How Can Modernization Reinvigorate Your Lab Spaces?

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Page/

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

Course Description

Join us for a dynamic look at how modernization can reinvigorate and transform your teaching and research labs. Success stories from the University of South Carolina and Rutgers University will showcase the exciting possibilities that await lab spaces on your campuses.

Modernization and reuse of your lab spaces not only provides a fresh look at repurposing buildings, but can dramatically transform your facilities into sustainable and flexible giants with future-proofed possibilities. Join our discussion to learn cost-effective benefits applicable to your campuses!

Learning Objectives

At the end of this course, participants will be able to:

1. Understand the characteristics of existing building stock that would make them appropriate candidates for new life as an academic or research facility.

2. Learn how mission-driven programs can best be accommodated and accomplished in renovated and modernized facilities.

3. Acquire strategies for future proofing facilities to allow for changing teaching and research populations and programs, safety and operational requirements, and pandemic adaptability.

4. Discover the sustainable, safety, and wellness opportunities of modernizing and re-purposing existing facilities for teaching and research.

INTRODUCTIONS

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THE PROMISE OF TRANSFORMATION

PROJECT DRIVERS & GOALS

UNIVERSITY OF SOUTH CAROLINA

Science and Technology Building
Chemistry Teaching Labs

- Constructed 1974
- Law Center – Original Use
- Gill and Wilkins – Original Architect
- 192,000 SF – Overall Building Size
- 120,000 SF – Overall Project Size
- Project Completed 1/2020

USC CHEMISTRY / PROJECT DRIVERS

- 30% Growth in 5 Years
- Increased Student Retention

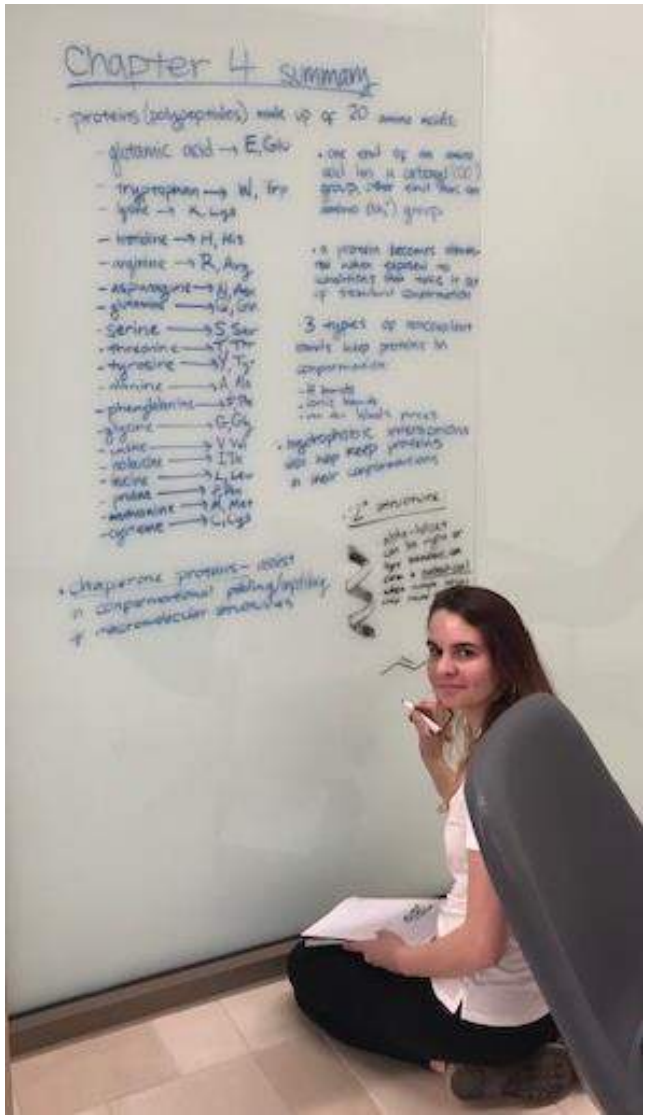
- Antiquated Labs – Existing Labs Constructed in 1967
- Zero Swing Space
- Cannot Shutdown Labs

