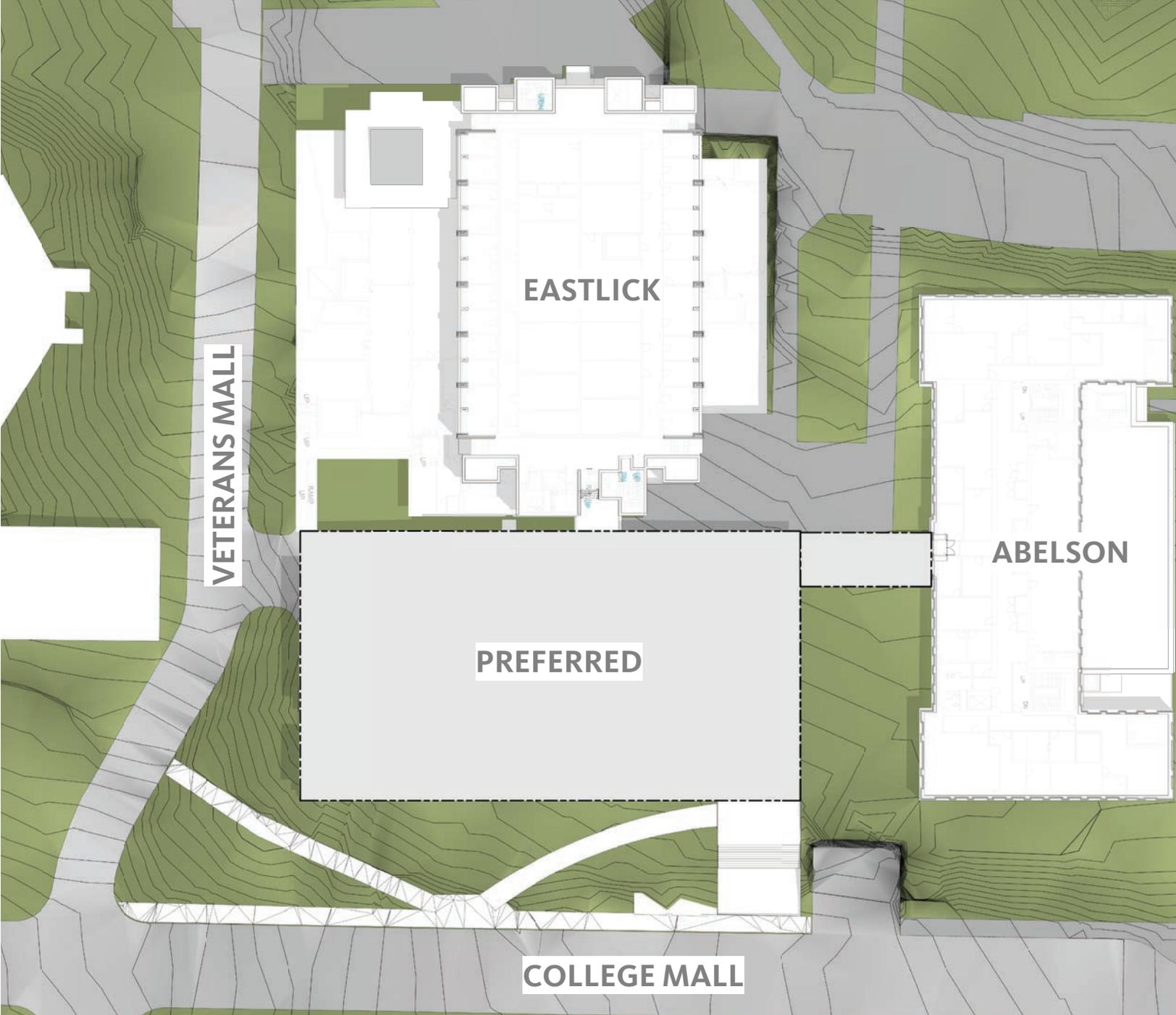


WASHINGTON STATE UNIVERSITY

Pullman Sciences Building Pre-Design

June 30, 2022





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WELCOME
VETERANS MALL
SHARED WALKWAY
YIELD TO PEDESTRIANS
RESTRICTED ACCESS

VETERANS MALL

WELCOME
COLLEGE MALL
SHARED WALKWAY
YIELD TO PEDESTRIANS
RESTRICTED ACCESS

10 10

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SECTION 01.

PROJECT OVERVIEW

Executive Summary
Background

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SUSTAINING THE FUTURE OF SCIENCE

The Collage of Art and Science (CAS) currently has some of the greatest deferred maintenance requests for the series of core buildings that make up the “Sciences Corridor.” These core buildings include Abelson, Eastlick, Fulmer Lab, Fulmer Annex, Fulmer Synthesis, Fulmer VIF, Heald, and Webster. The deferred maintenance cost of almost \$100M combined is greatly impacting the college’s ability to both teach STEM coursework, attract, and retain faculty, and perform leading-edge research.

The School of Biological Sciences and The Department of Chemistry routinely are awarded large grants from several federal and state agencies, as well as funding from well-renowned private institutions such as the Bill & Melinda Gates foundation and US Department of Agriculture. Over the last 10 years these research units were awarded over \$80 M in grants and produced over 1,400 peer reviewed publications. It is essential to provide sustained investments to the existing infrastructure to allow these programs to thrive in the coming years.

In 2014 Washington State University contracted NBBJ to develop an initial College of Arts and Sciences (CAS) facilities development plan which identified a series of potential projects to meet the needs of the college. The study identified the need for the demolition of Heald Hall and potential replacement with a new Pullman science building.

With the broader needs identified, Gensler was then contracted to develop a pre-design with a focus study of the space assessment needs of the core building that encompass the “Science Corridor” which runs east-west along NE College Ave. This pre-design study and space assessment allowed our team to create a “10-year roadmap” to identify the series of “enabling” projects that meet the Universities key goals. The goal of both creating sustained investments of deferred maintenance projects with minimal impacts to research and allow for the “decanting” of existing Heald Hall in preparation for abatement and demolition.

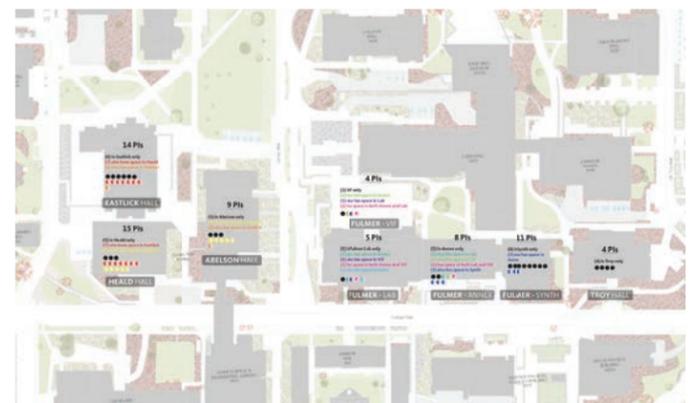
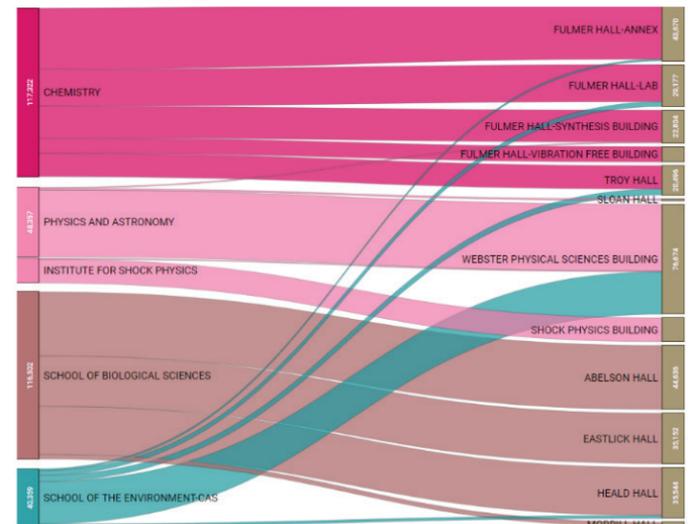
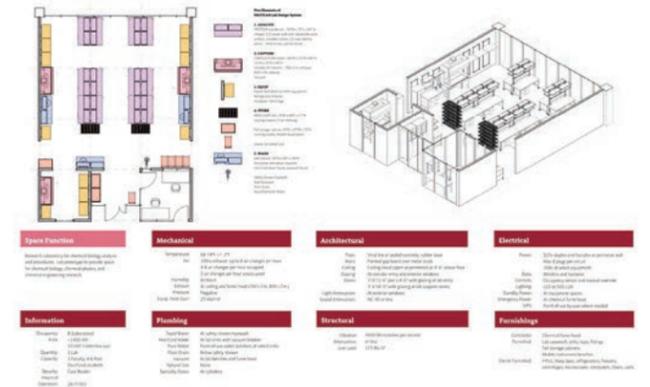


Through a series of visioning and project workshops we identified two clear programmatic guidelines to identify the series of enabling and decanting projects. 1. The Principal Investigators (PIs) would move once to minimize disruptions to research and 2. To designate existing core buildings as suitable to sustain instruction or research focused program. In our findings we identified Eastlick Hall, and Fulmer Lab as ideal candidates for instructional program. Abelson Hall, Fulmer VIF, Fulmer Annex, and Fulmer Synth as candidates for research program and the new Pullman Science building to house primarily research functions.

The new Pullman Science building is envisioned as a new catalyst building which through the lens of a modular planning approach will provide the modern infrastructure and facility to accommodate the growing needs and interest of the STEM programs at Washington State University for years to come. The building will accommodate a range of science practices through a plug and play approach and development of a “Hybrid” Bio-Chemistry lab module. These lab modules allow the University to accommodate a range of PIs through flexible, adaptable, research lab and lab support spaces as the field of science evolves.

The Pullman Science building will not only meet the infrastructure needs of the college, but also strengthen their recruitment and retention efforts through an adaptable infrastructure for a wide range of biological sciences and chemistry programs, each which contribute the University’s strategic plan and “Drive to 25”. The University’s mission is to maintain and boost student enrollment, while providing a transformative experience to both undergraduate, graduate, and development of its preeminent research avenues.

This high priority mission of sustained projects, including the new Pullman Science building informed by the 10-year roadmap will significantly contribute to increase the number of students, enhance training opportunities for the next generation of scientific leaders, reduce deferred maintenance cost, and move the capital plan forward through a balanced and sustained approach.

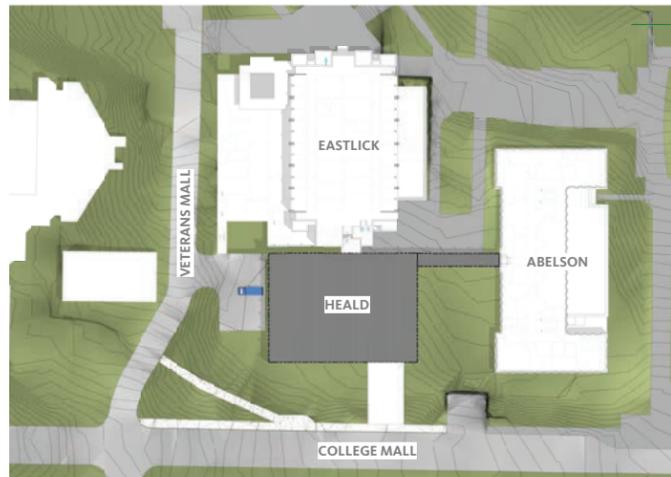


BACKGROUND & HISTORY

Growth in the WSU College of Arts & Sciences' cutting-edge life and physical sciences research, as well as sustained increases in student enrollment, have stretched current facilities in these areas to the limit. Leading the College to now face significant restrictions on sustaining ongoing research and seizing opportunities to pursue more innovative, cross-cutting forms of inquiry and teaching. In addition, buildings on the Washington State University Pullman campus, housing these programs are in poor quality and, on average, more than 40 years old. Together these infrastructure inadequacies continue to constrain the College's and University's ability to achieve their strategic goals and meet the state's educational objectives.

The proposed series of projects will form the foundational centerpiece of a long-term vision for an updated "science corridor" responsive to the demands of the 21st century. Initial planning envisioned the replacement of Heald Hall, a 58-year-old building with original systems that has never experienced a major remodel. As a result, Heald Hall is currently in a managed state of decline due to failing infrastructure, obsolete building systems, aged furnishings, and an overall inadequate layout. A series of sustained investments will not only provide flexible space to expand and enrich educational opportunities and research activities, but also support the College's and University's plans to stage renovations of aging facilities while continuing to fulfill our land-grant research and educational mission.

Life and physical science faculty at Washington State University contribute to a wide range of both discipline-specific, interdisciplinary research and educational programs. Those which include but are not limited to; Cell and Molecular Biology; Ecology and Evolution; Genetics; Biochemistry and Biological Systems; and Organic and Inorganic Chemistry.





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SECTION 02.

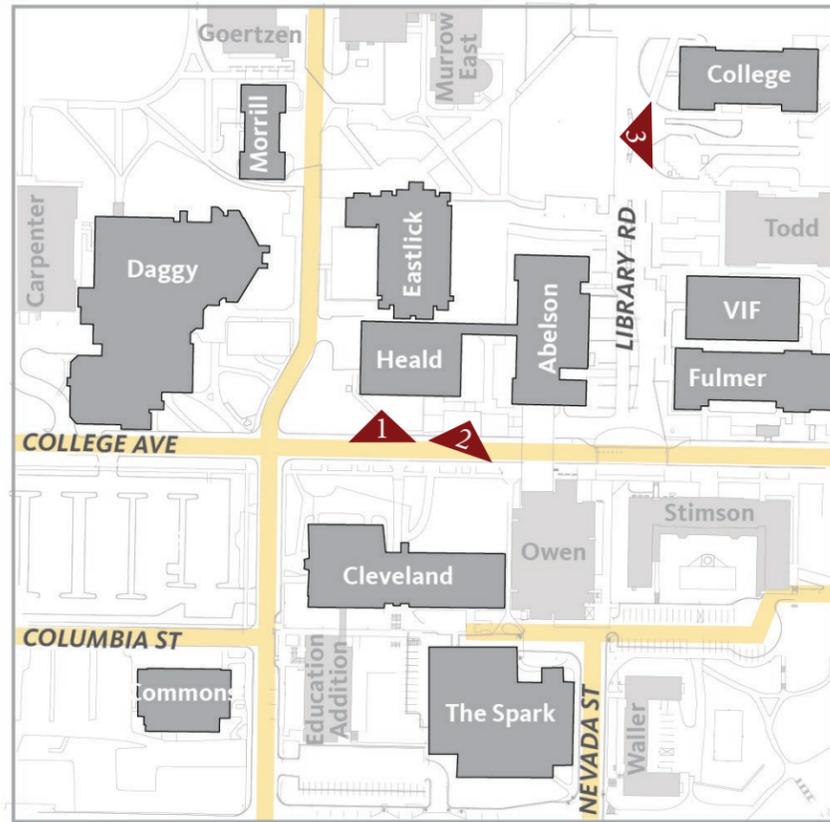
SITE CONTEXT

Existing Site Conditions
Site Analysis

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EXISTING SITE CONDITIONS - PHOTOS



3 Aerial view looking west to the green space behind Abelson and Eastlick Hall.



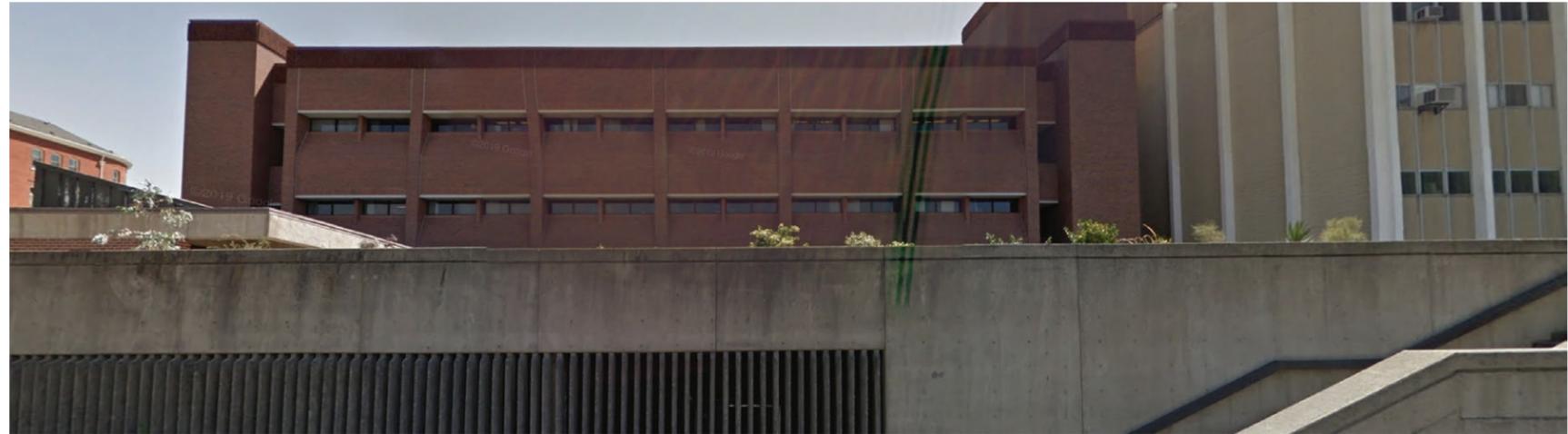
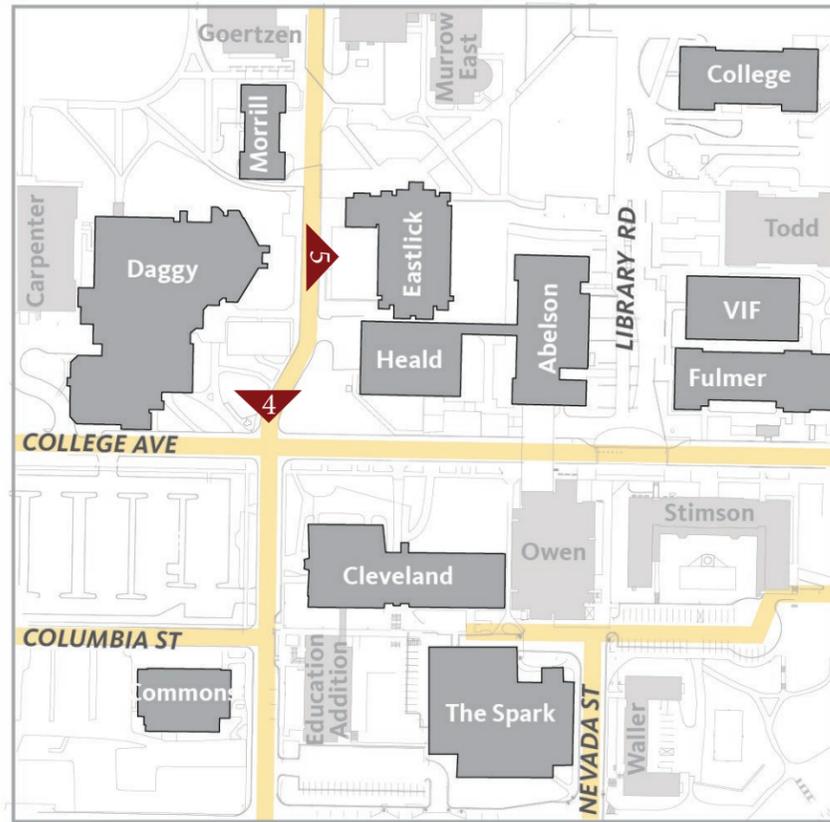
2 Looking east to Abelson Hall and College Ave.



1 Looking north to Heald Hall and Abelson Hall.

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EXISTING SITE CONDITIONS - PHOTOS



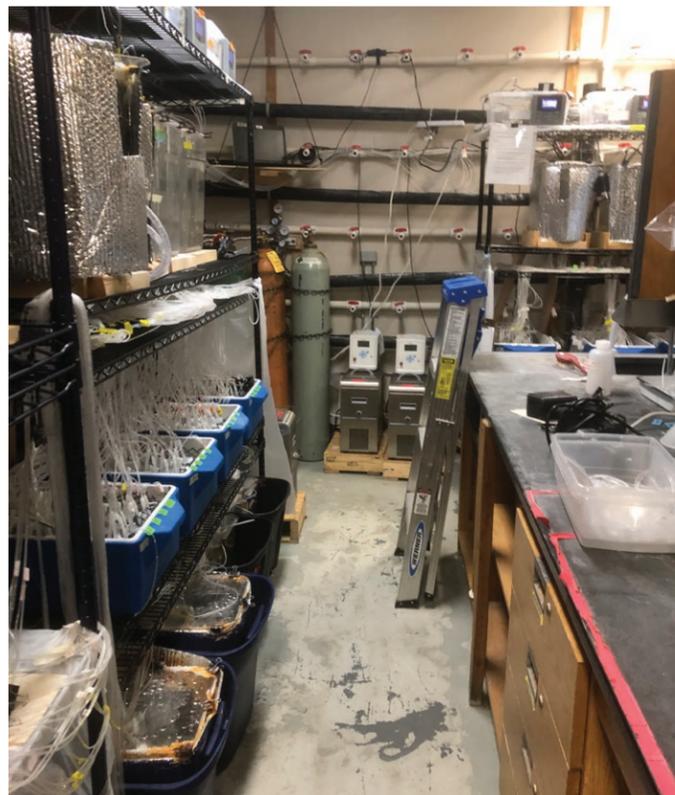
5 Looking east along Veteran's Way at the outdoor patio at Eastlick Hall.



4 Looking south towards the parking lot along College Ave.

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EXISTING SITE CONDITIONS - HEALD



Reserach Lab - Aquatics



Reserach Lab - Aquatics



Reserach Lab - Aquatics



General Use Classroom - Lecture Hall



Teaching Lab
20 WSU Pullman Life & Physical Sciences - Pre-design



Teaching Lab



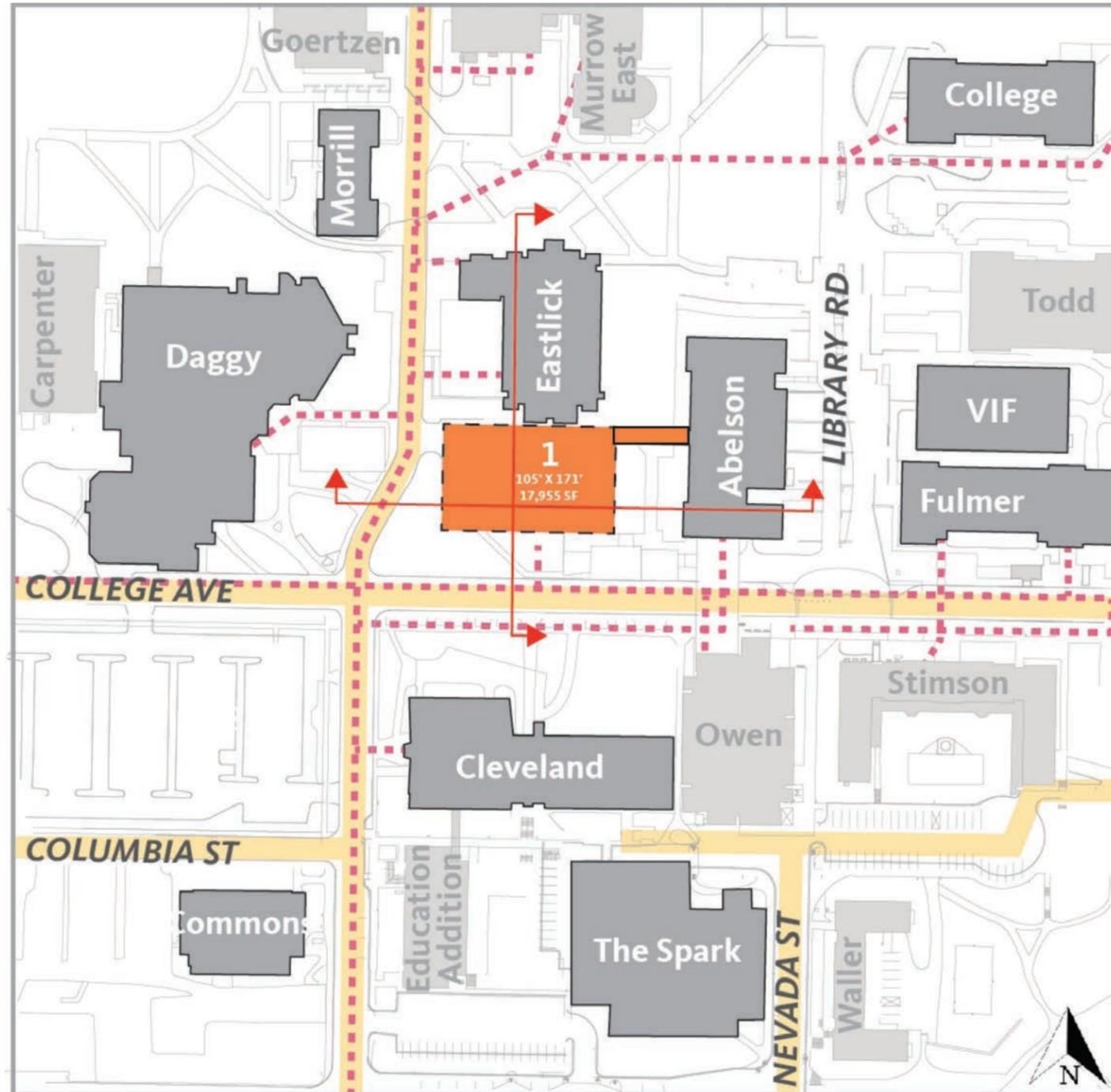
Environmental Chamber



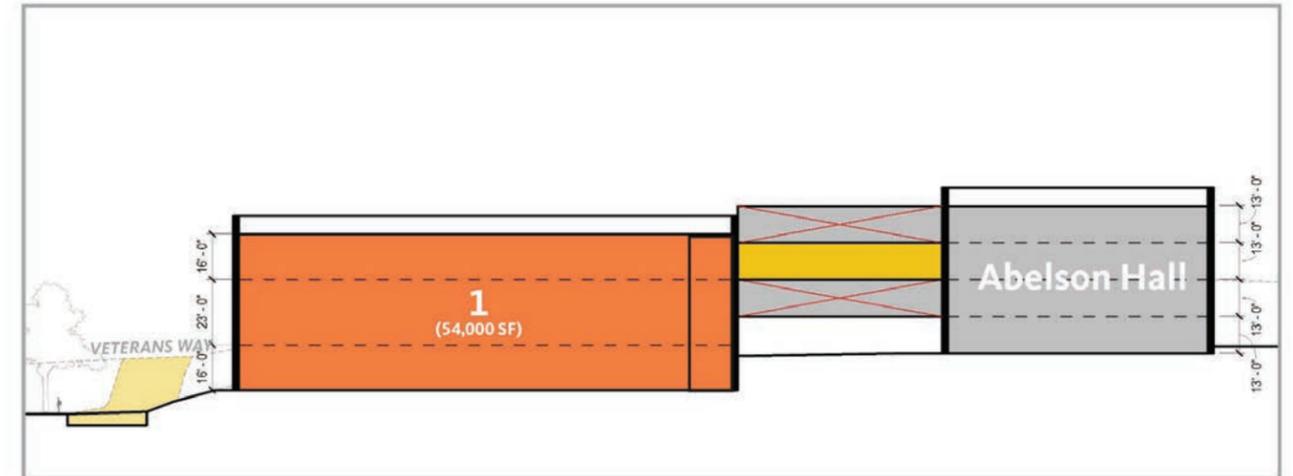
Reserach Lab - Procedure Room
WSU Pullman Life & Physical Sciences - Pre-design 21

SITE ANALYSIS - CHALLENGES & OPPORTUNITIES - Preferred Option 1

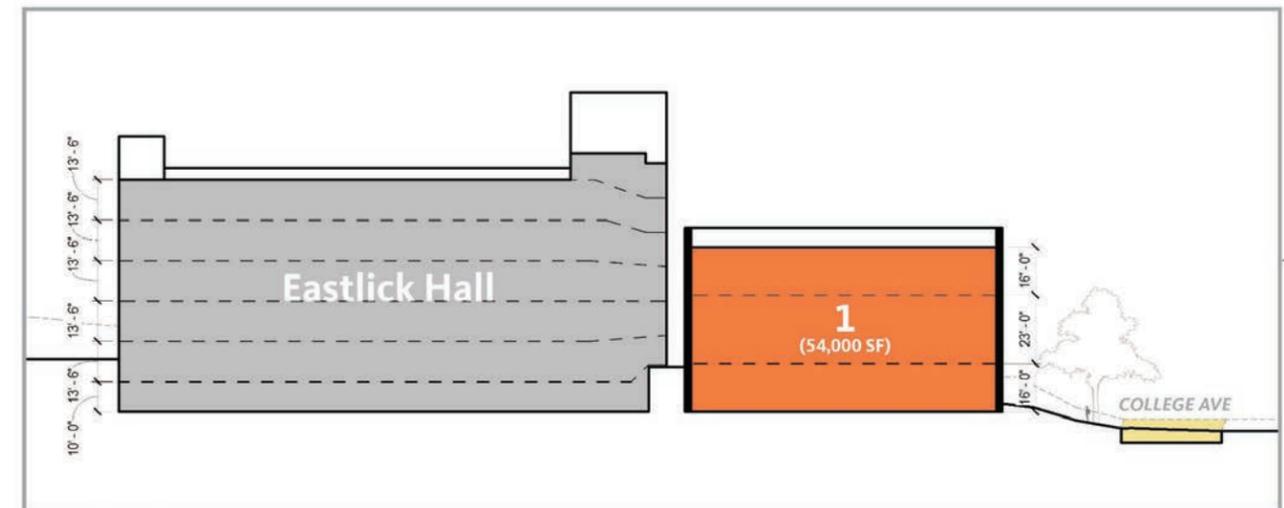
A quick site study of proposed floor to floor heights for the new research facility is 16'. Site sections demonstrate the adjacent challenges of creating connections to the existing Abelson and Eastlick Halls for site option 1.



Plan study of existing campus utility infrastructure adjacent to site.



East-West Section Study of potential vertical connections to existing Abelson Hall.



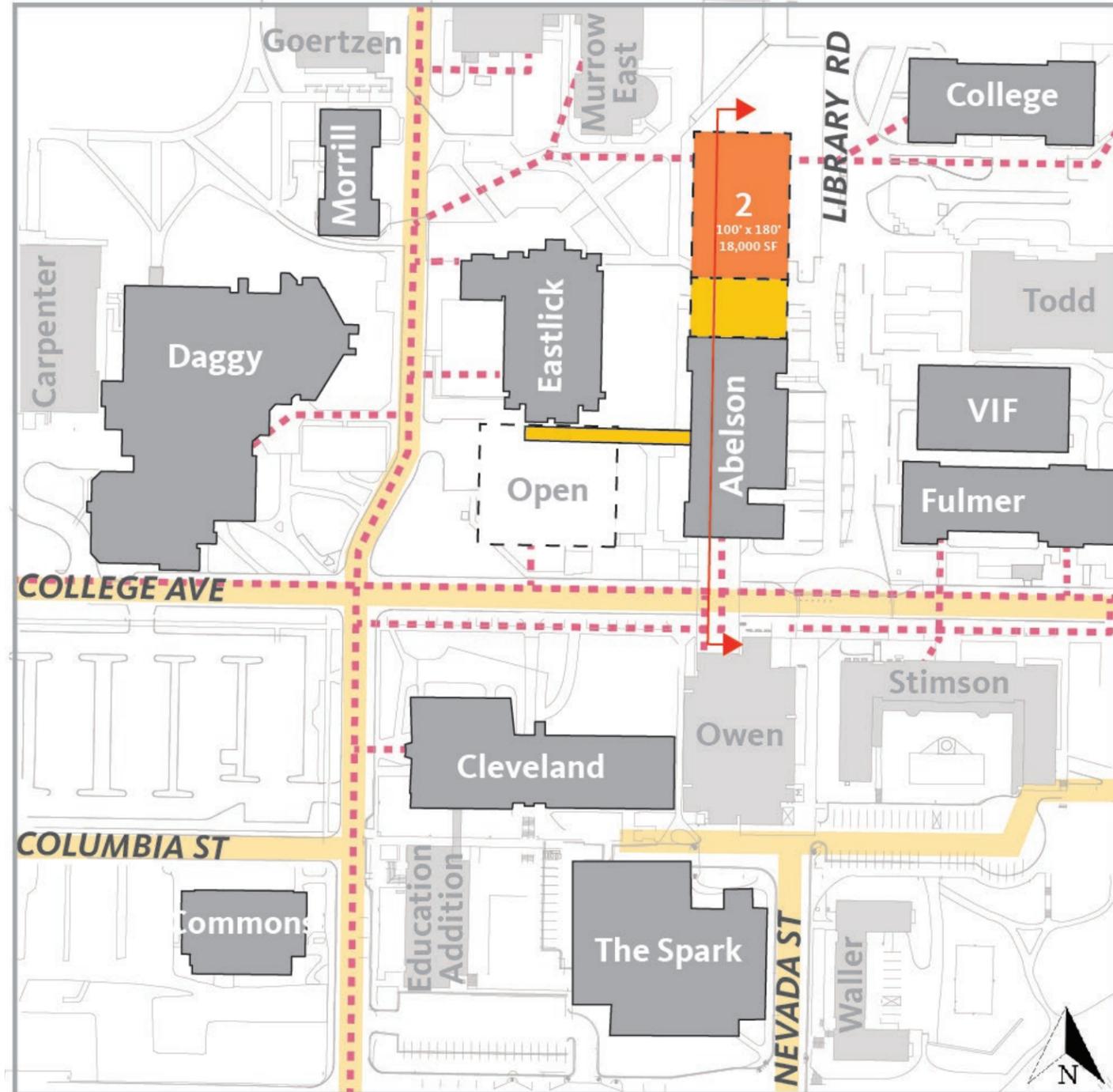
North-South Section Study of potential vertical connections to existing Eastlick Hall.

- Possible Site Location
- Utility Tunnels
- Streets

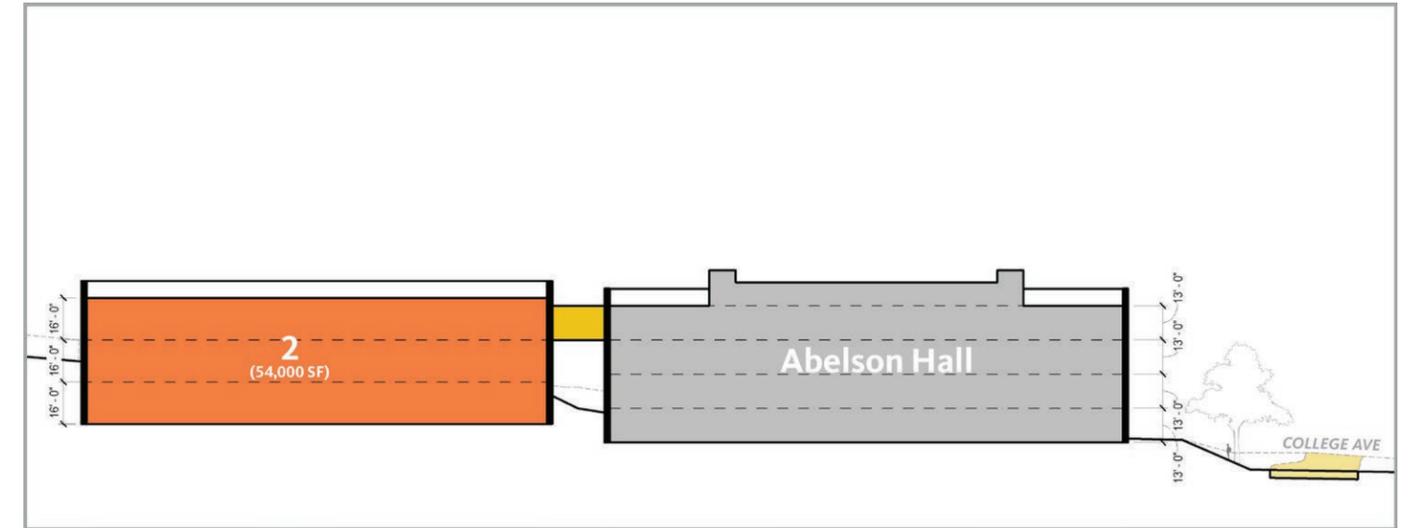
POTENTIAL PROS	POTENTIAL CONS	POTENTIAL MITIGATIONS
<ul style="list-style-type: none"> • Possible connection to Eastlick and Abelson • Gateway Building opportunity • Immediately demolishes and replaces Heald Hall • Access to existing utilidor • Access to two street fronts 	<ul style="list-style-type: none"> • Limited site area 	<ul style="list-style-type: none"> • Determine largest ideal flex lab layout per floor plate and evaluate with building height
	<ul style="list-style-type: none"> • Bridge Connection to Abelson Hall - Seismic Joint & Fire/Smoke Separation 	<ul style="list-style-type: none"> • Shore this existing bridge during construction or demolish and replace as part of project.
	<ul style="list-style-type: none"> • Connection to Eastlick - Seismic Joint & Fire/Smoke Separation 	<ul style="list-style-type: none"> • Maintaining the space construction type will allow for least stringent requirements for fire/smoke separation. Seismic joint will be required.
	<ul style="list-style-type: none"> • Construction Logistics and laydown 	<ul style="list-style-type: none"> • Use nearby parking lot (include cost associated with temporarily renting spaces during construction)
	<ul style="list-style-type: none"> • Construction Vibrations disruptive to Vivarium in Eastlick Basement 	<ul style="list-style-type: none"> • Explore Construction techniques to mitigate vibration due to proximity of live animals
	<ul style="list-style-type: none"> • Allowable quantities (chemicals) and control zones 	<ul style="list-style-type: none"> • Percentage of max allowable quantities is restricted once the building is greater than 3 stories - WSBC 428
	<ul style="list-style-type: none"> • Soil Conditions - Heald Hall auditorium is a large void. Adjacent existing service entrance to Abelson off College Ave. Conditions will present differential settlement. 	<ul style="list-style-type: none"> • Fill requirements and approach to differential settlement will need further study. There are also adjacent foundations from Eastlick that will require shoring.

SITE ANALYSIS - CHALLENGES & OPPORTUNITIES - Option 2

A quick site study of proposed floor to floor heights for the new reserach facility is 16'. Site sections demonstrate the adjacent challenges of creating connections to the existing Abelson Hall for site option 2. A possible bridge connection is shown to Eastlick Hall.



Plan study of existing campus utility infrastructure adjacent to site.



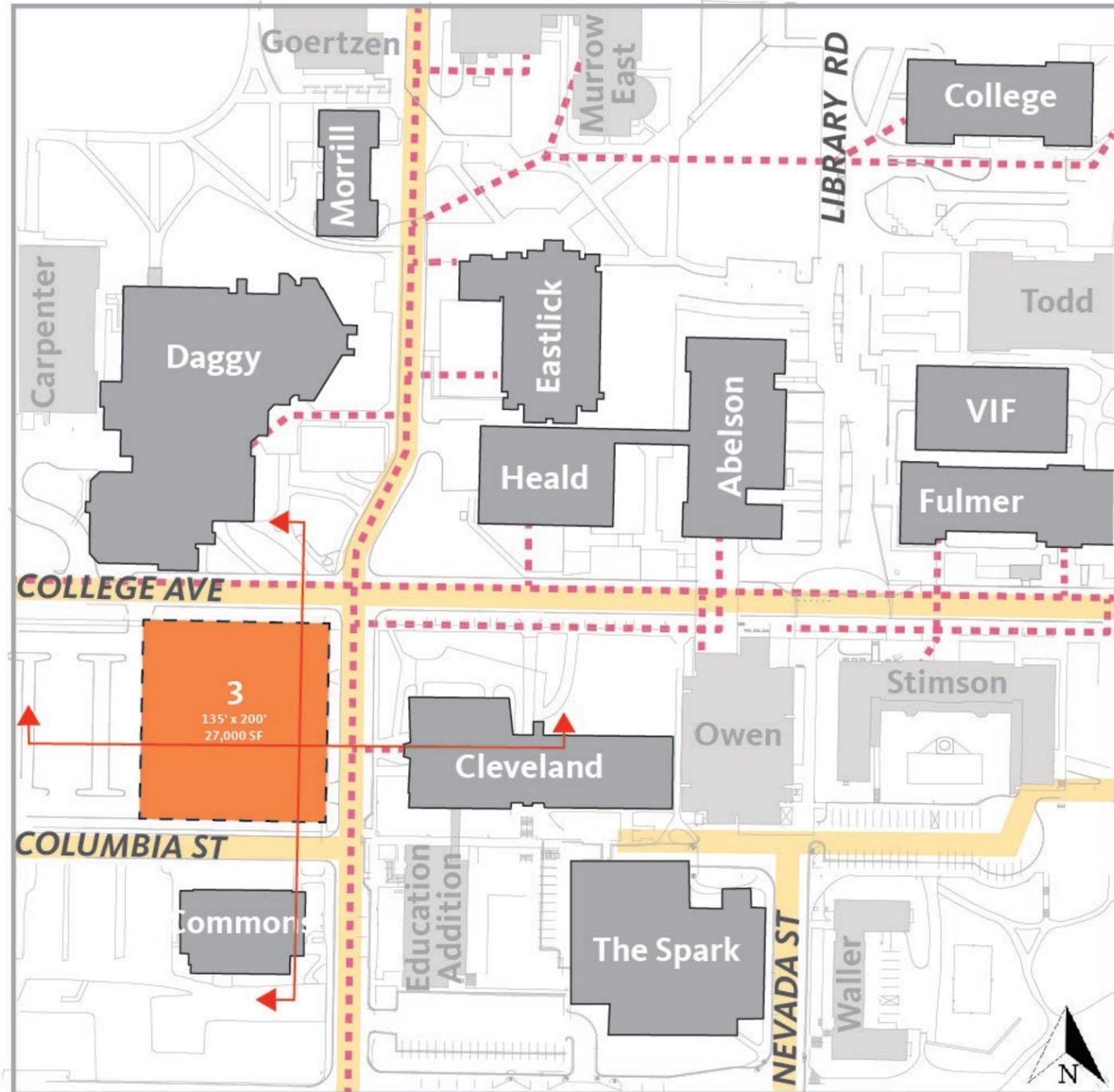
North - South Section Study of potential vertical connections to existing Abelson Hall.

- Possible Site Location
- Utility Tunnels
- Streets

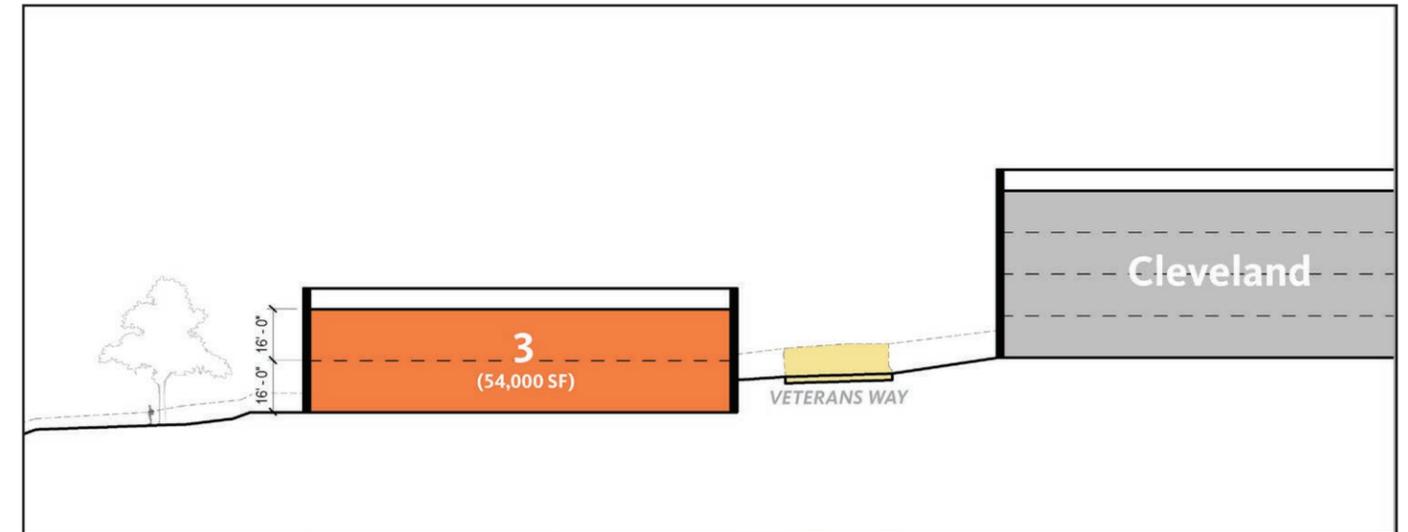
POTENTIAL PROS	POTENTIAL CONS	POTENTIAL MITIGATIONS
<ul style="list-style-type: none"> • Possible connection to Eastlick and Abelson - extend bridge to Eastlick • Provides more visibility to Abelson Hall - historic building. Open space or future development site. • Demolishes Heald Hall provides open space - opportunity for science on display • Extension/Addition to Abelson Hall more frontage on Library road • Minor disruptions with Vivarium in basement of Eastlick. Mitigation of vibration for demo phase of Heald. • Former site of the Administration Annex - Assumption is the site void were filled 	<ul style="list-style-type: none"> • Access to new building Loading is difficult (no direct street access) 	<ul style="list-style-type: none"> • Share loading with Abelson and create path to new addition
	<ul style="list-style-type: none"> • Mature Trees may impact building footprint 	<ul style="list-style-type: none"> • Demolish trees and incur cost for removal and replacement.
	<ul style="list-style-type: none"> • Connection to Abelson - Seismic Joint & Fire/Smoke Separation 	<ul style="list-style-type: none"> • Maintaining the space construction type will allow for least stringent requirements for fire/smoke separation. Seismic joint will be required.
	<ul style="list-style-type: none"> • Construction Logistics and laydown maybe more difficult on this site. 	<ul style="list-style-type: none"> • Use nearby parking (include cost associated with temporarily renting spaces during construction)
	<ul style="list-style-type: none"> • Construction Vibrations disruptive to Vivarium in Eastlick Basement 	<ul style="list-style-type: none"> • Explore Construction techniques to mitigate vibration due to proximity of live animals
	<ul style="list-style-type: none"> • Allowable quantities (chemicals) and control zones 	<ul style="list-style-type: none"> • Percentage of max allowable quantities is restricted once the building is greater than 3 stories - WSBC 428
	<ul style="list-style-type: none"> • Soil Conditions are unknown what type of fill was used. Site has a large grade drop north to south and east to west. 	<ul style="list-style-type: none"> • Soil conditions will need to be confirmed. Grades may require a stepped building.

SITE ANALYSIS - CHALLENGES & OPPORTUNITIES - Option 3

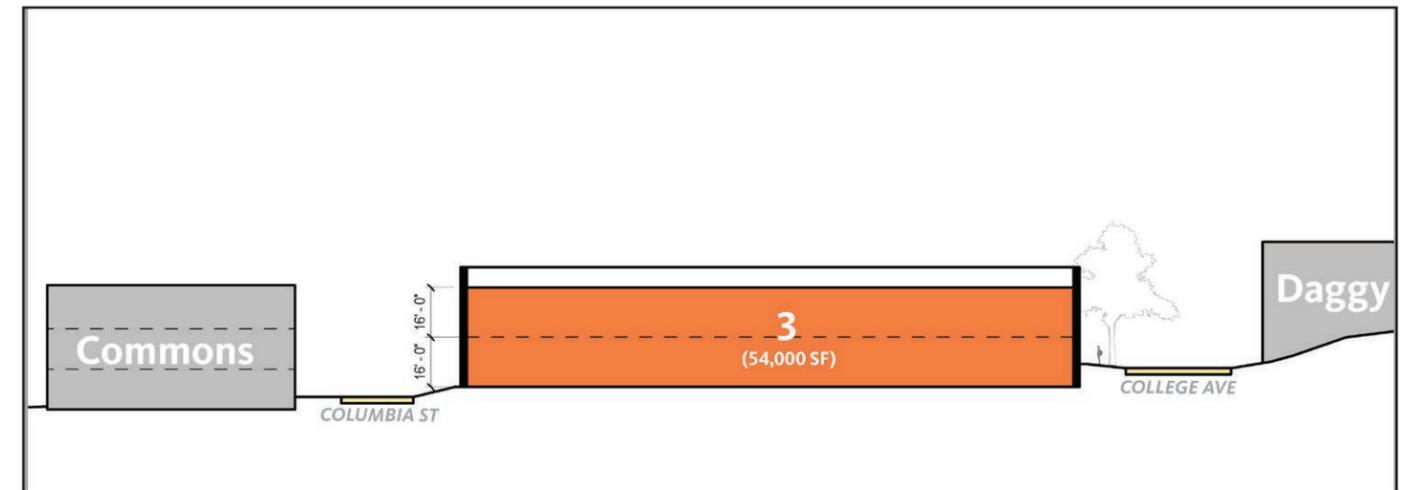
A quick site study of proposed floor to floor heights for the new reserach facility is 16'. Site sections demonstrate the adjacent conditions for site option 3.



Plan study of existing campus utility infrastructure adjacent to site.



East-West Section Study and relationship to existing Cleveland Hall.



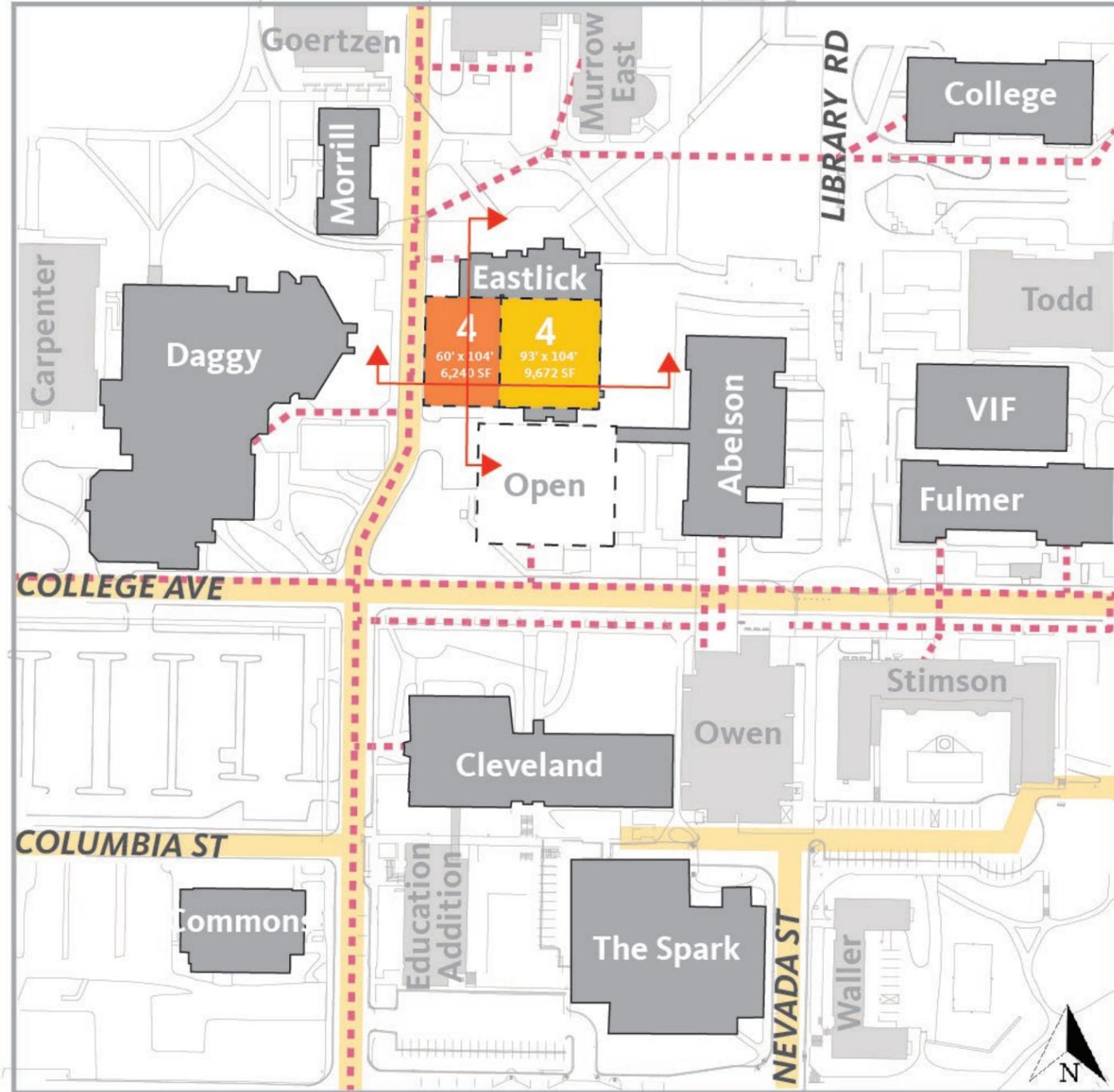
North - South Section Study and relationship to Commons & Daggy Hall.

- Possible Site Location
- Utility Tunnels
- Streets

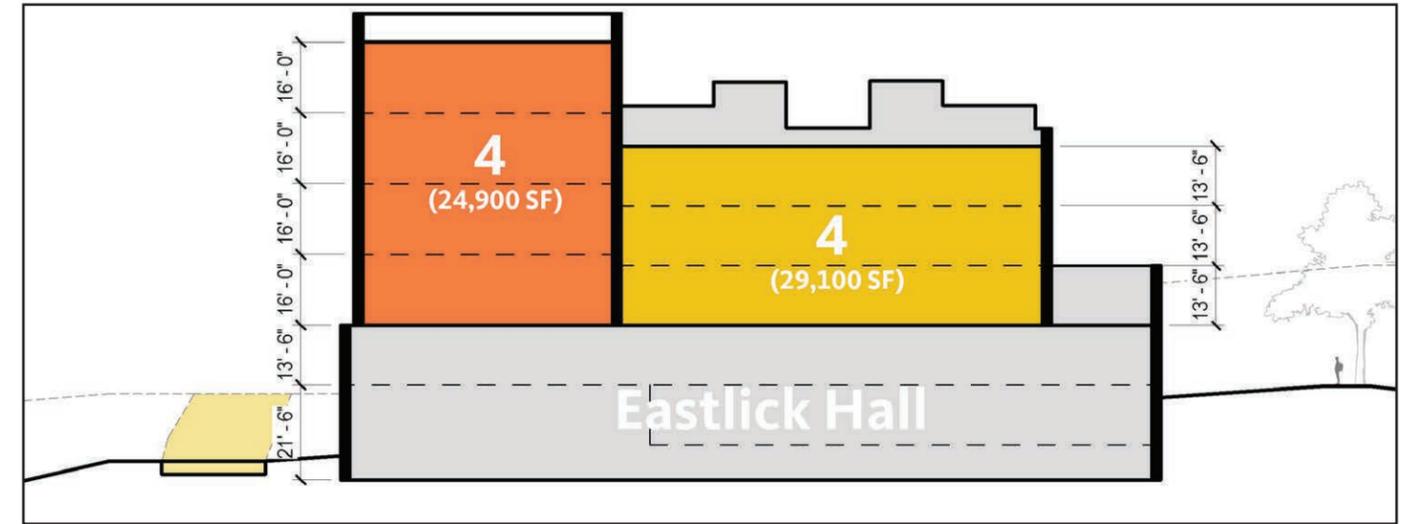
POTENTIAL PROS	POTENTIAL CONS	POTENTIAL MITIGATIONS
<ul style="list-style-type: none"> • Provides more visibility to Abelson Hall - historic building • Demolishes Heald Hall provides open space - opportunity for science on display • Access to two street fronts • Minor disruptions with Vivarium in basement of Eastlick. Mitigation of vibration for demo phase of Heald. • Greenfield Site; Soil condition undisturbed • Large footprint to accommodate ideal flexible lab configuration 	<ul style="list-style-type: none"> • Removal of existing parking on campus which is currently at a deficit and will incur cost for purchase of each stall 	<ul style="list-style-type: none"> • Incur cost and potential provide above or below grade parking at part of the project.
	<ul style="list-style-type: none"> • Mature Trees may impact building footprint 	<ul style="list-style-type: none"> • Demolish trees and incur cost for removal and replacement.
	<ul style="list-style-type: none"> • Construction Logistics and laydown 	<ul style="list-style-type: none"> • Use nearby parking (include cost associated with temporarily renting spaces during construction)
	<ul style="list-style-type: none"> • Allowable quantities (chemicals) and control zones 	<ul style="list-style-type: none"> • Percentage of max allowable quantities is restricted once the building is greater than 3 stories - WSBC 428
	<ul style="list-style-type: none"> • Conflicting masterplan potential site development with VCEA 	<ul style="list-style-type: none"> • Discussions with collage of VCEA and University of Washington leadership
<ul style="list-style-type: none"> • Soil conditions are silty loam. Grade change from east to west. Abandoned city sewer pipe running east-west in the middle of the site. 	<ul style="list-style-type: none"> • May require removal of silty loam to get to bedrock. Removal of existing sewer pipe maybe required. 	

SITE ANALYSIS - CHALLENGES & OPPORTUNITIES - Option 4

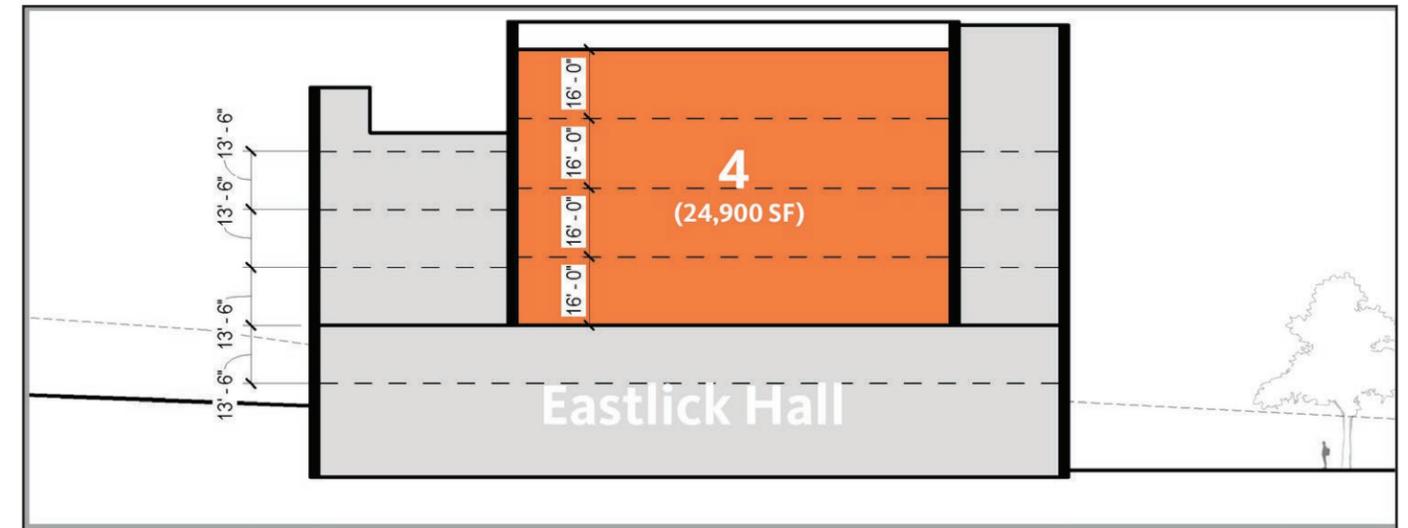
A quick site study of proposed floor to floor heights for the new reserach facility is 16'. Site sections demonstrate the adjacent challenges of creating connections to the existing Eastlick Hall for site option 4.



Plan study of existing campus utility infrastructure adjacent to site.



East-West Section Study of relationship to existing Eastlick Hall.



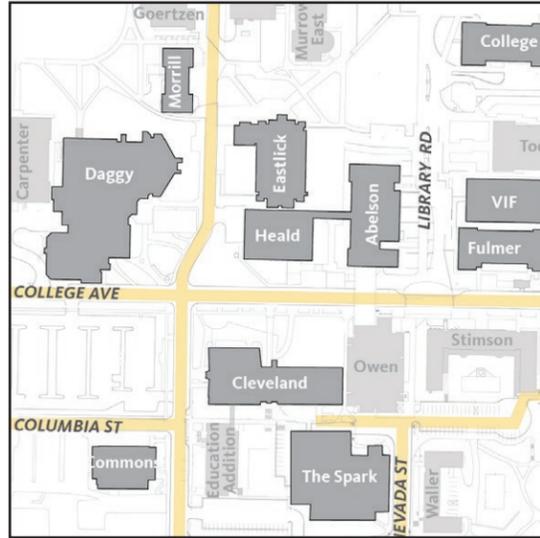
North - South Section Study of potential connections to existing Eastlick Hall.

- Possible Site Location
- Utility Tunnels
- Streets

POTENTIAL PROS	POTENTIAL CONS	POTENTIAL MITIGATIONS
<ul style="list-style-type: none"> • Provides more visibility to Abelson Hall - historic building • Demolishes Heald Hall provides open space - opportunity for science on display • Access to one street front • Connection to Eastlick as addition • Access to existing utilidor and loading • Limited floor plate • Eastlick was built on structural fill 	<ul style="list-style-type: none"> • New addition would require substantial alterations of existing Eastlick 	<ul style="list-style-type: none"> • Study options on where connections can be made effectively.
	<ul style="list-style-type: none"> • Seismic Upgrades would be triggered for Eastlick 	<ul style="list-style-type: none"> • Find cost saving strategies to seismic upgrades.
	<ul style="list-style-type: none"> • Construction Logistics and laydown 	<ul style="list-style-type: none"> • Use nearby parking (include cost associated with temporarily renting spaces during construction)
	<ul style="list-style-type: none"> • Allowable quantities (chemicals) and control zones 	<ul style="list-style-type: none"> • Percentage of max allowable quantities is restricted once the building is greater than 3 stories - WSBC 428
	<ul style="list-style-type: none"> • New foundation work would disrupt vivarium and animals. 	<ul style="list-style-type: none"> • Animals are moved to other facilities in the interim, may require additional funds for swing space.
	<ul style="list-style-type: none"> • Plaza area of Eastlick appears to have a mechanical space below it. 	<ul style="list-style-type: none"> • Existing services would need to be shut down and would impact Eastlick
	<ul style="list-style-type: none"> • If Heald is not demolished first - existing foundation of the adjacent building would create further challenges. 	<ul style="list-style-type: none"> • Heald may need to be demolished first, or supported temporarily.

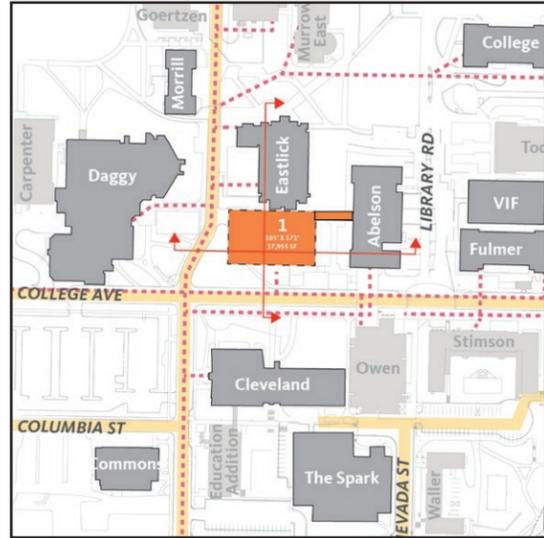
SITE OPTIONS SUMMARY

NO ACTION ALTERNATIVE



The **no action alternative** will be a deterrent to the required support facilities in the advancement and sustained growth of research and academic sciences. It would also be a detriment to continue to support the existing facility of Heald Hall that is no longer feasible to maintain.

PREFERRED SITE OPTION 1



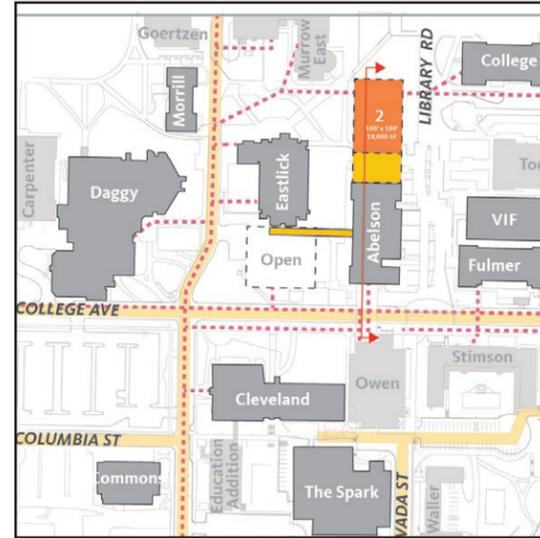
Site Option 1 is preferred as it allows for demolition of Heald Hall and the advantage of building on a previously developed site in the science corridor, while maintaining adjacent connections to Eastlick and Abelson Hall. We then looked at 4 alternatives for maximizing program using the LCCM worksheet located in section 7 of the report. All options maintain an estimated schedule; construction start date Jan. 2027, midpoint Oct. 2027, and completion Jun 2028.

Ownership Option 1: 49,020 GSF for 3 floors to include 10 research lab, lab support, and office modules.

Ownership Option 2: 65,915 GSF for 4 floors to include 14 research lab, lab support, and office modules.

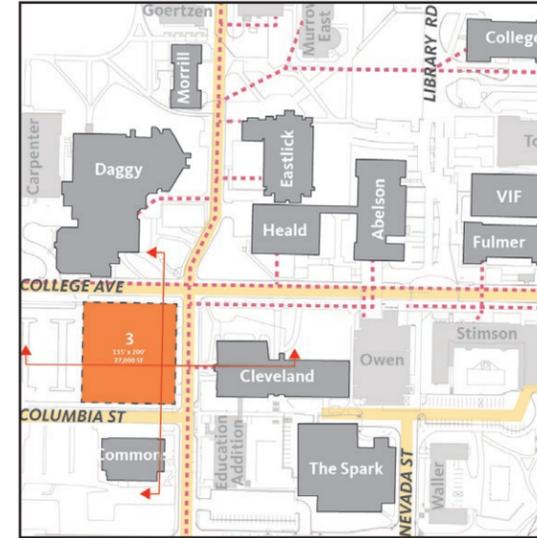
Ownership Option 3: 82,810 GSF for 5 floors to include 18 research lab, lab support, and office modules.

SITE OPTION 2



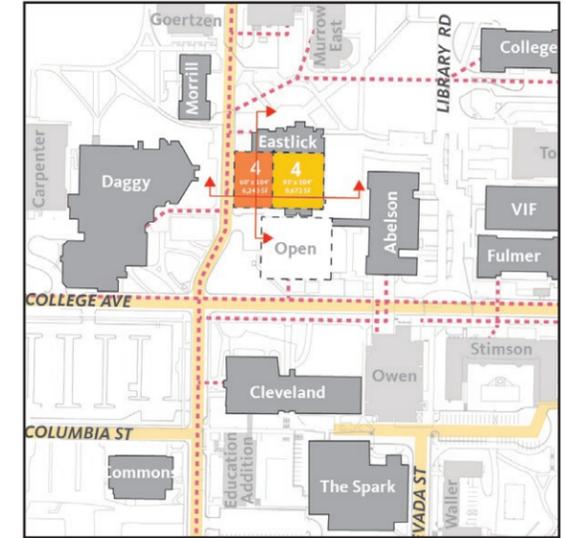
Site Option 2 access is challenging but did have the advantage of adjacency to Eastlick and Abelson. This is also a greenfield site which would remove the opportunity to maintain open spaces within the campus fabric.

SITE OPTION 3



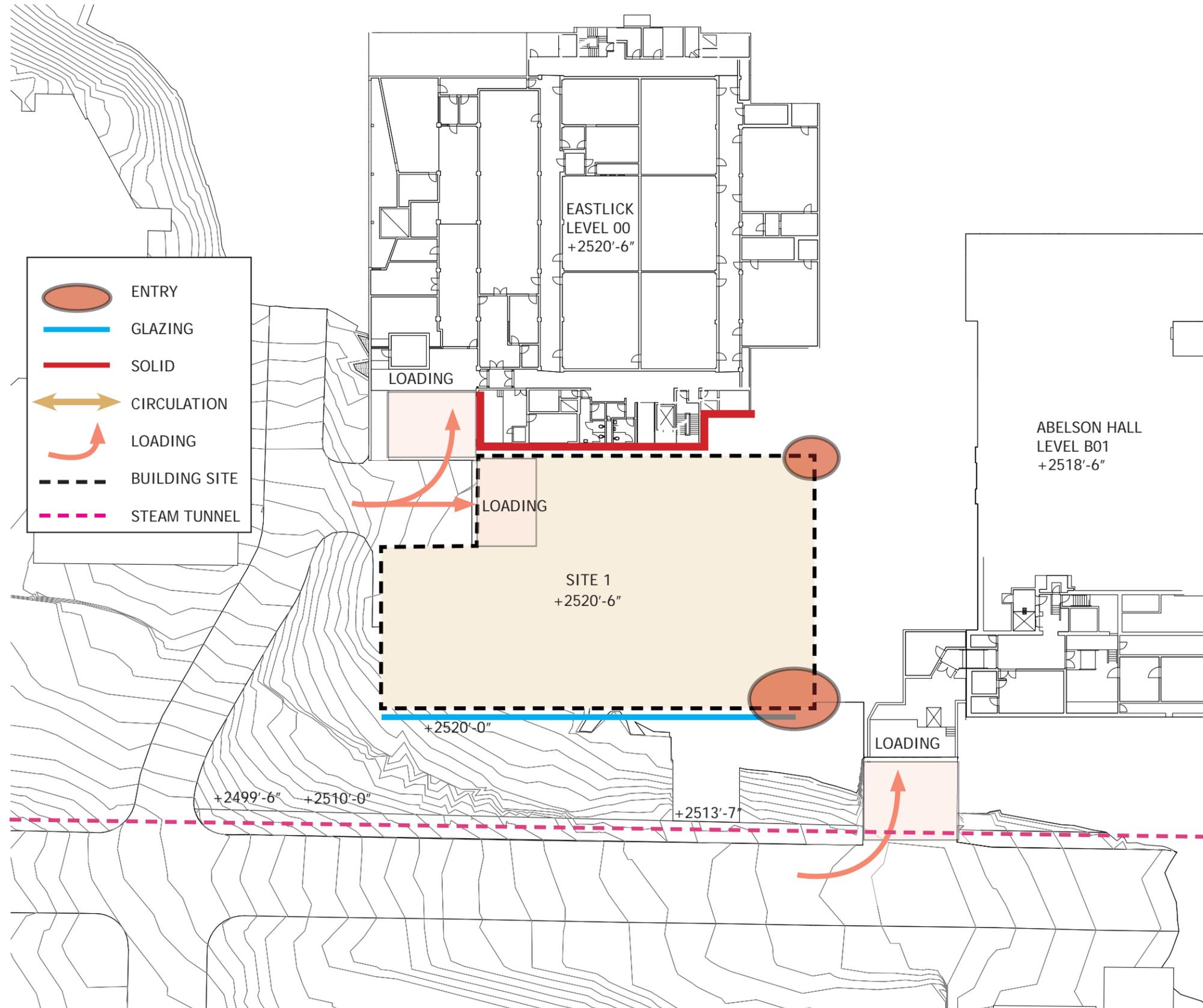
Site Option 3 is challenging due to existing infrastructure upgrades and would displace much needed parking on campus. The site would also disadvantage to allow for connections between the existing program in Eastlick and Abelson Halls.

OPTION 4



Site Option 4 would create a highly complex substantial alternation and addition to an existing facility that would be required to be vacated for work to proceed.

SITE ANALYSIS - CHALLENGES & OPPORTUNITIES - Preferred Option 1





Gensler

SECTION 03.

THE TEN YEAR ROADMAP

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CHARTING THE TEN YEAR ROADMAP

OUR APPROACH

Gensler was tasked to develop a pre-design with a focus study of the space assessment needs for the core building identified which encompass the “Science Corridor” that runs east-west along NE College Ave. This master plan study and space assessment allowed our team to create a “roadmap” to identify the series of “enabling” projects that both create sustained investment of deferred maintenance projects and allow for the “decanting” of existing Heald Hall in preparation of site demolition and abatement.

We approached design through a collaborative effort with consensus-building engagements. We held a series of design workshops, presentations, and focused working sessions with stockholders, facilities, and core leadership from the College of Arts and Sciences. We began the process with engagement of the core group in an on-site visioning session to identify priorities and clearly define the project goals that would be our “north star” each step of the process.

PROJECT GOALS

We identified two clear guidelines from the start that set the stage for identifying the series of enabling and decanting projects in support of the larger vision.

1. The Principal Investigators (PIs) would move once to minimize disruptions to research.
2. To designate existing building science facilities as suitable to sustain teaching or research focused programs.

DEVELOPING THE ROADMAP

We began our process where the 2014 Facilities Masterplan concluded which identified the catalyst project of the replacement of Heald Hall with a new Pullman Science Building. We began our data mining by hearing input of the ideas and assumptions evaluated by that study.

Next, we began gathering data of the existing spaces through a series of questionnaires and space assessment spreadsheets to understand how currently each of the core buildings identified was used and space assignments allocated.

We then brought on our analyst to identify patterns and average space allocation per Principal Investigator (PI) in the categories of lab support, lab bench space, and offices. The data allowed the team to provide comparison benchmarking with peer research institutions. The evaluation of the existing building infrastructure metrics the team assigned also allowed us to access whether each core building could accommodate either instructional or research-based programs.

Efforts then focused then on identifying available spaces with the Universities facilities group and CAS director of operations throughout the core buildings that would be evaluated as part of the series of enabling project to “decant” Heald but provide permanent new hubs for researchers.

The design team through a rigorous and collaborative process then provided various scenarios in which the 10-year roadmap of project could sustain, and ultimately determine the needs of the new Pullman Science Building. The question to answer - “how large of a facility do we need as part of the larger roadmap?”

As the design team worked in parallel to the efforts by the Universities facilities group, the pressures of the competing colleges were apparent. The facilities group touched base with the design team at regular intervals to provide feedback on the balancing act of all the project request and inform our teams efforts. With each piece of information, the 10-year plan was reshuffled to account for the larger plan forged ahead, while still “right-sizing” the new building site based on the number of modules to fit a flexible range of PIs.

BALANCING - THE TEN YEAR ROADMAP

2023-2025

Enabling projects are proposed to “decant” Heald Hall with the goal of providing permanent facilities to the PIs currently conducting their research in Heald. These series of projects are sustained investments to Eastlick, and Abelson Hall.

Bustad Hall tenant improvements would allow for the relocation of five microbiology teaching labs from Eastlick Hall.

2025-2027

Enabling project in Clark Hall to move School of Environment (SOE) Labs to finish decanting Heald Hall.

Demolition of Heald Hall; including the bridge connection to Abelson Hall.

Site 1 Design services and Early Site Prep / Foundations phased construction. This allows for the design and early phased construction work to begin in this biennium.

Enabling project to renovate vacated Fulmer Annex spaces to move 2 research labs from Fulmer Synth can allow for phased floor by floor Renovation of Fulmer Synth.

Renovation of Fulmer Synth Begins.

2027-2029

Site 1 Construction and completion allows for decanting

of second and third floor labs from Eastlick to move to Site.

Renovation of Fulmer Synth Construction continues.

Design services of renovation of Fulmer Lab begins.

2029-2031

Enabling projects for the renovation Eastlick Hall second and third floors from research to instructional use. This allows for decanting of Fulmer Lab and construction to begin.

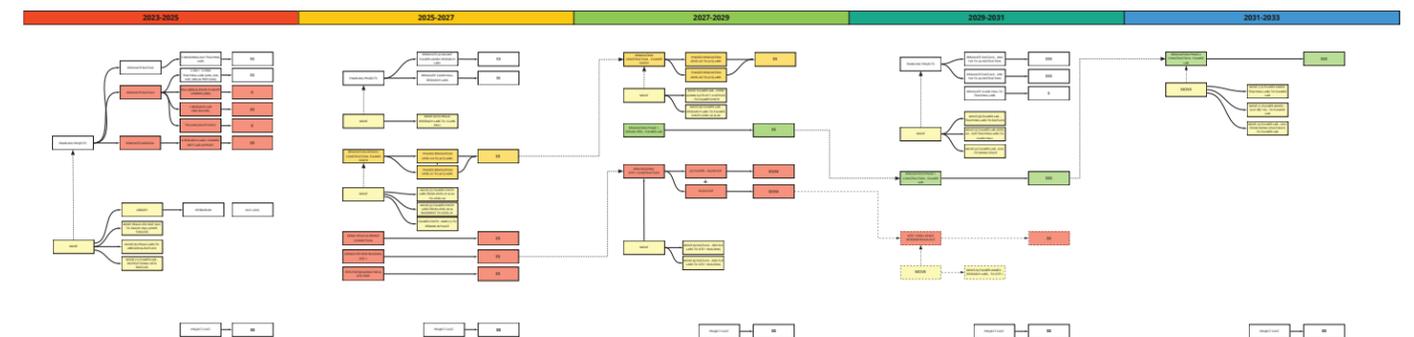
Move remainder of Fulmer Lab School of Environment Teaching Labs and General Use Classrooms

Renovation of Fulmer Lab Phase 1 construction begins; may require remainder of SOE teaching labs and General Use Classrooms to be relocated to swing space in Clark Hall.

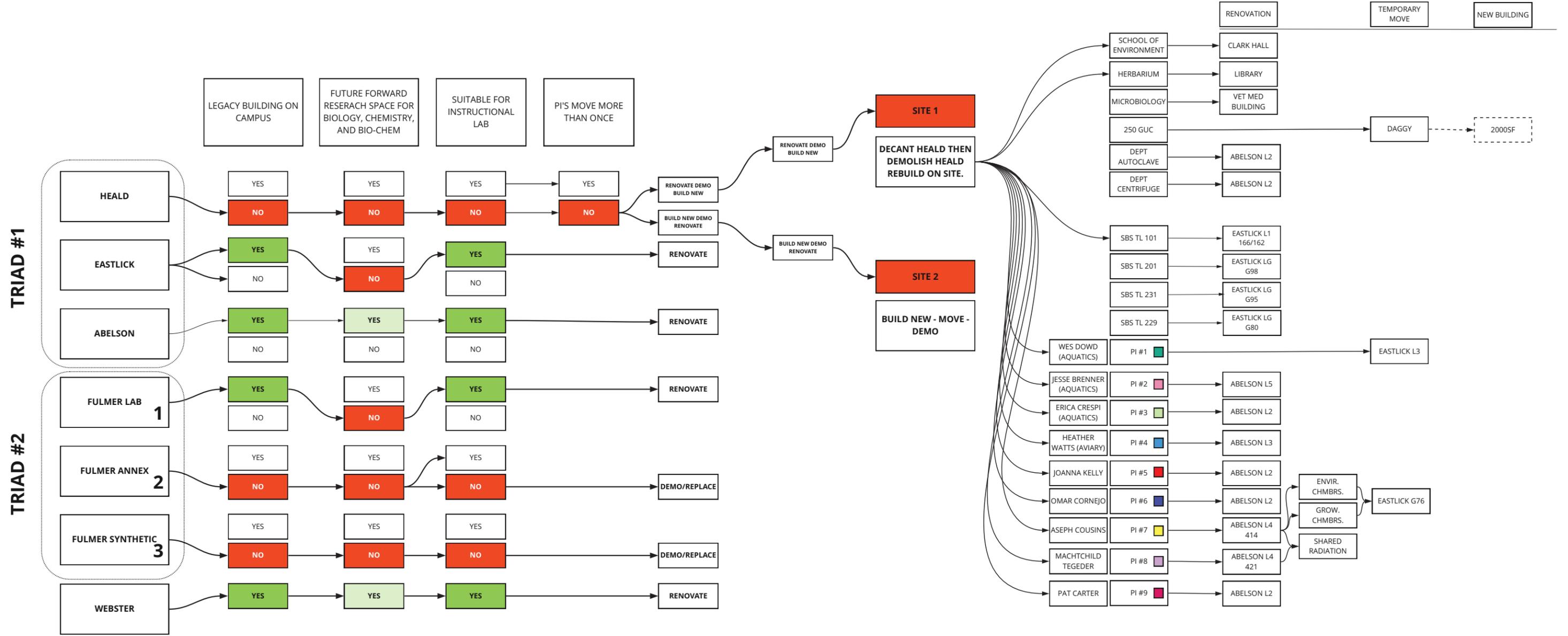
Optional Site 1 interior build-out to begin if shell space is allocated as a cost savings measure in 2027-2029 biennium.

2031-2033

Renovation of Fulmer Lab Phase 1 construction continues. When project is complete Fulmer Lab can be dedicated to Instructional Use.



