Repurposing with Purpose

2025 I2SL National Conference

UC Berkeley

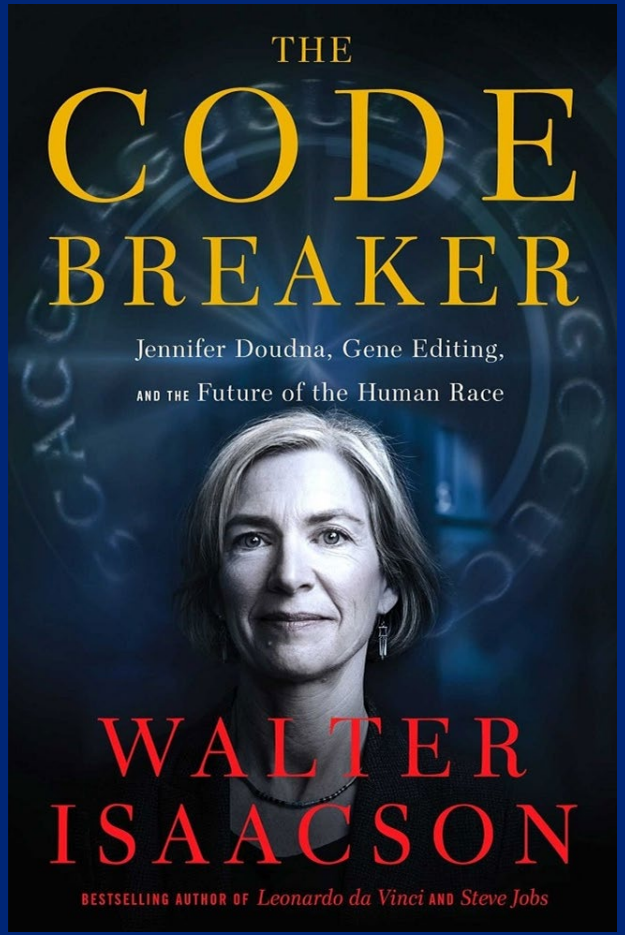
TAYLOR design

David Golden
Senior Project Manager
Capital Projects, UC Berkeley

Tad Costerison
AIA, LEED AP, NCARB
Senior Project Architect
Taylor Design

Learning Objectives

- Understand the positive and negative impacts of technology choices on future building uses and user
- Importance of historical systems data for future building renovations and iterations.
- Understand the commonalities and differences between generic molecular biology research space and entrepreneurship focused space.
- Demonstrate the advantages of a generic phenotype based design strategy for modularity and flexibility in executing a fast track project.



About Jennifer Doudna

- Li Ka Shing Chancellor's Chair Professor at UC Berkeley
- Howard Hughes Medical Institute Investigator
- Co-developing CRISPR-Cas9 genome editing technology
- Breakthrough Prize in Life Sciences
- Gruber Genetics Prize
- Kavli Prize in Nanoscience
- Foreign Policy's Leading Global Thinker
- L'Oréal-UNESCO For Women in Science Award
- Co-founding biotech companies
- Nobel Prize in Chemistry
- National Inventors Hall of Fame
- Elected to National Academy of Sciences
- National Academy of Medicine
- American Academy of Arts and Sciences

Innovative Genomics Institute

About

- Founded in **2015** by Jennifer Doudna and Jonathan Weissman
- Based at University of California, Berkeley, with partnerships/affiliated researchers at UCSF, UC Davis, UCLA, Lawrence Berkeley & Livermore Labs, Gladstone Institutes.

Mission

Develop next-generation genome engineering tools and translate them into affordable, accessible solutions in **human health**, **sustainable agriculture**, and **climate change**.

Drs Musunuru and Ahrens-Nicklas holding KJ after infusion of the CRISPR therapy.

Key Programs

- Human Health
- Sustainable Agriculture & Climate
- Technology & Translation / Genome Engineering Tools

Ethics, Access, & Public Impact

Emphasis on equitable access: ensuring that gene editing / therapies are affordable, accessible, especially for historically underserved populations

Existing Building Data

- 15 PI's
- **Area:** 113,200 gsf
- **Assignable:** 66,000 sf
- **Wet Lab:** 45,000 sf
- **Built:** 2012

SMITHGROUP

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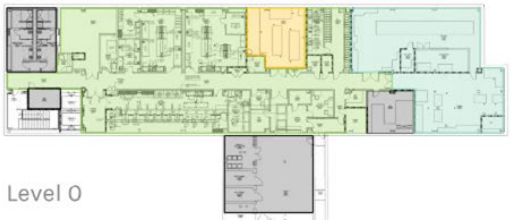
Typical Floor Plan

Functional Area Distribution

Research Lab	35%
Lab Support	30%
Office	19%
Office Support	2%
Conference	4%
Collaboration	5%
Bldg Support	5%

SMITHGROUP

Air Handler Summary



AHU – 1 Lab Areas - East
4 Fans: 12,500 / 14,000 CFM Each
Design CFM: 50,000 CFM
Maximum CFM: 56,000 CFM

AHU – 2 Lab areas - West
4 Fans: 15,000 / 17,000 CFM Each
Design CFM: 60,000 CFM
Maximum CFM: 68,000 CFM

AHU – 3 Office Areas
4 Fans: 12,000 / 13,500 CFM Each
Design CFM: 48,000 CFM
Maximum CFM: 54,000 CFM

AHU – 4 Chemistry Lab – 3rd Floor
4 Fans: 2,625 / 3,000 CFM Each
Design CFM: 10,500 CFM
Maximum CFM: 12,000 CFM

AHU – 5 Chiller Room
1 Fan: 4,000 CFM
Design CFM: 10,500 CFM
Maximum CFM: 12,000 CFM