USC / GOAL – STATE OF THE ART SAFETY & TECHNOLOGY IN LABS & TEACHING SPACES

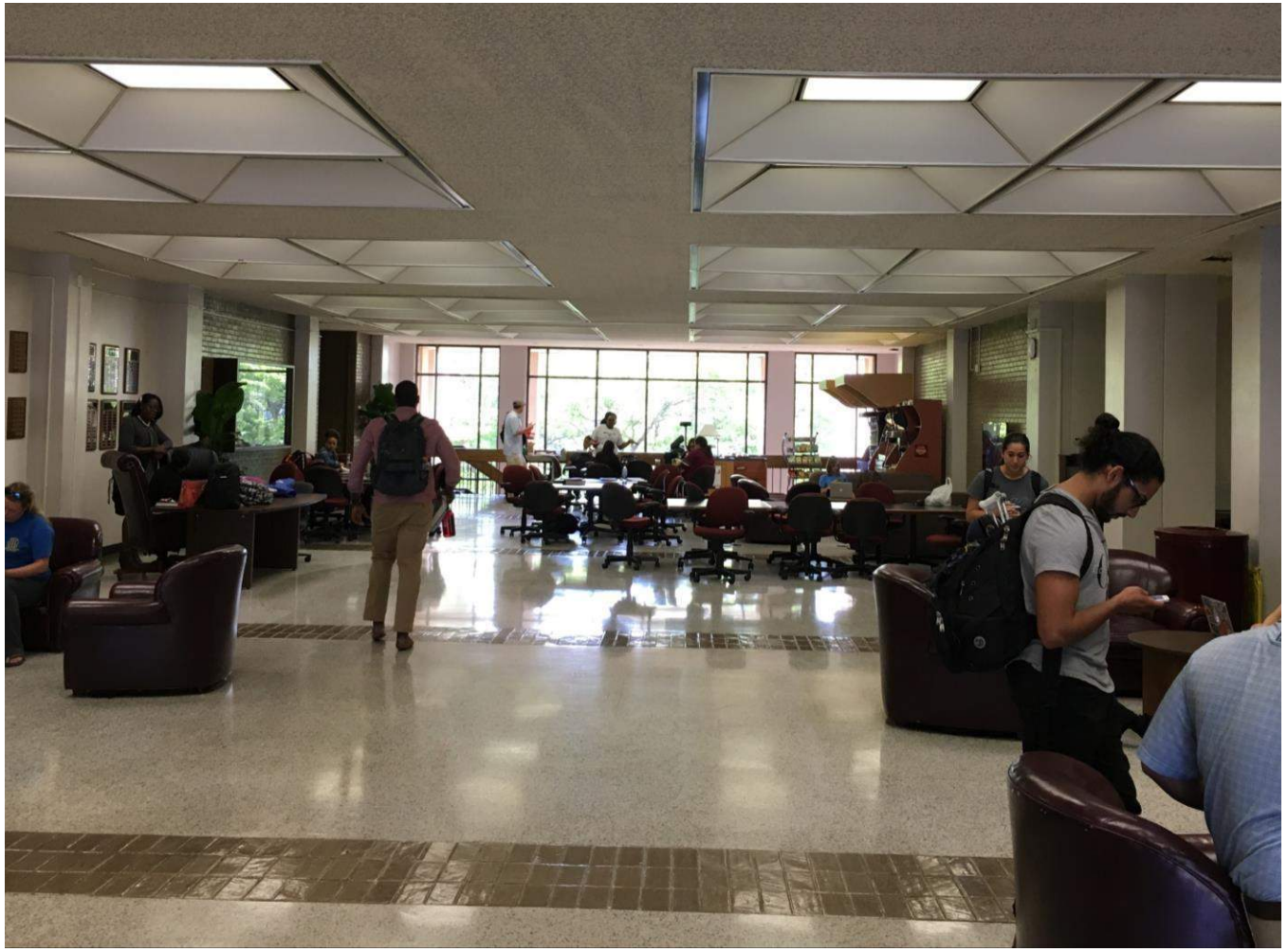
General Chemistry Lab

Organic Chemistry Lab

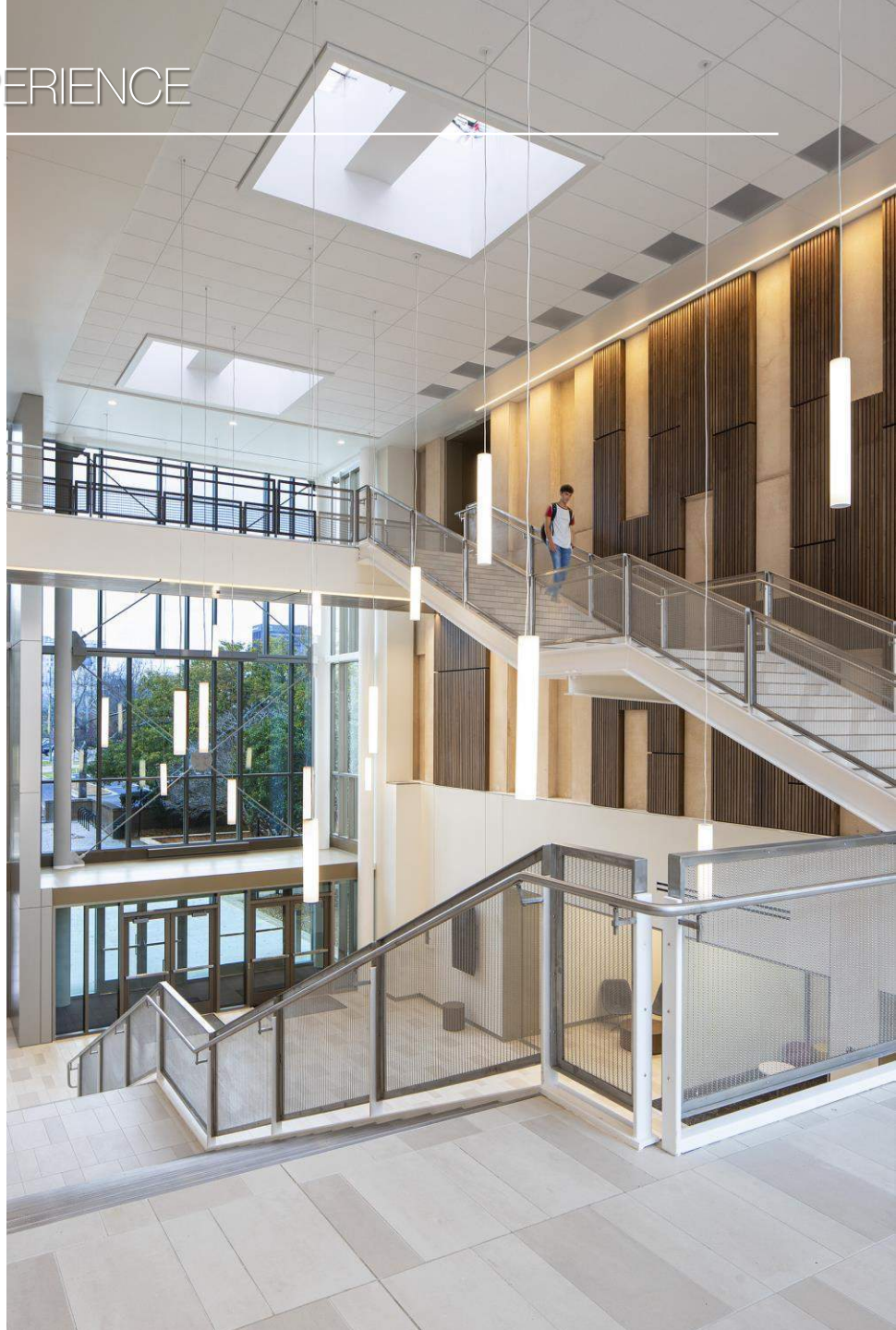
USC / GOAL – SPACES THAT PROMOTE SUCCESS & ATTRACT NEW STEM STUDENTS



USC / GOAL – DYNAMIC & INSPIRATIONAL FRONT DOOR EXPERIENCE



USC GOAL – DYNAMIC & INSPIRATIONAL FRONT DOOR EXPERIENCE



USC / GOALS

- Spaces that Promote Staffing Efficiencies
- Easily Maintained Spaces & Infrastructure
- Energy Efficiency

Medical Science Building
Academic and Research

- Constructed 1976
- 656,000 SF Biomedical Research and Teaching
- Schematic Design Completed 8/2020
- Multi-phase project, estimated completion TBD