PROJECT PARAMETERS AND LOGISTICS MINDMAP

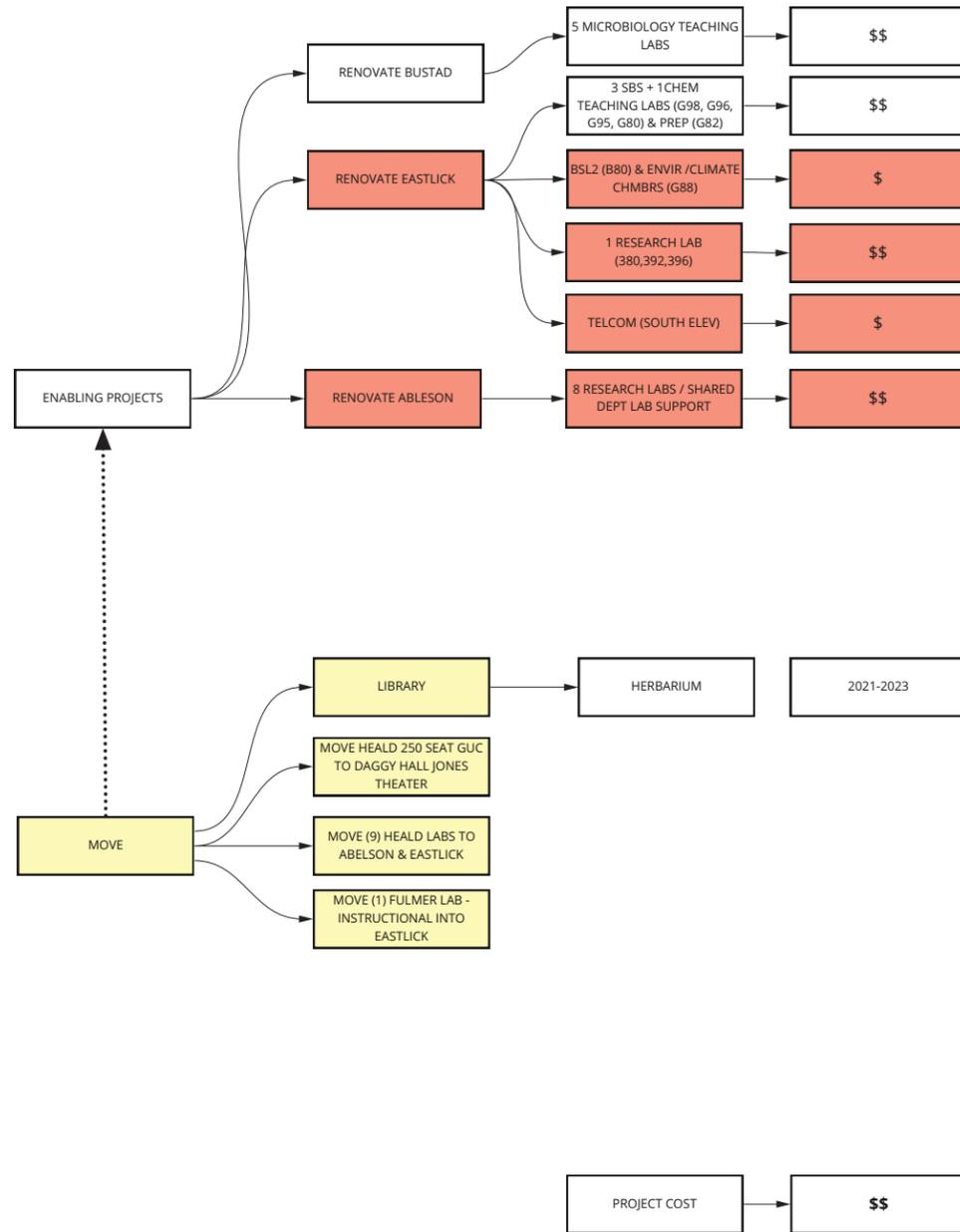


BUILDING EVALUATION CHART

	Architecture							Structural		MEP								
	Year	Legacy Building	Demo or Renovation	Occupancy Max Load Per Floor	Floor to Floor Height	# of Floors	Construction Type	Floor Loads	Structural System	How easy is it to provide a centralized ventilation system?	How easy is it to provide new lab exhausts routed up to the roof, with roof mounted fans and stacks?	What is the building heat source? Campus Steam, other?	What is the building cooling source? Campus chilled water, other?	Does the plumbing system have capacity?	Does the building have a DDC system?	Available Electrical Capacity	Age of electrical equipment	How easy is it to add new data closets, IDF, MDF, rooms for IT?
HEALD	1960 remodeled in 1967	No	Target for Demolition	Sprinklered (54 x 2) / 0.2 = 540 people	11'-6"	7 + Roof Penthouse	TYPE II-A	Classrooms LL=40 psf Corridors LL=100 psf	Multi-Story Concrete	Centralized ventilation system	Not Sufficient	District Steam	District Chilled Water		Yes	Not Sufficient	Not Sufficient	Not Sufficient
EASTLICK	1977	Yes	Renovation, mostly instructional lab, some	Sprinklered (44 x 2) / 0.2 = 440 people	13'-6"	5 + Mechanical Crawl Space	TYPE I-B	Laboratories LL = 80 psf + Partitions Corridors LL=100 psf	Multi-Story Concrete	Robust in terms of ventilation. 4 Air Handlers Hot deck / Cold deck.	Neutral	District Steam	District Chilled Water	Neutral	Yes	Dual Service / 208. Not current to lighting code.	Neutral	No IDF/ MDF
ABELSON	1935 remodeled in 1988	Yes	Renovation, research and instructional lab	Sprinklered (64 x 2) / 0.2 = 640 people	13'-0"	8	TYPE II-FR = TYPE II-B	Classrooms LL=70psf Beams = 50psf Attic = 50psf Corridors LL=100psf	Multi-Story Steel	Centralized ventilation system	greenhouse on top. Renovated in 1990's. We could reuse an existing	District Steam	District Chilled Water	Neutral	Yes	Adequate Capacity	Neutral	CAT3
FULMER - LAB	1939 remodeled 1982	Yes	Renovation, mostly instructional lab - ground	Sprinklered (59 x 2) / 0.2 = 590 people	13'-0"	4 + Roof Penthouse	TYPE II-A	Classroom = 70psf Beams = 50psf Terrazzo Slab = 37psf Toilet = 40psf Partitions = 40psf Center = 20psf	Multi-Story Concrete	piecemeal ventilation system. No forced Ventilation	has duct work on the outside.	District Steam	District Chilled Water	Di can be isolated. Not fully sprinklered	Yes	Adequate Capacity	Neutral	CAT3
FULMER - ANNEX	1995	No	Target for Demolition	Sprinklered (59 + 62) / 0.2 = 605 people	11'-6"	7 + Roof Penthouse	TYPE II-A	Classroom= 40 psf Lab = 80 psf Stair/Corridor = 100 Partitions = 20 psf Guardrail/Balcony = 50 psf	Multi-Story Concrete	piecemeal ventilation system	Neutral	District Steam	District Chilled Water	Lab water is feeding into Fulmer Lab and VIF	Yes	Adequate Capacity	Neutral	CAT5
FULMER - SYNTH	1987	No	Target for Demolition	Sprinklered (62 + 45) / 0.2 = 535 people	~19'-3"	7 + Mechanical	TYPE II-A	Floor_Lab = 80psf Partitions = 20psf Terraces = 100psf Corridor + stairs = 100psf	Multi-Story Steel	Centralized ventilation system	Neutral	District Steam	District Chilled Water	Neutral	Yes	Adequate Capacity	Neutral	CAT5
FULMER - VIF		Yes	Target for Demolition	Sprinklered (62 + 45) / 0.2 = 535 people	~19'-3"	7 + Mechanical	TYPE II-A	Floor_Lab = 80psf Partitions = 20psf Terraces = 100psf Corridor + stairs = 100psf	Multi-Story Steel	Centralized ventilation system	below grade building 1 story.	District Steam	District Chilled Water	Neutral	Yes	Adequate Capacity	Neutral	CAT5
WEBSTER		Yes	Target for Demolition	Sprinklered (62 + 45) / 0.2 = 535 people	~19'-3"	7 + Mechanical	TYPE I-B	Floor_Lab = 80psf Partitions = 20psf Terraces = 100psf Corridor + stairs = 100psf	Multi-Story Steel	Centralized ventilation system	tall multi-story building	District Steam	District Chilled Water	No Wet Labs Currently - Poor	Yes	Transformer update planned.	Neutral	CAT3

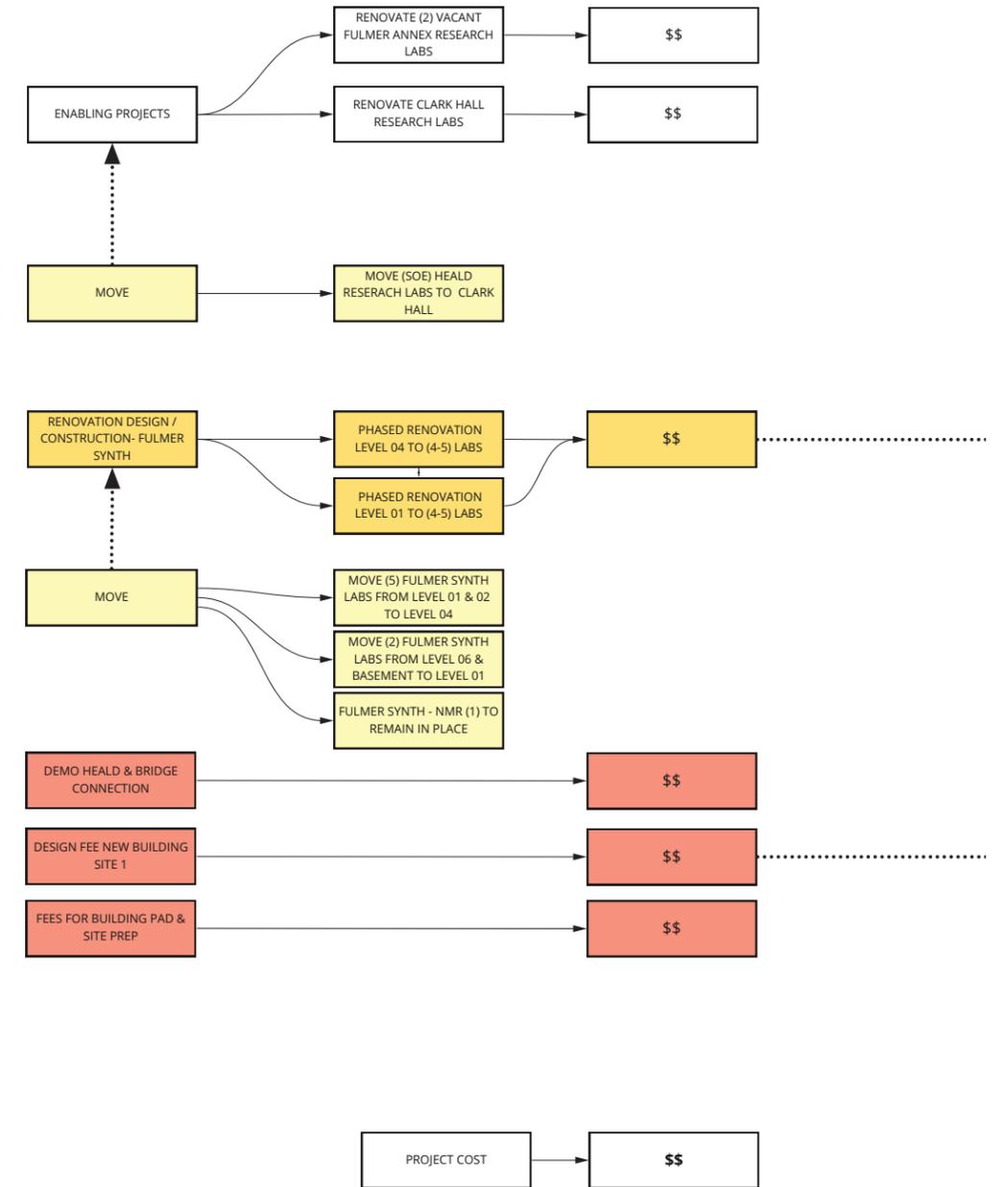
Goals: Decant Heald Hall to allow for demolition in the next biennium.

2023-2025



Goals: Demolition Heald Hall and begin design process for new building site 1. Phased by Floor Renovation of Fulmer Synth to allow for partial occupancy of facilities.

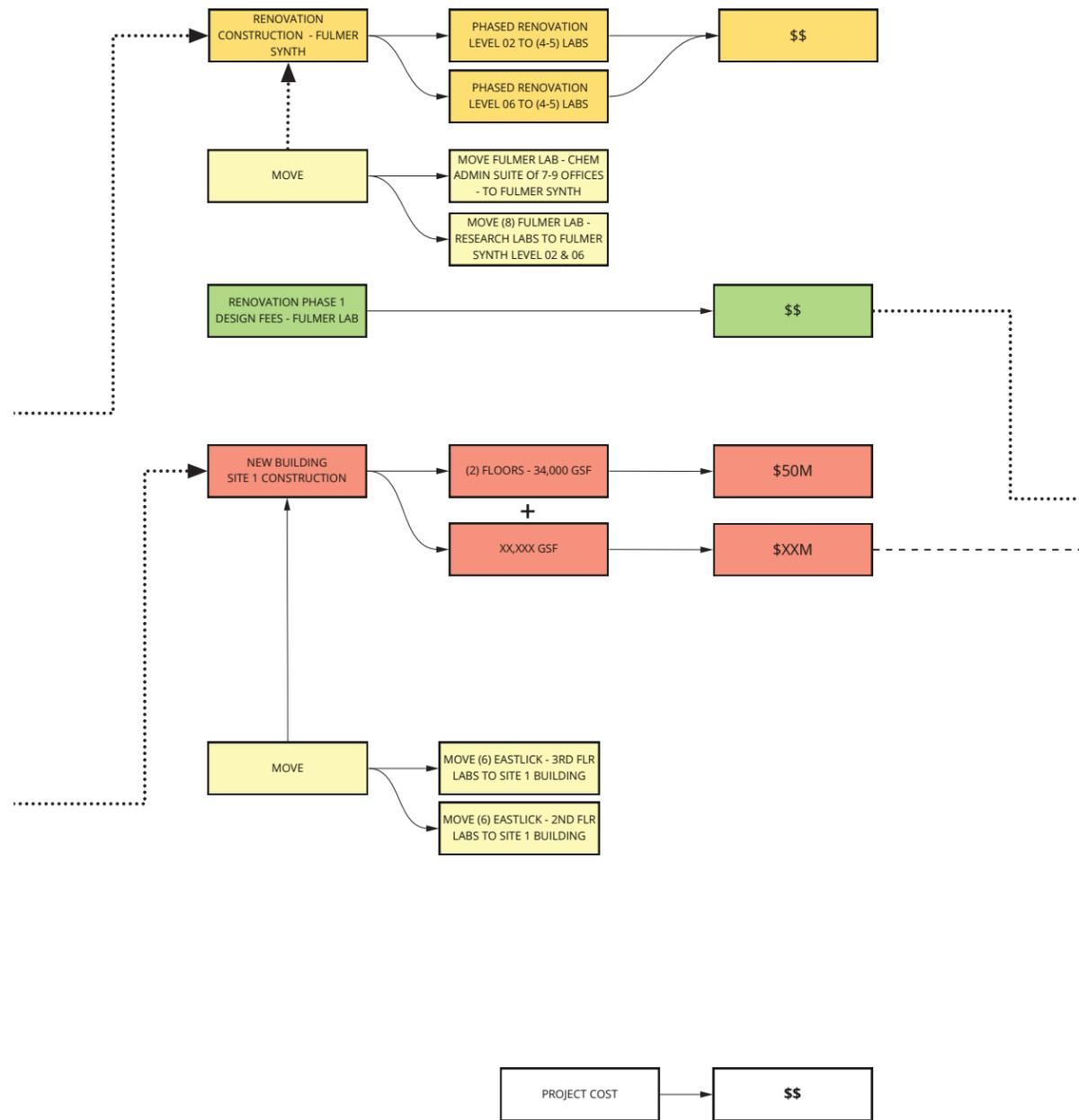
2025-2027



THE TEN-YEAR ROADMAP

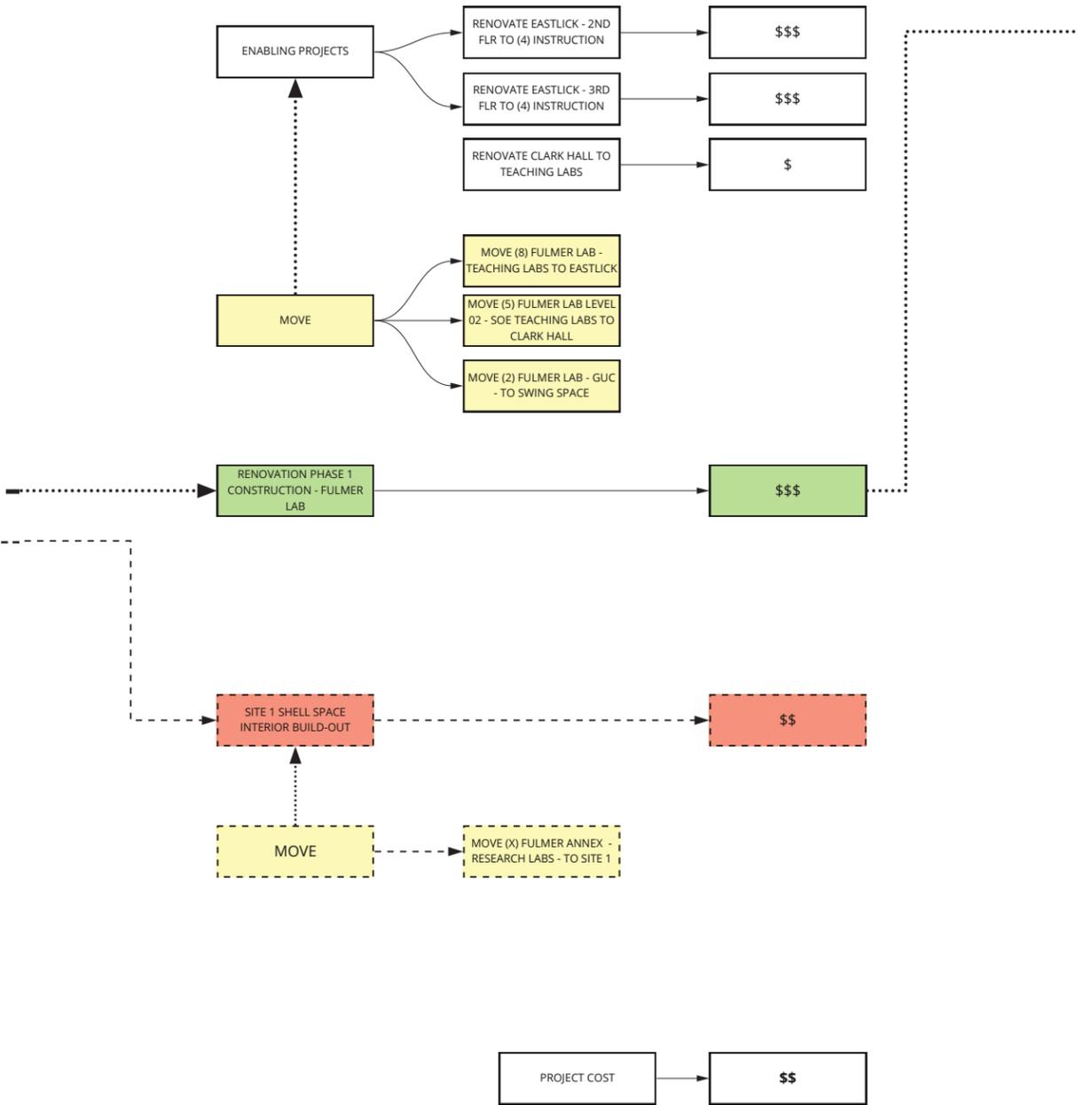
Goals: Phased by Floor Renovation of Fulmer Synth to allow for partial occupancy of facilities.
 Partial decanting of Fulmer Lab in preparation for renovation of existing facility.

2027-2029

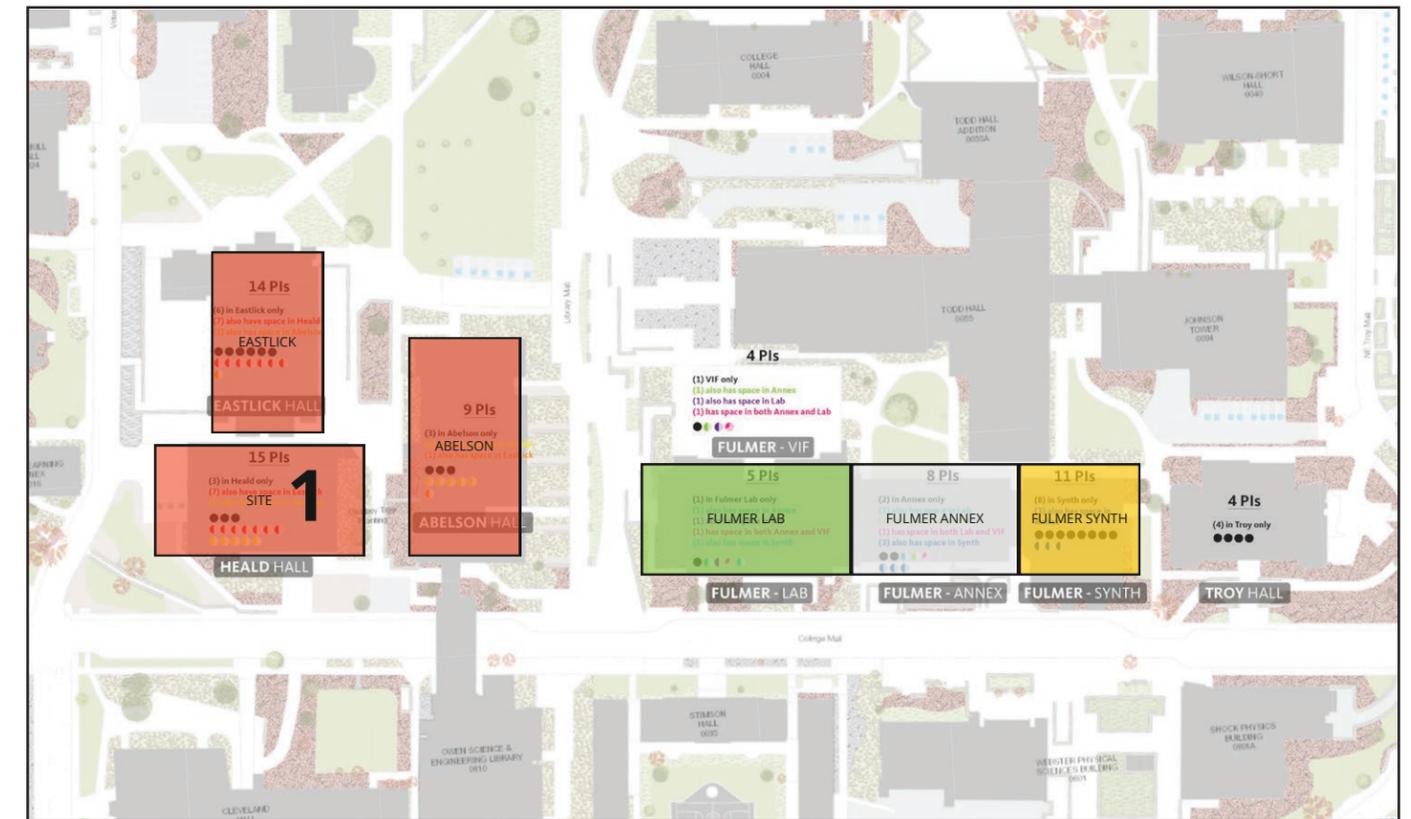
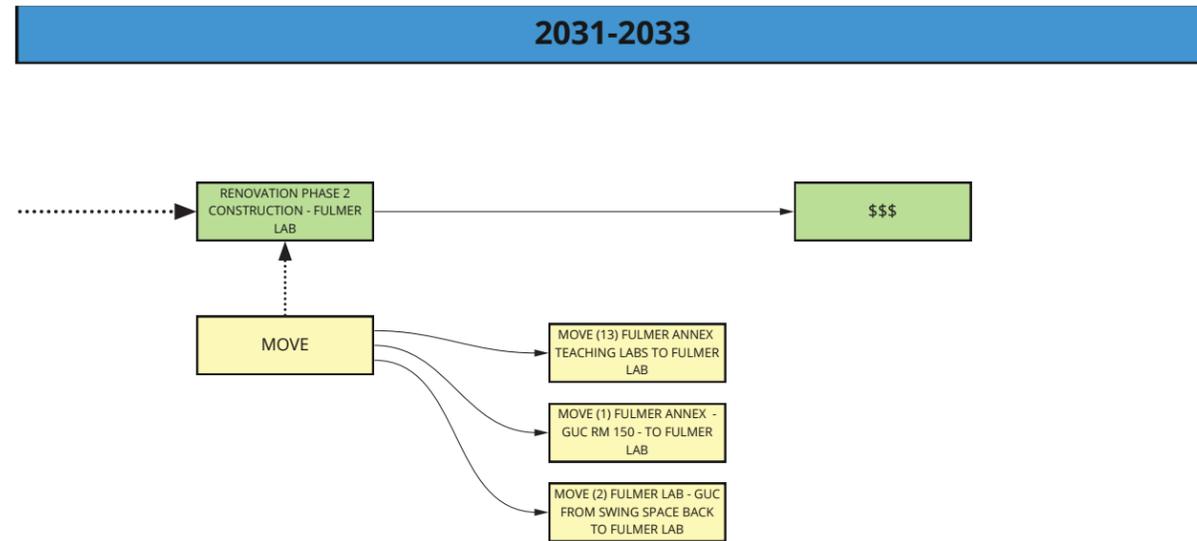


Goals: Decant remainder of Fulmer Lab in preparation for renovation.

2029-2031



Goals: Renovation of Fulmer Lab.



POTENTIAL CHALLENGES

Potential challenges within the 10-year roadmap will require evaluation of the Washington State Energy Code and Washington State Building Code triggers to Alterations. Level 3 Alterations that cover 50 percent of more of the aggregate areas of the building shall comply with WSEBC Chapter 9 may create construction phasing challenges and cost impacts. Further studied is necessitated on for the Renovations of the Fulmer Complex.

ROUGH ORDER OF MAGNITUDE PRICING

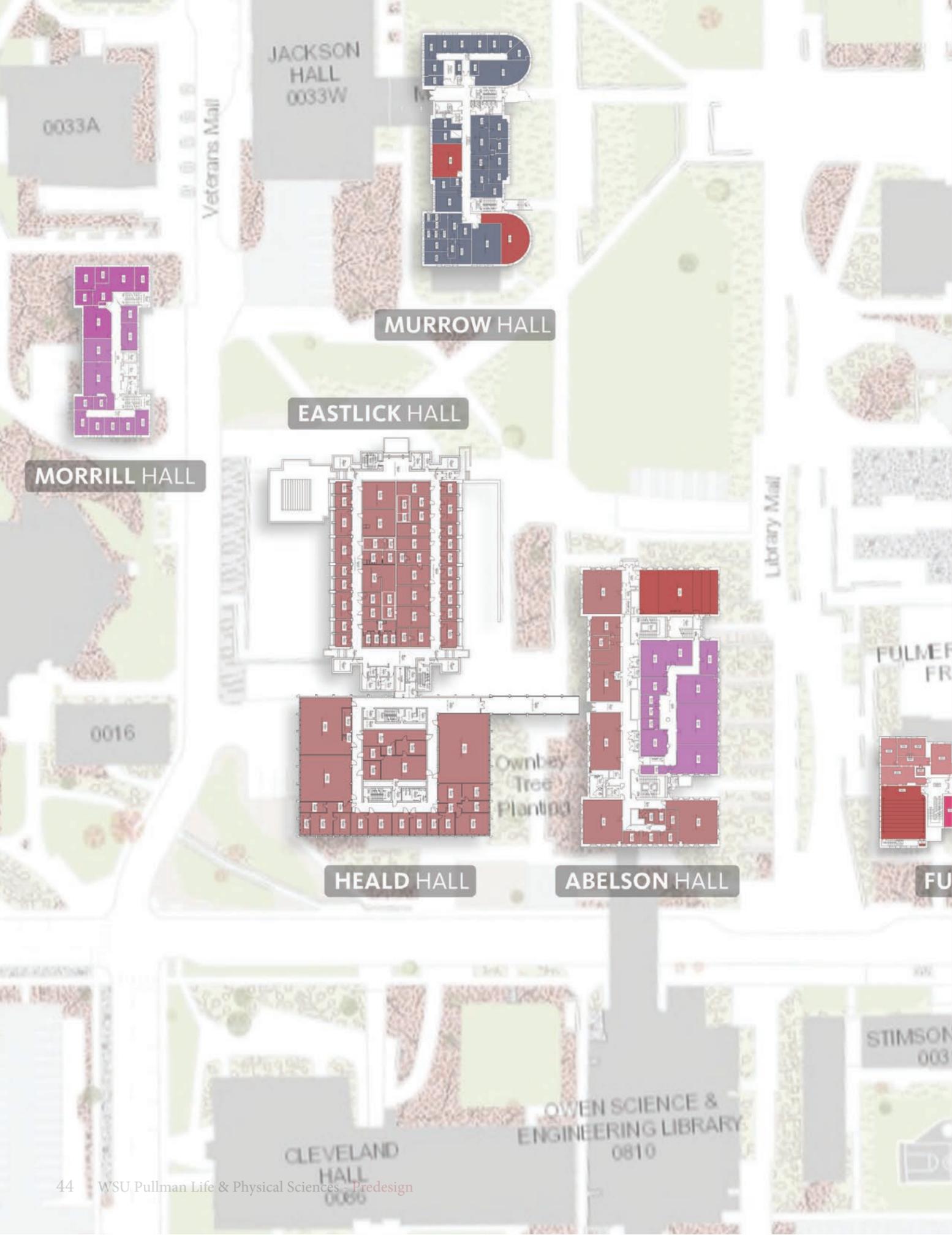
Project	Biennium	Reno Type	Square Ft	Cost	Sum	Time	Comments
Renovate Abelson	2023-2025	Heavy	12,159	\$496	\$6,029,227	29.00%	Addition of HVAC/equipment required
Renovate Eastlick - Telecom South Elevator	2023-2025	Medium	260	\$218	\$56,565	29.00%	New telecom closet in eastlick and new robust wireless system
Renovate Eastlick - (3) SBS & (1) Chemistry teaching labs G98, G96, G95, G80 & Prep G82	2023-2025	Medium	6,344	\$218	\$1,380,191	29.00%	
Renovate Eastlick - Research labs 380, 392 & 396	2023-2025	Heavy	1,151	\$510	\$586,670	29.00%	Addition of HVAC/equipment required. Addition of new exhaust required.
Renovate Eastlick - BSL2 & Environmental chambers	2023-2025	Heavy	1,269	\$510	\$646,815	29.00%	
Renovate Bustad	2023-2025	Light	2,713	\$129	\$351,333	29.00%	
Renovate Bustad	2023-2025	Medium	7,689	\$218	\$1,672,786	29.00%	
Building Infrastructure and Energy Code Investments	2023-2025	Heavy	7,725	\$510	\$3,937,470	29.00%	Variety of existing building investments
Heald GUC to Jones Theatre Temp	2023-2025	N/a					Temporary swing space - 250 seat auditorium for general use classroom
Move Teaching Labs from Heald to Eastlick/Abelson	2023-2025	N/a					3 teaching labs
Move Library - Herbarium	2023-2025	N/a					Renovation already funded
Relocate Microbiology	2023-2025	N/a					5 SOE microbiology teaching labs
Move PI's from Heald to Eastlick/Abelson	2023-2025	N/a					9 Principal Investigators
Total	2023-2025				\$14,661,057		
Total Project Cost					\$21,991,586		
State Funding Request					\$22,000,000		
Renovate Clark	2025-2027	Light	13,000	\$237	\$3,080,392	40.50%	
Demo Heald & Bridge	2025-2027	Full Demo	84,398	\$46	\$3,844,329	40.50%	Refer to full estimate
Design Fee New Building	2025-2027	N/a	0	\$0	\$5,000,000	0.00%	Refer to full estimate
New Building Construction Site Prep	2025-2027	New	32,495	\$46	\$1,478,523	40.50%	Refer to full estimate
Site Infrastructure Investments and Repairs	2025-2027	Heavy	3,000	\$510	\$1,529,114	40.50%	facilities
Move SOE Heald Research Labs to Clark Hall	2025-2027	N/a					
Total	2025-2027				\$14,932,358		
Total Project Cost					\$19,898,537		
State Funding Request					\$20,000,000		
New Building Construction	2027-2029	New	22,500	\$1,351	\$30,396,825	58.00%	Refer to full estimate
New Building Finish Site Work	2027-2029	New	32,495	\$17	\$541,692	58.00%	Refer to full estimate
New Building Construction Bridge	2027-2029	New	5,000	\$1,205	\$0	58.00%	Add alternate
Design / Construction Fee Fulmer Synth Renovation	2027-2029	N/a	60,560	\$0	\$0	58.00%	Refer to capital budget request
Design Fee for Fulmer Lab Renovation	2027-2029	N/a	61,573	\$0	\$0	0.00%	Refer to capital budget request
Move (6) Eastlick - 2nd floor labs to New Building	2027-2029	N/a					
Building	2027-2029	N/a					
Move (8) Fulmer Lab - research labs to Fulmer Synth	2027-2029	N/a					
Move (1) Fulmer Lab - office suite 7-9 offices to Fulmer Synth	2027-2029	N/a					
Total	2027-2029				\$30,938,517		
Total Project Cost					\$49,938,517		
State Funding Request					\$50,000,000		

CONTRACT TYPE AND MANAGEMENT

Rough order of magnitude, estimates, and LCCM scenarios in section 7 of the report are based on the recommendation of procuring design and construction services through a design-build format. Design-build allows the stakeholders to maximize on funds and achieve the priority goals for the new facility through challenges of the current and future market conditions.

Other available methods of procurement are design-bid-build, which will allow for more competitive bids if the market conditions allow but carries the risk of uncontrolled change orders late in the project stage. GC/CM can be a viable method on maximizing funds with continuous estimating support but may require further cycles of value engineering.

Project will be managed by Washington State University facilities alternative public works process. Under the authority of RCW 39.04 and CPARB Project Review Committee, WSU may procure Design-Build, GCCM and Job Order Contracts.



Gensler

SECTION 04. PROGRAMMING

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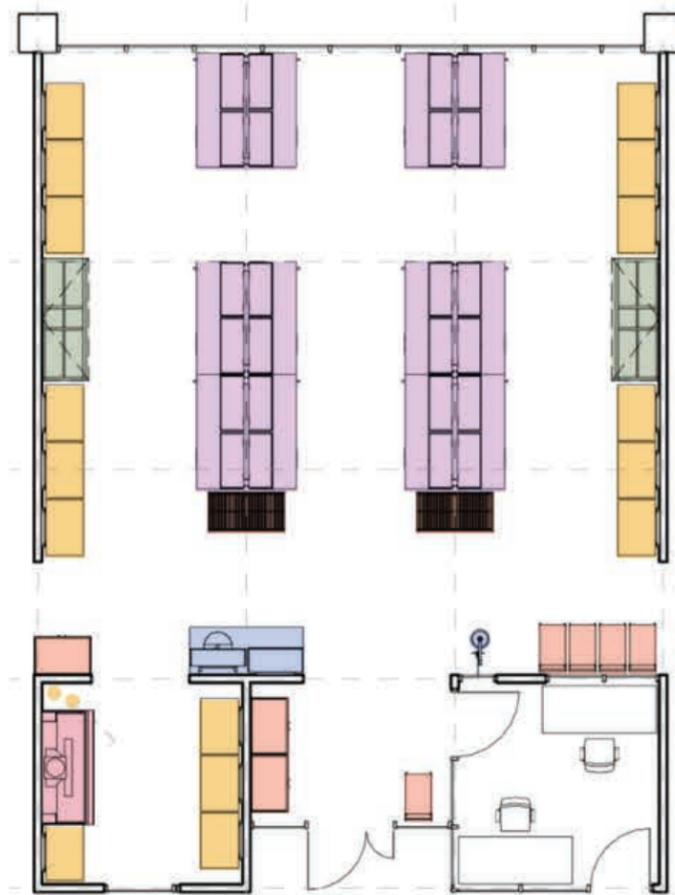
FUNCTIONAL PROGRAM SPREADSHEET - BASELINE

WSU Life & Physical Science - Pre Design Program

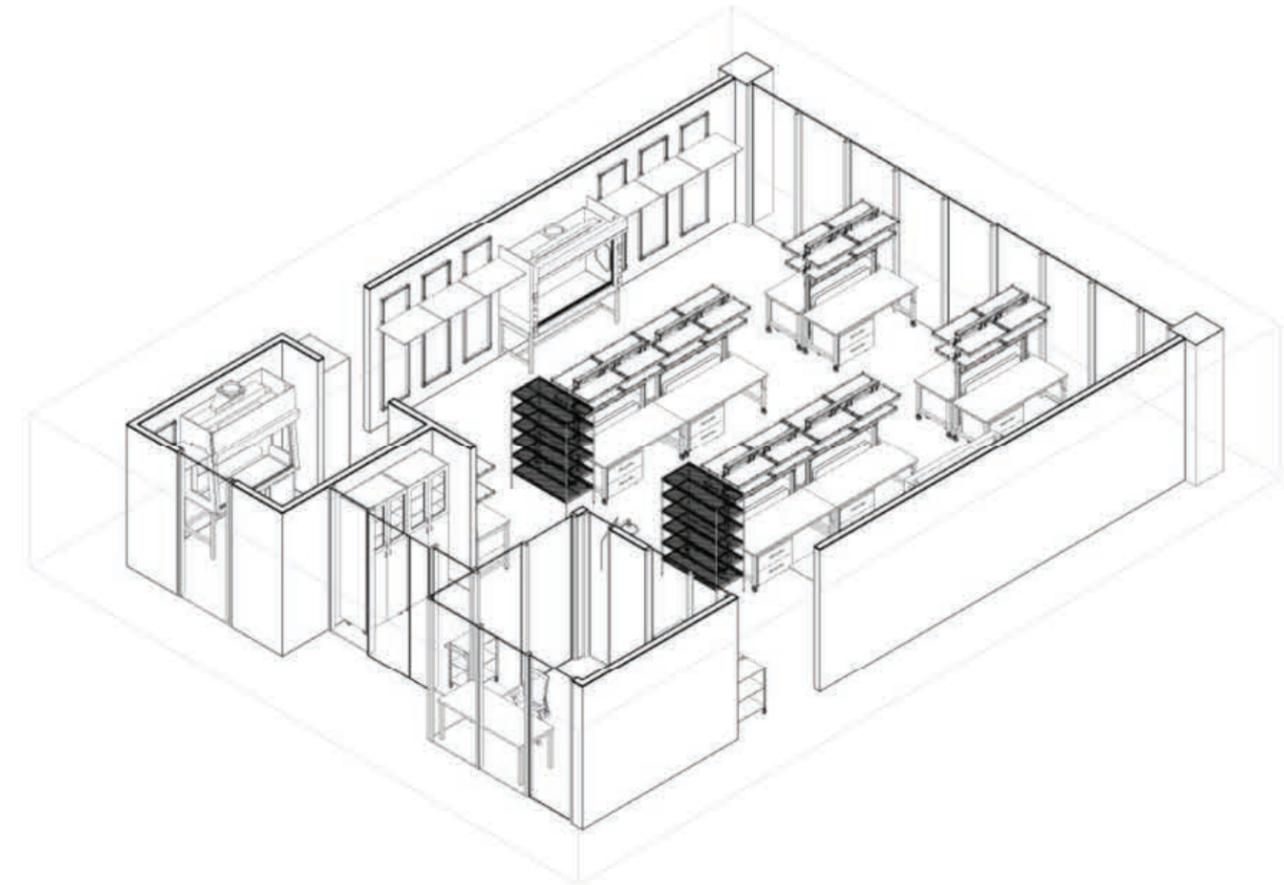
Ref. No.	Use Code	Space	module	# modules	No. of Occupants/ Space	ASF per Space	Number of Spaces	Subtotal Occupants	Subtotal ASF
1.0 Research Program									
1.01 Research Labs									
		Open Research Lab	1245	1		1,245	3		3,735
									0
									0
									0
		Research Space Sub Total							3,735
									3,735
Research Program Sub Total									3,735
1.02 Research Support									
		Lab Support	514	1		514	3		1,542
									0
									0
		Research Support Sub Total					14		1,542
									1,542
Research Support Program Sub Total									1,542
1.0 Research Lab & Support Program Total									5,277
2.0 Classroom & Teaching Lab									
		Classroom & Teaching Lab Sub Total							0
									0
Classroom & Teaching Lab Sub Total									0
2.0 Conference / Collaboration									
		Large Lounge / Kitchenette				555	1		555
		Medium Conf Room				306	1		306
		Small Lounge				168	1		168
		Art / Science Lounge				554	1		554
		Phone Room				53	2		106
		Conference / Collaboration Sub Total							1,689
									1,689
Conference / Collaboration Sub Total									1,689
3.0 Office / Admin									
		Faculty / PI Office			1	116	7	7	812
		Research Associate (Post Docs)			4	236	2	8	472
		Research Assistant / Teaching Assistant (Grad Students)			24	1,516	1	20	1,516
								35	2,800
									2,800
Office / Admin Sub Total									2,800

WSU Life & Physical Science - Pre Design Program

Ref. No.	Use Code	Space	module	# modules	No. of Occupants/ Space	ASF per Space	Number of Spaces	Subtotal Occupants	Subtotal ASF
4.0 Building Support									
		Loading Dock				933	1		933
		Trash/Recycling				235	1		235
		Telecom Room				152	2		304
		Electrical Panel Room				100	2		200
		Electrical Closet				16	2		32
		Mechanical Support Room				234	2		468
		Mechanical Main Room				661	1		661
		Electrical Main Room				453	1		453
		Emergency Power				88	1		88
		Storage				234	2		468
		Restrooms				225	2		450
		Gender Neutral				45	1		45
		Wellness / Mother's Room				51	1		51
		Janitors Closet				120	2		240
									4,627
									4,627
Building Support Sub Total									4,627
WSU Life & Physical Science Building - Total ASF									14,392
WSU Life & Physical Science building - Total GSF									22,500



- Five Elements of PROTEAN Lab Design System**
- 1. ANALYZE**
PROTEAN Lab Bench – 30"W x 72"L x 84" H
Integral 115 power and cord, Adjustable work surface, Lockable casters, (2) rows shelves above – Mobile base cabinet below
 - 2. CAPTURE**
Chemical Fume Hood – 60"W x 33"D x 96"H
Variable Air Volume – 700 c.f.m. exhaust
Vacuum
 - Biological Safety Cabinet, Class II Type C1
No external exhaust
Vacuum
 - 3. EQUIP**
Owner furnished scientific equipment
Refrigerator; Freezer
Incubator; Centrifuge
 - 4. STORE**
Metro shelf unit, 24"W x 48"L x 72"H
Locking Casters; 5 tier shelving
 - Tall storage cabinet, 24"D x 35"W x 72"H
Locking casters; Marker board doors
 - Owner furnished Cart.
 - 5. WASH**
Sink Station: 30"D x 60"L x 96"H
Accessible sink where required
Hot/Cold water faucet; eyewash faucet
 - Safety Shower/Eyewash
Wall Recessed
Floor Drain
Tepid Domestic Water



Space Function

Research laboratory for basic life science research – biology, biophysics, bioengineering, bioastronomy.

Mechanical

Temperature: 68-74°F +/- 2°F
Air: 100% exhaust – up to 8 air changes per hour
4-8 changes per hour occupied
2 air changes per hour unoccupied

Humidity: Ambient

Exhaust: At ceiling and fume hood (700 cfm)

Pressure: Negative

Equip. Heat Gain: 25 btuh/sf

Architectural

Floor: Vinyl tile or sealed concrete, rubber base
Walls: Painted gyp board over metal studs
Ceiling: Ceiling cloud (open at perimeter) at 9'-6" above floor
Glazing: At corridor entry and exterior windows
Doors: 3'-0"/1'-6" pair x 8'-0" with glazing at lab entry
3'-6" x 8'-0" with glazing at lab support rooms

Light Attenuation: At exterior windows
Sound Attenuation: NC 40 or less

Electrical

Power: 115v duplex and fourplex at perimeter wall, Max 8 plugs per circuit, 208v at select equipment

Data: Wireless and hardwire

Controls: Occupancy sensor and manual override

Lighting: LED at 500 LUX

Standby Power: At equipment spaces

Emergency Power: At chemical fume hood

UPS: Point-of-use by user where needed

Information

Occupancy: B (Laboratory)
Area: ~1400 ASF
33'x44' Centerline wall

Quantity: 1 Lab

Capacity: 1 Faculty; 4-6 Post-
Doc/Grad Students

Security: Card Reader

Hours of Operation: 24/7/365

Plumbing

Tepid Water: At safety shower/eyewash
Hot/Cold Water: At lab sinks with vacuum breaker
Floor Drain: Below safety shower
Vacuum: At lab benches and fume hood
Natural Gas: None
Specialty Gases: At cylinders

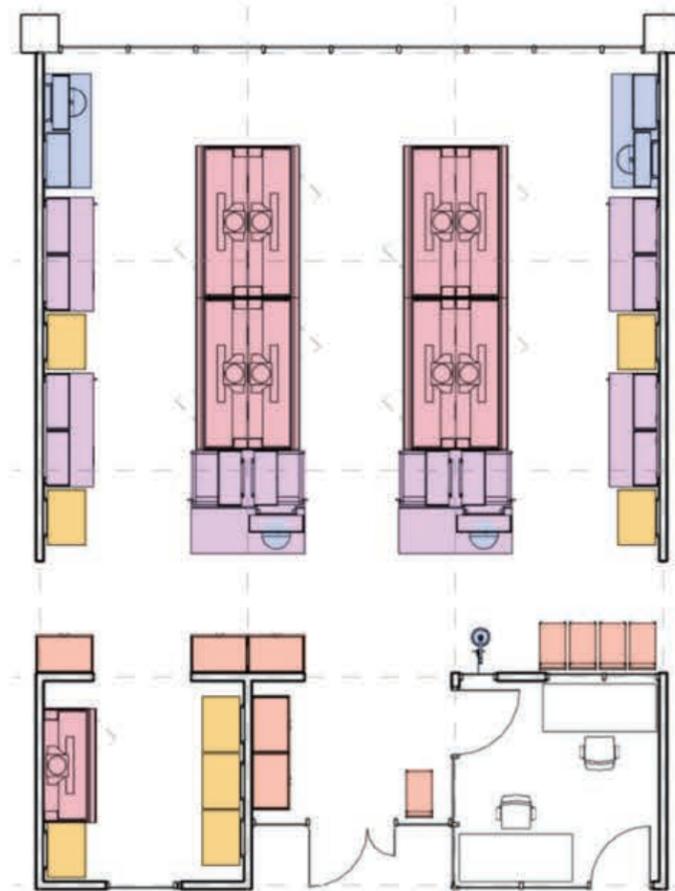
Structural

Vibration Attenuation: 4000 Microinches per second or less
Live Load: 125 lbs./sf

Furnishings

Contractor Furnished: Chemical fume hood
Lab casework, sinks, tops, fittings
Tall storage cabinets
Mobile instrument benches

Owner Furnished: Refrigerators, freezers
Incubators, centrifuges, microscopes, computers, chairs, carts



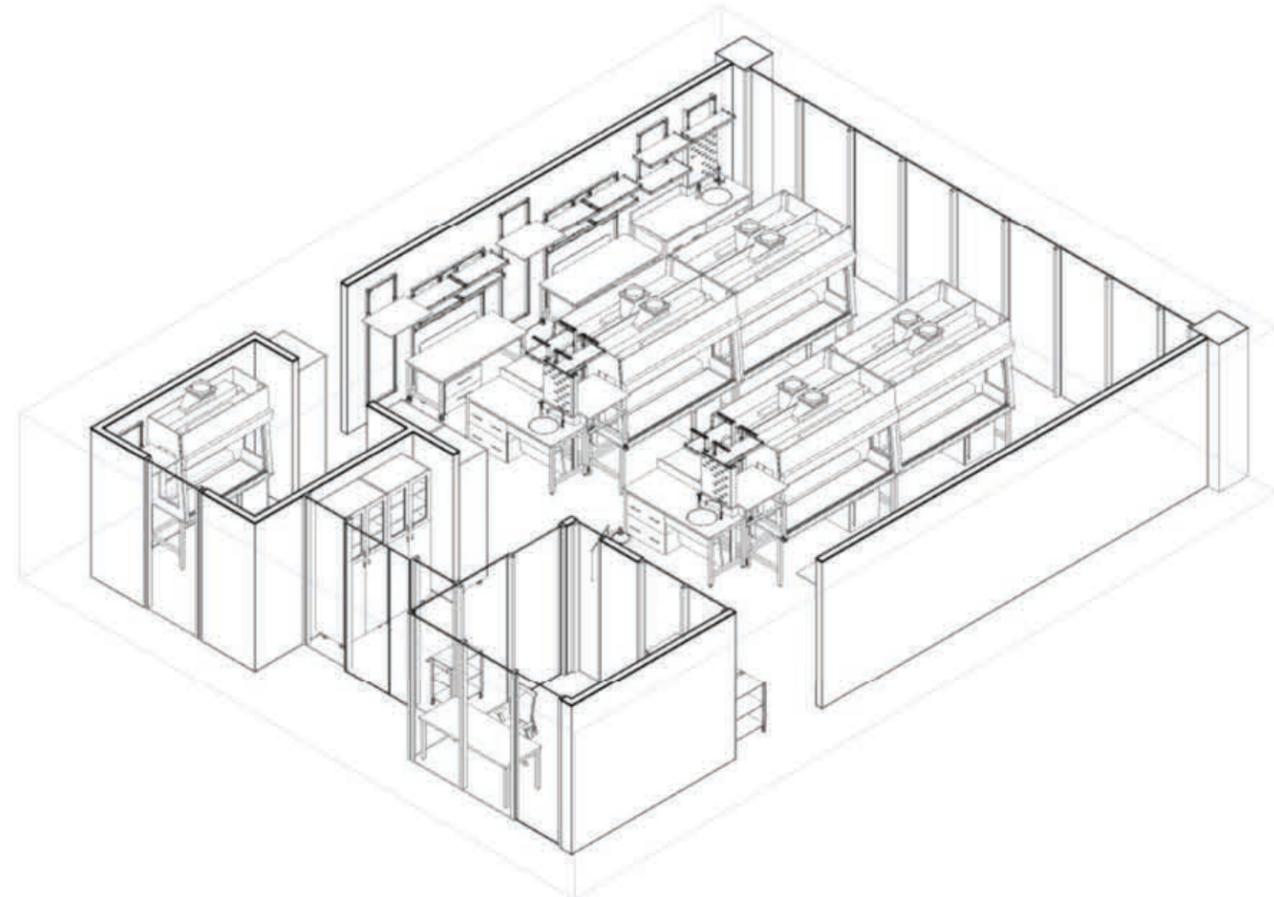
- Five Elements of PROTEAN Lab Design System**
- 1. ANALYZE**
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Integral 115 power and cord, Adjustable work surface, Lockable casters, (2) rows shelves above – Mobile base cabinet below
 - 2. CAPTURE**
Chemical Fume Hood – 60"W x 33"D x 96"H
Variable Air Volume – 700 c.f.m. exhaust Vacuum

96"W x 33"D x 96"H
Variable Air Volume – 1200 c.f.m. exhaust Vacuum
 - 3. EQUIP**
Owner furnished scientific equipment
Refrigerator, Freezer
Incubator, Centrifuge
 - 4. STORE**
Metro shelf unit, 24"W x 48"L x 72"H
Locking Casters; 5 tier shelving

Tall storage cabinet, 24"D x 35"W x 72"H
Locking casters; Marker board doors

Owner furnished Cart
 - 5. WASH**
Sink Station; 30"D x 60"L x 96"H
Accessible sink where required
Hot/Cold water faucet; eyewash faucet

Safety Shower/Eyewash
Wall Recessed
Floor Drain
Tepid Domestic Water



Space Function

Research Laboratory for organic chemistry research.

Mechanical

Temperature: 68-74°F +/- 2°F
 Air: 100% exhaust- up to 8 air changes per hour
 4-8 air changes per hour occupied
 2 air changes per hour unoccupied
 Humidity: Ambient
 Exhaust: At ceiling and fume hood (700 c.f.m., 1200 c.f.m.)
 Pressure: Negative
 Equip. Heat Gain: 25 btuh/sf

Architectural

Floor: Vinyl tile or sealed concrete, rubber base
 Walls: Painted gyp board over metal studs
 Ceiling: Ceiling cloud (open at perimeter) at 9'-6" above floor
 Glazing: At corridor entry and exterior windows
 Doors: 3'-0"/1'-6" pair x 8'-0" with glazing at lab entry
 3'-6"x8'-0" with glazing at lab support rooms
 Light Attenuation: At exterior windows
 Sound Attenuation: NC 40 or less

Electrical

Power: 115v duplex and fourplex at perimeter wall
 Max 8 plugs per circuit
 208v at select equipment
 Data: Wireless and hardware
 Controls: Occupancy sensor and manual override
 Lighting: LED at 500 LUX
 Standby Power: At equipment spaces
 Emergency Power: At chemical fume hood
 UPS: Point-of-use by user where needed

Information

Occupancy: B (Laboratory)
 Area: ~1400 ASF
 33'x44' Centerline wall
 Quantity: 1 Lab
 Capacity: 1 Faculty; 4-6 Post
 Doc/Grad students
 Security: Card Reader
 Hours of Operation: 24/7/365

Plumbing

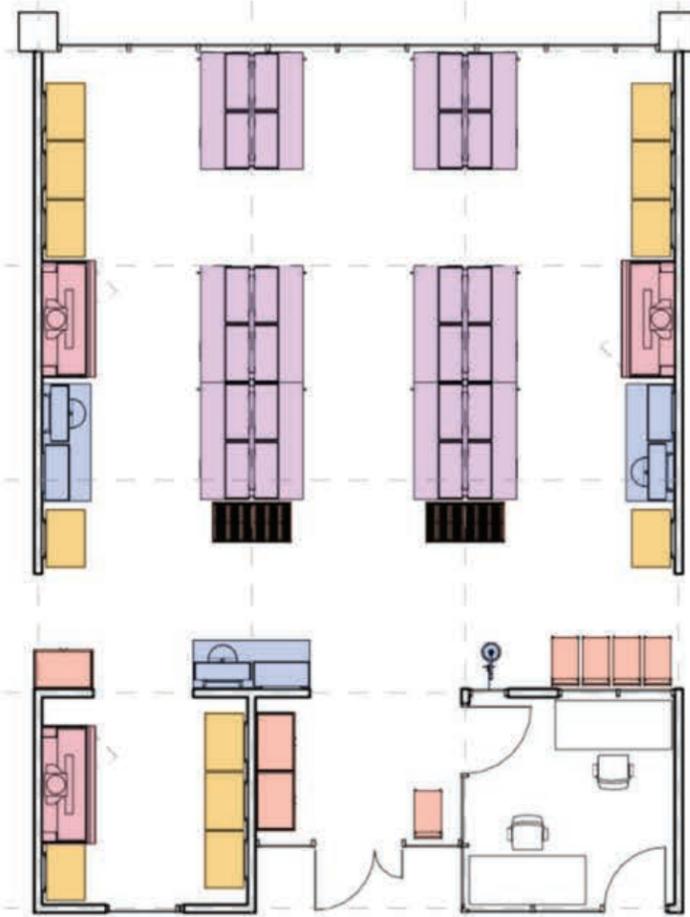
Tepid Water: At safety shower/eyewash
 Hot/Cold Water: At lab sinks with vacuum breaker
 Pure Water: Point-of-use water polishers at select sinks
 Floor Drain: Below safety shower
 Vacuum: At lab benches and fume hood
 Natural Gas: None
 Specialty Gases: At cylinders

Structural

Vibration Attenuation: 4000 Microinches per second or less
 Live Load: 125 lbs./sf

Furnishings

Contractor Furnished: Chemical fume hood
 Lab casework, sinks, tops, fittings
 Tall storage cabinets
 Mobile instrument benches
 Owner Furnished: HPLC, Mass Spec, refrigerators, freezers,
 centrifuges, microscopes, computers, chairs, carts



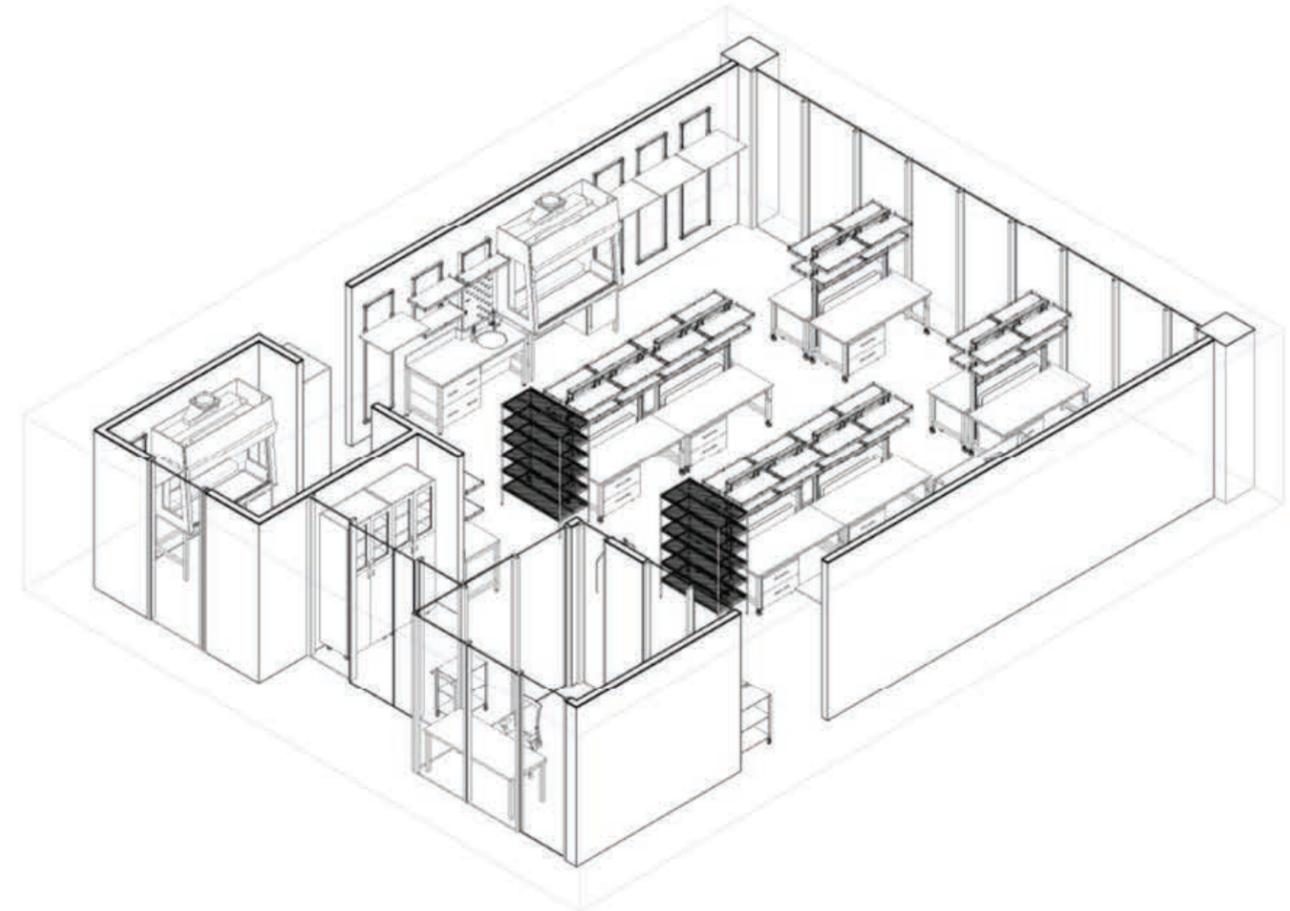
Five Elements of PROTEAN Lab Design System

- 1. ANALYZE**
PROTEAN Lab Bench - 30"W x 72"L x 84"H
Integral 115 power and cord, Adjustable work surface, Lockable casters, (2) rows shelves above - Mobile base cabinet below
- 2. CAPTURE**
Chemical Fume Hood - 60"W x 33"D x 96"H;
72"W x 33"D x 96"H
Variable Air Volume - 700 c.f.m. exhaust;
800 c.f.m. exhaust
Vacuum
- 3. EQUIP**
Owner furnished scientific equipment
Refrigerator; Freezer
Incubator; Centrifuge
- 4. STORE**
Metro shelf unit, 24"W x 48"L x 72"H
Locking Casters; 5 tier shelving

Tall storage cabinet, 24"D x 35"W x 72"H
Locking casters; Marker board doors

Owner furnished Cart
- 5. WASH**
Sink Station; 30"D x 60"L x 96"H
Accessible sink where required
Hot/Cold water faucet; eyewash faucet

Safety Shower/Eyewash
Wall Recessed
Floor Drain
Tepid Domestic Water



Space Function

Research Laboratory for chemical biology analysis and procedures. Lab prototype to provide space for chemical biology, chemical physics, and chemical engineering research.

Mechanical

Temperature: 68-74°F +/- 2°F
Air: 100% exhaust- up to 8 air changes per hour
4-8 air changes per hour occupied
2 air changes per hour unoccupied
Humidity: Ambient
Exhaust: At ceiling and fume hood (700 c.f.m, 800 c.f.m.)
Pressure: Negative
Equip. Heat Gain: 25 btuh/sf

Architectural

Floor: Vinyl tile or sealed concrete, rubber base
Walls: Painted gyp board over metal studs
Ceiling: Ceiling cloud (open at perimeter) at 9'-6" above floor
Glazing: At corridor entry and exterior windows
Doors: 3'-0"/1'-6" pair x 8'-0" with glazing at lab entry
3'-6"x8'-0" with glazing at lab support rooms
Light Attenuation: At exterior windows
Sound Attenuation: NC 40 or less

Electrical

Power: 115v duplex and fourplex at perimeter wall
Max 8 plugs per circuit
208v at select equipment
Data: Wireless and hardware
Controls: Occupancy sensor and manual override
Lighting: LED at 500 LUX
Standby Power: At equipment spaces
Emergency Power: At chemical fume hood
UPS: Point-of-use by user where needed

Information

Occupancy: B (Laboratory)
Area: ~1400 ASF
33'x44' Centerline wall
Quantity: 1 Lab
Capacity: 1 Faculty, 4-6 Post
Doc/Grad students
Security: Card Reader
Hours of Operation: 24/7/365

Plumbing

Tepid Water: At safety shower/eyewash
Hot/Cold Water: At lab sinks with vacuum breaker
Pure Water: Point-of-use water polishers at select sinks
Floor Drain: Below safety shower
Vacuum: At lab benches and fume hood
Natural Gas: None
Specialty Gases: At cylinders

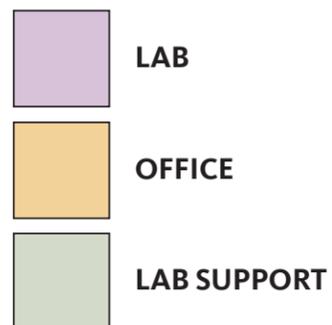
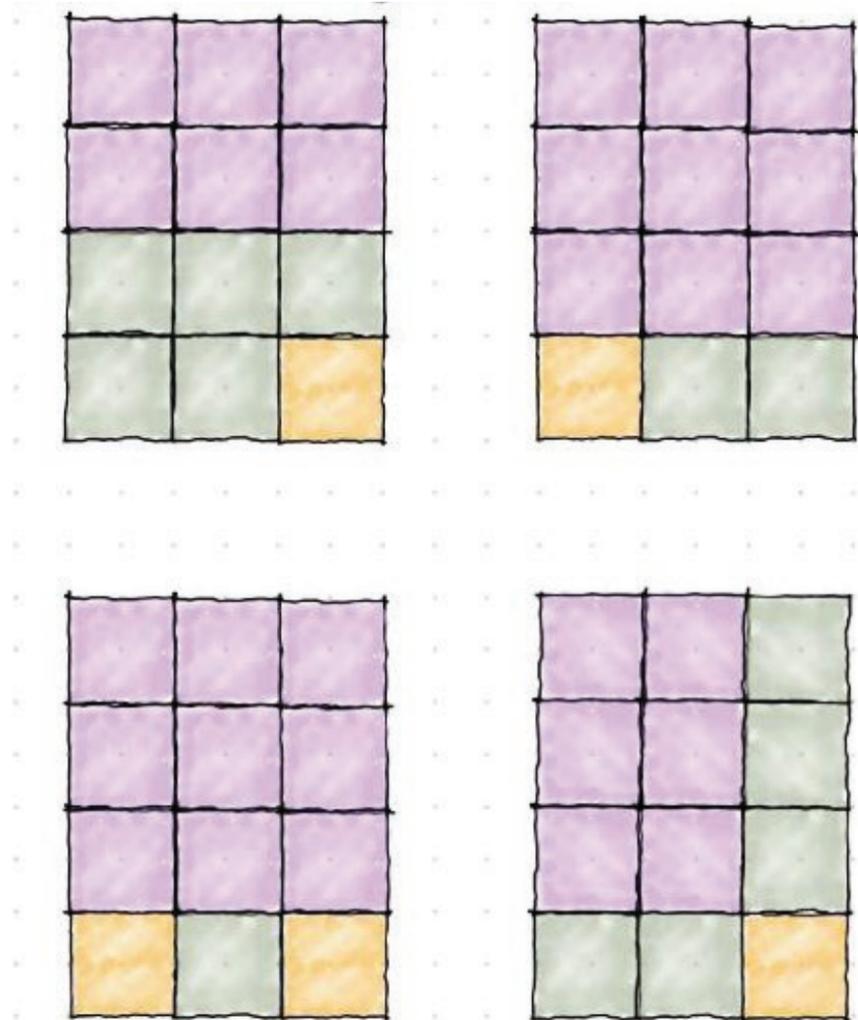
Structural

Vibration: 4000 Microinches per second
Attenuation: or less
Live Load: 125 lbs./sf

Furnishings

Contractor Furnished: Chemical fume hood
Lab casework, sinks, tops, fittings
Tall storage cabinets
Mobile instrument benches
Owner Furnished: HPLC, Mass Spec, refrigerators, freezers, centrifuges, microscopes, computers, chairs, carts

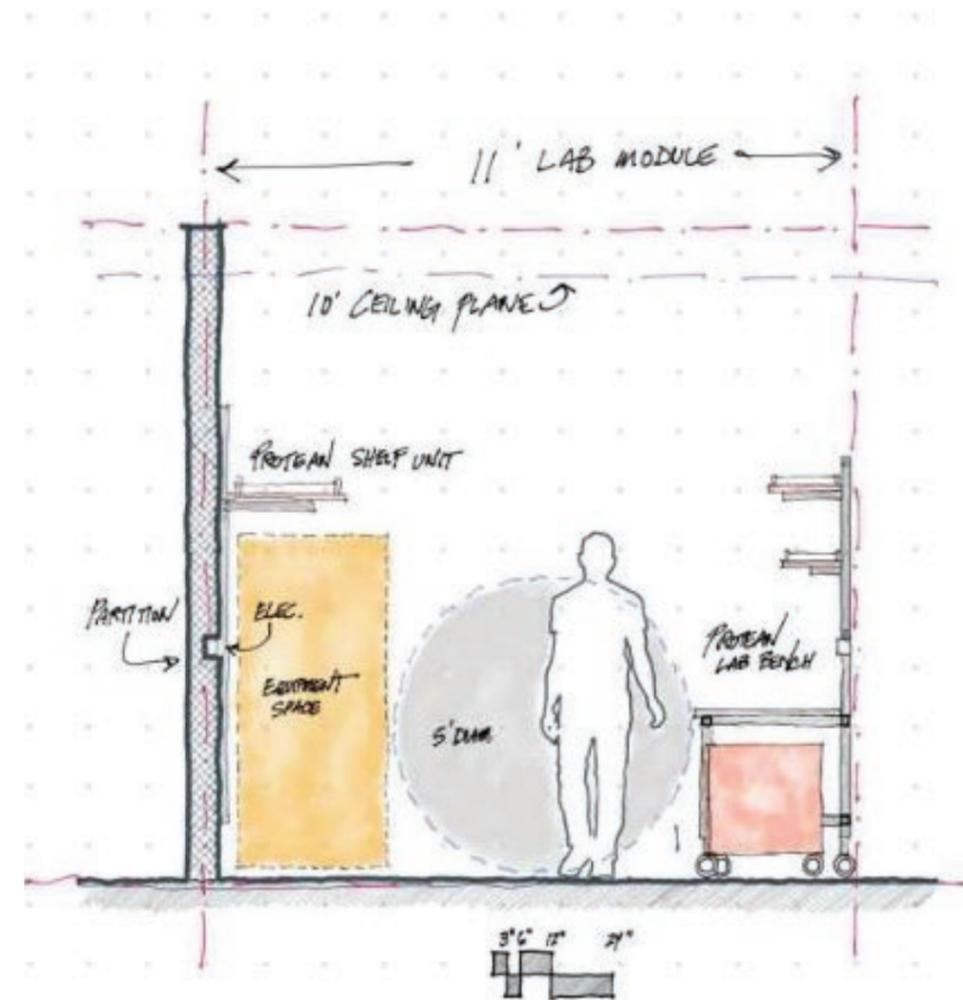
GRAPHIC PATTERNS - 11'-0" PLANNING MODULE



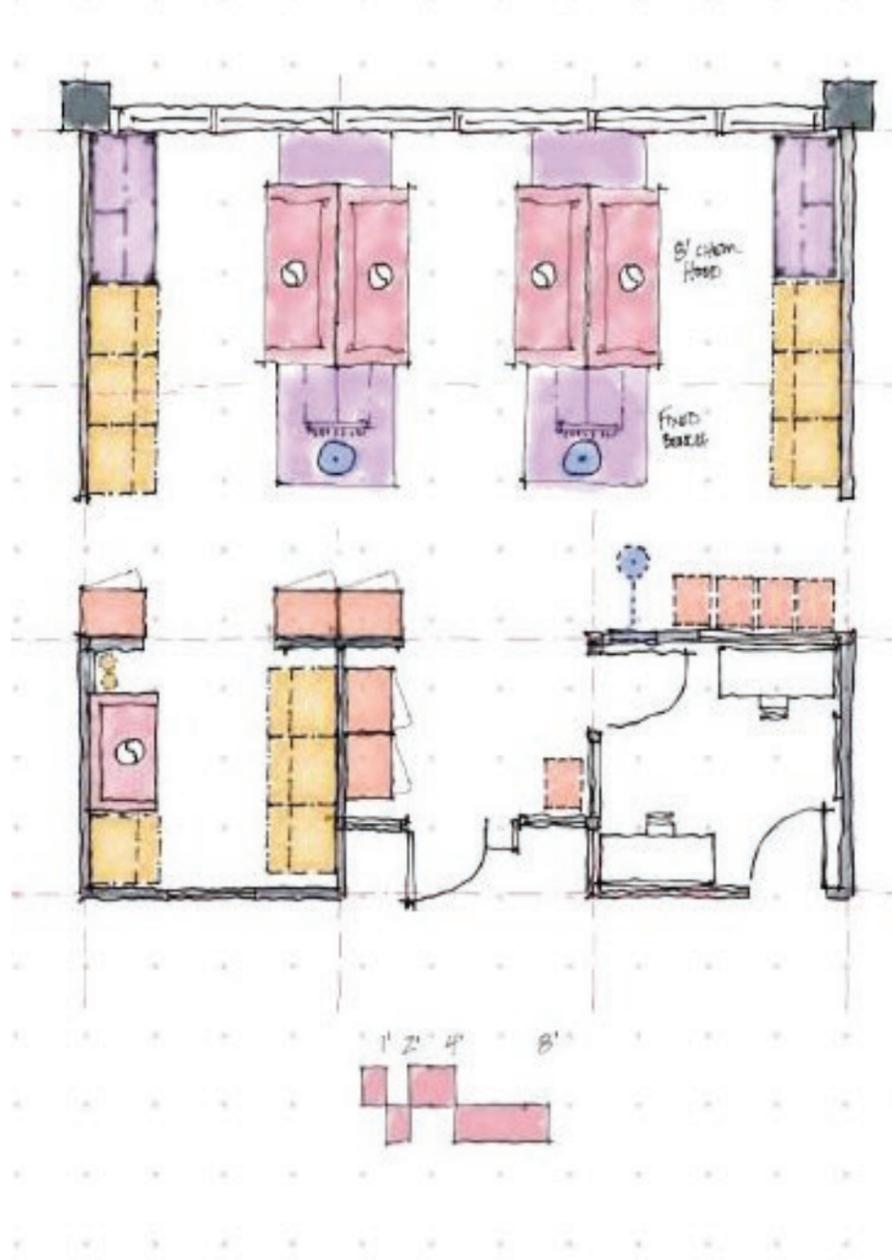
THE MODULE - SECTION

WHY USE THE MODULE?