AHU – 6 & 7
AHU-6: 10,000 CFM ELEC ROOM
AHU-7: 2,000 CFM PLUMB ROOM

Capacity: Metered Data Analysis

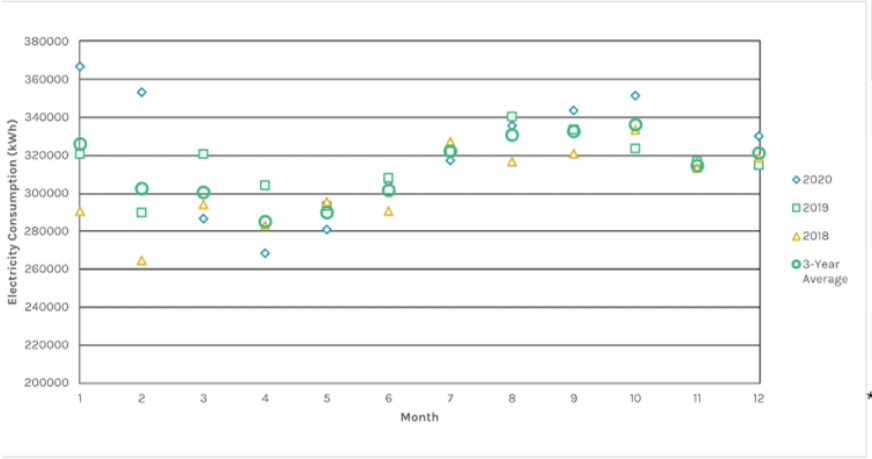
Electrical:
Total Building Power
2018: Full Year
2019: Full Year
2020: Full Year

Mechanical:
Air Handler: AHU-1, AHU-2, & AHU-3
Exhaust Fan: EF-1, EF-2, EF-3, & EF-4
Boiler: B-1 & B-2
Chiller: CH-1 & CH-2

2020 November
2020 December
2021 January

Conclusions:
Small mechanical data set – results impact
No major impact from COVID
~10% Capacity available for expansion

Recommend further data collection

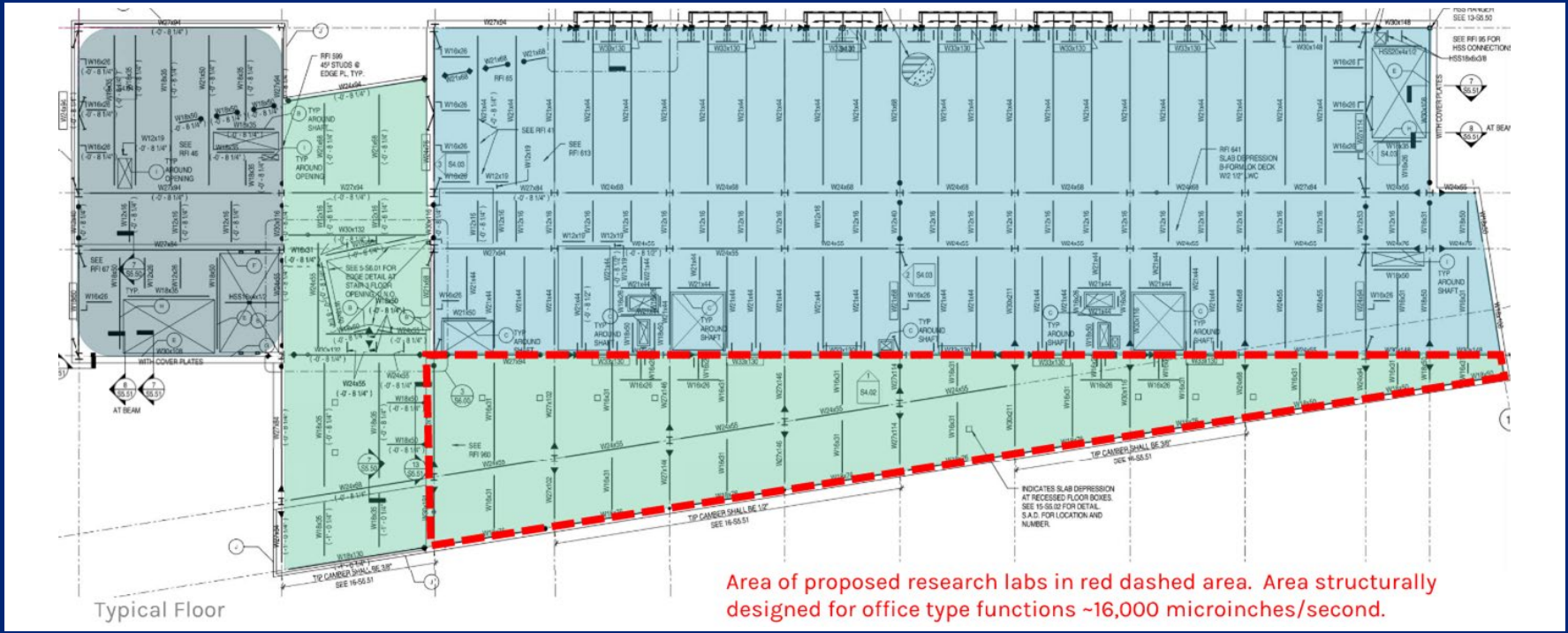


AHU TAG	Design CFM	Additional Capacity (CFM)	Additional Area* (SF)
AHU-1	50,000	5,000	2,860
AHU-2	60,000	6,000	3,430
AHU-3	48,000	4,800	2,740
AHU-4	10,500	1,050	600
	Total	**16,850**	**9,630**