RUTGERS UNIVERSITY NJMS / PROJECT OVERVIEW

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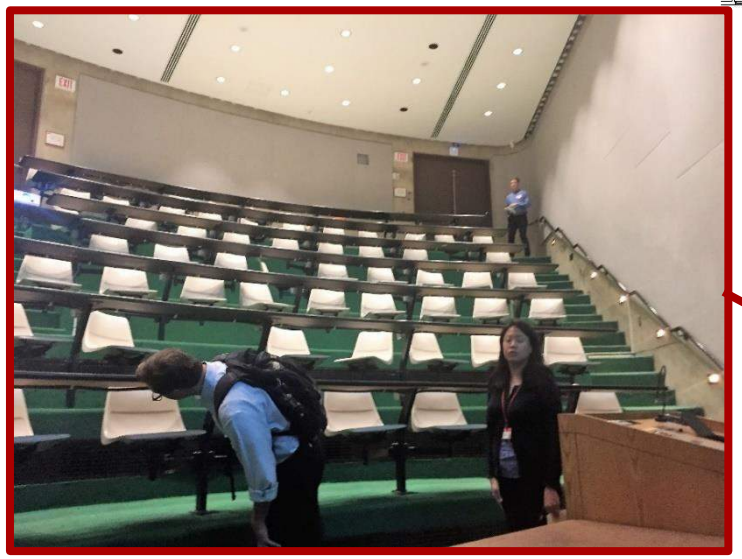
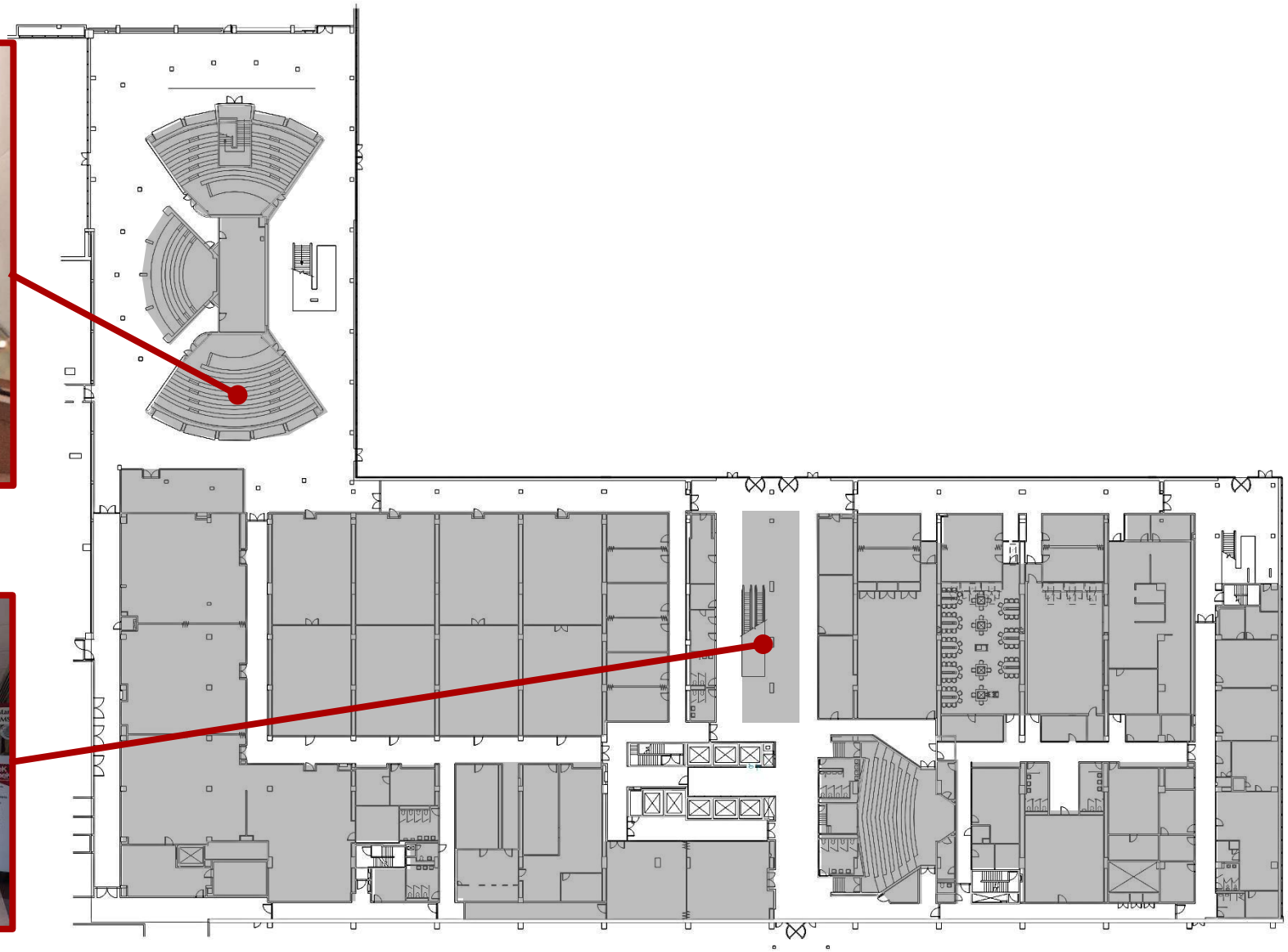
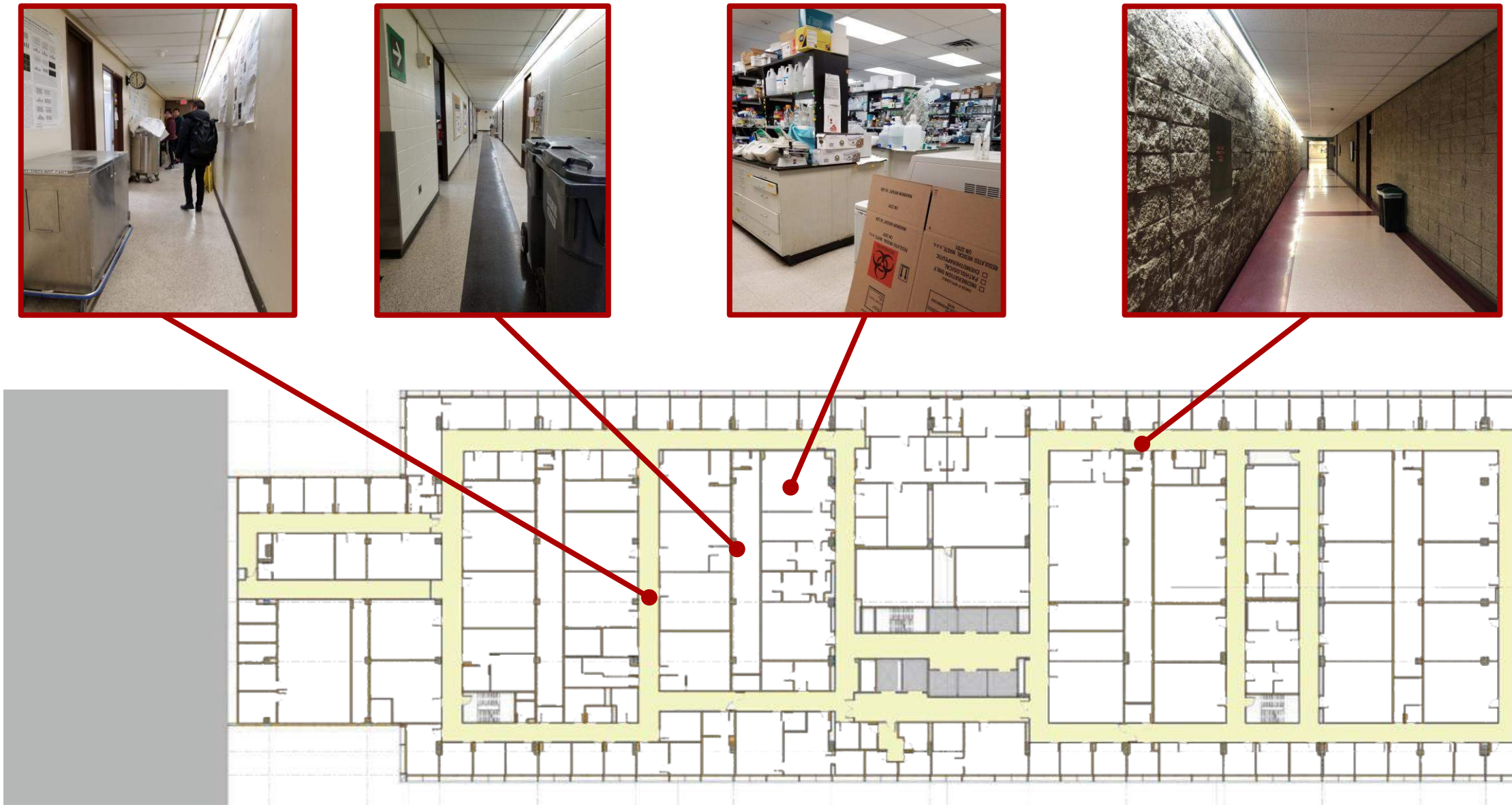
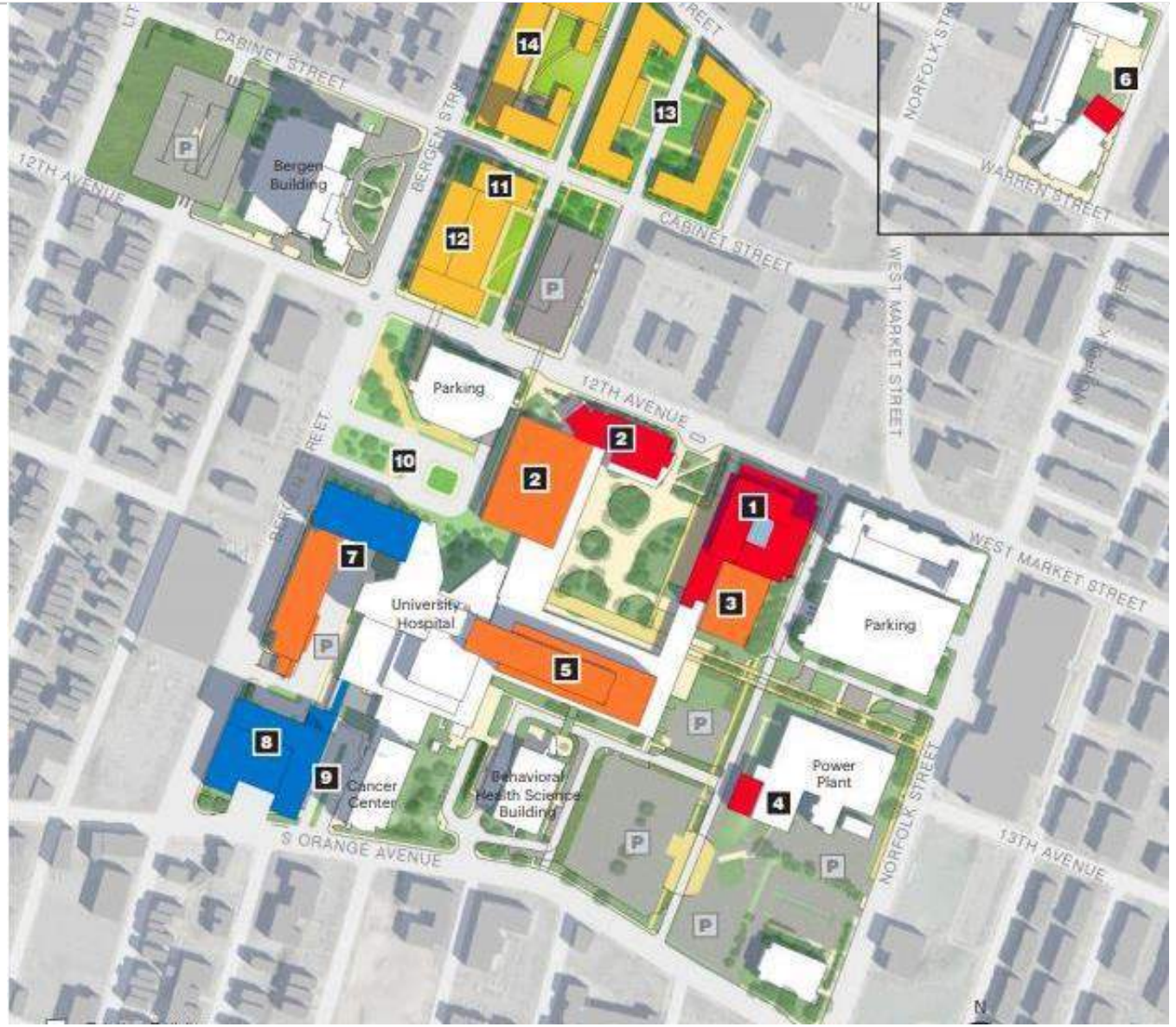




RUTGERS UNIVERSITY NJMS / PROJECT OVERVIEW



- Transform Medical Research and Education
- Advance the Rutgers University NJMS Strategic Plan
- Location, Location, Location



