



STEM COMPLEX

Gilroy Campus

PROGRAM AND CRITERIA
MAY 2022





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01

INTRODUCTION

01

INTRODUCTION

OVERVIEW

The STEM Complex represents the College’s on-going commitment to ensure Gavilan students have access to exceptional curriculum, equipment, and facilities that support STEM education. This document is the culmination of extensive engagement processes led by Steinberg Hart that describes the vision and program requirements for design and construction of the new facility.

After multiple programming meetings with College stakeholders, the STEM programming identified the opportunity to provide construction of a new Biology Building and the retrofit of the Life Science (LS) Building to the new STEM Building. These new and retrofitted facilities are essential for advancing the College’s mission to positively influence both Student Success and Guided Pathways Initiatives.

With the retrofit of the LS Building, the facility will become the hub for STEM programs. It will house the relocated Mathematics, Engineering, Science Achievement (MESA) program along with faculty offices and study rooms.

The interior of the building will promote clarity and ease of navigation, inviting interaction, collaboration, peer support, and learning throughout.

The new Biology Building offers students an opportunity to take advantage of expanded Gavilan curriculum offerings. Gavilan’s strength in STEM offerings will be highlighted by these new, state-of-the-art facilities.

The STEM Building and new Biology Building represent a continued emphasis on environmental stewardship. These principles will be supported by the building materials and systems while aligning with the current campus aesthetic and operational and maintenance preferences.

This section of the document outlines the programming process, describes the campus engagement activities, and summarizes the findings.

EXECUTIVE SUMMARY

PROJECT DESCRIPTION

The 2019 Facilities Master Plan Update for Gavilan College Gilroy Campus has been developed to serve as a guide for future development. The retrofit of the existing Life Science Building as the future STEM Building and the construction of a new Biology Building support the campus plan. This plan builds on the work of previous studies and strategy documents for a new vision of an updated STEM Complex. The following report offers potential solutions to needs identified by the analysis and finally delivers recommendations for the future of the new facilities.

BUILDING PROGRAM

The Building Program was developed through a series of discussions with key stakeholders, identifying the qualitative needs of all spaces and balancing them with a detailed quantitative analysis.

Space needs were identified as follows:

NEW BIOLOGY BUILDING

1.0	INSTRUCTIONAL SPACES	ASF 6,825
2.0	PREP LABS	ASF 1,825
3.0	OFFICES	ASF 330
TOTAL		ASF 8,980

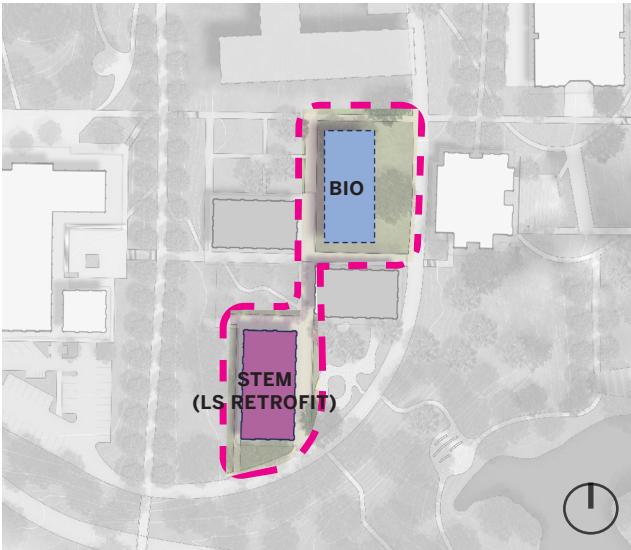
STEM BUILDING (LS BUILDING RETROFIT)

4.0	INSTRUCTIONAL SPACES	SF 2,035
5.0	COLLABORATION + STUDY SPACES	SF 4,711
6.0	OFFICES	SF 217
TOTAL		SF 6,963

The Building Program (Chapter 3.0) also describes desired and required program adjacencies for both facilities. With the STEM Building overtaking the existing Life Science Building, finding a configuration to support the new program was a necessary challenge to aptly and efficiently reuse the building.

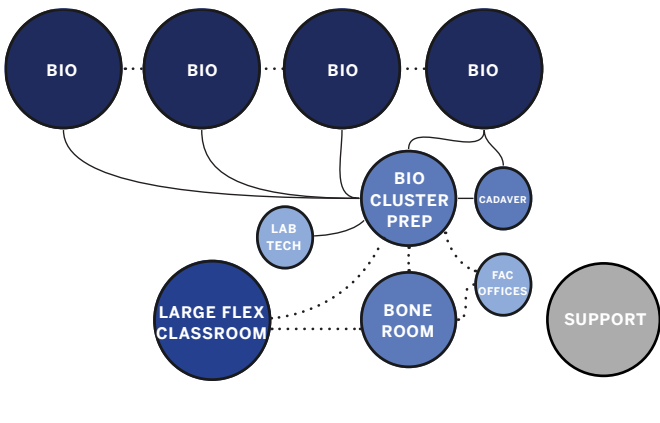
ROOM DATA

The Room Data Sheets (Chapter 4.0) provide an illustration of the furniture, fixtures, and equipment that should be included in each space, as well as the general configuration and flow of the room. Additionally, general recommendations and guidelines are listed to assist in the development of the space plan, the selection of materials, and system requirements. The illustrations are intended to convey the design intent of the space and are not a specific design solution.

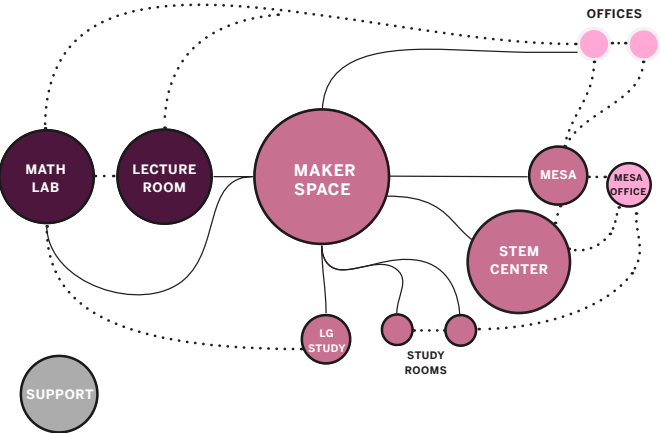


Limits of Work

NEW BIOLOGY BUILDING

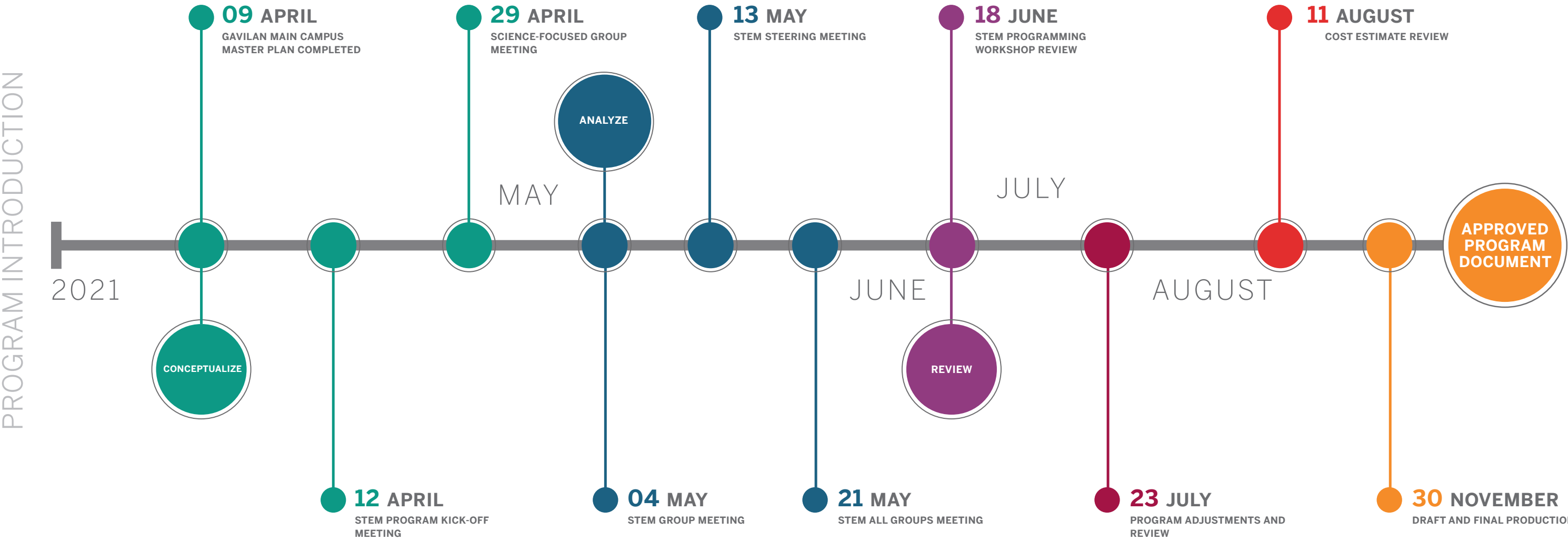


STEM (LS BUILDING RETROFIT)



- Direct Adjacency
- Near/Easily Accessible

PROCESS



The development of the new STEM Building and Biology Building Program has been a highly participatory process involving the College's many constituencies.

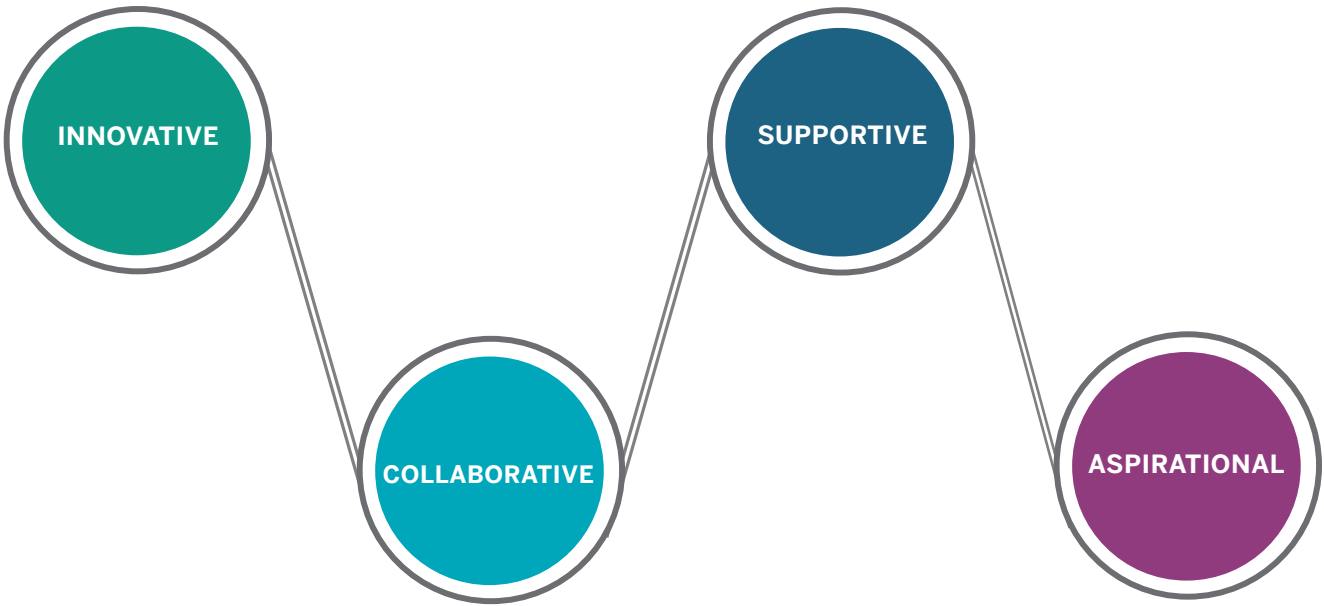
The process consisted of a series of meetings, interviews, and workshops conducted to involve the many voices of the Gavilan Joint Community College District (GJCCD) community.

GUIDING PRINCIPLES

The overarching goals and visioning of the new STEM Complex are dedicated to supporting student success. The plan is to allow for future growth that is innovative and aspirational. The STEM Complex shall be inviting to students, faculty, and staff as they use these spaces to collaborate and engage with each other.

The vision and goals that were established at the inception of the process were translated into a series of four guiding principles used to lead discussions, inspire development of the recommendations, and provide context by which future project decisions can be made.

The below guiding principles came out of the initial Visioning Meeting with the greater Visioning Committee. These concepts began as reflections and inspiration from a number of constituents and became the four guiding principles over the course of the Programming phase.



INNOVATIVE

Create a program that allows for growth and anticipates the future.

This critical building shall be forward-looking, providing for the needs of today while also planning for the pedagogy of tomorrow. It should be an iconic symbol of the STEM program’s presence on campus, the College’s dedication to innovative learning, and the legacy of the region and surrounding community.



COLLABORATIVE

Promote the creation and sharing of knowledge to ensure both student and academic faculty and staff success.

Design and organization of spaces shall facilitate peer-to-peer collaboration opportunities within an environment that provides state-of-the-art learning resources. Flexibility and adaptability of spaces shall provide ability to serve a wide range of student, faculty and staff needs.



SUPPORTIVE

Provide a centralized location for innovative services to promote holistic and varied support.

Integrating STEM learning spaces and academic services into a single experience, the STEM Building shall be a one-stop building. Shared resources such as the flexible program rooms, study rooms, and active classrooms will create an active, engaging experience. Design solutions should leverage technology and furniture choices that create inclusive learning environments to achieve greater access and service opportunities.



ASPIRATIONAL

Support student aspirations, reflect the culture and history of the College, and serve the academic needs of all to come.

A comfortable, accessible, and physically safe environment for students, faculty, staff, and visitors is vital to supporting students’ unique learning goals. Spaces should promote the advancement of knowledge and research through spaces that stimulate. The STEM Building shall be a pillar for student success and meet the technological demands of its industry.

LIST OF PARTICIPANTS

Representative stakeholders were identified to participate in committee and work group discussions. The formation of the STEM Steering Committee ensured the active inclusion of input from faculty, staff, students, and administrators. The Steering Committee was responsible for sharing project information and development with their representative groups and ultimately providing final recommendations to the College President/Superintendent.

In addition to the Steering Committee meetings, the programming team met with multiple internal stakeholder groups including students, faculty, staff and campus leadership. These project stakeholders were divided into two (2) subgroups: Involved (STEM Users) and Informed (College Community). The engagement sessions kicked-off on April 12, 2021 to provide the opportunity for broader input.

STEERING COMMITTEE

Dr. Kathleen Rose	Superintendent/Principal
Graciano Mendoza	VP of Administrative Services
Jennifer Nari	Dean of Student Learning Student Success, STEM
Jeff Gopp	Director, Facilities Services
Amelia Murphy	Lab Coordinator, STEM
David Argudo	Faculty, Physics
Marla Dresch	Faculty, Mathematics
Patrick Yuh	Faculty, Biology

FOCUS GROUP*

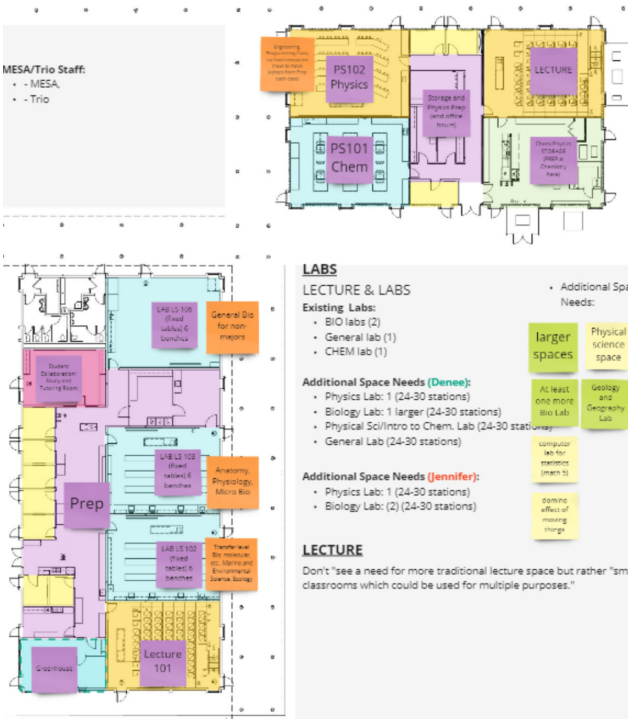
Alyssa Lai	Lab Coordinator, STEM
Brad Stone	Faculty, Chemistry
Elena Dachkova	Faculty, Mathematics
Erik Medina	Faculty, Mathematics
Esteban Talavera	Program Services, MESA
Ken Wagman	Faculty, Mathematics
Maria Quist-Shorey	Lab Coordinator, STEM
Raylene Potter	Faculty, Mathematics
Rey Morales	Faculty, Biology
Shawn Mulcare	Multimedia Technician
Victoria Masey	Instructional Program Specialist

CONSULTANTS

Steinberg Hart
CSW ST2 Consultants
Degenkolb Engineers
P2S, Inc.
Spurlock Landscape Architects
Cumming Group



Zoom Meeting, 04.12.2021



Existing Facility Analysis Meeting

*In alphabetical order

REFERENCE DOCUMENTS

AV/IT STANDARDS

Standards are being developed at the same time of Criteria documents

DISTRICT STANDARDS AND GUIDELINES

Gavilan Joint Community College District, District Standards and Design Guidelines, Summer 2020

EDUCATIONAL MASTER PLAN

Gavilan Join Community College District, Educational Master Plan, Spring 2017

FACILITIES MASTER PLAN

Gavilan College Gilroy Campus Master Plan Update, Spring 2020

FF&E STANDARDS

Gavilan Joint Community College District, District FF&E Standards, 2021

GEO-TECHNICAL REPORTS

In-process.

PRINCIPLES OF UNIVERSAL DESIGN

North Carolina State University, The Center for Universal Design

WAYFINDING

Gavilan Joint Community College District, District Wayfinding Standards, 2021

DEFINITIONS & ABBREVIATIONS

The following definitions will assist in the use of this Project Description and Room Criteria.

ADA

The Americans with Disabilities Act

APPROVAL

The College's written statement indicating that the project complies with the College requirements and desires.

AREA PER PERSON

The usable area required to accommodate an occupant, a function, equipment, or an occupant group.

ASF

Assignable Square Feet - the usable area required to accommodate a function, equipment, an occupant, or an occupant group. Typically described as “wall-to-wall”

AV

Audio Visual

CAPACITY

The number of people/seats per room. Capacity may not necessarily represent maximum occupant load per Code

CF/CI

Client Furnished and Client Installed

CFM

Cubic Feet per Minute

CORE

Vertical circulation, restrooms, and building service.

DBE

Design-Build Entity, selected to undertake the Project

DBF/DBI

Design-Build Entity Furnished and Design-Build Entity installed.

DESIRED OR PREFERRED

Item or description is an enhancement which may be provided in the project's design

ESTIMATED EFFICIENCY FACTOR

The Space Program Matrix identifies a target efficiency factor for the building. This number was used for budgeting purposes.

FF&E

Furniture, Fixtures and Equipment

GSF

Gross Square Feet - the total floor area of a building, including all levels, that are totally enclosed within the building envelope.

IT

Information Technology

LVT

Luxury Vinyl Tile (or planks)

N/A

Not applicable

OF/DBI

Owner-Furnished and Design-Build Entity installed.

OF/OI

Owner Furnished and Owner Installed

RC

Room Criteria

REQUIRED

Item or description must be provided

ROOM TYPE

A classification system defined by the State to classify all rooms in the community college system

SECURE ZONE

Access by restricted personnel only. Key card access required.

SLASH (/)

The symbol appears in place of the word “and”

UC

Under cabinet or under counter

02

PROJECT DESCRIPTION

PROJECT DESCRIPTION

OVERVIEW

This section of the document outlines the campus analysis and summarizes various constraints and opportunities.

The project includes the construction of a new Biology Building and the retrofit of the existing Life Science (LS) Building that is re-envisioned as the STEM Building. The new Biology Building will allow the College to achieve its academic goals around STEM education. It will support improved teaching and learning environments, integrate the latest technology, and adapt to flexible teaching methods. Classrooms, labs, study spaces and offices will be designed to maximize collaboration between disciplines and bolster access to needed resources.

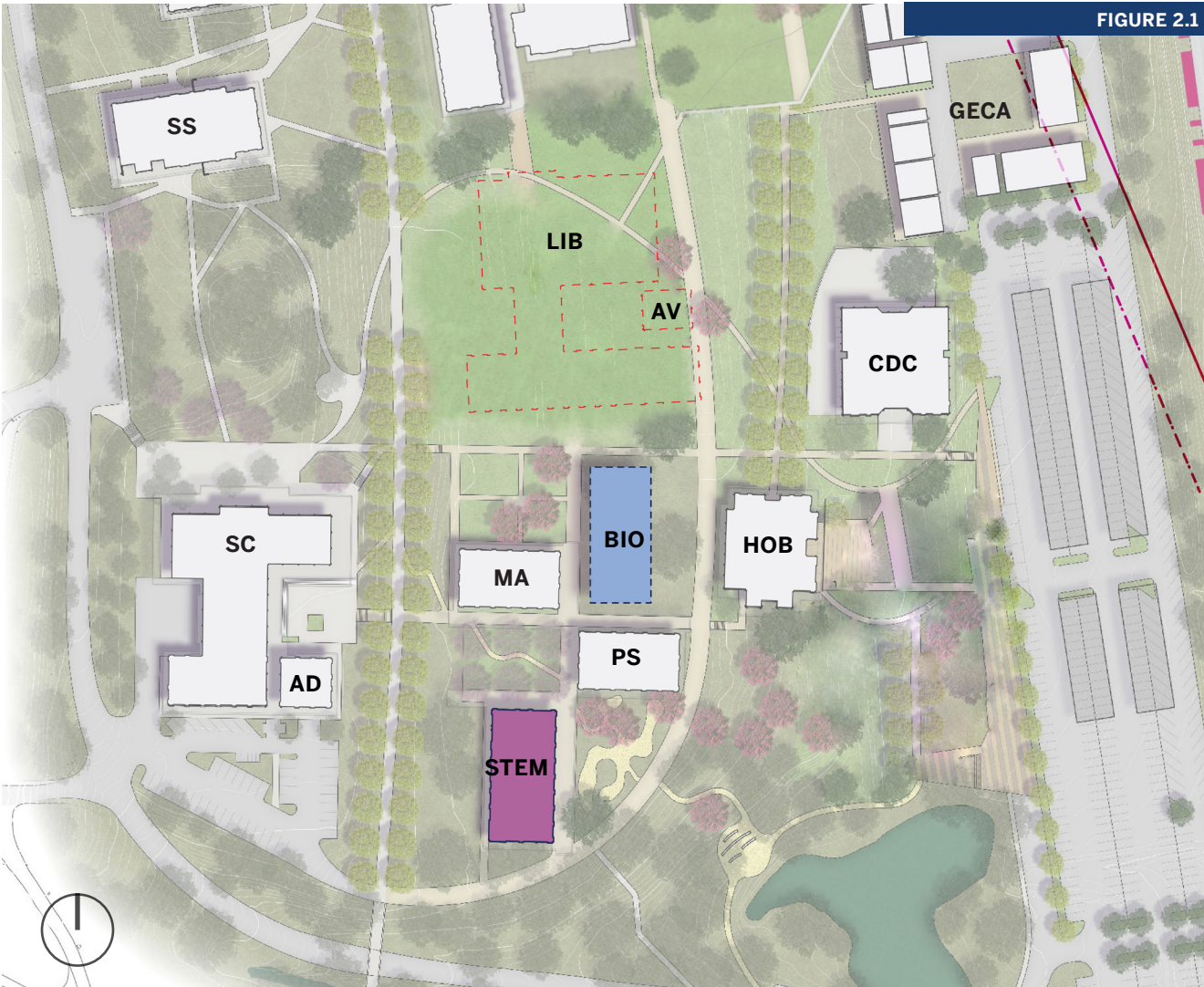
These new and repurposed facilities will establish a positive entry experience, engendering greater access to programs and services in a comfortable setting that offers intuitively legible pathways for students to begin or continue their educational journey at Gavilan College.

CAMPUS CONTEXT

BUILDING LOCATION

The STEM Complex will be located south of the main campus entry and Library, west of the Health Occupations Building and east of the Student Center and Administration Building. The STEM Building and new Biology Building are located within the current Math and Sciences academic area (see Figure 2.1). The STEM Complex is intended to be visible and recognizable from Sycamore Lane and the new future Campus Green (following demolition of the current Library).

- New Construction
- Retrofit
- Future Demolition



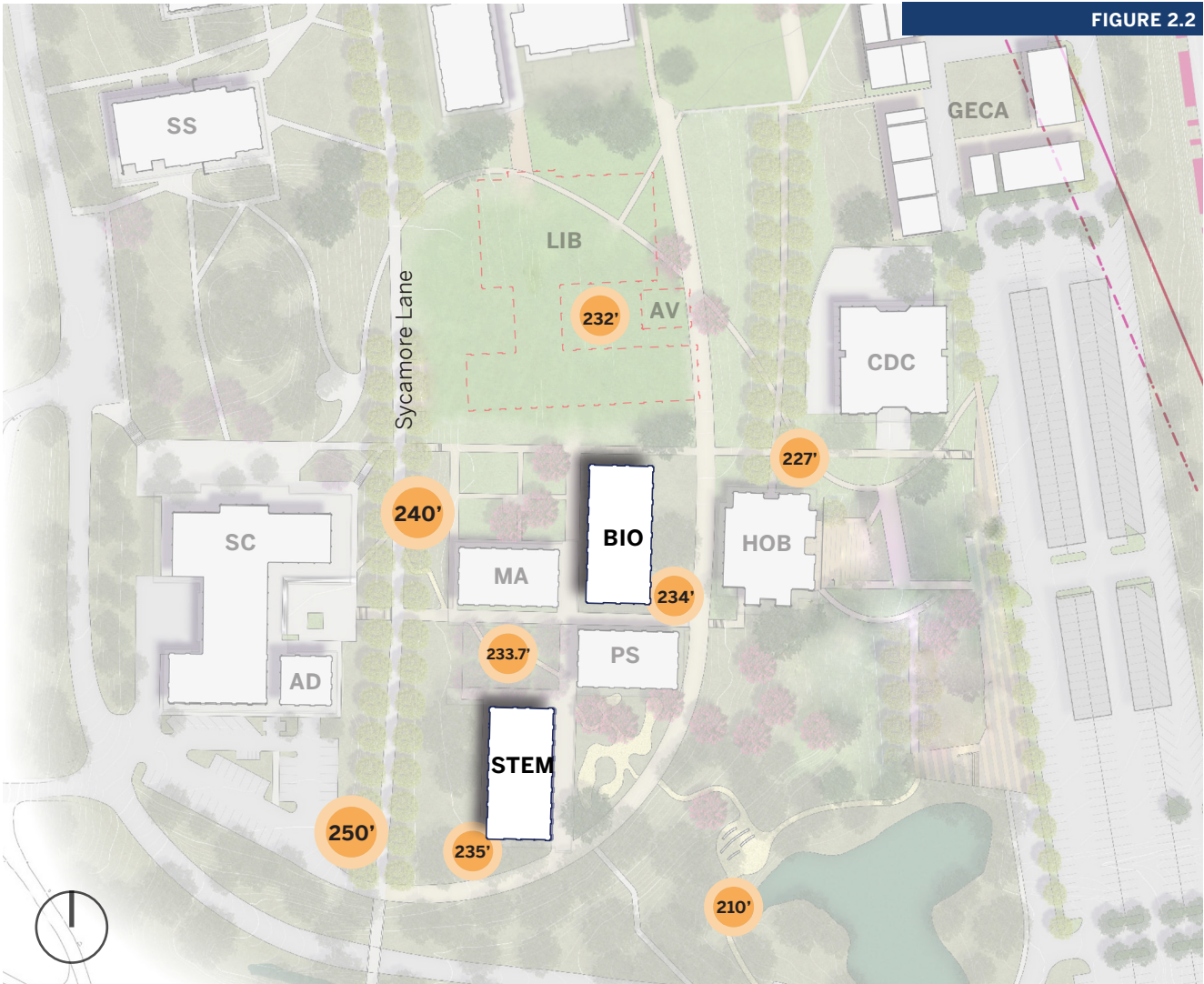
TOPOGRAPHY

The project site area is relatively flat. The Biology Building site has an elevation of approximately 235 feet.