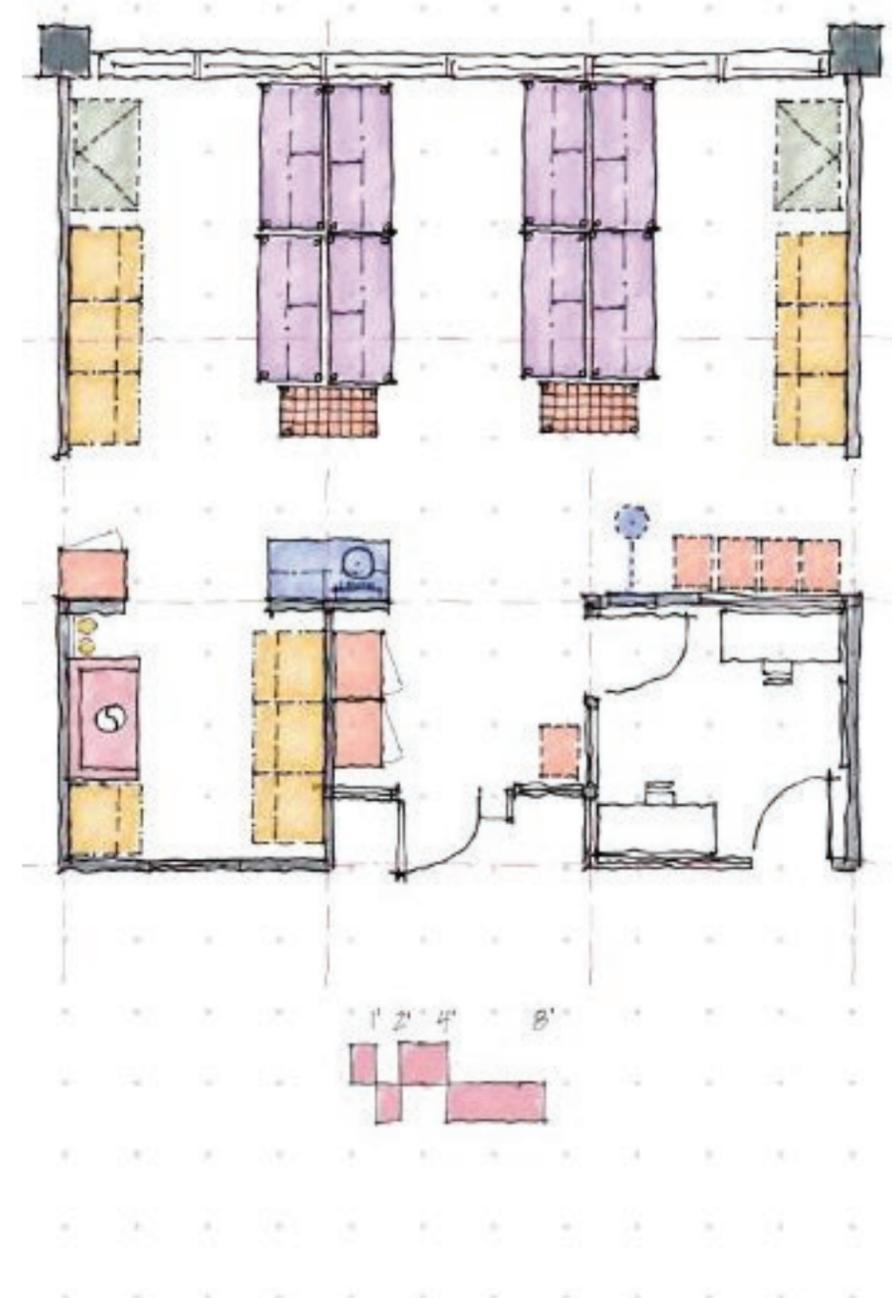
- Provides efficient use of spaces
- Maximizes bench & equipment space
- Adequate aisle space - promotes lab safety



3 x 3 - CHEMISTRY & ORGANIC CHEMISTRY - PATTERN

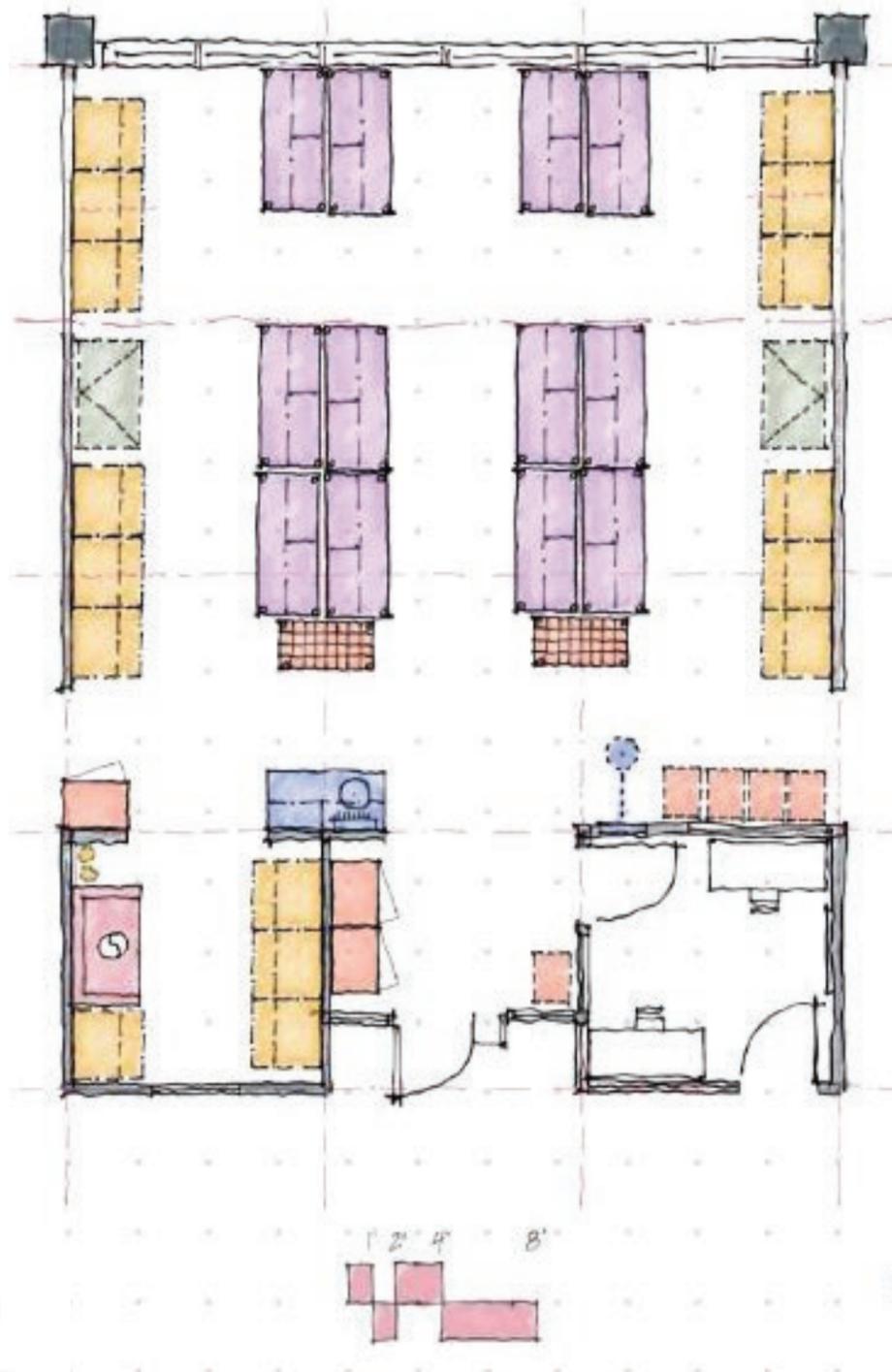


3 x 3 - BIOLOGY LIFE SCIENCES - PATTERN



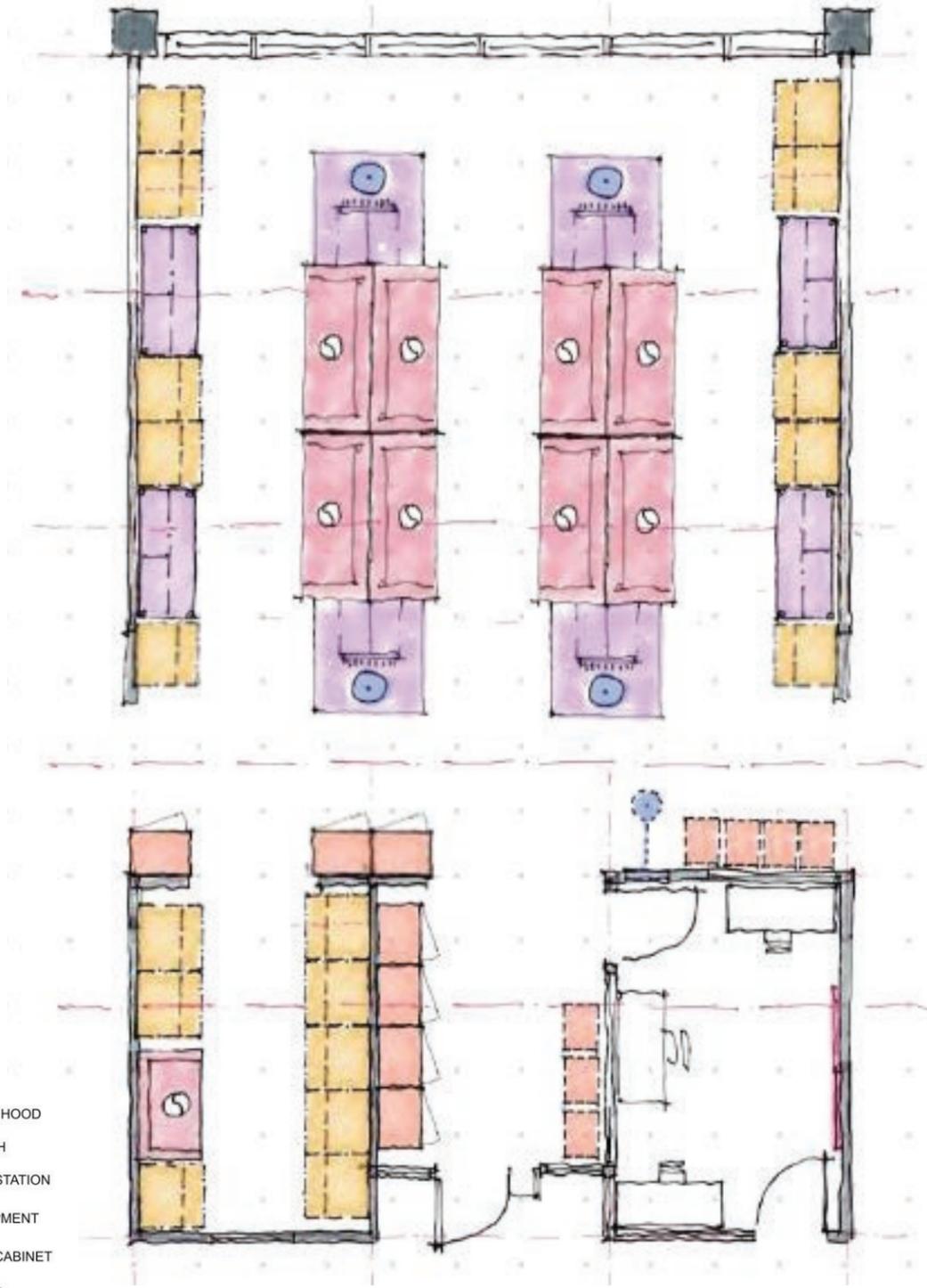
-  FUME HOOD
-  BENCH
-  SINK STATION
-  EQUIPMENT
-  TALL CABINET
-  CARTS
-  SAFETY SHOWER

3 X 4 - BIOLOGY LIFE SCIENCES - PATTERN

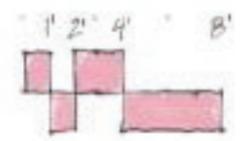


-  FUME HOOD
-  BENCH
-  SINK STATION
-  EQUIPMENT
-  TALL CABINET
-  CARTS
-  SAFETY SHOWER

3 x 5 - CHEMISTRY & BIO CHEMISTRY - PATTERN

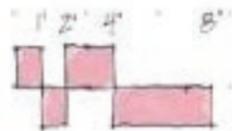
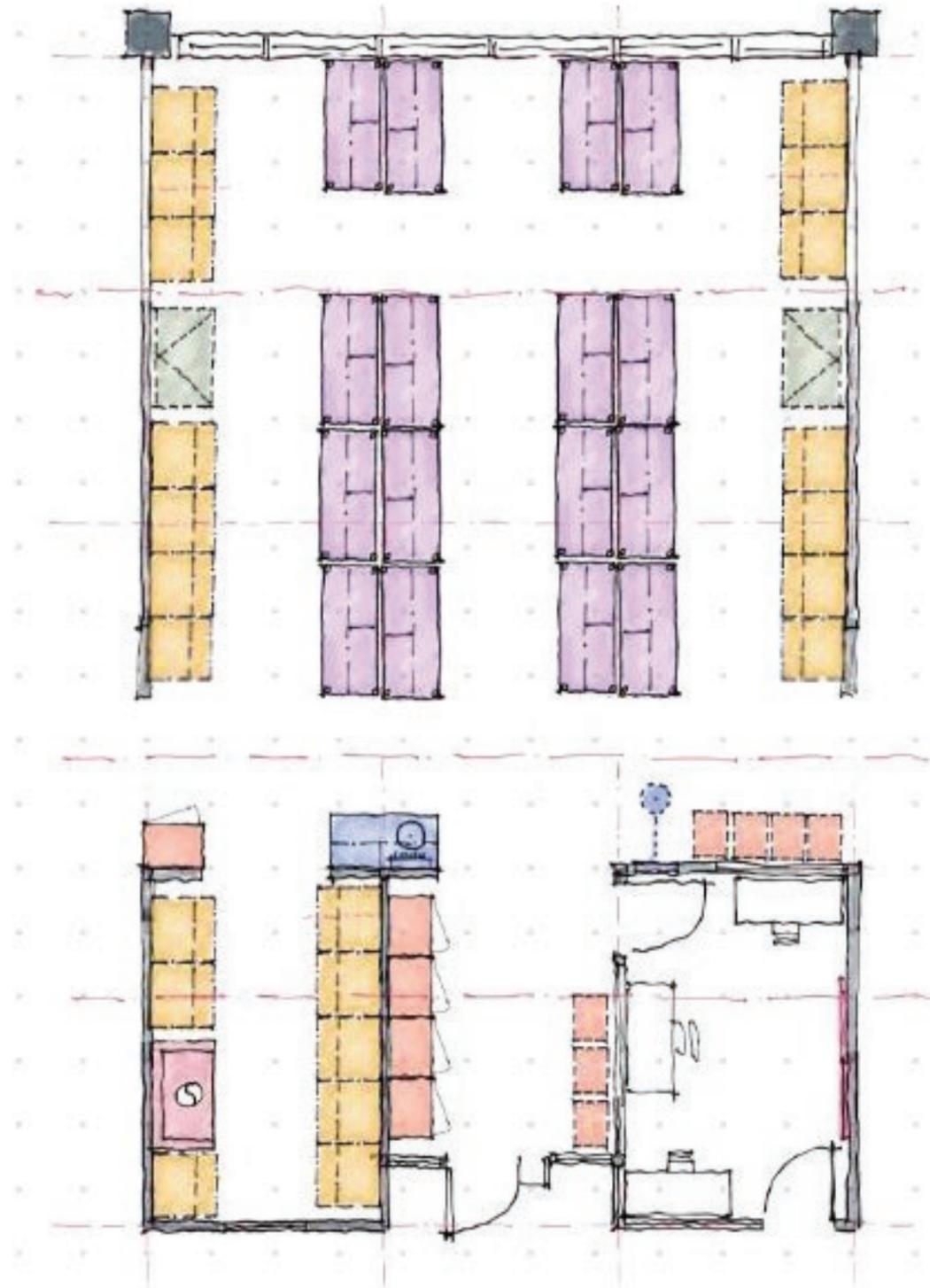


-  FUME HOOD
-  BENCH
-  SINK STATION
-  EQUIPMENT
-  TALL CABINET
-  CARTS
-  SAFETY SHOWER

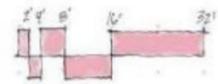
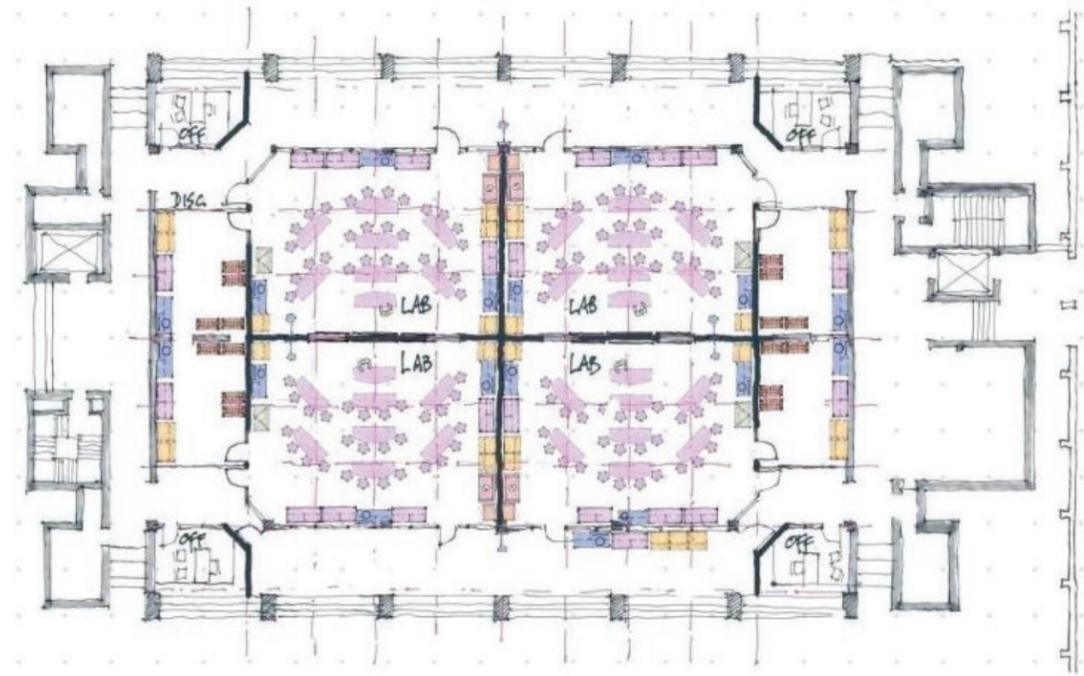
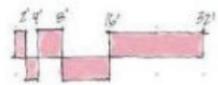
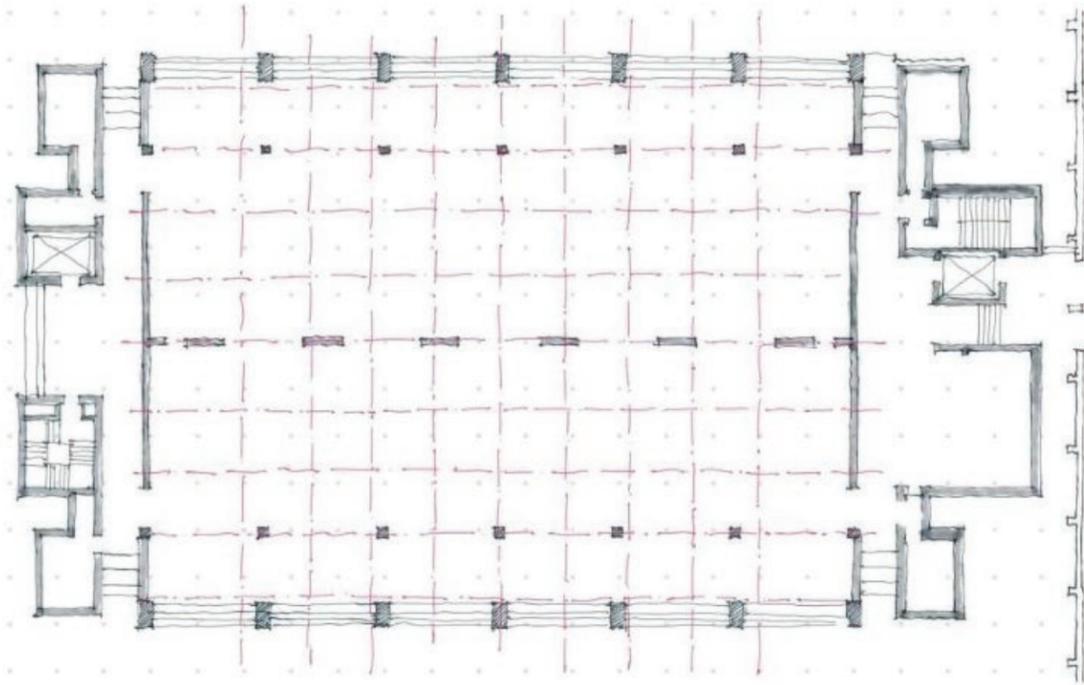


Gensler

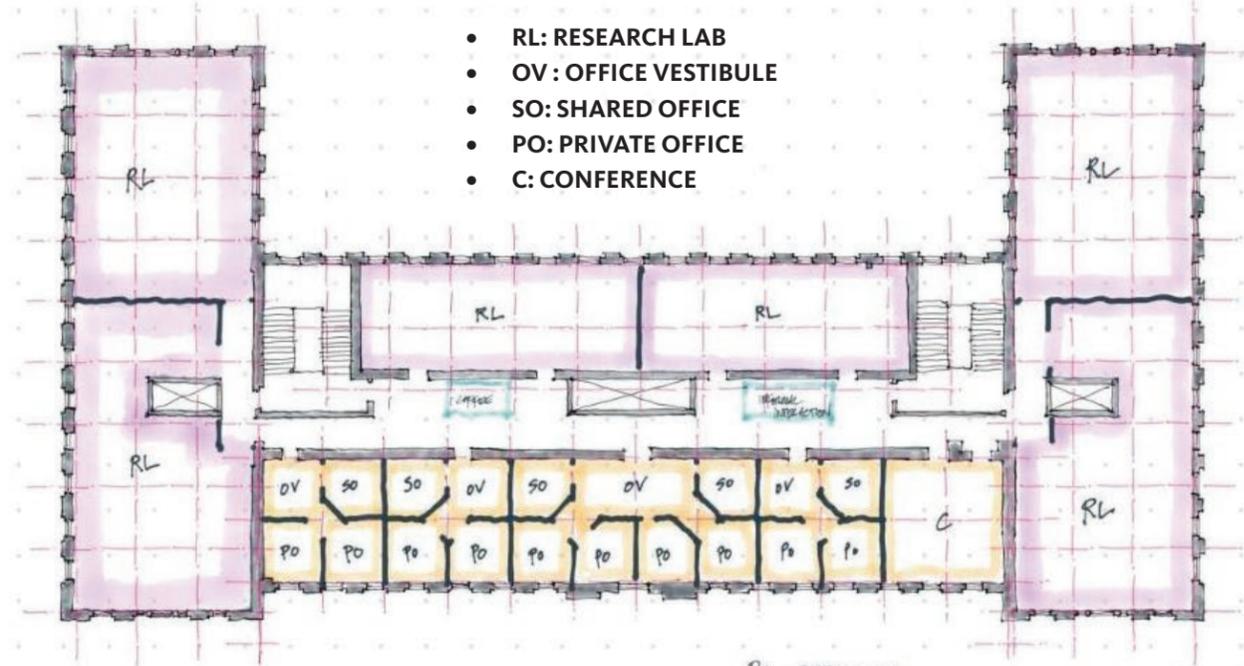
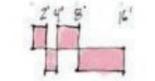
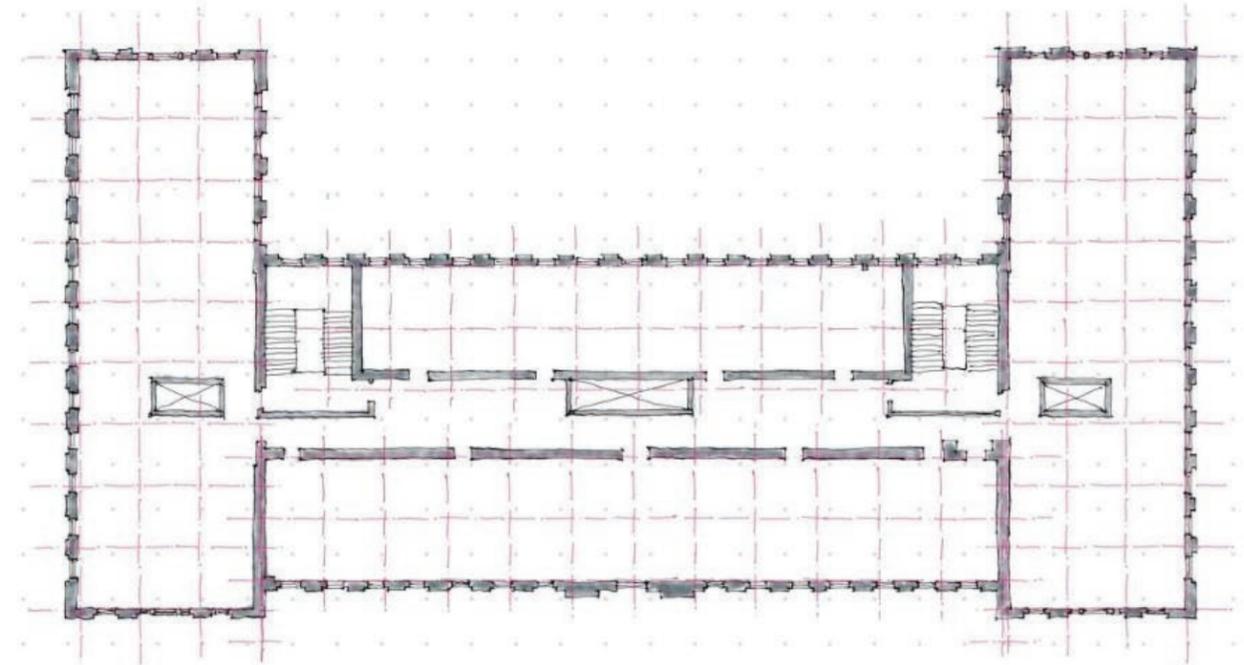
3 x 5 - BIOLOGY LIFE SCIENCES - PATTERN



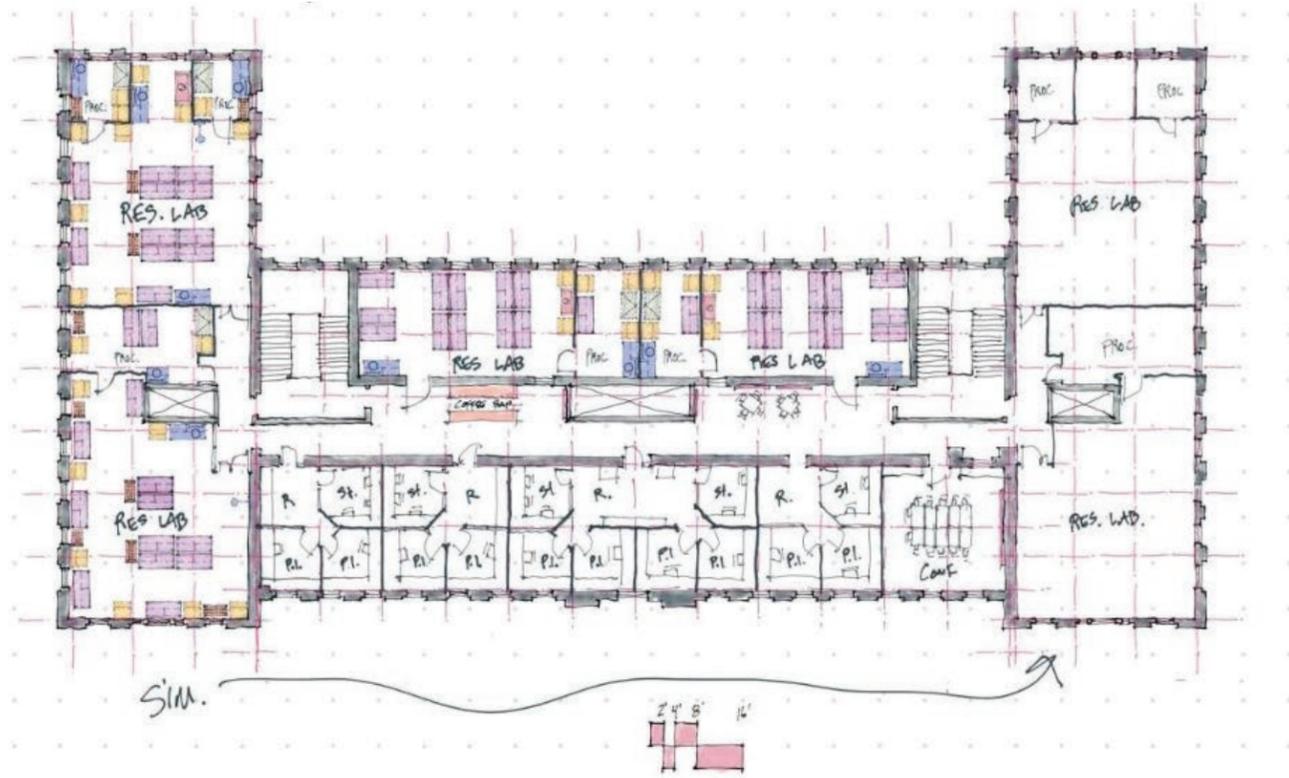
EASTLICK HALL - TEACHING LAB LAYOUT - TEST-FIT STUDY



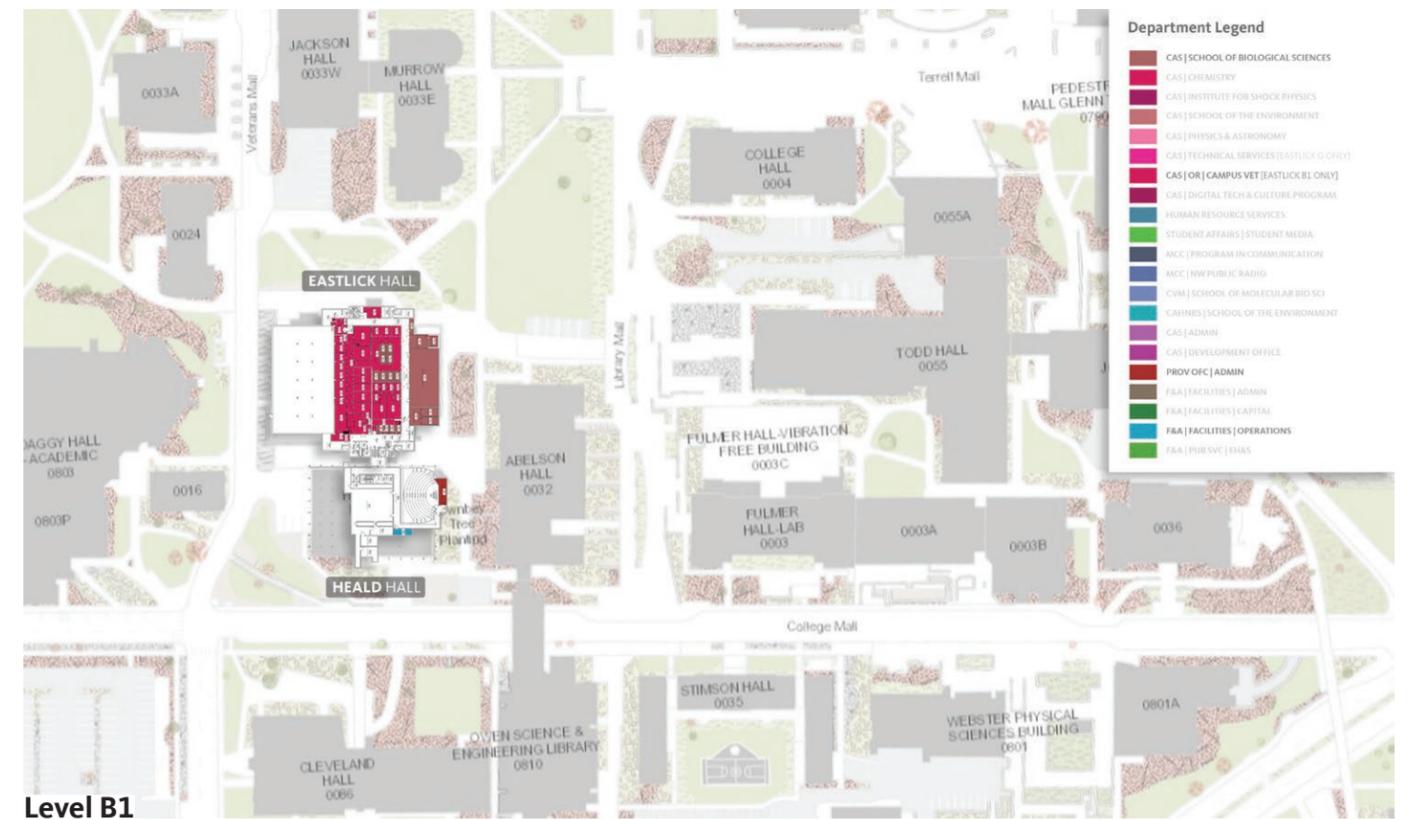
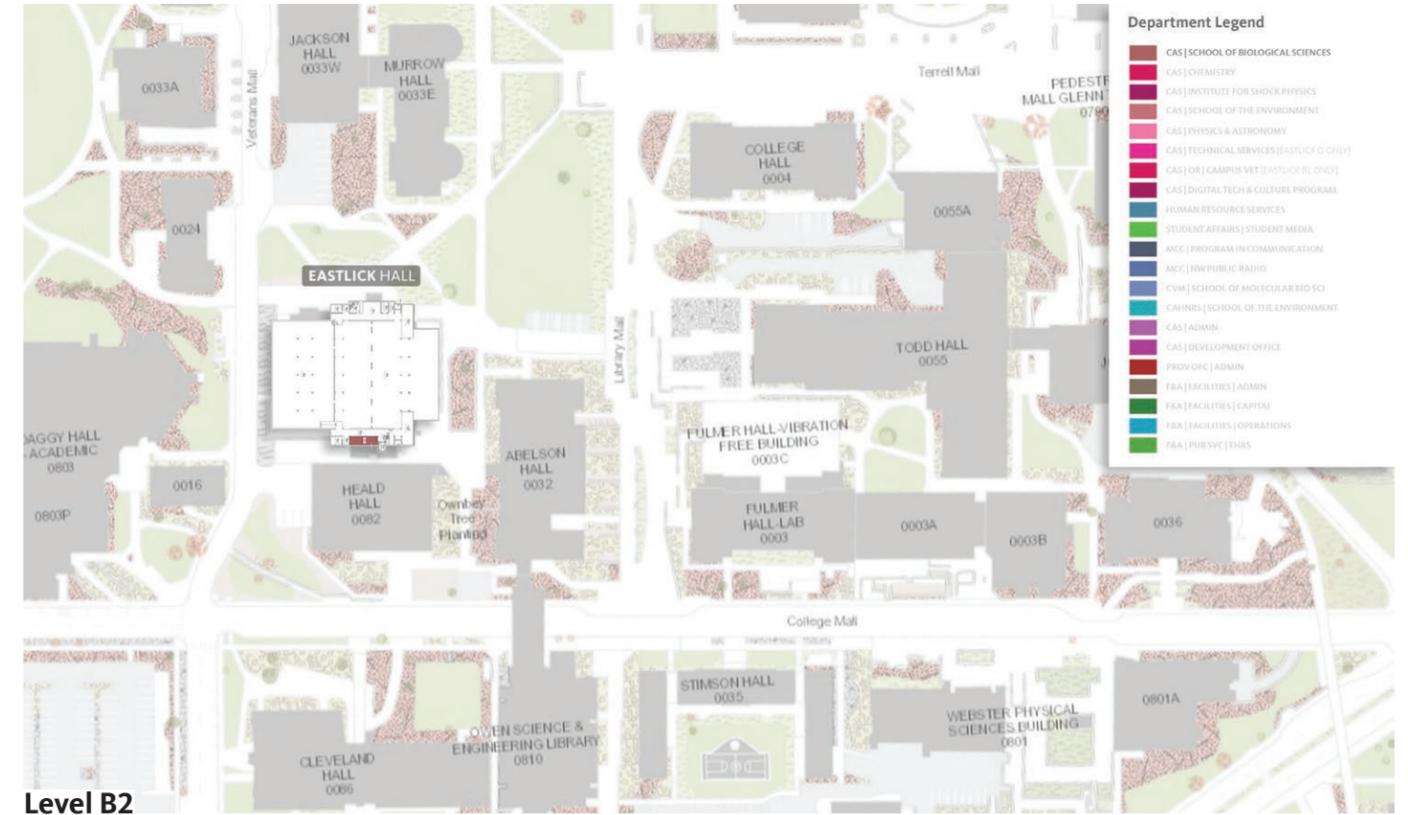
ABELSON HALL - RESEARCH LAB LAYOUT - TEST-FIT STUDY



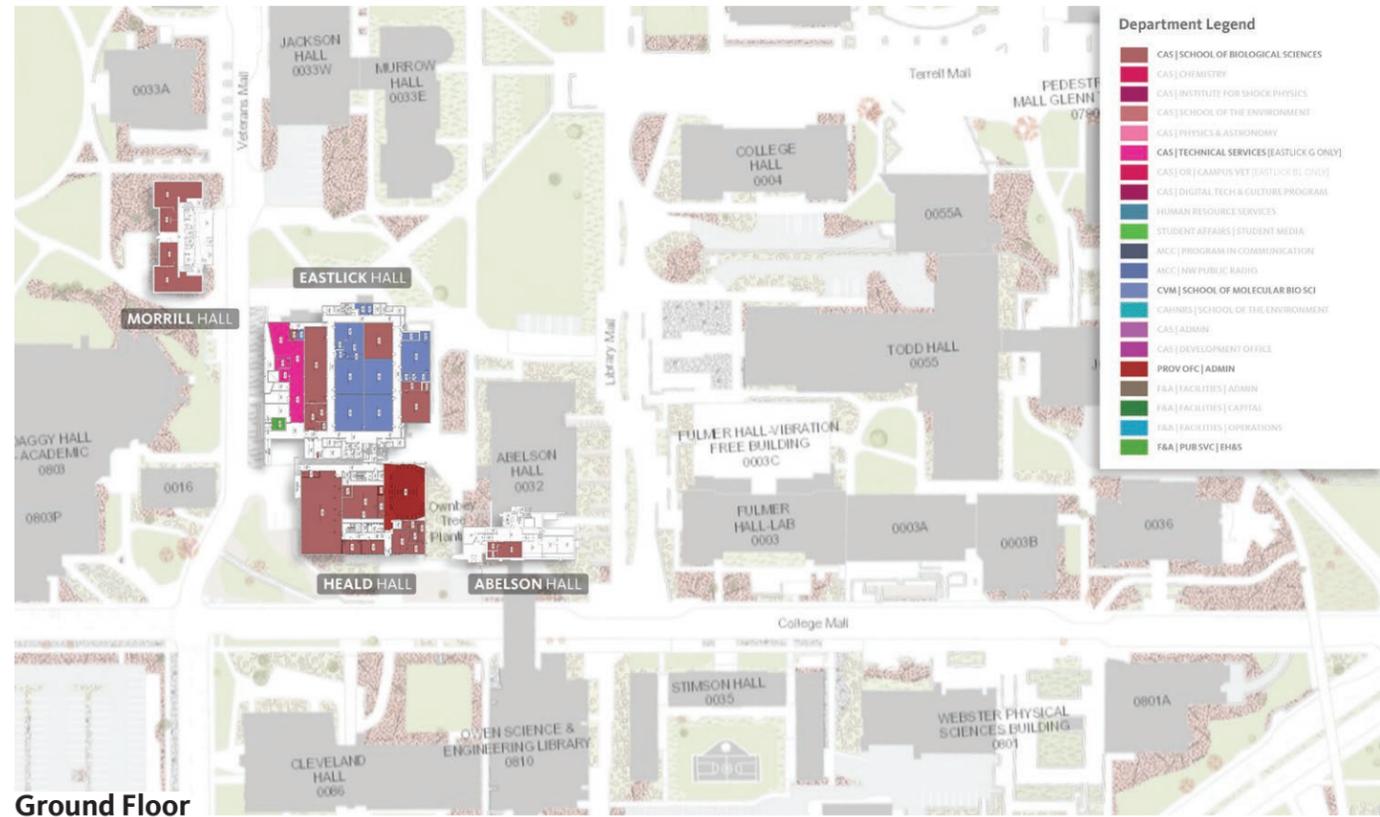
ABELSON HALL - RESEARCH LAB LAYOUT - TEST-FIT STUDY



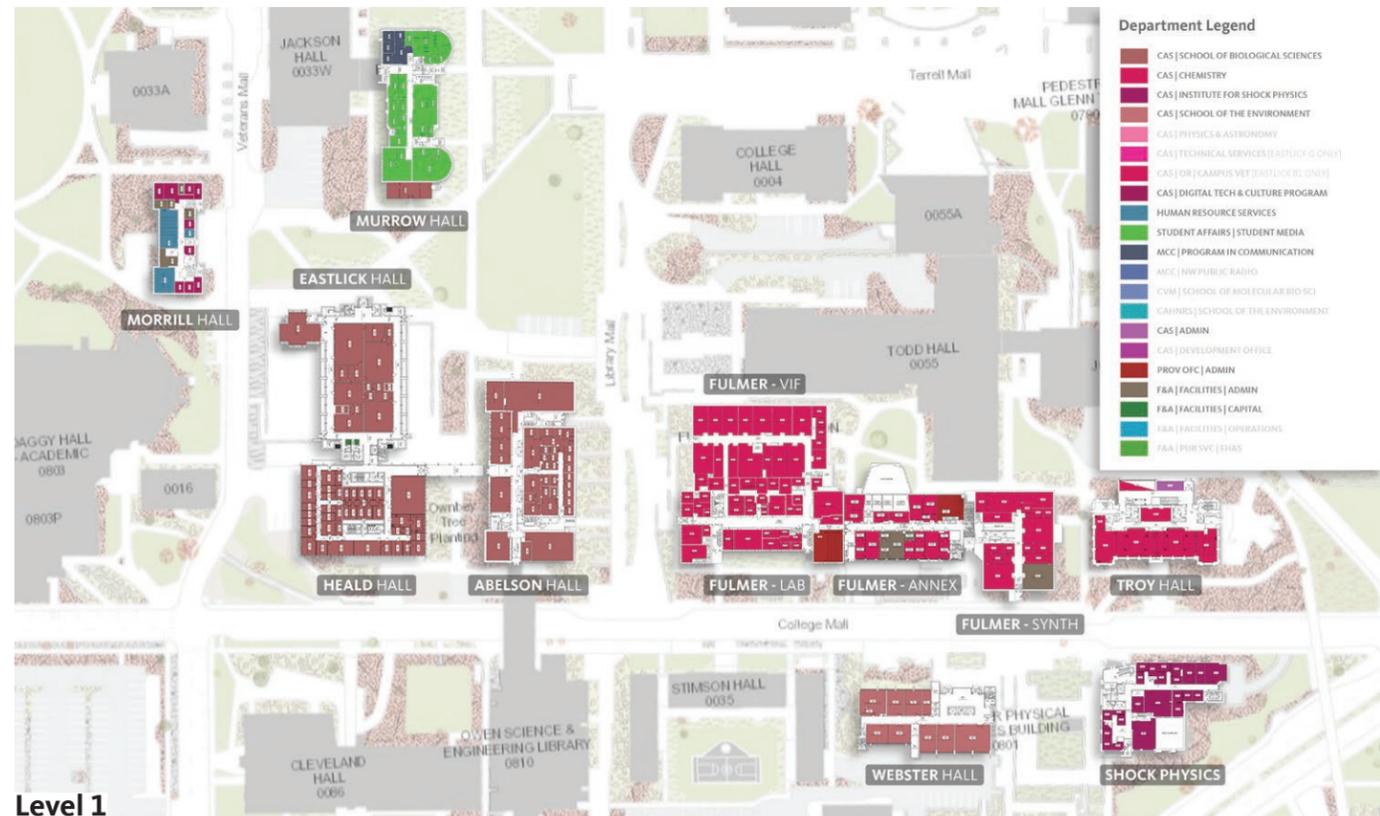
EXISTING PROGRAM ASSESSMENT



BIOLOGY LIFE SCIENCES

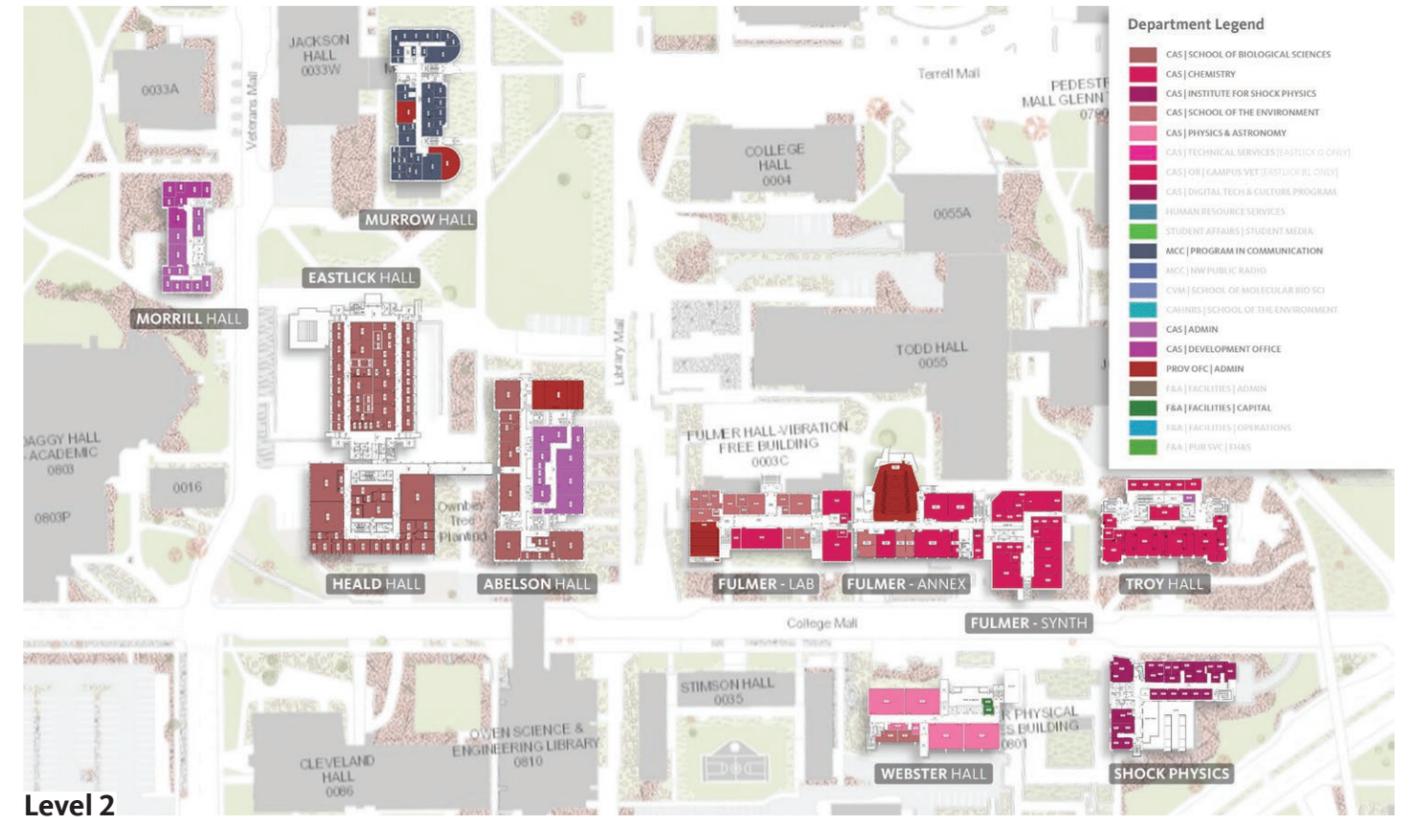


Ground Floor

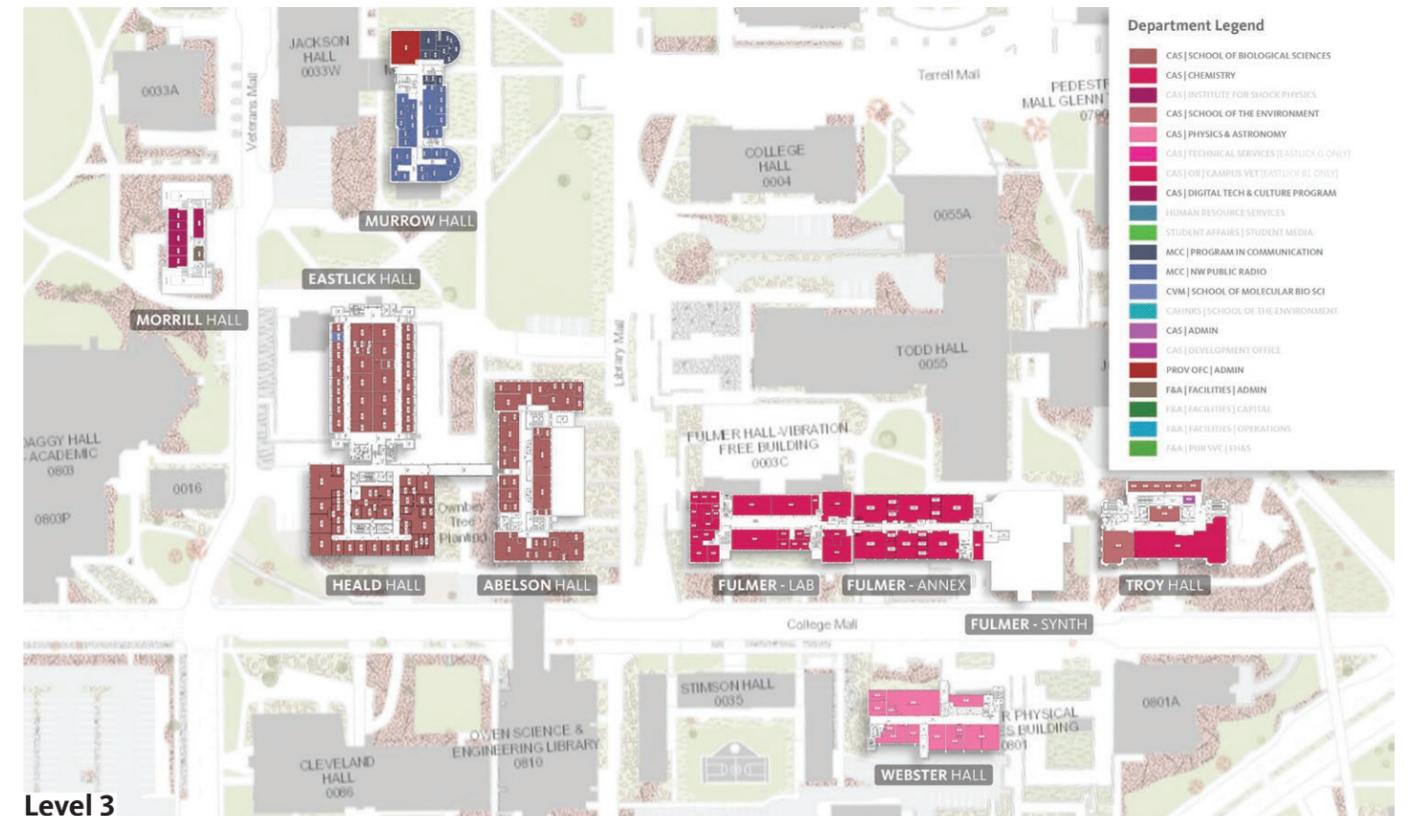


Level 1

EXISTING PROGRAM ASSESSMENT

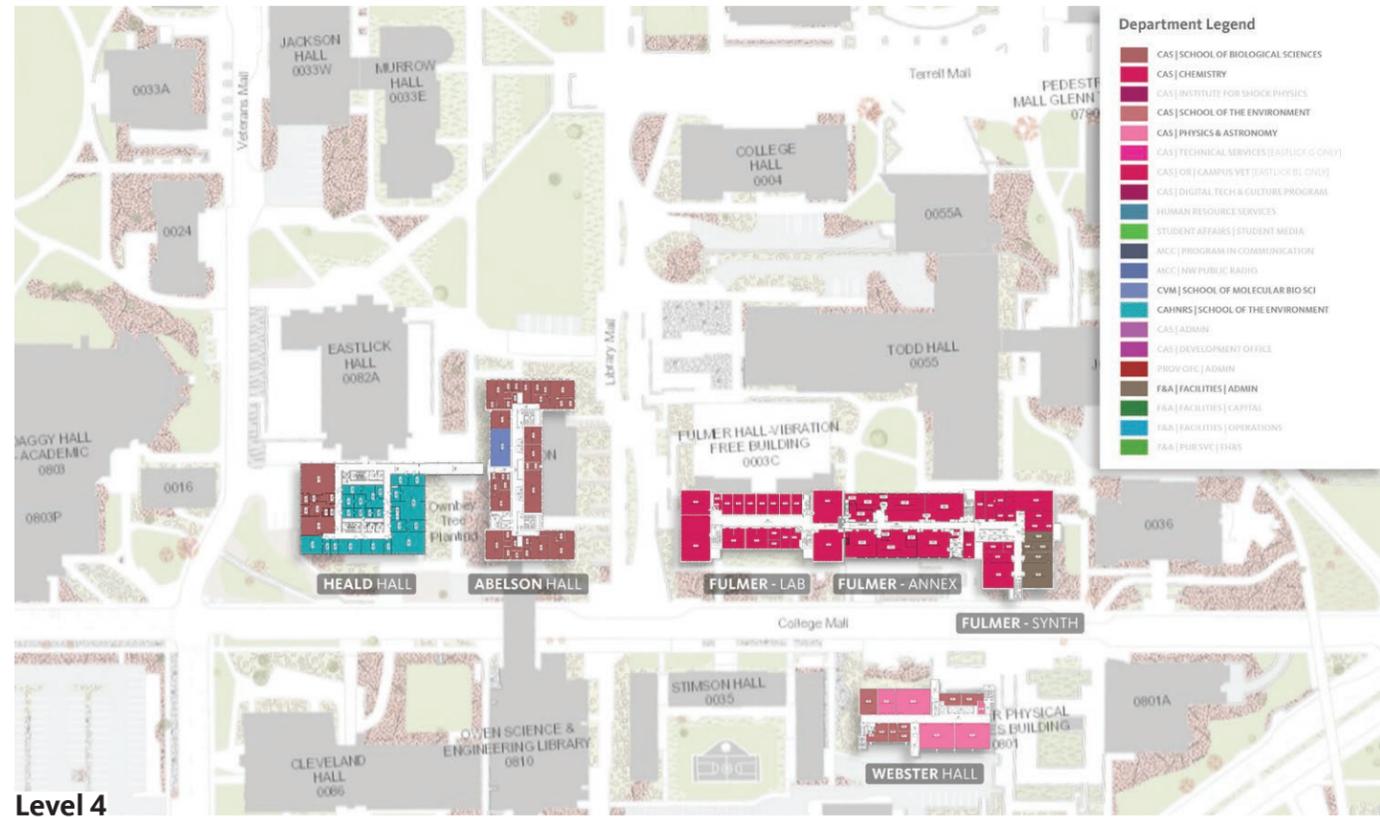


Level 2

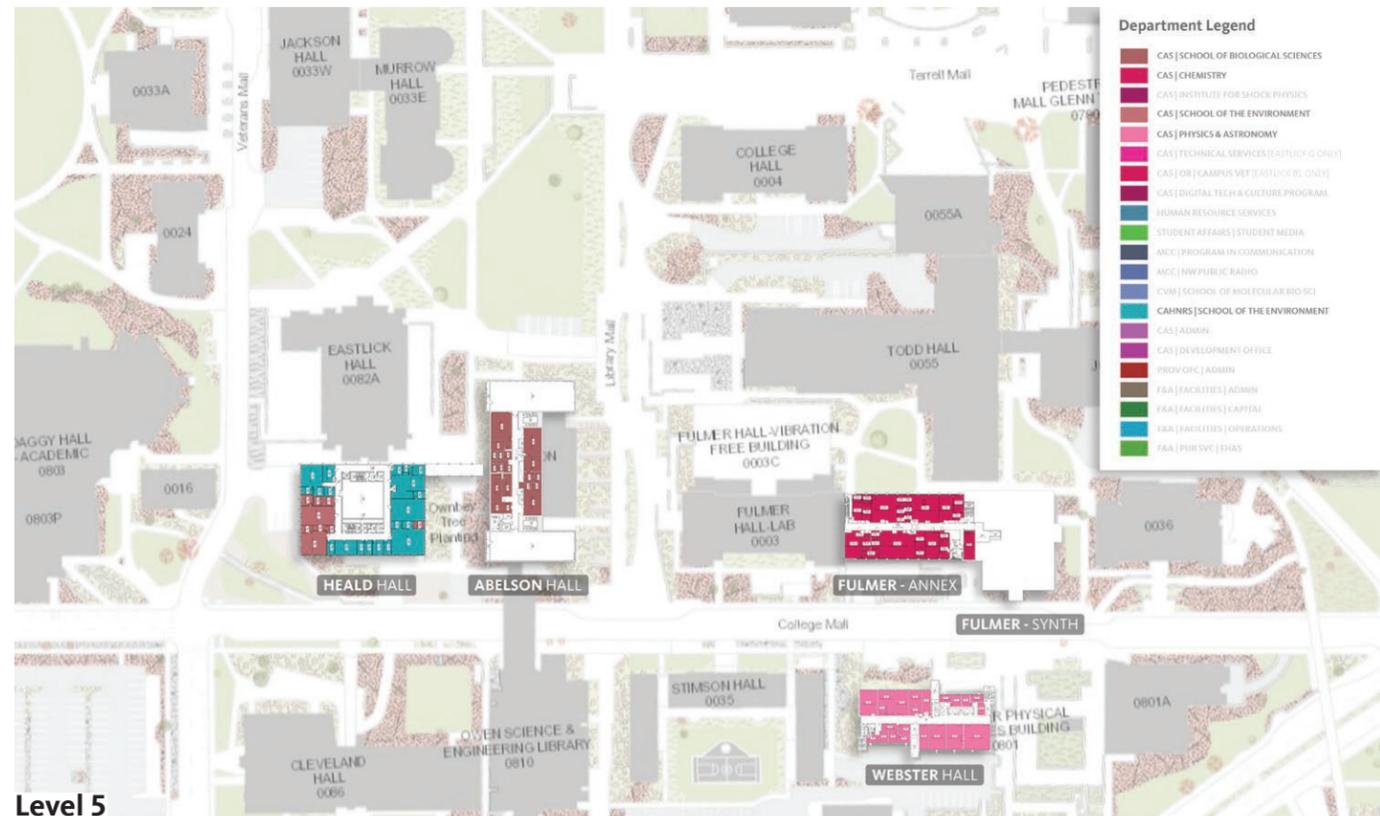
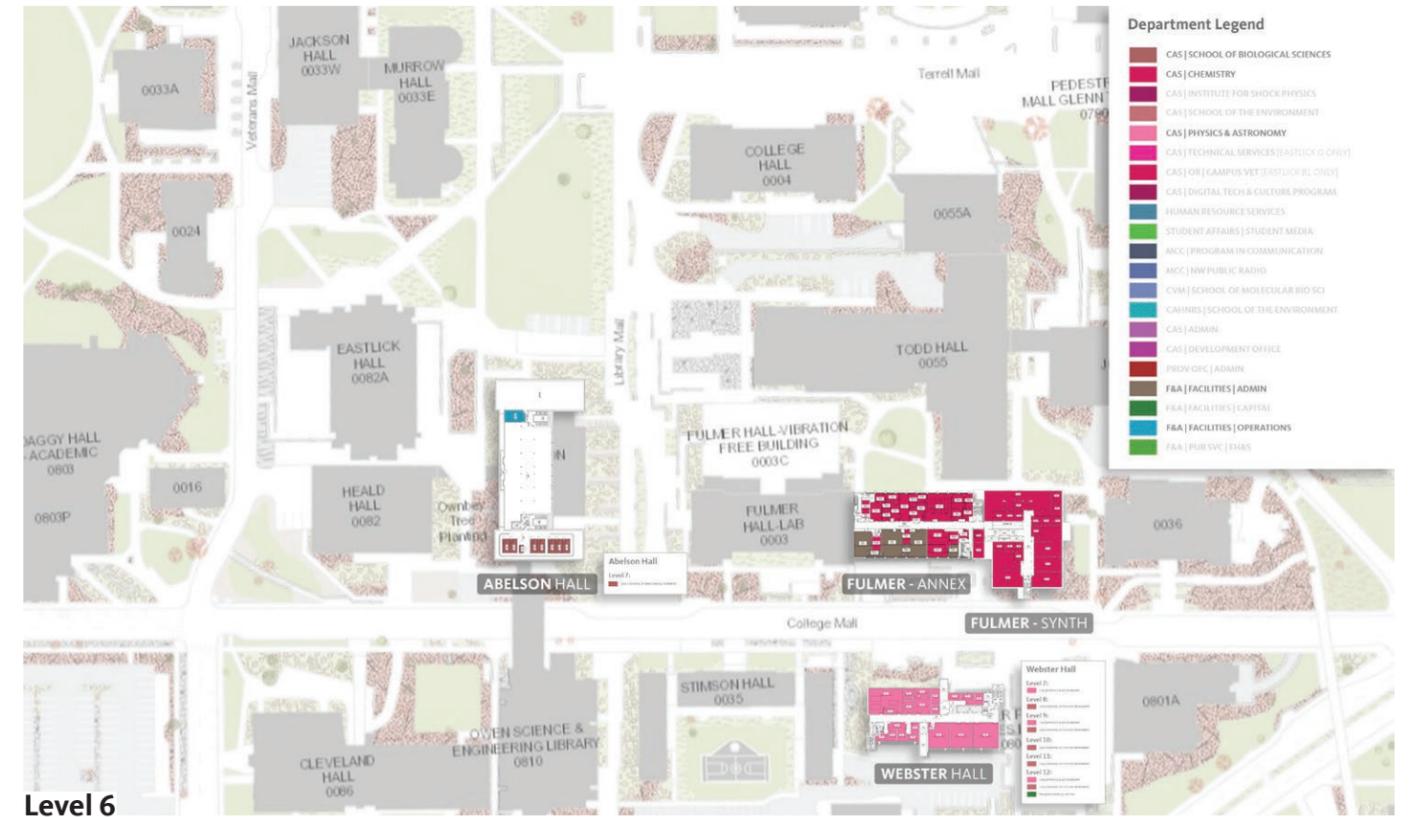


Level 3

BIOLOGY LIFE SCIENCES

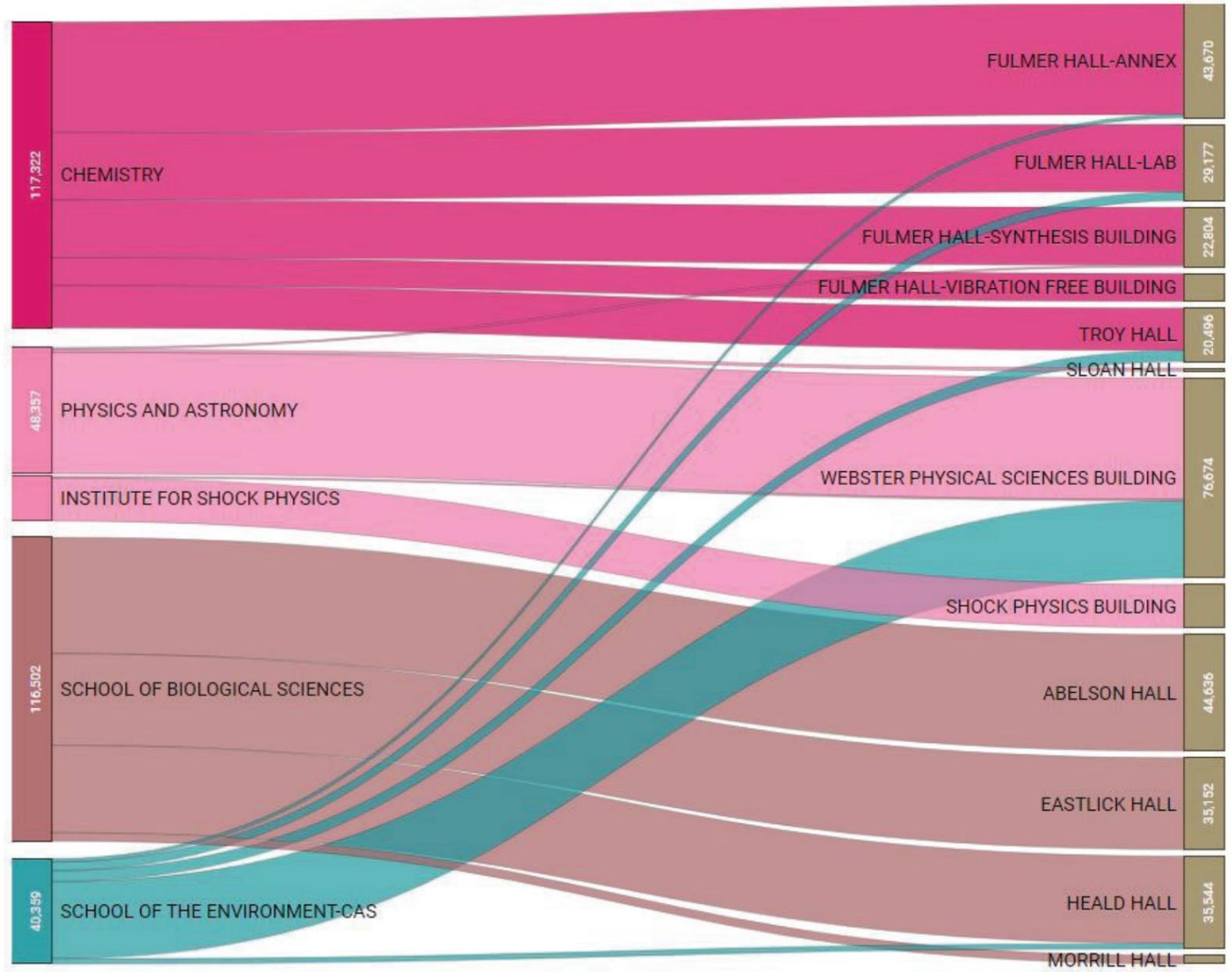


EXISTING PROGRAM ASSESSMENT



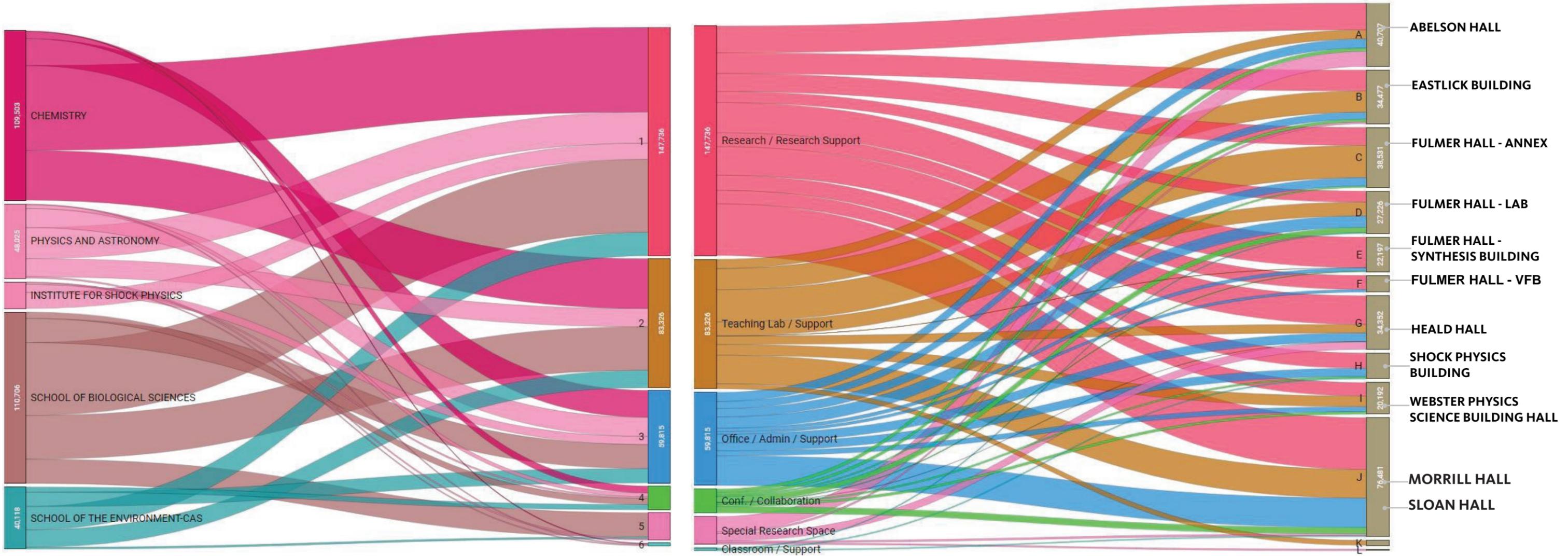
DEPARTMENT SPREAD - CAS (SCIENCES)

Data analysis of existing space assessment was visualized through the series of the following graphical tools such as sankey charts, square pie charts, and graphs. It is easy to comprehend visually the distribution of the types of spaces across the departments of chemistry, physics and astronomy, school of biological sciences, and school of environments.

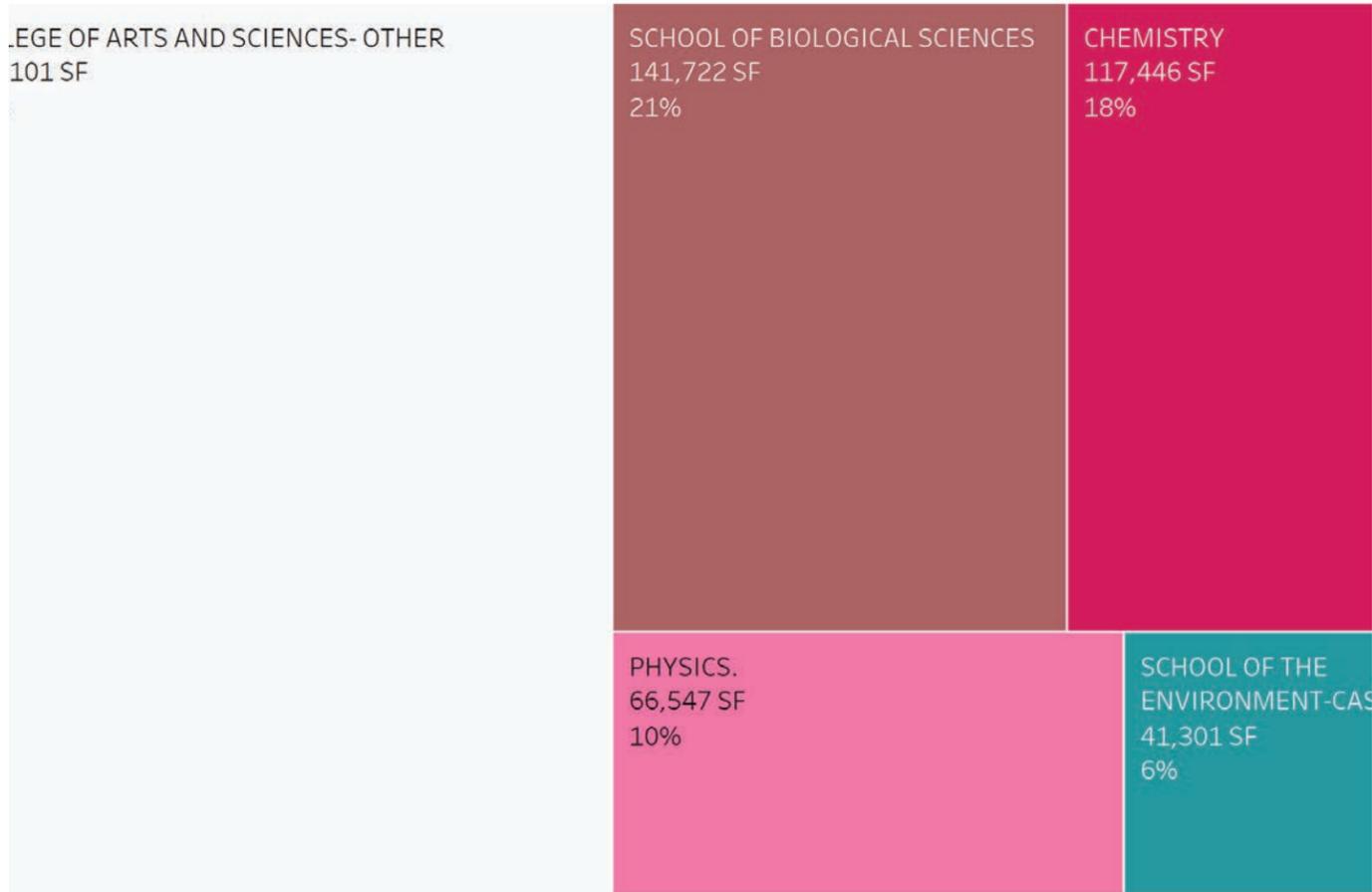


Department	Assigned SFT
CHEMISTRY	117446
FULMER HALL-ANNEX	42444
FULMER HALL-LAB	25854
FULMER HALL-SYNTHESIS BUILDING	22130
FULMER HALL-VIBRATION FREE BUILDING	10638
JOHNSON TOWER	124
TROY HALL	16256
PHYSICS AND ASTRONOMY	49201
FULMER HALL-SYNTHESIS BUILDING	674
JEWETT OBSERVATORY	744
SLOAN HALL	1146
SURPLUS STORES BUILDING	100
WEBSTER PHYSICAL SCIENCES BUILDING	46537
INSTITUTE FOR SHOCK PHYSICS	17346
SHOCK PHYSICS BUILDING	16575
SURPLUS STORES BUILDING	194
WEBSTER PHYSICAL SCIENCES BUILDING	577
SCHOOL OF BIOLOGICAL SCIENCES	141722
ABELSON HALL	44636
BOTANY FIELD LABORATORY	1142
BOTANY FIELD STORAGE BUILDING	294
CARVER FARM-FISH VIVARIA BUILDING	4344
CARVER FARM-STORAGE BUILDING	623
COMMONS	1254
EASTLICK HALL	35152
HEALD HALL	33534
MORRILL HALL	3180
MURROW HALL	845
SMOOT HILL-BARN	4765
SMOOT HILL-CARETAKERS RESIDENCE	1035
SMOOT HILL-HAY STORAGE BARN	3050
SMOOT HILL-RESEARCH-TA OFFICES	3120
SMOOT HILL-WILD ANIMAL BARN	1427
STEFFEN CENTER-BIOLOGICAL SCIENCES GREENHOUSE	3321
SCHOOL OF THE ENVIRONMENT-CAS	41301
COMMONS	942
FULMER HALL-ANNEX	1226
FULMER HALL-LAB	3323
HEALD HALL	2010
TROY HALL	4240
WEBSTER PHYSICAL SCIENCES BUILDING	29560
Grand Total	367016

SPACE TYPE SPREAD - CAS (SCIENCES)

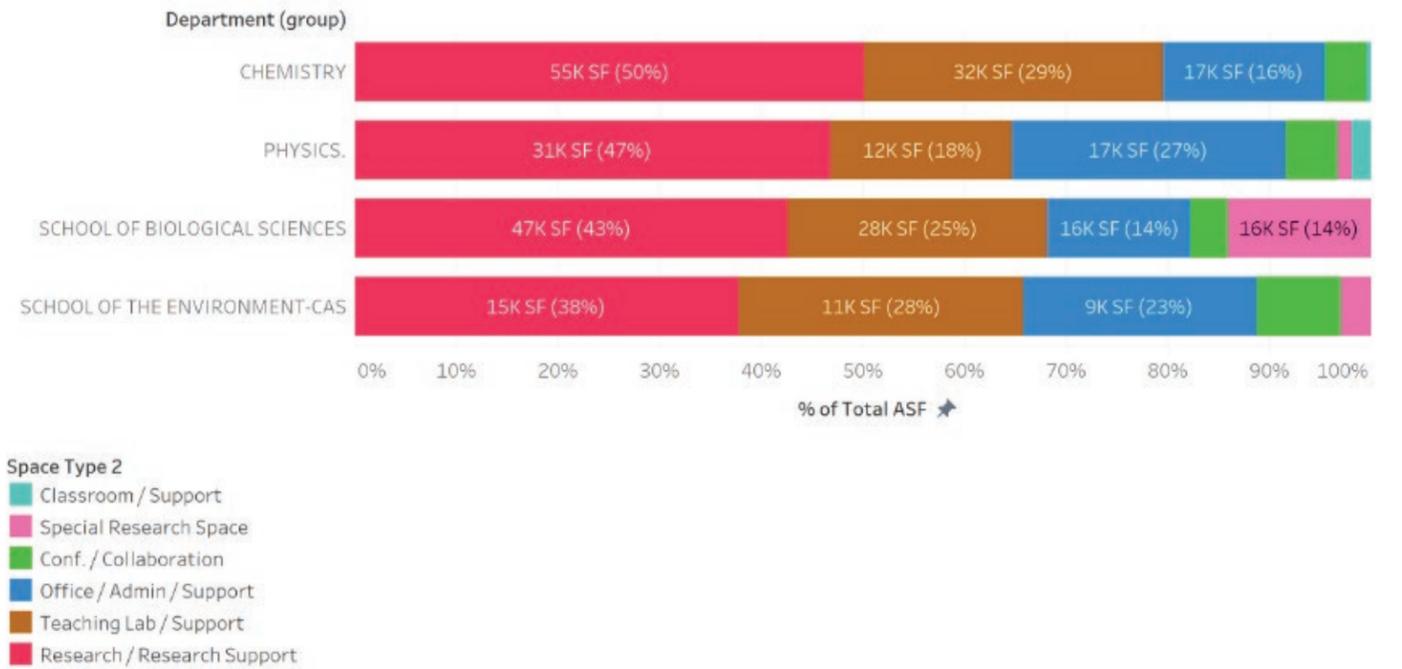


OVERALL DISTRIBUTION - CAS (SCIENCES)

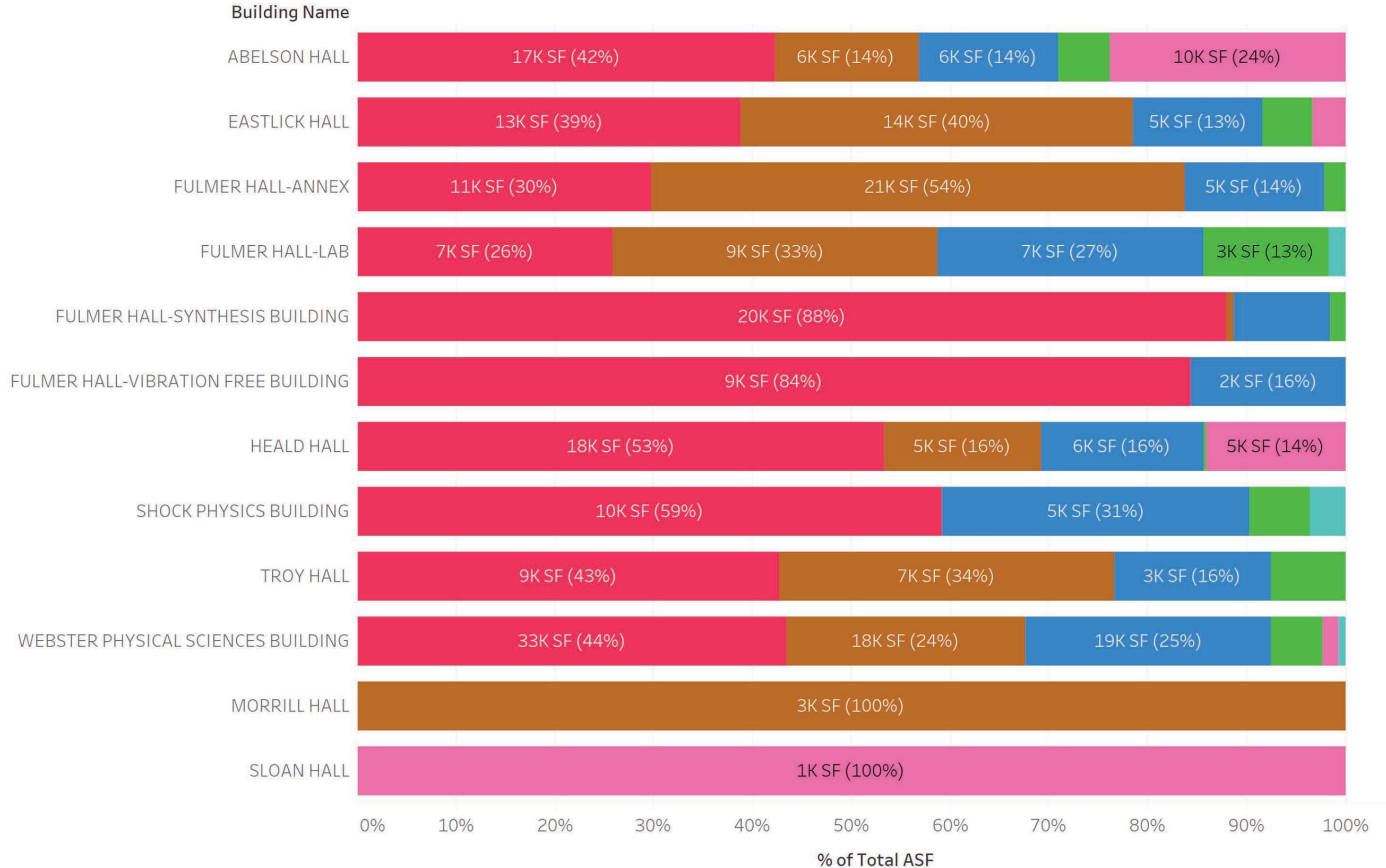


Department (group)	ASF	% of Total ASF along Department (group)
CHEMISTRY	117,446 SF	18%
PHYSICS.	66,547 SF	10%
SCHOOL OF BIOLOGICAL SCIENCES	141,722 SF	21%
SCHOOL OF THE ENVIRONMENT-CAS	41,301 SF	6%
COLLEGE OF ARTS AND SCIENCES- OTHER	298,101 SF	45%
Grand Total	665,117 SF	100%

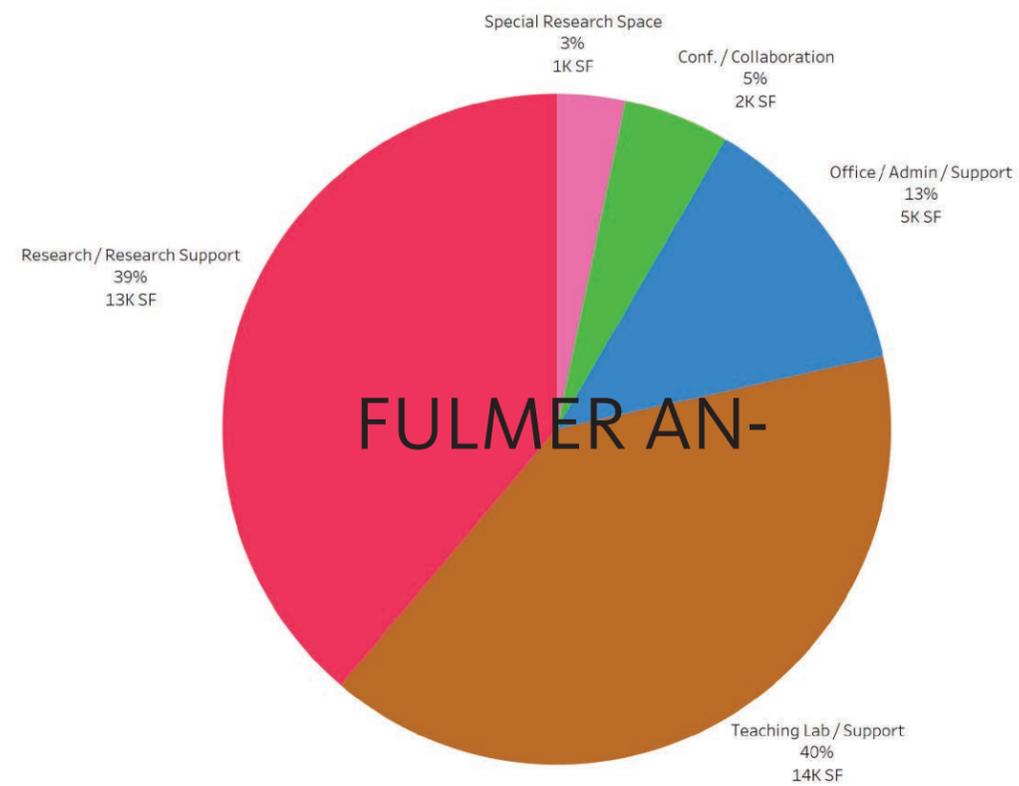
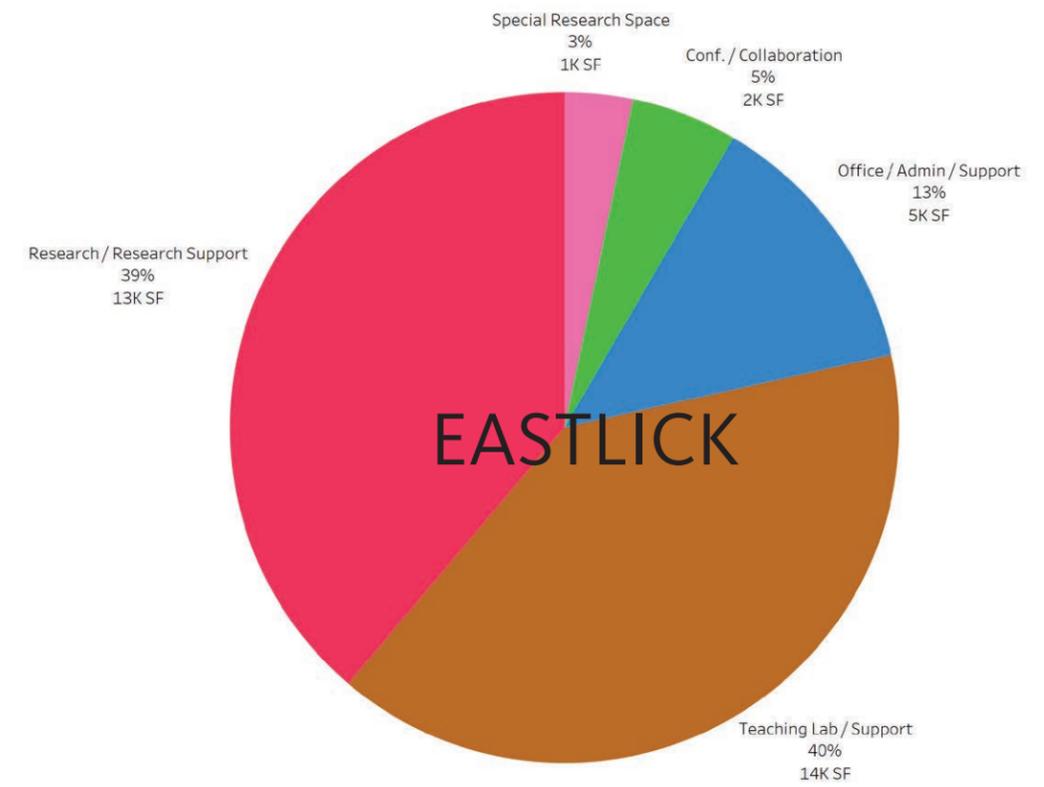
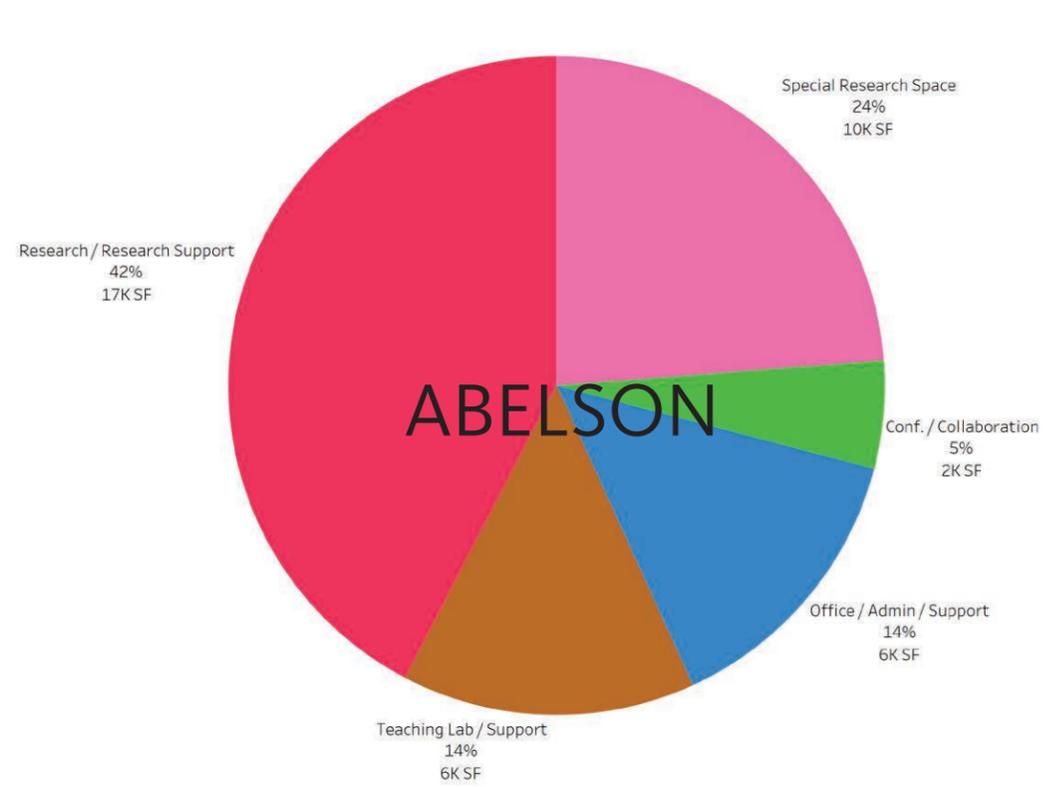
DEPT. VS SPACE TYPE - CAS (SCIENCES)