NJMS / GOAL – REPLACEMENT OF MEP/FP INFRASTRUCTURE & PHASED RENOVATIONS

THE PROMISE OF TRANSFORMATION

Building Performance

- Campus Energy Consumption
- Annual Operations

User Experience

- Retain/Recruit
- Modernize

RUTGERS UNIVERSITY NJMS / GOAL – RETAIN & RECRUIT PRINCIPAL INVESTIGATORS

RUTGERS UNIVERSITY NJMS / GOAL – ELEVATE MEDICAL EDUCATION

RUTGERS UNIVERSITY NJMS / GOAL – ELEVATE MEDICAL EDUCATION

RUTGERS UNIVERSITY NJMS / GOAL – ENHANCE EXTERIOR & PUBLIC SPACES

POLLING

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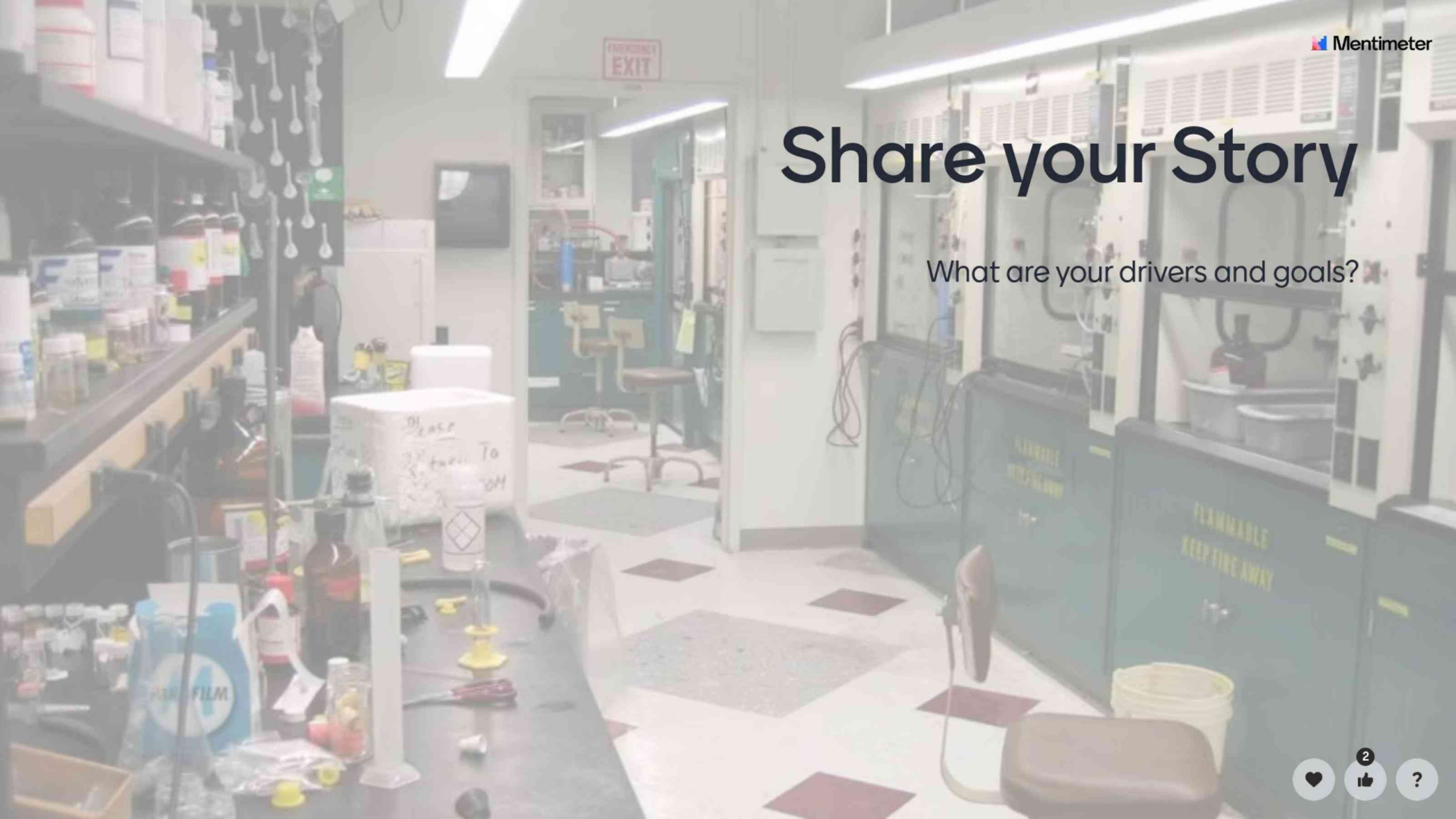


Mentimeter

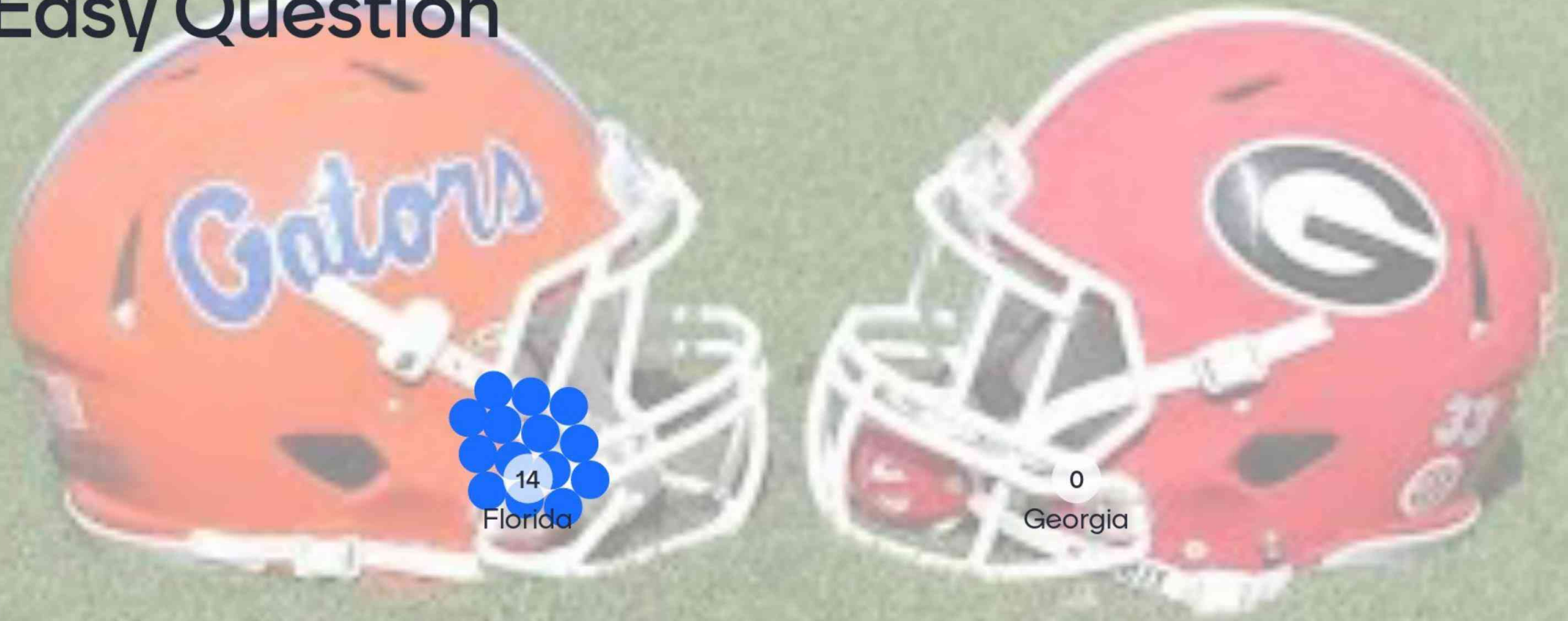
Share your Story

What are your drivers and goals?

