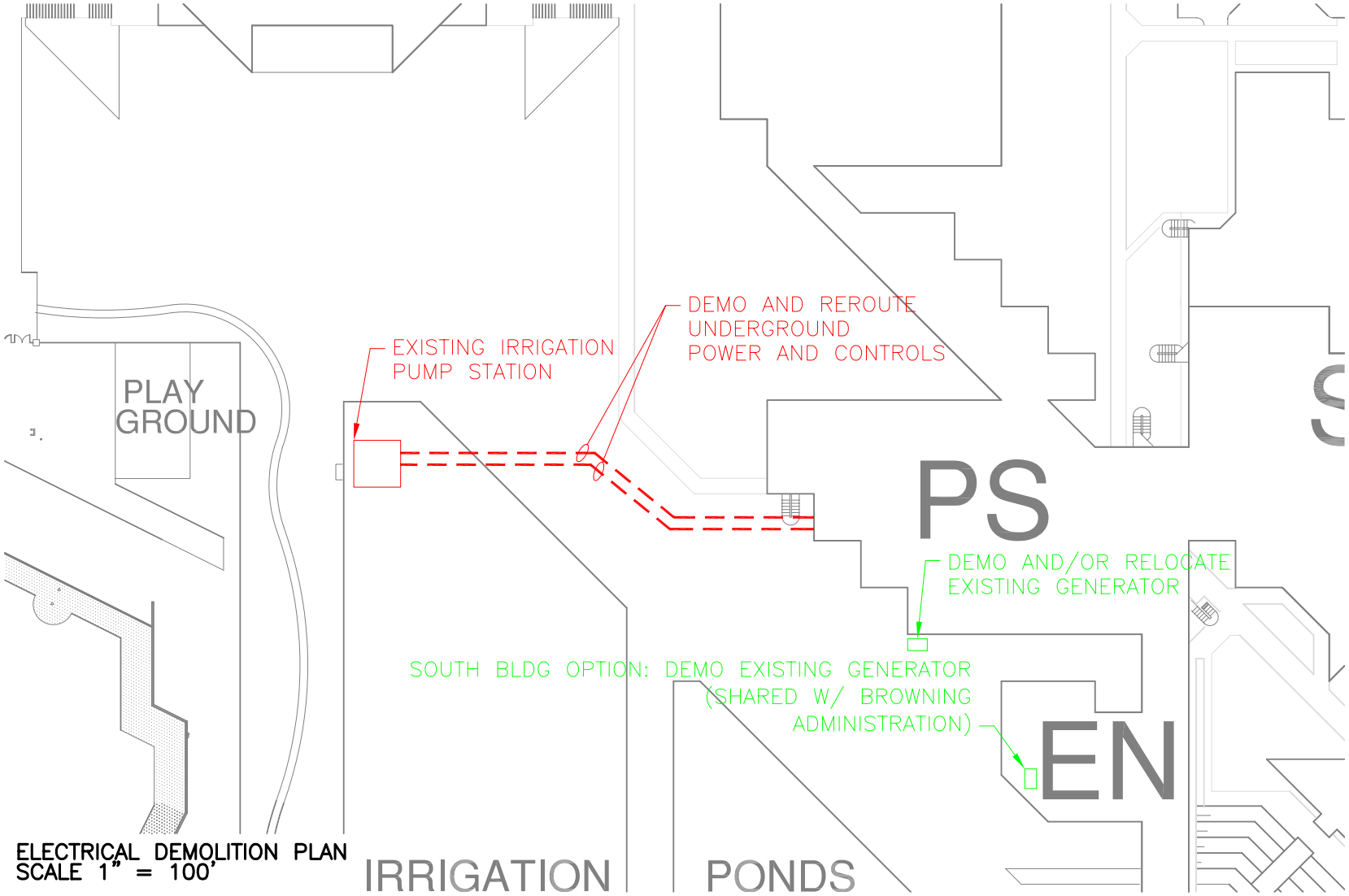


Figure Electrical 1

portion of the load, using an estimate of 59.1% is a high estimate.

It should be noted that each building's demand added individually will likely exceed the global Total Campus Demand, since individual building demands tend to peak at different times. Therefore, we have used a 30% factor to ensure each building demand is a bit closer in accuracy.

The following table summarizes the campus wide capacity and square footages, with a rough estimate of load on the facility, added by Loop:

Note that at 3398 kW, the central loop would be running at approximately175 amps. The feeder is good for approximately 225 amps showing the loop is near 78% of capacity, however, in a campus environment, it is usually recommended to run medium voltage feeders at 50% or less, to allow for adjacent loop switching in the event of construction, maintenance, or unplanned outages.

In addition, the more buildings placed on a loop, the more failures experienced in the event of a wire failure. The effect on the University of an unplanned outage multiplies, as well as the num-

Load	Square Footage	% of Total SF on Substation	Calculated Demand By SF	Approx. Demand x1.3
Sorenson Student	155,193	9.4%	541 kW	703 kW
Central Plant	13,740	N/A	N/A	*
Woodbury Business	78,720	4.8%	274 kW	356 kW
Browning Administration	81,645	4.9%	284 kW	369 kW
Environmental Technology	7,163	0.4%	25 kW	32 kW
Pope Science	81,389	4.9%	283 kW	368 kW
Physical Education	110,090	6.7%	383 kW	498 kW
McKay Center	179,112	10.8%	623 kW	809 kW
Liberal Arts	154,592	9.4%	537 kW	699 kW
Digital Learning	201,775	12.2%	701 kW	912 kW
Central Loop	977,542	59.1%	3398 kW	3398 kW**
Total Substation Load	1,654,115	100%	5750 kW	5750 kW ***

* This chiller plant likely takes a greater portion of the load than can be calculated by square footage. Since neglecting this increase leads to a slightly higher demand on the other loops, which in effect provides a safety, we have neglected the chiller plant in the calculations.

** No safety factor used on entire loop calculation – it may already be a bit high.

*** Actual measured value.

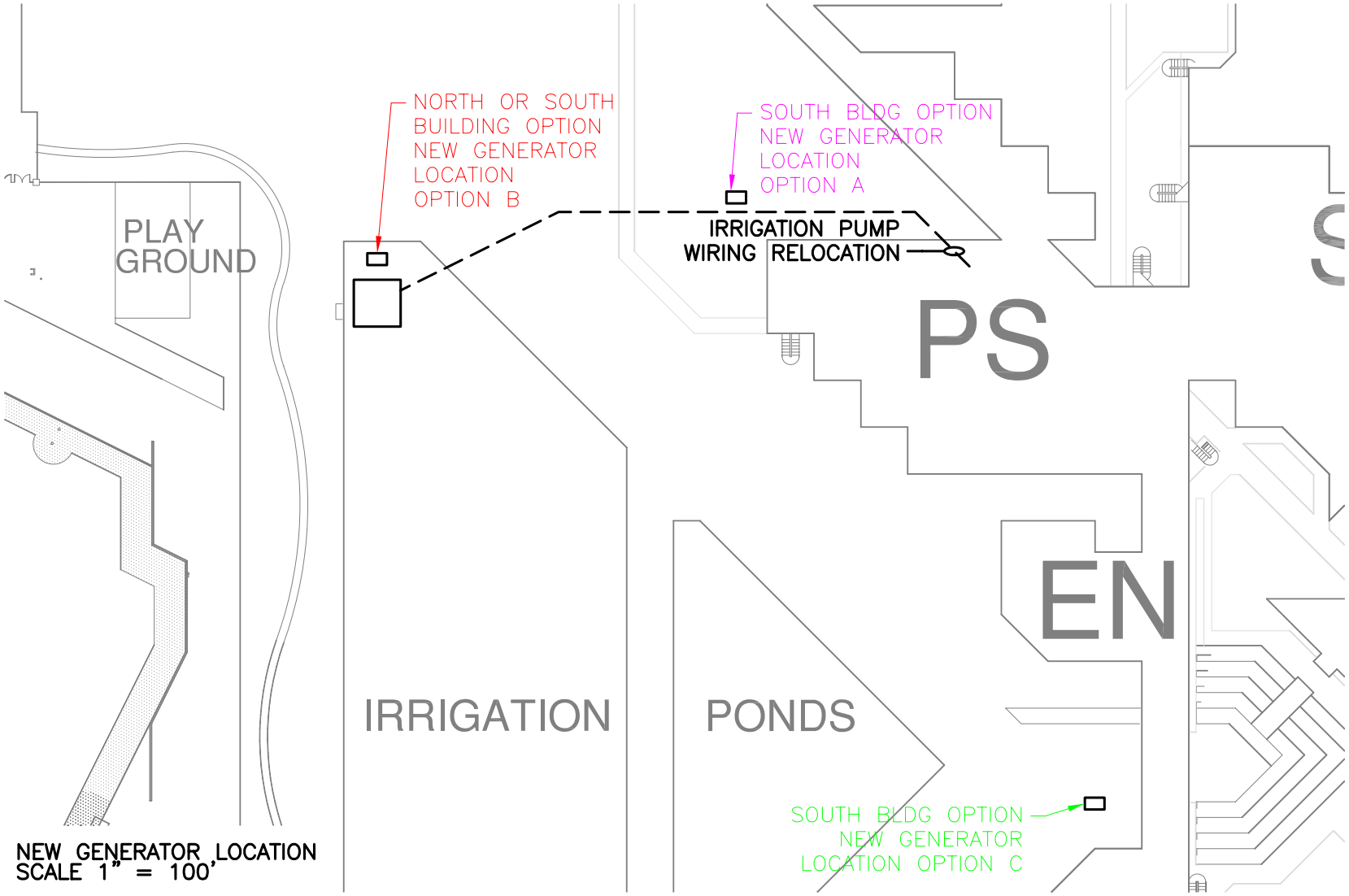


Figure Electrical 2

ber of people affected. Usually we recommend limiting the total number of square feet and the total number of buildings on a single feeder. At almost 1,000,000 square feet, and 8 major campus buildings, additional buildings would only exacerbate any outages. We would consider the loop nearing capacity, and running at more than recommended capacity.

Science Building Calculations

The new Pope Science building will be at least 140,000 SF, and designed for 30 W/SF. Initial loading will likely be 15 W/SF, with demand wattage likely in the 10 to 12 W/SF. At 12 W/SF, the additional load imposed by the Science building would be:

140,000 SF x 12 W/SF = 1,680 kW
(approximately 86 amps at 12470 volt)

If we assume the Environmental Technology Building will be demolished, we can eliminate the Environmental Technology building at 32 kW estimated demand, since it is planned to be torn down.

1680 kW – 32 kW = 1648 kW
(approximately 85 amps at 12470 volt)

Since the central loop is currently at 175 amps with a maximum capacity of 225 amps, there is no possible way that the Science building can just add to the loop without overloading the loop.

Campus Options to Allow Additional Capacity

We have studied various options to allow increased capacity on the loop. We briefly describe these options here, and have a site electrical options drawing that illustrates *(Figure Electrical 2)*.

Option A:
New loop feeder from North Substation (Preferred Option).

Since much of the future growth may occur in the North parking area, including a possible new Chiller Central Plant, it would be nice to start a "North loop" of medium voltage. This north Loop could be partially installed now, from the substation spare breaker to the Digital Learning Center. The DLC would be shifted to the North Loop, as well as the new Central Plant, which would allow capacity on the Central loop to decrease by 912 kW. In addition, the Liberal arts could also be shifted to the loop, freeing an additional 699 kW from the Central loop.

This option has the added benefit of providing redundancy to the central loop. If the north loop is cross tied to the central loop, the North loop could feed some or all of the buildings in the central loop in the event if a construction, maintenance, or unplanned outage, depending on the time of year and the loading on the feeder wire. Similarly, the central loop, during some times of the year, could provide some limited redundancy to the north loop.

Option B:
Move the Sorenson Center to the East Loop, and remove Pope Science off of the Central loop. Extend to the original feed point of the Sorenson Center as a stand alone service.

This option provides service capacity only for the Science building, but requires a feed line be extended from the Central Plant to the Science building, and some rework of the Sorenson center. The Science building would be removed from the Central Loop, freeing some minor capacity on the loop for future work. However, this option also loads down the East Loop, meaning there would be little free capacity on that loop for future growth on that part of campus.

Since this option is really a stop-gap, does not provide redundancy to the Pope Science building because it places it on a radial feed, we do not recommend this option.

Option C:
Increase cable size on South part of Central Loop, extend back to Sorenson Center Feeder.

The idea behind this is to create a higher capacity Central Loop and subdivide it. The problem is there are no free fused switch bays at the central plant. So to subdivide, there would remain at least one radial feed point, perhaps the Sorenson Center and the Science building, which could be cross-tied into the rest of the Central loop for emergency or maintenance feeds with the use of a switching location near the Science building. The south side of the central loop could be increased in feeder size to allow for a redundant feed to the Sorenson Center and the Science building off the Central Loop.

The advantage over option B is that it does not load up the East Loop, but does provide redundancy to both the Science building and the Sorenson Center by use of a cross-tie switch with the Central loop.

Eventually, the larger feeder size could be extended through the entire Central Loop, up to the McKay center and the PE building. The northern loop could be removed in the future and extended to the substation.

This is similar to Option B, but provides a "mini-loop" on the south part of the Central loop to provide redundancy in the case of outages.

The problem is that to upsize the feeder, with minimal disturbance to the existing buildings, will require a new feeder to be installed in parallel with the existing on the south part of the loop. This expense may be better served to start the north loop on Option A, therefore, we do not recommend this option.

Contributing Factors & Recommendations

If the Central Plant is chosen as the mechanical direction, and located near the Liberal Arts or Digital Learning Center, than it is pretty clear that Option A is the only way to go. We understand that the plant is planned, and may be partially funded through an Energy Services company. Since this plant seems imminent within a few years, we would highly recommend that the campus pursue option A.

There is a separate project to extend a loop from the substation to the west to pick up power services to the parking lights, and perhaps eventually the Education Building and Wolverine Service Center buildings along 800 South. If this project is funded and built prior to the Science building, it may use the spare breaker available in the substation. However, these two facilities and the parking could be on the same loop as the Digital Learning Center, Liberal Arts, and Chiller Plant, as they are minor loads.

Areas of Further Study

As mentioned, the campus does not have individual metering on each building. The calculated loads in this study are therefore approximate. We highly recommend that the designers and the University fund an actual metering project, or at least a metering study, of the buildings on campus. That would provide accurate, real time data for the actual demand of each individual building. If the metering cannot be purchased and installed on each building, then each building should be measured during a peak period as a study. The best time to accomplish this is in the month of September, when the historic peak demands have occurred.

Building 03

A. Architectural Narrative

Introduction

Based upon enrollment growth and vastly undersized science facilities on the main Utah Valley University campus, it is necessary to expand the science building to serve the student body with science programs that will prepare them to meet current and future marketplace demand in these important disciplines.

With current and projected enrollment, a minimum of 160,000 additional square feet of laboratory, classroom, office and support space are needed to meet the demand.

As noted in the section 2 site narrative, the preferred location for the science building addition is immediately adjacent to the existing building. Major occupants of the new space will be the life science programs which include biology, botany, zoology, anatomy, and physiology. Forensics will also be accommodated in the new facility. It is planned that when these programs move into the new space, the space they previously occupied in the Pope Science Building will become available for expansion of earth sciences, chemistry, physics, and math.

Master Plan Reconciliation

The UVU campus master plan completed in 2005 recognized the need for additional science space on campus and recommended a location immediately surrounding the existing Pope Science Building. After careful site analysis, determination of the programmatic needs of the College of Health and Science, and with an understanding of the desire of UVU administrators to pull students back to the core of campus, the programming process has concluded that the optimal location for the new addition is immediately adjacent to the existing Pope Science Building. *(See Site Options Section 2.)*

While the site fit is tight, this location helps create greater critical mass at the center of campus while preserving unencumbered space elsewhere for future facilities. It also supports the close relationship needed between the new addition and the existing Pope Science Building.

Existing Building

The current Pope Science Building was designed in 1987 by Scott, Louie, and Browning Architects. Construction occurred over the next two years. Its design and construction were based upon codes in effect at the time of design. The data on the documentation title sheet indicates the following design parameters:

- 83,200 square feet
- Seismic zone 3
- Occupancy B-2
- Construction type III – I hour
- 1982 UBC except wind velocity 90 mph, exposure C
- 1985 Uniform mechanical code
- 1985 Uniform plumbing code
- 1978 Utah State Handicap Code
- 1983 Model Energy Code
- 1987 National Electrical Code

The new science building addition needs to comply with all state and national codes and must be reviewed by the state code authority having jurisdiction as well as campus personnel and inspectors.

The existing facility follows the modernist campus style, with a concrete structural framework and masonry infill exterior walls, dark bronze glass and dark bronze glazing systems.

Major interior finishes include walls of exposed concrete, exposed masonry, and painted gypsum board; ceilings of acoustical tile, painted gypsum board, and exposed plenum; and floors that are carpeted, tiled, and exposed concrete.

The existing building incorporates the 30' x 30' campus planning module and the campus standard 15' floor to floor height. A large atrium connects the existing science building to the main campus mall spine system. This spine also serves to bring most of the utilities to the building.
The existing facilities include classrooms, offices, and teaching labs as the major components. Support, storage, and systems spaces are also included. A large atrium unifies the three levels. There are numerous paved and occupiable deck areas that extend out on all three levels.

Refer to the photos attached to the site section of the narrative. Copies of the basic floor plans are included for reference *(Figures 1 - 3)*.

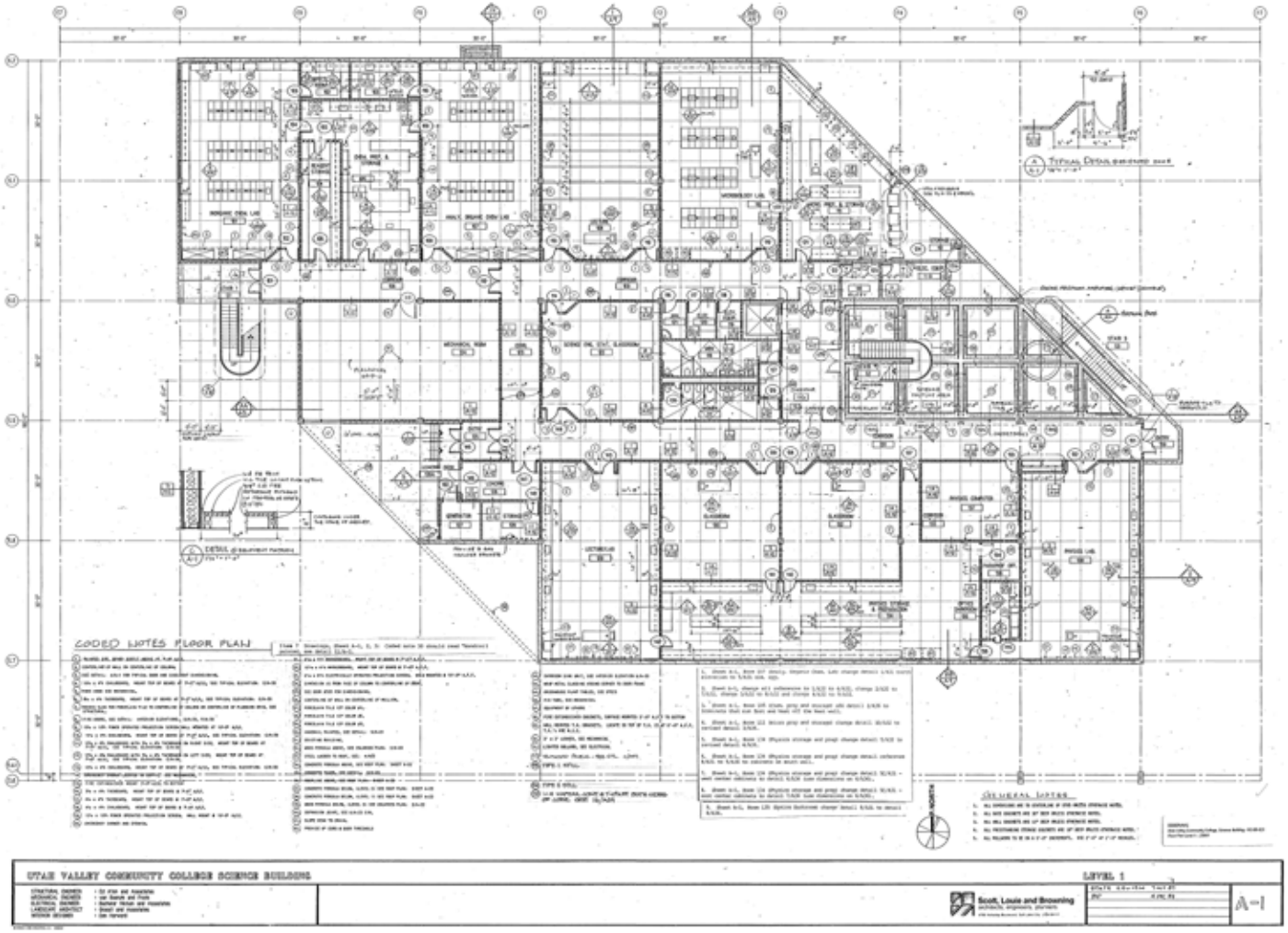


Figure 1 - Pope Science Building, First Floor

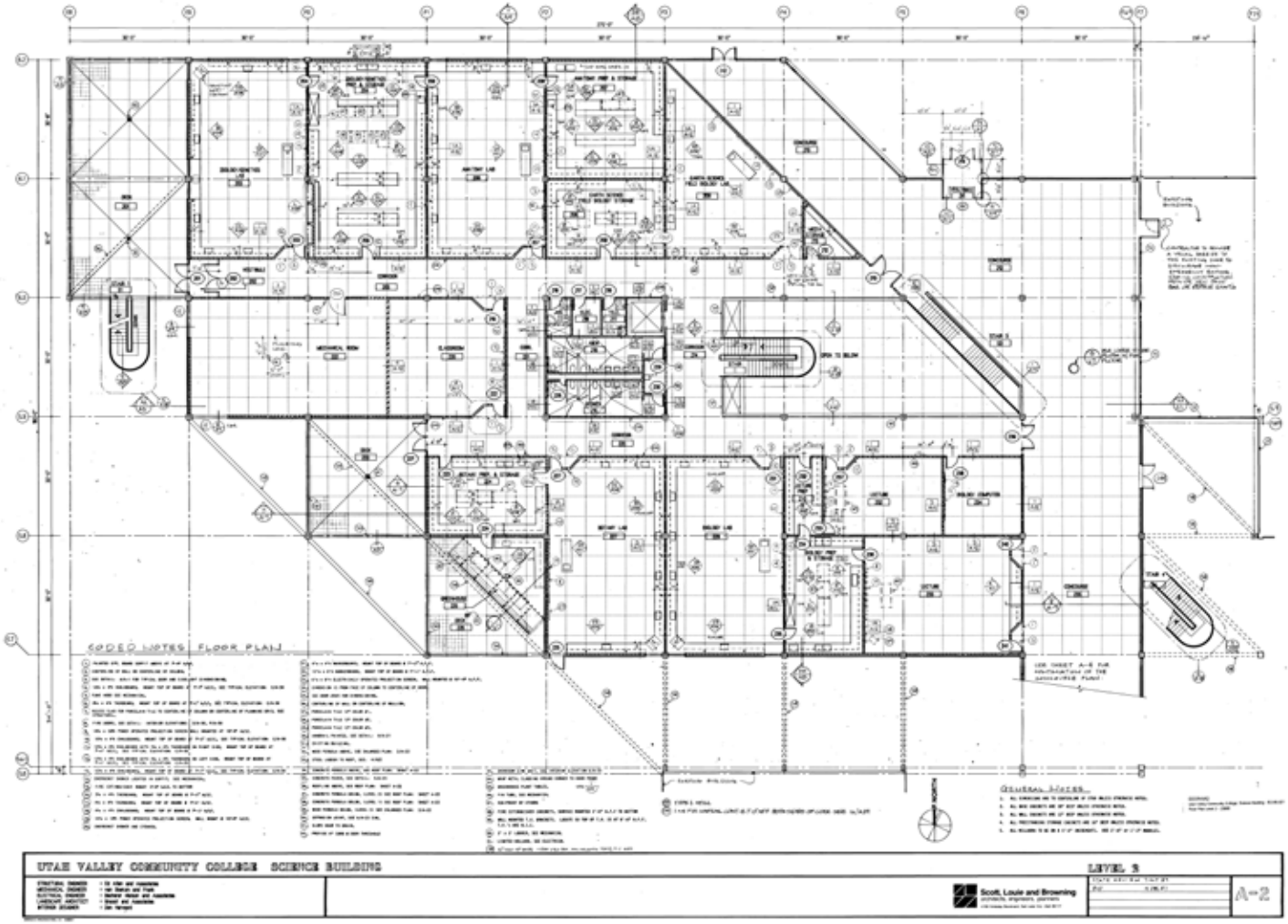


Figure 2 - Pope Science Building, Second Floor

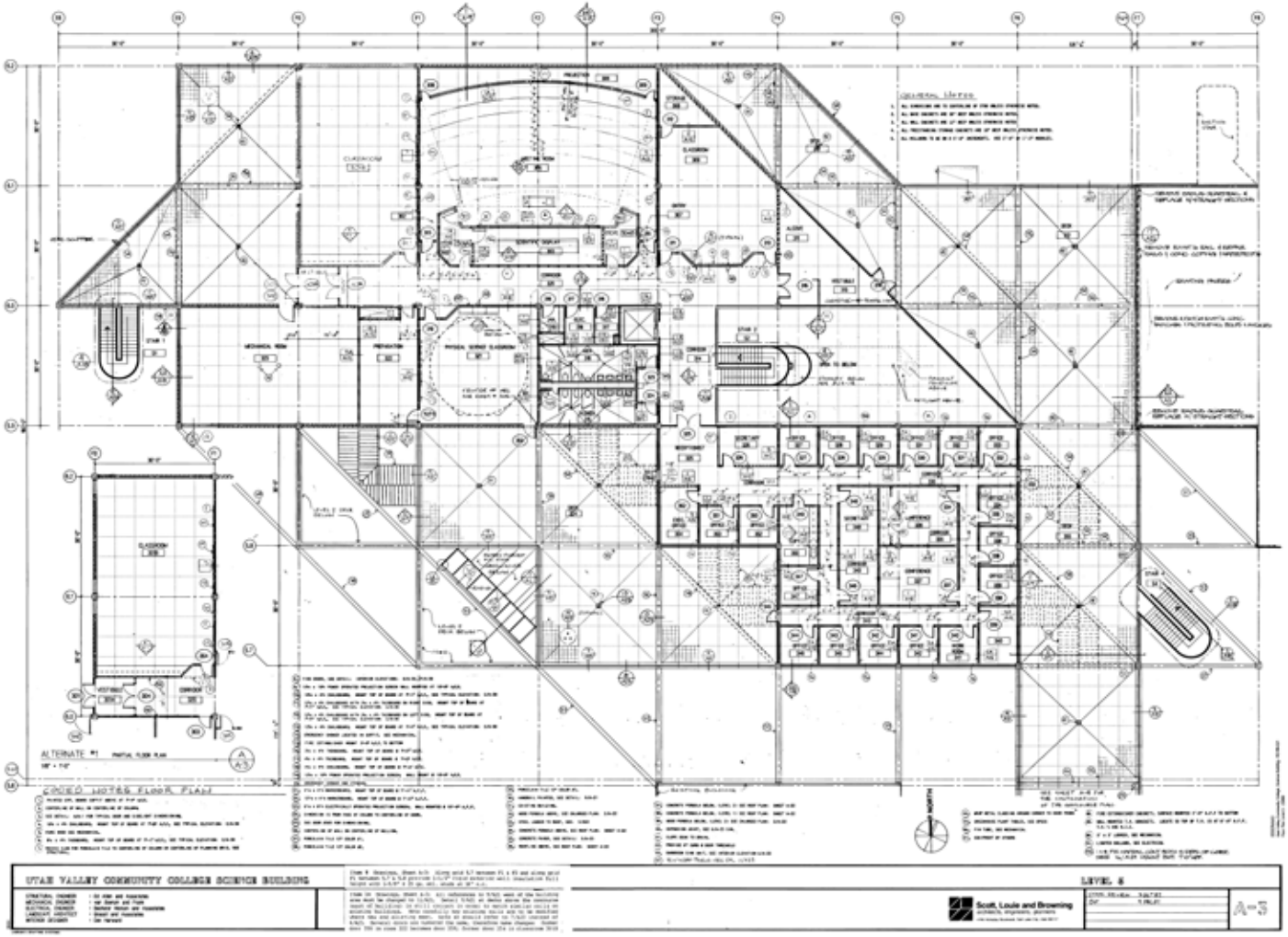


Figure 3 - Pope Science Building, Third Floor

Project Description

Based upon a basic construction budget of $40 million, it is expected that approximately 160,000 square feet of space can be built. See the space summary and associated cost estimate sections of this program. The new space will accommodate teaching labs, space for undergraduate research, lab support spaces, classrooms, and office areas. It is expected that typical building support spaces will also be provided such as electrical / telecommunications rooms, mechanical spaces and shafts, restrooms, storage areas, custodial closets, etc.

Of significance is a 360 seat lecture hall. This will be the largest seated lecture hall on campus. It will need to be subdivided into two equal halves with an appropriate acoustically rated folding panel partition system.

In order to accommodate the current and future needs of the College of Science and Health, an efficiency factor of 65% was used in order to maximize program space within the allowable construction budget. This will require careful planning and layout of the facilities.

Basic room diagrams shown in section 4 are based upon a laboratory layout module of 10'-6"x10'-6". Historically this module has been effective in achieving appropriate square foot per student ratios for science teaching lab facilities and also accommodating appropriately sized support and equipment spaces. This module also serves undergraduate research space planning as well.

A goal of the design will be to allow as much natural light into the facility as possible, including lab spaces.

Accommodating student needs is a major goal of this facility. To do so, casual and study lounge spaces, as well as seminar rooms, have been added to the program. It is hoped the lounge spaces can be located on every floor to provide a variety of spaces and views, where students can gather to collaborate or study independently.

An atrium in the new addition can act as an anchor and unifier of the multiple floors within the building, as the existing atrium serves in the Pope Science Building. The atrium will serve as a location for displays and art that can promote the science curricula, energize the College of Science and Health, and attract new students to the science programs.

As another means of attracting interest in the science programs, the research labs should have some transparency to the hallways and major corridors, allowing passersby to view the activities, experiments, and research that are taking place.

In order to optimize pedestrian traffic patterns and flow rates, the building's high-capacity classrooms should be located on the main level (the level which connects directly with the campus pedestrian concourse).

Flexibility of space is a key goal in the design of the new addition. This flexibility needs to be built into classrooms, laboratories, and support spaces. The building must be able to change as the science and program needs change.

Greenhouse facilities located on the roof are a potential design solution, but the college and the campus facilities department prefer the greenhouse to be on the ground.

Certain imaging equipment from the Biochemistry program, the balance room in the Forensics Suite, and perhaps the Physic Research space will need to be located on the ground floor on isolated slabs. This will preclude making the entire structure

Hall of Flags

Campus View From Interstate 15

unnecessarily adhere to higher than needed vibration control standards.
All mechanical equipment must be completely screened from views.

The material palette of the new addition should closely follow the existing campus standards to maintain the architectural continuity that creates the UVU campus identity.

Quality and Image

In designing and organizing the new addition, the following considerations should be addressed:

- The science building expansion will be a magnet to draw students back to the center of campus. This will also help redirect the academic focus back to the center of campus.

- It is critical that the new addition be able to share various facilities, components, and equipment with the Pope Science Building. Therefore, design contiguity is appropriate.

- The addition will link to the main pedestrian concourse at either the Hall of Flags or just north of the Pope Science Building. This will

create an opportunity to utilize displays, graphics, electronics, and information kiosks to attract students into the science building addition where they can become more familiar with the campus's science programs and offerings. This is seen as a way to encourage greater enrollment in the College of Science and Health.

- The exterior image of the addition needs to be a variation of the existing campus vernacular and design standards with high visibility from I-15 and University Parkway. Developing an iconic design that reinforces the status of UVU is critical to the architectural success of the science building addition. In creating this image, the recognizable character of the UVU style needs to be maintained.

- The design should honor the past while looking to the future.

- Science should shape the building. The building should not shape the science.

- Flexibility is critical to the current and future success of the new addition.

- The design should promote science and celebrate the high level of quality of the science programs at Utah Valley University.
- The design must express the fact that UVU enjoys full university status and is no longer a community college.

- While multi-level facilities can be considered, the scale of the new building should harmonize with the surrounding buildings and their views.

Applicable Codes

The current applicable building code for the new addition to the Pope Science Building is the 2006 International Building Code (IBC). The State of Utah will likely be adopting the 2009 edition of the IBC in January of 2010. If a construction drawing package including at least a minimum of footing and foundation plans is submitted to the State prior to the adoption date of December 31, 2009, it will be reviewed under the 2006 IBC.

In addition to the 2006 IBC, the design and construction of the new addition will be governed by the following codes:

- 2006 International Plumbing Code
- 2006 International Mechanical Code
- 2006 International Fuel Gas Code
- 2008 National Electrical Code
- 2006 International Fire Code
- 2006 International Energy Conservation Code

The existing Pope Science Building was completed in 1987 and its design and construction were based upon codes in effect at the time of design. The data on the documentation title sheet indicates the following design parameters:

- 83,200 square feet
- Seismic zone 3
- Occupancy B-2
- Construction type III – I hour
- 1982 UBC except wind velocity 90 mph, exposure C
- 1985 Uniform mechanical code
- 1985 Uniform plumbing code
- 1978 Utah State Handicap Code
- 1983 Model Energy Code
- 1987 National Electrical Code

Site and New Addition Footprint

The concept diagrams included in this Program indicate four possible options for locating the new addition on the site:

Option One proposes a four story addition to the south and west of the existing building and will require the demolition of the existing Environmental Technology Building. Option Two also involves a four story addition which is placed generally to the south of the existing building leaving the existing outdoor exit stair and dock area intact. This Option also requires the demolition of the existing Environmental Technology Building and may overlap somewhat into the east irrigation pond. Option Three locates the new addition to the north of the existing Pope Science Building and proposes a four story configuration. Option Four also adjoins the existing building on the north side, but proposes a three rather than four story addition.

With a total gross area of approximately 160,000 square feet, each of the individual floors in the four story Options will be roughly 40,000 square feet in area. Individual floors in the three story Option will be roughly 53,333 square feet in area. All Options will also include an enclosed Mechanical Penthouse.

In all Options, the addition will adjoin the existing Mall circulation spine which is considered an M Occupancy.

General Code Considerations for Additions to Existing Buildings

The project will be considered a new addition to the existing building as defined under IBC 3403.1. Under the language of this section, additions or alterations to a building must comply with the requirements of the code for new construction; however, portions of an existing building not altered and not affected by the alteration are not required to comply with the code requirements for a new structure.

Building Occupancy

While the primary occupancy for the new addition is Group B, it will contain mixed occupancies including Group A-3 for Lecture Halls with more than 50 persons and Group H in the Acids, Flammables, Specialty Chemical and Hazardous Waste Storage Areas. In buildings of mixed occupancy, the IBC provides three strategies for determining overall building area and height:

Accessory occupancies subsidiary to the primary occupancy not occupying more than 10 percent of the story in which they are located permit allowable area and height to be determined based on the primary occupancy. For the four story options, the aggregate areas of the A-3 and H occupancies may not exceed 10 percent of the approximately 40,000 square foot floor plates or 4,000 square feet per floor. By the same token, for the three story option, the aggregate areas of A-3 and H occupancies may not exceed 10 percent of the approximately 53,330 square foot floor plates or roughly 5,300 square feet per floor.

Non-separated occupancies shall be individually classified and the allowable area and height of the building is based on the most restrictive occupancy. The H occupancy, being most restrictive, would then limit allowable area and possibly introduce the need for multiple fire walls to achieve the desirable floor plate size. Furthermore, the H occupancy would only allow a height of two stories (assuming a fire sprinkled building) which would not serve the program needs of the addition.

For ***separated occupancies*** the allowable area shall be such that the sum of the ratios of the actual area divided by the allowable area for each occupancy does not exceed one.

Special Requirements of Anchor Buildings to Mall Occupancy

The new addition is an exterior perimeter building having direct access to the concourse with its mall occupancy and therefore is considered an anchor building (IBC402.2). It must have its required means of egress independent of the mall occupancy and doorways / pathways leading to the mall concourse. Similarly, the required path of egress travel of the mall occupancy shall not exit through the anchor building (IBC 402.4.3.1).

Anchor buildings shall be separated from the mall occupancy by fire walls complying with IBC Section 705 with the following exception: openings between anchor buildings of Type IA, IB, IIA and IIB construction need not be protected (IBC 402.7.3.1).

Although the total proposed building area is permitted under Type IIIA construction, the preceding exception suggests that a more restrictive construction type has the benefit of allowing openings between the mall and the anchor building.

Construction Type

Based on the recommendation of the State Building Official during the preliminary code review meeting, the new addition shall meet or exceed the fire-resistive requirements of the Construction Type of the existing building. Since the existing building was classified as Construction Type III 1-hr. under the U.B.C., the addition should be at least Construction Type IIIA under the IBC. Construction Types IIA and IA or IB will also satisfy the requirement of meeting or exceeding the fire-resistive requirements the Construction Type of the existing building.

Allowable Height and Area

(For Four Story Options)

For a building of Occupancy Group B and Construction Type IIIA, Table 503 allows a height of five stories.

During the preliminary code review meeting, the State Building Official noted that the total floor area of the existing building and addition must be taken together when determining allowable area. Assuming that the accessory occupancy strategy noted above is utilized, a tabulated area of 28,500 square feet for a building of Occupancy Group B and Construction Type IIIA is permitted (IBC 503). Taking the area increases allowed for location on property (open on three sides) and an automatic fire sprinkler system, the tabulated area can be increased to 99,465 square feet (IBC 506). The maximum allowable building area for buildings with three or more stories above grade is 99,465 x 3 or 298,395 square feet (IBC 506.4.). Combining the 83,200 square feet of the existing building with the 160,000 square feet of the addition yields a total area of 243,200 square feet which falls within the allowable area for Occupancy Group B and Construction Type IIIA.

The grade level floor of the existing building is its largest floor with an area of approximately 27,400 square feet. If a four story option is selected, the total floor area of this level would be approximately 67,400 square feet which is permitted within the allowable area of 99,465 square feet for a single floor (IBC 506.4.3).

In the scenario where a four story Option is selected, the highest occupied floor would be 60 feet above grade assuming a 15 foot floor height. Since this is less than 75 feet above fire department vehicle access, the building will not be considered a high rise (IBC 403.1)

Allowable Height and Area

(For Three Story Options)

The area of any covered mall building, including anchor buildings of Type I, II, III and IV construction shall not be limited provided the covered mall and attached anchor buildings are surrounded on all sides by permanent open space of not less than 60 feet and the anchor buildings do not exceed three stories in height (IBC 402.6).

Sprinkler and Fire Alarm System

New Group B occupancy buildings are required to have an approved automatic fire sprinkler system when they have a floor with an occupant load of 30 or more that is located 55 feet or more above the lowest level of fire department vehicle access (IBC 903.2.10.3).

A fire alarm system is required to be installed in occupancies that have an atrium connection of more than two stories (IBC 907.2.13). Manual fire alarm boxes are not required when Group B occupancies are equipped throughout with an automated fire sprinkler system and the alarm notification appliances will activate upon sprinkler water flow (IBC 907.2.2). Automatic fire detectors must be connected to the building's automatic fire alarm system (IBC 907.10). Visible alarm notification appliances must be provided in public and common areas (IBC 907.9.1.1). Audible alarm notification appliances must be provided in accordance with IBC Section 907.9.2.

The fire alarm system must be monitored by an approved supervising station in accordance with NFPA 72 (IBC 907.14). Primary and secondary power supplies for the fire alarm system must also be in accordance with NFA 72 (IBC 907.4).

Because the new construction will be an addition to the existing lab/classroom wing that existing wing will need to be upgraded to provide complete fire sprinkler protection for the entire building. The wing fire alarm system will also likely need to be upgraded to include the existing lab wing and the new addition, including new addition and visual notification appliances.

Possible Modifications to the Existing Atrium

Based on a conversation with the State Building Official conducted as part of this programming effort, if the addition connects directly with the circulation system of the existing building, the existing atrium will require modifications necessary to provide smoke evacuation.

New Atrium

This program includes a Lobby/Atrium to create a ceremonial space where the addition adjoins the Concourse. This space will require smoke control in accordance with IBC Section 909. The IBC allows an exception to this requirement for atriums that connect only two stories (IBC 404.4).

Any new atrium that may connect the new and existing buildings needs to meet the following atrium requirements from IBC Section 404.

- **User:** The atrium floor can be used for any approved use, as the atrium will be protected by the sprinkler system in accordance with Section 903.3.1.1 (IBC 404.2).

- **Sprinkler System:** An approved automatic fire sprinkler system is required to be installed throughout the building (IBC 404.3).

- **Smoke Control:** A smoke control system must be installed according to Section 909 (IBC 404.4), The smoke control equipment must be connected to a standby power system (IBC 404.6).

- **Enclosure:** The atrium must be separated from adjacent spaces by a 1-hour fire barrier, a horizontal assembly, or both (IBC 404.5). There are several exceptions to the requirement. Under specific conditions described in Section 404.5, a glass wall can be used to form a smoke partition. Also, a glass block wall with a 3/4 hour fire protection rating can be used. Adjacent spaces of the atrium do not need to be separated from the atrium when they are included in the design of the smoke control system.

- **Interior Finish:** Atrium walls and ceiling must have an interior finish of not less than Class B with no reduction in class for automatic fire sprinkler protection (IBC 404.7).

- Travel Distances Exit access travel distance within the atrium space must not exceed 200 feet (IBC 404.8) This does not apply to the lowest level of the atrium where the required means of egress is through the atrium space.

Chemical Storage

Control areas can be established to provide an alternative method for the handling of hazardous materials without classifying the occupancy as Group H. Control areas must be separated from each other by fire barriers (IBC 706), horizontal assemblies (IBC 711), or both (IBC 414.2.1),

The allowable hazardous quantities and number of control areas vary per floor level. See IBC Table 414.2.2 for maximum area and number of control areas per floor.

Sustainability Considerations

The State of Utah recently adopted LEED Silver certification as the standard for all new state-funded construction. The sustainability goal for this design will be to achieve a LEED Silver rating. LEED version 3 is now the standard, also called LEED 2009.

Each design team may have different strategies for achieving the Silver rating. Some reasonable strategies may include:

- Does site selection meet the LEED criteria?
- No new parking.
- Shower accommodations and bicycle racks for occupants with showers no more than 200 yards from the facility. Consider the Physical Education facilities as showers for bicycle commuters.
- Proximity to bus stops for campus and city transit systems.
- Landscape design that restores habitat.
- Open space considerations.
- Reduce heat island effects for both the site paving and the roof.
- Light pollution reduction.
- Design a water efficient landscape around the building and consider how the campus wide irrigation system figures into water use reduction strategies.
- Utilize water efficient fixtures to reduce water consumption.
- The greatest potential for improving the sustainable performance of the building is reflected in the new LEED standards for energy efficiency. Given the high volume of air needed within the lab facilities, it will be a challenge and goal to achieve a high level of energy efficiency within the HVAC and electrical systems of the building.
- The State mandates enhanced commissioning therefore the two points for this item can be added to the total score.
- Enhanced refrigerant management should be a given.
- With its Utah County location and proximity to recycling centers, a construction waste management program should be mandated.
- Recycled content, Regional materials, Rapidly renewable resources, and certified wood products should be achievable points.
- Increased building ventilation may be a possibility with the increased air flow required by the lab spaces.
- Both construction and pre-occupancy indoor air quality programs should be instituted.

- Low emitting products of all types should be the norm for the project.

- Controllability of lighting and thermal comfort should be possibilities as well as thermal comfort verification.

- Day lighting and views for occupied spaces seems like a reasonable goal given the request for maximum amounts of natural light throughout the new addition.

In all of the strategies to achieve a LEED Rating, the true goal of sustainability – reducing the impact our built environment has on the natural world – should not be lost.

The State and UVU Facilities are extremely interested in constructing a building that has significantly lower life cycle operation costs as well as lower life cycle maintenance costs. This may require that first costs be a bit higher in order to achieve true life cycle benefits.

It will be important for the building to incorporate principles of passive solar design.

Discussions with the campus have revealed that, while a vegetated roof can be a worthy goal, their preference is to avoid the maintenance problems that may be associated with a roof top landscape.

Consideration might be given to using photovoltaic panels to generate renewable energy for the project and for the campus. Such systems would be valuable as demonstration modules or displays. However, full electrical production for the building or the campus is not compatible with current campus electrical systems.

Specific Programming Considerations

During programming meetings and interviews, the programming consultants gathered the specific considerations and requirements that are listed below.

General

1. **Percent for Art.** The building project will include the Percent for the Arts program. The College of Science and Health would like the arts project to be very creative and unique. One possibility is an electronic display feature in a main lobby or atrium, such as a monitor wall or an electronic floor display.

2. **Atrium as Connector.** A multi-floor atrium should be incorporated into the building as a way to connect the building's different floors, or as a way to connect the addition with the existing building.

3. **Space Names.** The design architect should use space names in the documentation that will be used after construction when the building is occupied. This will require close coordination with campus and College representatives.
4. **O&M Manuals.** The contractor will be required to submit O&M manuals in hard copy as well as digital.

5. **Building Systems Training.** The specifications must require professional filming for all building systems training. All filming must be delivered in DVD format, rather than videotape.

6. **Building Service Entrance.** The building service entry must accommodate delivery vans and campus service vehicles. There

will be no semi-truck access to the building. The service area will have a 12-yard trash dumpster and may have a cardboard baler. There should be parking space for two service vehicles.

7. **Bird Nests.** The building should be planned to avoid birds nesting areas.

8. **Air Intake.** The air intake areas should not be adjacent to generators or exhaust air outlets.

9. **Toilet Room Chases.** Chases between toilet rooms should be a minimum of 3' wide, to allow maintenance staff access. They should be provided with switched light fixtures.

10. **Toilet Room Keying.** Toilet rooms should be provided with keyed double dead bolt locks (locks on each side of door).

11. **Chemical Exhaust Hood Discharge.** Locations must be coordinated with existing and new building intakes to avoid cross contamination.

Building 03

B. Structural Narrative

The structural framing system shall conform to and complement the layout of the architectural floor plan and contribute to the functional requirements of the programmed space. The structural system shall balance factors of structural integrity, performance, economy, flexibility for future use, and local availability of materials. Close interaction with other design professionals is necessary to identify and implement prudent economical structural decisions. The least expensive structural solution may not always be the least expensive overall building cost.

General

Structural opportunities that will significantly affect the overall performance and budget of this facility must be completely understood. Such opportunities include the unique site, attachment or close proximity of a new structure to an existing structure, vertical mixed use of program spaces, flexibility of design spaces, vibration mitigation for sensitive equipment, significant lateral design loads, and constructability on a restrictive site.

Additionally, the site soil characteristics and high water table present unique challenges at this site. Optional foundation systems noted in the soils report should be investigated to determine and verify the most cost-effective solution for supporting the new structure.

Close coordination with the Owner and Owner's representative will result in meeting the expectations and user desires for the structure with respect to both vertical and lateral loads. It is important to note that code required force levels represent the minimum requirements for life safety and do not necessarily meet owner needs for overall building performance. Therefore higher force levels may need to be used as design constraints in order to meet the College's performance expectations.

A strong emphasis on sustainable design must also be incorporated into the design process. The structure should utilize materials that are readily available and can be procured and erected in a reasonable manner for this site. Consideration should be given to the availability of skilled labor in each particular material type, bearing in mind that seasonal characteristics can also affect material selections.

Future expansion of the building is not an anticipated design parameter for this project. Interior expansion joints may be required depending on the final building lay-out. Seismic joints will also be required between new and existing structures and care should be given to the thermal expansion properties of the selected structural framing members.

Existing Building Considerations

The existing Pope Science building was designed and constructed in the 1980's, and it is unknown if it meets current seismic design standards. Funding for upgrading the existing structure to meet current seismic codes is not included in this project. Therefore, it is recommended that an expansion joint be utilized to seismically isolate the new addition from the existing building.

Additionally, no portion of the new facility should be built on top of the existing open deck areas or roof top areas. It is unclear if the existing structure has been designed to accommodate additional loading. Even if it has been designed to accommodate new construction in these areas, the seismic codes have changed such that adding new loads to the building may trigger a seismic upgrade to the existing facility. Again, this would be outside the budgetary scope of this project.

Care should be taken to ensure that construction of the new addition does not impose additional snow drifts onto the roof or open deck areas of the existing structure more than the existing structure can handle.

Design Criteria

The minimum code and standards for this project shall be based on the 2006 International Building Code (IBC) and all of the current editions of the IBC referenced standards. The 2009 version of IBC may be required if construction documents are not submitted to the State for review prior to their anticipated code adoption January 01, 2010. This project shall also conform to the latest DFCM Standards. Final structural documents shall clearly identify final design criteria and material strengths. As a minimum, the following design criteria and material strengths shall be utilized for this design. These criteria and strengths shall be evaluated on a continual basis as the design process evolves. The building is to be classified as Occupancy Category III per the IBC.

Floor Live Loads

Offices & Classrooms = 80 psf + 20 psf partition loading and a 2000 lb load over a 2.5 foot square footprint.
Corridors & Lobbies = 100 psf
Light Storage = 125 psf
Laboratories = 100 psf *

*General building vibration control to be 2,000 micro inches per second. It is recommended that the Electronic Imaging Suite in Biochemistry, the Balance Room in Forensics, and perhaps the Physics Research space be located on ground level isolated slabs.

Roof Live Loads (20 PSF Minimum)

Snow Exposure Category = C
Snow Ground Load = 43 psf
Snow Importance Factor = 1.1
Snow Thermal Factor = 1.0
Rain on Snow Surcharge = 5 psf

Snowdrift accumulations shall be considered at valleys, parapets, vertical offsets in roof elevations, and adjacent to penthouse or RTU locations as required by the IBC. Sliding snow shall also be considered where required.

Wind Loads

Exposure Category = C*
Basic Wind Velocity = 90 mph (3-second gust)
Importance Factor = 1.15

*Exposure C shall be used for elements and components, including exterior window and wall systems.

Seismic Loads

Importance Category = 1.25
Soil Site Class = D
Short-Period Mapped Acceleration, Ss = 1.152
Long-Period Mapped Acceleration, S1 = 0.484
Short Period Site Coefficient, Fa = 1.039
Long Period Site Coefficient, Fv = 1.516
Spectral Response Acceleration, SDS = 0.798
Spectral Response Acceleration, SD1 = 0.489
Seismic Design Category = D
Coefficients for Response Modification and Seismic Response, and Factors for System Overstrength and Deflection Amplification shall be determined based on the type of lateral force resisting system utilized in the design.

Miscellaneous Loads

Blast Loading and Progressive Collapse are not required design parameters for this project.

WORKING STRESSES FOR MATERIALS:

Concrete (28 day strength min.)
- **Footings** = 3,000 psi
- **Foundation Walls** = 4,000 psi
- **Slab-on-Grade** = 4,000 psi
- **Structural Slabs** = 4,000 psi
- **Columns/Piers** = 4,000 psi

Reinforcing Steel = ASTM 615, Grade 60 (Fy = 60 ksi)

Structural Steel
- **Wide-Flange Shapes** = ASTM A992
- **Other Shapes and Plates** = ASTM A36
- **Steel Tube Columns** = ASTM A500, Grade B (Fy = 46 ksi)

Structural System Description

The following systems description is based on a multi-story above grade structure. The base level shall be slab-on-grade. Overall square footage of each floor and total building area is described in further detail in other sections of this program. Typical floor-to-floor heights will be approximately 15'-0".

Primary framing grids for the main building will match the campus standard of 30' x 30' bays in each direction. It is noted that this bay size may not be the most economical when considering vibration design and constraints.

In general, the building cladding system shall be compatible with the existing building architecture, and shall be attached to the supporting structure. Connections between the cladding system and primary framing system shall allow for both lateral and vertical movement between the primary structure and the cladding system without damage to the cladding system.

The suspended floor framing will consist of structural steel wide-flange composite beams nominally spaced to support a composite steel floor deck and concrete topping slab. Columns will be structural steel wide-flange or tube columns and will bear directly on the concrete foundation system. Floor systems should be designed to mitigate vibrations. 2000 microinches per second is the building standard.

The roof framing will be of open-web joist and girder construction bearing on either wide-flange or tube steel columns. Where roof framing is below mechanical equipment or heavy loads, wide-flange sections should be used. Elevator or mechanical penthouses should also be of wide-flange construction and shall support concrete fill.

The lateral force resisting system will be most economically satisfied by utilizing Special Reinforced Concrete or Masonry shear walls or structural steel braced frames (special concentric braced frames, eccentric braced frames, buckling-restrained braced frames, or special moment frames). Lateral force resisting elements should be located as to optimize structural design, but also be compatible with the architectural footprint and flow of the programmed spaces. It is necessary that the lateral force resisting elements stack vertically from the roof to the foundation level. Smaller openings, such as doors, may be located within shear wall openings or between braces in braced frames.

The central heating and cooling plant may be constructed out of structural steel, similar to the methods noted above. Alternatively, the plant may be constructed of reinforced masonry exterior bearing walls with open-web steel joists and girders.

Seismic expansion joints will be located between the new addition and the existing structure. The joints shall be detailed as to accommodate the building drifts associated with a seismic event. Providing these joints will isolate the new and existing structures from one another and will reduce the seismic and gravity impacts on the existing structure. Additionally, new construction should not extend over or be built upon the existing deck areas.

Refer to other sections of this program for special requirements with regard to fire ratings and area separations.

Foundation Design

The following section is based on the Geotechnical Report prepared by RB&G Engineering, dated May 2009. The report lists three options for supporting the structure. These options include (1) spread footings on compacted granular fill, (2) deep foundations (driven piles and drilled shafts), and (3) mat foundations. The Geotechnical Engineer suggests that mat foundations appear to be the most efficient and cost-effective solution for supporting the new structure.

According to the Geotechnical Report, the mat foundation should be constructed on 1 foot of compacted sandy gravel, should bear a minimum of 2.5 feet below lowest adjacent final grade, and should be designed using a coefficient of subgrade reaction of 100 lb/in3 with 800 to 1200 psf net allowable soil bearing pressures. Soil bearing pressures may be increased by one-third where structural load combinations include seismic loads. A coefficient of friction of 0.40 may be used where friction is used to resist lateral seismic loads.

It is noted that the amount of over-excavation and replacement fill will be significantly reduced if a mat foundation is used. Differential settlements are also greatly reduced with a mat foundation system.

Due to its increased resistance to sulfate attack, Type II cement should be used in concrete that is in contact with native soils.

Problems associated with liquefaction during a seismic event are unlikely at this site, and no special mitigation of the foundation soils is required. Additionally, no active faults pass through the site area.

Active, passive, and at-rest earth pressures (as needed) should be used for designing retaining wall structures. Additional lateral pressures on retaining structures due to seismic soil loads should be calculated and applied to retaining structures as prescribed in the soils report.

Equipment and Mechanical Considerations

Some mechanical exhausts and equipment will be located on the roof. It is assumed that the vertical circulation of air and other mechanical or electrical equipment will be in identified shafts. These shafts can be economically provided when identified early in design. Attachment of utilities to the bottom of the floor slabs and structure can easily be achieved.

Areas where the mechanical equipment has motors, fans or other moving parts may cause unwanted noise and vibration. Reduced noise levels can be achieved in wall systems as identified by the architect. Vibration issues can be most effectively mitigated by providing isolation systems between the equipment and the structural framing systems. Such areas must be evaluated by both the mechanical and structural engineers to ensure proper vibration mitigation techniques have been implemented. Additionally, special consideration must be taken where utility equipment is adjacent to vibration sensitive laboratory equipment on structural floor systems.

Underground piping and other utilities may be located in a centralized underground tunnel. The location of the tunnel should be coordinated with the design team. If a mat foundation is used, it is recommended that the tunnel be located beneath the foundation or that the entire foundation be lowered beneath the tunnel. The mat foundation should not be interrupted to accommodate the tunnel. As such, if the location of the tunnel drives the foundation design, the design team may consider utilizing a different foundation system, or relocate the underground utilities entirely to arrive at the most economical solution.

Vibration

Vibration can be detrimental to laboratory function and research. Different areas of the addition require varying levels of vibration control. Vibration control will be required at the main floor level (slab-on-grade) for the EM Suite in Biochemistry and Balance Room in Forensics, and perhaps the Physics Research. At these locations, it is recommended that vibration sensitive equipment be located on an isolated slab. This will help ensure that vibrations from mechanical equipment and the structure are not transferred horizontally across the floor slab. Additionally, if a mat foundation is used, it is recommended that the slab also be isolated from the mat foundation to mitigate vibration concerns.

At suspended floors, it is noted that using a composite wide-flange steel floor system helps enhance vibration mitigation over other systems. Alternatively, it is also noted that cast-in-place concrete floor systems could help mitigate floor vibrations even further. However, certain premiums associated with building a concrete structure instead of a steel structure may preclude this system. Careful detailing and analysis of composite steel wide-flange floor systems has proven successful in helping to alleviate disruptive floor vibrations. Extreme care should be taken to ensure that the composite beams and girders, as well as the composite concrete metal decking, meet vibration control criteria.

The minimum level of vibration control at laboratory spaces is identified to be 2,000 micro-inches

per second. Alternatives to this level of control may be considered based on careful coordination with programmed occupants. It is suggested that this criteria not be reduced in the office areas such that future programming is restricted to existing laboratory areas. This issue warrants further exploration during the design phase relative to future building flexibility vs. construction costs.

Quality Control

Quality control can best be achieved through close coordination and communication between design professionals. All required testing and inspections for structural materials and processes are to be clearly identified on the contract documents. Timely site observations and review of shop drawings can mitigate conflicts before they happen.

Sustainability Standards

The referenced standard utilized in the development of sustainable design includes current editions of "LEED-NC for New Construction Reference Guide". The structural systems utilized can take into consideration the Credits available in the sections titled "Materials & Resources", and "Innovation in Design".

Materials & Resources

Close coordination with the General Contractor can result in the managing of construction waste, reducing waste, and the potential re-use of material on future stages of construction. Structural sizes can be normalized and result in multiple uses during construction. An example can be the use of shoring material or forming material eventually being used as framing members.

The incorporation of reuse material and recycled material provides opportunities for construction savings as well as benefiting regional companies. These materials can include exterior brick, concrete masonry units, structural steel, and concrete mixes (fly ash quantities) to name a few.

Perhaps the strongest effort will be in the efficiency of design. This should result in the need for less material than found in an inefficient design. The efficient layout and use of structural materials can result in overall less structural steel, structural concrete, and impact to the existing site. Although there may not be Credit Points directly associated with this effort, the overall impact on the economy in the production of less material is a very important part of Sustainable Design.

Buildings designed to last well into the future are the very essence of sustainable design. This structure will be designed to meet and even exceed current standards in earthquake design.

Innovation In Design

Opportunities exist in this area if the design professional has the ability to exceed noted values in the Materials and Resources Section above. If a very aggressive Construction Waste program is instituted where 95% of waste can be diverted away from land-fills, an additional Credit can be achieved.

Additionally, reducing overall height of the building reduces building shadow and reduces overall material use. Reducing the amount of building damage after a seismic event also has potential for innovation Credits. This may increase demand capacity on structural elements, but will provide the very essence of Sustainability.

Building 03

C. Mechanical / Plumbing Narrative

Applicable Codes & Standards

Conform to the latest edition of the following codes and standards, or the requirements defined in this program, whichever is more restrictive:

2006 IBC

2006 IMC

2006 IPC

2006 IFGC

2006 IFC

2006 IECC

ANSI Standard Z9.2-2007

ANSI Standard Z9.5-2003

OSHA Laboratory Standard

Latest Division of Facilities Construction and Management (DFCM) Design Requirements

Latest DFCM CADD Criteria

Latest Utah Valley University Design Criteria

LEED Version 3.0 – Silver Rating or better

** The 2009 version of these may be required if construction documents are not submitted to the State for review prior to their anticipated code adoption January 01, 2010.*

Available Utilities

Heating Hot Water

A 10"Φ heating hot water supply and return main extends the length of the existing Pope Science Building in the circulation corridor to the east.

Design supply temperature during the winter months is 105˚F during winter months, with design $\Delta T = 15$˚F. The design supply temperature during summer months is 90˚F, with design $\Delta T = 10$˚F.

Chilled Water

A 10"Φ chilled water supply and return main extends the length of the existing Pope Science Building in the circulation corridor to the east.

Design supply temperature is 48˚F, with design $\Delta T = 12$˚F

Culinary Water

An 8"Φ underground water line runs near the perimeter of the building, and is to be utilized for domestic water service to the building addition.

Natural Gas

Extend on-site natural gas line to the building.

Natural gas consumption will be limited to domestic water heating and laboratory use. Provide building shut off valve in an easily accessible location.

Sanitary Sewer

A new sewer main will be installed in the building as part of this project.

Anticipated building drain size = 6"Φ.

Gravity-flow sanitary sewer is required. Sewage ejection is not acceptable.

Storm Sewer

New storm drain will be available on site for the building.

Fire Service

New 8"Φ service will be installed into the building as part of this project.

Relocation Of Existing Utilities

See Site Utilities portion of this programming document for requirements for relocating existing utilities that lie beneath the footprint of the proposed building addition.

General Requirements for Mechanical Design

Temperature

Outdoor design temperatures (Provo):

Winter: 9 ˚F (ASHRAE 99.6%)

Summer: 95DB/62.4WB ˚F (ASHRAE .4%)

Evaporative: 87.0DB/66.4WB ˚F (ASHRAE .4%)

Indoor design temperatures:

Maintain at temperatures specified in the following table, +/- 2 ˚F.

	Occupied		Unoccupied	
	Cooling	Heating	Cooling	Heating
Normally Occupied Spaces	73	71	80	55
Computer/Server Rooms	72	72	72	72
Utility Spaces, Including Mechanical Rooms	90	60	90	60

Noise

Use the RC Mark II method for rating HVAC system related noise, and use the following table for maximum allowable noise levels generated by HVAC equipment:

Room Type	RC(N)
Classrooms	30
Private Offices	35
Open Plan Offices	40
Conference Rooms	35
Cooridors	40
Teaching Laboratories w/Hood	45
Research Laboratories w/Hoods	50
All Laboratories w/Hoods	30

Ventilation/Indoor Air Quality In Offices And Dry Lab Zones

Comply with ASHRAE 62.1-2007 and the International Codes for minimum ventilation requirements. Where discrepancies occur between the International Codes and the ASHRAE standard, use the more stringent requirements.

Design a ventilation system that results in an air change effectiveness greater than or equal to 0.9 as determined by ASHRAE 129-1997. Follow recommended design approaches in ASHRAE 2007 Fundamentals, Chapter 20.

Develop and implement an IAQ Construction Management Plan that includes the use of high efficiency filters (Minimum Efficiency Reporting Value (MERV) = 8, as determined by ASHRAE 52.2-1999), at each return air grille for systems used during construction.

Provide MERV 5 pre-filters and MERV 13 final filters at central air handlers upon completion of project.

Ventilation/Indoor Air Quality In Wet Lab Zones

All supply air introduced to wet laboratory zones shall be exhausted from the building. Supply air quantities shall be based upon heating and cooling loads, minimum dilution/ventilation requirements, and required make-up air for exhaust systems, whichever is greatest.

Determine minimum ventilation rates for these spaces by following the procedure for establishing a Laboratory Ventilation Management Plan outlined in ANSI Z9.5-2003.

Follow the recommended design approaches in chapter 14 of the 2007 ASHRAE HVAC Applications handbook.

Humidity

Humidification of the building is not required, except as noted in the laboratory room data sheets. Upper relative humidity levels inside the building will be passively limited by the central air handling system to no greater than approximately 55%. However, this is not a design requirement.

Project Documentation

Provide a design narrative that includes the following:

- Basis of design, including all information required to prepare the design.
- Sequence of operation of all systems, as well as their interaction with other systems.
- System description, including operating parameters and assumptions.
- Acceptance testing requirements, in tabular form, for use by the installing contractor and verification by the commissioning agent and design engineer. This may be incorporated into the commissioning documentation.
- A description of the methods used by the design team to achieve sustainability, including the integrated design process; and a description of the results, i.e. a description of the sustainable elements included in the design. Include in this section how the requirements of this program were met.
- Results of the energy simulation, with a design energy performance standard for the building.
- LEED submittal documents.

Energy Efficiency

Determine the energy cost budget for this building in compliance with ASHRAE/IESNA 90.1-2007, Section 11, then document that the proposed design reduces annual energy cost by at least 10%, using the methodology of ASHRAE/IESNA 90.1-2007, Appendix G. Cost-effective energy efficiency measures beyond this goal are encouraged and may be necessary to achieve a LEED rating of at least Silver.

Additionally, comply with the latest DFCM standards for building energy performance in effect at start of design.

This analysis may be performed by the mechanical or electrical design firm.

Design in accordance with the requirements of ASHRAE/IESNA 90.1-2007. Document compliance using COMchek-EZ. Note that compliance with the minimum requirements of the energy standard does not release the design from the requirement that annual energy cost be at least 10% less than baseline.

Strategies that the mechanical engineer can implement to reduce the building energy consumption for heating and cooling include:

- Oversize the duct and piping systems for low static pressure losses.
- Oversize coils to reduce pressure drop.
- Design new coils for higher temperature range on fluid side to reduce system flow.
- Evaporative cooling.
- Provide demand controlled ventilation in office and dry lab areas with varying occupancy.
- Minimize the amount of air that must be introduced into wet lab spaces.
- Evaluate variable flow lab exhaust systems.

- Evaluate the feasibility of heat recovery on the lab exhaust system.
- Consider reducing the air exchange rate inside laboratories when not occupied at night.
- Other strategies deemed appropriate by the design engineer and Owner's representatives.

Building Envelope

Reference IECC 2009, Climate Zone 5 for minimum envelope requirements.

Internal Loads

Use the following loads if more specific design information is not available:

People:	250 Btuh, sensible 200 Btuh, latent
Lights:	1.2 watts/ft^2, overhead
Equipment:	Laboratories: 8 W/ft^2 Lab Support: 16 W/ft^2 Lab Equipt Room: 16 W/ft^2 Environ. Room: 4kW per room
Server/Network Operations:	50 watts/ft^2

These values are in addition to building envelope gains, lighting gains, and gains from people. Modify internal load calculations as required when more specific design information becomes available, in order to maintain indoor design temperatures and optimize size and cost of mechanical systems.

Potable Water Consumption

Design the plumbing system so that the annual potable water consumption by interior plumbing fixtures is no more than 90% of the Energy Policy Act of 1992 plumbing fixture maximum. Additional reductions in water consumption may be required for the building to achieve a Silver LEED rating.

Strategies available to achieve water consumption reductions include low-consumption lavatory faucets, low-consumption urinals and flush valves, low water consumption flush-valve water closets, and other similar items. Use only those items and types of products acceptable to the owner. Waterless urinals are not acceptable.

Commissioning

Coordinate construction documents with the DFCM-selected commissioning agent. Commissioning of the building will comply with requirements for building commissioning detailed in the DFCM Solicitation for Commissioning Services.

Measurement And Verification

Provide continuous metering equipment and 4-20 MA signal outputs, integrated with building BMS system for the following uses:

Chilled water Btu consumption at building.
Heating water Btu consumption at building
Domestic water consumption at building

Systems

General Description

Provide central station custom or field built-up air handler(s) with cooling and heating coils as required to meet minimum ventilation standards. Use backward-inclined centrifugal fans with variable speed control. Locate air handling equipment indoors in a roof-mounted penthouse, or basement mechanical room with adequate service clearance. Locate prime-source mechanical equipment (i.e. heat exchangers, pumps) in mechanical room.

105˚F heating water supply temperature from the central plant must be considered when sizing all heating coils and heat exchangers.
Use variable speed return/relief fans for offices and other non-lab related spaces.

Building Operating Schedule

All laboratory mechanical and plumbing systems shall be operable 24 hours, 7 days a week with varying degrees of occupancy throughout each 24-hour period.

Heating Water

Central plant heating hot water is generated from heat recovery chillers. Natural gas boilers are available for supplemental heating of the water in emergency situations only.

Generate building heating hot water through a plate and frame heat exchanger, utilizing the campus low temperature system. Maximum allowable pressure drop on each side of the heat exchanger is 10 psig.

On source side of heat exchanger, note that campus supply temperature is 105˚ . Design approach is 5˚F.

On load side of heat exchangers, provide constant volume primary pumping and variable volume secondary pumping, with combined heating water transport energy consumption as follows:

	Maximum Water Transport Energy (bhp/1,000,000 Btuh)
Full Load	2.50
50% Load	1.15

Provide air handler coil as follows:

Tube		Fins	
Min Row	Min Thickness (in)	Max Fins Per Inch	Max Thickness (in)
2	0.035	6	0.0075

Specify minimum schedule 40 black steel piping of domestic manufacture.

Provide isolation valves (ball valve 3” and smaller, butterfly valves 4” and larger) at each air handler, pump, heat exchanger and any other device that requires maintenance.

Design piping system, including isolation valves and appropriate piping arrangements to allow maintenance of sub-zones of the heating water system without requiring complete shutdown. Review piping schematic with Physical Plant personnel.

Chilled Water

Central plant chilled water is generated by existing chillers. Provide variable speed distributed pumping for building distribution, without heat exchanger.

Design the chilled water transport energy consumption as follows:

	Maximum Water Transport Energy (bhp/ton)
Full Load	0.05
50% Load	0.04

Provide air handler coils as follows:

Tube		Fins	
Min Row	Min Thickness (in)	Max Fins Per Inch	Max Thickness (in)
6	0.035	10	0.0075

Specify minimum schedule 40 black steel piping of domestic manufacture.

Provide isolation valves (ball valve 3" and smaller, butterfly valves 4" and larger) at each air handler, pump, heat exchanger and any other device that requires maintenance.

Air Distribution

Document fan sizing calculations with zone-by-zone load calculations.

Use automatic dampers on exhaust fans in lieu of barometric dampers.

Document that transport energy consumption meets the following criteria:

	Maximum Air Transport Energy (bhp/1,000 cfm)
Full Load	1.0
50% Load	0.30

Require pressure and leak testing of all medium-pressure duct systems.

Provide each space with individual room temperature control. Provide zoning plan during schematic design review that indicates proposed zoning plan for review and approval by Facilities Planning staff.

Construct all new supply and transfer air ductwork with galvanized sheet metal, per the SMACNA duct construction manual.

Construct all new medium pressure ductwork to SMACNA 6" pressure class.

Construct all new low pressure ductwork to SMACNA 2" pressure class.

Seal both types of ductwork to SMACNA seal class A.

Do not duct return air outside the mechanical rooms. Return air path will be through return air plenums above ceilings, or unducted through spaces without ceilings. Short metal transfer ducts/sound boots will be used to allow return air paths to penetrate walls that extend to the structural deck above.

Duct return air inside the mechanical rooms to the air handlers.

Provide new outside air intakes for the building, and coordinate location relative to new and existing laboratory exhaust fan discharges, general exhaust fan discharges, plumbing vent terminations, generators and other sources of local air pollution.

Consider locating all air handlers on the roof of the building inside and enclosed penthouse. Stair access and an elevator stop should be provided to the penthouse.

Laboratory HVAC System Considerations

HVAC systems for wet laboratories to consist of supply air, fume hood exhaust, and general laboratory exhaust.

Use variable flow, manifolded laboratory exhaust system with n+1 redundant exhaust fans. Consider high-velocity, long throw discharge nozzles on laboratory exhaust fans. The use of such discharge nozzles may require bypass dampers to achieve a constant airflow rate through the fan and nozzle assemblies.

All fume hood exhaust ductwork to be constructed with type 316 stainless steel with welded joints and seams. Branch ducts serving laboratory general room exhaust grilles can be constructed with galvanized sheet metal back to the point the branch duct joins ducts serving fume hoods. All ducts must be constructed of type 316 stainless steel from this point on to the laboratory exhaust fans.

Air distribution systems shall be designed to afford flexibility for future redesign, primarily by providing accessibility to duct systems throughout facilities and, where feasible, by applying a modular layout of air distribution devices and by providing symmetry and uniformity to branch duct layout. Design the system to allow the number of fume hoods to increase by 25% in the future.

The air pressure inside all laboratories shall be negative with respect to corridors and adjacent spaces, unless noted otherwise. Tissue culture rooms, if any, shall be positively pressurized, unless noted otherwise. Modulate room supply air and laboratory common exhaust air flow rates response to changes in hood exhaust airflow rates and/or space heating/cooling demands to maintain proper pressure relationships. These airflows are to be modulated using supply and exhaust airflow control dampers, using either an airflow offset or differential pressure sensing system. The mode of operation in the rooms that have special and critical demands shall be displayed on graphic screens at the room.

Fume hoods shall be bench type with vertical restricted sashes, one flammable base cabinet, one corrosive acid base cabinet, and one base cabinet to conceal cup sink waste piping. Base cabinets will be vented behind the fume hood baffle and 12” above countertop. Flammable base cabinets are not vented. Fume hoods are to be equipped with audible/visual low flow alarms, occupant/motion sensors, and a sash position monitoring systems. Size hood exhaust airflow to account for sash stops that typically limit sash opening height to 18”. Fume hoods to have an average face velocity of 100 feet per minute, regardless of sash height, when occupants are sensed at the hood. Reduce the face velocity to 60 feet per minute when occupants are not detected at the hood.

Exhaust fans shall operate on emergency power.

Plumbing

Provide pressure reducing valve station for domestic water service in mechanical room in the new building.

Do not route pressurized piping over electrical rooms, telecom rooms, computer rooms or other rooms that would suffer catastrophic damage from fluid leakage.

Use Type L copper supply piping, no-hub SV service cast-iron waste piping above grade and PVC DWV piping below grade.

Specify piping of domestic manufacture.
Size hot and cold water piping to maintain 30 psi at hydraulically most remote fixture, and with maximum velocity of 6 fps.

Size roof drain system for 1.5" / hour maximum rainfall.

Support all piping from building structure via approved hangers and supports. Support piping to maintain required grading and pitching of lines, prevent vibration, and allow for expansion and contraction.

Insulate hot water, domestic cold water and primary roof drain piping. Provide all-service jacket in concealed areas, PVC jacket in exposed.

Identify all piping with markers at 20'-0" on center and at all wall penetrations.

Design full sized isolation ball valve at each floor, and at each terminal device.

Preferred plumbing fixtures are Kohler, with Zurn flush valves (automatic urinal, manual at water closet). Wall hung, vitreous china. Provide 1/8 gpf urinal flush valves, hard-wired automatic, and ducal flush manual flush valves for water closets.

Waterless urinals are not acceptable.

Design wall-hung, vitreous china lavatories, and low-flow, single temperature supply with hard-wired sensor faucet.

Design trap primers for floor drains and floor sinks.

Provide hose bibs on outside walls, two each on the west and south, and one each on the north and east. Provide a hose bib in each toilet room, with loose key handle.

Generate domestic hot water with two gas-fired water heaters. One water heater will provide domestic hot water for non-laboratory uses, and the second will provide domestic hot water for the laboratories. The water heater serving the laboratories is to receive cold water from the industrial water system that is isolated from the rest of the water supply with a reduced pressure backflow preventer. Generate and store at 140˚F, provide central tempering valve and circulate to non-lab spaces at 105˚F, and to lab spaces at 140˚F. Locate hot water circulating lines within 8 feet of fixtures being served.

Design an industrial cold and hot water system to serve lab countertop sinks and cup sinks inside hoods.

Design a potable tempered water system to serve all eye wash stations and safety showers.

Provide natural gas to laboratory benches, fume hoods, and biological safety cabinets. Provide an emergency gas shut-off valve in each laboratory and science room.

Laboratory gas systems require piping certified for "oxygen" service. Outlet pressure shall be

150 psig with line pressure not to exceed 200 psig.

CO2 gas shall be delivered from a central point on each floor and manifolded to the point of use terminating at a quick disconnect. Bulk containers or multiple cylinders, alarms, automated change-overs will be furnished by the vendor selected by the Owner.

Compressed air system: UVU has determined that a centralized compressed air system is not required and users will provide local air compressors as required. Equipment that requires compressed air will be specified with a local air compressor.

Vacuum system: Provide a dry vacuum system to laboratory benches, fume hoods, and biological safety cabinets. Base capacity on 2 outlets per lab module, with 0.5 SCFM per outlet @ 15" Hg, all single outlets.

Provide a centralized type III reagent grade water system with a continuous loop design to designated laboratory sinks. Base capacity on 2 outlets per double module laboratory, with 1 gpm per outlet @ 25-60 psig plus specific equipment consumption rates, glassware washers, and local water polishers. The lab-users will install local in-laboratory water polishing units to increase the quality of the type III reagent grade water to type I where deemed necessary, and are not to be included in the design. Type III reagent grade water basic specifications:

	CAP/NCCLS	ASTM
Resistivity (megohms/cm)	0.1	1.0*
Conductivity (microhms/cm)	10.0	1.0
Silicate (microhms/cm)	1000	500
Total Organic Carbon (microg/L)	N/A	200
Sodium (microg/L)	100	10
Chlorides (microg/L)		10

**The current ASTM standard for Type III water is 4. However, this low criteria was established to minimize the equipment's life cycle cost.*

Floor drains shall not be provided in laboratory areas except in glasswash rooms, photographic dark rooms, and at specific equipment locations, including sterilizers, glassware washers, ice machines, and specialized research equipment. Environmental room condensate will drain into floor drains located exterior to labs and will be easily accessible. Floor drains at safety showers shall be provided and special considerations shall be made to the floor area surrounding the drain to contain the water – consider sloping floor to drain.

Laboratory waste system: Policy and procedure will be to segregate and dispose of any toxic, radioactive, or high concentration wastes through local "in-lab" safety containers, without the use of the piped waste system. All laboratory waste will pass through a chemical dilution system with a sampling port prior to connection to the sanitary sewer.

Fire Protection

Provide fire sprinkler protection throughout building. System to comply with NFPA, campus fire marshal and State of Utah Fire Marshal requirements. Extend a fire sprinkler water supply pipe to the building from the existing below-grade water line. Review locations of fire sprinkler riser assemblies and FDCs with the campus fire marshal and state fire marshal.

A fire pump is not anticipated, because the flow and pressure requirements can likely be met from the campus system. The design team shall conduct a fire flow analysis per DFCM criteria during the design phase to confirm this assumption.

Provide individual floor control assembly, including zone check assembly, at each floor.

Provide an express drain system to simplify testing and draining the sprinkler piping on each floor.

Components and Installation: Capable of producing piping systems with 175-psig minimum working-pressure rating, unless otherwise indicated.

Specify all piping and components Schedule 40 minimum black steel, and of domestic manufacture.

Class I, standpipe system design shall be designed assuming 150 psi available at fire department connection. Pressure and required flow shall be provided by fire pumper truck.

Smoke Control

In the present conceptual layout of the building there are two locations where atria may be located. Design a smoke control system for each atrium. For the required smoke control system, provide a rational analysis report in compliance with IBC chapter 9. The purpose of this report is to obtain approval from the Utah State Fire Marshal, DFCM and UVU for the design fire rational analysis, which will then be used in the design of the atrium smoke control system.

Controls

Provide Direct Digital Control (DDC) system. The UVU Campus Standard is Yamas Controls as provided by Utah Yamas Controls.

Integrate the mechanical and electrical systems. Provide microprocessor to microprocessor communication between the DDC and variable frequency drives, air handler(s), electrical distribution, lighting, emergency generators, UPS system and building power. Provide 15% reserve capacity for additional points to be made available for non-mechanical/electrical monitoring.

Laboratory system controls devices to be from Phoenix, or an equal manufacturer.

Provide written sequence of operation on drawings for all systems controlled by the DDC system.

HVAC/ Plumbing Considerations For Existing Buildings

The existing outside air intakes and relief openings serving the existing Pope Science building may need to be reconfigured as the building addition is constructed along the south and west side of the existing building.

University maintenance staff stated the existing laboratory exhaust fans on the roof of the Pope Science building are occasionally not capable of moving all vapors in the exhaust stream adequately far from the roof of the building. Sometimes odors and vapors in the laboratory exhaust airstream are entrained in the existing outside air intakes. Consider optimizing the discharge of the existing laboratory exhaust fans and the location of the outside air intakes for the existing building so fumes and odors are not entrained in the outside air stream drawn into the building by the air handlers.

The new addition abuts the existing building, and the design team must ensure the existing fire sprinkler riser assembly serving the Pope Science building remains located against an exterior wall. Depending on the design of the addition, this could require relocating the existing fire riser assembly.

The existing Environmental Technology building may be demolished to make way for the new science building addition. If so, chilled and heating water piping serving this building shall be removed to the existing mains located in the main corridor to the east. All below-grade utilities serving this building shall be removed to points beyond the footprint of the science building addition.

Building 03

D. Electrical Narrative

Code Requirements

The codes and laws that apply to the electrical systems are the latest versions of the following:

National Electric Code (NEC) 2008

International Energy Conservation Code (IECC) 2006 (2009 to be adopted on Jan 1, 2010)

International Building Code (IBC) 2006 (2009 to be adopted on Jan 1, 2010)

International Fire Code (IFC) 2006 (2009 to be adopted on Jan 1, 2010)

International Mechanical Code (IMC) 2006 (2009 to be adopted on Jan 1, 2010)

National Fire Code (NFPA) 72 2007

American's with Disabilities Act (ADA) 1991

ADA Application Guide (latest edition)

Underwriters Laboratories (UL)

State of Utah Fire Marshal's requirements R710-4

American National Standards Institute (ANSI) A117.1

Available Utilities

The additional standards that apply to the electrical systems are the latest versions of the following:

ANSI standards as applicable

NEMA standards as applicable

IEEE standards as applicable

EIA/TIA standards as applicable to Information Technology

BICSI standards as applicable to Information Technology

DFCM Design Criteria – latest version

UVU Design Standards – latest version

UVU IT Infrastructure and Cabling Specifications – latest version

The building complex will likely be a business occupancies. The International Fire Code, for "B" occupancies, requires a manual fire alarm system for 500 or more. There is an exception that allows no manual fire alarm if the building is sprinkled with notification appliances that notify occupants during sprinkler flow. However,

in the University environment, and because smoke detectors are required by the State Fire Marshall for State owned buildings, the cost of adding manual fire alarm boxes is minimal, and is normally done at the University in these types of occupancies.

The State Fire Marshall requires smoke detectors in all corridors, and in paths of egress.

The IMC requires smoke detection on fan systems, and fan shutdown.

Power Service to New Facility

Due to a National Electrical Code requirement to avoid more than one disconnect unless grouped, and to avoid possible signage and/or fire/walls, it is proposed that a new electrical service be installed for the combined new and old buildings. The new service may refeed the existing service panel in the old facility.

The new facilities shall be designed for a maximum of 30 watts per square foot minimum due to the lab loads and expected growth over time. The University design guidelines require a minimum of 50% space and capacity, included in the 30 watts per square foot.

Loads	Connected Load	Design Watts/SF (w/50% spare)
Lights	1.2 (or less)	2.5
Receptacles	2	5.5
HVAC	6	12.0
Lab Equipment	4	8
Elevators	1	1
Misc.	1	1
TOTAL	15.2 W/SF	30 W/SF

277/480 volt service is desired. Dual transformers for 120/208 volt and 277/480 volt service may be considered as an energy saving option and to avoid stepdown transformers inside the building.

The service can originate from the existing Central distribution loop in the walkways immediately outside of the Pope Science Building. If the service is chosen to extend off the south side of the Pope building, the original tap box for the Environmental Tech building may be used. Refer to Site section 02, Campus Electrical Infrastructure, for further details of options for power service.

A new vault mounted vacuum fault interrupter (VFI) switch, with dielectric medium, is preferred over a fused switch. The switch shall be installed indoors near the main electrical room, similar to the Language Arts and/or the Digital Learning Center installations. Exterior switches are not acceptable. Oil switches and gas switches are not acceptable.

A new transformer(s), should be installed to serve the facility. The transformers must be screened from the public view. If located near the generator, a concrete or masonry “blast wall” shall screen the generator from any possible arc flash of the transformer.

The designer shall include a selective coordination study for the medium voltage service, to determine the overcurrent protection settings at the vacuum fault interrupter. The contractor shall adjust the overcurrent protection settings as part of the commissioning process.

Conduits running from the manholes to the building switch, and from the switch to the trans-

former shall be 5 inch PVC, with 10 feet of PVC wrapped rigid conduit where entering the manhole, penetrating building foundation wall, or exiting from underslab to transformer. Where medium voltage is installed inside the building, conduit shall be rigid, 5 inch size conduit, painted red and labeled according to the NEC. Provide at least one spare conduit in all new runs except where run inside existing mallway from Science building to Service point.

Power Service Accessories

Digital Metering equipment shall be provided at main service switchboard per campus standards.

Phase failure protection shall be provided for motor circuits.

Transient Voltage Surge suppression shall be provided at the main switchboard and the emergency switchboard, and at other selected locations through the facility as determined by the design engineer.

Power Distribution

Electrical rooms shall be stacked where possible to facilitate future changes and minimize the initial cost of feeder runs. Closets shall be centrally located to minimize branch circuit distances. No point in the building shall exceed 150 feet to the nearest electrical panel, preferably most circuits shall be less than 120 feet to the nearest panel. Electrical closets shall have unused wall space for future growth, minimum of 25% free wall space.

All power distribution feeders shall be in conduit, with copper conductors, full size neutrals, with isolated ground and equipment ground conductors per University Design Guidelines. Power panels shall be located within electrical closets, not within labs, where possible. Electrical service shall be located as near as possible to the largest mechanical loads, for efficiency and cost savings.

All outlet circuits shall have dedicated neutrals with single pole breakers. Shared neutrals with two and three pole breaker handles are not allowed.

All circuits shall be designed so there is no more than 5% maximum voltage drop from the main service entrance to the outlet or device. It is preferred that the feeder have no more than 2% voltage drop, and the branch circuit no more than 3% voltage drop, at maximum connected load. This may be accomplished by increasing wire size, or minimizing distance of the feeders and branch circuits, as appropriate.

Power panels for receptacle power shall be separate from panels feeding mechanical and lighting loads to allow for easy, separate metering as required by the IECC and/or USGBC LEED M&V points (if selected). Seperation will also reduce harmonic transfer between building mechanical loads and receptacle power.

Variable Frequency Drives

The electrical designer, not the mechanical designer shall specify the Variable Frequency Drives at the University. Exceptions may be allowed with prior approval from UVU for certain packaged units, however, specifications of the mechanical and electrical designers shall match as to harmonic control and accessories.