In the Campus Master Plan update, the development of equitable campus walkway and pathing solutions was a key emphasis. The most extensive future pathing will run north-to-south, connecting the new Biology Building to the new Library Student Resource Center at the north. This new pedestrian axis will serve the mid-slope area of campus and create intersections at the new heart of campus and the STEM Complex.

The retrofit of the Life Science Building and the addition of a new Biology Building will allow for opportunities to solidify and strengthen the existing Math and Sciences academic area. These new additions add a unique experience for users to connect with the campus and natural settings.

- Spot Elevations



CAMPUS CONTEXT CONT'D

ACCESSIBILITY

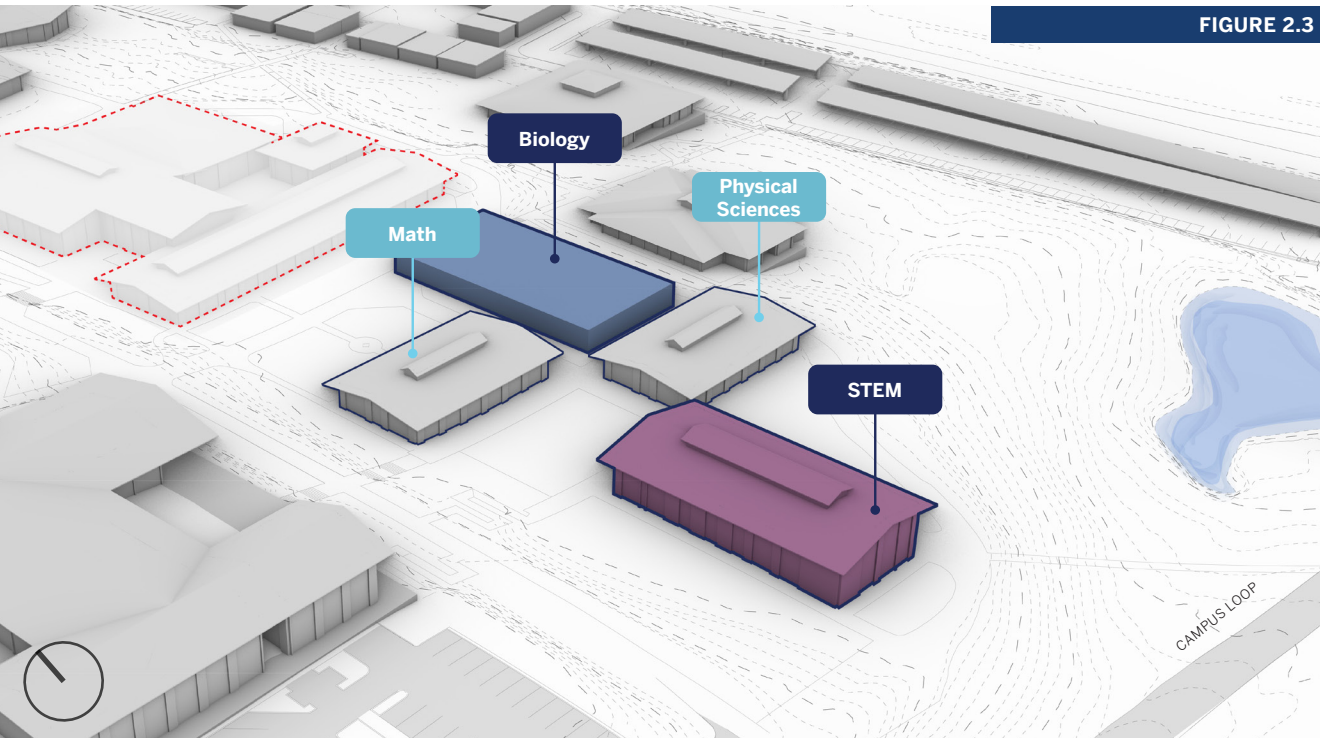
The 2020 Campus Accessibility Assessment Report indicates deficiencies and potential solutions for universal access at Gavilan. The exterior conditions of the STEM quad area reveal wear from the past decades, highlighting the opportunity for improvement. The challenges of the slope from the ramp coming off Sycamore Lane are also apparent.

Please refer to the Accessibility Assessment report for further details.

CIRCULATION

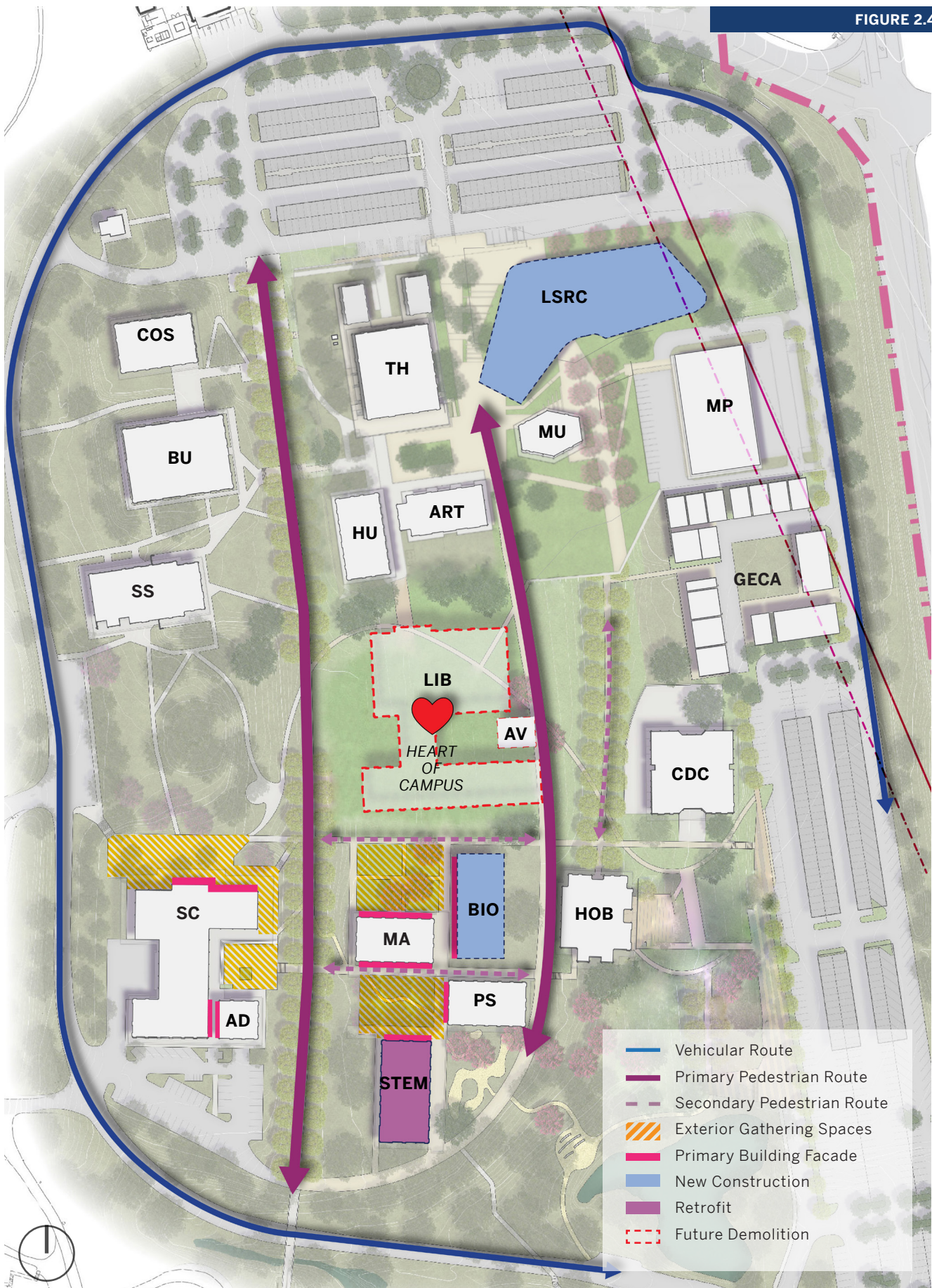
The new Biology Building will be located adjacent to the existing Math Building, north of the existing Physical Science Building, and flanking the southern edge of the proposed, redesigned heart of campus. By creating a clear, well-designed series of intersections, users will be able to traverse the area with ease, facilitating connections to the entire campus.

BIRDSEYE VIEW FROM THE SOUTHWEST



- New Construction
- Retrofit

FIGURE 2.4



Today, the existing Math and Sciences buildings are located on the southern half of the Campus. The renovations and scopes of each building vary by program need and existing building condition. The Life Sciences Building will be retrofitted to integrate the program needs of Gavilan’s growing STEM and MESA programs and serve as the new STEM Building. A new Biology Building is proposed to house more flexible labs and prep space, along with some faculty and staff areas.

PROJECT SCOPE SUMMARY

PROJECT SITE

Project Site Area ~42,500sf

DESIGN AND CONSTRUCTION

New Biology Building ~11,000gsf

RETROFIT

STEM Building (LS Retrofit) ~7,000sf

LANDSCAPE + HARDSCAPE

STEM Building (LS Retrofit) Site ~5,000sf

Biology Building Site ~12,500sf

PROJECT DESCRIPTION

The STEM Complex of four buildings (including Math, Physical Science, Biology, and STEM Buildings) aims to offer future Gavilan students the tools needed to succeed in all STEM disciplines by updating facilities, improving technology and resources, and enhancing peer and faculty/staff engagement.

The new facility and retrofitted STEM Building (LS Retrofit) are envisioned to bring expanded support to STEM students, highlighting the high value that Gavilan College places in these programs.

The STEM Building and new Biology Building are intended to invite the participation of all Gavilan students, serving as a resource as users learn, teach, study, collaborate, and innovate.

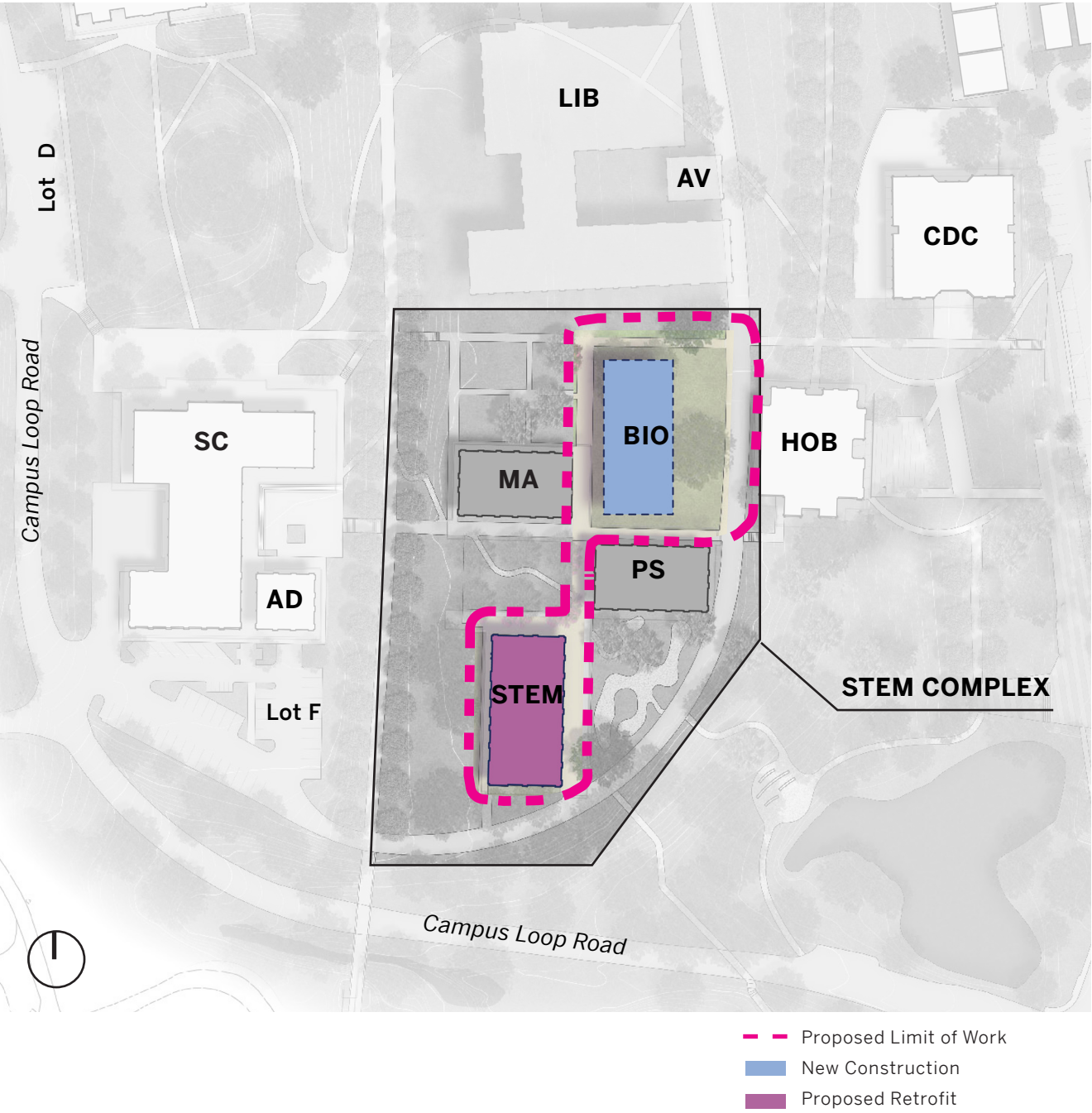
BIOLOGY BUILDING

The Biology Building will provide students flexible lab classrooms along with an adaptable lecture hall to meet the demand of academic programs. A large Biology Prep Lab, Cadaver Room, and study room/specimen room (the “Bone Room”) will also be included. Faculty Offices and Lab Tech Offices will have adjacencies to these lab spaces.

STEM BUILDING (LS RETROFIT)

Life Science will be retrofitted to house the STEM Center, Math Lab, Maker Space, study rooms, faculty/staff offices, and a lecture room. The MESA Room will also be relocated here from its current location in the Math Building, along with the MESA Office.

LIMIT OF WORK



03

BUILDING PROGRAM

3.1 BIOLOGY BUILDING PROGRAM

3.2 STEM BUILDING PROGRAM

3.1

BIOLOGY BUILDING PROGRAM

INTRODUCTION

This section of the document considers program spaces and desired adjacencies for the construction of the Biology Building.

The listed building program and associated information are considered minimum requirement for all spaces. The assignable square foot (ASF) has been provided for each required space. Room for circulation within the suite has been factored into the ASF for the spaces. The awarded Design-Build Entity (DBE) will be responsible for developing the required, total gross square feet (GSF) that includes, but is not limited to: building structure; building circulation; support spaces, such as mechanical, electrical and telecommunications areas; general toilet rooms; and maintenance spaces.

Where available, the District's guidelines for these types of spaces informed the ASF assigned to each category of space (e.g. office, workstation). Where District guidelines were not available, benchmarks from similar California community college facilities were used. College Leadership also reviewed the program to ensure equity/similarity across departments.

The Biology Building will contain a combination of classrooms, labs, offices, and collaboration spaces. While adaptability and flexibility are highly important to the facility, the biology instructional spaces are designed to primarily serve biology (and related STEM) uses. The Biology Building Lecture Room is intended for shared uses for all STEM and other programs on campus.

SPACE NEEDS OVERVIEW

The program for the Biology Building consists of the following broad categories.

INSTRUCTIONAL SPACES

The Biology Building will have four new labs intended to serve current and/or future programs in Anatomy/Physiology, Microbiology, Cellular & Molecular/Organismal Biology and General Biology. These labs will house the necessary equipment to meet the requirements of the curriculum. One flexible lecture classroom will provided in the Biology Building, offering the flexibility to create various learning environments with movable seating and table arrangements.

PREP LABS + ACADEMIC SUPPORT

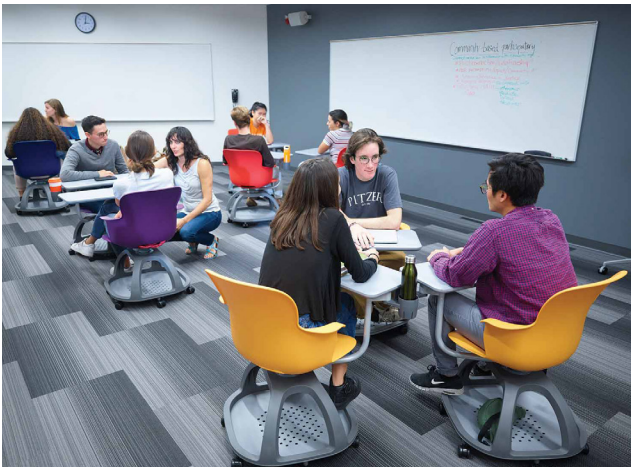
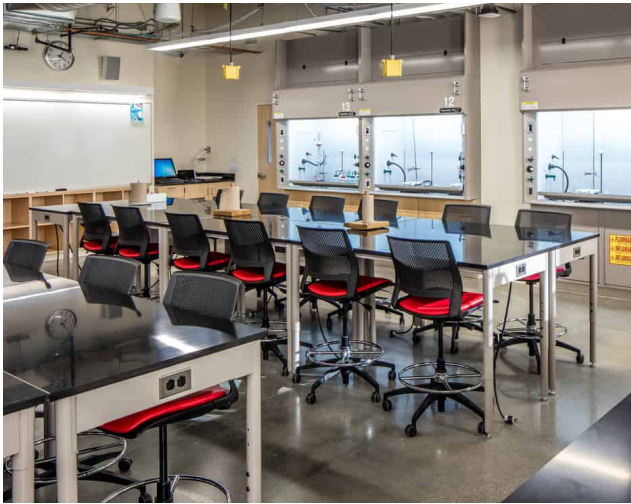
The Biology Building will have three Prep Lab/ Academic Support spaces. These include the large Bio Cluster Prep Lab, the Cadaver Room and the Bone Room. The large Prep Lab will be used in collaboration with the main four Biology Labs. The Cadaver and Bone Rooms will serve specific needs that support class labs and/or provide collaboration space for faculty, staff, and students.

OFFICES

The Biology Building will host two Standard Faculty Offices, one Lab Tech Office, and one lab tech workstation (located in the Prep Lab).

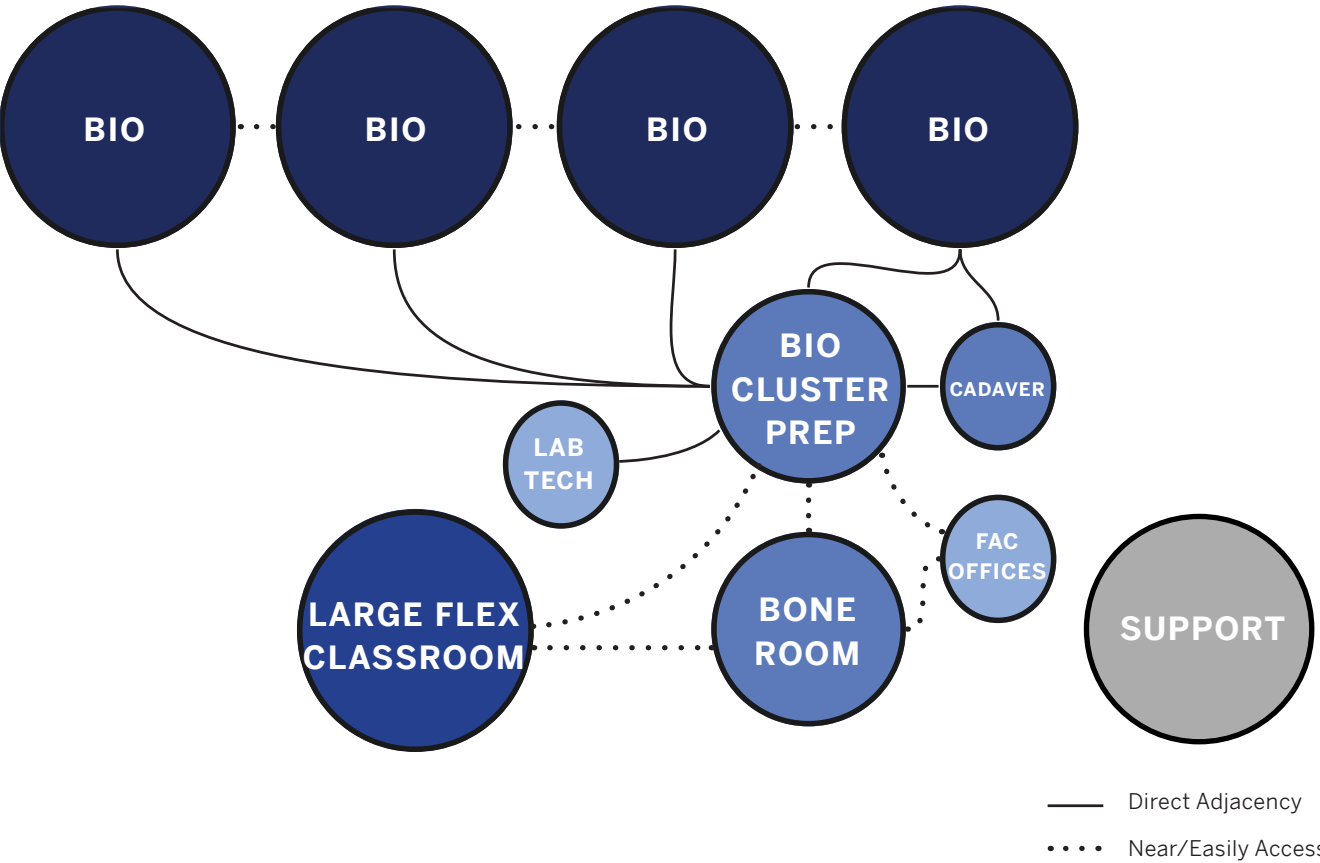
BUILDING SUPPORT

The building support areas shall include, but are not limited to, restrooms, lactation rooms, and general housekeeping to help provide basic services to the facilities. Restrooms shall be easily accessible and clearly visible.



PROGRAM ADJACENCIES

FIGURE 3.1.1



CONCEPTUAL ADJACENCIES DIAGRAM

Figure 3.1.1 describes the ideal spatial relationships between elements of the program. In the diagram, a room or space is represented by a colored circle. Each circle represents a room or space and shows its approximate size in comparison to the other spaces.

A graphic line (dotted or solid) between spaces or around spaces delineates whether the adjacency is direct (programs identified as needing to be “next” to each other) or near/easily accessible (programs identified as needing to be “close,” “down the hallway,” or “in the same building”).

In the new facility, Biology Labs shall have direct adjacency with the large Prep Lab and/or the Cadaver Room.

Faculty and Lab Tech offices shall have either direct or visual adjacency with the Prep Labs.

PROGRAM OVERVIEW

The following pages contain the programmatic space list. This list is organized by types of space use. All spaces are assigned a number that coincides with the room data sheets for ease of reference. Each space is assigned a room name that describes the function of the space. The individual assignable square feet (ASF) of each space, quantity, and total ASF are also included.

The ASF of each space has been vetted with the building user groups. However, the Design/Build team has some leeway to deviate from the recommended ASF provided all functionalities outlined in the adjacencies and room data sheets are achieved.

The gross square feet (GSF) of support spaces for the building have not been included with the programmatic space list to allow the Design/Build team to develop their own recommendations.

However, the District has stated a preference for the building to achieve a 70% ASF/GSF efficiency or better.

FIGURE 3.1.2

Program	Quantity	Proposed ASF
1.0 INSTRUCTIONAL SPACES	5	6,825
1.01 Biology Labs	4	5,600
1.02 Large Flexible Classroom	1	1,225
2.0 PREP LABS + ACADEMIC SUPPORT	3	1,825
2.01 Large Bio Cluster Prep Lab	1	900
2.02 Cadaver Room	1	275
2.03 Bone Room	1	650
3.0 OFFICES	3	330
3.01 Standard Faculty Offices	2	180
3.02 Lab Tech Office	1	150
Sub-Total		8,980
Efficiency		83%
TOTAL		10,775 GSF

DETAILED PROGRAM

FIGURE 3.1.3

Program	ASF	Quantity	Total ASF	Notes
1.0 INSTRUCTIONAL SPACES		5	6,825	
1.01 Biology Labs			5,600	
Biology Labs	1,400	4	5,600	Four labs for: Anatomy, Physiology, Organic & Zoology and General Labs.
1.02 Large Flexible Classroom			1,225	
Large Flexible Classroom	1,225	1	1,225	To include flexible technology, i.e. access to screens/monitors, mobile task chairs and movable tables.

The Labs will accommodate various Biology subdisciplines including Anatomy/Physiology, Microbiology, Cellular & Molecular/Organismal Biology and General Biology. These are training labs with movable tables and chairs, lab equipment, and access to advanced technology. These spaces should be directly adjacent to the Prep Labs and the Lab Tech Office.

The Large Flexible Classroom offers supplemental support to the lab curriculum spaces, accommodating lectures and other adaptable uses. It is intended to offer flexibility for various classroom layouts and settings.



DETAILED PROGRAM
CONT'D

FIGURE 3.1.4

	Program	ASF	Quantity	Total ASF	Notes
2.0	PREP LABS + ACADEMIC SUPPORT		3	1,825	
2.01	Large Bio Cluster			900	
	Prep Lab	900	1	900	Large General use Prep Lab servicing Biology Labs. Special equipment required. Includes 60 SF workstation for part-time faculty (Office Type A).
2.02	Cadaver Room			275	
	Cadaver Room	275	1	275	To include space for dissecting table and equipment.
2.03	Bone Room			650	
	Bone Room	650	1	650	To include mobile task chairs and movable tables.

The Prep Labs accommodate curricular and programmatic needs to service the Biology Lab spaces. The Prep Lab also features a workstation for a part-time faculty member. The Cadaver Room and Bone Room offer specialized learning spaces for students, faculty, and staff as they engage with the curriculum.