2

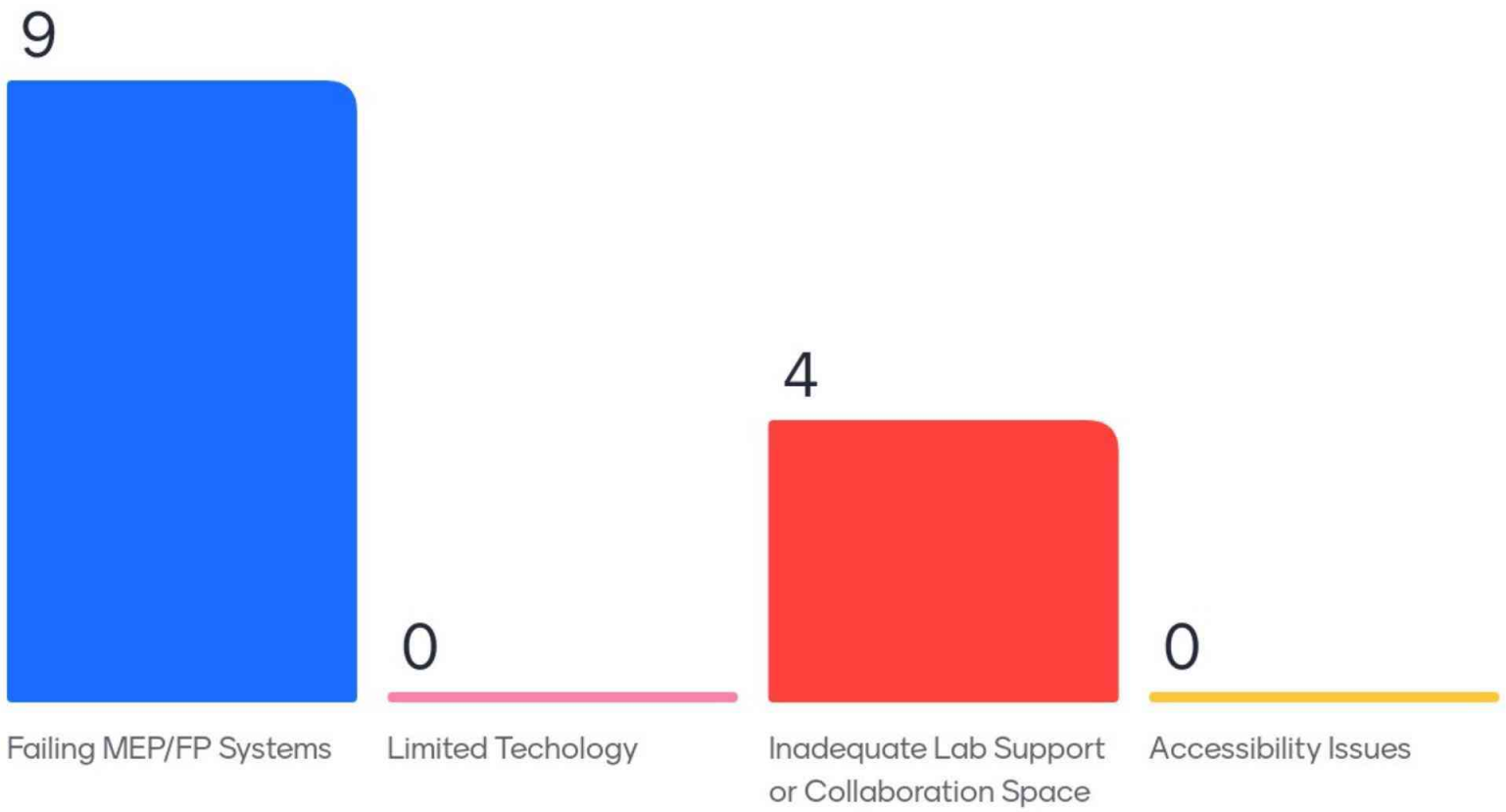
Mentimeter

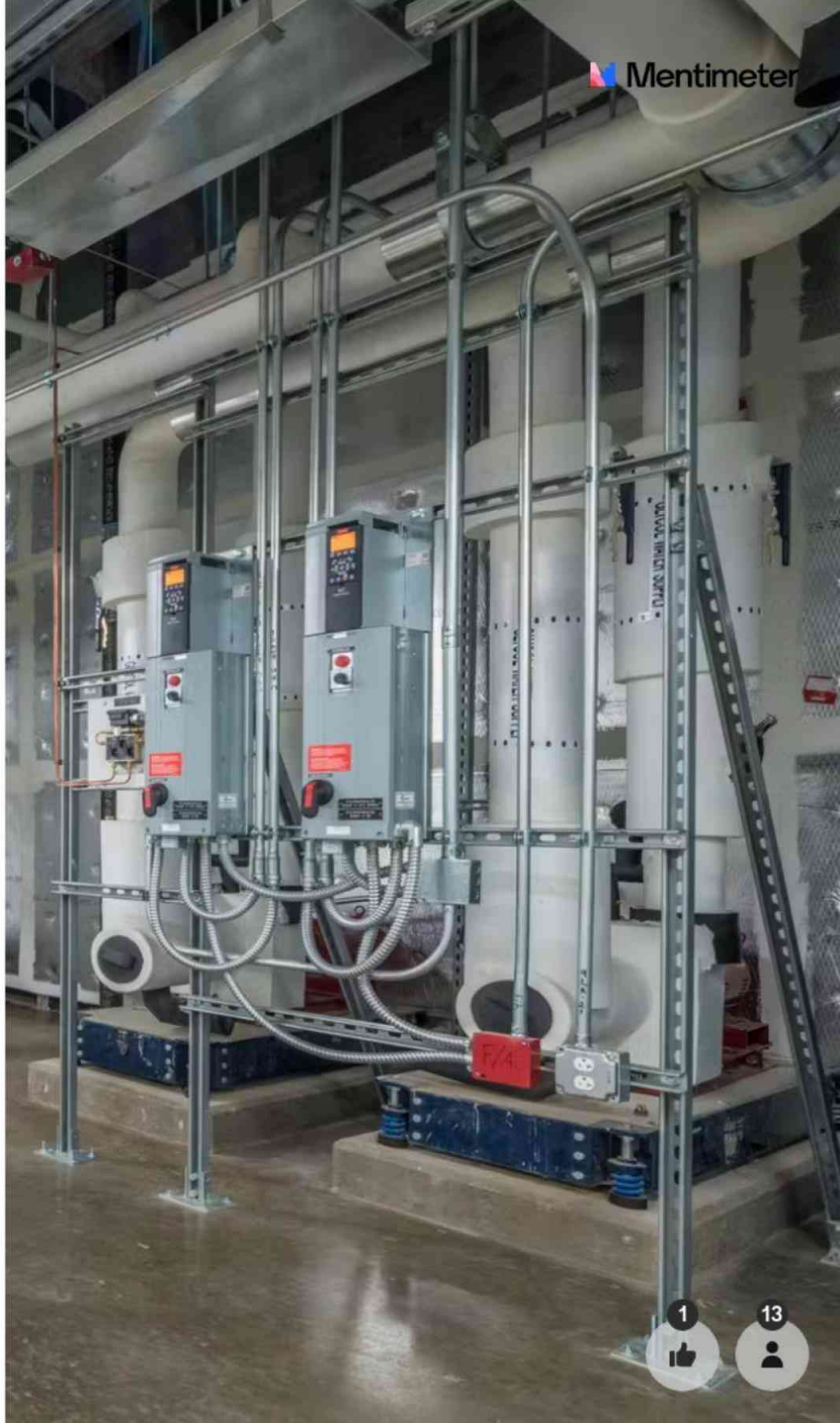
Easy Question



2
14

What are the biggest challenges you face with your existing facilities?