Emergency Power

Batteries are not allowed on new facilities at the University. A new, diesel generator will be required as part of the project. The generator will run egress lighting, fume hood exhaust fans, lab freezers and all information technology equipment inside the MDF/IDF rooms including HVAC inside the telecommunication rooms.

There are two existing generators that may be impacted by the construction of the new building. One feeds the Science building, and is located outside to the southwest of the existing building. The other is located inside the Environmental Building and shared between the Environmental building and the Business Admin building. If the Environmental building is torn down, the designers will need to do an early phase replacement of this generator for the Business Admin building. The new design shall consider additional capacity for the Business Admin building IDF/MDF rooms BU104 and BU204 in addition to the current egress lighting loading.

If the new building is built in the South option and both generators are impacted, it may be possible to use the Pope Science existing generator as a replacement of the Environmental Building/Business Admin generator, and provide a new generator for the new Science building/old Science building. Alternatively, a single generator may be provided for both Science buildings combined with the Business Admin building.

The existing generators shall be returned to the owner.

The generator may be located in the transformer yard area, screened from public view. Consideration shall be taken to control noise to at least 15 dB.

The tank shall have a minimum of 12 hours of backup fuel at 100% rated load.

A minimum of two ATS switches is required, one for life safety egress lighting, and the other for auxiliary equipment such as the computer data rooms.

UPS Systems

It is expected that small, rack mounted UPS systems will be provided in the MDF and IDF rooms as part of FF&E to backup telephone and data systems for the building. The UPS systems in all MDF/IDF rooms will be backed up by the building diesel engine generator.

Outlets

The number and location of outlets shall be coordinated with each space with users and comply with their needs and requirements.

For Instructional Spaces including fixed seating auditoriums and lecture halls, outlets of sufficient quantity for laptops shall be provided - where access is provided to a total of 25% of the total students within the room. For Student spaces, outlets shall be provided at all study spaces for laptop connections.

GFI outlets shall be provided for all vending machines and for break rooms, restrooms, roof outlets, and other locations within 6 feet of a sink.

Provide dedicated outlets for all copy machines, laser printers, vending outlets, microwaves, and other high-use equipment.

Provide at least one outlet in each storage and mechanical closet.

Power Shutdown at Instructional Labs

Provide a power shutdown switch near the gas shutoff switch, preferably near the exit door, for all instructional labs. Provide suitable cover to protect against accidental shutdown, and a sign indicating "POWER SHUTDOWN".

Lighting

Wherever possible, the designer shall utilize long life, energy efficient lighting solutions. Four foot T8 or T5 fluorescent lamps, with electronic ballasts, are preferred. T8 lamps shall be premium, greater than 3100 lumens. T8 ballasts shall be premium, high efficiency, with ballast factor less than 0.8.

For smaller fixtures, Biaxial fluorescent, or compact triple tube fluorescent lamps are preferred. Incandescent lamp sources shall be minimized. Where specified, long life low voltage halogen sources, or dimming systems that extend life of the lamps and save energy, are preferred. LED solid state systems may be considered, but must be approved by the campus prior to specification.

Lighting solutions shall incorporate automated controls per the latest version of the energy code. This can be timeclock switching systems, or occupancy based switching systems. If occupancy sensors are used, an override switch mounted on the wall will allow the user to turn off the lights for appropriate presentations. In addition, if the occupancy sensors fail, the University can have the immediate option of bypassing the sensor and using the switch only for control purposes. Dual technology occupancy sensors are preferred to help prevent false off and false on operation of the lights. Design Engineer shall include commissioning specifications in the design to commission all lighting control systems, and provide required owner training.

Daylighting controls may be considered in selected areas of the facility.

In the auditorium, classrooms, and lecture halls, preset dimming and lighting controls, integrated with audio/visual touchscreen, shall be provided as part of the "Premier" design system. If windows are included, the window shades shall also have motorized operators tied to the touchscreen. Electrical designer shall carefully coordinate with Technology designer to ensure smooth, problem free, operation.

In Seminar rooms of at least 40 people, lighting controls shall also be of the preset dimming type.

In all teaching spaces, zone control shall be provided to allow lights at the front near the projection image to be dim or off, while adjacent whiteboards can be partially or fully illuminated to provide dual function teaching. This method requires at least 3 lighting control zones, and preferably 4 lighting control zones as follows:

- General classroom illumination (away from projection screen)
- Lighting on whiteboard
- Lighting on projection area for whiteboard use (when projection is off)
- Other zones as suggested by the lighting designer, for example, perimeter walls, aisles and pathways, etc.

It is recommended that dimming be provided in all auditorium, lecture halls, classrooms, and larger seminar rooms, although limited use of fixed on-off control of some zones of lighting may be used. Dimming should use fluorescent

sources rather than incandescent for maximum life and energy savings.

Provide egress illumination and illuminated exit signs complying with all required codes. As a minimum, 1 footcandle shall be provided for all egress pathways. In addition, provide some illumination on backup generator power in restrooms, mechanical rooms, electrical rooms, and communications closets.

Illumination levels shall follow the published guidelines of the Illumination Engineering Society, North America (IESNA), and its recommended practices. Specifically, refer to RP1-93 "Office Lighting", RP3-00 "Lighting for Educational Facilities", and RP33-99 "Lighting for Exterior Environments.

Fire Alarm Systems

The fire alarm system will consist of manual pullstations, smoke detectors down corridors and paths of egress, and smoke detection on the fan systems exceeding 2000 CFM. Notification devices will be provided per code guidelines. Sprinkler system will be monitored for flow and tamper. The elevator shall be recalled according to ANSI guidelines.

Card Access and Security Systems

Card Access systems will be specified on select doors, including telecommunications MDF and IDF rooms.

CCTV cameras shall be provided inside near exterior exits, near telecommunications MDF/IDF closets, and public gathering spaces and elevator lobbies. In addition, CCTV cameras will be provided on the exterior, in weather housings, to view major sitelines of the exterior.

CCTV cameras shall be color. Black and White is not acceptable.

CCTV Exterior housings shall have weather accessories, defoggers and/or heaters to ensure a clear vision path.

Security systems shall be networkable and monitored through IP through Network Management Protocol (SNMP) compatible. Integrate all cameras into the campus wide NVR video surveillance VSS system.

All needed infrastructure and upgrades on the existing campus wide system for the additional cameras shall be specified including software and hardware licenses. Only qualified vendors, factory approved, and campus approved vendors may participate.

Grounding

Provide grounding equipment conductors in all feeder and branch circuits. Conduit ground is not acceptable. Provide an additional isolated ground conductor in all 120/208 branch power panelboard feeders, complete with isolated ground bus.

Provide grounding riser system for all telecommunications closets, complete with grounding bus bars.

Lightning Protection Systems

The designer shall provide a full lightning protection analysis per NFPA guidelines. It is anticipated that with the importance of the facility, a prominent location, and the overall square footage of the facility, the analysis may suggest a lightning protection system be added to the project. The final cost of such a system depends heavily on the construction materials used on the facility. The designer shall consult with the owner to determine if the system is desireable.

Clocks

Provide battery operated, radio frequency self correcting clocks in all public areas. This is a new developing campus standard, and one building has Primex. Since competitive bidding is desired by DFCM, Sapling and similar systems may be bid against Primex.

Designer shall ensure that repeaters are located within the building (or integral to clocks) so that signal reaches each specified clock location.

Public Safety Radio Repeater System

It has been noted that in some areas of UVU, the public safety/police radios do not work due to lack of signal. The designer shall specify appropriate repeater stations within the building to ensure coverage throughout the new science building.

Sustainable Principals & LEED Silver

It is desired that where economically feasible, sustainable practices and design shall be employed. The state will require this to be LEED silver, at a minimum. Many of the above system descriptions already use energy efficient design practices. The designer shall meet with the DFCM energy coordinator and meet all requirements of the DFCM energy standard.

Electrical designer shall include all commissioning requirements in the electrical specifications required for measurement and verification.

The lighting design is targeting 20-25% better than code for lighting energy density. As stated previously there may be daylighting controls within some of the spaces adjacent to exterior windows and clerestories to take advantage of free and efficient daylight when available; although, it is unlikely that sufficient daylighting controls will be provided to earn the LEED credit for daylighting. The lighting layouts and fixture selections will aid in reducing light pollution from interior light sources as well as aid in reducing sky glow from exterior sources.

There is some desire to have a few photovoltaic solar panels on the facility as a teaching and learning tool. It is unlikely that a few panels will meet the USGBC Energy and Atmosphere credit for either 1% on site energy generation, so seeking additional points for LEED certification is not mandatory. It is not desireable to have a large array and more than a few percent onsite generation of energy.

Building 03

E. Information Technology Narrative

Designer shall refer to the UVU Master Infrastructure and Master Cabling Specifications (10 Gig Solution) dated 07-08-09 in the appendix, all requirements shall apply.

Designer shall coordinate with UVU campus Office of Information Technology staff, including Kevin Dent, Infrastructure, Eddie Sorensen, and Tom Branam, Director of Telephone Service, and other appropriate staff. Campus IT staff will approve all designs prior to bidding.

Telecommunications Service to New Facility

The data fiber optic service to the new building shall be obtained from the "Greenhouse" Open Lab Computer Room MDF (Main Distribution Frame) immediately east of the Pope Science building. Voice is also available in the Greenhouse – although subject to exact number of pair confirmation by campus. If pair count is not fully available, additional pair count may be obtained in the Business Building - BU204. Service can be run in new and existing cable tray to the new facility.

In the Greenhouse, additional cable tray and/or D-rings are needed to consolidate the new cabling on the wall and above the racks. There is space available for additional cabling. New 110 style patch panels may be installed on the existing plywood, and new Light Interface Unit fiber patch panels may be installed on the existing racks.

The following service trunkline cables shall be provided and installed by the contractor:

- 300 pair copper voice backbone cable from new Science MDF to "Greenhouse" MDF (or BU204).
- 96 strand single mode fiber optic from new Science MDF to "Greenhouse" MDF.
- 48 strand multi-mode fiber optic from new Science MDF to "Greenhouse" MDF.
- The above combined 96 singlemode plus 48 multimode shall meet the 144 strand requirement in the master cabling specs.

All fiber optic shall be run in 1 inch innerduct inside new and existing cable tray. Designer shall verify fill of existing cable tray, where appropriate add new cable tray.

Telecommunications Trunklines Within New Facility

It is proposed that the new science MDF become the permanent MDF of both the new building and the existing Pope Science Building. A cable/tray and conduit link shall be connected between the new and old building facilities. This cable tray/conduit link would not be used as the main telecommunications service, but would contain additional voice and fiber optic cabling trunklines, or for security CCTV camera systems.

Each new Intermediate Distribution Frame (IDF) room shall be connected to the new MDF via cabletray/conduits, trunkline fiber optic, and trunkline copper voice cabling. In addition, the old MDF/IDF rooms inside the Pope Science building shall also be connected to the new MDF.

The following MDF to IDF trunkline cables shall be provided and installed by the contractor:

- 100 pair copper voice backbone cable from new Science MDF to each new and old IDF room.
- 24 strands single mode fiber optic cable from new Science MDF to new and old IDF room.
- 24 strands multimode fiber optic cable from the new Science MDF to new and old IDF room.

The existing fiber optic from the "Greenhouse" MDF to the old IDF rooms shall remain as a redundant pathway, these cables consist of 24 strand single mode and 24 strand multimode cables. Note that the old IDF rooms are congested and shared with storage space, additional racks may be required and removal of storage will be required.

Telecommunication MDF & IDF Room Requirements

The new IDF rooms shall be stacked with the new MDF to minimize cable distance and provide flexible future growth. Rooms shall be centrally located, to ensure no workstation cable is longer than 280 feet to any point within the facility. Where required, provide additional IDF closets to ensure that cable length is minimized and meets the standard. At a minimum, provide one MDF/IDF room per floor.

MDF and IDF rooms shall be directly accessable from the hallway, access through teaching spaces or offices is not acceptable.

Size of all Telecommunications rooms shall follow campus minimum size standards or written approval shall be obtained to deviate. MDF minimum size shall be 500 square feet suitable for a maximum of 18 floor racks. IDF minimum size shall be 140 square feet, suitable for a maximum of 4 floor racks plus appropriate wall space. Initially, provide only the floor racks required for cable and network installation, plus a minimum of 30% space available.

A dedicated HVAC cooling system shall be provided in each MDF and IDF rooms that can run 24 hours per day, 365 days per year. This requirement will not apply to the old IDF closets in the old Pope Science building.

Each new telecommunication MDF and IDF shall be on Emergency Generator backup, including all outlets, and HVAC.

All walls of MDF and IDF rooms in the new building must be covered with ¾ inch by 8 foot high plywood, painted with fire retardant paint. The plywood shall be used to mount copper voice cables, fire alarm, and security CCTV systems.

All MDF and IDF rooms shall have appropriate grounding, and grounding bus, tied back to the power service ground. Provide grounding jumpers to all metal raceways entering the closet. Provide spare holes on grounding bus for campus IT services to ground their equipment.

Each MDF and IDF shall have card access, and be monitored with a CCTV camera system, as per standards.

Horizontal Workstation Cabling Requirements

Cable tray or conduit homeruns shall distribute horizontal cabling throughout the facility. Open plenum wiring and j-hooks will not be allowed. Minimum size conduit shall be 1 inch.
Wireless access outlets shall be provided so there is reliable wireless access points in all student study areas and teaching areas.

Building 03

F. Building Technology & A/V Narrative

Designer shall refer to the UVU Master Infrastructure and Master Cabling Specifications dated 07-08-09 in the appendix, all requirements shall apply.

Designer shall coordinate all specifications and design with Media Services, Travis Tasker, Director of Media.

All new construction on UVU campus will include the necessary infrastructure necessary for the installation of technology whether or not the equipment itself will be purchased through the contractor or as part of the FF&E package.

All instructional areas, including labs, will contain appropriate facilities for Technology and A/V, as detailed below.

Additional Standards Requirements

The additional standards that apply to the Technology, in addition to codes and standards required for electrical systems are the latest versions of the following:

EIA/TIA 607 standards as applicable to A/V and Information Technology

BICSI standards as applicable to A/V and Information Technology

IEEE 208 standards as applicable

UVU IT Infrastructure and Cabling Specifications – latest version

"Standard Broadcast wiring and Installation Practices", as excerpted from "Recommended Wiring Practices", Sound System Engineering, 2nd Edition, D. Davis

"The Basics of Audio and Visual Systems Design", Revised Edition, Ray Wadsworth/International Communications Industries Association, INC

Note that the A/V and Media Integrator/Programmer must be CAIP Certified, and have a minimum of 5 years experience installing media equipment in an educational environment.

UVU Media Technology Definitions

There are three classification systems or levels within the different types of instructional spaces:

- Basic
- Standard
- Premier

All types of teaching environments, including lecture halls, classrooms, labs, and conference rooms shall follow the design standards of one of the three classifications of systems.

The intent of any new design is to follow similar standards used elsewhere on campus, to allow ease of use by teachers and staff.

Basic Systems

Basic Systems are normally specified in small conference rooms, smaller spaces needing A/V, and in areas where budget is a concern.

The Basic system consists of a fixed credenza, usually tied to a wall near the front of the room. The system would include laptop connections for an overhead projector, a DVD and/or Blu-Ray media player, and an amplifier with speakers either wall mount or overhead (overhead preferred). The control would be a simple 9 button panel, with volume control, and on-off of all sources.

Lighting control is integrated in basic systems, and there is a small touch screen panel. Lighting control may either be a dimming system or on-off zone control for basic systems.

Standard Systems

Standard Systems are to be specified in all classrooms and teaching lab spaces.

Standard systems have all of the features of simple systems, but instead of a credenza the A/V equipment is built into a fixed lecturn/podium or teaching station. The minimum size of the lecturn/podium is 24 inches deep, with the ability to house a 19 inch wide equipment rack. Heat relief by forced ventilation is required.

Location of the lecturn/podium and controls must not block the view of the projection area, nor shall the screen drop into or near the podium. The fixed podium shall be capable of allowing the instructor to walk all the way around without impact to the visual image.

A minimum of 4 data drops is required for the podium. It is recommended that spare conduits be provided to the fixed podium as follows:

(1) 2 inch conduit for A/V
(1) ¾ inch conduit for dedicated power branch circuit
(1) 1 inch conduit for 4 data cables
(1) 1 inch spare conduit

All conduits to have insulated bushings both ends, and contain no more than three 90 degree bends.

A/V must be installed separate from power and data cables.

The podium must have a built-in microphone as well as a wireless lapel mic for teachers. In larger rooms, provide two mic receivers, one for a lapel and one for a stick mic. Headsets may be checked out either from the Library or the department.

There is the addition of a tabletop or ceiling mounted document camera and a computer within the lecturn.

PA Speakers are preferred to be distributed overhead in Standard systems.

The control is a touchscreen. The touchscreen also has traditional buttons to the side, including source control on the left, and transports on the right.

Lighting is integrated into the A/V controls in the Standard System. Lighting control, volume, and menus all are reflected in the touchscreen.

Annotation is accomplished on Standard systems by dry-erase tabletop tablet or whiteboard surface on the table top, not on the touchscreen. "Walltalker" and similar systems are banned on campus.

Premier Systems

Premier Systems are normally specified in medium and large size lecture halls and auditoriums, or in other rooms as requested by the user group if allowed by the budget.

These systems include all of the equipment of the Standard system, but they use a high quality ceiling mounted document camera and a larger touch screen. ADA assisted listening systems are specified in larger lecture halls.

Auditoriums of greater than 300 seats shall include a projection/sound control room on the back of the auditorium. Provide wired stage type microphones, with several mic outlets and several input channels to allow panel discussions.

Premiere systems shall have the capability of recording the lecture via camera and recording media, for use as distribution on electronic media.

Provisions shall be made for the expansion of the facilities for video conferencing, including possible audience microphones (ceiling and/or tabletop), camera locations, and appropriate lighting to provide proper vertical illumination of faces. (downlights will not be acceptable).

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In all specified systems, the A/V integrator must provide the source code to UVU media services so the program can be changed at a later date without contacting the vendor.

Auditorium (360 seat)

The Auditorium shall be designed with the "premier" level system, duplicated for both sides of the dividable room. Designer shall ensure that the position of the two projectors and screens allow all users, either in divided mode or large auditorium mode, to have an unobstructed view of the media.

Lighting shall be zoned so that the instructor can use a whiteboard as well as the overhead projector, in a side by side configuration.

Lecture Halls (75 Seat And 60 Seat)

The lecture halls shall be designed with the "premier" level systems.

Lighting shall be zoned so that the instructor can use a whiteboard as well as the overhead projector, in a side by side configuration.

Classroom (48 seat)

The classroom shall be designed with the "premier" level systems.

Lighting shall be zoned so that the instructor can use a whiteboard as well as the overhead projector, in a side by side configuration.

Seminar (16, 20, & 40 Seat)

The seminar rooms shall be designed with the "standard" level systems.

Lighting shall be zoned in the largest 40 seat seminar room so that the instructor can use a whiteboard as well as the overhead projector, in a side by side configuration.

On the smaller dividable seminar rooms, the ability to provide projection on one side and white board on the other side when the divider is open, or projection on two screens at once, is desireable.

Computer Classroom

The computer classroom shall be designed with the "standard" level system. The small computer classroom is preferred to have raised floor, as per campus standards.

Lighting shall be zoned so that the instructor can use a whiteboard as well as the overhead projector, in a side by side configuration.

Printing will occur near the back of the room.

Deans Suite Conference Room

The Deans Suite conference room will be designed as a cross between the "Standard" and "Premier" levels, rather than the Simple level system. This will allow the integration of lighting control, and additional equipment for video conferencing including a room/audience camera and proper controlled lighting in video conference mode. A flat screen may be used instead of the projector.

Group Study

The Group study room will be designed with the "simple" level A/V system. A flat screen monitor instead of an overhead projector will be used.

Projection Screens

All projection screens shall be electrically operated. Consult with campus on type of screen, investigations are currently underway as to use of an approved "writable" surface as demand from the professors is asking for such a thing. In any case, a whiteboard should be located immediately to the side and/or behind the screen to allow simultaneous projection and writing on an adjacent board.

Digital Signage

The building will incorporate digital display monitors/signage and Emergency operation notification in the main lobby entry, elevator lobbies and other major entries into the facility, using a minimum size 46 inch flat LED or LCD screen. This may occur at more than one location as the building abuts the main circulation mall and at secondary entrances or lounge spaces. This digital

billboard will be used for campus events, Science events, and for campus emergencies. The sign will normally be hung in portrait format.

A second type of signage is for Entertainment. It is located in sitting spaces, student study areas, relaxation areas. This type of sign would be in landscape format, and have campus events, advertisements, source cable TV, and other types of media.

A 3rd type of signage is for Interactive (touch-screen) activities. This is usually in all major entrances in the facility. This sign should be floor or wall mounted, and located near the student main path of entry. Maps and wayfinding information may be used on this interactive display.

Backing will be required for all digital signage locations. Homerun all cabling from digital signage to the same conditioned MDF/IDF closet. All signs will homerun to the same IDF closet, with minimum two cables for media distribution plus a standard workstation data outlet ran to the nearest closet. In addition, provide a cable TV outlet at each sign. Total cables at each sign shall be four, two for media, one for data, and one for cable TV.

Provide small LED and/or LCD screens for room scheduling in lecture hall and auditorium multi-scheduled spaces.

Percent for Art Program

A creative art Video wall or floor display, related to science, may be considered. The designers shall consult and brainstorm with the Science department and UVU Media Services as to what type of learning display may be desired. The intention is to attract students and visitors to the science department, and make the entry about learning, similar to the displays in the existing atrium.

Cable TV

A cable TV broadband RF system is anticipated throughout the facility, including to all instructional labs, classrooms, conferences, and private offices. Provide appropriate coaxial cable, amplifiers, taps, and other equipment specified in the IT Infrastructure and Cabling Specifications attached in the appendix.

Media Storage

A media storage and repair room is required. See architectural description of the space.

Space Needs 04

Introduction

This section describes the space needs for the Science Building Addition. It contains a spreadsheet, organized by space category, with lists of spaces, their quantities, and their net and gross area amounts. The space categories are:

A Labs
B Classrooms
C Faculty-Staff Spaces
D Deans' Suite
E Shared spaces
F Building Support

Each category of the space list spreadsheet is followed by Room Data Sheets and Room Diagrams for each space. Some of the space groupings are illustrated by room adjacency diagrams that indicate desired space relationships.

The gross square foot amount for the building was calculated at a 65% net-to-gross ratio, which is high for this building type. The building will need to be planned very efficiently to achieve this ratio.

Code	Functional Area	Non Research NSF	Research NSF	Department NSF	Total NSF	GSF
	BUILDING SUMMARY					
A	Labs				68,884	105,975
100	Biotechnology	9,933	1,900	11,833		
200	Biology	8,073	1,200	9,273		
300	Botany	9,028	1,200	10,228		
400	Microscopy	1,701	1,224	2,925		
500	Physics	0	1,124	1,124		
600	Zoology	4,683	1,000	5,683		
700	Microbiology	8,107	720	8,827		
800	General Teaching Lab	1,953	0	1,953		
900	Anatomy/Physiology	10,480	480	10,960		
1000	Earth Science	2,228	0	2,228		
1100	General Lab Support	3,950	0	3,950		
B	Classrooms				21,250	32,692
C	Faculty-Staff Spaces				6,420	9,877
D	Deans' Suite				2,270	3,492
E	Shared Spaces				3,970	6,108
F	Building Support				1,465	2,254
	TOTALS	60,136	8,848	68,984	104,259	**160,398**

Building Efficiency (Net-to-Gross SF) 65%

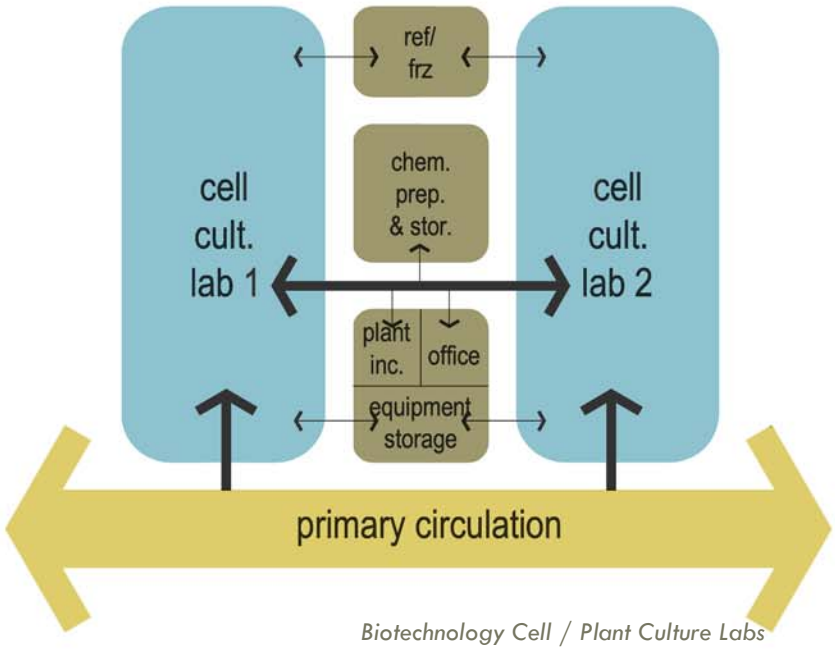
Definitions

1 NSF: Net Square Feet, or the space inside surrounding walls or furniture panels.

2 Building Grossing Factor: Factor that accounts for area needed for internal hallways, walls and building common spaces (major circulation, stairs, elevators, toilet rooms, mechanical/electrical rooms and chases, custodial closets, exterior walls).

3 GSF: Gross Square Feet, or total building area measured from outside surfaces of exterior walls (NSF/0.65).

Code	Department / Space Name	Qty.	NSF/ Space	Total NSF	Non Research NSF	Research NSF	GSF	Remarks
A100	BIOTECHNOLOGY							
A101	Intro To Biotech Lab	1	1,307	1,307			2,011	
A102	Prep Room	1	223	223			343	
A103	Lab Manager's Office	1	100	100			154	
A104	Protein Methods Lab	1	1,307	1,307			2,011	
A105	Prep Room	1	446	446			686	
A106	Lab Manager's Office	1	100	100			154	
A107	Cell/Plant Culture Lab 1	1	1,307	1,307			2,011	
A108	Prep & Storage	1	380	380			585	Also serves Cell/Plant Culture 2
A109	Refrigerators & Freezers	1	198	198			305	Also serves Cell/Plant Culture 2
A110	Plant Incubation	1	150	150			231	
A111	Equipment Storage	1	165	165			254	
A112	Lab Manager's Office	1	100	100			154	
A113	Cell/Plant Culture Lab 2	1	1,307	1,307			2,011	
A114	Adv./Basic Nucleic Acid Lab	1	1,307	1,307			2,011	
A115	Prep Room	1	446	446			686	
A116	Lab Manager's Office	1	100	100			154	
A117	Storage	1	200	200			308	
					9,143			
A118	Radioisotope Lab	1	100	100			154	
A119	Fluorescent Microscopy Room	1	100	100			154	
A120	Tissue Culture Room	2	120	240			369	
A121	Microscopy Room	1	50	50			77	
A122	LN2 Dewar Storage	1	120	120			185	
A123	Balance Room	1	180	180			277	
					790			
A124	Undergraduate Research Space	1	1,200	1,200			1,846	InnovaBio, Assumes 50 people
A125	Equipment Space	1	300	300			462	
A126	Instrument Space	1	300	300			462	
A127	Lab Manager's Office	1	100	100			154	
						1,900		
				11,833	9,933	1,900	18,205	



Biotechnology Cell / Plant Culture Labs

Lab Notes

- Entries should be at the rear of the room to minimize disruption.
- Projection surfaces should be away from room entries and windows.
- Labs should have secure storage for personal belongings either within the room or near the entry, to minimize students' bringing coats, backpacks, etc., into labs.

Notes

- All Biotechnology spaces listed opposite must be on same floor.
- A107 through A120 must be adjacent to each other.

A101
INTRO TO BIOTECH LAB
AREA: 1307 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1
  - Students - 24

LOCATION / ADJACENCIES
- A102 Prep Room
- A103 Lab Manager's Office

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-6" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI):
  - 1 Freezer
  - 1 Centrifuge
  - 1 Double-Door Deli Case

LABORATORY CASEWORK
- Epoxy Resin Bench Top and Sink
- Wood Casework
- Metal Casework under fume hood

NON-LAB EQUIPMENT
- White Board
- Projector

FURNISHINGS
- Fixed Casework
- Moveable Tables

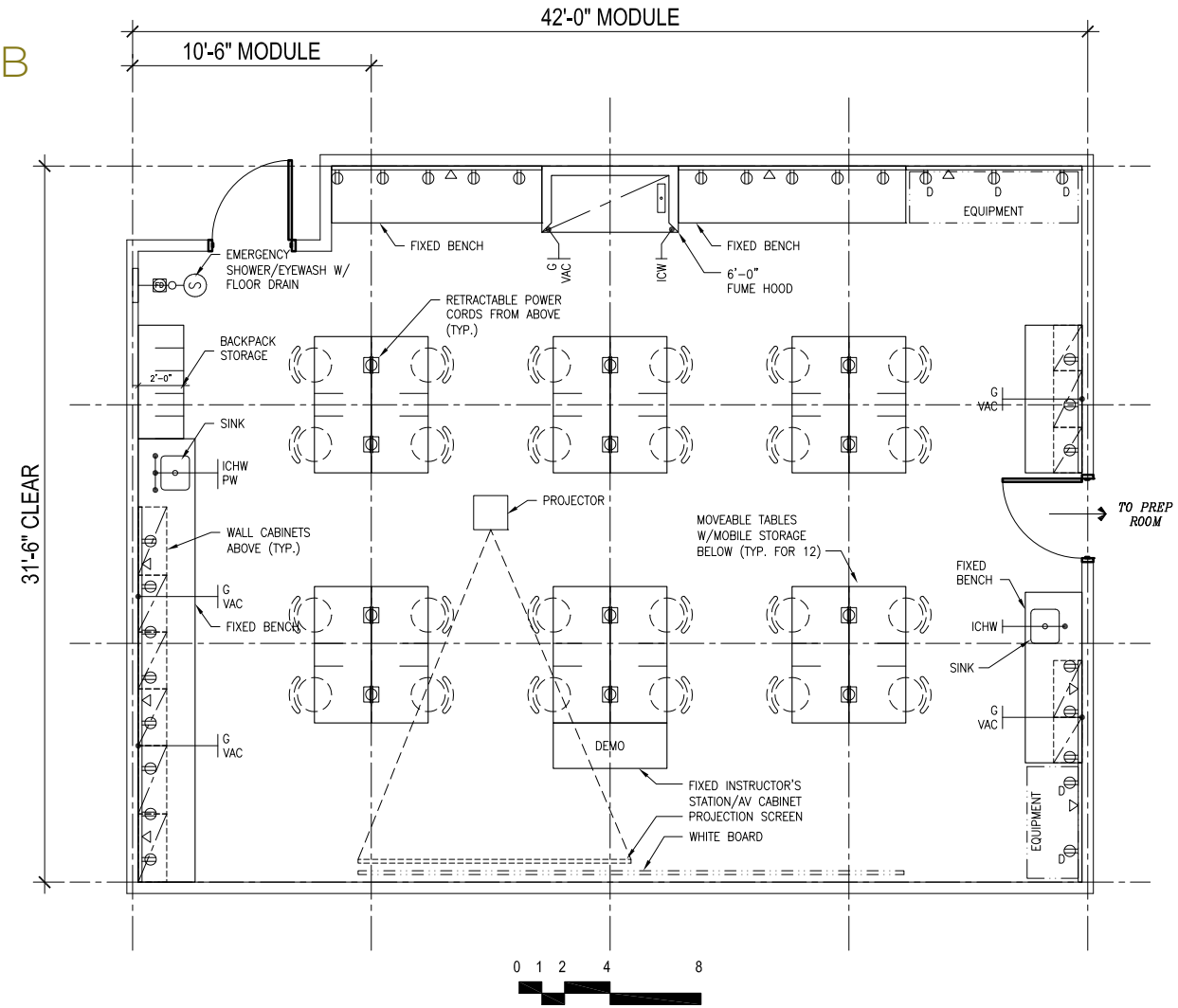
MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - 50% ± 20%
- 10 Air Changes / Hour

HOODS
- 6' Chemical Fume Hood

PIPED SERVICES
- Laboratory Gas (G)
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - 100 fc at Bench/Desk

A101
INTRO TO BIOTECH LAB
AREA: 1307 NSF



A102
PREP ROOM
AREA: 223 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1

LOCATION / ADJACENCIES
A101 Intro to Biotech Lab
A103 Lab Manager's Office

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"
- 3'-0" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 1 Refrigerator
- 1 Freezer
- 1 Under counter glassware washer

LABORATORY CASEWORK
Epoxy Resin Bench Top and Sink
Wood Casework
Metal casework below fume hoods

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- 50% ± 20%

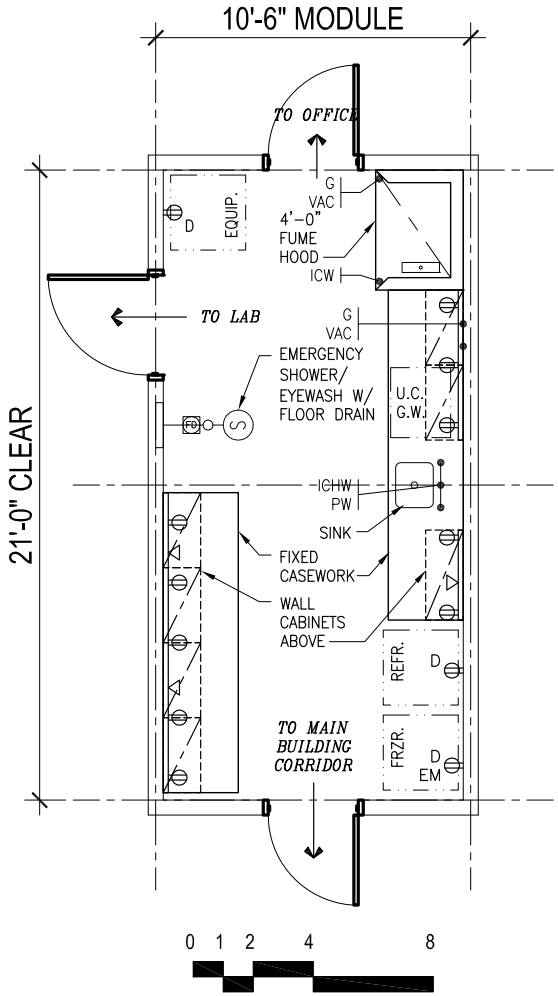
10 Air Changes / Hour

HOODS
4' Chemical Fume Hood

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

A102
PREP ROOM
AREA: 223 NSF



A103
LAB MANAGER'S OFFICE
AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1

LOCATION / ADJACENCIES
- A101 Intro to Biotech Lab
- A102 Prep Room

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

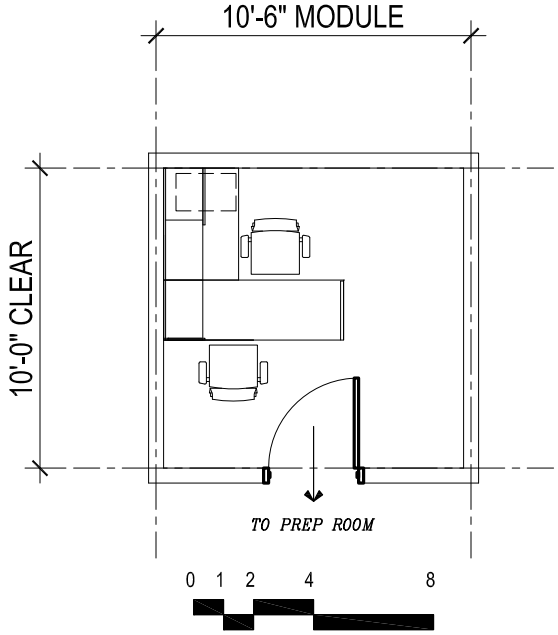
MECHANICAL
- Temperature
  - 73˚F ± 3˚F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting Level
  - Fluorescent Parabolic

A103

LAB MANAGER'S OFFICE

AREA: 100 NSF



A104
PROTEIN METHODS LAB
AREA: 1307 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1
  - Students - 24

LOCATION / ADJACENCIES
- A105 Prep Room
- A106 Lab Manager's Office

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-6" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI):
  - 2 centrifuges
  - 1 -20°F Freezer
  - 4 Double-door Deli Cases

LABORATORY CASEWORK
- Epoxy Resin Bench Top and Sink
- Wood Casework
- Metal Casework Under Fume Hood

NON-LAB EQUIPMENT
- White Board
- Projector

FURNISHINGS
- Fixed Casework
- Moveable Tables

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour

HOODS
- 6' Chemical Fume Hood

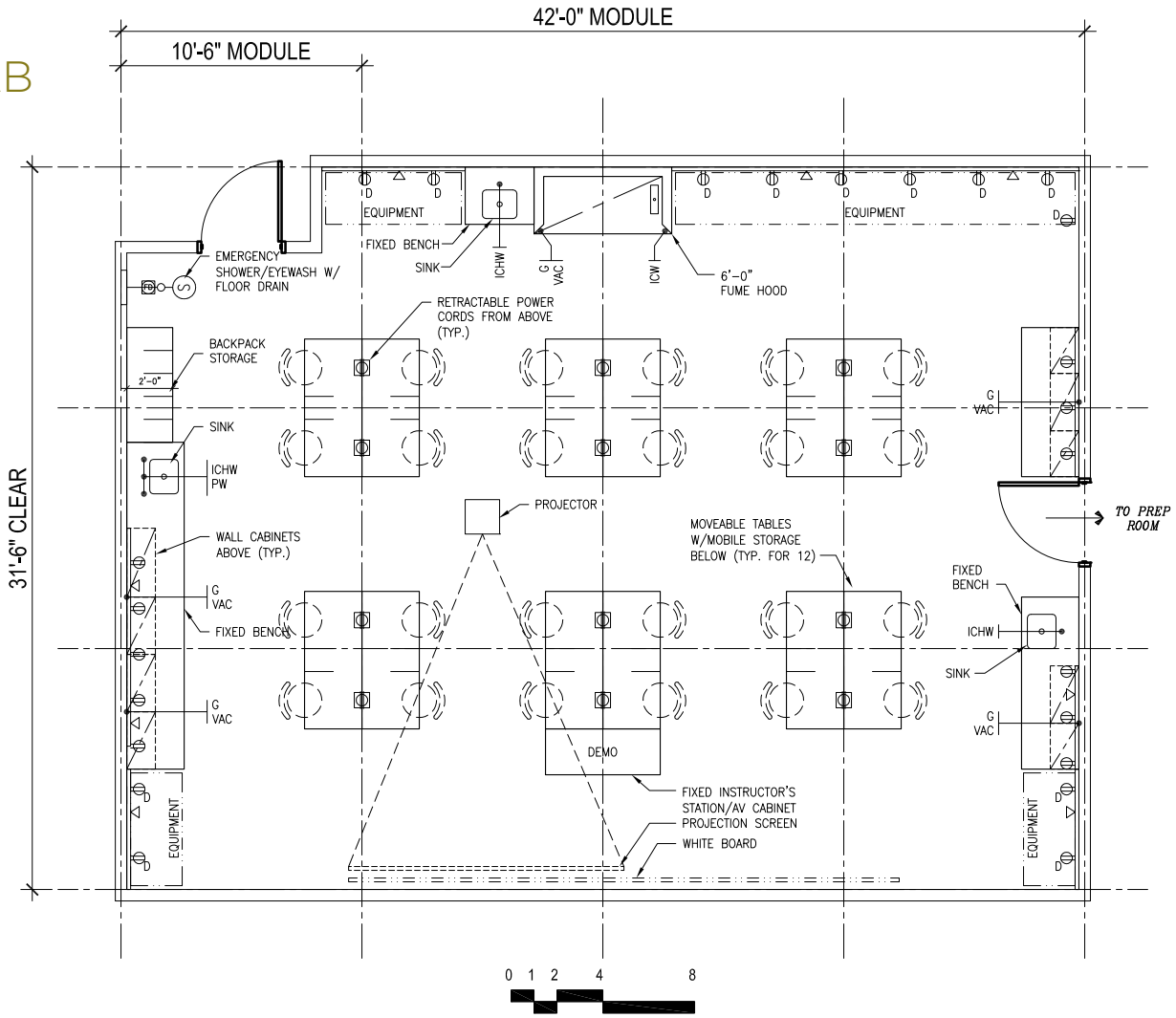
PIPED SERVICES
- Laboratory Gas (G)
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - 100 fc at Bench/Desk

A104

PROTEIN METHODS LAB

AREA: 1307 NSF



A105
PREP ROOM
AREA: 446 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1

LOCATION / ADJACENCIES
A104 Protein Methods Lab
A106 Lab Manager's Office

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 1 Refrigerator
- 1 Freezer
- 1 Under counter glassware washer

LABORATORY CASEWORK
Epoxy Resin Bench Top
Wood Casework

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

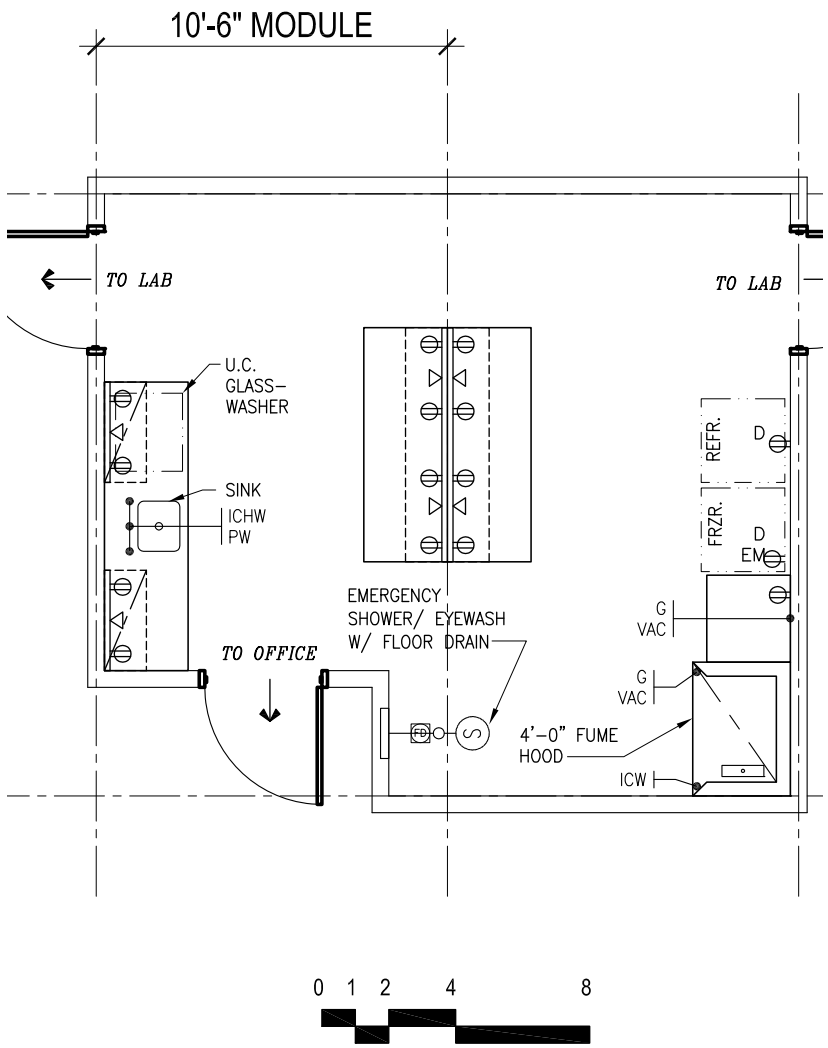
10 Air Changes / Hour

HOODS
4' Chemical Fume Hood

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

A105
PREP ROOM
AREA: 446 NSF



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A106
LAB MANAGER'S OFFICE
AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1

LOCATION / ADJACENCIES
- A104 Protein Methods Lab
- A105 Prep Room

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

MECHANICAL
- Temperature
  - 73˚F ± 3˚F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

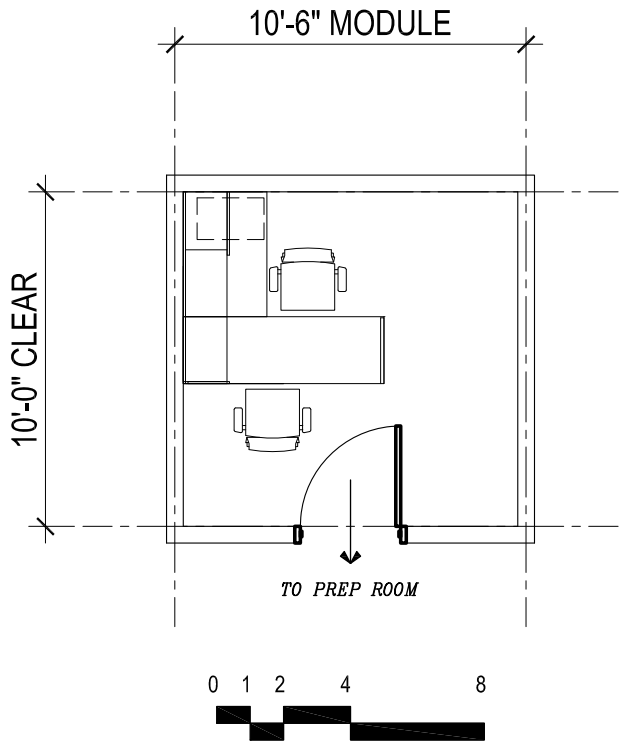
HOODS
- Backdraft Exhaust

ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting
  - Fluorescent Parabolic

A106

LAB MANAGER'S OFFICE

AREA: 100 NSF



A107
CELL/PLANT CULTURE LAB 1

AREA: 1307 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1
  - Students - 16

LOCATION / ADJACENCIES
- A108 Prep & Storage Room
- A109 Refrigerators & Freezers
- A110 Plant Incubation
- A111 Equipment Storage
- A112 Lab Manager's Office

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-6" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI):
  - 1 Refrigerator
  - 2 Centrifuges
  - 4 Double-Stacked Incubators
  - 2 Double-Door Deli Cases

LABORATORY CASEWORK
- Epoxy Resin Bench Top and Sinks
- Wood Casework
- Metal Casework Under Fume Hood

NON-LAB EQUIPMENT
- White Board
- Projector

FURNISHINGS
- Fixed Casework
- Moveable Tables

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour
- Air Pressure Positive

HOODS
- 6' Biological Safety Cabinets
  - Type II/A2

PIPED SERVICES
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)

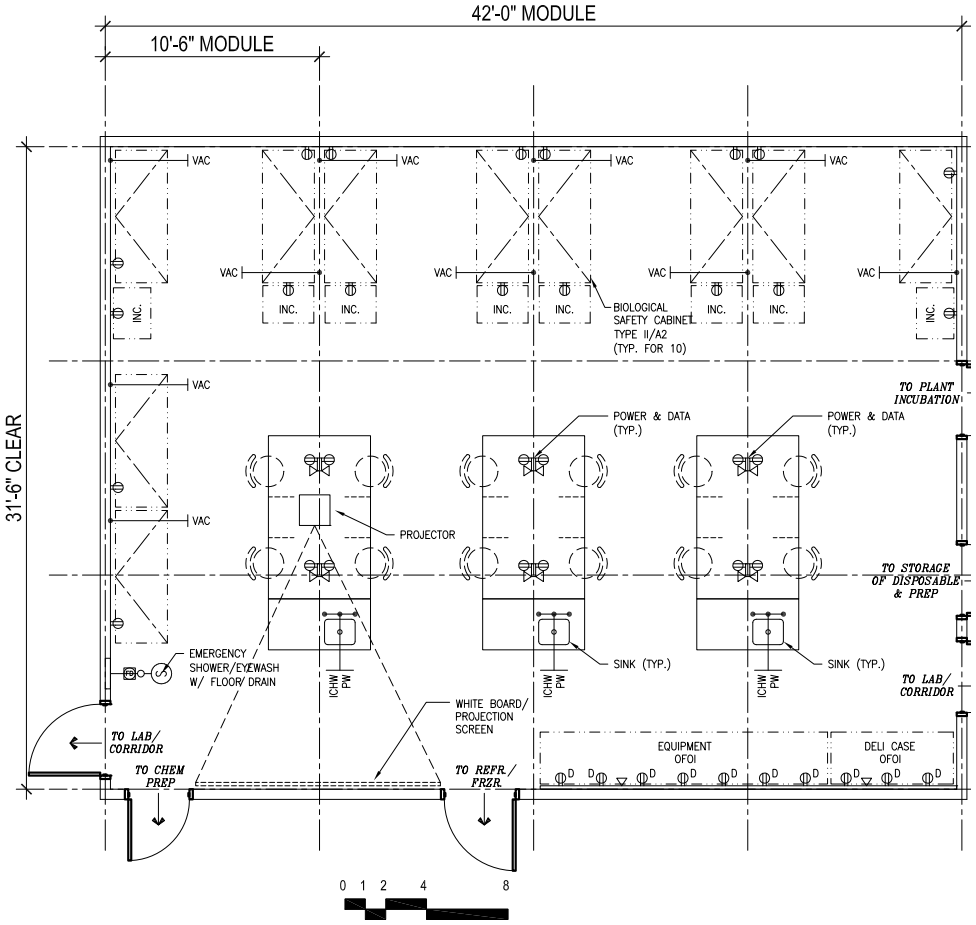
ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - 100 fc at Bench/Desk

NOTES
Backpack storage required outside of lab.

A107

CELL/PLANT CULTURE LAB 1

AREA: 1307 NSF



A108
PREP & STORAGE
AREA: 380 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1

LOCATION / ADJACENCIES
A107 Cell/Plant Culture Lab 1
A113 Cell/Plant Culture Lab 2

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 1 Refrigerator
- 1 Freezer
- 1 Under Counter Glassware Washer

LABORATORY CASEWORK
Epoxy Resin Bench Top and Sink
Wood Casework
Metal Casework Under Fume Hood

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73˚F ± 3˚F

Humidity
- N/A

10 Air Changes / Hour

HOODS
4' Chemical Fume Hood

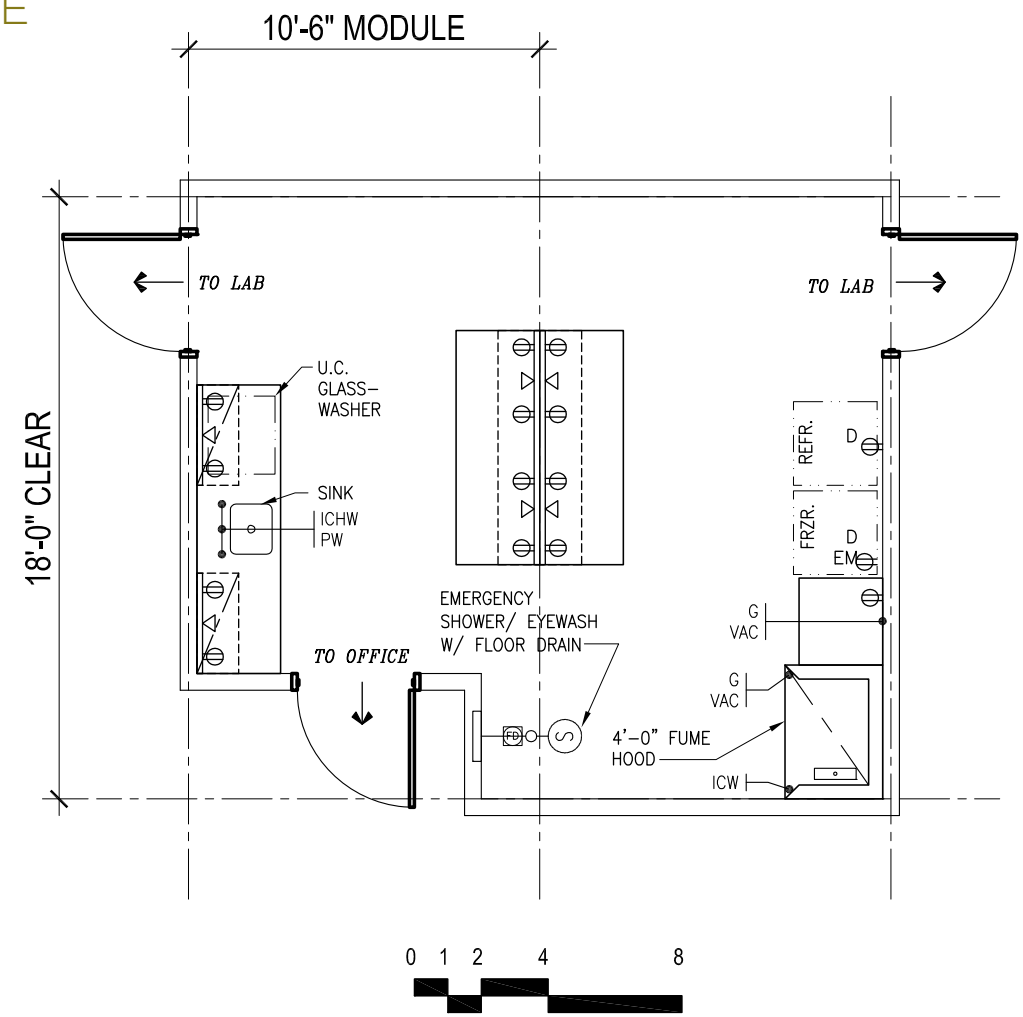
PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

A108

PREP & STORAGE

AREA: 380 NSF



A109
REFRIGERATORS & FREEZERS
AREA: 198 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1

LOCATION / ADJACENCIES
A107 Cell/Plant Culture Lab 1
A113 Cell/Plant Culture Lab 2

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI)
Heat Producing

MECHANICAL
Temperature
- 60˚F ± 90˚F

Humidity
- N/A

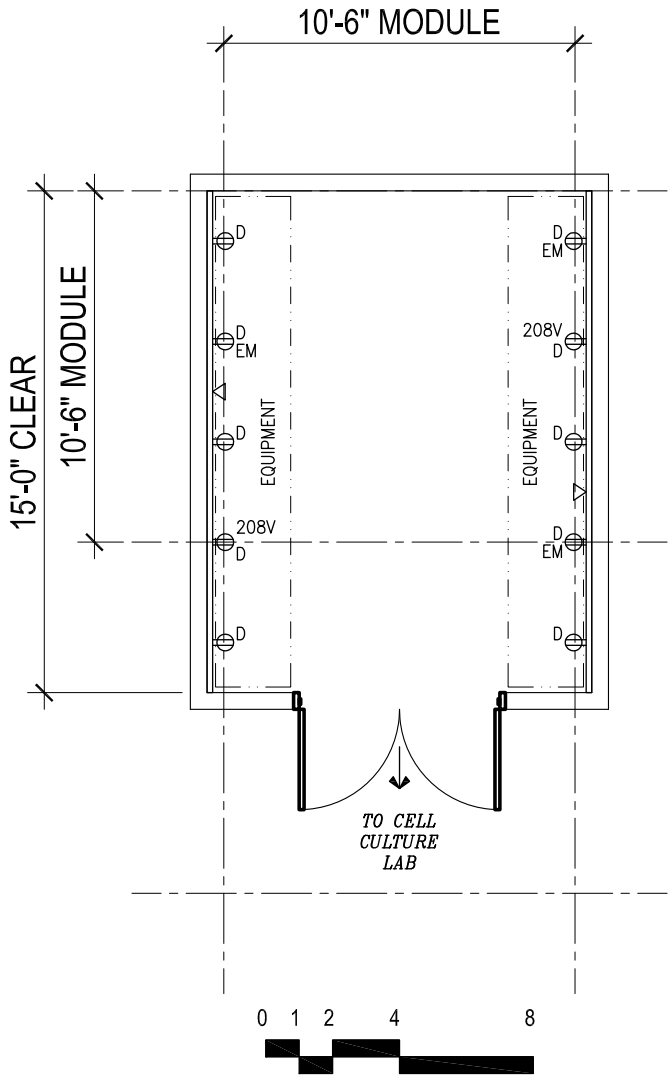
10-12 Air Changes / Hour

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
208V / 20A / 1 Phase
Data
Lighting Level
- 75 fc

A109

REFRIGERATORS & FREEZERS

AREA: 198 NSF



A110
PLANT INCUBATION
AREA: 150 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1

LOCATION / ADJACENCIES
A107 Cell/Plant Culture Lab 1
A113 Cell/Plant Culture Lab 2

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI)
Heat Producing

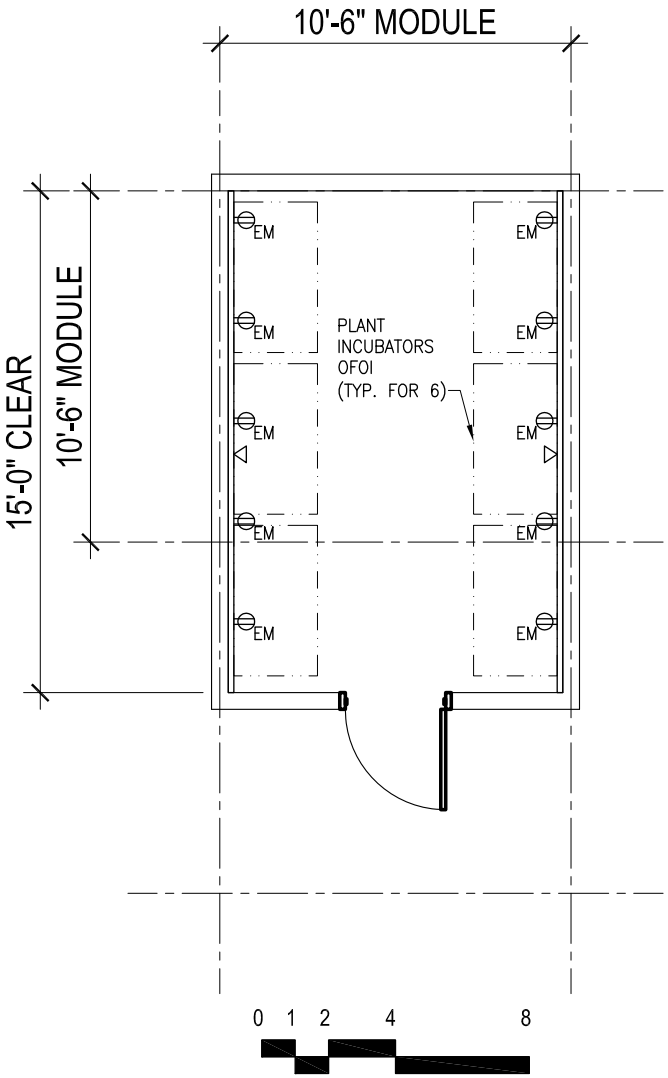
MECHANICAL
Temperature
- 73°F ± 5°F

Humidity
- N/A

10-12 Air Changes / Hour

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
208V / 20A / 1 Phase
Data
Lighting Level
- 75 fc

A110
PLANT INCUBATION
AREA: 150 NSF



A111
EQUIPMENT STORAGE
AREA: 165 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1

LOCATION / ADJACENCIES
A107 Cell/Plant Culture Lab 1
A113 Cell/Plant Culture Lab 2

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI)
Heat Producing
Noise Producing

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

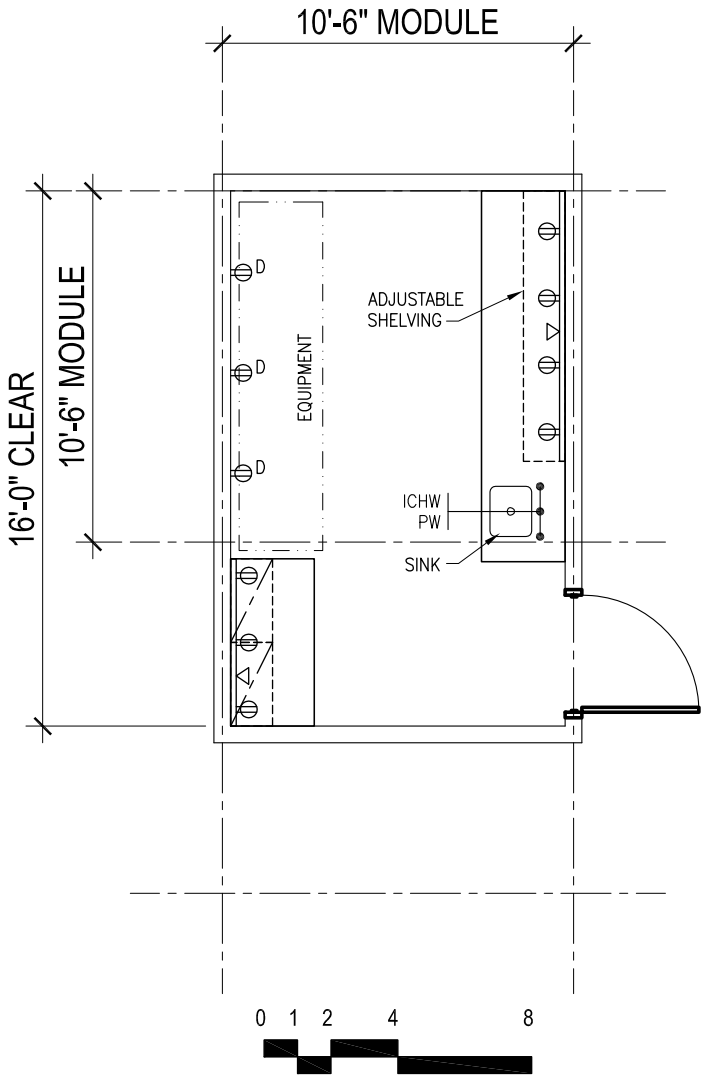
Humidity
- 50% ± 20%

10-12 Air Changes / Hour

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
208V / 20A / 1 Phase
Data
Lighting Level
- 75 fc at Bench/Desk

PIPED SERVICES
High Purity Water (PW)
(CHW)

A111
EQUIPMENT STORAGE
AREA: 165 NSF



A112
LAB MANAGER'S OFFICE
AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1

LOCATION / ADJACENCIES
- A107 Cell/Plant Culture Lab 1
- A113 Cell/Plant Culture Lab 2

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

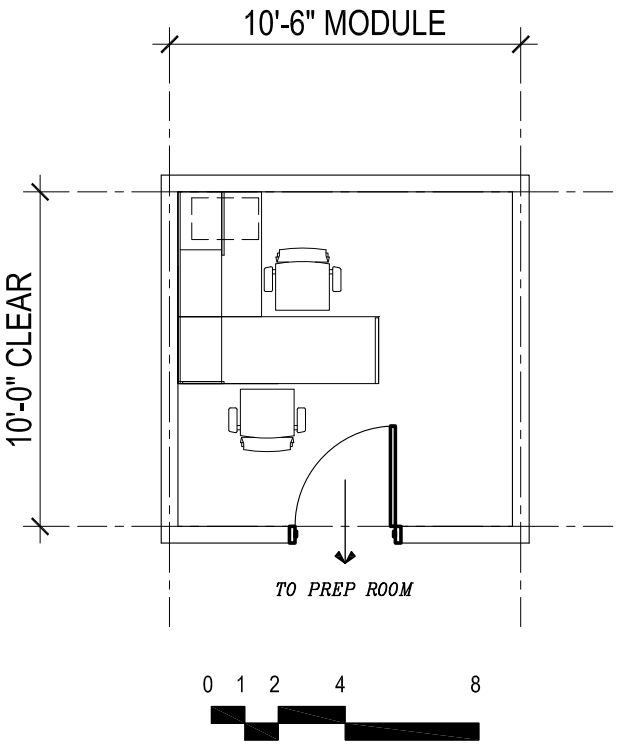
FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

MECHANICAL
- Temperature
  - 73˚F ± 3˚F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting
  - Fluorescent Parabolic

A112
LAB MANAGER'S OFFICE

AREA: 100 NSF



A113
CELL/PLANT CULTURE LAB 2

AREA: 1307 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1
  - Students - 16

LOCATION / ADJACENCIES
- A108 Prep & Storage Room
- A109 Refrigerators & Freezers
- A110 Plant Incubation
- A111 Equipment Storage
- A112 Lab Manager's Office

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-6" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI):
  - 1 Refrigerator
  - 2 Centrifuges
  - 4 Dougle-Stacked Incubators
  - 2 Double-Door Deli Cases

LABORATORY CASEWORK
- Epoxy Resin Bench Top and Sinks
- Wood Casework
- Metal Casework Under Fume Hood

NON-LAB EQUIPMENT
- White Board
- Projector

FURNISHINGS
- Fixed Casework
- Moveable Tables

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour
- Air Pressure Positive

HOODS
- 6' Biological Safety Cabinets
  - Type II/A2

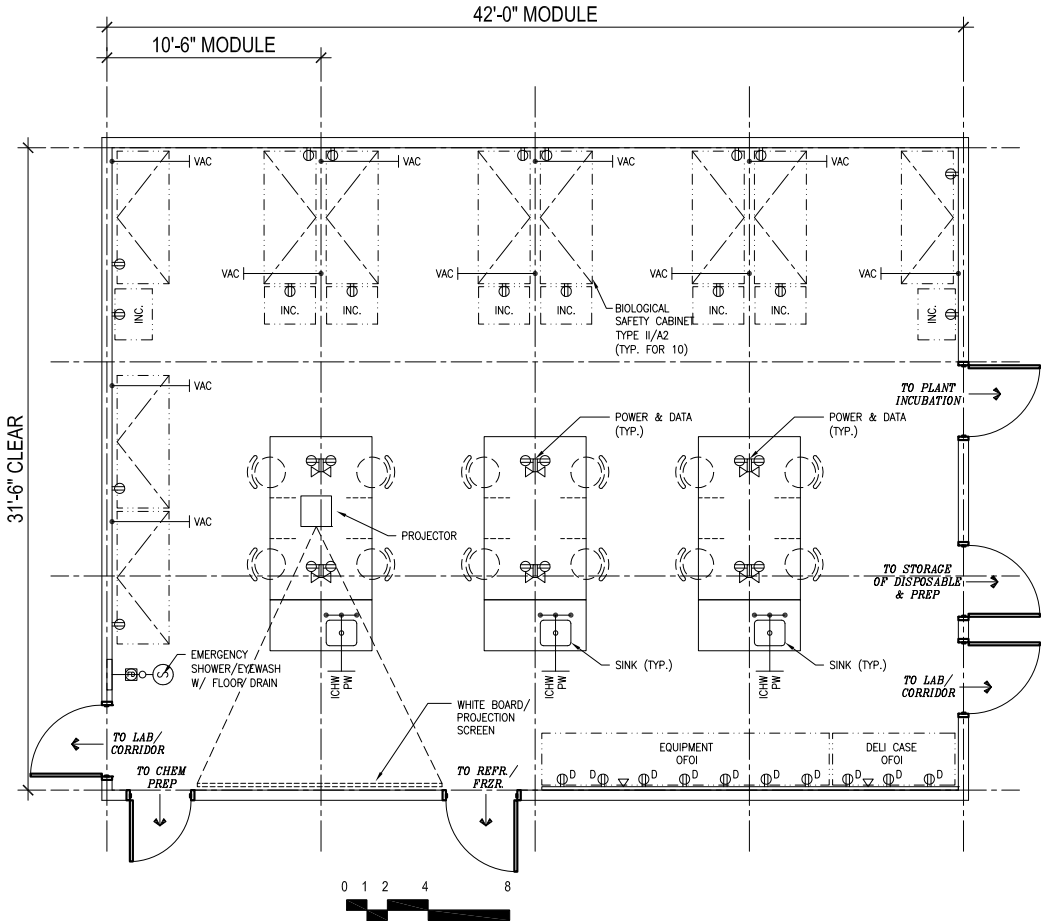
PIPED SERVICES
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - 100 fc at Bench/Desk

A113

CELL/PLANT CULTURE LAB 2

AREA: 1307 NSF



A114

ADV./BASIC NUCLEIC ACID LAB

AREA: 1307 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1
  - Students - 24

LOCATION / ADJACENCIES
- A115 Prep Room

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-6" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI):
  - 1 Freezer
  - 1 Centrifuge
  - 1 Double-Door Deli Case

LABORATORY CASEWORK
- Epoxy Resin Bench Top and Sinks
- Wood Casework
- Metal Casework Under Fume Hood

NON-LAB EQUIPMENT
- White Board
- Projector

FURNISHINGS
- Fixed Casework
- Moveable Tables

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour

HOODS
- 6' Chemical Fume Hood

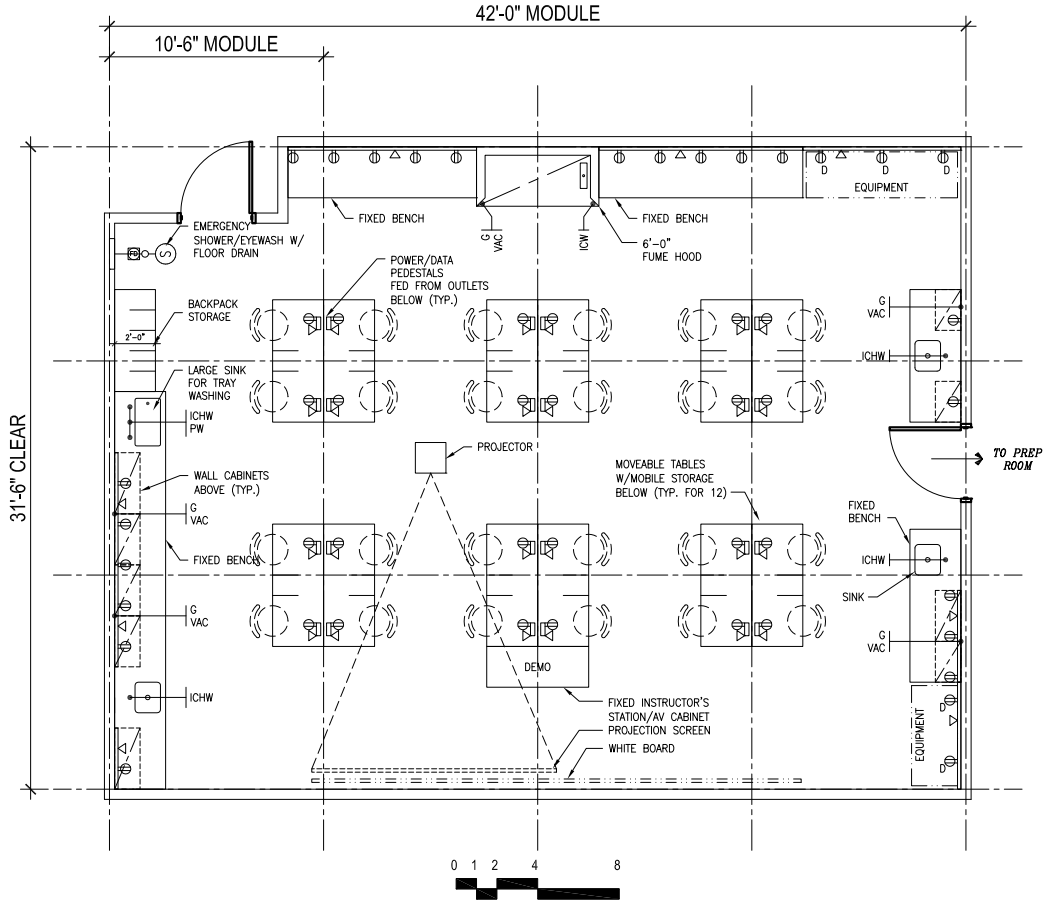
PIPED SERVICES
- Laboratory Gas (G)
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - 100 fc at Bench/Desk

A114

ADV./BASIC NUCLEIC ACID LAB

AREA: 1307 NSF



A115
PREP ROOM
AREA: 446 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1

LOCATION / ADJACENCIES
A114 Adv./Basic Nucleic Acid Lab

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"
- 3'-0" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 1, Refrigerator
- 1, Freezer
- 1, Undercounter Glassware Washer

LABORATORY CASEWORK
Epoxy Resin Bench Top and Sinks
Wood Casework
Metal Casework Under Fume Hood

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

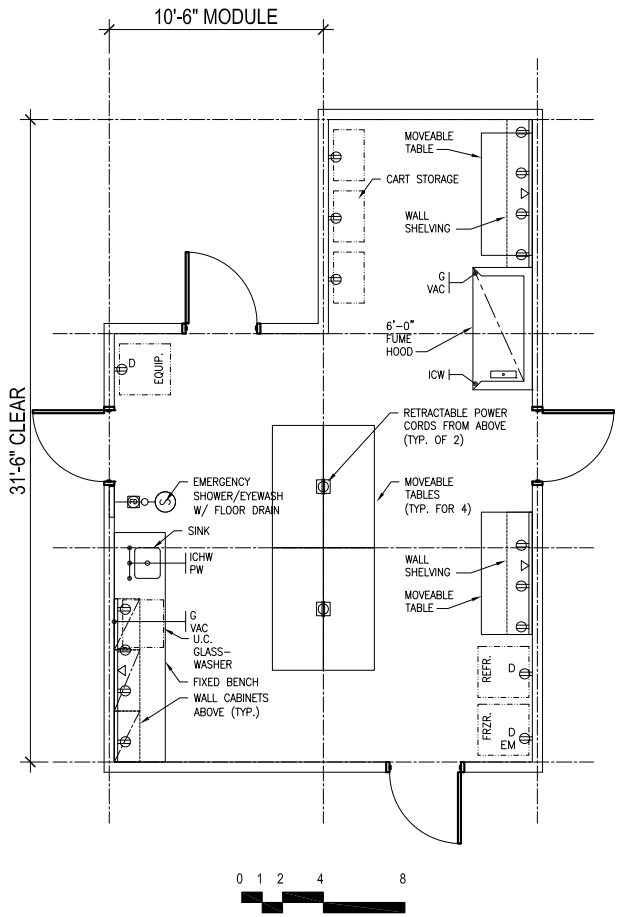
10 Air Changes / Hour

HOODS
4' Chemical Fume Hood

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

A115
PREP ROOM
AREA: 446 NSF



A116
LAB MANAGER'S OFFICE
AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1

LOCATION / ADJACENCIES
- A114 Adv./Basic Nucleic Acid Lab
- A115 Prep Room

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

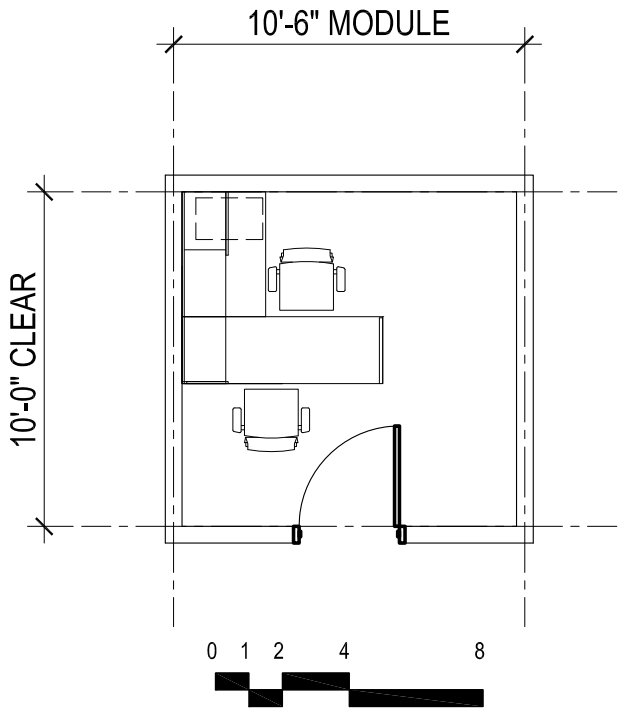
FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

MECHANICAL
- Temperature
  - 73˚F ± 3˚F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting
  - Fluorescent Parabolic

A116
LAB MANAGER'S OFFICE

AREA: 100 NSF



A117
STORAGE
AREA: 200 NSF

UTILIZATION
Hours of Use
14 hours / day
Hours of Operation
14 hours / day

LOCATION / ADJACENCIES
A116 Lab Manager's
Office

ARCHITECTURAL
Windows
Interior: Desired
Window Coverings Required
Exterior: Desired
Floor
VCT (Chemical Resistant)
Partitions
Gyp Board, Paint
Base
4" Vinyl
Ceiling
Acoustic Tile
Doors
3'-6" x 7'-0"
Security
Controlled Access

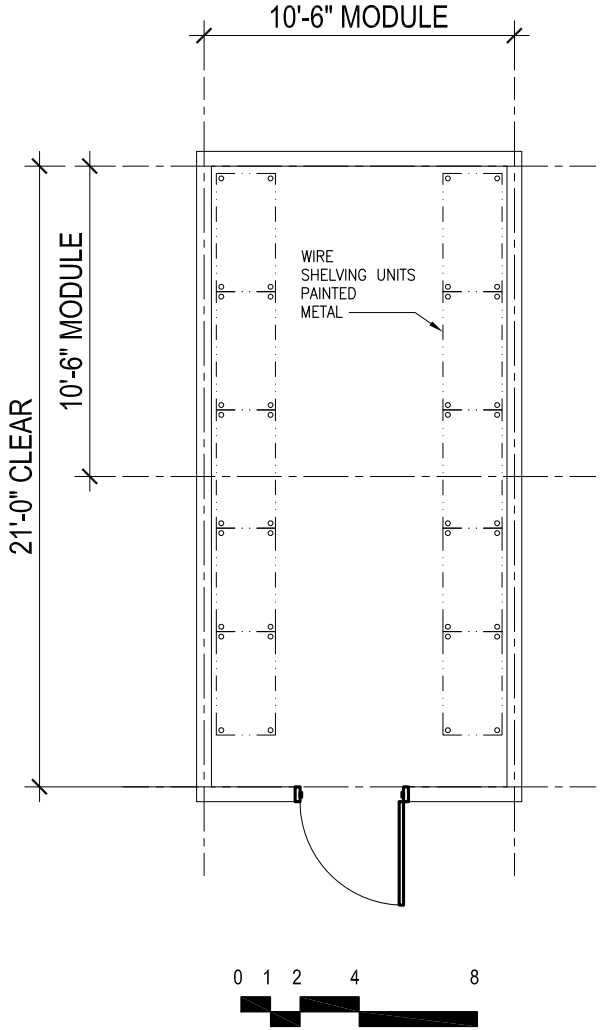
LABORATORY CASEWORK
Tall Storage Cabinets

MECHANICAL
Temperature
60°F - 90°F
Humidity
N/A

ELECTRICAL
120V / 20A / 1 Phase
Lighting Level
75 fc

NOTES
-Part of BSL-3 suite

A117
STORAGE
AREA: 200 NSF



A118
RADIOISOTOPE LAB
AREA: 100 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

ARCHITECTURAL
Windows
- Not required

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 1, Refrigerator
- 1, Freezer

LABORATORY CASEWORK
Epoxy Resin Bench Top and Sink
Wood Casework
Metal Casework Under Fume Hood

FURNISHINGS
Moveable Tables

MECHANICAL
Temperature
- 73°F ± 3°F

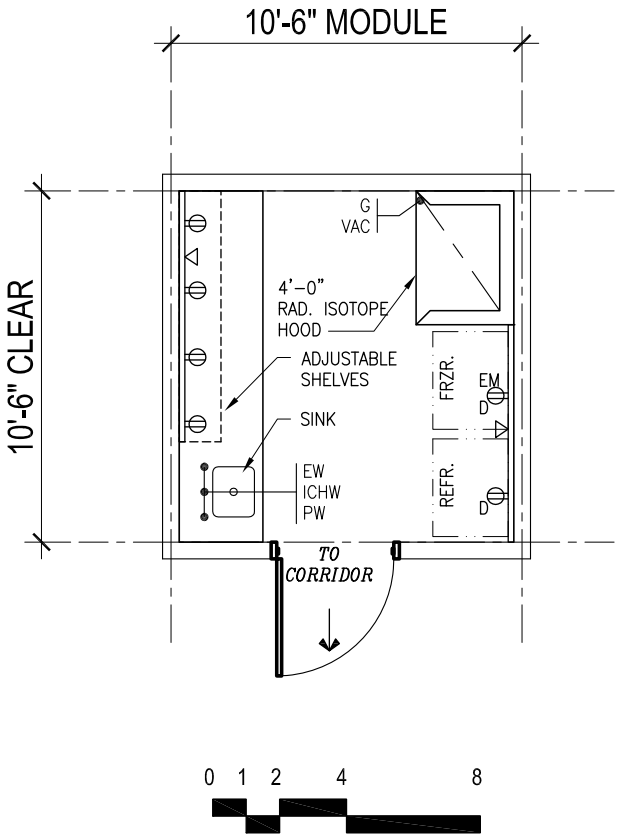
Humidity
- N/A

10 Air Changes / Hour

HOODS
6' Radiosotope Fume Hood

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

A118
RADIOISOTOPE LAB
AREA: 100 NSF



A119
FLUORESCENT MICROSCOPY ROOM

AREA: 100 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

ARCHITECTURAL

Windows
- Not desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-0" x 7'-0"

Security
- Controlled Access

LABORATORY CASEWORK

Epoxy Resin Bench Top
Wood Casework

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

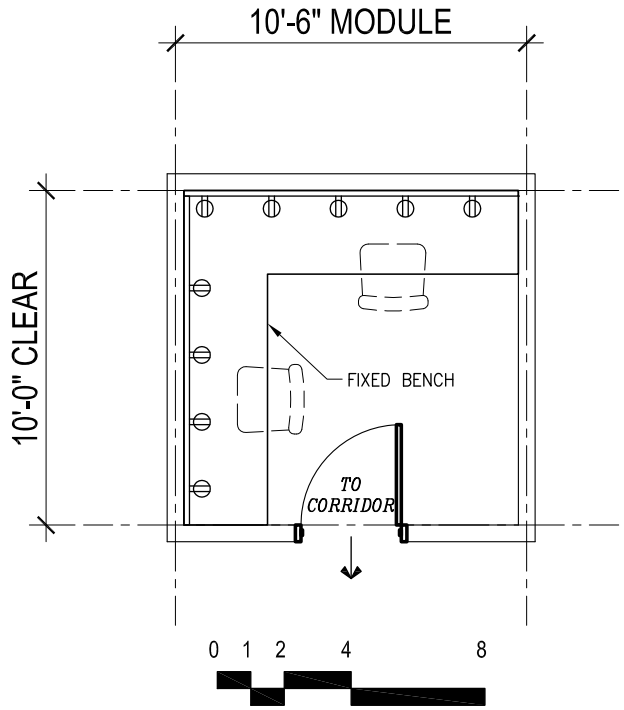
10 Air Changes / Hour

ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- Task Lighting
- 75 fc at Bench/Desk
- Darkenable
- Dimmable

A119
FLUORESCENT MICROSCOPY ROOM

AREA: 100 NSF



A120
TISSUE CULTURE ROOM
AREA: 120 NSF

UTILIZATION
Hours of Use
14 hours / day
Hours of Operation
14 hours / day

ARCHITECTURAL
Windows
Not required
Floor
VCT (Chemical Resistant)
Partitions
Gyp Board, Paint
Base
4" Vinyl
Ceiling
Acoustic Tile
Doors
3'-6" x 7'-0"
Security
Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
1, Refrigerator

LABORATORY CASEWORK
Epoxy Resin Bench Top and Sinks
Wood Casework

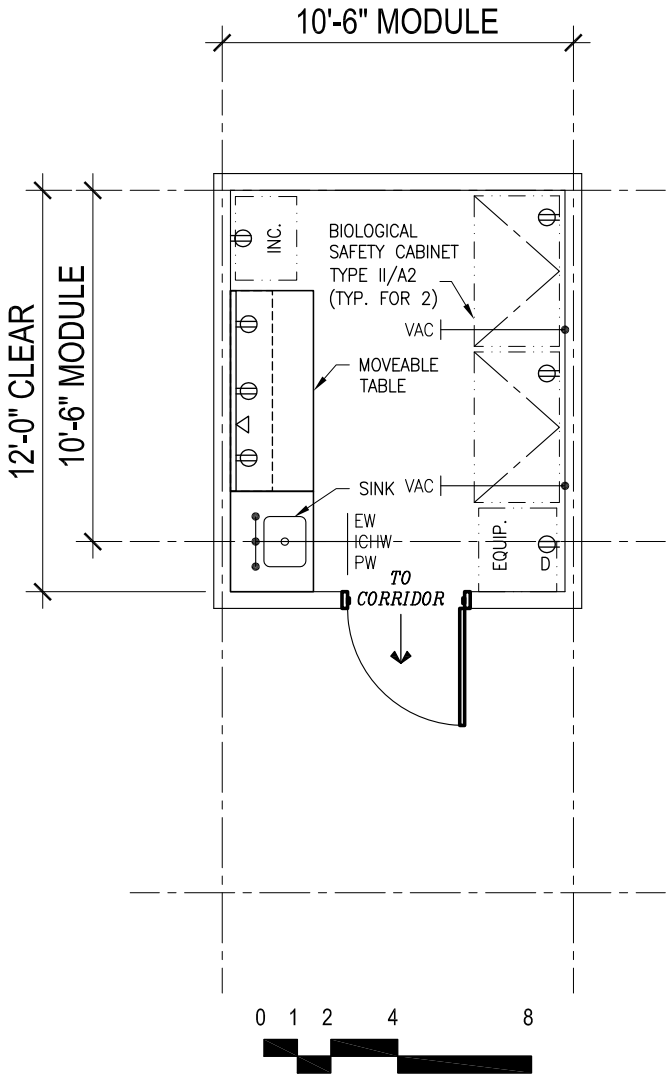
FURNISHINGS
Fixed Casework
Moveable Tables

MECHANICAL
Temperature
73°F ± 3°F
Humidity
N/A
10 Air Changes / Hour
Air Pressure Positive

HOODS
(2) 4' Biological Safety Cabinets
Type II/A2

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
100 fc at Bench/Desk

A120
TISSUE CULTURE ROOM
AREA: 120 NSF



A121
MICROSCOPY ROOM
AREA: 50 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day

ARCHITECTURAL
- Windows
  - Not desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

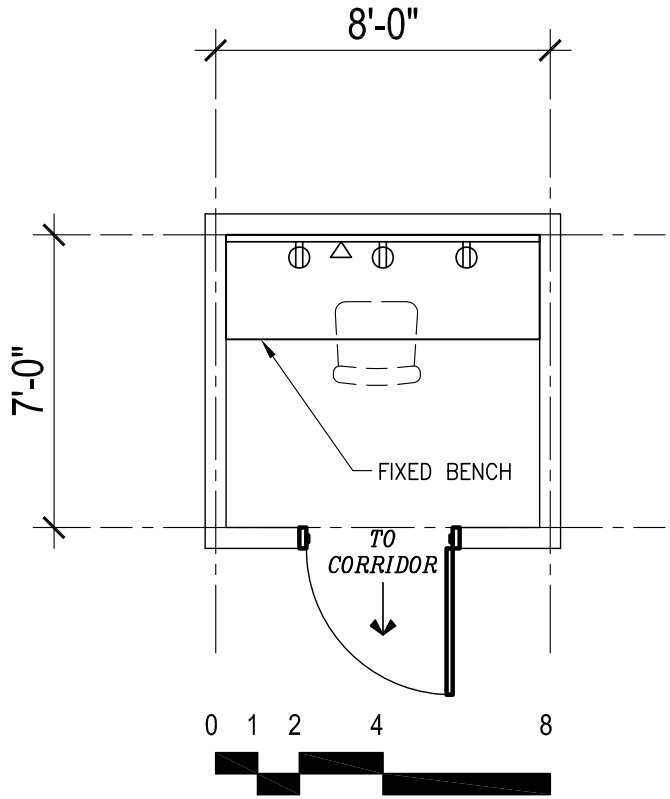
LABORATORY CASEWORK
- Epoxy Resin Bench Top
- Wood Casework

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour

ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - Task Lighting
  - 75 fc at Bench/Desk
  - Darkenable
  - Dimmable

A121
MICROSCOPY ROOM

AREA: 50 NSF



A122
LN2 DEWAR STORAGE
AREA: 120 NSF

UTILIZATION
Hours of Use
14 hours / day
Hours of Operation
14 hours / day

ADJACENCIES
A107 Cell/Plant Culture Lab 1

ARCHITECTURAL
Windows
Not required
Floor
Sealed Concrete
Partitions
Gyp Board, Epoxy Paint
Base
4" Vinyl
Ceiling
Open
Doors
6'-0" x 7'-0"
Security
Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI)

MECHANICAL
Temperature
75˚F ± 5˚F
Humidity
N/A
10 Air Changes / Hour

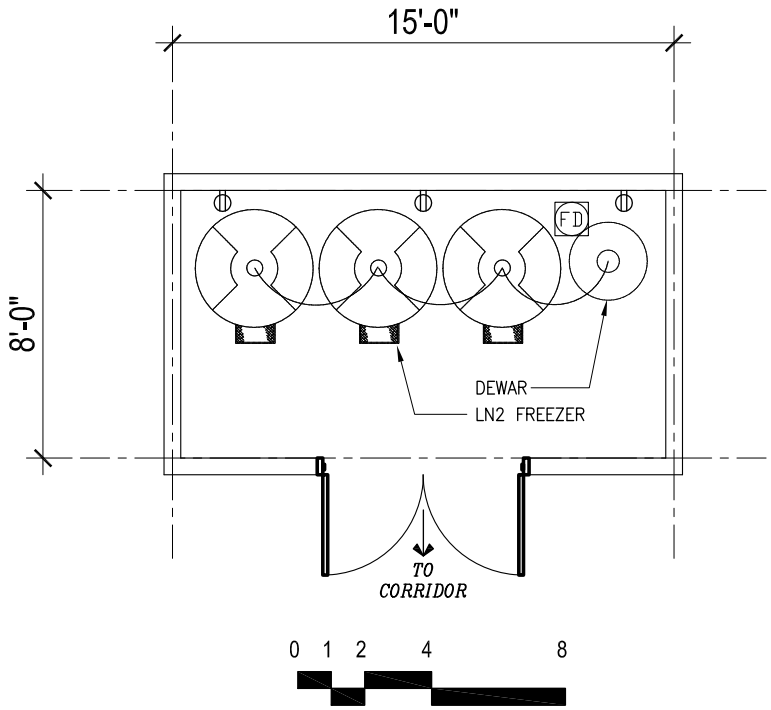
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
75 fc at Bench/Desk

NOTES
Venting of gases to outside

A122

LN2 DEWAR STORAGE

AREA: 120 NSF



A123
BALANCE ROOM
AREA: 180 NSF

UTILIZATION
Hours of Use
14 hours / day
Hours of Operation
14 hours / day

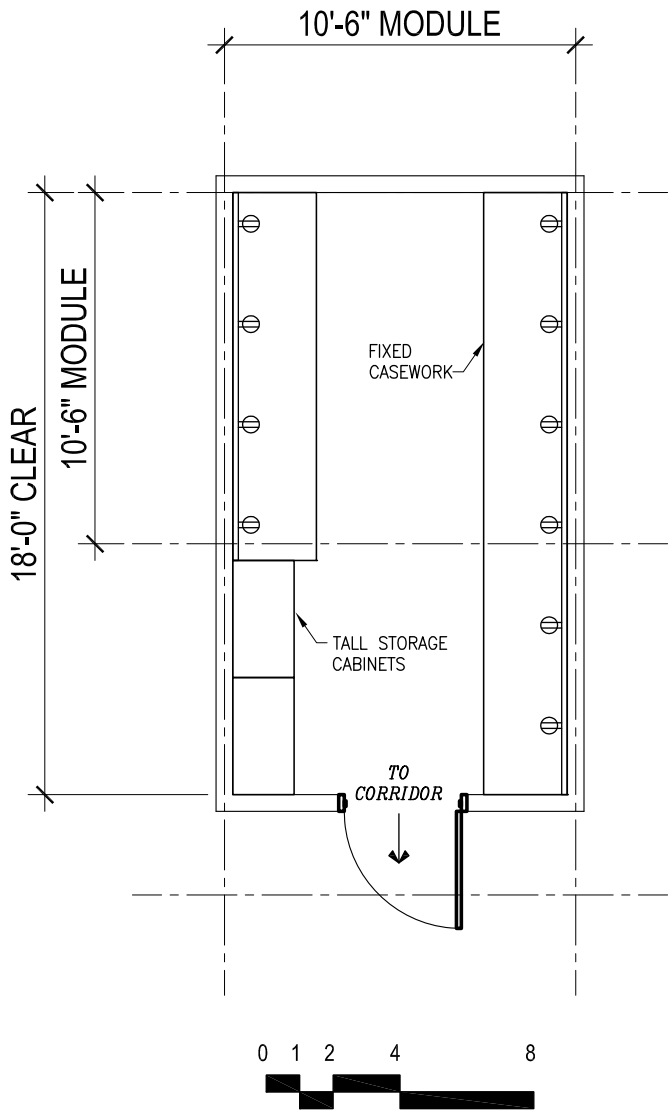
ARCHITECTURAL
Windows
Not required
Floor
VCT (Chemical Resistant)
Partitions
Gyp Board, Paint
Base
4" Vinyl
Ceiling
Acoustic Tile
Doors
3'-0" x 7'-0"
Security
Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI)

MECHANICAL
Temperature
73°F ± 3°F
Humidity
N/A
10 Air Changes / Hour
Low Air Velocity

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
75 fc at Bench/Desk

A123
BALANCE ROOM
AREA: 180 NSF



A124 A125 A126

UNDERGRADUATE RESEARCH SPACE

(INCLUDING EQUIPMENT SPACE AND INSTRUMENT SPACE)

AREA: 1800 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Students - 25

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-6" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK
- Epoxy Resin Bench Top and Sinks
- Wood Casework
- Metal Casework Under Fume Hood

FURNISHINGS
- Fixed Casework
- Moveable Tables

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour

HOODS
- 6' Chemical Fume Hood

PIPED SERVICES
- Laboratory Gas (G)
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - 100 fc at Bench/Desk

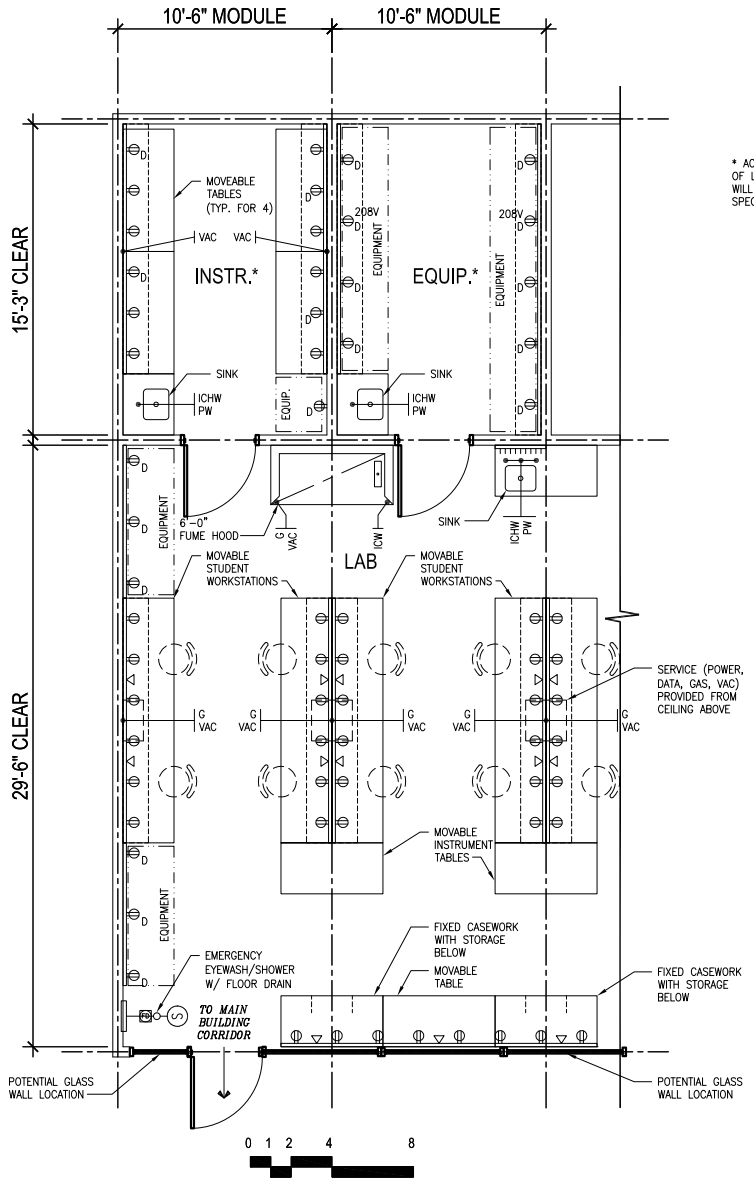
NOTES
- Assumes 25 Workstations

A124
A125
A126

UNDERGRADUATE RESEARCH SPACE

(INCLUDING EQUIPMENT SPACE AND INSTRUMENT SPACE)

AREA: 1800 NSF



* ACTUAL CONFIGURATION OF LAB SUPPORT SPACES WILL BE DEPENDENT ON SPECIFIC USER NEEDS

A127
LAB MANAGER'S OFFICE
AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1

LOCATION / ADJACENCIES
- A101 Intro to Biotech Lab
- A102 Prep Room

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security

FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

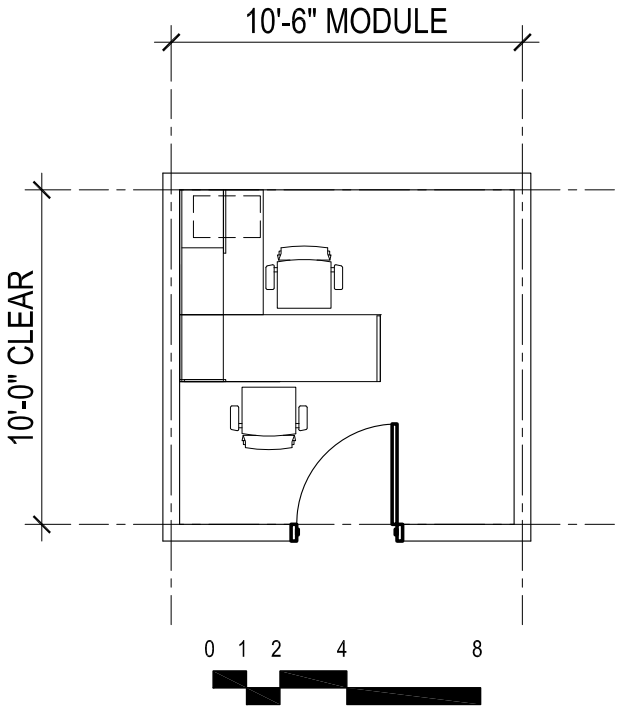
MECHANICAL
- Temperature
  - 73˚F ± 3˚F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting Level
  - Fluorescent Parabolic

A127

LAB MANAGER'S OFFICE

AREA: 100 NSF



Code	Department / Space Name	Qty.	NSF/ Space	Total NSF	Non Research NSF	Research NSF	GSF	Remarks
A200	BIOLOGY							
A201	General Bio/College Bio I Lab	1	1,307	1,307			2,011	
A202	College Biology I Lab	1	1,307	1,307			2,011	
A203	Prep Room	1	669	669			1,029	
A204	Lab Manager's Office	1	100	100			154	
A205	College Biology II Lab	1	1,307	1,307			2,011	
A206	Prep Room	1	223	223			343	
A207	Cell Biology Lab/Growth Chamber	1	1,307	1,307			2,011	
A208	Prep Room	1	446	446			686	
A209	Lab Manager's Office	1	100	100			154	
A210	Genetics/Molecular Lab	1	1,307	1,307			2,011	
					8,073			
A211	Molecular/UG Research Space	1	1,200	1,200			1,846	
						1,200		
				9,273	8,073	1,200	14,266	

Notes

- A207 and A210 must be located on the same floor.
- A201-A206 should be located together.