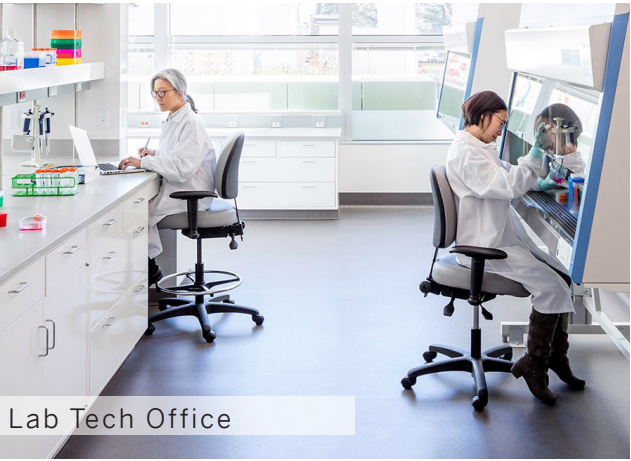


DETAILED PROGRAM
CONT'D

FIGURE 3.1.5

	Program	ASF	Quantity	Total ASF	Notes
3.0	OFFICES		3	330	
	Faculty and Staff Spaces			330	
3.01	Standard Faculty Offices	90	2	180	
3.02	Lab Tech Office	150	1	150	

The Faculty and Staff Office spaces are to be adjacent to the Prep Labs and accessible to the Classroom and Labs. The Biology Building will host two Standard Offices, one Lab Tech Office, and one lab tech workstation (located in the Prep Lab). For reference (not in scope), two additional offices for Biology faculty members are to be located in the existing Math Building.



3.2

STEM BUILDING PROGRAM

INTRODUCTION

This section of the document considers program spaces and desired adjacencies for the retrofit of the Life Sciences (LS) Building into the new STEM Building.

The listed building program and associated information are considered minimum requirement for all spaces. The assignable square foot (ASF) has been provided for each required space. Room for circulation within the suite has been factored into the ASF for the spaces. The awarded Design-Build Entity (DBE) will be responsible for developing the required, total gross square feet (GSF) that includes, but is not limited to, building structure; building circulation; support spaces, such as mechanical, electrical and telecommunications areas; general toilet rooms; and maintenance spaces.

Where available, the District's guidelines for these types of spaces informed the ASF assigned to each category of space (e.g. office, workstation). Where District guidelines were not available, benchmarks from similar California community college facilities were used. College leadership also reviewed the program to ensure equity and similarity across departments.

SPACE NEEDS OVERVIEW

INSTRUCTIONAL SPACES

The STEM Building will retain the 57-seat tiered Lecture Room. No architectural work is intended within this space. The former biology lab in LS-106 will become the flexible Math Lab. The Lecture Room and Math Lab will serve as supportive learning environments for evolving programmatic and pedagogic needs.

COLLABORATION + STUDY SPACES

A variety of collaboration spaces for faculty and students alike will be offered. Spaces like the STEM Center, Maker Space, MESA Room, and a variety of Study Rooms offer a similar space for students to spend time working independently or in groups. These spaces may be used for instruction, too.

OFFICES

The faculty and staff spaces are standard office environments with an emphasis placed on their visibility to the Maker Space. The increased visibility will foster an open atmosphere that encourages consultation and conversation. Adjacency to the Lecture Room, Math Lab, and STEM Center will further spur the desired collaborative and flexible environment.

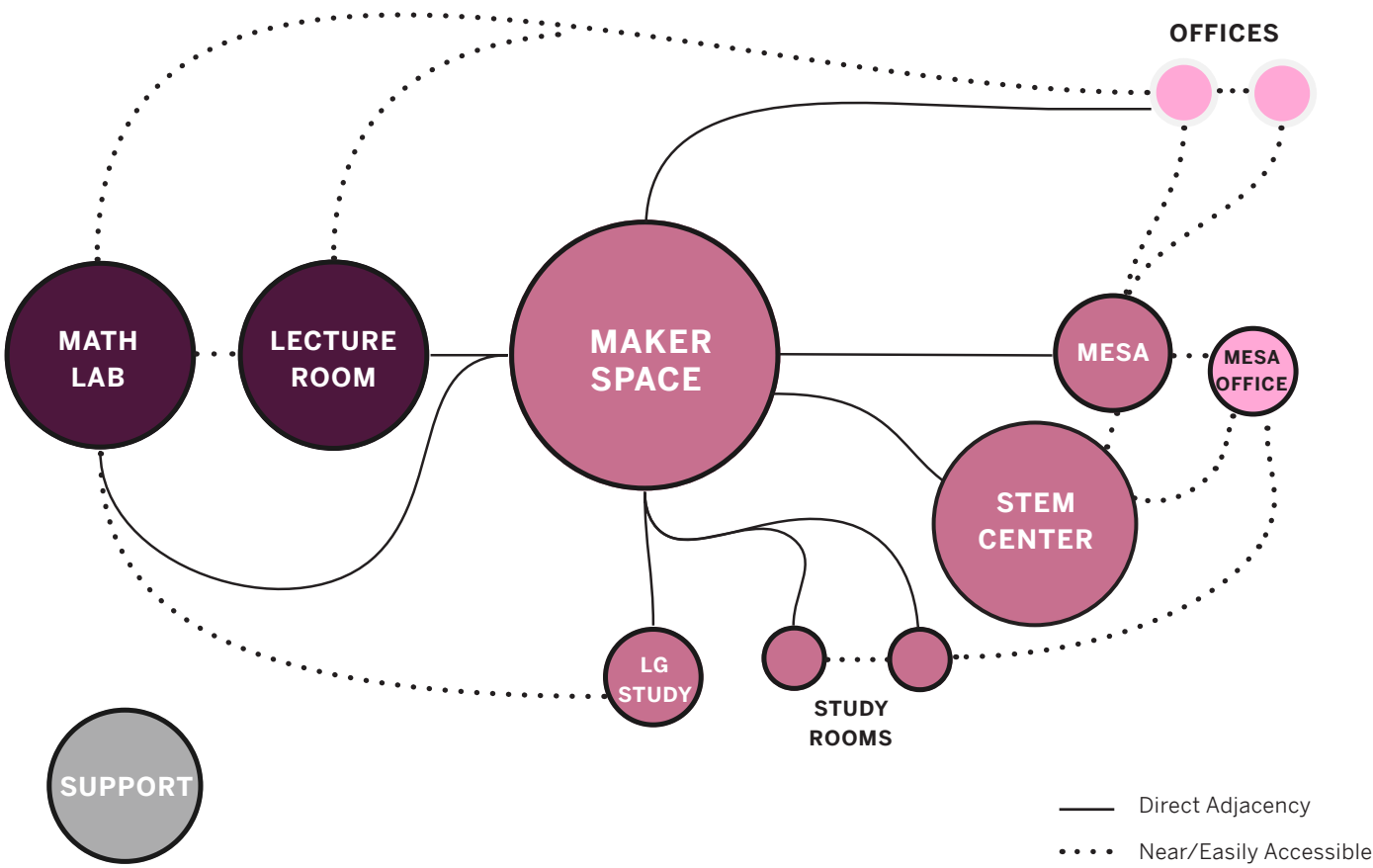
BUILDING SUPPORT

The building support areas shall include, but are not limited to, restrooms, lactation rooms, and general housekeeping to help provide basic services to the facilities. Restrooms shall be easily accessible and clearly visible.



PROGRAM ADJACENCIES

FIGURE 3.2.1



CONCEPTUAL ADJACENCIES DIAGRAM

Figure 3.2.1 describes the ideal spatial relationships between elements of the program. In the diagram, a room or space is represented by a colored circle. Each circle represents a room or space and shows its approximate size in comparison to the other spaces.

A graphic line (dotted or solid) between spaces or around spaces delineates whether the adjacency is direct (programs identified as needing to be “next” to each other) or near/easily accessible (programs identified as needing to be “close,” “down the hallway,” or “in the same building”).

Within the context of the existing building plan, it is preferred that the flexible study room be accessible to other spaces, through the Maker Space. These spaces will allow students to queue for classes, academic discourse, collaborative work, or soft seating.

Faculty and staff offices shall have either direct or visual adjacency with the Maker Space in order to facilitate student and faculty/staff interaction.

PROGRAM OVERVIEW

The following pages contain the programmatic space list. This list is organized by types of space use. All spaces are assigned a number that coincides with the adjacency diagram and room data sheets for ease of reference. Each space is assigned a room name that describes the function of the space. The program matrix also notes the existing Life Sciences Building room that will be converted into new STEM Building spaces, e.g. LS101. The individual assignable square feet (ASF) of each space, quantity, and total ASF are also included.

The ASF of each space has been vetted with the building user groups. However, the Design/Build team has some leeway to deviate from

the recommended ASF provided that all functionalities outlined in the adjacencies and room data sheets are achieved.

The gross square feet (GSF) of support spaces for the building have not been included with the programmatic space list to allow the Design/Build team to develop their own recommendations.

However, the District has stated a preference for the building to achieve a 70% ASF/GSF efficiency or better.

FIGURE 3.2.2			
Program		Quantity	Proposed ASF
4.0	INSTRUCTIONAL SPACES	2	2,035
4.01	Lecture Room	1	989
4.02	Math Lab	1	1,046
5.0	COLLABORATION AND STUDY SPACES	11	4,870
5.01	STEM Center	2	2,002
5.02	Maker Space	2	1,769
5.03	Large Study/Conference Room	2	422
5.04	Small Study Rooms	4	328
5.05	MESA Room	1	349
6.0	OFFICES	3	217
6.01	Standard Faculty Offices	2	146
6.02	MESA Office	1	71
Sub-Total			7,122 SF
Building Support			680 SF
TOTAL			7,802 SF*

* FUSION Overall GSF = 8,316 GSF

DETAILED PROGRAM

FIGURE 3.2.3

Program		ASF	Quantity	Total ASF*	Notes
4.0	INSTRUCTIONAL SPACES		2	2,035	
4.01	Lecture Room			989	
	LS101	989	1	989	57-seat tiered lecture space with access to flexible technology, i.e. access to screens/monitors. No architectural work is planned.
4.02	Math Lab			1,046	
	LS106	1,046	1	1,046	Indicated furniture is diagrammatic only - DBE to determine final FF&E and option to demolish existing fixed furniture.

* ASF as reported in as-built documents

Functionally, these existing spaces will continue to facilitate and accommodate multiple programmatic needs. They offer classroom layouts and access to technology for students to collaborate and engage with each other. The Instructional Spaces will continue to be multi-modal, allowing students and instructors to create class material that could be accessed in the classroom or online. Hybrid rooms support students in pursuing their academic path.



Classroom



Hyflex Classroom



Collab Space

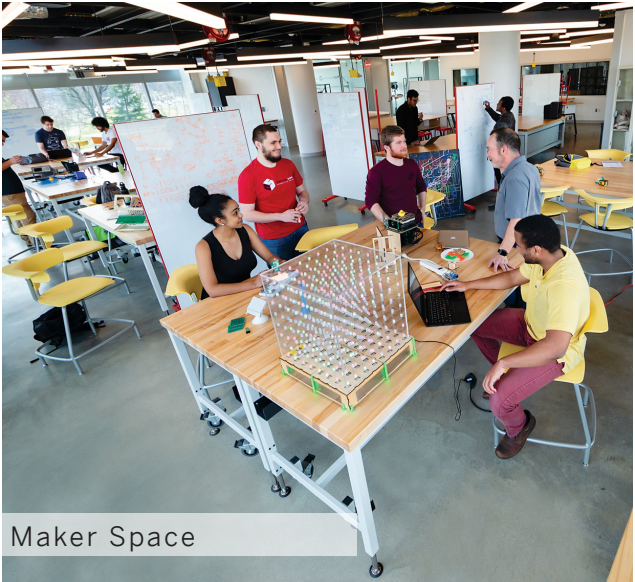
DETAILED PROGRAM
CONT'D

FIGURE 3.2.4

Program	ASF	Quantity	Total ASF*	Notes
5.0 COLLABORATION AND STUDY SPACES		11	4,870	
5.01 STEM Center		2	2,002	
LS102	1,001	1	1,001	
LS103	1,001	1	1,001	
5.02 Maker Space		2	1,769	
LS115	1,293	1	1,293	
LS109	476	1	476	Enclosed room to house specialized equipment.
5.03 Large Study/Conference Room		2	422	
LS104	263	1	263	
LS118	159	1	159	
5.04 Small Study Room		4	328	
LS110	103	1	103	
LS111	75	1	75	
LS112	75	1	75	
LS113	75	1	75	
5.05 MESA Room			349	
LS119 + LS120	349	1	349	Combined SF from existing rooms.

* ASF as reported in as-built documents

The STEM Center, Maker Space, and additional collaboration and study spaces will allow students to continue their learning outside of the classroom with access to technology and study room options. The Maker Space should accommodate access to flexible seating and tables, worktops, printers, and other user-identified equipment. Flexible lighting, power, and attention to acoustics will ensure an adaptable environment for known and yet-unknown uses. The above indicated combination of spaces will require the DBE's analysis within the limitations of the building structural and seismic systems. All efforts should be made to avoid more than voluntary structural and seismic updates.



Maker Space

DETAILED PROGRAM
CONT'D

FIGURE 3.2.5

Program	ASF	Quantity	Total ASF*	Notes
6.0 OFFICES		3	217	
6.01 Standard Faculty Offices		2	146	
LS114	75	1	75	
LS116	71	1	71	
6.02 MESA Office			71	
LS117	71	1	71	

* ASF as reported in as-built documents

The office spaces are to be directly adjacent to MESA and the Maker Space with visibility throughout the Maker Space. Visible adjacency to classrooms, Math Lab, and STEM Center will encourage a collaborative and flexible environment among students, faculty, and staff.



Small Office



Small Office

04

ROOM DATA

4.1 BIOLOGY BUILDING ROOM DATA

4.2 STEM CENTER ROOM DATA

4.1

BIOLOGY BUILDING ROOM DATA

OVERVIEW

The room data sheets provide a general understanding of the configuration and flow of the room as well as the furniture, fixtures and equipment that should be included within each space. They describe many of the technical requirements that will be needed for each space within the Biology Building. Room data sheets follow the order set in the Space Program Matrix.

Final room dimensions, technical requirements, and FF&E shall be discussed, confirmed, and finalized by the Design-Build Entity (DBE) team.

All areas and spaces must be accessible and comply w/ fire-life safety requirements. These data sheets are not meant to cover and/or indicate all accessibility, fire -life items. The Design-Build team is responsible for compliance to all accessibility codes, and guidelines weather or not specifically identified herein.

Refer to GJCCD Design Guidelines and Standards for additional requirements and recommendations for the Biology Building and STEM Center, including technology and security standards.

1.01 BIOLOGY LAB

DESIGN INTENT

The Biology Lab is a 1,400 SF training lab that includes movable tables and chairs, lab equipment, and access to advanced technology to accommodate various Biology sub-disciplines. The proposed arrangement of benches shall allow students to see one another, white boards and instructor more easily.

SPACE ADJACENCY

The Biology Lab shall be direct adjacent to the Prep Lab.

CHARACTERISTICS

Capacity:	25
Floor Finish:	Sealed concrete
Wall Finish:	Painted gypsum board, epoxy coated and resilient wall base
Ceiling Treatment:	Acoustic ceiling tile, mylar coated
Ceiling Height:	10'-6"
Natural Light:	Preferred
Window Treatment:	Shades required; no black-out shades; non-heat conductive shades preferred; glass break sensors
Door:	Sidelight or vision panel in door.
Security:	Access control lock (Columbine Locks), IDS
Casework:	Epoxy resin counter tops and wood casework; 24" deep lower and 18" deep uppers, typical. All upper cabinets must be lockable. See Room Diagram.
Accessories:	Vertical sliding whiteboard and analog smart-sync clock (hardwired). Flexible location camera transmits to Cadaver Room.

MECHANICAL,
ELECTRICAL &
PLUMBING

Ventilation:	Heating/cooling - Automatic thermostat
Electrical:	Minimum (7) power boxes (each located in bench stations) 110V, 20A, 1 Phase
Artificial Lighting:	Indirect LED (500 LUX with dimmer); zone lighting for marker board wall
Plumbing:	Sinks with hot and cold domestic water, natural gas, vacuum, and compressed air - all locations along perimeter and at lectern; DI water at one perimeter sink; safety shower w/eye wash; hot and cold domestic water, DI water, vacuum, compressed air and cup sink at fume hood

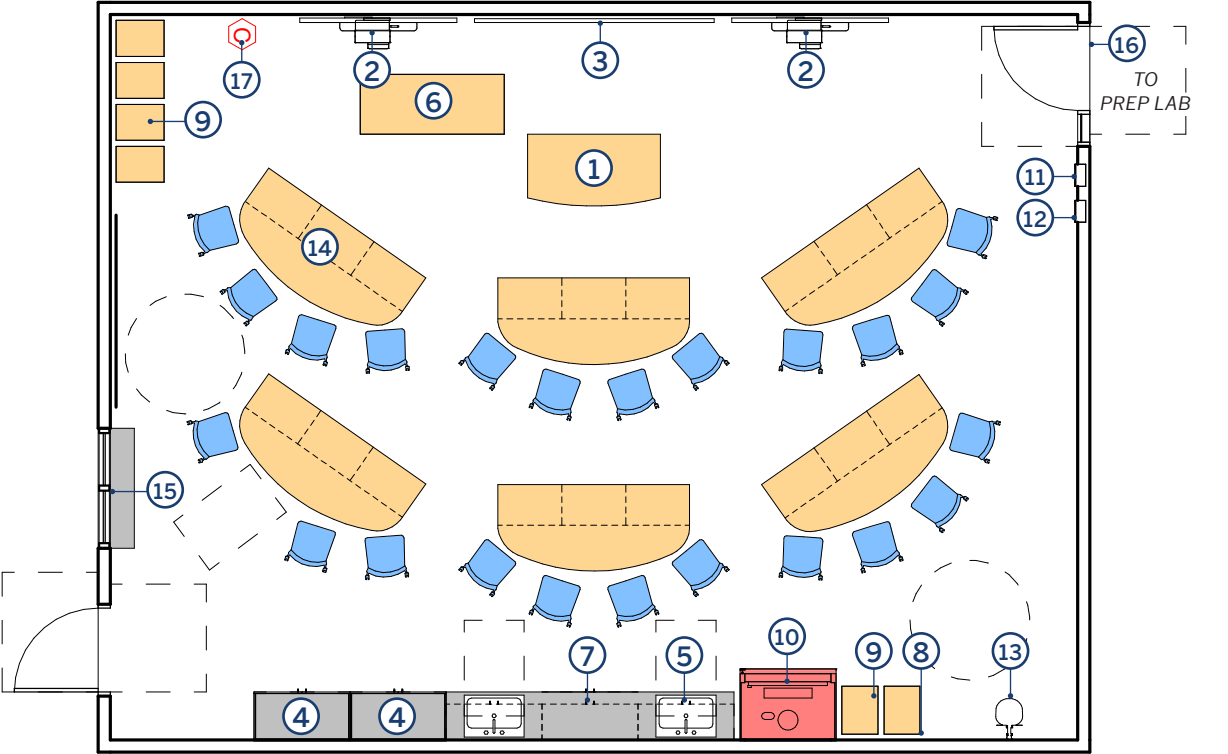
EQUIPMENT &
FURNISHINGS

See Room Diagram.

NOTES

Cabinet dimensions and storage requirements are to be determined with space users.

1.01 BIOLOGY LAB



- ①

INSTRUCTORS STATION
- ②

SMART BOARD W/ SHORT THROW PROJECTOR
- ③

VERTICAL SLIDING PANEL
- ④

TALL CABINET W/ MARKER BOARD DOORS, TYP.
- ⑤

ADA COMPLIANT SINK W/DI WATER
- ⑥

MOBILE BENCH
- ⑦

18" DEEP UPPER CASEWORK/ 24" LOWER CASEWORK, TYP.
- ⑧

WALL MOUNTED BULLETIN BOARD/PERIODIC TABLE
- ⑨

CART SPACE
- ⑩

BIO SAFETY CABINET
- ⑪

FIRE BLANKET WALL CABINET
- ⑫

RECESSED FIRE EXTINGUISHER CABINET
- ⑬

SAFETY SHOWER/EYE WASH STATION
- ⑭

MOBILE TABLE W/ OPEN SHELF CABINETS FOR MICROSCOPES, TYP.
- ⑮

PLANT AND SPECIMEN SHELVEING (GREENHOUSE)
- ⑯

42" WIDE DOOR
- ⑰

CAMERA (FEEDING TO CADAVER ROOM)
- MOVABLE FURNITURE
- MOVABLE SEATING
- FIXED FURNITURE
- EQUIPMENT
- ACCESSIBILITY CLEARANCE
- 5' ACCESSIBILITY TURNAROUND

1.02 LARGE FLEXIBLE CLASSROOM

DESIGN INTENT

The Large Flexible Classroom (1,225 SF) shall have scheduled general instruction and is intended to offer flexibility for various classroom layouts and settings, featuring movable seating and table arrangements to accommodate any class size and learning environment. On occasion, the room will be used for non-academic purpose, such as student club activities, meetings, and open study.

SPACE ADJACENCY

See Adjacency Diagram, page 3.3.

CHARACTERISTICS

Capacity:	50
Floor Finish:	Resilient floor tile
Wall Finish:	Painted gypsum board and resilient wall base
Ceiling Treatment:	Acoustic ceiling tile
Ceiling Height:	10'-6" minimum
Natural Light:	Required
Window Treatment:	Black-out shades required; non-heat conductive shades preferred
Door:	Sidelight or vision panel in door, STC 30 or higher
Security	Access control lock (Columbine Locks), IDS
Casework:	None

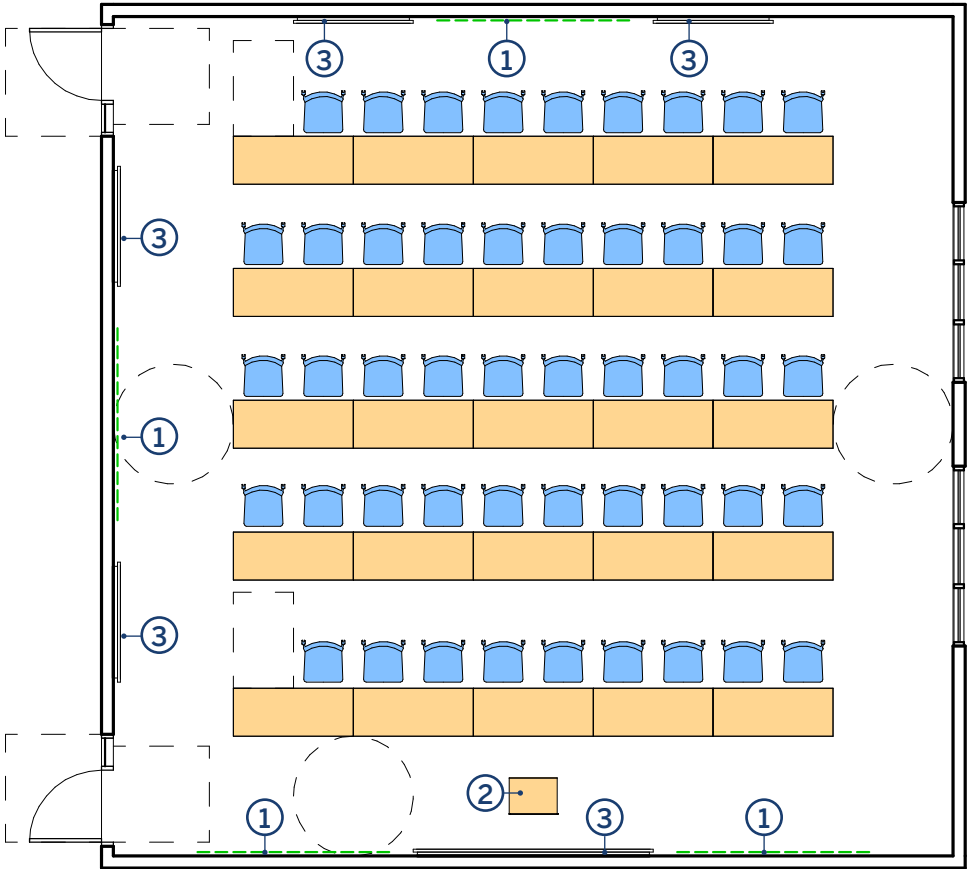
MECHANICAL,
ELECTRICAL &
PLUMBING

Ventilation:	Heating/cooling - Automatic thermostat
Electrical:	Minimum (6) flush-mounted floor power boxes
Artificial Lighting:	LED lighting, dimmable, zoned with multi-scene controls

EQUIPMENT &
FURNISHINGS

See Room Diagram.

1.02 LARGE FLEXIBLE CLASSROOM



- ① WRITABLE SURFACE
- ② MOBILE INSTRUCTOR MULTIMEDIA PODIUM
- ③ FLAT-PANEL DISPLAY
- MOVABLE FURNITURE
- MOVABLE SEATING
- ACCESSIBILITY CLEARANCE
- 5' ACCESSIBILITY TURNAROUND

2.01 PREP LAB

DESIGN INTENT

The Prep Lab (900 SF) provides support services to the Biology Labs. Its functions include media preparation for student experiments, storage of media and equipment, cleaning of media and equipment, and waste collection. The Prep Lab also includes a 60 SF workstation for a Lab Tech.

SPACE ADJACENCY

The Prep Lab shall have direct adjacency to the Biology Labs, Cadaver Room, and Lab Tech Office and be near or easily accessible to the Bone Room and Faculty Offices.

CHARACTERISTICS

Floor Finish:	Sealed concrete, rubber base
Wall Finish:	Painted gypsum board, epoxy coated and resilient wall base
Ceiling Treatment:	Acoustic ceiling tile, mylar coated
Ceiling Height:	10' - 6"
Natural Light:	Preferred
Window Treatment:	Shades required; no black-out shades; non-heat conductive shades preferred
Door:	Sidelight or vision panel in door
Security	Access control lock (Columbine Locks), IDS
Casework:	Epoxy resin counter tops and wood casework; 24" deep lower and 18" deep upper, typical. See Room Diagram.
Accessories:	Smart-sync clock (hardwired); writable surface; magnetic or glass whiteboard

MECHANICAL,
ELECTRICAL &
PLUMBING

Ventilation:	Heating/cooling - Automatic thermostat
Electrical:	110V, 20A, 1 Phase 208V, 30A, 1 Phase 208V, 30A 3 Phase; Standby/Dedicated Power at Equipment Spaces
Artificial Lighting:	Indirect LED (500 LUX with dimmer)
Plumbing:	Sinks with hot and cold domestic water, vacuum, and compressed air - all locations along perimeter and at lectern; DI water at one perimeter sink; safety shower w/eye wash; hot and cold domestic water, DI water, vacuum, compressed air and cup sink at fume hood

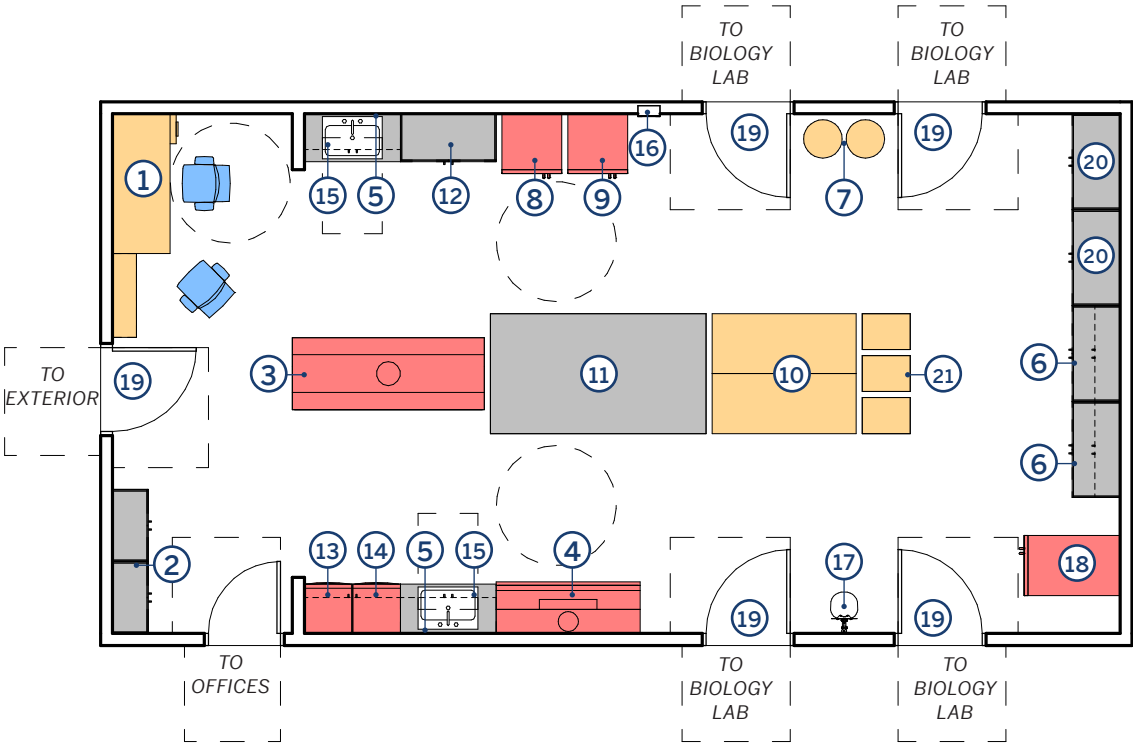
EQUIPMENT &
FURNISHINGS

See Room Diagram.