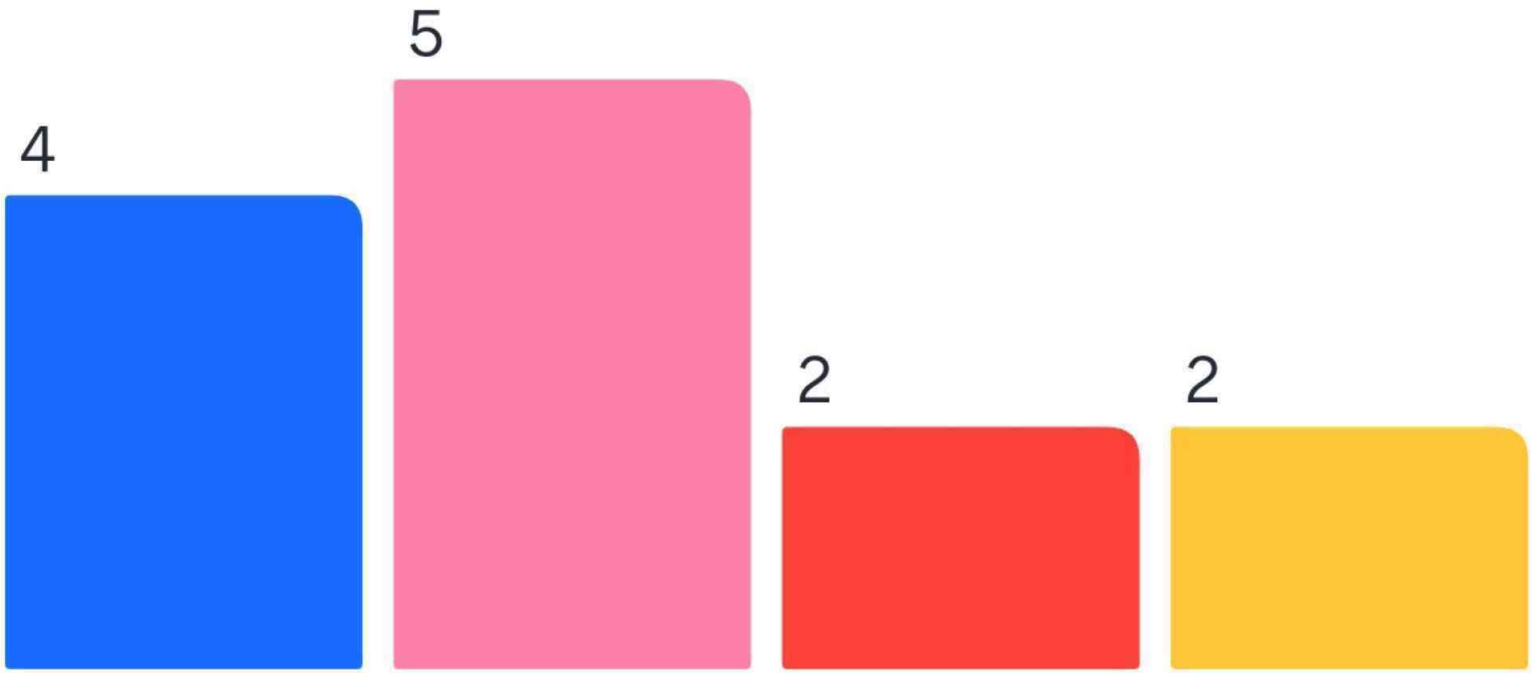
Mentimeter

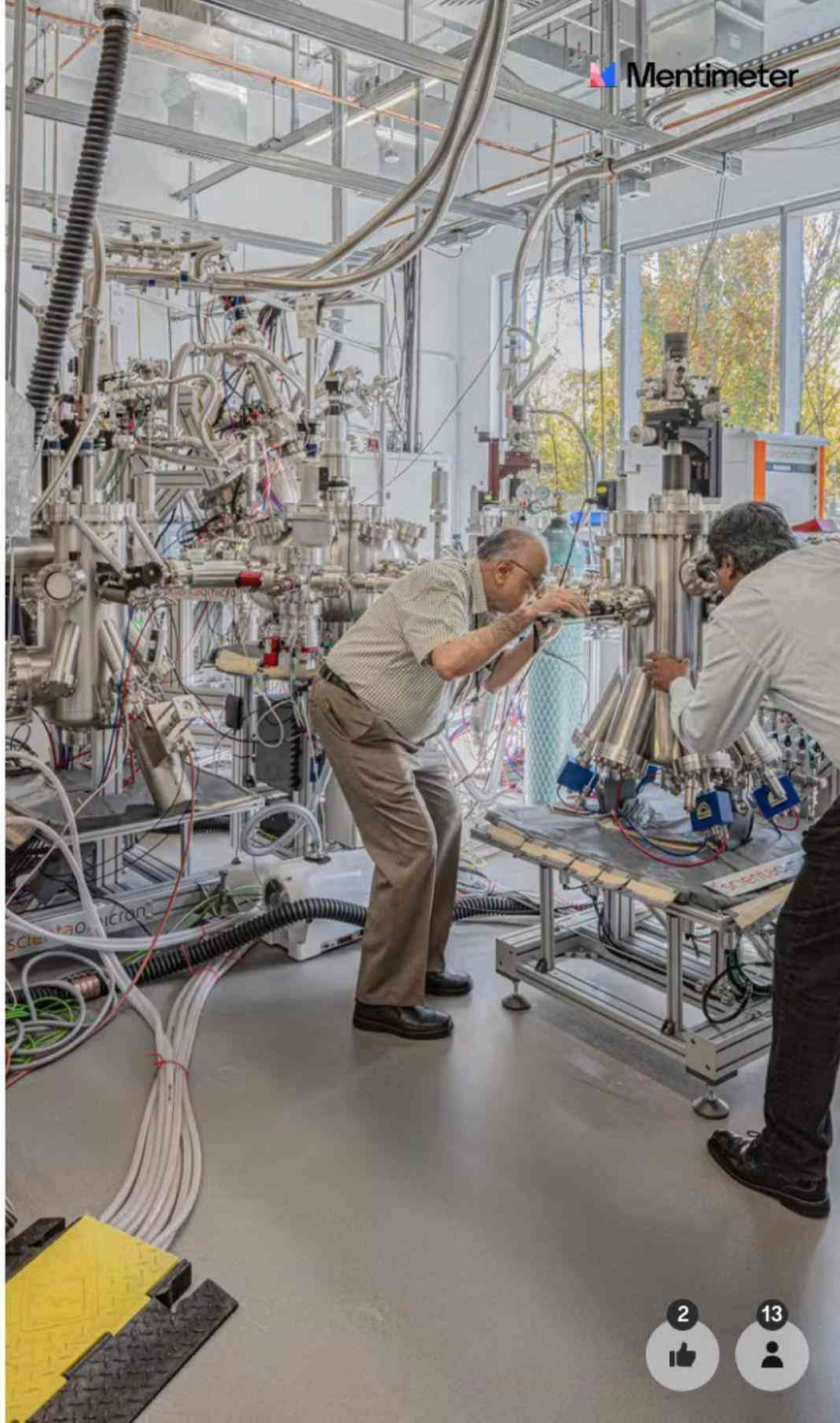
Other Challenges?

9 responses

7

What programmatic requirements/trends do you see your next renovation project needing to accommodate?





Mentimeter

Other Trends?

3 responses

rise in construction cost

supply chain timeline

more dry labs

3

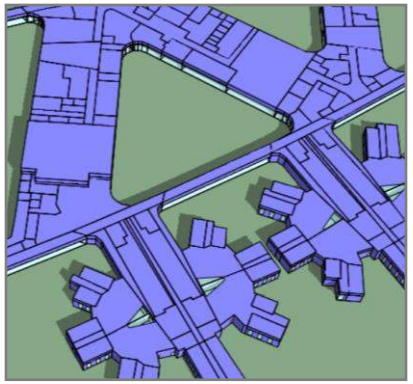
EXISTING BUILDINGS:

CAPABILITIES, VALUE PROPOSITIONS AND FUTURE-PROOFING

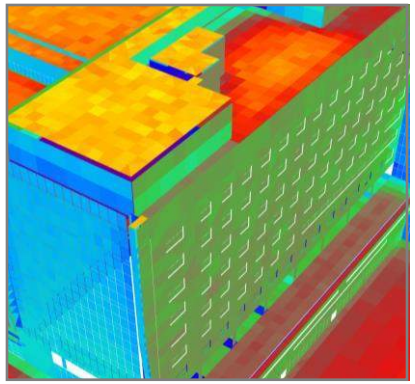
MODERNIZATION / APPROACH TO RENOVATION PROJECTS

“What can we do to help this building perform at its highest level?”

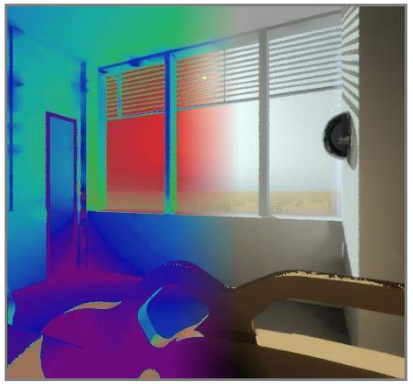
MODERNIZATION / HIGH PERFORMANCE DESIGN TOOLKIT