A201

GENERAL BIO/ COLLEGE BIO I LAB

AREA: 1307 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 24
- Faculty / Staff: 1

LOCATION | ADJACENCIES

A202 College Biology I Lab
A203 Prep Room
A204 Lab Manager's Office
A205 College Biology II Lab
Zoology

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI):
- 1 Freezer
- 1 Centrifuge
- 1 Double-door deli case

LABORATORY CASEWORK

Epoxy Resin Bench Top and Sinks
Wood Casework
Metal Casework under fume hood

NON-LAB EQUIPMENT

White board
Projector

FURNISHINGS

Fixed Casework
Moveable Tables

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS

6' Chemical Fume Hood

PIPED SERVICES

Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

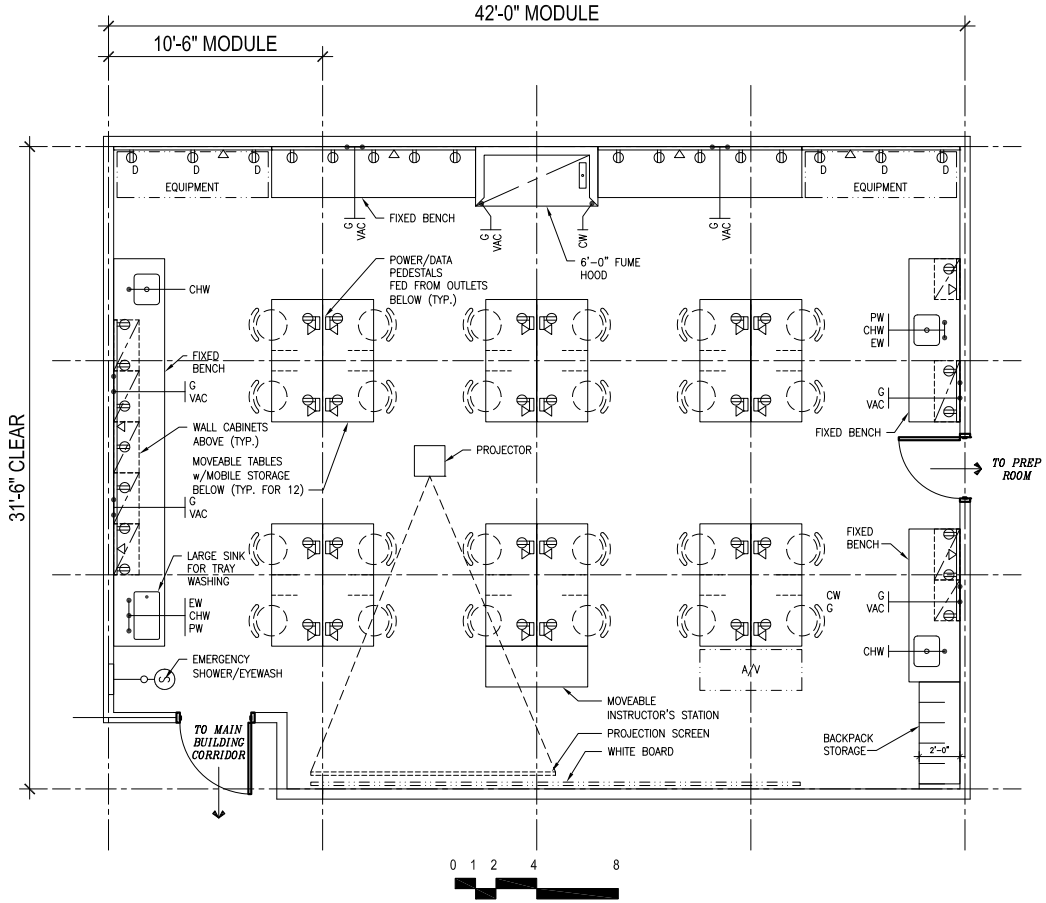
NOTES

None

A201

GENERAL BIO/ COLLEGE BIO I LAB

AREA: 1307 NSF



A202

COLLEGE BIOLOGY I LAB

AREA: 1307 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 24
- Faculty/Staff: 1

LOCATION | ADJACENCIES

A201 General Bio/College Bio I Lab
A203 Prep Room
A204 Lab Manager's Office
A205 College Biology II Lab
Zoology

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI):
- 1 Freezer
- 1 Centrifuge
- 1 Double-door deli case

LABORATORY CASEWORK

Epoxy Resin Bench Top and Sink
Wood Casework
Metal Casework under fume hood

NON-LAB EQUIPMENT

White board
Projector

FURNISHINGS

Fixed Casework
Moveable Tables

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS

6' Chemical Fume Hood

PIPED SERVICES

Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

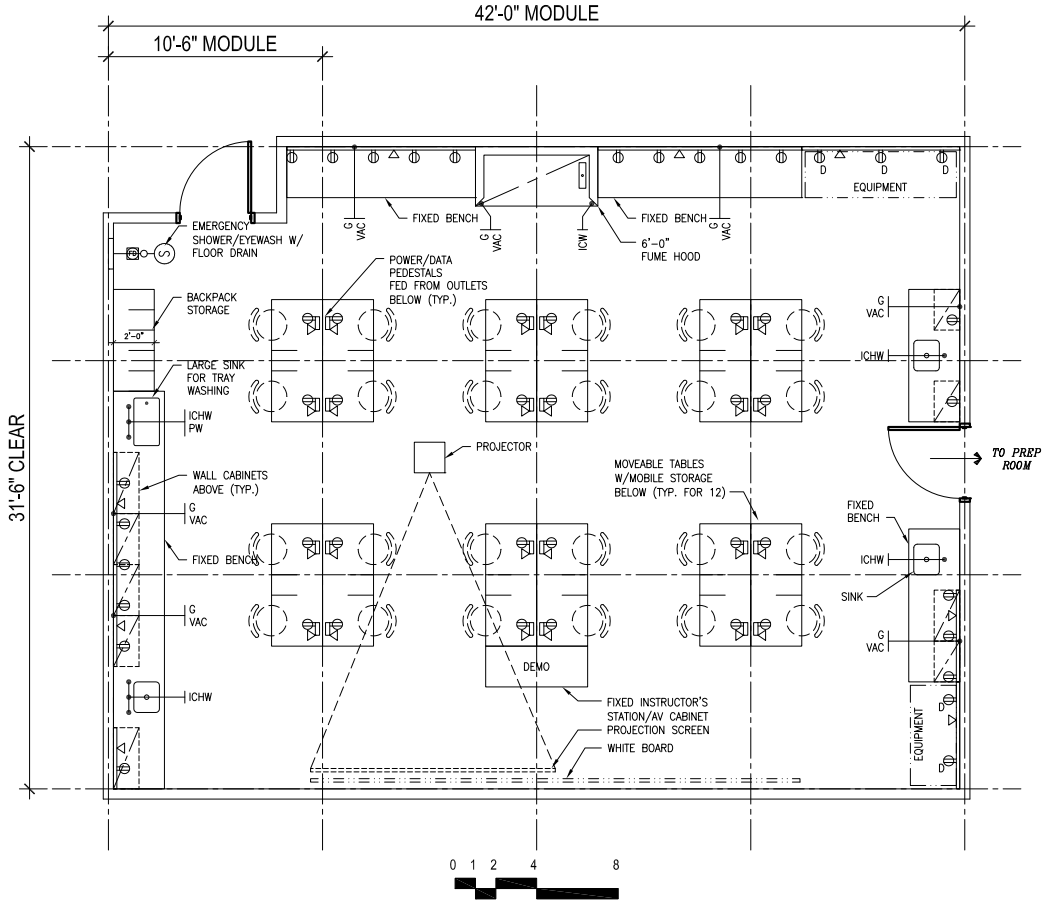
NOTES

None

A202

COLLEGE BIOLOGY I LAB

AREA: 1307 NSF



A203
PREP ROOM
AREA: 669 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 1

LOCATION | ADJACENCIES
A201 General Bio/College Bio I Lab
A202 College Biology I Lab
A204 Lab Manager's Office
A205 College Biology II Lab
Zoology

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 1 Refrigerator
- 1 Freezer

LABORATORY CASEWORK
Epoxy Resin Bench Top
Wood Casework

NON-LAB EQUIPMENT
None

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73˚F ± 3˚F

Humidity
- 50% ± 20%

10 Air Changes / Hour

HOODS
6' Chemical Fume Hood

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

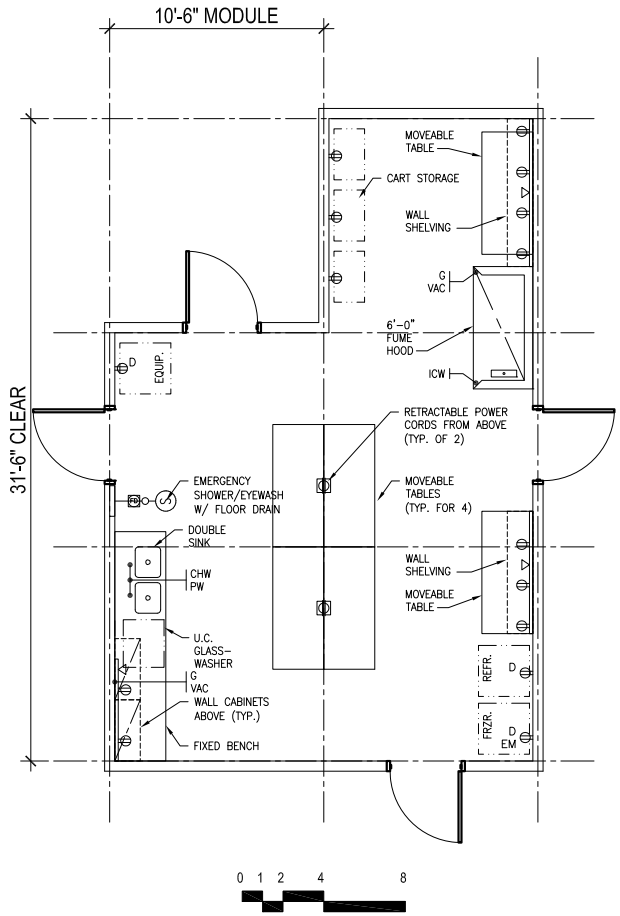
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

NOTES
None

A203

PREP ROOM

AREA: 669 NSF



A204

LAB MANAGER'S OFFICE

AREA: 100 NSF

UTILIZATION
Hours of Use
14 hours / day
Hours of Operation
14 hours / day
Capacity
Students: 0
Faculty/Staff: 1

LOCATION | ADJACENCIES
A201 General Bio/College Bio I Lab
A202 College Biology I Lab
A203 Prep Room

ARCHITECTURAL
Windows
Interior: Desired
Window Coverings Required
Exterior: Desired
Floor
Carpet
Partitions
Gyp Board, Paint
Base
4" Vinyl
Ceiling
Acoustic Tile
Doors
3'-0" x 7'-0"
Security
Controlled Access

LABORATORY EQUIPMENT
None

LABORATORY CASEWORK
None

NON-LAB EQUIPMENT
None

FURNISHINGS
Desk
Desk Chair
File Cabinet(s)
Bookcase(s)

MECHANICAL
Temperature
73°F ± 3°F
Humidity
N/A
4-6 Air Changes / Hour

HOODS
None

PIPED SERVICES
None

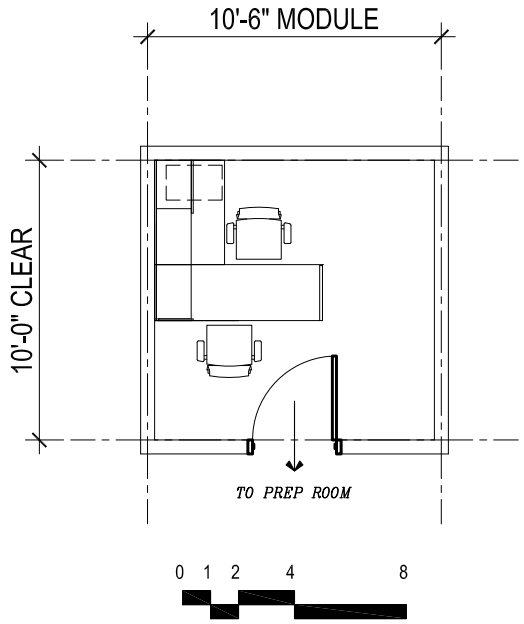
ELECTRICAL
120V / 20A / 1 Phase
Phone
Data
Lighting
Fluorescent Parabolic

NOTES
None

A204

LAB MANAGER'S OFFICE

AREA: 669 NSF



A205

COLLEGE BIOLOGY II LAB

AREA: 1307 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 24
- Faculty/Staff: 1

LOCATION | ADJACENCIES

A201 General Bio/College Bio I Lab
A202 College Biology I Lab
A203 Prep Room
A204 Lab Manager's Office

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI):
- 1 Freezer
- 1 Centrifuge
- 1 Double-door deli case

LABORATORY CASEWORK

Epoxy Resin Bench Top and sinks
Wood Casework
Metal Casework under fume hood

NON-LAB EQUIPMENT

White board
Projector

FURNISHINGS

Fixed Casework
Moveable Tables

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS

6' Chemical Fume Hood
Snorkels

PIPED SERVICES

Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

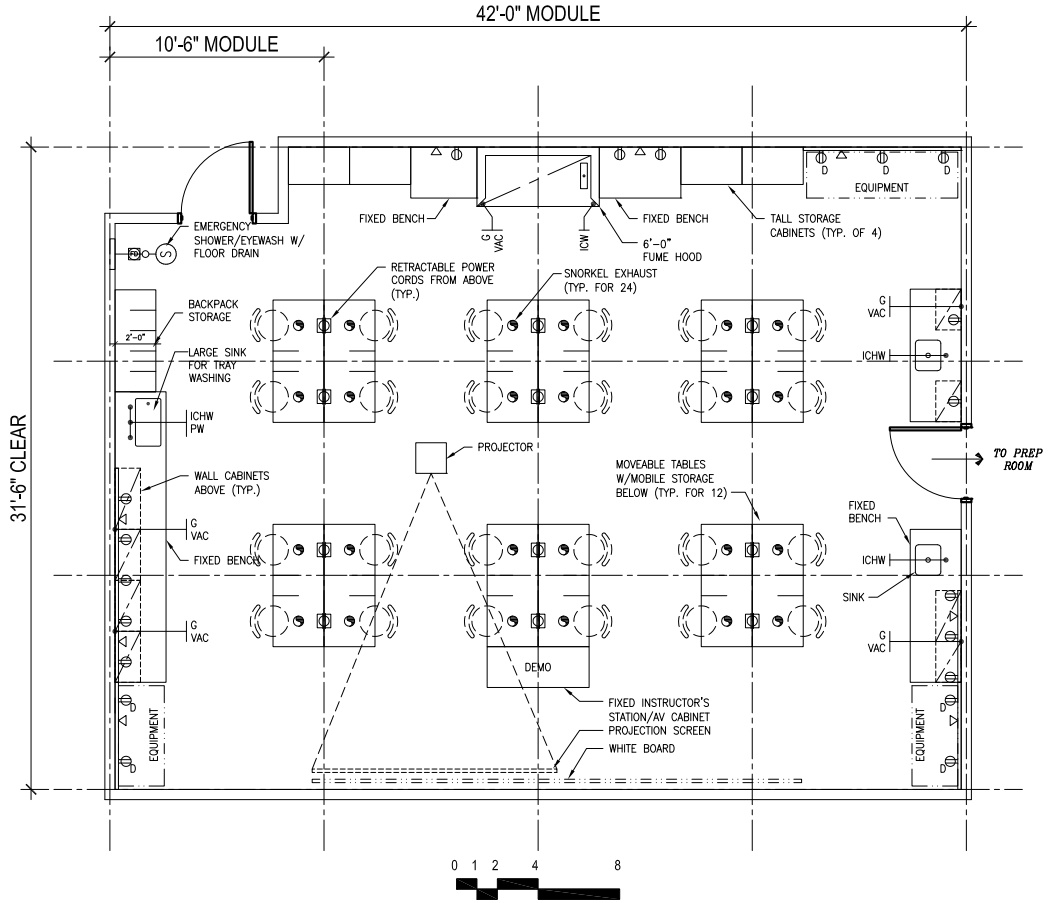
NOTES

None

A205

COLLEGE BIOLOGY II LAB

AREA: 1307 NSF



A206
PREP ROOM
AREA: 223 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 24
- Faculty/Staff: 1

LOCATION | ADJACENCIES
A201 General Bio/College Bio I Lab
A202 College Biology I Lab
A203 Prep Room
A204 Lab Manager's Office
A205 College Biology II

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 1 Freezer
- 1 Refrigerator
- 1 Under-counter glassware washer

LABORATORY CASEWORK
Epoxy Resin Bench Top and sink
Wood Casework
Metal Casework under fume hood

NON-LAB EQUIPMENT
White board
Projector

FURNISHINGS
Fixed Casework
Moveable Tables

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
6' Chemical Fume Hood
Snorkels

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower/Eyewash (ES / EW)

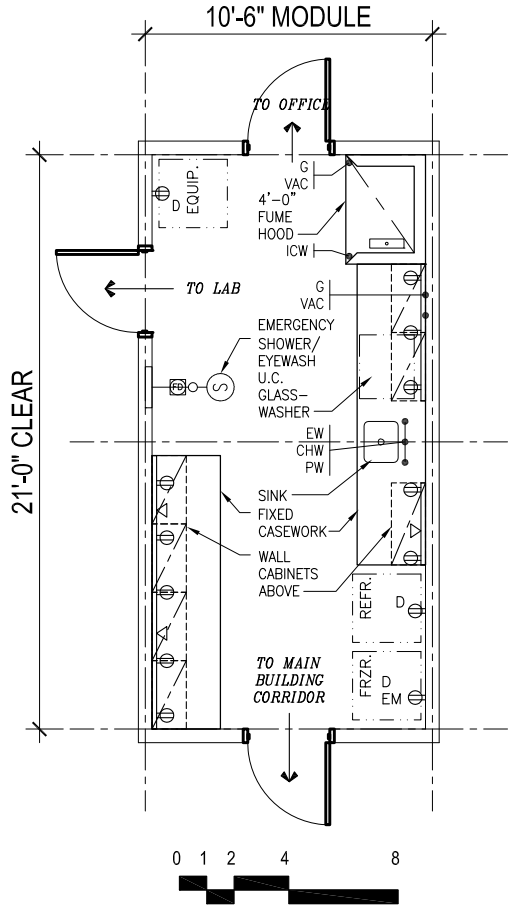
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

NOTES
None

A206

PREP ROOM

AREA: 223 NSF



A207

CELL BIOLOGY LAB/GROWTH CHAMBER

AREA: 1307 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Students: 24
  - Faculty/Staff: 1

LOCATION | ADJACENCIES
- Biotech Labs/Growth Chambers

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-6" x 7'-0"
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI):
  - 1 Freezer
  - 1 Centrifuge
  - 1 Double-door deli case

LABORATORY CASEWORK
- Epoxy Resin Bench Top and sinks
- Wood Casework
- Metal Casework under fume hood

NON-LAB EQUIPMENT
- White board
- Projector

FURNISHINGS
- Fixed Casework
- Moveable Tables

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour

HOODS
- 6' Chemical Fume Hood

PIPED SERVICES
- Laboratory Gas (G)
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)

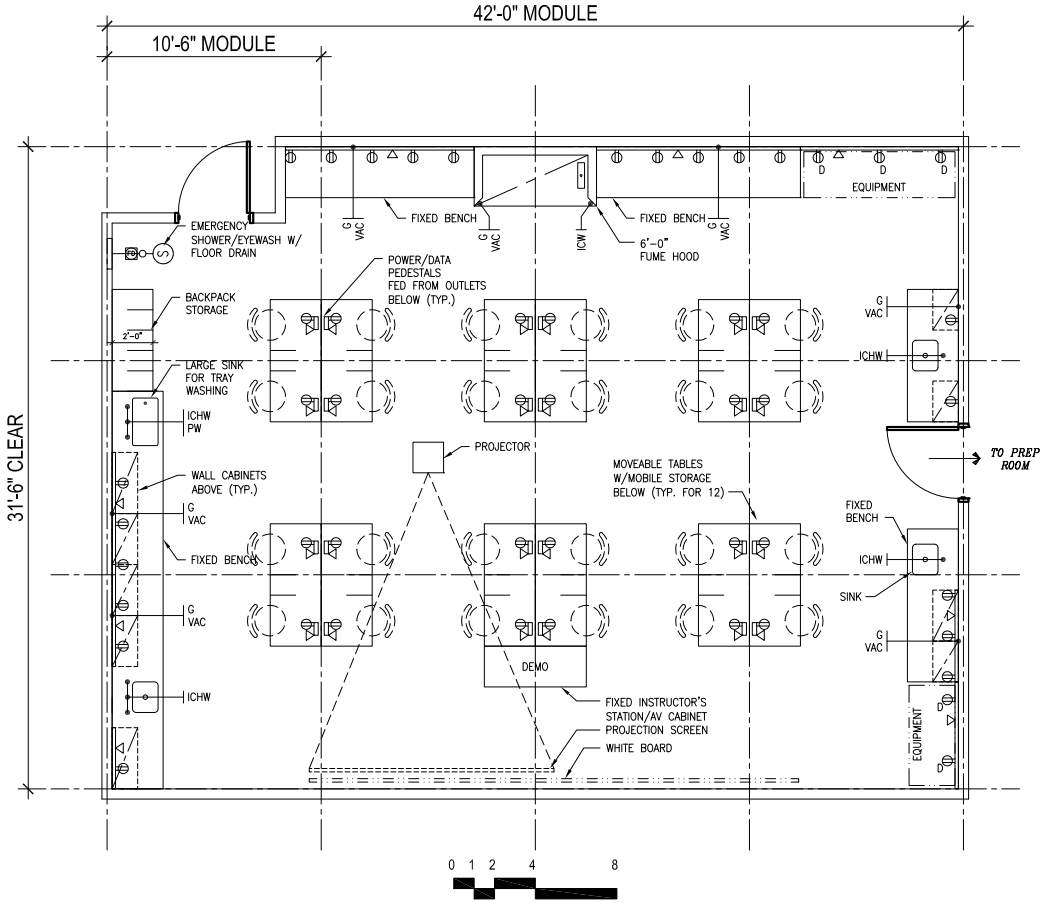
ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - 100 fc at Bench/Desk

NOTES
- None

A207

CELL BIOLOGY LAB/GROWTH CHAMBER

AREA: 1307 NSF



A208

PREP ROOM

AREA: 446 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 1

LOCATION | ADJACENCIES

A201 General Bio/College Bio I Lab
A202 College Biology I Lab
Biotech Labs

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI):
- 1 Refrigerator
- 1 Freezer
- 1 Under-counter glassware washer

LABORATORY CASEWORK

Epoxy Resin Bench Top
Wood Casework

NON-LAB EQUIPMENT

None

FURNISHINGS

Fixed Casework

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS

4' Chemical Fume Hood

PIPED SERVICES

Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

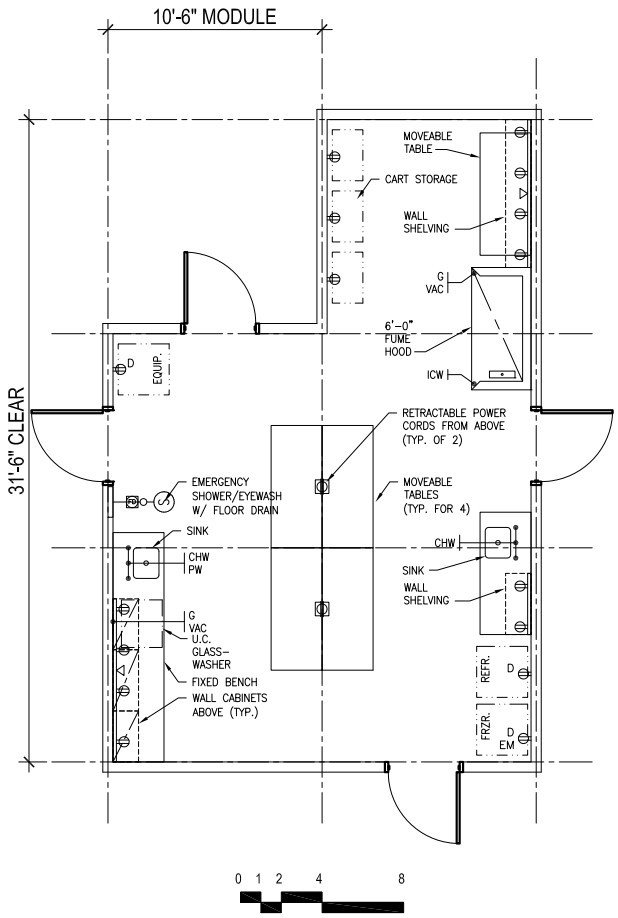
NOTES

None

A208

PREP ROOM

AREA: 446 NSF



A209

LAB MANAGER'S OFFICE

AREA: 100 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 1

LOCATION | ADJACENCIES

A201 General Bio/College Bio I Lab
A202 College Biology I Lab
A203 Prep Room
Biotech Labs

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- Carpet

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-0" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

None

LABORATORY CASEWORK

None

NON-LAB EQUIPMENT

None

FURNISHINGS

Desk
Desk Chair
File Cabinet(s)
Bookcase(s)

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

4-6 Air Changes / Hour

HOODS

None

PIPED SERVICES

None

ELECTRICAL

120V / 20A / 1 Phase
Phone
Data
Lighting
- Fluorescent Parabolic

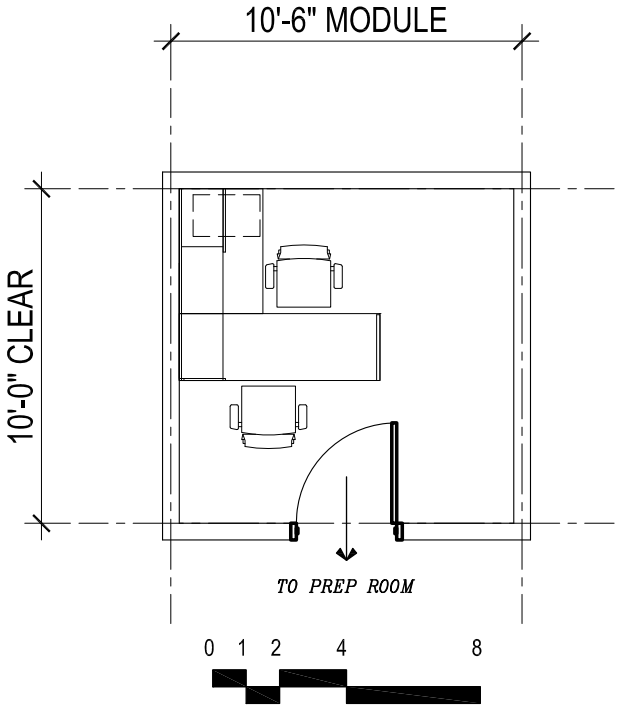
NOTES

None

A209

LAB MANAGER'S OFFICE

AREA: 100 NSF



A210

GENETICS / MOLECULAR LAB

AREA: 1307 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Students: 24
  - Faculty/Staff: 1

LOCATION | ADJACENCIES
- A206 Prep Room
- Biotech Labs

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-6" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI):
  - 1 Refrigerator
  - 1 Freezer
  - 1 Centrifuge
  - 1 Double-door deli case

LABORATORY CASEWORK
- Epoxy Resin Bench Top and sinks
- Wood Casework
- Metal Casework under fume hood

NON-LAB EQUIPMENT
- White board
- Projector

FURNISHINGS
- Fixed Casework
- Moveable Tables

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour

HOODS
- 6' Chemical Fume Hood

PIPED SERVICES
- Laboratory Gas (G)
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)

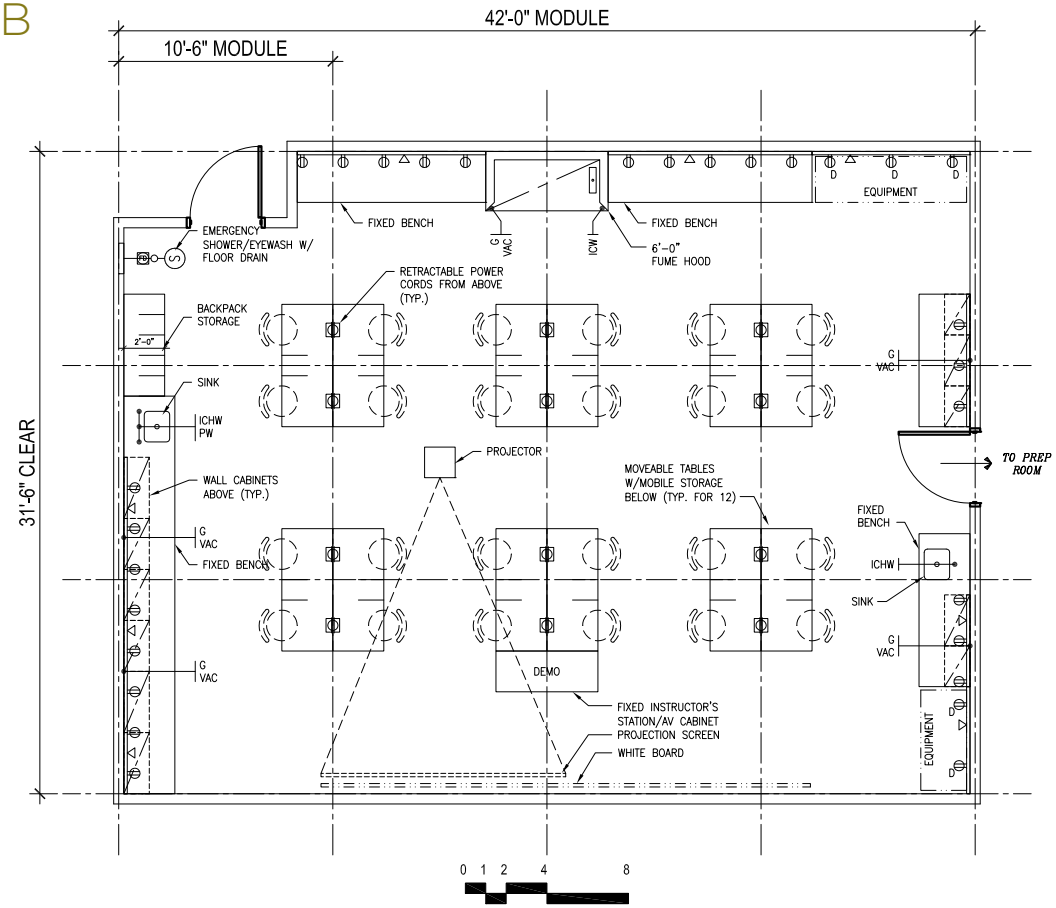
ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - 100 fc at Bench/Desk

NOTES
- None

A210

GENETICS / MOLECULAR LAB

AREA: 1307 NSF



A211

MOLECULAR / UNDERGRADUATE RESEARCH SPACE

AREA: 1200 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 25
- Faculty/Staff: 0

LOCATION | ADJACENCIES

None

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK

Epoxy Resin Bench Top and sinks
Wood Casework
Metal Casework under fume hood

NON-LAB EQUIPMENT

None

FURNISHINGS

Fixed Casework
Moveable Tables

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS

6' Chemical Fume Hood

PIPED SERVICES

Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Task Lighting
Lighting Level
- 100 fc at Bench/Desk

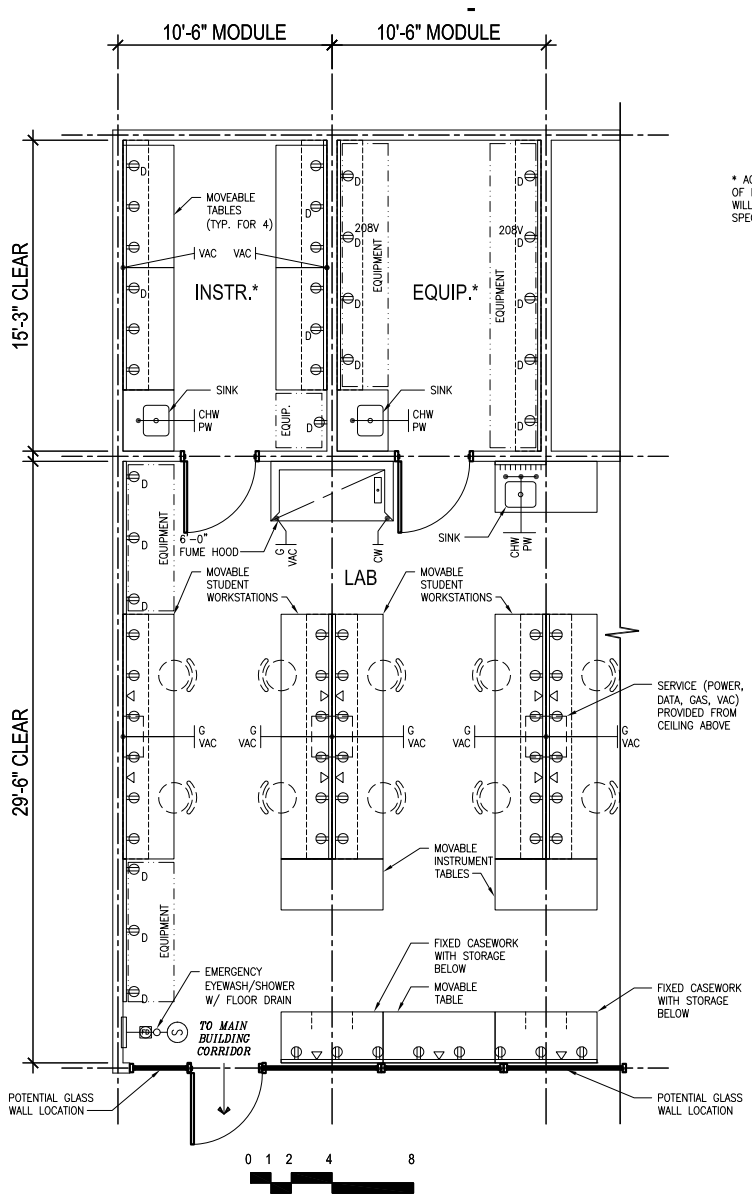
NOTES

- Assumes 25 workstations

A211

MOLECULAR / UNDERGRADUATE RESEARCH SPACE

AREA: 1200 NSF

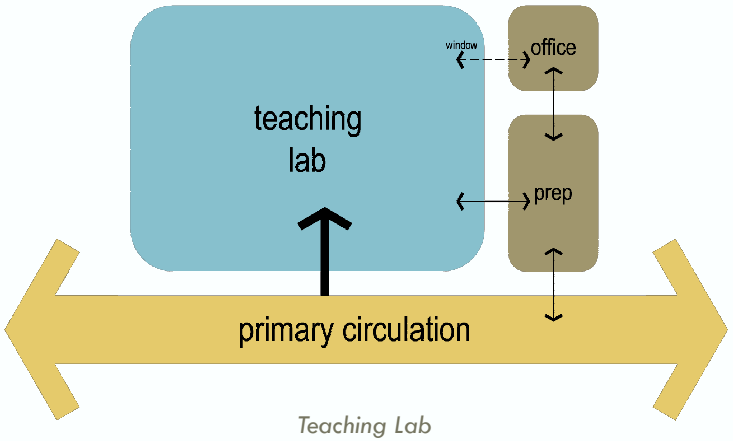


* ACTUAL CONFIGURATION OF LAB SUPPORT SPACES WILL BE DEPENDENT ON SPECIFIC USER NEEDS

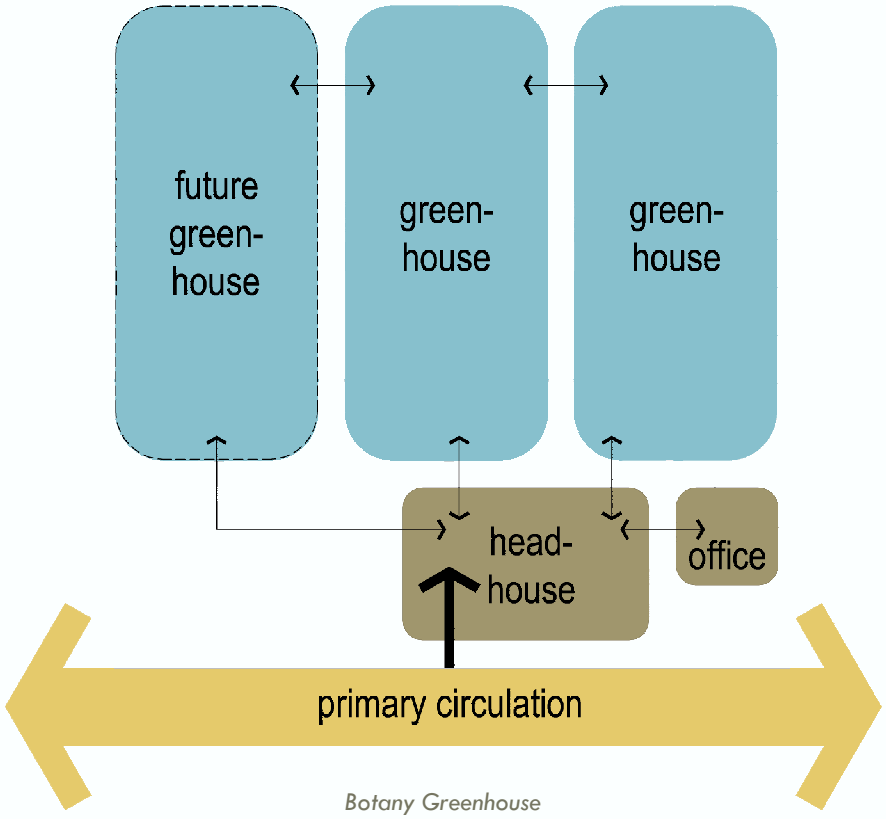
Code	Department / Space Name	Qty.	NSF/ Space	Total NSF	Non Research NSF	Research NSF	GSF	Remarks
A300	BOTANY							
A301	Teaching Lab	2	1,307	2,614			4,022	32 students each
A302	Prep Room	1	600	600			923	
A303	Lab Manager's Office	1	100	100			154	
					3,314			
A304	Greenhouse	2	1,200	2,400			3,692	
A305	Headhouse	1	550	550			846	
A306	Herbarium + Curator	1	1,607	1,607			2,472	Curator Office in Herbarium
A307	Prep Room	1	223	223			343	
A308	Lab Mgr.'s Office / Greenhouse	1	100	100			154	
					4,880			
A309	Controlled Environment Room	2	162	324			498	
A310	Plant Physiology Dark Room	1	60	60			92	Adjacent to Cell Bio/Plant Phys. and Pathology(A207)
A311	Field Gear Storage	1	450	450			692	Share with Earth Science; near loading dock
					834			
A312	Undergraduate Research Space	1	900	900			1,385	Includes Plant Anatomy, Plant Ecology, and Paleobotany. Assumes 8 for Botany
A313	UG Research Support	1	300	300			462	
						1,200		
				10,228	9,028	1,200	15,735	

Notes

- All Botany rooms must be adjacent to one another.



Teaching Lab



Botany Greenhouse

A301

TEACHING LAB

AREA: 1307 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 24
- Faculty/Staff: 1

LOCATION | ADJACENCIES

None

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI):
- 1 Freezer
- 1 Centrifuge
- 1 Double-door deli case

LABORATORY CASEWORK

Epoxy Resin Bench Top and sinks
Wood Casework
Metal Casework under fume hood

NON-LAB EQUIPMENT

White board
Projector

FURNISHINGS

Fixed Casework
Moveable Tables

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS

6' Chemical Fume Hood

PIPED SERVICES

Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

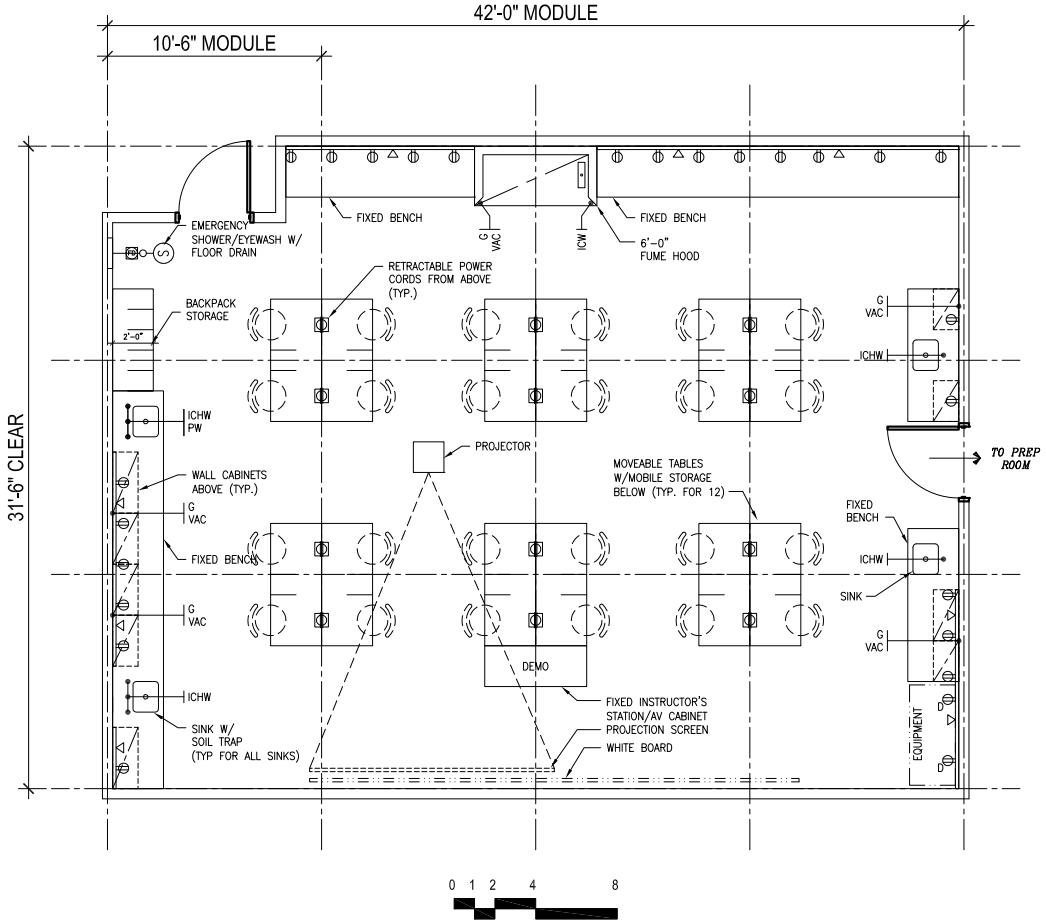
NOTES

A301 room will have a hood. The second will have hood infrastructure only.

A301

TEACHING LAB

AREA: 1307 NSF



A302
PREP ROOM
AREA: 600 NSF

UTILIZATION
Hours of Use
14 hours / day
Hours of Operation
14 hours / day
Capacity
Students: 0
Faculty/Staff: 1

LOCATION | ADJACENCIES
A301 Teaching Lab

ARCHITECTURAL
Windows
Interior: Desired
Window Coverings Required
Exterior: Desired
Floor
VCT (Chemical Resistant)
Partitions
Gyp Board, Paint
Base
4" Vinyl
Ceiling
Acoustic Tile
Doors
3'-6" x 7'-0"
Security
Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
1 Refrigerator
1 Freezer
1 Under counter glassware washer

LABORATORY CASEWORK
Epoxy Resin Bench Top and sinks
Wood Casework

NON-LAB EQUIPMENT
None

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
73˚F ± 3˚F
Humidity
N/A
10 Air Changes / Hour

HOODS
4' Chemical Fume Hood

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

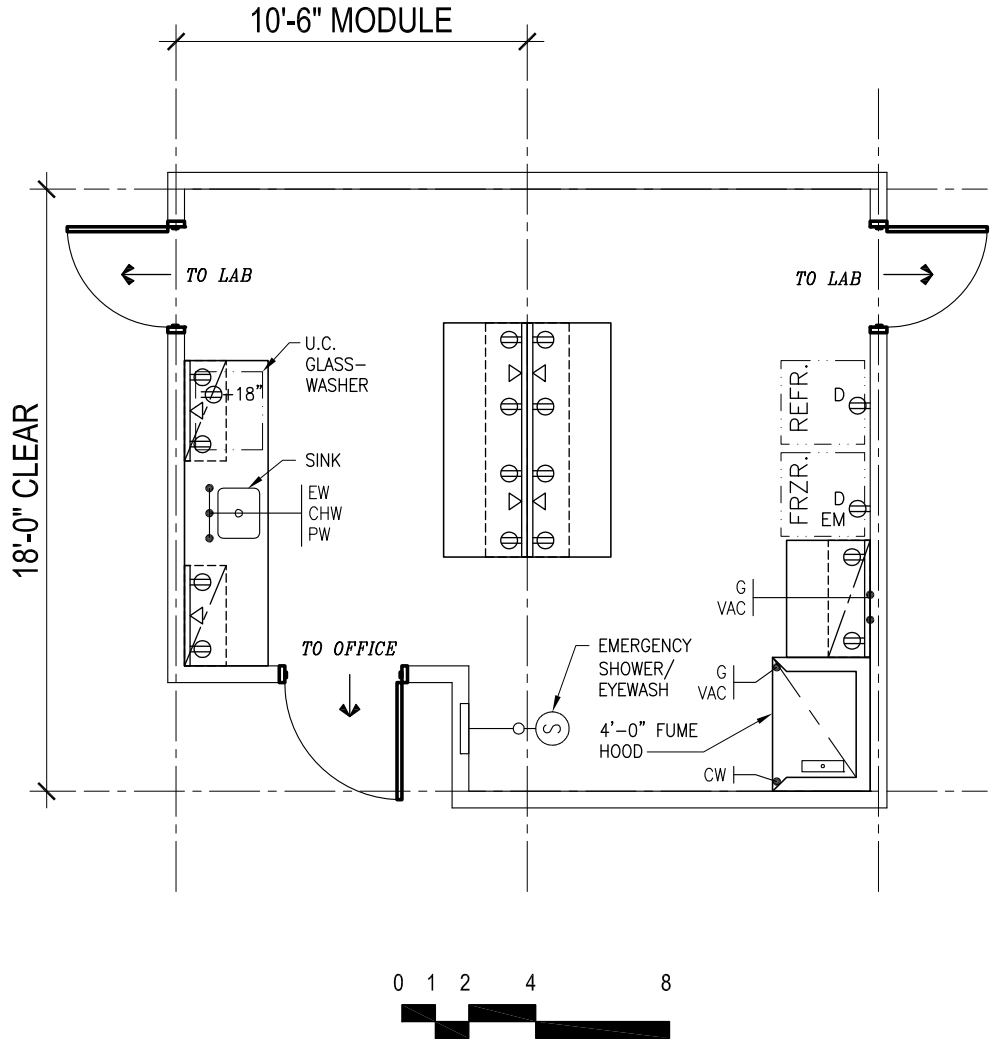
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
75 fc at Bench/Desk

NOTES
None

A302

PREP ROOM

AREA: 600 NSF



A303

LAB MANAGER'S OFFICE

AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Students: 0
  - Faculty/Staff: 1

LOCATION | ADJACENCIES
- A302 Prep Room

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- None

LABORATORY CASEWORK
- None

NON-LAB EQUIPMENT
- None

FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

HOODS
- None

PIPED SERVICES
- None

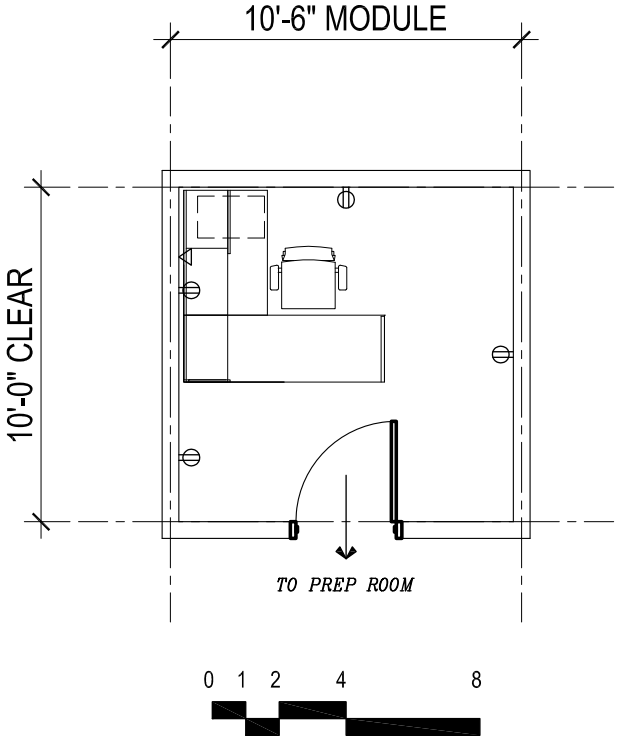
ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting
  - Fluorescent Parabolic

NOTES
- None

A303

LAB MANAGER'S OFFICE

AREA: 100 NSF



A304

GREENHOUSE

AREA: 1200 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Students: 24
  - Faculty/Staff: 1

LOCATION | ADJACENCIES
- A305 Headhouse
- A306 Herbarium

ARCHITECTURAL
- Windows
  - Interior: Required
  - Exterior: Required
- Floor
  - Sealed Concrete
- Partitions
  - Glass panels
- Base
  - None
- Ceiling
  - None - Open, glass panels
- Doors
  - 3'-6" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK
- Stainless Steel

NON-LAB EQUIPMENT
- None

FURNISHINGS
- Fixed Casework
- Moveable Tables

MECHANICAL
- Temperature
  - TBD
- Humidity
  - TBD
- 10 Air Changes / Hour

HOODS
- None

PIPED SERVICES
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)
- Drench Hose (EW)

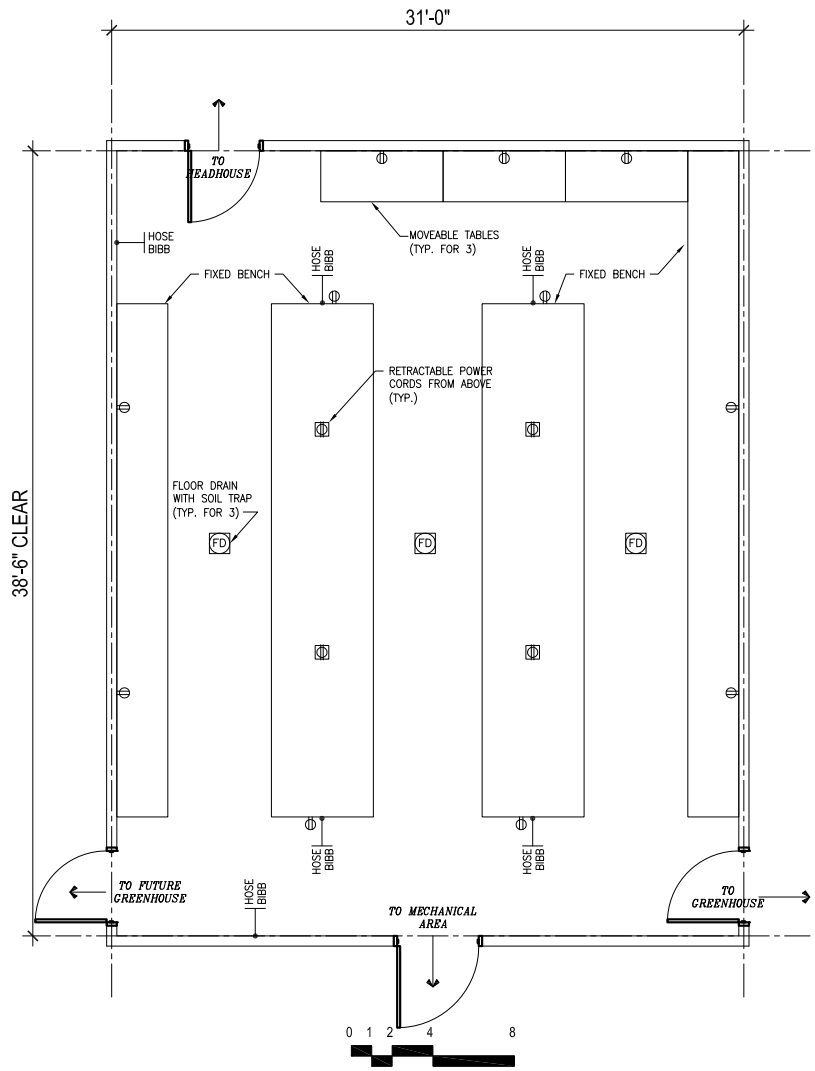
ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - Natural

NOTES
- No shadow facing south

A304

GREENHOUSE

AREA: 1200 NSF



A305

HEADHOUSE

AREA: 550 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 24
- Faculty/Staff: 1

LOCATION | ADJACENCIES

A304 Greenhouse
A306 Herbarium

ARCHITECTURAL

Windows
- Interior: Desired
- Exterior: Desired

Floor
- Sealed Concrete

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Gyp Board, Epoxy Paint

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK

Phenolic Resin with stainless steel tops

NON-LAB EQUIPMENT

None

FURNISHINGS

Fixed Casework
Moveable Tables

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS

None

PIPED SERVICES

Industrial Hot Water (IHW)
Industrial Cold Water (ICW)

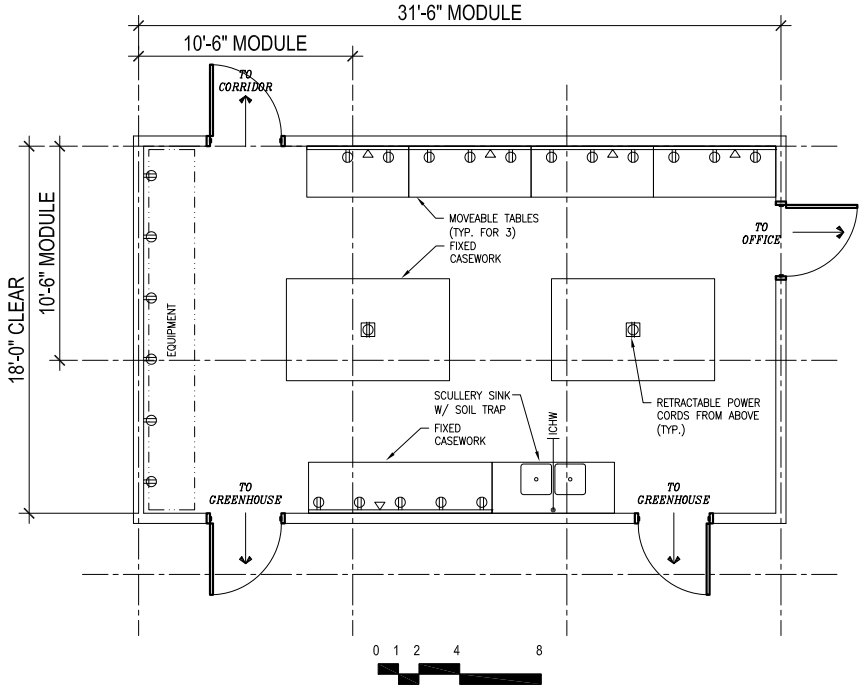
ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- Natural

NOTES

- Skylights preferred.

A305
HEADHOUSE
AREA: 550 NSF



A306
HERBARIUM + CURATOR
AREA: 1607 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 1

LOCATION | ADJACENCIES
A301 Teaching Lab
A307 Prep Room

ARCHITECTURAL
Windows
- Interior: Desired
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"
- 3'-0" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Herbarium Cabinets

LABORATORY CASEWORK
Plastic Laminate

NON-LAB EQUIPMENT
None

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- 40% ± 10%

10 Air Changes / Hour

HOODS
None

PIPED SERVICES
None

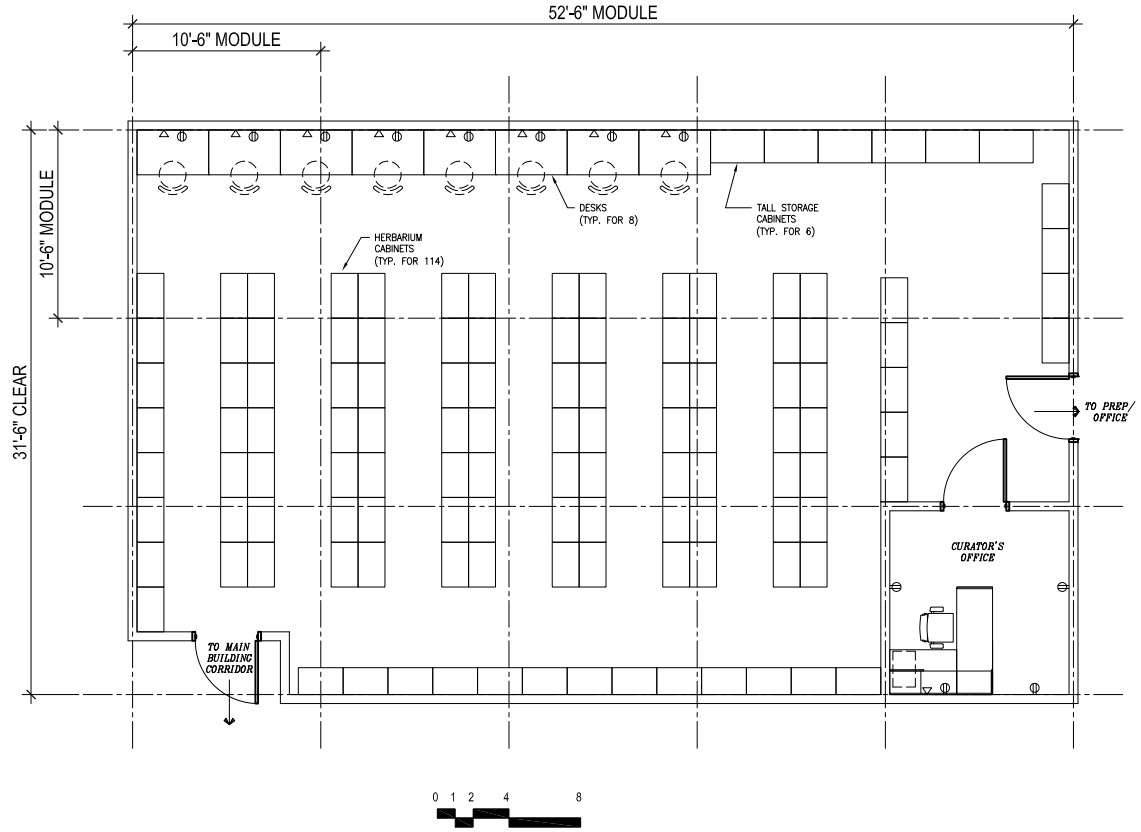
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
208V / 20A / 1 Phase
Data
Lighting Level
- Natural

NOTES
None

A306

HERBARIUM + CURATOR

AREA: 1607 NSF



A307

PREP ROOM

AREA: 223 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 1

LOCATION | ADJACENCIES

A306 Herbarium + Curator

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"
- Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI):
- 1 Refrigerator
- 1 Freezer
- 1 Under counter glassware washer
- 3 Herbarium Cabinets

LABORATORY CASEWORK

Epoxy Resin Bench Top
Wood Casework

NON-LAB EQUIPMENT

None

FURNISHINGS

Fixed Casework
Moveable Tables

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS

4' Chemical Fume Hood

PIPED SERVICES

Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

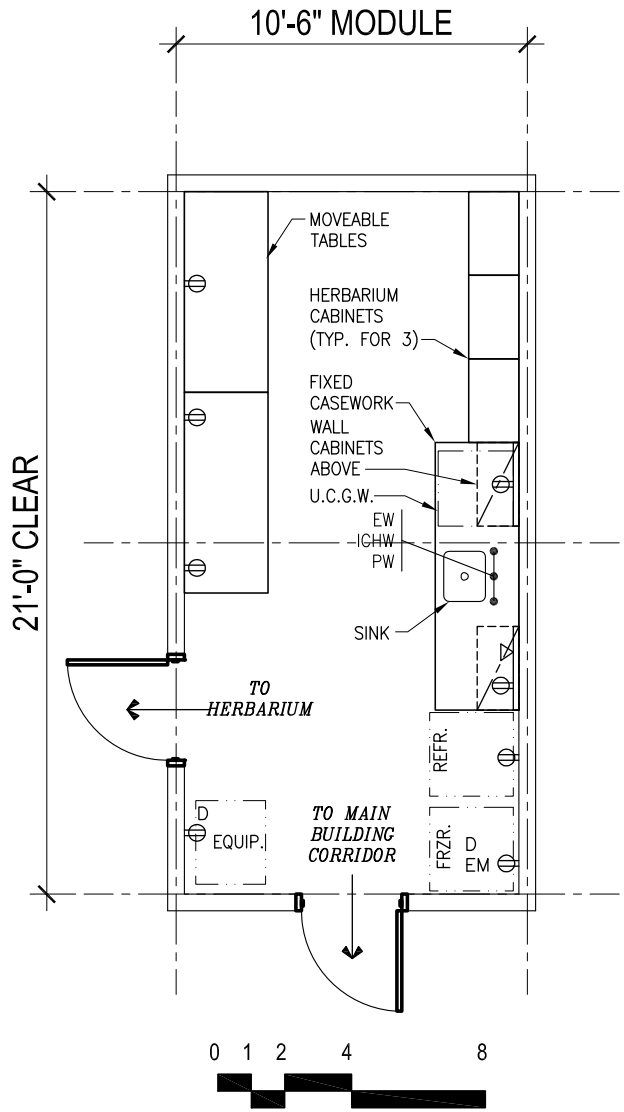
NOTES

None

A307

PREP ROOM

AREA: 223 NSF



A308

LAB MANAGER'S OFFICE/GREEN-HOUSE

AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Students: 0
  - Faculty/Staff: 1

LOCATION | ADJACENCIES
- A307 Prep Room

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- None

LABORATORY CASEWORK
- None

NON-LAB EQUIPMENT
- None

FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

HOODS
- None

PIPED SERVICES
- None

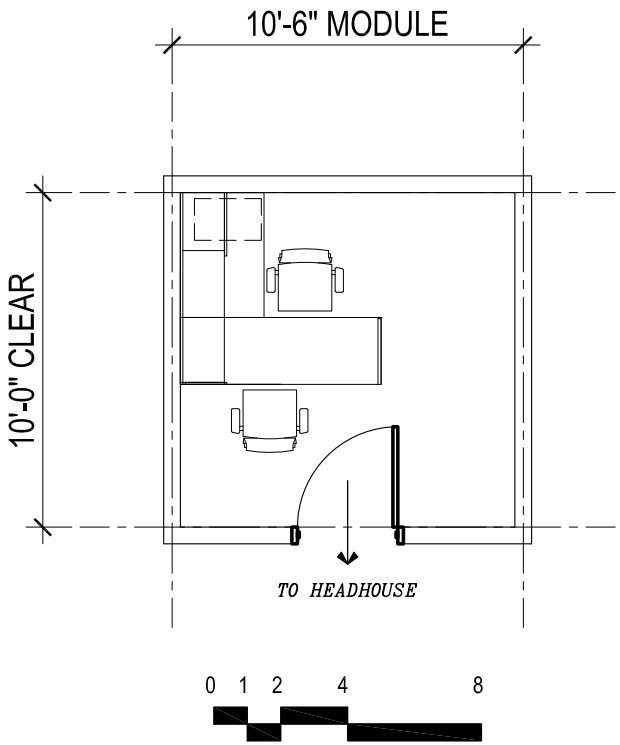
ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting
- Fluorescent Parabolic

NOTES
- None

A308

LAB MANAGER'S OFFICE/GREEN-HOUSE

AREA: 100 NSF



A309
CONTROLLED ENVIRONMENT ROOM

AREA: 162 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 0

LOCATION | ADJACENCIES
None

ARCHITECTURAL
Windows
- Interior: Desired
- Exterior: Desired

Floor
- VCT (chemical resistant)

Partitions
- Gyp Board, paint

Base
- 4" vinyl

Ceiling
- Acoustic tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
OFOI heat producing

LABORATORY CASEWORK
Epoxy resin bench top and sink

NON-LAB EQUIPMENT
None

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 40°F ± 1°F

Humidity
- N/A
- 10-12 Air Changes / Hour

HOODS
None

PIPED SERVICES
Industrial Cold Water (ICW)

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)

Data
- Emergency

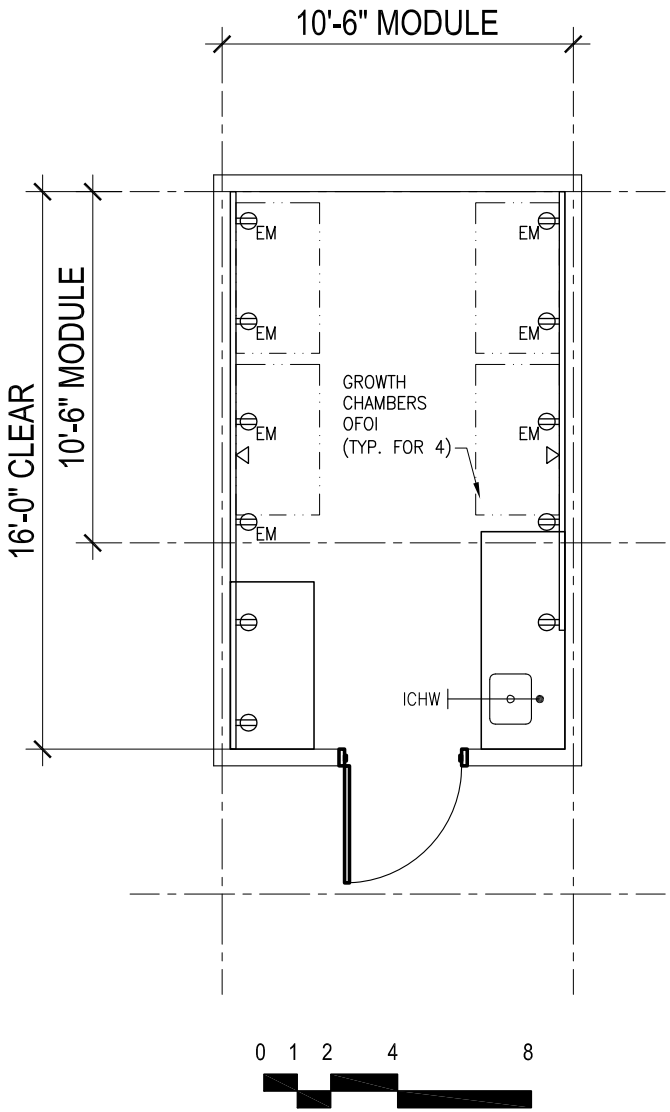
Lighting Level
- 75 fc at Bench/Desk

NOTES
None

A309

CONTROLLED ENVIRONMENT ROOM

AREA: 162 NSF



A310

PLANT PHYSIOLOGY DARK ROOM

AREA: 60 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 0

LOCATION | ADJACENCIES

A207 Cell Biology Lab/Growth Chamber

ARCHITECTURAL

Windows
- None Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-0" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

None

LABORATORY CASEWORK

Epoxy resin bench top and sink

Wood casework

NON-LAB EQUIPMENT

Dark Room Curtain

FURNISHINGS

Fixed Casework

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS

None

PIPED SERVICES

None

ELECTRICAL

120V / 20A / 1 Phase

120V / 20A / 1 Phase Dedicated (D)

Data

"In-Use" Light

Task Lighting

Lighting Level
- 75 fc at Bench/Desk

Safe Light

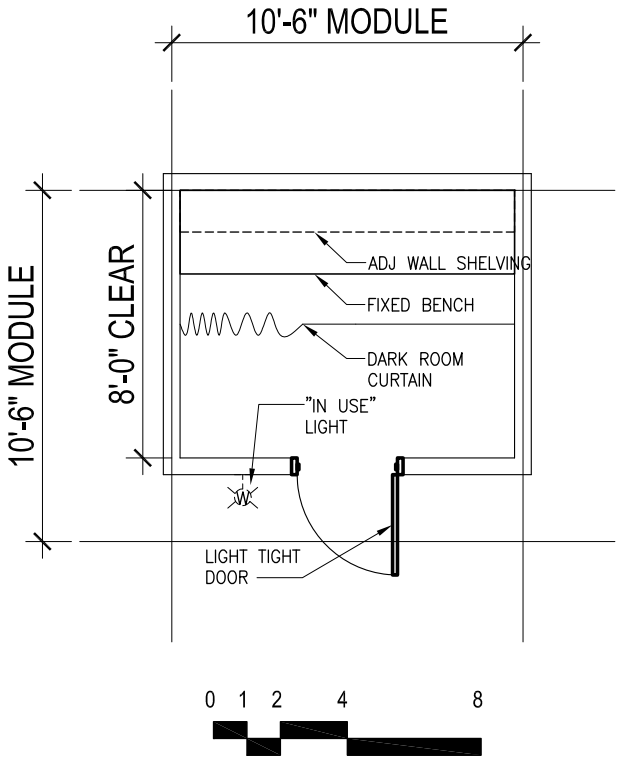
NOTES

Locate close to DI water source

A310

PLANT PHYSIOLOGY DARK ROOM

AREA: 60 NSF



A311
FIELD GEAR STORAGE
AREA: 450 NSF

UTILIZATION
Hours of Use
14 hours / day
Hours of Operation
14 hours / day
Capacity
Students: 0
Faculty/Staff: 0

LOCATION | ADJACENCIES
Loading Dock

ARCHITECTURAL
Windows
None Desired
Floor
Sealed Concrete
Partitions
Gyp Board, Paint
Base
4" Vinyl
Ceiling
Acoustic Tile
Doors
3'-6" x 7'-0"
Security
Controlled Access

LABORATORY EQUIPMENT
Scullery Sink
Heavy Duty Shelving

LABORATORY CASEWORK
None

NON-LAB EQUIPMENT
None

FURNISHINGS
None

MECHANICAL
Temperature
60°F - 90°F
Humidity
N/A
10 Air Changes / Hour

HOODS
None

PIPED SERVICES
None

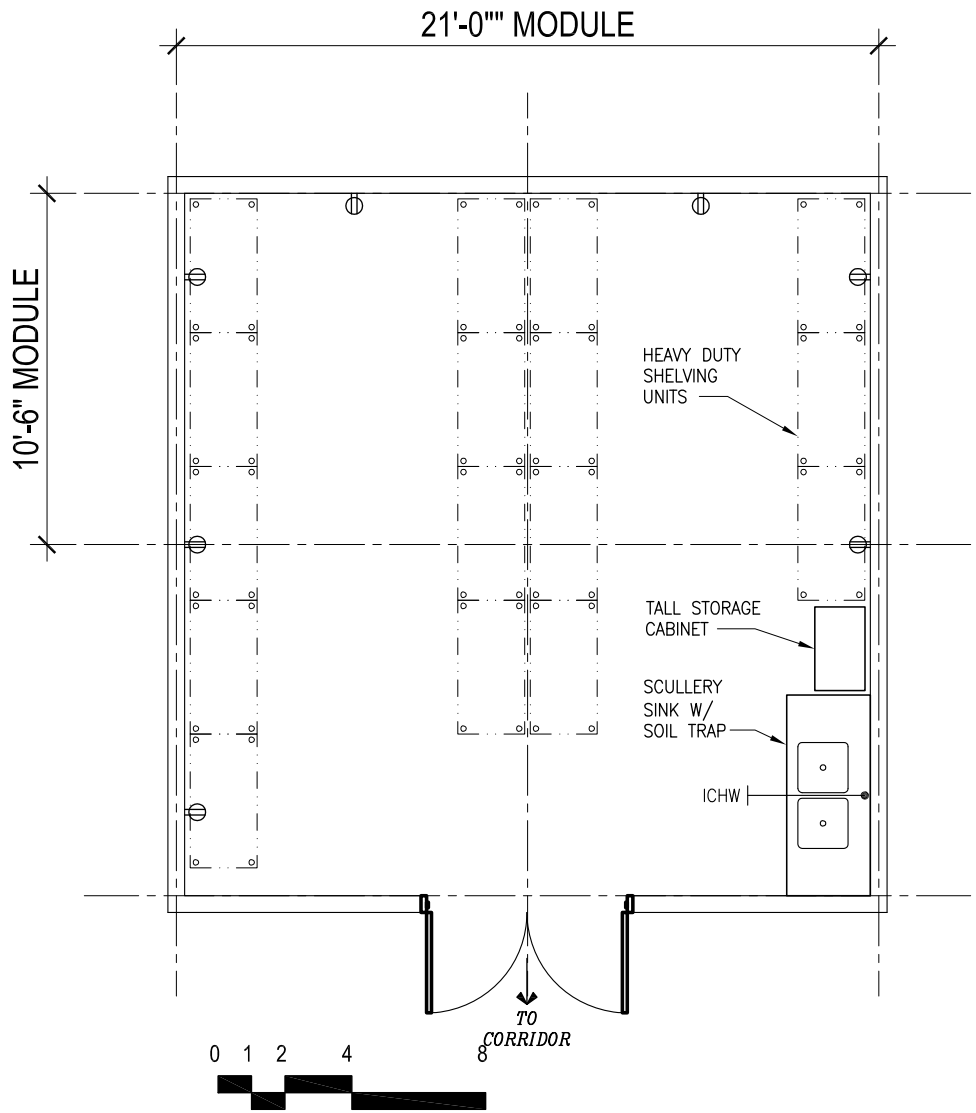
ELECTRICAL
120V / 20A / 1 Phase

NOTES
- Space shared between Botany and Earth Science

A311

FIELD GEAR STORAGE

AREA: 450 NSF



A312
A313

UNDERGRADUATE RESEARCH SPACE

(INCLUDING EQUIPMENT SPACE AND INSTRUMENT SPACE)

AREA: 1200 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Students: 8
  - Faculty/Staff: 0

LOCATION | ADJACENCIES
- None

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-6" x 7'-0"
  - Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK
- Epoxy Resin Bench Top and sinks
- Wood Casework
- Metal Casework under fume hood