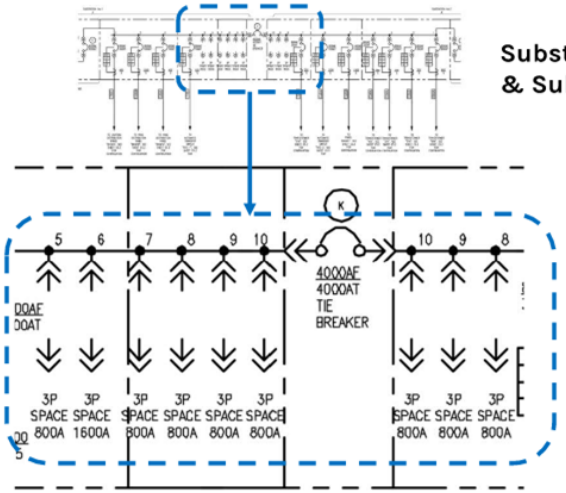
* Based on 1.7 CFM/SF

Structural Design

Vibration Concerns & Research Capacity



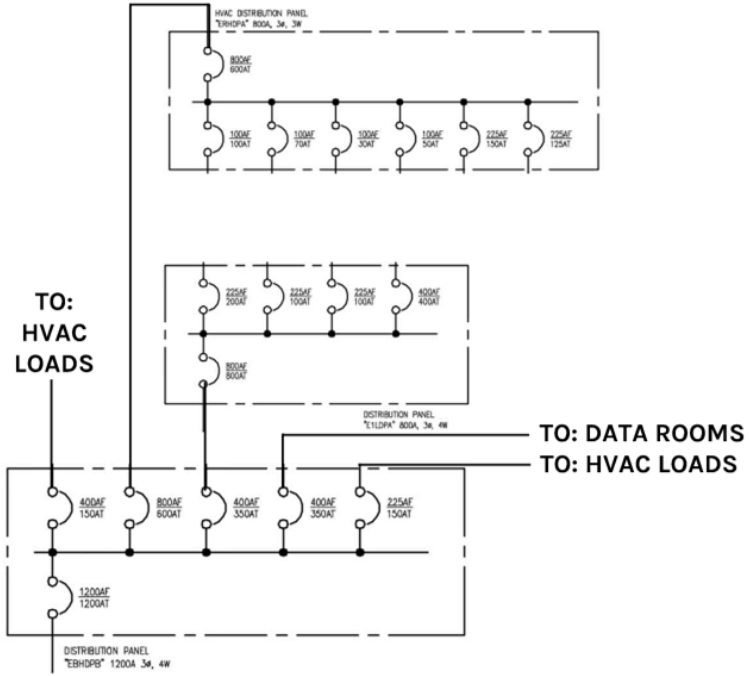
Potential to Add Capacity - Electrical



Substation #1
& Substation #2

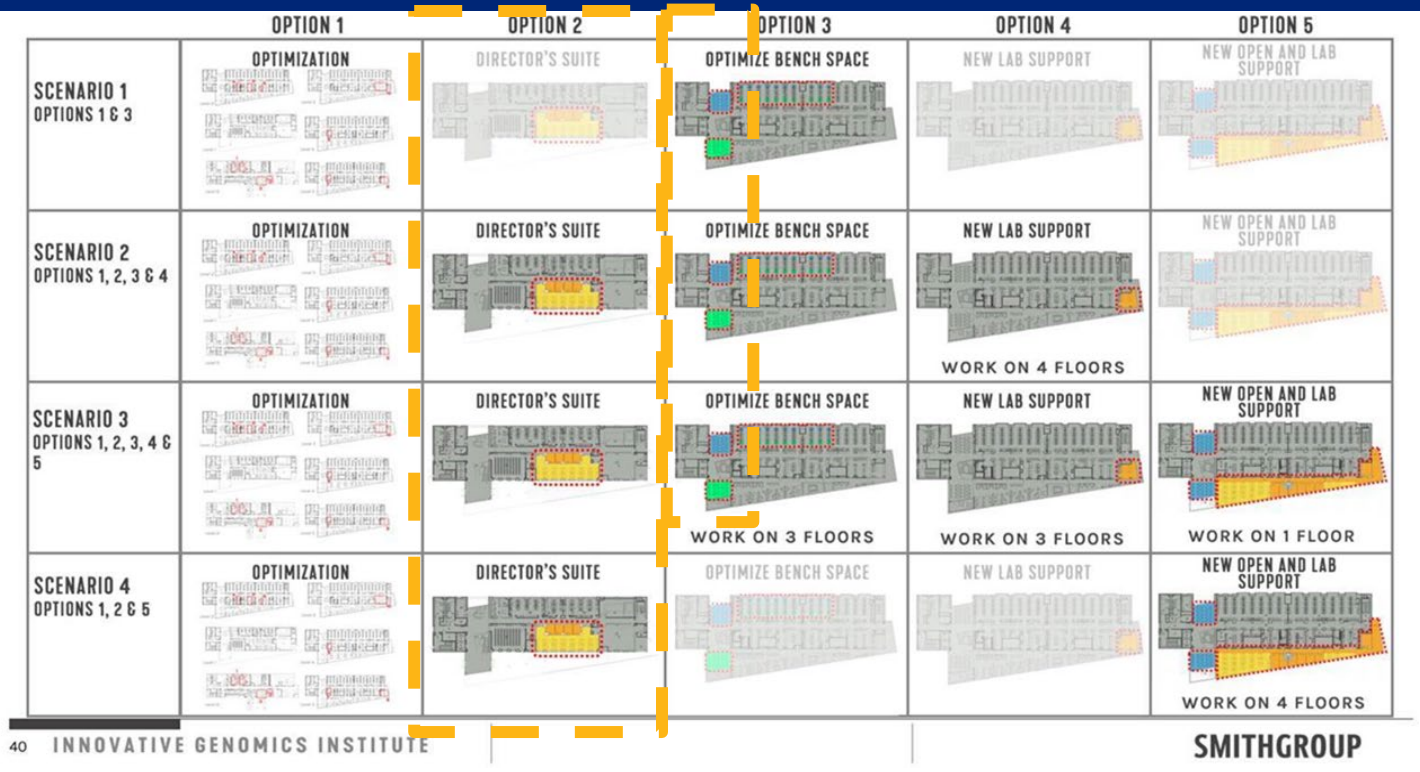
Normal Power:
(E) Equipment: SLD notes capacity