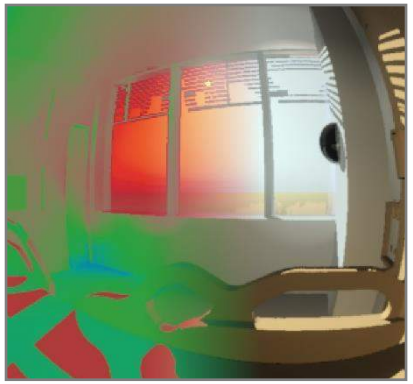
ENERGY SAVINGS



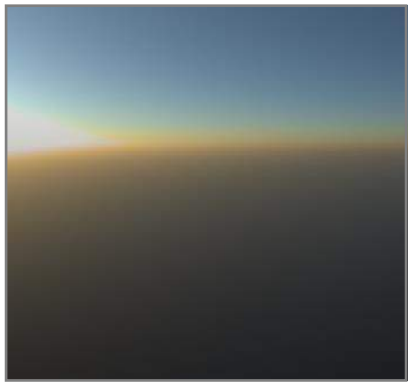
SOLAR EXPOSURE



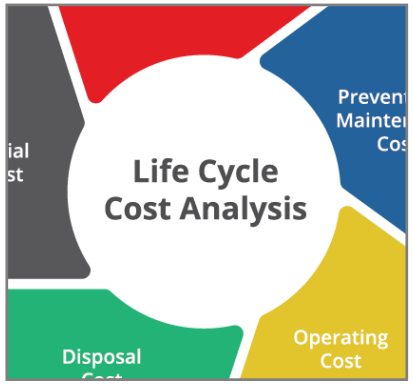
DAYLIGHTING



GLARE & VISUAL COMFORT

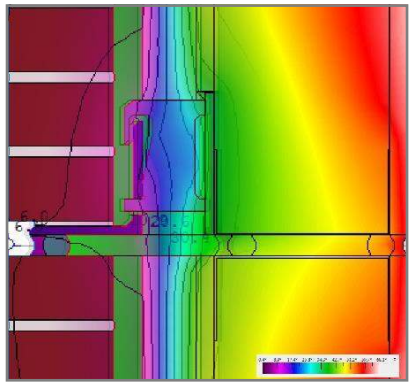


CIRCADIAN STIMULUS

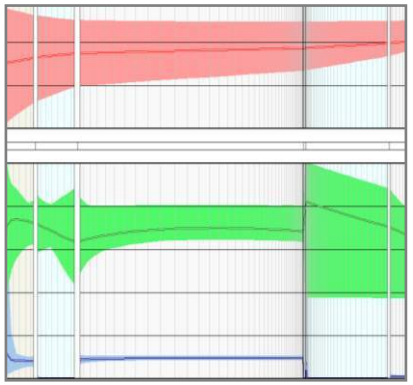


TOTAL COST OF OWNERSHIP

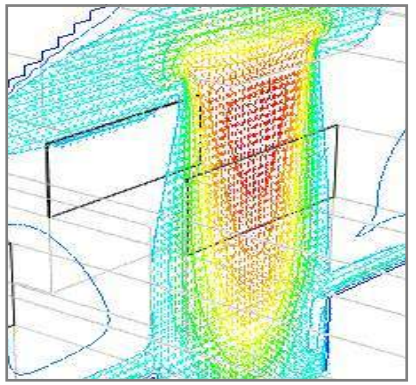
RENEWABLE ENERGY



THERMAL COMFORT



MOISTURE & CONDENSATION



FLUID DYNAMICS

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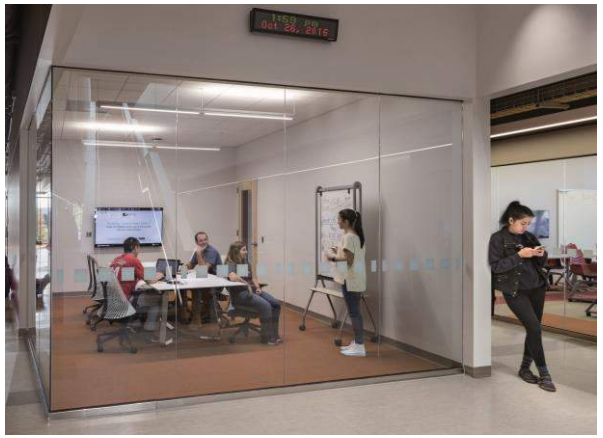
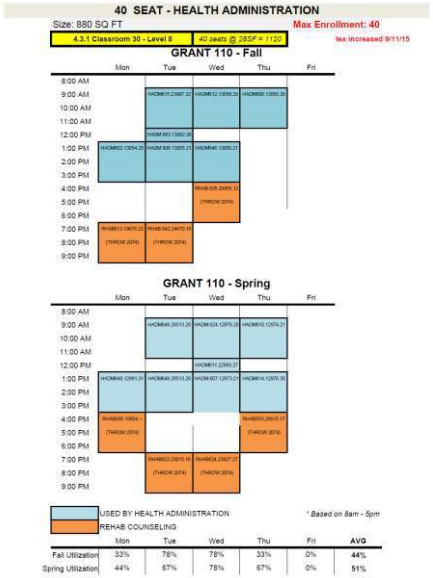
MODERNIZATION / PROGRAMMING TOOLKIT

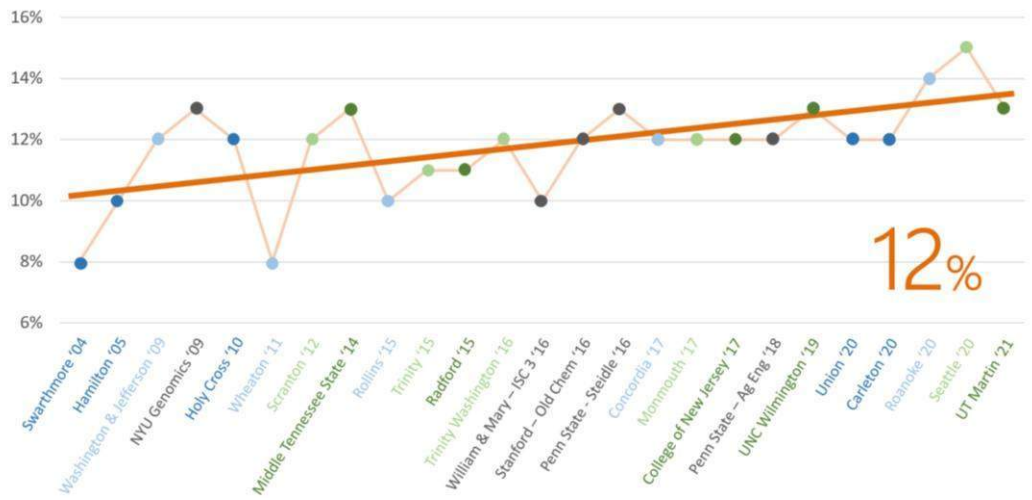
FORMAL LEARNING

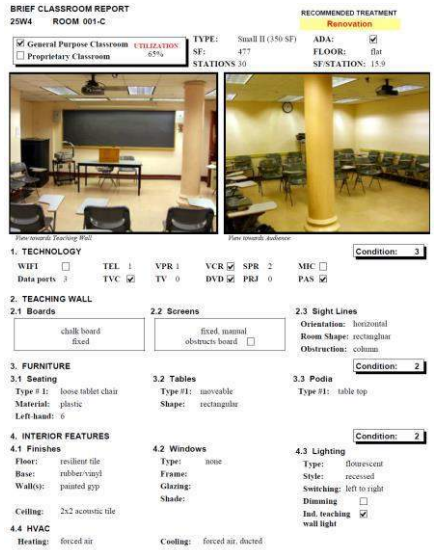


INFORMAL LEARNING

EXPERIENTIAL LEARNING







MODERNIZATION / BENEFITS OF NEW PROGRAM SPACE

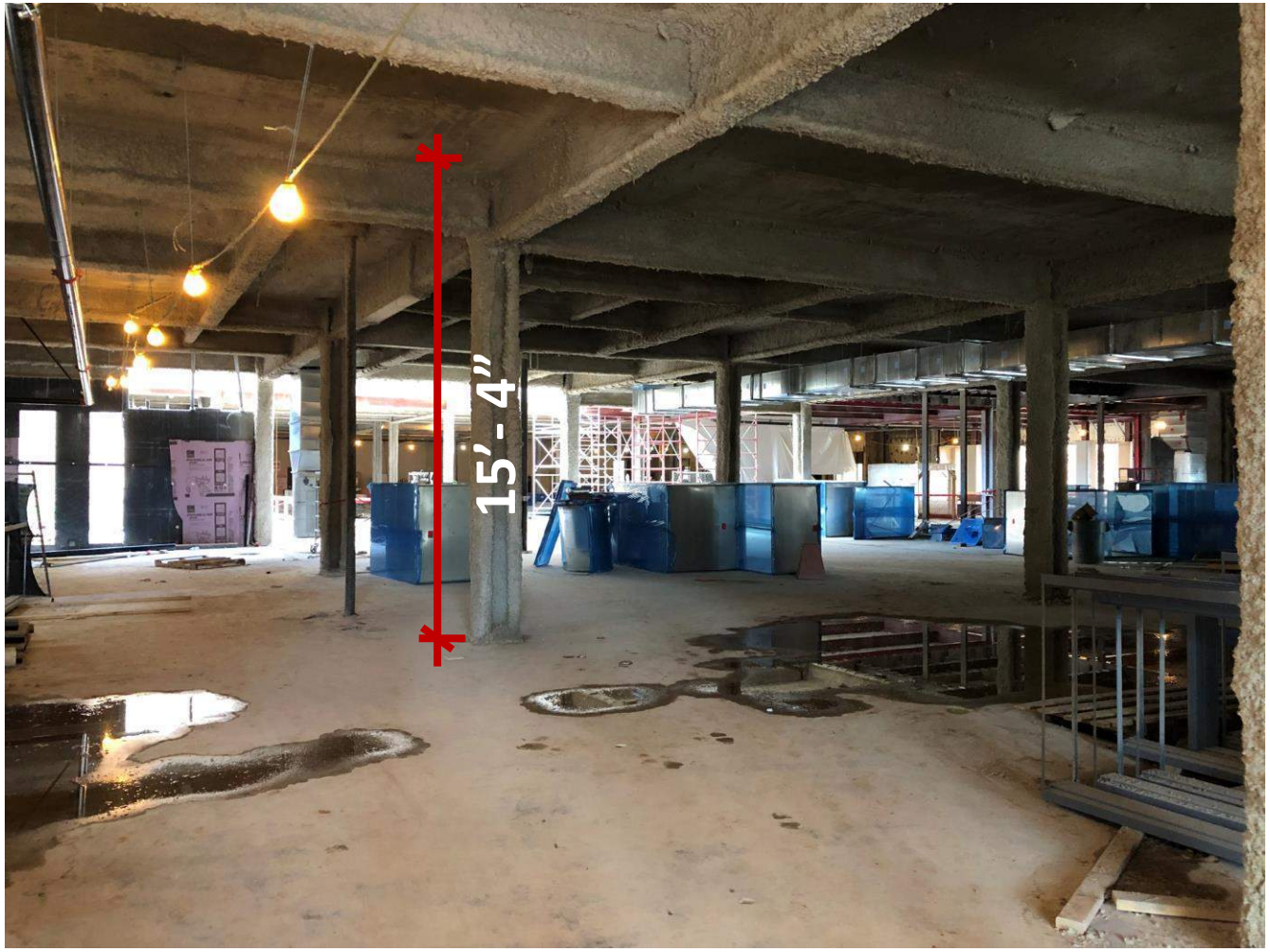
MODERNIZATION / BENEFITS OF NEW PROGRAM SPACE