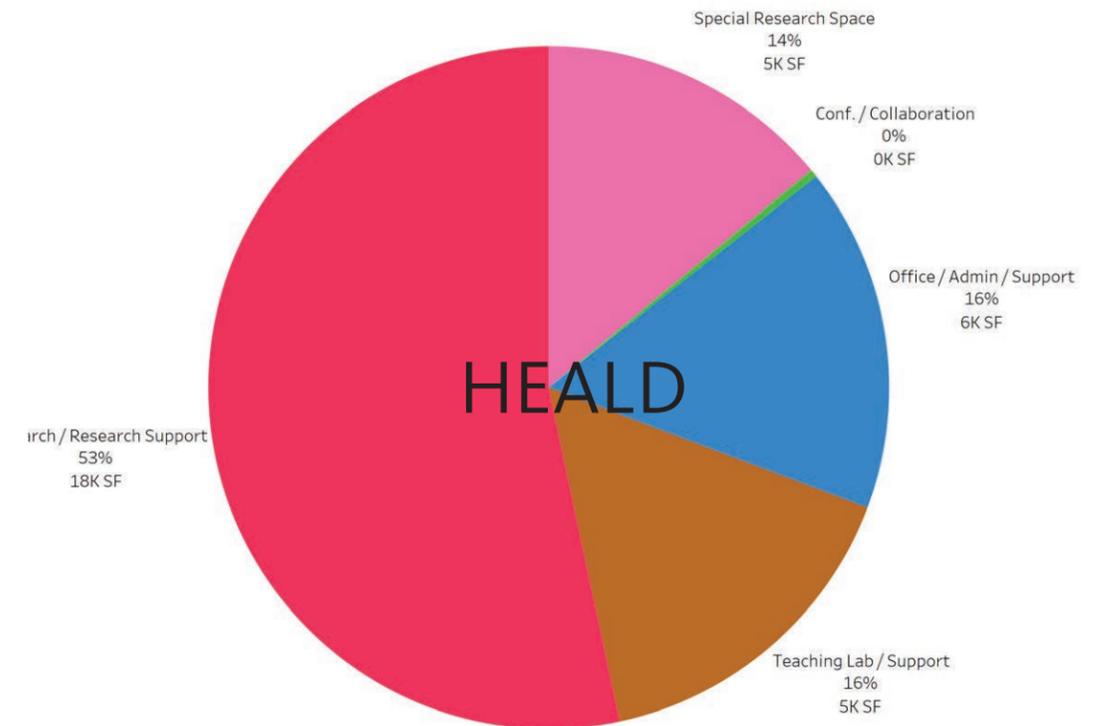
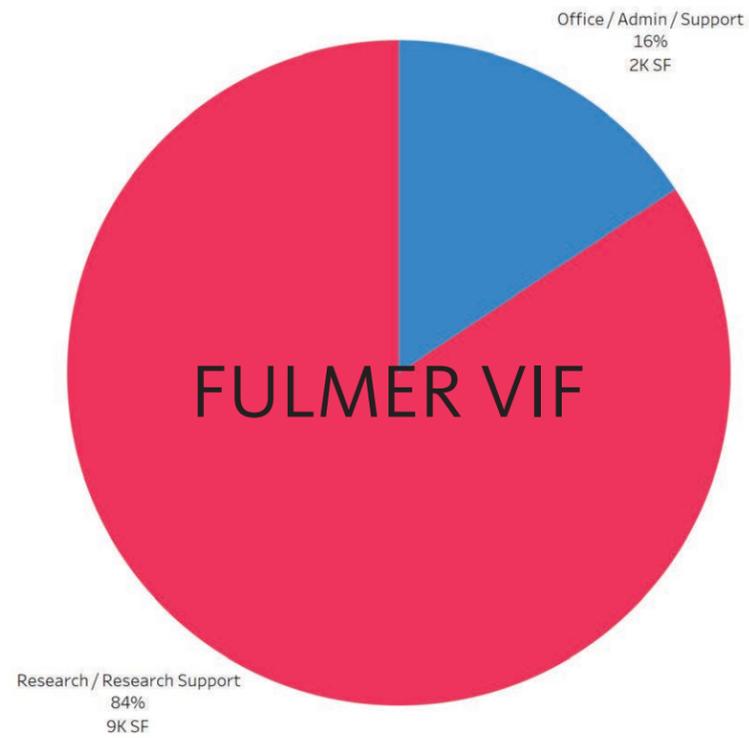
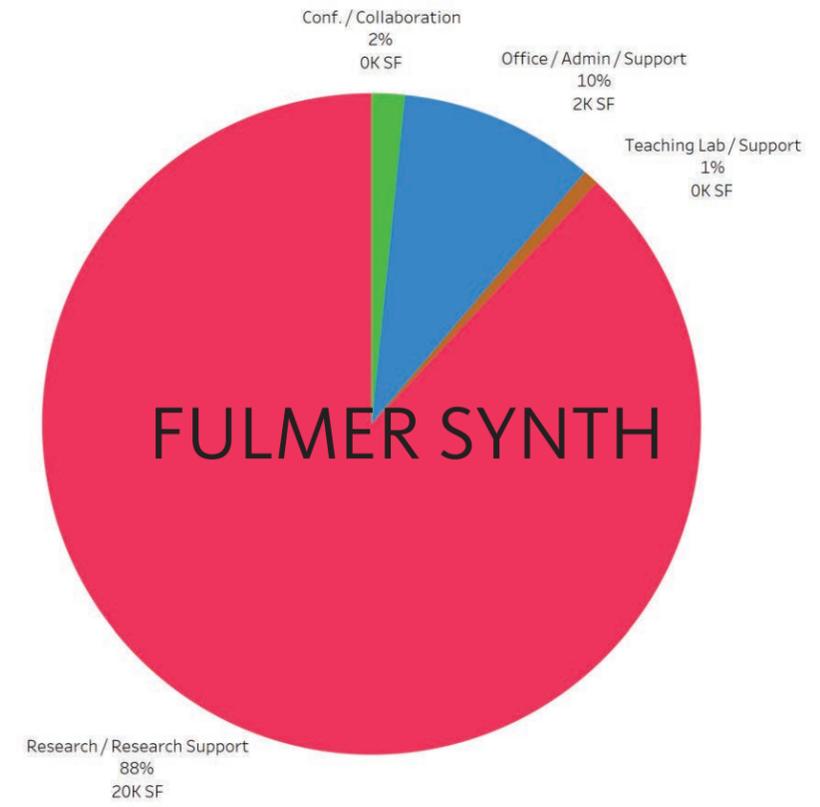
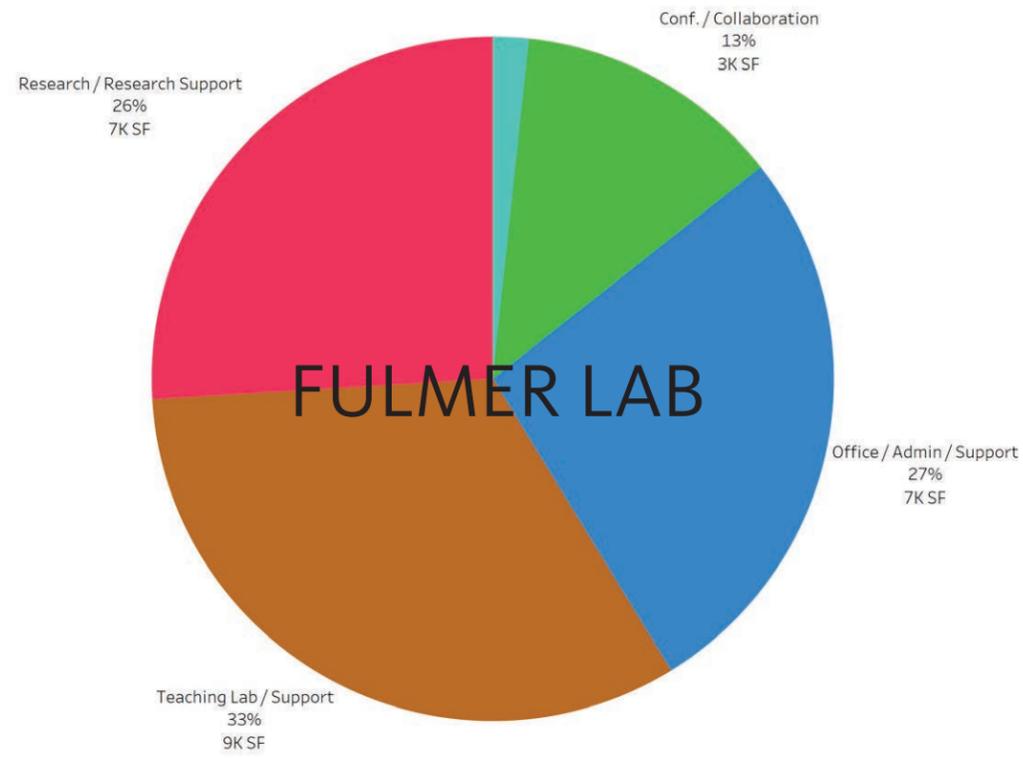
BUILDING VS SPACE TYPE - CAS (SCIENCES)

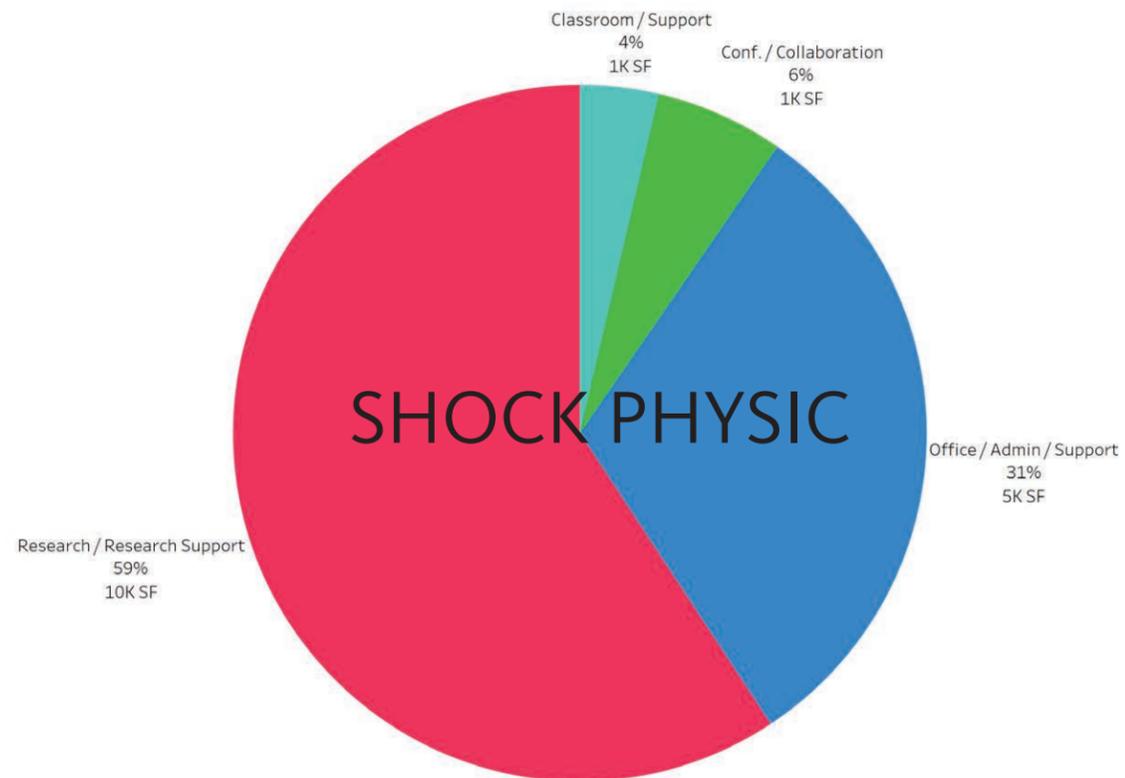
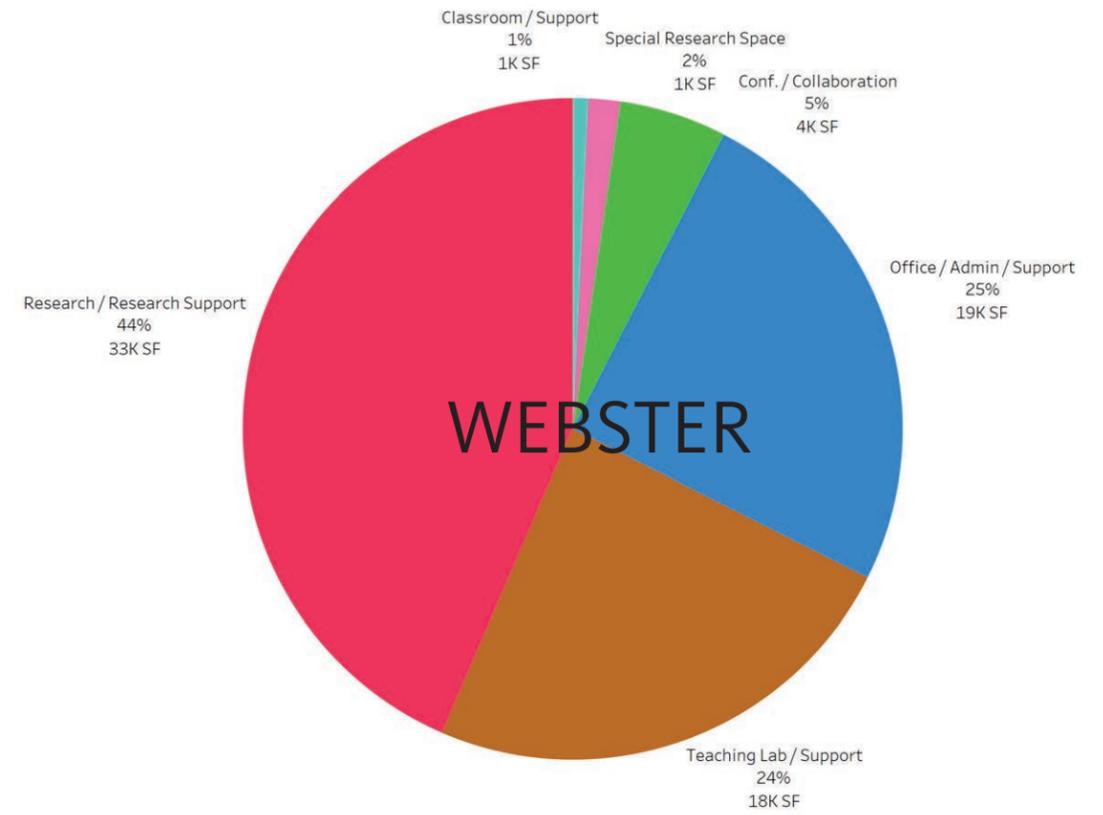
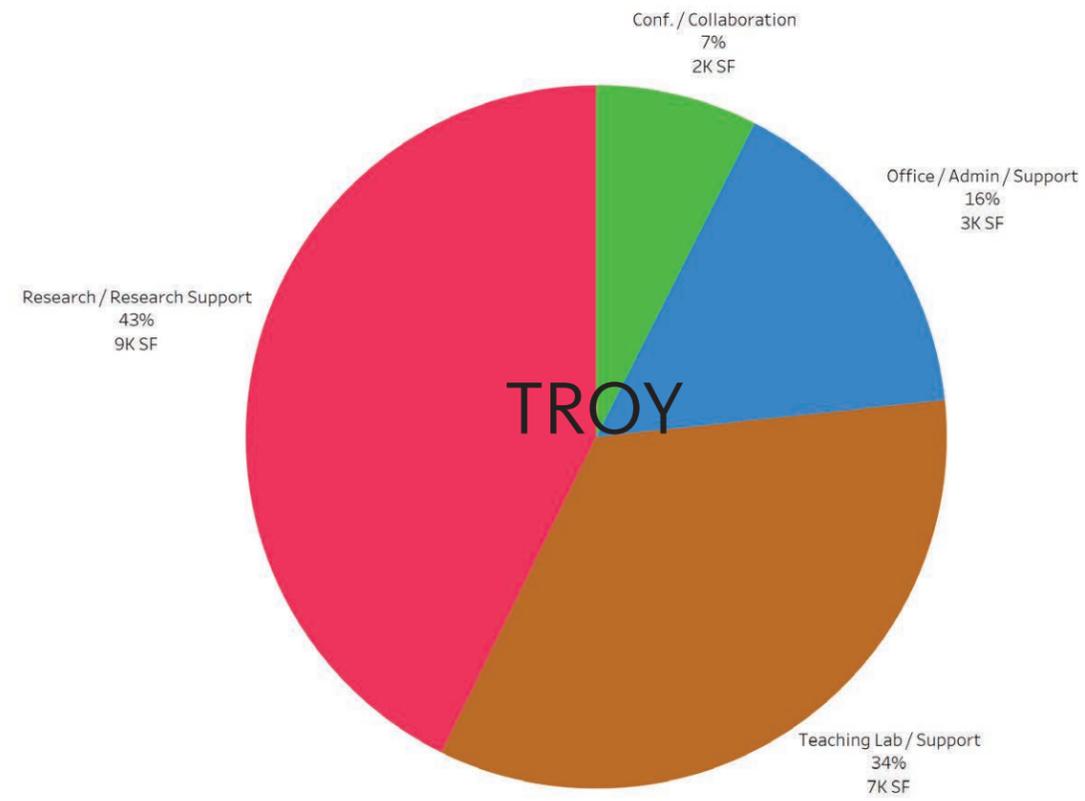


BUILDING VS SPACE TYPE - CAS (SCIENCES)



BUILDING VS SPACE TYPE - CAS (SCIENCES)

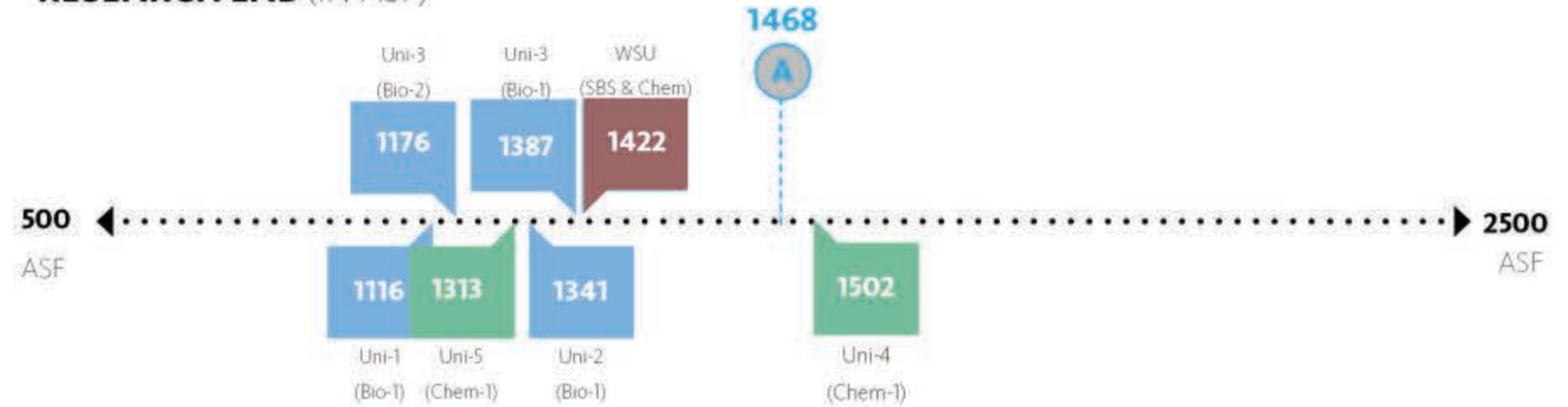




Key insights

Place holder text

RESEARCH LAB (IN ASF)



Legend

- WSU School of Biological Sciences & Chemistry Benchmark Avg.
- Biology Dept./School
- Chemistry Dept./School
- #VALUE
- Avg. Benchmark Value (excl. WSU)

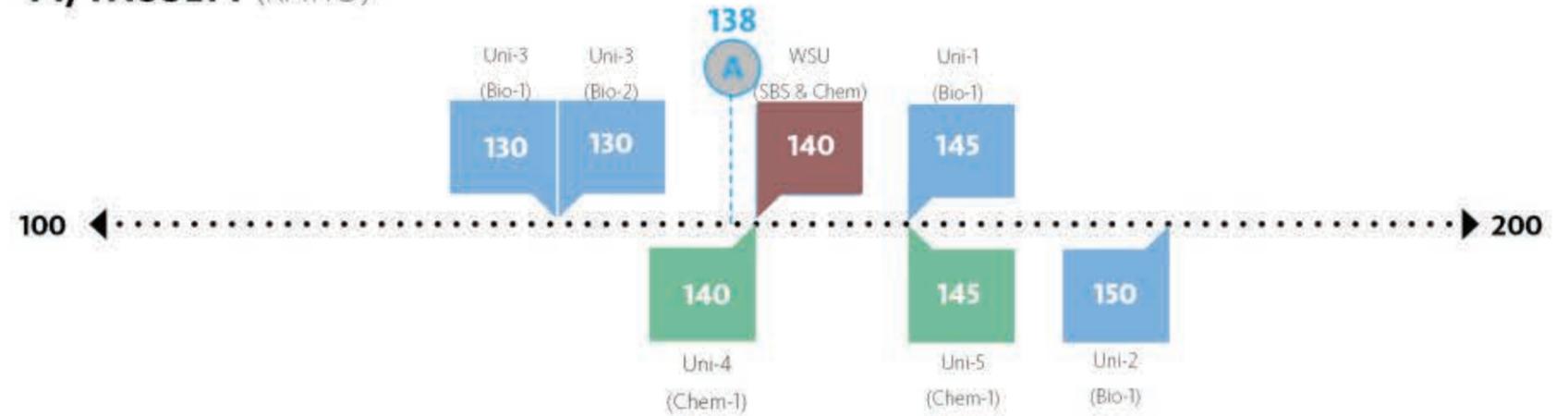
RESEARCH LAB SUPPORT (IN ASF)



Note: For better space realization, the Department / School of Biology/Biochemistry and Chemistry has been benchmarked against key ratio and area among the selected peer universities in the USA, Namely, Cunny ARSC, Rutgers, University of Alberata, Standford Bass, UW Madison, not in the same order.

Key insights

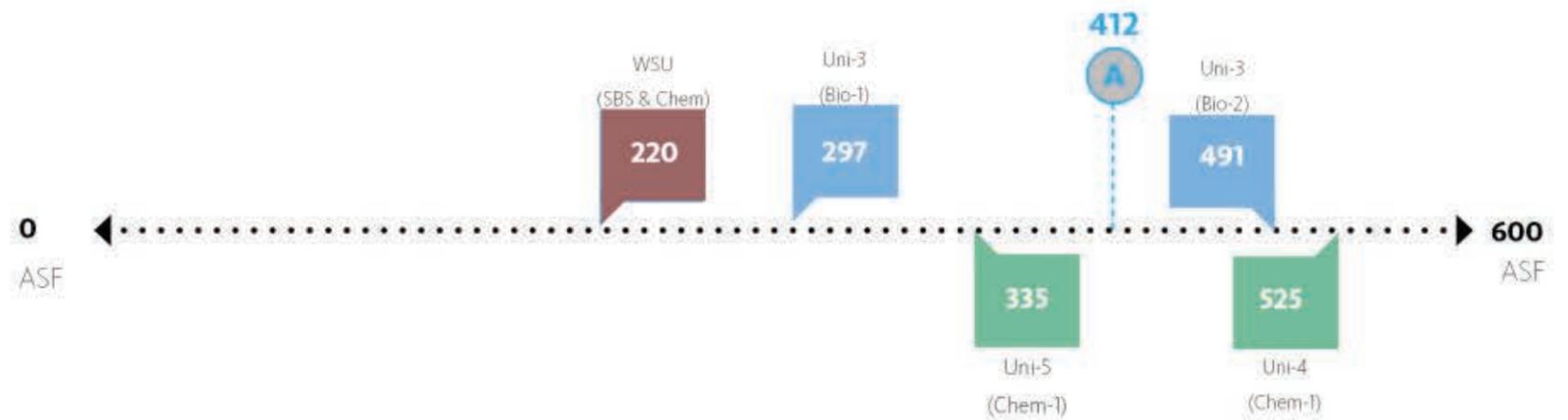
PI/ FACULTY (RATIO)



Legend

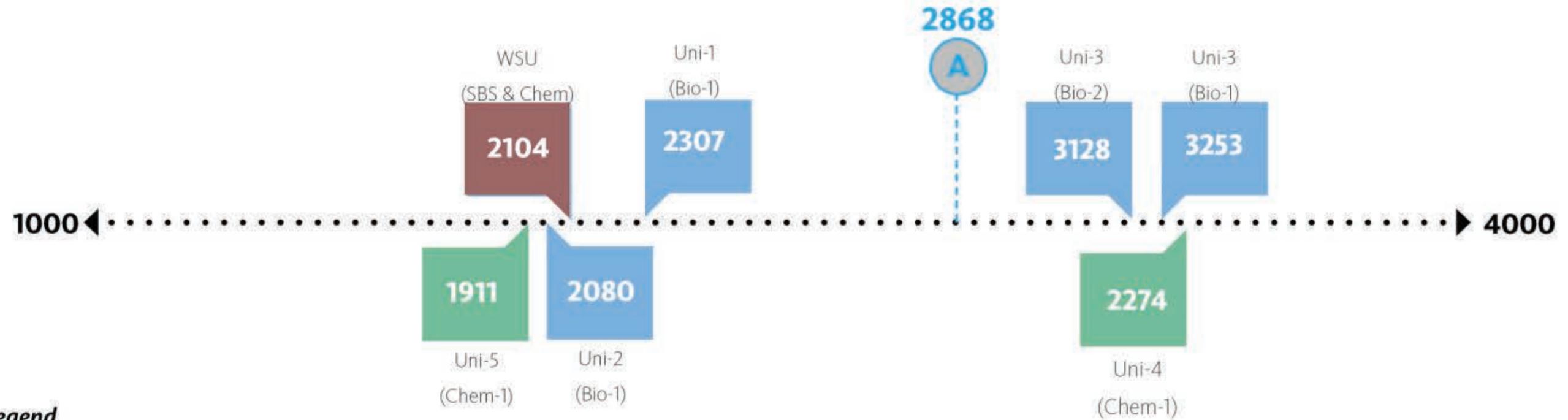
- WSU School of Biological Sciences & Chemistry Benchmark Avg.
- Biology Dept./School
- Chemistry Dept./School
- # VALUE
- Avg. Benchmark Value (excl. WSU)

GRADUATE STUDENT OFFICE (IN ASF)



Note: For better space realization, the Department / School of Biology/Biochemistry and Chemistry has been benchmarked against key ratio and area among the selected peer universities in the USA, Namely, Cunny ARSC, Rutgers, University of Alberata, Stanford Bass, UW Madison, not in the same order.

ACCUMULATIVE



Legend

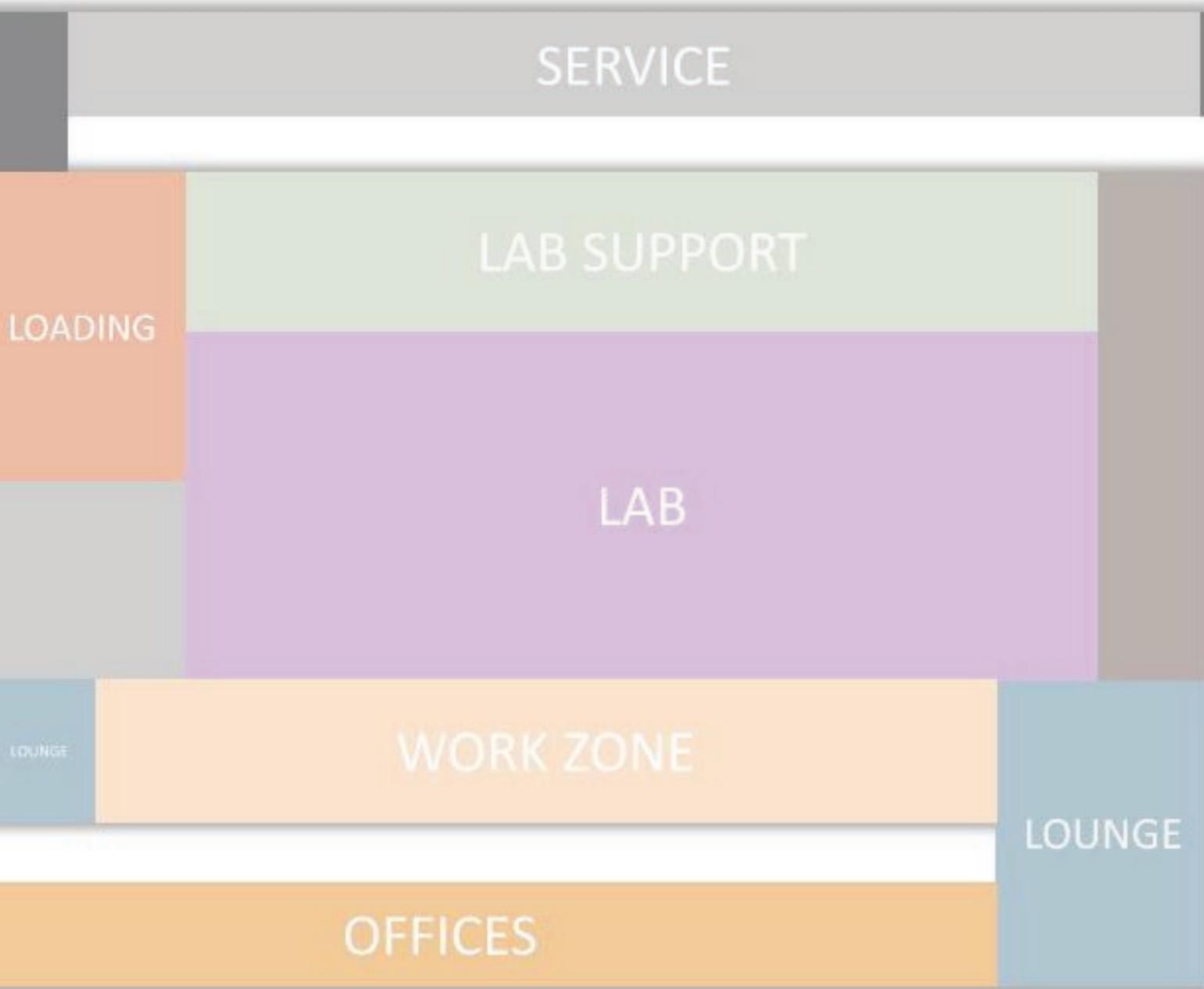
 WSU School of Biological Sciences & Chemistry Benchmark Avg.

 Biology Dept./School

 Chemistry Dept./School

 #VALUE Avg. Benchmark Value (excl. WSU)

Note: For better space realization, the Department / School of Biology/Biochemistry and Chemistry has been benchmarked against key ratio and area among the selected peer universities in the USA, Namely, Cuny ARSC, Rutgers, University of



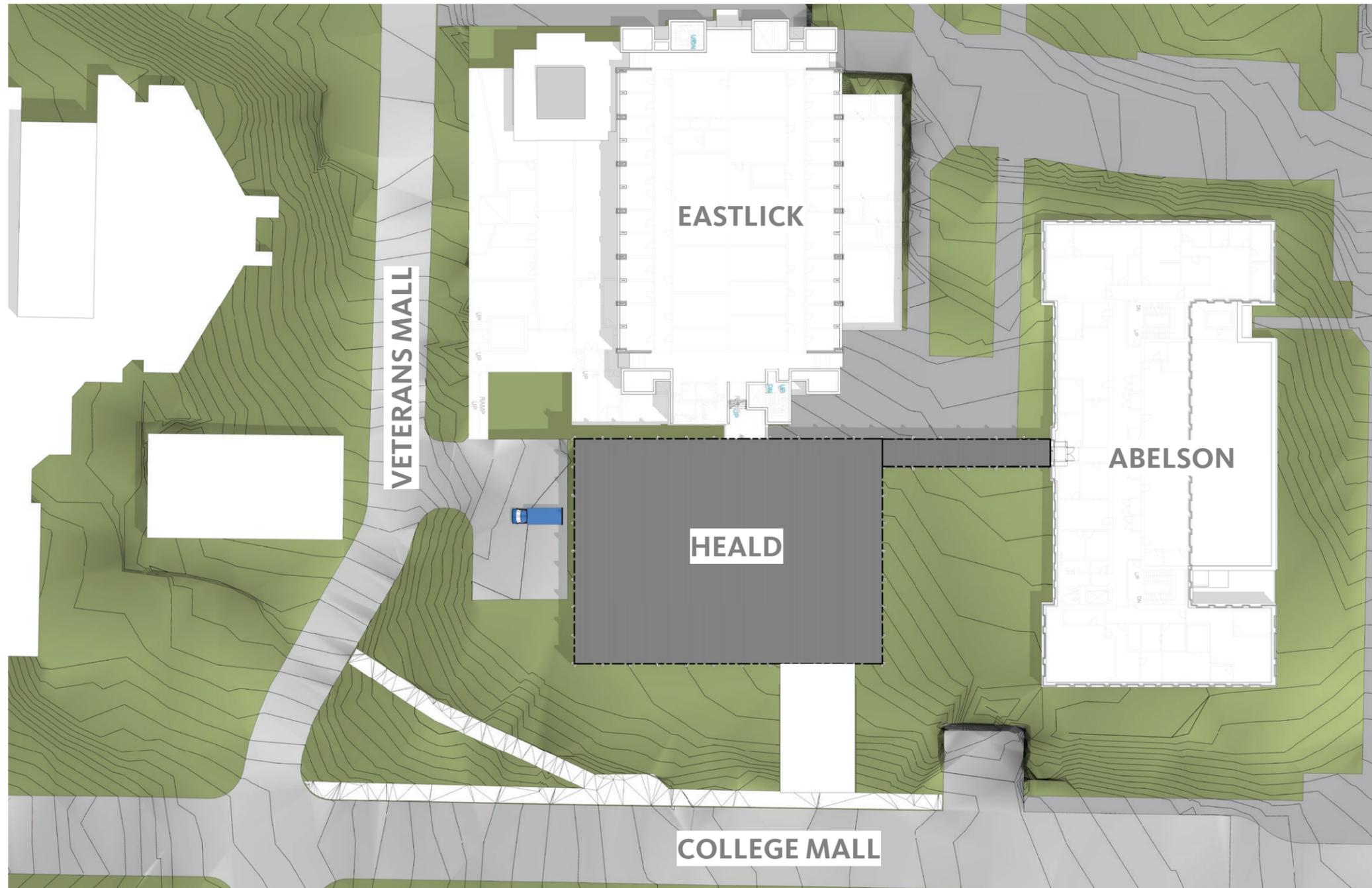
Gensler

SECTION 05.

CONCEPT DESIGN

Concept Site Plans	92
Concept Floor Plans	98
Concept Roof Plan	106
Concept Sections	108
Concept Exterior Perspectives	112
Project Schedule	122

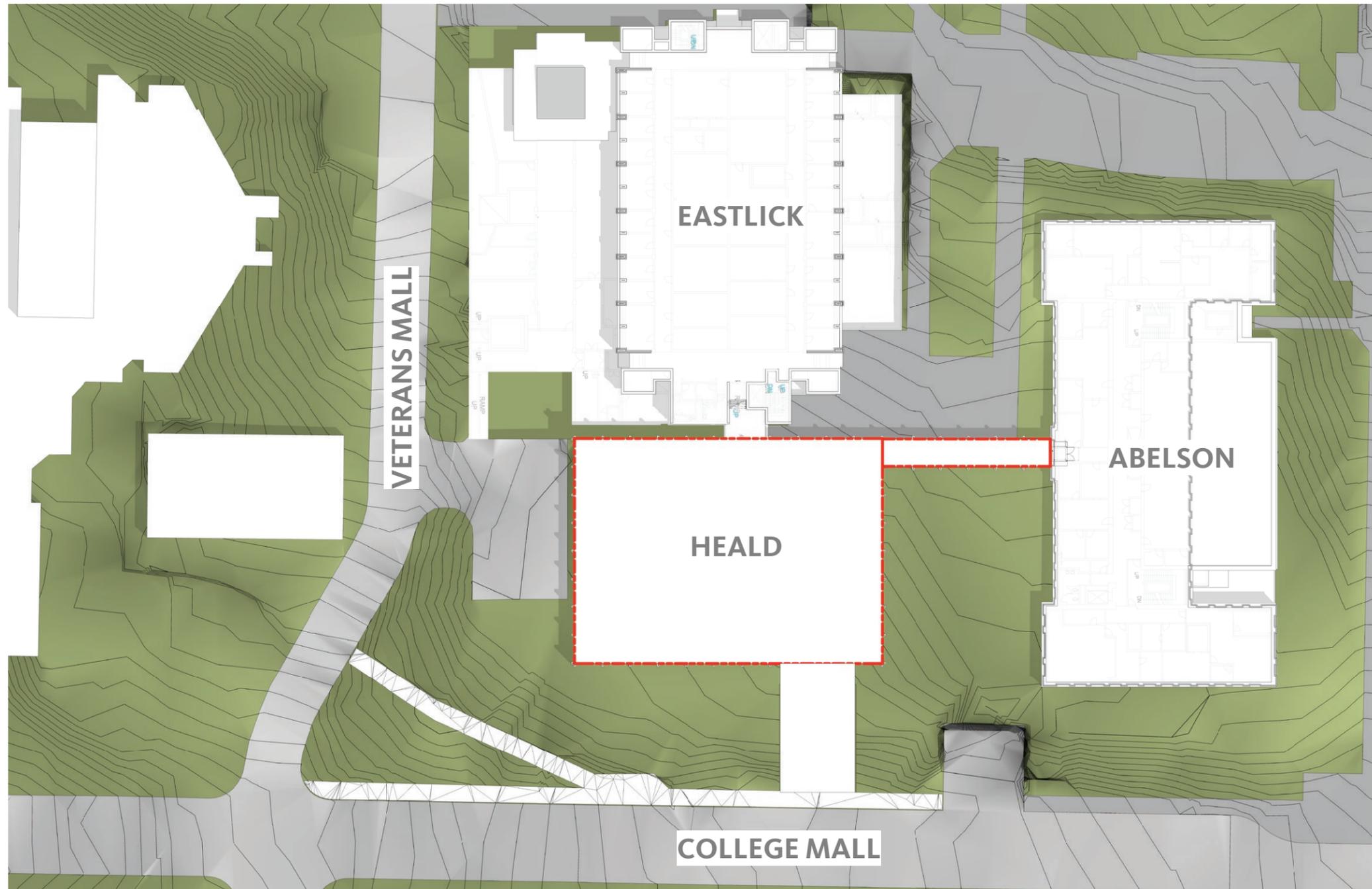
SITE PLAN - EXISTING CONDITIONS



BACKGROUND

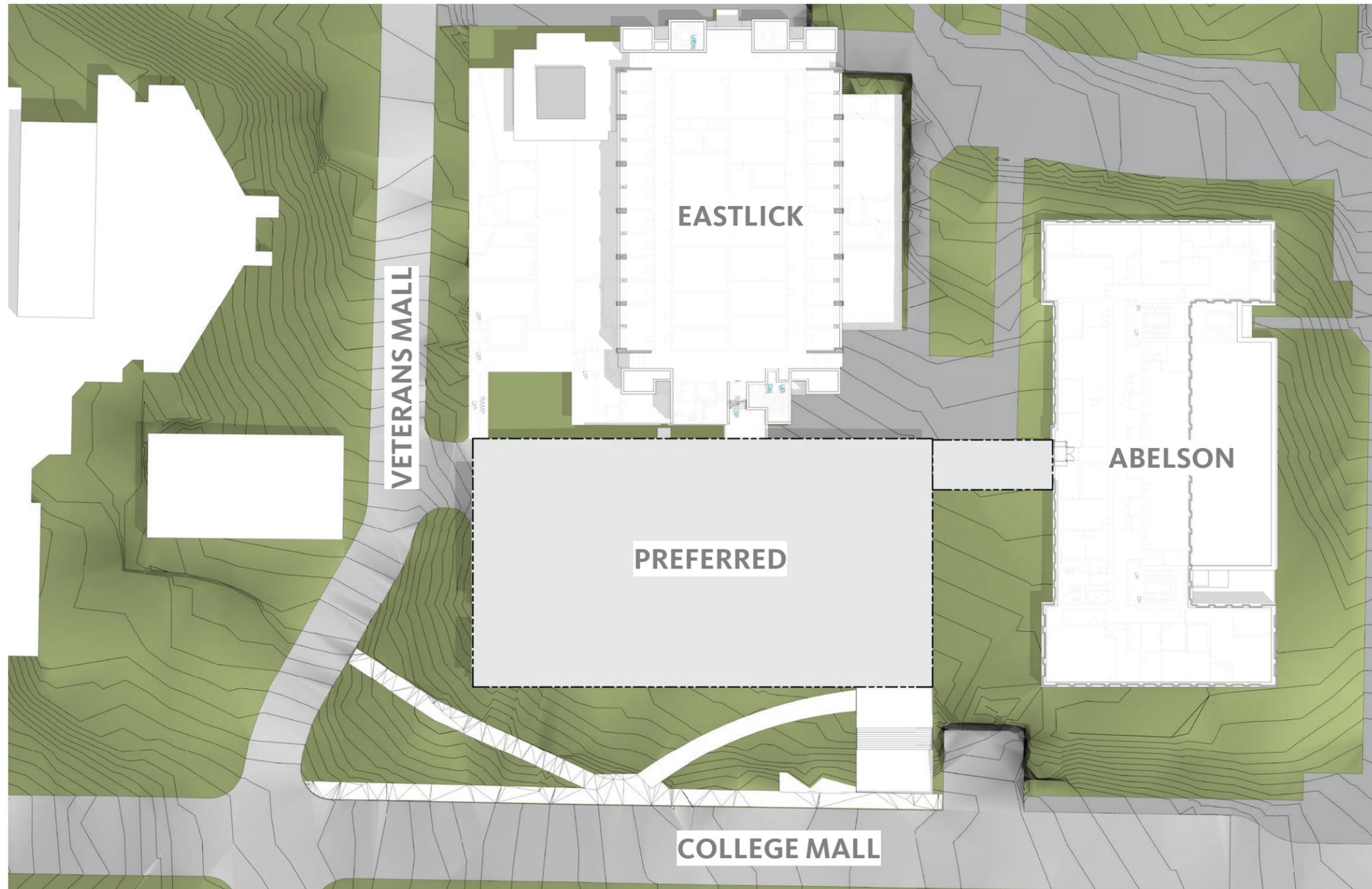
Heald Hall is currently located at the intersection of NE college avenue and veteran's way and connected to Eastlick Hall through a north multistory elevator lobby. Heald Hall is also connected to Abelson by ways a multistory bridge connection.

SITE PLAN - PROPOSED DEMOLITION



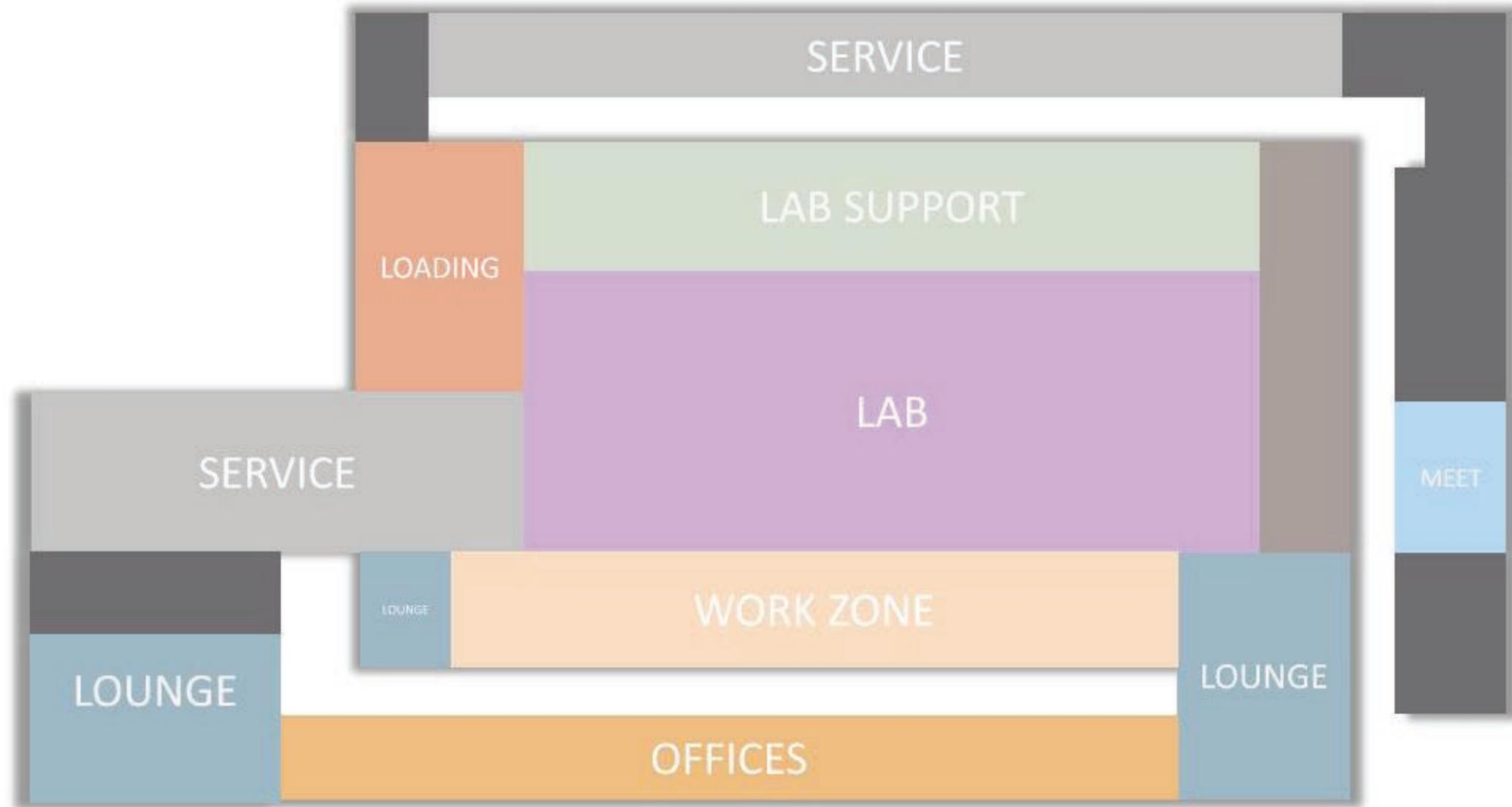
DEMOLITION

Heald Hall demolition is proposed to include the site extents shown in red. The demolition of the existing building will require site restoration of the exterior of Abelson Hall and Eastlick Hall where the connection the Heald no longer remains. Based on conversations throughout the workshops the desire is to provide a future connection to Abelson if possible. A connection to Eastlick will become less critical once sustained tenant improvements convert the building to primarily an instructional-based program.

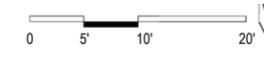


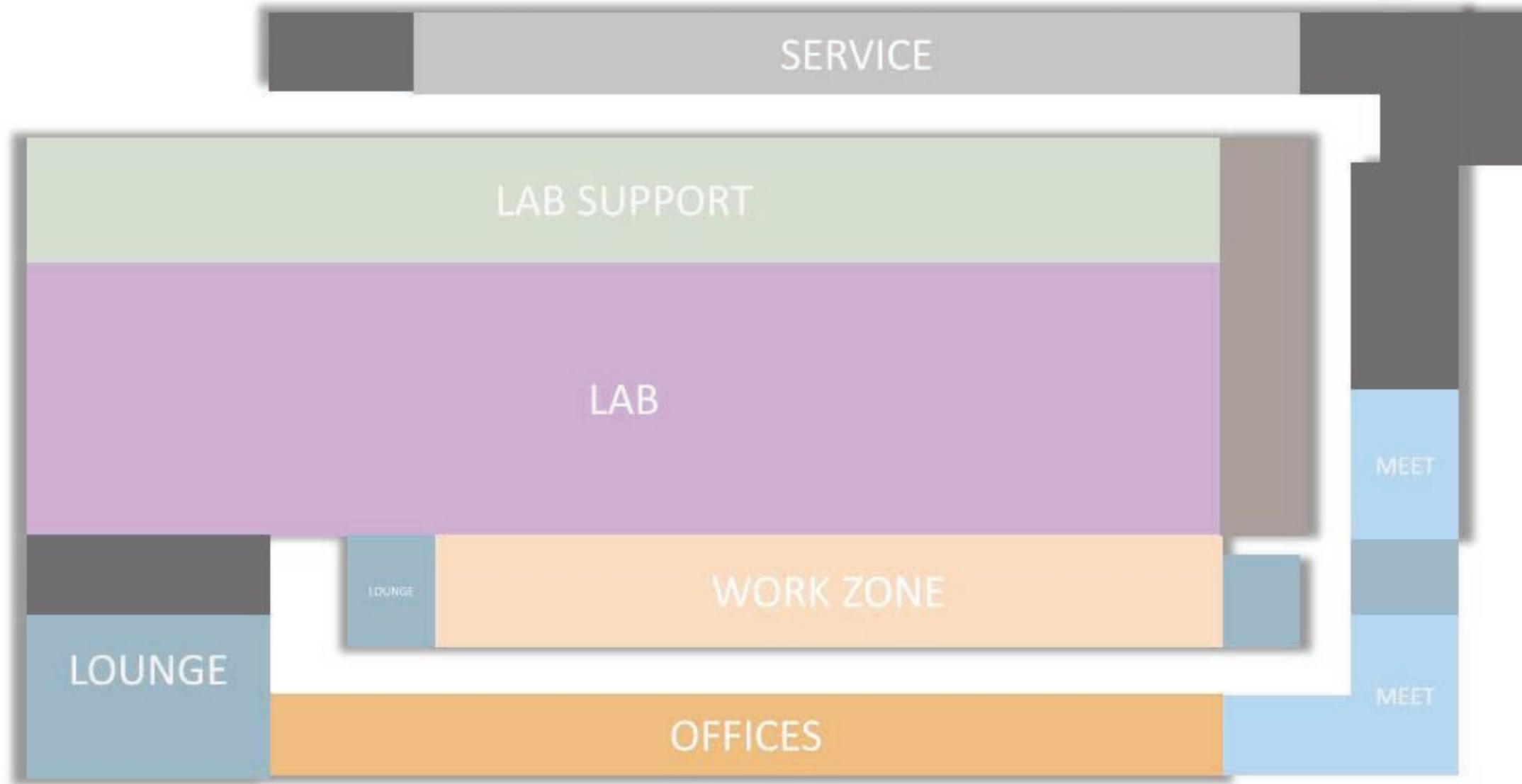
PREFERRED OPTION

The preferred option presented will replace demoed Heald and expand towards the west and south portion of the campus. The entrance of the building will face the more prominent street, College Mall. A bridge to Abelson will connect on the third floor of the new facilities via a mezzanine space and is to be included as an alternate to be considered if costs allow. The loading dock will be placed perpendicular to the Eastlick loading dock, tucked off Veteran's Way. The freight elevator will be located off the loading dock for convenience.



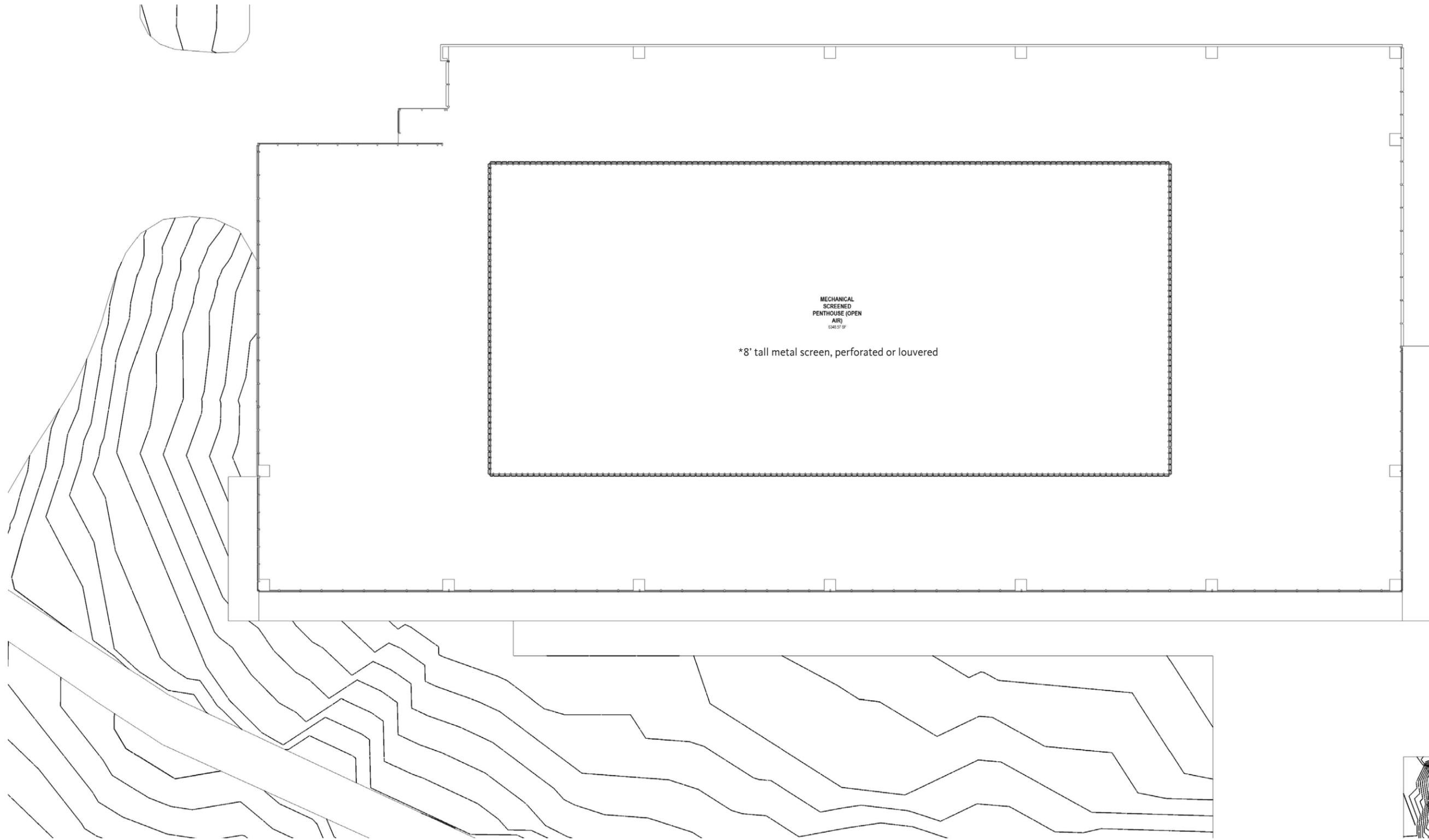
FLOOR PLAN - LEVEL 1



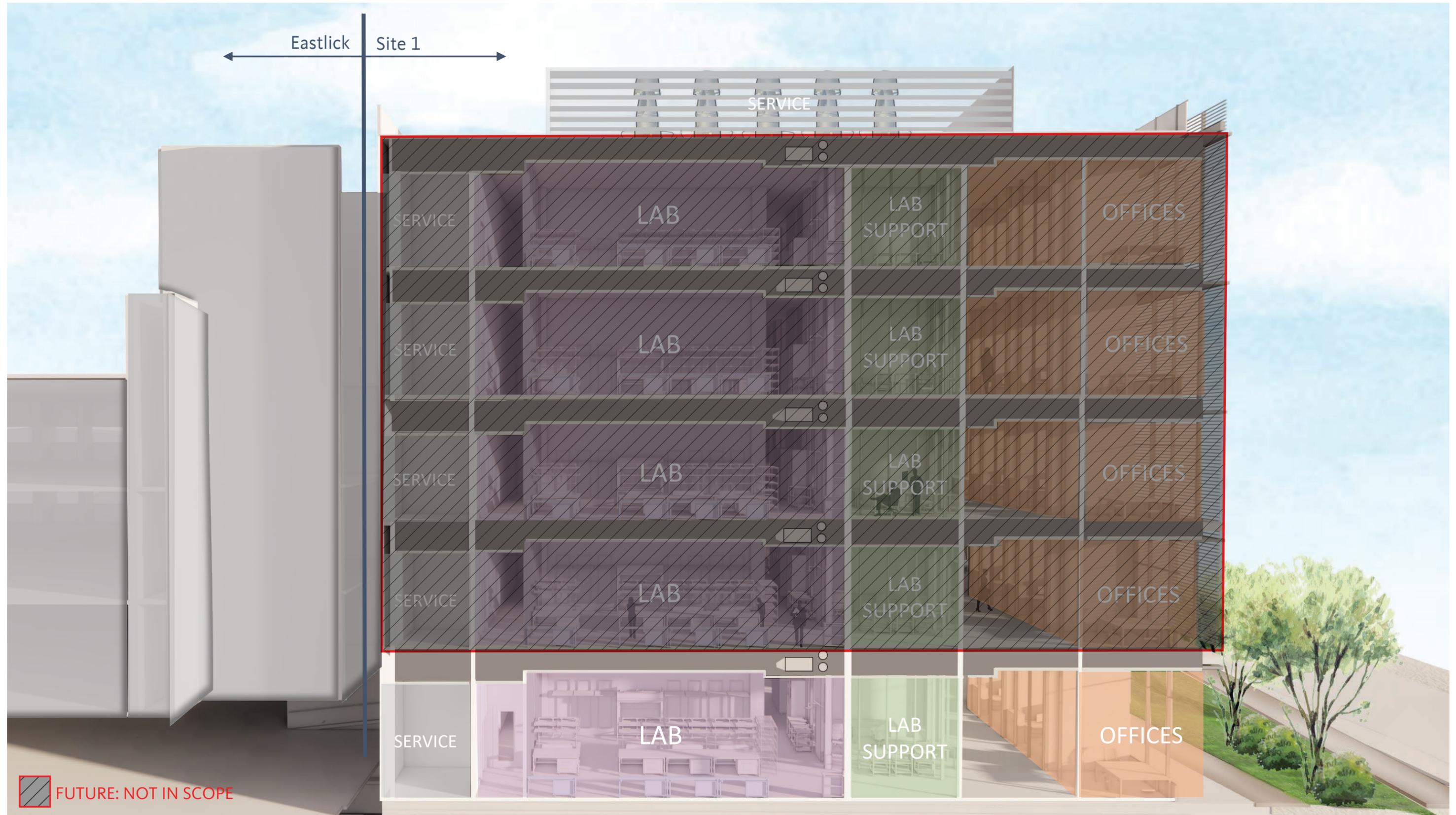


FLOOR PLAN (TYPICAL) : LEVEL 2 - FUTURE: NOT IN SCOPE

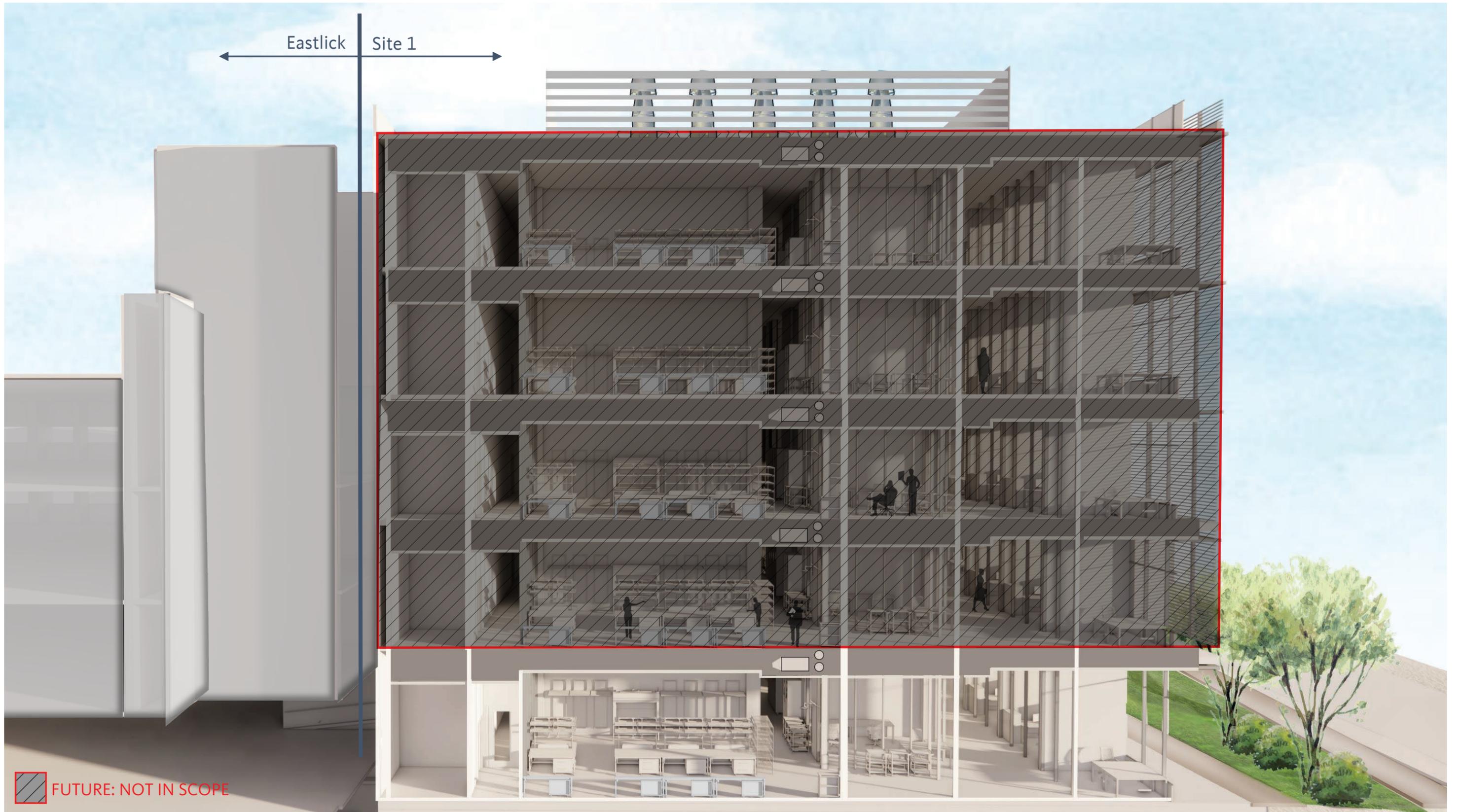




SECTION STACKING DIAGRAM - MAXIMIZING SITE POTENTIAL



SECTION PERSPECTIVE - MAXIMIZING SITE POTENTIAL











EXTERIOR CONCEPT OPTIONS - SUMMARY

EXTERIOR 1

Option 1 uses a metal horizontal louvered screen to help diffuse the direct light into the office bar predominantly along the south-facing facade. Borrowed light through the use of glazing at the interior of the office lab, allows for the building to maximize the use of daylight.



EXTERIOR 2

Option 2 aims to highlight the collaborative zones by allowing them to protrude from the skin. As opposed to stacking, these square framed elements would be placed along the office bar to highlight collaborative spaces in order to allow the building to showcase a rhythmic facade and create a display of the sciences.

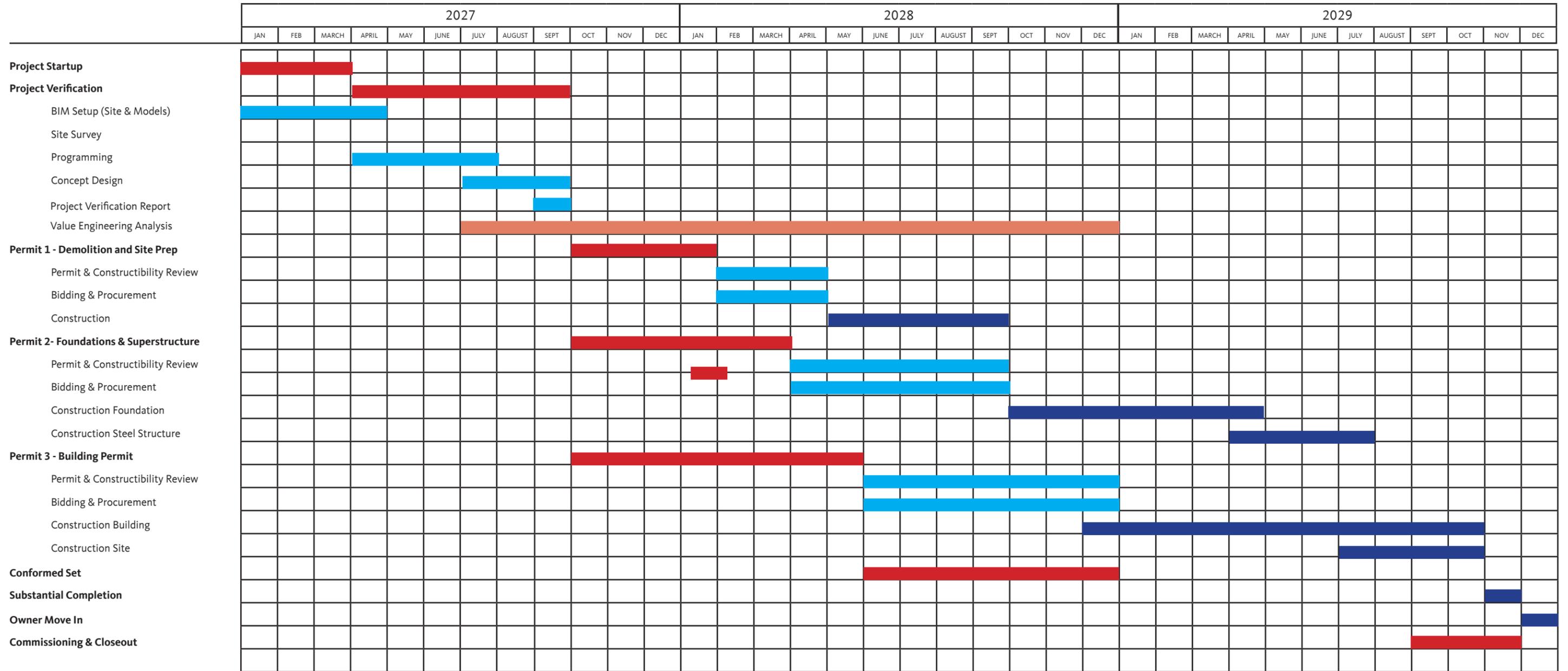


PREFERRED OPTION

The preferred option showcases the light shelf on the exterior of the building and continues the motif on the interior in the office bar. By using the light shelf, we are able to drive deep the borrowed light from the south facing offices into the collaborative and lab research areas.



DESIGN & CONSTRUCTION SCHEDULE



HIGH-LEVEL MILESTONES

The high-level milestone schedule for the project is shown above, including time frames for design, construction, bid, acquisition, and occupancy. Value-engineering analysis and constructibility review are shown as a continuous effort across the design development through a design-build framework.

SCHEDULE IMPACTS

Factors that may delay the project schedule are longer than expected lead-times for procurement of critical path scope of work, timely approvals by owner stakeholders, or acquisitions in financing of the project.

PERMITTING IMPACTS

Permit reviews are conducted through the City of Pullman, Protective Inspections Division. Project teams should contact the Local jurisdiction soon after the beginning of project to meet with officials to discuss expected review times frames, process, and recommend approach and requirements for submission of permits.



Gensler

SECTION 06.

TECHNICAL NARRATIVES

Architectural Narrative	126
Site Design & Utilities	128
Structural Systems	132
Mechanical/Plumbing Systems	136
Electrical/IT Systems	145

ARCHITECTURAL MATERIALS

CODES AND STANDARDS

The buildings will be designed and constructed to conform with applicable codes and standards:

- International Building Code
- International Fire Code
- National Fire Protection Association (NFPA) Codes
- Washington Administrative Code
- International Mechanical Code
- Uniform Plumbing Code
- NFPA 70, National Electric Code (NEC)
- U.S. Environmental Protection Agency 40 CFR

Site and building design to conform with the principles of Universal Design, and to be in conformance with:

- Americans with Disabilities Act
- ANSI A117.1
- Washington Administrative Code

EXTERIOR ENCLOSURE

Technical considerations of the building enclosure described below. Aesthetics of the buildings are discussed in Section 04.

Performance Criteria

The enclosure system and materials are to provide a high level of energy efficiency, with the ability to withstand long term appearances with minimal maintenance.

Exterior Walls

- A continuous, uninterrupted non-vapor-permeable air/water barrier is to be applied to the exterior wall sheathing.
- Rigid insulation is to be continuous and uninterrupted. Place on the exterior side of the wall sheathing to minimize thermal bridging. Batt insulation to be used in stud cavities to obtain an overall R-21 value.

- When detailing cladded, careful consideration is to be given to accommodate movement at transitions. The design intent is for cladding to be installed as a rainscreen element. All materials to be prefinished, long lasting, and low maintenance.

SUSTAINABILITY GOALS

The building goal is to achieve a minimum of LEED Silver to meet Chapter 39.35D RCW requirement for high-performance buildings, with the opportunity to reach LEED Gold through the Washington State Energy Code requirements.

Recommendation to pursue embodied carbon neutral goals through selection and procurement of materials with a low Global Warming Potential and Environmental Product Declarations with the goal of meeting the Zero by 2040 challenge, set by Architecture 2030.

Refer to page 137 for additional sustainability strategies.

Proposed buildings over 20,000 gross square feet may study incentives for following the state energy standards for clean buildings, per RCA 19.27A.210 before they take effect. Compliance with standards begin in 2026 for Tier 1 Buildings 20,000 to 50,000 square ft. Tier 1 requirements note benchmarking, implementation of an energy management plan, and operations and maintenance program. Compliance with standards for Tier 2 Buildings between 50,000 to 90,000 square ft do not take effect until 2028. Design team will need to evaluate compliance dependent on outcome of gross square footage.

COMMISSIONING

To assure building quality by establishing a process to verify the building enclosure and systems are designed and constructed to meet the goals of the project and owner. It is recommended for the team to establish the criteria for performance as it relates to LEED, Washington State Energy Code, and other sustainability goals.

ARCHITECTURAL MATERIALS

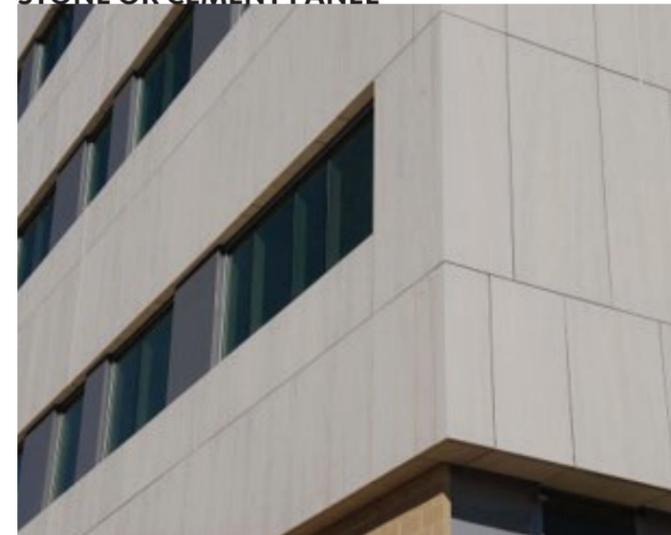
BRICK



GLAZING



STONE OR CEMENT PANEL



METAL PANEL



PHENOLIC COMPOSITE PANEL



TERRACOTTA



1. Site

- a. The New Science Building will be located in the place of Heald Hall on the northeast corner of College Avenue and Veteran's Way, situated south of Eastlick Hall and west of Abelson Hall. The new building footprint is 20,400 square feet.
- b. The existing and new sites are similar, with the building occupying the north and east portions of approximately 0.80 acres with landscaping and pathways traversing the south and west portion. The main entrance of both the existing and new buildings is located off College Avenue by a flight of stairs. Pedestrian access is also granted from Eastlick Hall and the Abelson Hall sky bridge. Sky bridge connections will not be maintained after construction of the new building, though the sky bridge itself will remain in place. A loading dock off Veteran's Way currently serves Eastlick Hall and Heald Hall. The loading dock will be reconfigured as part of the new building layout and a generator pad (approximately 500 sf) will be added.
- c. College Avenue and Veteran's Way adjacent to the project site are closed to public vehicle traffic and transit. There is no designated parking along the site frontage at this time. WSU vehicles and emergency vehicles are permitted to access both streets. Fire trucks access the site from both College Avenue and Veteran's Way. Additional fire access from the driveway north of Abelson may also be used to provide coverage to the north side of the building.
- d. The existing site has two pedestrian ramps from Veteran's Way to the College Avenue sidewalk. One of these pathways will be demolished to accommodate construction of the new building and site. The new building will provide a new accessible ramp from the College Avenue sidewalk to the main entrance. An additional new ramp will convey pedestrians from the main entrance plaza to the existing plaza between Abelson and Heald, above the Abelson Hall loading dock.
- e. There are four existing parking spots at the existing Heald and Abelson loading dock area. Three of these four parking spots are signed as accessible parking. These four stalls are not included in the current site plan for the new building. A fee imposed by WSU for removing four parking spaces will be incurred by the new building project.
- f. A heavy-duty asphalt or concrete pavement section is

recommended for the reconfigured loading dock. Re-use of the existing storm drains is viable as the contributing basin area will decrease in size. A reinforced concrete pad with a retaining wall is recommended for the generator pad. Runoff from the generator pad could utilize adjacent landscaping for runoff disposal, or a connection to the existing storm drain may be feasible. Sidewalk and ramp pavements shall be concrete. Pervious concrete may be used in pedestrian areas to manage runoff and provide on-site infiltration.

- g. The existing Heald Hall site contains approximately thirty documented trees and bushes. The south and west portions of landscaping include western red cedar, juniper, arborvitae, silver maple, crabapple, Austrian pine, and ponderosa pine. These trees, with the exception of one silver maple, are likely to be demolished during construction of the new Science Building. Additional plantings such as nannyberry, magnolia, redwood, arborvitae, and a tulip tree between Heald and Abelson Halls will likely be removed during construction. A fee imposed by WSU for removing existing trees will be incurred by the new building project.

2. Soils

- a. Typical regional soils consist of windblown loess underlain by basalt. Because the project site is located in a developed area with an existing building, fill materials are also anticipated to be present. A geotechnical engineering report was not performed as part of the pre-design effort and previous geotechnical reports for Heald Hall were not available. Existing soils information was obtained from geotechnical reporting for Eastlick Hall (1975) and Abelson Hall (1983). Borings from the Eastlick 1975 report reveal a clayey silt overburden above basalt rock. An irregular layer of weathered basalt was found above and below the harder basalt rock at depths of a few inches to several tens of feet in depth. No groundwater was encountered. The depth to rock was reported as 11-27+ feet below grade. The Abelson report from 1983 was focused on the southwest end of Abelson Hall for construction of the Abelson loading dock, located adjacent to the proposed stairs and pedestrian ramp in the southeast corner of this project site. The borings from this 1983 report extended 10.8 and 7.5 feet below grade and revealed layers of silt fill, old topsoil, and native silt. No groundwater was encountered.

- b. The existing auditorium and basement level voids of Heald Hall will be filled after Heald Hall is demolished. The new Science Building does not have a proposed basement. Over-excavation of existing fill and subgrades below the auditorium and basement voids may be necessary to control differential settlement in the new Science Building. Proximity to Eastlick Hall and the existing Abelson Hall loading dock (both to remain) are to be considered when designing footings for the new Science Building.

3. Grading

- a. The existing Heald Hall and the new Science Building site slopes will be similar. The finished floor elevation of the New Science Building is 2524 feet. The finished floor of Heald Hall is 2524.50 (from the south entrance off College Avenue).
- b. Pedestrian access to the new Science Building will be provided by stairs and a new ramp. The ramp has been laid out to be at a 1:12 (8.33%) maximum slope.
- c. A second ramp from the new Science Building entry plaza up to the south Abelson Plaza shall be constructed with 1:12 (8.33%) maximum slopes.
- d. Plaza areas and ramp landings shall be graded at 1:50 (2.0%) maximum in transverse and longitudinal directions. Landings on ramps are required every 30 feet and at changes in direction.

4. Drainage

- a. Heald Hall is served by an existing 4-inch roof drain line and an existing 6-inch storm drain line from the existing loading dock. The 4-inch roof drain will be removed to accommodate the new Science Building footprint. The existing catch basin and 6-inch drain line are to remain to capture runoff from the reconfigured loading dock area. The loading dock is the only pollutant-generating surface associated with the new Science Building site. As there will be a reduction in contributing area. This runoff may continue to be discharged to the WSU storm drain system.
- b. An existing 6-inch storm drain line runs east-to-west between Eastlick and Heald Halls conveying water from the sky bridge and east side of Eastlick to the storm drains west of Eastlick and Heald. This pipe will be uncovered during Heald demolition and new Science Building construction. Re-routing this drain down the east side of the new Science

Building is recommended.

- c. Roof runoff from the new Science Building may be piped directly to the WSU storm drain system utilizing new or existing roof drain piping.
- d. Site drainage from the new plaza and ramps shall utilize pervious concrete and/or adjacent landscape areas for on-site infiltration.
- e. The following compares surface areas between the existing and new sites:

Area	Existing (Heald)	Proposed (new Science Building)
Roof	13,330 sf	18,385 sf
Pollutant-generating pavement	2,920 sf	2,200 sf
Non-pollutant generating pavement	4,250 sf	4,500 sf
Landscape	15,150 sf	10,565 sf
Total	35,650 sf	35,650 sf

5. Utilities

- a. Utility and stormwater information was obtained from WSU CAD maps and GIS website.
- b. Utility and drainage demolition, re-routing, and new routing is shown on the enclosed exhibits.

6. Sanitary Sewer

- a. Heald Hall is served by two 8-inch ductile iron sewer services out of the south side of the building. These services merge and connect to a sewer manhole in College Avenue where an 8-inch ductile iron sewer main flows west down College Avenue. It is recommended the new Science Building use a camera to inspect these two 8-inch services and, if found satisfactory, re-use these services for the new building. It is not recommended that any new services be extended all the way to the sewer main in College Avenue as this would require crossing through or under the existing steam tunnel. Re-use of existing piping north of the steam tunnel is recommended.
- b. Eastlick Hall is served by an 8-inch sewer pipe located west

of Heald Hall with a manhole in the shared loading dock. The new Science Building will encroach on this service. The existing Eastlick sewer service shall be intercepted with two new manholes and relocated to the west.

- c. Sewer from the Glenn Terrell Mall and Library Way is conveyed between Heald and Abelson Halls (under the sky bridge). This service is to remain and be protected during construction.

7. Domestic Water

- a. Heald Hall is served by a 10-inch potable water pipe from the low-pressure water pipe distribution system near the loading dock area. It appears this pipe provides both domestic and fire protection water to the existing building. This service should be resized and replaced for the new Science Building, though the location may remain the same. The water meter and backflow prevention assembly should be located inside the new Science Building.

8. Fire Protection Water

- a. Heald Hall is served by a 10-inch potable water pipe from the low-pressure water pipe distribution system near the loading dock area. It appears this pipe provides both domestic and fire protection water to the existing building. This service should be resized and replaced for the new Science Building, though the location may remain the same. A new post indicator valve and new fire department connection should also be included for the new Science Building. The FDC should be remote from the building and placed near College Avenue or Veteran's Way.
 - i. Heald Hall has two existing fire department connections. These shall be demolished as part of the Heald demolition.
- b. The low pressure fire service is supplied by a 10-inch low pressure water line that runs north/south along the east side of Veteran's Way. There are two fire hydrants served off this 10-inch low-pressure water main. These existing hydrants are to remain. One is located near the Heald/Eastlick loading dock and the other is located near the northeast corner of College Ave and Veteran's Way. No additional hydrants are anticipated for the new Science Building. The 10-inch low pressure water main is to remain and be protected during

construction.