NON-LAB EQUIPMENT
- None

FURNISHINGS
- Fixed Casework
- Moveable Tables

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour

HOODS
- 6' Chemical Fume Hood

PIPED SERVICES
- Laboratory Gas (G)
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Task Lighting
- Lighting Level
  - 100 fc at Bench/Desk

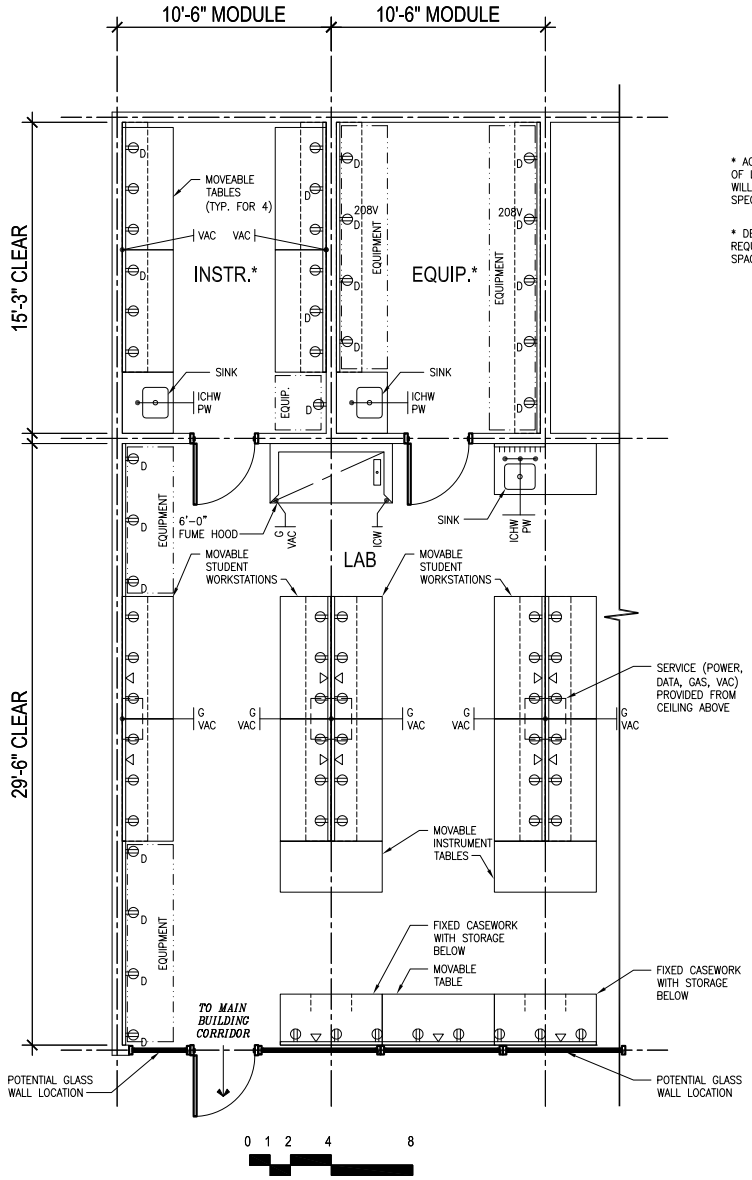
NOTES
-Assumes 8 workstations (for Plant molecular, Plant Anatomy, Plant Ecology, and Paleobotany)

A312
A313

UNDERGRADUATE RESEARCH SPACE

(INCLUDING EQUIPMENT SPACE AND INSTRUMENT SPACE)

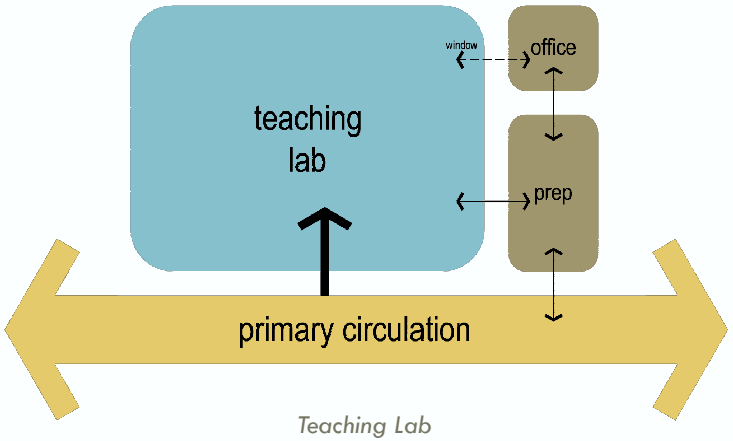
AREA: 1200 NSF



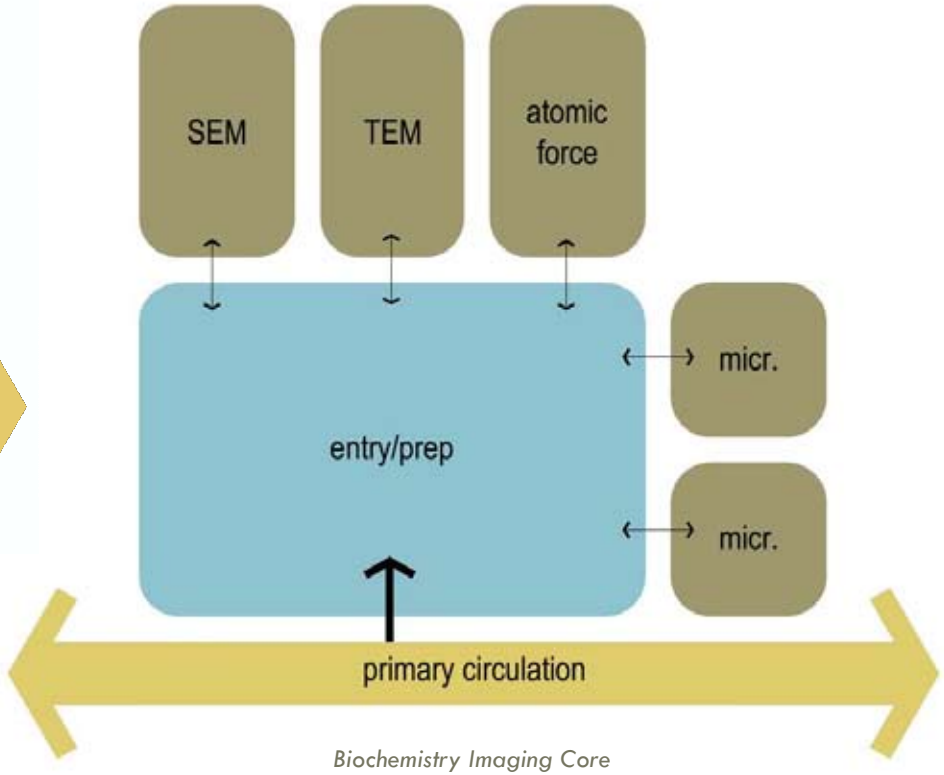
* ACTUAL CONFIGURATION OF LAB SUPPORT SPACES WILL BE DEPENDENT ON SPECIFIC USER NEEDS

* DEPARTMENT HAS REQUESTED TWO SEPARATE SPACES AT 600 SF EACH

Code	Department / Space Name	Qty.	NSF/ Space	Total NSF	Non Research NSF	Research NSF	GSF	Remarks
A400	MICROSCOPY							
A401	Lab Manager's Office	1	100	100			154	
					100			
A402	EM Prep/Entry	1	635	635			977	
A403	SEM/TEM/AF Microscopy	4	150	600			923	Slab-on-grade location
A404	Confocal Microscopy	1	120	120			185	
A405	Equipment Room	1	186	186			286	
A406	Fluorescent Microscope Room	1	60	60			92	
					1,601			
A407	Research Space	1	750	750			1,154	Assumes 20 people
A408	Equipment Space	1	187	187			288	
A409	Instrument Space	1	187	187			288	
A410	Lab Manager's Office	1	100	100			154	
						1,224		
				2,925	1,701	1,224	4,500	



Teaching Lab



Biochemistry Imaging Core

A401

LAB MANAGER'S OFFICE

AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Students: 0
  - Faculty/Staff: 1

LOCATION | ADJACENCIES
- A104 Protein Methods Lab

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- None

LABORATORY CASEWORK
- None

NON-LAB EQUIPMENT
- None

FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

HOODS
- None

PIPED SERVICES
- None

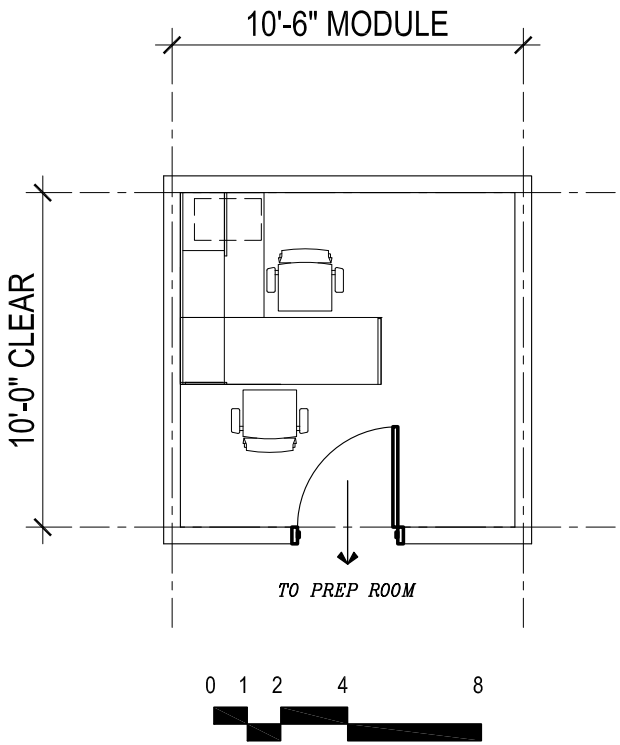
ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting
  - Fluorescent Parabolic

NOTES
- None

A401

LAB MANAGER'S OFFICE

AREA: 100 NSF



A402

EM PREP | ENTRY

AREA: 635 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 0

LOCATION | ADJACENCIES
A403 SEM/TEM/AF Microscopy
A404 Confocal Microscopy
A405 Equipment Room
A406 Fluorescent Microscope Room

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
1 Refrigerator
1 Freezer
1 Under counter glassware washer

LABORATORY CASEWORK
Epoxy resin bench top and sink
Wood casework
Metal casework under fume hood

NON-LAB EQUIPMENT
None

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
6' Chemical Fume Hood

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

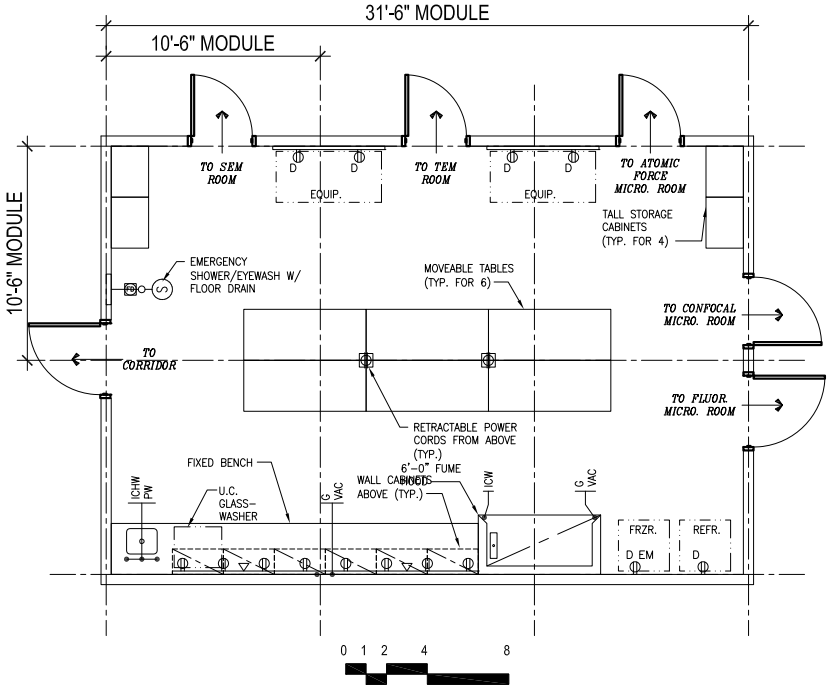
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

NOTES
None

A402

EM PREP | ENTRY

AREA: 635 NSF



A403

SEM/TEM/AF MICROSCOPY

AREA: 150 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 0

LOCATION | ADJACENCIES

A402 EM Prep Entry
A404 Confocal Microscopy
A405 Equipment Room
A406 Fluorescent Microscope Room

ARCHITECTURAL

Windows
- Not Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI):
- Microscope

LABORATORY CASEWORK

Epoxy Resin Bench Top
Wood Casework

NON-LAB EQUIPMENT

None

FURNISHINGS

None

MECHANICAL

Temperature
- 73°F ± 2°F

Humidity
- N/A

10 Air Changes / Hour

HOODS

None

PIPED SERVICES

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
220V, 3 Phase 50-60 HZ. ± 10%
Data
"In-Use" Light
Task Lighting
Lighting Level
- 75 fc at Bench/Desk

Darkenable

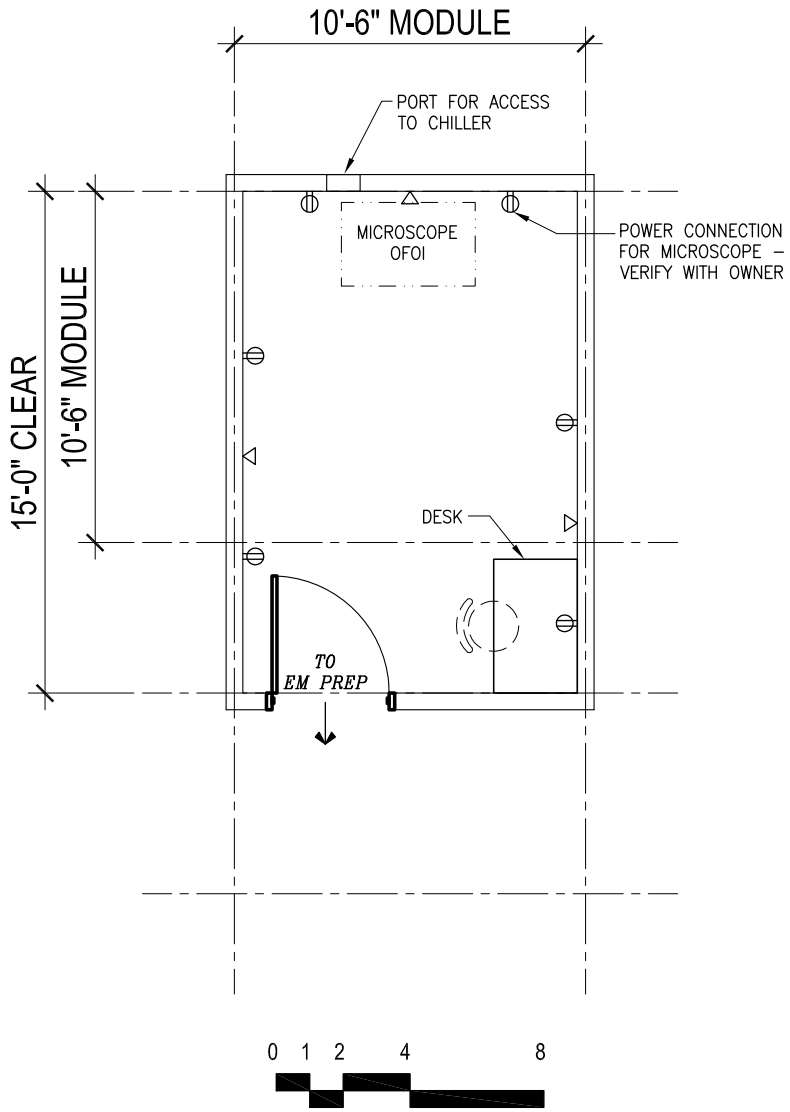
NOTES

None

A403

SEM/TEM/AF MICROSCOPY

AREA: 150 NSF



A404

CONFOCAL MICROSCOPY

AREA: 120 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 1

LOCATION | ADJACENCIES

A402 EM Prep Entry
A403 SEM/TEM/AF Microscopy
A405 Equipment Room
A406 Fluorescent Microscope Room

ARCHITECTURAL

Windows
- Not Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile - High ceiling for instrumentation

Doors
- 3'-6" x 7'-0"
- 3'-0" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK

Epoxy Resin Bench Top
Wood Casework

NON-LAB EQUIPMENT

Fixed Casework

FURNISHINGS

None

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS

None

PIPED SERVICES

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
"In-Use" Light
Task Lighting
Lighting Level
- 75 fc at Bench/Desk

Darkenable

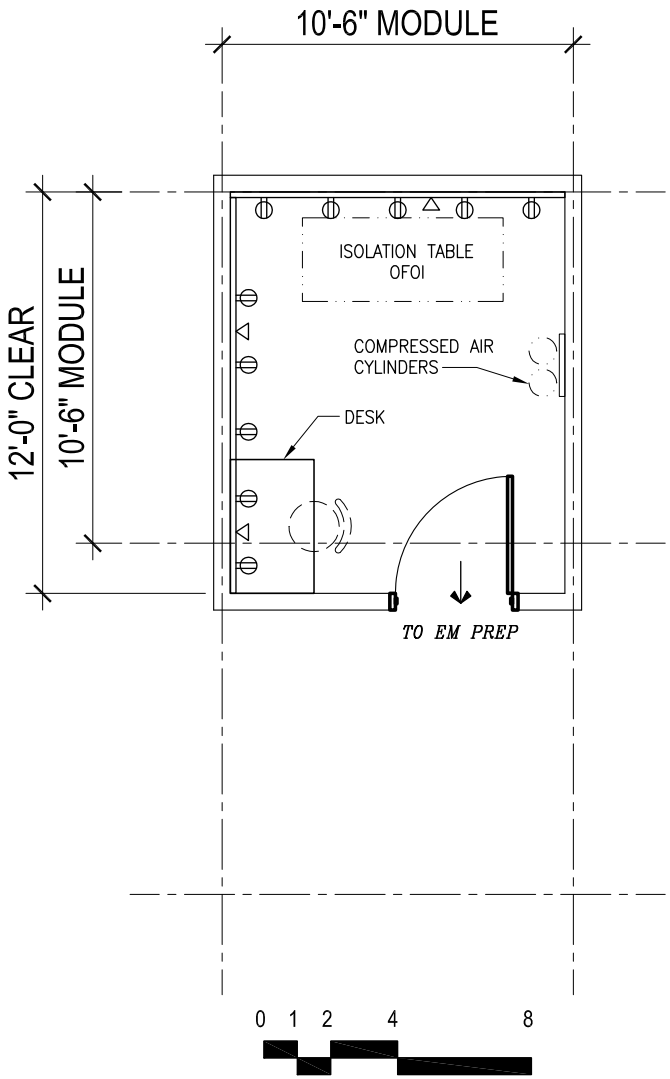
NOTES

None

A404

CONFOCAL MICROSCOPY

AREA: 120 NSF



A405
EQUIPMENT ROOM
AREA: 186 NSF

UTILIZATION
Hours of Use
14 hours / day
Hours of Operation
14 hours / day
Capacity
Students: 0
Faculty/Staff: 0

LOCATION | ADJACENCIES
A402 EM Prep Entry
A403 SEM/TEM/AF Microscopy
A404 Confocal Microscopy
A406 Fluorescent Microscope Room

ARCHITECTURAL
Windows
Not Required
Floor
VCT (Chemical Resistant)
Partitions
Gyp Board, Paint
Base
4" Vinyl
Ceiling
Acoustic Tile
Doors
3'-6" x 7'-0"
Security
Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI)
Heat Producing

LABORATORY CASEWORK
None

NON-LAB EQUIPMENT
None

FURNISHINGS
None

MECHANICAL
Temperature
73°F ± 3°F
Humidity
N/A
10-12 Air Changes / Hour

HOODS
None

PIPED SERVICES
None

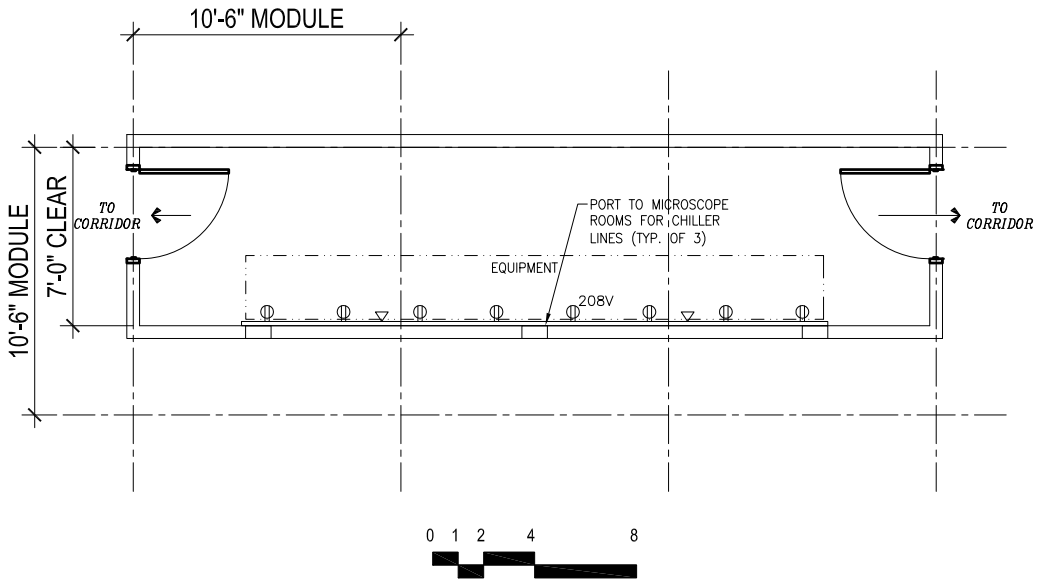
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
208V / 20A / 1 Phase
Data
Lighting Level
75 fc

NOTES
None

A405

EQUIPMENT ROOM

AREA: 186 NSF



A406

FLUORESCENT MICROSCOPE ROOM

AREA: 60 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 0

LOCATION | ADJACENCIES

A402 EM Prep Entry
A403 SEM/TEM/AF Microscopy
A404 Confocal Microscopy
A405 Equipment Room

ARCHITECTURAL

Windows
- Not Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"
- Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK

Epoxy Resin Bench Top
Wood Casework

NON-LAB EQUIPMENT

None

FURNISHINGS

Fixed Casework

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10-12 Air Changes / Hour

HOODS

None

ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
"In-Use" Light
Task Lighting
Lighting Level
- 75 fc at Bench/Desk

Darkenable

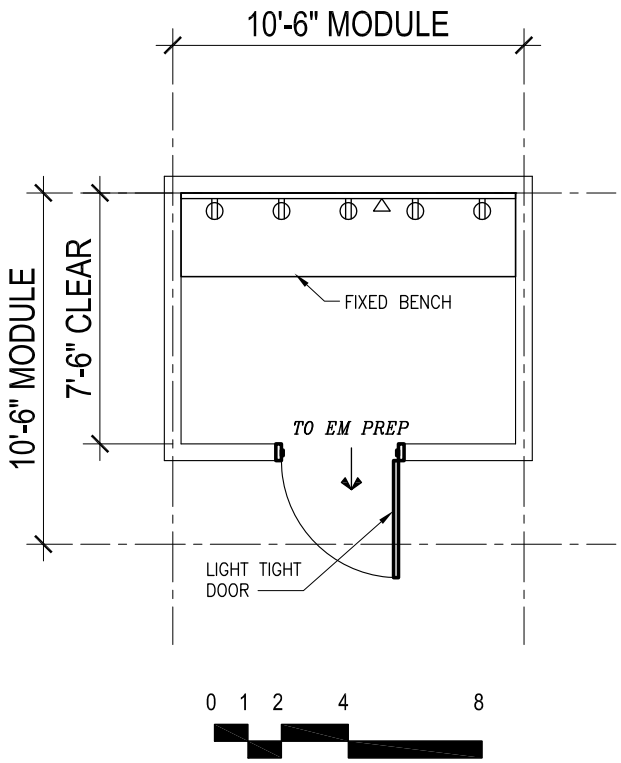
NOTES

None

A406

FLUORESCENT MICROSCOPE ROOM

AREA: 60 NSF



A407
A408
A409

RESEARCH SPACE

(INCLUDING EQUIPMENT SPACE AND INSTRUMENT SPACE)

AREA: 1124 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Students: 8
  - Faculty/Staff: 0

LOCATION | ADJACENCIES
- None

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-6" x 7'-0"
  - Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK
- Epoxy resin bench top and sink
- Wood Casework
- Metal Casework under fume hood

NON-LAB EQUIPMENT
- None

FURNISHINGS
- Fixed Casework
- Moveable Tables

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour

HOODS
- 6' Chemical Fume Hood

PIPED SERVICES
- Laboratory Gas (G)
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES/EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES/EW)

ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Task Lighting
- Lighting Level
  - 100 fc at Bench/Desk

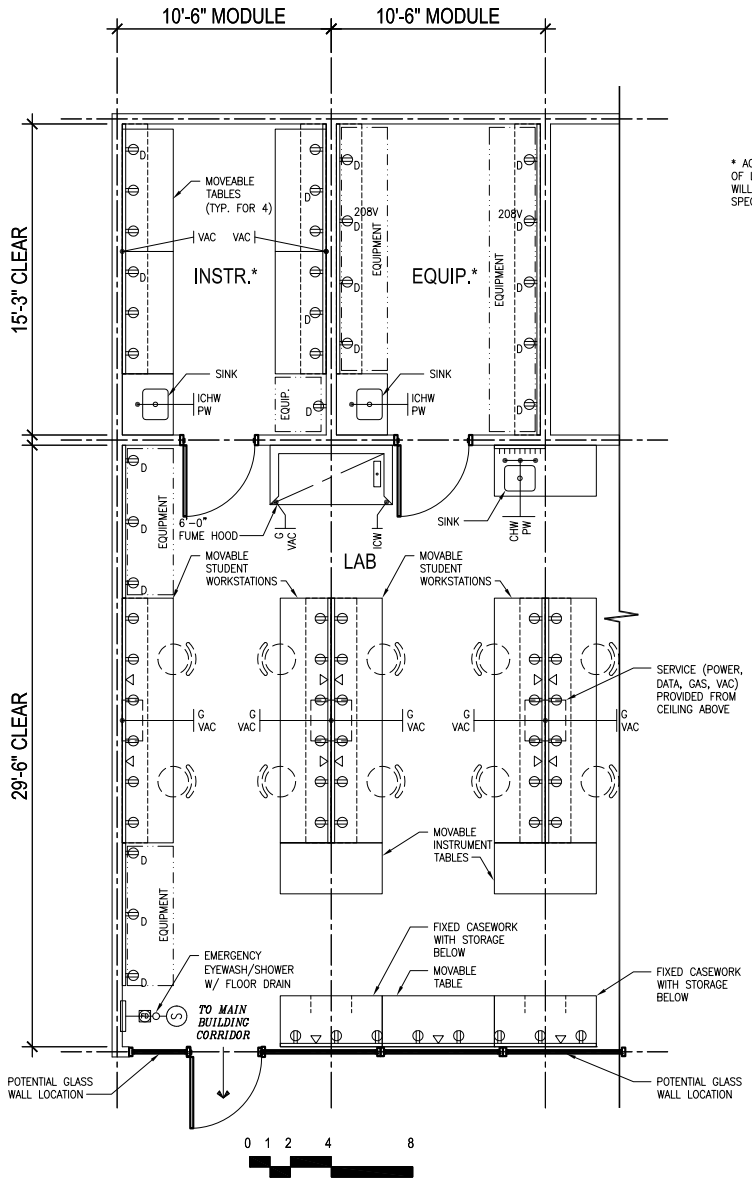
NOTES
- -Assumes 20 workstations

A407
A408
A409

RESEARCH SPACE

(INCLUDING EQUIPMENT SPACE AND INSTRUMENT SPACE)

AREA: 1124 NSF



* ACTUAL CONFIGURATION OF LAB SUPPORT SPACES WILL BE DEPENDENT ON SPECIFIC USER NEEDS

A410

LAB MANAGER'S OFFICE

AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Students: 0
  - Faculty/Staff: 1

LOCATION | ADJACENCIES
- A101 Intro to Biotech Lab
- A102 Prep Room

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- None

LABORATORY CASEWORK
- None

NON-LAB EQUIPMENT
- None

FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

HOODS
- None

PIPED SERVICES
- None

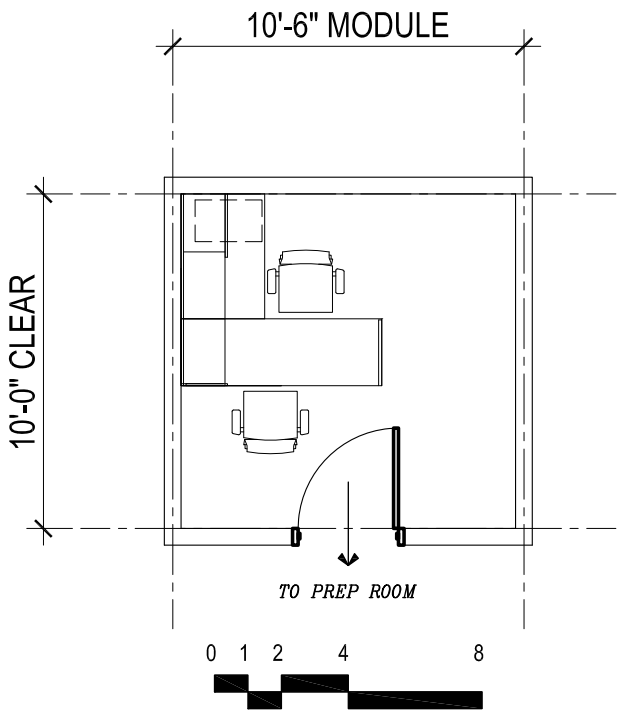
ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting
  - Fluorescent Parabolic

NOTES
- None

A410

LAB MANAGER'S OFFICE

AREA: 100 NSF



Code	Department / Space Name	Qty.	NSF/ Space	Total NSF	Non Research NSF	Research NSF	GSF	Remarks
A500	PHYSICS							
A501	Research Space	1	750	750			1,154	8 students
A502	Equipment Space	1	187	187			288	
A503	Instrument Space	1	187	187			288	
						1,124		
				1,124	0	1,124	1,729	

A501 A502 A503

RESEARCH SPACE

(INCLUDING EQUIPMENT SPACE AND INSTRUMENT SPACE)

AREA: 1124 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students - 8

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK

Epoxy resin bench top and sink
Wood Casework
Metal Casework under fume hood

FURNISHINGS

Fixed Casework
Moveable Tables

MECHANICAL

Temperature
- 72°F ± 2°F

Humidity
- N/A

10 Air Changes / Hour

HOODS

6' Chemical Fume Hood

PIPED SERVICES

Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

NOTES

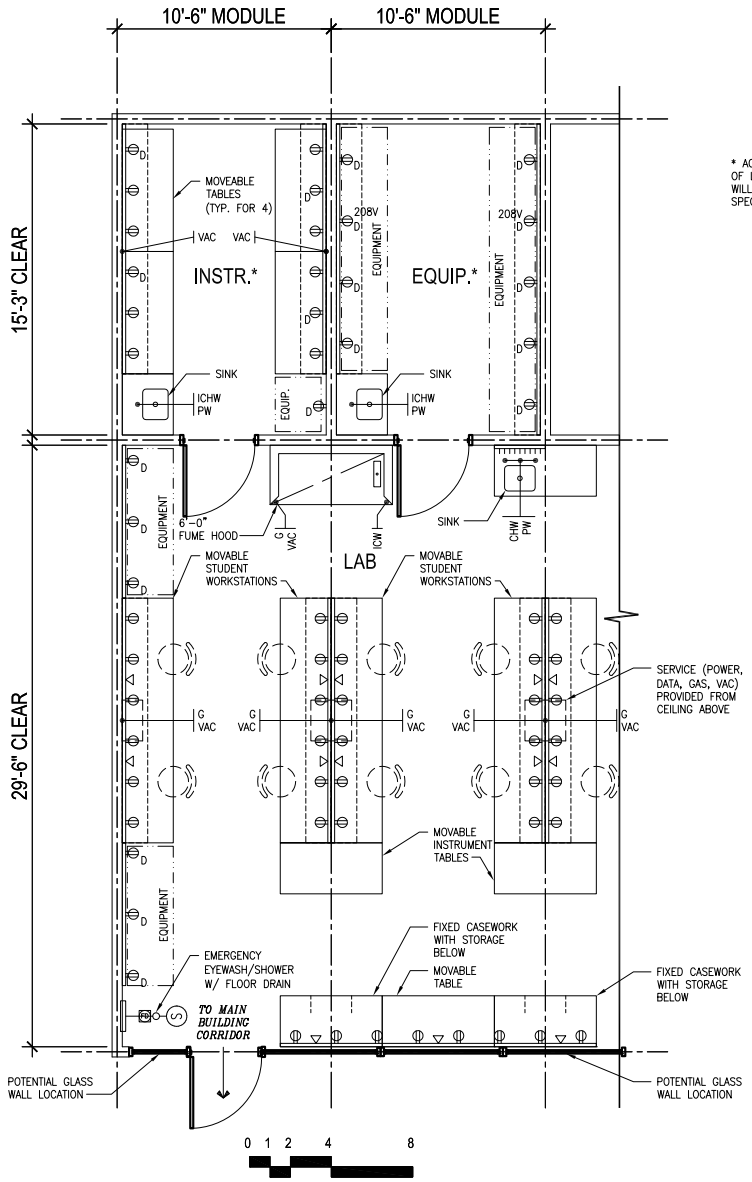
Assumes 8 Workstations

A501
A502
A503

RESEARCH SPACE

(INCLUDING EQUIPMENT SPACE AND INSTRUMENT SPACE)

AREA: 1124 NSF



* ACTUAL CONFIGURATION OF LAB SUPPORT SPACES WILL BE DEPENDENT ON SPECIFIC USER NEEDS

Code	Department / Space Name	Qty.	NSF/ Space	Total NSF	Non Research NSF	Research NSF	GSF	Remarks
A600	ZOOLOGY							
A601	Teaching Lab	1	1,307	1,307			2,011	
A602	Prep Room	1	446	446			686	
A603	Lab Manager's Office	1	100	100			154	
A604	Specimen Storage Room	1	323	323			497	
A605	Science Methods Lab	1	1,307	1,307			2,011	
					3,483			
A606	Research Space	1	600	600			923	Assumes 8 people
A607	Equipment Space	1	150	150			231	
A608	Instrument Space	1	150	150			231	
A609	Lab Manager's Office	1	100	100			154	
						1,000		
A610	Wet Lab / Dry Lab	1	600	600			923	
A611	Specimen Storage Room	1	500	500			769	
					1,200			
				5,583	4,683	1,000	8,589	

Notes

- A601-A605 should be grouped together.
- A606-A612 should be grouped together.

A601
TEACHING LAB
AREA: 1307 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 24
- Faculty / Staff: 1

LOCATION | ADJACENCIES
A602 Prep Room
A603 Lab Manager's Office
A604 Specimen Storage Room
A605 Science Methods Lab

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 1 Freezer
- 1 Centrifuge
- 1 Double door deli case

LABORATORY CASEWORK
Epoxy Resin Bench Top and sinks
Wood Casework
Metal Casework under fume hood
Ventilated base cabinets

NON-LAB EQUIPMENT
White board
Projector

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
Snorkels

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

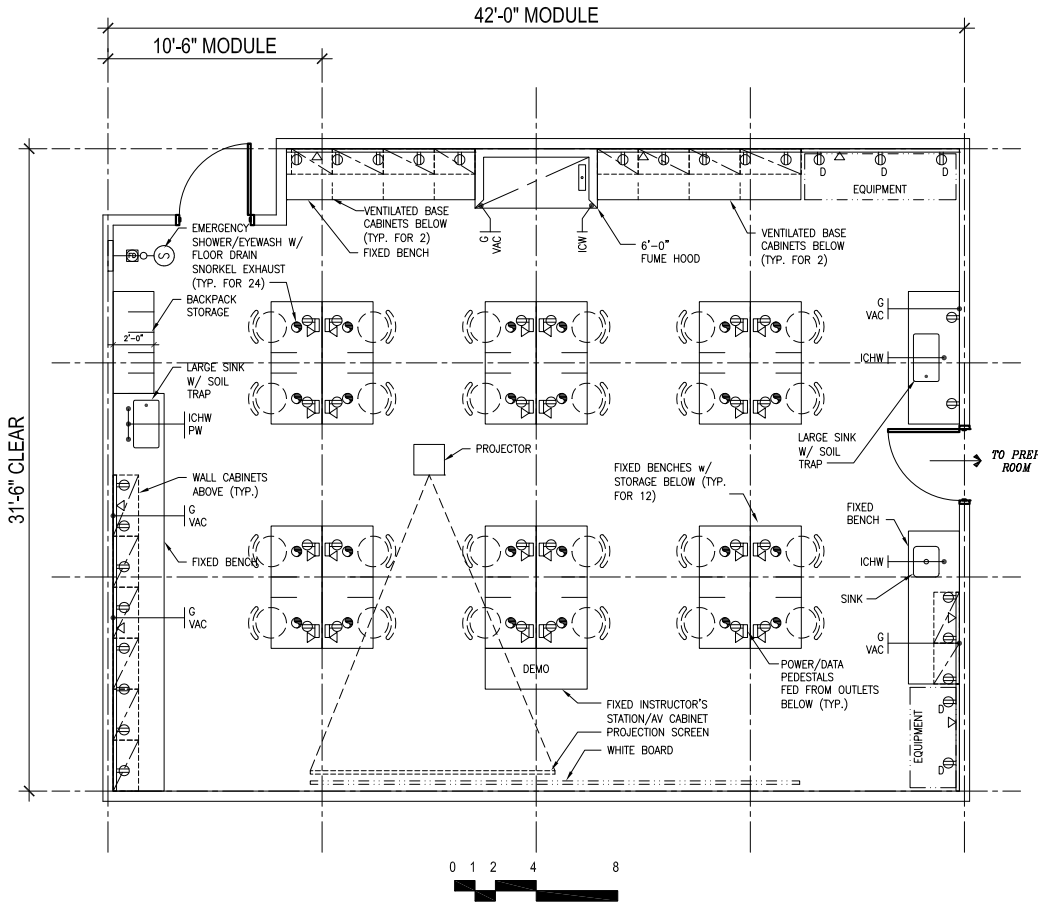
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

NOTES
- Space for (2) salt water aquaria, (3) freshwater aquaria. User has suggested aquaria that is built into the wall to save counter space.

A601

TEACHING LAB

AREA: 1307 NSF



A602
PREP ROOM
AREA: 446 NSF

UTILIZATION
Hours of Use
14 hours / day
Hours of Operation
14 hours / day
Capacity
Students: 0
Faculty/Staff: 1

LOCATION | ADJACENCIES
A601 Teaching Lab
A603 Office
A604 Specimen Storage Room
A605 Science Methods Lab

ARCHITECTURAL
Windows
Interior: Desired
Window Coverings Required
Exterior: Desired
Floor
VCT (Chemical Resistant)
Partitions
Gyp Board, Paint
Base
4" Vinyl
Ceiling
Acoustic Tile
Doors
3'-6" x 7'-0"
Security
Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
1 Refrigerator
1 Freezer
1 Under counter glass washer

LABORATORY CASEWORK
Epoxy Resin Bench Top
Wood Casework

NON-LAB EQUIPMENT
None

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
73˚F ± 3˚F
Humidity
N/A
10 Air Changes / Hour

HOODS
6' Chemical Fume Hood

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

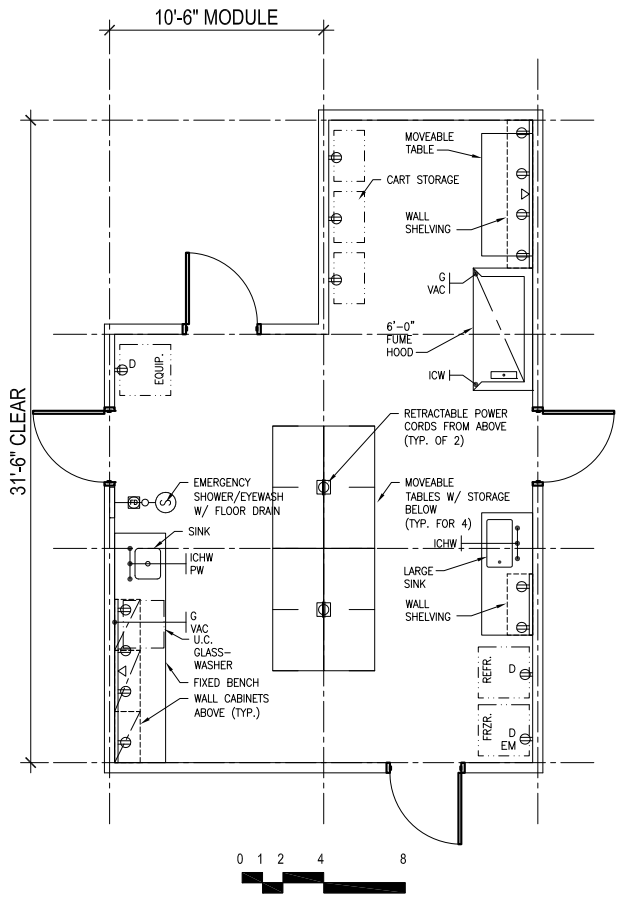
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
75 fc at Bench/Desk

NOTES
None

A602

PREP ROOM

AREA: 446 NSF



A603

LAB MANAGER'S OFFICE

AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Students: 0
  - Faculty/Staff: 1

LOCATION | ADJACENCIES
- A601 Teaching Lab
- A602 Prep Room

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- None

LABORATORY CASEWORK
- None

NON-LAB EQUIPMENT
- None

FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

HOODS
- None

PIPED SERVICES
- None

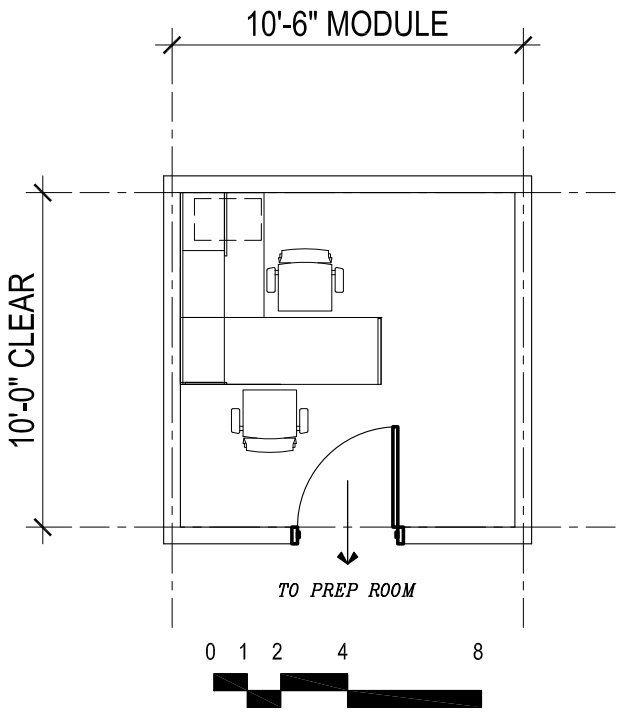
ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting
  - Fluorescent Parabolic

NOTES
- None

A603

LAB MANAGER'S OFFICE

AREA: 100 NSF



A604
SPECIMEN STORAGE ROOM
AREA: 323 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 1

LOCATION | ADJACENCIES
None

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
None

LABORATORY CASEWORK
Epoxy resin bench top
Wood casework

NON-LAB EQUIPMENT
None

FURNISHINGS
None

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
None

PIPED SERVICES
None

ELECTRICAL
120V / 20A / 1 Phase

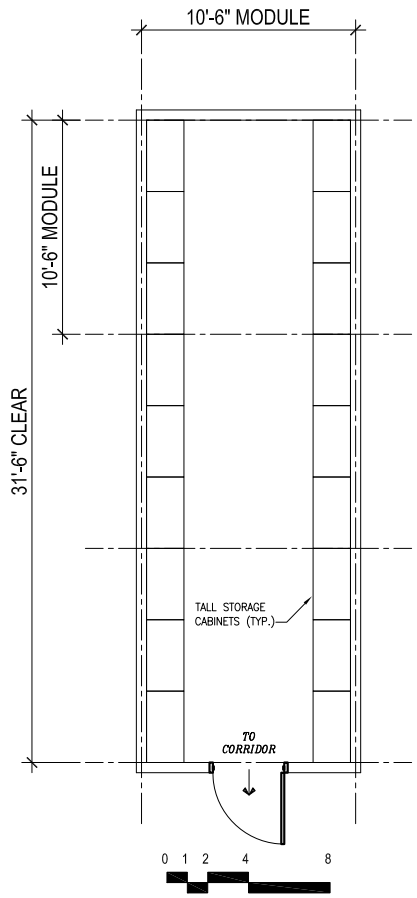
Lighting level
- 75 fc

NOTES
None

A604

SPECIMEN STORAGE ROOM

AREA: 323 NSF



A605
SCIENCE METHODS LAB
AREA: 1307 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 16
- Faculty/Staff: 1

LOCATION | ADJACENCIES
None

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"
- 3'-0" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
None

LABORATORY CASEWORK
Epoxy Resin Bench Top and sinks
Wood Casework
Metal Casework under fume hood

NON-LAB EQUIPMENT
White board
Projector

FURNISHINGS
Fixed Casework
Moveable Tables

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
6' Chemical Fume Hood
Snorkels

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

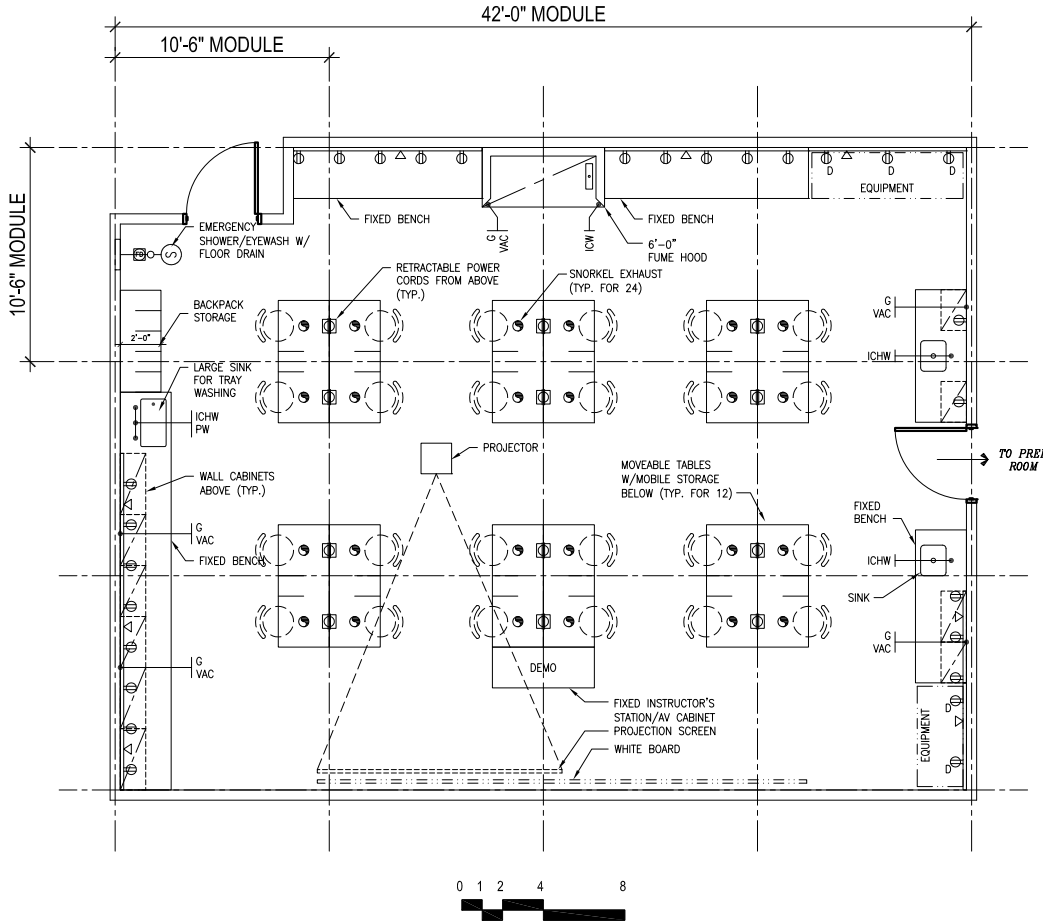
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

NOTES
- Camera and Sound System required for video taping

A605

SCIENCE METHODS LAB

AREA: 1307 NSF



A606
A607
A608

RESEARCH SPACE

(INCLUDING EQUIPMENT SPACE AND INSTRUMENT SPACE)

AREA: 900 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Students: 8
  - Faculty/Staff: 0

LOCATION | ADJACENCIES
- None

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-6" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK
- Epoxy Resin Bench Top and sinks
- Wood Casework
- Metal Casework under fume hood

NON-LAB EQUIPMENT
- None

FURNISHINGS
- Fixed Casework
- Moveable Tables

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour

HOODS
- 6' Chemical Fume Hood

PIPED SERVICES
- Laboratory Gas (G)
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Task Lighting
- Lighting Level
  - 100 fc at Bench/Desk

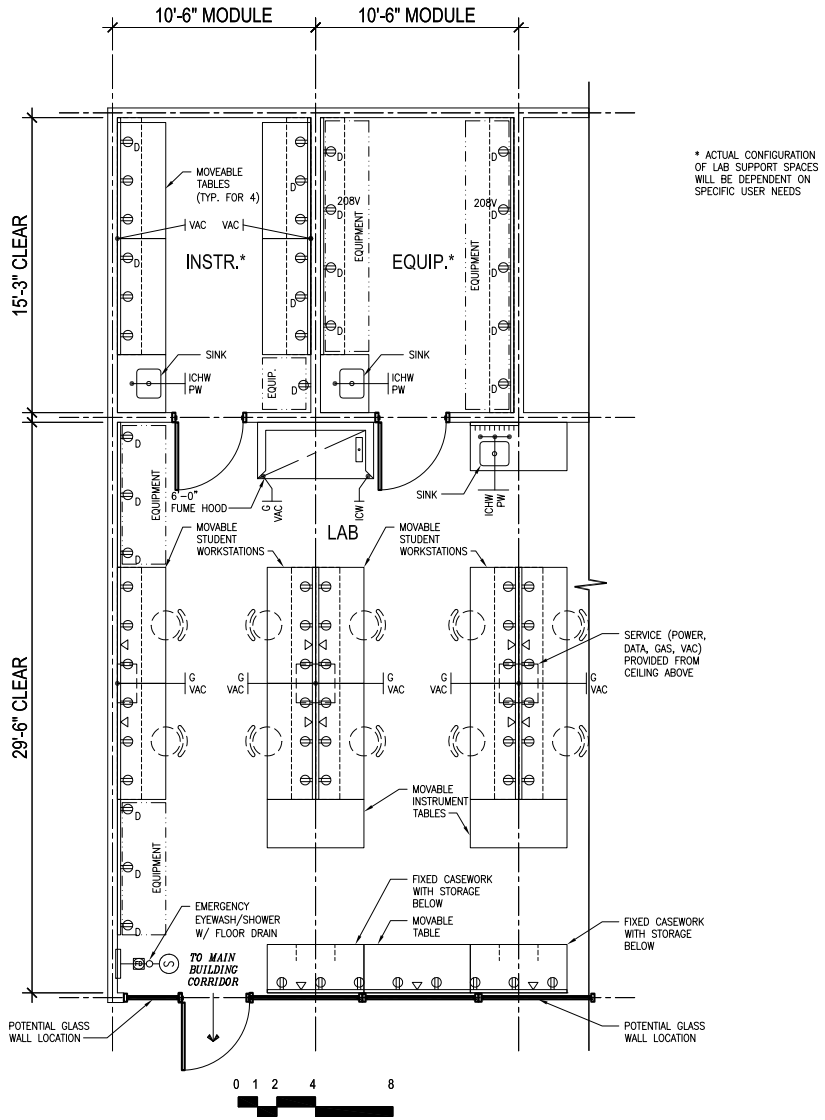
NOTES
- Assumes 8 workstations

A606
A607
A608

RESEARCH SPACE

(INCLUDING EQUIPMENT SPACE AND INSTRUMENT SPACE)

AREA: 900 NSF



* ACTUAL CONFIGURATION OF LAB SUPPORT SPACES WILL BE DEPENDENT ON SPECIFIC USER NEEDS

A609

LAB MANAGER'S OFFICE

AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Students: 0
  - Faculty/Staff: 1

LOCATION | ADJACENCIES
- A101 Intro to Biotech Lab
- A102 Prep Room

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- None

LABORATORY CASEWORK
- None

NON-LAB EQUIPMENT
- None

FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

HOODS
- None

PIPED SERVICES
- None

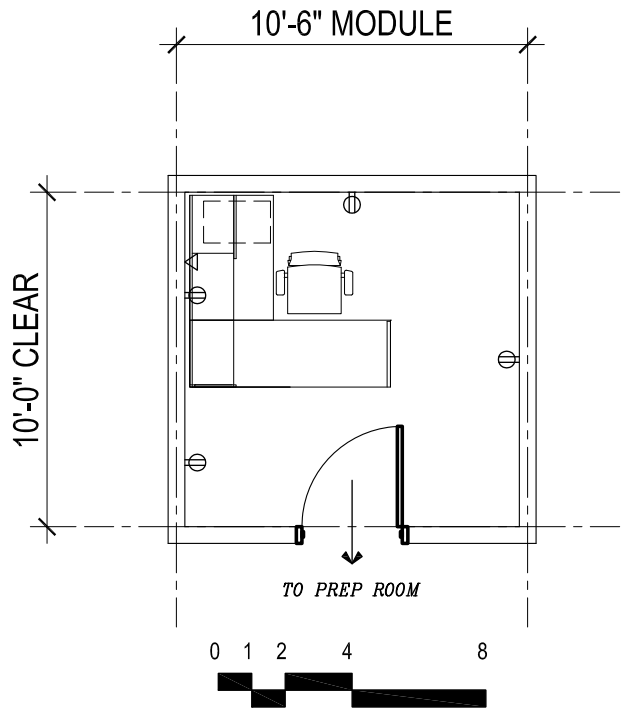
ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting
  - Fluorescent Parabolic

NOTES
- None

A609

LAB MANAGER'S OFFICE

AREA: 100 NSF



A610
WET LAB / DRY LAB
AREA: 600 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 8
- Faculty/Staff: 1

LOCATION | ADJACENCIES
None

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"
- 3'-0" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 1 Freezer
- 1 Centrifuge
- 1 Double door deli case

LABORATORY CASEWORK
Epoxy Resin Bench Top and sinks
Wood Casework
Metal Casework under fume hood

NON-LAB EQUIPMENT
None

FURNISHINGS
Fixed Casework
Moveable Tables

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
6' Chemical Fume Hood

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

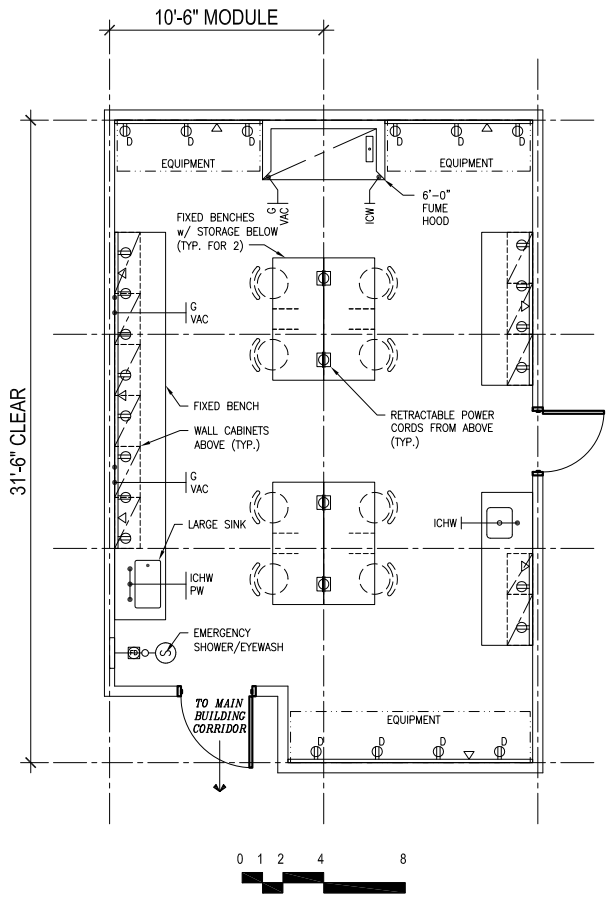
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Task Lighting
Lighting Level
- 100 fc at Bench/Desk

NOTES
None

A610

WET LAB / DRY LAB

AREA: 600 NSF



A611
SPECIMEN STORAGE ROOM
AREA: 500 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 1

LOCATION | ADJACENCIES
None

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
None

LABORATORY CASEWORK
Tall Storage Cabinets

NON-LAB EQUIPMENT
None

FURNISHINGS
None

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
None

PIPED SERVICES
None

ELECTRICAL
120V / 20A / 1 Phase

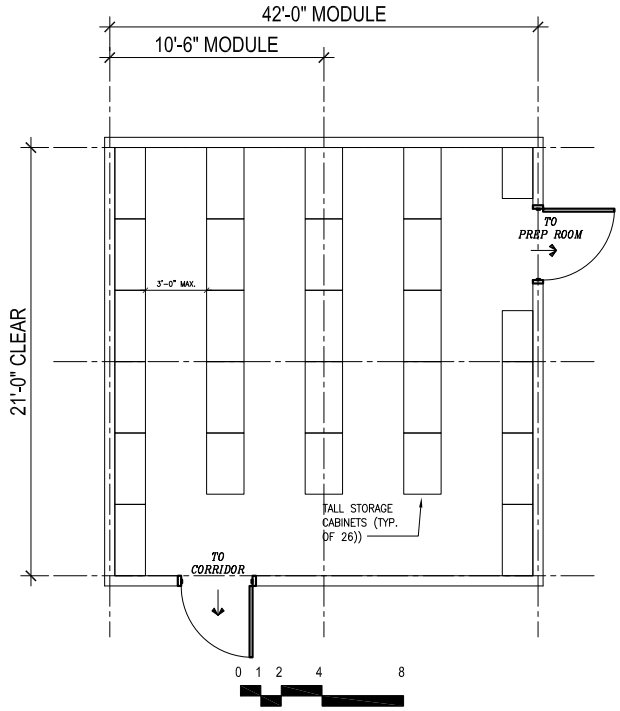
Lighting Level
- 75 fc

NOTES
None

A611

SPECIMEN STORAGE ROOM

AREA: 500 NSF



Code	Department / Space Name	Qty.	NSF/ Space	Total NSF	Non Research NSF	Research NSF	GSF	Remarks
A700	MICROBIOLOGY							
A701	Adv./Gen. Micro Teaching Lab	1	1,307	1,307			2,011	
A702	Environmental Room	1	162	162			249	
A703	Lab Manager's Office	1	100	100			154	
					1,569			
A704	Intro to Micro Teaching Lab	1	1,307	1,307			2,011	
A705	Storage	1	223	223			343	
					1,530			
A706	Pre-Health/Micro Teaching Lab	1	1,307	1,307			2,011	
A707	Lab Manager's Office	1	100	100			154	
					1,407			
A708	Virology Teaching Lab	1	977	977			1,503	
A709	Prep Room	1	720	720		720	1,108	
A710	Lab Manager's Office	1	100	100			154	
					1,077			
A711	Prep Room	1	700	700			1,077	
A712	Glass Washing/Autoclave Room	1	500	500			769	Includes general autoclave (counts as one of required)
A713	Environmental Room	1	162	162			249	
A714	Storage	1	162	162			249	
					1,524			
A715	Personnel/Service Circulation	1	1,000	1,000			1,538	
					1,000			
				8,827	8,107	720	13,580	

Notes

- All rooms in Microbiology should be designed to allow bsl-3.

A701
ADVANCED/ GENERAL MICRO TEACHING LAB

AREA: 1307 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 24
- Faculty Staff: 1

LOCATION/ADJACENCIES
None

ARCHITECTURAL
Windows
- Interior: desired; window coverings required
- Exterior: desired

Floor
- VCT (Chemical resistant)

Partitions
- Gyp board, paint

Base
- 4" vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-0" x 7'-0"
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 4 incubators
- 1 Double-door deli case
- 1 Glovebox

LABORATORY CASEWORK
Epoxy resin bench top and sinks
Wood Casework

NON-LAB EQUIPMENT
White board
Projector

FURNISHINGS
Fixed Casework
Moveable tables

MECHANICAL
Temperature
- 72°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
6' Biological Safety Cabinet
- -Type II/B2

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

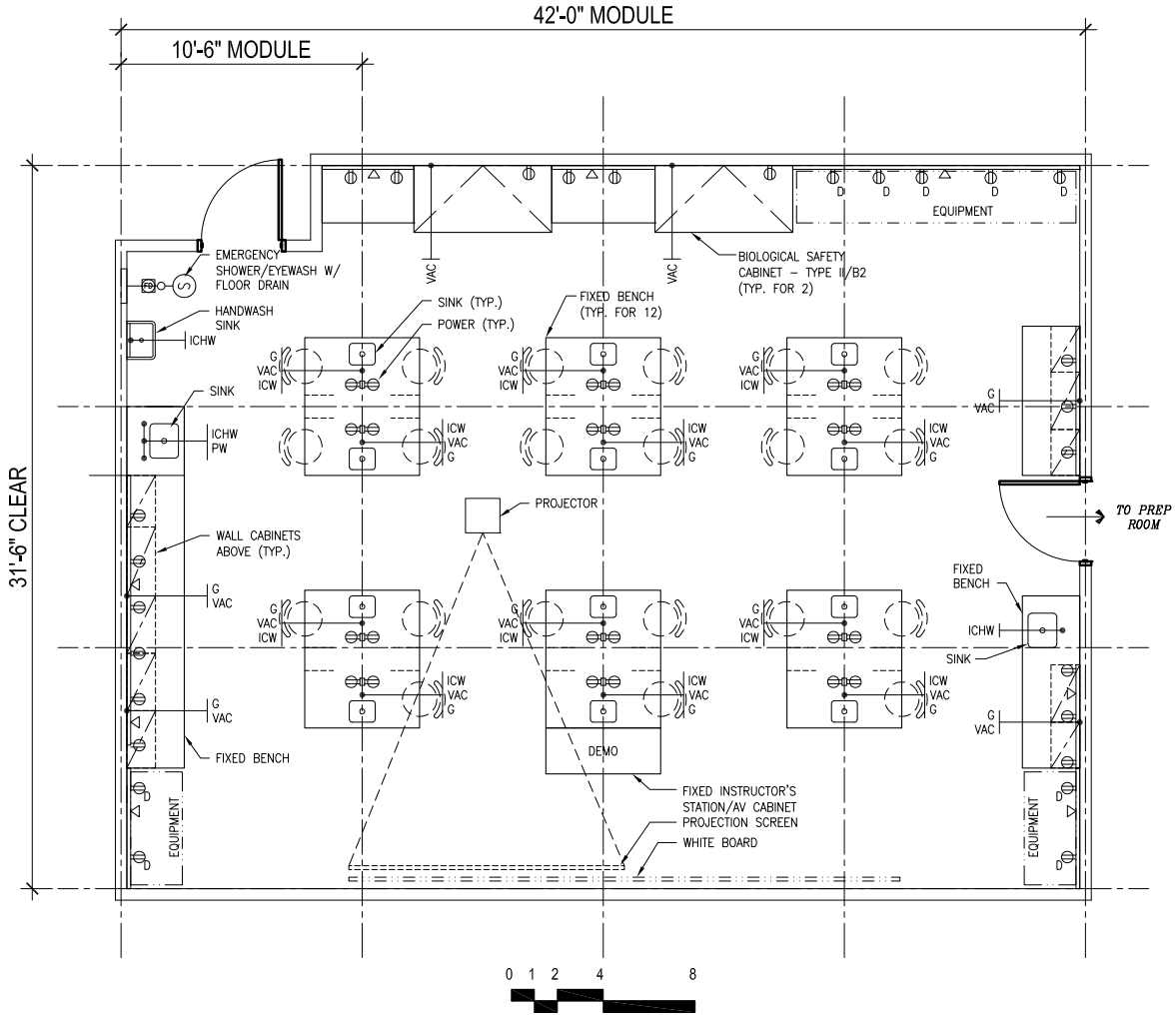
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

NOTES
-Part of BSL-3 suite
-Backpack storage required outside room

A701

ADVANCED/ GENERAL MICRO TEACHING LAB

AREA: 1307 NSF



A702
ENVIRONMENTAL ROOM

AREA: 162 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty: 1

ARCHITECTURAL

Windows
- None desired

Floor
- Welded Seam Sheet Vinyl

Partitions
- Pre-Fabricated, Aluminum

Base
- Integral with floor

Ceiling
- Anodized Aluminum, Egg crate

Doors
- 3'-0" x 7'-0"

Security
- Controlled Access

LABORATORY CASEWORK

Stainless Steel Tops
Stainless Steel Casework

FURNISHINGS

Fixed Casework

MECHANICAL

Temperature
- 4°C ± 0.5°C

Humidity
- N/A

1 Air Changes / Hour

PIPED SERVICES

Industrial Hot Water (IHW)
Industrial Cold Water (ICW)

ELECTRICAL

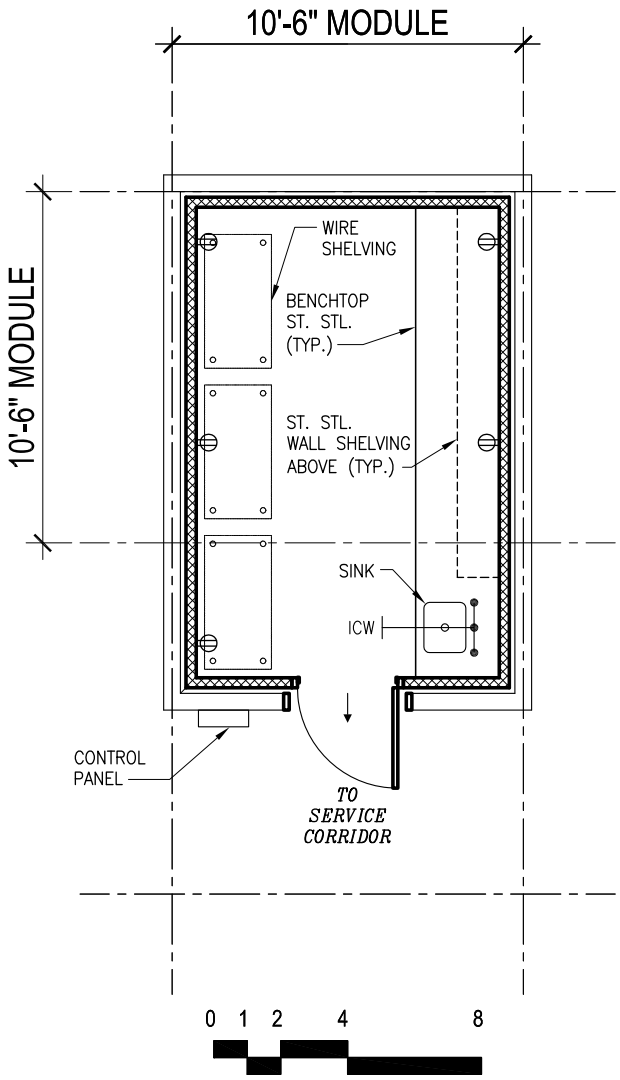
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

NOTES

Part of BSL-3 suite

A702
ENVIRONMENTAL ROOM

AREA: 162 NSF



A703
LAB MANAGER'S OFFICE
AREA: 100 NSF

UTILIZATION
Hours of Use
14 hours / day
Hours of Operation
14 hours / day

LOCATION/ADJACENCIES
A701 Advanced/General Micro Teaching Lab
A702 Environmental Room
A705 Storage

ARCHITECTURAL
Windows
Windows
Interior: desired; window coverings required
Exterior: desired
Floor
Carpet
Partitions
Gyp board, paint
Base
4" Vinyl
Ceiling
Acoustic tile
Doors
3'-0" x 7'-0"
Security
Controlled Access

LABORATORY CASEWORK
None

FURNISHINGS
Desk
Desk Chair
File Cabinet(s)
Bookcase(s)

MECHANICAL
Temperature
72°F ± 2°F
Humidity
N/A
1 Air Changes / Hour

HOODS
None

PIPED SERVICES
None

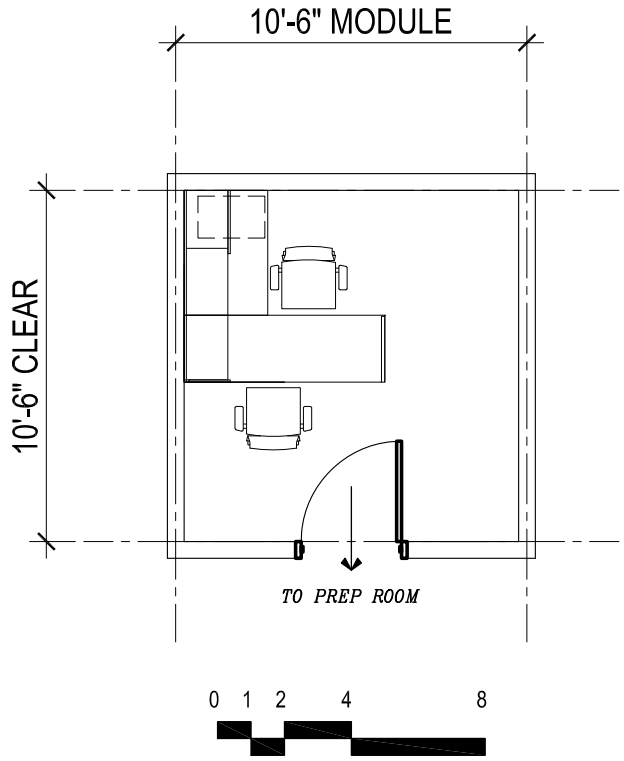
ELECTRICAL
120V / 20A / 1 Phase
Phone
Data
Lighting
Fluorescent Parabolic

NOTES
Part of BSL-3 suite

A703

LAB MANAGER'S OFFICE

AREA: 100 NSF



A704
INTRO TO MIRCO TEACHING LAB
AREA: 1307 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1
- Students - 24

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 4 Incubators

1 Double-door deli case

LABORATORY CASEWORK
Epoxy Resin Bench Top and sinks
Wood Casework

NON-LAB EQUIPMENT
White Board
Projector

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
6' Biological Safety Cabinet - Type II/B2

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

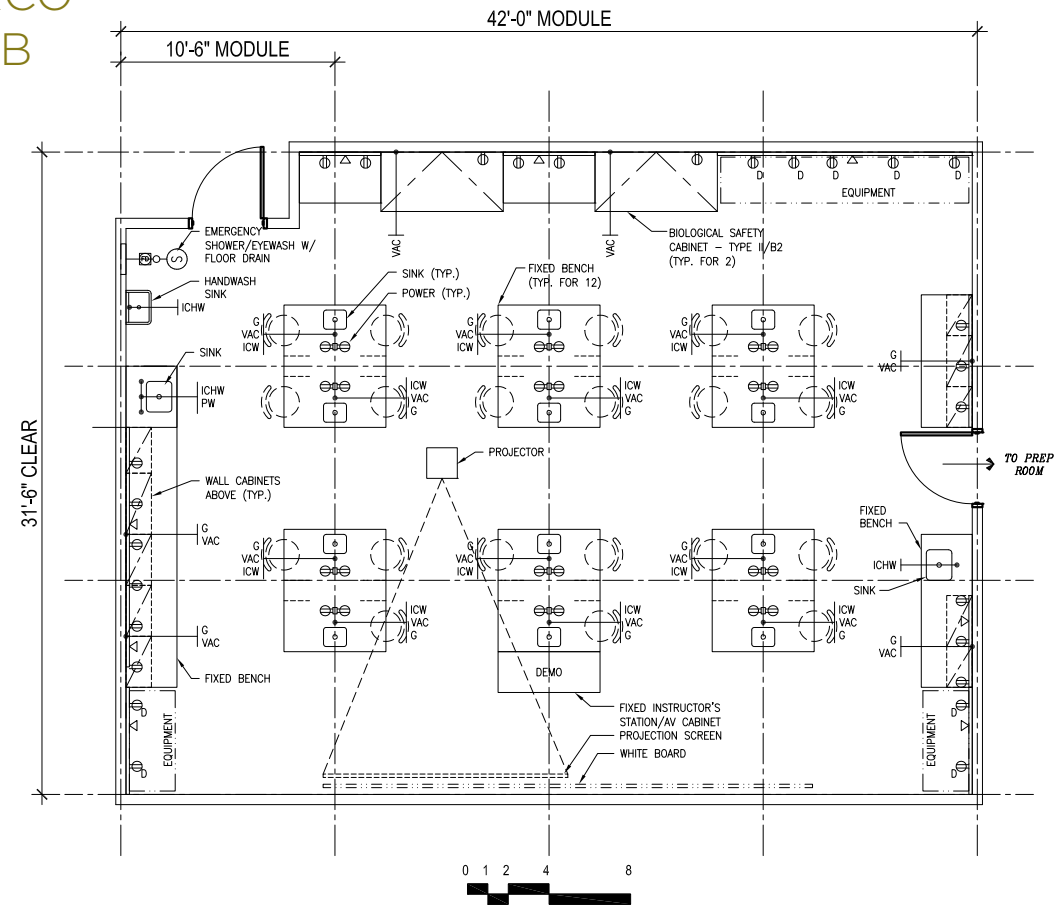
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

NOTES
-Part of BSL-3 suite
-Back pack storage required outside of room

A704

INTRO TO MIRCO TEACHING LAB

AREA: 1307 NSF



A705
STORAGE
AREA: 223 NSF

UTILIZATION
Hours of Use
14 hours / day
Hours of Operation
14 hours / day

LOCATION / ADJACENCIES
A704 Intro to Micro Teaching Lab

ARCHITECTURAL
Windows
Interior: Desired
Window Coverings Required
Exterior: Desired
Floor
VCT (Chemical Resistant)
Partitions
Gyp Board, Paint
Base
4" Vinyl
Ceiling
Acoustic Tile
Doors
3'-6" x 7'-0"
Security
Controlled Access

LABORATORY CASEWORK
Tall Storage Cabinets

MECHANICAL
Temperature
60°F - 90°F
Humidity
N/A

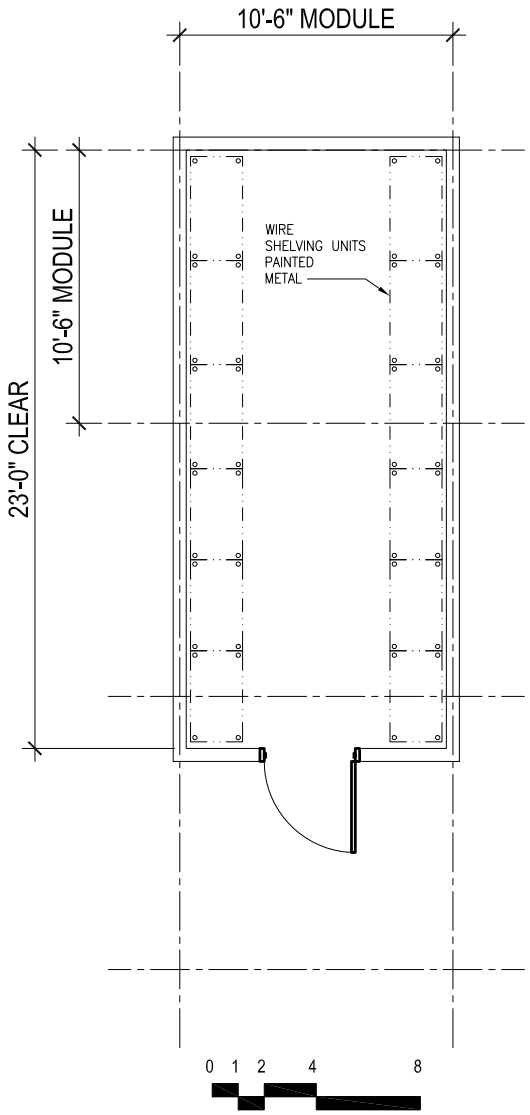
ELECTRICAL
120V / 20A / 1 Phase
Lighting Level
75 fc

NOTES
-Part of BSL-3 suite

A705

STORAGE

AREA: 223 NSF



A706

PRE-HEALTH/ MIRCO TEACHING LAB

AREA: 1307 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1
- Students - 24

LOCATION / ADJACENCIES
A710 Undergraduate Research

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 4 Incubators
- 1 Double-door deli case

LABORATORY CASEWORK
Epoxy Resin Bench Top
Wood Casework
Metal Casework

NON-LAB EQUIPMENT
White Board
Projector

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
6' Biological Safety Cabinet - Type II/B2

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

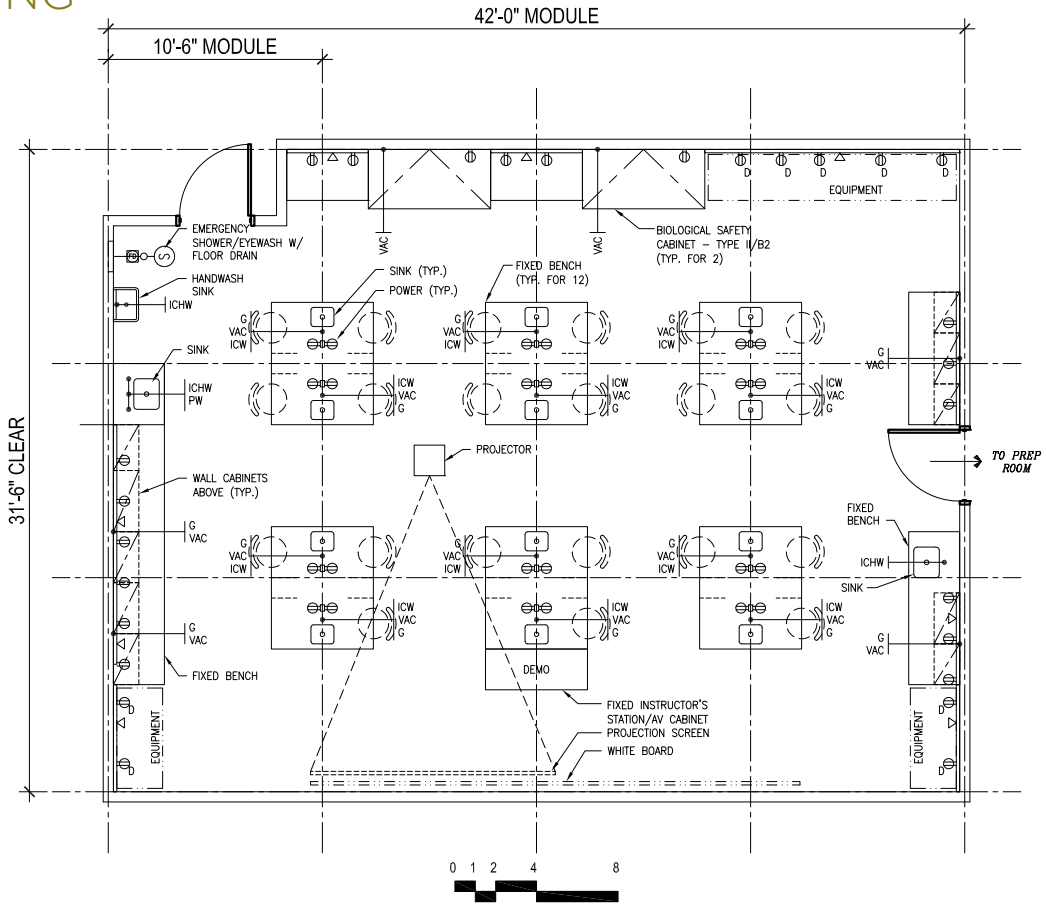
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

NOTES
-Part of BSL-3 suite
-Back pack storage required outside of room

A706

PRE-HEALTH/ MIRCO TEACHING LAB

AREA: 1307 NSF



A707
LAB MANAGER'S OFFICE
AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1

LOCATION / ADJACENCIES
- A706 Pre-Health/Micro Teaching Lab

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

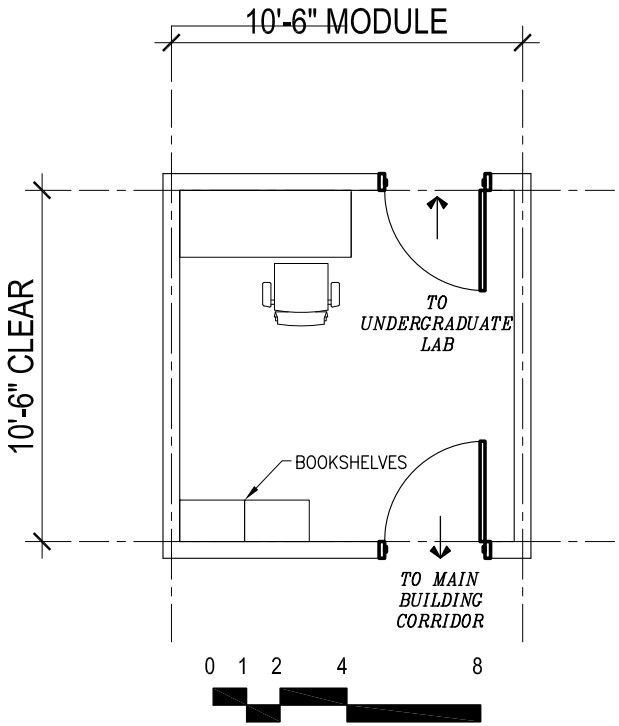
ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting Level
  - Fluorescent Parabolic

NOTES
- Part of the BSL-3 suite

A707

LAB MANAGER'S OFFICE

AREA: 100 NSF



A708
VIROLOGY TEACHING LAB
AREA: 977 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1
- Students - 16

LOCATION / ADJACENCIES
A709 Prep Room
A710 Lan Manager's Office
A711 Prep Room
A719 Glass Washing/Autoclave Room

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 1 Refrigerator
- 1 Freezer

LABORATORY CASEWORK
Epoxy Resin Bench Top and sinks
Wood Casework

NON-LAB EQUIPMENT
White Board
Projector

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

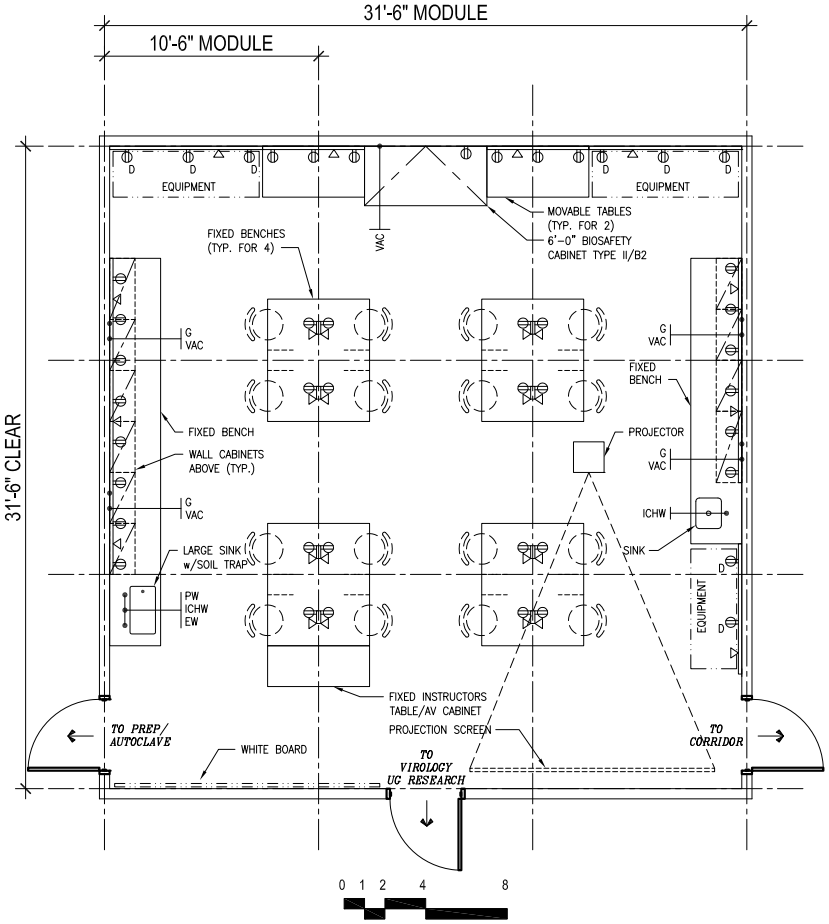
HOODS
6' Biological Safety Cabinet - Type II/B2

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
120V / 20A / 1 Phase
210V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

NOTES
-Part of BSL-3 Suite
-Backpack storage required outside of room

A708
VIROLOGY TEACHING LAB
AREA: 977 NSF



A709
PREP ROOM
AREA: 720 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

LOCATION / ADJACENCIES
A713 Virology Teaching Lab

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 1 Refrigerator (each room)
- 1 Freezer (each room)
- 1 Incubator (each room)

LABORATORY CASEWORK
Epoxy Resin Bench Top and sink
Wood Casework

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
4' Biological Safety Cabinets - Type II/B2

PIPED SERVICES
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)

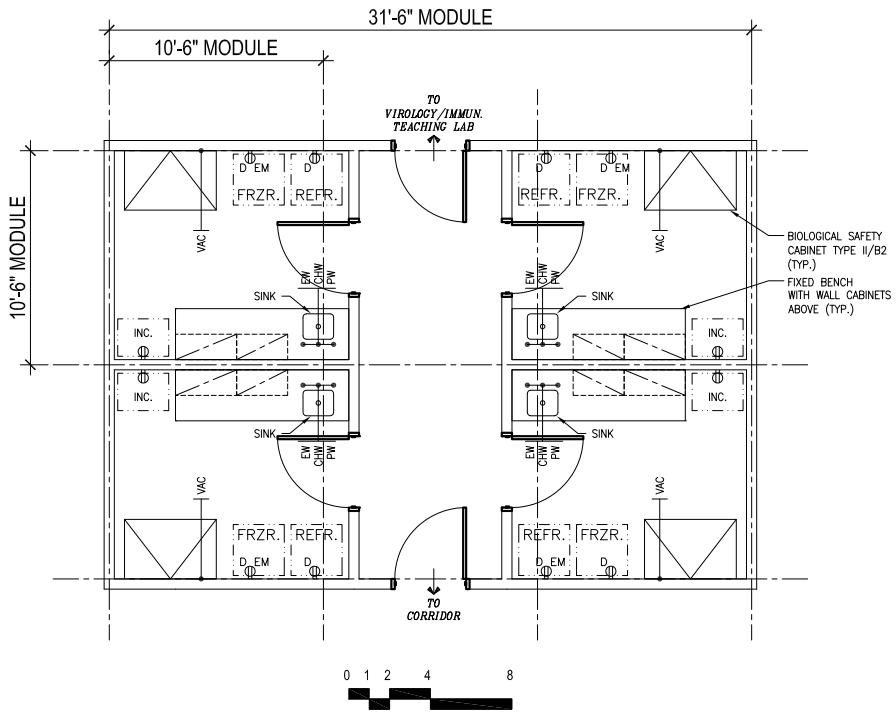
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