(N) Equipment: SLD notes capacity,
but needs field verification



Emergency / Standby Power:
No Spare Breakers

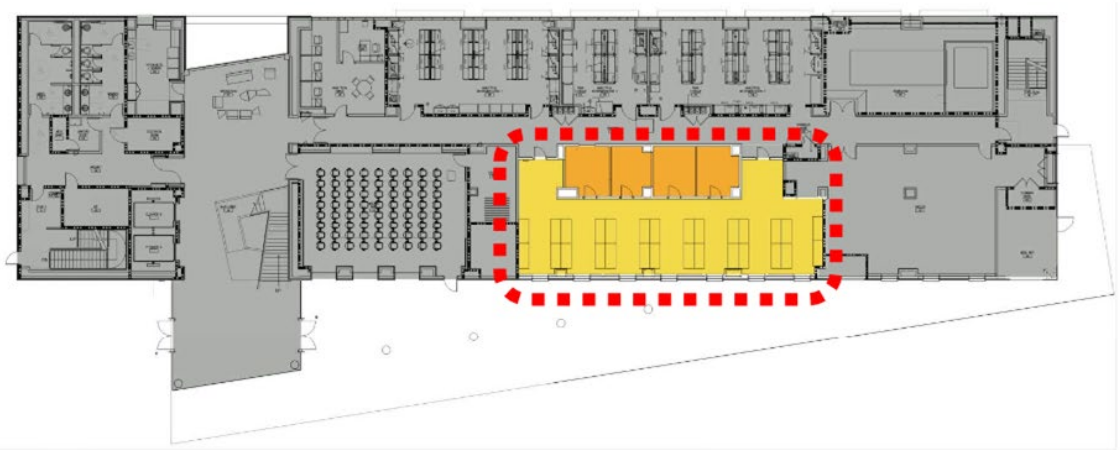
Planning Scenarios



Research Space Expansion

Opportunities to Expand Research

- Director's Suite Conversion



Level 1

Total Area Available: 1,984 sqft

Open Lab: 1,513 sqft
Support Lab (4): 471 sqft

28 Bench locations

- Open Lab
- Support Lab
- Open Office
- Private Office
- Interaction
- Vertical Circulation
- Building Support
- Lab Tech Desk

Research Space Expansion

Opportunities to Expand Research

- Typical Floor Expansion

Typical Floor

Total Area Available: 5,437 sqft

Open Lab:	1,772 sqft
Support Lab (7):	974 sqft
Corridor:	1,098 sqft
Write-Up Area:	1,278 sqft

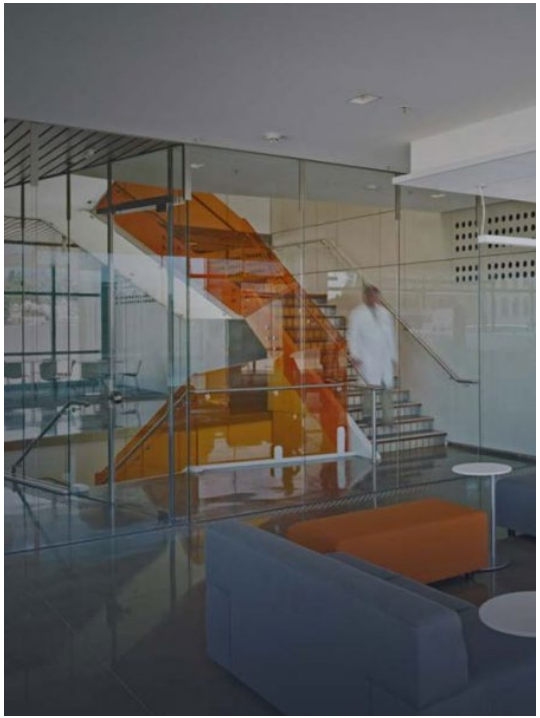
40 Bench locations
42 Write-up desks

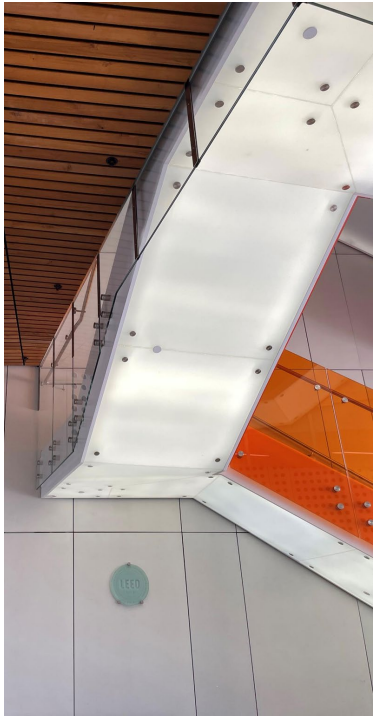
- Open Lab
- Support Lab
- Open Office
- Private Office
- Interaction
- Vertical Circulation
- Building Support
- Lab Tech Desk

H.S. Chau Center Gift

Innovative Genomics Institute

Innovative Genomics Institute

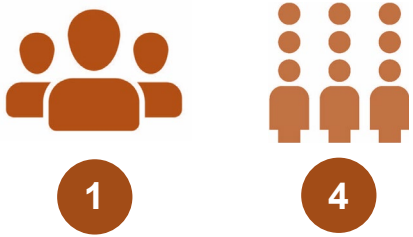




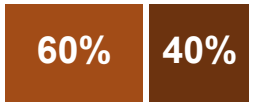
Research Profiles “Phenotypes”