- c. There is a 6-inch high pressure water pipe running east/west between the existing Heald Hall and College Avenue. This line is to remain and be protected.

9. Chilled Water Supply & Return

- a. 10-inch chilled water supply and return pipes run across the southwest corner of the project site under the landscaping. The southwest corner of the new Science Building will encroach on these pipes, requiring these two pipes be relocated south and west of the existing pedestrian pathway.

10. Steam Tunnel Service

- a. Heald Hall is served by the campus steam and condensate system (tunnel section C52.1). The steam tunnel, including piping, enters Heald from the south. The larger steam and condensate main lines are located under the sidewalk on the north side of College Avenue. Another steam tunnel is located along the east edge of Veteran's Way. This existing steam tunnel and piping is to be re-used for the new building. The length of tunnel and piping will be shortened to accommodate the larger footprint of the new building.
- b. Long-term plans for eliminating the campus steam system would require abandonment of the tunnel spur to the new Science Building.
- c. Heald's telecommunications service is provided via the tunnel service spur. It is anticipated the new Science Building's service will also be served via the tunnel spur.
- d. Heald's electrical service is also provided via the tunnel service spur. It is anticipated the new Science Building's electrical service will also be served via the tunnel spur. Additional electrical and telecommunications lines are located in the larger tunnels within College Avenue and Veteran's Way. New service connections could be made by penetrating the existing tunnels.

11. Natural Gas

- a. Heald Hall is currently served by an Avista natural gas pipe with a meter in the northwest corner of the building. This service follows the east edge of Veteran's Way, then crosses the College Avenue steam tunnel to connect to a main in

College Avenue. This service could be re-used for the new Science Building, though the point of connection would be moved to accommodate the new Science Building footprint. Service sizing shall be determined by the mechanical engineer.

1. The selection of the individual members of the structural system shall consider the overall structure depth of each floor level and the effect on the ceiling cavity and other systems. Height limits may influence the selection of the structural system.

2. The roof will likely be designed for a combination of photovoltaic systems, mechanical systems, and a screen wall.

3. The lateral force-resisting system (LFRS) location shall be located to have the least interference with the openness of the floor plate. The current assumption is to provide either buckling restrained braced frames (BRBs) around the perimeter of the floor plate for the steel and cross-laminated timber options or concrete shear walls at stair and elevator cores and at select demising walls for the post-tensioned concrete option.

4. The LFRS is expected to be designed for standard education occupancy and is not considered to be an immediate occupancy structure. This needs to be reviewed with the client: if the building needs to be operational immediately after a major earthquake for emergency services, this will require an increase in structural resiliency.

5. Floor flatness shall meet industry standards for education occupancy floors.

6. Floor vibration control shall meet relatively tight standards so there is minimal perceptibility by occupants. All system options presented could meet the vibration standards for this project however some options are more susceptible to vibrations. In general, the concrete option would be least susceptible to vibration, the steel option would be more susceptible, and the mass timber option would be the most susceptible. If there are lab equipment requiring highly sensitive vibration control, it is assumed such equipment would be located on the slab on grade thus not adding additional cost to any of the superstructure options.

7. The geotechnical information is not available at the time of this report but is assumed to favor conventional footings as shown in the attached conceptual plans.

APPLICABLE CODE AND STANDARDS

The project will be governed by the Washington State Building Code as adopted and amended by the City of Pullman. The preliminary LFRS and foundation sizes have been determined using the current adopted Building Code at the time of writing this report. Future editions of the Building Code may require higher seismic and wind design forces than previous building

codes. The building code shall be considered in the selection and design of the structural system. The following criteria are current building code minimum design loads for floors, roofs, wind, and seismic.

LOADING CRITERIA

GRAVITY LOADING

The following loads are in addition to the self-weight of the structure. The following live loads are the minimum recommended by the building code or as specified by the client. Live loads are reduced where permitted.

Table 1. Floor and Roof Loads

Area	Live Loading	Super-Imposed Dead Load	Note
Offices & Upper Corridor	80 psf throughout or offices at 50psf+ 20 psf for partitions	20 psf	
Lobbies and Corridors on Main Floor	100 psf	20 psf	
Stairs/Exits	150 psf	10 psf	
Mechanical/ Electrical Rooms	125 psf	20 psf	1
Labs & Storage (light)	125 psf	20 psf	2
Roof	25 psf (R) or Snow Drift Load	25 psf includes OV	

1. The live load for mechanical/electrical rooms will be 150psf, or the actual weight of the equipment plus 50psf for the surrounding space, whichever is greater.

2. The live load was specified by the client.

In addition to these uniform loads, a perimeter dead load is applied to the structure to account for the weight of the cladding system.

Table 2. Cladding Loads – actual loads may differ depending on system selection and sizes.

Load Type	Load
Glass Window Wall	15 psf
Precast Panel	75 psf
Metal Panel	10 psf

SNOW DESIGN CRITERIA

Snow drifting, unbalanced loading, and partial loading are considered in the design of the roof framing. The following parameters for snow loads are in accordance with the building code:

Table 3. Snow Design Criteria

Parameter	Value
Ground Snow Load (Pg)	30 psf
Risk Category	II
Terrain Category	B
Exposure	Fully Exposed
Snow Exposure Factor (Ce)	0.9
Thermal Factor	1.0
Importance Factor (Is)	1.0
Flat Roof Snow Load (Pf)	20 psf

WIND DESIGN CRITERIA

The following parameters for wind loads are in accordance with the building code:

Table 4. Wind Design Criteria

Parameter	Value
Basic Wind Speed, 3 -second gust (V)	102 mph
Exposure	B
Enclosure Classification	Enclosed
Topographic Factor	1.0

SEISMIC DESIGN CRITERIA

The following parameters for seismic loads are in accordance with the IBC:

Table 5. Seismic Design Criteria

Parameter	Value
Building Latitude	46.7295 N
Building Longitude	117.1661 W
Risk Category	II
Importance Factor (Ie)	1.0
Mapped Spectral Acceleration	$S_S = 0.295g$; $S_1 = 0.107g$
Mapped Long Period	TL = 16
Site Class	D
Site Class Coefficients	$F_a = 1.56$; $F_v = 2.39$
Spectral Response Coefficients	$S_{DS} = 0.308$; $S_{D1} = 0.171$
Seismic Design Category	C
Analysis Procedure Used	$SDS = 0.308$; $SD1 = 0.171$

FLOOR VIBRATIONS CRITERIA

The following parameters for floor vibrations are in accordance with criteria discussed with Gensler:

Table 6. Floor Vibration Criteria

Parameter	Value
Occupants Walking	9 Hz
Equipment Vibration Attenuation	800 mips or less

MATERIALS

The material properties used for the design include the following:

Table 7. Mass Timber Properties

Parameter	Value
Cross Laminated Timber Panels	Per Manufacturer
Structural Steel Connectors	Per Manufacturer

Table 8. Structural Steel Properties

Member	Standard Strength
Wide Flange Shapes	ASTM A992, Fy = 50 ksi ASTM A913, Fy = 50 ksi
Table Sections	ASTM A500, Gr B, Fy = 46 ksi
Pipe Sections	ASTM A53, Type E or S Grade B, Fy = 35 ksi
Angle and Chanel Sections	ASTM A36, Fy = 36 ksi
Miscellaneous Plates	ASTM 572, Fy = 50 ksi
High-Strength Bolts	ASTM A325

Table 9. Concrete Properties

Member	Standard Strength
Slab on Ground, Sidewalks, Curgbs, Mechanical pads	f'c = 4,000 psi*
Basement walls & foots, Spread Foots, Shear Walls & Columns	f'c = 5,000 psi*
Post Tensioned Slabs	f'c = 6,000 psi*
Reinforcing Steel	ASTM A615, Grade 60 ASTM A415, Grade 60
Post - Tensioning Tendons	ASTM A415, Grade 270
Welded Wire Fabric	ASMTM A185

*28-day strength

CONSTRUCTION

FOUNDATIONS

For cost estimating purposes the foundations are assumed to be conventional spread footings with a frost line of 30". Following is a summary of the foundation sizes for the Structural Options with an assumed bearing capacity of 4,000psf. See Figure 1 for a conceptual foundation plan.

Table 10. Spread Footing Sizes (Plan Dimensions x Thickness)

Column	Structural Option 1 (Steel)	Structural Option 2 (Concrete)	Structural Option 3 (Hybrid CLT)
Interior	13 ft sq x 32"	16ft sq x 38"	12ft sq x 30"
Exterior	9ft sq x 24"	12ft sq x 30"	7ft sq x 18"

The ground floor will be a 4-inch slab on ground without any below grade sections and with some portions thickened to support heavy loads or vibration sensitive equipment. If portions of the lower floor will be below ground due to slope across the site, a cantilever concrete retaining wall would be used at the perimeter. If portions of the ground floor will be at a higher elevation than exterior grade a concrete stem wall would be used at the perimeter. Additional information about the foundation recommendations and options would be discussed in a forthcoming geotechnical report

GRAVITY AND LATERAL FRAMING SYSTEM

The building on this site could be constructed of structural steel, concrete, or mass timber materials. The selection of the structural system will be controlled by the design considerations mentioned above, the configuration of the building, and the height limits on the site. The following structural options shall be considered and are shown conceptually in Figures 2 – 10:

STRUCTURAL OPTION 1: STEEL BEAMS AND COLUMNS WITH COMPOSITE DECK:

The composite deck would be 3-1/2" concrete over a 3" metal deck. The framing sizes would vary depending on span length and spacing: beams would be nominal 12"-30" deep; girders would be nominal 27"-36" deep. The LFRS would be BRBs. See Figures 2 – 4.

STRUCTURAL OPTION 2: CONCRETE COLUMNS WITH POST-TENSIONED (P-T) SLABS:

This alternative is the heaviest of the options. The typical P-T floor slab would be 10"-12" thick spanning to 16" thick x 8ft wide P-T beams. The P-T roof slab would be 8"-10" thick spanning to 12" thick x 8ft wide P-T beams. The wide shallow beams span to concrete columns. The LFRS would be 12"-14" thick concrete shear walls. See Figures 5 – 7.

STRUCTURAL OPTION 3: STEEL BEAMS AND COLUMNS W/ CLT FLOORS & ROOF:

This alternative is the lightest of the options. It is similar to Option 1 but would replace the concrete filled metal deck with cross-laminated timber (CLT) floor panels spanning to wide flange steel beams and columns. The CLT panels are estimated as 5-ply thickness with acoustical mat and concrete topping. The framing sizes supporting the panels would vary depending on span length and spacing: beams would be nominal 12"-27" deep; girders would be nominal 27"-33" deep. This system would require a slightly lighter BRB system than Option 1. See Figures 8 – 10.

Mass timber is covered by the building code in construction Type IV A, B, or C. Each of these construction type designations has different requirements for the fire rating of the material, minimum thickness of wood, and fire protective, non-combustible materials. For this building, Type IV-C would likely be most appropriate.

STRUCTURAL ADD ALTERNATE – PEDESTRIAN BRIDGE:

A pedestrian bridge spanning from Level 3 of the new building to the existing Abelson Hall. The bridge would be a steel truss each side and a truss frame top and bottom built of either Wide Flange or HSS chord and web members. See Figures 2, 3, 5, 7, 8, 9 and 11.

The structural options listed previously were evaluated against the floor vibration criteria in Table 10 (excluding the pedestrian bridge). In all cases, the largest framing bay(s) located in the northern half of the floor plan did not satisfy all criteria with the framing sizes typical of adjacent bays. Therefore, two sub-

options were included for each structural system – Sub-Option 'A' and 'B' – and are shown in the attached Figures. Sub-option 'A' prioritizes uniform framing and designates zones where vibration-sensitive equipment is not recommended; Sub-Option 'B' prioritizes vibration control and increases localized framing sizes beyond the typical depths to accommodate the placement of vibration-sensitive equipment.

1.0 PROJECT BACKGROUND

1.1 GENERAL

A new 5-story research laboratory facility of approximately 100,000 sq ft is to be provided on the Washington State University, Pullman campus at the current location of Heald Hall (near the intersection of Veterans Way and NE College Ave). There are 3 primary types of research labs: Life Science, Bio-Chemistry, and Chemistry. Life Science research lab functions include research in biology, biochemistry, biophysics, bioengineering, and bioastronomy. Bio-Chemistry research lab functions include research in chemical biology, chemical physics, and chemical engineering. Chemistry research lab functions include research in organic chemistry. Additional rooms include procedure rooms, lab support spaces, offices, conference rooms, lounge spaces, storage rooms, mechanical/electrical rooms, and restrooms. The building will include electrical, technology, plumbing systems, fire protection systems, as well as heating, ventilation, and air-conditioning (HVAC) systems.

This Pre-Design report is intended to provide guidelines for designing the HVAC, electrical, plumbing, fire protection, fire alarm, and technology systems for the new laboratory building. The mechanical and plumbing design-build team shall perform an ELCCA to determine the most cost-effective system type out of several system options. The building shall be designed for a 50-year service lifetime. The design-build team shall review their findings with the owner, who will make the final decision on system type.

1.2 APPLICABLE CODES AND STANDARDS

The following codes (and standards) will be referenced and adhered to for mechanical systems engineering. The design shall conform to the “current” version of the code or standard at the time of system design.

- International Building Code (IBC) (with Washington State amendments)
- International Energy Conservation Code (IECC)
- International Mechanical Code (IMC)
- Washington State Energy Code (WSEC)
- Uniform Plumbing Code (UPC)
- National Electrical Code (NEC) 2020
- Illuminating Engineering Society (IES)

- International Fire Code (IFC)
- International Fuel Gas Code (IFGC)
- NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems
- NFPA 72, National Fire Alarm Code
- NFPA 110, Standards for Emergency and Standby Power Systems
- ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality
- ASHRAE 90.1, Standard for Energy Conservation in New Building Design
- ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy
- ANSI/AIHA Z9.5, Laboratory Ventilation
- ADA Standards for Accessible Design (ADA)
- WAC 194-50, Washington State DO Commerce Adoption and Amendment of ASHRAE Standard 100, 2018 (AKA. the “Washington Clean Buildings Act”)
- IEEE-SA-C2-2022, National Electrical Safety Code
- ANSI/NECA-1-2015, Standard for Good Workmanship in Electrical Construction
- American National Standards Institute/Telecommunications Industry Association (ANSI/TIA)
- ANSI/TIA 568-D Series, Commercial Building Telecommunications Wiring Standard
- ANSI/NECA/BICSI 568-2006, Standard for Installing Commercial Building Telecommunications Cabling
- ANSI /TIA 569-C, Commercial Building Standard for Telecommunications Pathways and Spaces
- ANSI/TIA 606C, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
- ANSI /TIA 607C, Commercial Building Grounding and Bonding Requirements for Telecommunications
- ANSI/NECA/BICSI-607-2011, Standard for Telecommunications Bonding and Grounding Planning and Installation Methods for Commercial Buildings
- ANSI /EIA-310-D, Cabinets, Racks, Panels, and Associated Equipment
- ANSI/TIA/EIA 526-14A, Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant
- ANSI/TIA/EIA 526-7, Measurement of Optical Power Loss of installed Single-mode Fiber Cable Plant
- Federal Communications Commission (F.C.C.), Part 15 and Part 68.

- WSU-IS standards
- WSU Design Guidelines
- WSU Capital Programs – Standard Specification Sections

1.3 BUILDING DESCRIPTION

The building is classified as an education facility. The primary space types are as follows:

- Research laboratories
- Laboratory support spaces
- Offices
- Lounge/Break room
- Conference room(s)
- Restrooms
- Mechanical room
- Electrical/IDF room

1.4 MECHANICAL, ELECTRICAL, AND PLUMBING SYSTEM DESIGN GOALS

The mechanical, electrical, plumbing, and technology (MEPT) systems shall be designed with the intent for the building to achieve LEED Gold status (current version). Optimize building sustainability by implementing an integrated design approach; coordinate with the architect on important design factors such as building envelope, building orientation, and shading strategies.

To promote electrification and minimize combustible sources, utilize heat pumps/heat recovery chillers to the greatest extent possible. Although the Washington State University campus has a steam distribution system, for energy efficiency and carbon reduction reasons connecting to this system is not desirable. Additionally, avoid pursuing designs using fossil fuel heating. Implement energy recovery features to the greatest extent possible.

The building performance shall exceed the current Washington State Energy Code by at least 15%.

The Washington Administrative Code (WAC) 194-50-150 requires commercial buildings over 50,000 sq ft to report their energy use intensity (EUI) measurement (in units of KBtu/sq ft/year), calculated as:

(Annual building net energy consumed / gross floor area).

This building is anticipated to be above the area threshold. MEP systems shall be designed in an energy-efficient way to ensure that the overall building EUI does not exceed the maximum allowable EUI target (EUI_t) value of 95.38 (per WAC 194-50-070), as calculated by

$$EUI_t = (S) * (EUI_{t1}) * (15\% \text{ improvement}) = (1.1) * (102) * (1-0.15) = 95.38.$$

1.5 SUSTAINABLE STRATEGIES

The following MEP sustainable strategies should be evaluated and coordinated with the LEED sustainability team for achieving the project goals:

- Energy efficient lighting to achieve required the foot-candles in spaces with reduced fixtures. The design goal is to beat Washington Energy Code lighting requirements by a minimum of 20%.
- Energy-efficient full-cutoff LED lighting outdoors.
- Energy-efficient distribution transformers to reduce no-load and load loss issues.
- Occupancy sensors in all zones to control lighting, controlled plug loads, and VAV boxes where feasible.
- Task lighting to reduce overhead lighting power densities.
- Utilize Skylights and Solatubes to maximize natural lighting in the building.
- Metering per system (Lighting, HVAC, domestic, etc.) of energy consumption displayed on building automation system (BAS).
- Low flow water fixtures, use of reclaimed water for water closets, and effective control/reduced use of water for irrigation.
- Highest efficiency computers and equipment in the labs to reduce energy and heat loss.
- HVAC, plumbing, lighting controls, access control, and lab controls integrated into a building automation system (BAS).
- Solar PV design to offset energy consumption and reduce carbon footprint of the building.

2.0 MECHANICAL SYSTEMS

2.1 GENERAL

Mechanical work involves providing heating/cooling, ventilation, and exhaust systems for the new facility.

2.1.1 HVAC DESIGN CRITERIA

Outdoor Design Criteria:

Use the WSEC design criteria and ASHRAE weather data to determine outdoor design conditions.

- Location: Pullman, WA (Climate Zone 5B).
- Summer (cooling) design: ASHRAE's 0.4% frequency of occurrence for dry-bulb temperature and mean coincident wet-bulb temperature (92°F db, 64°F wb).
- Winter (heating) design: ASHRAE's 99.6% frequency for mean coincident dry-bulb temperature (7°F db).

Indoor Design Criteria:

- Laboratory, laboratory support: 72 degrees F, 50% relative humidity (RH) cooling and 68°F, 30%RH heating.
- Offices, conference rooms, and lounges: 75 degrees F, 50% RH cooling and 68°F, 30% RH heating.
- Electrical rooms: 75 degrees F, 50% RH cooling and 68 degrees F, 30% RH heating.
- Mechanical spaces: 85 degrees F cooling and 55 degrees F heating.

Note: lab room data sheets list required humidity as "ambient"; there is no planned humidity control.

2.2 PROPOSED HVAC SYSTEMS

2.2.1 GENERAL

The following HVAC systems are potential system designs. An ELCCA shall determine the final system design. The lab spaces shall have independent airside systems (e.g., exhaust, ventilation) from the rest of the building (e.g., offices, meeting) and shall have the capability to operate 24/7.

2.2.2 VENTILATION AND EXHAUST

GENERAL BUILDING VENTILATION

Provide a high-efficiency ventilation system for the building.

Two potential system options are:

1. A Dedicated Outside Air System (DOAS) with energy recovery (Figure 2.1).
2. A High Efficiency Variable Air Volume (HEVAV) system (Figure 2.2).

In either case the system shall provide ventilation outside air to the occupiable spaces as required by code.

Figure 2.1: Rooftop DOAS Unit

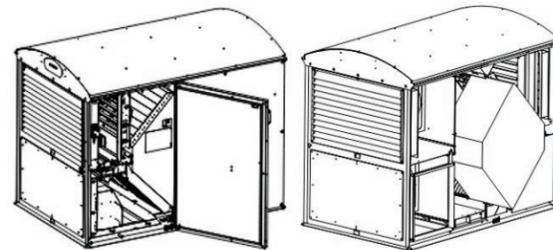
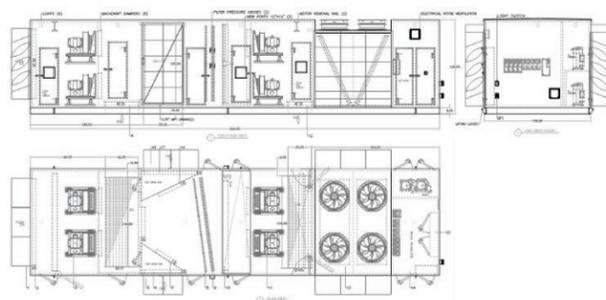


Figure 2.2: Rooftop Air Handler for HEVAV



GENERAL BUILDING EXHAUST

If Option 1, a DOAS system, is used, general building exhaust (e.g., restrooms, janitor's closets, etc.) will be routed through the DOAS unit. This design should incorporate a total energy recovery heat exchanger (a heat wheel) to increase system energy efficiency.

If Option 2, an HEVAV system, is used, a rooftop exhaust fan will be provided for general exhaust.

Per WSU Design Guidelines, provide each mechanical room with a thermostat controlled exhaust fan.

FUME HOOD EXHAUST

Fume hoods (non-bypass type) will be provided in the lab spaces. Fume hoods will be designed for a 100 fpm face velocity at 18 inch sash height, and include audible/visual alarms. Each fume hood will be ducted to a centralized VAV exhaust system and include a venturi style air valve for airflow modulation (Figure 2.3). The central VAV system will include 100% redundant rooftop lab exhaust fans. The designer shall evaluate the requirements for exhaust air filtration depending on what is being exhausted.

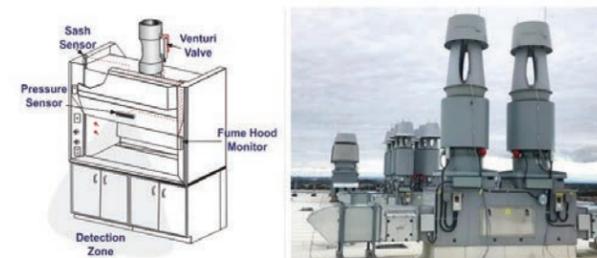


Figure 2.3: Fume Hood Room Layout (left), Rooftop Exhaust Fan (right)

Makeup air to the fume hoods will be provided by a rooftop VAV makeup air handler. Air should be delivered to the room at a low velocity to facilitate ideal fume hood operation. The air shall be tempered with a heating/cooling coil before being delivered to the space. The type of coil will depend on the overall heating and cooling system design. The designer shall evaluate an energy recovery system between the fume hood exhaust airstream and the makeup outside airstream as a means of increasing system energy efficiency.

Biological safety cabinets with high efficiency HEPA filters will be used in laboratories working with microbiological hazards.

Other exhaust hoods and cabinets will be provided for various

other exhausting needs, e.g., gas cylinder cabinets and vented cabinets for hazardous substances.

Laboratory spaces will be ventilated 24 hours a day and will be exhausted directly outdoors. The system for laboratory spaces will reduce airflow during unoccupied hours and will maintain the space at negative pressure with respect to adjacent occupied areas.

2.2.3 HEATING AND COOLING

DECOUPLED VENTILATION AND HEATING/COOLING

If a DOAS system is used, an option may be to provide zone level heating and cooling using either (condensing) fan coils or (non-condensing) chilled beams (Figure 2.4). The terminal unit would include a heating water coil and a chilled water coil. For chilled beams, ventilation air may be ducted directly to the space or ducted into the chilled beam. For fan coils, air would be ducted to the space, and the fan coil would temper recirculated room air. This design will require a central heating hot water system and a central chilled water system.

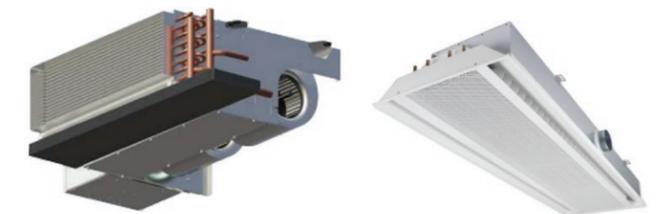


Figure 2.4: Fan Coil (left), Chilled Beam (right)

The central heating system may consist of a "secondary" variable flow heating water loop serving terminal units (e.g., chilled beams or VAV single duct terminal units) and a "primary" constant flow heating water loop that includes the heating water boilers heat pumps?. Major heating system equipment includes outdoor electric (air source) heat pump boilers, circulation pumps, a buffer tank, expansion tanks, and a chemical feeder. As supplemental heating, the designer shall evaluate providing an electric boiler or steam-to-heating water heat exchanger using the campus central steam distribution system.

If chilled water is included in the design, the designer shall evaluate connecting to the campus chilled water distribution system. Additionally, the designer shall evaluate whether using the existing chilled water loop as a heat source is feasible. If available loop capacity does not exist, one or more heat recovery chillers may be provided (Figure 2.5). Major equipment is similar to that described in the heating water section. However, heat recovery chillers are 4-pipe units that have the capability to transfer heat between the chilled water and heating water systems. This means that they are “recovering” energy that would otherwise be rejected (to the atmosphere).



Figure 2.5: Heat Recovery Chiller (left), Buffer Tank (middle), Circulation Pump (right)

An alternate heating and cooling design would be provided by a Variable Refrigerant Flow (VRF) system with energy recovery. The VRF system consists of outdoor heat pump units, energy recovery branch controllers, fan coil units, and interconnecting refrigerant piping (Figure 2.6). Fan coils provide zone level heating/cooling based on temperature sensors. An option would be to provide a mix of systems, where VRF may serve the smaller support spaces (e.g., offices, meeting rooms, etc.), and the centralized heating hot water system and chilled water system would serve the laboratories and support spaces.



Figure 2.6: Fan Coil Unit (left), Branch Controller (Middle), Outdoor Heat Pump (right)

COMBINED VENTILATION AND HEATING/COOLING

If a HEVAV system is used, a centralized heating system and a centralized cooling system will be required. Per WSU Design Guidelines, mechanical equipment is preferred to be located indoors or inside a penthouse whenever possible. The central air handler will provide cooling. One option is to provide a refrigerant heating/cooling coil paired with an outdoor heat pump. Alternatively, a chilled water coil and hot water preheat coil may be used. The central air handler would provide tempered ventilation air to VAV terminal units, which would vary the airflow supplied to the spaces in response to cooling or make up air needs. The VAV terminal units would likely include hot water reheat coils.

CONSTANT CLIMATE ROOMS

For rooms requiring constant temperature control (e.g., IDF, MDF, electrical rooms), evaluate the need for a dedicated cooling system capable of operating 24/7. The preferred approach is to utilize a heat recovery system (e.g., a VRF fan coil) where waste heat removed from the room can be redistributed (recovered) to a different thermal zone requiring heat. As part of the ELCCA, the engineer shall evaluate which system type is most cost effective.

2.2.4 CONTROLS

For the HEVAV option, occupancy sensors will be provided in large rooms with variable occupancy loads, and as required by code.

Evaluate the need for indoor air quality sensors with gas detection.

A direct digital control (DDC) system shall be provided for the building. The new system should be BACnet, Java Application Control Engine (JACE) by Tridium/Honeywell, or another control system by Johnson Controls. The building’s DDC system shall be integrated into the existing campus automation system, consisting of Siemens Building Technologies Apogee and Allerton.

3.0 PLUMBING SYSTEMS

3.1 PLUMBING FIXTURES

Provide plumbing fixtures as required. Provide water-saving plumbing fixtures to the greatest extent possible. Typical fixtures include low-flow flush valves (wall hung water closets and urinals), low-flow lavatory faucets, and low-flow manual faucets (e.g., for kitchen and lab sinks).

Per WSU Design guidelines, each restroom shall be provided a hose bibb and floor drains for maintenance.

Shutoff valves shall be provided for all equipment and end fixtures.

3.2 POTABLE WATER

A reduced pressure backflow assembly (RPBA) shall be provided for the building's potable water system at the point of entry. The domestic water service pressure shall be evaluated to determine whether a building pressure reducing valve (PRV) is required. Domestic cold water shall be piped throughout the building to plumbing fixtures as required. The designer shall evaluate the requirements for backflow prevention devices (e.g., at lab sinks). Coordinate with the landscape architect for irrigation water requirements.

Domestic hot water shall be generated and stored at 140 degrees F to prevent legionella growth. Hot water shall be generated by one or more (depending on the building demand) storage type water heaters. Energy-efficient heat pump water heaters shall be explored (Figure 3.1); natural gas water heaters shall not be used. Domestic hot water shall be tempered down to 120 degrees F using a master thermostatic mixing valve and circulated throughout the building by a circulation pump. A domestic water expansion tank shall be provided.



Figure 3.1: Heat Pump Water Heater (left), Mixing Valve (middle), Circulation Pump (right)

Each distinct laboratory space shall be provided with at least one emergency combination shower and face wash fixture. The emergency fixture shall be provided with a thermostatic mixing valve to generate tepid water. Additional features include an audible/visual flow alarm and floor drain.

3.3 PURE WATER

A central purified water system (reverse osmosis) will be on a separate plenum-rated polymer piping system and will be distributed to the laboratories. This system will supply water for lab experiments and equipment cleaning. Individual small wall mounted water polishers will be provided as required to provide small quantities of ultra-high-purity water for lab uses.

3.4 OIL-FREE COMPRESSED AIR

A central oil-free (and dried) instrument-grade compressed air (CA) system will be provided at 100 psig. Pressure reducing valves will be provided downstream of the laboratory point of connection to deliver laboratory compressed air (LA) at 15–30 psig. The system will include refrigerant dryers, receiver tank and filters.

3.5 VACUUM

A centralized dry vacuum system will be distributed to the laboratories with 19 to 23 inch Hg negative pressure. Vacuum pumps will be used for deeper vacuum needs. The system will include a receiver tank.

3.6 SPECIALTY GASES

Specially gases are assumed to be provided by local gas cylinders (e.g., Helium, Hydrogen, Nitrogen) with flexible hose connections, as required.

3.7 WASTE AND VENT

Two separate waste and vent systems will be used: a sanitary waste (SW) system and a laboratory waste (LW) system. The SW system will be cast iron piping and will connect to the city's SW system. The LW system will be comprised of chemical-resistant material (such as polypropylene), will have an acid neutralizing tank, and will connect to the city's SW system outside the building. A sampling pit could be used at a designated location prior to discharging to the city's SW system (e.g., to monitor pH).

The closest upstream sewer main manhole invert elevation shall be compared to the building floor invert elevations levels to determine whether a backwater valve (and access vault) is required on the sewer main exiting the building.

3.8 DRAINAGE

Condensate drainage piping shall be provided for cooling coils and routed to the sanitary waste system via an indirect drainage connection.

3.9 NATURAL GAS

No natural gas (NG) is anticipated for the building.

3.10 RAINLEADER

Evaluate the life cycle cost of providing a complete rainwater harvesting system. Major components include filters, storage tanks, and pumps. Additional components include graywater piping to graywater fixtures.

4.0 FIRE PROTECTION SYSTEMS

4.1 GENERAL

Fire-smoke dampers will be utilized in duct shafts throughout the building per code requirements. Chemical fume hood and Bio safety cabinet exhaust duct systems will be provided in dedicated shafts with no fire dampers.

The sprinkler system will primarily be a light hazard wet sprinkler system. Small areas of the building such as storage areas will require systems of greater hazard classification but will not significantly impact the overall sprinkler coverage. Dry sprinklers will be provided for exterior areas of the building such as overhangs and covered loading to provide complete protection.

The fire protection engineer shall evaluate the need for a fire pump, given the anticipated height (4 stories) of the building. A Detector double check valve will be provided for the fire service. The building will be zoned for one zone per floor. A fire dept connection will be provided. A post indicator valve will be provided if required by WSU fire department.

5.0 ELECTRICAL SYSTEMS

The electrical design for the subject facility will include a state-of-the-art electrical system that meets the established campus standards. The system will provide interior and exterior lighting, power distribution systems, and a fire alarm system. All systems will be designed to provide the user with maximum flexibility, and all equipment that forms part of these systems will be selected for durability and maintenance ease. Efficient lighting will be chosen with controls that allow the owner to fine-tune the energy usage.

5.1 DEMOLITION AND MAKE READY

Existing utilities and electrical components on the site will be demolished. Any site power that is required to keep the campus operational during the construction of this building will be served from either an adjacent building or temporary power source. All demolition and make-ready work will be performed ahead of time to minimize the impact on the campus.

5.2 PRIMARY SERVICE

Primary electrical service at 13.8kV will be extended from the existing campus distribution system and routed in underground concrete-encased duct banks to serve a 4-way selector switch that will serve two outdoor pad-mounted liquid-filled transformers. One transformer will serve 480Y/277-volt loads and the other one shall serve 208Y/120-volt loads. Transformers will be located in an outdoor utility yard with containment for liquid per WSU requirements. An underground concrete-encased ductbank will be provided from the transformers to the dedicated 480Y/277-volt and 208Y/120-volt switchboards in the main electrical room.

5.3 NORMAL POWER DISTRIBUTION SYSTEM

The 480Y/277-volt switchboard will serve panelboards on each floor and on the roof that in turn will serve lighting, mechanical equipment, large plumbing equipment, elevators, and all 480-volt and 277-volt loads within the building.

The 208Y/120-volt switchboard will serve panelboards on each floor and on the roof that in turn will serve plug loads, telecom, small mechanical and plumbing loads, and all other 208-volt and 120-volt loads within the building. Power will be segregated between plug loads, lighting, mechanical, plumbing, telecom, and elevators as required by Washington State Energy Code.



Figure 5.1: Padmount Liquid Filled Transformer

5.3.1 SWITCHBOARDS AND PANELBOARDS

All switchboards and panelboards for the project will be provided with at least 25% extra spares and spaces for future circuit breakers. Within the electrical rooms themselves, ample space will be provided for future equipment expansion. The switchboard bus will be oversized to account for a proposed future solar PV system to be installed on the roof.

Panelboards and a complete branch circuit wiring system will be provided to serve plug loads, lighting, laboratory equipment, and other miscellaneous loads within the building. Panelboards will be located in the back of the house corridors and distributed throughout the floor to minimize branch circuit lengths. No panelboards will be provided in the public access corridors.

Dedicated panelboards will be provided for the lab spaces. Lab panels will not be shared with other areas (including offices, utility spaces, and common areas) in the building.

Dedicated panelboards will be provided for Building Distribution Frame (BDF) and Intermediate Distribution Frame (IDF) rooms to isolate the sensitive equipment in the room from outside electrical interference, simplify the installation and maintenance, and provide space for future growth.

Surge protection devices will be provided on the main switchboard, distribution boards, telecom panels, lab panels, and all panels serving computer and other non-linear loads.



Figure 5.2: Switchboard

5.3.2 PLUG LOADS

Hybrid electrical outlets that provide USB charging ports for mobile devices will be provided in open areas and lounges for additional convenience and user flexibility.

Dedicated special receptacles will be provided for lab equipment at accessible locations. Controlled receptacles will be provided as required by code.

5.3.3 AUXILIARY LOADS

Electrical power connections will be made to all mechanical equipment, domestic hot water heaters, pumps, elevator, etc., including all electrically associated devices such as disconnect switches, contactors, magnetic or manual starters, lock-out switches, etc., that are not furnished under the mechanical or plumbing sections.

Multiple dedicated receptacles will be provided in the IDF and BDF as required by Telecom. Isolation transformers will be provided as required by the Telecom and audio-visual design team to minimize interference and harmonics caused by other electrical loads.

5.4 EMERGENCY POWER DISTRIBUTION SYSTEM

A diesel-fired engine generator will be provided with a sub-base tank to serve back-up power to the emergency and standby loads. The sub-base tank will be sized to operate the buildings at 100%

of the emergency and standby loads for 24 hours continuously.

An underground concrete-encased ductbank will be provided from the generator to the main electrical room to serve automatic transfer switches and panelboards serving life safety and standby loads. Separate dedicated automatic transfer switches and panelboards will be provided for life safety and standby loads. Normal power to the automatic transfer switches will be provided from the main switchboard and emergency power will be provided by circuit breakers in the generator. Life safety automatic transfer switch and panelboard will be provided in a separate emergency electrical room as required by NFPA 110.

Generator will be provided with a spare circuit breaker for load bank connection. Generator will be provided with emission reduction means to minimize particular matter and fuel emissions.



Figure 5.3: Diesel Generator with sub base tank

5.5 SOLAR PV DESIGN

A solar photovoltaic (PV) system will be provided on the roof consisting of efficient photovoltaic panels, string inverters, combiner boxes, and DC panels. The solar PV system will be interconnected with the building's electrical system and connected to the main switchboard. The most optimal solar panel placement will be identified, and the location will be selected to maximize roof space and achieve the maximum possible power generation.

5.6 LIGHTING

Light fixtures and systems will be selected for efficiency, durability, ease of maintenance, and to accentuate area architecture.

Indoor lighting will be tailored to the building's needs and theme. All interior light fixtures will be dimmable with LED source and a minimum efficacy of 100 lumens per watt. All LED sources will have a minimum of 80 CRI and maximum of 3 MacAdam Ellipse binning to achieve consistent fixture-to-fixture color.

Uniform and low glare lighting design will be achieved by using direct and indirect light source at laboratory and classrooms. Vertical illumination will be provided on presentation and whiteboard walls by additional asymmetric optic light fixtures.



Figure 5.4: Light Fixtures

Average and minimum maintained illumination level at work surface will be per IES standard, as shown in the following table.

Space Types	Minimum Average Foot Candles
Laboratories	50-100 fc at work plane
Classroom and Lecture Hall	40-50 fc at work plane
Corridors	20 fc at ground level
Stairs	10 fc* minimum at ground level
Office and Meeting Rooms	35-45 fc at work plane Additional task light will be provided as required per design
Restrooms	15 fc at ground level
Lounge and Break Rooms	25-30 fc

Lighting controls will give users flexible control of light levels and harvest daylight savings. Occupancy controls will be provided to maximize energy savings in intermittently occupied spaces.

All interior and exterior lighting will be UL/ETL listed and DLC premium rated to achieve maximum efficacy. All light fixtures will have a minimum 5-year warranty and 50,000 hours LED life.

5.6.1 SKYLIGHTS AND SOLATUBES

Evaluate the life cycle cost of providing skylights and Solatubes in common areas and corridors to maximize the use of daylighting. Provide appropriate daylighting controls to minimize energy consumption.

5.7 LIGHTING CONTROLS

Lighting will be controlled by an advanced networked lighting control system that enables user configurability and achieves energy savings via a combination of time-based, daylight-based, sensor-based, and manual lighting control schemes. The system will be modular, allowing control devices to be easily added or removed for future programming needs. The lighting control head end will be capable of controlling and monitoring any space in a cluster by area or zone and by set schedules/presets. The lighting control system will be addressable through software residing on a dedicated head-end server, which will allow integration with the campus energy management system.

Continuous dimming controls will be provided in spaces to reduce energy consumption while increasing user lighting options and system flexibility. Automatic sensor-based motion-detection controls will be provided with dual technology consisting of Passive Infrared (PIR) and acoustics.

5.8 METERING

An electrical meter will be provided for the service entrance switchboards. Sub meters will also be provided and will be segregated at the panel level as follows:

- HVAC
- IDF/Telecom
- Process/Plug Loads
- Domestic Water
- Lighting
- Elevator

Comprehensive power, energy, and demand measurements will be collected and integrated with the campus remote monitoring system. The energy monitoring system will have the ability to interface with a dashboard at the building.

5.9 FIRE ALARM

A manual, fully-addressable fire alarm system will be provided for the facility conforming to current International Building, Fire, and NFPA 72 Codes. New initiating devices including manual pull stations and duct detectors will be installed per current codes. New indicating devices will be distributed and installed throughout the proposed buildings per current codes. The new fire alarm system will be a JCI Simplex system consistent with campus standards.



Figure 5.5: Fire Alarm Devices

6.0 TECHNOLOGY

The telecommunications system for the subject facility will be composed of a state-of-the-art infrastructure designed to support voice, data, wireless communications, security, and audiovisual systems that meet established campus standards. It will be designed according to existing IT/AV/Security Master Plan documents and standards, ANSI/TIA 568D Series and 569C standards, BICSI methodologies, and industry best practices. The design shall be centered around continuing to extend the manufacturer's 25-year warranty for the WSU campus, which includes maintaining the existing standard cabling solution.

A certified representative shall install the telecommunications infrastructure, with material and labor covered under existing campus extended warranties for compliance with Washington State University Pullman Life & Physical Sciences project standards. The cables shall be installed by a certified contractor and be provided with a 30-year product warranty. (Washington State University Pullman Life & Physical Sciences standards include Cable MFG, enhanced Cat 6A cable, and connectivity).

6.1 DEMOLITION AND MAKE READY

The Telecom Room in Heald Hall serves other buildings on campus. After demolition of Heald Hall, all telecom wires associated with the other buildings will be re-routed to the BDF in the proposed building. Coordination will be necessary to ensure that no unplanned communications outage is experienced for any building on campus. All demolition and make-ready work will be performed ahead of time to minimize the impact on the campus.

6.2 TELECOMMUNICATIONS

6.2.1 INTRA-BUILDING SPACES

The new building will have dedicated telecommunications rooms on each floor. The main telecom room, referred to as the BDF, will be located on the ground floor. The BDF will serve as the connection point from the building to the existing campus backbone. Both the BDF and IDF telecom rooms will support the distribution of horizontal communications cabling and the associated work area outlets for voice/data services. The BDF/IDF are strategically located and shall have no cable of more than 260 linear feet. The BDF and the IDF rooms will house the cable

terminations and equipment to support voice, data, wireless communications, security, and video services as required by the University.

The BDF and the IDF of Building M are similar in size to each other: the BDF will be a minimum of 10 by 15 feet, and the IDF will be a minimum of 10 by 12 feet.

The BDF and the IDF rooms will be connected with a minimum of four 4-inch conduits for distribution of optical fiber and copper riser backbone cables. Ceilings in the BDF/IDF will be open to the deck above, doors shall be a minimum 36 inches wide by 7 feet high, and flooring will be sealed concrete or anti-static flooring with no water sources in the room such as sinks, water heaters or plumbing systems.

There is a limitation on the maximum number of cables that can be installed in the conduit and cable tray due to the large outside diameter of the Category 6A CMP (OD = .250IN). 4-inch conduits and sleeves shall not have more than 120 cables installed, and the 12-inch by 6-inch cable basket-tray shall not have more than 650 cables installed.

The BDF and IDFs will be provided with an electrical panel dedicated for service in the BDF/IDF. Each equipment rack will include dedicated power outlets and a dedicated modular UPS and horizontal power strip. Convenience outlets will be located around the room's perimeter for maintenance in support of telecom equipment. The rack-mounted UPS will include 30–45-minute battery backup with capacity to support 2 times the "day one" planned capacity.

The BDF and IDF rooms will be provided with a 24/7 controlled environment that is separate from the building's HVAC system. Equipment in the telecom rooms will be rack-mounted on equipment racks with double-sided vertical wire managers, 48 port modular jack angled patch panels, and University-provided network equipment.

Grounding and bonding will comply with National Electrical Code, ANSI/TIA 607D & ANSI/BICSI-N3-2020 for the design.

6.2.2 INTRA-BUILDING PATHWAYS

The structure will utilize a support system of wire basket cable tray, wire hangers, pullbox, and conduit above ceilings to distribute the horizontal station cables from the telecom rooms to the voice/data outlets. Pathways will be designed to meet the required fill factor for cable tray, conduits, sleeves, pull-boxes, etc.

6.2.3 HORIZONTAL CABLING

Horizontal, Category 6A, 4 pair, plenum-rated (CMP), copper (Blue) station cables will be installed from each outlet jack (WAO) to either the BDF or one of the facilities IDF room(s)/ enclosure(s). Additional outlets will be provided as necessary for miscellaneous requirements, as noted below. A voice or data outlet will be provided adjacent to the equipment location for each of the following:

- Fax machines
- Fire alarm control panel
- Energy management control system cabinet
- Printers

6.2.4 WIRELESS COMMUNICATIONS

Data outlets will be included to provide wireless access points that provide wireless coverage throughout the building. Wireless access point outlets will be provided with two Cat 6A data jacks terminated on a modular 2-port box within the ceiling space. The design-build team will complete predictive wireless heat mapping to confirm coverage throughout the building. Wireless access point devices will be provided and installed by the Contractor. Predictive heat-mapping is included and shall be the basis for WAP placement. The contractor shall provide modeling of finished wireless access solution.

6.2.5 INTRA-BUILDING BACKBONE CABLING

Backbone cabling between the BDF/MDF and each IDF will include multi-pair copper and optical fiber.

6.2.6 INTER-BUILDING BACKBONE CABLING

IT services will extend from the BDF/IDF in the proposed building through underground conduit ductbank and manholes to the existing campus IT infrastructure. Copper and fiber optic cables
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will be routed in underground conduits to connect to the existing campus infrastructure.

6.3 AUDIO VISUAL SYSTEMS

Audio-visual (A/V) systems infrastructure and equipment will be installed to support the functions of the Washington State University (WSU) Pullman Life & Physical Sciences room types. The design-build contractor will install A/V infrastructure and projection screens. A/V infrastructure will be provided in all classrooms, conference rooms, laboratories, lobbies, and large gathering spaces.

6.4 SECURITY SYSTEM

The design of the video surveillance system will match the existing (WSU) campus-wide IP-based surveillance system and cameras. IP camera locations will be connected via Cat 6A cable to patch panels located in the BDF/IDF rooms.

It is anticipated that cameras will be located to capture:

- Views of the perimeter of the building and adjacent walkways at a level of detail sufficient to provide a basic description of an individual.
- Views of building entryways at a level of detail sufficient to allow for facial recognition.
- Views of passageways from public to private portions of the interior of the building at a level of detail sufficient to provide facial recognition.

The physical access control system will match the existing (WSU) campus standard with access-control locksets at the required locations, including but not limited to:

- Main exterior door locations
- Telecom equipment rooms
- Computer labs
- Office suites
- Offices containing high-value or sensitive materials

Access control system power supplies and any other related equipment will be wall-mounted within the BDF/IDF rooms.

The Intrusion Detection System will match the existing **(WSU)**

campus standard. Intrusion detection components such as motion detectors and/or door or window position sensors shall be utilized where required, for example in high-value classrooms/ laboratories where there are alternative means of entry into the space other than an access-controlled door such as ground-level windows and roof hatches.

Duress/panic buttons will be a component of the intrusion detection system and shall be provided at:

- All cash handling areas
- All offices associated with disciplinary functions
- All executive office suites

Emergency call stations will be installed at key locations adjacent to the building. The phone will be connected via dedicated outside plant Cat 6A cabling to the nearest BDF/IDF room within the building.



Gensler

SECTION 07.

APPENDIX

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Discussion	Action / Decisions Pending / Follow up
<p>of focus can be accomplished.</p> <p>Tours of buildings on campus such as the Veterinary Biomedical Research Building as the most recently completed research facility on campus.</p> <p>Looking for Gensler's expertise and opportunities to learn from the A/E team.</p> <p>Perhaps engage not only faculty but post-docs through an open house, focus group, or survey.</p>	

Meeting Notes

Project	WSU Life and Physical Sciences - Pre-Design	Project Number	1571-2021
Meeting Location	Smith CUE 518	Meeting Date and/or Time	11/09/2021
<input type="checkbox"/> Via Telephone			
Meeting Subject	Visioning & Kickoff Meeting	Meeting Number	002
		File	1MN
		This is page	1 of 5

Present
 Joann L Thomas / WSU Project Manager
 Jason Baerlocher / WSU Project Manager

Todd Butler/ WSU Dean of College of Arts and Sciences
 Courtney Meehan / WSU Associate Dean for Research and Graduate Education
 Wade Lafferty / WSU CAS Director of Operations and IT
 Trent Amonett / WSU Operations Coordinator
 Laura Child / WAS Senior Director of Development
 Pat Carter / WSU Chair, School of Biological Sciences (SBS)
 Wes Dowd / WSU Associate Professor, SBS (Marine Environmental Animal Physiology)
 Kirk Peterson / WSU Chair, Department of Chemistry
 Brian Clowers / WSU Associate Professor, Chemistry (Analytical Chemistry)
 Squeak Meisel / WSU Chair, Department of Fine Arts

Kristin Jensen / Gensler Managing Principal
 Jim Cox / Gensler Senior Lab Planner
 Donna Barry / Gensler Design Director
 Francesly Sierra / Gensler Project Manager

Distribution cc:

Prepared by Francesly Sierra **Date Issued** 11/12/2021

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Discussion	Action / Decisions Pending / Follow up
<p>Introductions</p> <p>The goal of the visioning kick-off is to gather information on the goals and purpose of the project in development of a framework for the creation of a program and site selection for the new pullman life & physical sciences building.</p> <p>This process is part of the bigger piece of the pie. This will be a state funded building. We are funded through pre-design. This whole process will be part of the Gensler report to the state and informs the universities asks. The state is moving to a design-build process. Over the course of this project, we can consider if this is the correct approach and whether it is a 3-biennium process or a 2-biennium process. Deliverables are an OFM submission and then a pre-design report.</p> <p>Future Trends:</p> <ul style="list-style-type: none"> • Communities of Collaborators • Dynamic Developments • Shared Resources 	<p>For Information</p> <p>For Information</p>

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Meeting Notes continued

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Discussion	Action / Decisions Pending / Follow up
<p>Automation</p> <ul style="list-style-type: none"> • The Rise of the In-Between Space • Institution-Industry • Authentic Connections • Science in the Spotlight • The Future Labs • Agile Infrastructure • Sustainable Strategies <p>What is the purpose of this project? Why now?</p> <ul style="list-style-type: none"> • Retaining existing skilled researchers • Modern labs for recruitment of new talent • Fail safe point for Biology Research. Unit can no longer function within the older facilities. The same can be said about the Chemistry unit. • Its more costly to renovate the existing Heald Hall. Safety issues and building systems are at the end of life. • First step in the long-term capital master plan. Use this project to facilitate future projects. • To renovate Fulmer Hall, units must be moved out. • For the researchers having an interim space is not ideal. The ideal scenario is to move them once. • Building needs to be responsive to how science is done 10 – 15 years in the future and accommodate unforeseen methodologies. This is a 40 old building that will outlast most of the researchers. • Chemistry and Biology FTEs earn large amount of tuition and grant dollars. <p>How would this project transform your research?</p> <ul style="list-style-type: none"> • Project would break down barriers for research. • Research would go quicker. • In Heald we make lemonade out of lemons. If we had a new building, we could make "craft cocktails". • A lot of time is wasted on upkeeping the building maintenance. • Not an efficient use of the funds that we are given. • If we had new space - we would have more grant money flowing in. • When we have new faculty - they end up spending start-up money in costly renovation in lieu of using it to buy instrumentation. • We want to show how there a different way of doing work. • A new building would help us attract the best and brightest. <p>What are some of the guiding principles?</p> <ul style="list-style-type: none"> • Integrated research and learning. • Retrain and recruit the best talent and students. • Visual Interaction. • Move research units once, ideally. <p>How do you work currently? At what levels do you collaborate; researchers, graduate students, or individually?</p> <ul style="list-style-type: none"> • Chemistry research is a collection of islands, but we are not internally collaborative. When we add a new hire, we are looking for an additional expertise. It's not a team of chemical biologist. In Chemistry we have various sub-sets. We don't see chemistry 	<p>For Information</p> <p>For Information</p> <p>For Information</p>

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Discussion	Action / Decisions Pending / Follow up
<p>publishing together. We don't have duplication in specialties. We don't have a lot of time to do the spontaneous interaction.</p> <ul style="list-style-type: none"> Biology research is highly collaborative. Especially in the plant physiologist, animal physiology, and environmentalist units – Collaboration is part of our core master plan. <p>Peer benchmarking?</p> <ul style="list-style-type: none"> Who do you compare yourself too? <ul style="list-style-type: none"> Oregon State - Benchmark UW - Aspirational Colorado State - Benchmark Wisconsin - Aspirational Kansas State - Benchmark Who is WSU competing against? <ul style="list-style-type: none"> UC Davis Iowa Arizona State UC Berkely Why do we lose researchers? <ul style="list-style-type: none"> Pay Facilities Cultural Climate <p>What are your hopes and fears?</p> <ul style="list-style-type: none"> Future Investments New Building that is active and full people. A place where they want to go and be. Revitalization of school of biological sciences. We have lost of faculty, and more is retiring in 5 years. Bring SBS from the demographic pothole. Student engagement. Flexibility to grow and shrink. Administration support from above the college level - greatest hope and fear if there is a change in momentum. Biggest worry that is becomes a one off - hunger games type project. It destructive to the program and people careers. Its vitalizing to have students want to hang out in the building. <p>Research vs Teaching Spaces?</p> <ul style="list-style-type: none"> Both Chemistry and Biology teach in 2 forms. Teaching Labs and Lectures. It was hard during the pandemic to teach in a virtual format. Move towards more interactive lectures. Do you think the remote learning will continue? Performance is down across the college during the virtual portion of the pandemic. We have group projects for discussion during the lecture. The stadium seating does not work for those activities. We would like to break down foundational courses into smaller 50 student classes in lieu of the 200 seat classes. Why would we give up 2000 sf for a large 200 seat GUE lecture hall? Teaching labs are the priority over large lecture halls. 	<p>For Information</p> <p>For Information</p> <p>For Information</p>

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Discussion	Action / Decisions Pending / Follow up
<p>Discussion</p> <ul style="list-style-type: none"> How do you want to teach? – A maximum of 50 – 100 seat classrooms would work best. You empower the undergrad to schedule the breakout sessions instead. Hope teaching labs evolve into a maker space type model where its more adaptable for different types of experiments. If Heald goes down - there will be 2 years before we have another lecture hall replacement. Can we not put teaching labs in this building? Research needs are greater. The renovations of Eastlick and Abelson will most likely satisfy the teaching space program needs. Research space is teaching space. UG's and G's must work in the labs as a requirement. What program do we want to have on the ground floor? Fine art has an active 1st floor with exhibits and a general use classroom. <p>Site Analysis</p> <ul style="list-style-type: none"> Director of our herbarium vision of bringing sciences up into humanities. Get all the museums in one location. Where you start with fine arts and move towards the bug and herb museum. Can this be building be like the fine arts red cube. Creating an anchor point on campus. Heald Hall – Currently has 12 PIs which can move into Eastlick & Abelson to empty the building. Separate renovation funds will pay to accommodate the move of the herbarium and the remaining 12 PIs. Any utilities we need to bring to the site is part of the budget. Challenge with developing a plot that has existing at grade parking is the expense to purchase and rent each stall (\$13,000) and how to possibly replace them. 4 teaching labs in Heald will be able to move into Eastlick and Abelson. WSU is planning to move 1 of the 4 this biennium. Potential development sites: <ul style="list-style-type: none"> Over the patio of Eastlink - There is a Vivarium Below It. Green Space Behind Abelson Parking Lot - Master Plan Site B Existing site of Heald Hall <p>Programming:</p> <ul style="list-style-type: none"> Biology- SBS <ul style="list-style-type: none"> Plant Physiology Animal Physiology Genetics and Evolution Disease Ecology - BSL2 Genomics New Hires Chemistry - Organic and In Organic <ul style="list-style-type: none"> 2 People from Fulmer and New Hires Jeff Bell - Analytical Brian C. - Analytical New Hires Biology requires animal and plant housing space separate from the labs. Average of grads students - 4 per PI currently, plan for 5-6 grads to 	<p>For Information</p> <p>For Information</p>

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Discussion	Action / Decisions Pending / Follow up
accommodate growth. <ul style="list-style-type: none"> What are your office size standards? <ul style="list-style-type: none"> 120 sf - PI 60 sf - Grad 	
Other: <ul style="list-style-type: none"> Pullman Integrated Sciences Fund - \$60K Donation to Start - Projected 2027 Occupancy - 5 Years Out 	For Information
Action Items: <ul style="list-style-type: none"> Wade to send document of FTE data points - Completed What is the culture or traditions of this building? - Gensler to send as part of questionnaire Daggy Hall is part of the Engineering Masterplan and there are competing visions - Gensler to request Inventory Space Plans - Gensler to request - Completed 	Gensler / WSU

Meeting Notes continued

Project WSU Life and Physical Sciences - Pre-Design **Project Number** 1571-2021

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Discussion	Action / Decisions Pending / Follow up
<ul style="list-style-type: none"> This site would require the parking spots are purchased for approx. \$1.2 million if 120 spots are removed. Utility tunnel would need be extended to bring services to the site. Would fragment SBS and Chemistry. Site Option 4 – Demo Heald and Build on Top of Eastlick Patio and Renovate Eastlink <ul style="list-style-type: none"> This is not a viable option. There are too many negatives associated. Sites 1 & 2 are the only acceptable options the team can proceed with. The goal is to free up enough space to fully vacate another building and pull another Heald. For example, vacate one of the Fulmer buildings and then demo and replace. 	
<p>Programming:</p> <ul style="list-style-type: none"> Benchmarking of spaces – the average PI from other competing institutions is 1,450 net assignable sq ft for Lab/Lab Support/PI. PI Offices are 120 NASF Post Doc Offices are 60 NASF and shared spaces. Grad Students are 30 NASF and shared spaces. Collaboration spaces are 10 – 15% of NASF Net: Gross Ratio = 55 – 60% Efficiency Modular Planning = 11 x 33' = 363 ASF 	For Information
<p>Benchmarking Virtual Tour:</p> <ul style="list-style-type: none"> Rutgers – Chemistry and Chemistry Biology Building University of Illinois at Chicago – ACT Building University of Atlanta – CCIS Building Sandford University – Biology Building University of Wisconsin-Madison – Biochemical Sciences Complex The goal is to find the right ratio for PI/Grad/Support/Lab. The density of hood space is a driver for cost and program. 	For Information
<p>Strawman Program:</p> <ul style="list-style-type: none"> Make sure to account for the teaching component in the program. From a fume hood density perspective, we need low to medium intensity for SBS and Chemistry. SBS has both low and medium density uses. Chemistry has a low-density use. We can design in future capacity for mechanical equipment. Vibration is not a concern. Fulmer has the space already allocated for any vibration sensitive equipment which is 4000 mimps. Abelson currently has a microscopy center that functions for the whole campus. 	For Information

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Project WSU Life and Physical Sciences - Pre-Design **Project Number** 1571-2021

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Discussion	Action / Decisions Pending / Follow up
<p>Project Parameters:</p> <ul style="list-style-type: none"> We need to determine the module at 10 years, 20, and future. We need to understand the flavor of research. BSL Level. Modules for Lab/Lab Support, Shared Space, Animal Space Types. Identify the need and which project(s) will support the masterplan and sequence of projects. How many and type of teaching labs. Primarily a research building with a teaching component. <p>Budget & Cost:</p> <ul style="list-style-type: none"> If we fundraise 30M, how does that get folded into the project. Based on a rough ROM of just design-build cost –we are looking at a possible gross sq ft cost of \$1000 if construction occurred in 2025. <p>Action Items:</p> <ul style="list-style-type: none"> Gensler to send Joanie a request for GIS access. – Completed Gensler will confirm the ROM breakdown of total project cost with their estimator. – In Progress Gensler to discuss project parameters with WSU Facilities Services and Core stakeholders. Gensler to provide potential cost loading to the program spreadsheet as it is developed. Gensler to share the strawman program for review and comment. - Completed 	<p>For Information</p> <p>Gensler / WSU</p>

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Meeting Notes

Project	WSU Life and Physical Sciences - Pre-Design	Project Number	1571-2021
Meeting Location	Zoom Invite	Meeting Date and/or Time	12/09/2021
<input checked="" type="checkbox"/> Via Telephone			
Meeting Subject	Masterplan Update Discussion with Facilities and Core Leadership	Meeting Number	004
		File	1MN
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Present	Joann L Thomas / WSU Project Manager Jason Baerlocher / WSU Project Manager Olivia Yang / WSU AVP for Facilities Services Joe Kline / WSU AVP Capitol Projects Todd Butler/ WSU Dean of College of Arts and Sciences Wade Lafferty / WSU CAS Director of Operations and IT Don Hulst / WSU Director, Facility Information Resource Mgt. Jim Cox / Gensler Senior Lab Planner Donna Barry / Gensler Design Director Francesly Sierra / Gensler Project Manager		
Distribution	cc:Kristin Jensen / Gensler Principal in Charge		
Prepared by	Francesly Sierra	Date Issued	12/13/2021

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Discussion	Action / Decisions Pending / Follow up
<p>WSU Facilities Background:</p> <ul style="list-style-type: none"> WSU has a deferred maintenance backlog of approximate 1.6B. To address this WSU would like to invest 70M per year but currently are only investing about 22M per year. WSU notes they do currently have a lot of space but not efficiently used. The intent with the Pullman Sciences Pre-design is to plan for a new science building within the larger context of an update to the CAS Masterplan. The goal is to find out where this project falls as a domino in a series of projects. WSU would like Gensler, within the scope of this study, to create a roadmap to phase the investment of potential new and renovated buildings within the Science Corridor. Heald, Abelson, Fulmer, Eastlick. The team can even look at some buildings that are not currently assigned within the Masterplan. The thinking is to do a first phase investment in Eastlick, then Heald comes down, then build something new either behind Abelson or on 	For Information

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Meeting Notes continued

Project	WSU Life and Physical Sciences - Pre-Design	Project Number	1571-2021
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Discussion	the vacated Heald site. WSU would like Gensler to help identify the pre and post projects that need to occur to accommodate the demolition of Heald in the bigger picture with ROMs. No need to get into granular details such as relocating the IT closets for the proposed phased projects.		
	<ul style="list-style-type: none"> WSU (Todd) indicated there is a major donor who wants to see how the Masterplan for the phasing of sciences is proposed. Building will the cornerstone and catalyst for future development along the science corridor. The final work product is still for Gensler to deliver the Pre-Design / OFM. 		
Future Predictions:	<ul style="list-style-type: none"> WSU (Olivia) wants to know what the size of each science department will be in 10-15 years. How do you want each collage to grow? Number of PI's each research area wants to accommodate? WSU would like each Collage to determine if buildings should be organized by department or by type? Existing floor plans in Heald, Eastlick, Abelson and others are cobbled together. WSU would like to see more clarity in the module. WSU (Joe) The process is about getting out those fat pencil sketches of what Eastlick or Abelson could be. What if we put all of chemistry in Abelson? What if we could reconfigure Eastlick and Abelson to accommodate flexible space for the future? WSU (Joe) But we also must submit a proposed building to OFM. Before we figure out what program is determined for the new building. Then let's look at what functions go best into Eastlick, Abelson, and what layout and module can be accommodated. WSU (Joe) hopes to be funded based on the argument to the state for our follow-through of the sciences masterplan with some flexibility to adjust as various proposed projects within this study are funded. 		
Masterplan Principles:	<ol style="list-style-type: none"> Rationalize the new building space. Conceptual clarity. Intellectual coherence <ol style="list-style-type: none"> For example: There is a group within the School of Environment – that are not planned for the new Heald replacement. They are a wild-life ecology group with new PI's. They will need to be moved to a location where they can maintain their network /collaboration. Important for early career researchers. Can we identify the groups that need to work together? 		
	For Information		
	For Information		

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Discussion

Action / Decisions Pending / Follow up

Data Collection:

- Gensler received a copy of the CAS Space Inventory Spreadsheet. Gensler would like to know which PI or Faculty is assigned to each of the spaces listed. Are there individually assigned spaces, versus shared spaces?
- Gensler will update the spreadsheet and provide columns to identify requested data points such as, identifying how many post-doc, grad, or undergrad students are currently assigned per PI. This spreadsheet will be sent to WSU (Don Hulst) and WSU (Wade Lafferty) to compile data.
- Gensler can then conduct an analysis of existing space types.
- Gensler will also request future needs/wants by each department or group. Compare this information against the functionality of existing space and conduct a gap analysis, using benchmarking and best practice design standards, to determine how much additional new space is required.
- Gensler also recommends WSU (Todd) push the current stakeholders to think beyond “replacement mode” and into the future where they conduct science within modern day laboratory space.
- WSU (Olivia) Indicated thinking about possible renovation projects within a Mini-Majors project type funding framework.
- WSU (Olivia) noted projects under 10M (Mini’s) do not require a pre-design report be submitted first. Therefore, as a possible scenario, WSU could improve the space in Eastlick to move those out of Heald. Then proceed to Demo Heald and prep the site within that cost range.
- WSU (Joe) plans to use this pre-design for funding asks to the state for multiple projects. Estimator can provide ROM based on benchmarking.

For Information

The Science Corridor:

- WSU’s masterplan indicated the idea of a “science corridor”. Gensler asked for clarification of the “science corridor” boundary. Can we look at buildings on both sides of the street?
- How does knowledge carry from 18 undergraduate programs to the flow of professional research?

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Discussion

Action / Decisions Pending / Follow up

- Gensler requested copies of the R-sheets and R-Detailed sheets for all the science buildings and buildings that make up the “science corridor”.
- WSU (Todd) indicated that anything south of the avenue can blur potential, but with respect to the programs that are already located within those buildings.
- WSU (Todd) noted that proposed site #4 is currently seen as a student service building for engineering, but perhaps it has a shared function with CAS?
- WSU (Joe) indicated we do not want to spend a lot of time on the life-cycle cost. This is just a requirement we need to fill for the OFM.
- WSU (Joe) to address the needs of potential donors. WSU would like Gensler to help the college capture a list of needs or wants and WSU prioritize this list (ranked from most to least).

Action Items:

- Gensler to provide updated CAS spreadsheet with data points requested to WSU. - Completed
- WSU to provide requested R-sheet floor plans and R-detailed floor plan sheets by organization and by function. WSU noted this will be completed by Dec 24th.
- Gensler to plan the next 6-8 weeks to address master-planning update efforts starting in January of 2022. Efforts will include:
 - Gap analysis of future needs and existing conditions
 - Adjacency diagrams and planning
 - Phasing and sequence of proposed projects
 - List of priorities
 - Providing dates and times for workshops.
- Gensler to confirm if the workshop on Dec. 17th should be postponed. - Confirmed & Completed

Gensler / WSU

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Meeting Notes

Project	WSU Life and Physical Sciences - Pre-Design	Project Number	1571-2021
Meeting Location	Zoom Meeting	Meeting Date and/or Time	01/18/2022 - 10AM - 1PM
<input checked="" type="checkbox"/> Via Telephone			
Meeting Subject	Workshop #2	Meeting Number	005
		File	1MN
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Present	Joann L Thomas / WSU Project Manager Olivia Yang / WSU Project Manager Todd Butler/ WSU Dean of College of Arts and Sciences Courtney Meehan / WSU Associate Dean for Research and Graduate Education Wade Lafferty / WSU CAS Director of Operations and IT Trent Amonett / WSU Operations Coordinator Laura Child / WAS Senior Director of Development Pat Carter / WSU Chair, School of Biological Sciences (SBS) Wes Dowd / WSU Associate Professor, SBS (Marine Environmental Animal Physiology) Kirk Peterson / WSU Chair, Department of Chemistry Brian Clowers / WSU Associate Professor, Chemistry (Analytical Chemistry) Squeak Meisel / WSU Chair, Department of Fine Arts Jim Cox / Gensler Senior Lab Planner Donna Barry / Gensler Design Director EJ Deasis / Gensler Designer Francesly Sierra / Gensler Project Manager		
Distribution	cc:		
Prepared by	Francesly Sierra	Date Issued	01/19/2022

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Discussion	Action / Decisions Pending / Follow up
<p>Workshop Goals:</p> <p>The goal of this workshop is to help gather data to best inform the following questions:</p> <ul style="list-style-type: none"> Identify the need and which project(s) will support the masterplan and sequence of projects. (Which buildings are we planning to decant?) Where are we decanting Heald? and how big does a new building need to be? How much will it cost? How much will the state support and how much needs to be funded privately? <p>Programming & Analysis:</p> <ul style="list-style-type: none"> Gensler presented a series of infographics depicting the information received from WSU on space allocation per PIs and Instructional Faculty for SBS and Chemistry. We did not received data on SOE or Physics/Astronomy. The following feedback was received: 	<p>For Information</p> <p>For Information</p>

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Project	WSU Life and Physical Sciences - Pre-Design	Project Number	1571-2021
Meeting Date	01/18/2022 - 10AM - 1PM	This is page	2 of 3
Discussion	<ul style="list-style-type: none"> Heald Hall <ul style="list-style-type: none"> School of Environments has space assigned on the top 2 floors. Teaching portion in graph distribution looks low. Special research allocation shown is part of research labs but can be shown separately. Ground level has the Herbarium Morrill Hall <ul style="list-style-type: none"> SBS has the human anatomy lab in this building. Fulmer Hall <ul style="list-style-type: none"> Any spaces called out as Prov Admin in the space floor plans are general use classrooms. <p>Benchmarking</p> <ul style="list-style-type: none"> Gensler presented benchmarking existing space allocation for PIs against peer institutions. Discussion noted the following: <ul style="list-style-type: none"> The PI module agreed upon should be a continued irradiative process to find what is reasonable. When we look at peer institutions the existing space allocation is within the average targets, but we know the existing space is not efficient. The list of peers noted are reasonable. Additional peers will most likely not move the needle too far. Cost budget and basis should be further discussed with facilities. <p>Sciences Corridor (Master planning)</p> <ul style="list-style-type: none"> Efforts for sequence of projects should look at it from not just a new building perspective but also from a renovation perspective. Perhaps the ask to the state is 2-3 projects combined? We would like to get a better understanding of the available instructional space – teaching labs and general use classrooms. The current planning is to move all the teaching labs from Heald into Eastlick – information to be confirmed with Wade. If classroom space is proposed as part of the project, based on the current cost assumptions we will need additional funding. Their may need to be a better understanding of the funding allocation from facilities. Classroom space has less stringent MEP demands and would be better suited for older buildings. Accumulative research lab space available is approximately 110,000 ASF. It would be helpful to see the accumulative space available for teach labs/support and general use classrooms. Approximately 220,000 ASF is available across the “sciences” buildings. <p>PI Site Plan & Future Growth</p> <ul style="list-style-type: none"> Assume that a specific PI belongs to the building where their lab is located and not their offices. There are 6 PIs for SOE in addition to the 15 PIs shown on the site plan for Heald Hall. SBS has a total of 22 PIs and would like to have a total of 28 PIs in the future to best support the program. Chemistry has a total of 17 PIS and would like to have a total of 26 PIs in the future to best support the program. 		
Action / Decisions Pending / Follow up	<p>For Information</p> <p>For Information</p>		

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Meeting Notes continued

Project	WSU Life and Physical Sciences - Pre-Design	Project Number	1571-2021
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Meeting Date	01/18/2022 - 10AM - 1PM	This is page	3 of 3
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Discussion	Action / Decisions Pending / Follow up
<ul style="list-style-type: none"> • Considers a staged need to accommodate future growth. • Review NBBJ report for information on proposed projects and general use classrooms. • Spring break is a good time to visit the campus and review any existing buildings. • Goal is to sequence projects to move research modules once. <p>Action Items:</p> <ul style="list-style-type: none"> • Gensler to reach out to Wade to map out all the existing program currently still in Heald and what is currently planned to move out. • Gensler to reach out to Wade for further space allocation data on physics and SOE. • Gensler to distribute presentation slides from workshop #2 • Gensler to meet with facilities for further discussions on master planning effort of the pre-design. 	<p>Gensler / WSU</p>

Meeting Notes

Project	WSU Life and Physical Sciences - Pre-Design	Project Number	1571-2021
Meeting Location	Zoom Meeting	Meeting Date and/or Time	02/01/2022 - 10AM - 12PM
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Meeting Subject	Workshop #3	Meeting Number	006
		File	1MN
		This is page	1 of 3

Present

Joann L Thomas / WSU Project Manager
 Olivia Yang / WSU Project Manager

Todd Butler/ WSU Dean of College of Arts and Sciences
 Courtney Meehan / WSU Associate Dean for Research and Graduate Education
 Wade Lafferty / WSU CAS Director of Operations and IT
 Trent Amonett / WSU Operations Coordinator
 Laura Child / WAS Senior Director of Development
 Pat Carter / WSU Chair, School of Biological Sciences (SBS)
 Wes Dowd / WSU Associate Professor, SBS (Marine Environmental Animal Physiology)
 Kirk Peterson / WSU Chair, Department of Chemistry
 Brian Clowers / WSU Associate Professor, Chemistry (Analytical Chemistry)
 Squeak Meisel / WSU Chair, Department of Fine Arts

Jim Cox / Gensler Senior Lab Planner
 Donna Barry / Gensler Design Director
 EJ Deasis / Gensler Designer
 Francesly Sierra / Gensler Project Manager

Distribution cc:

Prepared by Francesly Sierra **Date Issued** 01/19/2022

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Discussion	Action / Decisions Pending / Follow up
<p>Workshop Goals:</p> <p>The goal of this workshop is to help gather data to best inform the following questions:</p> <ul style="list-style-type: none"> Identify the need and which project(s) will support the masterplan and sequence of projects. (Which buildings are we planning to decant?) <p>Roadmap:</p> <p>Gensler presented a series of infographics depicting the information received from WSU and understanding the roadblocks and challenges to examine the entirety of CAS Sciences space allocation and needs – including a decision matrix. The following feedback was presented:</p> <ul style="list-style-type: none"> The need to sequence a series of project to make this project work. We demand multiple entry points. WSU generally does not have readily available swing space. Which is a challenge. 	<p>For Information</p> <p>For Information</p>

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Meeting Notes continued

Project	WSU Life and Physical Sciences - Pre-Design	Project Number	1571-2021
Meeting Date	02/01/2022 - 10AM - 12PM	This is page	2 of 3

Discussion	Action / Decisions Pending / Follow up
<ul style="list-style-type: none"> This circles back to exam the larger ecosystem that is driving research and teaching. What is the PI average based on the existing 39 PI? - Pat – This was based on the space allocation spread sheet provided for existing. What is the timing of the temporary move? - Wes – Duration’s impact research program. We are looking at 2–4-year timeframe based on the funding cycles. This comes back to how many PIs can fit into the new building for each funding cycle. Perhaps there are PIs that can move every 2 years? The visual/decision tree is nice and lays out the scope of the problem – Brian So where do the activities in Fulmer Annex and Fulmer Syn go for a couple of years while Bldg 3 is being built? – Craig When showing the 10 yr. master plan it is a draft of what is possible. Need to make sure that things are scoped to be flexible to meet financial constraints. As we talk about the science corridor. Physics is not in the conversation. Webster sways and is not suitable for certain experiments. We could move SOE into Webster. Is there additional space that could occur south of the corridor? - Brian. At some point we need to zoom at the full CAS environment – Olivia Idea of moving once is an easy sell - Brian. You can convince post-tenure to move twice. Moving equipment is important. Making 1 and 2 bigger - could revitalize that core and restore those teaching spaces. Can we look at the site constraints - what can we fit for the new builds? What can we max out? We have a list of these buildings and how much they cost? <p>Teaching Labs / GUCs:</p> <ul style="list-style-type: none"> The largest GUC is in Todd to the north which is 550 students. The Spark has a lot of teaching space for GUCs. But teaching labs are needed. It’s good to have this conversation - Todd. This gets us closer to student engagement. We want to get to both research and instructional needs. And We need to replace GUCs. These are elements that we need to support the campus and the need of CAS. Speaking of large GUCs in the area, Webster has some large ones including another 250 seat - 101, 102, 201 and 202 are taught. – Wade <p>Renovation Projects:</p> <ul style="list-style-type: none"> We have a deferred maintenance problem - we want to reinvest in the existing buildings. - Olivia Heald deferred maintenance is now about \$19M. Fulmer’s are over \$40M. Webster is \$35M on its own. - Wade Abelson & Eastlick are \$33M Fulmer Annex, Fulmer - Synth, and Heald - cannot be corrected. Fulmer is made of shotcrete. 	