NOTES
-Part of BSL-3 Suite

A709

PREP ROOM

AREA: 720 NSF



A710
LAB MANAGER'S OFFICE
AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1

LOCATION / ADJACENCIES
- A708 Virology Teaching Lab
- A709 Prep Lab

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

MECHANICAL
- Temperature
  - 73˚F ± 3˚F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

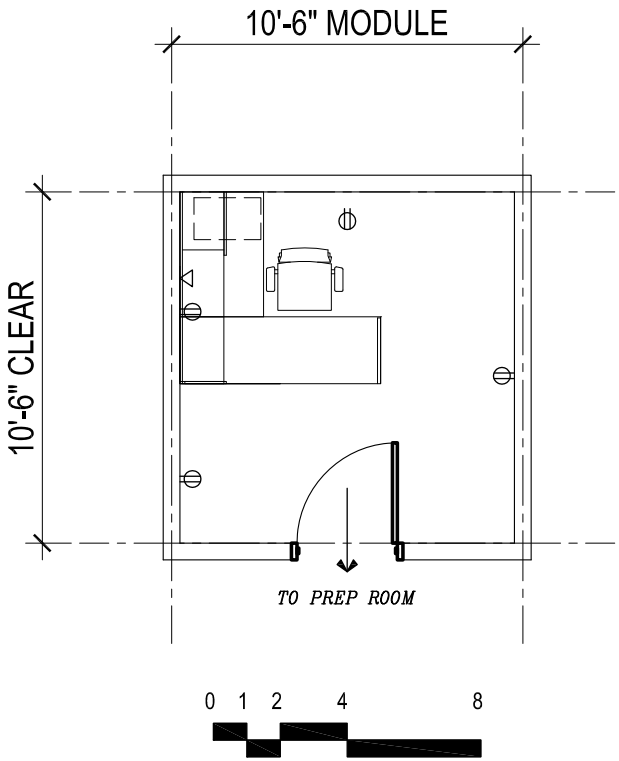
ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting Level
  - Fluorescent Parabolic

NOTES
-Part of BSL-3 Suite

A710

LAB MANAGER'S OFFICE

AREA: 100 NSF



A711
PREP ROOM
AREA: 700 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK
Epoxy Resin Bench Top and sinks
Wood Casework
Metal Casework under fume hood

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
4' Chemical Fume Hood
4' Biological Safety Cabinet - Type II/B2

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

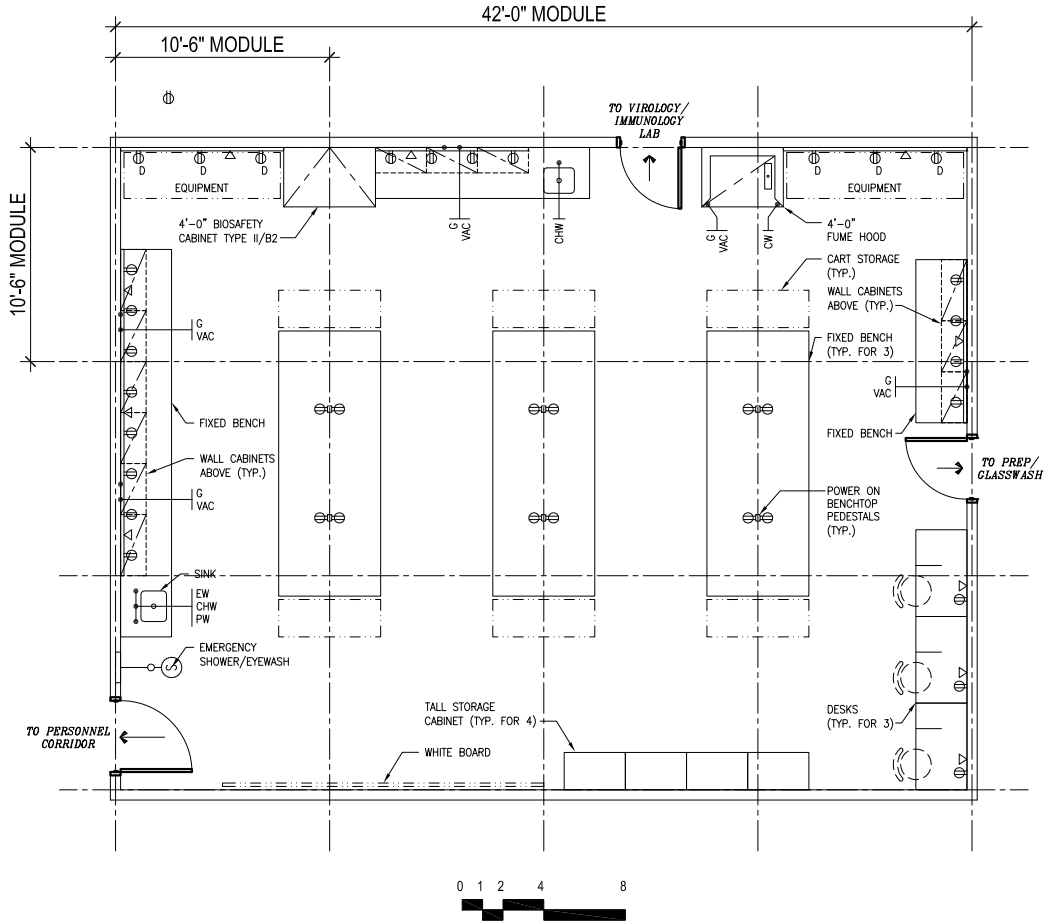
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

NOTES
-Part of BSL-3 Suite

A711

PREP ROOM

AREA: 700 NSF



A712

GLASS WASHING/ AUTOCLAVE ROOM

AREA: 500 NSF

UTILIZATION
Hours of Use
14 hours / day
Hours of Operation
14 hours / day
Capacity
Faculty/Staff - 0

LOCATION / ADJACENCIES
Accessible by all Labs on floor

ARCHITECTURAL
Windows
Not required
Floor
Welded Seam Sheet Vinyl
Partitions
Gyp Board, Paint
Base
Integral with floor
Ceiling
Acoustic Tile
Doors
3'-6" x 7'-0"
Security
Controlled Access

LABORATORY EQUIPMENT
Scullery Sink
20"x20"x38" sterilizer w/ Integral Steam Generator
Glassware washer/dryer

LABORATORY CASEWORK
Epoxy Resin Bench Top and sinks
Wood Casework

NON-LAB EQUIPMENT
None

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
73°F ± 3°F
Humidity
N/A
10 Air Changes / Hour

HOODS
Canopy Hood

PIPED SERVICES
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Floor Sink (FS)

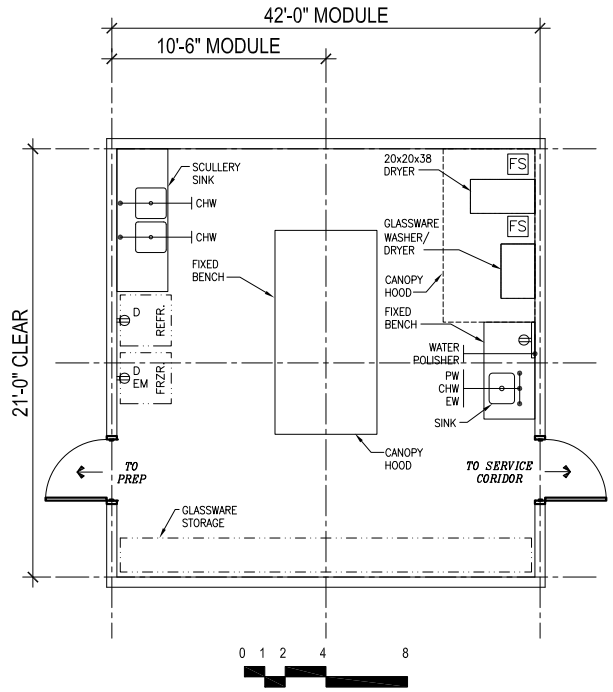
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
75 fc at Bench/Desk

NOTES
-Part of BSL-3 Suite

A712

GLASS WASHING/ AUTOCLAVE ROOM

AREA: 500 NSF



A713
ENVIRONMENTAL ROOM
AREA: 162 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

ARCHITECTURAL
Windows
- None desired

Floor
- Recessed; Welded Seam Sheet Vinyl

Partitions
- Pre-Fabricated, Aluminum

Base
- Integral with floor

Ceiling
- Anodized Aluminum, Egg crate

Doors
- 3'-0" x 7'-0"

Security
- Controlled Access

LABORATORY CASEWORK
Stainless Steel Tops
Stainless Steel Casework

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 40°F ± 1°F

Humidity
- N/A

1 Air Changes / Hour

PIPED SERVICES
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)

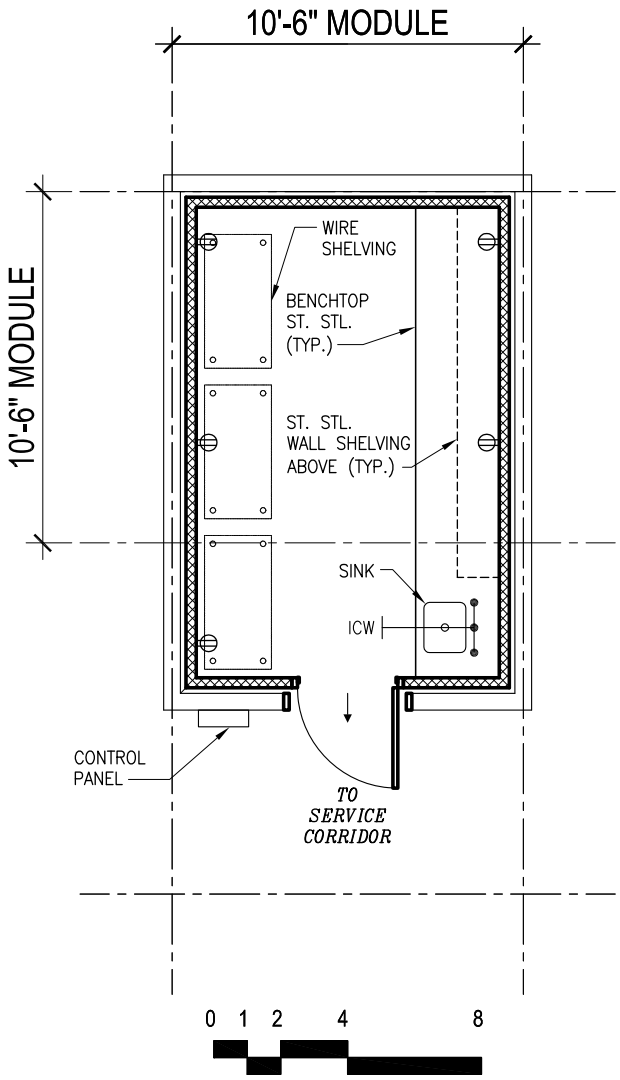
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

NOTES
-Part of BSL-3 Suite

A713

ENVIRONMENTAL ROOM

AREA: 162 NSF



A714
STORAGE
AREA: 162 NSF

UTILIZATION
Hours of Use
14 hours / day
Hours of Operation
14 hours / day

ARCHITECTURAL
Windows
Interior: Desired
Window Coverings Required
Exterior: Desired
Floor
VCT (Chemical Resistant)
Partitions
Gyp Board, Paint
Base
4" Vinyl
Ceiling
Acoustic Tile
Doors
3'-6" x 7'-0"
Security
Controlled Access

LABORATORY CASEWORK
Tall Storage Cabinets

MECHANICAL
Temperature
60°F - 90°F
Humidity
N/A
10 Air Changes / Hour

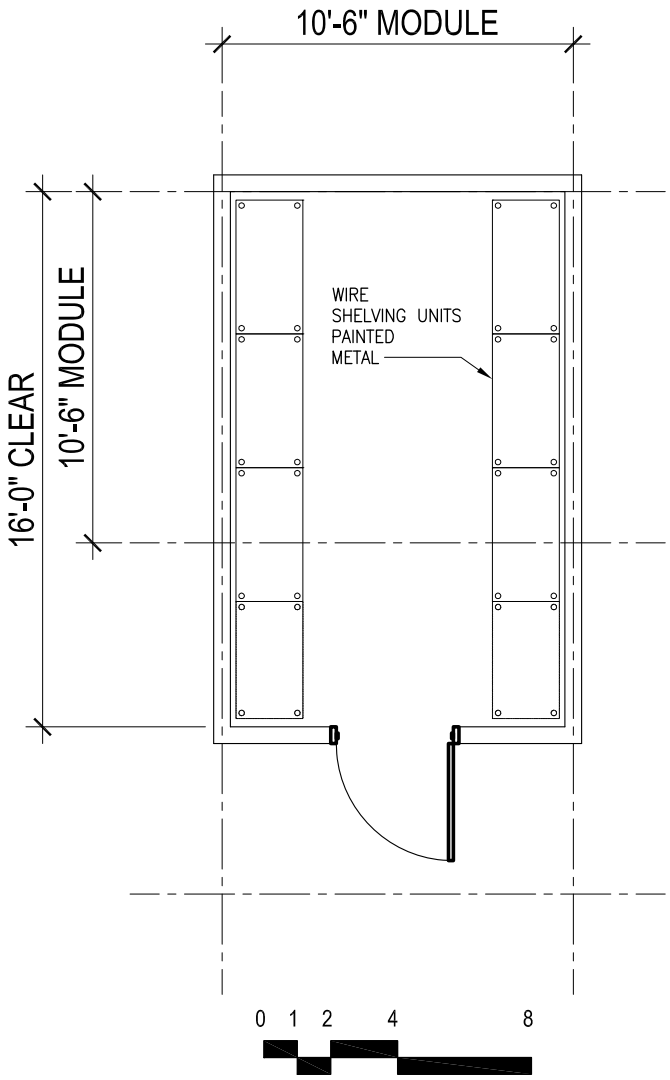
ELECTRICAL
120V / 20A / 1 Phase
Lighting Level
75 fc

NOTES
-Part of BSL-3 Suite

A714

STORAGE

AREA: 162 NSF



A715

PERSONNEL/ SERVICE CIRCULATION

AREA: 1000 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- None

Security
- Controlled Access

LABORATORY CASEWORK

Tall Storage Cabinets

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

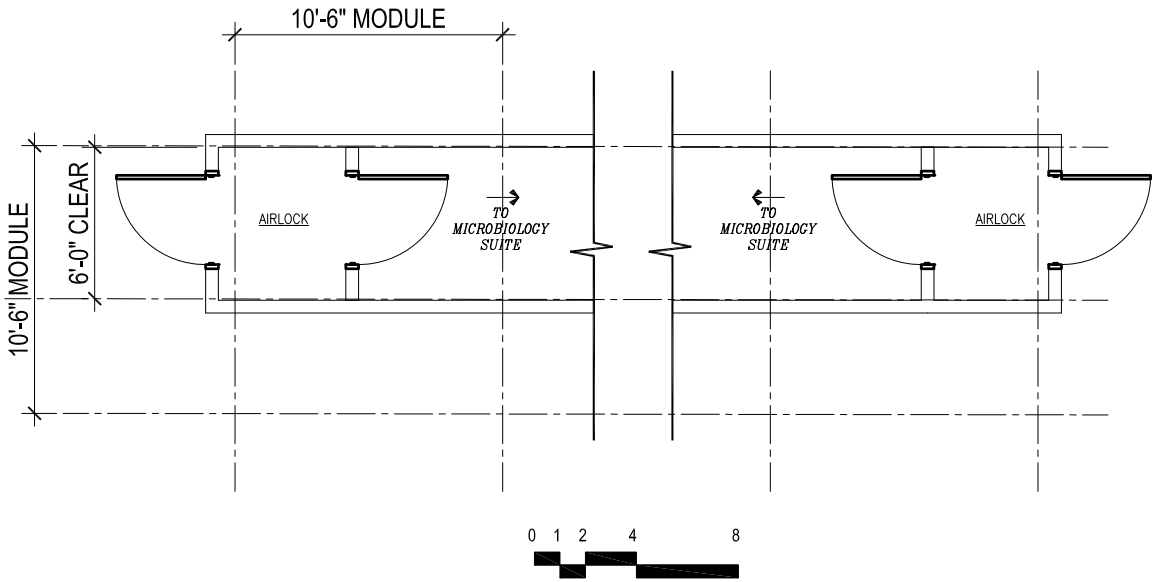
NOTES

-Part of BSL-3 Suite
-Includes airlock

A715

PERSONNEL/ SERVICE CIRCULATION

AREA: 1000 NSF



Code	Department / Space Name	Qty.	NSF/ Space	Total NSF	Non Research NSF	Research NSF	GSF	Remarks
A800	GENERAL TEACHING LAB							
A801	Biology Teaching Lab	1	1,307	1,307			2,011	
A802	Prep Lab	1	323	323			497	
					1,630			
A803	Balance Room	1	223	223			343	Slab-on-grade location
A804	Instrument Room	1	100	100			154	
					323			
				1,953	1,953	0	3,005	

A801
BIOLOGY TEACHING LAB
AREA: 1307 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 24
- Faculty / Staff: 1

LOCATION | ADJACENCIES
A802 Prep Lab
A803 Balance Room
A804 Instrument Room

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI)
- 1 Freezer
- 1 Centrifuge
- 1 Double-door deli case

LABORATORY CASEWORK
Fixed Casework

NON-LAB EQUIPMENT
None

FURNISHINGS
None

MECHANICAL
Temperature
- 73˚F ± 3˚F

Humidity
- N/A

10 Air Changes / Hour

HOODS
(1) 4' Chemical Fume Hood
(3) 6' Chemical Fume Hoods

PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

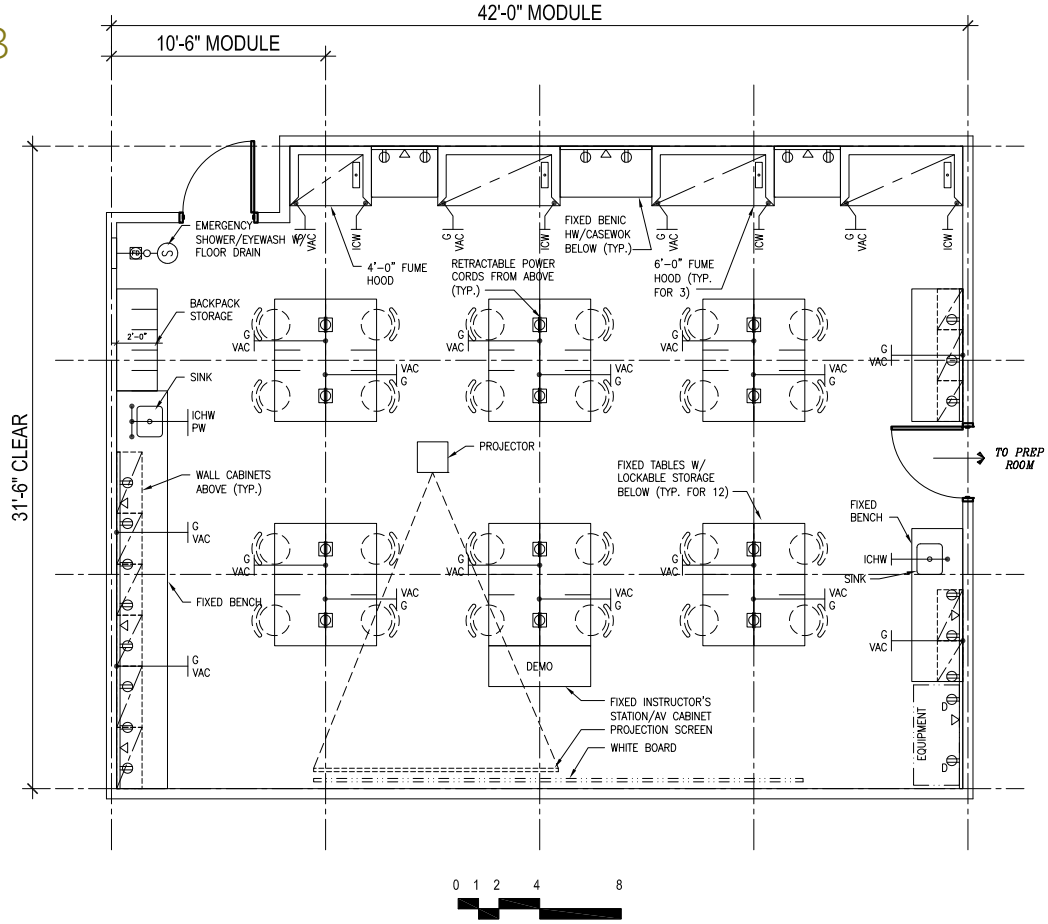
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Task Lighting
Lighting Level
- 100 fc at Bench/Desk

NOTES
- Student storage to be lockable with padlocks

A801

BIOLOGY TEACHING LAB

AREA: 1307 NSF



A802

PREP LAB

AREA: 323 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 1

LOCATION | ADJACENCIES

A801 Biology Teaching Lab

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"
- 3'-0" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI):
- 1 Refrigerator
- 1 Freezer
- 1 Under counter glass washer

LABORATORY CASEWORK

Epoxy Resin Bench Top and sinks
Wood Casework
Metal Casework under fume hood

NON-LAB EQUIPMENT

None

FURNISHINGS

Fixed Casework
Moveable Tables
Tall Storage Cabinets

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS

4' Chemical Fume Hood

PIPED SERVICES

Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

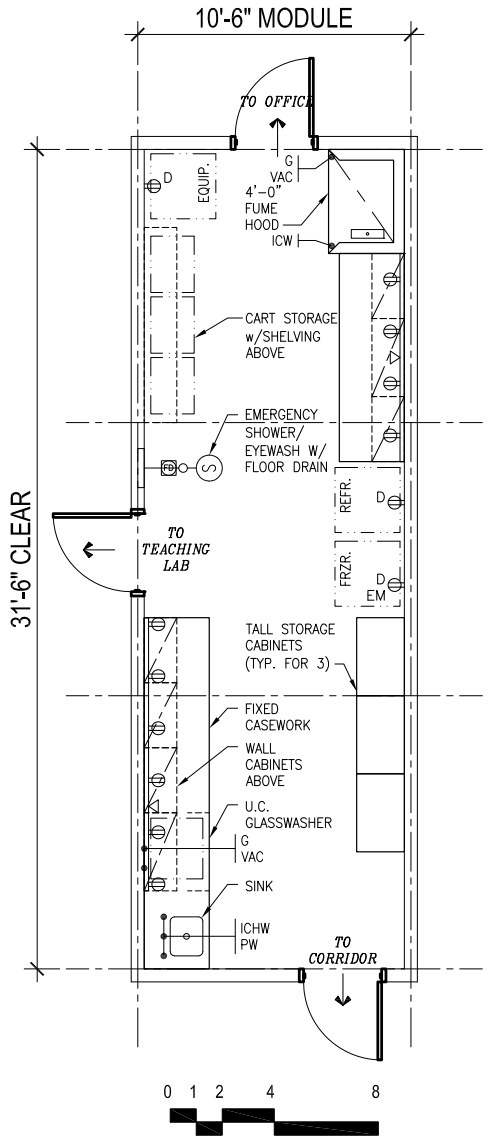
NOTES

None

A802

PREP LAB

AREA: 323 NSF



A803
BALANCE ROOM
AREA: 223 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 0

LOCATION | ADJACENCIES
A801 Biology Teaching Lab

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Vibration Sensitive
Owner Furnished, Owner Installed (OFOI):
- Balancers

LABORATORY CASEWORK
None

NON-LAB EQUIPMENT
None

FURNISHINGS
Tall Storage Cabinets

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

6 Air Changes / Hour (low velocity)
Low air dispersion diffusion

HOODS
None

PIPED SERVICES
None

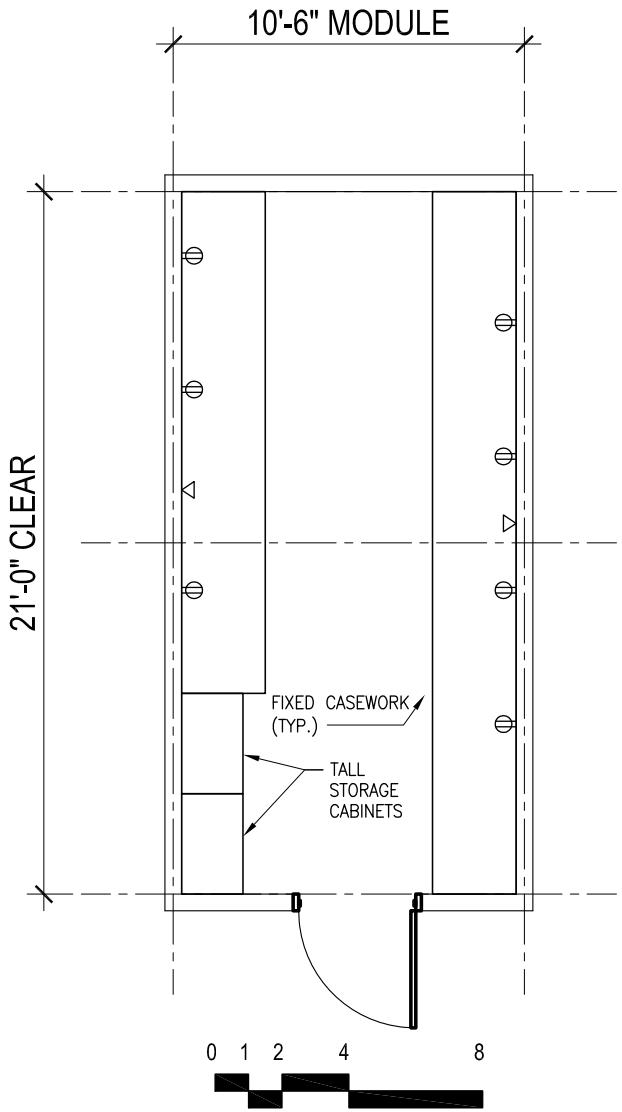
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

NOTES
- Room to be located in basement or on isolation pad for vibration

A803

BALANCE ROOM

AREA: 223 NSF



A804
INSTRUMENT ROOM
AREA: 100 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students: 0
- Faculty/Staff: 0

LOCATION | ADJACENCIES
A801 Biology Teaching Lab

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- AA Unit

LABORATORY CASEWORK
Fixed casework

NON-LAB EQUIPMENT
None

FURNISHINGS
None

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
Stainless Steel Snorkel for AA

PIPED SERVICES
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)

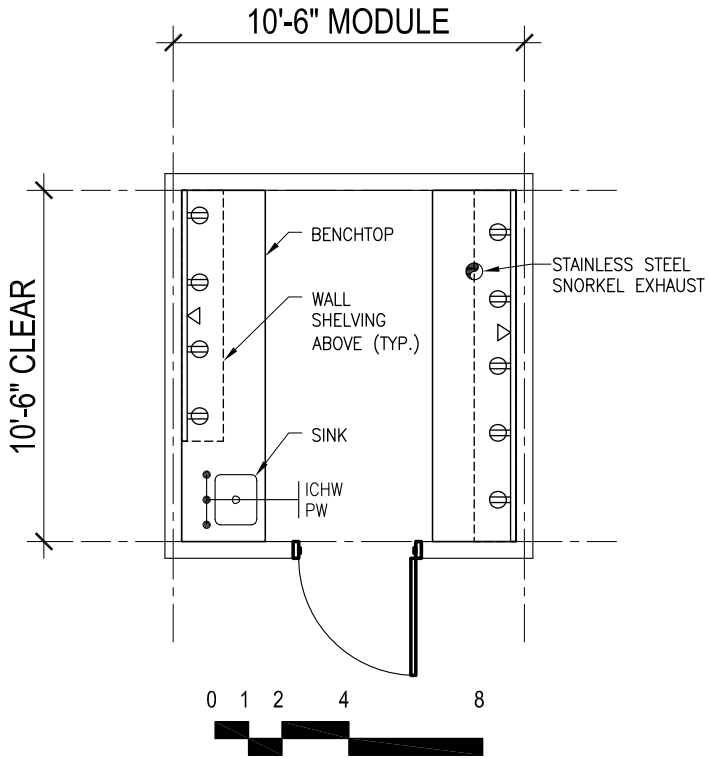
ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting level
- 75 fc at Bench/Desk

NOTES
None

A804

INSTRUMENT ROOM

AREA: 100 NSF



Code	Department / Space Name	Qty.	NSF/ Space	Total NSF	Non Research NSF	Research NSF	GSF	Remarks
A900	ANATOMY/PHYSIOLOGY							
A901	Advanced Cadaver Teaching Lab	2	1,307	2,614			4,022	Sub-dividable
A902	Wet Teaching Prep	1	323	323			497	
A903	Lab Manager's Office	1	100	100			154	
A904	Dry Teaching Lab	2	1,307	2,614			4,022	
A905	Physiology Teaching Lab	2	1,307	2,614			4,022	24 students each
A906	Physiology Prep Lab	1	485	485			746	
A907	Human Performance Lab	1	1,307	1,307			2,011	
A908	Human Performance Storage	1	323	323			497	
					10,380			
A909	Instructor Room	1	100	100			154	
					100			
A910	Undergraduate Research Space	1	480	480			738	
						480		
				10,960	10,480	480	16,862	

A901
ADVANCED CADAVER TEACHING LAB

AREA: 1307 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1
  - Students - 24

LOCATION / ADJACENCIES
- A902 Wet Teaching Prep

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Welded Seam Sheet Vinyl
- Partitions
  - Gyp Board, Paint
- Base
  - Integral with floor
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-6" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI)
- Cadaver Tables with backdraft exhaust

LABORATORY CASEWORK
- Epoxy Resin Bench Top and sinks
- Wood Casework

NON-LAB EQUIPMENT
- White Board
- Projector
- Chalkboard

FURNISHINGS
- Fixed Casework
- Moveable Tables
- Ventilated Base Cabinets

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour

HOODS
- Backdraft Exhaust

PIPED SERVICES
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Emergency Shower / Eyewash (ES / EW)

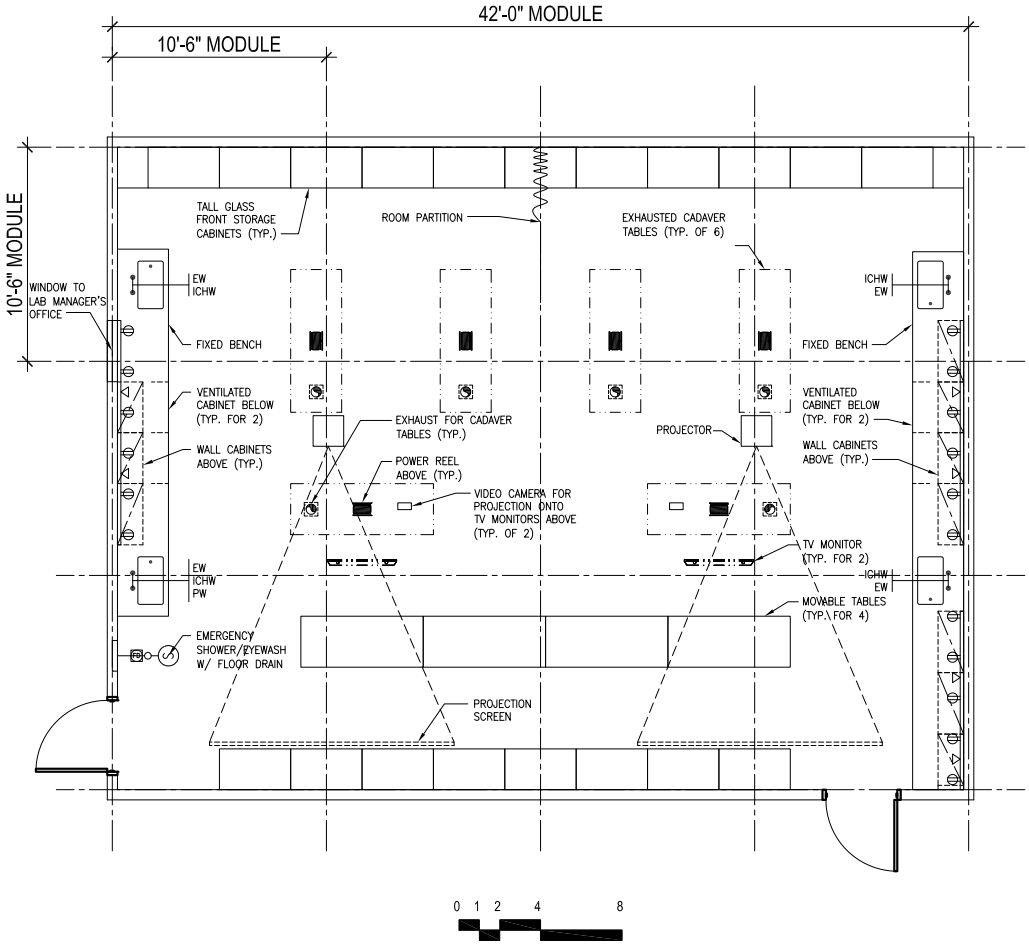
ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - 100 fc at Bench/Desk

NOTES
- -Projector and (2) TV Screens for Demo
- -Security Camera required

A901

ADVANCED CADAVER TEACHING LAB

AREA: 1307 NSF



A902
WET TEACHING PREP
AREA: 323 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Students - 0
- Faculty/Staff - 1

LOCATION / ADJACENCIES
A901 Advanced Cadaver Teaching Lab

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI)
Cadaver Tables

LABORATORY CASEWORK
Epoxy Resin Bench Top and sinks
Wood Casework
Metal Casework under fume hood

NON-LAB EQUIPMENT
None

FURNISHINGS
Fixed Casework
Moveable Tables
Ventilated Base Cabinets

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

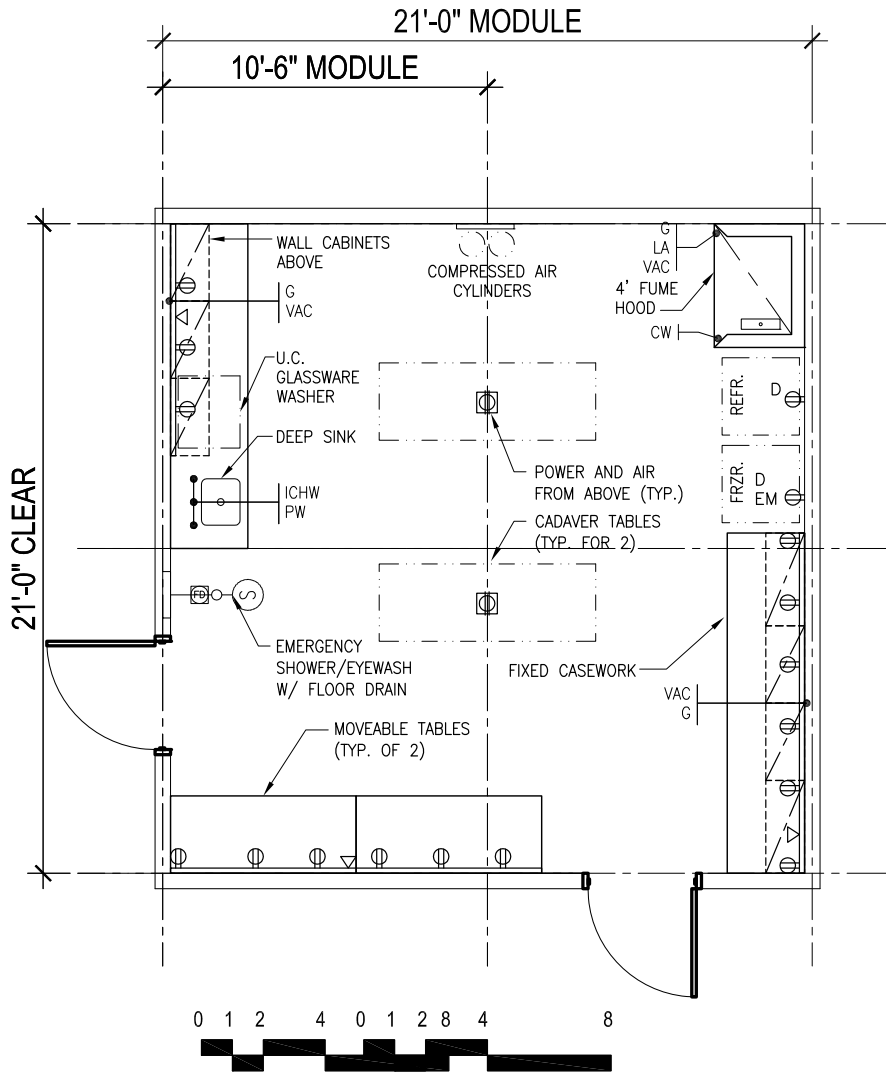
20 Air Changes / Hour

HOODS
4' Chemical Fume Hood

PIPED SERVICES
Laboratory Gas (G)
Lab Air (LA)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Emergency Shower/Eyewash (ES / EW)

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

A902
WET TEACHING PREP
AREA: 323 NSF



A903
LAB MANAGER'S OFFICE
AREA: 100 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1

LOCATION / ADJACENCIES
- A901 Advanced Cadaver Teaching Lab
- A902 Wet Teaching Prep

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

FURNISHINGS
- Desk
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

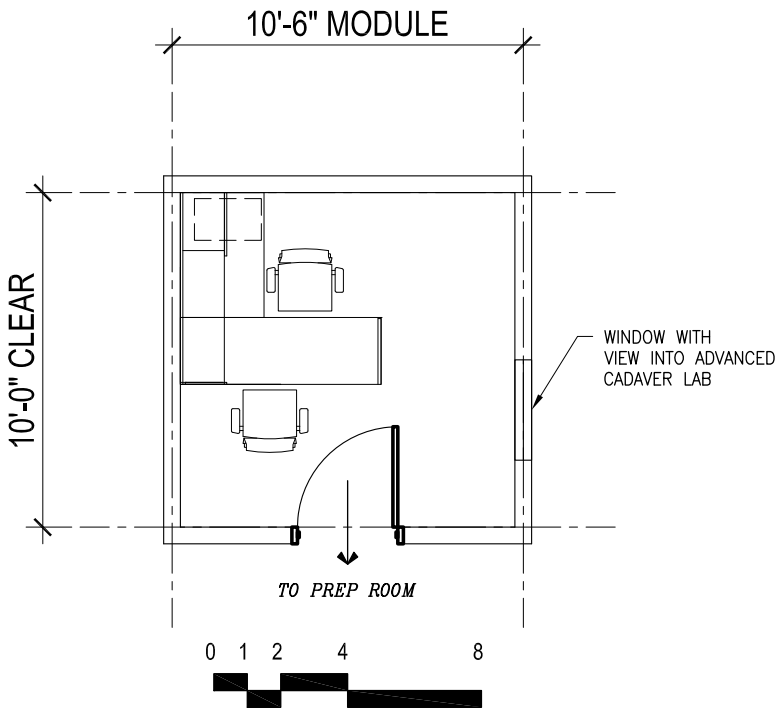
MECHANICAL
- Temperature
  - 73˚F ± 3˚F
- Humidity
  - N/A
- 4-6 Air Changes / Hour

ELECTRICAL
- 120V / 20A / 1 Phase
- Phone
- Data
- Lighting
  - Fluorescent Parabolic

A903

LAB MANAGER'S OFFICE

AREA: 100 NSF



A904

DRY TEACHING LAB

AREA: 1307 SF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1
- Students - 24

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK

- Epoxy Resin Bench Top
- Wood Casework
- Metal Casework

NON-LAB EQUIPMENT

- Chalkboard
- Projector
- Whiteboard

FURNISHINGS

- Fixed Casework
- Moveable Tables
- Ventilated Base Cabinets

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

PIPED SERVICES

- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Emergency Shower / Eyewash (ES / EW)

ELECTRICAL

- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - 100 fc at Bench/Desk

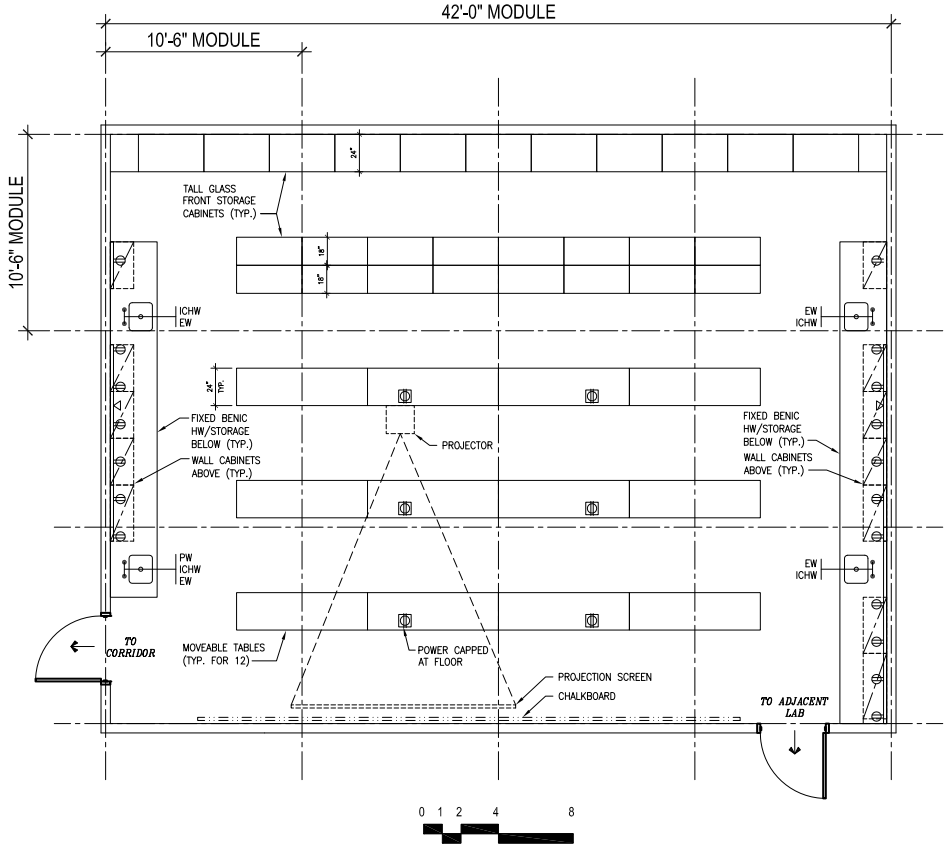
NOTES

- -Security Camera
- -Smart Classroom

A904

DRY TEACHING LAB

AREA: 1307 SF



A905
PHYSIOLOGY TEACHING LAB
AREA: 1307 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1
- Students - 24

LOCATION / ADJACENCIES
A906 Physiology Lab Prep

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 1 Freezer
- 1 Centrifuge
- 1 Double-door deli case

LABORATORY CASEWORK
- Epoxy Resin Bench Top and sinks
- Wood Casework

NON-LAB EQUIPMENT
- White Board
- Projector

FURNISHINGS
- Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
- Snorkels

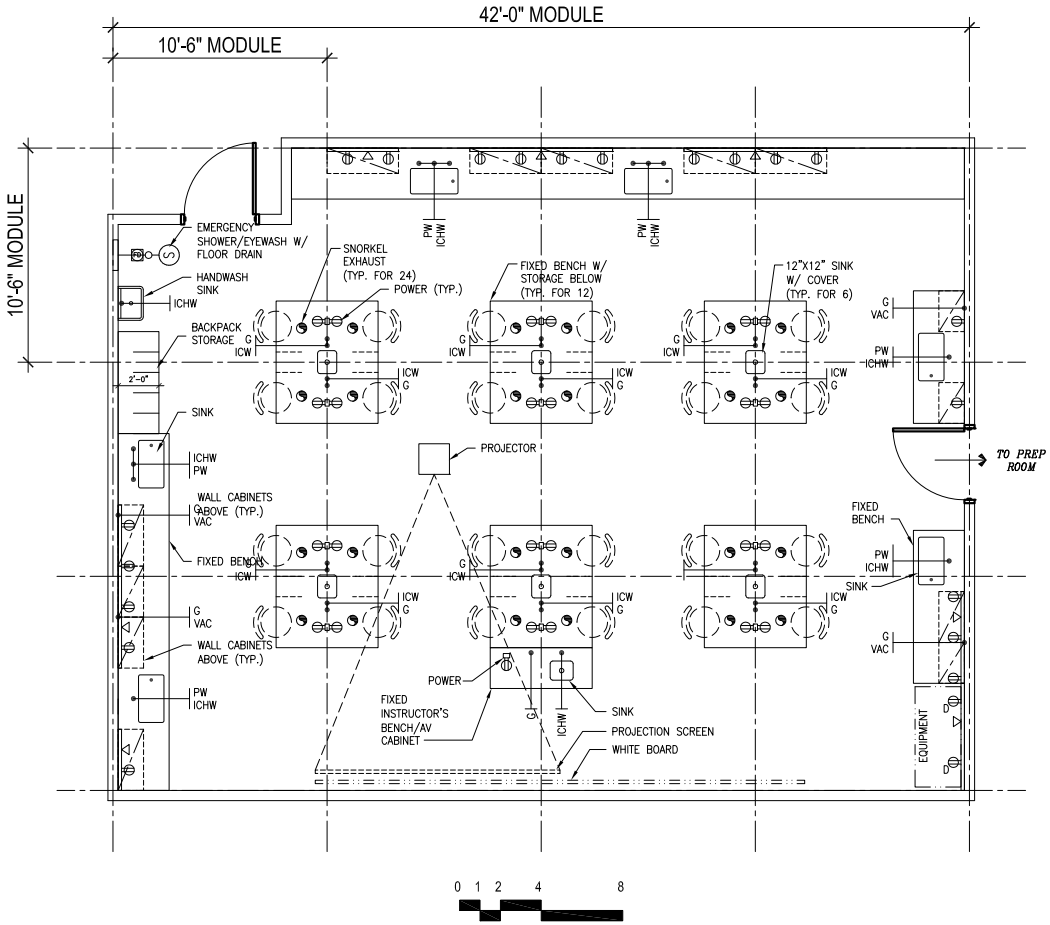
PIPED SERVICES
Laboratory Gas (G)
Laboratory Vacuum (VAC)
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

NOTES
None

A905
PHYSIOLOGY TEACHING LAB

AREA: 1307 NSF



A906
PHYSIOLOGY PREP LAB

AREA: 485 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1

LOCATION / ADJACENCIES
A905 Physiology Teaching Lab

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- 1 Refrigerator
- 1 Freezer
- 1 Under counter glassware washer

LABORATORY CASEWORK
Epoxy Resin Bench Top and sinks
Wood Casework
Metal Casework under fume hood

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
4' HCl Fume Hood

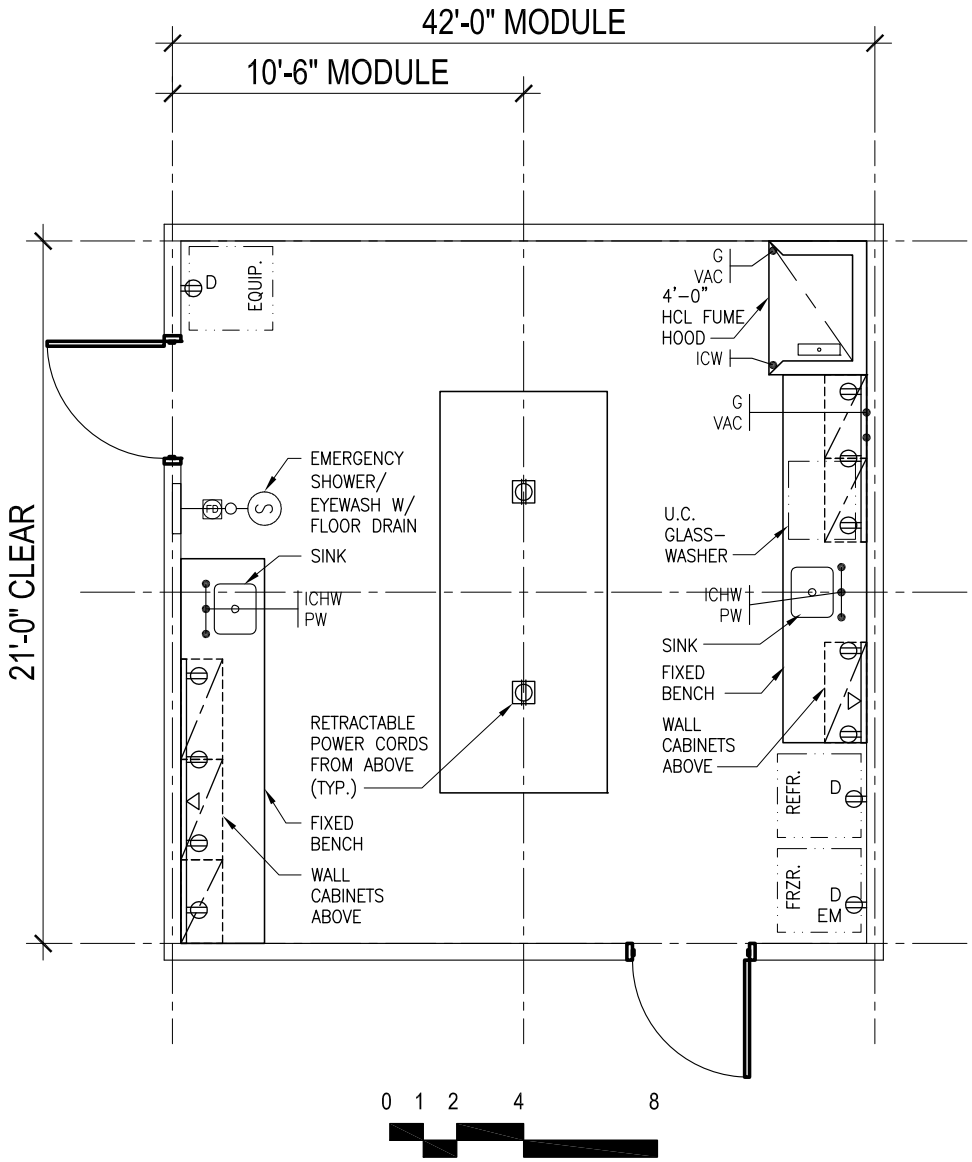
PIPED SERVICES
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

NOTES
Spill trays in all base storage cabinets

A906
PHYSIOLOGY PREP LAB

AREA: 485 NSF



A907

HUMAN PERFORMANCE LAB

AREA: 1307 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1
- Students - 24

LOCATION / ADJACENCIES

A908 Human Performance Storage

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI):
- 3 Treadmills
- 3 Padded Tables
- 5 Stationery Cycles

LABORATORY CASEWORK

Epoxy Resin Bench Top and sinks
Wood Casework

FURNISHINGS

Fixed Casework
Moveable Tables
Ventilated Base Cabinets

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

PIPED SERVICES

Industrial Hot Water (IHW)
Industrial Cold Water (ICW)

ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

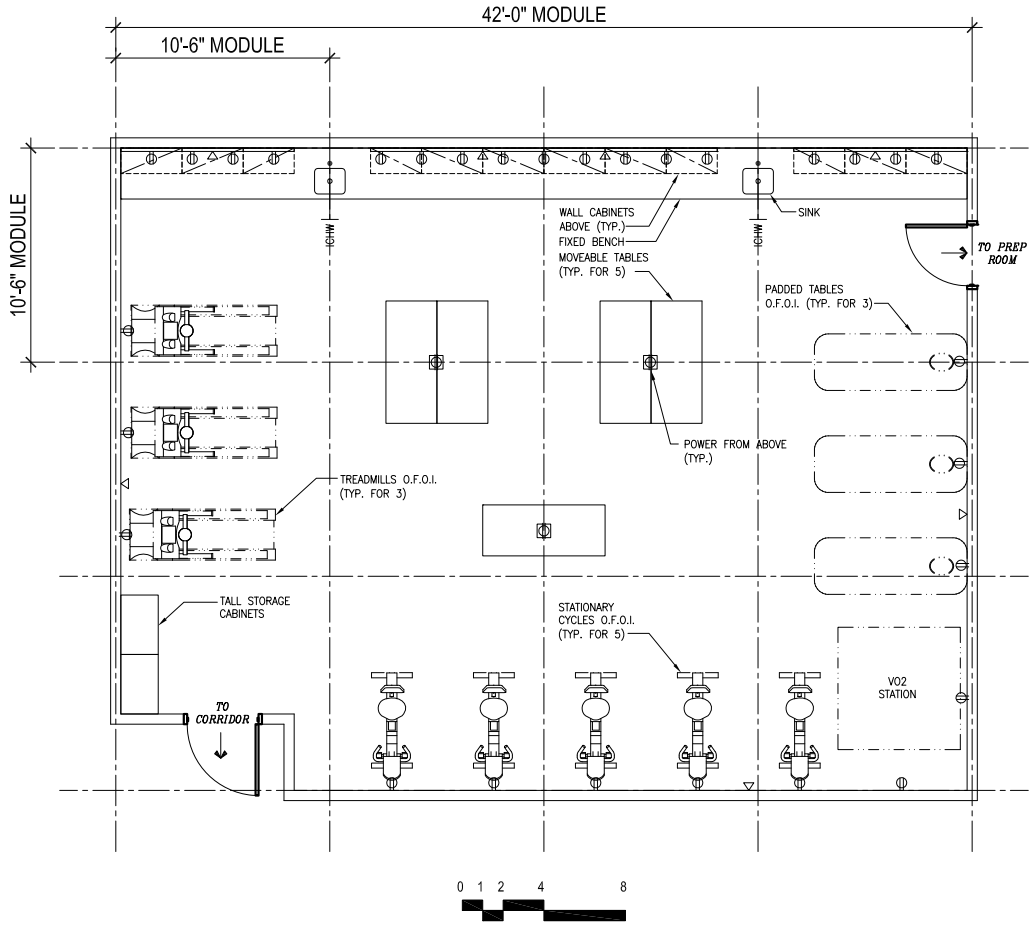
NOTES

Security Camera

A907

HUMAN PERFORMANCE LAB

AREA: 1307 NSF



A908
HUMAN PERFORMANCE LAB

AREA: 323 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

LOCATION / ADJACENCIES

A907 Human Performance Lab

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Heavy Duty Shelving

MECHANICAL

Temperature
- 60°F - 90°F

Humidity
- N/A

10 Air Changes / Hour

ELECTRICAL

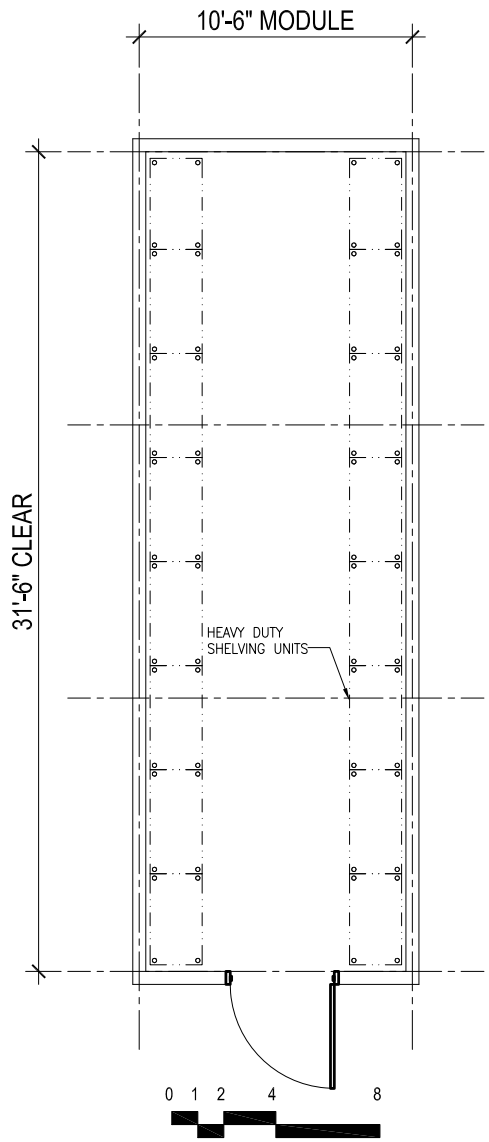
120V / 20A / 1 Phase

Lighting Level
- 75 fc at Bench/Desk

A908

HUMAN PERFORMANCE LAB

AREA: 323 NSF



A909 INSTRUCTOR ROOM

AREA: 100 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 3

LOCATION / ADJACENCIES

A902 Wet Teaching Prep

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- VCT (Chemical Resistant)

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI):
- 1 Refrigerator
- 1 Freezer

LABORATORY CASEWORK

Epoxy Resin Bench Top and sink

Wood Casework

FURNISHINGS

Fixed Casework

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

PIPED SERVICES

Industrial Hot Water (IHW)

Industrial Cold Water (ICW)

ELECTRICAL

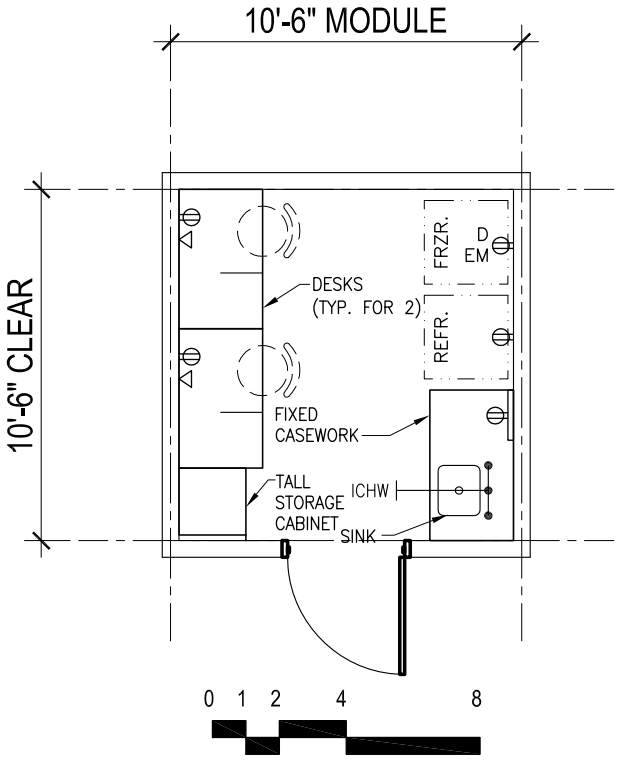
120V / 20A / 1 Phase

120V / 20A / 1 Phase Dedicated (D)

Data

Lighting Level
- 75 fc at Bench/Desk

A909
INSTRUCTOR ROOM
AREA: 100 NSF



A910
UNDERGRADUATE RESEARCH SPACE

AREA: 480 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 8

LOCATION / ADJACENCIES
- A902 Wet Teaching Prep

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - VCT (Chemical Resistant)
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Vinyl
- Ceiling
  - Acoustic Tile
- Doors
  - 3'-6" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK
- Epoxy Resin Bench Top and sinks
- Wood Casework
- Metal Casework under fume hood

FURNISHINGS
- Fixed Casework
- Moveable Tables

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour

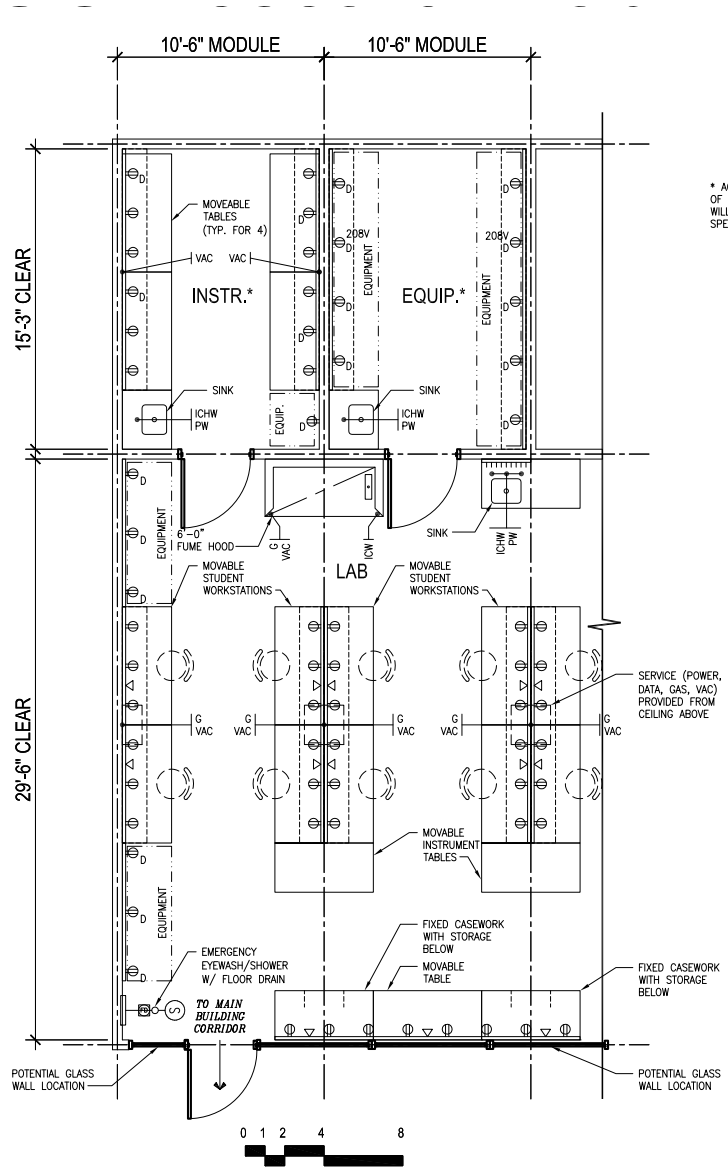
HOODS
- 6' Chemical fume hood

PIPED SERVICES
- Laboratory Gas (G)
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Emergency Shower/Eyewash (ES / EW)

ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Task Lighting
- Lighting Level
  - 100 fc at Bench/Desk

A910
UNDERGRADUATE RESEARCH SPACE

AREA: 480 NSF



* ACTUAL CONFIGURATION OF LAB SUPPORT SPACES WILL BE DEPENDENT ON SPECIFIC USER NEEDS

Code	Department / Space Name	Qty.	NSF/ Space	Total NSF	Non Research NSF	Research NSF	GSF	Remarks
A1000	EARTH SCIENCE							
A1001	GIS Lab	1	1,307	1,307			2,011	Share w/Bioinformatics; 24 stations
A1002	Sample Prep	1	323	323			497	
A1003	Rock Crushing/Grinding Room	1	323	323			497	
A1004	Polishing/Thin Section	1	162	162			249	
A1005	Acid Digestion Lab	1	113	113			174	
					2,228			
				2,228	2,228	0	3,428	

A1001

GIS LAB

AREA: 1307 NSF

UTILIZATION

Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

Capacity
- Faculty/Staff - 1
- Students - 24

LOCATION / ADJACENCIES

A602 Prep Lab
A603 Lab Manager's Office

ARCHITECTURAL

Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- Carpet

Partitions
- Gyp Board, Paint

Base
- 4" Vinyl

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT

Owner Furnished, Owner Installed (OFOI)

LABORATORY CASEWORK

Epoxy Resin Bench Top and sink
Wood Casework

NON-LAB EQUIPMENT

White Board
Projector

FURNISHINGS

Fixed Casework
Moveable Tables

MECHANICAL

Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

PIPED SERVICES

Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)
Tempered Water (ES / EW)
Floor Drain (FD)
Emergency Shower / Eyewash (ES / EW)

ELECTRICAL

120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 100 fc at Bench/Desk

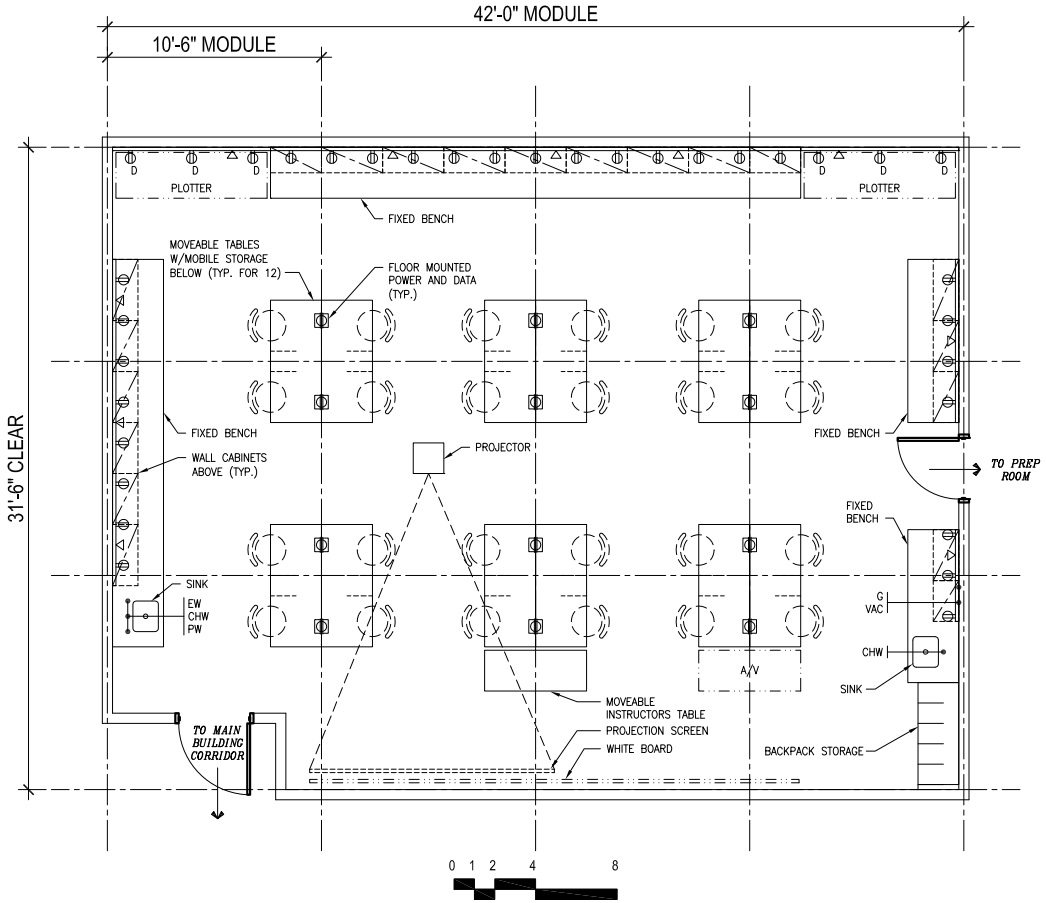
NOTES

Camera Required for Projecting Maps

A1001

GIS LAB

AREA: 1307 NSF



A1002
A1003
A1005

SAMPLE PREP/ ROCK CRUSHING/ GRINDING/ ACID DIGESTION

AREA: 759 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 1

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Sealed Concrete
- Partitions
  - Gyp Board, Epoxy Paint
- Base
  - 4" Vinyl
- Ceiling
  - Opem
- Doors
  - 3'-6" x 7'-0"
  - 3'-0" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Owner Furnished, Owner Installed (OFOI)
  - (3) Rock Saws
  - (1) Grinder
  - (1) Rock Crusher
- Work Bench

LABORATORY CASEWORK
- Wood Bench Top
- Phenolic Resin Casework
- Metal Casework

FURNISHINGS
- Fixed Casework
- Moveable Tables

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour

HOODS
- Snorkels
- 4' Fume hood

PIPED SERVICES
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)

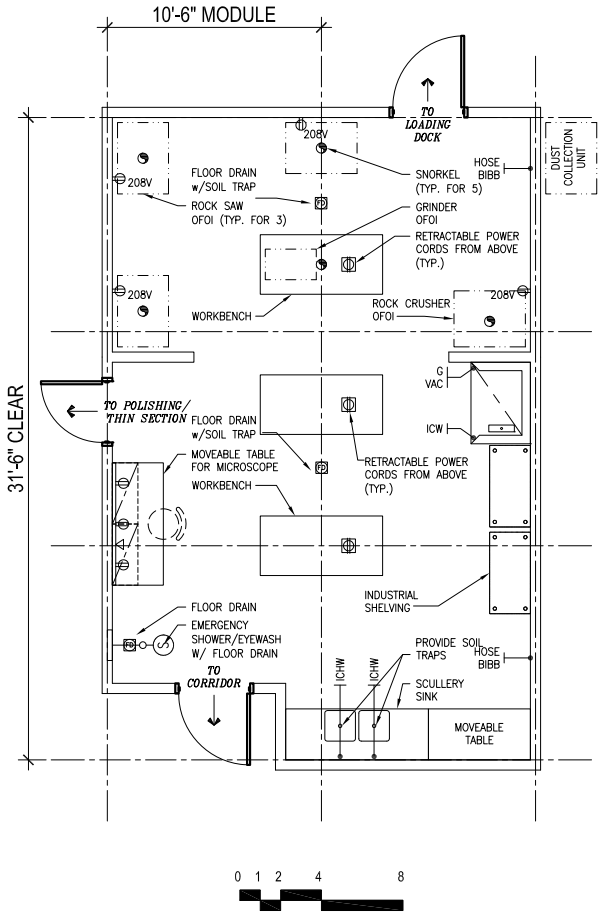
ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - 100 fc at Bench/Desk

NOTES
- -Dust Collection System Required
- -Soundproofing required

A1002
A1003
A1005

SAMPLE PREP/ ROCK CRUSHING/ GRINDING/ ACID DIGESTION

AREA: 759 NSF



A1004
POLISHING/THIN SECTION
AREA: 162 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

LOCATION / ADJACENCIES
A1002 Sample Prep
A1003 Rock Crushing/Grinding Room
A1005 Acid Digestion Lab
Loading Dock

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- Sealed Concrete

Partitions
- Gyp Board, Epoxy Paint

Base
- 4" Vinyl

Ceiling
- Opem

Doors
- 3'-6" x 7'-0"
- 3'-0" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
Owner Furnished, Owner Installed (OFOI)
- (1) Polisher

LABORATORY CASEWORK
Epoxy resin casework and sink
Wood casework
Metal casework under fume hood

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 73°F ± 3°F

Humidity
- N/A

10 Air Changes / Hour

HOODS
Snorkel
4' Fume hood

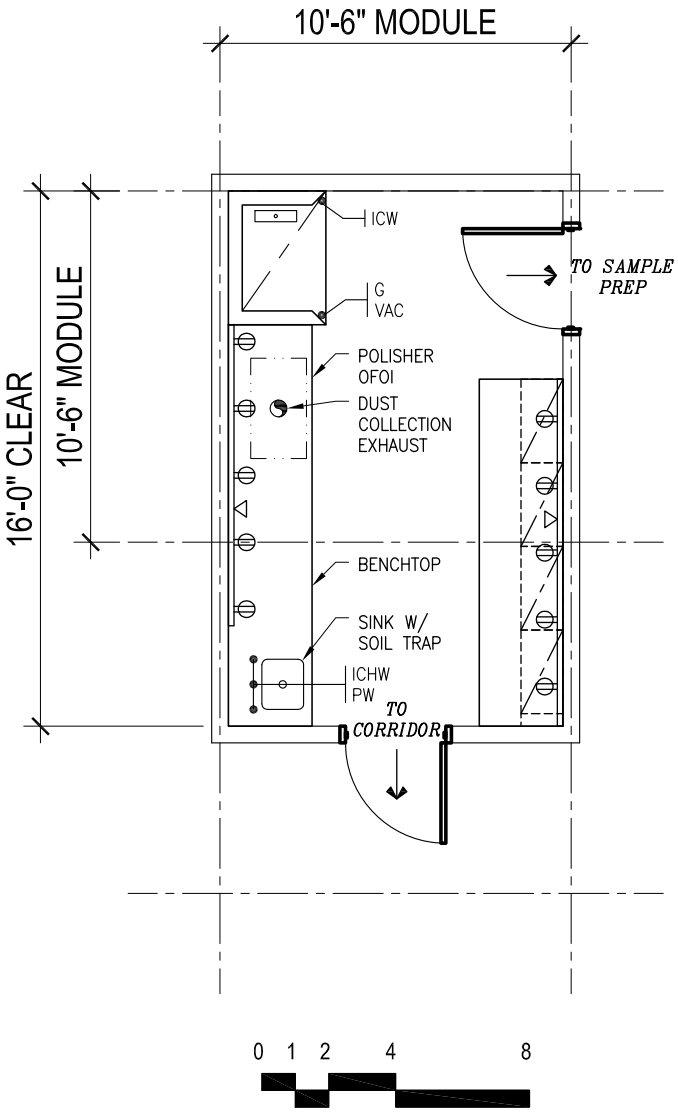
PIPED SERVICES
Industrial Hot Water (IHW)
Industrial Cold Water (ICW)
High Purity Water (PW)

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data
Lighting Level
- 75 fc at Bench/Desk

A1004

POLISHING/THIN SECTION

AREA: 162 NSF



Code	Department / Space Name	Qty.	NSF/ Space	Total NSF	Non Research NSF	Research NSF	GSF	Remarks
A1100	GENERAL LAB SUPPORT							
	Lab Stores / Receiving							
A1101	Prep Storage	1	2,000	2,000			3,077	Next to loading dock
A1102	Acids Storage	1	100	100			154	
A1103	Flammables Storage	1	100	100			154	
A1104	Specialty Chemical Storage	1	100	100			154	
A1105	Hazardous Waste Storage	1	100	100			154	
A1106	Gas Cylinder Storage	1	100	100			154	
A1107	Nitrogen Tank Room	1	50	50			77	By loading dock for vendor access
A1108	Offices / Lab Mgr & Rec'g	2	100	200			308	Disbursement window in one
					2,750			
A1109	Sterilizer Alcove	4	100	400			615	Includes autoclave cost; one/floor
					400			
A110	Animal Care Facility	1	800	800			1,231	Lower level location
					800			
				3,950	3,950	0	6,077	

EXTERIOR AREAS (not included in area summary)								
A1201	Rooftop Telescope	1	900	900	900		900	Rooftop telescope pad & access

A1101-A1108

LAB STORES/ RECEIVING

AREA: 2750 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day
- Capacity
  - Faculty/Staff - 2

LOCATION / ADJACENCIES
- Loading Dock

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Sealed Concrete
- Partitions
  - Gyp Board, Epoxy Paint
- Base
  - 4" Vinyl
- Ceiling
  - Open
- Doors
  - 3'-6" x 7'-0"
  - 6'-0" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Gas Cylinders

LABORATORY CASEWORK
- Epoxy Resin Bench Top
- Wood Casework

FURNISHINGS
- Fixed Casework
- High Density Shelving
- Chemical Storage Cabinets

MECHANICAL
- Temperature
  - 73°F ± 3°F
- Humidity
  - N/A
- 10 Air Changes / Hour

HOODS
- 8' Walk-In Fume Hood
  - High and Low exhaust in chemical storage rooms

PIPED SERVICES
- Laboratory Gas (G)
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)
- Drench Hose (EW)

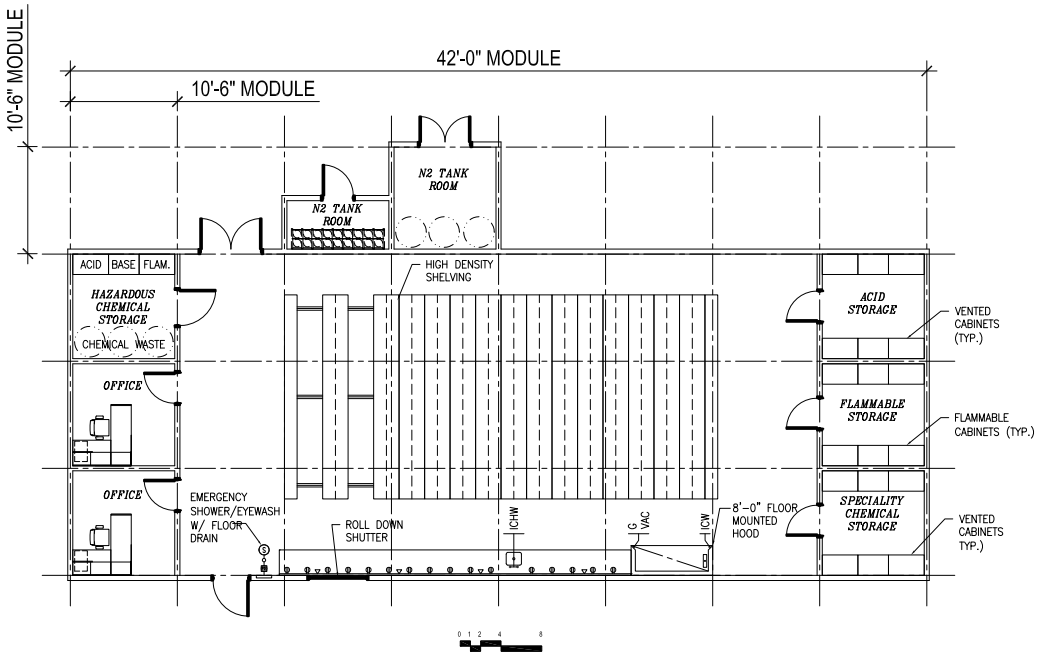
ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - 75 fc at Bench/Desk

NOTES
- High Occupancy for chemical storage rooms

A1101-A1108

LAB STORES/ RECEIVING

AREA: 2750 NSF



A1109
STERILIZER ALCOVE
AREA: 100 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

LOCATION / ADJACENCIES
One Room per Floor

ARCHITECTURAL
Windows
- Interior: Desired
- Window Coverings Required
- Exterior: Desired

Floor
- Welded Seam Sheet Vinyl

Partitions
- Gyp Board, Epoxy Paint

Base
- Integral with Floor

Ceiling
- Acoustic Tile

Doors
- 3'-6" x 7'-0"

Security
- Controlled Access

LABORATORY EQUIPMENT
20"x20"x38" Sterilizer with integral steam generator

Water Polisher

LABORATORY CASEWORK
Stainless Steel Bench Top

Stainless Steel Casework

FURNISHINGS
Fixed Casework

MECHANICAL
Temperature
- 60°F - 90°F

Humidity
- N/A

10 Air Changes / Hour

PIPED SERVICES
Industrial Hot Water (IHW)

Industrial Cold Water (ICW)

High Purity Water (PW)

ELECTRICAL
120V / 20A / 1 Phase

120V / 20A / 1 Phase Dedicated (D)

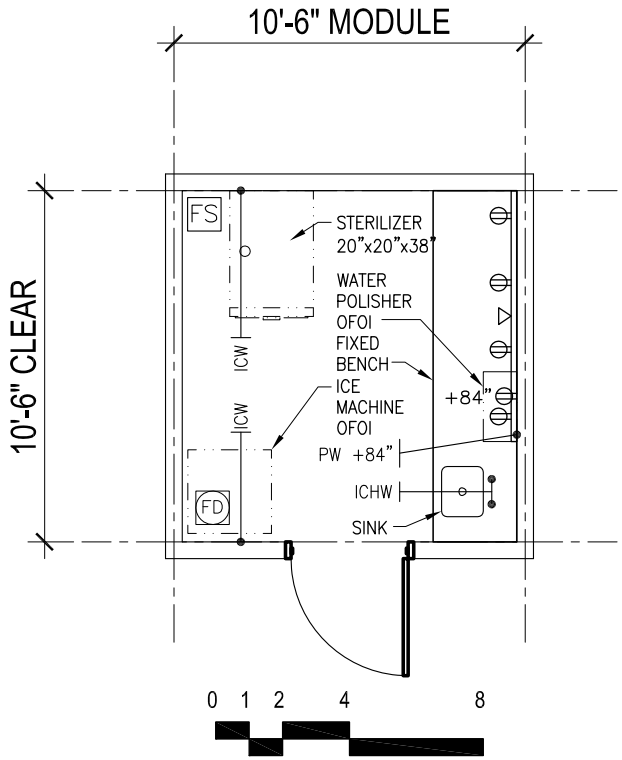
Data

Lighting Level
- 75 fc at Bench/Desk

A1109

STERILIZER ALCOVE

AREA: 100 NSF



A1110
ANIMAL CARE FACILITY
AREA: 800 NSF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Hours of Operation
  - 14 hours / day

ARCHITECTURAL
- Windows
  - Interior: Desired
  - Window Coverings Required
  - Exterior: Desired
- Floor
  - Epoxy
- Partitions
  - Gyp Board, Epoxy Paint
- Base
  - Coved
- Ceiling
  - Gyp Board, Epoxy Paint
- Doors
  - 3'-6" x 7'-0"
  - 6'-0" x 7'-0"
- Security
  - Controlled Access

LABORATORY EQUIPMENT
- Cage and Bottle Washer
- 20"x20"x38" Sterilizer with integral steam generator
- Owner Furnished Owner Installed (OFOI)
  - 4' Biological Safety Cabinet Type 11/A2

LABORATORY CASEWORK
- Stainless Steel Bench Top
- Phoenolic Resin Casework

FURNISHINGS
- Fixed Casework

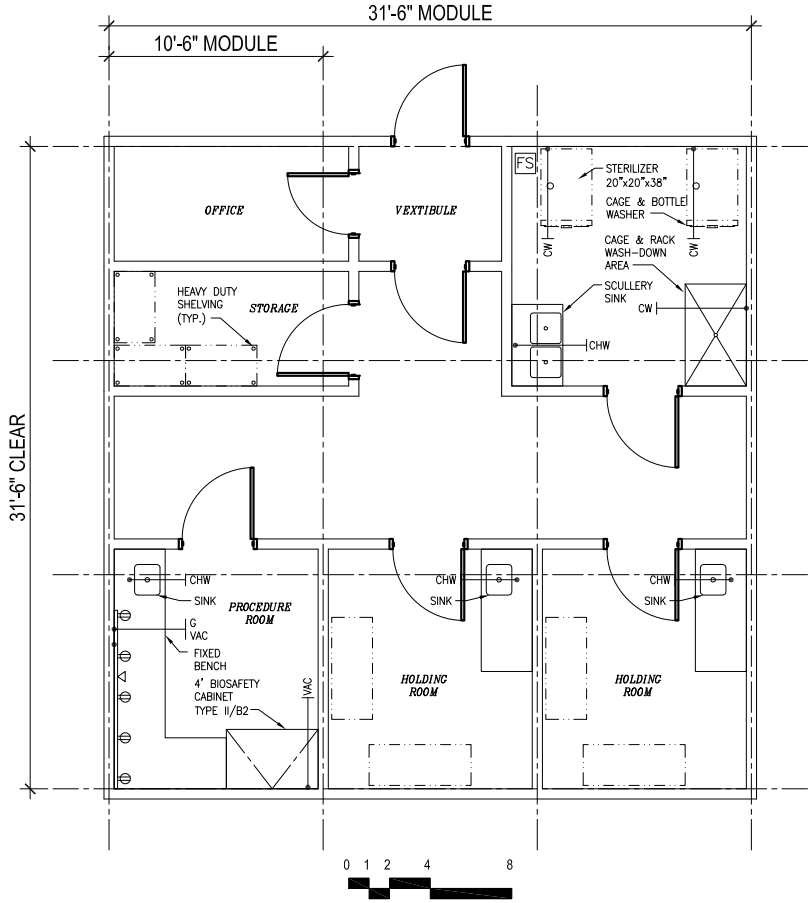
MECHANICAL
- Temperature
  - 68-73°F ± 1°F
- Humidity
  - N/A
- 10-12 Air Changes / Hour

HOOD
- 6' fume hood

PIPED SERVICES
- Laboratory Vacuum (VAC)
- Industrial Hot Water (IHW)
- Industrial Cold Water (ICW)
- High Purity Water (PW)
- Tempered Water (ES / EW)
- Floor Drain (FD)
- Emergency Shower / Eyewash (ES / EW)

ELECTRICAL
- 120V / 20A / 1 Phase
- 120V / 20A / 1 Phase Dedicated (D)
- Data
- Lighting Level
  - 30-35 fc at Bench/Desk

A1110
ANIMAL CARE FACILITY
AREA: 800 NSF



A1201
ROOFTOP TELESCOPE
AREA: 900 NSF

UTILIZATION
Hours of Use
- 14 hours / day

Hours of Operation
- 14 hours / day

LOCATION/ADJACENCIES
Roof

ARCHITECTURAL
Windows
- None

Floor
- Sealed Concrete

Partitions
- None

Base
- None

Ceiling
- None

Doors
- None

Security
- Controlled Access

NON-LAB EQUIPMENT
Owner Furnished, Owner Installed (OFOI):
- Telescope

MECHANICAL
Temperature
- Outside

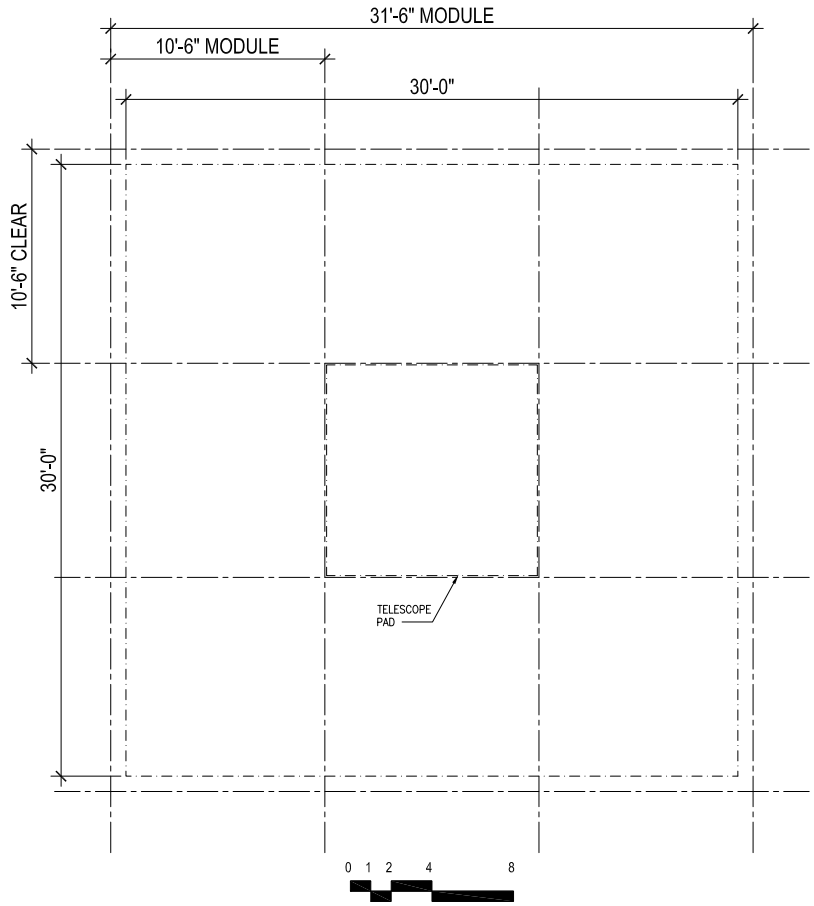
Humidity
- Uncontrolled

ELECTRICAL
120V / 20A / 1 Phase
120V / 20A / 1 Phase Dedicated (D)
Data

A1201

ROOFTOP TELESCOPE

AREA: 900 NSF



Code	Function / Space Name	Qty.	NSF/ Space	Total NSF	Station Qty.	NSF/ Station	GSF	Remarks
B	CLASSROOMS							
B101	Auditorium	1	4,800	4,800	360	13	7,385	360 fixed seats; sloping floor;
B102	Lecture, 75-Seat, Sloped	1	1,200	1,200	75	16	1,846	75 fixed, tablet-arm seats; sloped
B103	Lecture, 75-Seat, Tiered	1	2,250	2,250	75	30	3,462	Tiered floor - group work
B104	Lecture, 60-Seat, Sloped	3	1,080	3,240	60	18	4,985	60 fixed, tablet-arm seats; sloped
B105	Classroom, 48-Seat	5	1,200	6,000	48	25	9,231	Flat floor; rows of tables
B106	Seminar, 40-Seat	1	800	800	40	20	1,231	U-shaped table set-up
B107	Seminar, 20-Seat, Dividable	1	400	400	20	20	615	Divides in two with movable
B108	Seminar, 16-Seat	2	320	640	16	20	985	Single table set-up
B109	Computer Classroom	2	960	1,920	24	40	2,954	24 stations; rows of tables
				21,250			32,692	

Notes

- Entries should be at the rear of the room to minimize disruption.
- Projection surfaces should be away from room entries and windows.
- High-capacity classrooms should be located on the building's main level (the level which connects with the campus concourse).