Entrepreneurial Scientist

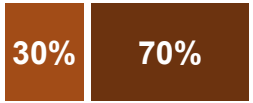
Avg Group Size



Lab / Lab Support

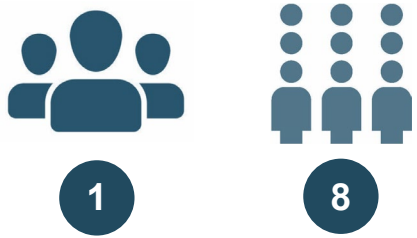


Office / Workstation Support

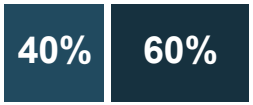


Faculty PI

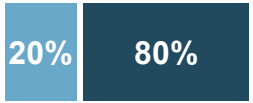
Avg Group Size



Lab / Lab Support



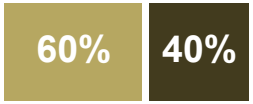
Office / Workstation Support



Doctorate Scientist

Avg Group Size

Lab / Lab Support



Office / Workstation Support

TAYLOR design

Berkeley
UNIVERSITY OF CALIFORNIA

OPEN LAB	AREA
16 Lab Benches	560 SF
6-8 Write Up Desks	90 SF
Shared Supply	125 SF
Equipment	125 SF
2 Sinks	90 SF
End Benches + Circulation	125 SF
Sub Total	1,125 SF

EQUIPMENT

Modular benches
Write up stations
Sinks
Floor space for equipment
Consumable storage
Flammable cabinet
Wall space for shelving
Emergency eyewash and shower

LAB SUPPORT	AREA
Tissue Culture Room	325 SF
2nd Support Room	200 SF
Large Equipment	50 SF
Refrigeration + Freezers	125 SF
Consumable Storage	90 SF
Gas Cylinder Storage	25 SF
Sub Total	700 SF
Total	1,925SF

EQUIPMENT

Bio Safety Cabinets
Incubators
Space for BSL2 waste
Fume Hood
Work bench
Corrosive cabinet
Floor space for equipment

+4c Refrigerator
-20c Freezer
-80c Freezer
Consumable storage
Wall space for shelving
Emergency eyewash/shower
Sinks
Floor centrifuge

OFFICE SUPPORT	AREA
Open Office	225 SF

FURNITURE

Worktable
Flexible seating

Flexible workstations
Phone booths
Collaborative work technology







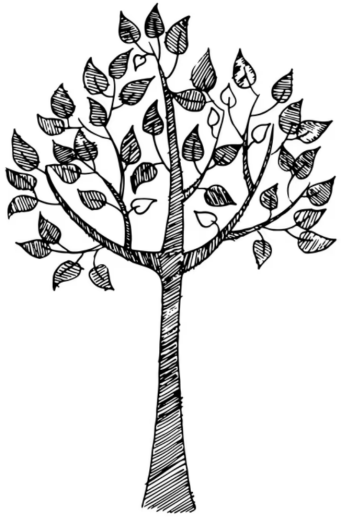





Test Fits

A Framework for Adaptive Lab Environments

A novel design strategy that establishes a baseline "type" of lab environment.



Genotype: DNA that determines the lab's potential (research focus, user needs, equipment)

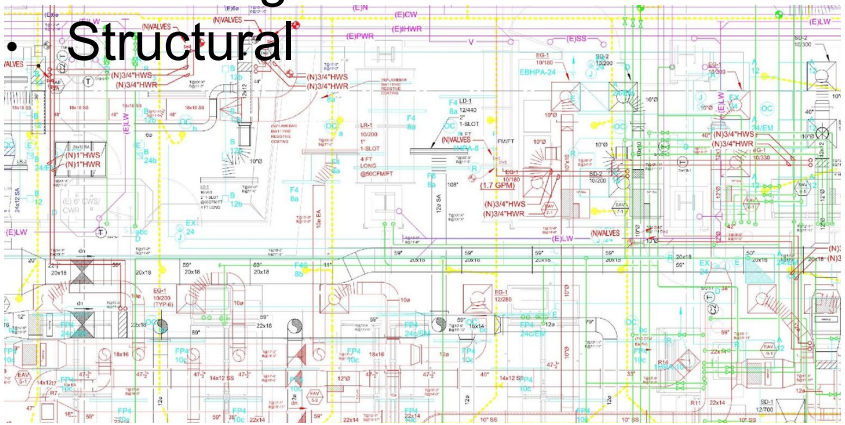
Phenotype: Traits that represent the physical lab environment (layout, infrastructure, look/feel)