NOTES

DBE to study opportunities to mitigate noise impact from autoclave and other equipment. Cabinet dimensions and storage requirements are to be determined with space users.

2.01 PREP LAB



- ①

TECH WORKSTATION
- ②

FLAMMABLES/CORROSIVES TALL CABINETS
- ③

CHEMICAL FUME HOOD, DOUBLE-SIDED
- ④

BIO SAFETY CABINET
- ⑤

18" DEEP UPPER CASEWORK
- ⑥

18" DEEP UPPER CASEWORK/24" LOWER CASEWORK, TYP.
- ⑦

BIOLOGICAL AND CHEMICAL WASTE DRUMS
- ⑧

REFRIGERATOR
- ⑨

FREEZER
- ⑩

MOBILE SHELVING
- ⑪

LAB BENCHES, WITH POWER IN SLAB
- ⑫

INCUBATOR
- ⑬

U.C. ICE MACHINE
- ⑭

U.C. DISHWASHER
- ⑮

ADA-COMPLIANT SINK AND COUNTER
- ⑯

RECESSED FIRE EXTINGUISHER CABINET
- ⑰

SAFETY SHOWER/EYE WASH STATION
- ⑱

AUTOCLAVE
- ⑲

42" WIDE DOOR
- ⑳

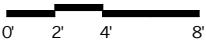
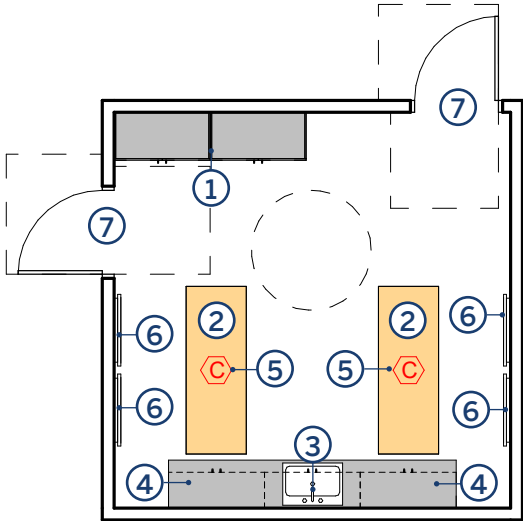
TALL CABINETS
- ㉑

CART SPACE
- MOVABLE FURNITURE
- MOVABLE SEATING
- BUILT-IN CASEFOWRK
- EQUIPMENT
- ACCESSIBILITY CLEARANCE
- 5' ACCESSIBILITY TURNAROUND

2.02 CADAVER ROOM

DESIGN INTENT	The Cadaver Room is a 275 SF specialized prep lab that provides additional support services to certain Biology curricula.		
SPACE ADJACENCY	The Cadaver Room shall have direct adjacency to the Prep Lab.		
CHARACTERISTICS	Capacity:	4	
	Floor Finish:	Resilient floor tile	
	Wall Finish:	Painted gypsum board with resilient wall base	
	Ceiling Treatment:	Acoustic ceiling tile	
	Ceiling Height:	10'-6" minimum	
	Natural Light:	None	
	Window Treatment:	N/A	
	Door:	Vision panel in door, STC 30 or higher; black-out shades preferred	
	Security	Access control lock (Columbine Locks), IDS	
	Casework:	See Room Diagram.	
MECHANICAL, ELECTRICAL & PLUMBING	Accessories:	Smart-sync clock (hardwired); writable surface; magnetic or glass whiteboard. Flexible location cameras transmit to class labs; flat-panel displays connect to cameras in class lab(s).	
	Ventilation:	Dedicated heating/cooling, 100% exhaust. Coordinate other room preferences with space users.	
	Electrical:	Power/Data needs to be on multiple walls to allow for user reconfiguration.	
	Artificial Lighting:	LED lighting, dimmable; source/task lighting as required at cadaver stations	
EQUIPMENT & FURNISHINGS	See Room Diagram.		
NOTES	Cabinet dimensions and storage requirements are to be determined with space users.		

2.02 CADAVER ROOM



- ①

TALL CABINET
- ②

CADAVER TABLES
- ③

ADA-COMPLIANT SINK
- ④

18" DEEP UPPER CASEWORK/ 24" LOWER CASEWORK, TYP.
- ⑤

FLEXIBLE LOCATION CAMERA
- ⑥

FLAT-PANEL DISPLAY W/ QUADRUPLUX CONNECTION
- ⑦

42" WIDE DOOR

MOVABLE FURNITURE

FIXED FURNITURE

ACCESSIBILITY CLEARANCE

5' ACCESSIBILITY TURNAROUND

2.03 BONE ROOM

DESIGN INTENT

The Bone Room is a 650 SF specimen room that provides additional opportunity for student and staff engagement. Flexible furniture and technology will allow other uses that include small group study or small break-out labs.

SPACE ADJACENCY

The Bone Room shall be near or easily accessible to the Prep Lab and the Faculty Offices.

CHARACTERISTICS

Capacity:	16
Floor Finish:	Sealed concrete, rubber base
Wall Finish:	Painted gypsum board with resilient base
Ceiling Treatment:	Acoustic ceiling tile
Ceiling Height:	10'-6" minimum
Natural Light:	Required
Window Treatment:	Manual, light-filtering roller shades required; non-heat conductive shades preferred
Door:	Sidelight or vision panel in door, STC 30 or higher
Security	Access control lock (Columbine Locks), IDS
Casework:	Tall cabinets, counters with upper and lower storage. See Room Diagram.
Accessories:	Smart-sync clock (hardwired); magnetic or glass whiteboard

MECHANICAL,
ELECTRICAL &
PLUMBING

Ventilation:	Heating/cooling - Automatic thermostat
Electrical:	Power/Data needs to be on multiple walls to allow for user reconfiguration. Recessed floor box.
Artificial Lighting:	LED lighting, dimmable
Plumbing:	Sinks with hot and cold domestic water, vacuum, and compressed air; DI water

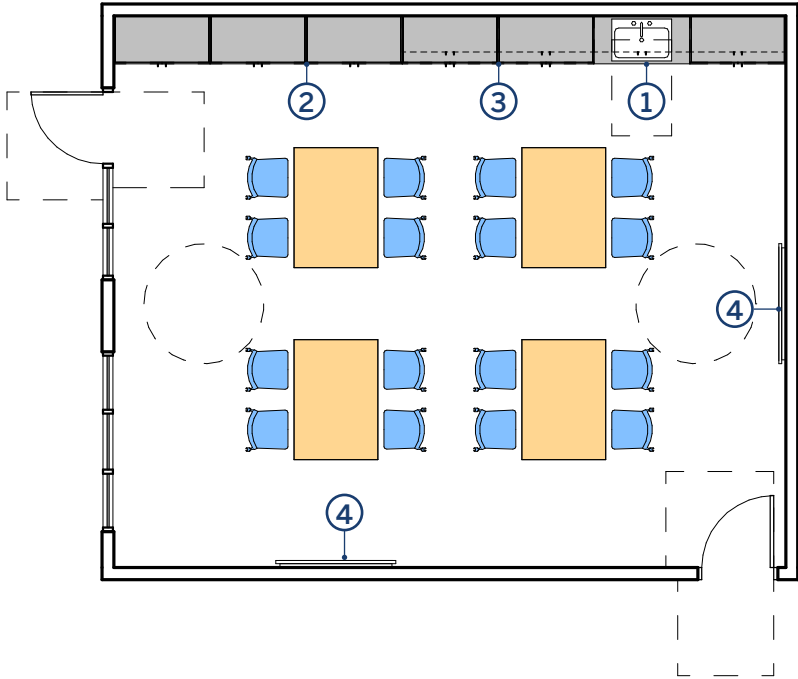
EQUIPMENT &
FURNISHINGS

See Room Diagram.

NOTES

Cabinet dimensions and storage requirements are to be determined with space users.

2.03 BONE ROOM



- ① ADA-COMPLIANT SINK
- ② TALL CABINET W/ GLASS DOORS
- ③ 18" DEEP UPPER CASEWORK/ 24" LOWER CASEWORK, TYP.
- ④ FLAT-PANEL DISPLAY W/ QUADRUPLIX CONNECTION
- MOVABLE FURNITURE
- MOVABLE SEATING
- BUILT-IN CASEWORK
- ACCESSIBILITY CLEARANCE
- 5' ACCESSIBILITY TURNAROUND

3.01 STANDARD OFFICE

DESIGN INTENT

The Biology Building Standard Office is a 90 SF single-person office that accommodates one (1) guest. These offices are anticipated to be used by full-time faculty throughout the day and week, inclusive of evening hours.

SPACE ADJACENCY

The Biology Building Standard Office shall be near or easily accessible to the Bone Room.

CHARACTERISTICS

Capacity:	2
Floor Finish:	Resilient floor tile or modular carpet tile
Wall Finish:	Painted gypsum board with resilient wall base
Ceiling Treatment:	Acoustic ceiling tile
Ceiling Height:	10'-6" minimum
Natural Light:	Required
Window Treatment:	Manual, light-filtering roller shades required; non-heat conductive shades preferred
Door:	Sidelight or vision panel in door, STC 30 or higher
Security	Access control lock (Columbine Locks), IDS
Casework:	See Room Diagram.
Accessories:	None

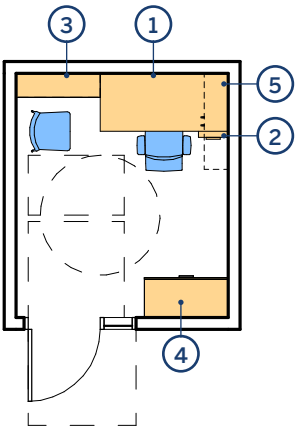
MECHANICAL,
ELECTRICAL &
PLUMBING

Ventilation:	Heating/cooling - Automatic thermostat
Electrical:	Power/Data needs to be on multiple walls to allow for user reconfiguration.
Artificial Lighting:	LED lighting, dimmable

EQUIPMENT &
FURNISHINGS

See Room Diagram.

3.01 STANDARD OFFICE



- ① 30x72" - SIT TO STAND DESK
- ② MOBILE PEDESTAL
- ③ 42" WIDE BOOKSHELF
- ④ 42" WIDE LATERAL FILE CABINET
- ⑤ WALL MOUNTED OVERHEAD STORAGE UNIT

- MOVABLE FURNITURE
- MOVABLE SEATING
- ACCESSIBILITY CLEARANCE
- 5' ACCESSIBILITY TURNAROUND

3.02 LAB TECH OFFICE

DESIGN INTENT

The Lab Tech Office is a 150 SF office that accommodates two (2) faculty workstations and two (2) guests. These offices are anticipated to be used by Lab Technicians.

SPACE ADJACENCY

The Lab Tech Office shall be directly adjacent to the Prep Lab.

CHARACTERISTICS

Capacity:	4
Floor Finish:	Resilient floor tile or modular carpet tile
Wall Finish:	Painted gypsum board with resilient wall base
Ceiling Treatment:	Acoustic ceiling tile
Ceiling Height:	10’-6” minimum
Natural Light:	Required
Window Treatment:	Manual, light-filtering roller shades; non-heat conductive shades preferred
Door:	Sidelight or vision panel in door, STC 30 or higher
Security	Access control lock (Columbine Locks), IDS
Casework:	See Room Diagram.
Accessories:	Whiteboard; consider magnetic or glass whiteboard.

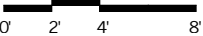
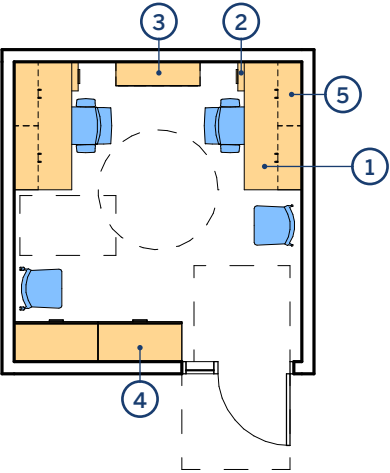
MECHANICAL,
ELECTRICAL &
PLUMBING

Ventilation:	Heating/cooling - Automatic thermostat
Electrical:	Power/Data needs to be on multiple walls to allow for user reconfiguration.
Artificial Lighting:	LED lighting, dimmable

EQUIPMENT &
FURNISHINGS

See Room Diagram.

3.02 LAB TECH OFFICE



- ① 30" X 72" SIT-TO-STAND DESK
- ② MOBILE PEDESTAL
- ③ 42" WIDE BOOKSHELF
- ④ 42" WIDE LATERAL FILE CABINET
- ⑤ WALL MOUNTED OVERHEAD STORAGE UNIT

- MOVABLE FURNITURE
- MOVABLE SEATING
- ACCESSIBILITY CLEARANCE
- 5' ACCESSIBILITY TURNAROUND

4.2

STEM CENTER
ROOM DATA

OVERVIEW

The room data sheets provide an understanding of the general configuration and flow of the room as well as the furniture, fixtures and equipment that should be included in each space. The room data sheets provide descriptions for many of the technical requirements that will be needed for each space within the new STEM Center (renovation of the Life Sciences Building). Room data sheets follow the order set in the Space Program Matrix. Room diagrams depict existing spaces in the Life Sciences Building that correspond to the newly proposed uses described in the program.

Final room dimensions, technical requirements, and FF&E shall be discussed, confirmed, and finalized by the Design-Build Entity (DBE) team.

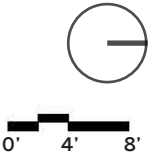
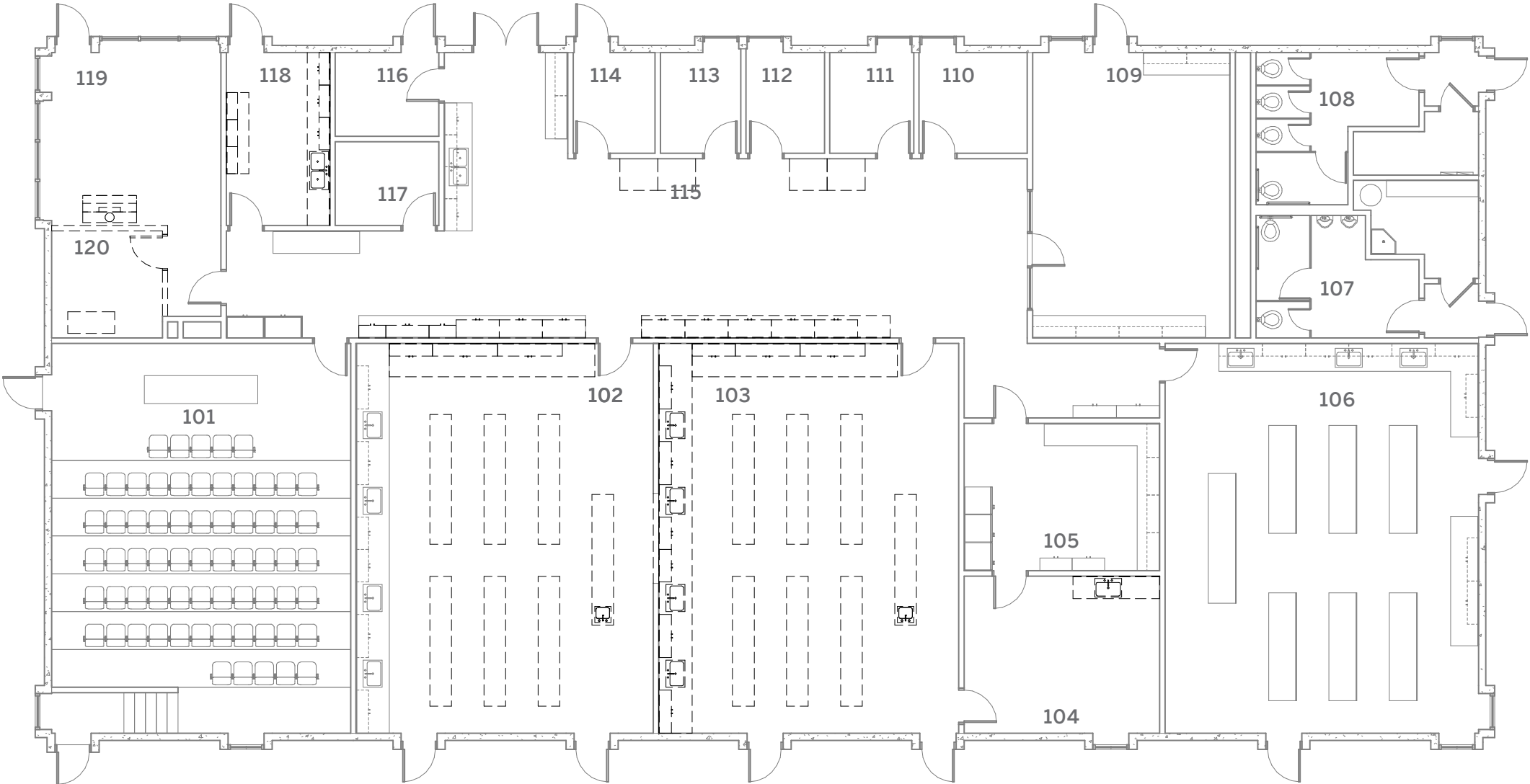
All areas and spaces must be accessible and comply w/ fire-life safety requirements. These data sheets are not meant to cover and/or indicate all accessibility, fire -life items. The Design-Build team is responsible for compliance to all accessibility codes, and guidelines weather or not specifically identified herein.

Refer to GJCCD Design Guidelines and Standards for additional requirements and recommendations for the Biology Building and STEM Center, including technology and security standards.

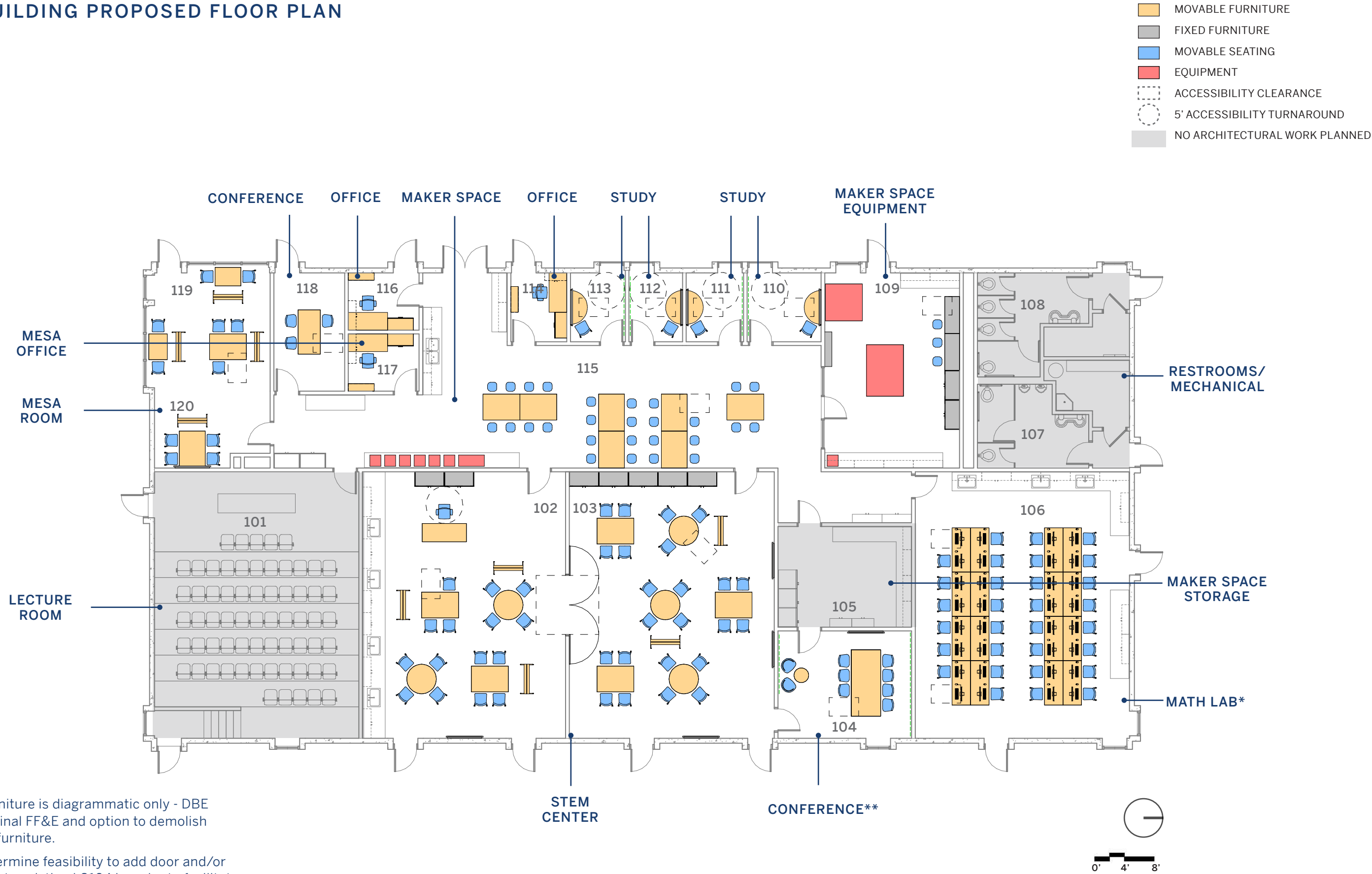
STEM BUILDING PROPOSED DEMOLITION PLAN

NOTE: DBE team to evaluate opportunities to minimize structural demolition and new wall construction (and related costs), working within only voluntary structural and seismic updates.

- EXISTING TO REMAIN
- PROPOSED DEMOLITION



STEM BUILDING PROPOSED FLOOR PLAN



*Indicated furniture is diagrammatic only - DBE to determine final FF&E and option to demolish existing fixed furniture.

** DBE to determine feasibility to add door and/or glass windows to existing LS104 in order to facilitate connection between STEM Center and Math Lab.

4.02 MATH LAB

DESIGN INTENT

The Math Lab is a 1,046 SF instructional space that will offer a flexible classroom layout and access to technology for students to collaborate and engage with each other.

SPACE ADJACENCY

The Math Lab shall be directly adjacent to the Maker Space and near or easily accessible to the STEM Center.

CHARACTERISTICS

Capacity:	29
Floor Finish:	Resilient floor tile
Wall Finish:	Painted gypsum board with resilient base
Ceiling Treatment:	Acoustic ceiling tile
Ceiling Height:	10'-6" minimum
Natural Light:	Required
Window Treatment:	Manual, light-filtering roller shades required; non-heat conductive shades preferred
Door:	Existing, or as new, provide sidelight or vision panel in door, STC 30 or higher
Security	Access control lock (Columbine Locks), IDS
Casework:	None
Accessories:	Smart-sync clock (hardwired); magnetic or glass whiteboard

MECHANICAL,
ELECTRICAL &
PLUMBING

Ventilation:	Heating/cooling - Automatic thermostat
Electrical:	Existing, provide additional power/data to facilitate user reconfiguration.
Artificial Lighting:	LED lighting, dimmable

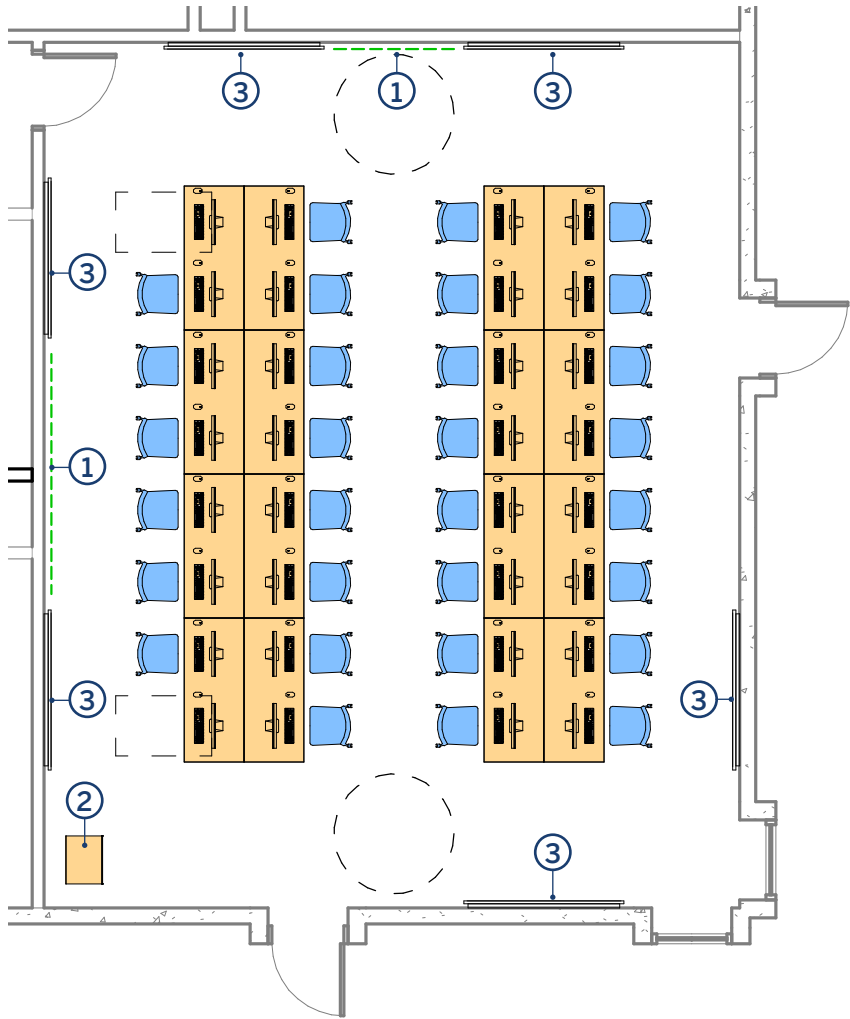
EQUIPMENT &
FURNISHINGS

See Room Diagram.