B101
AUDITORIUM
AREA: 4,800 SF

UTILIZATION
- Hours of Use
  - 18 hours / day
- Occupants
  - Presenter(s)
  - Audience - 360
- Function
  - Lectures, Performances

LOCATION / ADJACENCIES
- Adjacent to
  - Lobby / Atrium (Prefunction)
  - Public Entrance
- Easy access to
  - Service entrance
- Main Level Location Desired

ARCHITECTURAL
- Windows
  - None
- Floor
  - Carpet at Aisles
  - Sealed Concrete at Chairs
  - Sloping
- Partitions
  - Special Finish, Upgraded
  - Designed for Acoustic Needs
- Base
  - Special Finish, Upgraded
- Ceiling
  - Designed for Acoustic Needs
  - Special Finish, Upgraded
  - Height: Varies, 10-12'
- Doors
  - Double 3'-0" x 7'-0"
- Security
  - Controlled Access
- Sound
  - Special Acoustic Consideration

EQUIPMENT
- White Brd., 2-Layer, Vertical-Stack (2)
- Fixed Auditorium Seating – 360
- Presenter Podium / Control Station (2)
- LCD Projector, Ceiling-Mount (2)
- Projection Screen, Ceiling-Recess (2)
- Sound System, Wireless (2)
- Document Camera (2)

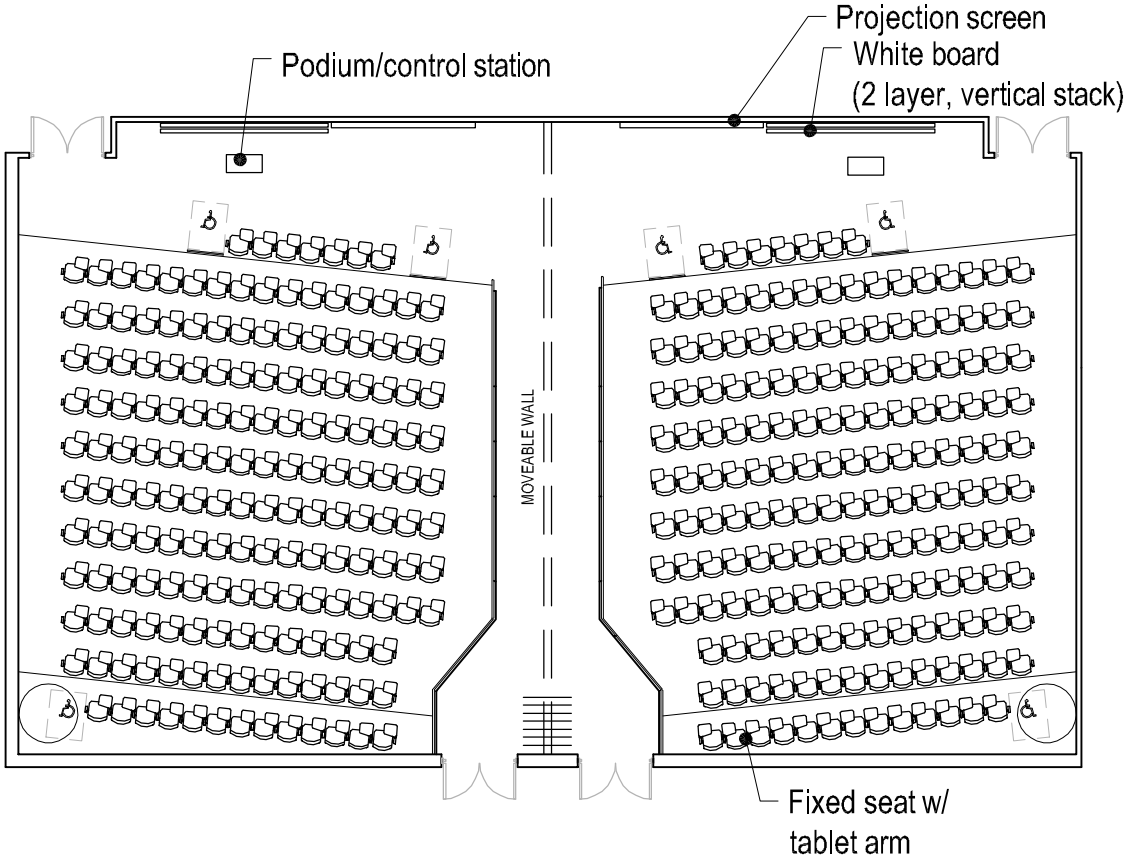
FURNISHINGS
- Presenter Chairs – 6
- Presenter Table, (2) 8'L x 3'W

MECHANICAL / PLUMBING
- Individual HVAC Zone (2)

ELECTRICAL
- Voice/Data & Electrical – Podium
- Voice/Data & Electrical – Projector
- Voice/Data & Electrical – Screen
- Electrical Convenience Outlets
- Electrical Outlets at 25% of Seating
- Data Outlets at 10% of Seating
- Lighting – Dimmable Fluorescent
- Lighting – Zoned, Preset Levels

NOTES
- Presenter Area: 20'W x 12'D
- Room Darkening Capability
- Room Subdivides in Two

B101
AUDITORIUM
AREA: 4,800 SF



B102
LECTURE HALL
75 SEAT, SLOPED

AREA: 1,200 SF

UTILIZATION
- Hours of Use
  - 15 hours / day
- Occupants
  - Presenter(s)
  - Students – 75
- Function
  - Lecture Hall / Teaching Space

LOCATION / ADJACENCIES
- Adjacent to
  - Major Circulation
- Easy access to
  - Teaching Labs
- Main Level Location Desired

ARCHITECTURAL
- Windows
  - None
- Floor
  - Carpet at Aisles
  - Sealed Concrete at Chairs
  - Sloping
- Partitions
  - Gyp Board, Paint
  - Designed for Acoustic Needs
- Base
  - 4" Rubber
- Ceiling
  - Designed for Acoustic Needs
  - Acoustic Ceiling Tile
  - Height: Varies, Approx. 10-12'
- Doors
  - 3'-0" x 7'-0"
  - Sidelight with Window Covering
- Security
  - Controlled Access
- Sound
  - Special Acoustic Considerations

EQUIPMENT
- White Board, 2-Layer, Vertical-Stack
- Fixed Auditorium Seating,
  - Tablet-Arm – 75
- Presenter Control Station /
  - Demonstration Table
- Document Camera
- LCD Projector, Ceiling-Mount
- Writeable Projection Surface
- Wireless Audio Enhancement System
- Tack Strip

FURNISHINGS
- Presenter Chair / Stool – 1

MECHANICAL / PLUMBING
- Individual HVAC Zone
- Sink at Demonstration Table

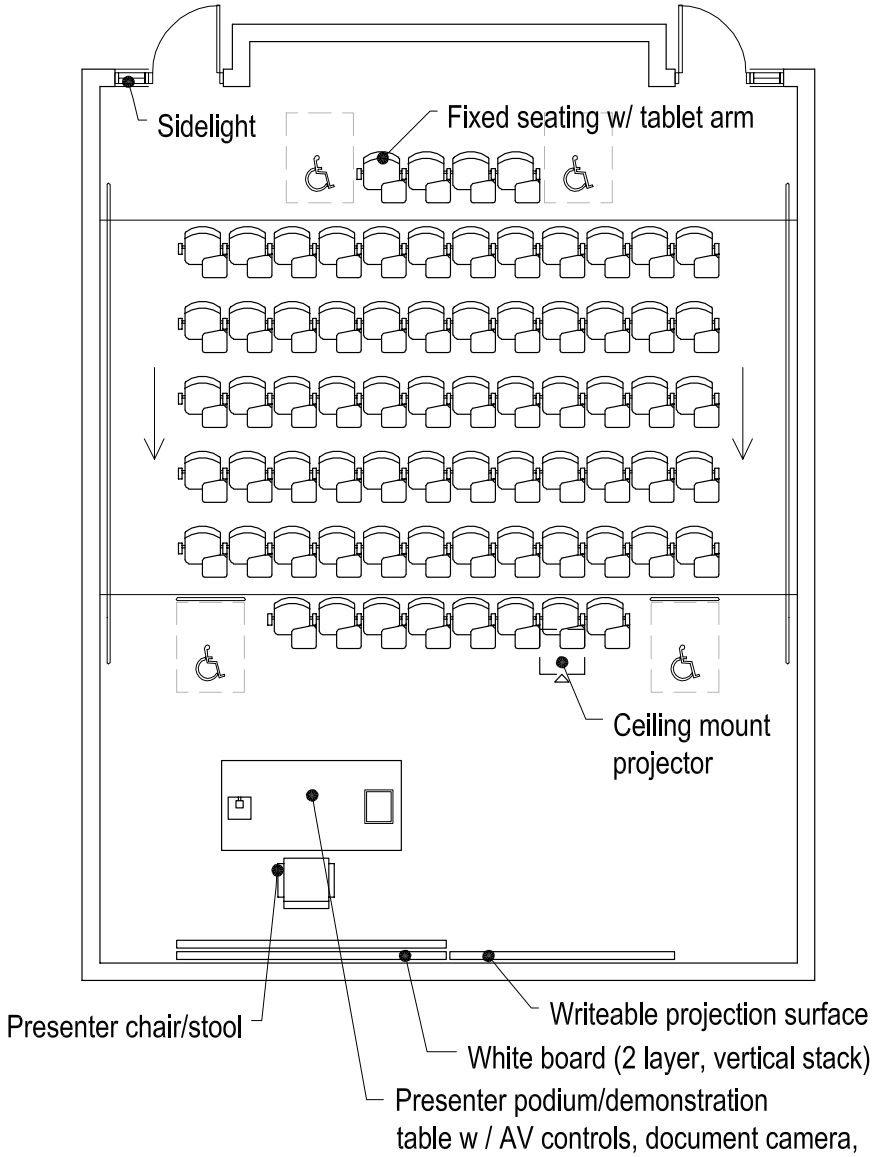
ELECTRICAL
- Voice/Data & Electrical – Podium
- Electrical at Demonstration Table
- Electrical Convenience Outlets
- Electrical Outlets at 25% of Seating
- Data Outlets at 10% of Seating
- Lighting – Dimmable Fluorescent
- Lighting – Zoned, Preset Levels

NOTES
- Presenter Area: 20'W x 12'D
- Projection Surface & White Board
  - Side-by-Side
- Room Darkening Capability

B102

LECTURE HALL
75 SEAT, SLOPED

AREA: 1,200 SF



B103
LECTURE HALL
75 SEAT, TIERED

AREA: 2,250 SF

UTILIZATION
- Hours of Use
  - 15 hours / day
- Occupants
  - Presenter(s)
  - Students – 75
- Function
  - Lecture Hall / Teaching Space

LOCATION / ADJACENCIES
- Adjacent to
  - Major Circulation
- Easy access to
  - Teaching Labs
- Main Level Location Desired

ARCHITECTURAL
- Windows
  - None
- Floor
  - Carpet at Aisles
  - Sealed Concrete at Chairs
  - Sloping
- Partitions
  - Gyp Board, Paint
  - Designed for Acoustic Needs
- Base
  - 4" Rubber
- Ceiling
  - Designed for Acoustic Needs
  - Acoustic Ceiling Tile
  - Height: Varies, Approx. 10-12'
- Doors
  - 3'-0" x 7'-0"
  - Sidelight with Window Covering
- Security
  - Controlled Access
- Sound
  - Special Acoustic Considerations

EQUIPMENT
- White Board, 2-Layer, Vertical-Stack
- Fixed Auditorium Seating,
  - Tablet-Arm – 75
- Presenter Control Station /
  - Demonstration Table
- Document Camera
- LCD Projector, Ceiling-Mount
- Writeable Projection Surface
- Wireless Audio Enhancement System
- Tack Strip

FURNISHINGS
- Presenter Chair / Stool – 1

MECHANICAL / PLUMBING
- Individual HVAC Zone
- Sink at Demonstration Table

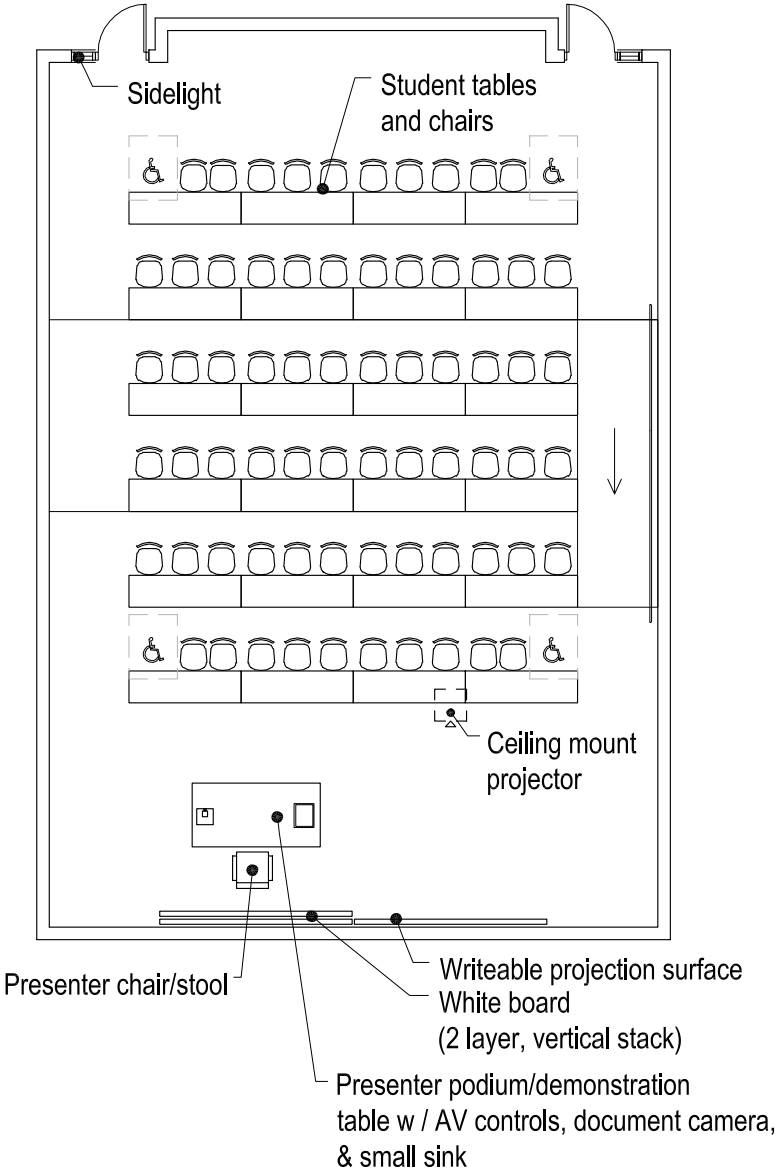
ELECTRICAL
- Voice/Data & Electrical – Podium
- Voice/Data & Electrical – Projector
- Voice/Data & Electrical – Camera
- Electrical at Demonstration Table
- Electrical Convenience Outlets
- Electrical Outlets at 25% of Seating
- Data Outlets at 10% of Seating
- Lighting – Dimmable Fluorescent
- Lighting – Zoned, Preset Levels

NOTES
- Presenter Area: 20'W x 12'D
- Projection Surface & White Board
  - Side-by-Side
- Room Darkening Capability

B103

LECTURE HALL
75 SEAT, TIERED

AREA: 2,250 SF



B104
LECTURE
60-SEAT, SLOPED

AREA: 1,080 SF

UTILIZATION
- Hours of Use
  - 15 Hours / Day
- Occupants
  - Presenter(s)
  - Students - 60
- Function
  - Lecture Hall / Teaching Space

LOCATION / ADJACENCIES
- Adjacent to
  - Major Circulation
- Easy access to
  - Teaching Labs
- Main Level Location Desired

ARCHITECTURAL
- Windows
  - None
- Floor
  - Carpet at Aisles
  - Sealed Concrete at Chairs
  - Sloping
- Partitions
  - Gyp Board, Paint
  - Designed for Acoustic Needs
- Base
  - 4" Rubber
- Ceiling
  - Designed for Acoustic Needs
  - Acoustic Ceiling Tile
  - Height: Varies, Approx. 10-12'
- Doors
  - 3'-0" x 7'-0"
  - Sidelight with Window Covering
- Security
  - Controlled Access
- Sound
  - Special Acoustic Considerations

EQUIPMENT
- White Board, 2-Layer, Vertical-Stack
- Fixed Auditorium Seating,
  - Tablet-Arm - 60
- Presenter Control Station /
  - Demonstration Table
- LCD Projector, Ceiling-Mount
- Document Camera
- Writeable Projection Surface
- Wireless Audio Enhancement System

FURNISHINGS
- Presenter Chair / Stool - 1

MECHANICAL / PLUMBING
- Individual HVAC Zone
- Sink at Demonstration Table

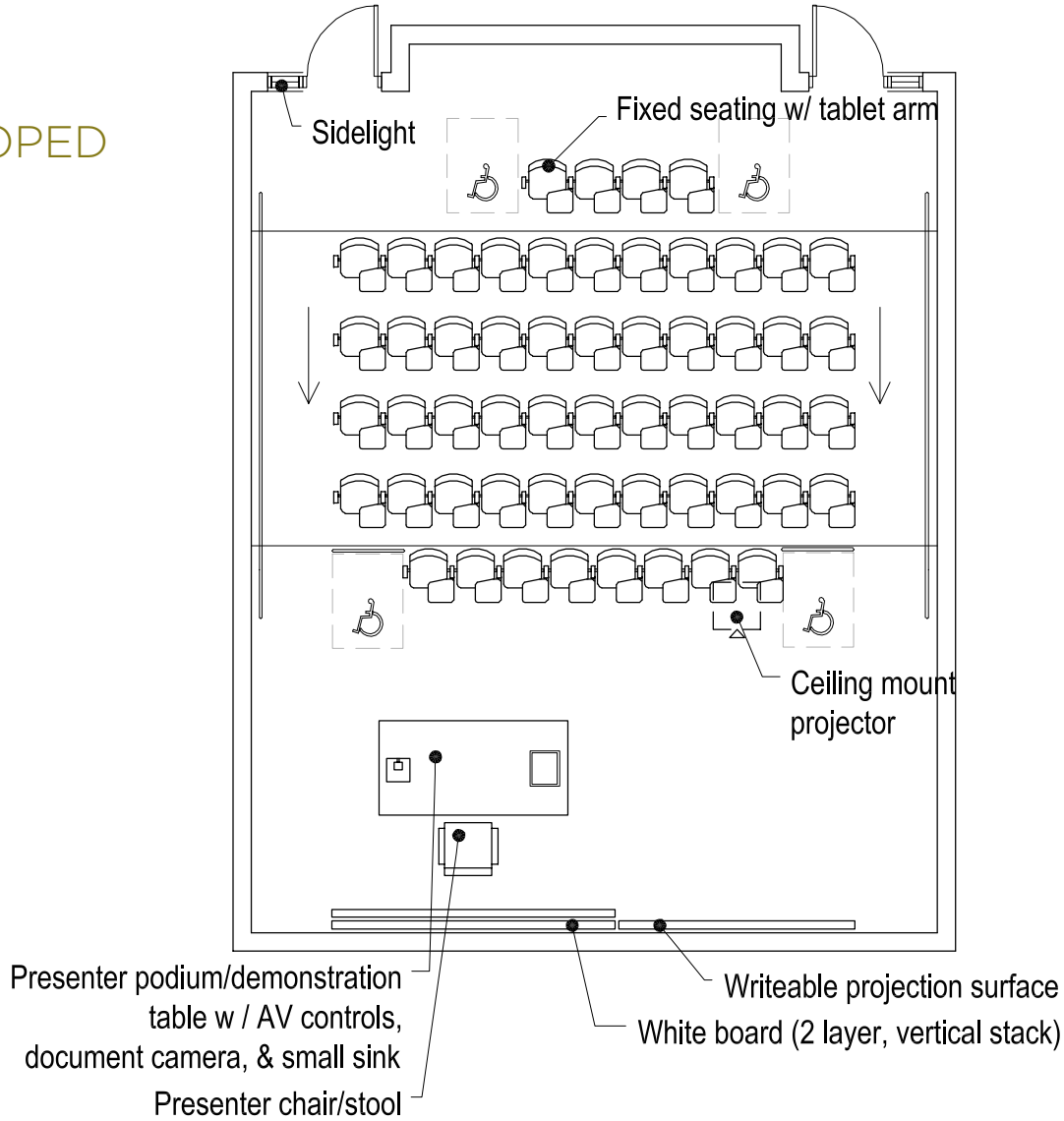
ELECTRICAL
- Voice/Data & Electrical - Podium
- Voice/Data & Electrical - Projector
- Voice/Data & Electrical - Camera
- Electrical at Demonstration Table
- Electrical Convenience Outlets
- Electrical Outlets at 25% of Seating
- Data Outlets at 10% of Seating
- Lighting - Dimmable Fluorescent
- Lighting - Zoned, Multiple Levels

NOTES
- Presenter Area: 20'W x 12'D
- Projection Surface & White Board
  - Side-by-Side
- Room Darkening Capability

B104

LECTURE
60-SEAT, SLOPED

AREA: 1,080 SF



B105
CLASSROOM 48 SEAT
AREA: 1,200 SF

UTILIZATION
- Hours of Use
  - 15 hours / day
- Occupants
  - Presenter(s)
  - Students - 48
- Function
  - Teaching Space

LOCATION / ADJACENCIES
- Adjacent to
  - Major Circulation
- Easy access to
  - Teaching Labs

ARCHITECTURAL
- Windows
  - None
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Ceiling Tile
  - Height: 10'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Sidelight with Window Covering
- Security
  - Controlled Access
- Sound
  - Sound Separation Required

EQUIPMENT
- White Board, 2-Layer, Vertical-Stack
- Presenter Control Station / Demonstration Table
- LCD Projector, Ceiling-Mount
- Writeable Projection Surface
- Audio Enhancement System
- Tack Strip

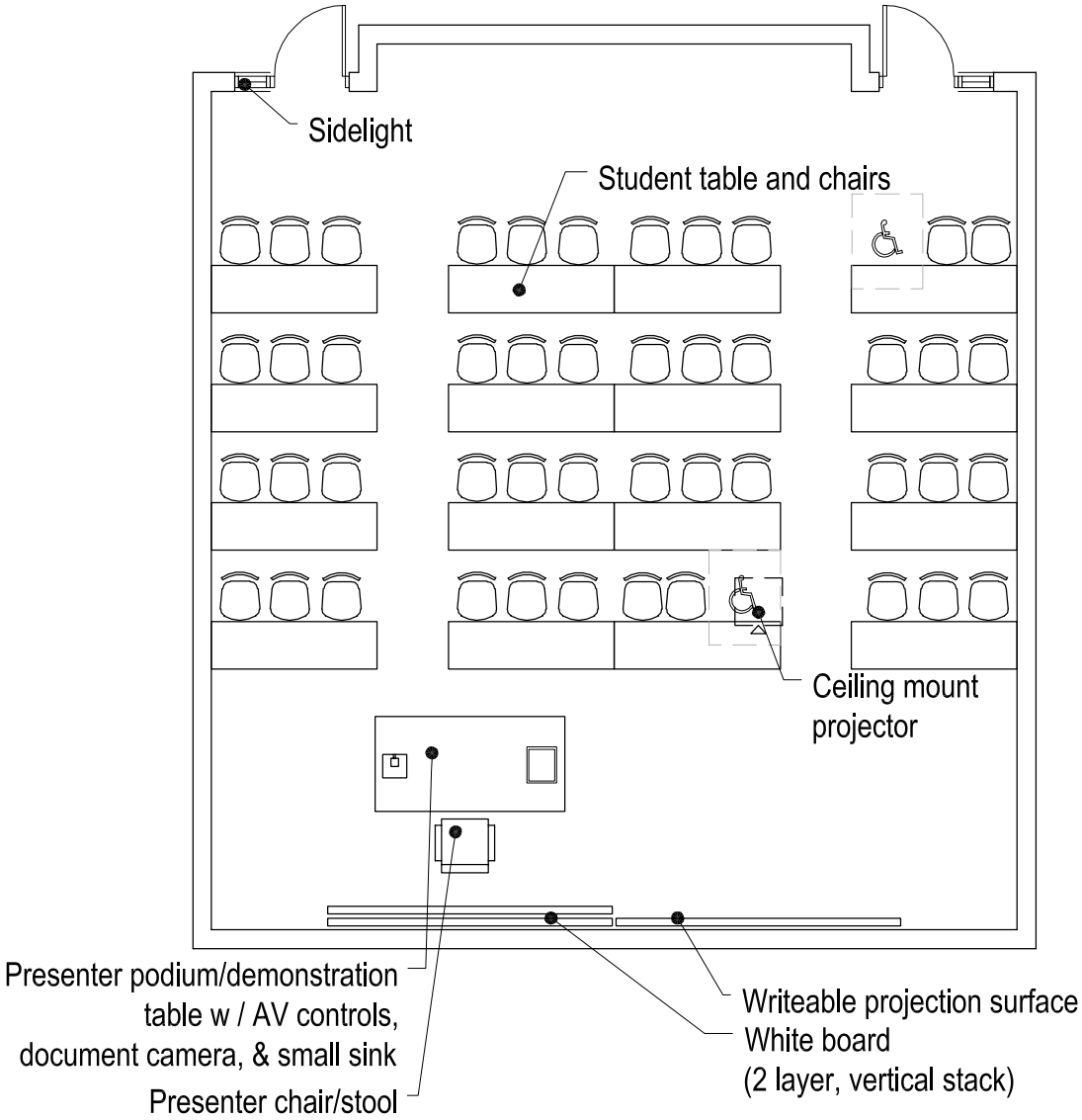
FURNISHINGS
- Presenter Chair / Stool – 1
- Student Tables, (16) 7'L x 2'W
- Student Chairs – 48

MECHANICAL / PLUMBING
- Individual HVAC Zone
- Sink at Demonstration Table

ELECTRICAL
- Voice/Data & Electrical – Podium
- Voice/Data & Electrical – Projector
- Voice/Data & Electrical – Camera
- Electrical at Demonstration Table
- Electrical Convenience Outlets, Perimeter
- Lighting - Dimmable Fluorescent
- Lighting – Zoned, Multiple Levels

NOTES
- Projection Surface & White Board Side-by-Side
- Room Darkening Capability

B105
CLASSROOM
48 SEAT
AREA: 1,200 SF



B106
SEMINAR 40 SEAT
AREA: 800 SF

UTILIZATION
- Hours of Use
  - 15 hours / day
- Occupants
  - Up to 40 People
- Function
  - Teaching Space
  - Conference Room

LOCATION / ADJACENCIES
- Adjacent to
  - Major Circulation
- Easy access to
  - Teaching Labs
  - Classrooms
  - Faculty Offices

ARCHITECTURAL
- Windows
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Ceiling Tile
  - Height: 10'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Sidelight with Window Covering
- Security
  - Controlled Access
- Sound
  - Sound Separation Required

EQUIPMENT
- White Board, 2-Layer, Vertical-Stack
- Presenter Control Station (Credenza)
- LCD Projector, Ceiling-Mount
- Writeable Projection Surface
- Audio Enhancement System
- Tack Strip

FURNISHINGS
- Tables, Configurable (8) 7'L x 42"W
- Chairs – 40

MECHANICAL / PLUMBING
- Individual HVAC Zone

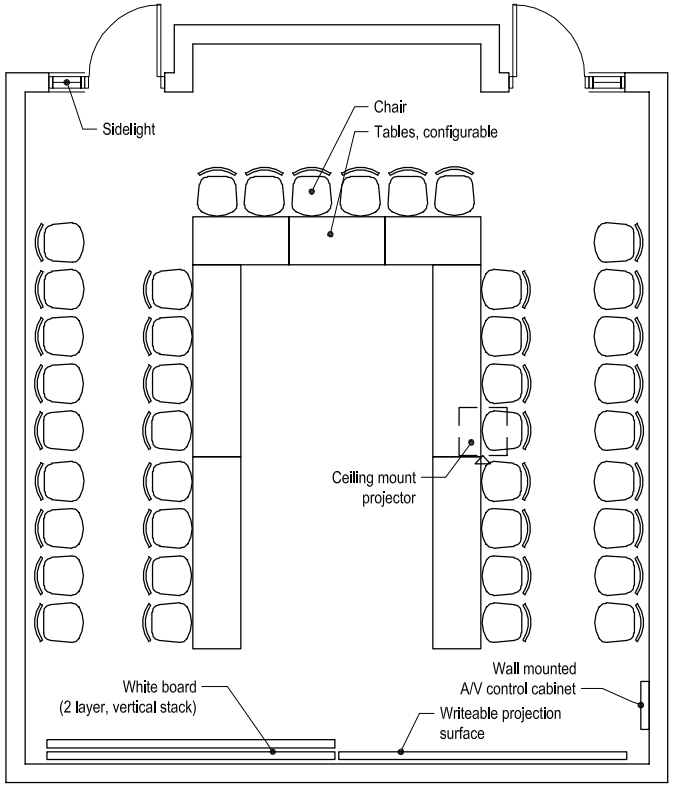
ELECTRICAL
- Voice/Data & Electrical – Podium
- Electrical Convenience Outlets, Perimeter
- Data Outlets, Perimeter
- Lighting – Zoned, Multiple Levels

NOTES
- Projection Surface & White Board Side-by-Side
- Seating for 28 at Tables; 12 at Perimeter
- Room Darkening Capability

B106

SEMINAR
40 SEAT

AREA: 800 SF



B107

SEMINAR 20-SEAT DIVIDABLE

AREA: 400 SF

UTILIZATION

- Hours of Use
  - 15 hours / day
- Occupants
  - Up to 20 People
- Function
  - Teaching Space
  - Conference Room
  - Divides in 2 Spaces w/Movable Partition

LOCATION / ADJACENCIES

- Adjacent to
  - Major Circulation
- Easy access to
  - Teaching Labs
  - Classrooms
  - Faculty Offices

ARCHITECTURAL

- Windows
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
  - Movable Partition, STC 50
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Ceiling Tile
  - Height: 10'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Sidelight with Window Covering
- Security
  - Controlled Access
- Sound
  - Sound Privacy Required

EQUIPMENT

- Wall-Mounted Control Station
- LCD Projector, Ceiling-Mount
- Writeable Projection Surface

FURNISHINGS

- Tables, Movable, (2) 8'L x 42"W
- Chairs - 20

MECHANICAL / PLUMBING

- Individual HVAC Zone

ELECTRICAL

- Voice/Data & Electrical - Control Station
- Voice/Data & Electrical - LCD Projector
- Electrical Convenience Outlets, Perimeter
- Data Outlets, Perimeter
- Lighting - Dimmable Fluorescent
- Lighting - Zoned, Multiple Levels

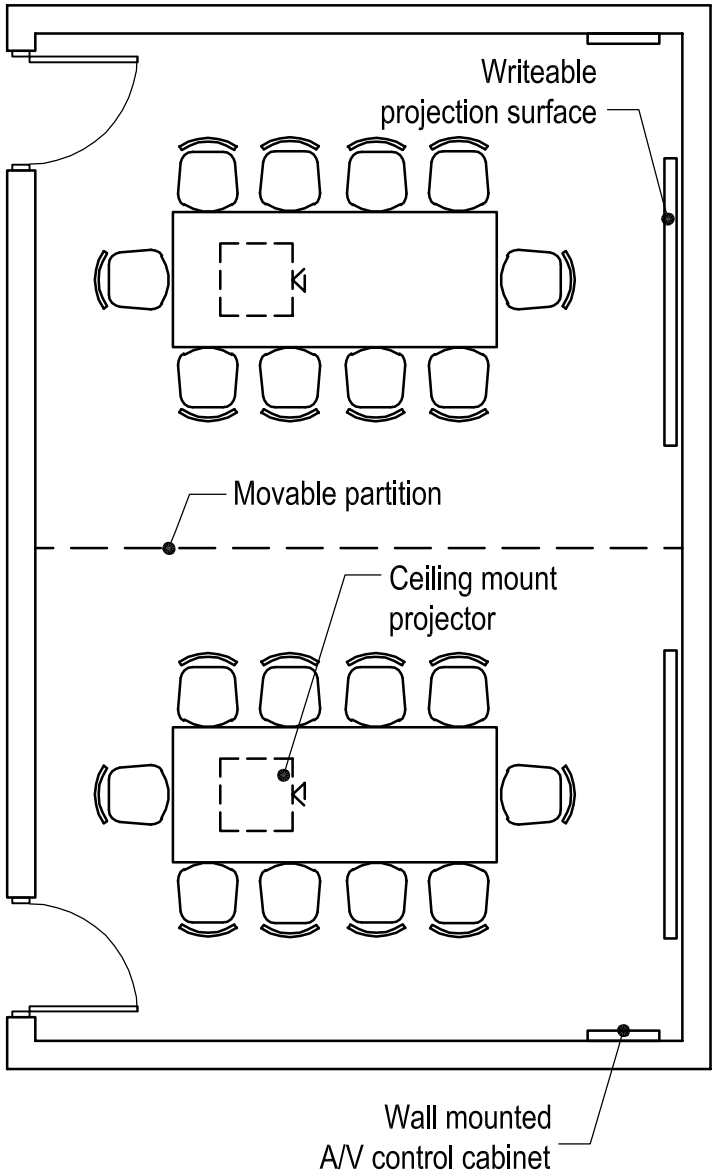
NOTES

- Projection Surface & White Board Side-by-Side
- Seating for 28 at Tables; 12 at Perimeter
- Room Darkening Capability

B107

SEMINAR 20-SEAT DIVIDABLE

AREA: 400 SF



B108
SEMINAR
16 SEAT
AREA: 320 SF

UTILIZATION
- Hours of Use
  - 15 hours / day
- Occupants
  - Up to 16 People
- Function
  - Teaching Space
  - Conference Room

LOCATION / ADJACENCIES
- Adjacent to
  - xx
- Easy access to
  - Public entrance
  - Service entrance
  - Xx

ARCHITECTURAL
- Windows
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Ceiling Tile
  - Height: 10'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Sidelight with Window Covering
- Security
  - Controlled Access
- Sound
  - Sound Separation Required

EQUIPMENT
- White Board, 2-Layer, Vertical-Stack
- Presenter Control Station (Credenza)
- LCD Projector, Ceiling-Mount
- Writeable Projection Surface
- Audio Enhancement System
- Tack Strip

FURNISHINGS
- Tables, Configurable (4) 7'L x 42"W
- Chairs – 16

MECHANICAL / PLUMBING
- Individual HVAC Zone

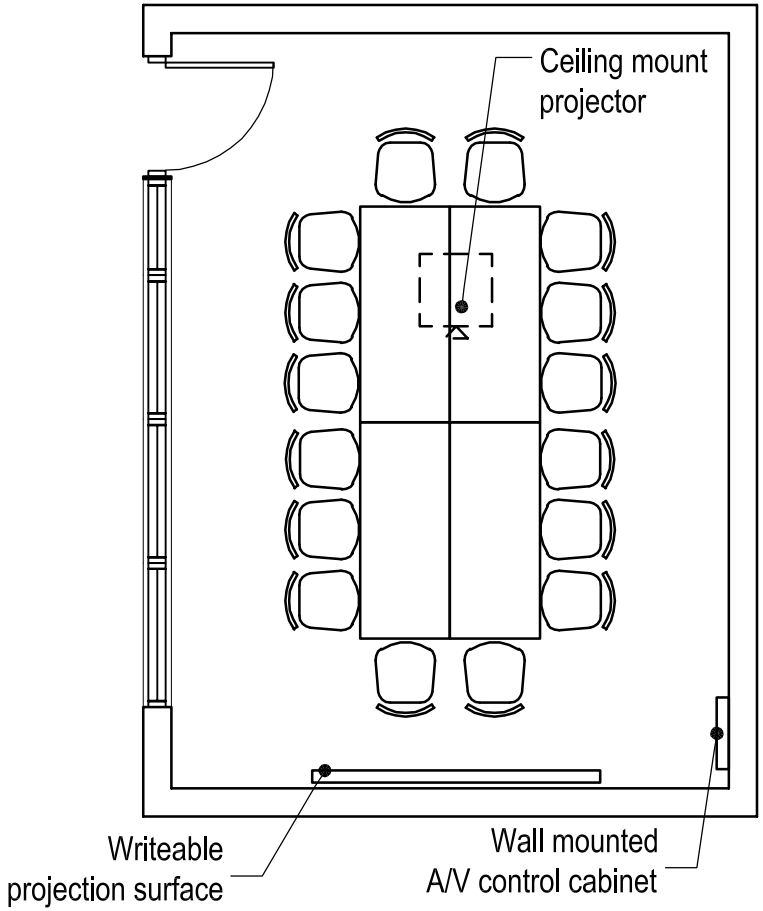
ELECTRICAL
- Voice/Data & Electrical – Podium
- Electrical Convenience Outlets, Perimeter
- Data Outlets, Perimeter
- Lighting – Zoned, Multiple Levels

NOTES
- Projection Surface & White Board Side-by-Side
- Seating for 16 at Tables
- Room Darkening Capability

B108

SEMINAR
16 SEAT

AREA: 320 SF



B109 COMPUTER CLASSROOM

AREA: 960 SF

UTILIZATION

- Hours of Use
  - 15 hours / day
- Occupants
  - Presenter(s)
  - Students - 24
- Function
  - Teaching Space

LOCATION / ADJACENCIES

- Adjacent to
  - Major Circulation
- Easy access to
  - Teaching Labs
  - Classrooms

ARCHITECTURAL

- Windows
  - None
- Floor
  - Raised Access Floor
  - Carpet, tile
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Ceiling Tile
  - Height: 10'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Sidelight with Window Covering
- Security
  - Controlled Access
- Sound
  - Sound Separation Required

EQUIPMENT

- White Board, 2-Layer, Vertical-Stack
- Presenter Podium / Control Station
- LCD Projector, Ceiling-Mount
- Writeable Projection Surface
- Audio Enhancement System
- Student Computer Stations – 24
- Student Printers – 2
- Tack Strip

FURNISHINGS

- Presenter Chair / Stool – 1
- Student Tables, (8) 7'W x 2'D
- Student Chairs – 24
- Worksurface for Student Printers – 8'L x 2'D

MECHANICAL / PLUMBING

- Individual HVAC Zone

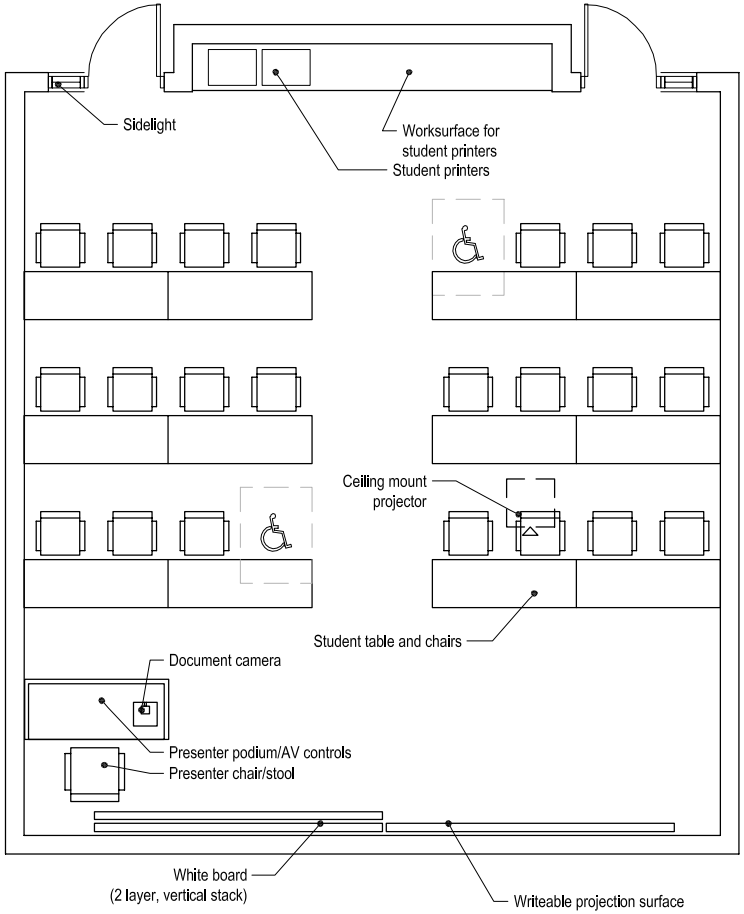
ELECTRICAL

- Voice/Data & Electrical – Podium
- Electrical Convenience Outlets, Perimeter
- Data Outlets, Perimeter
- Lighting – Zoned, Multiple Levels

NOTES

- Projection Surface & White Board Side-by-Side
- 3 Computer Stations per Table
- Room Darkening Capability

B109
COMPUTER CLASSROOM
AREA: 960 SF



Code	Function / Space Name	Qty.	NSF/ Space	Total NSF	Station Qty.	NSF/ Station	GSF	Remarks
C	FACULTY-STAFF SPACES							
C101	Biology Faculty Office	30	120	3,600	-	-	5,538	
C102	Biology Professor-in-Residence	2	120	240	-	-	369	
C103	CRO InnovaBio Faculty Office	1	120	120	-	-	185	
C104	CRFS Office	1	150	150	-	-	231	
C105	Adjunct Faculty Office	1	900	900	15	60	1,385	(15) shared workstations
C106	Administrative Assistant	3	80	240	-	-	369	Open office workstation
C107	Faculty Work Room	1	320	320	-	-	492	Copy, print, fax, work space, storage
C108	Unisex Shower / Toilet	1	100	100			154	
	Biology Chair Office Suite							Share support spaces w/Dean Suite
C109	Biology Dept. Chair Office	1	150	150			231	
C110	Associate Dept. Chair Office	2	150	300			462	
C111	Administrative Assistant Wrkst.	1	80	80			123	
C112	Reception / Waiting	1	100	100			154	Includes Work-Study Recep. Station
				6,420			9,877	

Notes

- Faculty offices are to be spread throughout building, close to teaching and research labs, as well as classrooms.

C101
BIOLOGY FACULTY OFFICE
AREA: 120 SF

UTILIZATION
- Hours of Use
  - 8 hours / day
- Occupants
  - Faculty Member - 1
  - Visitors - 2
- Function
  - Private Office
  - Small Meetings

LOCATION / ADJACENCIES
- Offices Located throughout Building
- Easy access to
  - Faculty Work Room
  - Classrooms
  - Teaching Labs

ARCHITECTURAL
- Windows
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Privacy Requirement

EQUIPMENT
- Computer
- Telephone

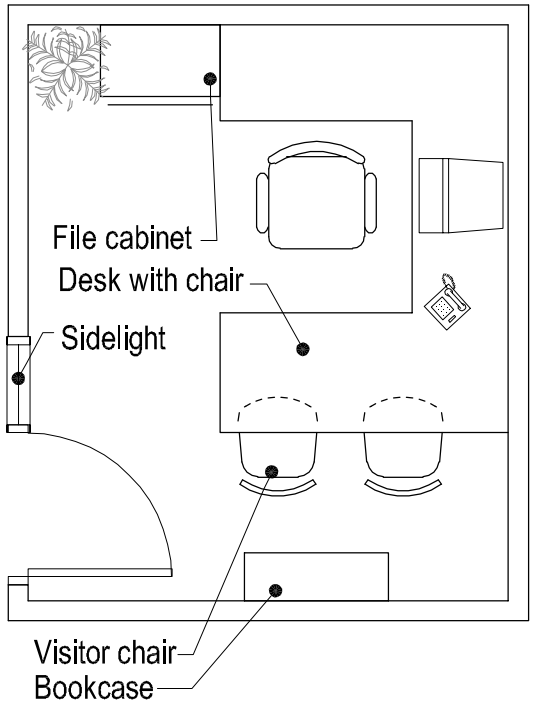
FURNISHINGS
- Desk
- Desk Chair
- Visitor Chairs - 2
- File Cabinet(s)
- Bookcase(s)

MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Voice/Data Outlets at Desk
- Electrical Outlets at Desk & Perimeter
- Lighting Fluorescent Parabolic

c101
BIOLOGY FACULTY OFFICE

AREA: 120 SF



c102

BIOLOGY

PROFESSOR-IN-RESIDENCE

AREA: 120 SF

UTILIZATION

- Hours of Use
  - 9 hours / day
- Occupants
  - Faculty Member - 1
  - Visitors - 2
- Function
  - Private Office
  - Small Meetings

LOCATION / ADJACENCIES

- Adjacent to
  - Dean's Suite
- Easy access to
  - Faculty Work Room
  - Classrooms
  - Teaching Labs

ARCHITECTURAL

- Windows
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Privacy Requirement

EQUIPMENT

- Computer
- Telephone

FURNISHINGS

- Desk
- Desk Chair
- Visitor Chairs - 2
- File Cabinet(s)
- Bookcase(s)

MECHANICAL / PLUMBING

- Shared HVAC Zone

ELECTRICAL

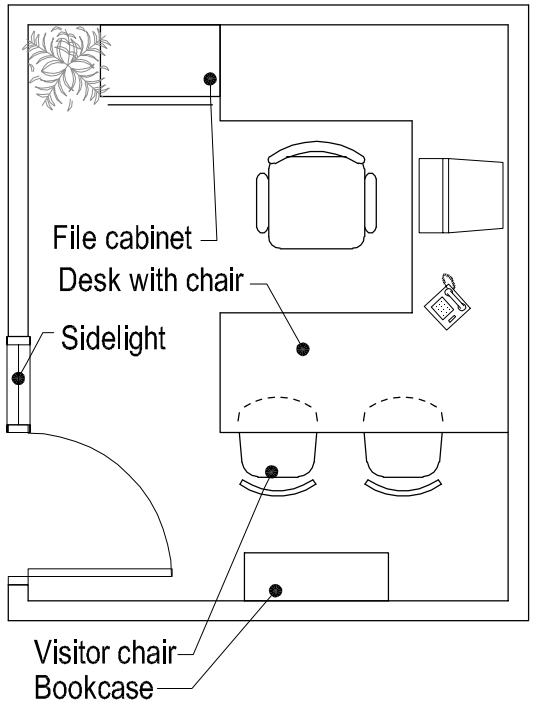
- Voice/Data Outlets at Desk
- Electrical Outlets at Desk & Perimeter
- Lighting – Fluorescent Parabolic

c102

BIOLOGY

PROFESSOR-IN-RESIDENCE

AREA: 120 SF



c103

CRO InnovaBio FACULTY OFFICE

AREA: 120 SF

UTILIZATION

- Hours of Use
  - 9 hours / day
- Occupants
  - Faculty Member - 1
  - Visitors - 2
- Function
  - Private Office
  - Small Meetings

LOCATION / ADJACENCIES

- Easy access to
  - Faculty Work Room
  - Classrooms
  - Teaching Labs

ARCHITECTURAL

- Windows
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Privacy Requirement

EQUIPMENT

- Computer
- Telephone

FURNISHINGS

- Desk
- Desk Chair
- Visitor Chairs - 2
- File Cabinet(s)
- Bookcase(s)

MECHANICAL / PLUMBING

- Shared HVAC Zone

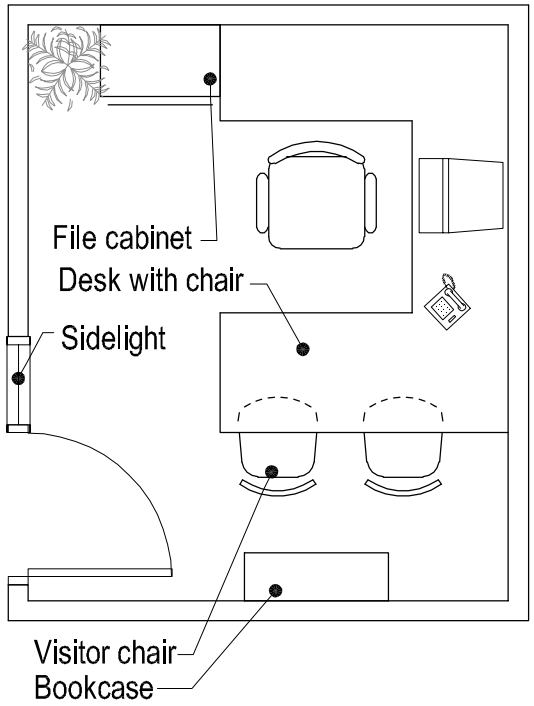
ELECTRICAL

- Voice/Data Outlets at Desk
- Electrical Outlets at Desk & Perimeter
- Lighting – Fluorescent Parabolic

c103

CRO InnovaBio
FACULTY OFFICE

AREA: 120 SF



c104

CRFS OFFICE

AREA: 150 SF

UTILIZATION

- Hours of Use
  - 9 hours / day
- Occupants
  - Administrative Assistant - 1
  - Visitors - 4
- Function
  - Private Office
  - Small Meetings

LOCATION / ADJACENCIES

- Easy access to
  - Faculty Work Room
  - Classrooms
  - Teaching Labs

ARCHITECTURAL

- Windows
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Privacy Requirement

EQUIPMENT

- Computer
- Telephone

FURNISHINGS

- Desk
- Desk Chair
- Visitor Chairs - 4
- File Cabinets - 2

MECHANICAL / PLUMBING

- Shared HVAC Zone

ELECTRICAL

- Voice/Data Outlets at Desk
- Electrical Outlets at Desk & Perimeter
- Lighting – Fluorescent Parabolic

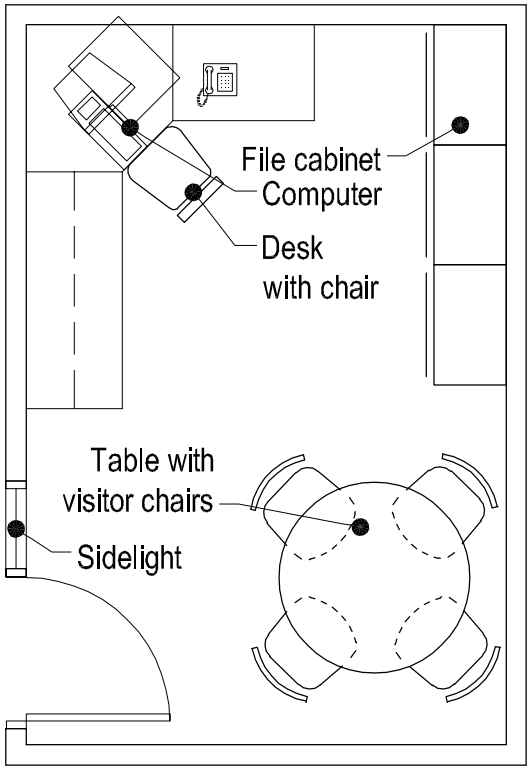
NOTES

- Capitol Reef Field Station Office

c104

CRFS OFFICE

AREA: 150 SF



c105
ADJUNCT FACULTY OFFICE
AREA: 900 SF

UTILIZATION
- Hours of Use
  - 14 hours / day
- Occupants
  - Adjunct Faculty Member - 12
  - Visitors - 12
- Function
  - Shared Workspace for Adjunct Faculty
  - Student Consultations

LOCATION / ADJACENCIES
- Two Rooms Located on Different Floors
- Easy access to
  - Faculty Work Room
  - Classrooms
  - Teaching Labs

ARCHITECTURAL
- Windows
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Sound Separation from Adjoining Spaces

EQUIPMENT
- Computer - 12
- Telephone - 12
- Printer / Copier

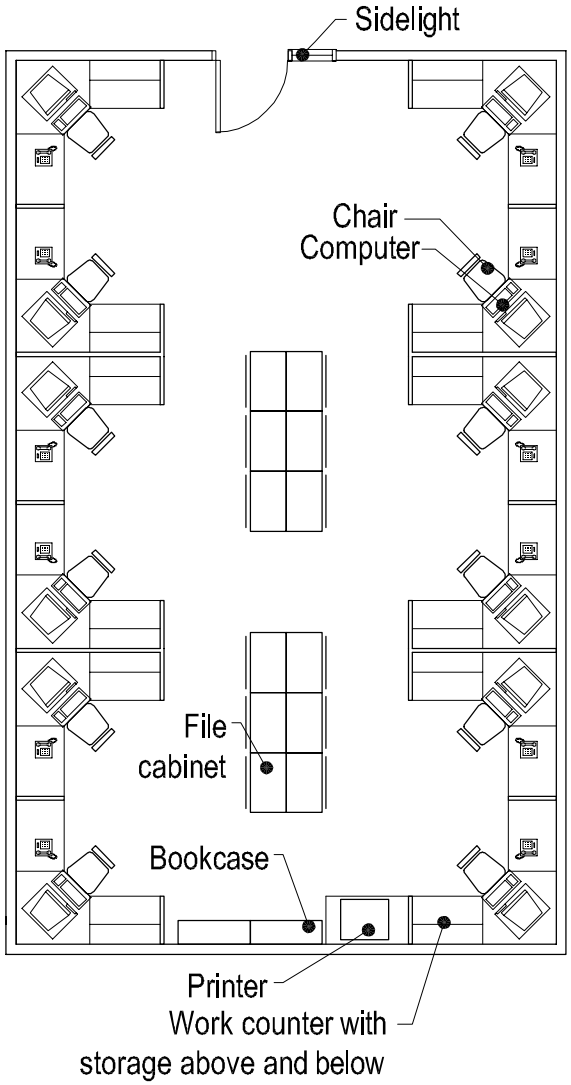
FURNISHINGS
- 5' x 6' Workstations - 12
- Desk Chairs - 12
- File Cabinets (12 drawers)
- Open Shelving

MECHANICAL / PLUMBING
- Individual HVAC Zone

ELECTRICAL
- Voice/Data Outlets at Workstations
- Electrical Outlets at Workstations & Perimeter
- Lighting – Fluorescent Parabolic

NOTES
- 1 Room for Biology
- 1 Room for Earth Science, Physics, Chemistry

c105
ADJUNCT FACULTY OFFICE
AREA: 900 SF



c106
ADMINISTRATIVE ASSISTANT

AREA: 80 SF

UTILIZATION
- Hours of Use
  - 9 hours / day
- Occupants
  - Assistant - 1
  - Visitor - 1
- Function
  - Open Office Workstation

LOCATION / ADJACENCIES
- Spread throughout Building
- Easy access to
  - Faculty Work Room

ARCHITECTURAL
- Windows
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - None
- Security
  - Public Access
- Sound
  - Sound Absorption

EQUIPMENT
- Computer
- Telephone

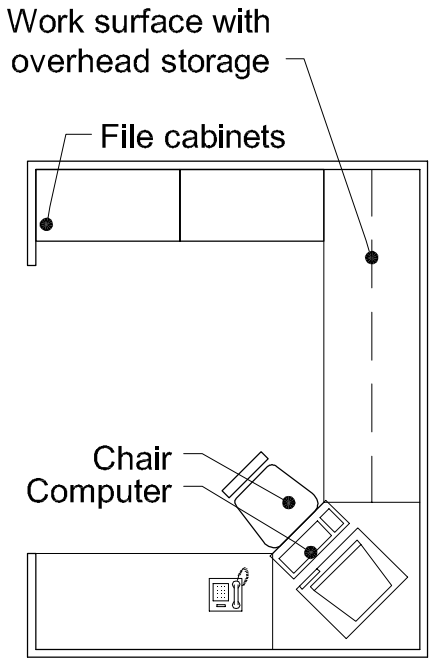
FURNISHINGS
- Open Office Workstation
- Desk Chair
- Visitor Chair
- File Cabinet(s)
- Bookcase(s)

MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Voice/Data Outlets at Workstation
- Electrical Outlets at Desk & Perimeter
- Lighting – Fluorescent Parabolic

c106
ADMINISTRATIVE ASSISTANT

AREA: 80 SF



c107
FACULTY WORK ROOM
AREA: 320 SF

UTILIZATION
- Hours of Use
  - 15 hours / day
- Occupants
  - None
- Function
  - Shared Faculty/Staff Work/Prep Space
  - Copying, Collating, Assembling

LOCATION / ADJACENCIES
- Central Location
- Easy Access by Faculty & Staff

ARCHITECTURAL
- Windows
  - None
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Sound Separation from Adjoining Spaces

EQUIPMENT
- Millwork Base/Upper Cabinets with Storage
- Millwork Work Island with Storage
- Faculty Mailboxes, (80) 10"w-12"d-4"h
- Copier
- Printer
- Fax Machine
- Telephone – Wall-Mount
- Various Equipment, Surface-Mount

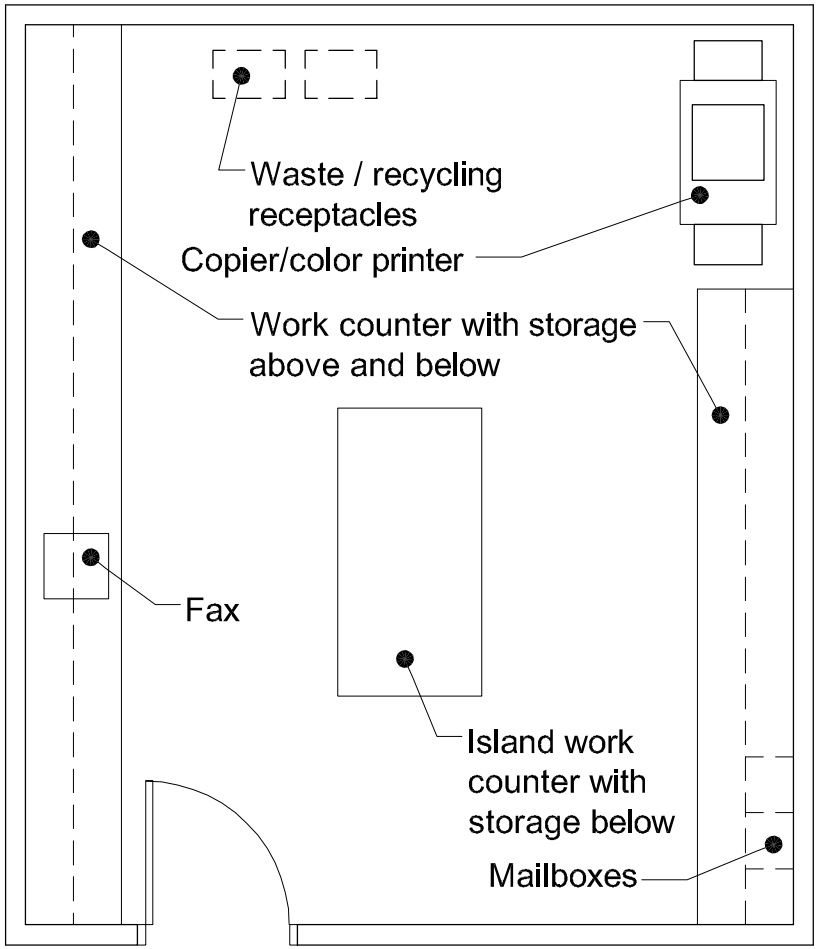
FURNISHINGS
- Waste & Recycling Receptacles
- Supply Storage Cabinet

MECHANICAL / PLUMBING
- Individual HVAC Zone
- Exhaust

ELECTRICAL
- Voice/Data Outlets at Equipment Locations
- Electrical Outlets at Equipment & Perimeter
- Lighting – Fluorescent Parabolic

c107
FACULTY WORK ROOM

AREA: 320 SF



c108
UNISEX SHOWER/ TOILET
AREA: 100 SF

UTILIZATION
- Hours of Use
  - 24 hours / day
- Occupants
  - Faculty/Staff - 1
- Function
  - Single-User Shower / Toilet Facilities

LOCATION / ADJACENCIES
- Low Visibility
- Easy access to
  - Main Entries
  - Main Corridor

ARCHITECTURAL
- Windows
  - None
- Floor
  - Ceramic Tile
- Partitions
  - Gyp Board, Paint
  - Gyp Board, Ceramic Tile
- Base
  - Ceramic Tile
  - Integral with Floor / Wall
- Ceiling
  - Gyp Board, Paint
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
- Security
  - Controlled Access
- Sound
  - Privacy Requirement

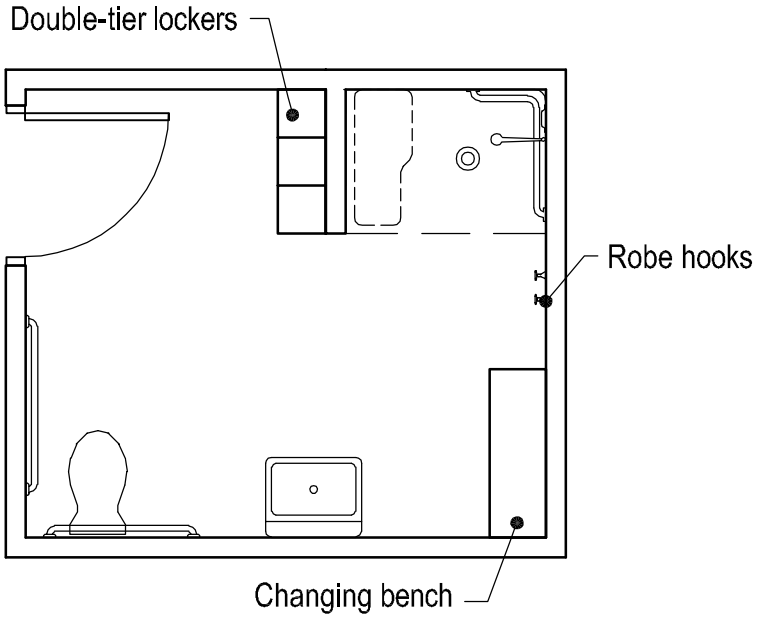
EQUIPMENT
- Toilet
- Lavatory
- Pre-Fabricated Shower
- Toilet Room Accessories
- Shower Room Accessories
- Double-Tier Lockers - 3

FURNISHINGS
- Changing Bench

MECHANICAL / PLUMBING
- Individual HVAC Zone
- Exhaust
- Plumbing for Toilet, Shower, Lavatory

ELECTRICAL
- Electrical Convenience Outlets at Sink
- Lighting - High-Efficiency Fluorescent
- Task Lighting at Mirror

c108
UNISEX SHOWER/ TOILET
AREA: 100 SF



c109
BIOLOGY DEPT. CHAIR OFFICE
AREA: 150 SF

UTILIZATION
- Hours of Use
  - 9 hours / day
- Occupants
  - Dept. Chair - 1
  - Visitors - 2
- Function
  - Private Office
  - Small Meetings

LOCATION / ADJACENCIES
- Within Biology Chair Suite
- Adjacent to Deans' Suite for
  - Shared Support

ARCHITECTURAL
- Windows
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Privacy Requirement

EQUIPMENT
- Computer
- Telephone

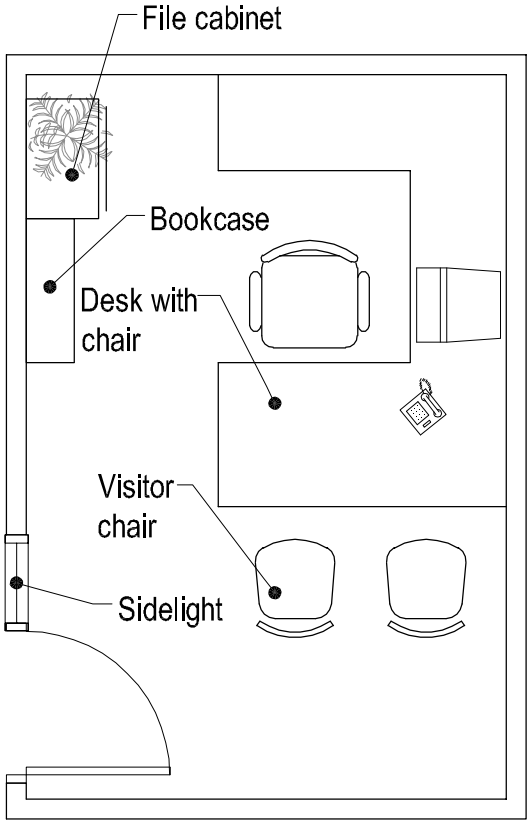
FURNISHINGS
- Desk
- Desk Chair
- Visitor Chairs - 2
- File Cabinet(s)
- Bookcase(s)

MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Voice/Data Outlets at Desk
- Electrical Outlets at Desk & Perimeter
- Lighting - Fluorescent Parabolic

c109
BIOLOGY DEPT. CHAIR OFFICE

AREA: 150 SF



C110
ASSOCIATE DEPT. CHAIR OFFICE

AREA: 150 SF

UTILIZATION
- Hours of Use
  - 9 hours / day
- Occupants
  - Associate Dept. Chair - 1
  - Visitors - 2
- Function
  - Private Office
  - Small Meetings

LOCATION / ADJACENCIES
- Within Biology Chair Suite
- Adjacent to Deans' Suite for
  - Shared Support

ARCHITECTURAL
- Windows
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Privacy Requirement

EQUIPMENT
- Computer
- Telephone

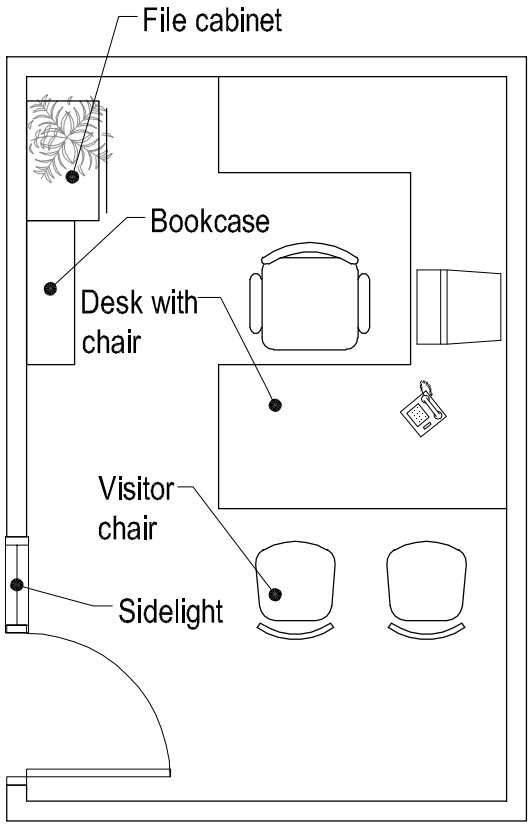
FURNISHINGS
- Desk
- Desk Chair
- Visitor Chairs - 2
- File Cabinet(s)
- Bookcase(s)

MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Voice/Data Outlets at Desk
- Electrical Outlets at Desk & Perimeter
- Lighting - Fluorescent Parabolic

c110
ASSOCIATE DEPT. CHAIR OFFICE

AREA: 150 SF



C111
ADMINISTRATIVE ASSISTANT WORKSTATION

AREA: 80 SF

UTILIZATION
- Hours of Use
  - 9 hours / day
- Occupants
  - Assistant - 1
- Function
  - Open Office Workstation

LOCATION / ADJACENCIES
- Within Biology Chair Suite
- Adjacent to Deans' Suite for
  - Shared Support
- Assistant Adjacent to Receptionist

ARCHITECTURAL
- Windows
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - None
- Security
  - Public Access
- Sound
  - Sound Absorption

EQUIPMENT
- Computer
- Telephone
- Printer

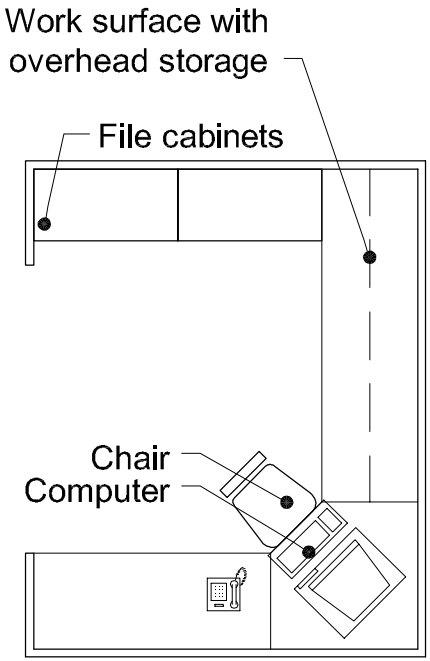
FURNISHINGS
- Open Office Workstation
- Desk Chair
- File Cabinet(s)
- Bookcase(s)

MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Voice/Data Outlets at Workstation
- Electrical Outlets at Desk & Perimeter
- Lighting - Fluorescent Parabolic

C111
ADMINISTRATIVE ASSISTANT WORKSTATION

AREA: 80 SF



C112
RECEPTION/ WAITING
AREA: 100 SF

UTILIZATION
- Hours of Use
  - 9 hours / day
- Occupants
  - Assistant - 1
- Function
  - Entry to Biology Chairs' Suite
  - Receptionist Workstation - 36 NSF
  - Waiting Space for 2 People

LOCATION / ADJACENCIES
- Within / Adjacent to Biology Chairs' Suite
- Adjacent to Reception Workstation

ARCHITECTURAL
- Windows
  - Exterior: Desired
  - Interior to Main Corridor: Required
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3' x 7' Suite Entry Door, Glass
- Security
  - Controlled Access
- Sound
  - Sound Absorption

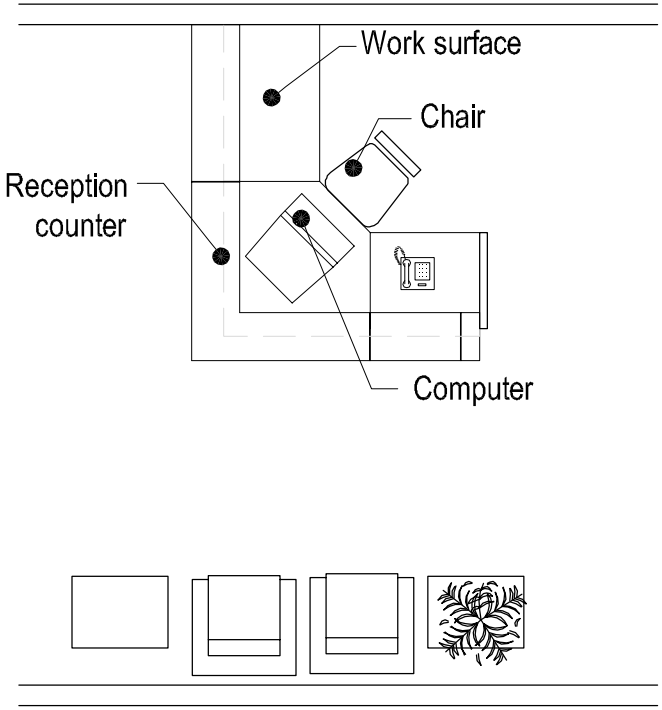
EQUIPMENT
- Computer / Telephone at Receptionist Workstation

FURNISHINGS
- Reception Workstation - 6' x 6'
- Receptionist Chair
- Lounge / Waiting Seats - 2

MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Data & Electrical at Reception Workstation
- Convenience Electrical Outlets
- Lighting - Fluorescent Parabolic

C112
RECEPTION/ WAITING
AREA: 100 SF



Code	Function / Space Name	Qty.	NSF/ Space	Total NSF	Station Qty.	NSF/ Station	GSF	Remarks
D	DEANS' SUITE							
	Offices-Workstations							
D101	Dean's Office	1	170	170	-	-	262	Private office; conference table for 4
D102	Associate Dean's Office	2	150	300	-	-	462	1 existing, 1 future.
D103	Assistant Dean's Office	2	150	300	-	-	462	4 total; 2 - no offices
D104	Administrative Office	1	150	150	-	-	231	Private office; 2 visitor chairs
D105	Web Development Office	1	120	120	-	-	185	Private office; 2 visitor chairs
D106	Administrative Assistant	1	120	120	-	-	185	Adjacent to Receptionist
D107	Reception Workstation	1	80	80	-	-	123	Future position; work/study student
				1,240			*1,908*	
	Ancillary Spaces							
D108	Waiting	1	150	150	-	-	231	Deans' office entry; 4 seats
D109	Conference Room	1	160	160	8	20	246	Table with 8 chairs.
D110	Work Room	1	320	320	-	-	492	Copy, print, fax, storage, mailboxes
D111	File Room	1	100	100	-	-	154	7 file cabinets; future paperless
D112	Storage Room	1	150	150	-	-	231	Storage; kitchenette
D113	Wide-Format Printer	1	150	150	-	-	231	Poster printer; work area
				1,030			*1,585*	
				2,270			3,492	

D101
DEAN'S OFFICE
AREA: 170 SF

UTILIZATION
- Hours of Use
  - 9 hours / day
- Occupants
  - Dean
  - Visitors - 8
- Function
  - Private Office
  - Small Meetings

LOCATION / ADJACENCIES
- Within Dean's Suite
- Quiet, Private Location
- Easy Access to:
  - Administrative Assistant
  - Conference Room

ARCHITECTURAL
- Windows
  - Exterior: Required
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Privacy Requirement

EQUIPMENT
- Computer
- Telephone

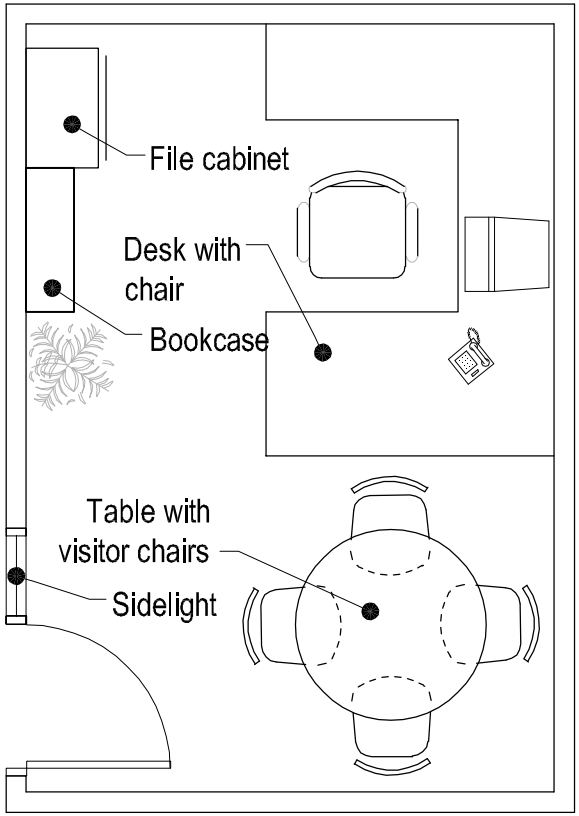
FURNISHINGS
- Desk
- Desk Chair
- 7' Conference Table
- Visitor Chairs - 8
- File Cabinet(s)
- Bookcase(s)

MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Voice/Data Outlets at Desk
- Electrical Outlets at Desk & Perimeter
- Lighting – Fluorescent Parabolic

NOTES
- Dean's Suite Easy to Locate, but Not High-Visibility

D101
DEAN'S OFFICE
AREA: 170 SF



D102
ASSOCIATE DEAN'S OFFICE
AREA: 150 SF

UTILIZATION
- Hours of Use
  - 9 hours / day
- Occupants
  - Associate Dean
  - Visitors - 2
- Function
  - Private Office
  - Small Meetings

LOCATION / ADJACENCIES
- Within Dean's Suite
- Quiet, Private Location
- Easy Access to:
  - Administrative Assistant
  - Conference Room

ARCHITECTURAL
- Windows
  - Exterior: Required
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Privacy Requirement

EQUIPMENT
- Computer
- Telephone

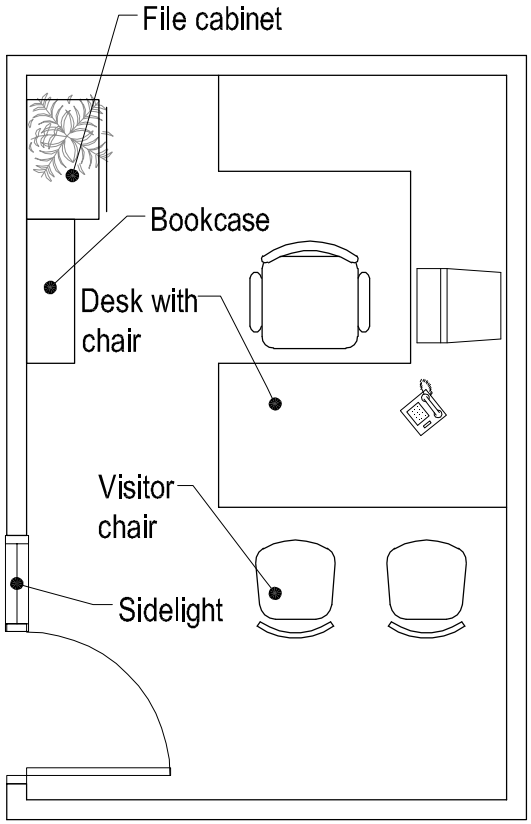
FURNISHINGS
- Desk
- Desk Chair
- Visitor Chairs - 2
- File Cabinet(s)
- Bookcase(s)

MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Voice/Data Outlets at Desk
- Electrical Outlets at Desk & Perimeter
- Lighting – Fluorescent Parabolic

NOTES
- Dean's Suite Easy to Locate, but Not High-Visibility

D102
ASSOCIATE DEAN'S OFFICE
AREA: 150 SF



D103
ASSISTANT DEAN'S OFFICE
AREA: 150 SF

UTILIZATION
- Hours of Use
  - 9 hours / day
- Occupants
  - Assistant Dean
  - Visitors - 2
- Function
  - Private Office
  - Small Meetings

LOCATION / ADJACENCIES
- Within Dean's Suite
- Quiet, Private Location
- Easy Access to:
  - Administrative Assistant
  - Conference Room

ARCHITECTURAL
- Windows
  - Exterior: Required
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Privacy Requirement

EQUIPMENT
- Computer
- Telephone

FURNISHINGS
- Desk
- Desk Chair
- Visitor Chairs - 2
- File Cabinet(s)
- Bookcase(s)

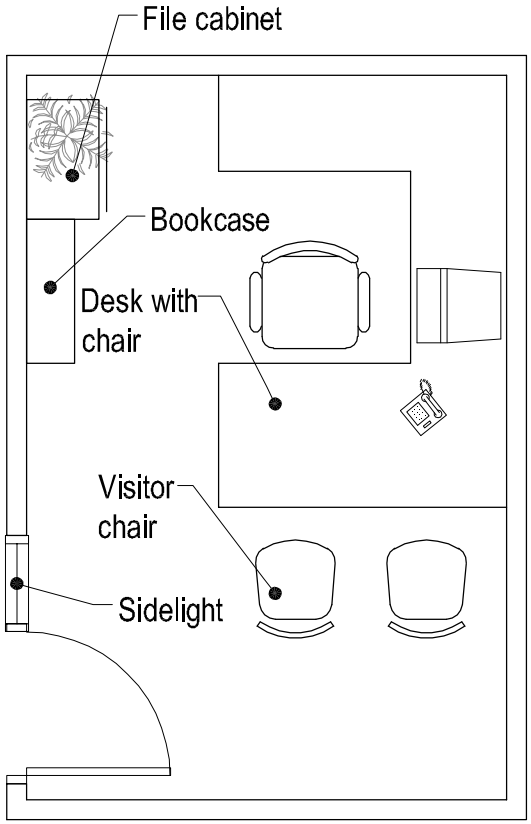
MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Voice/Data Outlets at Desk
- Electrical Outlets at Desk & Perimeter
- Lighting – Fluorescent Parabolic

NOTES
- Dean's Suite Easy to Locate, but Not High-Visibility

D103
ASSISTANT DEAN'S OFFICE

AREA: 150 SF



D104
ADMINISTRATIVE OFFICE
AREA: 150 SF

UTILIZATION
- Hours of Use
  - 9 hours / day
- Occupants
  - Administrative Staff
  - Visitors - 2
- Function
  - Private Office
  - Small Meetings

LOCATION / ADJACENCIES
- Within Dean's Suite
- Quiet Location

ARCHITECTURAL
- Windows
  - Exterior: Required
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Privacy Requirement

EQUIPMENT
- Computer
- Telephone

FURNISHINGS
- Desk
- Desk Chair
- Visitor Chairs - 2
- File Cabinet(s)
- Bookcase(s)

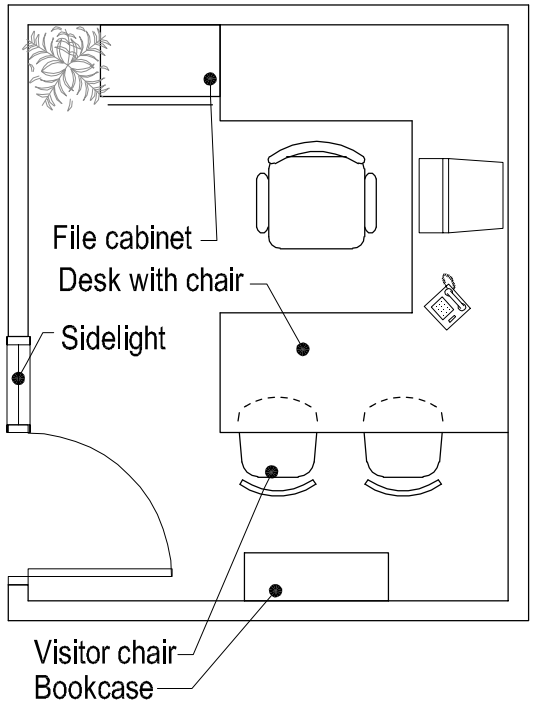
MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Voice/Data Outlets at Desk
- Electrical Outlets at Desk & Perimeter
- Lighting – Fluorescent Parabolic

NOTES
- Dean's Suite Easy to Locate, but Not High-Visibility

D104
ADMINISTRATIVE OFFICE

AREA: 150 SF



D105
WEB DEVELOPMENT OFFICE
AREA: 120 SF

UTILIZATION
- Hours of Use
  - 9 hours / day
- Occupants
  - Web Developer
  - Visitors - 2
- Function
  - Private Office
  - Small Meetings

LOCATION / ADJACENCIES
- Within Dean's Suite
- Quiet Location

ARCHITECTURAL
- Windows
  - Exterior: Required
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Privacy Requirement

EQUIPMENT
- Computer - 2
- Telephone

FURNISHINGS
- Desk
- Desk Chair
- Visitor Chairs - 2
- File Cabinet(s)
- Bookcase(s)

MECHANICAL / PLUMBING
- Shared HVAC Zone

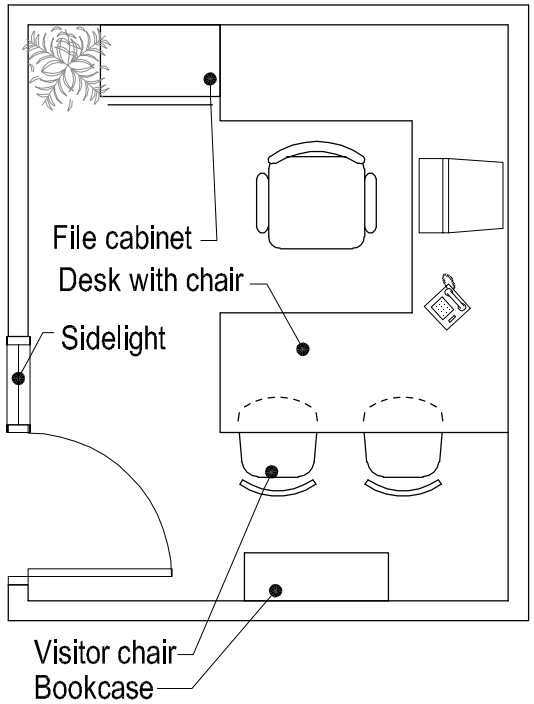
ELECTRICAL
- Voice/Data Outlets at Desk
- Electrical Outlets at Desk & Perimeter
- Lighting – Fluorescent Parabolic

NOTES
- Dean's Suite Easy to Locate, but Not High-Visibility

D105

WEB DEVELOPMENT OFFICE

AREA: 120 SF



D106
ADMINISTRATIVE ASSISTANT

AREA: 120 SF

UTILIZATION

- Hours of Use
  - 9 hours / day
- Occupants
  - Assistant - 1
  - Visitor - 1
- Function
  - Open Office Workspace
  - Administrative Assistant for Deans
  - Back-up Receptionist for Dean's Suite

LOCATION / ADJACENCIES

- Visibility to Dean's Suite Entry
- Easy access to Work Room

ARCHITECTURAL

- Windows
  - Exterior: Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - None
- Security
  - Public Access
- Sound
  - Sound Absorption

EQUIPMENT

- Computer
- Telephone

FURNISHINGS

- Open Office Workstation
- Desk Chair
- Visitor Chair
- File Cabinet(s)
- Shelving

MECHANICAL / PLUMBING

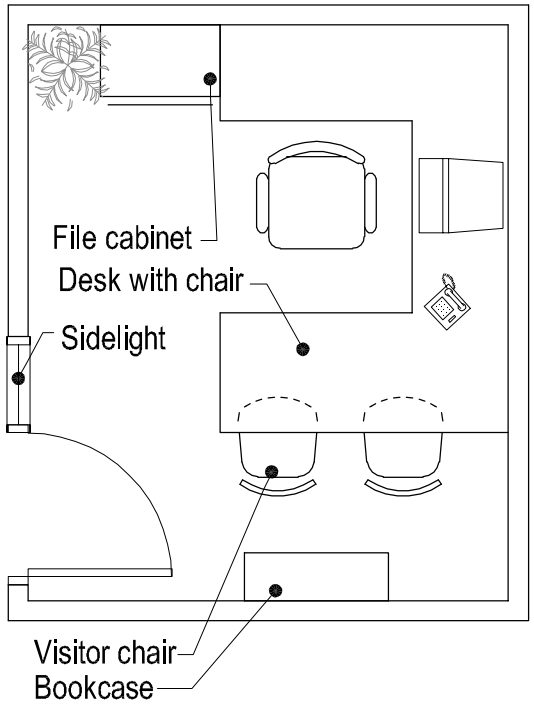
- Shared HVAC Zone

ELECTRICAL

- Voice/Data Outlets at Workstation
- Electrical Outlets at Workstation
- Lighting – Fluorescent Parabolic

D106
ADMINISTRATIVE ASSISTANT

AREA: 120 SF



D107
RECEPTION WORKSTAION
AREA: 80 SF

UTILIZATION
- Hours of Use
  - 9 hours / day
- Occupants
  - Assistant - 1
- Function
  - Open Office Workstation
  - Receptionist for Dean's Suite

LOCATION / ADJACENCIES
- Adjacent to Dean's Suite Entry
- Adjacent to Dean's Suite Waiting

ARCHITECTURAL
- Windows
  - Exterior: Desired
  - Interior: Required, to Corridor
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - None
- Security
  - Public Access
- Sound
  - Sound Absorption

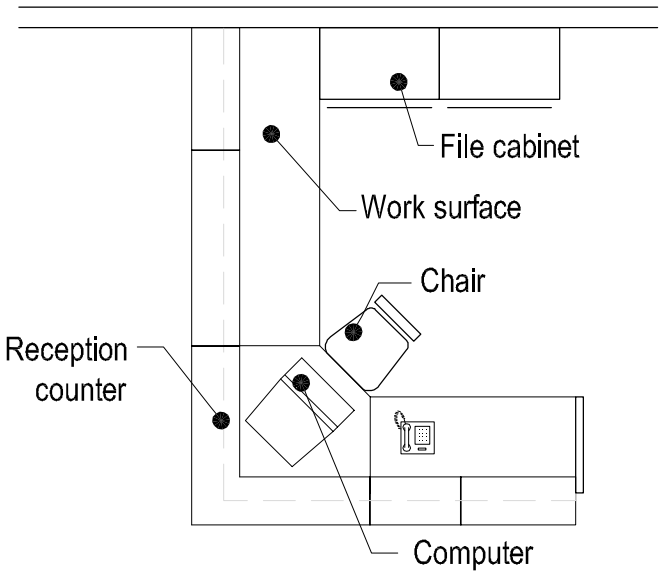
EQUIPMENT
- Computer
- Telephone

FURNISHINGS
- Open Office Workstation
- Reception Transaction Counter
- Desk Chair

MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Voice/Data Outlets at Workstation
- Electrical Outlets at Workstation
- Lighting – Fluorescent Parabolic

D107
RECEPTION WORKSTAION
AREA: 80 SF



D108
WAITING
AREA: 150 SF

UTILIZATION
- Hours of Use
  - 9 hours / day
- Occupants
  - Visitors - 4
- Function
  - Entry to Dean's Suite
  - Waiting Space for 4 People
  - Art / Science Display

LOCATION / ADJACENCIES
- Adjacent to Dean's Suite Entry Door
- Adjacent to Reception Workstation

ARCHITECTURAL
- Windows
  - Exterior: Desired
  - Interior: Required, to Corridor
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3' x 7' Suite Entry Door, Glass
- Security
  - Controlled Access
- Sound
  - Sound Absorption

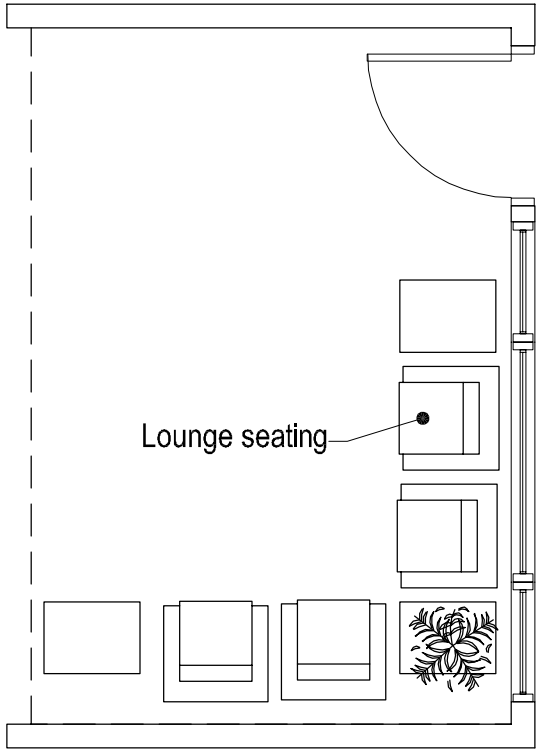
EQUIPMENT
- None

FURNISHINGS
- Lounge / Waiting Seats - 4

MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Convenience Electrical Outlets
- Lighting – Fluorescent Parabolic

D108
WAITING
AREA: 150 SF



D109 CONFERENCE ROOM

AREA: 160 SF

UTILIZATION

- Hours of Use
  - 9 hours / day
- Occupants
  - Up to 8 People
- Function
  - Conference Room for Deans
  - Scheduled by Dean's Suite

LOCATION / ADJACENCIES

- Within Dean's Suite
- Adjacent to Waiting
- Easy Access by Faculty & Staff

ARCHITECTURAL

- Windows
  - None
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Ceiling Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Sidelight with Window Covering
- Security
  - Controlled Access
- Sound
  - Sound Privacy

EQUIPMENT

- White Board
- Presenter Podium / Control Station (Small)
- LCD Projector, Ceiling-Mount
- Writeable Projection Surface
- Projection Screen, Ceiling-Mount

FURNISHINGS

- Table, 8'L x 42"W
- Chairs - 8

MECHANICAL / PLUMBING

- Individual HVAC Zone

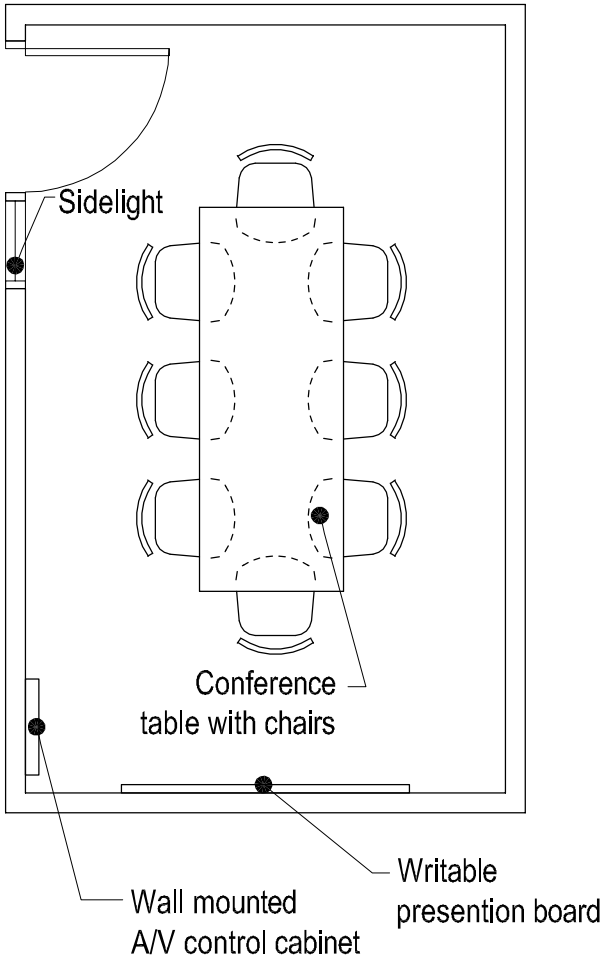
ELECTRICAL

- Voice/Data & Electrical – Podium
- Electrical Convenience Outlets, Perimeter
- Data Outlets, Perimeter
- Lighting –Multiple Levels

NOTES

- Room Darkening Capability

D109
CONFERENCE ROOM
AREA: 160 SF



D110
WORK ROOM
AREA: 320 SF

UTILIZATION
- Hours of Use
  - 15 hours / day
- Occupants
  - None
- Function
  - Work/Prep Space for Dean's Suite
  - Copying, Collating, Assembling
  - Will be used by Faculty with Offices Nearby

LOCATION / ADJACENCIES
- Within Dean's Suite
- Easy Access by Faculty & Staff
- Adjacent to Waiting

ARCHITECTURAL
- Windows
  - None
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Vision Panel or Sidelight
  - Window Covering
- Security
  - Controlled Access
- Sound
  - Sound Separation from Adjoining Spaces

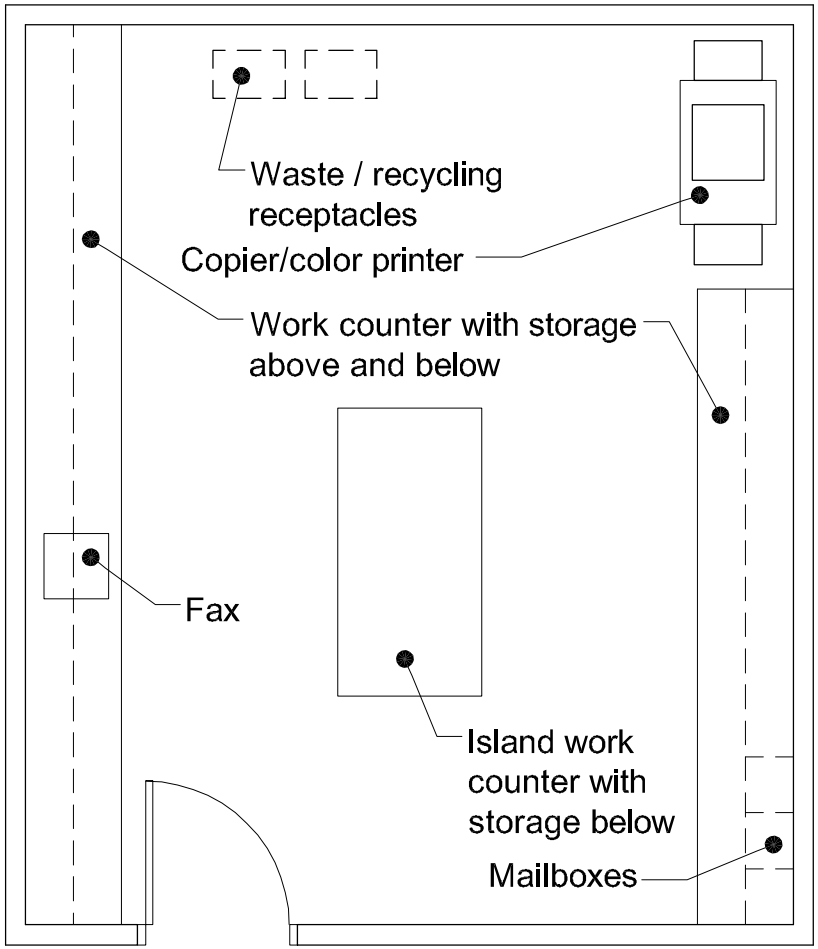
EQUIPMENT
- Millwork Base/Upper Cabinets with Storage
- Millwork Work Island with Storage
- Copier
- Printer
- Fax Machine
- Telephone – Wall-Mount
- Various Equipment, Surface-Mount

FURNISHINGS
- Waste & Recycling Receptacles
- Supply Storage Cabinet

MECHANICAL / PLUMBING
- Individual HVAC Zone
- Exhaust

ELECTRICAL
- Voice/Data Outlets at Equipment Locations
- Electrical Outlets at Equipment & Perimeter
- Lighting – Fluorescent Parabolic

D110
WORK ROOM
AREA: 320 SF



D111
FILE ROOM
AREA: 100 SF

UTILIZATION
Hours of Use
- 9 hours / day

Occupants
- None

Function
- File Storage for Dean's Suite

LOCATION / ADJACENCIES
Within Dean's Suite
Easy Access by Admin. Assistant & Deans
Adjacent to Work Room

ARCHITECTURAL
Windows
- None

Floor
- Carpet

Partitions
- Gyp Board, Paint

Base
- 4" Rubber

Ceiling
- Acoustic Tile
- Height: 9'-0" Min.