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Meeting Notes continued

Project	WSU Life and Physical Sciences - Pre-Design	Project Number	1571-2021
Meeting Date	02/01/2022 - 10AM - 12PM	This is page	3 of 3

Discussion	Action / Decisions Pending / Follow up
<ul style="list-style-type: none"> Deferred maintenance issues are due to management of existing space, instead we focused on just new buildings. Can we do renovations to Fulmer Lab, Eastlick, and Abelson. Look at where we can move folk into spaces outside of CAS? - Olivia <p>Action Items:</p> <ul style="list-style-type: none"> Gensler to reach out to Wade to map out all the existing program currently still in Abelson. Gensler to distribute presentation slides from workshop #3. Gensler to meet with facilities for further discussions on master planning effort of the pre-design. WSU Facilities to review swing space available outside of CAS to verify if Renovating and demolishing Heald can happen first? 	<p>Gensler / WSU</p>

Meeting Notes continued

Project	WSU Life and Physical Sciences - Pre-Design	Project Number	1571-2021
Meeting Date	02/15/2022 - 10AM - 1PM	This is page	3 of 3

Discussion	Action / Decisions Pending / Follow up
<p>Glen - to what extent do you burden the system vs. take it out of the building and make it a piece of equipment. Previously, the way it was done with a centralized system in the building for purified water – this is very expensive and requires a lot of maintenance. If we shift, we would not make it a central system – make it a point of water polishers.</p> <ul style="list-style-type: none"> Brian – I vote for not burdening the building Pat – I am also on board with the water being decoupled from the building If the university can't commit to a nitrogen central location Gensler suggest doing the same with gasses. Wes – we want back-up power in a centralized form. Currently, Fulmer does not have backup power. <p>Glen - If there is a desire to flip a teaching lab into a research lab – and visa versa – overnight, then we need to understand the constraints</p> <ul style="list-style-type: none"> The university would like research labs to take president. Don't want to constrain research labs for the sake of a teaching lab. <p>Action Items:</p> <ul style="list-style-type: none"> Gensler can provide 50-minute presentation of the flexible lab design to the larger faculty at SBS and Chemistry. WSU to provide options on when this should occur on the schedule. Gensler to provide test-fits of a typical floor in Abelson and Eastlick. Gensler to provide concept options for workshop#2 for the new science research lab building. 	<p>Gensler / WSU</p>

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Meeting Notes

Project	WSU Life and Physical Sciences - Pre-Design	Project Number	1571-2021
Meeting Location	Zoom Meeting	Meeting Date and/or Time	02/28/2022 - 9AM - 11AM
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Meeting Subject	Workshop #5	Meeting Number	007
		File	1MN
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Present	Joann L Thomas / WSU Project Manager Olivia Yang / WSU Project Manager
	Todd Butler/ WSU Dean of College of Arts and Sciences Courtney Meehan / WSU Associate Dean for Research and Graduate Education Wade Lafferty / WSU CAS Director of Operations and IT Trent Amonett / WSU Operations Coordinator Laura Child / WAS Senior Director of Development Pat Carter / WSU Chair, School of Biological Sciences (SBS) Wes Dowd / WSU Associate Professor, SBS (Marine Environmental Animal Physiology) Kirk Peterson / WSU Chair, Department of Chemistry Brian Clowers / WSU Associate Professor, Chemistry (Analytical Chemistry) Squeak Meisel / WSU Chair, Department of Fine Arts
	Glenn Berry / Gensler Senior Lab Planner Donna Barry / Gensler Design Director EJ Deasis / Gensler Designer Tina McKone/ Gensler Architect Francesly Sierra / Gensler Project Manager

Distribution cc:

Prepared by Francesly Sierra **Date Issued** 03/02/2022

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Discussion	Action / Decisions Pending / Follow up
<p>Workshop Goals:</p> <p>The goal of this workshop is to gain a better understanding for the concept of "flexible labs" and how this can achieve the goals of a new building within the master plan roadmap. We discussed the following:</p> <ul style="list-style-type: none"> • Updates to the proposed masterplan • Test-fit studies for existing buildings • Proposed lab modules • Concept options for site 1 <p>Masterplan:</p> <ul style="list-style-type: none"> • Todd - provide renovation projects for chemistry as well in biennium 1 for a balanced approach. • Olivia - I think time is against you in the first biennium. Demo may not be possible until all the enabling projects occur. Review time assumptions for project durations. Let's make sure we get the most 	<p>For Information</p> <p>For Information</p>

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Project	WSU Life and Physical Sciences - Pre-Design	Project Number	1571-2021
Meeting Date	02/28/2022 - 9AM - 11AM	This is page	2 of 3

Discussion	Action / Decisions Pending / Follow up
<p>bang for our buck.</p> <ul style="list-style-type: none"> • Don't be afraid of pushing out projects based on schedule. This may be looking out more than 10 years. • 23-25 should be focused on enabling project. <p>Eastlick:</p> <ul style="list-style-type: none"> • This is an approach for if you can decant a full floor to accommodate teaching labs. • But there may be floor with just individual room Tis. • Restrooms are on the floor • Future Elevator Shaft in Eastlick - No elevator was installed but may have telecom. • Telecom is proposed in the existing connection between Eastlick and Heald. • Pat - Eastlick on the ground level - I do not see a need to renovate - light renovation. <p>Abelson</p> <ul style="list-style-type: none"> • This is an approach if you can decant a full floor to accommodate research labs for 6 - 8 Pls. • PO and PI offices. • Conference room • Wes - this layout is great to have a community of offices. Most of our offices on the 2nd and 3rd floor of Eastlick. • Pat - no issue with research and teaching spaces. • Level 3 - Academic and Office should remain. • Todd - Inclusive Restrooms are preferred. <p>Lab Prototype Modules:</p> <ul style="list-style-type: none"> • The bench space is the fume hoods in organic chemistry. • Kirk - the difference is synthetic is not as quite as intensive than the classic chemistry. Because of synthetic space we don't need as many fume hoods. A Mix of chemical and biology - hybrid module would be ideal. • We could have 3 types of modules. • 3 x 5 has more support space. • We are showing student desking in the module. • Kirk - We filled up the grad student space. We need to add more office space for shared. In Troy, we filled it all. • Kirk - For safety reason we want to move student space outside. <p>Concept Options:</p> <ul style="list-style-type: none"> • Lab Bar option is preferred. • Is there a need for security? - yes, it is a tricky issue. • How do we separate the research? 	<p>For Information</p> <p>For Information</p> <p>For Information</p> <p>For Information</p>

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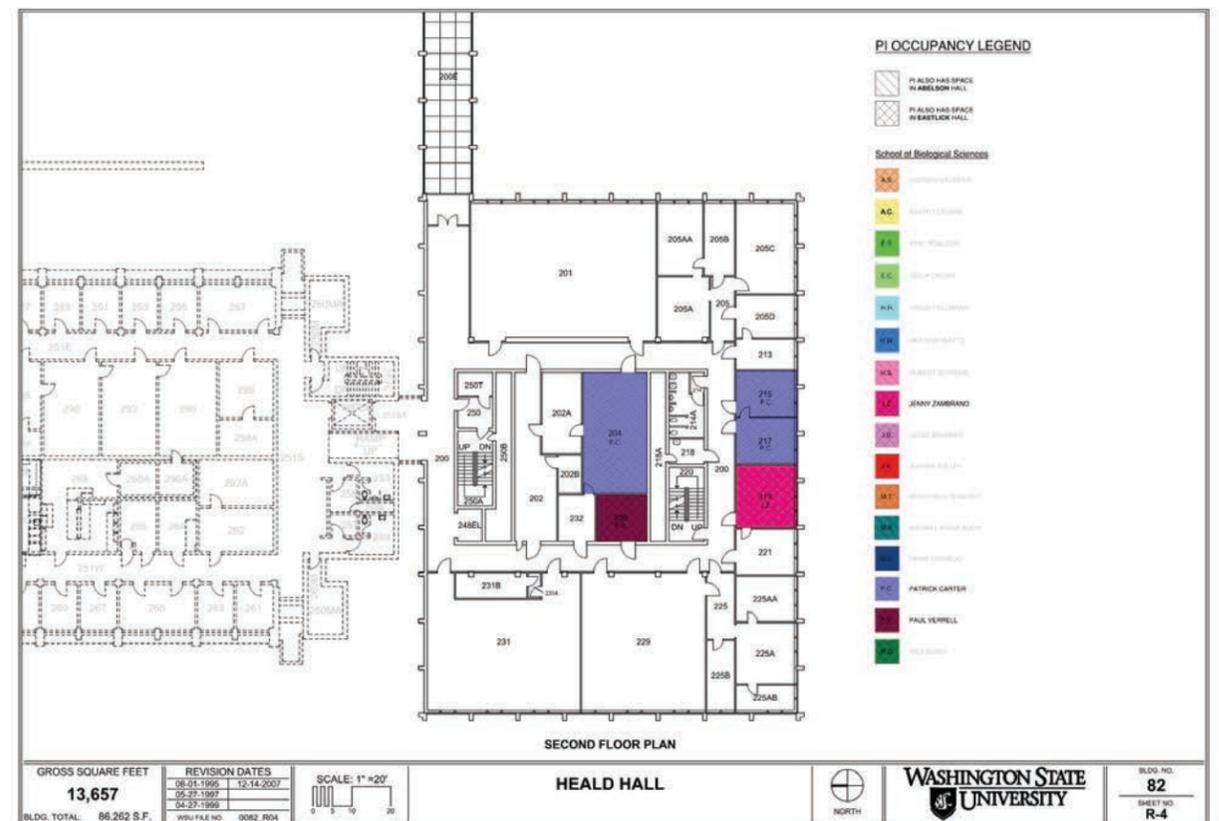
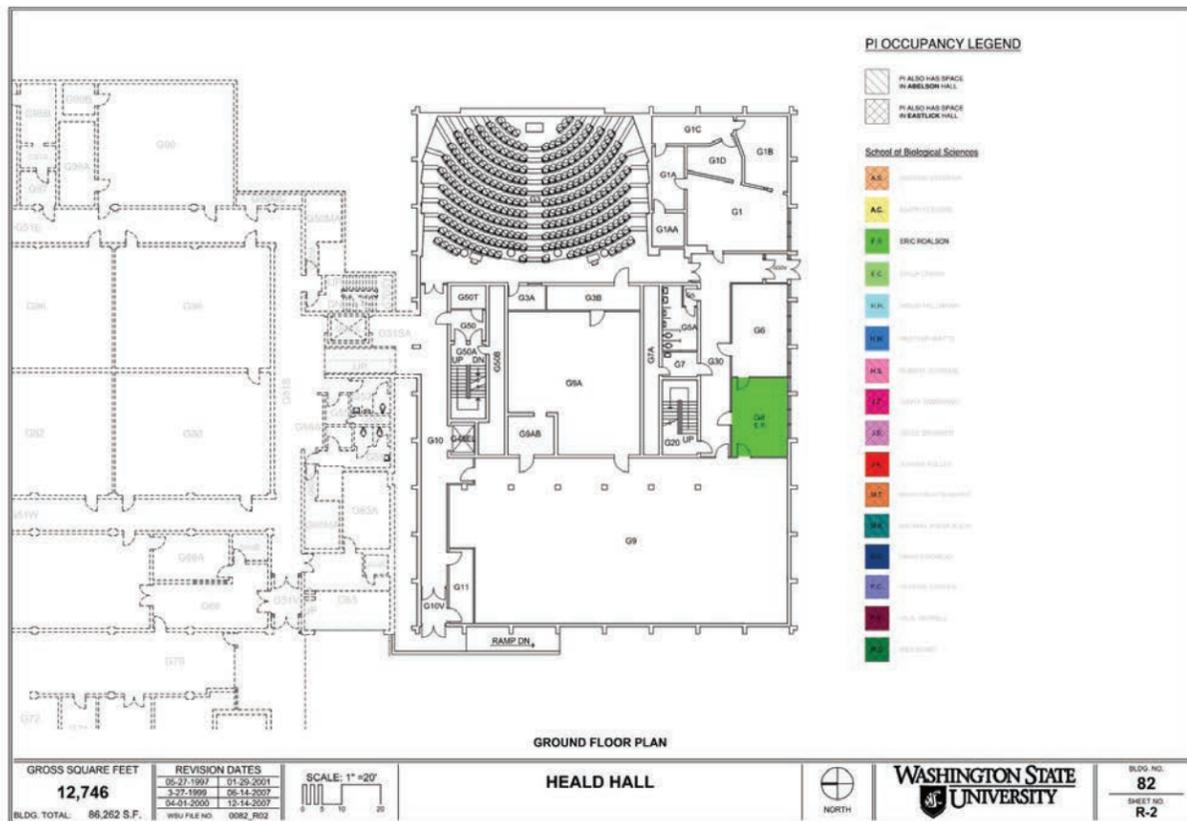
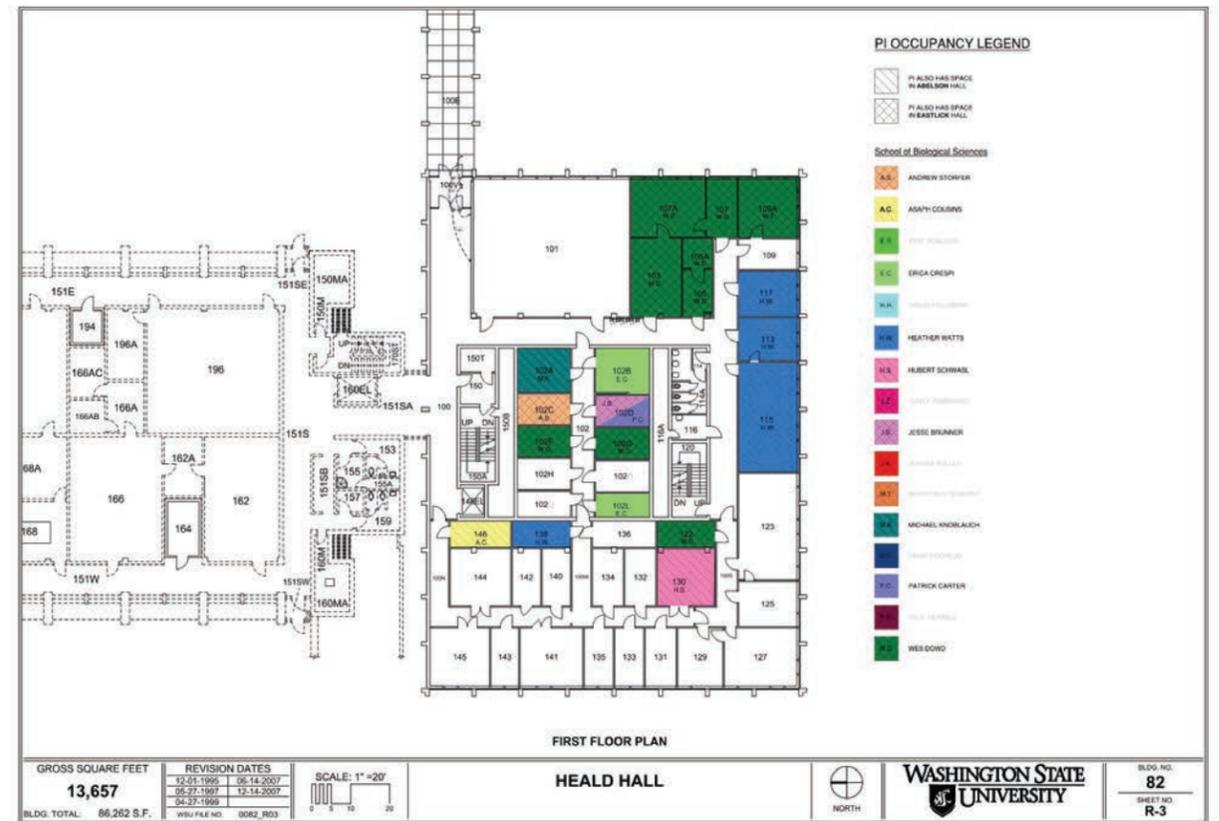
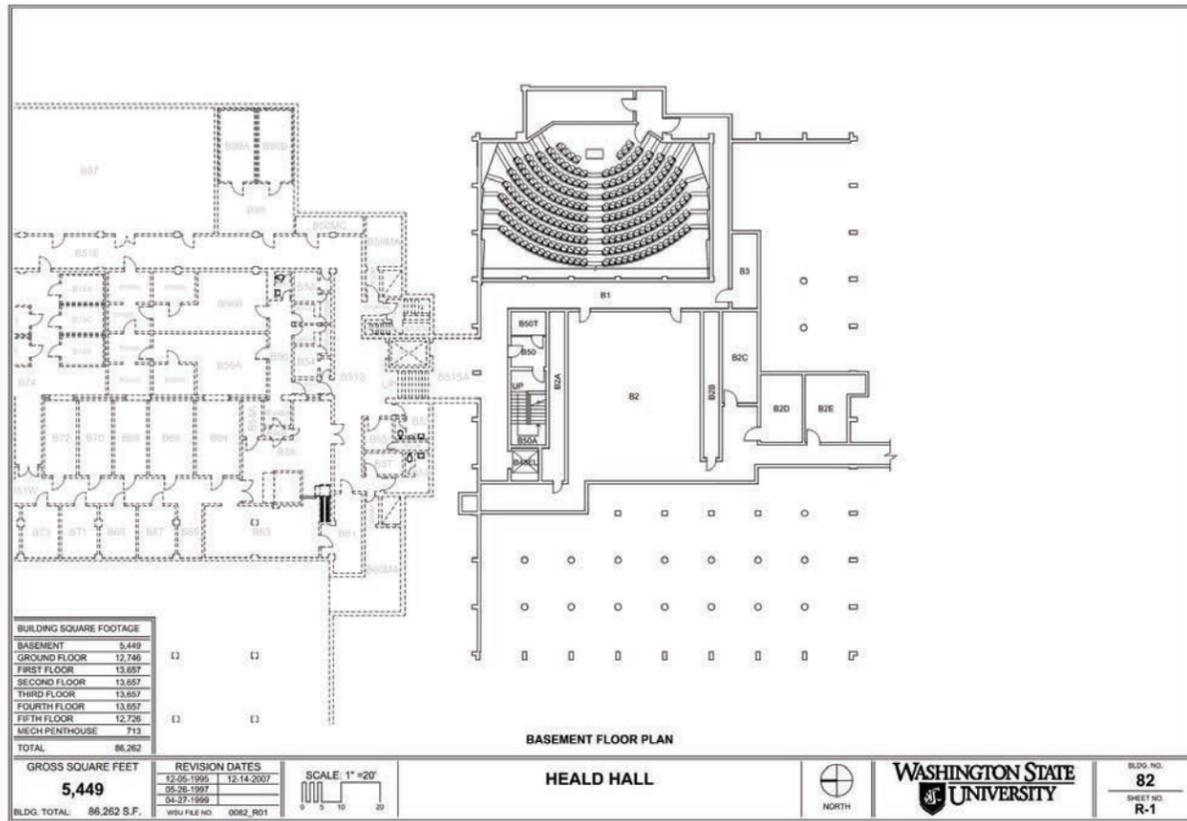
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Discussion	Action / Decisions Pending / Follow up
<ul style="list-style-type: none"> Craig -Extending the building over the loading dock area will need to have suitable clearance for delivery vehicles and waste trucks to be able to tip dumpsters Todd - One of the advantages of this general plan is that since we are moving current faculty to permanent homes, we can "hire into" this new building with faculty who will begin their careers operating in whatever fashion the building presents. Pat - we will have students working late at night. We need a single access point for security. 	
<p>Ground Floor: Olivia - should we test teaching lab on the ground floor if it works with the masterplan. Todd - Student engagement on the first floor is important</p> <ul style="list-style-type: none"> Faculty teaching labs are also research labs. Is there a way to break the binary? Given the financial limitations - can we see research labs that are also teaching labs - public Seminar rooms on the ground floor. 	For Information
<p>Action Items:</p> <ul style="list-style-type: none"> Gensler can provide 50-minute presentation of the flexible lab design to the larger faculty at SBS and Chemistry. WSU to provide options on when this should occur on the schedule. Gensler to provide updated concept and roadmap with detail for draft of report and workshop #6. 	Gensler / WSU

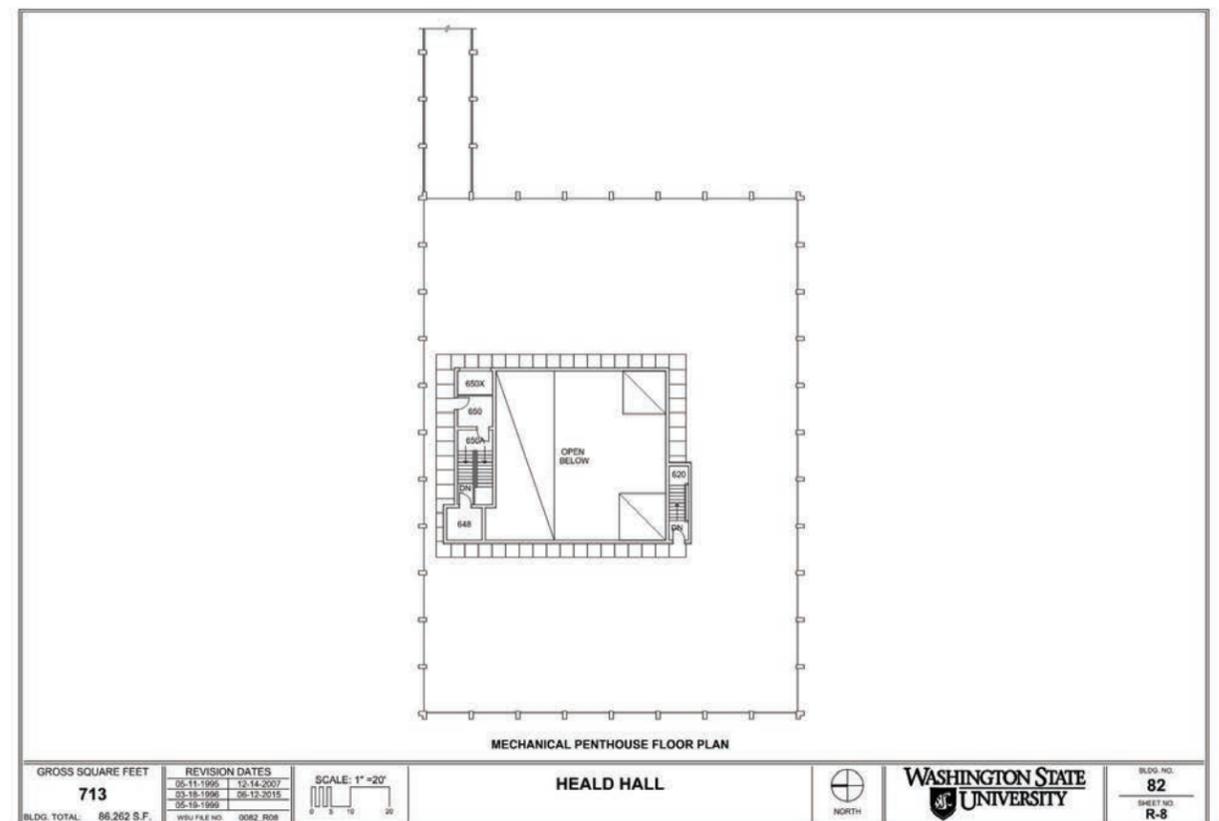
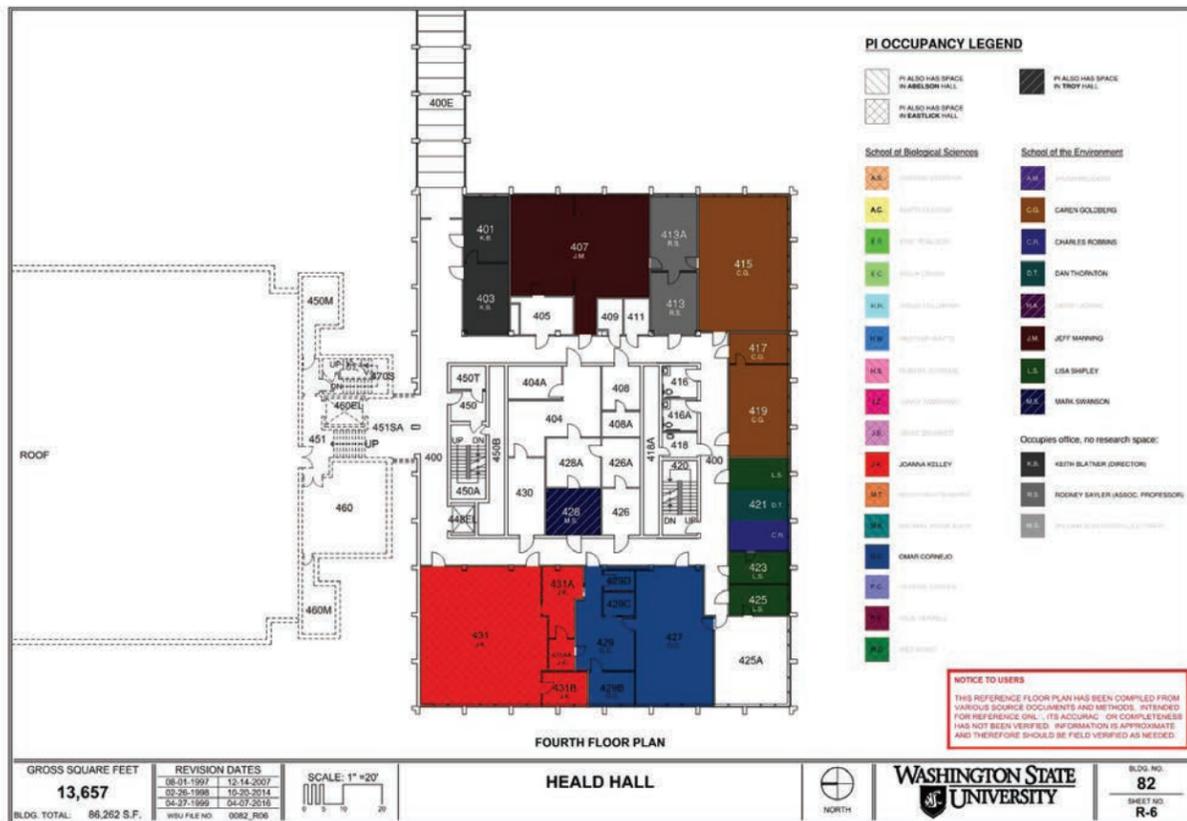
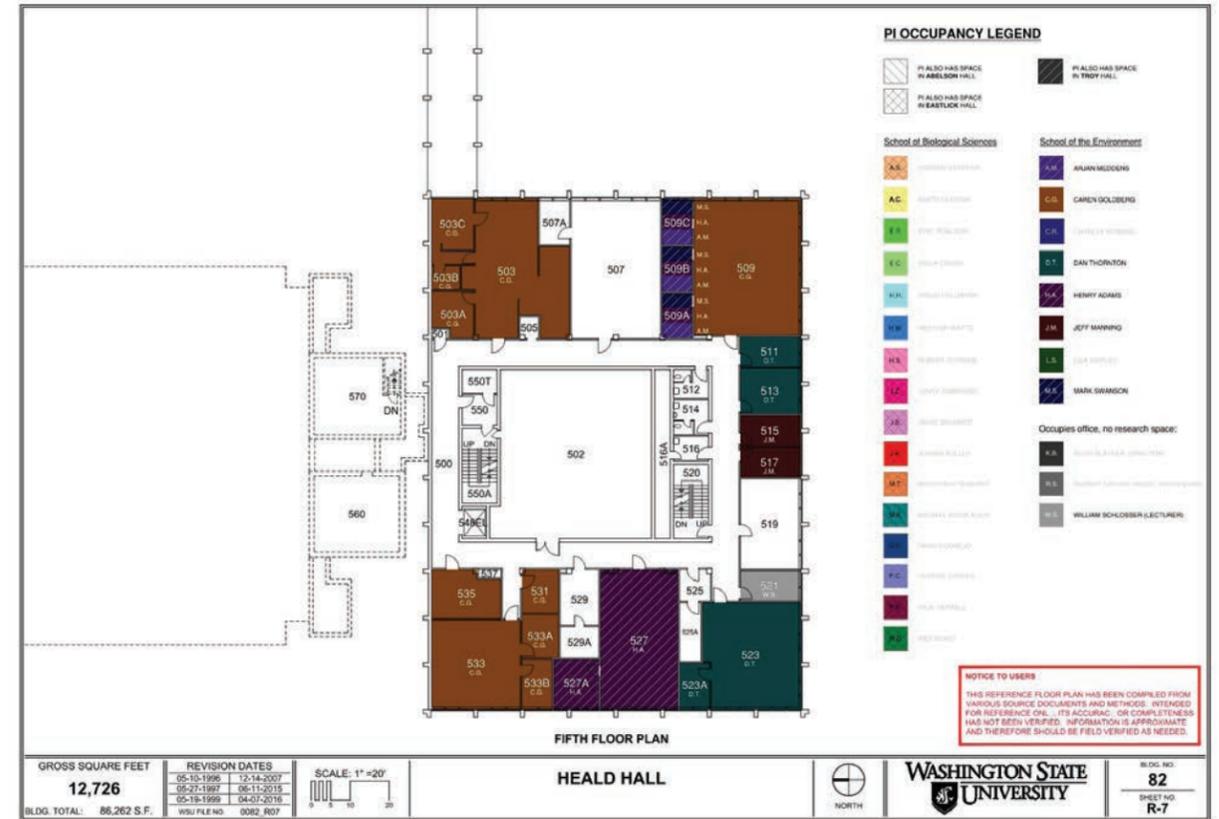
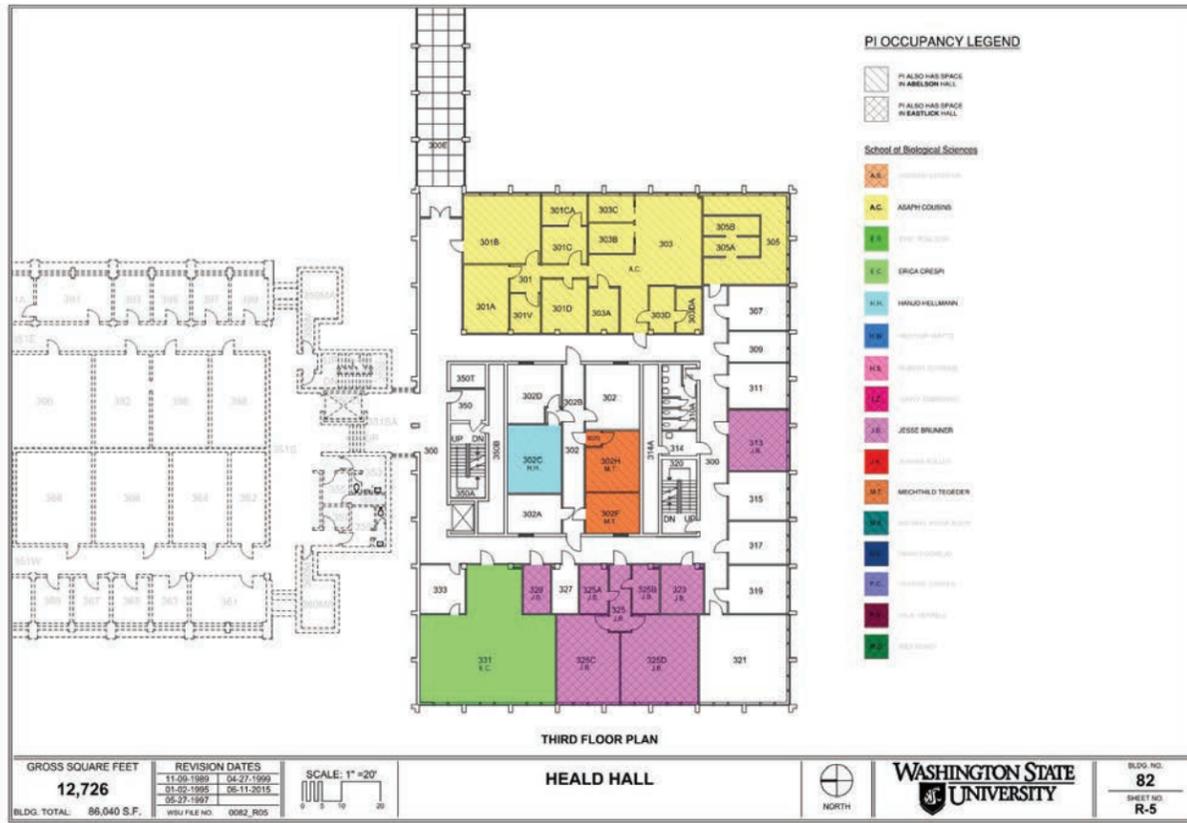
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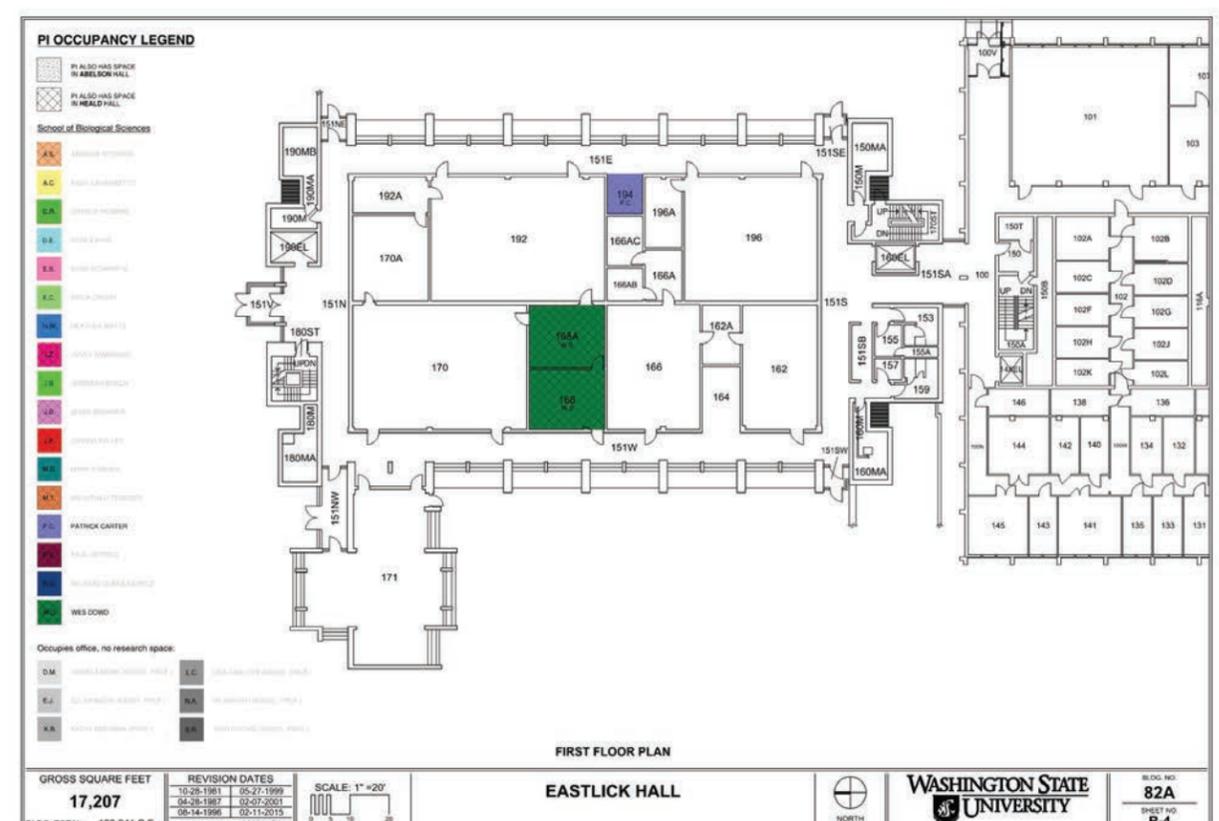
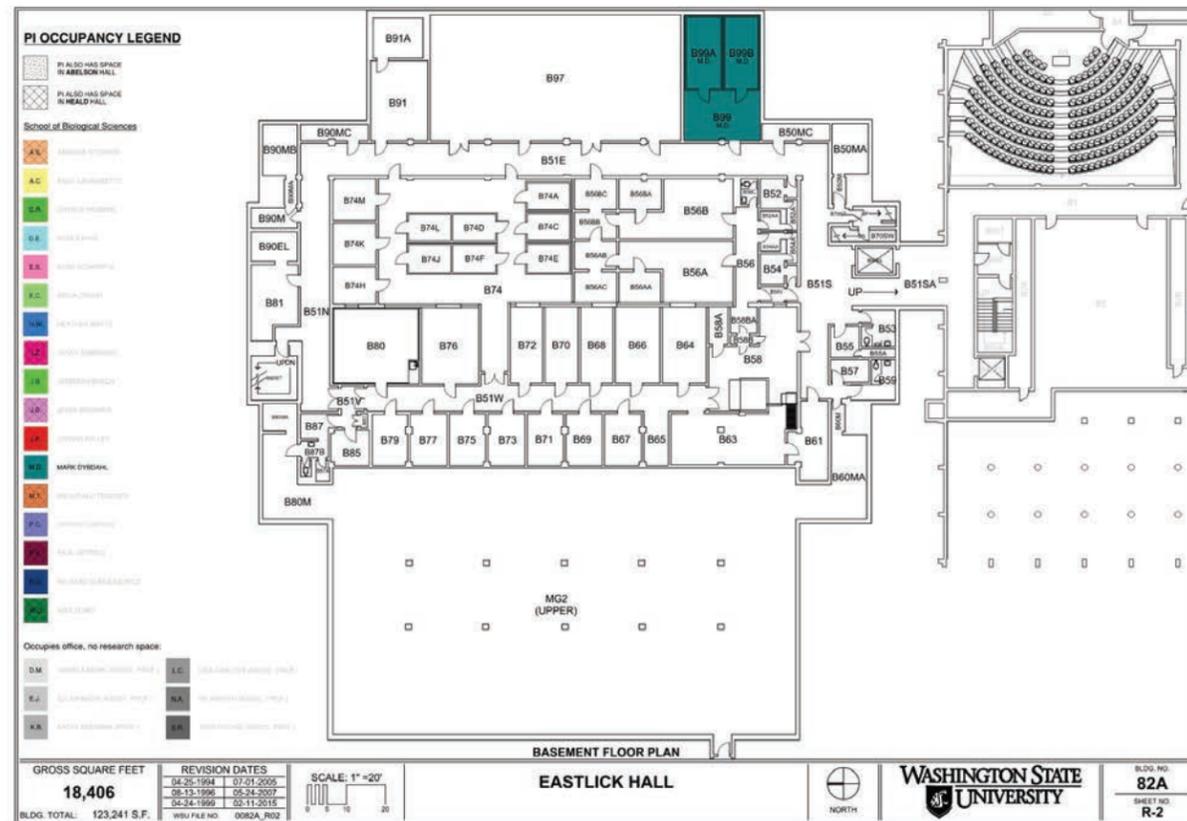
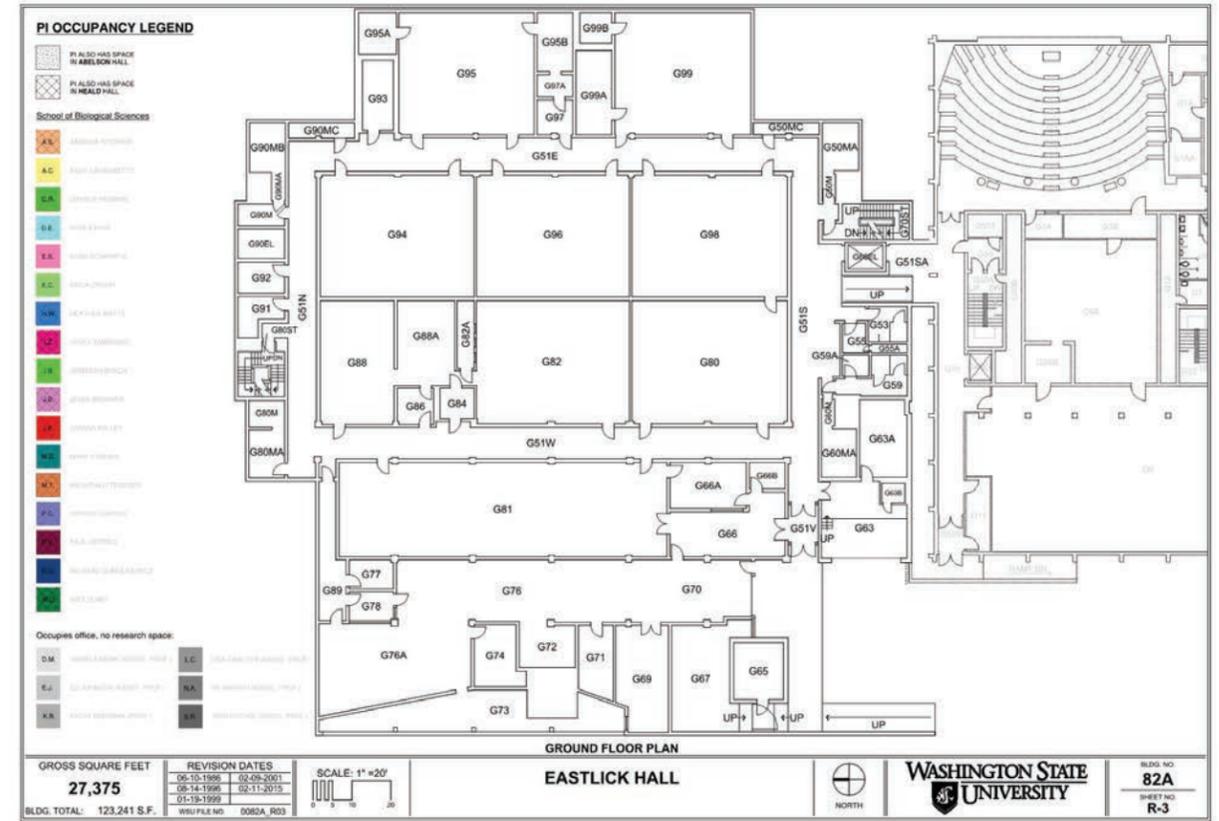
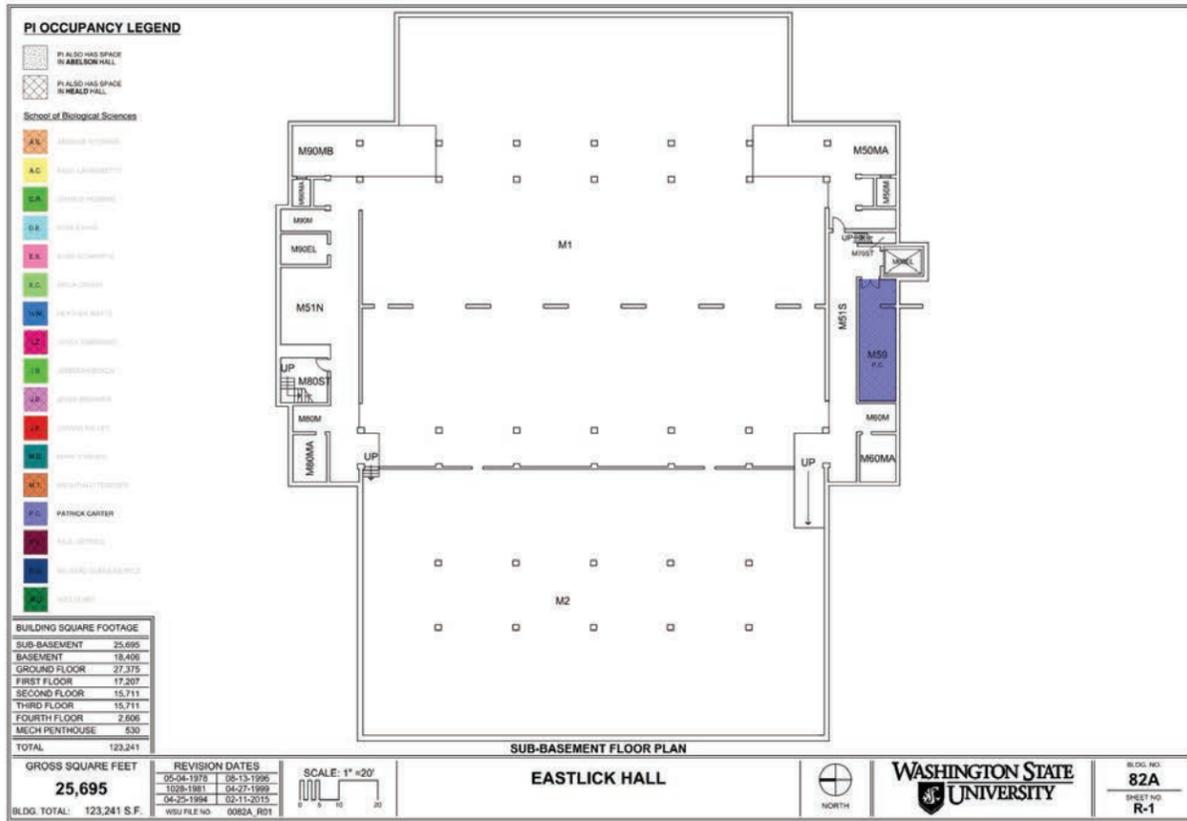
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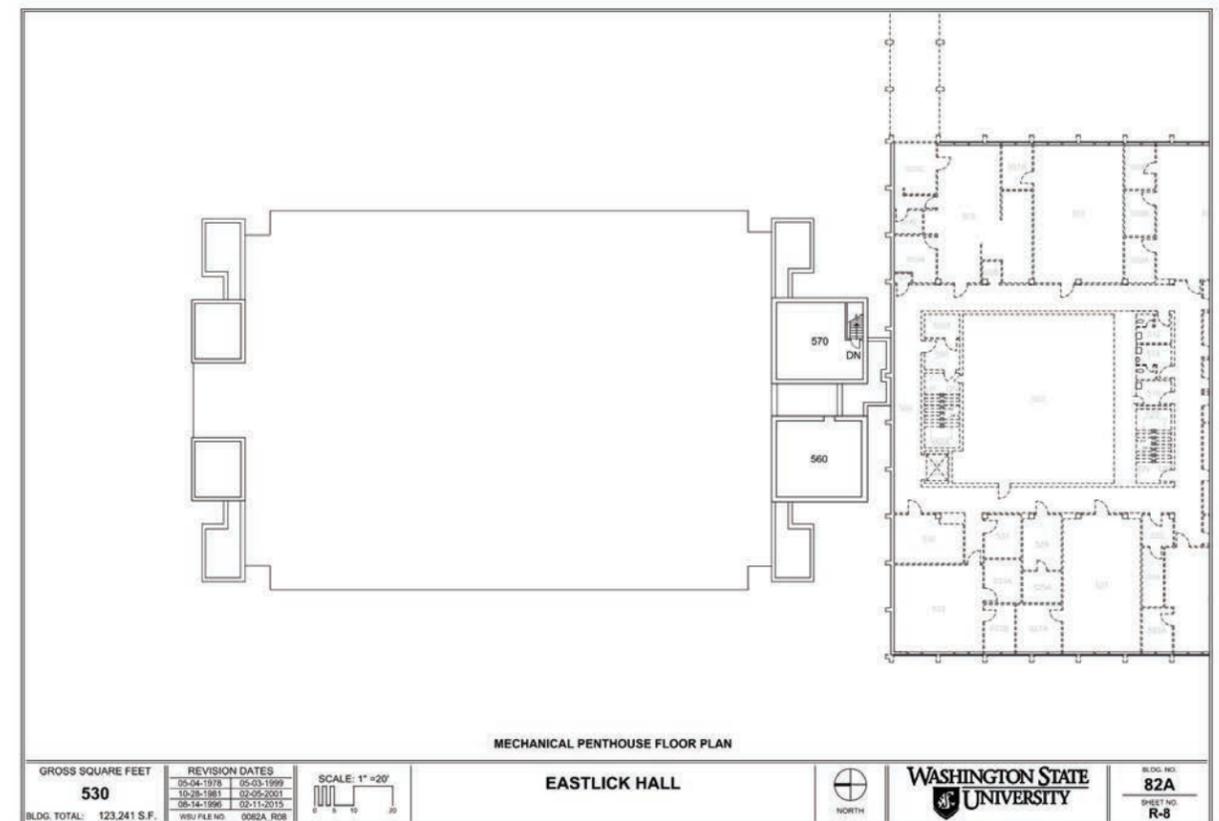
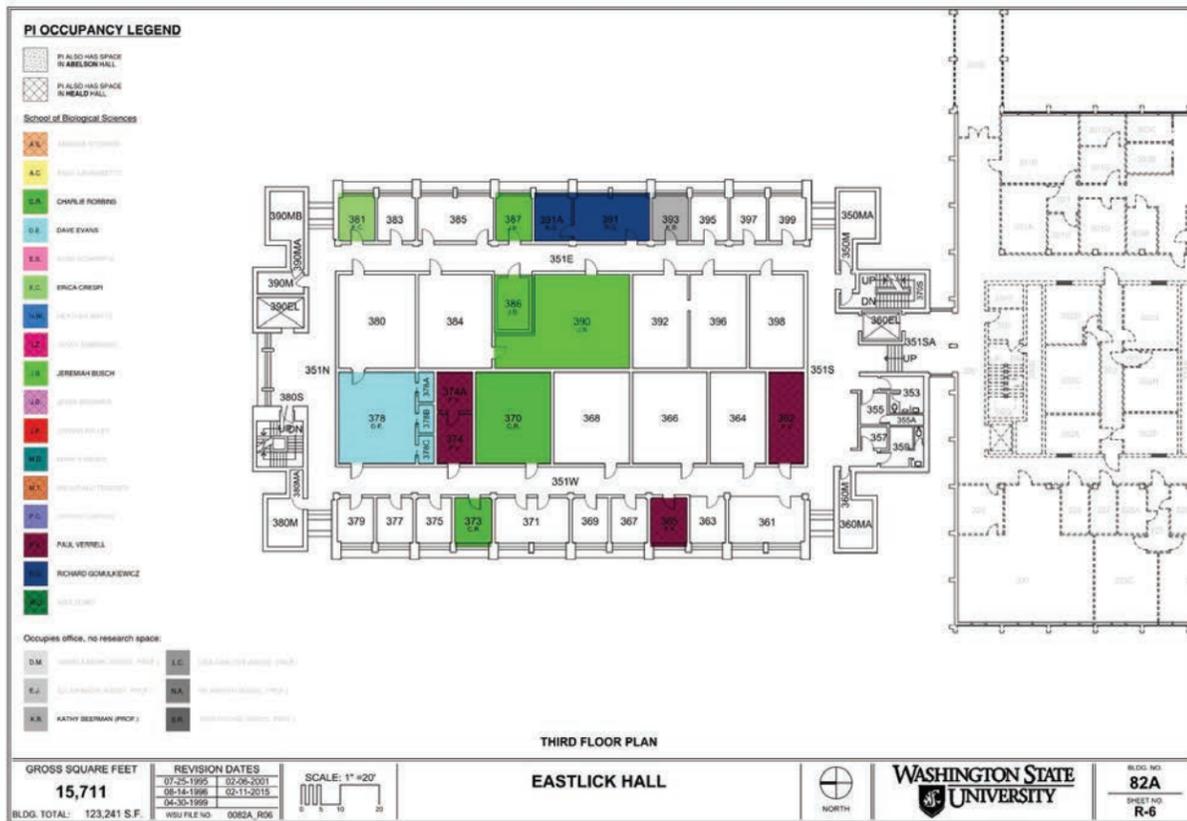
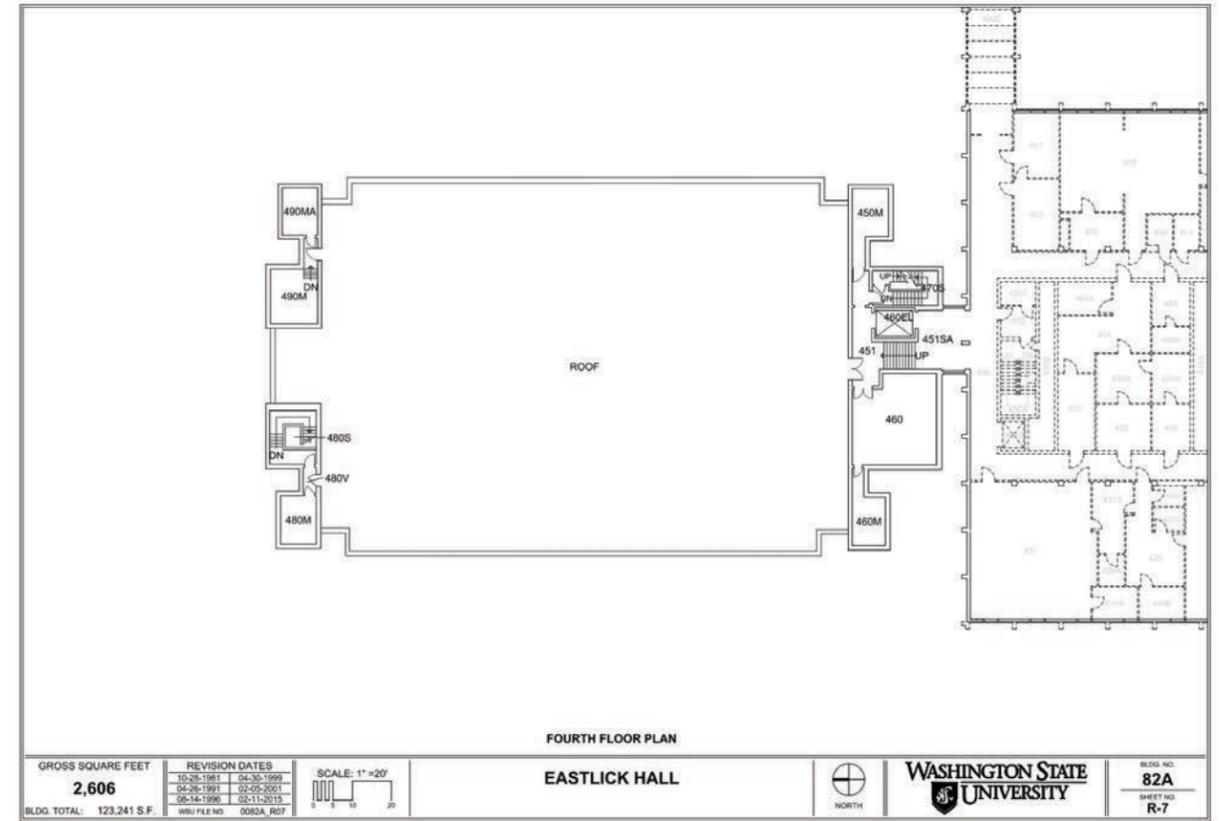
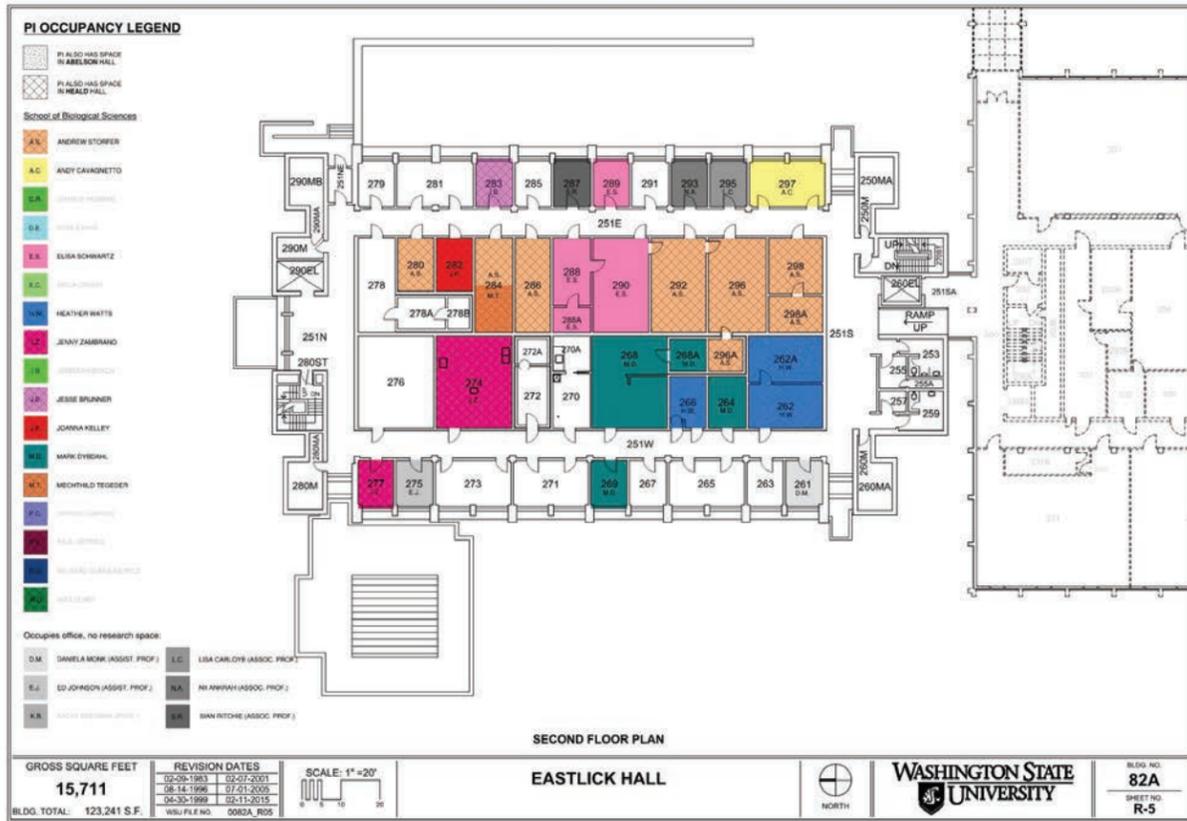
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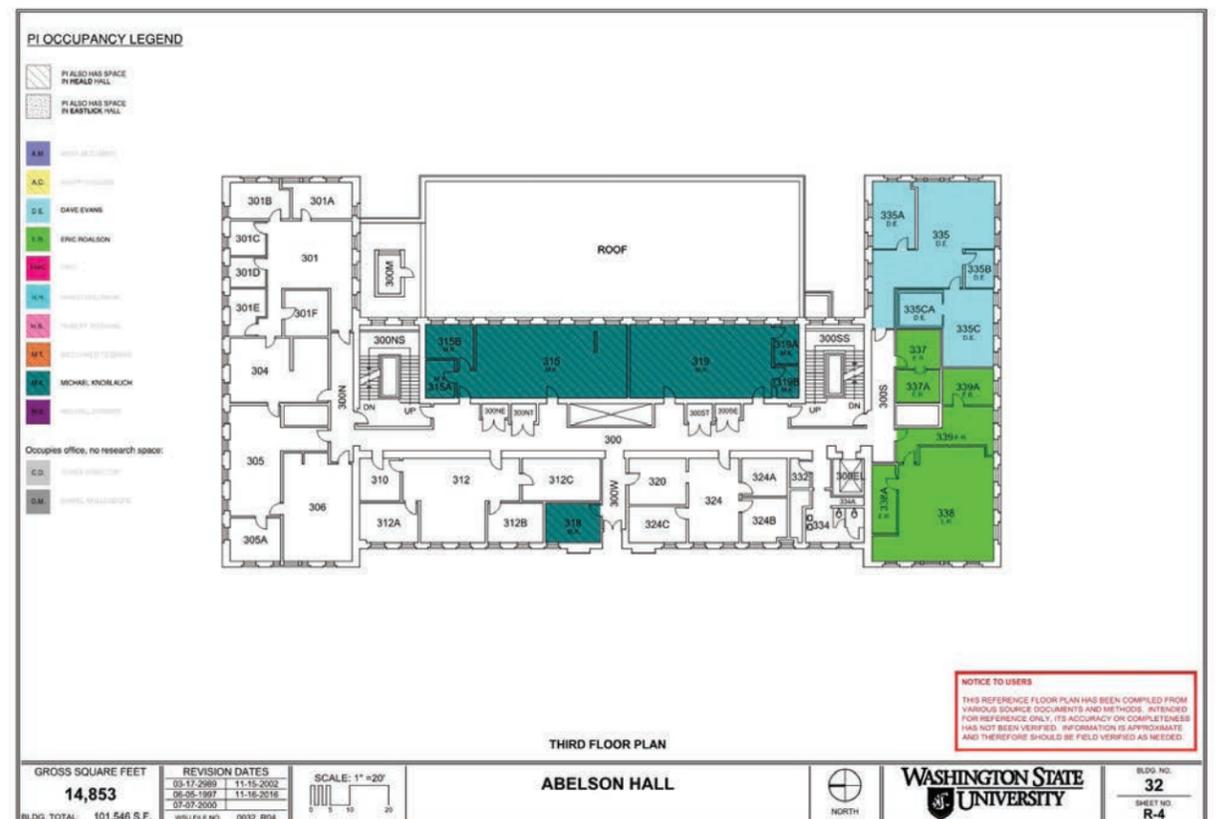
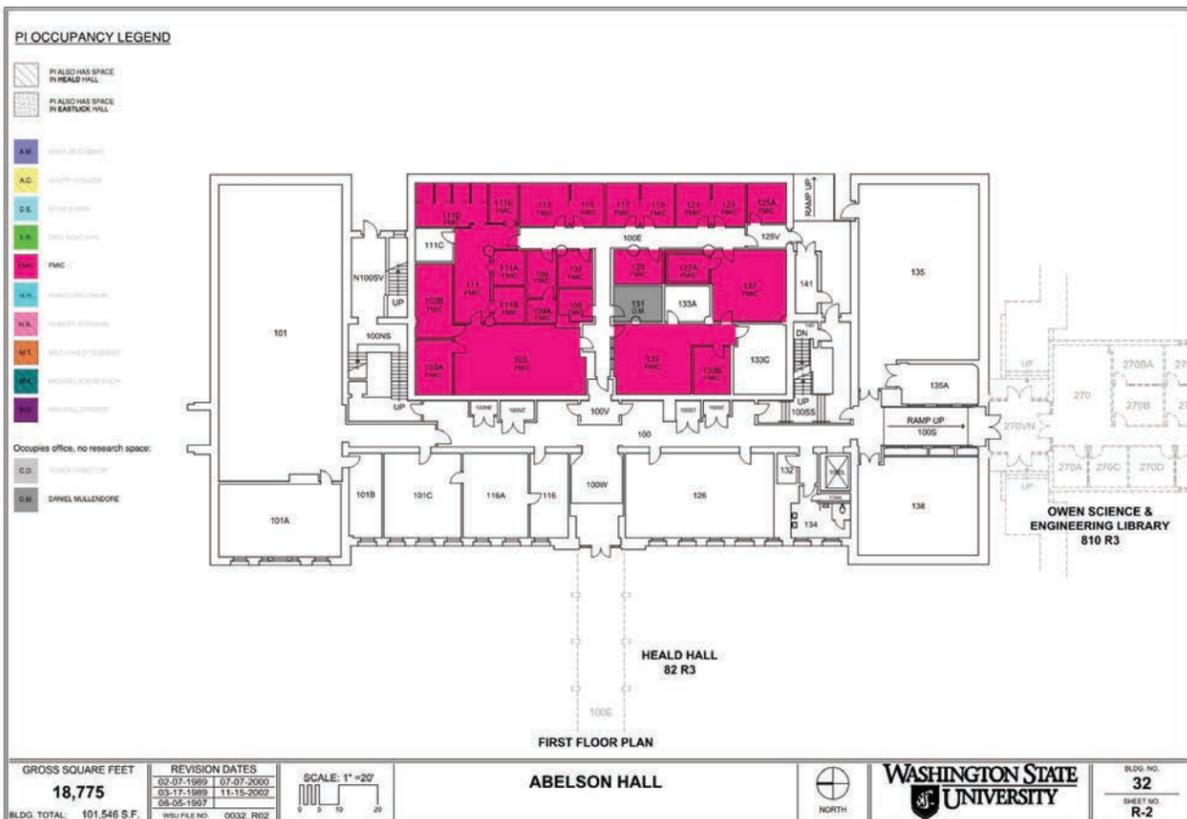
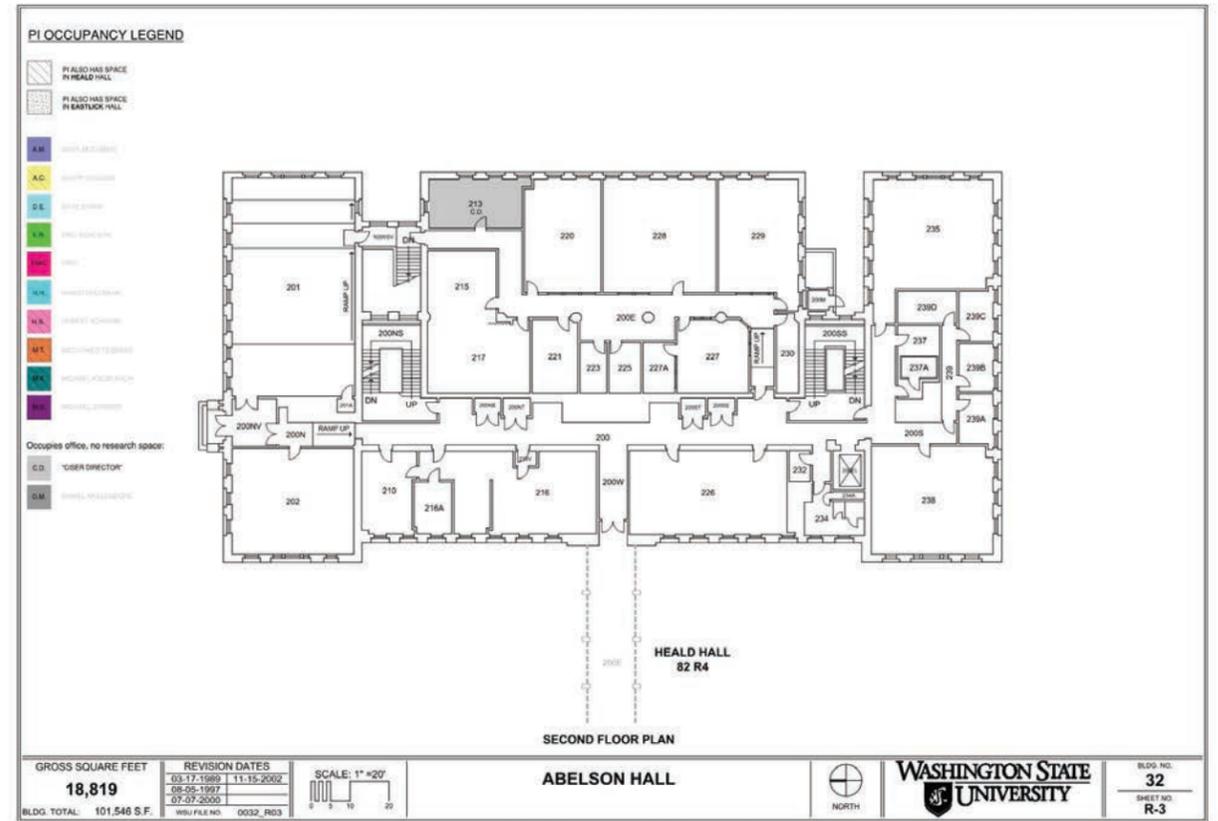
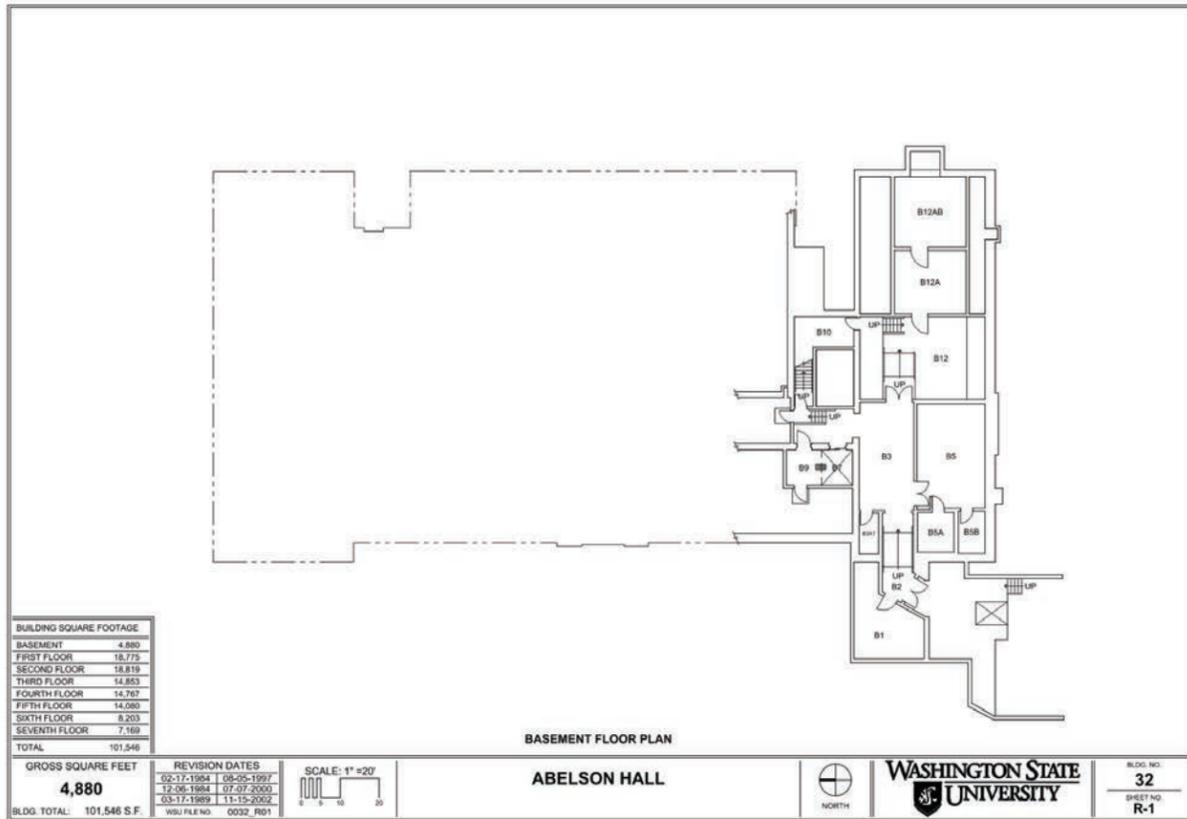
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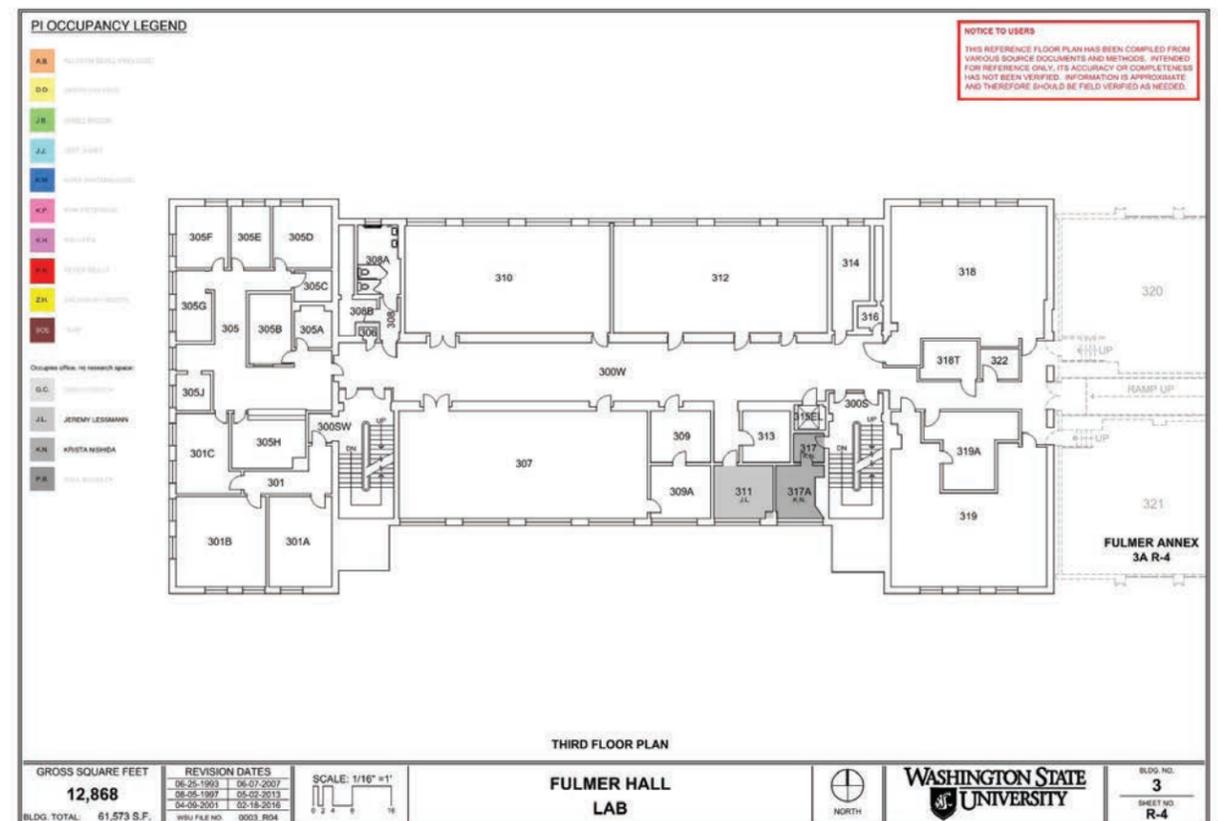
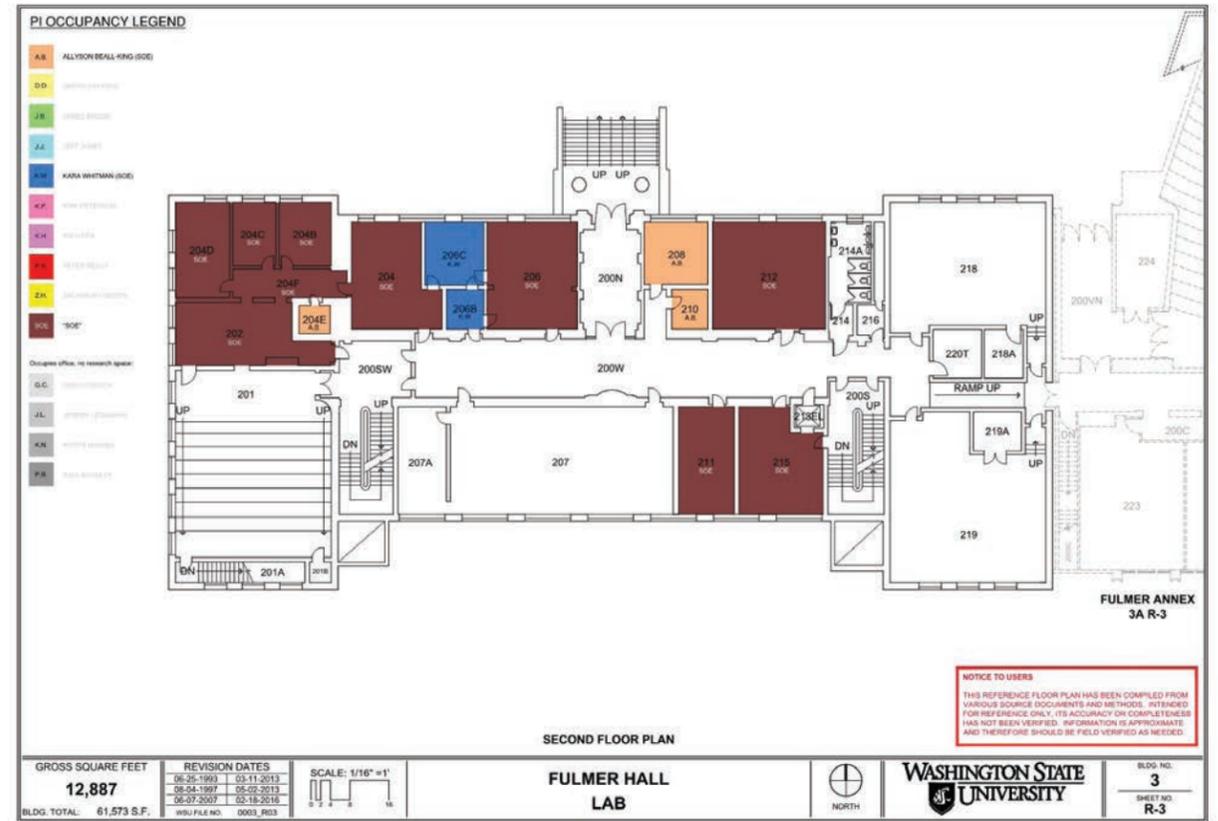
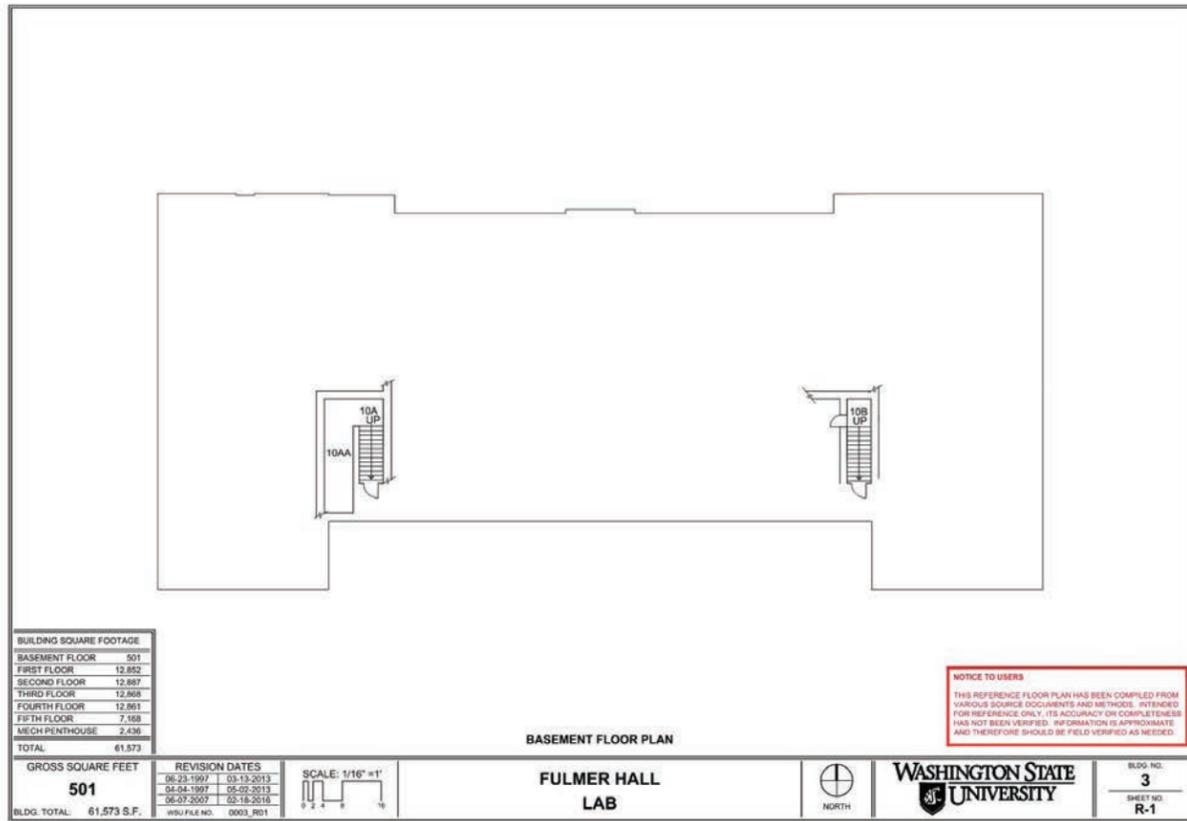
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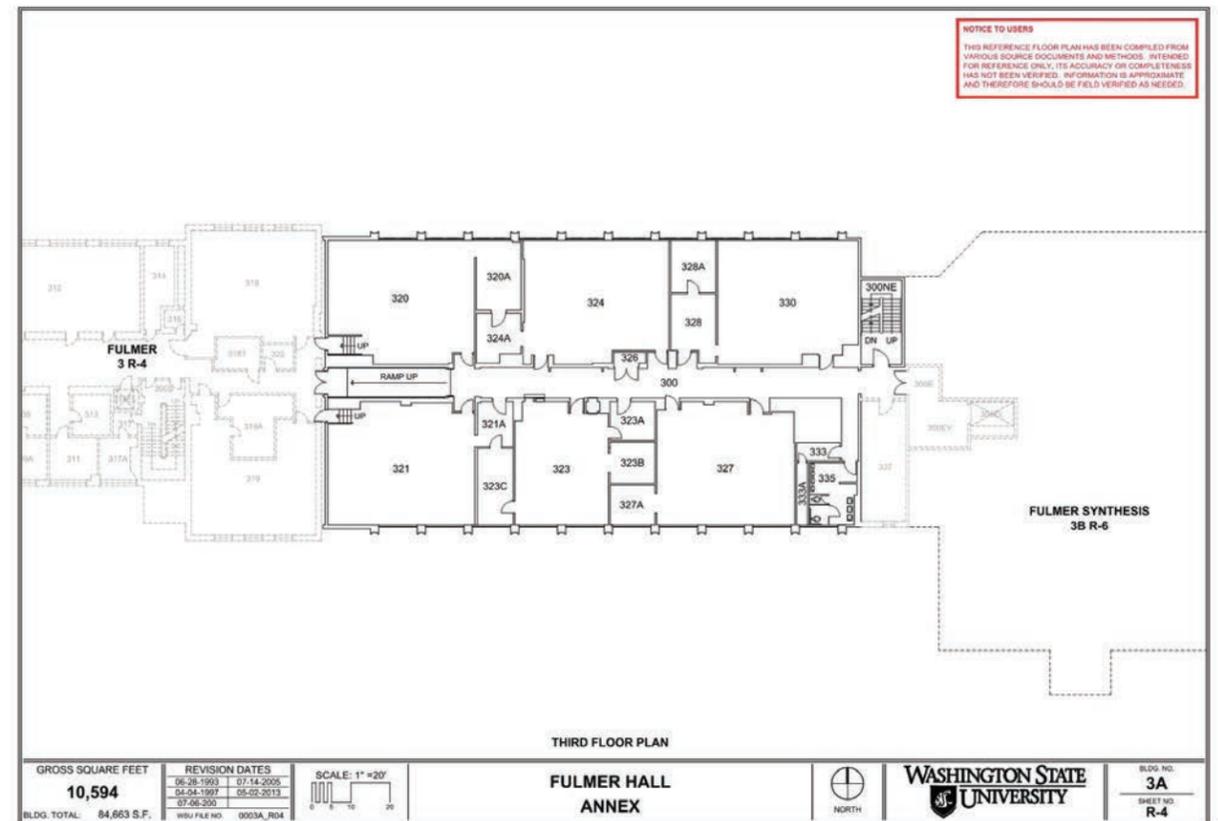
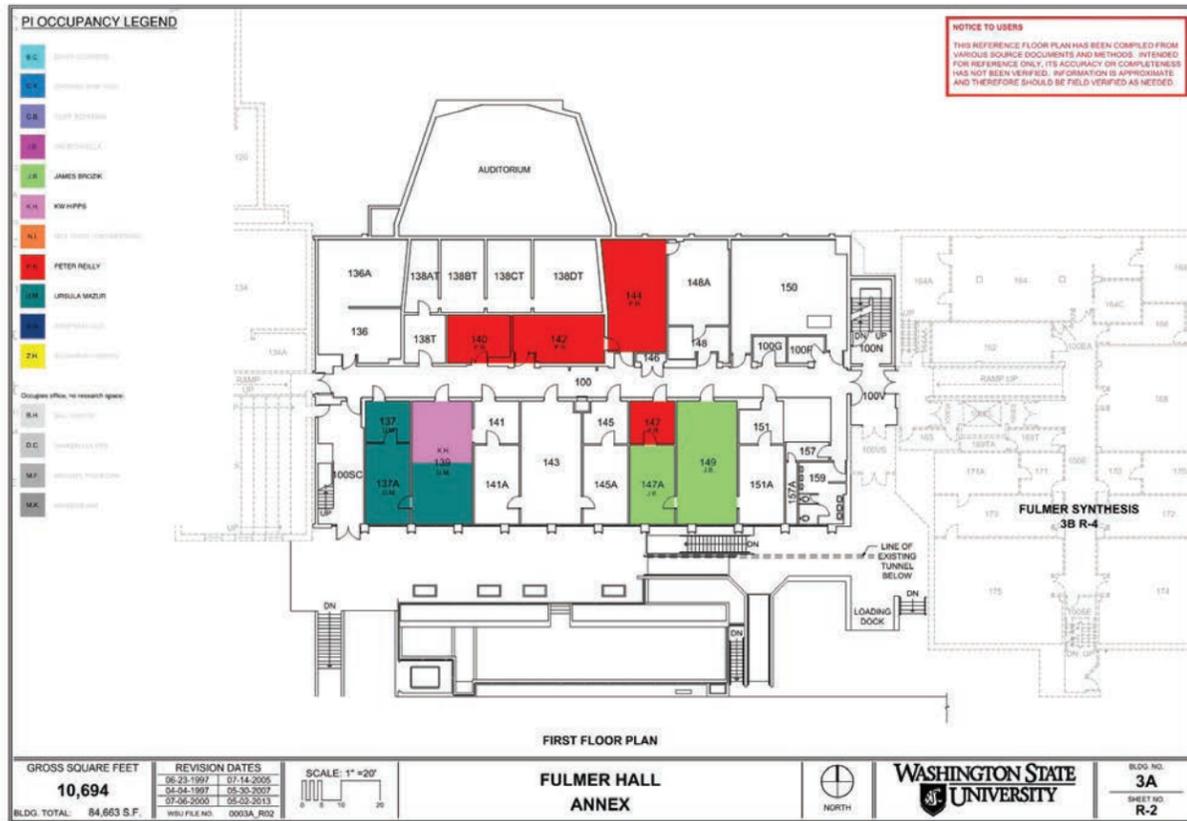
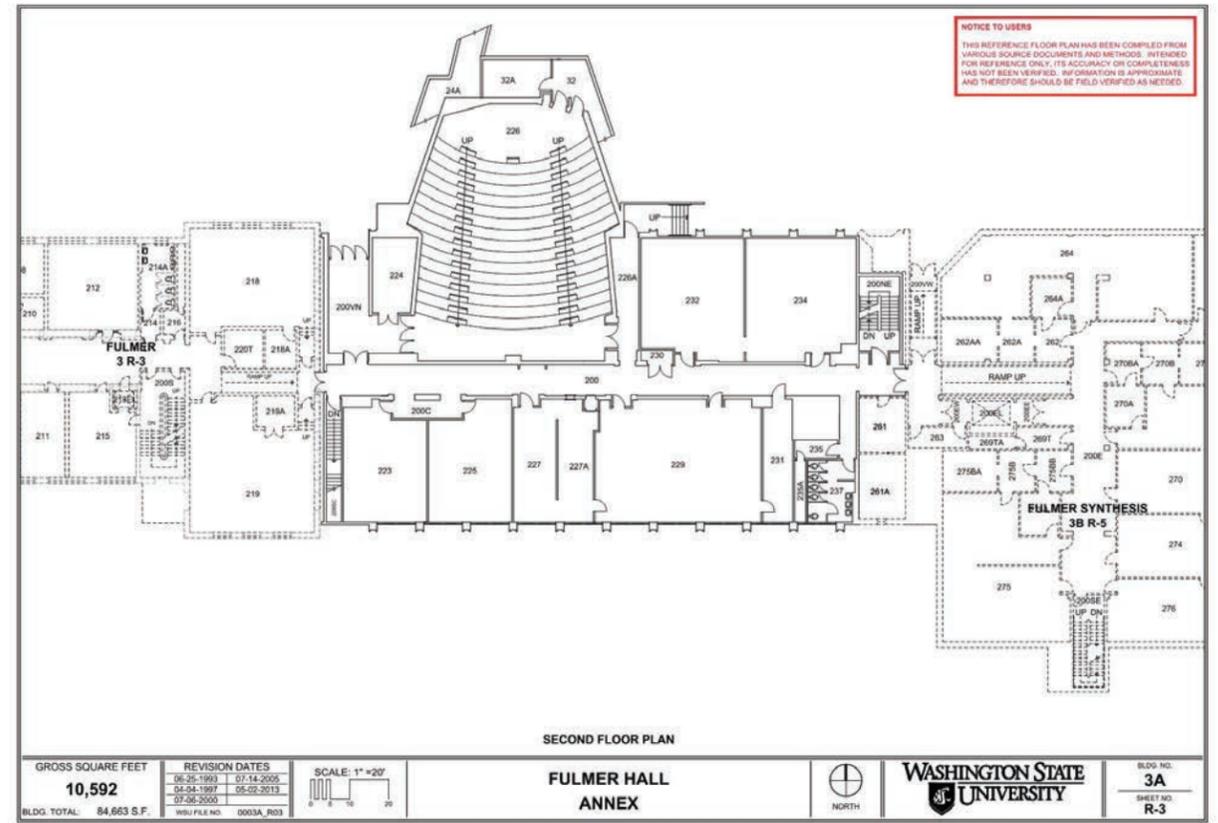
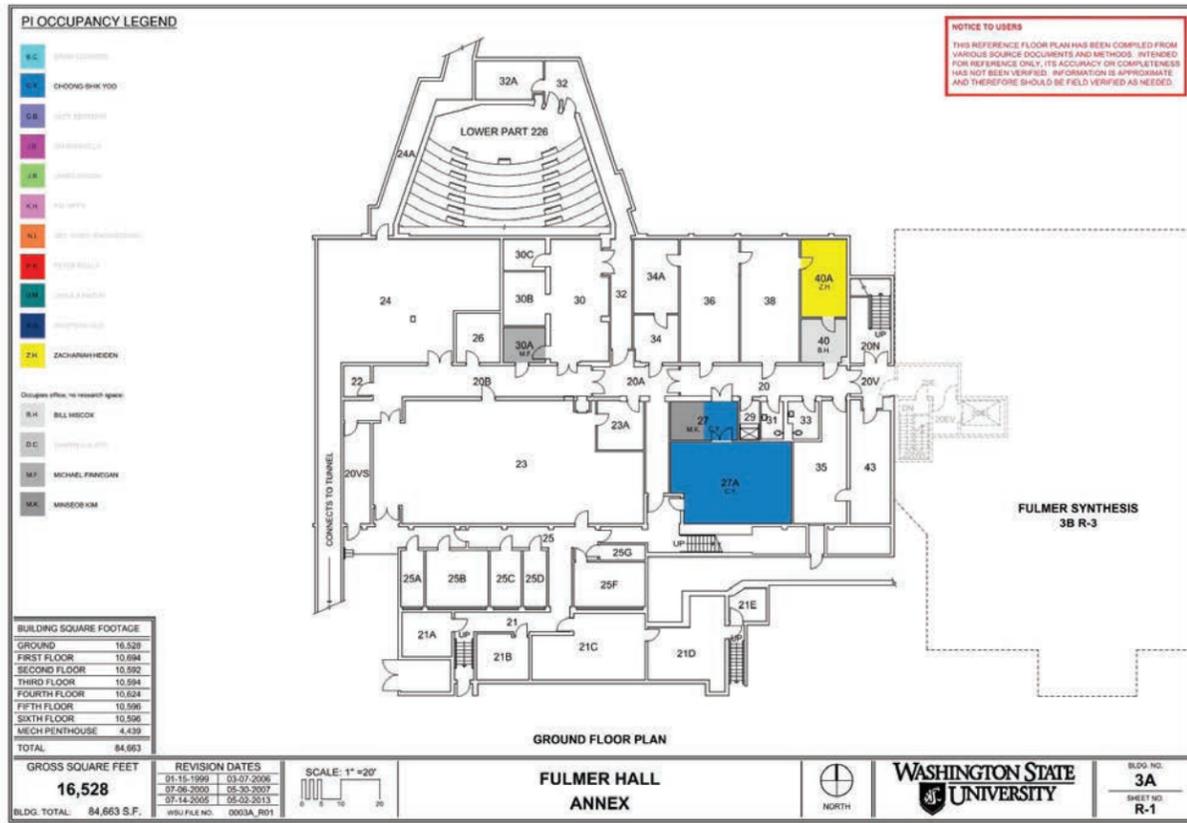
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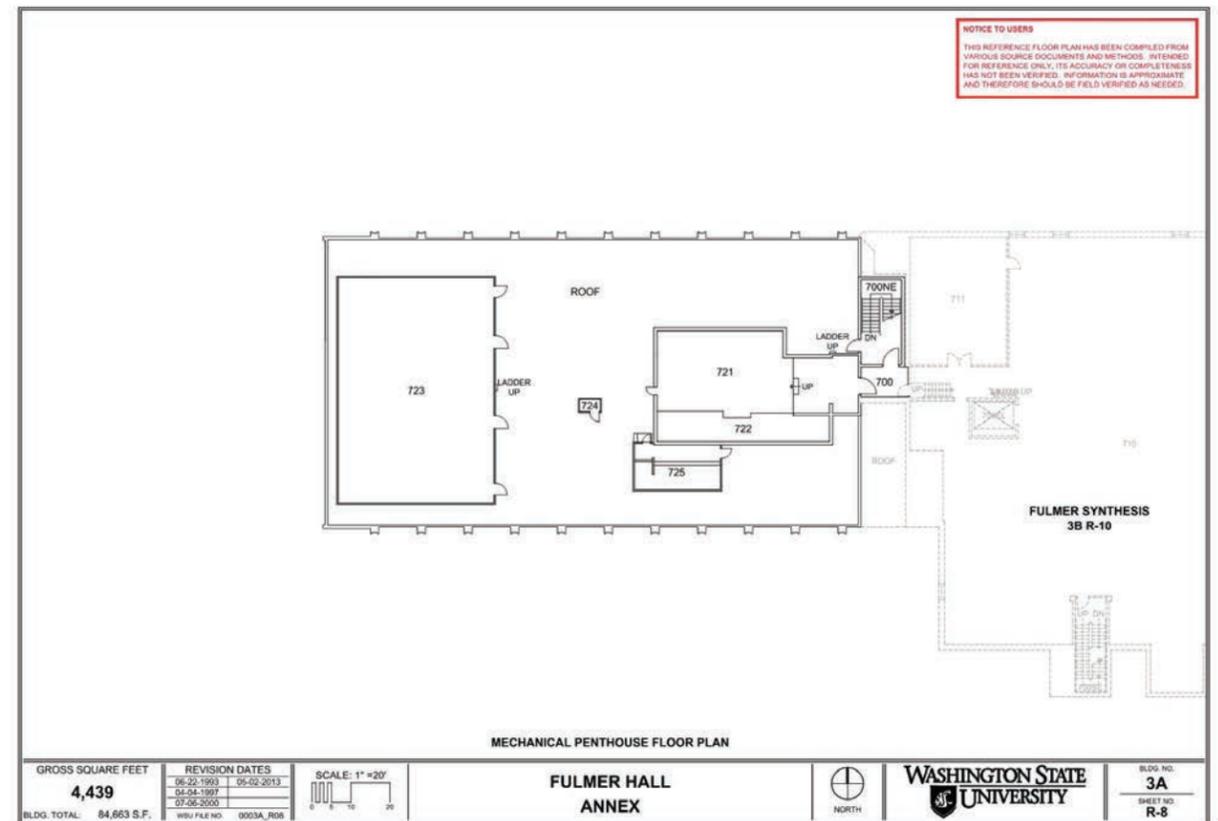
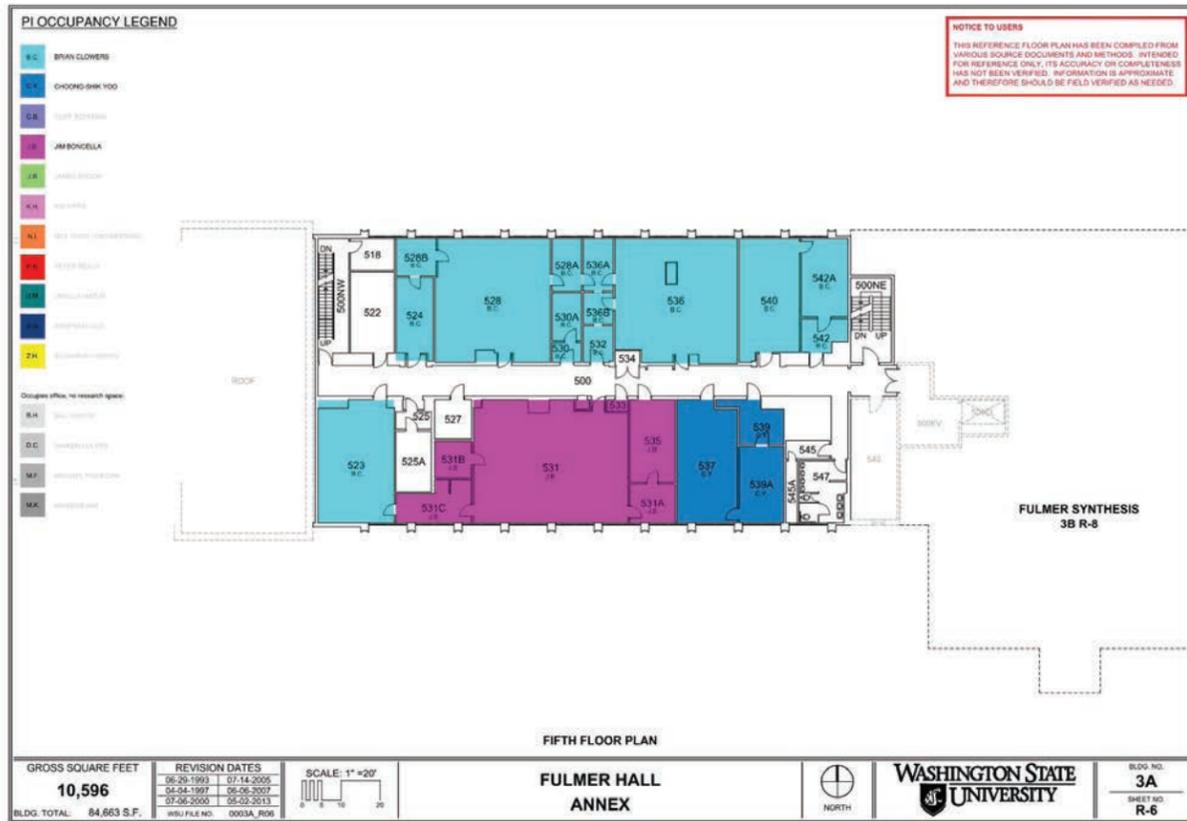
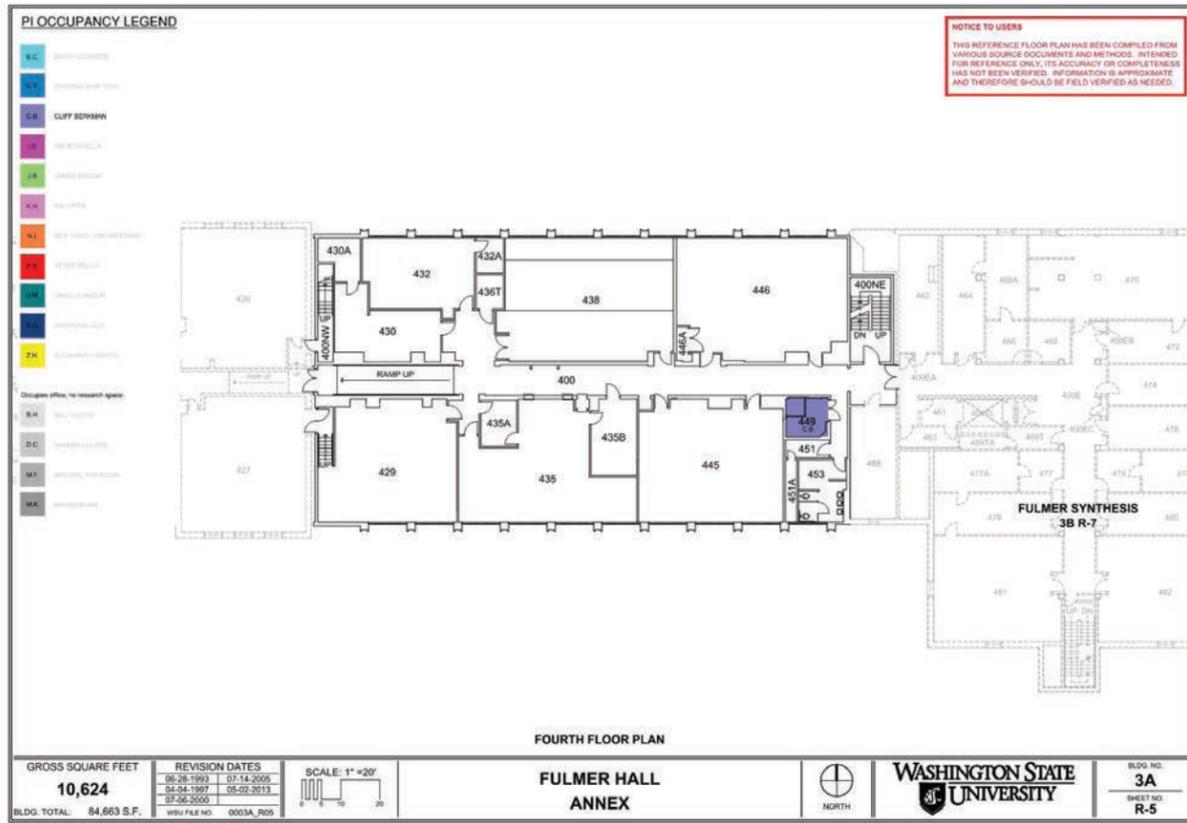
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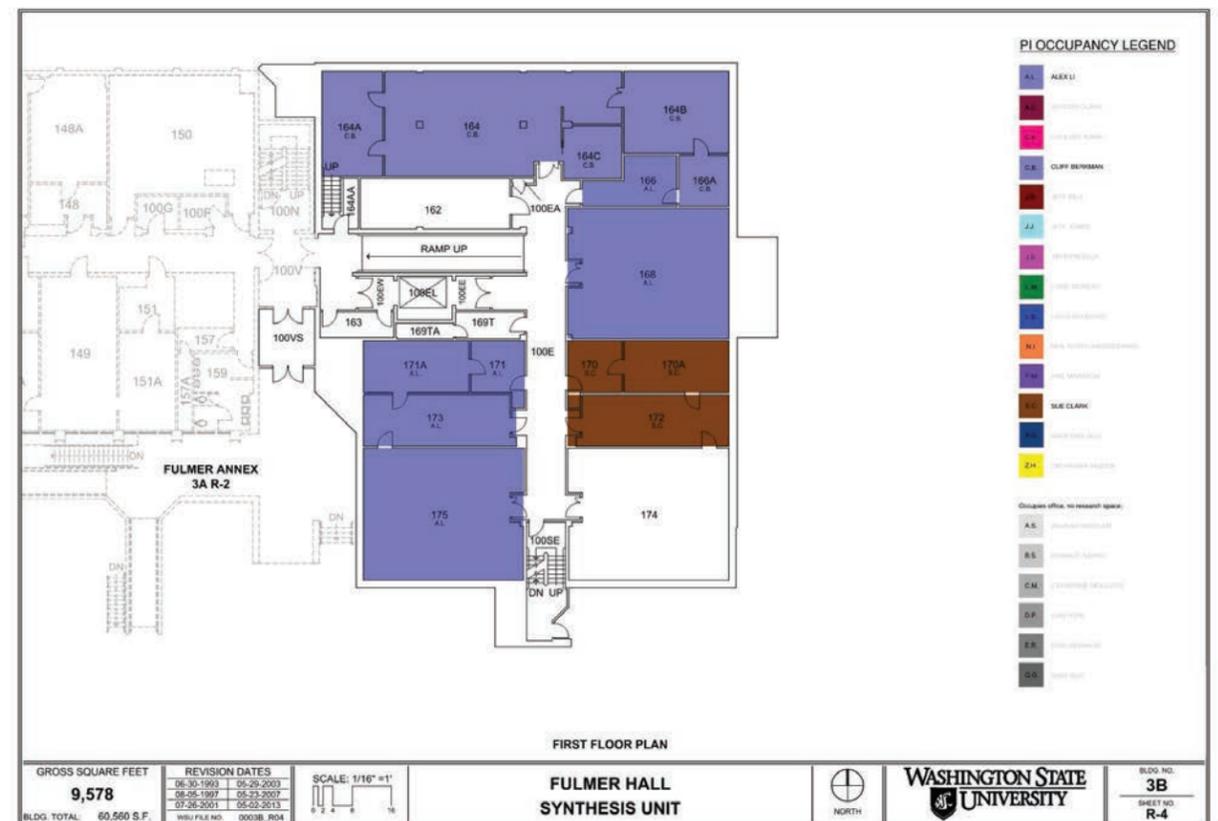
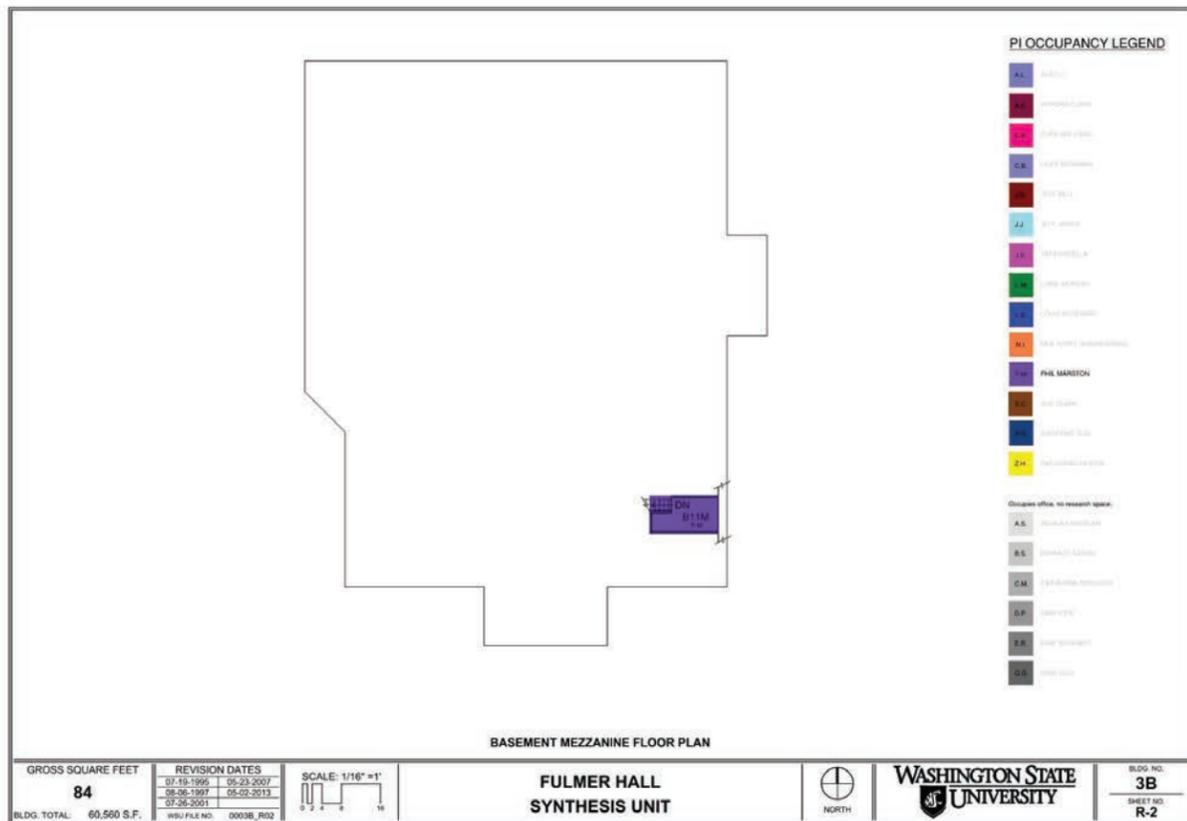
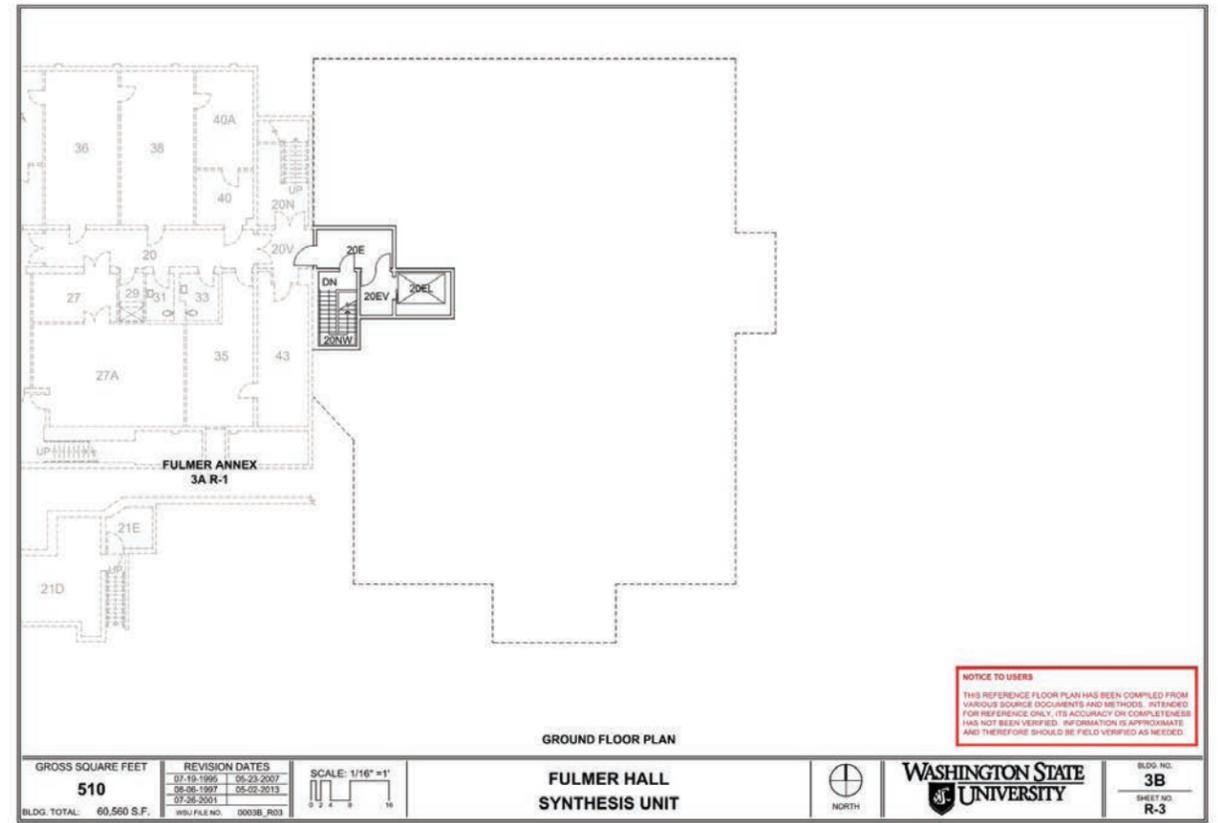
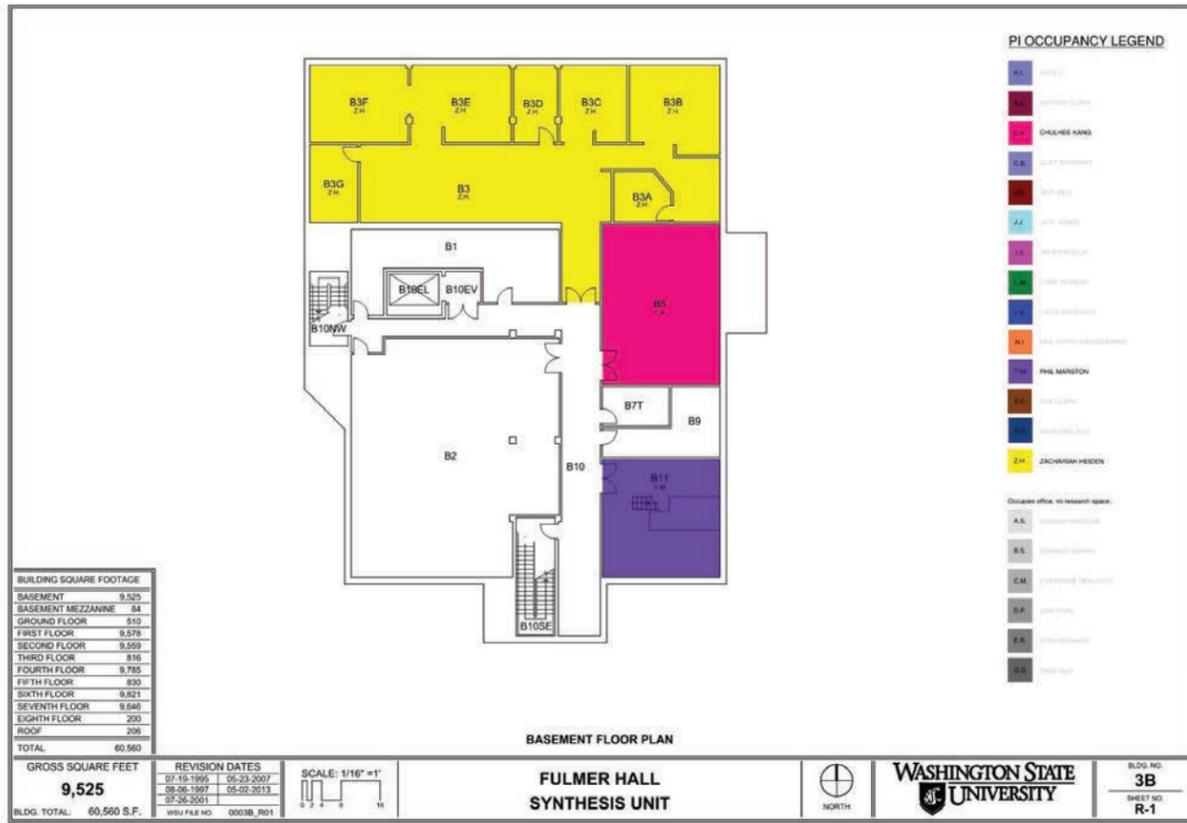
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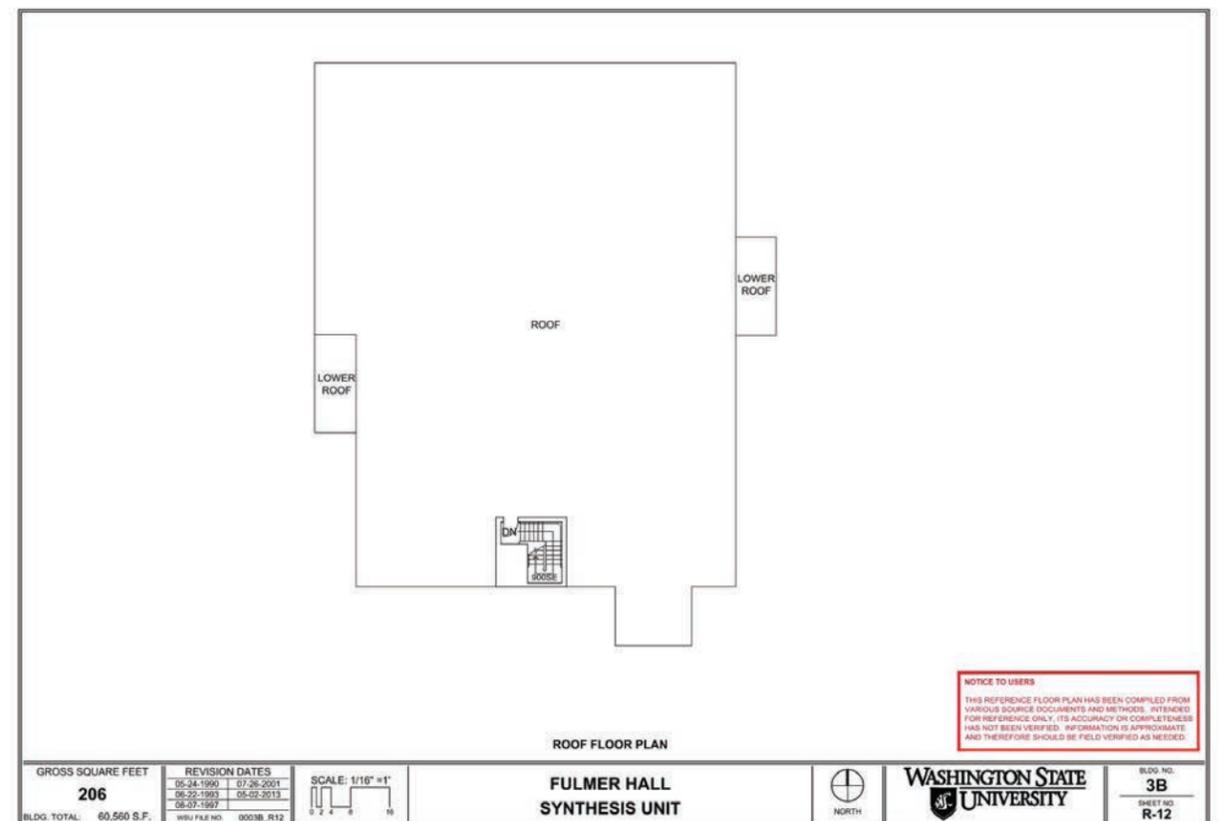
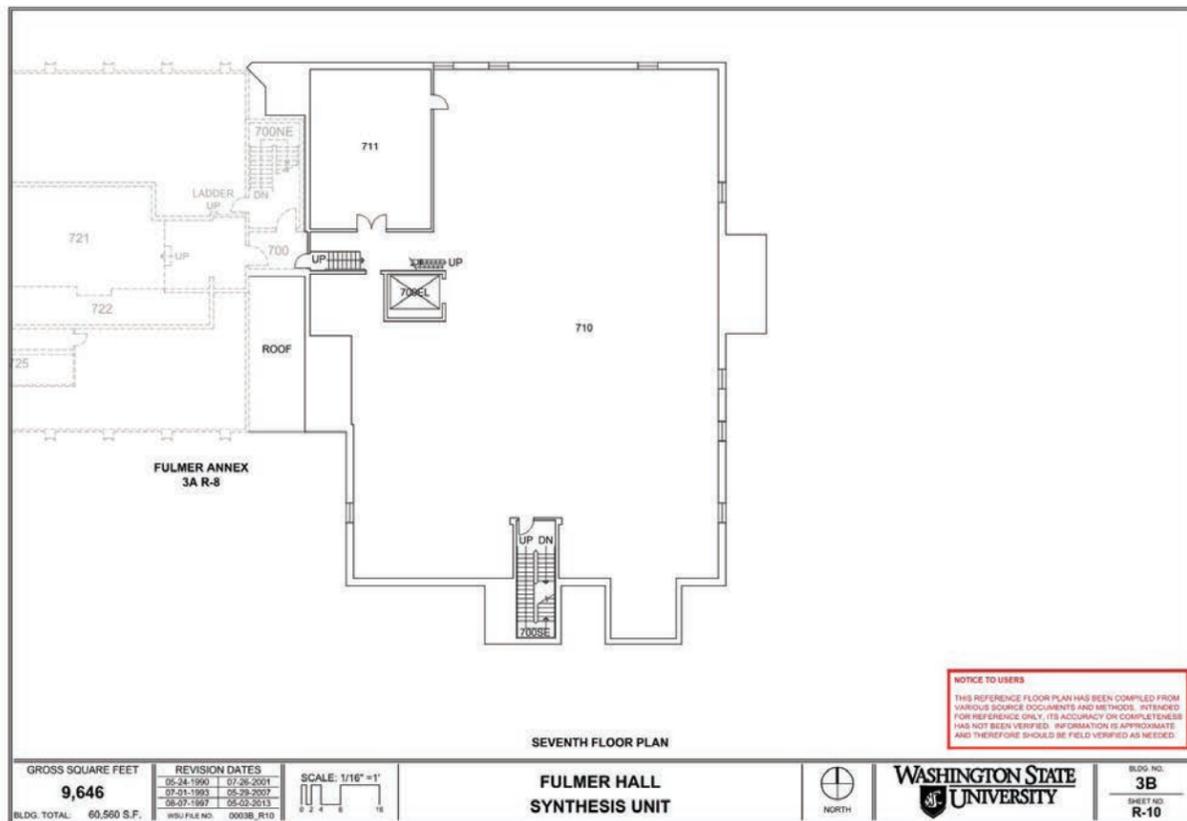
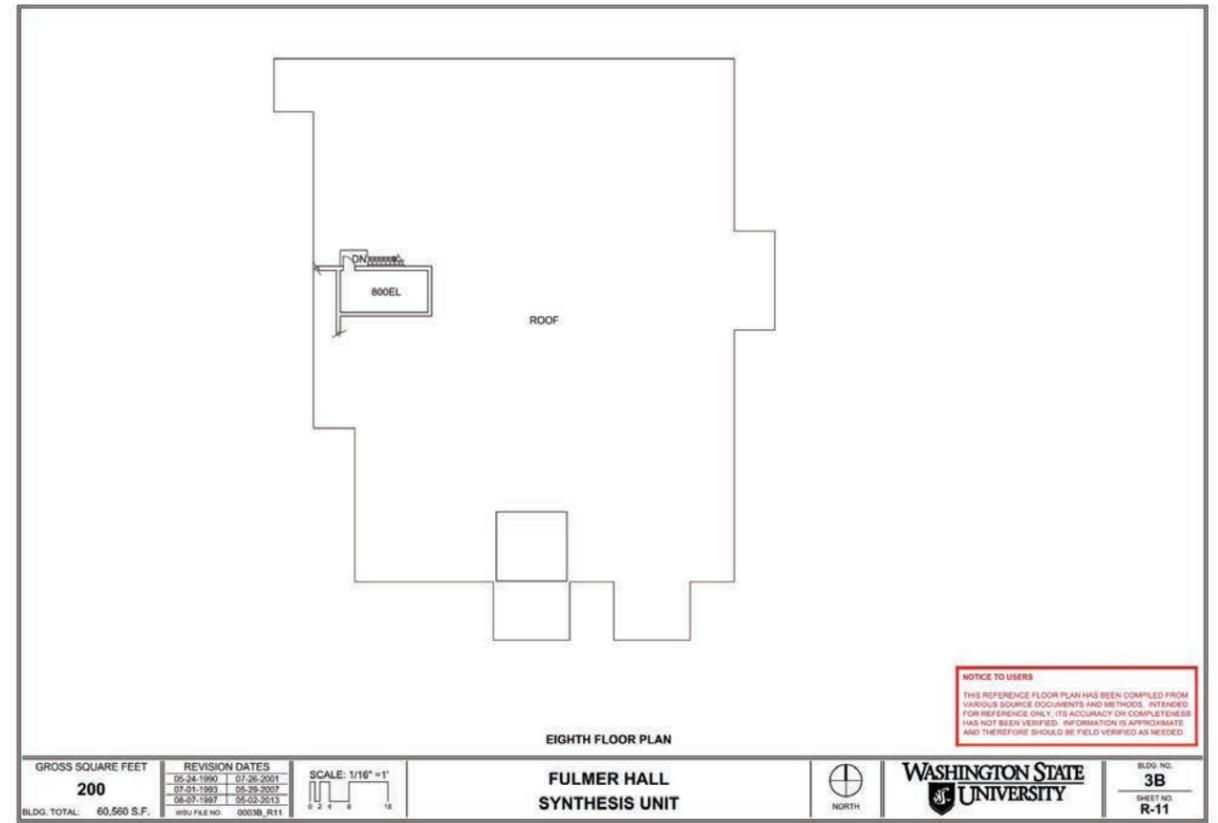
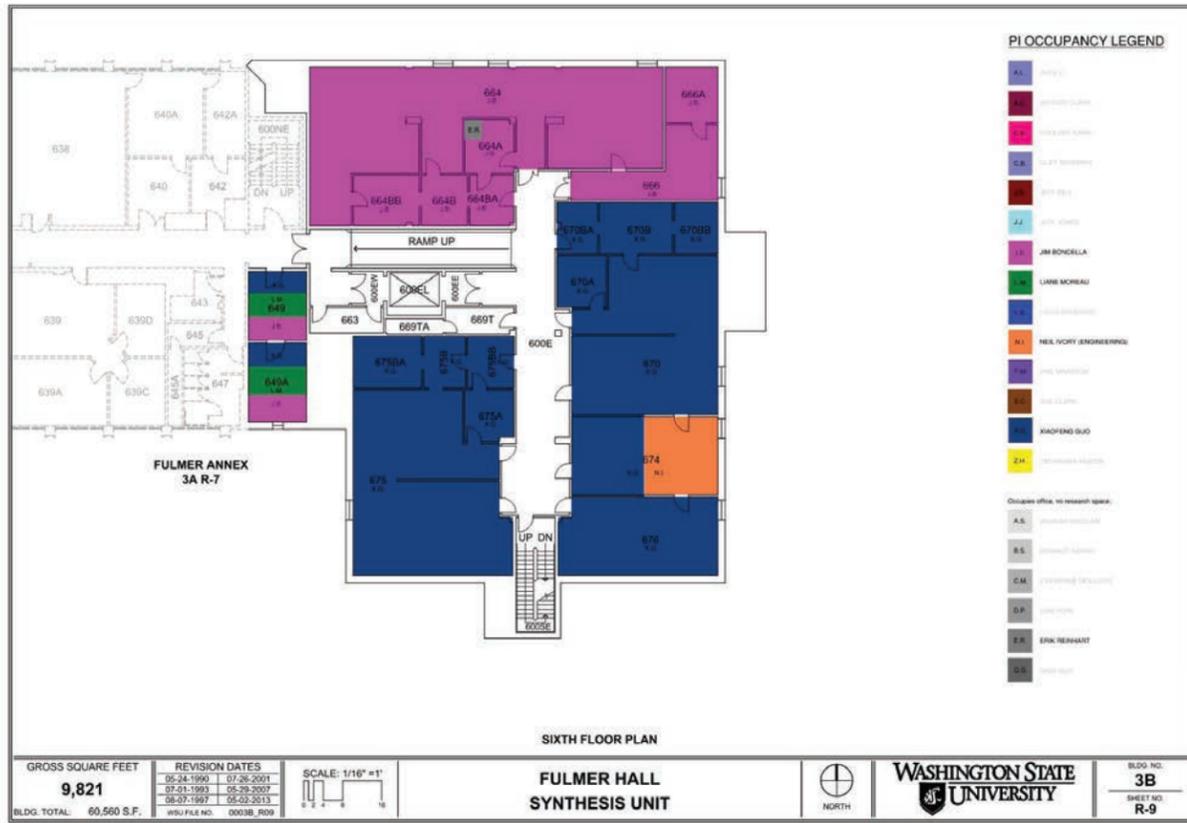
PI OCCUPANCY PLANS - FULMER ANNEX