NOTES

Indicated furniture is diagrammatic only - DBE to determine final FF&E and option to demolish existing fixed furniture.

4.02 MATH LAB



- ① WRITABLE SURFACE
- ② MOBILE INSTRUCTOR MULTIMEDIA PODIUM
- ③ FLAT-PANEL DISPLAY W/ QUADRUPLIX CONNECTION
- MOVABLE FURNITURE
- MOVABLE SEATING
- 30"X48" ACCESSIBILITY CLEARANCE
- 5' ACCESSIBILITY TURNAROUND

5.01 STEM CENTER

DESIGN INTENT

The STEM Center is an approximately 2,000 SF space that will offer a flexible classroom layout and access to technology for students to collaborate, engage with STEM faculty, and receive peer or faculty tutoring.

SPACE ADJACENCY

The STEM Center shall have direct adjacency with the Maker Space and be near or easily accessible to the Lecture Room, the Math Lab, study rooms, and the MESA Room.

CHARACTERISTICS

Capacity:	45
Floor Finish:	Resilient floor tile
Wall Finish:	Painted gypsum board w/resilient base
Ceiling Treatment:	Acoustic ceiling tile
Ceiling Height:	10'-6" minimum
Natural Light:	Preferred, where feasible
Window Treatment:	Black-out shades required; non-heat conductive shades preferred
Door:	Existing, or as new, provide sidelight or vision panel in door, STC 30 or higher
Security	Access control lock (Columbine Locks), IDS
Casework:	Tall cabinets, typical. See Room Diagram.
Accessories:	Smart-sync clock (hardwired)

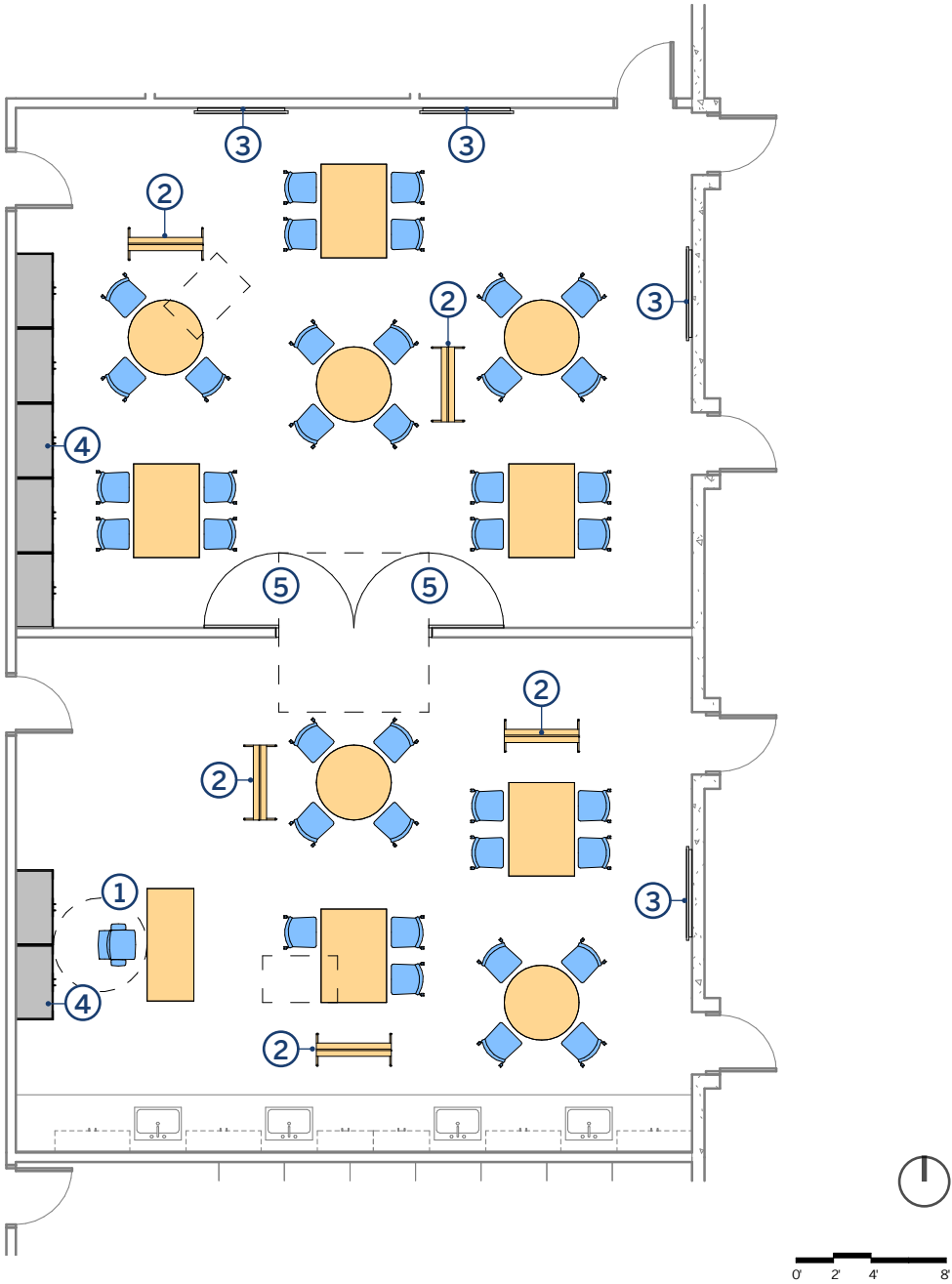
MECHANICAL,
ELECTRICAL &
PLUMBING

Ventilation:	Heating/cooling - Automatic thermostat
Electrical:	Minimum (6) flush-mounted floor power boxes in each of the two rooms, (12) total
Artificial Lighting:	LED lighting, dimmable

EQUIPMENT &
FURNISHINGS

See Room Diagram.

5.01 STEM CENTER



- ① STAFF DESK/RECEPTION AREA
- ② MOBILE WHITE BOARDS
- ③ FLAT-PANEL DISPLAY W/ QUADRUPLUX CONNECTION
- ④ TALL CABINET, TYP.
- ⑤ 48" DOOR
- MOVABLE FURNITURE
- MOVABLE SEATING
- FIXED FURNITURE
- ACCESSIBILITY CLEARANCE
- 5' ACCESSIBILITY TURNAROUND

5.02 MAKER SPACE

DESIGN INTENT

The Maker Space (1,769 SF) will allow students to continue their learning outside of the classroom with access to technical equipment and collaborative space to meet various gathering needs. The Maker Space should accommodate access to flexible seating and tables, worktops, and a variety of equipment.

SPACE ADJACENCY

The Maker Space shall be directly adjacent to the Faculty Offices, MESA Office, STEM Center, Study Rooms and instructional spaces.

CHARACTERISTICS

Capacity:	30
Floor Finish:	Resilient floor tile or sealed/stained concrete
Wall Finish:	Painted gypsum board w/resilient base
Ceiling Treatment:	Acoustic ceiling tile
Ceiling Height:	10'-6" minimum
Natural Light:	Preferred, where feasible
Window Treatment:	Black-out shades required; non-heat conductive shades preferred
Door:	Existing, or as new, provide sidelight or vision panel in door, STC 30 or higher
Security	Access control lock (Columbine Locks), IDS
Casework:	Tall cabinets, typical. See Room Diagram.
Accessories:	Smart-sync clock (hardwired), printer, computers, vending machine

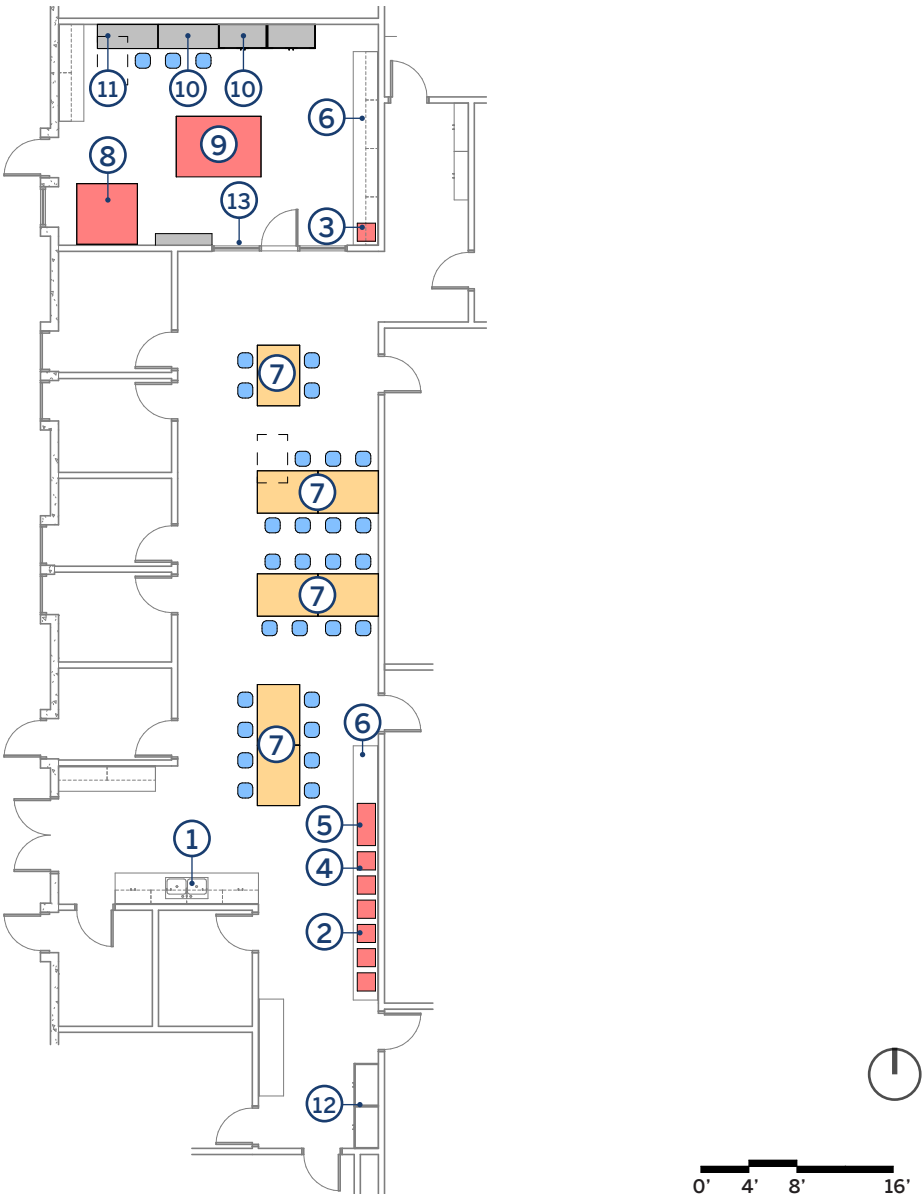
MECHANICAL,
ELECTRICAL &
PLUMBING

Ventilation:	Heating/cooling - Automatic thermostat
Electrical:	Power/Data needs to be on multiple walls to allow for user reconfiguration.
Artificial Lighting:	LED lighting

EQUIPMENT &
FURNISHINGS

See Room Diagram. Additional equipment kept in storage: circular saw; orbital sander; hot wire foam cutter; tool box and power tools; saw horses.

5.02 MAKER SPACE



- ① ADA-COMPLIANT SINK

② 3D PRINTER (5)

③ CNC MILL AND/OR ROUTER

④ PLASTIC BENDER

⑤ TENSILE TEST MACHINE

⑥ 24" LOWER CASEWORK, TYP.

⑦ WORKBENCH W/ LAPTOP CONNECTIONS

⑧ LASER CUTTER

⑨ TABLE SAW

⑩ WORKBENCH W/ SOLDERING STATIONS
- ⑪ 18" DEEP UPPER CASEWORK/ 24" LOWER CASEWORK, TYP.

⑫ TALL CABINET

⑬ DISPLAY SHELVING

MOVABLE FURNITURE

MOVABLE SEATING

FIXED FURNITURE

EQUIPMENT

ACCESSIBILITY CLEARANCE

5' ACCESSIBILITY TURNAROUND

5.03 LARGE STUDY/CONFERENCE ROOM

DESIGN INTENT

The Large Study/Conference Rooms are approximately 160-260 SF spaces that provide a flexible study area for students. The furniture should be flexible enough to allow for various configurations but should support quiet individual work. This space is anticipated to be used throughout the day and week.

SPACE ADJACENCY

The Large Study/Conference Room shall be directly adjacent to the Maker Space.

CHARACTERISTICS

Capacity:	10
Floor Finish:	Resilient floor tile or modular carpet tile
Wall Finish:	Painted gypsum board with resilient wall base with writable surface
Ceiling Treatment:	Acoustic ceiling tile
Ceiling Height:	10'-6" minimum
Natural Light:	Required
Window Treatment:	Manual, light-filtering roller shades required; non-heat conductive shades preferred
Door:	Existing, or as new, provide sidelight or vision panel in door, STC 30 or higher
Security	Access control lock (Columbine Locks), IDS
Casework:	None
Accessories:	Smart-sync clock (hardwired), printers; writable surface

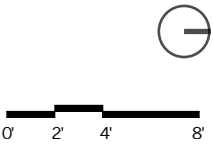
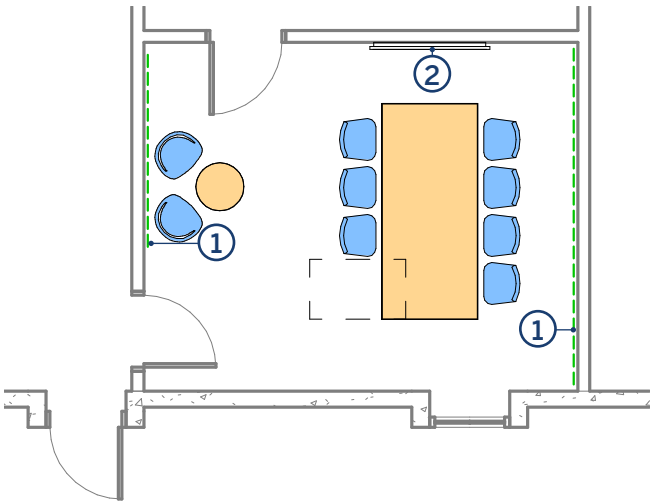
MECHANICAL,
ELECTRICAL &
PLUMBING

Ventilation:	Heating/cooling - Automatic thermostat
Electrical:	Existing, provide additional power/data to facilitate user reconfiguration.
Artificial Lighting:	LED lighting, dimmable

EQUIPMENT &
FURNISHINGS

See Room Diagram.

5.03 LARGE STUDY/CONFERENCE ROOM



- ① WRITABLE SURFACE
- ② FLAT-PANEL DISPLAY W/ QUADRUPLUX CONNECTION
- MOVABLE FURNITURE
- MOVABLE SEATING
- ACCESSIBILITY CLEARANCE
- 5' ACCESSIBILITY TURNAROUND

5.04 SMALL STUDY ROOM

DESIGN INTENT

The Small Study Rooms are approximately 75-100 SF spaces that provide a focused study space for students. It will support studying for up to 2 students. A writable surface will be integrated into the walls of this space. This space is anticipated to be used throughout the day and week.

SPACE ADJACENCY

The Small Study Rooms shall be directly adjacent to the Maker Space and be near or easily accessible to the MESA Room.

CHARACTERISTICS

Capacity:	2 per room
Floor Finish:	Resilient floor tile or modular carpet tile
Wall Finish:	Painted gypsum board with resilient wall base
Ceiling Treatment:	Acoustic ceiling tile
Ceiling Height:	10'-6" minimum
Natural Light:	None
Window Treatment:	N/A
Door:	Existing, or as new, provide sidelight or vision panel in door, STC 30 or higher
Security	Access control lock (Columbine Locks), IDS
Casework:	None
Accessories:	Smart-sync clock (hardwired), printers; magnetic or glass whiteboard

MECHANICAL,
ELECTRICAL &
PLUMBING

Ventilation:	Heating/cooling - Automatic thermostat
Electrical:	Existing, provide additional power/data to facilitate user reconfiguration.
Artificial Lighting:	LED lighting, dimmable

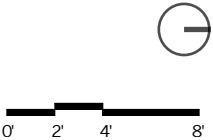
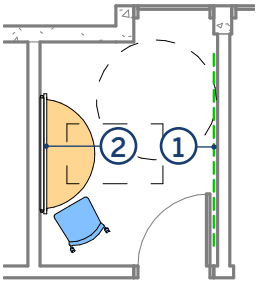
EQUIPMENT &
FURNISHINGS

See Room Diagram.

NOTES

Study room shall have interior access, only. Replace, fix (closed), or lock-off exterior access.

5.04 SMALL STUDY ROOM

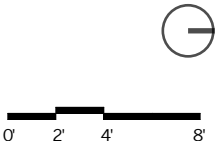
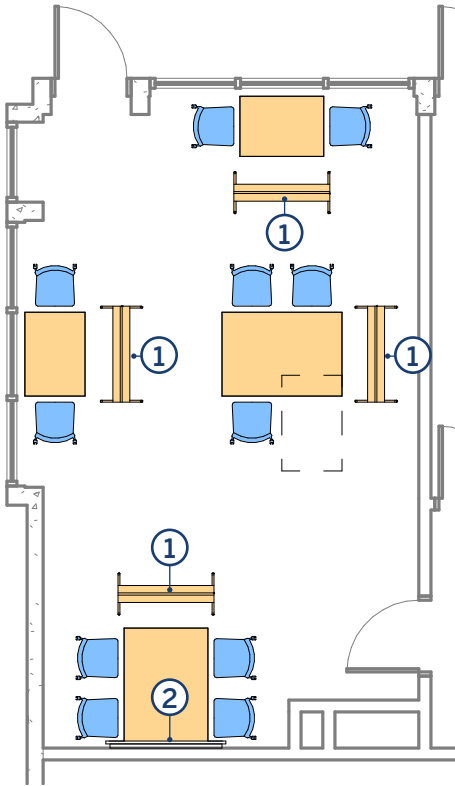


- ① WRITABLE SURFACE
- ② FLAT-PANEL DISPLAY W/ QUADRUPLIX CONNECTION
- MOVABLE FURNITURE
- MOVABLE SEATING
- ACCESSIBILITY CLEARANCE
- 5' ACCESSIBILITY TURNAROUND

5.05 MESA ROOM

DESIGN INTENT	The MESA Room is a 349 ASF collaboration space that will allow students to continue their learning outside of the classroom with access to technology and study room options to meet various gathering needs.
SPACE ADJACENCY	The MESA Room shall be direct adjacent to the Maker Space and be near or easily accessible to the MESA Office and Study Rooms.
CHARACTERISTICS	<div>Capacity:12</div> <div>Floor Finish:Resilient floor tile or modular carpet tile</div> <div>Wall Finish:Painted gypsum board with resilient wall base</div> <div>Ceiling Treatment:Acoustic ceiling tile</div> <div>Ceiling Height:10'-6" minimum</div> <div>Natural Light:Preferred</div> <div>Window Treatment:Manual, light-filtering roller shades required; non-heat conductive shades preferred</div> <div>Door:Existing, or as new, provide sidelight or vision panel in door, STC 30 or higher</div> <div>SecurityAccess control lock (Columbine Locks), IDS</div> <div>Casework:None</div> <div>Accessories:Smart-sync clock (hardwired)</div>
MECHANICAL, ELECTRICAL & PLUMBING	<div>Ventilation:Heating/cooling - Automatic thermostat</div> <div>Electrical:Existing, provide additional power/data to facilitate user reconfiguration.</div> <div>Artificial Lighting:LED lighting, dimmable</div>
EQUIPMENT & FURNISHINGS	See Room Diagram.
NOTES	Existing greenhouse glazing to be replaced with insulated storefront system, or infilled with wall (to avoid direct sunlight/heat gain). Either West or South glazing required for daylight.

5.05 MESA ROOM



- ① MOBILE WHITEBOARD
- ② FLAT-PANEL DISPLAY W/ QUADRUPLIX CONNECTION
- MOVABLE FURNITURE
- MOVABLE SEATING
- FIXED FURNITURE
- ACCESSIBILITY CLEARANCE
- 5' ACCESSIBILITY TURNAROUND

6.01 FACULTY OFFICE

DESIGN INTENT

The STEM Center Faculty Offices are 71-75 SF single-person offices. These offices are anticipated to be used by full-time faculty throughout the day and week, inclusive of evening hours.

SPACE ADJACENCY

The Faculty Offices shall be direct adjacent to the Maker Space and be near or easily accessible to the Study Rooms, MESA Room and STEM Center.

CHARACTERISTICS

Capacity:	1
Floor Finish:	Resilient floor tile or modular carpet tile
Wall Finish:	Painted gypsum board with resilient wall base
Ceiling Treatment:	Acoustic ceiling tile
Ceiling Height:	10'-6" minimum
Natural Light:	Required
Window Treatment:	Manual, light-filtering roller shades required; non-heat conductive shades preferred
Door:	Existing, or as new, provide sidelight or vision panel in door, STC 30 or higher
Security	Access control lock (Columbine Locks), IDS
Casework:	See Room Diagram.
Accessories:	None

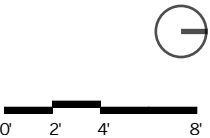
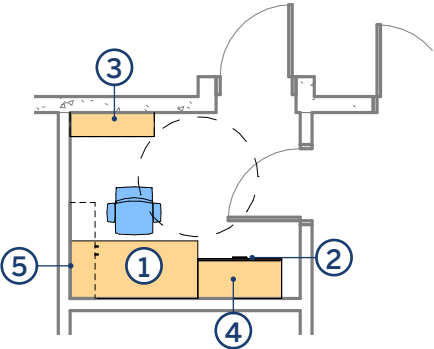
MECHANICAL,
ELECTRICAL &
PLUMBING

Ventilation:	Heating/cooling - Automatic thermostat
Electrical:	Existing, provide additional power/data to facilitate user reconfiguration.
Artificial Lighting:	LED lighting, dimmable

EQUIPMENT &
FURNISHINGS

See Room Diagram.

6.01 FACULTY OFFICE



- ①

30" X 72" SIT-TO-STAND DESK
- ②

MOBILE PEDESTAL
- ③

42" WIDE BOOKSHELF
- ④

42" WIDE LATERAL FILE CABINET
- ⑤

COUNTER W/PENCIL DRAWERS AND WALL MOUNTED OVERHEAD STORAGE UNIT
- MOVABLE FURNITURE
- MOVABLE SEATING
- ACCESSIBILITY CLEARANCE
- 5' ACCESSIBILITY TURNAROUND

6.02 MESA OFFICE

DESIGN INTENT

The MESA Office is a 71 SF single-person office. These offices are anticipated to be used by MESA faculty members.

SPACE ADJACENCY

The MESA Office shall be direct adjacent to the Maker Space and be near or easily accessible to the Study Rooms, MESA Room and STEM Center.

CHARACTERISTICS

Capacity:	1
Floor Finish:	Resilient flooring or modular carpet tile
Wall Finish:	Painted gypsum board with resilient wall base
Ceiling Treatment:	Acoustic ceiling tile
Ceiling Height:	10'-6" minimum
Natural Light:	Required
Window Treatment:	Manual, light-filtering roller shades required; non-heat conductive shades preferred
Door:	Existing, or as new, provide sidelight or vision panel in door, STC 30 or higher
Security	Access control lock (Columbine Locks), IDS
Casework:	See Room Diagram.
Accessories:	Whiteboard consider magnetic or glass whiteboard

MECHANICAL,
ELECTRICAL &
PLUMBING

Ventilation:	Heating/cooling - Automatic thermostat
Electrical:	Power/Data needs to be on multiple walls to allow for user reconfiguration.
Artificial Lighting:	LED lighting, dimmable

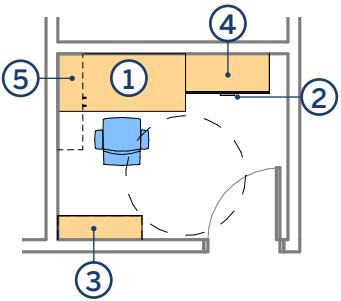
EQUIPMENT &
FURNISHINGS

See Room Diagram.

NOTES

DBE to determine with faculty if both interior and exterior access is required.

6.02 MESA OFFICE



- ① 30" X 72" SIT-TO-STAND DESK
- ② MOBILE PEDESTAL
- ③ 42" WIDE BOOKSHELF
- ④ 42" WIDE LATERAL FILE CABINET
- ⑤ COUNTER W/PENCIL DRAWERS AND WALL MOUNTED OVERHEAD STORAGE UNIT

- MOVABLE FURNITURE
- MOVABLE SEATING
- ACCESSIBILITY CLEARANCE
- 5' ACCESSIBILITY TURNAROUND

OPPORTUNITIES

In addition to the design, equipment, and furnishing information detailed in the Room Data sheets above, a list of additional opportunities is provided to assist the DBE team with final determinations. This list is intended to support the prioritization of specific features for the College.

For the rooms listed on the following page, there is indication of features that should be considered the minimum requirement for a space, i.e. 1,200 SF total area. The table also identifies features that build upon the minimum requirements and represent potential opportunities for the spaces should resources permit. For example, while 1,225 SF is identified as the minimum required floor area for the Large Flexible Classroom in the Biology Building, if feasible, increasing the space to 1,500 would allow for greater capacity.

Program		Minimum Requirement	Opportunities
BIOLOGY BUILDING			
1.01	Biology Lab	1,200 SF	1,400 SF
		“Greenhouse” plant/specimen shelving located in Bio Lab	Greenhouse in separate room/facility
1.02	Large Flexible Classroom	1,225 SF (50 capacity)	1,500 SF (60 capacity)
2.01	Prep Lab	900 SF	1,200 SF
		Direct adjacency w/ (4) Bio Labs	Direct adjacency w/ Faculty Offices
		Autoclave located on opposite wall from workstation	Enclosed space for autoclave to mitigate noise
		(1) fridge and (1) freezer	(2) fridge and (2) freezer
2.03	Bone Room	650 SF (16 capacity)	750 SF (18 capacity)
Offices			
		(3) full-time faculty offices in Bio Building; (1) in existing Math Building	(4) full-time faculty offices in Bio Building
		PT faculty located at workstation in Prep Lab	PT faculty located in separate office
STEM BUILDING			
4.02	Math Lab	Converting Bio Lab to Math Lab, maintaining existing furniture	Replace fixed furniture, flooring
5.01	STEM Center	(2) 4’ doors connecting existing LS102 + LS103	Maximize opening - structural engineer to verify
5.02	Maker Space	Maker Space to consist of existing LS109 + LS115	Expand Maker Space with demolition of (2) additional existing offices (LS110 + LS111)
5.03	Large Study/Conference Room	Maintain (2) existing doors in LS104 leading to Maker Space and STEM Center	Add an additional door connecting to the Math Lab
Support			
		Existing LS105 to remain as storage	Explore option to demolish LS105 and add floor area to Maker Space (LS115) or Lg Study/Conference Room (LS104)

05

CIVIL DESIGN CRITERIA

CIVIL DESIGN CRITERIA

INTRODUCTION

The location of the proposed Biology Building site will be situated in an open area just north of the Physical Science Building and just east of the Math Building. The Life Science Building will consist of tenant improvements only and will utilize existing utilities and access points. The existing utilities that surround the site include sewer, storm drain, domestic water, fire water, electric, gas, and communication. The topography of the Biology Building site slopes from west to east with an elevation drop of about one foot.