Doors
- 3'-0" x 7'-0"

Security
- Controlled Access

Sound
- No Requirements

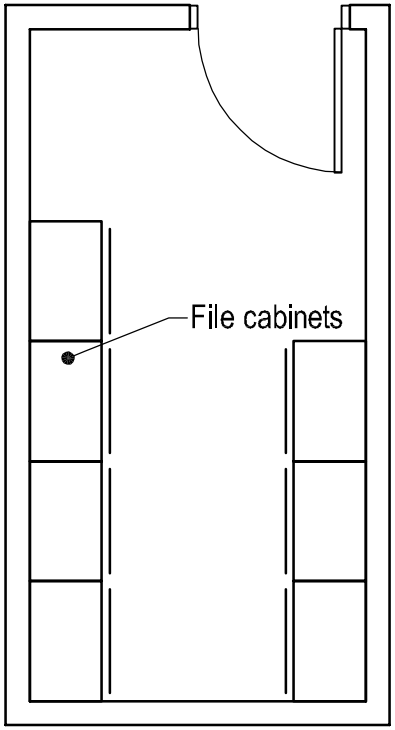
EQUIPMENT
None

FURNISHINGS
File Cabinets
File Shelving

MECHANICAL / PLUMBING
Minimal HVAC

ELECTRICAL
Electrical Outlets at Perimeter
Lighting – Fluorescent Parabolic

D111
FILE ROOM
AREA: 100 SF



D112
STORAGE ROOM
AREA: 150 SF

UTILIZATION
Hours of Use
- 9 hours / day

Occupants
- None

Function
- Storage of Frames, Brochures, Tee Shirts, Laptops, Projectors

LOCATION / ADJACENCIES
Within Dean's Suite
Easy Access by Admin. Assistant
Adjacent to Work Room

ARCHITECTURAL
Windows
- None

Floor
- Carpet

Partitions
- Gyp Board, Paint

Base
- 4" Rubber

Ceiling
- Acoustic Tile
- Height: 9'-0" Min.

Doors
- 3'-0" x 7'-0"

Security
- Controlled Access

Sound
- No Requirements

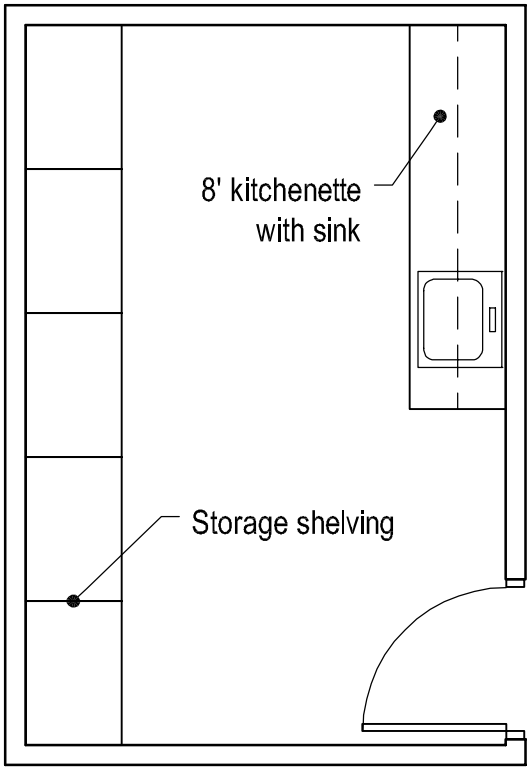
EQUIPMENT
None

FURNISHINGS
Storage Shelving, 18"D x 3'W Sections

MECHANICAL / PLUMBING
Minimal HVAC

ELECTRICAL
Electrical Outlets at Perimeter
Lighting – Fluorescent Parabolic

D112
STORAGE ROOM
AREA: 150 SF



D113
WIDE-FORMAT PRINTER

AREA: 150 SF

UTILIZATION

- Hours of Use
  - 15 hours / day
- Occupants
  - None
- Function
  - Equipment for Making Banners, Posters
  - Printing, Assembling, Fabrication
  - Will be used by College Faculty

LOCATION / ADJACENCIES

- Within Dean's Suite
- Secondary Access from Main Corridor

ARCHITECTURAL

- Windows
  - None
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Tile
  - Height: 9'-0" Min.
- Doors
  - (2) 3'-0" x 7'-0"
  - (1) – Dean's Suite
  - (1) – Main Corridor
- Security
  - Controlled Access
- Sound
  - Sound Separation from Adjoining Spaces

EQUIPMENT

- Millwork Base/Upper Cabinets with Storage
- Millwork Work Island with Storage
- Wide-Format Printer
- Telephone – Wall-Mount

FURNISHINGS

- Waste & Recycling Receptacles

MECHANICAL / PLUMBING

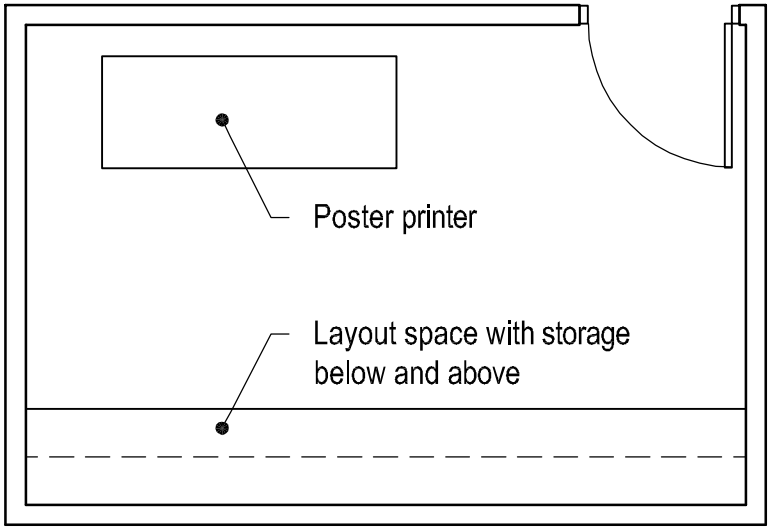
- Individual HVAC Zone
- Exhaust

ELECTRICAL

- Voice/Data Outlets at Equipment Locations
- Electrical Outlets at Equipment & Perimeter
- Lighting – Fluorescent Parabolic

D113
WIDE-FORMAT PRINTER

AREA: 150 SF



Code	Function / Space Name	Qty.	NSF/ Space	Total NSF	Station Qty.	NSF/ Station	GSF	Remarks
E	SHARED SPACES							
E101	Lobby / Atrium	1	1,500	1,500	-	-	2,308	Auditorium Prefunction/Display
E102	Casual Lounge	1	1,600	1,600	80	20	2,462	Lounge seating/table-chair
E103	Group Study	5	150	750	10	15	1,154	Rooms off major circulation
E104	Recycling Center	4	30	120	-	-	185	One per floor
				3,970			6,108	

E101
LOBBY / ATRIUM
AREA: 1,500 SF

UTILIZATION
- Hours of Use
  - 24 hours / day
- Occupants
  - Up to 150 People
- Function
  - Main Entry to Building
  - Auditorium Prefunction
  - Exhibit / Display for College

LOCATION / ADJACENCIES
- Adjacent to:
  - Main Entry
  - Auditorium
- Easy access to:
  - Service entrance

ARCHITECTURAL
- Windows
  - Exterior: Required
  - Windows Coverings May be Required
- Floor
  - Hard-Surface / Carpet Combination
  - Upgraded / Durable
- Partitions
  - Special Finish, Upgraded / Durable
  - Acoustic Treatment
- Base
  - Special Finish, Upgraded / Durable
- Ceiling
  - Special Finish, Upgraded / Durable
  - Acoustic Treatment
  - Partially Open to Above
- Doors
  - Main Entry Doors – Glass Storefront
- Security
  - Main Entry – Controlled Access
  - Public Access from Within Building
- Sound
  - Acoustic Considerations

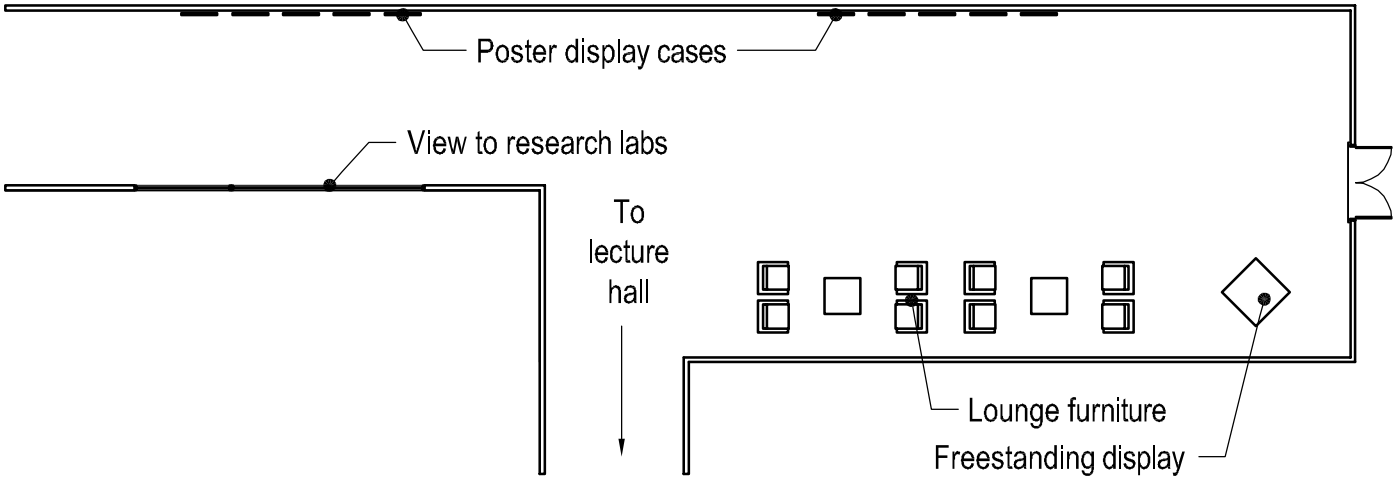
EQUIPMENT
- Display Equipment / Hardware, Wall/Ceiling/Floor-Mount
- Possible Built-In Seating

FURNISHINGS
- Varies – Lounge Seating, Tables / Chairs, Study Carrels

MECHANICAL / PLUMBING
- Individual HVAC Zone

ELECTRICAL
- Electrical Convenience Outlets
- Data Outlets
- Lighting – Zoned, Multiple Levels
- Upgraded Fixture Design

E101
LOBBY / ATRIUM
AREA: 1,500 SF



E102
CASUAL LOUNGE
AREA: 1,600 SF

UTILIZATION
- Hours of Use
  - 24 hours / day
- Occupants
  - Up to 80 People
- Function
  - Small Group Casual Lounge / Study
  - Students, Faculty, Staff Usage

LOCATION / ADJACENCIES
- Spread throughout Building
- Adjacent to Main Circulation
- Small Groupings of 4 to 8 Seats

ARCHITECTURAL
- Windows
  - Exterior: Desired
- Floor
  - Hard-Surface / Carpet Combination
  - Same Flooring as Main Circulation Upgraded / Durable
- Partitions
  - Varies – Special Finish / Gyp, Paint
  - Same Finish as Main Circulation
- Base
  - Special Finish, Upgraded / Durable
- Ceiling
  - Varies –Special Finish / Acoustic Tile
- Doors
  - None
- Security
  - Public Access
- Sound
  - None

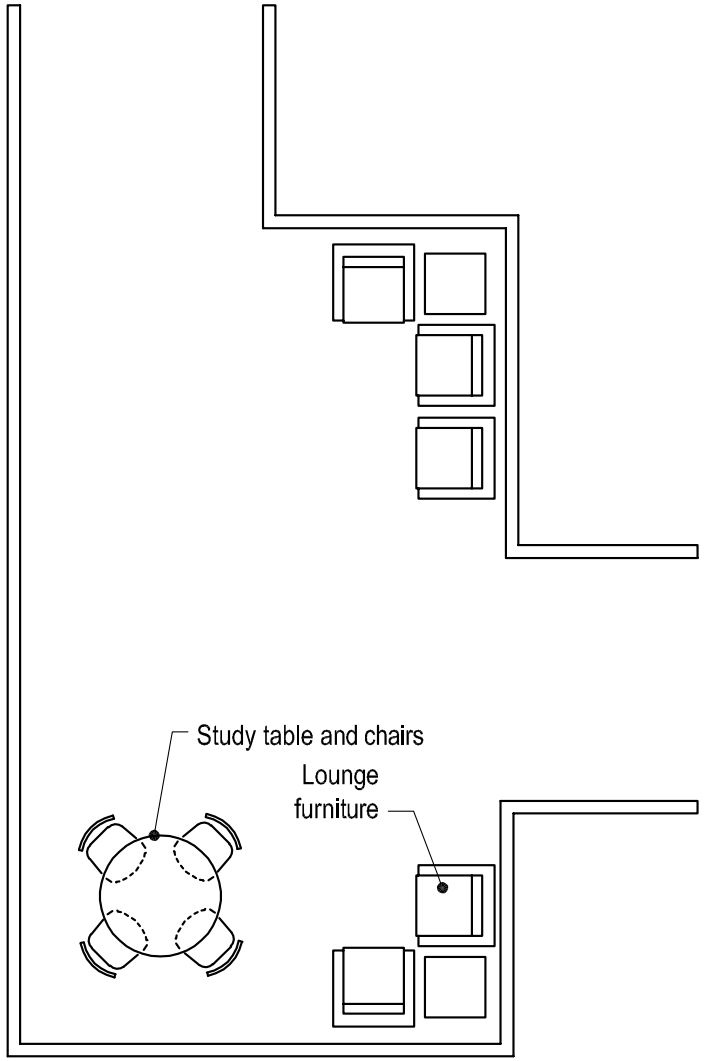
EQUIPMENT
- Display Equipment / Hardware, Wall/Ceiling/Floor-Mount
- Possible Built-In Seating

FURNISHINGS
- Lounge Seating

MECHANICAL / PLUMBING
- Individual HVAC Zone

ELECTRICAL
- Electrical Convenience Outlets
- Data Outlets
- Lighting – Zoned, Multiple Levels
- Upgraded Fixture Design

E102
CASUAL LOUNGE
AREA: 1,600 SF



E103
GROUP STUDY
AREA: 150 SF

UTILIZATION
- Hours of Use
  - 15 hours / day
- Occupants
  - Up to 10 People
- Function
  - Group Study
  - Individual Study
  - Video Conference Room
  - AV Media Usage

LOCATION / ADJACENCIES
- Spread throughout Building
- Adjacent to Main Circulation

ARCHITECTURAL
- Windows
  - Desired
- Floor
  - Carpet
- Partitions
  - Gyp Board, Paint
- Base
  - 4" Rubber
- Ceiling
  - Acoustic Ceiling Tile
  - Height: 9'-0" Min.
- Doors
  - 3'-0" x 7'-0"
  - Interior Window to Main Circulation
- Security
  - Controlled Access
- Sound
  - Sound Privacy

EQUIPMENT
- White Board
- Wall-Mounted Control Station
- LCD Projector, Ceiling-Mount
- Wall-Mounted Flat-Screen Monitor

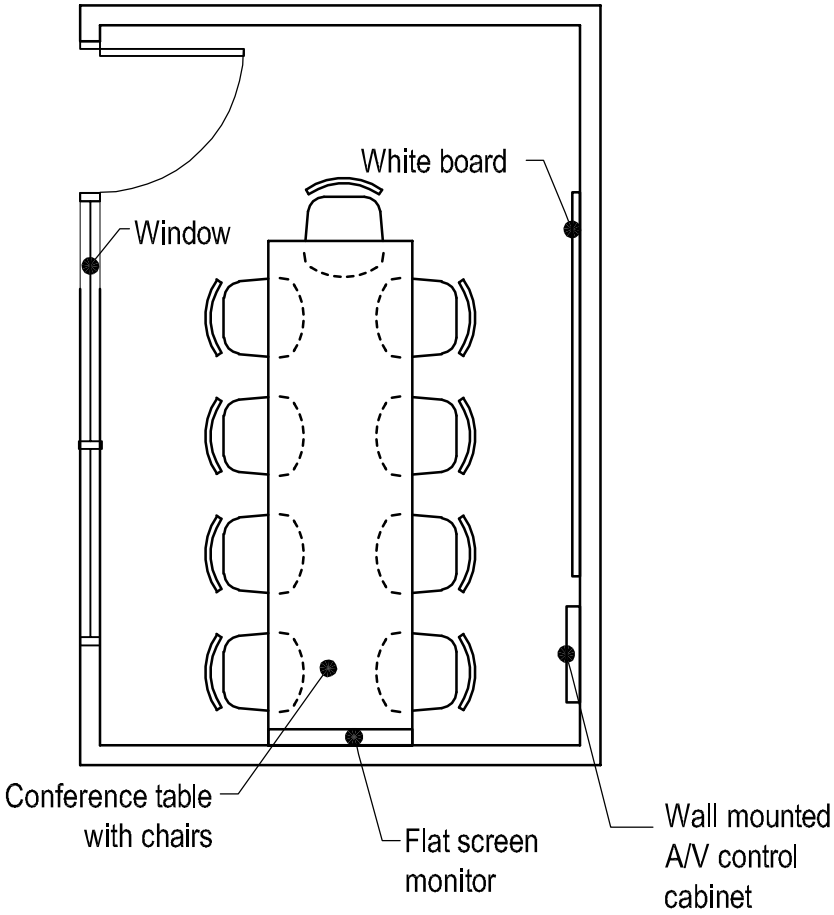
FURNISHINGS
- Table, 10'L x 36"W
- Chairs – 10

MECHANICAL / PLUMBING
- Individual HVAC Zone

ELECTRICAL
- Voice/Data & Electrical – Control Panel
- Voice/Data & Electrical – Wall-Mounted Monitor
- Electrical Convenience Outlets, Perimeter
- Data Outlets, Perimeter
- Lighting –Multiple Levels

NOTES
- Room Darkening Capability

E103
GROUP STUDY
AREA: 150 SF



E104
RECYCLING CENTER
AREA: 30 SF

UTILIZATION
- Hours of Use
  - 24 hours / day
- Occupants
  - None
- Function
  - Open Area Alcove
  - Recess for Recycling Containers

LOCATION / ADJACENCIES
- Four Areas - One Per Floor
- Adjacent to Main Circulation

ARCHITECTURAL
- Windows
  - None
- Floor
  - Hard-Surface / Carpet
  - Same Flooring as Main Circulation
  - Upgraded / Durable
- Partitions
  - Varies – Special Finish / Gyp, Paint
  - Same Finish as Main Circulation
- Base
  - Special Finish, Upgraded / Durable
- Ceiling
  - Varies –Gyp, Paint / Acoustic Tile
- Doors
  - None
- Security
  - Public Access
- Sound
  - None

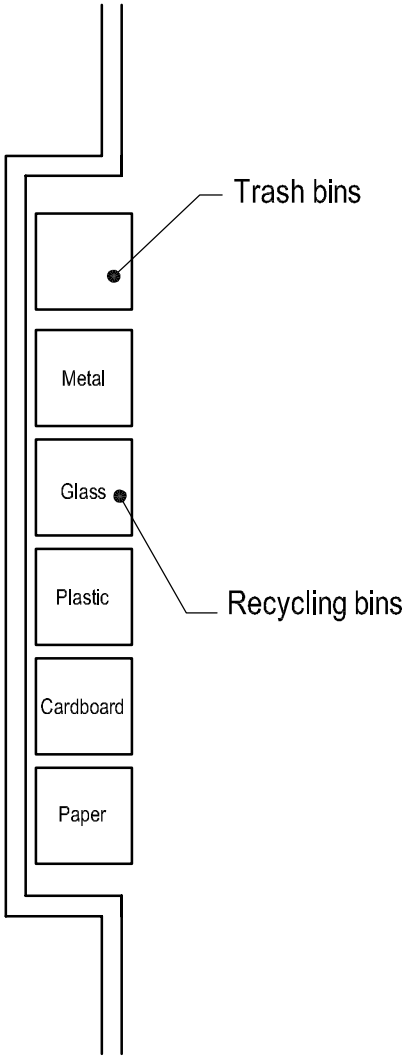
EQUIPMENT
- None

FURNISHINGS
- 5 Recycling Containers
- Paper, Cardboard, Metals, Glass, Plastic
- 1 Waste Container

MECHANICAL / PLUMBING
- Main Circulation HVAC Zone

ELECTRICAL
- Convenience Electrical Outlets
- Lighting – Fluorescent Parabolic

E104
RECYCLING CENTER
AREA: 30 SF



Code	Function / Space Name	Qty.	NSF/ Space	Total NSF	Station Qty.	NSF/ Station	GSF	Remarks
F	BUILDING SUPPORT							
F101	Dock / Service Entrance	1	200	200	-	-	308	10′ D, 20′ W covered dock; 2 bays
F102	Holding Area	1	200	200	-	-	308	Immediately inside dock access door
F103	Trash / Recycling	1	150	150	-	-	231	
F104	Maintenance Storage	1	450	450	-	-	692	Building maintenance materials
F105	Main Custodial Room	1	225	225	-	-	346	
F106	Custodial Closet	2	120	240	-	-	369	
				1,465			2,254	

F101
DOCK / SERVICE ENTRANCE
AREA: 150 SF

UTILIZATION
- Hours of Use
  - 24 hours / day
- Occupants
  - None
- Function
  - Covered Exterior Dock
  - Receipt & Unloading of Deliveries
  - Loading Area
  - Trash & Recycling Holding & Pick-Up

LOCATION / ADJACENCIES
- Grade Level
- Building Service Drive Termination Point
- Directly Adjacent to Holding Area

ARCHITECTURAL
- Windows
  - None
- Floor
  - Sealed Concrete
- Partitions
  - Building Exterior Walls
- Base
  - Building Exterior Walls
- Ceiling
  - Building Exterior Material
- Doors
  - Double 3' x 7' Doors (180 Degree Swing)
- Security
  - Controlled Access
- Sound
  - None

EQUIPMENT
- Trash Dumpster – 12 Cu. Yard
- Recycling Container(s)

FURNISHINGS
- None

MECHANICAL / PLUMBING
- None (Exterior Space)

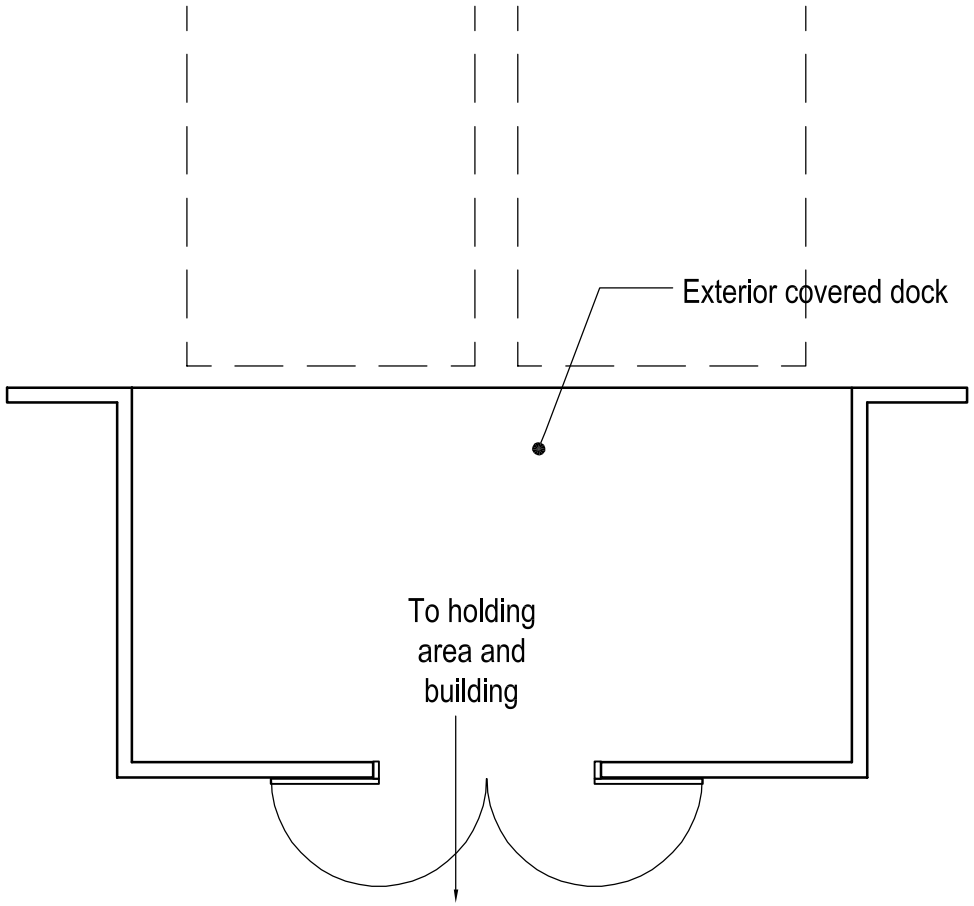
ELECTRICAL
- Convenience Electrical Outlets
- Lighting – Fluorescent Service Lighting

NOTES
- Adjacent Service Vehicle Parking – 2
- Dock Height – 2' Above Grade
- Avoid Dock Area / Door Swing Conflicts

F101

DOCK / SERVICE ENTRANCE

AREA: 150 SF



F102
HOLDING AREA
AREA: 200 SF

UTILIZATION
- Hours of Use
  - 24 hours / day
- Occupants
  - None
- Function
  - Interior Loading / Unloading Area
  - Holding of Incoming / Outgoing Items

LOCATION / ADJACENCIES
- Directly Adjacent to Dock / Service Entrance
- Easy Access to Service Elevator
- Easy Access to Maintenance Storage

ARCHITECTURAL
- Windows
  - None
- Floor
  - Sealed Concrete
- Partitions
  - Durable – Masonry or High-Impact Gypsum
- Base
  - Masonry or 4" Rubber
- Ceiling
  - Open to Structure Above
- Doors
  - Double 3' x 7' Doors (180 Degree Swing)
- Security
  - Controlled Access
- Sound
  - None

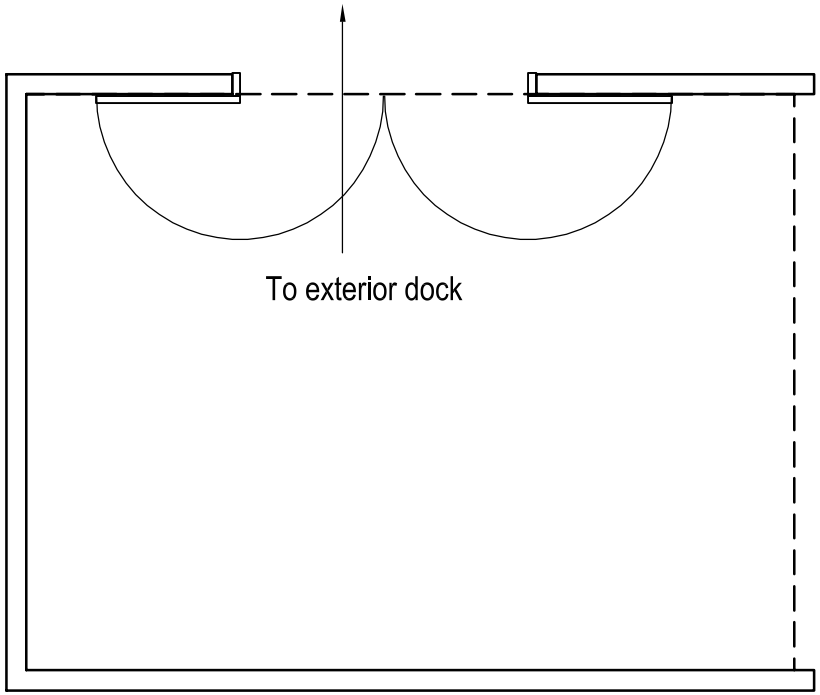
EQUIPMENT
- None

FURNISHINGS
- None

MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Convenience Electrical Outlets
- Lighting – Fluorescent Service Lighting

F102
HOLDING AREA
AREA: 200 SF



F103
TRASH / RECYCLING
AREA: 200 SF

UTILIZATION
- Hours of Use
  - 24 hours / day
- Occupants
  - None
- Function
  - Holding Area for Outgoing Recycled Materials

LOCATION / ADJACENCIES
- Adjacent to
  - Holding Area
  - Dock / Service Entrance
- Easy Access to Service Elevator

ARCHITECTURAL
- Windows
  - None
- Floor
  - Sealed Concrete
- Partitions
  - Durable – Masonry or High-Impact Gypsum
- Base
  - Masonry or 4" Rubber
- Ceiling
  - Open to Structure Above
- Doors
  - Double 3' x 7' Doors (180 Degree Swing)
- Security
  - Controlled Access
- Sound
  - None

EQUIPMENT
- Trash / Recycling Containers

FURNISHINGS
- None

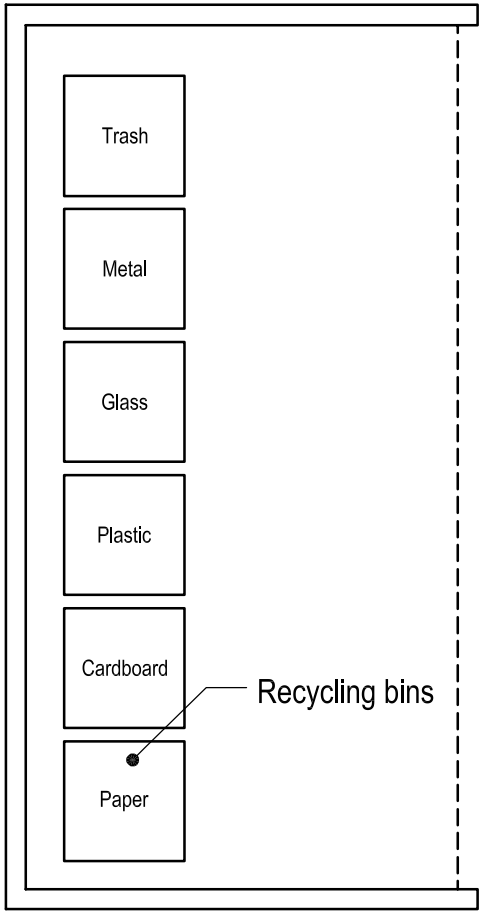
MECHANICAL / PLUMBING
- Shared HVAC Zone

ELECTRICAL
- Convenience Electrical Outlets
- Lighting – Fluorescent Service Lighting

F103

TRASH / RECYCLING

AREA: 200 SF



F104
MAINTENANCE STORAGE
AREA: 450 NSF

UTILIZATION
- Hours of Use
  - 15 hours / day
- Occupants
  - Custodial Supervisor
- Function
  - Storage of Maintenance Materials / Supplies
  - Storage of Maintenance Equipment
  - Custodial Operations Office

LOCATION / ADJACENCIES
- Adjacent to
  - Dock / Service Entrance
- Easy Access to Service Elevator

ARCHITECTURAL
- Windows
  - None
- Floor
  - Sealed Concrete
- Partitions
  - Durable – Masonry or High-Impact Gypsum
- Base
  - Masonry or 4" Rubber
- Ceiling
  - Open to Structure Above
- Doors
  - Double 3' x 7' Doors (180 Degree Swing)
- Security
  - Controlled Access
- Sound
  - None

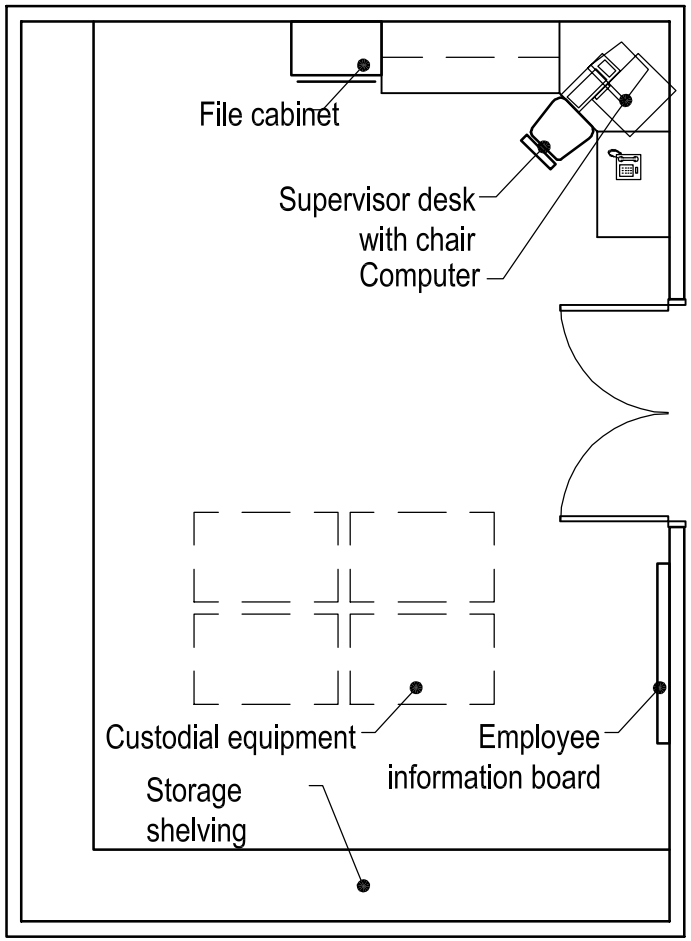
EQUIPMENT
- None

FURNISHINGS
- Adjustable Steel Storage Shelving
- Desk (Custodial Supervisor)
- Desk Chair
- Tack Surface / Notice Board

MECHANICAL / PLUMBING
- Dedicated HVAC Zone

ELECTRICAL
- Electrical / Data Outlets at Desk
- Convenience Electrical Outlets
- Electrical Outlets for Charging Maintenance Equipment
- Lighting – Fluorescent Service Lighting

F104
MAINTENANCE STORAGE
AREA: 450 NSF



F105
MAIN CUSTODIAL ROOM

AREA: 225 NSF

UTILIZATION

Hours of Use
- 15 hours / day

Occupants
- None

Function
- Storage of Maintenance Materials / Supplies
- Storage of Maintenance Equipment / Carts

LOCATION / ADJACENCIES

Adjacent to
- Public Toilet Rooms on One Floor

Easy Access to Service Elevator

3 Custodial Closets Spread Throughout Building

ARCHITECTURAL

Windows
- None

Floor
- Sealed Concrete or VCT

Partitions
- Gypsum, Painted
- Ceramic Tile Surround at Floor Sink

Base
- 4" Rubber

Ceiling
- Open to Structure Above

Doors
- 3' x 7' Door

Security
- Controlled Access

Sound
- None

EQUIPMENT

Floor Sink

Wall-Mounted Mop Rack

Wall-Mounted Heavy-Duty Adjustable Steel Shelving

FURNISHINGS

None

MECHANICAL / PLUMBING

Dedicated HVAC Zone

Exhaust

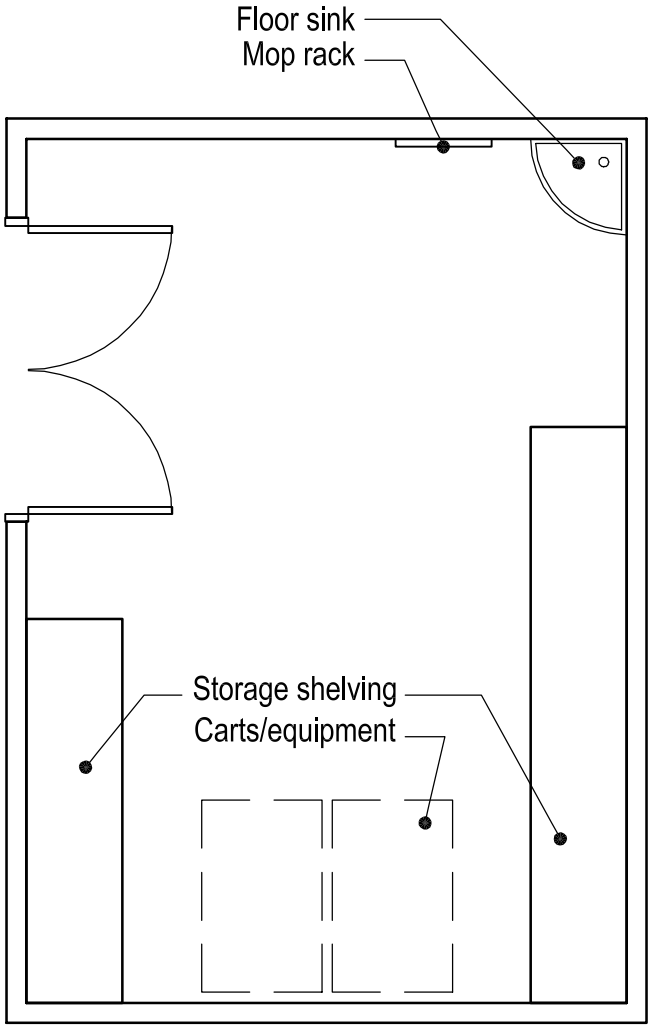
ELECTRICAL

Convenience Electrical Outlets

Electrical Outlets for Charging Custodial Equipment

Lighting – Fluorescent Service Lighting

F105
MAIN CUSTODIAL ROOM
AREA: 225 NSF



F106
CUSTODIAL CLOSET
AREA: 120 NSF

UTILIZATION
- Hours of Use
  - 15 hours / day
- Occupants
  - None
- Function
  - Storage of Custodial Materials / Supplies
  - Storage of Custodial Equipment / Carts

LOCATION / ADJACENCIES
- Adjacent to
  - Public Toilet Rooms on One Floor
- Easy Access to Service Elevator
- 3 Custodial Closets Spread Throughout Building

ARCHITECTURAL
- Windows
  - None
- Floor
  - Sealed Concrete or VCT
- Partitions
  - Gypsum, Painted
  - Ceramic Tile Surround at Floor Sink
- Base
  - 4" Rubber
- Ceiling
  - Open to Structure Above
- Doors
  - 3' x 7' Door
- Security
  - Controlled Access
- Sound
  - None

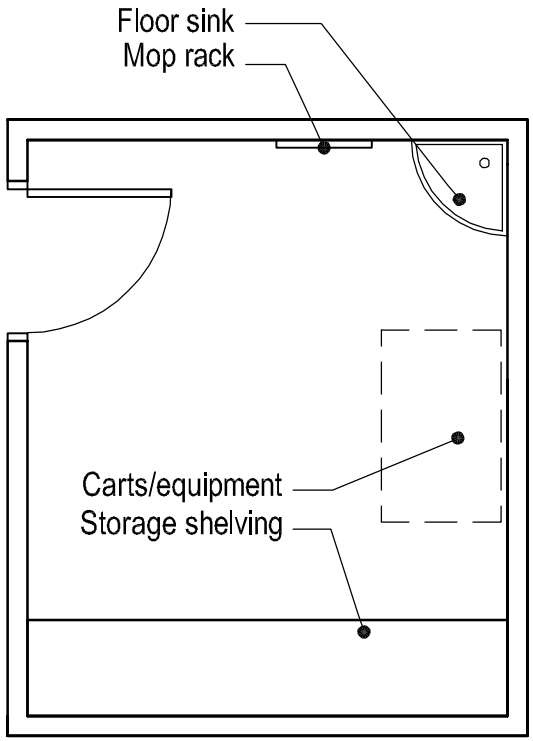
EQUIPMENT
- Floor Sink
- Wall-Mounted Mop Rack
- Wall-Mounted Heavy-Duty Adjustable Steel Shelving

FURNISHINGS
- None

MECHANICAL / PLUMBING
- Dedicated HVAC Zone
- Exhaust

ELECTRICAL
- Convenience Electrical Outlets
- Electrical Outlets for Charging Custodial Equipment
- Lighting – Fluorescent Service Lighting

F106
CUSTODIAL CLOSET
AREA: 120 NSF



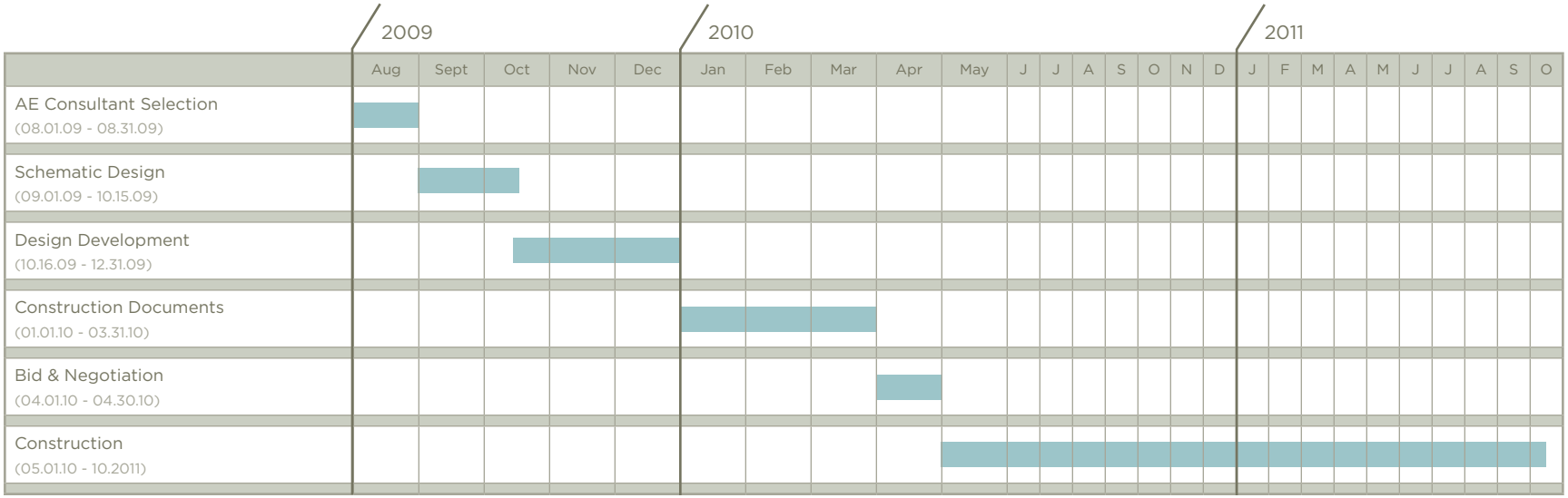
Schedule 05

The University and DFCM would like the UVU Science Building Addition project to be "shovel-ready" by the end of March 2010. A project schedule that achieves this is shown below.

The schedule shows schematic design beginning in September of 2009, with a fully developed set of design development drawings completed by the end of December 2009.

Construction is anticipated to require approximately 18 months, with substantial completion occurring in late October of 2011. This will allow the University to move into the building and occupy it for use by spring term of 2012.

Utah Valley University Science Building Addition



Cost Analysis 06

The opinion of probable cost for the UVU Science Building Addition is:

Building construction & site development $40.8 million

This Cost Summary page is followed by a 16-division breakdown of project construction costs based on the program space list and conceptual plans.

UVU BUDGET

Science Building Addition
Utah Valley University
UVU
MHTN Architects
Cost opinion by Glen Beckstead

Preparation Date JULY 22 2003
Gross Square Feet 160398

COST OPINION : PRE-CONSTRUCTION-DETAILED

	COST PER SF		TOTAL
SITE WORK IMPROVEMENTS	$ 5.62		**$ 901,733**
EARTH WORK UNDER THE BUILDING	$ 0.47		**$ 75,218**
CONCRETE	$ 9.90		**$ 1,588,606**
MASONRY/ EXTERIOR SKIN	$ 10.10		**$ 1,620,278**
METALS	$ 30.74		**$ 4,930,719**
WOODS AND PLASTICS	$ 8.05		**$ 1,291,734**
THERMAL AND MOISTURE PROTECTION	$ 4.06		**$ 651,441**
DOORS AND WINDOWS	$ 7.31		**$ 1,172,195**
FINISH	$ 29.08		**$ 4,664,351**
SPECIALTIES	$ 2.77		**$ 444,902**
EQUIPMENT	$ 4.70		**$ 754,541**
SPECIAL CONSTRUCTION	$ 6.37		**$ 1,022,500**
CONVEYING SYSTEMS	$ 2.00		**$ 320,795**
MECHANICAL	$ 60.16		**$ 9,648,971**
ELECTRICAL	$ 33.47		**$ 5,368,242**
	$ 214.82		**$ 34,456,228**
UNDEFINED BUILDING ELEMENTS	$ 21.48	10.00%	$ 3,445,623
GENERAL CONDITIONS	$ 10.74	5.00%	$ 1,722,811
PROFIT AND OVERHEAD	$ 7.52	3.50%	$ 1,205,968
CONSTRUCTION SUB TOTAL	**$ 254.56**		**$ 40,830,630**

UVU BUDGET

SITE WORK					
CLEAR AND ROUGH GRADE	80199	SF	$ 0.25	$	20,050
ALLOW FOR SITE CUT AND FILL	2970	CY	$ 6.00	$	17,822
FINISH GRADE	80199	SF	$ 0.20	$	16,040
HAUL OFF SITE	1485	CY	$ 7.00	$	10,396
DEMOLITION OF EXISTING BUILDING	7050	SF	$ 3.00	$	21,150
SITE IMPROVEMENTS					
HARDSCAPE, PAVING	28872	SF	$ 4.00	$	115,486
SOFTSCAPE, PLANTING	19248	SF	$ 2.00	$	38,495
TRASH ENCLOSURE	1	EA	$ 7,500.00	$	7,500
PIPE BOLLARDS ACCESS CONTROL ALLOW)	5	EA	$ 220.00	$	1,059
STRIPING FOR ASPHALT	58	EA	$ 5.00	$	289
TREES 2 1/2" ALLOW 1 PER 3500 SF SITE	23	EA	$ 280.00	$	6,416
SITE UTILITIES					
WATER DISTRIBUTION	150	LF	$ 34.00	$	5,100
SEWERAGE	150	LF	$ 42.00	$	6,300
FIRE HYDRANT (ALLOW)	3	EA	$ 3,900.00	$	11,700
SITE DRAINAGE	23097	EA	$ 0.35	$	8,084
MANHOLE (ALLOW)	4.0	EA	$ 4,850.00	$	19,448
WATER METER VAULT	160398	SF	$ 0.25	$	40,099
ELECTRICAL DISTRIBUTION BY ELECTRIC CO	150	LF	$ 80.00	$	12,000
OFF SITE ELECTRICAL DISTRIBUTION	1	SUM	$ 500,000.00	$	500,000
GAS DISTRIBUTION BY GAS CO.	150	LF	$ 28.00	$	4,200
SITE LIGHTING	80199	SF	$ 0.50	$	40,099
				$	**901,733**
EARTH WORK AT BUILDING					
CUT WORK AT BUILDING FOOTINGS	616	CY	$ 8.00	$	4,928
CUT WORK AT BUILDING FLOOR	2376	CY	$ 8.00	$	19,010
BACKFILL	616	CY	$ 11.00	$	6,776
HAUL OFF SITE OR SPREAD ON SITE	2376	CY	$ 6.00	$	14,258
STRUCTURAL FILL UNDER FOOTINGS	324	CY	$ 20.00	$	6,483
STRUCTURAL FILL UNDER FLOOR SLAB	1188	CY	$ 20.00	$	23,763
				$	**75,218**
CONCRETE					
ALL CONCRETE COSTS INCLUDE NORMAL REINFORCING					
CONTINUOUS FOOTING	146	CY	$ 325.00	$	47,430
SPOT FOOTINGS	178	EA	$ 325.00	$	57,921
ADD FOR MAT FOOTING	1782	CY	$ 325.00	$	579,213
ELEVATOR PIT, CONCRETE	5	EA	$ 3,500.00	$	18,470
SLAB ON GRADE 4" W/ GRAVEL BASE AND 6" X 6" WWF REINFORCING	32080	SF	$ 4.00	$	128,318
SLAB ON GRADE 12" W/ GRAVEL BASE AND STEEL REINFORCING	960	SF	$ 8.50	$	8,160
FOUNDATION WALL 8" TO 12" THICK 2' 6" H	1970	SF	$ 22.00	$	43,344
SUSPENDED SLAB.	128318	SF	$ 5.50	$	705,749
				$	**1,588,606**

UVU BUDGET

MASONRY / EXTERIOR SKIN					
EXTERIOR FINISH	57372	SF	$ 27.00	$	1,549,036
PARAPET FINISH AND WALL	1576	SF	$ 32.00	$	50,437
ALLOWANCE FOR WINDOW SILL AND RETURN	946	LF	$ 22.00	$	20,805
				$	**1,620,278**
METALS					
COLUMNS WF SHAPES	200.5	TON	$ 3,400.00	$	681,689
ALLOW FOR SNOW LOAD ON EXISTING BUILDIN(	400	LF	$ 500.00	$	200,000
SUSPENDED FLOOR STRUCTURE WF and joist	769.9	TON	$ 3,400.00	$	2,617,687
ROOF STRUCTURE JOIST	128.3	TON	$ 3,400.00	$	436,281
ANGLE AT EXTERIOR WALL	3940	LF	$ 18.00	$	70,927
MISC. STEEL	60.1	TON	$ 3,500.00	$	210,522
ROOF DECK	32080	SF	$ 2.50	$	80,199
FLOOR DECK	128318	SF	$ 2.50	$	320,795
EXPANSION JOINT NEW TO EXISTING	1520	LF	$ 68.00	$	103,360
STEEL LADDER TO ROOF	16	LF	$ 88.00	$	1,408
WALL CAP	788	LF	$ 12.50	$	9,851
METAL STAIR AND RAILINGS	12.0	FLT	$ 16,500.00	$	198,000
				$	**4,930,719**
WOOD AND PLASTICS					
WALL PLATES BOLTED AND SHAPED	788	LF	$ 5.00	$	3,940
MISC. ROUGH CARPENTRY	160398	SF	$ 0.25	$	40,099
STAINLESS STEEL BASE	10	LF	$ 450.00	$	4,500
UPPER CABINETS GLASS DOORS	449	LF	$ 180.00	$	80,863
UPPER CABINETS W/ DOORS	599	LF	$ 145.00	$	86,853
CHEMICAL RACKS	674	LF	$ 145.00	$	97,710
RECEPTION DESK	25	LF	$ 780.00	$	19,500
MISC. CASEWORK	160	LF	$ 550.00	$	88,219
TEACHING AND LABORATORY CASEWORK METAL WITH SOLID CHEM-RESISTANT TOP	1497	LF	$ 550.00	$	823,609
VANITY - SOLID SURFACE	80	LF	$ 380.00	$	30,400
ENTRY RECEPTION DESK	160398	SF	$ 0.10	$	16,040
				$	**1,291,734**
THERMAL AND MOISTURE PROTECTION					
FOUNDATION INSULATION	1970	SF	$ 2.00	$	3,940
EXTERIOR WALL INSULATION R 19	57372	SF	$ 0.60	$	34,423
SOUND INSULATION (ALLOW)	240596	SF	$ 0.60	$	144,358
FIRE PROOF STRUCTURE	0	SF	$ 1.00	$	-
ROOFING	33683	SF	$ 4.50	$	151,576
ROOF INSULATION RIGID	32080	SF	$ 3.00	$	96,239
ROOF CRICKETS	3208	SF	$ 2.50	$	8,020
ALLOW FOR ROOF TOP MECHANICAL COVER	2358	SF	$ 75.00	$	176,838
ROOFING SPECIALTIES	32080	SF	$ 0.10	$	3,208
* SOFFIT FINISH, METAL PANEL(ALLOW)	600	SF	$ 28.00	$	16,800
ALLOW FOR SEALANT	8020	LF	$ 2.00	$	16,040
				$	**651,441**

UVU BUDGET

	DOORS AND WINDOWS				
	DOORS EXTERIOR STORE FRONT AND SIDE LITE				
*	COMPLETE HARDWARE, 6' X 7'	4 EA	$ 1,895.00	$	7,580
	DOORS INTERIOR WOOD OR HOLLOW METAL				
	COMPLETE HARDWARE, PAINTED	267 EA	$ 920.00	$	245,943
*	POWER OPERATOR (PAIR)	1 EA	$ 2,750.00	$	2,750
	SECURITY DOOR ACCESS ALCAN # W RECORD	107 EA	$ 350.00	$	37,426
	LEAD SHIELDED DOOR 3' X 7'	2 EA	$ 1,875.00	$	3,750
	DARK ROOM DOOR HC 3' 6" ROUND	1 EA	$ 4,875.00	$	4,875
	ROLL UP DOORS AT DOCK	8 EA	$ 2,275.00	$	18,245
	INTERIOR GLASS AND GLAZING	2139 SF	$ 25.00	$	53,466
	PUNCHED WINDOWS	1891 SF	$ 32.00	$	60,524
	STORE FRONT WINDOWS	14185 SF	$ 36.00	$	510,671
	WINDOW WALL GLAZING SYSTEM	5674 SF	$ 40.00	$	226,965
				$	**1,172,195**
	FINISH				
	EXTERIOR METAL STUDS 6" LB	37828 SF	$ 3.00	$	113,483
	INTERIOR WALLS STUDS GYP. TWO SIDES	240596 SF	$ 6.00	$	1,443,578
	ADDITIONAL LAYER OF GYP ON 25% OF WALL	60149 SF	$ 1.65	$	99,246
	GYP FINISHED AT EXTERIOR WALL	37828 SF	$ 1.65	$	62,415
	GYP SHEATHING AT EXTERIOR WALL	37828 SF	$ 1.30	$	49,176
	FRAMING AND GYP AT SOFFIT	1250 SF	$ 32.00	$	40,000
	FLOOR FINISH CHEMICAL RESISTANT VINYL	47,614 SF	$ 8.00	$	380,910
	FLOOR FINISH SHEET VINYL	47,614 SF	$ 6.00	$	285,683
	FLOOR FINISH EPOXY SYSTEM (ANIMAL ROOM)	1,167 SF	$ 18.00	$	21,004
	FLOOR FINISH RUBBER AT OPERATING SPACE	1,200 SF	$ 18.50	$	22,200
	FLOOR FINISH QUARRY TILE	2,978 SF	$ 17.00	$	50,633
	FLOOR FINISH CARPET	4,295 SY	$ 38.00	$	163,198
	ALLOW FOR OVERALL FINISH	160,398 SF	$ 5.00	$	801,988
	FLOOR FINISH CONCRETE SEALED	155 SF	$ 0.75	$	116
	WALL FINISH PAINT	189228 SF	$ 1.50	$	283,843
	X- RAY ROOM WITH LEAD SHIELDING 1/16"	1580 SF	$ 12.75	$	20,145
	WALL FINISH SPECIAL EPOXY SYSTEM	2334 SF	$ 12.50	$	29,172
	WALL FINISH EPOXY PAINT	4102 SF	$ 1.50	$	6,152
	CEILING FINISH EXPOSED	155 SF	$ 1.50	$	232
	CEILING SUSPENDED GYPSUM EPOXY PAINT	5345 SF	$ 9.00	$	48,108
	CEILING LAY IN TILE OR EXPOSED PAINTED	212306 SF	$ 3.50	$	743,071
				$	**4,664,351**
	SPECIALTIES				
	FIRE EXTINGUISHER IN CABINET	15 EA	$ 235.00	$	3,525
	RAISED COMPUTER FLOORING	5000 SF	$ 18.00	$	90,000
	CLASSROOM SPECIALTIES WHITE BD MOVIE	85 EA	$ 750.00	$	63,750
	HALLWAY WALL BUMPERS	658 LF	$ 22.50	$	14,807
	STAINLESS STEEL CORNER PROTECTORS 4'	128 EA	$ 125.00	$	16,040
	TOILET PARTITIONS	60 EA	$ 925.00	$	55,500
	BATHROOM SPECIALTIES	20 EA	$ 8,500.00	$	170,000
	JANITOR SHELVING	5 EA	$ 145.00	$	725
	TRAFFIC MATT	380 SF	$ 18.50	$	7,030
	SIGNAGE ALLOW	267 EA	$ 88.00	$	23,525
				$	**444,902**

UVU BUDGET

EQUIPMENT				
WINDOW BLINDS (ALLOW 80%)	17401 SF	$ 3.00	$	52,202
DOCK EQUIPMENT	8 EA	$ 4,500.00	$	36,089
GLASS WASH AND DRY	5 EA	$ 45,000.00	$	225,000
AUTOCLAVE	5 EA	$ 35,000.00	$	175,000
BIOLOGICAL FUME HOODS 4' TO 6' WITH BASE	25 EA	$ 6,500.00	$	162,500
CHEMICAL FUME HOODS 4' TO 6' WITH BASE	13 EA	$ 6,500.00	$	81,250
BREAK ROOM EQUIPMENT	5.0 EA	$ 4,500.00	$	22,500
			$	**754,541**
SPECIAL CONSTRUCTION				
EXPERIMENTAL GRADE GREEN HOUSE WITH FULL BLACK OUT SHADES AND NARROW TEMPERATURE AND HUMIDITY CONTROL	5000 SF	$ 180.00	$	900,000
CLEAN ROOM	0 SF	$ 980.00	$	-
POWER OPERATED COMPACT STORAGE	350 SF	$ 350.00	$	122,500
			$	**1,022,500**
CONVEYING SYSTEMS				
ELEVATOR SIZE AND SPEED NEEDED	160398 SF	$ 2.00		$320,795
			$	**320,795**
MECHANICAL				
PLUMBING	155398 SF	$ 7.00	$	1,087,783
HAZARDOUS MATERIAL DRAINAGE / STORAGE	127625 SF	$ 0.50	$	63,813
DI WATER SYSTEM	147445 SF	$ 2.00	$	294,889
ROOF DRAINAGE	32080 SF	$ 1.50	$	48,119
GAS - AIR - VAC	147445 SF	$ 2.00	$	294,889
HVAC SYSTEM	160398 SF	$ 45.00	$	7,217,888
FIRE SPRINKLER	160398 SF	$ 4.00	$	641,590
TOTAL		$ 60.16	**$**	**9,648,971**
ELECTRICAL				
SITE LIGHTING		IN SITE COST		
MAIN DISTRIBUTION	160398 SF	$ 3.00	$	481,193
BRANCH CONDUIT AND WIRE	160398 SF	$ 5.00	$	801,988
POWER DISTRIBUTION	160398 SF	$ 3.00	$	481,193
LIGHTING	160398 SF	$ 6.00	$	962,385
LIGHTING CONTROL	160398 SF	$ 0.50	$	80,199
ALARM SYSTEMS	160398 SF	$ 2.00	$	320,795
SECURITY SYSTEMS	160398 SF	$ 3.00	$	481,193
SPECIALTY AND SUPPORT	160398 SF	$ 5.00	$	801,988
PHONE AND DATA	160398 SF	$ 3.00	$	481,193
SECURITY CAMERAS	32 EA	$ 1,250.00	$	25,000
SECURITY DOOR CONTROL (CARD KEY)	40 EA	$ 890.00	$	50,124
GENERATOR	1 EA	$ 400,993.77	$	400,994
		$ 33.47	**$**	**5,368,242**

Appendix 07

Table of Contents

A. UVU IT Infrastructure & Cabling Specifications

B. Geotechnical Report

C. Site Survey

D. Site Topographical Map

Utah Valley University
IT Infrastructure and Cabling Specifications for all new construction and remodeled spaces

Cable TV, Media, Voice and Data (10Gig Solution)

Revised 07/8/09

The purpose of this document is to define UVU IT Infrastructure and Cabling specifications and standards.

All new construction and/or remodels on UVU campus will, at least, include the infrastructure necessary for the installation of technology weather the technology itself will be purchased as part of the building project or at a future date.

Bonding All bonding must comply with current TIA/EIA 607 standards.

Testing and Documentation All voice/data and fiber cables must be tested and certified to run at minimum speeds as set buy cable manufacture. Each cable must be documented and recorded in a database and supplied to UVU in a digital format. CAD drawings documenting the voice/data/fiber systems will also need to be supplied to UVU. **All work must meet 569 Pathways Standards.**

Certification and Warranty All voice/data/fiber work must have both installers guarantee as well as a manufacturer's warrantee. Each fiber will be tested at both 850nM and 1300nM multimode, or 1310nM and 1550nM singlemode. All work will be in compliance with UVU standards and stay in compliance of EIA/TIA standards. All state and local codes must also be followed. Any changes from these standards must have written permission from UVU IT. All contractors will keep UVU updated throughout the project.

Contractors, Sub-contractors and Installers All contractors, sub-contractors and installers must be approved by UVU IT. All voice/data contractors, sub-contractors and installers must be Siemon CI's.

Abandoned Cable All abandoned cable that isn't terminated at both ends must be removed by contractor before any cable can be placed. Abandoned cable can also be determined by UVU IT.

Communications Wire Drop and Termination Specification Horizontal voice drop cable must be a blue cat5e wire, terminated on (2) USOC RJ-14c jacks. Blue and orange pairs must be terminated on jack 1. Green and brown pairs terminated on jack 2. Jacks must be mounted in the upper left of the double gang face plate on the work station end and terminated in the IDF/MDF on standard 110 style termination block. Horizontal data drop cables must be white 10G 6A terminated on angled RJ45 10G 6A jacks and mounted in the lower left double gang face plate on the work station end and terminated in the IDF/MDF/Switch enclosure with flat RJ45 10G 6A jacks on a 48 port 10G 6A patch panel.

Any unused face plate hole on the workstation end will be filled with a blank cover. All wire used at UVU will be plenum rated and terminated to 568B wiring standards. All wiring will be in a conduit or cable tray. (1) 10G 6A white patch cable will be supplied for every terminated horizontal data connection from the patch panel in the IDF/MDF (50% 3', 25% 5', and 25% 7'). The channel link must comply with the TIA/EIA standards for Cat 6A.

Conduit No Communications or Media conduit will be smaller than 1". All work must meet the 572 TIA/EIA standards.

Communications Conduit All data/voice communication conduit runs will consist of 1" conduits that go from the termination box in the wall up into the ceiling and then stubs into the nearest cable tray. These conduit runs will have a maximum of (3) 90 degree bends. All termination boxes will be double gang with a double mud ring unless otherwise specked by UVU. All conduit ends will have insulating bushings to protect cables from abrasion.

Podium Communications Conduit All podium data/voice communication conduit runs will consist of (2) 1" and (1) 2" conduit that go from the in-floor termination box through the floor then up the wall into the ceiling and then stubs into the nearest cable tray. These conduit runs will have a maximum of (3) 90 degree bends. All conduit ends will have insulating bushings to protect cables from abrasion.

Media Conduit All media conduit runs must consist of mix of 1" and 2" conduits. These conduit runs will have a maximum of (3) 90 degree bends. All termination boxes will be double gang with a double mud ring unless otherwise specked by UVU. All conduit ends will have insulating bushings to protect cables from abrasion.

Standard Communications Drop A standard drop is (1) voice cable and (2) data cables. (See UVU Communications Wire Drop and Termination Specification)

Raised Floor Communications Drop A raised floor drop is (2-12) data cables to MUTOA points/termination boxes. MUTOA point/termination box jacks under the floor must be equally distributed around the room with a maximum patch cord to computer length of 25' (maximum of (12) data connections to any one location). All jacks including wall and podium data drops in a lab will terminate in the uplink patch panel located in the switch enclosure. A complete end to end/channel link solution will be provided which means patch cords on both ends. (See UVU Communications Wire Drop and Termination Specification)

Movable/Modular Furniture Communications Drop Furniture will be connected to the hardwired jack via a patch cord with a coupler located in the furniture. No pertinent wiring will be allowed in furniture.

Wireless Access/IP camera drop A wireless access/IP camera drop is (2) data cables, located above the drop ceiling or above 120" from floor. Purple patch cords will be provided for every terminated wireless access/IP camera connection from the Max patch panel in the MDF/IDF (50% 3', 25% 5', and 25% 7'). (See UVU Communications Wire Drop and Termination Specification)

Podium Communications Drop A podium drop is (6) data, (1) voice and (1) cable TV. This communications drop will also include (2) 20 amp duplex power outlets on separate circuits. This will be terminated in (1) in-floor box. This Podium Data/Power in-floor Box will be located within 4" of the Podium Media in-floor box. This in-floor box needs to be adequately sized to accommodate all connections without compromising the integrity of the cables. The floor box must be level with the floor and have the capability of placing a podium over it. (See UVU Communications Wire Drop and Termination Specification)

Front Wall Communications Drop A front wall drop is (4) data cables, installed on the front wall near the center, above the drop ceiling or above 120" from floor. (See UVU Communications Wire Drop and Termination Specification)

Fiber Multimode and singlemode fiber will be rated to the appropriate TIA/EIA standard to provide 10G. Each fiber cable will be terminated, documented and labeled at each end in its own RIC/LIU. All fiber terminations must be SC connectors. All fiber must be in conduit or plenum innerduct. All singlemode terminations will be fusion spliced pigtails. Multimode and singlemode duplex SC-LC fiber patch cords will be provided for a minimum of 25% of the installed fiber in the building (60% 1 Meter and 40% 3 Meter).

Fiber Uplinks Fiber uplinks will be at least (24) strands of singlemode and at least (24) strands of multimode fiber to all IDF rooms from the MDF room, and (12) strands of singlemode and at least (12) strands of multimode fiber to all server room racks/enclosures from the MDF room. There must also be at least (12) strands of multimode fiber to each wall mount swing out switch enclosure.

Backbone Fiber Connection Backbone fiber that connects a buildings main data room (MDF) to another campus buildings main data room (MDF) will be at least (144) strands of singlemode fiber. All fiber cables will be terminated in separate RIC/LIU's.

Wiring for Security Devices Proximity lock wiring (See UVU Locksmith for Specs). Security camera (See wireless access/IP camera drop).

Data/network Equipment Connectivity for each jack must be provided. All data equipment must be compatible with current UVU systems and standards. See UVU IT for current spec.

Raised floor area Tiles must use stringer cross beam construction for support. Tiles need to be 2'x2' in size and non-concrete filled. Tiles will be held in place by friction and not individually attached using screws. Floor must have a minimum depth of 12" to allow for infrastructure placement without restricting air flow. Cable tray must be provided under raised floor area for cable management. Raised floor and cable tray must be properly grounded.

Computer Lab Raised floors All computer labs will have raised floor and follow all the specifications and standards that are outlined in the "Raised Floor Area" of this document. In a building where there are multiple computer labs those labs should be grouped together with

a common raised floor. There should be enough conduits from under floor to switch enclosure to allow for required cable plus 50% room for growth. Computer labs can have carpet on top of raised floor tiles. Conditioned power must be supplied under computer lab raised floors to adequately support computer lab workstations.

Switch enclosures Computer lab switch enclosures will be located either in a common Data/Telecomm Rooms (IDF/MDF) type room that is shared by multiple labs or in a Wall Mount Swing Out Switch Enclosure.

Server Room will have raised floor and follow all the specifications and standards that are outlined in the "Raised Floor Area" of this document. Tiles in the Server Room must have an anti-static finished tile surface (without carpet). Conditioned power that is protected with UPS and connected to a generator back up system must be supplied under server room raised floors to adequately support computer equipment that is installed in the server room (contact UVU IT Services to coordinate). All power distribution equipment such as transformers, UPS equipment, breaker panels, and PDU equipment will not be housed in the server room. Optimally the server room will be located adjacent to the buildings MDF. There must be a clear and easily accessible cable tray path that connects the server room with the MDF and there must be enough cable tray capacity between these two rooms to allow for 400% growth. The room will have a horizontal ladder/cable tray on all outside walls and extend just above the top of all the equipment racks/enclosures. Server rooms must have a 24/7 365 days a year HVAC system, controlled independently from the buildings HVAC system. The rooms HVAC system must be on the generator back up system. Temperature and humidity need to be monitored by both IT Services and Central Plant via TCP/IP. A secondary/backup heat displacement system that is manually controlled, reversible from outside supply to outside exhaust will be provided. Access will be proximity lock controlled as well as have video security monitoring. A ground bus connected to the main building ground will be provided. All walls must be covered with ¾" 8' high plywood, painted with a fire retardant paint.

Data/Telecomm Rooms (IDF/MDF) Data/Telecomm Rooms consist of IDF and MDF rooms. Optimally these rooms are located in the central core of a building. When construction consists of multiple floors these Data/Telecomm Rooms must be stacked on top of each other. These rooms work best if they are rectangle in shape with a door in one end. There must be a minimum of (2) 4" x 12" holes or (4) 4" conduit sleeves in floor/ceiling with vertical ladder/cable trays connecting the rooms. The room will have a horizontal ladder/cable tray on all outside walls with a tee extending just above the top of racks. In general all horizontal copper cabling (except for computer labs) will terminate in one of these rooms. All copper data connections to these rooms can be no longer then 280' (permanent link). Each rack and one or more outlets on each wall must have (1) dedicated 20 amp circuit conditioned through a UPS and connected to a generator back up system. Power transformers will not be housed in the IDF/MDF rooms. Rooms must have a 24/7 365 days a year HVAC system, controlled independently from the buildings HVAC system. The rooms HVAC system must be on the generator back up system. Temperature and humidity need to be monitored by both IT Services and Central Plant via TCP/IP. Access will be proximity lock controlled as well as have video security monitoring. A ground bus connected to the main

building ground will be provided. These rooms need to be directly accessible from the hallway. All IDF and MDF walls must be covered with ¾" 8' high plywood, painted with a fire retardant paint.

IDF Rooms All IDF rooms must be at least 140 square feet and centrally located on each floor and stacked vertically above each other and with the MDF room.

MDF Rooms The MDF room must be at least 500 square feet and centrally located on the floor and stacked vertically above or below the IDF rooms.

Wall Mount Swing Out Switch Enclosure Switch enclosures will be an enclosed standard 19" equipment rack with front and rear rack rails with a smoked glass front cover. Enclosure must lock and have a hinge in the front and rear for center swing out feature, with a door that will swing left or right. Enclosure must lock in front and rear and have wire management. Enclosure dimensions are 36" high with a center section no less than 18". Enclosures will be mounted in compliance with ADA standards, which is the bottom of the enclosure can be no lower then 80" from the floor. Each enclosure must have fiber uplink to MDF/IDF, (1) dedicated 20 amp circuit conditioned through a UPS and connected to a generator back up system, and a rack mount power strip. There should be enough conduit capacity from switch enclosure to the cable tray and to under the floor to allow for cabling, fiber and innerduct plus 50% room for growth.

Telco Racks MDF/IDF racks must be 7 foot full size steel racks, with cable and power management. Each rack must have a full height vertical cable management system attached. Just above the highest patch panel and just below the lowest patch panel there must be a 2RU horizontal wire management panel. In between each patch panel there needs to be a 2U horizontal wire management panel. Each rack must have (1) dedicated 20 amp circuit conditioned through a UPS and connected to a generator back up system. Each rack must have a rack mount power strip. All racks must be properly grounded to TIA/EIA standards. Copper cable, fiber optic cable and data electronics must be terminated and installed in separate racks. There must be enough rack capacity to handle all cable and equipment plus allow for 50% growth.

Equipment Racks/Enclosures Server room racks/enclosures must have an equipment mounting height of 42U for EIA-310-D 19" equipment. Cable and power management in the racks/enclosures must be provided. Each rack/enclosure must have (2) dedicated 20 amp circuits conditioned through a UPS and connected to a generator back up system. Each rack/enclosure must have (2) rack mount power strips. Each equipment rack/enclosure will have fiber uplinks to the MDF room. All racks/enclosures must be properly grounded to TIA/EIA standards.

Patch Panels 48 port 10G 6A Patch Panel

Phone feeder cable All feeder cable must be terminated in 110 style termination blocks. All feeder cable must be riser rated. All feeder cable must be fully tested for continuity. No defective pairs will be accepted.

Cable Tray Cable tray must follow all major corridors of the building; it must be ladder type and must be sized appropriately to provide adequate capacity for cable spec plus 50% growth, minimum size to be 4"x12". The cable tray must penetrate all necessary walls in order to provide a continuous path. If it is not possible to continue the cable tray through the wall (4) 4" conduits must be provided in order to continue the path. Cable tray must extend into IDF/MDF rooms and will connect to ladder/cable tray on all outside walls with a tee extending to just above the top of racks of the IDF/MDF. Vertical ladder/cable trays will be used for any vertical rise of tray or when connecting rooms above or below tray. When a cable tray goes through a floor/ceiling there must be a minimum of (2) 4" x 12" rectangular holes or (4) 4" conduit sleeves in floor/ceiling with vertical ladder/cable trays connecting the rooms. A separate cable tray will be installed for all backbone hard sheath cable and inner duct. All cable trays will be properly grounded. There must be enough cable tray capacity to allow for 50% growth.

Cable TV Standard Drop
Digital Cable TV Option: IPTV specs to be determined. See owner.

Analog Cable TV Option: All Horizontal cable TV drops must be made with (1) white RG-6 plenum rated cable. All cable TV drops must be terminated with F-Conn Industries (part # FS6-R), Digicon (part # DS6.01-02), or equivalent RG6 F connector's.

In offices, cable TV outlets will be terminated along with (1) of the standard communications voice/data drops. It will be located with the standard communications voice/data drop opposite the hallway entrance to the office. It will consist of (1) coax F-type angled module located on the bottom right of double gang face plate.

In non media enhanced instructional space/labs, cable TV outlets will be terminated in the front corner of the instructional space/lab normally opposite the hallway entrance, and 12" from the ceiling in the media front side J-box. It will consist of a coax coupler with (1) F-type adapter located on the bottom of face plate with a flat blank cover in the top of the face plate. There shall also be a power outlet within 12" of cable TV box to provide power for display.

In media enhanced instructional space/labs, cable TV outlet will be terminated in the podium communications drop it will consist of a coax F-type angled module located on the bottom right of double gang face plate.

All RG6 cable TV drops will home run back to the nearest tap location in the hallway cable tray or Data/Telecomm room. No daisy chains, splitters or combiners are to be used in the distribution lines. Cable TV drops will normally not be any longer then 100' and may not exceed 150' maximum. A minimum RF level of 0 to +4 dB will be maintained at the wall output connection. Cable TV drops normally will be grouped in the hallway cable tray in groups of (4-6) drops per tap location. Each cable TV drop must be labeled at each tap location.

Cable TV Distribution System
Digital Cable TV Option: IPTV specs to be determined. See owner.