PI OCCUPANCY PLANS - FULMER SYNTH



PI OCCUPANCY PLANS - FULMER SYNTH



Ownership Option 1 Information Sheet

* **Requires a user input** Green Cell = Value can be entered by user. Yellow Cell = Calculated value.

*	Project Description	3 Floors with full-buildout to include 10 research lab, lab support and office modules.	
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*	Construction or Purchase/Remodel	Construction
---	---	--------------

*	Project Location	Pullman	Market Area = Eastern Counties
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*	Statistics	
*	Gross Sq Ft	49,020
*	Usable Sq Ft	33,824
	Space Efficiency	69%
	Estimated Acres Needed	3.00
	MACC Cost per Sq Ft	\$751.69
	Estimated Total Project Costs per Sq Ft	\$1,410.16
	Escalated MACC Cost per Sq Ft	\$1,132.16
	Escalated Total Project Costs per Sq Ft	\$2,123.93

*	Move In Date	8/1/2028
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Interim Lease Information	Start Date
Lease Start Date	
Length of Lease (in months)	
Square Feet (holdover/temp lease)	
Lease Rate- Full Serviced (\$/SF/Year)	
One Time Costs (if double move)	

Construction Cost Estimates (See Capital Budget System For Detail)			
	Known Costs	Estimated Costs	Cost to Use
Acquisition Costs Total	\$ 0	\$ 750,000	\$ 0
Consultant Services			
A & E Fee Percentage (if services not specified)	14.08%	6.34% Std	14.08%
Pre-Schematic Design services	\$ -		
Construction Documents	\$ 4,887,962		
Extra Services	\$ -		
Other Services	\$ -		
Design Services Contingency	\$ 244,398		
Consultant Services Total	\$ 5,132,360	\$ 2,222,123	\$ 5,132,360
Construction Contracts			
Site Work	\$ 2,131,997		
Related Project Costs	\$ -		
Facility Construction	\$ 34,715,641		
MACC SubTotal	\$ 36,847,638	\$ 17,739,358	\$ 36,847,638
Construction Contingency (5% default)	\$ 5,527,146	\$ 1,842,382	\$ 5,527,146
Non Taxable Items			\$ -
Sales Tax		\$ 3,316,287	\$ 3,316,287
Construction Additional Items Total	\$ 5,527,146	\$ 5,158,669	\$ 5,527,146
Equipment			
Equipment	\$ 1,105,429		
Non Taxable Items	\$ -		
Sales Tax	\$ -		
Equipment Total	\$ 1,105,429		\$ 1,105,429
Art Work Total	\$ 0	\$ 184,238	\$ 0
Other Costs			
General Conditions	\$ 2,947,811		
Contractor Overhead and Profit	\$ 3,316,287		
Insurance	\$ 736,953		
Other Costs Total	\$ 7,001,051		\$ 7,001,051
Project Management Total	\$ 13,512,545		\$ 13,512,545
Grand Total Project Cost	\$ 69,126,169	\$ 26,054,388	\$ 69,126,169

Construction One Time Project Costs		
One Time Costs	Estimate	Calculated
Moving Vendor and Supplies	\$ 0	\$ 1,853
Other (not covered in construction)		
Total	\$ 0	\$ 0

\$300 / Person in FY22

Ongoing Building Costs					
Added Services	New Building Operating Costs	Known Cost /GSF/ 2028	Estimated Cost /GSF/ 2028	Total Cost / Year	Cost / Month
<input checked="" type="checkbox"/>	Energy (Electricity, Natural Gas)	\$ -	\$ 1.48	\$ 72,724	\$ 6,060
<input checked="" type="checkbox"/>	Janitorial Services	\$ -	\$ 2.14	\$ 105,134	\$ 8,761
<input checked="" type="checkbox"/>	Utilities (Water, Sewer, & Garbage)	\$ -	\$ 0.53	\$ 26,086	\$ 2,174
<input checked="" type="checkbox"/>	Grounds	\$ -	\$ 0.08	\$ 3,952	\$ 329
<input checked="" type="checkbox"/>	Pest Control	\$ -	\$ 0.15	\$ 7,114	\$ 593
<input checked="" type="checkbox"/>	Security	\$ -	\$ 0.15	\$ 7,114	\$ 593
<input checked="" type="checkbox"/>	Maintenance and Repair	\$ -	\$ 8.37	\$ 410,258	\$ 34,188
<input checked="" type="checkbox"/>	Management	\$ -	\$ 1.21	\$ 59,286	\$ 4,940
<input checked="" type="checkbox"/>	Road Clearance	\$ -	\$ 0.21	\$ 10,276	\$ 856
<input checked="" type="checkbox"/>	Telecom	\$ -	\$ -	\$ -	\$ -
	Additional Parking	\$ -	\$ -	\$ -	\$ -
	Other	\$ -	\$ -	\$ -	\$ -
	Total Operating Costs	\$ -	\$ 14.32	\$ 701,945	\$ 58,495

Ownership Option 2 Information Sheet

* Requires a user input Green Cell = Value can be entered by user. Yellow Cell = Calculated value.

*	Project Description	4 Floors with full-buildout to include 14 research lab, lab support and office modules.
---	----------------------------	---

*	Construction or Purchase/Remodel	Construction
---	---	--------------

*	Project Location	Pullman	Market Area = Eastern Counties
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*	Statistics	
*	Gross Sq Ft	65,915
*	Usable Sq Ft	45,481
	Space Efficiency	69%
	Estimated Acres Needed	3.00
	MACC Cost per Sq Ft	\$724.85
	Estimated Total Project Costs per Sq Ft	\$1,251.09
	Escalated MACC Cost per Sq Ft	\$1,091.74
	Escalated Total Project Costs per Sq Ft	\$1,884.35

*	Move In Date	8/1/2028
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Interim Lease Information	Start Date
Lease Start Date	
Length of Lease (in months)	
Square Feet (holdover/temp lease)	
Lease Rate- Full Serviced (\$/SF/Year)	
One Time Costs (if double move)	

Construction Cost Estimates (See Capital Budget System For Detail)			
	Known Costs	Estimated Costs	Cost to Use
Acquisition Costs Total	\$ 0	\$ 750,000	\$ 0
Consultant Services			
A & E Fee Percentage (if services not specified)	14.08%	6.03% Std	14.08%
Pre-Schematic Design services	\$ -		
Construction Documents	\$ 6,427,032		
Extra Services	\$ -		
Other Services	\$ -		
Design Services Contingency	\$ -		
Consultant Services Total	\$ 6,427,032	\$ 2,881,318	\$ 6,427,032
Construction Contracts			
Site Work	\$ 2,131,997		
Related Project Costs	\$ -		
Facility Construction	\$ 45,646,537		
MACC SubTotal	\$ 47,778,534	\$ 23,853,320	\$ 47,778,534
Construction Contingency (5% default)	\$ 321,352	\$ 321,352	\$ 321,352
Non Taxable Items	\$ -		\$ -
Sales Tax	\$ -	\$ 4,300,068	\$ 4,300,068
Construction Additional Items Total	\$ 321,352	\$ 321,352	\$ 321,352
Equipment			
Equipment	\$ 1,433,356		
Non Taxable Items	\$ -		
Sales Tax	\$ -		
Equipment Total	\$ 1,433,356		\$ 1,433,356
Art Work Total	\$ 0	\$ 238,893	\$ 0
Other Costs			
General Conditions, Overhead & Profit	\$ 3,822,283		
Contractor Overhead and Profit	\$ 4,300,068		
Insurance	\$ 955,571		
Other Costs Total	\$ 9,077,922		\$ 9,077,922
Project Management Total	\$ 17,427,554		\$ 17,427,554
Grand Total Project Cost		\$ 28,044,883	\$ 82,465,750

A & E
MACC

Construction One Time Project Costs		
One Time Costs	Estimate	Calculated
Moving Vendor and Supplies	\$ 0	\$ 1,853
Other (not covered in construction)	\$ -	
Total	\$ 0	\$ 0

\$300 / Person in FY22

Ongoing Building Costs					
Added Services	New Building Operating Costs	Known Cost /GSF/ 2028	Estimated Cost /GSF/ 2028	Total Cost / Year	Cost / Month
<input checked="" type="checkbox"/>	Energy (Electricity, Natural Gas)	\$ -	\$ 1.48	\$ 97,789	\$ 8,149
<input checked="" type="checkbox"/>	Janitorial Services	\$ -	\$ 2.14	\$ 141,369	\$ 11,781
<input checked="" type="checkbox"/>	Utilities (Water, Sewer, & Garbage)	\$ -	\$ 0.53	\$ 35,076	\$ 2,923
<input checked="" type="checkbox"/>	Grounds	\$ -	\$ 0.08	\$ 5,315	\$ 443
<input checked="" type="checkbox"/>	Pest Control	\$ -	\$ 0.15	\$ 9,566	\$ 797
<input checked="" type="checkbox"/>	Security	\$ -	\$ 0.15	\$ 9,566	\$ 797
<input checked="" type="checkbox"/>	Maintenance and Repair	\$ -	\$ 8.37	\$ 551,656	\$ 45,971
<input checked="" type="checkbox"/>	Management	\$ -	\$ 1.21	\$ 79,719	\$ 6,643
<input checked="" type="checkbox"/>	Road Clearance	\$ -	\$ 0.21	\$ 13,818	\$ 1,151
<input checked="" type="checkbox"/>	Telecom	\$ -	\$ -	\$ -	\$ -
	Additional Parking	\$ -	\$ -	\$ -	\$ -
	Other	\$ -	\$ -	\$ -	\$ -
	Total Operating Costs	\$ -	\$ 14.32	\$ 943,874	\$ 78,656

Ownership Option 3 Information Sheet

Requires a user input Green Cell = Value can be entered by user. Yellow Cell = Calculated value

Project Description	5 Floors with full-buildout to include 18 research lab, lab support and office modules.
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Construction or Purchase/Remodel	Construction
---	--------------

Project Location	Pullman	Market Area = Eastern Counties
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Statistics	
Gross Sq Ft	82,810
Usable Sq Ft	57,139
Space Efficiency	69%
Estimated Acres Needed	4.00
MACC Cost per Sq Ft	\$708.97
Estimated Total Project Costs per Sq Ft	\$1,326.47
Escalated MACC Cost per Sq Ft	\$1,067.82
Escalated Total Project Costs per Sq Ft	\$1,997.88

Move In Date	8/1/2028
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Interim Lease Information	Start Date
Lease Start Date	
Length of Lease (in months)	
Square Feet (holdover/temp lease)	
Lease Rate- Full Serviced (\$/SF/Year)	
One Time Costs (if double move)	

Construction Cost Estimates (See Capital Budget System For Detail)			
	Known Costs	Estimated Costs	Cost to Use
Acquisition Costs Total	\$ 0	\$ 1,000,000	\$ 0
Consultant Services			
A & E Fee Percentage (if services not specified)	14.08%	5.79% Std	14.08%
Pre-Schematic Design services	\$ -		
Construction Documents	\$ 7,966,103		
Extra Services	\$ -		
Other Services	\$ -		
Design Services Contingency	\$ 398,305		
Consultant Services Total	\$ 8,364,408	\$ 3,399,247	\$ 8,364,408
Construction Contracts			
Site Work	\$ 2,131,997		
Related Project Costs	\$ -		
Facility Construction	\$ 56,577,433		
MACC SubTotal	\$ 58,709,430	\$ 29,967,283	\$ 58,709,430
Construction Contingency (5% default)	\$ 8,806,415	\$ 8,806,415	\$ 8,806,415
Non Taxable Items	\$ -		\$ -
Sales Tax	\$ -	\$ 5,283,849	\$ 5,283,849
Construction Additional Items Total	\$ 8,806,415	\$ 8,806,415	\$ 8,806,415
Equipment			
Equipment	\$ 1,174,189		
Non Taxable Items	\$ -		
Sales Tax	\$ -		
Equipment Total	\$ 1,174,189		\$ 1,174,189
Art Work Total	\$ -	\$ 293,547	\$ 293,547
Other Costs			
General Conditions	\$ 4,696,754		
Contractor Overhead and Profit	\$ 5,283,849		
Insurance	\$ 1,174,189		
Other Costs Total	\$ 11,154,792		\$ 11,154,792
Project Management Total	\$ 21,342,564		\$ 21,342,564
Grand Total Project Cost		\$ 43,466,492	\$ 109,845,345

Construction One Time Project Costs		
One Time Costs	Estimate	Calculated
Moving Vendor and Supplies	\$ 0	\$ 1,853
Other (not covered in construction)		
Total	\$ 0	\$ 0

\$300 / Person in FY22

Ongoing Building Costs					
Added Services	New Building Operating Costs	Known Cost /GSF/ 2028	Estimated Cost /GSF/ 2028	Total Cost / Year	Cost / Month
<input checked="" type="checkbox"/>	Energy (Electricity, Natural Gas)	\$ -	\$ 1.48	\$ 122,853	\$ 10,238
<input checked="" type="checkbox"/>	Janitorial Services	\$ -	\$ 2.14	\$ 177,603	\$ 14,800
<input checked="" type="checkbox"/>	Utilities (Water, Sewer, & Garbage)	\$ -	\$ 0.53	\$ 44,067	\$ 3,672
<input checked="" type="checkbox"/>	Grounds	\$ -	\$ 0.08	\$ 6,677	\$ 556
<input checked="" type="checkbox"/>	Pest Control	\$ -	\$ 0.15	\$ 12,018	\$ 1,002
<input checked="" type="checkbox"/>	Security	\$ -	\$ 0.15	\$ 12,018	\$ 1,002
<input checked="" type="checkbox"/>	Maintenance and Repair	\$ -	\$ 8.37	\$ 693,054	\$ 57,754
<input checked="" type="checkbox"/>	Management	\$ -	\$ 1.21	\$ 100,152	\$ 8,346
<input checked="" type="checkbox"/>	Road Clearance	\$ -	\$ 0.21	\$ 17,360	\$ 1,447
<input checked="" type="checkbox"/>	Telecom	\$ -	\$ -	\$ -	\$ -
	Additional Parking	\$ -	\$ -	\$ -	\$ -
	Other	\$ -	\$ -	\$ -	\$ -
	Total Operating Costs	\$ -	\$ 14.32	\$ 1,185,803	\$ 98,817

Life Cycle Cost Analysis - Project Summary

Agency	Washington State University
Project Title	WSU Pullman Sciences Building

Existing Description	
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Lease Option 1 Description	
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Lease Option 2 Description	
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Ownership Option 1 Description	3 Floors with full-buildout to include 10 research lab, lab support and office modules.
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Ownership Option 2 Description	4 Floors with full-buildout to include 14 research lab, lab support and office modules.
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Ownership Option 3 Description	5 Floors with full-buildout to include 18 research lab, lab support and office modules.
---------------------------------------	---

Lease Options Information	Existing Lease	Lease Option 1	Lease Option 2
Total Rentable Square Feet	-	17,569	-
Annual Lease Cost (Initial Term of Lease)	\$ -	\$ -	\$ -
Full Service Cost/SF (Initial Term of Lease)	\$ -	\$ -	\$ -
Occupancy Date	n/a	12/20/2029	
Project Initial Costs	n/a	\$ -	\$ -
Persons Relocating	6	6	-
RSF/Person Calculated	-	2,928	-

Ownership Information	Ownership 1	Ownership 2	Ownership 3
Total Gross Square Feet	49,020	65,915	82,810
Total Rentable Square Feet	33,824	45,481	57,139
Occupancy Date	8/1/2028	8/1/2028	8/1/2028
Initial Project Costs	\$ 0	\$ 0	\$ 0
Est Construction TPC (\$/GSF)	\$ 2,124	\$ 1,884	\$ 1,998
RSF/Person Calculated	5,637	7,580	7,580

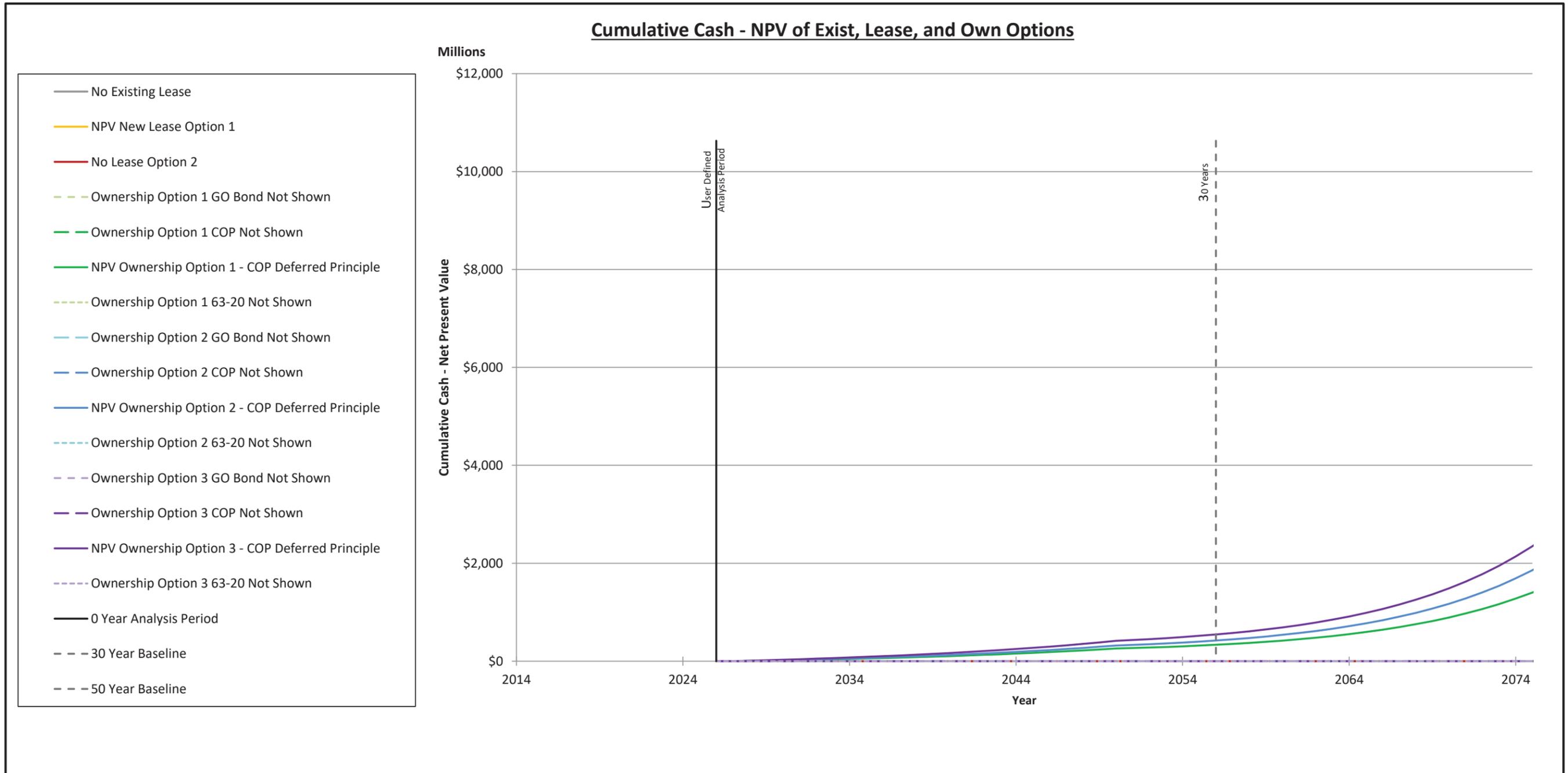
Financial Analysis of Options

		Display Option?	Yes	Yes	Yes	No	No	Yes	No	No	No	Yes	No	No	No	Yes	No
		Financial Comparisons	Existing Lease	Lease 1	Lease 2	Ownership 1				Ownership 2				Ownership 3			
Years	Financing Means	Current	Current	Current	GO Bond	COP	COP Deferred *	63-20	GO Bond	COP	COP Deferred	63-20	GO Bond	COP	COP Deferred	63-20	
0	0 Year Cumulative Cash	\$ -	\$ -	\$ -			\$ -				\$ -				\$ -		
	0 Year Net Present Value	\$ -	\$ -	\$ -			\$ -				\$ -				\$ -		
	Lowest Cost Option (Analysis Period)																

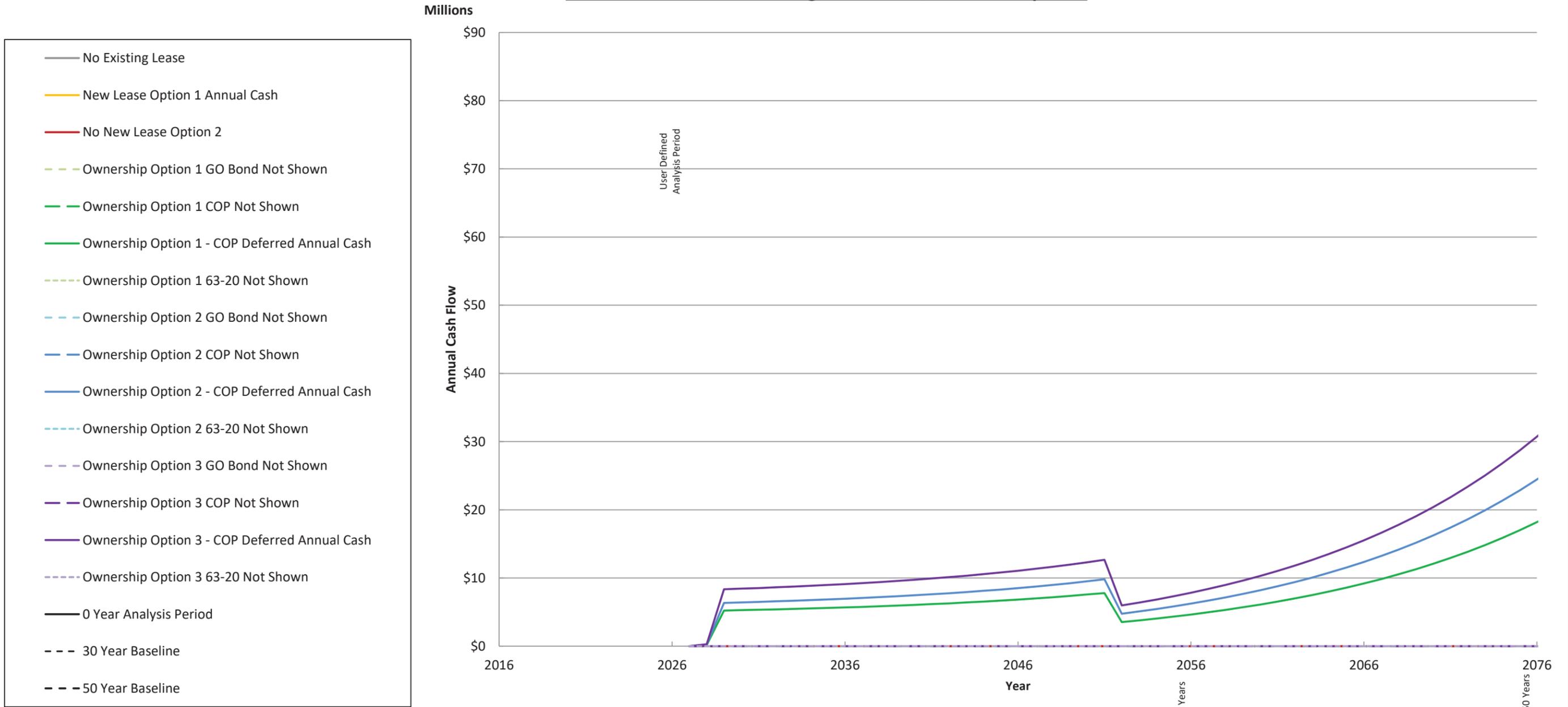
		Existing Lease	Lease 1	Lease 2	Ownership 1				Ownership 2				Ownership 3			
Years	Financing Means	Current	Current	Current	GO Bond	COP	COP Deferred *	63-20	GO Bond	COP	COP Deferred	63-20	GO Bond	COP	COP Deferred	63-20
30	30 Year Cumulative Cash	\$ -	\$ -	\$ -			\$ 163,081,187				\$ 203,611,292				\$ 264,289,728	
	30 Year Net Present Value	\$ -	\$ -	\$ -			\$ 317,049,739				\$ 398,844,056				\$ 515,954,947	
	Lowest Cost Option (30 Years)						1				2				3	

		Existing Lease	Lease 1	Lease 2	Ownership 1				Ownership 2				Ownership 3			
Years	Financing Means	Current	Current	Current	GO Bond	COP	COP Deferred *	63-20	GO Bond	COP	COP Deferred	63-20	GO Bond	COP	COP Deferred	63-20
50	50 Year Cumulative Cash	\$ -	\$ -	\$ -			\$ 367,114,972				\$ 477,966,391				\$ 608,966,141	
	50 Year Net Present Value	\$ -	\$ -	\$ -			#####				#####				#####	
	Lowest Cost Option (50 Years)						1				2				3	

* - Defers payment on principle for 2 years while the building is being constructed. See instructions on Capitalized Interest.



Annual Cash Flow of Existing, New Lease, and Own Options



Financial Assumptions

Date of Life Cycle Cost Analysis:	4/26/2022
Analysis Period Start Date	8/2/2026
User Input Years of Analysis	0

All assumptions subject to change to reflect updated costs and conditions.

	Lease Options			Ownership Option 1			Ownership Option 2			Ownership Option 3		
	Existing Lease	Lease Option 1	Lease Option 2	GO Bond	COP	63-20	GO Bond	COP	63-20	GO Bond	COP	63-20
Inflation / Interest Rate	7.064%	7.064%	7.064%	2.881%	2.981%	3.081%	2.881%	2.981%	3.081%	2.881%	2.981%	3.081%
Discount Rate	-3.814%	-3.814%	-3.814%	-3.814%	-3.814%	-3.814%	-3.814%	-3.814%	-3.814%	-3.814%	-3.814%	-3.814%
Length of Financing	N/A	N/A	N/A	25	25	25	25	25	25	25	25	25

See Financial Assumptions tab for more detailed information

COP Deferred and 63-20 Financing defer the payment on principle until construction completion.

New Lease Assumptions

Real Estate Transaction fees are 2.5% of the lease for the first 5 years and 1.25% for each year thereafter in the initial term of the lease.

Tenant Improvements are typically estimated at \$19 per rentable square foot.

IT infrastructure is typically estimated at \$1500 per person.

Furniture costs are typically estimated at \$7000 per person and do not include new workstations.

Moving Vendor and Supplies are typically estimated at \$300 per person.

Default Ownership Options Assumptions

Assumes a 2 month lease to move-in overlap period for outfitting building and relocation.

Assumes surface parking.

The floor plate of the construction option office building is 25,000 gross square feet.

The estimated total project cost for construction is \$506.63 per square foot.

See the Capital Construction Defaults tab for more construction assumptions.



COST ESTIMATE

Washington State University Demolition of Heald Hall & Site Prep Estimate

Pullman, WA

Gensler
CONCEPT DESIGN DOCUMENTS
OCMI JOB #: 211031.000
27 May 2022

INTRODUCTORY NOTES

This estimate is based on verbal direction from the client and the following items, received 5/13/2022 through 5/26/2022:

Specifications and Reports

WSU Pullman Site 1 Option 2 estimate comments dated May 13, 2022.

The following items are excluded from this estimate:

- Professional fees.
- Building permits and fees.
- Inspections and tests.
- Furniture, fixtures & equipment, except as noted.
- Installation of owner furnished equipment.
- Construction change order contingency.
- Overtime.
- Hazardous material abatement/removal.
- Items referenced as NOT INCLUDED or NIC in estimate.

The midpoint of construction of October 2025 is based on:

- Construction start date of January 2025
- Estimated construction duration of 18 months

- Please note that the first summary sheet shows total project costs for each area including markups, while the second summary sheet shows the Net Direct Construction cost for each area and then adds in markups separately.
- This estimate is based on a Design-Build delivery method.
- This estimate is based on prevailing wage labor rates.
- This estimate is based on a detailed measurement of quantities. We have made allowances for items that were not clearly defined in the drawings. The client should verify these allowances.
- This estimate is based on a minimum of four competitive bids and a stable bidding market.
- This estimate should be updated if more definitive information becomes available, or if there is any change in scope.
- We strongly advise the client to review this estimate in detail. If any interpretations in this estimate appear to differ from those intended by the design documents, they should be addressed immediately.



CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

PROJECT SUMMARY

ELEMENT	TOTAL COST	GFA	\$/SF AREA
CONSTRUCTION COST FUNDED 2025 - 2027			
01. HEALD BUILDING DEMOLITION AND PEDESTRIAN BRIDGE DEMOLITION	\$3,844,329	84,398	\$45.55
02. SITE UTILITY AND FOUNDATION PREP SITE 1, OPTION 2	\$1,475,351	32,495	\$45.40
TOTAL CONSTRUCTION COST	\$5,319,680		
DESIGN FEE	\$5,000,000		
UNIVERSITY PROJECT MANAGEMENT FEES	38.00% \$7,600,000		
TOTAL CONSTRUCTION COST	\$17,919,680		

CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

DETAILED PROJECT SUMMARY

ELEMENT	TOTAL COST	GFA	\$/SF AREA
01. HEALD BUILDING DEMOLITION AND PEDESTRIAN BRIDGE DEMOLITION	\$2,137,334	84,398	\$25.32
02. SITE UTILITY AND FOUNDATION PREP SITE 1, OPTION 2	\$820,252	32,495	\$25.24
TOTAL NET DIRECT COST	\$2,957,586		
GENERAL MARKUPS			
DESIGN CONTINGENCY	10.00% \$295,759		
ESCALATION TO MIDPOINT 10/2025	17.08% \$555,780		
CONTRACTOR CONTINGENCY			
GENERAL CONDITIONS/REQUIREMENTS	25.00% \$952,281		
CONTRACTOR OVERHEAD AND PROFIT	9.00% \$428,526		
INSURANCE	2.50% \$129,748		
CONSTRUCTION COST	\$5,319,680		
DESIGN FEE	\$5,000,000		
UNIVERSITY PROJECT MANAGEMENT FEES	38.00% \$7,600,000		
TOTAL CONSTRUCTION COST	\$17,919,680		

BUILDING SUMMARY

ELEMENT		TOTAL COST	\$/SF AREA
A SUBSTRUCTURE			
B SHELL		\$42,000	\$0.50
C INTERIORS		\$15,750	\$0.19
D SERVICES			
E EQUIPMENT AND FURNISHINGS			
F OTHER BUILDING CONSTRUCTION		\$2,079,584	\$24.64
G BUILDING SITEWORK			
NET DIRECT BUILDING COST		\$2,137,334	\$25.32
DESIGN CONTINGENCY	10.00%	\$213,733	\$2.53
SUBTOTAL		\$2,351,067	\$27.86
ESCALATION TO MIDPOINT 10/2025	17.08%	\$401,641	\$4.76
SUBTOTAL		\$2,752,708	\$32.62
GENERAL CONDITIONS/REQUIREMENTS	25.00%	\$688,177	\$8.15
SUBTOTAL		\$3,440,885	\$40.77
CONTRACTOR OVERHEAD AND PROFIT	9.00%	\$309,680	\$3.67
SUBTOTAL		\$3,750,565	\$44.44
INSURANCE	2.50%	\$93,764	\$1.11
TOTAL BUILDING COST		\$3,844,329	\$45.55

GROSS FLOOR AREA: 84,398 SF

DETAILED SUMMARY

ELEMENT		TOTAL COST	\$/SF AREA
A10 FOUNDATIONS			
A20 BASEMENT CONSTRUCTION			
B10 SUPERSTRUCTURE		\$10,500	\$0.12
B20 EXTERIOR CLOSURE		\$31,500	\$0.37
B30 ROOFING			
C10 INTERIOR CONSTRUCTION		\$15,750	\$0.19
F20 SELECTIVE DEMOLITION (OTHER THAN HAZMAT)		\$2,079,584	\$24.64
G90 OTHER SITE CONSTRUCTION			
NET DIRECT BUILDING COST		\$2,137,334	\$25.32
DESIGN CONTINGENCY	10.00%	\$213,733	\$2.53
SUBTOTAL		\$2,351,067	\$27.86
ESCALATION TO MIDPOINT 10/2025	17.08%	\$401,641	\$4.76
SUBTOTAL		\$2,752,708	\$32.62
GENERAL CONDITIONS/REQUIREMENTS	25.00%	\$688,177	\$8.15
SUBTOTAL		\$3,440,885	\$40.77
CONTRACTOR OVERHEAD AND PROFIT	9.00%	\$309,680	\$3.67
SUBTOTAL		\$3,750,565	\$44.44
INSURANCE	2.50%	\$93,764	\$1.11
TOTAL BUILDING COST		\$3,844,329	\$45.55

CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
B SHELL				
B10 SUPERSTRUCTURE				
Floor Construction				
Patch repair metal deck and associated items at new infill	1	LS	10,500.00	\$10,500
B10 SUPERSTRUCTURE				\$10,500
B20 EXTERIOR ENCLOSURE				
Infill pedestrian opening, match existing, Allow	1	LS	31,500.00	\$31,500
B20 EXTERIOR CLOSURE				\$31,500
B SHELL				\$42,000
C INTERIORS				
C10 INTERIOR CONSTRUCTION				
Interior framing, gypsum board, paint at interior of exterior infill	1	LS	15,750.00	\$15,750
C10 INTERIOR CONSTRUCTION				\$15,750
F20 SELECTIVE DEMOLITION (OTHER THAN HAZMAT)				
Complete building demolition				
Heald building, including	86,262	SF	23.46	\$2,023,353
- basement				
- Ground floor through 5th floor				
- Penthouse				
Haul off, included in above square foot cost		NOTE		
Demolish pedestrian bridge completely	1,772	SF	22.96	\$40,689
Haul off construction debris, Allow	197	CY	25.61	\$5,042
Protect/shield off bridge connection opening to existing 'building to remain'	1	LS	10,500.00	\$10,500
F20 SELECTIVE DEMOLITION (OTHER THAN HAZMAT)				\$2,079,584
F SPECIAL CONSTRUCTION AND DEMOLITION				\$2,079,584

CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

BUILDING SUMMARY

ELEMENT	TOTAL COST	\$/SF AREA
A SUBSTRUCTURE		
B SHELL		
C INTERIORS		
D SERVICES		
E EQUIPMENT AND FURNISHINGS		
F OTHER BUILDING CONSTRUCTION		
G BUILDING SITEWORK	\$820,252	\$25.24
NET DIRECT BUILDING COST	\$820,252	\$25.24
DESIGN CONTINGENCY 10.00%	\$82,025	\$2.52
SUBTOTAL	\$902,277	\$27.77
ESCALATION TO MIDPOINT 10/2025 17.08%	\$154,139	\$4.74
SUBTOTAL	\$1,056,416	\$32.51
GENERAL CONDITIONS/REQUIREMENTS 25.00%	\$264,104	\$8.13
SUBTOTAL	\$1,320,520	\$40.64
CONTRACTOR OVERHEAD AND PROFIT 9.00%	\$118,847	\$3.66
SUBTOTAL	\$1,439,367	\$44.30
INSURANCE 2.50%	\$35,984	\$1.11
TOTAL BUILDING COST	\$1,475,351	\$45.40

GROSS FLOOR AREA: 32,495 SF

DETAILED SUMMARY

ELEMENT	TOTAL COST	\$/SF AREA
A10 FOUNDATIONS		
A20 BASEMENT CONSTRUCTION		
B10 SUPERSTRUCTURE		
B20 EXTERIOR CLOSURE		
B30 ROOFING		
C10 INTERIOR CONSTRUCTION		
C20 STAIRWAYS		
C30 INTERIOR FINISHES		
D10 CONVEYING SYSTEMS		
D20 PLUMBING SYSTEMS		
D30 HVAC SYSTEMS		
D40 FIRE PROTECTION SYSTEMS		
D50 ELECTRICAL SYSTEMS (OTHER THAN TELECOM)		
D5050 TELECOM		
E10 EQUIPMENT		
E20 FURNISHINGS		
F10 SPECIAL CONSTRUCTION		
F20 SELECTIVE DEMOLITION (OTHER THAN HAZMAT)		
F2020 HAZMAT ABATEMENT		
G10 SITE PREPARATION	\$633,987	\$19.51
G20 SITE IMPROVEMENTS		
G30 SITE CIVIL/MECHANICAL UTILITIES	\$65,515	\$2.02
G40 SITE ELECTRICAL UTILITIES	\$120,750	\$3.72
G90 OTHER SITE CONSTRUCTION		
NET DIRECT BUILDING COST	\$820,252	\$25.24
DESIGN CONTINGENCY	10.00% \$82,025	\$2.52
SUBTOTAL	\$902,277	\$27.77
ESCALATION TO MIDPOINT 10/2025	17.08% \$154,139	\$4.74
SUBTOTAL	\$1,056,416	\$32.51
GENERAL CONDITIONS/REQUIREMENTS	25.00% \$264,104	\$8.13
SUBTOTAL	\$1,320,520	\$40.64
CONTRACTOR OVERHEAD AND PROFIT	9.00% \$118,847	\$3.66
SUBTOTAL	\$1,439,367	\$44.30
INSURANCE	2.50% \$35,984	\$1.11
TOTAL BUILDING COST	\$1,475,351	\$45.40

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
G BUILDING SITEWORK				
G10 SITE PREPARATION				
Site demolition				
Clear and grub	32,495	SF	0.27	\$8,751
Tree removal, Allow	1	LS	21,000.00	\$21,000
Miscellaneous site removal, Allow	1	LS	15,750.00	\$15,750
Protect in place Allowance	1	LS	10,500.00	\$10,500
Site utility relocations, excluded		NIC		
Site earth work				
Field staking and layout Allowance	32,495	SF	0.68	\$22,178
Over excavation, Allow 4'	3,333	CY	16.57	\$55,232
Haul	3,333	CY	24.03	\$80,104
Engineered fill (including drainage layer), backfill, Allow	6,769	CY	33.09	\$223,987
Spreading and compaction	6,769	CY	5.25	\$35,537
Grading, rough and fine	32,495	SF	1.06	\$34,570
Site building pad				
Excavation building slab	1,410	CY	16.57	\$23,363
Excavation foundations	1	LS	21,000.00	\$21,000
Excavation loading dock and approach	197	CY	16.57	\$3,265
Site utility (wet and dry) trenching, Allowance	1	LS	52,500.00	\$52,500
Miscellaneous site preparation Allowance	1	LS	26,250.00	\$26,250
G10 SITE PREPARATION				\$633,987
G20 SITE IMPROVEMENTS				
G20 SITE IMPROVEMENTS				
G30 SITE CIVIL/MECHANICAL UTILITIES				
Storm water service				
Man hole	1	EA	9,670.50	\$9,671
Connect to existing storm water main at site, 6"	1	EA	346.50	\$347
Pipe and fittings, PVC SDR-35 , including trench and backfill 6"	50	LF	21.26	\$1,063
Clean-out	1	EA	598.50	\$599
Fire water service				
Connect to existing water main at site, 6"	1	EA	819.00	\$819
Double detector check valve, 6"	1	EA	7,696.50	\$7,697
Fire hydrant including valve	1	EA	4,987.50	\$4,988
Post indicator valve, 6"	1	EA	3,952.96	\$3,953
Reduced pressure backflow preventer, 6"	1	EA	6,892.70	\$6,893
Fire department connection	1	EA	3,264.68	\$3,265
Pipe and fittings, ductile, including trench and backfill				

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DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
6"	50	LF	33.77	\$1,688
Domestic water service				
Connect to existing water main at site, 4"	1	EA		
Reduced pressure backflow preventer, 4"	1	EA	5,008.50	\$5,009
Pipe and fittings, copper, K, including trench and backfill				
4"	50	LF	106.10	\$5,305
Valves				
4"	1	EA	971.25	\$971
Sanitary waste service				
Connect to existing sewer main at site, Manhole	1	EA	556.50	\$557
Pipe and fittings, PVC SDR-35, including trench and backfill				
8"	50	LF	28.89	\$1,444
G30 SITE CIVIL/MECHANICAL UTILITIES				\$65,515
G40 SITE ELECTRICAL UTILITIES				
Site incoming electrical services, Allow	1	LS	78,750.00	\$78,750
Site incoming telecommunication services, Allow	1	LS	26,250.00	\$26,250
Site incoming fire alarm service	1	LS	15,750.00	\$15,750
G40 SITE ELECTRICAL UTILITIES				\$120,750
G60 OTHER SITE CONSTRUCTION				
G60 OTHER SITE CONSTRUCTION				
G BUILDING SITEWORK				\$820,252



COST ESTIMATE

Washington State University Pullman Sciences Building Estimate

Pullman, WA

Gensler
CONCEPT DESIGN DOCUMENTS
OCMI JOB #: 211031.000
27 May 2022

INTRODUCTORY NOTES

This estimate is based on verbal direction from the client and the following items, received 4/13/2022 through 5/2/2022:

General Specifications and Reports	Final floor plans, floor 1, floor 3 (2 pages) Gensler pre-design report dated 06/15/2022. (99 pages)
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The following items are excluded from this estimate:

- Professional fees.
- Building permits and fees.
- Inspections and tests.
- Furniture, fixtures & equipment, except as noted.
- Installation of owner furnished equipment.
- Construction change order contingency.
- Overtime.
- Hazardous material abatement/removal.
- Items referenced as NOT INCLUDED or NIC in estimate.