The proposed site civil design guidelines below include project descriptions and Design Criteria for grading, pavements, storm water management, and wet utilities.

GRADING AND DRAINAGE

The finished grading should be designed to direct stormwater runoff away from the proposed building and towards stormwater treatment and storage facilities. Hardscape areas should be graded and coordinated with the building improvements, to meet ADA requirements and provide proper drainage. Softscape areas will be graded, as coordinated with the landscape architect, to utilize infiltration opportunities in order to reduce the amount of storm water runoff into the piping system. The onsite Storm drain system shall be designed to have a 25-yr storm event capacity.

DESIGN CRITERIA

- Grading requirements shall be consistent with the project Geotechnical report
- Cut and fill slopes should be 2:1 (horizontal to vertical) or flatter
- ADA path of travel improvements shall meet the most current version of the California Building Code (CBC), Part 2, Volume 1, Chapter 11B accessibility requirements

PAVEMENTS

All pavements shall be designed to meet the requirements of the project Geotechnical Report, which provides pavement sections for asphalt and concrete for both pedestrian use and vehicular use. The walkways and EVA routes shall be reinforced concrete over Class II aggregate base. Pavement finishes shall be consistent with the overall campus character as outlined in the “Landscape Guidelines” section of the 2020 Facilities Master Plan. Accessible path of travel shall be provided to the new building entryways and public areas.

DESIGN CRITERIA

- Pedestrian walkways and service vehicle pathways shall be 8’ wide minimum.
- EVA access shall be 20’ wide minimum.
- Standard Parking stalls shall be 9’ wide by 18’ long minimum
- Compact stalls shall be 8’ wide by 16’ long minimum
- ADA stall dimensions and striping shall be per CBC requirements
- Parking lot drive aisles shall be 24’ wide minimum for 90 degree stalls
- Curb and gutters for roadways and parking lot shall be Portland Cement Concrete

STORMWATER

The project will be required to provide post construction stormwater treatment and storage facilities. The storage facilities shall be sized for the 100-yr storm event and to be of adequate size to retain and infiltrate stormwater on the site to pre-developed levels as required by the County of Santa Clara C3 requirements. All Storm water runoff from impervious surfaces shall be directed to stormwater treatment and storage facilities. Utilize Best Management Practices (BMP’s) and Low Impact Development (LID) principles when designing the storm water runoff facilities.

DESIGN CRITERIA

- Develop a Stormwater Control Plan per Santa Clara County C3 requirements.
- Use LID practices such as BioRetention ponds, Vegetated swales, and planter boxes

SANITARY SEWER

There is an existing sanitary sewer that runs along the north side of the proposed Bio Building which flows from west to east. This is a PVC line that was installed in 2006. See Figure 5.1. The existing line then continues to the north end of the campus where it flows to a sewer pump station and then pumped to a city manhole on Santa Teresa blvd which is owned and operated by the City of Gilroy south county regional waste water authority. The new building shall be provided with a sewer lateral to connect to the existing sewer system.

DESIGN CRITERIA

- Sewer pipes shall be PVC SDR 26 material
- Minimum slopes shall be 2% for 4”, 0.7% for 6”, and 0.4% for 8”
- Sewer mains shall have 10’ minimum horizontal separation from domestic water lines
- Sewer laterals shall have 5’ minimum horizontal separation from domestic water lines

STORM DRAINAGE

The existing drainage for the Biology Building site is overland runoff which flows west to east to an existing drainage system on the west side of the Health Occupations Building (HOB). See Figure 5.1. The proposed project storm drain inlets shall be placed at all low points within pathways, and landscape areas. The building roof leaders shall be conveyed to Stormwater management areas for treatment and storage. Drains within landscape areas to be coordinated with the landscape architect. Drains within pedestrian hardscape areas to be heel proof catch basins or area drains.

DESIGN CRITERIA

- Storm drain pipes shall be sized to accommodate a 25-yr storm event
- Minimum pipe size shall b 6"
- Storm drain pipe slopes shall be designed to maintain a minimum velocity of 2 ft/sec
- Storm drain lines 6" and smaller shall be SDR 35 PVC
- Storm drain lines 8" and larger shall be HDPE or RCP

WATER DISTRIBUTION

The existing fire water runs through the site and will need to be relocated due to the location of the proposed building footprint. The existing domestic water line runs along the west side of the HOB building and also along the west side of the Math building. See Figure 5.1. The domestic water is the original Transite pipe built in 1967. The fire water is C900 PVC pipe built in 2013. Both systems are fed from two 650 thousand gallon tanks located in the hills west of the campus and were installed in 2013. The existing water pressure ranges from 90psi to 110psi per the 2013 Water Storage and Distribution improvement plans (DSA# 01-113107). The sizes of proposed domestic water and irrigation services will be based on demands determined by the project MEP and Landscape architect. The sizes of the fire water system will be based on the California fire code requirements. There are two existing fire hydrants in the vicinity of the new building so there is most likely no need for any additional hydrants.

DESIGN CRITERIA

- Backflow devises shall be provided for each system (domestic, fire, and Irrigation)
- Waterlines shall have 3' minimum cover
- Water lines 4" and larger shall be PVC C900 material
- Irrigations lines shall be PVC schedule 40
- Fire Hydrants shall be placed at 300' maximum spacing and approved by the local fire authority

NATURAL GAS

The existing gas line runs through the proposed site and will need to be relocated due to the location of the proposed building footprint. See Figure 5.1. The campus gas distribution system is fed from a PG&E gas meter located at the northeast corner of Parking Lot A. The entire campus gas distribution system was replaced in 2006 with new polyethylene pipe.

DESIGN CRITERIA

- The proposed Bio building is to be all electric. No new gas required.

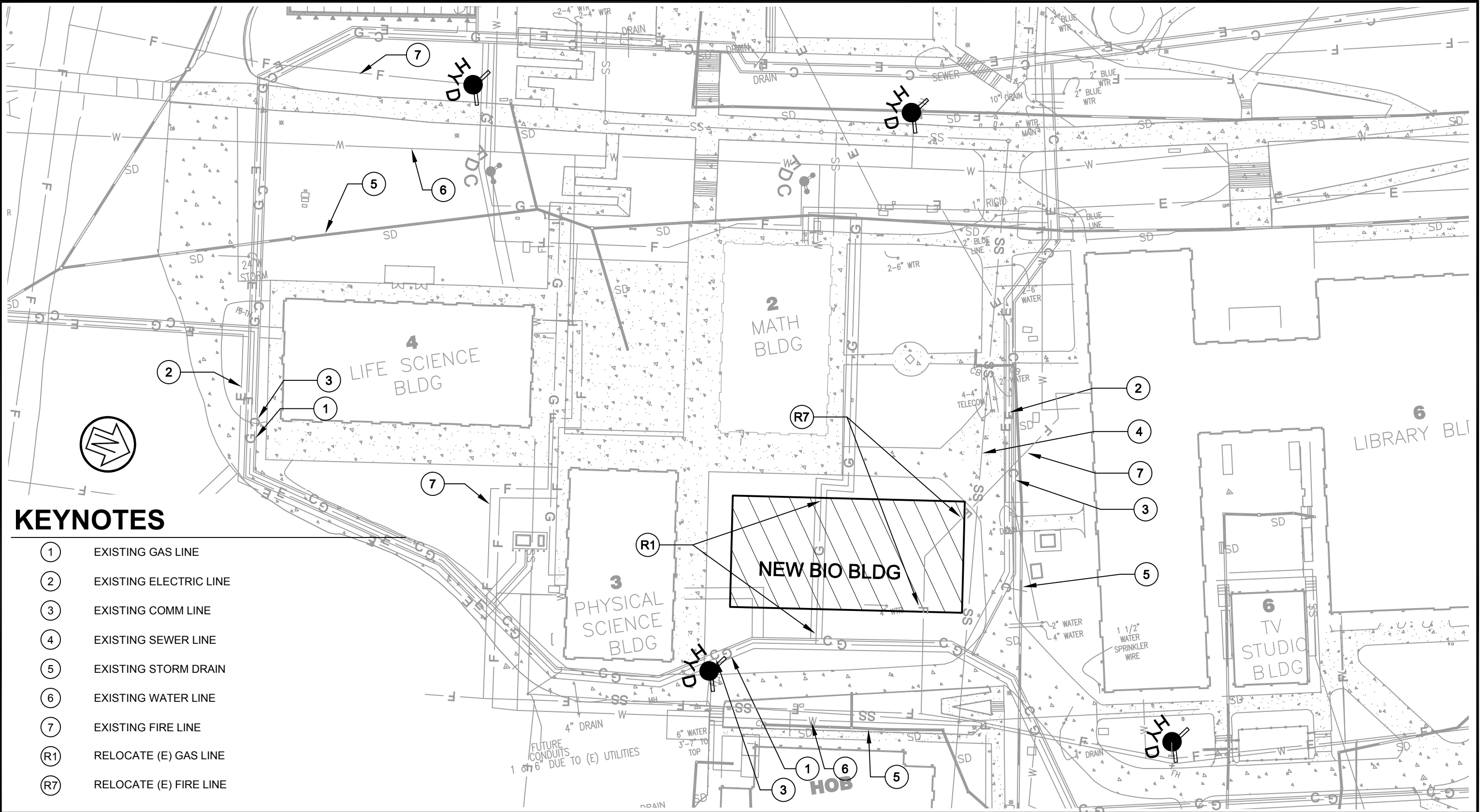
POWER AND COMMUNICATION

The existing electric and communication lines run along the south side of the library. There is also an existing communication line that runs along the east side of the proposed site. See Figure 5.1. The entire campus electric and low voltage systems were replaced in 2006 with new wiring and mostly new conduits. New services shall be provided to the Bio building by the DBE team.

DESIGN CRITERIA

- To be provided by dry utility consultant

Figure: 5.1 UTILITY COMPOSITE PLAN



Rev	Date	Description	Checked	<div>CSW ST2</div> <div>CSW/Stuber-Stroeh Engineering Group, Inc.</div> <div>Civil & Structural Engineers Surveying & Mapping Environmental Planning Land Planning Construction Management</div> <div>45 Leveroni Court Novato, CA 94949</div> <div>tel: 415.883.9850 fax: 415.883.9835</div> <div>http://www.cswst2.com</div> <div>© 2013</div>	Prepared Under the Direction of:	Job No. 2200081	Date: 04/22/22	
							Scale: 1" = 50'	
							<div>GAVILAN COLLEGE STEM PROJECT UTILITY COMPOSITE PLAN</div> <div>CITY OF GILROY SANTA CLARA COUNTY CA</div>	
-								

06

LANDSCAPE DESIGN CRITERIA

06

LANDSCAPE DESIGN
CRITERIA

INTRODUCTION

The Landscape Design Criteria establish a landscape framework and are intended to provide general direction to design professionals for the STEM Center project at Gavilan College. These criteria address the following areas:

- Hardscape Materials
- Site Furnishing
- Site Lighting
- Planting Overview
- Irrigation Materials
- Site Sustainability
- General Planting Notes

Refer to *Design Guidelines and Standards* for more information.

HARDSCAPE MATERIALS

Hardscape paving shall be easily maintained and of high albedo materials that mitigate conduction of heat. Walkways, driveways, plazas and gathering spaces shall be smooth and level to create a safe and pleasant pedestrian environment. Paving materials should be simple, long-lasting and durable. Hardscape finishes and colors shall reinforce the campus' connection to the surrounding landscape. Paving materials shall be durable and low maintenance. Reinforced cast in place concrete shall be used for the majority of pedestrian areas. Cast in place concrete shall use locally sourced sand and aggregate and warm, neutral integral colors that are high-albedo to reduce the Urban Heat Island effect. Concrete finishes and shall be retarder or other long-lived, long-wearing integral treatment. No surface applied stains nor stamped concrete finishes shall be used

Accent hardscape materials shall be used at plazas, terraces, promenades and other focal areas through a combination of pavers, integral color concrete, score joint patterns and contrasting finishes. Stabilized decomposed granite paving shall be used at tertiary pathways and small courtyards and gathering spaces that are located away from building entries.

Walls and stairs shall be cast in place concrete in colors and finishes to match paving and/or architecture. Handrails for ramps and stairs and guardrails at overlooks and drops greater than 30" shall be stainless steel of simple and uniform design that complements the architecture.

SITE FURNISHING

Well placed site furnishings greatly enhance the campus experience and contribute to the development of the campus community by creating inviting spaces for students, faculty and visitors. Site furnishings should include a combination of fixed and movable seating in a variety of sizes and configurations to appeal to a wide range of users. Benches should line pedestrian walkways to encourage people watching and spontaneous interactions. Tables, chairs, trash and recycle receptacles and built-in seating areas should be concentrated in plazas and courtyards to provide a variety of options for outdoor eating, studying or gathering. Light fixtures, benches, shelters, trash receptacles and bicycle racks should be uniform in nature with a complimentary palette of form and color to reinforce the overall campus identity. All site features and furniture, including trash and recycling receptacles, bollards, and other site furnishings shall match or better the quality of District standards. Site furnishings shall be of durable, materials such as pre-cast concrete, recycled plastic lumber, integrally finished metal such as cast aluminum or stainless steel. Wood should be avoided due to high maintenance requirements. Powder-coated finishes should be avoided in site furnishings that are subject to heavy use due to difficulty refinishing. Provide anti-graffiti coating as well as integrated or securely applied skateboard deterrents for furnishings and site features such as walls and raised planters.



SITE LIGHTING

Site lighting shall meet District design standards and guidelines for pedestrian walkways and plazas. 24 hour site lighting should be integrated to provide safe levels of illumination for visitors. Lighting locations are to be coordinated with all proposed trees, considering trees' mature height and canopy. Locations are to also be coordinated with other site elements such as furnishings and overhead building canopies. Pedestrian scale lighting should be provided at all courtyard and seating areas.

Lighting shall employ a variety of fixture types to illuminate pathways and gathering spaces to minimum code standards while minimizing visual clutter. All light fixtures shall be Dark Skies compliant and shielded to prevent glare for pedestrians. Fixture styles shall be modern but complementary to the existing architecture and natural context. Lamps shall be LED at a color temperature/ light value that maximizes visibility, minimizes color distortion and glare and deters crickets and other nuisance insects. Provide exterior power, charging ports and WiFi connectivity at exterior classroom, study and gathering spaces



PLANTING OVERVIEW

Planting is central to reinforcing the Gilroy campus' sense of place and is an essential component of creating inviting and functional outdoor spaces that both mitigate the climate and highlight what makes Gavilan College unique. The iconic foothill landscape of oaks, massed shrubs and grasses inform the entire character of Gavilan's campus.

Trees shall be generally evergreen canopy to provide year-round shade and minimize seasonal maintenance and clean-up. Large scale and legacy trees should be preserved wherever possible. Canopy and seasonal accent trees should be used for visual interest, varied scale and to define smaller gathering areas. For the STEM building canopy trees should be thoughtfully located to the south and west of use areas to provide shade. Generally plant materials shall be selected to provide year round interest including a combination of evergreen and plants with seasonal accents. To increase native biodiversity, native plants characteristic of the foothills should be prioritized in the naturalized, buffer and informal areas. Succulents can be used to provide accent and structure; they shall be located to minimize pedestrian contact. All plant materials shall be low water and low maintenance native or non-invasive, locally-adapted species with no known pests or diseases. For example coniferous evergreens should be avoided to minimize habitat for bark beetles. In addition, in recognition of seasonal fire hazards, plant materials shall be fire resistant. Use of turf grass on campus is limited to event and recreational areas and so is not appropriate for LSRC. Note due to heat gain and long term maintenance issues, artificial turf shall not be used on campus.

The following descriptions for courtyards and planting areas adjacent to the STEM building will help guide the creation of outdoor spaces that provide shade, privacy and visual delight.

NORTH STEM PLAZA

The North side of the STEM building faces a courtyard existing framed by mathematics and science buildings. The existing formal grove of canopy trees provides a shaded, shared entry and gathering space for these buildings. The existing trees should be assessed by an arborist and preserved. Upgrades to the courtyard should include refreshed understory planting, accessible pedestrian paths and shaded seating as well as security lighting. Circulation within the courtyard should provide an accessible link from Sycamore Lane through the STEM complex to the future pedestrian mid-terrace promenade to the east of the science complex.



EAST LEARNING GARDEN

The east side of the STEM building faces the existing Science Quad, an informal natural setting for outdoor collaboration, learning and relaxation. Existing large canopy trees provide a provide a shaded, comfortable environment for these outdoor activities. The planting and hardscape should be refreshed to provide ample program area for outdoor activities and a plant palette that reflect STEM academic program. The simple understory planting should consist of a mix of water-wise shrubs, groundcovers and perennials that provide separation and screening, defining outdoor rooms and seating areas. They should also provide curriculum value (for example plants with medicinal or ethnobotanic value; interesting adaptive behavior or drought-adapted morphologies). Cobbles and boulders used for mulch, landscape accents or seating areas should be selected to reflect the range of geological formations found in the geographical region. STEM faculty snd users should be engaged to help define relevant interpretive themes and topics for the plant palette.

WEST AND SOUTH BUILDING FACES

The west and south faces of the buildings face Sycamore Walk and the future mid-terrace pedestrian promenade. Planting should frame and screen views into and from the building, providing a softening buffer between pedestrians and classrooms. Secondary entries and egress paths shall be accessible.

IRRIGATION MATERIALS

All irrigation to be AB1881 compliant including but not limited to drip irrigation, low-flow heads, high efficiency rotors. No schedule 125 pipes shall be used on site. Irrigation equipment shall be Hunter unless approved by the District. Irrigation Water supply shall be reclaimed if available, or else piped for future connection to reclaimed water supply. Irrigation controllers shall include a weather based master irrigation controller that utilizes current weather data, rain shut-off device, and Ethernet connections for remote access, ensuring that the irrigation schedule is based upon actual "real time" plant needs allowing for greater system control and minimizes potential overwatering. Point-Irrigation (drip) systems shall be used to allocate more efficient delivery of water to root systems and minimize run-off. The use of overhead spray heads shall be limited to turf grass application.

All irrigation products specified shall achieve an operational uniformity of 80% in all landscape areas. Design of the irrigation system should be based upon solar exposure and plant groupings. Multiple valve boxes shall be provided for each of these variances. All trees shall have an additional support irrigation system providing water to each individual tree utilizing a bubbler system on a separate valve. Screening Hedges and vines shall each receive a dual point drip kit per plant. Point source/drip irrigation shall apply water to at least 60% of the root ball and shall be adjusted as the drip line or canopy edge of the plant matures.

SITE SUSTAINABILITY

Stormwater run-off shall be directed to planting areas wherever possible to allow recharge of the water table. Design of treatment and storage facilities shall consider aesthetics as well as function. Plant materials shall be low maintenance, native and locally adapted drought-tolerant species that also tolerate periodic inundation. Swales and basins shall be designed to create opportunities for adjacent seating and demonstration of LID principles.

Locally Sourced Materials: Natural materials such as hardscape aggregates, stone pavers and veneers, decomposed granite, cobbles and boulders shall be locally sourced to match site context.

Water Management: Plant materials shall be native and locally adapted drought-tolerant species, selected with consideration of appropriate sun exposure and arranged in groups with similar water requirements. Irrigation systems shall be high efficiency with plants with different water requirements on separate valves. Irrigation controller shall be equipped with a weather sensor.

The design of plumbing and mechanical systems shall consider treatment and reuse of water for irrigation. Examples include gray water, condensate and backwash from osmosis filters.

Gavilan College is a pesticide and herbicide-free campus: planting should be designed to facilitate hand-weeding and other non-chemical weed treatments. It is strongly recommended that all planting areas have a minimum of (2) grow-kill cycles after clearing and grubbing to minimize weeds. Additionally all planting areas shall have 3" of organic or mineral mulch. Weed barrier shall be used

at all decomposed granite and cobble or mineral mulch areas. Plants species shall have no known pests or diseases that require regular treatment. Principles of Integrated Pest Management shall be applied when considering planting design.

GENERAL PLANTING NOTES

The following notes are general requirements to assist in preparation of project specifications and construction documents:

EXISTING SITE

Prior to the start of work, the contractor shall familiarize himself with plant material identified by the District to be preserved, relocated, and removed. All planting to remain shall be protected from damage by staff and equipment and will be irrigated as necessary during the entire construction contract. All minor damage by contractor to existing trees and shrubs shall be repaired at the contractor's expense by a licensed tree surgeon or other approved personnel. Damage to a tree or shrub which results in death or permanent damage shall result in removal and replacement of the tree or shrub with one of equal value at contractor's expense.

SOILS TESTING

Soils percolation tests shall be performed prior to planting. If soil fails percolation tests, provide remedial measures for drainage of planting areas. Soils tests to determine texture, nutrients and required amendments shall be conducted prior to planting. Soils with high sodium content may require deep water leaching. Fill in all depressions, voids, erosion scars, or settled trenches generated by the deep leaching with conditioned soil, leaving a final finish grade smooth and even.

FINE GRADING & DRAINAGE

Coordinate all drainage work with all other trades. Established site drainage shall be maintained by contractor during all phases of landscape construction. Final finish grades shall insure positive drainage of the site with all surface drainage away from buildings, walls

and toward drains and catch basins. Minor modifications to grade may be required to establish the final grades. Clean all planting areas to a depth of twelve (12) inches, removing all weeds, debris, rocks, or other deleterious matter 1 inch diameter or larger from the site. All undulations and irregularities in the planting surfaces resulting from tillage, rototilling, and all other operations shall be leveled and floated out before planting. Final grades shall be approved by the District before planting operations will be allowed to begin.

SOIL PREPARATION

If the moisture content of the soil should reach such a level that working it would destroy soil structure, spreading and grading operations shall be suspended until the moisture content is increased or reduced to acceptable levels and the desired results are likely to be obtained.

Gavilan College District uses non-chemical weed control methods. Prior to planting, eradicate weeds within the limits of work using a minimum of two grow-kill cycles. Irrigate twice each day for approximately 5 to 10 minutes each watering time (as appropriate to site conditions) for a period of 30 calendar days. Apply compliant post emergent herbicide according to manufacturer's recommendations and/or physically remove weeds dead or alive within the limits. Take care to protect existing plant material which is to remain as shown on the plans. Existing native vegetation shall not be irrigated and irrigation run-off shall not spread to areas with existing native plants.

Grub / clean and rototill all planting areas to a depth of twelve (12) inches, removing all weeds, debris, rocks, or other deleterious matter 1 inch diameter or larger from the site (unless specified otherwise). Then blend in conditioners per the specifications.

LANDSCAPE ARCHITECTURAL DESIGN CRITERIA

ROOT BARRIERS

Each tree and shrub shall be placed in the center of the hole and shall be set plumb and held rigidly in position until the planting backfill has been tamped down around each root ball. All plants shall be set at such a level that after settling they bear the same relationship to the surrounding finish grade as they bore to the soil line grade in the container, unless otherwise noted. All plants shall be thoroughly watered into the full depth of each planting hole immediately after planting.

Root control barriers shall be installed where tree trunk is within five feet of hardscape (or closer). Install root barriers adjacent, and parallel to, edge of hardscape (linear application) and not encircling root ball. Barriers shall be 10 - ft. Min. Length; center strip of root barrier on the tree trunk.

PLANTING

Planting shall be performed during those periods when weather and soil conditions are suitable in accordance with locally accepted horticultural practice. Contractor shall only install as many plants as can be planted and watered on that same day. Plant locations shall be checked for possible interference with existing underground piping, prior to excavation of holes. If underground construction or utility lines are encountered in the excavation of planting areas, notify the owner. Expenses for repair of damage to existing utilities shall be the responsibility of the contractor.

All excavated holes shall have vertical sides with roughened surfaces and shall be of the minimum sizes indicated on drawings. Holes shall be, in all cases, large enough to permit handling and planting without injury or breakage of root balls or roots. Each tree and shrub shall be placed in the center of the

hole and shall be set plumb and held rigidly in position until the planting backfill has been tamped down around each rootball. All plants shall be set at such a level that after settling they bear the same relationship to the surrounding finish grade as they bore to the soil line grade in the container, unless otherwise noted. All plants shall be thoroughly watered into the full depth of each planting hole immediately after planting.

MAINTENANCE

Pruning shall not be done except by approval of the District. Landscape areas shall be kept free of weeds, noxious grass, and all other undesired vegetative growth and debris. Plant materials shall be kept in a healthy, optimum growing condition and in a visually pleasing appearance by watering, pruning, mowing, fertilizing, restaking, District-compliant pest and disease control strategies, weeding, clean-up and any maintenance operation necessary to insure a healthy, vigorous stand of plants at the time of final inspection.

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STRUCTURAL DESIGN CRITERIA

STRUCTURAL DESIGN CRITERIA

INTRODUCTION

The 2019 Facilities Master Plan Update for the Gavilan College Gilroy campus includes the development of a STEM Complex comprised of the repurposing of the existing Life Science Building into a STEM Center and the construction of a new Biology Building. The new Biology Building will be located to the east of the existing Mathematics Building and north of the existing Physical Sciences Building.

The preliminary schedule has the design of the new Biology building being submitted to DSA in 2024. The structural design shall be in accordance with Title 24 California Code of Regulations and the 2022 California Building Code (CBC) which will be effective January 1, 2023. In addition, the design shall consider the Division of State Architect (DSA) Bulletins, Guidelines, Interpretations of Regulations, Policies and Procedures documents as applicable.

The CBC adopts provisions specifically applicable to California Community College Buildings (CCC) per Education Code section 81053 that allow for alternative structural building standards that may be utilized for the design in lieu of the Field Act provisions. These alternate provisions are comparable to those enforced at other colleges and universities in California. Should the college want to use the alternate provisions, they are required to submit a written letter to DSA confirming use and the design criteria (DSA -SS/CC) shall be clearly noted on the drawings.

Structural design considerations for the LSRC include the architectural design aesthetic, open floor plans for the entry, shared spaces, library space and classrooms, MEP systems, acoustics, and vibrations. Market conditions, construction cost and construction schedule are also drivers in the selection of structural framing and lateral force resisting systems.

STRUCTURAL SYSTEMS

Structural design considerations for the Biology building include any architectural design features along with flexible and open floor plans for biology labs, prep labs, and general lecture classrooms. Market conditions, construction cost and construction schedule are also drivers in the selection of structural framing and lateral force resisting systems.

The gravity carrying system shall support the anticipated dead loads and minimum live loads and meet the minimum deflection code criteria specified within this document. Given this building is anticipated to be a single story, vibration criteria should be easily achieved with a slab-on-grade, however the site should be assessed for any ambient vibrations should vibration sensitive equipment be used in the labs.

Importance should be placed on the lateral force resisting system due to the high seismicity. The lateral system selection shall consider the program and building use, flexibility for future uses, and seismic performance and system ductility. The appropriate bracing and anchorage of building contents and nonstructural systems shall also be considered in the design and selection of the lateral system.

GEOTECHNICAL + FOUNDATION

The geotechnical engineering study and engineering geologic study prepared in June of 2021 by Atlas Technical Consultants LLC for the planned new Library Student Resource Center will be the basis of the foundation design for the new Biology Building.

There are no geologic hazards of concern; the soil is only moderately expansive and only moisture conditioning of the subgrade will be required; ground water is about 30 ft below the ground surface.