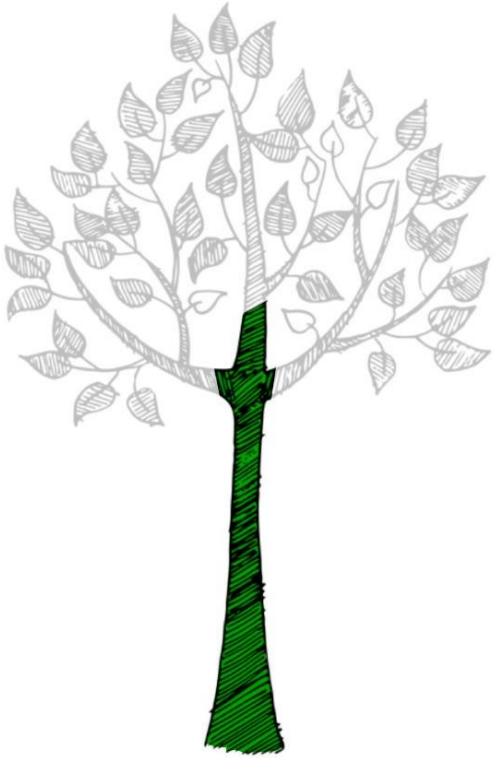
Adaptive Design Strategies

Trunk = Core Infrastructure

The stable backbone

- Mechanical
- Electrical
- Plumbing
- Structural





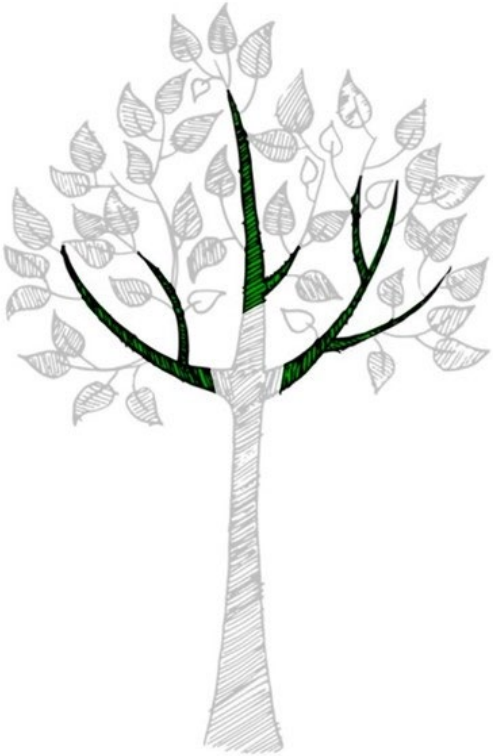
Core Infrastructure
Strong tree trunk

Adaptive Design Strategies

Branches = Program Adaptations

The extensions where the building flexes

- Lab layouts
- Support spaces
- Offices



Program Adaptations
Flexible, bending branches

Adaptive Design Strategies

16	Benches
6	Write Up Desks
1,125sf	Lab
700sf	Support
62/38	Lab/Support
4	BSC
8	Incubators
1	Fume Hood
1	-80c
1	-20c
2	+4c
1	Deli

Adaptive Design Strategies

Leaves = Users and Outcomes

Vitality of the system

- Scientists
- Startups
- Discoveries

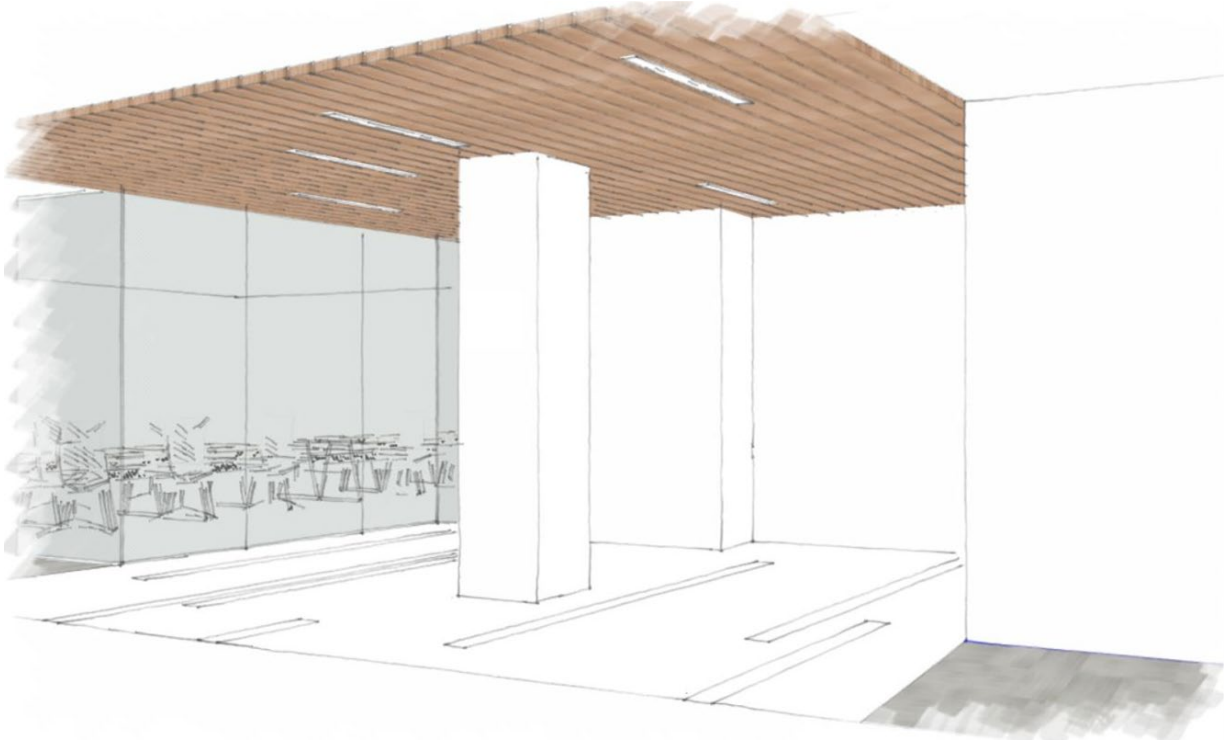
Scientists/Research/Outcomes
Expression of the tree's vitality

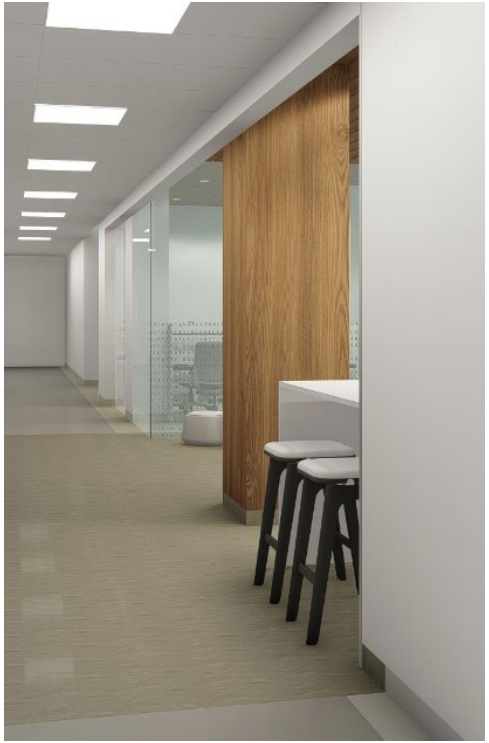
Design Challenge

"Scientists do exciting work - make science exciting."