The midpoint of construction of October 2027 is based on:

- Construction start date of January 2027
- Estimated construction duration of 18 months

- Please note that the first summary sheet shows total project costs for each area including markups, while the second summary sheet shows the Net Direct Construction cost for each area and then adds in markups separately.
- This estimate is based on a Design-Build delivery method.
- Design fees to be in the previous biennium.
- This estimate is based on prevailing wage labor rates.
- This estimate is based on a detailed measurement of quantities. We have made allowances for items that were not clearly defined in the drawings. The client should verify these allowances.
- This estimate is based on a minimum of four competitive bids and a stable bidding market.
- This estimate should be updated if more definitive information becomes available, or if there is any change in scope.
- We strongly advise the client to review this estimate in detail. If any interpretations in this estimate appear to differ from those intended by the design documents, they should be addressed immediately.



PROJECT SUMMARY

ELEMENT	TOTAL COST	GFA	\$/SF AREA
CONSTRUCTION COST FUNDED IN 2027-2029			
01. FLOOR LEVEL 1	\$27,620,451	22,500	\$1,227.58
03. ROOF	\$2,776,215	22,500	\$123.39
04. SITE WORK	\$541,746	32,495	\$16.67

TOTAL CONSTRUCTION COST	\$30,938,412
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UNIVERSITY PROJECT MANAGEMENT FEES	38.00%	\$19,000,000
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TOTAL CONSTRUCTION COST	\$49,938,412
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DETAILED PROJECT SUMMARY

ELEMENT	TOTAL COST	GFA	\$/SF AREA
01. FLOOR LEVEL 1	\$16,374,776	22,500	\$727.77
03. ROOF	\$1,645,878	22,500	\$73.15
04. SITE WORK	\$321,174	32,495	\$9.88

TOTAL NET DIRECT COST	\$18,341,828
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GENERAL MARKUPS		
DESIGN CONTINGENCY	10.00%	\$1,834,183
ESCALATION TO MIDPOINT 10/2027	27.08%	\$5,464,336
GENERAL CONDITIONS/REQUIREMENTS	8.00%	\$2,051,228
CONTRACTOR OVERHEAD AND PROFIT	9.00%	\$2,492,242
INSURANCE	2.50%	\$754,595

CONSTRUCTION COST	\$30,938,412
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UNIVERSITY PROJECT MANAGEMENT FEES	38.00%	\$19,000,000
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TOTAL CONSTRUCTION COST	\$49,938,412
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BUILDING SUMMARY

ELEMENT		TOTAL COST	\$/SF AREA
A SUBSTRUCTURE		\$2,609,279	\$115.97
B SHELL		\$5,087,317	\$226.10
C INTERIORS		\$2,314,207	\$102.85
D SERVICES		\$5,713,686	\$253.94
E EQUIPMENT AND FURNISHINGS		\$650,287	\$28.90
F OTHER BUILDING CONSTRUCTION			
G BUILDING SITEWORK			
NET DIRECT BUILDING COST		\$16,374,776	\$727.77
DESIGN CONTINGENCY	10.00%	\$1,637,478	\$72.78
SUBTOTAL		\$18,012,254	\$800.54
ESCALATION TO MIDPOINT 10/2027	27.08%	\$4,878,319	\$216.81
SUBTOTAL		\$22,890,572	\$1,017.36
GENERAL CONDITIONS/REQUIREMENTS	8.00%	\$1,831,246	\$81.39
SUBTOTAL		\$24,721,818	\$1,098.75
CONTRACTOR OVERHEAD AND PROFIT	9.00%	\$2,224,964	\$98.89
SUBTOTAL		\$26,946,782	\$1,197.63
INSURANCE	2.50%	\$673,670	\$29.94
TOTAL BUILDING COST		\$27,620,451	\$1,227.58

GROSS FLOOR AREA: 22,500 SF

DETAILED SUMMARY

ELEMENT		TOTAL COST	\$/SF AREA
A10 FOUNDATIONS		\$2,609,279	\$115.97
A20 BASEMENT CONSTRUCTION			
B10 SUPERSTRUCTURE		\$2,516,590	\$111.85
B20 EXTERIOR CLOSURE		\$2,570,727	\$114.25
B30 ROOFING			
C10 INTERIOR CONSTRUCTION		\$1,611,669	\$71.63
C20 STAIRWAYS		\$48,195	\$2.14
C30 INTERIOR FINISHES		\$654,343	\$29.08
D10 CONVEYING SYSTEMS			
D20 PLUMBING SYSTEMS		\$860,540	\$38.25
D30 HVAC SYSTEMS		\$2,336,110	\$103.83
D40 FIRE PROTECTION SYSTEMS		\$192,780	\$8.57
D50 ELECTRICAL SYSTEMS (OTHER THAN TELECOM)		\$1,653,038	\$73.47
D5050 TELECOM/ELECTRONIC SAFETY AND SECURITY		\$671,218	\$29.83
E10 EQUIPMENT		\$575,128	\$25.56
E20 FURNISHINGS		\$75,159	\$3.34
G90 OTHER SITE CONSTRUCTION			
NET DIRECT BUILDING COST		\$16,374,776	\$727.77
DESIGN CONTINGENCY	10.00%	\$1,637,478	\$72.78
SUBTOTAL		\$18,012,254	\$800.54
ESCALATION TO MIDPOINT 10/2027	27.08%	\$4,878,319	\$216.81
SUBTOTAL		\$22,890,572	\$1,017.36
GENERAL CONDITIONS/REQUIREMENTS	8.00%	\$1,831,246	\$81.39
SUBTOTAL		\$24,721,818	\$1,098.75
CONTRACTOR OVERHEAD AND PROFIT	9.00%	\$2,224,964	\$98.89
SUBTOTAL		\$26,946,782	\$1,197.63
INSURANCE	2.50%	\$673,670	\$29.94
TOTAL BUILDING COST		\$27,620,451	\$1,227.58

CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
A SUBSTRUCTURE				
A10 FOUNDATIONS				
Spread footing, assembly	103	CY	918.34	\$94,937
Continuous footing, assembly	232	CY	1,093.45	\$253,210
Slab on grade, 4"	22,500	SF	15.18	\$341,534
Thickened edge	74	CY	436.99	\$32,527
Control joints, Allowance	22,500	SF	1.61	\$36,146
Concrete curb, Allowance	812	LF	1,702.90	\$1,381,903
Retaining wall (Assumed), length, height TBD	1	LS	168,682.50	\$168,683
Loading dock with associated items, Allow	1	LS	48,195.00	\$48,195
Miscellaneous (embeds, hold downs, etc.)	1	LS	252,143.68	\$252,144

A10 FOUNDATIONS \$2,609,279

A SUBSTRUCTURE \$2,609,279

B SHELL

B10 SUPERSTRUCTURE

Structural Steel				
Wide flange	169	TON	7,126.49	\$1,202,595
Piping and tube steel	56	TON	8,843.26	\$497,433
Miscellaneous angles and channels	23	TON	11,528.74	\$259,397
Fireproofing, structural steel	248	TON	448.33	\$110,962
Metal deck with reinforced lightweight concrete	22,500	SF	17.74	\$399,040
Fireproofing, structural steel	22,500	SF	2.10	\$47,163

B10 SUPERSTRUCTURE \$2,516,590

B20 EXTERIOR ENCLOSURE

Metal stud framing, 6"	18,676	SF	14.97	\$279,580
DensGlass sheathing	15,626	SF	3.66	\$57,119
Adhered membrane	15,626	SF	2.07	\$32,319
Rigid insulation, 2", Assumed	15,626	SF	1.88	\$29,373
Panel systems, Allowance (materials TBD)	15,626	SF	42.84	\$669,426
Support framing for panel system, Allow	15,626	SF	9.10	\$142,253
Soffit (above loading dock, framing and finish), Allow	2,100	SF	27.85	\$58,477
Aluminum fully glazed including frame and hardware				
Entry doors, inc. automatic opener	4	PR	15,704.93	\$62,820
Hollow metal door, frame and hardware				
Single	4	EA	3,120.80	\$12,483
Double	2	PR	5,361.10	\$10,722

CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Specialty door, frame and hardware				
Loading dock roll up doors, 10' x 10'	2	EA	5,524.84	\$11,050
Windows				
Storefront/curtain wall	3,050	SF	176.51	\$538,315
Curtain wall, Allow	3,703	SF	158.51	\$586,955
Sun/light shelf	161	LF	196.52	\$31,640
Miscellaneous exterior enclosure Allowance	1	LS	48,195.00	\$48,195

B20 EXTERIOR CLOSURE \$2,570,727

B30 ROOFING

See roof tab NOTE

B30 ROOFING

B SHELL

\$5,087,317

C INTERIORS

C10 INTERIOR CONSTRUCTION

Interior framing				
Metal studs framing	30,636	SF	12.31	\$377,092
Metal studs framing (interior of exterior)	14,329	SF	12.31	\$176,373
Furring, columns	2,668	SF	6.03	\$16,077
Shaft wall	4,278	SF	8.57	\$36,654
Insulation	44,965	SF	1.36	\$61,085
Gypsum board, taped and finished	82,547	SF	3.34	\$275,709
Gypsum board, fire taped	19,573	SF	3.04	\$59,592
Shaft liner	4,278	SF	4.80	\$20,522
Cementitious backerboard (tiled walls)	1,352	SF	5.18	\$7,000
Plywood sheathing, Allowance	1	LS	24,097.50	\$24,098
Wood doors, framing and hardware				
Single	14	EA	2,540.85	\$35,064
Double	3	PR	4,081.51	\$12,245
Aluminum fully glazed including frame and hardware				
Single	23	EA	4,004.57	\$92,105
Double	3	PR	6,916.70	\$20,750
Windows				
Curtain wall/storefront	2,808	SF	105.85	\$297,218
Miscellaneous Allowance	1	LS	26,775.00	\$26,775
Paint doors, per leaf	98	EA	133.88	\$13,066

CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Rough carpentry (backing, anchorage, structural supports for lab hoods), Allow	22,500	SF	2.68	\$60,244
C10 INTERIOR CONSTRUCTION				\$1,611,669
C20 STAIRS				
Stair case #2	1	FLT	48,195.00	\$48,195
C20 STAIRS				\$48,195
C30 INTERIOR FINISHES				
Walls				
Wall, paint	81,195	SF	1.93	\$156,528
Ceramic wall tile, Allow	1,352	SF	27.85	\$37,648
FRP, Allowance	1	LS	16,065.00	\$16,065
Epoxy coating/specialty coating	1	LS	19,278.00	\$19,278
Flooring				
Carpet tile (offices, lounge, phone rooms, conference)	1,561	SF	6.70	\$10,454
VCT	17,762	SF	5.51	\$97,883
Ceramic tile	512	SF	24.95	\$12,775
Specialty flooring in lobby, Allow	1	LS	16,600.50	\$16,601
Concrete, sealer	2,664	SF	1.67	\$4,438
Epoxy floor paint	1	LS	17,671.50	\$17,672
Base				
Ceramic tile	170	LF	21.89	\$3,721
Rubber, 4" high	2,252	LF	3.43	\$7,727
Specialty base, Allow	1	LS	8,032.50	\$8,033
Ceiling				
Hard lid	1,260	SF	14.94	\$18,821
Open to structure (including shafts)	2,750	SF		No Cost
ACT, including grid system, 2' 0" x 4' 0"	18,490	SF	7.90	\$146,009
Moisture resistant, premium	3,570	SF	1.85	\$6,593
Soffits, Allow 10% of total ceiling	2,250	SF	29.17	\$65,639
Paint				
Ceilings	3,510	SF	2.41	\$8,458
C30 INTERIOR FINISHES				\$654,343
C INTERIORS				\$2,314,207
D20 PLUMBING SYSTEMS				
Equipment				
Water heater (Heat pump), 200 gallon, (Allowance)	3	LS	47,948.67	\$140,969

CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Miscellaneous fittings and accessories	1	LS	2,848.86	\$4,188
Fixtures including rough-in				
Water closet	9	EA	1,802.49	\$15,898
Water closet (ADA)	3	EA	2,026.33	\$5,957
Lavatory, vanity mounted	6	EA	2,228.75	\$13,105
Sink, lab	6	EA	2,658.22	\$15,630
Drinking fountain	1	EA	2,848.86	\$4,188
Emergency eye wash station	3	EA	2,382.98	\$7,006
Automatic sensor, premium				
Water closet	12	EA	462.67	\$5,441
Lavatory	6	EA	591.19	\$3,476
Miscellaneous fittings				
Floor drain with P- trap and strainer	3	EA	550.49	\$1,618
Domestic water system				
Pipe with fittings and supports				
Above grade, cold water (type "L" copper)				
1/2"	51	LF	11.35	\$584
3/4"	89	LF	12.64	\$1,122
1"	103	LF	13.81	\$1,420
1-1/4"	26	LF	25.18	\$667
2"	1,142	LF	29.53	\$33,725
Above grade, hot water (type "L" copper)				
1/2"	53	LF	11.35	\$606
3/4"	78	LF	12.64	\$981
1-1/4"	27	LF	25.18	\$692
1-1/2"	741	LF	20.05	\$14,848
Insulation, fiberglass with jacket				
1/2"	53	LF	5.23	\$279
3/4"	78	LF	5.72	\$444
1-1/4"	27	LF	6.35	\$175
1-1/2"	741	LF	6.72	\$4,973
Thermostatic mixing valve	4	EA	1,642.91	\$7,245
Back flow preventer	6	EA	642.60	\$3,778
RO system for pure water	1	EA	66,462.03	\$97,699
Wall mounted water polisher	15	EA	9,290.59	\$136,572
Sanitary waste system				
Pipe with fittings, below grade, Cast iron	289	LF	37.75	\$10,927
Trench, backfill, and remove excess spoil	28	CY	67.81	\$1,894
Pipe with fittings and supports, above grade, Cast Iron	39	LF	31.26	\$1,218
Sanitary vent system				
Pipe with fittings and supports, above grade, Cast iron				
1-1/2"	155	LF	28.72	\$4,459
2"	475	LF	31.26	\$14,862

CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Lab waste system				
Pipe with fittings, below grade, PVC	637	LF	37.44	\$23,854
Trench, backfill, and remove excess spoil	57	CY	67.81	\$3,887
Acid neutralizing tank (Including rough-in kit)	1	EA	6,961.50	\$10,233
Sampling pit	1	EA	3,748.50	\$5,510
Indirect condensate drain system				
Connection to AC units, 2"	63	EA	714.36	\$45,155
Pipe with fittings and supports, 2"	1,389	LF	34.63	\$48,103
Insulation, 2"	1,389	LF	10.38	\$14,415
Compressed air				
Pipe with fittings and supports, black steel, sch 40				
Above grade, 3/4"	377	LF	14.33	\$5,399
Air compressor	1	EA	4,403.06	\$6,473
Refrigerated compressed air dryer	1	EA	3,413.50	\$5,018
PRV	3	EA	374.85	\$1,102
Outlet valves	24	EA	374.85	\$8,816
Vacuum system				
Vacuum pump	1	EA	10,026.88	\$14,740
Receiver tank	1	EA	4,819.50	\$7,085
Controls	1	LS	3,079.13	\$4,526
Pipe with fittings and supports, black steel, sch 40				
Above grade, 3/4"	377	LF	14.33	\$5,399
Outlet valves	26	EA	374.85	\$9,919
Harvesting system				
Storage tanks	3	EA	9,639.00	\$28,339
Pumps	3	EA	4,819.50	\$14,169
Pipes	779	LF	42.51	\$33,130
Filtration system	1	LS	8,621.55	\$8,622
D20 PLUMBING SYSTEMS				\$860,540
D30 HVAC SYSTEMS				
Equipment				
DOAS with ERV	7	EA	8,531.69	\$62,708
VRF condenser (10 Tons)	4	EA	20,161.58	\$88,913
VRF FCUs	51	EA	4,008.75	\$206,250
4 Pipes FCUs	12	EA	3,213.00	\$37,785
Heat recovery chiller 35Ton	1	EA	70,686.00	\$103,908
Buffer tank	3	EA	4,153.31	\$12,211
Exhaust fan, restroom	3	EA	1,056.03	\$3,105
Pumps				
Circulation pump	3	EA	5,342.15	\$15,706
Variable frequency drive, 3 hp.,	3	EA	2,891.70	\$8,502

CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Hoods				
Lab hoods	26	EA	22,317.28	\$590,515
VAV terminal with redundant exhaust fans	4	EA	13,944.42	\$61,495
Makeup air units (7000 CFM)	3	EA	35,343.00	\$103,908
Chilled water distribution				
Pipe with fittings and supports including insulation				
Steel, sch. 40	585	LF	39.71	\$23,234
Hot water distribution				
Pipe with fittings and supports including insulation				
Steel, sch. 40	585	LF	39.71	\$23,234
Air distribution system				
Ductwork, galvanized steel				
Supply	13,405	LB	13.07	\$175,174
Exhaust	783	LB	13.07	\$10,238
4" Hoods exhaust	1,588	LF	20.72	\$32,898
Insulation/liner	13,405	SF	2.34	\$31,408
Air inlets and outlets				
Supply diffuser, lay-in/sidewall	115	EA	335.22	\$38,437
Return register	63	EA	189.57	\$11,983
Damper				
Volume, manual	115	EA	211.09	\$24,204
Refrigeration piping				
Piping components and specialties	121	EA	149.94	\$18,074
Pipe, with insulation, fittings, and supports	7,718	LF	15.62	\$120,558
Automatic temperature control				
DDC control system				
Programing	1	LS	5,355.00	\$7,872
Sensor point including local controller and wiring				
Fan coil units (5 Points)	63	EA	4,819.50	\$304,641
DOAS (5 Points)	6	EA	4,819.50	\$28,339
Heat recovery chiller (16 Points)	1	EA	15,422.40	\$22,671
Pumps	3	EA	1,927.80	\$5,668
Expansion tank	3	EA	1,927.80	\$5,668
Makeup air unit	3	EA	9,639.00	\$28,339
VAV exhaust	4	EA	6,747.30	\$29,756
Communication bus	8,379	LF	1.95	\$16,331
Programmable thermostat including control wiring for FCU	63	EA	546.21	\$34,526
Balancing, by and independent contractor				
Air balance				

CONCEPT DESIGN DOCUMENTS R2

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DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Equipment	1	LS	12,316.50	\$12,317
Air inlets and outlets	178	EA	95.91	\$17,059
Commissioning including documentation, performance	1	LS	18,474.75	\$18,475
D30 HVAC SYSTEMS				\$2,336,110
D40 FIRE PROTECTION SYSTEMS				
Fire sprinklers including pipes, valves, gages and control	22,500	SF	8.57	\$192,780
D40 FIRE PROTECTION SYSTEMS				\$192,780
D50 ELECTRICAL SYSTEMS (OTHER THAN TELECOM)				
Power and distribution - building support				
Power equipment and distribution feeders, Allow	22,500	SF	17.11	\$385,078
Mechanical equipment connections & branch wiring	22,500	SF	4.94	\$111,089
Convenience power devices & branch wiring	22,500	SF	4.28	\$96,390
Lighting fixtures & branch wiring	22,500	SF	11.19	\$251,819
Lighting control system	22,500	SF	3.10	\$69,642
Temporary lighting & power	22,500	SF	1.36	\$30,604
Grounding system	22,500	SF	0.39	\$8,675
Power and distribution - research lab & support				
Power equipment and distribution feeders, Allow	5,072	SF	30.20	\$153,170
Mechanical equipment connections & branch wiring	5,072	SF	17.42	\$88,368
Convenience power devices & branch wiring	5,072	SF	20.13	\$102,114
Lighting fixtures & branch wiring	5,072	SF	17.77	\$90,135
Lighting control system	5,072	SF	3.10	\$15,710
Temporary lighting & power	5,072	SF	1.36	\$6,873
Grounding system	5,072	SF	0.39	\$1,964
Power and distribution - conference				
Power equipment and distribution feeders, Allow	1,158	SF	22.15	\$25,656
Mechanical equipment connections & branch wiring	1,158	SF	6.68	\$7,737
Convenience power devices & branch wiring	1,158	SF	7.55	\$8,746
Lighting fixtures & branch wiring	1,158	SF	19.75	\$22,875
Lighting control system	1,158	SF	3.10	\$3,588
Temporary lighting & power	1,158	SF	1.36	\$1,570
Grounding system	1,158	SF	0.39	\$449
Power and distribution - offices				
Power equipment and distribution feeders, Allow	3,352	SF	20.13	\$67,484
Mechanical equipment connections & branch wiring	3,352	SF	5.81	\$19,466
Convenience power devices & branch wiring	3,352	SF	5.03	\$16,871
Lighting fixtures & branch wiring	3,352	SF	15.14	\$50,743
Lighting control system	3,352	SF	3.10	\$10,382
Temporary lighting & power	3,352	SF	1.36	\$4,542

CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Grounding system	3,352	SF	0.39	\$1,298
D50 ELECTRICAL SYSTEMS (OTHER THAN TELECOM)				\$1,653,038
D5050/D7070 TELECOM AND ELECTRONIC SAFETY/SECURITY				
Telecommunication system - building support				
Telecommunication system, Allow	22,500	SF	4.61	\$103,619
A/V system infrastructure	22,500	SF	1.65	\$37,110
Telecommunication system - research lab & support				
Telecommunication system, Allow	5,072	SF	21.69	\$109,989
A/V system infrastructure	5,072	SF	2.90	\$14,720
Telecommunication system - conference				
Telecommunication system, Allow	1,158	SF	8.13	\$9,416
A/V system infrastructure	1,158	SF	3.88	\$4,491
Telecommunication system - offices				
Telecommunication system, Allow	3,352	SF	5.42	\$18,169
A/V system infrastructure	3,352	SF	2.13	\$7,138
Electronic safety and security - building support				
CCTV system, Allow	22,500	SF	2.71	\$60,967
Access control system	22,500	SF	2.32	\$52,292
Intrusion alarm system	22,500	SF	1.75	\$39,279
Fire alarm system	22,500	SF	4.65	\$104,583
Electronic safety and security - research lab & support				
CCTV system, Allow	5,072	SF	2.71	\$13,746
Access control system	5,072	SF	2.32	\$11,782
Intrusion alarm system	5,072	SF	1.74	\$8,837
Fire alarm system	5,072	SF	4.65	\$23,565
Electronic safety and security - conference				
CCTV system, Allow	1,158	SF	2.71	\$3,140
Access control system	1,158	SF	2.32	\$2,691
Intrusion alarm system	1,158	SF	1.74	\$2,018
Fire alarm system	1,158	SF	4.65	\$5,382
Electronic safety and security - offices				
CCTV system, Allow	3,352	SF	2.71	\$9,084
Access control system	3,352	SF	2.32	\$7,787
Intrusion alarm system	3,352	SF	1.74	\$5,840
Fire alarm system	3,352	SF	4.65	\$15,573
D5050/D7070 TELECOM AND ELECTRONIC SAFETY/SECURITY				\$671,218

CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
D SERVICES				\$5,713,686
E EQUIPMENT AND FURNISHINGS				
E10 EQUIPMENT				
Loading dock equipment, Allow	1	LS	34,272.00	\$34,272
Institutional equipment				
Storage, Allow	22,500	SF	2.68	\$60,244
Lab Specialties				
Modular casework, including fume hoods	1	LS	461,868.75	\$461,869
Owner furnished, contractor installed				
Refrigerator, freezer, centrifuges, microscopes, computers, chairs, carts, etc.	1	LS	16,065.00	\$16,065
Kitchen appliances	1	LS	2,677.50	\$2,678
E10 EQUIPMENT				\$575,128
E20 FURNISHINGS				
Casework (non lab), Allow	1	LS	55,424.25	\$55,424
Restroom specialties				
Toilet seat cover dispenser (recessed)	12	EA	132.61	\$1,559
Waste receptacle (recessed)	12	EA	539.43	\$6,344
Toilet tissue dispenser, double	12	EA	121.07	\$1,424
Feminine napkin dispenser	2	EA	666.82	\$1,334
Feminine napkin disposal (surface mounted)	2	EA	140.61	\$281
Grab bar set	3	EA	274.50	\$823
Mop and broom rack	1	EA	287.90	\$288
Soap dispenser, liquid	6	EA	133.17	\$783
Hand dryer, electric sensor	6	EA	1,066.59	\$6,272
Mirror	3	EA	208.96	\$627
E20 FURNISHINGS				\$75,159
E EQUIPMENT AND FURNISHINGS				\$650,287

CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

BUILDING SUMMARY

ELEMENT	TOTAL COST	\$/SF AREA
A SUBSTRUCTURE		
B SHELL	\$1,598,478	\$71.04
C INTERIORS		
D SERVICES	\$47,400	\$2.11
E EQUIPMENT AND FURNISHINGS		
F OTHER BUILDING CONSTRUCTION		
G BUILDING SITEWORK		
NET DIRECT BUILDING COST	\$1,645,878	\$73.15
DESIGN CONTINGENCY 10.00%	\$164,588	\$7.32
SUBTOTAL	\$1,810,466	\$80.47
ESCALATION TO MIDPOINT 10/2027 27.08%	\$490,334	\$21.79
SUBTOTAL	\$2,300,800	\$102.26
GENERAL CONDITIONS/REQUIREMENTS 8.00%	\$184,064	\$8.18
SUBTOTAL	\$2,484,864	\$110.44
CONTRACTOR OVERHEAD AND PROFIT 9.00%	\$223,638	\$9.94
SUBTOTAL	\$2,708,502	\$120.38
INSURANCE 2.50%	\$67,713	\$3.01
TOTAL BUILDING COST	\$2,776,215	\$123.39

GROSS FLOOR AREA: 22,500 SF

DETAILED SUMMARY

ELEMENT		TOTAL COST	\$/SF AREA
A10 FOUNDATIONS			
A20 BASEMENT CONSTRUCTION			
B10 SUPERSTRUCTURE		\$559,386	\$24.86
B20 EXTERIOR CLOSURE		\$341,279	\$15.17
B30 ROOFING		\$697,813	\$31.01
D20 PLUMBING SYSTEMS		\$47,400	\$2.11
D30 HVAC SYSTEMS			
G90 OTHER SITE CONSTRUCTION			
NET DIRECT BUILDING COST		\$1,645,878	\$73.15
DESIGN CONTINGENCY	10.00%	\$164,588	\$7.32
SUBTOTAL		\$1,810,466	\$80.47
ESCALATION TO MIDPOINT 10/2027	27.08%	\$490,334	\$21.79
SUBTOTAL		\$2,300,800	\$102.26
GENERAL CONDITIONS/REQUIREMENTS	8.00%	\$184,064	\$8.18
SUBTOTAL		\$2,484,864	\$110.44
CONTRACTOR OVERHEAD AND PROFIT	9.00%	\$223,638	\$9.94
SUBTOTAL		\$2,708,502	\$120.38
INSURANCE	2.50%	\$67,713	\$3.01
TOTAL BUILDING COST		\$2,776,215	\$123.39

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
B SHELL				
B10 SUPERSTRUCTURE				
Roof				
Metal deck with reinforced lightweight concrete	22,500	SF	17.74	\$399,040
Miscellaneous steel, Allow	23	TON	7,126.49	\$160,346
B10 SUPERSTRUCTURE				\$559,386
B20 EXTERIOR ENCLOSURE				
Parapet framing, Allow 4' height	3,248	SF	14.34	\$46,579
DensGlass sheathing	3,248	SF	3.66	\$11,872
Adhered membrane	3,248	SF	2.07	\$6,718
Panel systems (materials TBD)	3,248	SF	32.13	\$104,358
Support framing for panel system, Allow	3,248	SF	9.10	\$29,568
Gyp board (interior of parapet)	3,248	SF	2.19	\$7,126
Plaster finish, allow	2,436	SF	16.97	\$41,345
Roof mechanical screen, louvered	2,500	SF	37.49	\$93,713
B20 EXTERIOR CLOSURE				\$341,279
B30 ROOFING				
Membrane roofing system	22,500	SF	14.07	\$316,628
Membrane roofing system at parapet	812	SF	14.99	\$12,175
Rigid insulation	23,312	SF	3.56	\$83,088
Crickets (for drainage) Allowance	2,250	SF	2.64	\$5,938
Adhered membrane	22,500	SF	2.07	\$46,536
Cover board	22,500	SF	2.98	\$67,065
Walk pads	1	LS	12,852.00	\$12,852
Flashing and sheet metal, Allow	22,500	SF	2.68	\$60,244
Roof hatch	1	EA	1,983.81	\$1,984
Sealant and caulking, Allow	22,500	SF	1.18	\$26,507
Mechanical pad/curb, Allow	1	LS	21,420.00	\$21,420
Miscellaneous roof accessories, Allow	22,500	SF	1.93	\$43,376
B30 ROOFING				\$697,813
B SHELL				\$1,598,478
D20 PLUMBING SYSTEMS				
Roof drainage system				
Roof drain	14	EA	749.00	\$10,340
Pipe with fittings and supports, above grade, cast iron, 4"	934	LF	39.69	\$37,060

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DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
D20 PLUMBING SYSTEMS				\$47,400
D50 ELECTRICAL SYSTEMS (OTHER THAN TELECOM)				
Electrical scope included in building support		NOTE		
D50 ELECTRICAL SYSTEMS (OTHER THAN TELECOM)				
D5050 TELECOM				
Low voltage services included in building support		NOTE		
D5050 TELECOM				
D SERVICES				\$47,400

CONCEPT DESIGN DOCUMENTS R2

OCMI JOB #: 211031.000 | 27 May 2022

BUILDING SUMMARY

ELEMENT		TOTAL COST	\$/SF AREA
G BUILDING SITEWORK		\$321,174	\$9.88
NET DIRECT BUILDING COST		\$321,174	\$9.88
DESIGN CONTINGENCY	10.00%	\$32,117	\$0.99
SUBTOTAL		\$353,291	\$10.87
ESCALATION TO MIDPOINT 10/2027	27.08%	\$95,683	\$2.94
SUBTOTAL		\$448,974	\$13.82
GENERAL CONDITIONS/REQUIREMENTS	8.00%	\$35,918	\$1.11
SUBTOTAL		\$484,892	\$14.92
CONTRACTOR OVERHEAD AND PROFIT	9.00%	\$43,640	\$1.34
SUBTOTAL		\$528,533	\$16.27
INSURANCE	2.50%	\$13,213	\$0.41
TOTAL BUILDING COST		\$541,746	\$16.67

GROSS FLOOR AREA: 32,495 SF

DETAILED SUMMARY

ELEMENT		TOTAL COST	\$/SF AREA
G10 SITE PREPARATION			
G20 SITE IMPROVEMENTS		\$321,174	\$9.88
G30 SITE CIVIL/MECHANICAL UTILITIES			
G40 SITE ELECTRICAL UTILITIES			
G90 OTHER SITE CONSTRUCTION			
NET DIRECT BUILDING COST		\$321,174	\$9.88
DESIGN CONTINGENCY	10.00%	\$32,117	\$0.99
SUBTOTAL		\$353,291	\$10.87
ESCALATION TO MIDPOINT 10/2027	27.08%	\$95,683	\$2.94
SUBTOTAL		\$448,974	\$13.82
GENERAL CONDITIONS/REQUIREMENTS	8.00%	\$35,918	\$1.11
SUBTOTAL		\$484,892	\$14.92
CONTRACTOR OVERHEAD AND PROFIT	9.00%	\$43,640	\$1.34
SUBTOTAL		\$528,533	\$16.27
INSURANCE	2.50%	\$13,213	\$0.41
TOTAL BUILDING COST		\$541,746	\$16.67

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
G20 SITE IMPROVEMENTS				
Hardscapes				
Generator pad with retaining walls	500	SF	64.26	\$32,130
Paving at loading dock	2,660	SF	12.85	\$34,186
New ADA ramp (from College Avenue sidewalk to main entrance)	1	LS	32,130.00	\$32,130
New ADA ramp (main entrance plaza to Abelson and Heald)	1	LS	42,840.00	\$42,840
Pedestrian paving Allowance	1	LS	26,775.00	\$26,775
Paving repairs at existing (utility trenching), Allowance	1	LS	21,420.00	\$21,420
Paving markings, Allowance	1	LS	3,213.00	\$3,213
Site fencing, gates, Allowance	1	LS	32,130.00	\$32,130
Soft scapes				
Landscape and irrigation Allowance	9,995	SF	8.03	\$80,285
Miscellaneous site improvements (bollards, bike racks, etc)	1	LS	16,065.00	\$16,065
G20 SITE IMPROVEMENTS				\$321,174
G30 SITE CIVIL/MECHANICAL UTILITIES				
G30 SITE CIVIL/MECHANICAL UTILITIES				
G40 SITE ELECTRICAL UTILITIES				
G40 SITE ELECTRICAL UTILITIES				
G BUILDING SITEWORK				\$321,174

Funding Analysis of Preferred Alternative

Funding Sources

The University is requesting \$22,000,000 in design and construction funding in the 2023-2025 biennium, for the enabling project to renovate Eastlick, Abelson, & Bustad Halls. WSU will request design and demolition funding in the 2025-2027 biennium, and construction funding for the new Sciences Building in the 2027-2029 biennium.

Expected Receipt of the Funds

Washington State University anticipates receiving State Capital funds for the Easlick, Abelson, & Bustad Halls renovation in July 2023, design and demolition funding in July 2025 and construction funding for the new Sciences Building in July 2027.

Operations and Maintenance Assumptions

WSU establishes operating and utility costs and FTE maintenance staffing requirements based upon the square footage of the facility and average O&M costs across the campus. According to the recent and projected M&O Funding rates for Washington State University, the anticipated annual impact on the University's operating and maintenance budget is \$14.88 per net new area (gsf) projected to 2029.

The projected total annual operating budget for the new Sciences Building will be approximately \$334,800 based upon 22,500 gross square feet times \$14.88, the current cost of maintenance. Because the new Sciences Building replaces Heald Hall the universities deferred maintenance backlog will be reduced by \$21,284,211.

The numbers below reflect the change in operation costs required of the university's annual operating budget allocation.

Operating Budget Impacts

Fiscal Year	FTE Staffing	FTE Staffing Change	Projected O & M Cost	O & M Cost Change
2029	1.18	1.18	\$167,400.00	\$167,400.00
2030	2.37	1.18	\$334,800.00	\$167,400.00
2031	2.37	0	\$334,800.00	\$0.00
2032	2.37	0	\$334,800.00	\$0.00
2033	2.37	0	\$334,800.00	\$0.00

Furnishings, Fixtures, and Equipment

Budget for furnishings, fixtures, and equipment is accounted for in the C-100 cost outline.

STATE OF WASHINGTON AGENCY / INSTITUTION PROJECT COST SUMMARY <i>Updated June 2022</i>	
Agency	Washington State University
Project Name	Sciences Building
OFM Project Number	

Contact Information	
Name	Joanie Thomas
Phone Number	509-335-9027
Email	thomasjl@wsu.edu

Statistics			
Gross Square Feet	22,500	MACC per Gross Square Foot	\$824
Usable Square Feet	14,392	Escalated MACC per Gross Square Foot	\$1,100
Alt Gross Unit of Measure			
Space Efficiency	64.0%	A/E Fee Class	A
Construction Type	Research Facilities	A/E Fee Percentage	8.33%
Remodel	No	Projected Life of Asset (Years)	75

Additional Project Details			
Procurement Approach	DB-Progressive	Art Requirement Applies	Yes
Inflation Rate	4.90%	Higher Ed Institution	Yes
Sales Tax Rate %	7.90%	Location Used for Tax Rate	3,812
Contingency Rate	5%		
Base Month (Estimate Date)	June-22	OFM UFI# (from FPMT, if available)	
Project Administered By	Agency		

Schedule			
Predesign Start	July-21	Predesign End	June-22
Design Start	July-25	Design End	June-27
Construction Start	July-27	Construction End	August-29
Construction Duration	25 Months		

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Project Cost Estimate			
Total Project	\$64,025,838	Total Project Escalated	\$70,500,262
		Rounded Escalated Total	\$70,500,000

Cost Estimate Summary

Acquisition			
Acquisition Subtotal	\$0	Acquisition Subtotal Escalated	\$0

Consultant Services			
Predesign Services	\$600,000		
Design Phase Services	\$6,262,009		
Extra Services	\$1,131,000		
Other Services	\$656,989		
Design Services Contingency	\$432,500		
Consultant Services Subtotal	\$9,082,498	Consultant Services Subtotal Escalated	\$11,096,409

Construction			
Maximum Allowable Construction Cost (MACC)	\$18,530,246	Maximum Allowable Construction Cost (MACC) Escalated	\$24,754,032
DB-Progressive Risk Contingencies	\$3,014,285		\$4,030,100
DB-Progressive Management	\$6,424,278		\$8,589,260
Owner Construction Contingency	\$3,426,512		\$4,581,247
Non-Taxable Items	\$0		\$0
Sales Tax	\$3,225,877	Sales Tax Escalated	\$3,314,416
Construction Subtotal	\$44,059,761	Construction Subtotal Escalated	\$45,269,055

Equipment			
Equipment	\$3,536,869		
Sales Tax	\$279,413		
Non-Taxable Items	\$0		
Equipment Subtotal	\$3,816,282	Equipment Subtotal Escalated	\$5,102,369

Artwork			
Artwork Subtotal	\$350,748	Artwork Subtotal Escalated	\$350,748

Agency Project Administration			
Agency Project Administration Subtotal	\$1,898,660		
DES Additional Services Subtotal	\$0		
Other Project Admin Costs	\$235,000		
Project Administration Subtotal	\$2,133,660	Project Administration Subtotal Escalated	\$2,852,704

Other Costs			
Other Costs Subtotal	\$4,582,889	Other Costs Subtotal Escalated	\$5,828,977

Project Cost Estimate			
Total Project	\$64,025,838	Total Project Escalated	\$70,500,262
		Rounded Escalated Total	\$70,500,000

Funding Summary

	Project Cost (Escalated)	Funded in Prior Biennia	New Approp Request 2023-2025	2025-2027	Out Years
Acquisition					
Acquisition Subtotal	\$0				\$0
Consultant Services					
Consultant Services Subtotal	\$11,096,409	\$500,000		\$5,000,000	\$5,596,409
Construction					
Construction Subtotal	\$45,269,055			\$15,000,000	\$30,269,055
Equipment					
Equipment Subtotal	\$5,102,369				\$5,102,369
Artwork					
Artwork Subtotal	\$350,748				\$350,748
Agency Project Administration					
Project Administration Subtotal	\$2,852,704				\$2,852,704
Other Costs					
Other Costs Subtotal	\$5,828,977				\$5,828,977
Project Cost Estimate					
Total Project	\$70,500,262	\$500,000	\$0	\$20,000,000	\$50,000,262
	\$70,500,000	\$500,000	\$0	\$20,000,000	\$50,000,000
Percentage requested as a new appropriation			0%		

What is planned for the requested new appropriation? (Ex. Acquisition and design, phase 1 construction, etc.)
 The predesign identified enabling projects that need to be completed to allow the new Sciences Building to be constructed.
 The enabling projects in the 2023-2025 biennium are part of a separate funding request.
Insert Row Here

What has been completed or is underway with a previous appropriation?
 The funding in the 2021-2023 biennium allowed the predesign to be completed creating the roadmap that will be followed over the next four biennia.
Insert Row Here

What is planned with a future appropriation?
 The 2025-2027 biennium will allow for the demolition of Heald Hall and the design of the new Sciences Building.
 The 2027-2029 biennium will allow for the construction of the new Sciences Building.
Insert Row Here

Cost Estimate Details

Consultant Services				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
1) Pre-Schematic Design Services				
Programming/Site Analysis				
Environmental Analysis				
Pre-design Study	\$500,000			
Honorarium	\$100,000			
Insert Row Here				
Sub TOTAL	\$600,000	1.1558	\$693,480	Escalated to Design Start
2) Construction Documents				
A/E Basic Design Services	\$1,262,009			69% of A/E Basic Services
Other	\$5,000,000			
Insert Row Here				
Sub TOTAL	\$6,262,009	1.2101	\$7,577,657	Escalated to Mid-Design
3) Extra Services				
Civil Design (Above Basic Svcs)	\$81,000			
Geotechnical Investigation	\$180,000			
Commissioning	\$195,000			
Site Survey	\$60,000			
Testing	\$210,000			
LEED Services	\$135,000			
Voice/Data Consultant	\$0			
Value Engineering				
Constructability Review	\$150,000			
Environmental Mitigation (EIS)	\$25,000			
Landscape Consultant				
Audit	\$95,000			
Insert Row Here				
Sub TOTAL	\$1,131,000	1.2101	\$1,368,624	Escalated to Mid-Design
4) Other Services				
Bid/Construction/Closeout	\$566,989			31% of A/E Basic Services
HVAC Balancing				
Staffing	\$90,000			
Other				
Insert Row Here				
Sub TOTAL	\$656,989	1.3370	\$878,395	Escalated to Mid-Const.
5) Design Services Contingency				
Design Services Contingency	\$432,500			
Other				
Insert Row Here				
Sub TOTAL	\$432,500	1.3370	\$578,253	Escalated to Mid-Const.
CONSULTANT SERVICES TOTAL	\$9,082,498		\$11,096,409	

Cost Estimate Details

Construction Contracts				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
1) Site Work				
G10 - Site Preparation	\$0			
G20 - Site Improvements	\$321,174			
G30 - Site Mechanical Utilities	\$0			
G40 - Site Electrical Utilities	\$0			
G60 - Other Site Construction				
Other				
Insert Row Here				
Sub TOTAL	\$321,174	1.2719	\$408,502	
2) Related Project Costs				
Offsite Improvements				
City Utilities Relocation				
Parking Mitigation				
Stormwater Retention/Detention				
Other				
Insert Row Here				
Sub TOTAL	\$0	1.2719	\$0	
3) Facility Construction				
A10 - Foundations	\$2,609,279			
A20 - Basement Construction	\$0			
B10 - Superstructure	\$3,075,976			
B20 - Exterior Closure	\$2,912,006			
B30 - Roofing	\$697,813			
C10 - Interior Construction	\$1,611,669			
C20 - Stairs	\$48,195			
C30 - Interior Finishes	\$654,343			
D10 - Conveying	\$0			
D20 - Plumbing Systems	\$907,940			
D30 - HVAC Systems	\$2,336,110			
D40 - Fire Protection Systems	\$192,780			
D50 - Electrical Systems	\$2,324,256			
F10 - Special Construction	\$650,287			
F20 - Selective Demolition	\$0			
General Conditions	\$0			
Equip. & Furnishings	\$188,418			
Insert Row Here				
Sub TOTAL	\$18,209,072	1.3370	\$24,345,530	
4) Maximum Allowable Construction Cost				
MACC Sub TOTAL	\$18,530,246		\$24,754,032	
	\$824		\$1,100 per GSF	

5) GCCM Risk Contingency			
GCCM Risk Contingency	\$2,129,941		
Other	\$884,344		
Insert Row Here			
Sub TOTAL	\$3,014,285	1.3370	\$4,030,100
6) GCCM or Design Build Costs			
GCCM Fee	\$2,920,769		
Bid General Conditions	\$3,003,509		
GCCM Preconstruction Services	\$500,000		
Other			
Insert Row Here			
Sub TOTAL	\$6,424,278	1.3370	\$8,589,260
7) Owner Construction Contingency			
Allowance for Change Orders	\$926,512		
Other	\$2,500,000		
Insert Row Here			
Sub TOTAL	\$3,426,512	1.3370	\$4,581,247
8) Non-Taxable Items			
Other			
Insert Row Here			
Sub TOTAL	\$0	1.3370	\$0
9) Sales Tax			
Sub TOTAL	\$3,225,877		\$3,314,416
CONSTRUCTION CONTRACTS TOTAL	\$44,059,761		\$45,269,055

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Cost Estimate Details				
Consultant Services				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
1) Pre-Schematic Design Services				
Programming/Site Analysis				
Environmental Analysis				
Pre-design Study	\$500,000			
Honorarium	\$100,000			
Insert Row Here				
Sub TOTAL	\$600,000	1.1558	\$693,480	Escalated to Design Start
2) Construction Documents				
A/E Basic Design Services	\$1,262,009			69% of A/E Basic Services
Other	\$5,000,000			
Insert Row Here				
Sub TOTAL	\$6,262,009	1.2101	\$7,577,657	Escalated to Mid-Design
3) Extra Services				
Civil Design (Above Basic Svcs)	\$81,000			
Geotechnical Investigation	\$180,000			
Commissioning	\$195,000			
Site Survey	\$60,000			
Testing	\$210,000			
LEED Services	\$135,000			
Voice/Data Consultant	\$0			
Value Engineering				
Constructability Review	\$150,000			
Environmental Mitigation (EIS)	\$25,000			
Landscape Consultant				
Audit	\$95,000			
Insert Row Here				
Sub TOTAL	\$1,131,000	1.2101	\$1,368,624	Escalated to Mid-Design
4) Other Services				
Bid/Construction/Closeout	\$566,989			31% of A/E Basic Services
HVAC Balancing				
Staffing	\$90,000			
Other				
Insert Row Here				
Sub TOTAL	\$656,989	1.3370	\$878,395	Escalated to Mid-Const.
5) Design Services Contingency				
Design Services Contingency	\$432,500			
Other				
Insert Row Here				
Sub TOTAL	\$432,500	1.3370	\$578,253	Escalated to Mid-Const.
CONSULTANT SERVICES TOTAL	\$9,082,498		\$11,096,409	

Cost Estimate Details

Construction Contracts				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
1) Site Work				
G10 - Site Preparation	\$0			
G20 - Site Improvements	\$321,174			
G30 - Site Mechanical Utilities	\$0			
G40 - Site Electrical Utilities	\$0			
G60 - Other Site Construction				
Other				
Insert Row Here				
Sub TOTAL	\$321,174	1.2719	\$408,502	
2) Related Project Costs				
Offsite Improvements				
City Utilities Relocation				
Parking Mitigation				
Stormwater Retention/Detention				
Other				
Insert Row Here				
Sub TOTAL	\$0	1.2719	\$0	
3) Facility Construction				
A10 - Foundations	\$2,609,279			
A20 - Basement Construction	\$0			
B10 - Superstructure	\$3,075,976			
B20 - Exterior Closure	\$2,912,006			
B30 - Roofing	\$697,813			
C10 - Interior Construction	\$1,611,669			
C20 - Stairs	\$48,195			
C30 - Interior Finishes	\$654,343			
D10 - Conveying	\$0			
D20 - Plumbing Systems	\$907,940			
D30 - HVAC Systems	\$2,336,110			
D40 - Fire Protection Systems	\$192,780			
D50 - Electrical Systems	\$2,324,256			
F10 - Special Construction	\$650,287			
F20 - Selective Demolition	\$0			
General Conditions	\$0			
Equip. & Furnishings	\$188,418			
Insert Row Here				
Sub TOTAL	\$18,209,072	1.3370	\$24,345,530	
4) Maximum Allowable Construction Cost				
MACC Sub TOTAL	\$18,530,246		\$24,754,032	
	\$824		\$1,100 per GSF	

Cost Estimate Details

Construction Contracts				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
1) Site Work				
G10 - Site Preparation	\$0			
G20 - Site Improvements	\$321,174			
G30 - Site Mechanical Utilities	\$0			
G40 - Site Electrical Utilities	\$0			
G60 - Other Site Construction				
Other				
Insert Row Here				
Sub TOTAL	\$321,174	1.2719	\$408,502	
2) Related Project Costs				
Offsite Improvements				
City Utilities Relocation				
Parking Mitigation				
Stormwater Retention/Detention				
Other				
Insert Row Here				
Sub TOTAL	\$0	1.2719	\$0	
3) Facility Construction				
A10 - Foundations	\$2,609,279			
A20 - Basement Construction	\$0			
B10 - Superstructure	\$3,075,976			
B20 - Exterior Closure	\$2,912,006			
B30 - Roofing	\$697,813			
C10 - Interior Construction	\$1,611,669			
C20 - Stairs	\$48,195			
C30 - Interior Finishes	\$654,343			
D10 - Conveying	\$0			
D20 - Plumbing Systems	\$907,940			
D30 - HVAC Systems	\$2,336,110			
D40 - Fire Protection Systems	\$192,780			
D50 - Electrical Systems	\$2,324,256			
F10 - Special Construction	\$650,287			
F20 - Selective Demolition	\$0			
General Conditions	\$0			
Equip. & Furnishings	\$188,418			
Insert Row Here				
Sub TOTAL	\$18,209,072	1.3370	\$24,345,530	
4) Maximum Allowable Construction Cost				
MACC Sub TOTAL	\$18,530,246		\$24,754,032	
	\$824		\$1,100 per GSF	

Cost Estimate Details

Equipment				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
1) Equipment				
E10 - Equipment	\$1,400,000			
E20 - Furnishings	\$700,000			
F10 - Special Construction	\$475,000			
Other	\$500,000			
Moble Lab Casework	\$461,869			
Sub TOTAL	\$3,536,869	1.3370	\$4,728,794	
2) Non Taxable Items				
Other				
Insert Row Here				
Sub TOTAL	\$0	1.3370	\$0	
3) Sales Tax				
Sub TOTAL	\$279,413		\$373,575	
EQUIPMENT TOTAL	\$3,816,282		\$5,102,369	

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Cost Estimate Details

Artwork				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
1) Artwork				
Project Artwork	\$0			0.5% of total project cost for new construction
Higher Ed Artwork	\$350,748			0.5% of total project cost for new and renewal construction
Other				
Insert Row Here				
ARTWORK TOTAL	\$350,748	NA	\$350,748	

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Cost Estimate Details

Project Management				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
1) Agency Project Management				
Agency Project Management	\$1,898,660			
Additional Services				
On-Site Supervision	\$235,000			
Insert Row Here				
<i>Subtotal of Other</i>	<i>\$235,000</i>			
PROJECT MANAGEMENT TOTAL	\$2,133,660	1.3370	\$2,852,704	

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Cost Estimate Details

Other Costs				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
Mitigation Costs	\$746,972			
Hazardous Material Remediation/Removal	\$2,944,584			
Historic and Archeological Mitigation	\$50,000			
Facilities / Admin	\$60,000			
Permits / Utility Fees	\$781,333			
OTHER COSTS TOTAL	\$4,582,889	1.2719	\$5,828,977	

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Allyson Brooks Ph.D., Director
State Historic Preservation Officer

July 16, 2020

Louise Sweeney, DBIA
Project Manager Lead
WSU Facilities Services, Capital
McCluskey Building
PO Box 641150
Pullman, WA 99164-1150

In future correspondence please refer to:
Project Tracking Code: 2020-07-04613
Re: Washington State University 2021-2023 Capital Budget Request

Dear Louise Sweeney:

Thank you for contacting the Washington State Department of Archaeology and Historic Preservation (DAHP). The above referenced project has been reviewed on behalf of the State Historic Preservation Officer (SHPO) under provisions of Governor's Executive Order 05-05. Our review is based upon documentation contained in your communication.

We understand the following projects to be in the pre-design or design phase, and are therefore exempt from further review under Governor's Executive Order 05-05:

- Pullman Life and Physical Sciences Building
- Engineering Building Predesign

Please be aware that it is our current opinion that both Heald Hall and Dana Hall meet the criteria for listing in the National Register of Historic Places under Criterion C. Should the construction become obligated with Washington State Capital Funding and include the demolition of either historic property, we encourage Washington State University to ensure budgetary consideration for mitigation measure to compensate for the loss of these historic properties. However, we would also like to take this opportunity to encourage the University to identify and pursue alternatives to demolition of these historic properties as they progress through the pre-design and design phases, and DAHP would be happy to be consulted on these alternatives at any time.

Campus Fire Protection and Domestic Water Reservoir: If the existing water tank is 45 years or older, DAHP will need an EZ-2 as well.

Vancouver Life Sciences Building: In the Pre-design review it was suggested that an archaeologist be hired to monitor site disturbances during construction, and DAHP continues this recommendation at this time.

These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer (SHPO) in conformance with Governor's Executive Order 05-05. Should additional information become available, our assessment may be revised.

Finally, please note that in order to streamline our responses, DAHP requires that Resource documentation (HPI, Archaeology sites, TCP) and reports be submitted electronically. Correspondence must be emailed in PDF format to the appropriate compliance email address. For more information about how to submit documents to DAHP please visit: <https://dahp.wa.gov/project-review>. To assist you in

State of Washington • Department of Archaeology & Historic Preservation
P.O. Box 48343 • Olympia, Washington 98504-8343 • (360) 586-3065
www.dahp.wa.gov



conducting a cultural resource survey and inventory effort, DAHP has developed Guidelines for Cultural Resources Reporting. You can view or download a copy from our website.

Thank you for the opportunity to review and comment. Please ensure that the DAHP Project Number (a.k.a. Project Tracking Code) is shared with any hired cultural resource consultants and is attached to any communications or submitted reports. If you have any questions, please feel free to contact me.

Sincerely,

Holly Borth
Project Compliance Reviewer
(360) 586-3533
holly.borth@dahp.wa.gov

State of Washington • Department of Archaeology & Historic Preservation
P.O. Box 48343 • Olympia, Washington 98504-8343 • (360) 586-3065
www.dahp.wa.gov



June 14, 2022

Department of Archaeology and Historical Preservation
PO Box 48343
Olympia, WA 98504-8343

Via email: 2102@dahp.wa.gov

Subject: WSU 2023-2025 Budget Notification

To the DAHP:

Washington State University is compiling the Capital Budget Request for the upcoming 2023-25 biennium. Per the Governor's Executive Order 21-02, WSU is notifying you if the following project requests:

Previously DAHP exempted projects:

These projects received exemption during the predesign phase.

- 1) Spokane Biomedical and Health SC Phase 2: DAHP log# 2016-03809 (enabling project listed below)
- 2) Pullman Life and Physical Sciences: DAHP log# 2018-07-05050 (enabling projects listed below)
- 3) Engineering Building – VCEA Student Success Building: DAHP log# 2020-07-04613. Request for design and construction funds for 2023-25 biennium. The new building will be constructed on the site of an existing parking lot. The 2025-27 request will include funds to demolish Dana Hall (1949) and we intend to document its historical significance as required.

Projects #1 and #2 listed above will begin with enabling projects for this next 2023-25 biennium.

Projects That May Require the EZ-1:

- 1) Spokane enabling project - Team Health Education Building: scope includes demolition and replacement of a 6,000sf blue metal building constructed in 1973 and a 35,600sf two story 1910 brick masonry addition to the original six story 1909 Jensen Byrd building. The six-story Jensen Byrd building will receive modifications to secure the façade once the two structures are removed.
- 2) Pullman Life and Physical Science enabling projects:

PO Box 641150, 2425 Grimes Way, Pullman, WA 99164-1150 | 509-335-9000 | facilities.wsu.eduJune 13, 2022
Page 2 of 2

- Eastlick Hall: scope includes renovation of 12,800sf of the total 123,241sf of existing teaching laboratories in the 1977 science facility. Design and construction in one biennium.
 - Abelson Hall: scope includes renovation of 15,800sf of the total 101,546sf of existing teaching laboratories in the 1935 science facility. Design and construction in one biennium.
- 3) Bustad Renovation: renovation in Bustad Hall (circa 1978) includes laboratory modernization for specific program needs in approximately 8500sf of the buildings 143,159sf. Design and construction in one biennium.
 - 4) Knott Dairy Center: scope includes renovation and/or replacement of various 1959 circa farm structures that have outlived their useful life. Design and construction in one biennium.
 - 5) Remote Collection Storage: scope includes design and construction of a new roughly 15,000sf to 20,000sf storage facility on the outskirts of campus.

Follow Up Items

Campus Fire Protection and Domestic Water Reservoir: DHP log# 2020-07-04613. The existing water tanks to be removed are older than 45 years, therefore an EZ GEO 21-02 form will be submitted shortly.

Vancouver Life Sciences Building: DHP log# 2018-08-06384. A professional archaeologist is on site during excavation activities. A final report will be submitted to DAHP.

Tri Cities Academic Building: DAHP log# 2016-06-04617: A professional archaeologist was hired to be on site during excavation activities. A final report has been submitted to DAHP.

Thank you for your review of the above materials. Please let me know if there's any additional information required.

Sincerely,



Louise Sweeney
Project Manager Lead
Facilities Services, Capital
Washington State University

Cc: file

PO Box 641150, 2425 Grimes Way, Pullman, WA 99164-1150 | 509-335-9000 | facilities.wsu.edu

Num.	Description	Report Page Location
1. Executive Summary		
	Executive Summary	10-12
2. Problem Statement		
A.	Identify Problem	30-41
B.	Identify Requirements	30-41
C.	Explain Connections	30-41
D.	Solving the Problem	30-41
E.	Relevant History	154-190
3. Analysis of Alternatives (Including the Preferred Alternative)		
A.	Analysis of Alternatives	22-37, 218-240
4. Detailed Analysis of Preferred Alternative		
A.	Preffered Alternative in Detail	46-84, 92-121
B.	Site Analysis	22-25, 92-97
C.	Long Term Plans	30-41
D.	Other laws and regulations	126-151
E.	Further Study	126-151
F.	Identify Significant Components	126-151
G.	IT	149-151
H.	Site Related Measures	128-131
I.	Commissioning	126
J.	Future Phases	30-41
K.	Delivery Methods	43
L.	Schedule	122-123
5. Detailed Analysis of Preferred Alternative		
A.	Cost Estimate	241-273
B.	Proposed Funding	274-298
C.	Facilities Operations	274-298
D.	FF&E	274-298
Predesign Appendices		
A.	Completed Life Cycle Cost Model	218-239
B.	A Letter from DAHP	299-302

PREDESIGN MANUAL

8.1 About the predesign

Purpose of the capital project predesign

The Office of Financial Management (OFM) is required by RCW [43.88.110\(5\)](#) to institute procedures for reviewing capital projects proposed by state agencies. A predesign is one step in a comprehensive review and funding process for state agency capital construction.

The intent of a predesign is to explore alternatives for proposed capital projects. The predesign should assess which alternative best addresses the problem, opportunity, or program requirement and at what cost, generally at less than schematic-level design information. Decision makers in the Governor’s Office, OFM and the Legislature use this information to determine whether the project should proceed toward design and construction.

Predesign basics

It is highly recommended that agencies schedule an initial scoping meeting with their OFM capital budget [analyst](#) and predesign consultant (if selected) to confirm the predesign requirements and expectations for the project. To ensure that major construction projects are carried out in accordance with legislative and executive intent, design and construction appropriations may not be expended or encumbered until OFM has reviewed and approved the agency’s predesign.

Predesigns **are** required for all capital construction projects:

- Valued over \$10 million, or
- Projects selected by the Legislature or OFM because they are particularly time sensitive, have high risk or are of particular interest to decision makers.

UPDATED

Note: For projects under \$10 million that involve: (a) housing of new state programs, (b) a major expansion of existing state programs or (c) relocation of state agency programs, agencies must submit a modified predesign to OFM’s facilities oversight [program](#). This includes the consolidation of multiple state agency tenants into one facility, as directed by RCW [43.82.035](#). Information about the modified predesign is available on OFM’s facilities [webpage](#). Projects that meet the capital requirements for predesign on major facility projects with an estimated project cost of \$10 million or more are not required to prepare a modified predesign.

If an appropriation for a predesign is included in the budget, the predesign scope must align with any associated budget provisos. Agencies undertaking a predesign without an appropriation should coordinate with their capital budget [analyst](#).

OFM has authority to make exception to some of the predesign requirements but must report any exceptions to the fiscal committees of the legislature with a justification. Contact your capital budget analyst for approval early in the predesign process if your agency believes one or more elements of the predesign will not add value for decision makers or if there are other compelling reasons that may warrant an exception.

NEW

Pre-design submittal

For projects to qualify for design consideration in the capital budget, submit the pre-design no later than July 1 of even-numbered years, as required in the capital budget [instructions](#). If pre-design and design are funded in the same biennium, OFM will not release the allotment for design of the project until the pre-design is approved (RCW [43.88.110](#)).

UPDATED

- If the pre-design is below the 20 MB restriction for email, email it to ofm.budget@ofm.wa.gov, your OFM capital budget analyst.
- For agencies *within the SGN*, larger files should be copied to OFM's FTP site by pasting the following address into File Explorer (not a browser) – "[ftp://ftp.ofm.wa.gov/OFM/Capital Budget Submittals](ftp://ftp.ofm.wa.gov/OFM/CapitalBudgetSubmittals)." Please notify your capital budget analyst as files are posted on the FTP site as it is not monitored year-round.
- For agencies *not within the SGN*, files larger than 20 MB can be placed on an agency FTP site for download or mailed on a thumb drive to OFM at the following address:

Office of Financial Management
Capital Budget
P.O. Box 43113
Olympia, WA 98504-3113

Pre-design review and approval

After receiving a pre-design, OFM will review the document to ensure that projects are carried out in accordance with this pre-design manual and the direction provided in the capital budget. OFM may require changes or additional information before approval. Agencies should make an appropriate allowance in their consultant contracts for the time involved in the OFM review and approval process. Approval of the completed pre-design does not guarantee additional appropriation for design or construction.

To facilitate the approval process, we recommend agencies meet with OFM and legislative staff to present a high-level summary of their pre-design and to answer any preliminary questions. Agencies should contact their capital budget [analyst](#) to schedule this meeting.

Please note that the purpose of a pre-design is to explore alternatives for proposed capital projects. Pre-designs also provide professional cost estimates to inform appropriation amounts. If a pre-design is completed several biennia before design funding is appropriated, it may have limited value for decision makers. In some cases, agencies may be required to complete additional analysis if the pre-design for a project is more than two biennia old, or less in areas experiencing rapid market changes.

8.2 Contents of a pre-design

A pre-design should include the content detailed in this section. Contact a capital budget [analyst](#) early in the pre-design process if specific content detailed below will not aid decision makers in assessing which alternative best addresses the problem, opportunity or program requirement. OFM will approve limited scope pre-designs on a case-by-case basis.

Executive summary

Summarize the problem, opportunity, or program requirements; alternatives considered; preferred alternative; and why that alternative was selected. Include basic project cost information.

Problem statement

- A. Identify the problem, opportunity or program requirement addressed by the project and how it will be accomplished.
- B. Identify and explain the statutory or other requirements that drive the project's operational programs and how these affect the need for space, location, or physical accommodations. Include anticipated caseload projections (growth or decline) and assumptions, if applicable.
- C. Explain the connection between the agency's mission, goals, and objectives; statutory requirements; and the problem, opportunity, or program requirement.
- D. Describe in general terms what is needed to solve the problem.
- E. Include any relevant history of the project, including previous pre-designs or budget funding requests that did not go forward to design or construction.

Analysis of alternatives (including the preferred alternative)

- A. Describe all alternatives that were considered, including the preferred alternative. Alternatives may include collocation, renovation, leased space, purchase, new construction or other options explored. Include the following:
 - i. A no action alternative. Describe the programmatic outcome of not addressing the problem or opportunity. Do the problems which were driving the project still exist? Are the necessary technologies available to meet the project objectives within the proposed project funding and timeline?
 - ii. The advantages and disadvantages of each alternative. Include a high-level summary table with your analysis that compares the alternatives, including the anticipated cost for each alternative.
 - iii. Cost estimates for each alternative.
 - a. Provide enough information so decision makers have a general understanding of the project costs.
 - b. To compare the life cycle cost of different alternatives, use OFM's Life Cycle Cost [Model](#) (LCCM, RCW [39.35B.050](#)). Include the completed life cycle cost summary as an appendix. OFM's LCCM is the only authorized tool for the completion of this section because it provides a standard methodology and set of assumptions for state agency facility construction.
- Note: In addition to the LCCM, there are two other additional life cycle cost analysis tools maintained by the state, the Life Cycle Cost Tool (LCCT) maintained by the OFM and the Energy Life Cycle Cost Analysis (ELCCA) maintained by the DES Energy Program. Although these two tools are not required for pre-design, they are required in early stages of in design phase for state agency facility construction projects. Consider incorporating these tools in pre-designs where the focus of the project is the replacement of building systems.**
- 1) OFM's Life Cycle Cost Tool (LCCT) is used for the design of facilities with an area of 5,000 square feet or greater (Executive Order [13-03](#)) to demonstrate how the building design contributes to energy efficiency and conservation. The tool, instructions and training webinars are available at OFM's forms [webpage](#).
 - 2) The DES Energy Program's Energy Life Cycle Cost [Analysis](#) (ELCCA) is required for projects over 25,000 square feet (RCW [39.35.050](#)). This tool evaluates energy-using systems such as heating, cooling, lighting, building envelope and domestic hot water.
- iv. Schedule estimates for each alternative. Estimate the start, midpoint, and completion dates.

Detailed analysis of preferred alternative

- A. Describe the preferred project alternative in detail, including the following:
 - i. Nature of space. How much of the proposed space will be used for what purpose (e.g., office, lab, conference, classroom, etc.).
 - ii. Occupancy numbers.
 - iii. Basic configuration of the building, including square footage and the number of floors.
 - iv. Space needs assessment. Compare the project space needs to currently recognized space planning guidelines and identify the guidelines used. These may include
 - a. OFM’s Statewide Space Use [Guidelines](#).
 - b. For four-year higher education facilities, Facilities Evaluation and Planning [Guide](#).
 - c. For community and technical colleges, the Facilities Coding [Manual](#) for space use coding, the Capital Analysis [Model](#) (Chapter 6, appendix H), and Policy Manual and [Guidelines](#) on Utilization of Classrooms and Labs.
- B. Site analysis
 - i. Identify site studies that are completed or underway and summarize their results. These studies may include:
 - a. Phase 1 environmental survey assessment
 - b. Geotechnical assessment
 - c. Transportation or traffic study
 Please be prepared to provide these documents upon request.
 - ii. Provide the following:
 - a. Location.
 - b. Building footprint and its relationship to adjacent facilities and site features. Provide an aerial view, sketches of the building site and basic floor plans.
 - c. Water rights and water availability.
 - d. Stormwater requirements.
 - e. For projects including proposed land acquisition, please attach a title report including legal description and analysis of easements as an appendix to the predesign document. Please also detail any acquisition issues.
 - f. Property setback requirements.
 - g. Potential issues with the surrounding neighborhood, during construction and ongoing once operational.
 - h. Utility extension or relocation issues.
 - i. Potential environmental impacts:
 - (i) Green space and natural amenities that need to be preserved or accorded special treatment.
 - (ii) Required or potential site mitigation, including history of possible contamination.
 - (iii) Wetlands and shoreline impacts, including a wetlands delineation and the need to fill wetlands.
 - (iv) Shoreline jurisdiction issues.
 - (v) Requirements for the State Environmental Policy Act, National Environmental Policy Act, or an environmental impact statement.
 - (vi) Other regulatory requirements, such as hydraulic project approval and U.S. Army Corps of Engineers permits.
 - j. Parking and access issues, including improvements required by local ordinances, local road impacts and parking demand.
 - k. Impact on surroundings and existing development with construction lay-down areas and construction phasing.

- C. Identify whether the proposed project is consistent with applicable long-term plans (such as Thurston County and Capitol campus master plans and agency or area master plans) as required by RCW [43.88.110](#). Please be prepared to provide pertinent documentation submitted to planning authorities.
- D. Consistency with other laws and regulations. Provide documentation that indicates the preferred option is consistent with the following:
 - i. High-performance public buildings (Chapter [39.35D](#) RCW). All state-funded buildings 5,000 square feet or more must be designed, constructed, and certified to the LEED™ silver standard at a minimum.
 - ii. The state efficiency and environmental performance (SEEP) executive order requires, subject to available funding, newly constructed state-owned (including lease purchase) buildings be designed as zero energy or zero energy capable, and include consideration of embodied carbon. In unique situations where a cost-effective, zero energy building is not yet technically feasible, buildings must be designed to exceed the current state building code for energy efficiency to the greatest extent possible (Executive Order [20-01](#)). For questions about SEEP or zero energy buildings, please visit the [Zero Energy Toolkit](#) or contact SEEP Director Hanna Waterstrat at hanna.waterstrat@commerce.wa.gov.
 - iii. Proposed building projects over 20,000 gross square feet must follow the state energy standards for clean buildings, per RCW [19.27A.210](#).
 - a. Tier 1 Buildings: non-residential buildings, including state agency facilities, greater than 50,000 square feet in floor area. State agencies are eligible to participate in the incentive program if their buildings meet criteria required to participate. While mandatory compliance with the Standard does not start until 2026, agencies should plan for how they will comply with these standards and submit associated budget requests, as several biennia of improvements may be necessary.
 - b. Tier 2 Buildings: multifamily residential, nonresidential, hotel motel and dormitory buildings exceeding 20,000 square feet in floor area and multifamily residential buildings with floor areas equal to or exceeding 50,000 square feet. This new law requires that Commerce develop reporting requirements for covered Tier 2 buildings including benchmarking, operations and maintenance planning and energy management planning. Reporting requirements will become effective in 2027 for Tier 2 buildings. Tier 2 buildings, including state-owned facilities, are also able to participate in an incentive program starting in 2025. For more information, see Commerce’s [website](#) or contact buildings@commerce.wa.gov.
 - iv. Compliance with required vehicle charging capability for new buildings that provide on-site parking (RCW [19.27.540](#)).
 - v. Greenhouse gas emissions reduction policy (RCW [70A.45.050](#)), including consideration of:
 - a. The state's limits on the emissions of greenhouse gases established in RCW [70A.45.050](#);
 - b. Statewide goals to reduce annual per capita vehicle miles traveled by 2050, in accordance with RCW [47.01.440](#), except that the agency shall consider whether project locations in rural counties, as defined in RCW [43.160.020](#), will maximize the reduction of vehicle miles traveled; and
 - c. Applicable federal emissions reduction requirements.
 - vi. Archeological and cultural resources (Executive Order [21-02](#) and Section 106 of the National Historic Preservation Act of 1966). Agencies must consult with DAHP and affected tribes on the potential effects of projects on cultural resources and historic properties proposed in state-funded construction or acquisition projects, including grant or

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pass-through funding that culminates in construction or land acquisitions. Consultation with the department of archaeology and historic preservation and affected tribes must be initiated early in the project planning process, prior to construction or taking title. Agencies must attach a letter from DAHP confirming that the proposed capital project was reviewed. (Some agencies may have an exemption from this requirement from DAHP.) If the request is a grant that contains multiple subprojects, ensure that this requirement is contained in the application process or the contract. Contact Dr. Rob Whitlam at DAHP (360) 890-2615 for assistance. Please allow DAHP a minimum of 30 days for review. If mitigation is anticipated, please ensure it is worked into the project schedule and budget.

- vii. Americans with Disabilities Act implementation (Executive Order [96-04](#)).
 - viii. Compliance with planning under Chapter [36.70A](#) RCW, as required by RCW [43.88.0301](#).
 - ix. Information required by RCW [43.88.0301](#)(1).
 - x. Other codes or regulations.
- E. Identify problems that require further study (for example, environmental contaminants, traffic studies or IT or other infrastructure challenges). Evaluate identified problems to establish probable costs and risk.
- F. Identify significant or distinguishable components, including major equipment and ADA requirements in excess of existing code.
- G. Identify planned technology infrastructure and other related IT investments that affect the building plans. [Contact](#) the Office of the Chief Information Officer (OCIO) to coordinate IT requirements. Some projects may require oversight by OCIO and the Technology Services Board. See RCW [43.88.092](#) and [43.105.205](#) (for higher education).
- H. Identify any site-related security measures such as setbacks, lighting, etc. and/or physical security measures such as security systems, barrier protection, etc. for the project.
- I. Describe planned building commissioning to ensure systems function as designed.
- J. Describe any future phases, plans or other facilities that will affect this project, including impacts to current lease contracts. Include detail on the need to backfill space or cost assumptions for vacant space.
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- K. Project management and delivery method alternatives considered.
- v. Provide a comparative discussion of the pros and cons of the project delivery methods considered for this project and offer a recommendation of proposed procurement method for the preferred alternative. The delivery methods considered could include design-build, phased construction, general contractor/construction manager (GC/CM) or conventional design/bid/build. The proposed method of project delivery must be justified.
 - (a) For design-build, link the justification to RCW [39.10.300](#) for uses, RCW [39.10.320](#) requirements and RCW [39.10.330](#) for process.
 - (b) For GC/CM, link the justification to the requirements in RCW [39.10.340](#) for uses, RCW [39.10.350](#) for requirements and RCW [39.10.360](#) for process.
 - vi. Describe how the project will be managed within the agency:
 - (a) Identify roles and responsibilities for the project.
 - (b) Identify in-house staffing requirements for the proposed project.
 - (c) Identify consultant services, DES resources or additional staff needed to manage the project.
- L. Schedule
- vii. Provide a high-level milestone schedule for the project, including key dates for budget approval, design, bid, acquisition, construction, equipment installation, testing, occupancy and full operation.

- viii. Incorporate value-engineering analysis and constructability review into the project schedule, as required by RCW [43.88.110](#)(5)(c).
- ix. Describe factors that may delay the project schedule, such as an environmentally sensitive location, possible presence of archaeological or historical assets, or possible contamination of the site or buildings undergoing renovation.
- x. Describe the permitting or local government ordinances or neighborhood issues (such as location or parking compatibility) that could affect the schedule.
- xi. Identify when the local jurisdiction will be contacted and whether community stakeholder meetings are part of the process.

Project budget analysis for the preferred alternative

- A. Cost estimate. Provide the following:
 - i. Major assumptions used in preparing the cost estimate
 - ii. Summary table of Uniformat II Level 2 cost estimates
 - iii. The [C-100](#) in Excel
- B. Proposed funding
 - i. Identify the fund sources and expected receipt of the funds.
 - ii. If alternatively financed, such as through a Certificate of Participation (COP), provide the projected debt service and fund source. Include the assumptions used for calculating finance terms and interest rates. For assistance, please contact Matt Schoenfeld at the Office of the State Treasurer at 360-902-9022 or [email](#).
- C. Facility operations and maintenance requirements
 - i. Define the anticipated impact of the proposed project on the operating budget for the agency or institution. Include maintenance and operating assumptions (including FTEs) and moving costs.
 - ii. Show five biennia of capital and operating costs from the time of occupancy, including an estimate of building repairs, replacement, and maintenance.
 - iii. Identify the agency responsible for ongoing maintenance and operations, if not maintained by the owner.
- D. Furniture, fixtures, and equipment. Clarify whether furniture, fixtures and equipment are included in the project budget. If not included, explain why.

8.3 Appendices

Appendix 1: Predesign checklist and outline

A predesign should include the content detailed here. OFM will approve limited scope predesigns on a case-by-case basis.

Executive summary

Problem statement, opportunity, or program requirement

- Identify the problem, opportunity, or program requirement that the project addresses and how it will be accomplished.
- Identify and explain the statutory or other requirements that drive the project’s operational programs and how these affect the need for space, location, or physical accommodations. Include anticipated caseload projections (growth or decline) and assumptions, if applicable.
- Explain the connection between the agency’s mission, goals, and objectives; statutory requirements; and the problem, opportunity, or program requirements.
- Describe in general terms what is needed to solve the problem.
- Include any relevant history of the project, including previous predesigns or budget funding requests that did not go forward to design or construction.

Analysis of alternatives (including the preferred alternative)

- Describe all alternatives that were considered, including the preferred alternative. Include:
 - A no action alternative.
 - Advantages and disadvantages of each alternative. Please include a high-level summary table with your analysis that compares the alternatives, including the anticipated cost for each alternative.
 - Cost estimates for each alternative:
 - Provide enough information so decision makers have a general understanding of the costs.
 - Complete OFM’s Life Cycle Cost [Model](#) (RCW [39.35B.050](#)).
 - Schedule estimates for each alternative. Estimate the start, midpoint, and completion dates.

Detailed analysis of preferred alternative

- Nature of space – how much of the proposed space will be used for what purpose (i.e., office, lab, conference, classroom, etc.)
- Occupancy numbers.
- Basic configuration of the building, including square footage and the number of floors.
- Space needs assessment. Identify the guidelines used.
- Site analysis:
 - Identify site studies that are completed or under way and summarize their results.
 - Location.

- Building footprint and its relationship to adjacent facilities and site features. Provide aerial view, sketches of the building site and basic floorplans.
- Water rights and water availability.
- Stormwater requirements.
- Ownership of the site, easements, and any acquisition issues.
- N/A Property setback requirements.
- Potential issues with the surrounding neighborhood, during construction and ongoing.
- Utility extension or relocation issues.
- Potential environmental impacts.
- N/A Parking and access issues, including improvements required by local ordinances, local road impacts and parking demand.
- Impact on surroundings and existing development with construction lay-down areas and construction phasing.
- Consistency with applicable long-term plans (such as the Thurston County and Capitol campus master plans and agency or area master plans) as required by RCW [43.88.110](#).
- Consistency with other laws and regulations:
 - High-performance public buildings (Chapter [39.35D](#) RCW).
 - State efficiency and environmental performance, if applicable (Executive Order [20-01](#)).
 - State energy standards for clean buildings (RCW 19.27A.210).
- N/A Compliance with required vehicle charging capability for new buildings that provide on-site parking (RCW 19.27.540).
- Greenhouse gas emissions reduction policy (RCW [70.235.070](#)).
- Archeological and cultural resources (Executive Order [05-05](#) and [Section 106](#) of the National Historic Preservation Act of 1966). If mitigation is anticipated, please note this in the predesign with narrative about how mitigation is worked into the project schedule and budget.
- Americans with Disabilities Act (ADA) implementation (Executive Order [96-04](#)).
- Compliance with planning under Chapter [36.70A](#) RCW, as required by RCW [43.88.0301](#).
- Information required by RCW [43.88.0301](#)(1).
- Other codes or regulations.
- Identify problems that require further study. Evaluate identified problems to establish probable costs and risk.
- Identify significant or distinguishable components, including major equipment and ADA requirements in excess of existing code.
- Identify planned technology infrastructure and other related IT investments that affect the building plans.
- N/A Identify any site-related and/or physical security measures for the project.
- Describe planned commissioning to ensure systems function as designed.
- Describe any future phases or other facilities that will affect this project, including impacts to current lease contracts. Include detail on the need to backfill space or cost assumptions for vacant space.

- ✓ Provide a comparative discussion of the pros and cons of the project delivery methods considered for this project and offer a recommendation of proposed procurement method for the preferred alternative. The proposed method of project delivery must be justified.
- ✓ Describe how the project will be managed within the agency.
- ✓ Schedule.
- ✓ Provide a high-level milestone schedule for the project, including key dates for budget approval, design, bid, acquisition, construction, equipment installation, testing, occupancy and full operation.
- ✓ Incorporate value-engineering analysis and constructability review into the project schedule, as required by RCW [43.88.110\(5\)\(c\)](#).
- ✓ Describe factors that may delay the project schedule.
- ✓ Describe the permitting or local government ordinances or neighborhood issues (such as location or parking compatibility) that could affect the schedule.
- ✓ Identify when the local jurisdiction will be contacted and whether community stakeholder meetings are a part of the process.

Project budget analysis for the preferred alternative

- ✓ Cost estimate.
 - ✓ Major assumptions used in preparing the cost estimate.
 - ✓ Summary table of Unifomat Level II cost estimates.
 - ✓ The [C-100](#).
- ✓ Proposed funding.
 - ✓ Identify the fund sources and expected receipt of the funds.
- N/A If alternatively financed, such as through a COP, provide the projected debt service and fund source. Include the assumptions used for calculating finance terms and interest rates.
- ✓ Facility operations and maintenance requirements.
 - ✓ Define the anticipated impact of the proposed project on the operating budget for the agency or institution. Include maintenance and operating assumptions (including FTEs) and moving costs.
 - ✓ Show five biennia of capital and operating costs from the time of occupancy, including an estimate of building repair, replacement, and maintenance.
- N/A Identify the agency responsible for ongoing maintenance and operations, if not maintained by the owner.
- ✓ Clarify whether furniture, fixtures and equipment are included in the project budget. If not included, explain why.

Pre-design appendices

- ✓ Completed Life Cycle Cost [Model](#).
- ✓ A letter from DAHP.
- N/A Title report for projects including proposed acquisition.