The building can be supported on conventional spread footings bearing on the existing native soil. Allowable bearing pressures for dead load are 3000psf, for dead plus live load are 4500 psf, and for loads including wind and seismic are 6000 psf.

BASIS OF DESIGN

LOADING CRITERIA

All construction shall comply with the following codes:

- Title 24, Part 2, 2022 California Building Code, based on 2018 International Building Code with any City of Gilroy Amendments.
- ASCE 7-16, Minimum Design Loads for Buildings and Other Structures
- ACI 318-19, Building Code Requirements for Structural Concrete
- AISC 360-16, Specifications for Structural Steel Buildings
- AISC 341-16, Seismic Provisions for Structural Steel Buildings
- AWS D1.1-15, Structural Welding Code
- AWS D1.8-16, Structural Welding Code, Seismic Supplement
- AISI S100-16/S1-18, Design of Cold-Formed Steel Structural Members

DESIGN LOAD COMBINATIONS

Load Combinations for use with Allowable Stress Design is per CBC 2022, Section 1605A.3.

Load Combinations using Strength Design or Load and Resistance Factor Design are per CBC 2022, Section 1605A.2.

WIND LOADS

Per the 2022 CBC, Section 1609A and 1609A.6 Alternate All-Heights Method, Design Factors:

- Basic Wind Speed: TBD
- Exposure Type: TBD
- Risk Category: TBD
- Importance Factor, I_w : TBD

SEISMIC LOADS

Seismic loads are per the 2022 CBC Section 1613A and ASCE 7-16 Chapters 12, 20 and 22. The seismic coefficients below, are per the geotechnical report.

- $SS = 1.527$, MCER ground motion (0.2 sec period)
- $S1 = 0.617$, MCER ground motion (1 sec period)
- $SDS = 1.222$
- $SD1 = 0.576$
- $F_a = 1.2$
- $F_v = 1.4$
- Site Class: Site Class C, very dense soil, soft rock

Once the design builder selects a seismic lateral for resisting system the following seismic factors can be determined.

- Response Modification Factor, R
- Displacement Amplification Factor, C_d
- Overstrength Factor, Ω_o
- Seismic Response Coefficient, CS
- Seismic Design Category
- Risk Category: to be coordinated with architect based on occupancy and potential for hazardous materials
- Importance Factor, $I_e = \text{TBD}$, likely 1.0

BASIS OF DESIGN CONT'D

GRAVITY LOADS

Gravity dead loads will consist of the computed actual weights of materials of construction and fixed equipment/furniture.

Table 7.1 LIVE LOADS*:

Office & Classroom	50 PSF + 20 PSF partitions
Corridors & Exit ways	80 PSF + 20 PSF partitions
Mechanical/Electrical Rooms	125 PSF (or actual weight if heavier)
Light Storage	125 PSF
Roofs	20 PSF

CONCENTRATED LOADS 2,000 pounds

*Live loads may be reduced where permissible by ASCE 7-16 and CBC 2022.

DEFLECTION CONTROL

Structural framing members are designed to limit deflections per ASCE 7-16 and CBC 2022 with the following minimum criteria:

Table 7.2 DEFLECTION CONTROL CRITERIA

Roof LL (Plaster and Stucco ceiling)	L/360
Roof LL (Non-plaster ceiling)	L/240
Roof LL (No ceiling)	L/240

VIBRATION CONTROL

Floors are designed to meet recommended limits specified in AISC Design Guide 11 “Floor Vibration Due to Human Activity” for single walkers, multiple walkers, for fast, moderate, and slow walking pace. Given that a single story building is planned, we do not anticipate that vibrations will be of concern unless there is some ambient vibrations near the site from equipment, vehicles or others operations.

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MECHANICAL DESIGN CRITERIA

MECHANICAL DESIGN CRITERIA

INTRODUCTION

The Heating, Ventilation, and Air Conditioning (HVAC) systems shall be designed with an emphasis on energy efficiency, reliability, and ease of maintenance. The Design-Build Entity (DBE) is responsible for final systems selection, design, engineering, installation, and performance for a complete and functional system that meets all requirements of the RFP. DBE shall select locations for all mechanical, electrical, and plumbing equipment. DBE is responsible for coordination of mechanical systems with the rest of the project. Systems covered by this Narrative include:

- HVAC Systems
- Controls and Monitoring

The building’s energy efficiency shall meet or exceed the minimum performance requirements of the California Energy Code in effect at the time of submission to the Authority Having Jurisdiction (AHJ).

The project consists of a new Biology Building and the interior renovation of the existing LS Building to include program for:

- Biology classroom and lab space including Cadaver and Bone rooms.
- Maker space.
- General classroom and collaborative learning spaces.
- Office spaces.

Existing Life Science (STEM Building) mechanical systems to be modernized or replaced. DBE to coordinate scope with District M&O leadership to understand problems or issues to be resolved with the existing systems.

All spaces shall be provided with heating, ventilation, and air conditioning unless approved in writing by the District. Provide complete design and construction of the new HVAC and controls systems for the new building. All HVAC systems shall utilize electricity as the primary heating and cooling energy source. Natural gas-fired equipment shall not be provided. Gas or propane-based backup heating systems may be proposed at the DBE’s discretion, pending approval from the Owner.

HVAC DESIGN GENERAL

Ease of maintenance and low operational costs of the HVAC system and its components shall be a priority of the DBE. The operation and maintenance of HVAC system should be within the capacity of the District's maintenance staff's realm of abilities and equipment.

Access to primary mechanical equipment shall be through doors or gates; the design shall avoid limited access paths such as, but not limited to, ladder-only access, roof hatches, and manhole vaults. A defined walking path shall be provided on the roof to all major mechanical equipment with bridges over all duct, piping, and conduit obstructions. Provisions shall be made for maintenance and repair of the HVAC equipment so that these events can take place without special equipment and rigging of parts and materials into place. Mechanical equipment shall not be visible from grade level outside the building, nor from nearby buildings. DBE shall screen HVAC equipment through the use of parapets, building façade, roof screens, equipment enclosures, or similar Architectural features.

Designer shall not locate mechanical equipment directly overhead of sound sensitive spaces. Typically the equipment that will cause noise and vibration issues includes, but is not limited to: exhaust fans, air handling units, air conditioning units, or condensing units. Mechanical equipment that is needed directly for the spaces, such as exhaust fans, air distribution grilles, registers, and diffusers shall be designed to operate within the acoustical requirements listed in the acoustical design criteria. Additional noise mitigation may be required for systems that serve sensitive spaces such as library and study rooms.

Access to mechanical spaces through offices and/or classrooms is prohibited.

The HVAC equipment shall not use hard to find components or custom-made parts that will need to be replaced as part of routine or lifetime maintenance. Should the contractor submit equipment not listed as an acceptable manufacturer in the specifications the equipment shall have locally stocked parts and service available within a 150-mile radius of the campus for all HVAC equipment.

DBE is responsible for calculating heating and cooling loads and final equipment selections. Any HVAC loads and equipment capacities provided in this document are estimated from the campus programming needs and are for reference only. Loads shall be calculated using an industry standard calculation software such as Trace 700, HAP, IESVE, or similar. Title 24 performance approach shall be used to determine compliance with the California Energy Code. Energy model shall be run in a software approved by the California Energy Comission such as EnergyPro or IESVE.

DESIGN CRITERIA

A complete HVAC system is required. HVAC systems must comply with California Building Code, California Mechanical Code, California Energy Code, and California Fire Code. Where these codes are silent, use current edition of the ASHRAE handbooks at the time of design. Dust collection systems shall be compliant with NFPA 664 in addition to all California Codes.

APPLICABLE CODES

The below listed codes are based on an assumed DSA submittal on or prior to December 31, 2025. Design builder is responsible for designing a code compliant building under the applicable codes at the time of submission to the Authority Having Jurisdiction.

- California Building Standards Administrative Code (Title 24, Part I), 2022
- California Building Code (Title 24, Part 2), 2022
- California Mechanical Code (Title 24, Part 4), 2022
- California Energy Code (Title 24, Part 6), 2022
- California Fire Code (Title 24, Part 9), 2022
- California Green Building Standards Code (Title 24, Part 9), 2022
- California Reference Standards Code (Title 24, Part 12), 2022

REFERENCE ORGANIZATIONS AND GUIDELINES

AMCA:	Air Movement and Control Association
ANSI:	American National Standards Institute
ARI:	Air Conditioning and Refrigeration Institute

ASHRAE:	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
NFPA:	National Fire Protection Association
OSHA:	Occupational Safety and Health Administration, U.S. Department of Labor
SMACNA:	Sheet Metal and Air-Conditioning Contractors National Association
UL:	Underwriters Laboratories, Inc.

USE OF CURRENT VERSIONS

The above codes, standards, and guidelines shall be the current adopted editions, including all effective addenda, amendments, publications, supplements, and references to such in effect upon award of the Project.

Reference to the standards of any technical society organizations, or association, or to the laws, ordinances or codes of governmental authorities shall mean the latest standard, code, or specification adopted, published, and effective at the date of award, unless specifically stated otherwise in this document.

See Chapter 4 Room Data Sheets for additional requirements that may affect the HVAC design associated with individual program spaces. Use the following design condition and load allowance information for performance calculations:

- Project Location Gilroy, California 95020
- Latitude 36.975°
- Longitude -121.569°
- Elevation 220 feet

ENERGY EFFICIENCY

The DBE must certify at the completion of the project that the building meets or exceeds the 2019 edition of California Title 24 Non-Residential Building Standards.

OUTDOOR DESIGN CONDITIONS

Heat gains and losses to the exterior shall be calculated using ASHRAE outdoor design conditions at frequency levels of 0.4% for summer dry bulb and wet bulb temperature and 0.4% for winter dry bulb temperature.

Table: 8.1 OUTDOOR DESIGN CONDITIONS

	SUMMER	WINTER
Design Temperature	93/68°F	28°F
Mean Daily Range	25 °F	

INDOOR DESIGN CONDITIONS

All occupiable spaces shall be designed to maintain temperatures in accordance with ASHRAE Standard 55 for thermal comfort. All spaces containing temperature sensitive equipment shall be designed to maintain temperature within the allowable range of that equipment.

Relative humidity between 30% and 80% is considered normal for the air conditioning system. The spaces in this building do not require specialized humidity control equipment. IDF/BDF spaces shall maintain space relative humidity between 30-50%. DBE to determine if specialized humidity control equipment is required for these spaces.

EXTERNAL LOADS

External loads must be based on listed design conditions and the proposed materials and construction for the building. Manually operated internal shading may not be used to reduce the load calculated. Fixed exterior shading may be allowed to reduce calculated cooling load.

VENTILATION RATES

The amount of ventilation air provided to each space shall be calculated per California Energy Code. Spaces that utilize CO2 sensors for demand control ventilation shall have an absolute minimum ventilation rate of 0.15 CFM/ SF, regardless of the space occupancy.

All spaces shall be mechanically ventilated continuously during hours of scheduled occupancy. Systems with demand control ventilation shall be provided with direct airflow measurement (air flow measurement stations) to ensure minimum outside airflow rates are maintained. Air flow measuring stations should have low pressure drop with the air handling system in 100% economizer mode.

INTERNAL LOADS

Lighting Load: Calculate based on proposed light fixture specifications and design.

People Load:

- Rooms with fixed or movable seating: the greater of the two calculations – actual seat count or 50% of the occupancy used for egress puproses.
- Corridor and circulation areas: 150 SF/person.
- Occupant density for all other areas shall be per California Energy Efficiency Standards.

Special Room Loads:

- BDF Telecommunications Rooms: 12,000 BTU per hour minimum. Mechanical Engineer shall calculate actual heat load in room based upon telecommunications design.
- IDF Telecommunications Rooms: 12,000 BTU per hour minimum. Mechanical Engineer shall calculate actual heat load in room based upon telecommunications design.
- Elevator Equipment Rooms: Refer to basis of design manufacturer's heat loads.

Space load calculations should model required space temperatures per the 2021 ASHRAE Fundamentals Handbook, Load and Energy Calculations. The portion of the load attributable to elements above this level should be applied to the cooling system only, not the space. Trace 700, HAP, eQUEST, or approved software shall be utilized.

HVAC SYSTEM DESIGN CRITERIA

DBE shall propose Mechanical system configurations in their design-build proposal. Systems shall be selected in accordance with the requirements of the criteria and with the following priorities in mind:

- Gas-fired equipment shall not be used for this project. All HVAC systems shall be fully electric.
- Local availability of parts
- Maintainability
- Access for service
- Future flexibility
- Energy efficiency
- Overall system life cycle cost

Equipment installation shall comply with the following requirements:

- 1.Ensure minimum service clearances are maintained for all equipment as recommended by the manufacturer.
2. No equipment shall be within 10’ of the edge of a roof unless parapet height exceeds 42” above the finished roof surface.
3. Provide spare parts for all equipment as recommended by the manufacturer.
4. Provide startup filters for all air handling systems and replace all startup filters prior to turnover. Furnish two additional sets of replacement filters for all air handling systems.

DEDICATED HEATING AND COOLING UNITS

BDF/IDF, elevator machine, and inverter rooms shall be provided with dedicated direct expansion (DX) heat pump split systems to provide 24/7 thermal control. This requirement shall extend to any room dedicated to the use of telecommunications equipment. Split systems shall include a ducted fan coil located outside of the room of service, with ducted supply and return to and from the room.

DUCTWORK

All duct systems shall be constructed of rigid sheet metal, except for connections to equipment and runouts to grilles, registers, and diffusers 5’ or less. Ductwork sizing and routing will be coordinated with all other systems, including structural, architectural, and fire protection.

Ductwork system will be designed in accordance with the latest edition and printing of the ASHRAE and SMACNA HVAC Systems Duct Design Manual.

PIPING

If Hydronic systems are proposed, piping shall be designed for the temperatures and pressures required by the design. Ductile iron piping is prohibited. All hydronic piping shall be sized in accordance with ASHRAE 90.1. Piping support spacing shall be in accordance with the California Mechanical Code or the manufacturer’s recommendations; the more stringent requirement shall apply.

Heating hot water piping shall have isolation and bypass valves at the building to isolate it from the campus central distribution system. New underground piping shall be provided with leak detection, thermal expansion loops, and accessible service valves as required.

Isolation valves shall be located throughout the systems to allow for ease of maintenance. At a minimum, provide valves at each floor. Depending on the layout, it may be beneficial to install additional valves to isolate smaller sections of floors.

EXHAUST SYSTEMS

New exhaust systems shall be segmented by service. Exhaust for one service shall not be connected to exhaust of any other service. Exhaust systems shall consist of:

- Permanent product conveying exhaust system (dust collection) for maker labs.
- Dedicated exhaust systems for Educational Science Laboratory spaces
- General exhaust for restrooms, janitor closets, copy rooms, café, and other Air Class 2 spaces not otherwise noted.

Exhausted spaces shall be under negative pressure relevant to adjacent spaces. Return air from these spaces is not permitted. It is preferred that one common exhaust system is used for each exhaust system if the building layout permits this. The exhaust fans will be located on the roof. The exhaust fans shall be manufactured by Greenheck, Loren Cook, or equal. General requirements for exhaust systems listed below:

- The restrooms shall have a minimum exhaust rate of 70 CFM per fixture (water closets and urinals).
- Direct drive exhaust fans with electronic speed control are required. Exhausters/Ventilators shall have a bird screen, back-draft dampers, and factory roof curb (where appropriate). Belt drive fans are only permitted for excessive static pressures, but direct drive is preferred.
- Roof top exhaust fans for ventilators shall not be located within six feet of a roof edge.
- Exhaust systems for janitor’s closets or other spaces with potentially noxious fumes shall operate 24/7.

HVAC SYSTEM DESIGN

CRITERIA CONT'D

HVAC CONTROLS

The building automation/energy management system shall be open-source with no proprietary drivers or software. All components shall be compatible with the BACnet protocol (ANSI/ASHRAE Standard 135-2016). The building controllers shall integrate with central utilities control systems. The system shall be able to integrate multiple building functions, including equipment supervision and control, alarm management, energy management, historical data management, and archiving.

All control panels shall be stand alone in memory, networking, and control operations. The design of the controls shall be in a modular format, permitting future expansion capabilities. The system shall monitor and control equipment according to the sequence of operation, as well as additional input and output points. The building control system shall operate to ensure operational safety, regulatory compliance, and to satisfy process constraints as well as occupant comfort.

All HVAC systems shall be zoned for thermal comfort. Each meeting room shall be an independent thermal control zone. Offices with an identical load profile may be zoned together with a maximum of three private offices per thermal control zone. Large spaces shall be divided into interior and perimeter zones. Flex rooms with combineable spaces shall be provided with a separate zone control for each partitioned area.

Each thermal control zone shall be provided with an adjustable, Title 24 compliant temperature sensor with setpoint and temperature display built-in. Combination sensors shall be provided for spaces with CO2, relative humidity, or occupancy sensing controls. Device mounting shall comply with CBC requirements for accessibility and combo sensors with CO2 sensing shall be installed in accordance with the Energy Code.

Project shall include all associated software and graphical programming required for a fully functioning building automation system. Controls shop drawings shall indicate the proposed graphics, control points, and trending data to be programmed into the BAS system. Sample screens for the BAS shall be reviewed and approved by the campus. BAS software shall be housed on a server located on campus provided by the DBE.

DDC Points; DBE shall provide unique and discrete points for each input and output, for both analog and digital points. Ganging points together shall not be allowed.

DBE shall submit as part of their proposed design a list of equipment that will be connected to the DDC system. They shall identify any additional DDC points needed for their design that was not listed above. They shall provide a list of DDC points listed above that are not used in their design. DBE shall provide a unit cost for additional points as part of the proposal.

Building submetering is recommended to provide maximum visibility to the Campus on how their energy is being used and to optimize building efficiency.

EQUIPMENT STARTUP

All new mechanical equipment shall be started up by factory-trained personnel in accordance with manufacturers' recommendations. DBE shall coordinate with manufacturer's representatives for any equipment requiring factory startup. Include all startup reports as part of the project close out documentation.

TEST AND BALANCE

DBE shall provide air and water systems balanced by an independent test and balance (TAB) contractor with active NEBB or TABB certification. The TAB contractor shall also perform duct leakage testing in accordance with California Mechanical Code and SMACNA standards. Include all test and balance reports as part of the project close out documentation.

COMMISSIONING

All building HVAC systems shall be commissioned in accordance with Title 24 and District requirements. DBE shall participate in all building commissioning activities as required by the commissioning agent.

09

PLUMBING AND FIRE PROTECTION DESIGN CRITERIA

PLUMBING AND FIRE PROTECTION DESIGN CRITERIA

INTRODUCTION

The plumbing and fire protection systems shall be designed with emphasis and focus on low flow fixtures and systems to achieve a sustainable building.

The intent of this report is to establish a basis of design / criteria for the plumbing discipline to meet the project requirements and coordinate the integration of these systems into the building architecture. The design of the proposed project will incorporate the objective of providing a system that complies with the occupant needs and provides a more efficient and safer environment. The scope of Plumbing shall include plumbing fixtures, domestic water distribution, sanitary sewer, waste, vent, storm drainage, deionized water and acid waste system.

- Plumbing and Piping
- Fire Suppression

PLUMBING AND PIPING

APPLICABLE CODES

- California Building Standards Administrative Code (Title 24, Part I)
- California Building Code (Title 24, Part 2)
- California Plumbing Code (Title 24, Part 5)
- California Mechanical Code (Title 24, Part 5)
- California Energy Code (Title 24, Part 6)
- California Fire Code (Title 24, Part 9)
- California Reference Standards Code (Title 24, Part 12)

Table: 9.1 REFERENCE ORGANIZATIONS AND GUIDELINES

ANSI:	American National Standards Institute
AGA:	American Gas Association
ASME:	American Society of Mechanical Engineers
ASSE:	American Society of Sanitary Engineers
ASTM:	American Society of Testing and Materials
AWWA:	American Water Works Association
CISCP:	Cast Iron Soil Pipe institute
NSF:	National Sanitation Foundation
PDI:	Plumbing and Drainage Institute
NFPA:	National Fire Protection Association
OSHA:	Occupational Safety and Health Administration, U.S. Department of Labor
SMACNA:	Sheet Metal and Air-Conditioning Contractors National Association
SOCCCD:	South Orange County Community College District Design Standards
UL:	Underwriters Laboratories, Inc
NFPA 13:	Installation of Sprinkler Systems
NFPA 14:	Standards for Installation of Standpipe, Private Hydrant and Hose Systems
NFPA 24:	Installation of Private Fire Service Mains and their Appurtenances

USE OF CURRENT VERSIONS

The above codes, standards, and guidelines shall be the current adopted editions, including all effective addenda, amendments, publications, supplements and references to such in effect upon award of the Project.

Reference to the standards of any technical society organizations, or association, or to the laws, ordinances or codes of governmental authorities shall mean the latest standard, code, or specification adopted, published and effective at the date of award, unless specifically stated otherwise in this document.

DOMESTIC WATER SYSTEMS

A new domestic water service line and backflow prevention shall be provided for the new building to provide for all domestic water demands as well as industrial water needs.

A central backflow prevention device shall separate the domestic and industrial services. Domestic cold water shall be distributed to fixtures throughout the building via looped distribution through each floor of the building. Looped piping is to be supplied on each floor to maintain water flow / pressure to all fixtures equally.

Domestic cold water supply shall connect to the new cold water campus distribution loop. Points of connection will be coordinated with Civil Engineer. A water meter located at the building entry and connected to the EMS shall be provided and coordinated with Mechanical and Electrical accordingly.

A new Electric Water Heater shall be provided to supply for all domestic hot water needs. Instantaneous Water Heaters will be used for remote locations if needed. A hot water recirculation pump shall be provided with a

7day/24hr programmable time clock. Water temperature within the hot water distribution system shall be maintained by means of a hot water return system designed to maintain a 10-Degree-F temperature differential between the hot water supply and return piping connections at the storage tanks.

The hot water heating equipment and associated components will be located in a dedicated water heater room. Hot water shall be routed to all domestic plumbing fixtures. All hot water distribution piping will be insulated with appropriate thickness of insulation and fire-retardant jacket.

The cold water systems shall be sized using flush valve curves, and hot water systems using flush tank curves. Size equipment branches and mains based on flow requirements without diversity.

Isolation Valves shall be provided at each level of the building. Groups of fixtures on each floor shall be provided with isolation valves for ease of maintenance. Each plumbing fixture shall also be provided with individual isolation valves (fixture stops) for maintenance purposes. Water temperature shall be controlled by a thermostatic mixing valve at the water supply side of the fixture.

Restroom fixtures shall be operated by hard wired, infrared technology. Faucets and flush valves shall be provided with metal cap and manual bypass. Water closet flush valves shall be dual flush type. Water hammer arrestors shall be provided in the wall, as required, behind an access panel.

Trap primers with access panels for all floor drains and floor sinks shall be provided.

Isolation valves and unions at equipment connections are required.

PLUMBING AND PIPING CONT'D

Refer to Campus Standards and Specifications for additional requirements. Refer to room data sheets for provision of fixtures and services in each of the spaces.

Minimum residual pressure at most remote water closet is required to be at least 25 psig. Install pressure regulators to comply with California Plumbing Code, Chapter 6 should the incoming pressure exceed 80 psig. Contractor shall obtain the latest flow test data to determine the need for booster pump and/or Pressure reducing valve. If a booster pump is determined necessary contractor shall design a booster pump in full compliance with plumbing code and provisions of this design criteria. See booster pump design criteria below. If the incoming pressure exceed 80 psig then a pressure reducing station shall be provided. See Pressure Reducing Station below.

Water velocity exceeding 5 ft/sec is unacceptable.

Minimum supply pipe size is ½” for one plumbing fixture with a maximum flow of 2.0 gpm, 1-1/2 for a flush valve water closet, 3/4 for a shower or sink and 3/4 for a urinal.

Provide ¾-inch hose bibs to allow service to all areas of the exterior including the roof with a 50-foot hose.

Additional Hose bibbs at roof for future PV panel wash down (if any) shall be provided.

Separate isolation valves are required for main supply to building, each toilet room, each floor and each zone or lab spaces.

Routing of water lines in Electrical, Elevator Machine, IDF or BDF rooms shall not be permitted.

Provide 0.35 gpm aerator with lavatory faucets to meet Cal Green requirements. Chrome plated stops with gasket seats are required for sinks, lavatories, and wash basins when exposed to public view. Provide at least one hose bibb with vacuum breaker in a lockable cabinet under the lavatories in each public toilet room. Exposed branch water supply piping in toilet rooms and custodial rooms must be chromium plated. Floor type service sinks are required in custodial closets and shall include removable rim guards, mop hanger bracket and stainless steel splash panels.

BOOSTER PUMP

- Booster pump to be equip with VFD.
- Provide full size by-pass line for the booster.
- BMS to be provided and coordained with Electrical and Mechanical. Control Conduit shall be extended from booster pump to IDF/ MDF room.
- Provide a pump that is a Duplex minimum with a lead lag sequence.
- Provide Expansion Tank and size per manufacturers recommendation.
- Provided skid mounted package system.
- Meet building demand for total GPM and total feet of head.
- PRV at discharge side of booster pump.
- Floor sink provided in front of booster pump with trap primer.
- Housekeeping pad for booster pump and tank.
- Provide pressure gauges at inlet and outlet of pump.
- Booster control panel to have graphical LCD screen.

PRESSURE REDUCING STATION

Pressure Reducing station to be multi stage with a high low arrangement.

Floor Sink with trap primer to be provided in front of Pressure Reducing Station.

Pressure relief valve to be provided immediately downstream of PRV.

The drain line from pressure relief valve to be piped to discharge into the floor sink with 2” air gap.

A full size by pass line to be provided.

Hub drain for the fire sprinkler system main drain inside the fire riser room on the ground floor will be provided and connected to the sanitary system as applicable. Coordination with Fire Sprinkler contractor will be required.

ACID WASTE SYSTEM

Acid waste shall serve all science classrooms and science prep/workroom sinks for both student and Instructor use where corrosive chemicals might be used.

An exterior chemical sample box and Neutralization Tank shall be provided and placed underground prior to connecting to the sanitary sewer lateral serving the building.

Sample box shall include a removable gastight, bolted cover, p-trap and cleanout.

A combination emergency eye/face wash and shower shall be provided in the Science Lab with adjacent floor drain connected to acid waste/ vent with Trap Primer.

A pull-down emergency eye/face wash shall be provided in the Workroom at the common sink.

Acid Waste stub-out for connections to fume hood (if any) will be provided. Location of fume hoods to be determined.

Acid waste vents shall not interconnect with vents of other Plumbing systems.

Floor drain with trap primer shall be provided at all deluge shower locations within classrooms or workroom areas.

STORM DRAINAGE SYSTEMS

The building storm drainage system shall be sized based on Chapter 11, Table 1101.7 and 1101.11 of the California Plumbing Code. Sizes shall be based on 2”/hour rainfall intensity.

A complete gravity storm drainage system connecting to each roof drain and overflow drain shall be provided.

Roof drains will be collected and connected to separate risers and will be connecting to the underground on-site storm drainage system per coordination with Civil Engineer. The Civil Engineer will collect the roof drainage system from the building to central collection points including any perimeter exterior drains.

Primary drainage will be connected to campus infrastructure while Secondary (Overflow) drains will daylight and terminate thru face of outside wall at 12” to 18” above finished grade. Provide wall flanges at overflow terminations.