Program Adaptions

Bending Branches

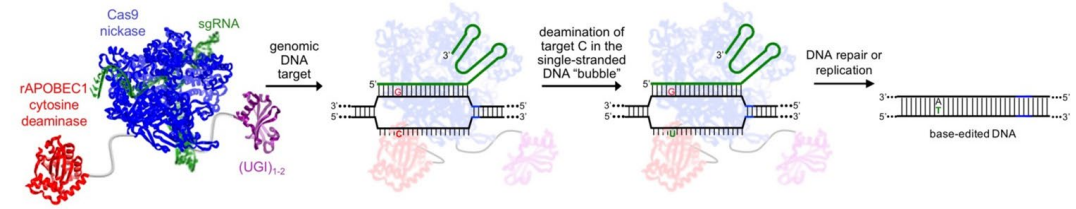




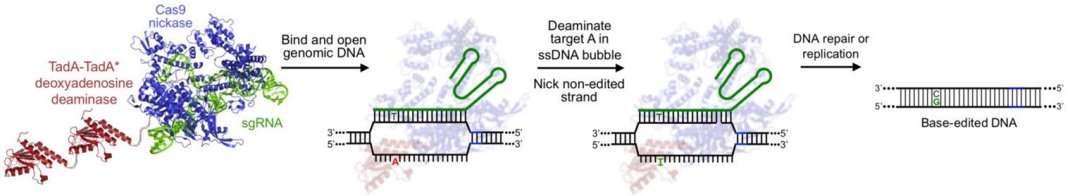
Translating Science

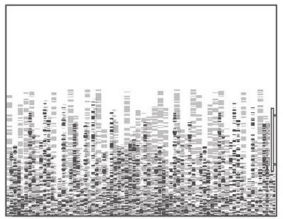
Bending Branches

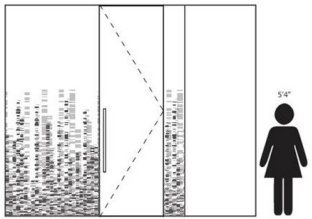
Cytosine base editing:

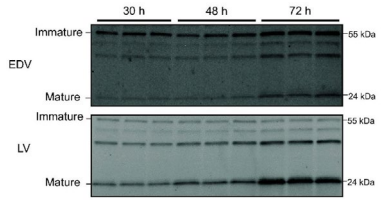


Adenosine base editing:










135
OPEN LAB
133

VS

SIEMENS

Technical Specification Sheet
Document No. 149-524T
Nov 15, 2023

Conical Venturi Air Valve for Critical Environments

Figure 1. Constant Volume Venturi Air Valve Single Body 10" with Orifice Plate Airflow Sensor.

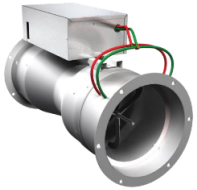


Figure 2. Variable Volume Venturi Air Valve Single Body 10" with Orifice Plate airflow Sensor, and Standard Electric Actuator, and flanged ends.

RFI detail

#59 Sequence of Operation for Mechoshades Controls

RODAN BUILDERS, INC.

Status	**Open** In review
Created on	Aug 8, 2022 by **Jessica Romero** (Rodan Builders Inc.)
Ball in court	**Jessica Romero** (Rodan Builders Inc.)
Due date	Aug 15, 2022

Question

Please provide Sequence of Operation (SOO) for Lighting and Mechoshades Controls.

Impact

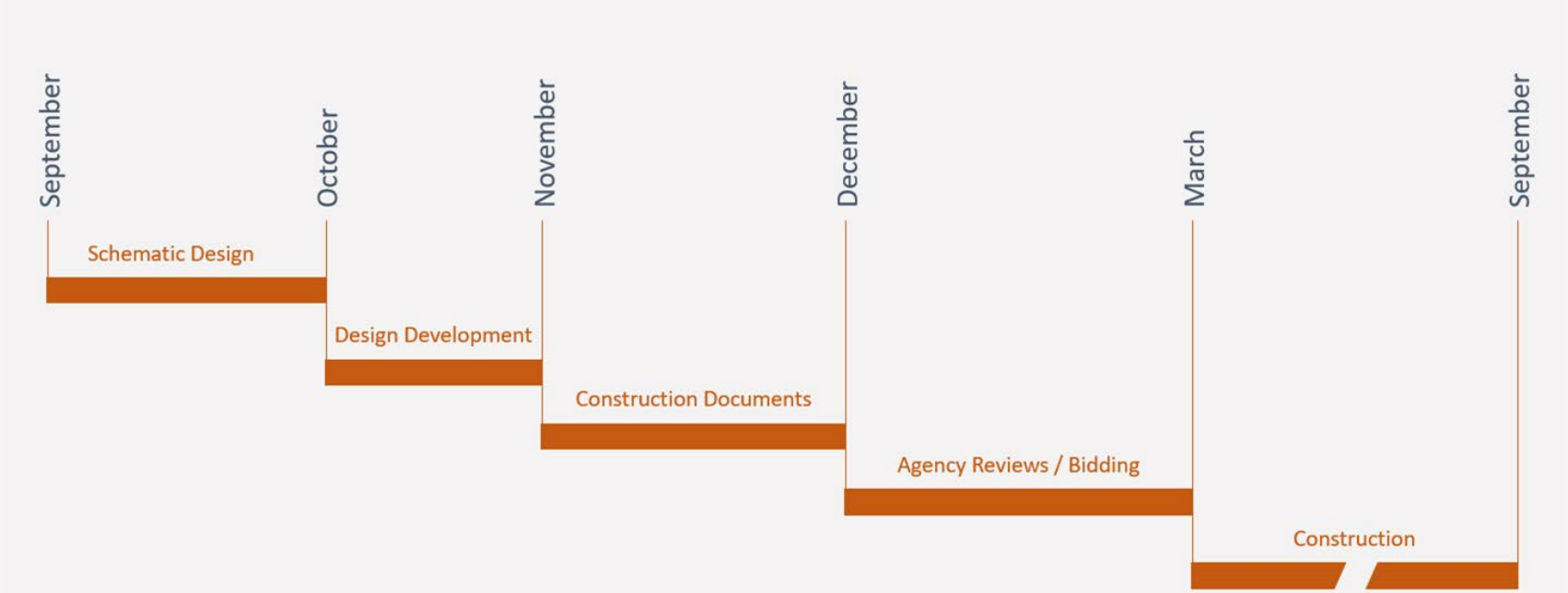
Cost impact	Unknown
Schedule impact	Unknown

TAYLOR DESIGN RESPONSE:
Per discussions during 9/7/22 OAC meeting, UCB has decided to proceed with updating the existing motors and wiring for the Mechoshades. The Mechoshades will not connect to existing controls.