Analog Cable TV Option: This system will be integrated into the existing campus wide C-Cor 750 MHz bi-directional Mid-Split broadband distribution system, using C-Cor Bridging Amplifier's (part # FNB99DS-L08G6C1), or equivalent, and ½" plenum rated Commscope trunk cable (part # Commscope 2312 White), or equivalent, installed with no splices and terminated with Gilbert ½ " Trunk connectors (part # 500-CH-DU-03) , or equivalent. Amplifiers may be placed in phone/data rooms or hung from the cable tray (As specified by UVU).
This cable TV broadband RF distribution system will distribute campus audio and video signals throughout the building including all instructional space labs and all offices. The system will use broadband bi-directional bridging amplifiers, a main trunk line to maintain an independent distribution system to amplifiers and a building distribution trunk line with directional couplers (taps). Power is provided thru the trunk cable from the CS Building head-end unless the signal is provided to the building via fiber then a power supply will be required in the building. The building distribution trunk line will have appropriately spaced multi-outlet "0" loss directional couplers (taps). Taps will be Regal RTM-XXBCP, or equivalent, with XX being the appropriate dB drop value of 32, 26, 23, 20, 14, and 11 (part # RTM-XXBCP). Taps will normally serve a maximum of six individual cable TV drops and have (2) ports available for future UVU use. Taps will be mounted on the hallway cable trays or in the phone/data rooms with an appropriately designed output gain, so that a minimum RF level of 0 to +4 dB will be maintained at the wall television connection. The cable TV distribution system will provide all cable, amplifiers, splitters, directional couplers (taps), terminators, outlets, and connectors. It will be designed and engineered to established Cable TV standards. The design will include schematics as to where all amps and taps should be located as well as the proper values for the taps. Documentation, including as-builds to where all amps and taps are located as well as the values for the taps will be supplied to UVU. The complete cable TV distribution system will be bid as a single lump sum unit price.

UVU Media Technology Definitions UVU media enhanced teaching environments consist of four types of instructional space: lecture halls, classrooms, labs and conference rooms. There are also three classifications or levels within the different types of instructional spaces: Premier, Standard and Basic. All new construction and/or remodels on UVU campus involving instructional space will include the infrastructure necessary for such technology as laid out in this document weather the equipment will be installed with the project or at a later date.

Media Testing and Documentation All media cabling must be tested and certified by the installer according to UVU specifications. Cable must be documented in a database and supplied to UVU in a digital format. CAD drawings documenting all media connections, settings and systems will need to be supplied to UVU upon substantial completion. All

system interfaces must match existing campus system. In the case that UVU Media Engineering opts to do the classroom integrations proper infrastructure and resources we be put into place to accommodate their needs following the standards outlined in this document.

Media Certification and Warranty If an AV integration company is used on a project they must have at least 5 years experience installing media equipment in the education environment and be accepted by UVU. All installations must be warranted by installer as specified in building program. All media integrators will follow UVU media standards and will stay in compliance with standards set fourth in the buildings program. Any deviance from these standards requires consent from UVU. Contractor and media integrator will keep UVU Media Engineering updated and informed throughout the building project.

Media Wire and Termination Specification All media cabling must be plenum rated (unless specified by UVU). Highest resolution signals will always be used. Each cable must be labeled on both ends first stating the destination and then the origination signal. All cable should be run in a cable management system following LVC standards, and will be organized in a professional manner approved by UVU. All cable will have enough length in order to allow for cable management without having any stress or strain to the cable or equipment connection. Cables will be terminated to length without excess cable length. All cabling should follow industry standards for length of run. VGA cables will be no longer than 45" without amplification. Cable used will be certified by UVU prior to use on any project. All cable clean-up will use Velcro straps instead of cable ties.

Media Integration All media integration must meet or exceed ADA, Americans with Disabilities Act, standards as well as UVU campus standards as outlined in this document. In person coordination is also recommended with the UVU media department as to assure continuity throughout all campus technology installs. Both cabling and equipment integration will be done as part of the building construction process, providing UVU a turn-key solution upon completion of the building. In the event that the media integration is not done as part of the building construction, UVU media and one sub-contractor will be allowed in the building 4 months prior to substantial completion, allowing them to complete the media work along with the final stages of the building construction process. UVU media will be compensated for labor and overtime costs through the building budget. All other UVU media projects and support priority needs will then be lowered.

Mounts Plywood or wood stud backing will be in place for all equipment mounted on walls including flat panels. Mounts will span at least 3 studs. Chief brand mounts will be used with all security features added. Currently UVU uses the non universal RPM series (projector and flat panel specific) when mounting displays.

Media Control System Crestron Control systems will be in place for easy control of all classifications of media systems. These systems will include touch panel/button interfaces, network control for all control systems, desktop executable files for IP control, and latest versions of Crestron Roomview. All programs will be compatible and interfaced with existing UVU systems. Two way Serial RS232 control must be used before any other control option.

Media Control System Programming Only level 3 Crestron Certified programmers can bid or do any programming at UVU. UVU will maintain rights to all Media and Crestron programs and source code. Before substantial completion programmer will deliver all final program files to the UVU liaison prior to UVU building sign off.

Media Equipment All media equipment must be compatible with current UVU systems and equipment standards. Campus standard equipment models must be used to accommodate easy support and issues such as bulb replacement etcetera…. All proposed models will be approved by UVU Media Engineering. A current list of brands and models being used can be requested from UVU media Engineering. UVU is always open to new ideas and suggestions, but reserves the right to stick with tried and true brands and models.

Media Conduit Layout ***(See Instructional Space Conduit Layout Plan)***

Main Media J-box 24"x24"x4" deep J-box will function as the main junction for all of the media A/V cabling in each room. (See Instructional Space/Lab Conduit Layout Plan) It is located on the front wall of the instructional space/lab above the ceiling grid. This box will have the following conduits connecting to it: 2" and two 1" conduits from the podium media in-floor box, 1" conduit to the cable tray, 1" conduits to J-box's on each side of the front wall (for display, speakers, CVS systems), 2" conduit that extends back above the ceiling (approx. 12') from the front of the room to the projector position (See Projector Placement), 1" conduit to ceiling mounted document camera location above podium, 1" conduit to IP camera location, and 1" conduit to motorized Screen for low voltage control. There will also be 4 data ports present within or within 12" of the main media J-box. These jacks will be used for: projector monitoring, IP cameras and IPTV. A 20 amp duplex power outlet will also be placed on the front wall within 12" of the main media J-box.

Podium Media (In-Floor Box) Minimum 6"x 6"x 4" deep in-floor box will have a 2" and 1" conduit for the media integrator and a 1" virgin conduit with pull string for future UVU use. These conduits will run from the in-floor box to the main media J-box. The in-floor box must be level with the floor and have the capability of placing a podium over it.

1" Conduit to hallway cable tray 1" conduit will run from the main media J-box to the hall cable tray. This conduit may be used for cable TV and other future room inputs and outputs.

1" Conduits to each side of the front wall 1" conduits will run from the main media J-box to double gang box's with a single gang mud ring's, which will be located on both sides of the front wall 24" from the side wall and 12" down from the ceiling. These boxes will be used for displays, flat panels, speakers, cable TV and RF receivers for CVS systems.

Projector Location 2" conduit will extend back (approx. 12ft) from the main media J-box above the ceiling from the front of the room to the projector position. The exact position will be determined by the display equipment selected. There will also be a 20 amp duplex outlet within 12" of the projector location (See projector manufacture and UVU specs for projector placement). The projector needs to be aliened with the motorized screen position.

Document Camera Conduit 1" conduit will run from the 24x24 main media J-box to a double gang J-box located above the ceiling grid over the podium. Exact placement will be coordinated with UVU Media Engineering

1" conduit to IP camera location 1" conduit will run from the 24x24 main media J-box to the back corner of the room opposite the entrance with a double gang J-box located above the ceiling grid 2' from the side wall.

Motorized Screen Conduit 1" conduit will run from the 24x24 main media J-box to the location of the screen. This will be used for low voltage control of screen. The screen will be offset to one side of the front wall, opposite the entrance with the projector and projector conduit placed accordingly. Power will also be present for screen.

Motorized Screen A motorized screen will be centered on the side of the room away from the entrance with one side of the screen near the center of the room. The motorized screen will be installed above the ceiling grid with accommodations made in the drop ceiling. The screen will be low voltage controlled from the room control system and from a front wall switch.

Lighting Ideally media enhanced areas have dimmable florescent and/or incandescent lighting that is RS 232 control via the room control system (Crestron Control). Typically the control system will have lighting presets and dimming controls in the front and back of the room. Lights should be arranged in stations or circuits as follows: The row of lighting in the front of the room should be one circuit. There should be incandescent directional lights pointed at the teacher podium on another circuit. All other rows of lights will have inboards and outboards on separate circuits to provide various lighting scenes. If UVU decides to go with non dimmable lighting for any reason, the lights will be arranged so that the front row is one circuit. All other rows of lights will have inboards and outboards on separate circuits so that we can simulate light dimming. All circuits need to be controlled via presets that are controllable through a central room control system via RS-232 or relay control. Lighting will be controlled from three locations the: media control system, front of the room and rear near the room entrance.

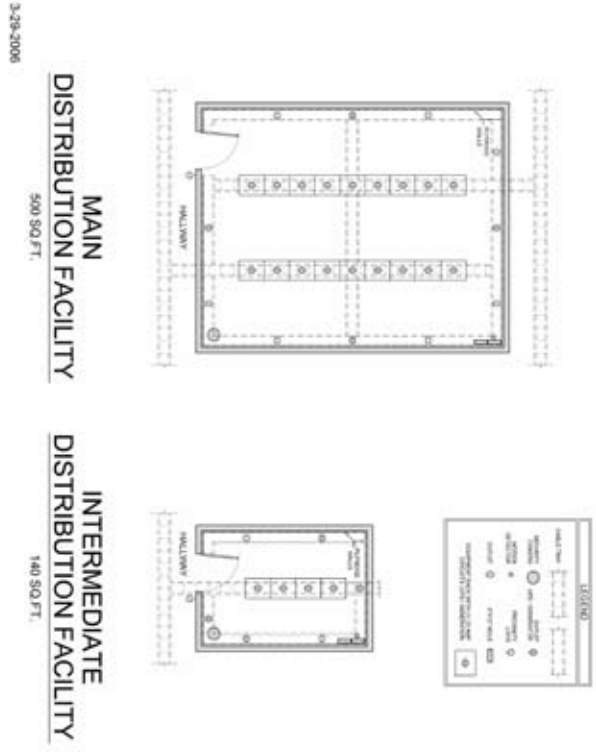
Podium Podiums will be supplied as part of the infrastructure. They will be built to UVU's current campus standard. All dimensions and an example drawing will be supplied by UVU. The podium will have two 19 1/8" wide rack mounting areas on both sides of the podium with a 4" race way between the two for routing cables. The side of the podium nearest the class (Back of Podium) will have locking doors for access to the back of all equipment and cable chase. The front side of the podium will have a locking door on the side nearest the wall with the side nearest the center having a magnetic electric strike that will open upon login for teacher equipment access. The podium will be placed over the podium in-floor box and the podium data drop. Two data ports, using patch cords, will be extended to the top of the podium along with a duplex power outlet and terminated into a surface mount enclosure. There will also be auxiliary inputs available in the enclosure.

Video Surveillance Systems (VSS) Cameras will be specified for viewing of owner specified subject areas, and installed in appropriately rated enclosures. Cameras must be in place in all building entry/exit points as well as MDF/IDF's. Other select building thoroughfares, elevators, lobbies and other select sensitive interior areas will also be covered. IP camera signals will tie in the central campus NVR VSS system. Additional software licensing and NVR storage space will be addressed as part of the building budget.

Digital Signage System (DSS) Flat panel displays will be installed throughout the building. Ideally each display will be back-set into the walls to accommodate for ADA standards. Where this is not possible other considerations will be made for ADA requirements. Displays will be strategically placed throughout the building following a similar pattern to the VSS system. Each display location will have power and data present along with 2 homerun CAT5 cables for central distribution running to a central IDF (all cables to one IDF). These CAT5 runs must meet campus data specifications and be yellow in color.

Preferred Voice and Data Wiring Companies Only the following listed companies can bid on the voice and data wiring at UVU:

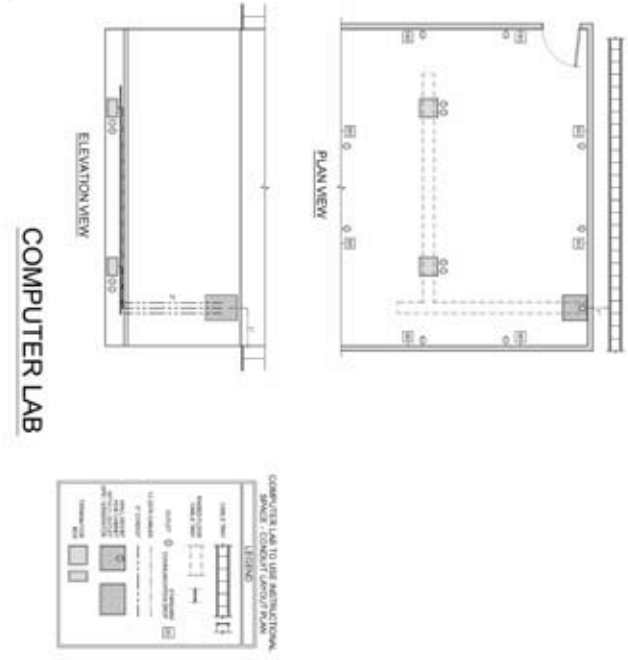
1. Americom Technology (Phone 892-0519 Fax 892-0585)
2. Cache Valley Electric (Tim Hadden, Phone 908-4190 Fax 908-7041)
3. Niels Fugal & Sons (Matt Pierce, Phone 785- 3152 Fax 796-5081)

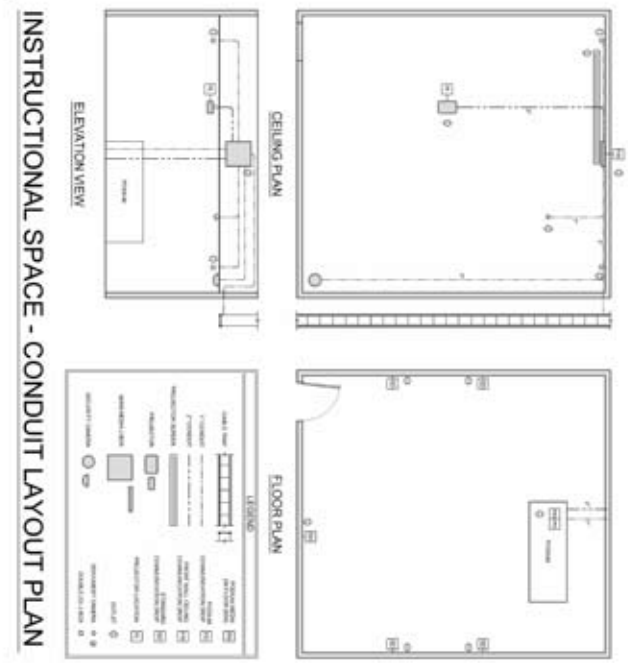


MAIN DISTRIBUTION FACILITY
500 SQ.FT.

INTERMEDIATE DISTRIBUTION FACILITY
140 SQ.FT.

3-29-2006


PLAN VIEW
ELEVATION VIEW
COMPUTER LAB
3-29-2006


CEILING PLAN
FLOOR PLAN
ELEVATION VIEW
INSTRUCTIONAL SPACE - CONDUIT LAYOUT PLAN
3-29-2006

GEOTECHNICAL INVESTIGATION

UVU SCIENCE BUILDING ADDITION

Orem, Utah

Prepared for: DFCM

May 2009

RB&G ENGINEERING, INC.

200901-022

RB&G ENGINEERING, INC.

May 29, 2009

Dave McKay
DFCM
4110 State Office Building
Salt Lake City, UT 84114

Subject: Utah Valley University
Science Building Addition
DFCM Project No. 0920790/Contract No. 097429
Geotechnical Investigation

Gentlemen:

A Geotechnical Investigation has been completed for the proposed addition to the Science Building located on the UVU Campus in Orem, Utah. The results of the study are summarized in the report transmitted herewith.

We appreciate the opportunity of providing this service for you. If there are any questions relating to the information contained herein, please call.

Sincerely,

RB&G ENGINEERING, INC.

Bradford E. Price, P.E.

bep/jal

NO.162291 BRADFORD E. PRICE STATE OF UTAH PROFESSIONAL ENGINEER

1435 WEST 820 NORTH, PROVO, UTAH 84601-1343
PROVO 801-374-5771 SALT LAKE CITY 801-521-5771 FAX 801-374-5773

Geotechnical Investigation

UVU
Science Building Addition

Orem, Utah

Prepared for: DFCM

May 2009

RB&G ENGINEERING, INC.

RB&G ENGINEERING, INC.

UVU
Science Building Addition
Orem, Utah

Geotechnical Investigation

INTRODUCTION

This report outlines the results of a geotechnical investigation performed for the proposed addition to the Science Building located on the Utah Valley University (UVU) Campus in Orem, Utah, at the location shown on the Vicinity and Site Plan Maps in Figures 1 and 2. The purpose of this investigation was to determine the characteristics of the subsurface material throughout the site so that satisfactory substructures can be designed to support the proposed facilities.

RB&G Engineering performed geotechnical investigations for the Science Building in 1986 and 1987, and applicable information from these investigations has been used during this study.

The information contained in the report is discussed under the following headings: (1) Geological and Existing Site Conditions, (2) Field and Laboratory Testing Procedures, (3) Subsurface Soil and Water Conditions, (4) Site Preparation and Compacted Fill Requirements, and (5) Foundation Considerations and Recommendations.

I. GEOLOGICAL AND EXISTING SITE CONDITIONS

The natural surface materials in this general area have been mapped as Lacustrine sand deposits laid down during the Provo regressive phase of the Bonneville lake cycle (upper Pleistocene). The Wasatch Fault Zone is located approximately 3 miles east of the site. Utah County Natural hazards maps identify this area as having moderate liquefaction potential.

The area where the proposed addition will be located is presently landscaped in lawn grass with some trees and shrubs. In general, the topography slopes relatively steeply downward from the existing building on the north to a relatively flat area between the building and ponds shown in Figure 2. Much of the area south of the PS and EN buildings is landscaped with terraces planted in shrubs.

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Structures in the immediate vicinity are supported using spread foundations on compacted fill. Foundations appear to be performing in a satisfactory manner, in that no significant cracking was observed in foundation walls.

As shown in Figure 2, lined detention ponds are located immediately south and west of the proposed addition. Other than the information provided above, no conditions appear to exist at this site which would adversely affect foundation performance.

II. FIELD AND LABORATORY TESTING PROCEDURES

The subsurface investigation was performed using a CME 55 rotary drill rig with a tri-cone rock bit and NW casing to advance the boring and water as the drilling fluid. During the subsurface investigation, sampling was performed at one- to three-foot intervals in the upper 15 feet and at five-foot intervals thereafter. Both disturbed and undisturbed samples were obtained during the field investigations. Disturbed samples were obtained by driving a 2-inch split spoon sampling tube through a distance of 18 inches using a 140-pound weight dropped from a distance of 30 inches. The number of blows to drive the sampling spoon through each 6 inches of penetration is shown on the boring logs. The sum of the last two blow counts, which represents the number of blows to drive the sampling spoon through 12 inches, is defined as the standard penetration value. The standard penetration value, corrected for overburden and hammer energy, provides a good indication of the in-place density of sandy material; however, it only provides an indication of the relative stiffness of the cohesive material, since the penetration resistance of materials of this type is a function of the moisture content.

Undisturbed samples were obtained at select locations by pushing a thin-walled sampling tube into the subsurface material using the hydraulic pressure on the drill rig. The location at which the undisturbed samples were obtained is shown on the boring logs.

Miniature vane shear tests, which provide an indication of the undrained shearing strength of cohesive materials, were performed on samples of the clay soil during the field investigations. The results of these tests are shown on the boring logs as the torvane value in tsf.

Each sample obtained in the field was classified in the laboratory according to the Modified Unified Soil Classification System. The symbol designating the soil type according to this system, is presented on the boring logs. A description of the Modified Unified Soil Classification

System is presented in the appendix, and the meaning of the various symbols, shown on the logs, can be obtained from this figure.

Laboratory tests performed during this investigation to define the characteristics of the subsurface material throughout the proposed site included in-place dry unit weight, natural moisture content, Atterberg Limits, mechanical analyses, unconfined compressive strength, consolidation, pH, resistivity, and sulfate tests. Testing was performed following procedures outlined in the American Society for Testing and Materials (ASTM) standards.

III. SUBSURFACE SOIL AND WATER CONDITIONS

The characteristics of the subsurface material were evaluated by drilling two borings to a depth of 81.5 feet and one boring to 33 feet at the approximate locations shown in Figure 2. The logs for the borings are presented in the appendix. It will be noted from the boring logs that the ground elevation at each boring location was within 0.5 feet of the floor elevation at the west entrance of the restricted lab area.

It will be observed that the subsurface profile consists of a surface layer of medium dense silty sand and firm silt extending 5 to 7 feet below the existing ground surface, underlain generally by firm to stiff lean clay with occasional silty sand layers extending to a depth of about 43 feet. From a depth of 43 feet to the bottom of the borings at 81.5 feet, the soil profile consists predominantly of dense to very dense sand with silt.

Groundwater was encountered at a depth of between 3.3 and 6 feet below the existing ground surface at the time the field investigation was performed (May 2009).

The results of classification, density and moisture tests are presented on the boring logs, and the results of all laboratory tests, with exception of the consolidation tests, are summarized in Table 1, Summary of Test Data in the appendix. It will be noted from Table 1 that the in-place dry unit weight of the cohesive soils varies from 86.5 to 101.6 pcf, and that the natural moisture content of the cohesive material ranges from 22.9 to 36.1%. The unconfined compressive strength of the cohesive soil varies from 526 to 2840 psf.

The compressibility characteristics of the subsurface material were evaluated by performing five consolidation tests on samples obtained from Boring B1 at 9 to 10.5 feet, Boring B2 at 6 to 7.5

RB&G ENGINEERING, INC.

UVU
Science Building Addition
Orem, Utah

Geotechnical Investigation

INTRODUCTION

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The allowable bearing capacity of the cohesive material in the upper 15 feet of the soil profile ranges from about 800 to 2100 psf, with an average of about 1200 psf. It is readily apparent that supporting the structure using spread footings on the native soil would result in excessively large foundations.

Foundation support options considered during preparation of this report include (1) spread footings on compacted granular fill, (2) deep foundations, and (3) mat foundations. Each of these foundation types are discussed separately below:

1. Spread Footings on Compacted Granular Fill

A significant increase in bearing capacity can be achieved by placing the footings on compacted fill. The following table shows the required fill thickness to obtain a given allowable bearing capacity for continuous and spot footings:

ALLOWABLE BEARING CAPACITY	CONTINUOUS FOOTINGS Depth of Fill (ft)	SQUARE FOOTINGS Depth of Fill (ft)
2000	1.0 x B, (B≥ 2 ft)	0.41 x B, (B≥ 3 ft)
2500	1.5 x B, (B≥ 2 ft)	0.58 x B, (B≥ 4 ft)
3000	2.0 x B, (B≥ 2 ft)	0.73 x B, (B≥ 4 ft)
4000	N/A	1.00 x B, (B≥ 4 ft)

B = Width of Footing

If the spot footings are designed using an allowable bearing capacity of 3000 psf, column loads of 600,000 pounds would require a 14 foot square footing and about 10.5 feet of granular fill over the lean clay. Using an allowable bearing capacity of 4000 psf requires at 12.3 foot square footing and about 12.3 feet of fill. Placement of this magnitude of compacted fill results in excavation below the existing groundwater level, requiring dewatering and stabilization of the subgrade. Dewatering of the lean clay can best be accomplished using closely spaced well points. The groundwater level should be lowered to at least 2 feet below the base of the excavation. The width of footing excavations should be equal to the width of the footing plus the depth of fill, plus 2 feet.

Due to the anticipated footing width and required depth of fill, it may be more efficient to excavate the entire footprint and replace with compacted fill, if the spread footing option is used. The on-site silty sand can be used as structural fill below a depth of 5 feet from footing subgrade. Structural fill within 5 feet of footing subgrade should consist of relatively well graded sand gravel having a maximum size of 4 inches with less than 20%

passing a No. 200 sieve. The fines should have a plasticity index less than 5. The fill should be placed in lifts not exceeding 1 foot in thickness and compacted to an in-place dry unit weight of at least 95% of the maximum laboratory density as determined by ASTM D 1557. To ensure that compaction requirements are met, each lift should be tested, with testing performed at 50 foot intervals along continuous footing lines and at each spot footing. Testing should be performed in accordance with ASTM D 6938 (nuclear method), or ASTM D 1556 (sand cone method).

If the foundations for the proposed facility are designed in accordance with the recommendations outlined above, the maximum settlement of any footing should not exceed one inch and differential settlement throughout the structure should not exceed 0.5 inch. It is generally recognized that the tolerable differential settlement for steel and concrete structures is about 0.002 times the column spacing. This criteria is tantamount to a differential settlement of about 0.5 inch for column spacing's of 20 feet and 0.7 inch for column spacing's of 30 feet. Since it is not anticipated that the column spacing for this structure will be less than 20 feet, a differential settlement of 0.5 inch should be satisfactory for the proposed facility.

2. Mat Foundation

The relatively low bearing capacity of the natural subgrade soils and the anticipated large structural loads make a mat foundation an efficient option to provide uniform distribution of soil pressure under the foundation.

Settlement analyses have been performed assuming net allowable bearing capacities of 800 psf and 1200 psf for the mat foundation. A total estimated consolidation settlement at the center of the mat of 0.91 inches for the 800 psf loading and 1.26 inches for the 1200 psf loading has been computed. Differential settlement will be less than 0.6 inches, which should be entirely satisfactory for a mat type foundation.

It is recommended that a coefficient of subgrade reaction (k_1) of 50 lb/in^3 be used for the lean clay and plastic silt subgrade. It is also recommended that consideration be given to over excavating the subgrade and placing 1 foot of compacted sandy gravel beneath the mat foundation. The fill should be compacted to an in-place unit weight equal to at least 92% of the maximum density as determined by ASTM D 1557. If this action is taken, the

coefficient of subgrade reaction can be increased to 100 lb/in^3. The fill can include the 6" layer of free draining gravel beneath the mat discussed in Section VI.A below.

3. Deep Foundations

Driven Piles

Consideration has been given to supporting the structure on driven piles extending at least 5 feet into the dense silty sand which was encountered at a depth of about 43 feet throughout the site. Axial compressive capacities for 12.75-inch, 14-inch, and 16-inch (outside diameter) closed-end concrete-filled steel pipe piles are summarized on the following table.

Pipe Pile Outside Diameter (inches)	Ultimate Skin Friction (kips)	Ultimate End Bearing (kips)	Allowable Capacity Assuming Factor of Safety = 2.25 (kips)
12.75	116	133	110
14.0	133	162	131
16.0	162	212	166

Pile layouts should be designed with a minimum center-to-center spacing of 3 pile diameters between piles. It will be noted that a factor of safety of 2.25 has been used to calculate the allowable capacities. This factor of safety assumes that PDA testing will be performed during driving of one pile for columns located near the four corners and center of the structure. Pile uplift capacity can be estimated by using a factor of safety of 3 with the ultimate skin friction values. If this option is selected, pile lateral capacities, along with estimated pile group settlement, can be evaluated. It is anticipated that group settlement will be tolerable for column loads less than 600 kips. We recommend that the geotechnical engineer's representative be present during pile installation.

Drilled Shafts

Drilled shafts have also been considered as a foundation option for supporting the structure. It has been assumed that the shafts will be drilled at least 5 feet into the dense silty sand referenced in the Driven Pile section above. Procedures outlined in FHWA-HI-88-042, Drilled Shafts: Construction Procedures and Design Methods, have been used to determine the ultimate axial compressive capacity (nominal resistance) of drilled shafts. Capacity analyses have been performed for straight-sided drilled shafts using soil parameters obtained from the borings. If allowable stress

design methods are used, we recommend that a factor of safety of 2.5 be applied to the ultimate capacity to determine the allowable capacity. It has been assumed that high quality construction, good specifications and excellent inspection will exist for each foundation. The estimated capacities of the drilled shafts can be taken from the table below.

Shaft Diameter (ft)	Ultimate Side Resistance (kips)	Ultimate End Resistance (kips)	Total Ultimate Capacity (kips)	Allowable Capacity (kips)
3	258	322	580	232
3.5	301	439	740	296
4	344	573	917	367
4.5	387	725	1112	445
5	403	895	1298	519

The allowable uplift resistance of a single drilled shaft may be taken as the ultimate side resistance value shown on the table above divided by a factor of safety of 3.0. A center-to-center spacing of at least three shaft diameters should exist to minimize interaction and overlapping stresses between shafts, which would result in reduced capacity.

The design of rebar and concrete should follow established guidelines. If the foundation recommendations presented above are followed, the maximum settlement of any drilled shaft should not be greater than about 1 inch. Due to the high water table and presence sand layers, drilling slurry or casing will likely be required for shaft excavation. Concrete should be placed by tremie methods to ensure that no voids exist within the shafts. Concrete used for shafts should have a relatively high slump (6 inches or greater) to allow workability and proper placement between reinforcement and the sides of the shafts. Within each shaft, concrete should be placed in a generally continuous manner to prevent cold joints and other problems associated with excessive waits between concrete trucks. It is essential that drilled shaft construction be carefully inspected to ensure that loose material is removed from the base and that the concrete is placed using proper procedures.

While all options discussed above will provide satisfactory support, it is our opinion that supporting the structure on a mat type foundation may be the most efficient design.

B. SEISMIC CONSIDERATIONS

The site is classified as Site Class D, as per Section 1613 of the 2006 International Building Code. The site is located at latitude 40.2778° North and longitude 111.7153° West. Probabilistic peak ground acceleration (PGA) values are tabulated below:

Probabilistic ground motion values in %g.

	10%PE in 50 yr	2%PE in 50 yr
PGA	17.70	50.57
0.2 sec SA	42.19	114.89
1.0 sec SA	14.24	48.47

The allowable soil bearing pressure indicated above may be increased by one-third where seismic forces are involved in the structural loads. If the frictional resistance of the footings and floor slabs are used to resist seismic forces, we recommend a coefficient of friction of 0.40 be used to calculate these forces. See Section C below for recommendations related to resistance provided by passive earth pressures.

A liquefaction analysis has been performed for the site assuming a seismic event having an acceleration of 0.34g, which is 2/3's of the event having a probability of exceedence of 2% in 50 years. The results of the analysis indicate that the sand in the upper 80 feet will have a factor of safety greater than 1.5 against liquefaction. Based upon the results of the analysis, it is concluded that problems associated with liquefaction during a seismic event are unlikely at this site, and no special mitigation of the foundation soils is required.

C. LATERAL EARTH PRESSURES

It is not anticipated that earth-retaining structures will be required for the proposed facility. If earth-retaining structures are required, however, and if backfilling is performed using granular material, and if the backfill behind the wall is horizontal, we recommend that the earth pressures be calculated using the following equation, along with the earth pressure coefficient outlined below:

$$P = \tfrac{1}{2}\,\gamma\,K\,H^2$$

Where P = total lateral force on wall, plf
K = earth pressure coefficient
γ = unit weight of soil (125 pcf)
H = height of retained soil against wall

The earth pressure coefficient used in designing the walls will depend upon whether the wall is free to move during backfilling operations, or whether the wall is restrained during backfilling. If the wall is free to move during backfilling operations and the backfill material is granular soil, we recommend an active earth pressure coefficient of 0.30 be used in the above equation to calculate the lateral earth pressures. If the walls are restrained from any movement during backfilling and the backfill material is granular soil, we recommend an at-rest earth pressure coefficient of 0.45 be used to calculate the lateral earth pressure. A passive earth pressure coefficient of 3.0 may be used to estimate the lateral resistance of the soil in cases where the wall tends to move toward the backfill. In each of these cases, the earth pressure diagram may be approximated as a triangle, such that the resultant earth pressure force P acts at a height of approximately H/3 above the base of the wall.

For the seismic event having a 2-percent probability of exceedance in 50 years, the additional active earth pressure due to ground acceleration may be estimated using a coefficient of 0.2. The seismic ground motion will reduce the available passive resistance. This reduction may be accounted for as an earth pressure acting in the direction opposite the passive resistance, and computed using a coefficient of 0.5. The pressure diagrams for these forces may be roughly approximated as inverted triangles, such that the resultant forces of the seismic components act at heights of approximately 2H/3 above the base of the wall.

For non-yielding walls, the increase in earth pressure corresponding to the seismic event may be estimated using the equation $P_{EQ} = a_h \gamma H^2$, where a_h is a seismic coefficient of 0.34. This force is in addition to the at-rest pressure, and acts at a height of about 0.53H above the base of the wall.

It should be recognized that the pressures calculated by the above equation are earth pressures only and do not include hydrostatic pressures. Where hydrostatic pressures may exist behind a retaining structure, we recommend either the wall be designed to resist hydrostatic pressure, or that a drainage system be placed behind the wall to prevent the development of hydrostatic pressures.

V. SITE PREPARATION AND COMPACTED FILL REQUIREMENTS

As indicated above, the vegetative cover throughout the building site consists of lawn grass, shrubs and trees. We recommend that the upper 6 inches be stripped from the area and that tree roots be grubbed to remove the excess organic matter in the upper portion of the soil profile.

Temporary excavations extending to a depth of less than 20 feet can be sloped at 1 horizontal to 1 vertical.

It is anticipated that stabilization of the foundation excavations may be required prior to placement of structural fill. Care should be taken to prevent heavy construction equipment from traversing directly on the subgrade soils. Stabilization techniques are dependant upon conditions encountered and construction methods. Where very soft clay exists, it is anticipated that cobble rock will provide the most effective means of stabilization. Where cobble rock is required, it should consist of 3 to 8 inch rock placed in single lifts, tamped into the clay such that the voids are filled. Excess cobbles which cannot be tamped into the clay should be removed to prevent migration of fines into the voids, which would result in settlement. Placement of a geotextile fabric, such as Mirafi 600X or equivalent will be effective in stabilizing moderately soft areas.

We recommend that imported fill used to establish final grade throughout the site consist of granular soil having a maximum size of 4 inches with less than 20% passing a No. 200 sieve. We recommend that the material passing a No. 200 sieve have a plasticity index less than 5. The fill should be compacted to an in-place density equal to at least 92% of the maximum density as determined by ASTM D 1557. Structural fill beneath foundations, if needed, should meet requirements outlined in Section IV.A.

We recommend that a free-draining granular layer be placed beneath ground level floor slabs. The free-draining granular layer should be at least 6 inches thick and should have a maximum size less than 1 inch and not more than 5% passing a 200 sieve. The free-draining material should be densified using at least 4 passes of a smooth drum 5-ton vibratory roller or equivalent. If the above specifications are followed, the granular layer will prevent the accumulation of moisture beneath the floor slab and will also serve adequately as a base beneath the floor slabs. A subgrade modulus of 100 pci can be used for design.

Grading around the structure should be performed in such a manner that all surface water will flow freely from the area and that no ponding will occur adjacent to the structure which will permit deep percolation into the foundation area. Roof drains should extend well beyond the building lines to prevent seepage into the foundation soils. Sprinkler heads located adjacent to the building should be directed away from the structure to prevent the percolation of water into the foundation zone.

Backfilling around foundation walls should be performed using granular material densified to an in-place unit weight equal to at least 90% of the maximum laboratory density indicated above.

VI. LIMITATIONS

The conclusions and recommendations presented in this report are based upon the results of the field and laboratory tests which, in our opinion, define the characteristics of the subsurface material throughout the site in a satisfactory manner. It should be recognized that soil materials are inherently heterogeneous and that conditions may exist throughout this site which could not be defined during this investigation. Since the bearing capacity for foundation design is dependent upon adequate compaction of imported fill, it is requested that testing of the fill be performed under the direct supervision of the soils engineer.

It is recommended that a soils engineer observe the foundation excavations prior to placement of footings. If driven pile or drilled shaft foundations are used, it is requested that we be present during the initial driving/drilling, and that we have the opportunity to observe all test results.

If during construction, conditions are encountered which appear to be different than those presented in this report, it is requested that we be advised in order that appropriate action may be taken.

The information contained in this report is provided for the specific location and purpose of the client named herein and is not intended or suitable for reuse by any other person or entity whether for the specified use, or for any other use. Any such unauthorized reuse, by any other party is at that party's sole risk and RB&G Engineering, Inc. does not accept any liability or responsibility for its use.

Figures

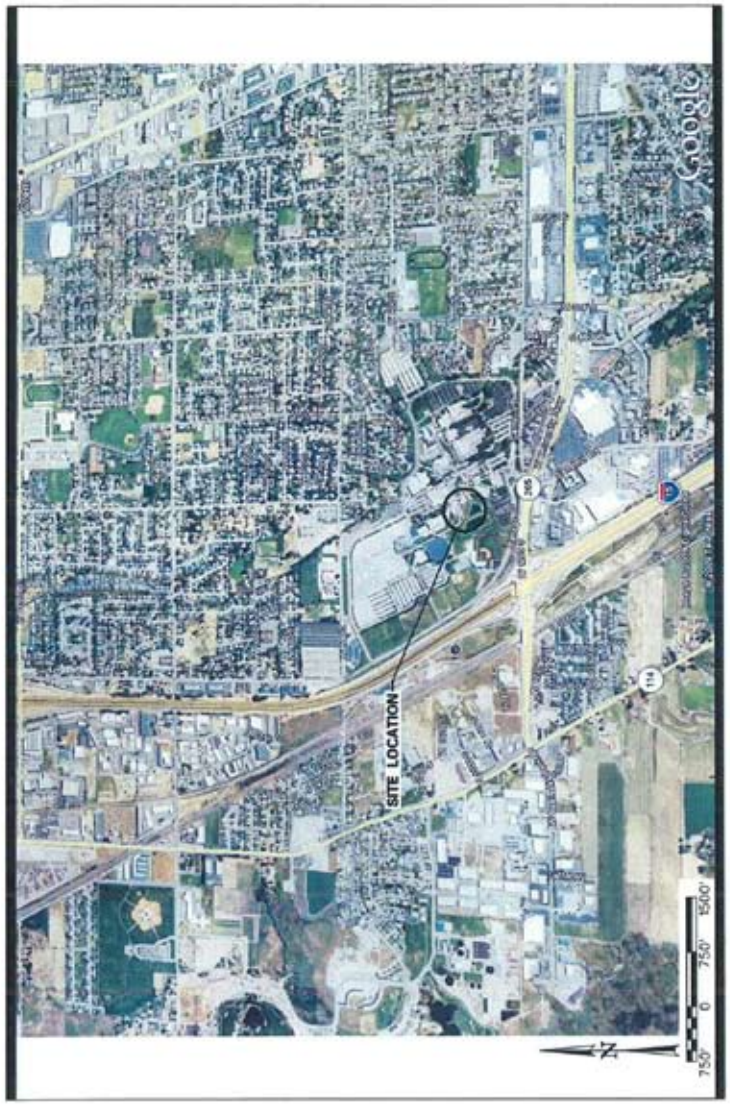

Figure 1 VICINITY MAP
UVU - Science Building Addition
Orem, Utah

RB&G ENGINEERING, INC.

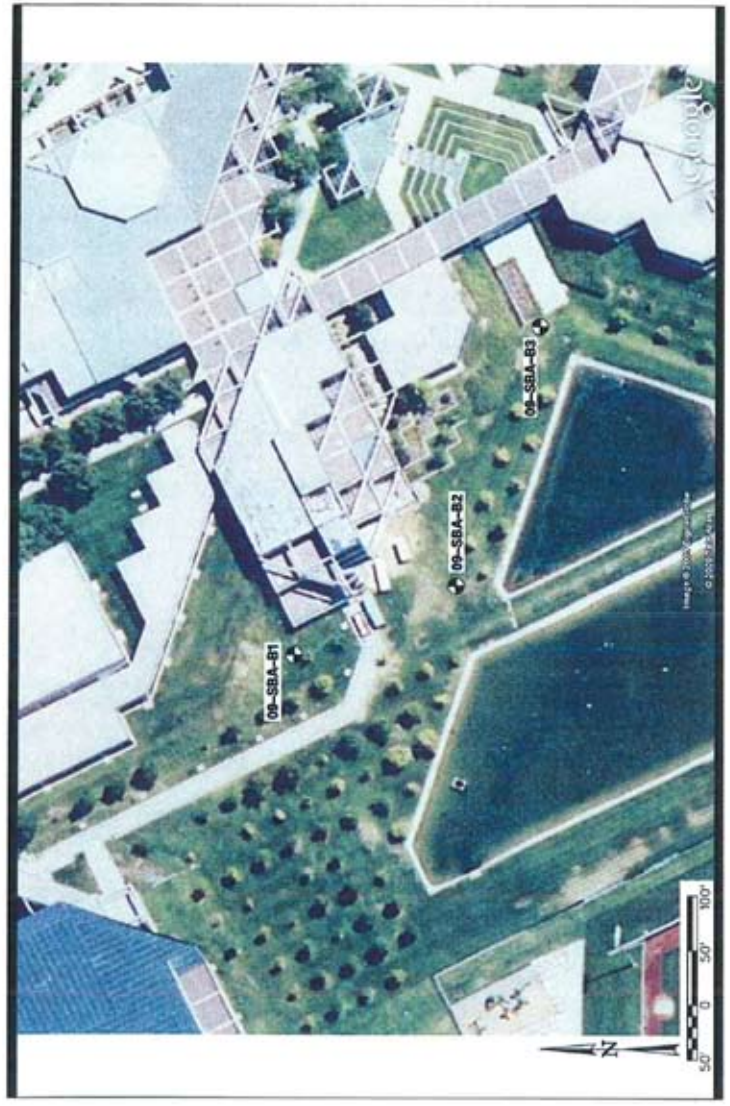

Figure 2 SITE PLAN & TEST HOLE LOCATIONS
UVU - Science Building Addition
Orem, Utah

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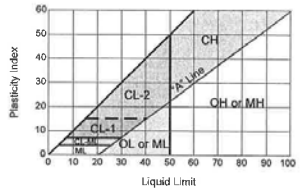
Appendix

Unified Soil Classification System

Major Divisions			Group Symbols	Typical Names	Laboratory Classification Criteria		
COARSE-GRAINED SOILS *more than half of material is larger than No. 200 sieve*	Gravels *more than half of coarse fraction is larger than No. 4 sieve size*	Clean Gravels *little or no fines*	GW	Well graded gravels, gravel-sand mixtures, little or no fines	*For laboratory classification of coarse-grained soils* Determine percentage of gravel and sand from grain-size curve. Depending on percentage of fines (*fraction smaller than No. 200 sieve size*), coarse-grained soils are classified as follows: **Less than 5%** GW, GP, SW, SP **More than 12%** GM, GC, SM, SC **5% to 12%** Borderline cases requiring use of dual symbols**	$C_u = \frac{D_{60}}{D_{10}}$ $C_c = \frac{(D_{30})^2}{D_{60} \times D_{60}}$	Greater than 4 Between 1 and 3
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		Gravels With Fines *appreciable amount of fines*	GM* d / u	Silty gravels, poorly graded gravel-sand-silt mixtures		Atterberg limits below "A" line, or PI less than 4	Above "A" line with PI between 4 and 7 are borderline cases requiring uses of dual symbols
			GC	Clayey gravels, poorly graded gravel-sand-clay mixtures		Atterberg limits above "A" line, or PI greater	
	Sands *more than half of coarse fraction is smaller than No. 4 sieve size*	Clean Sands *little or no fines*	SW	Well graded sands, gravelly sands, little or no fines		$C_u = \frac{D_{60}}{D_{10}}$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$	Greater than 6 Between 1 and 3
			SP	Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW	
		Sands with Fines *appreciable amount of fines*	SM* d / u	Silty sands, poorly graded sand-silt mixtures		Atterberg limits below "A" line, or PI less than 4	Above "A" line with PI between 4 and 7 are borderline cases requiring uses of dual symbols
			SC	Clayey sands, poorly graded sand-clay mixtures		Atterberg limits above "A" line, or PI greater	
FINE-GRAINED SOILS *more than half of material is smaller than No. 200 sieve*	Silts and Clays *liquid limit is less than 50*		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	*For laboratory classification of fine-grained soils*		
			CL 1 / 2	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL	Organic silts and organic silt-clays of low plasticity			
	Silts and Clays *liquid limit is greater than 50*		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH	Inorganic clays of high plasticity, fat clays			
			OH	Organic clays of medium to high plasticity, organic silts			
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils			



Plasticity Chart

NOTE: USCS Modified to include CL-type subcategories

*Division of GM and SM groups into subdivisions of d and u for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when liquid limit is 28 or less and the PI is 6 or less, the suffix u used when liquid limit is greater than 28.

***Borderline classification:* Soils possessing characteristics of two groups are designated by combinations of group symbols. (For example GW-GC, well graded gravel-sand mixture with clay binder.)

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RB&G ENGINEERING, INC. 2/5/99

DRILL HOLE LOG — BORING NO. 09-SBA-B1

SHEET 1 OF 2

PROJECT: UVU - SCIENCE BUILDING ADDITION
CLIENT: DFCM
LOCATION: SEE SITE PLAN
DRILLING METHOD: 96-CME-55 / N.W. CASING TO 18.5'
DRILLER: T. KERN
DEPTH TO WATER - INITIAL: ▽ 6.0' AFTER 24 HOURS: ▼ N.M.

PROJECT NUMBER: 200901.022
DATE STARTED: 5/7/09
DATE COMPLETED: 5/7/09
GROUND ELEVATION: 100.4'*
LOGGED BY: C. SANBORN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS	Material Description		Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
100				16	5,7,8,(31)	SM	brown, moist, dense	Organics in top 6"		16.0		NP	8	46	46	
				16	4,2,5,(16)	SM	brown, very moist, med. dense	SILTY SAND		20.7		NP	0	61	39	
95 ▽	5			15	Pushed	SM	brown, wet		93.5	28.3		NP	0	55	45	UC
				18	1,1,3,(8) 0.14	CL	brown, very moist, soft									
90	10			14	Pushed 0.28	CL-2	brown, moist, firm		86.5	34.2	39	19				CT UC
				16	Pushed 0.38	CL	brown, moist, firm									
85	15			18	1,2,2,(7) 0.30	CL-1	brown, moist, firm	LEAN CLAY W/SAND silt lenses		34.3	35	12				
80	20			15	Pushed 0.57	CL-1	brown, moist, stiff		101.2	25.4	26	8				
75	25			15	3,3,7,(14) 0.40	CL	brown, moist, firm	LEAN CLAY W/SAND sand layers to 1" thick								
70	30			15	0.35 Pushed	CL SM	brown, moist, firm; brown, wet	SILTY SAND								
				18	3,7,8,(19) 0.61	CL	brown, moist, stiff									
65	35			18	3,6,7,(16) 0.66	CL	brown, moist, stiff	LEAN CLAY W/SAND numerous silt and/or sand lenses & layers to 1/2" thick								
60	40			16	Pushed 0.52	CL,SM	brown, moist/wet, stiff/med. dense	INTERBEDDED LEAN CLAY & SILTY SAND LAYERS 4"-8" THICK								
				18	8,13,11,(28) 0.54	CL,SM	brown, moist/wet, stiff/med. dense									
								SAND W/SILT occasional clay layers to 1 1/2" thick								

RB&G ENGINEERING, INC.

LEGEND:
DISTURBED SAMPLE: 2,3,2 ← Blow Count per 6"; 0.45 ← Torvane (tsf)
UNDISTURBED SAMPLE: PUSHED 0.45 ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compressio
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrain
CU = Consolidated, Undrained
HYD = Hydrometer

DH_LOG V6 UVUSCIENCEBLDGADD.GPJ US EVAL.GDT 5/26/09

DRILL HOLE LOG — BORING NO. 09-SBA-B1

SHEET 2 OF 2

PROJECT: UVU - SCIENCE BUILDING ADDITION
CLIENT: DFCM
LOCATION: SEE SITE PLAN
DRILLING METHOD: 96-CME-55 / N.W. CASING TO 18.5'
DRILLER: T. KERN
DEPTH TO WATER - INITIAL: ▽ 6.0' AFTER 24 HOURS: ▼ N.M.

PROJECT NUMBER: 200901.022
DATE STARTED: 5/7/09
DATE COMPLETED: 5/7/09
GROUND ELEVATION: 100.4'*
LOGGED BY: C. SANBORN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS	Material Description		Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
55				6	5,20,20,(45)	SP-SM	gray, wet, dense									
50	50			15	2,21,21,(45)	SP-SM	brown, wet, dense									
45	55			6	22,27,30,(59)	SP-SM	gray, wet, very dense									
								SAND W/SILT occasional clay layers to 1 1/2" thick								
40	60			18	5,17,14,(31)	SP-SM	gray, wet, dense									
35	65															
30	70			16	21,7,11,(17) 0.37	SP-SM CL	gray, wet, med. dense; gray, moist, firm	LEAN CLAY sand lenses								
25	75			14	21,37,39,(68)	SP-SM	gray, wet, very dense	SAND W/SILT clay lenses								
20	80			17	30,31,18,(43)	SP-SM	gray, wet, dense									
								*Assumed finish floor elevation of 100.0' at west entance of restricted lab area, grass level								
15	85															

RB&G ENGINEERING, INC.

LEGEND:
DISTURBED SAMPLE: 2,3,2 ← Blow Count per 6"; 0.45 ← Torvane (tsf)
UNDISTURBED SAMPLE: PUSHED 0.45 ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DH_LOG V6 UVUSCIENCEBLDGADD.GPJ US EVAL.GDT 5/26/09

DRILL HOLE LOG — BORING NO. 09-SBA-B2

SHEET 1 OF 1

PROJECT: UVU - SCIENCE BUILDING ADDITION
CLIENT: DFCM
LOCATION: SEE SITE PLAN
DRILLING METHOD: 96-CME-55 / N.W. CASING TO 15'
DRILLER: T. KERN
DEPTH TO WATER - INITIAL: ▽ N.M. **AFTER 24 HOURS:** ▼ 3.3'

PROJECT NUMBER: 200901.022
DATE STARTED: 5/7/09
DATE COMPLETED: 5/7/09
GROUND ELEVATION: 99.6' *
LOGGED BY: C. SANBORN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
				17	9,12,9,(44) 0.28	SM	brown, moist, dense — SILTY SAND								
						ML	brown, moist, firm								
				9	Pushed 0.66	ML	brown, moist, stiff — SILT W/SAND plastic	93.0	30.1	32	8				UC
95	5			16	Pushed 0.53	CL-2	brown, moist, stiff	93.6	29.1	37	17				CT
90	10			18	Pushed 0.35	CL-1	brown, moist, firm	92.9	32.3	35	14				UC
				17	1,2,2,(8) 0.64	CL	brown, moist, stiff — LEAN CLAY W/SAND occasional silt lenses								
85	15			18	0,3,3,(11) 0.32	CL-2	brown, moist, firm		27.6	37	18				
80	20			18	Pushed 0.24	SM	brown, wet — SILTY SAND								
						CL	brown, moist, soft								
75	25			18	4,5,6,(17) 0.61	CL	brown, moist, stiff — LEAN CLAY frequent silt and/or sand lenses								
70	30			15	Pushed 0.50	CL	brown, moist, stiff — LEAN CLAY sand layers to 1 1/2" thick								
				18	4,8,8,(22) 0.69	CL	brown, moist, stiff								
65	35						*Assumed finish floor elevation of 100.0' at west entance of restricted lab area, grass level								

DH LOGS VE UVUSCIENCEBLDGADD.GPJ US EVAL.GDT 5/28/09

RB&G ENGINEERING, INC.

LEGEND:
DISTURBED SAMPLE — 2,3,2 ← Blow Count per 6" ; 0.45 ← Torvane (tsf)
UNDISTURBED SAMPLE — PUSHED 0.45 ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compress
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undr
CU = Consolidated, Undrain
HYD = Hydrometer

DRILL HOLE LOG — BORING NO. 09-SBA-B3

SHEET 1 OF 2

PROJECT: UVU - SCIENCE BUILDING ADDITION
CLIENT: DFCM
LOCATION: SEE SITE PLAN
DRILLING METHOD: 96-CME-55 / N.W. CASING TO 15'
DRILLER: T. KERN
DEPTH TO WATER - INITIAL: ▽ 3.9' **AFTER 24 HOURS:** ▼ N.M.

PROJECT NUMBER: 200901.022
DATE STARTED: 5/8/09
DATE COMPLETED: 5/8/09
GROUND ELEVATION: 100.5'*
LOGGED BY: C. SANBORN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
100						SM	SILTY SAND organics (grass)								
				15	10,8,5,(27)	GM	brown, moist — 4" CONCRETE								
						SM	brown, moist, med. dense — SILTY GRAVEL W/SAND								
						SM	brown, very moist — SILTY SAND								
	5			9	3,1,3,(9) 0.30	ML	brown, very moist, firm — SILT W/SAND plastic		30.7	30	7				
95				17	Pushed 0.18	CL-2	brown, moist, soft	87.1	36.1	42	20				UC
90	10			17	Pushed 0.37	CL-1	brown, very moist, firm	87.2	32.7	32	11				CT UC
				17	1,2,3,(10) 0.58	CL	brown, moist, stiff								
85	15			18	0,4,4,(15) 0.33	CL-1	brown, moist, firm — LEAN CLAY W/SAND silt lenses, occasional sand layers to 1/2" thick		26.8	32	13				
80	20			18	Pushed 0.58	CL-1	brown, moist, stiff		28.7	31	11				
75	25			18	0,3,2,(8) 0.40	CL	brown, moist, firm								
70	30			17	Pushed 0.71	CL-1	brown, moist, stiff	95.1	23.1	31	12				CT
65	35			16	4,7,5,(16) 0.44	CL	brown, moist, firm — LEAN CLAY frequent silt lenses, occasional sand layers to 1" thick - becoming more frequent w/depth								
60	40			15	Pushed 0.60	CL-1	brown, moist, stiff	101.6	22.9	29	8				CT
							SILTY SAND few clay layers to 1" thick								

DH LOGS VE UVUSCIENCEBLDGADD.GPJ US EVAL.GDT 5/28/09

RB&G ENGINEERING, INC.

LEGEND:
DISTURBED SAMPLE — 2,3,2 ← Blow Count per 6" ; 0.45 ← Torvane (tsf)
UNDISTURBED SAMPLE — PUSHED 0.45 ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

DRILL HOLE LOG — BORING NO. 09-SBA-B3

SHEET 2 OF 2

PROJECT: UVU - SCIENCE BUILDING ADDITION
CLIENT: DFCM
LOCATION: SEE SITE PLAN
DRILLING METHOD: 96-CME-55 / N.W. CASING TO 15'
DRILLER: T. KERN
DEPTH TO WATER - INITIAL: ▽ 3.9' AFTER 24 HOURS: ▼ N.M.

PROJECT NUMBER: 200901.022
DATE STARTED: 5/8/09
DATE COMPLETED: 5/8/09
GROUND ELEVATION: 100.5'*
LOGGED BY: C. SANBORN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS	Material Description		Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
55																
			18		6,10,9,(22)	SM	brown, wet, med. dense	SILTY SAND few clay layers to 1" thick		25.9		NP	0	62	38	
50	50		0		21,23,24,(52)	-	no recovery									
								SAND W/SILT occasional clay lenses & layers to 1" thick								
45	55		15		9,11,25,(38)	SP-SM	gray, wet, dense									
40	60		14		8,18,20,(38)	SP-SM	gray, wet, dense									
35	65															
30	70		12		7,24,30,(54)	SP-SM	gray, wet, very dense	SAND W/SILT clay lenses								
25	75															
20	80		12		29,33,36,(69)	SP-SM	gray, wet, very dense									
								*Assumed finish floor elevation of 100.0' at west entance of restricted lab area, grass level								
15	85															

RB&G ENGINEERING, INC.

LEGEND:
DISTURBED SAMPLE — 2,3,2 ← Blow Count per 6"; 0.45 ← Torvane (tsf)
UNDISTURBED SAMPLE — PUSHED 0.45 ← Torvane (tsf)

OTHER TESTS
UC = Unconfined Compressi
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undra
CU = Consolidated, Undrain
HYD = Hydrometer

DH_LOGV6 UNUSCENCEBLOGADD.GPJ US EVAL.GDT 5/29/09

DRILL HOLE LOG — BORING NO. 09-SBA-B2

SHEET 1 OF 1

PROJECT: UVU - SCIENCE BUILDING ADDITION
CLIENT: DFCM
LOCATION: SEE SITE PLAN
DRILLING METHOD: 96-CME-55 / N.W. CASING TO 15'
DRILLER: T. KERN
DEPTH TO WATER - INITIAL: ▽ N.M. AFTER 24 HOURS: ▼ 3.3'

PROJECT NUMBER: 200901.022
DATE STARTED: 5/7/09
DATE COMPLETED: 5/7/09
GROUND ELEVATION: 99.6' *
LOGGED BY: C. SANBORN, J. BOONE

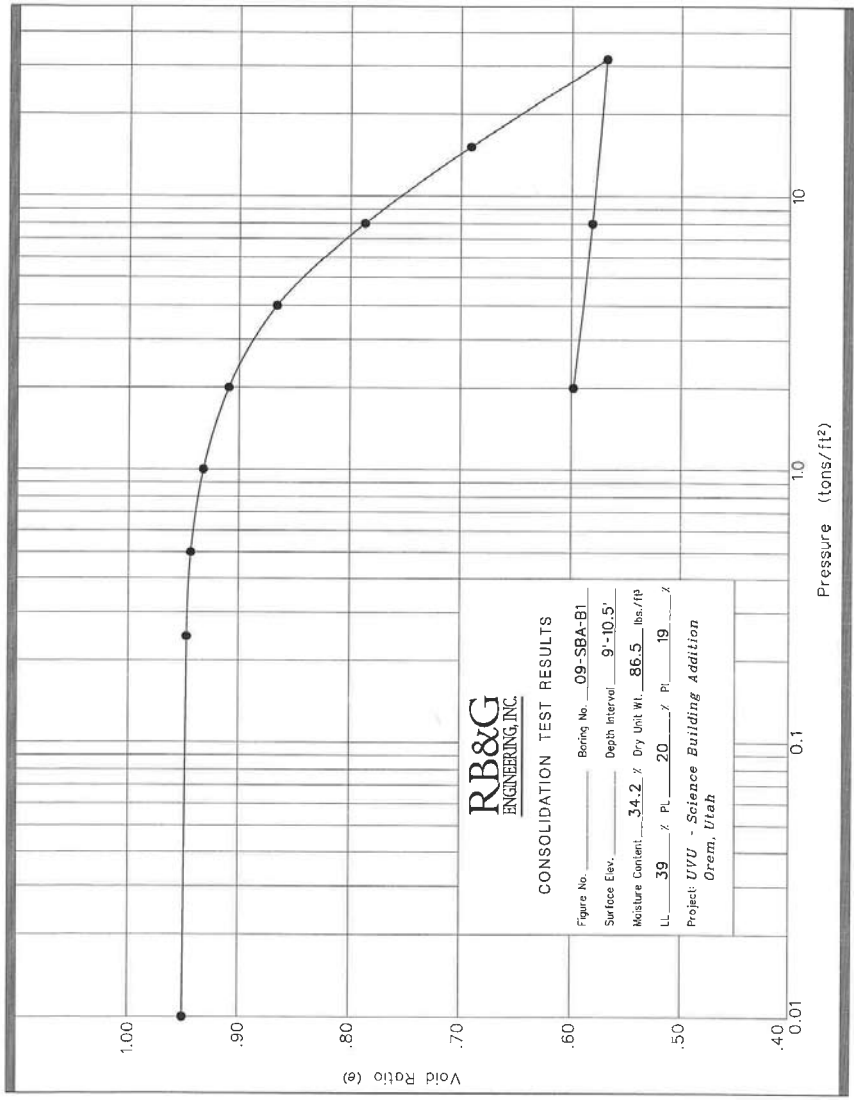
Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	USCS	Material Description		Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Other Tests
			17		9,12,9,(44) 0.28	SM	brown, moist, dense	SILTY SAND								
						ML	brown, moist, firm									
			9		Pushed 0.66	ML	brown, moist, stiff	SILT W/SAND plastic	93.0	30.1	32	8				UC
95	5		16		Pushed 0.53	CL-2	brown, moist, stiff		93.6	29.1	37	17				CT
90	10		18		Pushed 0.35	CL-1	brown, moist, firm		92.9	32.3	35	14				UC
			17		1,2,2,(8) 0.64	CL	brown, moist, stiff	LEAN CLAY W/SAND occasional silt lenses								
85	15		18		0,3,3,(11) 0.32	CL-2	brown, moist, firm			27.6	37	18				
80	20		18		Pushed 0.24	SM	brown, wet	SILTY SAND								
						CL	brown, moist, soft									
75	25		18		4,5,6,(17) 0.61	CL	brown, moist, stiff	LEAN CLAY frequent silt and/or sand lenses								
70	30		15		Pushed 0.50	CL	brown, moist, stiff	LEAN CLAY sand layers to 1 1/2" thick								
			18		4,8,8,(22) 0.69	CL	brown, moist, stiff									
								*Assumed finish floor elevation of 100.0' at west entance of restricted lab area, grass level								
65	35															

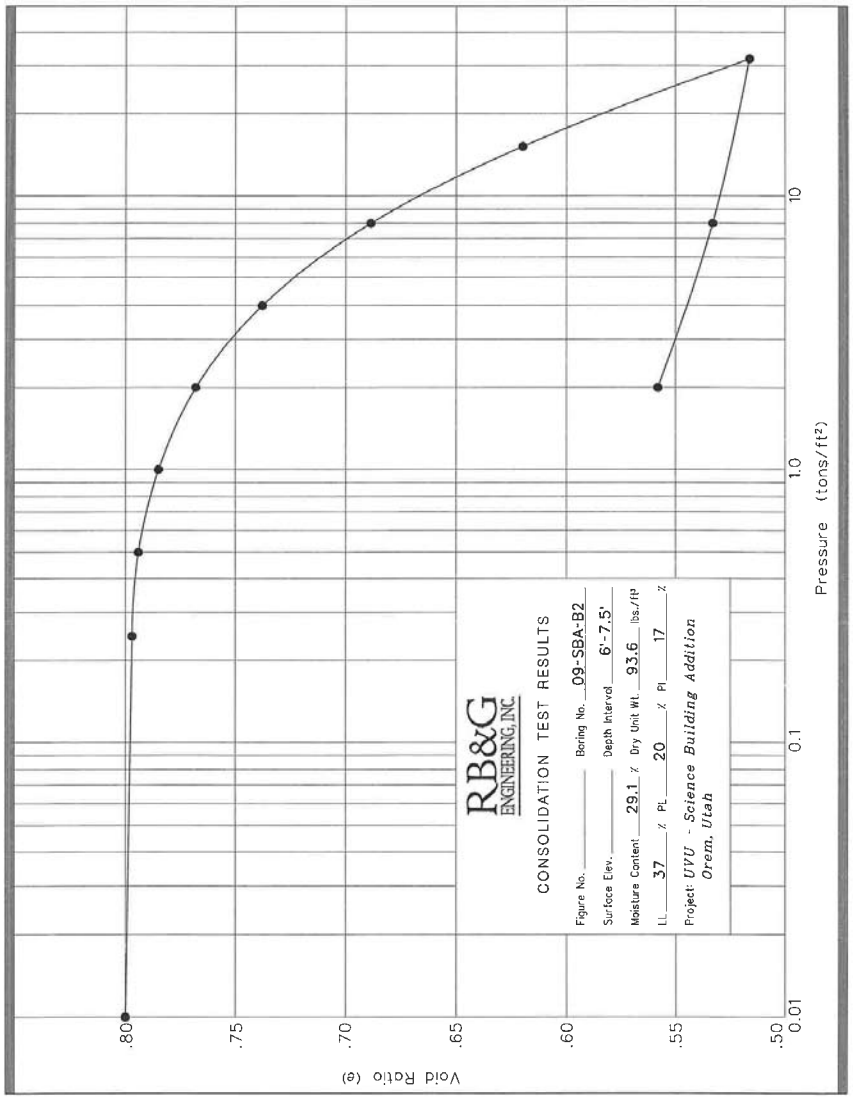
RB&G ENGINEERING, INC.

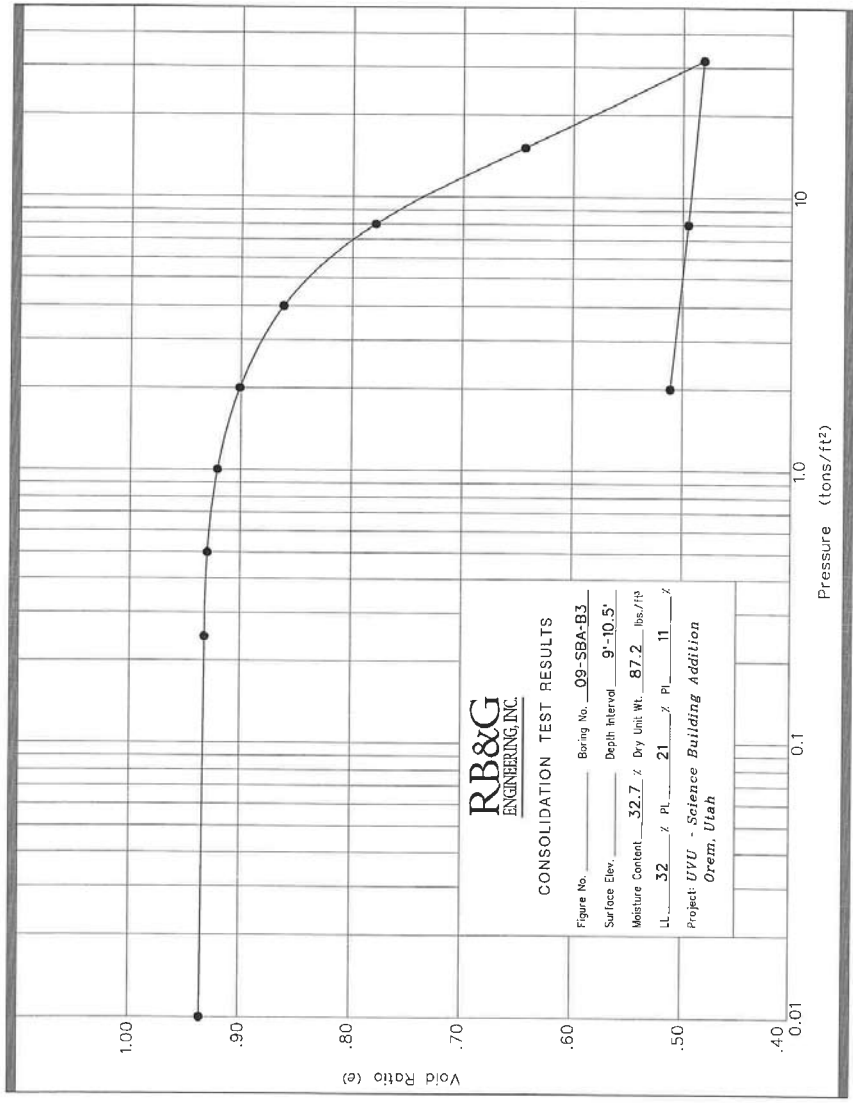
LEGEND:
DISTURBED SAMPLE — 2,3,2 ← Blow Count per 6"; 0.45 ← Torvane (tsf)
UNDISTURBED SAMPLE — PUSHED 0.45 ← Torvane (tsf)

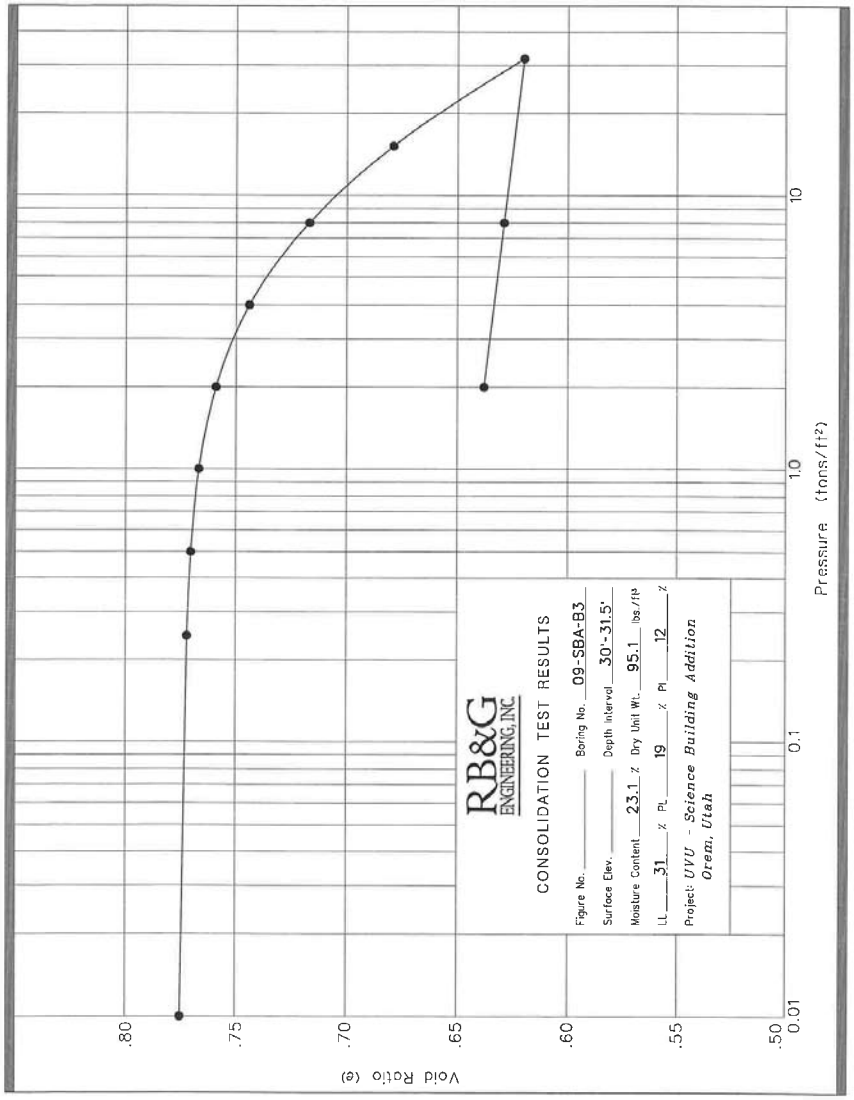
OTHER TESTS
UC = Unconfined Compression
CT = Consolidation
DS = Direct Shear
UU = Unconsolidated, Undrained
CU = Consolidated, Undrained
HYD = Hydrometer

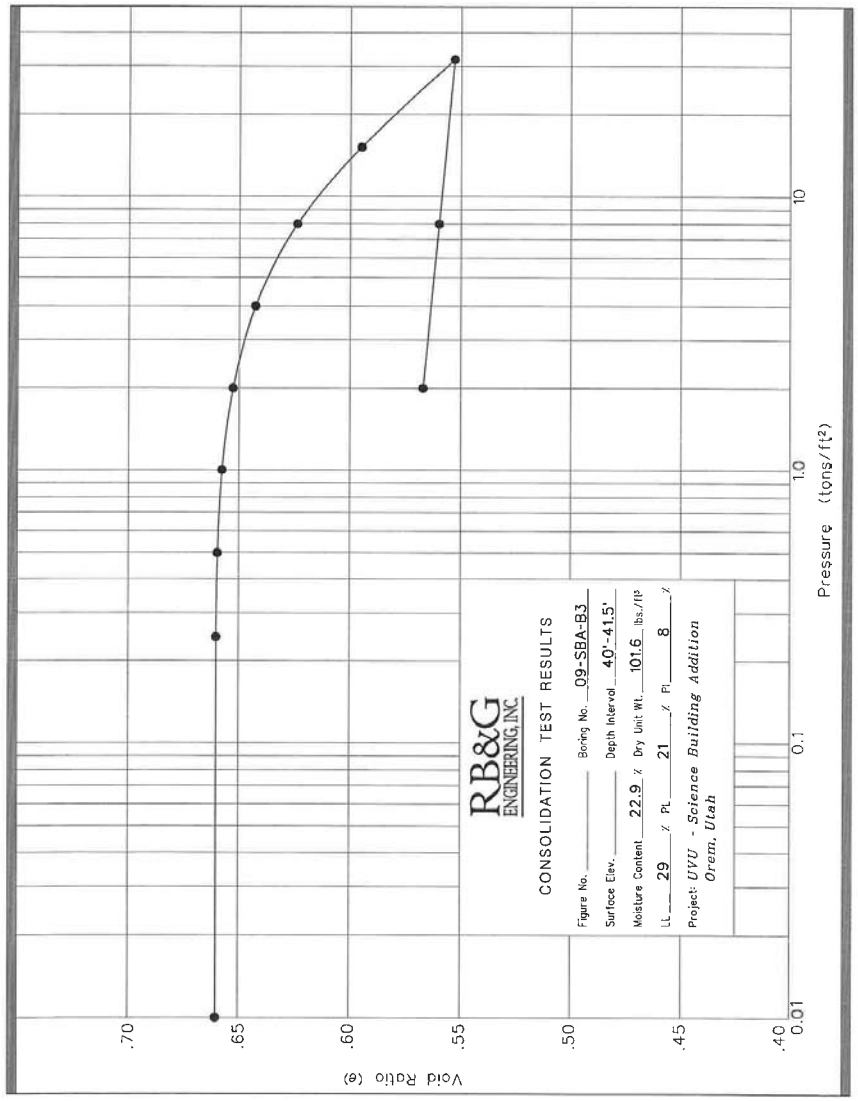
DH_LOGV6 UNUSCENCEBLOGADD.GPJ US EVAL.GDT 5/29/09

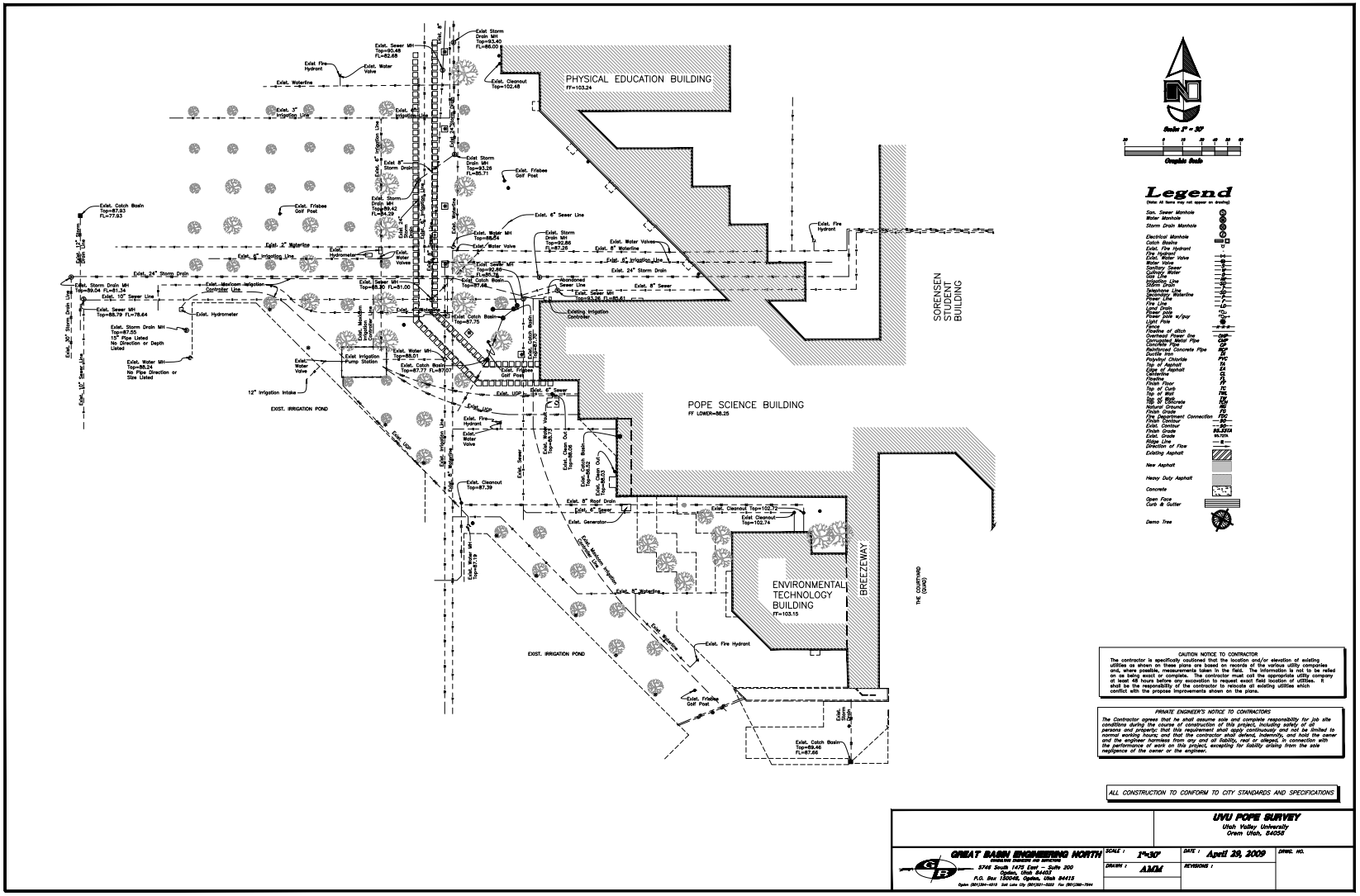

RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No.
Boring No. 09-SBA-B1
Surface Elev.
Depth Interval 9'-10.5'
Moisture Content 34.2 % Dry Unit Wt. 86.5 lbs./ft³
LL 39 % PL 20 % PI 19 %
Project: UVU - Science Building Addition
Orem, Utah
Void Ratio (e)
1.00
.90
.80
.70
.60
.50
.40
0.01
0.1
1.0
10
Pressure (tons/ft²)

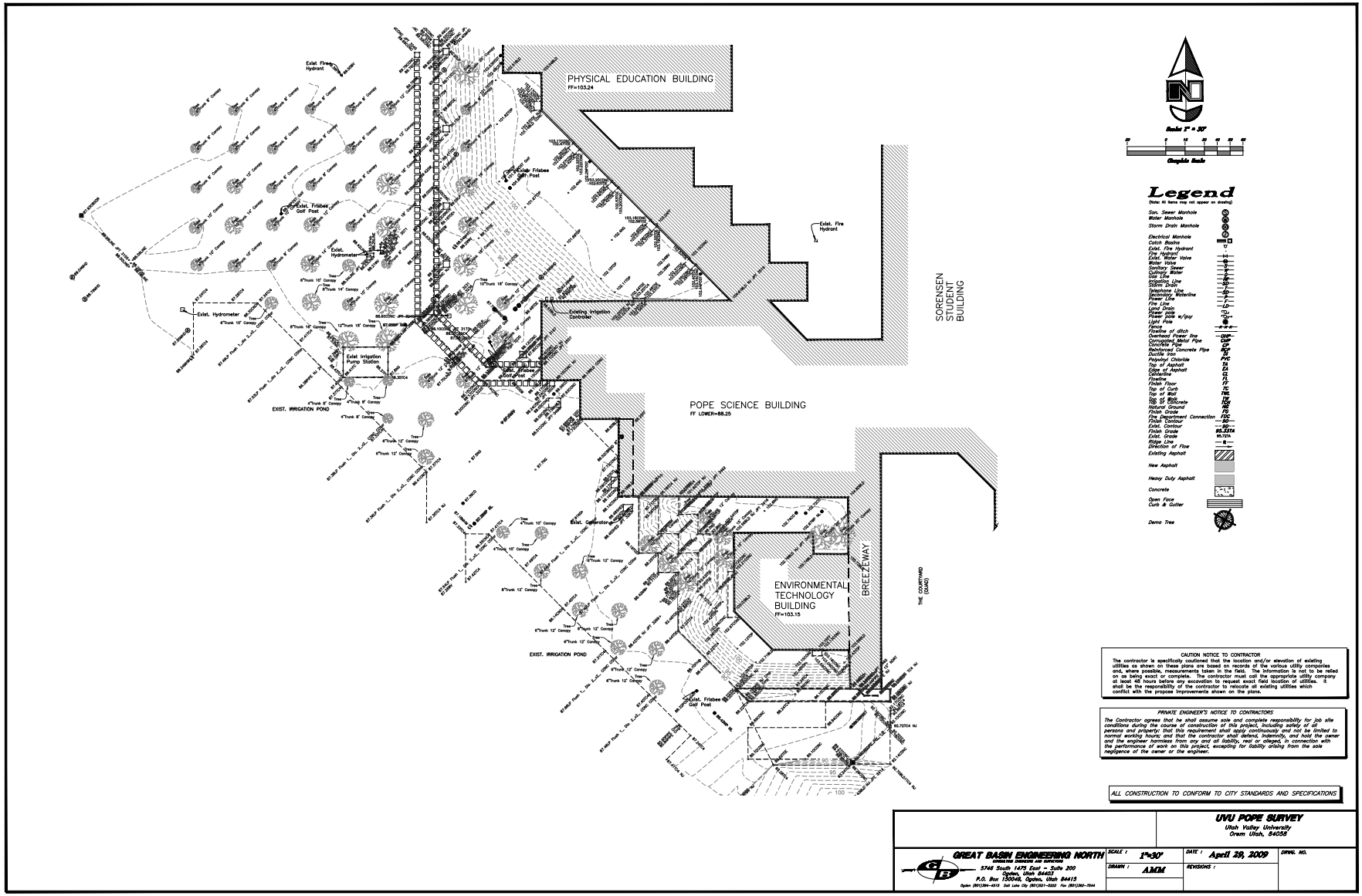

RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No.
Boring No. 09-SBA-B2
Surface Elev.
Depth Interval 6'-7.5'
Moisture Content 29.1 % Dry Unit Wt. 93.6 lbs./ft³
LL 37 % PL 20 % PI 17 %
Project: UVU - Science Building Addition
Orem, Utah
Void Ratio (e)
.80
.75
.70
.65
.60
.55
.50
0.01
0.1
1.0
10
Pressure (tons/ft²)


RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 09-SBA-B3
Surface Elev. _____ Depth Interval 9'-10.5'
Moisture Content 32.7 % Dry Unit Wt. 87.2 lbs./ft³
LL 32 % PL 21 % PI 11 %
Project: UVU - Science Building Addition
Orem, Utah
Void Ratio (e)
1.00
.90
.80
.70
.60
.50
.40
0.01
0.1
1.0
10
Pressure (tons/ft²)


RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No. _____ Boring No. 09-SBA-B3
Surface Elev. _____ Depth Interval 30'-31.5'
Moisture Content 23.1 % Dry Unit Wt. 95.1 lbs./ft³
LL 31 % PL 19 % PI 12 %
Project: UVU - Science Building Addition
Orem, Utah
Void Ratio (e)
.80
.75
.70
.65
.60
.55
.50
0.01
0.1
1.0
10
Pressure (tons/ft²)


RB&G
ENGINEERING, INC.
CONSOLIDATION TEST RESULTS
Figure No.
Boring No. 09-SBA-B3
Surface Elev.
Depth Interval 40'-41.5'
Moisture Content 22.9 %
Dry Unit Wt. 101.6 lbs./ft³
LL 29 % PL 21 % PI 8 %
Project: UVU - Science Building Addition
Orem, Utah
Void Ratio (e)
.70
.65
.60
.55
.50
.45
.40
0.01
0.1
1.0
10
Pressure (tons/ft²)


PHYSICAL EDUCATION BUILDING
FF=103.24
SORENSEN STUDENT BUILDING
POPE SCIENCE BUILDING
FF LOWER=88.25
ENVIRONMENTAL TECHNOLOGY BUILDING
FF=103.15
BREEZEWAY
THE COURTYARD (GRASS)
EXIST. IRRIGATION POND
12" Irrigation Intake
Exist. Irrigation Pump Station
Exist. Fire Hydrant
Exist. Water Valve
Exist. Waterline
Exist. Hydrometer
Exist. Cleanout
Exist. Catch Basin
Exist. Storm Drain
Exist. Sewer
Exist. Generator
Existing Irrigation Controller
Scale 1" = 30'
Graphic Scale
Legend
(Note: All items may not appear on drawing)
San. Sewer Manhole
Water Manhole
Storm Drain Manhole
Electrical Manhole
Catch Basins
Exist. Fire Hydrant
Fire Hydrant
Exist. Water Valve
Water Valve
Sanitary Sewer
Culinary Water
Gas Line
Irrigation Line
Telephone Line
Secondary Waterline
Power Line
Fire Line
Gas Meter
Power Pole
Power Pole w/guy
Light Pole
Fence
Centerline of ditch
Overhead Power line
Corrugated Metal Pipe
Concrete Pipe
Reinforced Concrete Pipe
Quick Clay
Polyvinyl Chloride
Top of Asphalt
Edge of Asphalt
Centerline
Grade
Finish Floor
Top of Curb
Top of Wall
Top of Rock
Top of Retaining
Natural Ground
Finish Grade
Fire Department Connection
Finish Contour
Exist. Contour
Finish Grade
Exist. Grade
Slope Grade
Direction of Flow
Existing Asphalt
New Asphalt
Heavy Duty Asphalt
Concrete
Open Face
Curb & Gutter
Demo Tree
CAUTION NOTICE TO CONTRACTOR
The contractor is specifically cautioned that the location and/or elevation of existing utilities as shown on these plans are based on records of the various utility companies and, where possible, measurements taken in the field. The information is not to be relied on as being exact or complete. The contractor must call the appropriate utility company at least 48 hours before any excavation to request exact field location of utilities. It shall be the responsibility of the contractor to relocate all existing utilities which conflict with the propose improvements shown on the plans.
PRIVATE ENGINEER'S NOTICE TO CONTRACTORS
The Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the contractor shall defend, indemnify, and hold the owner and the engineer harmless from any and all liability, real or alleged, in connection with the performance of work on this project, excepting for liability arising from the sole negligence of the owner or the engineer.
ALL CONSTRUCTION TO CONFORM TO CITY STANDARDS AND SPECIFICATIONS
UVU POPE SURVEY
Utah Valley University
Orem Utah, 84058
GREAT BASIN ENGINEERING NORTH
ENGINEERING PLANNING AND SURVEYING
5746 South 1475 East – Suite 200
Ogden, Utah 84403
P.O. Box 1300048, Ogden, Utah 84415
Ogden (801)394-4515 Salt Lake City (801)521-5202 Fax (801)399-7944
SCALE : 1"=30'
DRAWN : AMM
DATE : April 29, 2009
REVISIONS :
DRWG. NO.


PHYSICAL EDUCATION BUILDING
FF=103.24
SORENSEN STUDENT BUILDING
POPE SCIENCE BUILDING
FF LOWER=88.25
ENVIRONMENTAL TECHNOLOGY BUILDING
FF=103.15
BREEZEWAY
THE COURTYARD (QUAD)
EXIST. IRRIGATION POND
Exist. Fire Hydrant
Exist. Frisbee Golf Post
Exist. Hydrometer
Exist. Irrigation Pump Station
Existing Irrigation Controller
Exist. Generator
Scale 1" = 30'
Legend
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Ogden, Utah 84403
P.O. Box 13004b, Ogden, Utah 84415
SCALE : 1"=30'
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