Sump pumps for general building drainage are acceptable only if gravity flow cannot be achieved, in which case duplex submersible style intrinsically safe units equipped with automatic float controls and high-water alarms are required. All basins must be designed for full immersion.

PLUMBING AND PIPING CONT'D

DEIONIZED WATER (DI)

A central deionized water system shall be provided for the buildings to satisfy laboratory requirements.

Deionized water shall be generated utilizing centrally located equipment.

Initial cost, operating cost, environmental consideration and minimization of chemical use, reliability, and constructability shall be considered. Serviceability for vendor shall be considered in the equipment layout to facilitate access to equipment that requires periodic replacement.

Type I of II ASTM water quality shall be provided. Purity requirements shall be verified with users.

Point of use polishers shall be utilized where higher purity is required by individual users. Threaded fitting shall be provided at point of use water polisher connection. Local polishing equipment shall be owner furnished and owner installed. Local polishing equipment shall be owner furnished and owner installed.

Associated equipment to be provided as part of this project shall include DI storage tank(s), distribution supply and recirculation piping, and associated pumps. Duplex pumps at 100% capacity each shall be provided for the main distribution DI loop. Ultra-violet light treatment with dual supply filters with independent control valves shall be provided.

Sizing of equipment shall be determined based on laboratory DI outlets and equipment demand (such as glass washers, etc.) as well as distribution/recirculation pipe routing and configuration.

Supply and recirculation distribution piping shall be routed throughout the building to serve each

laboratory with DI water requirements.

Each floor shall be provided with separate DI loop complete with balancing valve, shut-off valve, and flow meter.

Water velocity in the piping shall be between 6 to 9 ft/sec for the supply loops, and 3 to 6 ft/sec for the return leg.

Shut-off valve shall be provided to each laboratory room.

System shall be designed to avoid dead legs greater than 6 times the pipe diameter.

HW, CW ABOVE GRADE:	Copper tube, Type L, with wrought copper fittings with brazed or soldered joints.
HW, CW BELOW GRADE:	Copper tube, Type K, with wrought copper fittings with brazed joints.
W, V BELOW GRADE:	Heavy duty cast iron. No hub, minimum 1/4" per foot slope with Polyethylene tubing or pipe wrap.
W, W, V ABOVE GRADE:	Heavy duty cast iron. No hub, minimum 1/4" per foot slope.
AW, AV ABOVE GRADE:	Flame Retardant Polypropylene (PP), sch. 40 above grade with fused fittings
AW, AV BELOW GRADE:	Flame Retardant Polypropylene (PP), sch. 80 with fused fittings
Condensate (CD):	Type "L" copper, insulated, minimum 1/4" per foot slope.
SD, OD:	General Service cast iron. No hub, minimum 1/4" per foot slope. Piping located under the building slab will be extra-heavy weight, hub-and-spigot soil pipe.
DI:	Polypropylene pipe and fittings with heat fusion joints (Pipe type must be rated for Di water).

PLUMBING FIXTURES

Water closets @ 1.28 GPF w/ Hardwired, Sensored flushvalves – American Standard, Kohler, Sloan

Urinals – Sloan @ 1/8 GPF w/ Hardwired, Sensored flushvalves – American Standard, Kohler, Sloan

Lavatory @ 0.35 GPM w/ metered operation faucet – American Standard, Kohler, Chicago Faucet

Classroom/Lab sink faucets @ 1.5 GPM w/ Manual faucet – Elkay, Chicago faucet, Sloan

Garbage Disposals: ABS with stainless steel grinding elements, 3/4-HP.

Drinking Fountains: Stainless steel, dual dish, refrigerated, 120-VAC (hardwired) with bottle filler.

Mop Sinks: Enameled cast iron, floor mounted.

Mop Sink Faucets: Chrome plated brass.

Hose Bibs: Rough cast brass, loose key tee.

Wall Hydrants: Rough cast brass, wheel handle, aluminum box and locking cover.

Floor Drains: Cast iron with nickel bronze strainers.

Floor Sinks: Enameled cast iron, with enameled cast iron grate.

Roof Drains: Cast iron with cast iron domes.

Emergency Eye Wash / Shower: Combination emergency eye wash / shower. Meets ANSI Z358.1-2014 Requirements

FIRE SUPPRESSION

FIRE PROTECTION SYSTEM
DESIGN GOALS, GENERAL

A firewater line shall be connected to the Campus Fire Water Loop. A double detector check assembly (DDCA) shall be installed outside the building to protect the supply water main. Downstream of the building DDCA, a fire department connection (FDC) shall be provided to allow the fire department to pressurize the building firewater lines. An electric driven fire pump dedicated to the building shall also be installed inside the fire pump room. The fire pump shall be sized and installed in full compliance with NFPA 20 and CFC.

APPLICATION CODES

California Building Standards Administrative Code (Title 24, Part 1)

California Building Code (Title 24, Part 2)

California Plumbing Code (Title 24, Part 5)

California Fire Code (Title 24, Part 9)

California Referenced Standards Code (Title 24, Part 12)

PUBLICATIONS AND STANDARDS

Underwriters Laboratories (UL)

National Fire Protection Association

NFPA 13 - Installation of Sprinkler Systems, 2016 Edition

NFPA 14 – Standard for the Installation of Standpipe and Hose Systems, 2016

NFPA 20 – Installation of Stationary Pumps for Fire Protection, 2016

NFPA 24 - Standard for the Installation of Private

Fire Service Mains and Their Appurtenances, 2016 Edition

NFPA 72 – National Fire Alarm and Signaling Code, 2016 Edition

APPLICATION

Light Hazard – Common spaces, Administration spaces, Lounge, Restrooms, concessions and ticket, Green room

Design Density: 0.1 GPM/SF

Ordinary Hazard Group I – Black Box, Control Rooms, Telecom rooms, Mechanical rooms, Storage rooms, Electrical rooms, Custodial rooms

Design Density: 0.15 GPM/SF,

Ordinary Hazard Group II – Stages and seating areas, Loading galleries, Trap room, Scene Shop, Costume shop

Design Density: 0.2 GPM/SF

Non-separated rooms – rooms shall assume the hazard classification of highest-hazard adjacent space where there is no sufficient separation per CBC

Design Density: Varies bases on hazard classification

SYSTEM DESCRIPTION

Water Supply shall be from a fire water line tying into a dedicated fire water system comprised of a backflow preventer, fire water meter and Post Indicator valve.

Protection Area per head:

Table 9.3 PROTECTION AREA PER HEAD

CONSTRUCTION TYPE	MAX. PROTECTION AREA (SF)	MAX. SPACING (FEET)	OCCUPANCY CLASSIFICATION
Noncombustible unobstructed	225	15	Light Hazard
Noncombustible obstructed	225	15	Light Hazard
Combustible unobstructed w/ no exposed members	225	15	Light Hazard
Combustible unobstructed w/ members less than 3ft on center	130	15	Light Hazard
Combustible obstructed all w/ exposed members 3ft or more on center	168	15	Light Hazard
Combustible obstructed all w/ members less than 3 ft on center	130	15	Light Hazard
Combustible concealed all spaces in accordance w/ 8.6.4.1.4	120	15 parallel to the slope 10 perpendicular to the slope	Light Hazard
ALL	130	15	Ordinary Hazard

FIRE SUPPRESSION CONT'D

SYSTEM COMPONENTS

The system components shall include the following:

- Fire Pump
- Fire Pump Controller interconnected with the building FACP
- Jockey Pump
- Jockey pump controller
- FDC
- Fire pump test header

Flow Meter:

Automatic Fire Sprinkler piping, sprinklers, hangers, and seismic bracing

Valve and water-flow switch monitoring

Audible sprinkler flow alarms on the exterior and interior of the building. The fire protection system shall be monitored by the central fire alarm system in the building

Pre-action control valve interlocked with FACP with air compressor and pressure switch.

Piping shall be concealed above ceilings and within walls except for non-public equipment rooms without ceilings. Piping in public areas with no ceilings will be coordinated with architect.

Coverage shall be provided for rooms, void spaces, underneath stains, overhangs and as required by code, with sprinkler protection in combustible attics.

Sprinkler heads in ceilings shall be concealed pendant type with white or chrome finish cover plate flush with ceiling. Sprinkler heads will be concealed in finished ceilings and exposed uprights in non-finished spaces such as mechanical rooms, data rooms, and/or electrical rooms. High temperature sprinkler heads will be provided in electrical rooms. OS&Y gate or butterfly valves with tamper switches shall be provided to isolate heads in these rooms.

All isolating and sectionalizing valves on the fire protection system shall be provided with tamper switches that shall be annunciated at the fire alarm control panel.

The system shall have a central control panel with digital read-out as part of the Fire alarm system. The system should be installed so that it may be connected to an automation system.

Piping Material 2” nominal diameter and smaller shall be ASTM A 795 steel piping schedule 40 black steel-pipe. Connections or fittings shall be threaded, flanged or welded.

Piping larger than 2” nominal diameter may be ASTM A 795 Schedule-10 roll-grooved black steel pipe. Connections or fittings shall be grooved or welded.

Sprinkler heads shall be spaced for symmetry with ceiling features. Any additional heads required to accomplish this spacing shall be provided in base bid. Basis of head location shall be:

Align in straight rows

Maximize symmetry in room

Locate in center of ceiling tiles where applicable

All valves controlling the water supply for the standpipe system shall be electronically monitored by an approved central station, remote station, or proprietary monitoring station.

All products used for the installation of these systems shall be U.L. listed for service in a Fire Protection system or shall be approved by the Authority Having Jurisdiction for their intended use.

All Sprinkler heads exposed to the elements shall have a factory applied corrosion resistant finish.

The design team shall provide double interlock pre-action sprinkler system in all IT rooms, control rooms, and all other similar rooms that house high value equipment. The pre-action system shall be interlocked with Fire Alarm Control Panel. A rate of rise heat detector shall be provided in all above mentioned rooms.

FIRE PUMP SYSTEM REQUIREMENTS

A complete, functional and adequately sized electric fire pump shall be provided to address the pressure demand of the sprinkler system in the building. The Fire pump shall be horizontal split case or vertical inline and shall be provided with Jockey pump, Fire pump and jockey pump controller, VFD, etc.

The Fire Pump controller shall be interlocked with the Fire Alarm control panel, and shall have indicating lights on the Fire alarm control panel and Fire Alarm Annunciation Panel, indicating the status of the fire pump. The Fire Pump shall be UL listed and rated to the building demand in accordance with requirements of NFPA 20 and California Fire Code.

STANDPIPE SYSTEM

Per California Building Code Section 905.3.1 a standpipe system shall be installed in building four stories or more in height. A Manual-Wet Class I standpipe system, designed in accordance with NFPA 14, 2016 Edition shall be provided since the building will be protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Hose connections shall be provided in accordance with 2019 CBC Section 905.4. In

interior exit stairway, hose connections shall be located on main floor landings unless otherwise approved.

10

ELECTRICAL DESIGN CRITERIA

ELECTRICAL DESIGN CRITERIA

INTRODUCTION

The electrical system for the STEM Center at Gavilan College shall be designed with emphasis and focus on energy efficiency. The Design-Built-Entity (DBE) is responsible for system selection, design, engineering, calculations, coordination with other trades, installation, testing, and commissioning all which shall meet the current T24 energy codes.

The electrical system shall encompass the main distribution system, interior and exterior lighting, power to support equipment, convenience power and fire alarm system. All these systems shall be designed to provide the user maximum flexibility. All equipment that forms part of these systems shall be selected for durability and maintenance ease that are consistent with Gavilan College Campus Standards.

The following applicable codes and standards shall be referenced for the electrical design for the proposed building.

APPLICABLE CODES

- California Building Standards Administrative Code (Title 24, Part I)
- California Building Code (Title 24, Part 2)
- California Plumbing Code (Title 24, Part 5)
- California Mechanical Code (Title 24, Part 5)
- California Energy Code (Title 24, Part 6)
- California Fire Code (Title 24, Part 9)
- California Reference Standards Code (Title 24, Part 12)

REFERENCE STANDARDS AND GUIDELINES

NFPA 72: National Fire Alarm Code

Latest Edition of the Illuminating Engineering Society of North America Handbook

NFPA 30 Flammable and Combustible Liquids

DESIGN CRITERIA

The service for the new STEM Center shall be tied into the Campus 4.16KV loop. Actual size of service shall be determined by DBE and shall be based on electrical demand loads. Include 25% spare capacity for future flexibility.

BUILDING DISTRIBUTION

The electrical equipment shall be housed in the main electrical room and sub electrical rooms. The DBE shall determine system voltage based on building square footage and electrical demand loads.

Service gear shall be provided with a digital meter for monitoring of overall load, and for sub-metering of mechanical, lighting and power loads.

The metering system shall at minimum meter peak amperage, voltage, peak kW, and continuous kWH consumption. CT's and PT's shall be sized to allow IDR level metering.

BUILDING POWER AND DISTRIBUTION SYSTEM

A 480/277V and 208/120V systems are anticipated to be provided as follows:

Table: 10.1 BUILDING POWER AND DISTRIBUTION

	VOLT/PHASE
Large motors (1/2 HP & larger)	480-volt, 3 phase.
Small motors (1/3 HP & smaller)	120-volt and 208-volt
Lighting, LED	277-voltw
Receptacles, general purpose	120-volt
Receptacles, special Purpose	208-volt, 1 phase
VAV boxes	120-volt
Misc. power	120-volt and 208-volt

BUILDING INTERIOR

The basis for calculating the Volt-Ampere to be provided per Square Foot floor area would be as follows:

Table: 10.2 BUILDING INTERIOR

AREA	CONNECTION	VOLT AMPERE (PSF)
OFFICES	Lighting	0.65
	Receptacle	2.0
CLASSROOMS	Lighting	0.7
	Receptacle	3.0
STUDY SPACES/ STUDY ROOMS/ CONFERENCE ROOMS	Lighting	0.85
	Receptacle	3.0
COMPUTER AREAS	Lighting	0.7
	Receptacle	3.0
LABS AND PREP LABS	Lighting	0.85
	Receptacle	3.0
FLEX CLASSROOM	Lighting	0.7
	Receptacle	3.0
RESTROOMS	Lighting	0.65
STORAGE/OTHER	Lighting	0.4
CORRIDOR	Lighting	0.6
	Receptacle	0.5
LOBBY AREAS	Lighting	0.85
	Receptacle	3.0
MECHANICAL/ ELECTRICAL/ SUPPORT SPACES	Lighting	0.6
	Receptacle	ACTUAL MOTOR HP

ELECTRICAL SYSTEM

All conduits consisting of 480/277V, 3 phase, 4 wire conductors shall originate from the main 480/277V switchboard housed in the main electrical room to lighting panels on each floor of the building. Likewise, conduits consisting of 208/120V, 3 phase, 4 wire conductors shall originate from the 208/120V distribution boards housed in the main electrical room and floor electrical rooms and shall serve the power panels on each floor of the building to meet the power demands of the building. 480-208Y/120V, 3-phase, 4-wire distribution transformers sized to meet the load requirements shall be provided in the electrical room on each floor. Panel boards shall be surface mounted in the electrical rooms and recess mounted in other locations. All panel boards shall be 42 circuits 3 phase. 30% spare circuit breakers shall be included in each panel.

*DBE shall determine final system voltage.

Equipment not related to the support of the electrical rooms and telecom rooms(e.g., piping, ductwork, etc.) cannot be installed in, pass through, or enter electrical rooms per California Electrical Code (CEC) 110.26, f.

MEDIUM VOLTAGE PADMOUNT TRANSFORMERS

- Shall be pad mount, oil-filled type.
- Dual radial incoming feed.

METERING

- Provide metering on main building service.
- Meters shall be Modbus compatible and be connected to the Campus BMS via CAT 6 connection.
- The meter shall be a multi-point meter in the main switchboard that meters all sub-breakers in the main switchboard.

- The building loads (Lighting, HVAC, receptacles) shall be metered independently, and recorded/trended by the Campus BMS.
- Square-D as manufacturer.

SWITCHBOARD, PANELBOARDS

- Breakers shall be bolt-on.
- Minimize use of shunt trip breakers.
- Square-D is preferred manufacturer.

LOW VOLTAGE DRY TYPE TRANSFORMERS

- Square-D is is preferred manufacturer.

ENCLOSED SWITCHES AND DISCONNECTS

- Square-D is is preferred manufacturer.

LABELING

- Switchboard, Panels, Disconnect switches: Provide phenolic label on equipment indicating equipment name, voltage, and source.
- Receptacle and light switch cover plate: Provide pre-printed vinyl labels on all cover plates indicating circuit.
- Junction boxes. Provide pre-printed vinyl labels on all junction box indicating circuit and source for all wiring.

ELECTRICAL REQUIREMENTS FOR TELECOMMUNICATION ROOMS

DBE shall provide dedicated 208/120V, 3-phase, 4-wire electrical panel with built-Surge Protective Device (SPD) at Telecom rooms room.

Provide rack mounted dedicated 20A/120V quad receptacles and 30A/208V receptacles at each equipment rack.

Provide convenience receptacles, no less than 6 feet on center or one per wall minimum at each telecom room.

Location of other non-dedicated electrical equipment within telecommunication rooms is not allowed.

Refer to telecommunications systems design criteria for additional requirements.

EMERGENCY SYSTEM

LIFE SAFETY:

- Emergency lighting shall be provided via a lighting inverter.
- Light fixtures shall be selected along the egress paths to achieve minimum 1fc.
- Emergency light fixtures shall be controlled with general lighting but shall be interfaced with the lighting inverter so the lights go to full on when there is a loss of power to the building.

The DBE is responsible for egress lighting selection and shall size inverter based on required load.

OTHER:

- DBE shall size and provide UPS backup in telecom rooms.

WIRING METHODS

All cables and conduits shall run parallel and perpendicular to building structure. Cables and conduits shall not run diagonally to the structure are unacceptable.

CONDUIT

- a. Minimum conduit size of 3/4 inch when installed above ground, serving receptacles and other power related is required. Increase

conduit size as required per code. Support all conduits per current CEC. Allowed length of flex conduit shall be limited to 4 feet or less. Surface mounted conduit is acceptable only in locations where exposed structure is the finished surface; in such cases, locate conduit for minimum visual impact.

- b. Above ground: rigid conduit, IMC or EMT are acceptable. Rigid conduit is required in outdoor locations and where conduit is exposed to physical damage.
- c. Underground: Schedule 40 PVC with concrete encasement (red dye on top surface of the duct bank) is required. Use PVC-wrapped or PVC-coated steel elbows for plastic conduit runs and elbows penetrating floor slabs. Minimum underground conduit size shall be 2".
- d. MC cable, rigid non-metallic conduits, electrical non-metallic tubing, and screw type fittings are unacceptable.
- e. Spare conduits (minimum size 2") shall be provided to each panelboard from the electrical room. Additional (6) 3/4"conduit stub outs from each panelboard shall be stubbed above the ceiling.

POWER AND LIGHTING SYSTEMS
600 OR LESS
CONDUCTORS

- All wiring shall be copper.
#12 and larger shall be stranded.
- Minimum conductor size for runs over 100 feet for 120/208V system shall be #10 AWG or larger as per CEC Voltage Drop calculations.

Provide no more than (6) convenience duplex receptacles on one 20A/1P branch circuit. Circuits serving convenience receptacles shall be segregated from other loads.

At enclosed open spaces, place convenience receptacles 15 apart for general use, maintenance, and cleaning.

At small enclosed spaces, place (1) convenience receptacle per wall (where not obstructed by furniture).

At corridors place convenience receptacles 30 feet apart for general use maintenance, and cleaning.

Open offices, private offices, copier rooms, kitchenettes, lobbies, and conference rooms shall meet switch receptacle Title 24 requirements.

Where furniture is energized for integral outlets, provide power to furniture per manufacturer requirements.

Provide floorboxes in lecture rooms and large classrooms; configuration to match furniture layout. Provide Legrand RC series or equal.

Provide duplex/USB receptacles in seating and gathering areas.

Provide power outlet, one duplex per each communications outlet location including those equipped with cable and jacks, or conduits and boxes placed for future.

Provide power to electronic wayfindings, message boards, check-in stations.

Provide power to laptop carts.

Provide power to fax machines and copy/scan machines.

Provide 120V power to irrigation controller(s) and as required per landscape.

Provide 120V Power to “Blue Light Phone” (emergency telephone station) and security system.

Provide 120V receptacles, with weather proof covers, in exterior areas for maintenance.

Exterior receptacles shall be routed through a relay control panel to allow shut off during non-scheduled Campus hours.

Provide power to audio visual equipment. Wall power shall be quad receptacles.

Provide power to DDC mechanical controls.

Provide dedicated power connection to lab equipment.

Provide overcounter surface raceway in lab countertops. Legrand or Hubbell preferred.

All circuits for audio visual equipment loads shall be provided with dedicated neutrals. No sharing of neutrals shall be allowed.

Multi-wire (shared neutral and ground) receptacle circuits are not acceptable. A dedicated neutral and ground is required for each receptacle circuit.

Provide power wiring to all motors, fans, pumps and all equipment provided under mechanical, plumbing and architectural sections shall be provided as part of the electrical construction.

All wiring below 120V shall be considered as part of other trades such as mechanical systems. All low voltage devices, where required, shall be provided with raceway only.

Provide provisions to allow the building to be PV ready as required by Title 24. Provisions shall include spare breaker to tie in the system, space for future inverter, and conduits to the roof space.

GROUNDING

A complete grounding system per CEC shall be established in the building and the main switchboards shall be connected to this grounding system. A central grounding system shall be provided from the building service substation to panels, metallic conduit and raceways. A separate ground conductor shall be provided for all circuits. All metallic piping attached to the building is also required to be bonded.

LIGHTING

Light fixtures and systems shall be selected for efficiency, durability, maintenance ease, and to accentuate the area architecture. Indoor lighting shall be tailored to building’s needs and theme.

ELECTRICAL SYSTEM CONT'D

The illumination levels shall conform to the latest edition of Illuminating Engineering Society (IES) guidelines and shall be as follows:

Table: 10.3 ELECTRICAL SYSTEMS GENERAL

AREA	AVERAGE FOOTCANDLES
LOBBY, WELCOME DESK	20-40 FC (FLOOR LEVEL)
OPEN OFFICE, PRIVATE OFFICE	35-50 FC
CONFERENCE ROOMS	30-50 FC
LABS AND PREP LABS	50-70 FC
CLASSROOM AND LECTURE ROOMS	35-50 FC
CORRIDORS	15 FC (FLOOR LEVEL)
STORAGE/SUPPORT SPACES	15 FC (FLOOR LEVEL)
TELECOM ROOMS	MIN. 35-50 FC
ELECTRICAL ROOM	20-40 FC (FLOOR LEVEL)
EXTERIOR/LANDSCAPING	1-5 FC (GRADE LEVEL), 1 FC AVERAGE FOR MAIN EGRESS WAYS

Note # 1 - values at work/activity level, unless otherwise noted.

Foot-candle levels shall comply with campus energy standards and shall be designed based on user requirements.

All spaces shall be illuminated with efficient LED light fixtures (a minimum efficiency of 90%). Task light fixtures shall be considered in offices to reduce the overall lighting power density.

General lighting shall be level 80 color rendering index (CRI) minimum.

Lighting shall have a color temperature of 5000K.

Use light fixtures that have a rated life L70 for LED sources of at least 24,000 hours.

Campus has preference on indirect/direct general lighting where possible.

Location of lighting shall not interfere with video projection systems Lighting at projection screen area shall be zoned separately from remainder od lighting for AV zone control.

Lobby shall be illuminated with statement LED lighting.

Electrical, Mechanical and data rooms shall be illuminated with industrial LED fixtures. Provide vapor tight, 4' sections, with cable/chain hung for ease of alterations.

Recessed fixtures are preferred for conference rooms, offices, and other rooms when possible. Light fixtures shall be selected and located to allow ease of maintenance.

LED exit signs shall be provided at all exits and along the path of egress and shall be vandal resistant. Illumination levels shall conform to

current CBC requirement at floor level during loss of normal power.

Exterior light fixtures shall be LED and shall be Dark Skies compliant and shielded to prevent grate for pedestrians. Lighting shall match Gavilan Campus aesthetics and standards.

Interior photometrics calculations shall utilize the following:

- a. Calculation plane of 30" or work plane height for working areas (study rooms, conference rooms, offices, etc.)
- b. Calculation plane of floor for corridors and restrooms.
- c. Light loss factor of 0.9.
- d. Reflectances shall be 80/50/20. These shall be adjusted down if finishes in the room are worse than indicated.
- e. Major obstructions shall be modeled in the calculations.

Lighting power densities and controls shall comply with Utility Company's Energy Savings program and shall beat current Title 24 requirements by a minimum of 20%.

ELECTRICAL SYSTEM CONT'D

LIGHTING CONTROLS

The DBE shall provide multilevel dimming controls that meet Title 24 requirement. Provide Lutron lighting controls for control of interior and exterior lighting. Low voltage wireless controls for interior and exterior are preferred. Provide Lutron Vive for interior applications, wireless and wired hybrid system can be considered.

Dimming Switching shall be provided in all spaces. Automatic dimming controls shall be provided in all day-lit areas to harvest the daylight savings. Automatic shut off for all areas shall be accomplished through low voltage lighting control panel and override switches in compliance with current California Energy Code. Likewise corridor lighting shall be capable of dimming when occupants are not detected as required by Title 24. Occupancy sensors equipped with dimming switches consistent with campus standards shall be provided in all offices. Restrooms shall be provided with single level switch and ceiling mounted occupancy sensors. All fixtures provided shall be compatible with the control system.

Offices, conference room, multipurpose rooms with A/V equipment shall have lighting controls integrated with the A/V control equipment.

Outdoor lighting control shall allow control via time clock and photosensor. Contractor is required to include all parts, time and material to tie into Campus desired lighting control system.

SUSTAINABLE DESIGN STRATEGIES

The following sustainable design strategies should be adopted in design of the electrical systems:

- Exterior fixtures shall be selected to prevent light pollution.
- Avoid uplights, or fixtures which spill into sky.
- Interior fixtures shall not be positioned to aim directly out windows.
- Utilize automatic day lighting and demand control system.
- Utilize energy efficient lighting in spaces to achieve required foot candles with reduced fixture counts.
- Utilize energy efficient distribution transformers to reduce no load and load losses. All transformers shall comply to LEED efficiency requirements.
- Utilize metering with central display to monitor energy generation and consumption.
- Utilize high performance corrosion resistant coatings for exterior hardware and equipment.

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FIRE ALARM DESIGN CRITERIA

FIRE ALARM DESIGN CRITERIA

The DBE shall provide mass notification Fire Alarm System Edwards EST4. System shall conform to current California Building, Fire and NFPA 72 codes. The State Fire Marshal Division of State Architecture (DSA) is the primary jurisdictional authority for this project.

The communication shall include both fire alarm signal and mass notification system. One remote LCD alphanumeric annunciator at building entrance with an eighty character digital readout indicating which device is in alarm or trouble mode is required. Fire Alarm System shall be installed in dedicated and marked conduits (red stripes at each end is required). All fire alarm boxes are required to have red covers. New initiating and indicating devices shall be placed throughout the floors to meet current CBC and CFC code requirements.

Locate the Fire Alarm Control Panel (FACP) with an eighty character digital readout indicating which device is in alarm or trouble mode inside the Electrical room or Telecom room. Note that the Fire Alarm Control Panels provided shall be equipped with a program key.

Upon completion of installation Contractor shall include all testing for new facilities to demonstrate proper operation of all equipment.