Brian Ceraban
9/7/22

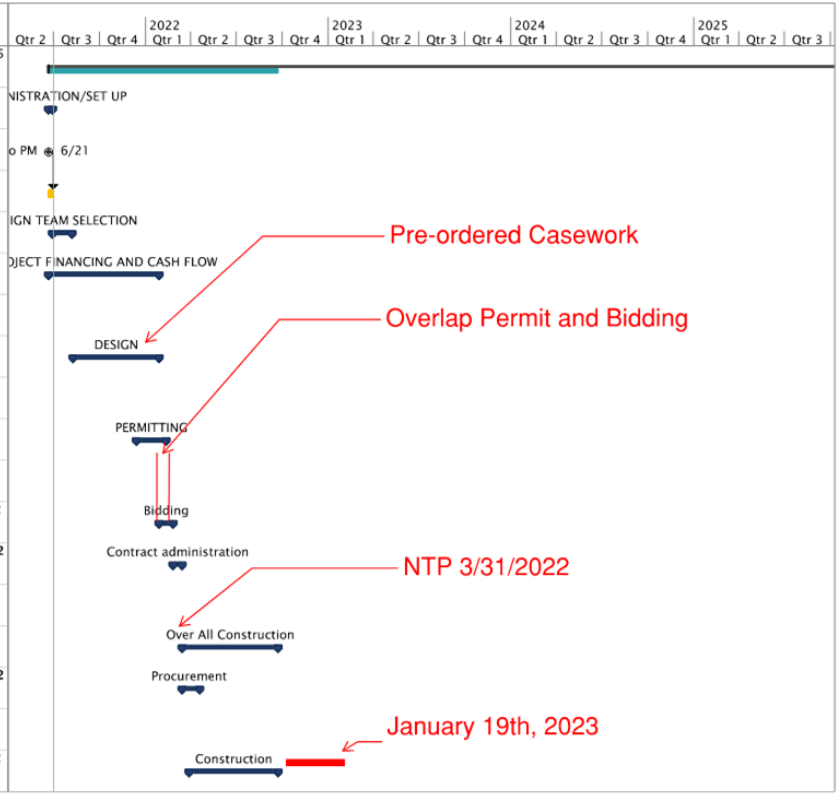
Other attributes

Schedule


September
October
November
December
March
September
Schematic Design
Design Development
Construction Documents
Agency Reviews / Bidding
Construction

Berkeley Capital Projects
CAPITAL STRATEGIES

ID	Task Mode	Task Name	Duration	Start	Finish
1		**IGIB Office to Lab**	218 wks?	Mon 6/21/21	Tue 10/21/25
2		**ADMINISTRATION/SET UP**	1.2 wks	Mon 6/21/21	Mon 6/28/21
3		Project assigned to PM	0 days	Mon 6/21/21	Mon 6/21/21
4		PM meet with client, scope project	6 days	Mon 6/21/21	Mon 6/28/21
5		**DESIGN TEAM SELECTION**	**5.6 wks**	**Tue 6/29/21**	**Fri 8/6/21**
18		**PROJECT FINANCING AND CASH FLOW**	30.2 wks	Mon 6/21/21	Thu 1/27/22
23					
24		**DESIGN**	23.4 wks	Mon 8/9/21	Thu 1/27/22
52					
53		**PERMITTING**	8 wks	Tue 12/14/21	Thu 2/10/22
59					
60		**Bidding**	**3.8 wks**	**Fri 1/28/22**	**Thu 2/24/22**
69		**Contract administration**	**2.4 wks**	**Fri 2/25/22**	**Mon 3/14/22**
73					
74		**Over All Construction**	27 wks	Tue 3/15/22	Thu 9/22/22
75		**Procurement**	**5 wks**	**Tue 3/15/22**	**Mon 4/18/22**
81					
82		**Construction**	**25 wks**	**Tue 3/29/22**	**Thu 9/22/22**



BY JENNIFER KAHN BACKCHANNEL SEP 19, 2023 6:00 AM

Crispr Pioneer Jennifer Doudna Has the Guts to Take On the Microbiome

The world-famous biochemist is ready to tackle everything from immune disorders and mental illness to climate change—all by altering microbes in the digestive tract.

Key Take Aways

- Know your client.
- A “Generic” or “Phenotype” design philosophy speeds decisions.
- Pre-order long lead items where possible.
- Strategic risk is worth taking.
- A collaborative relationship between designers, contractors, facilities staff is essential for success.
- Our buildings are becoming increasingly more complicated. “The internet of things” is our new reality leading to design obsolesces.
- Data is cheap, and useful!

Project Team

TAYLOR design

miyamoto.

IMEG

RODAN BUILDERS, INC.

BMI Baja Mechanical Inc.

one workplace

TEPS TOTAL ENVIRONMENTAL & POWER SYSTEMS, INC.

HIGHPOINT ACOUSTIC SPECIALTIES

Laboratory by Design, Inc. The Key to Your Lab Needs LabsByDesign.com | 707 252 8218 | Napa, CA

PRIBUSS ENGINEERING, INC. MECHANICAL CONTRACTORS

Questions