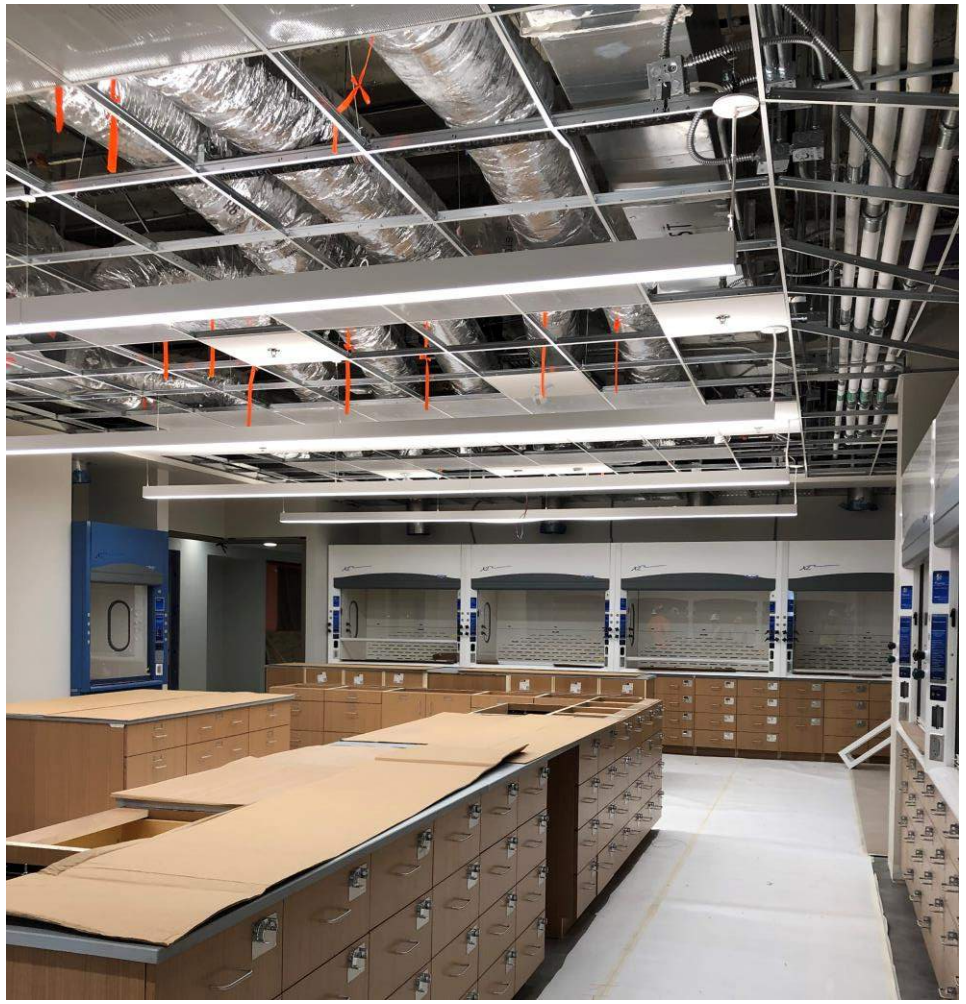
- Retention
- Recruiting
- Accreditation
- Productivity
- Infrastructure
- Reliability

UNIVERSITY OF
SOUTH CAROLINA

USC / MODERNIZATION APPROACH

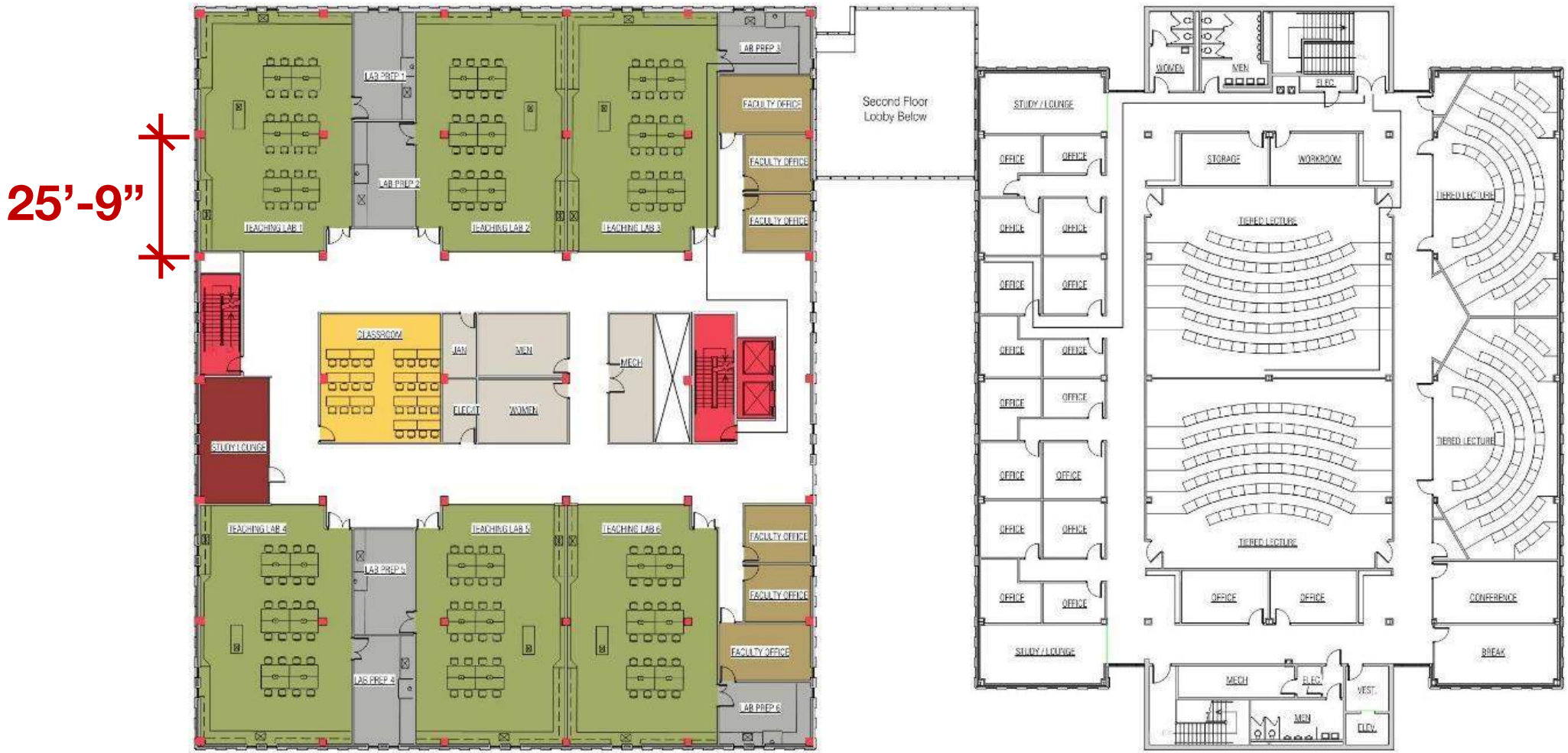
USC / OPPORTUNITY – TALL FLOOR TO FLOOR HEIGHT



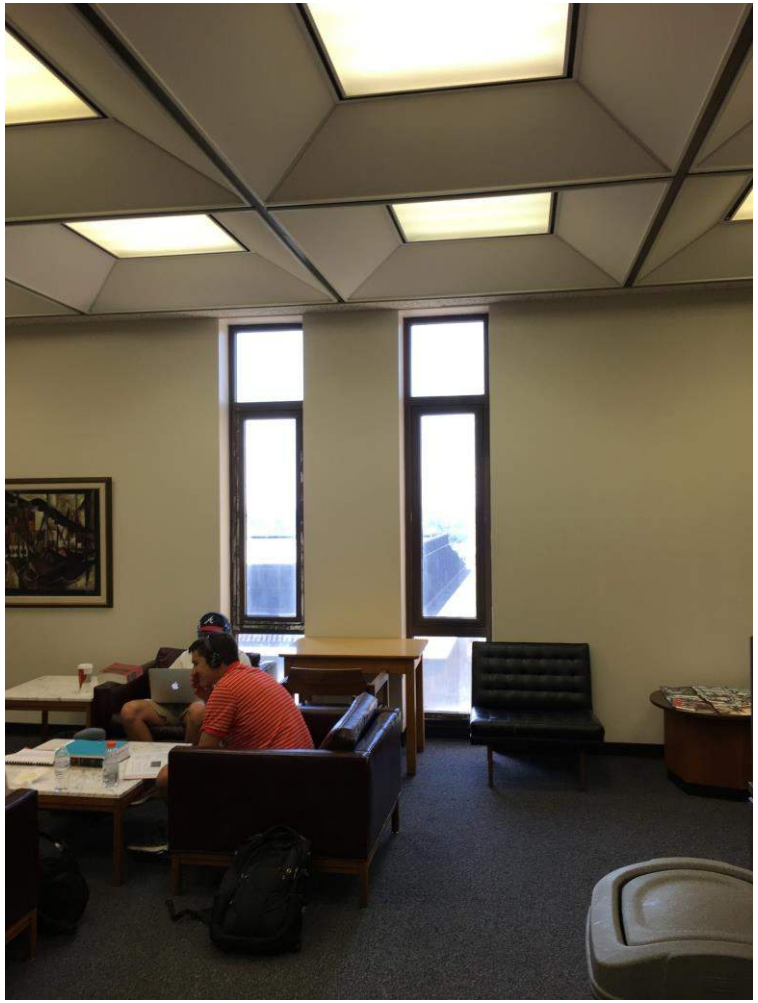


USC / OPPORTUNITY – LARGE & OPEN ROOF

USC / CHALLENGE – STRUCTURAL BAY

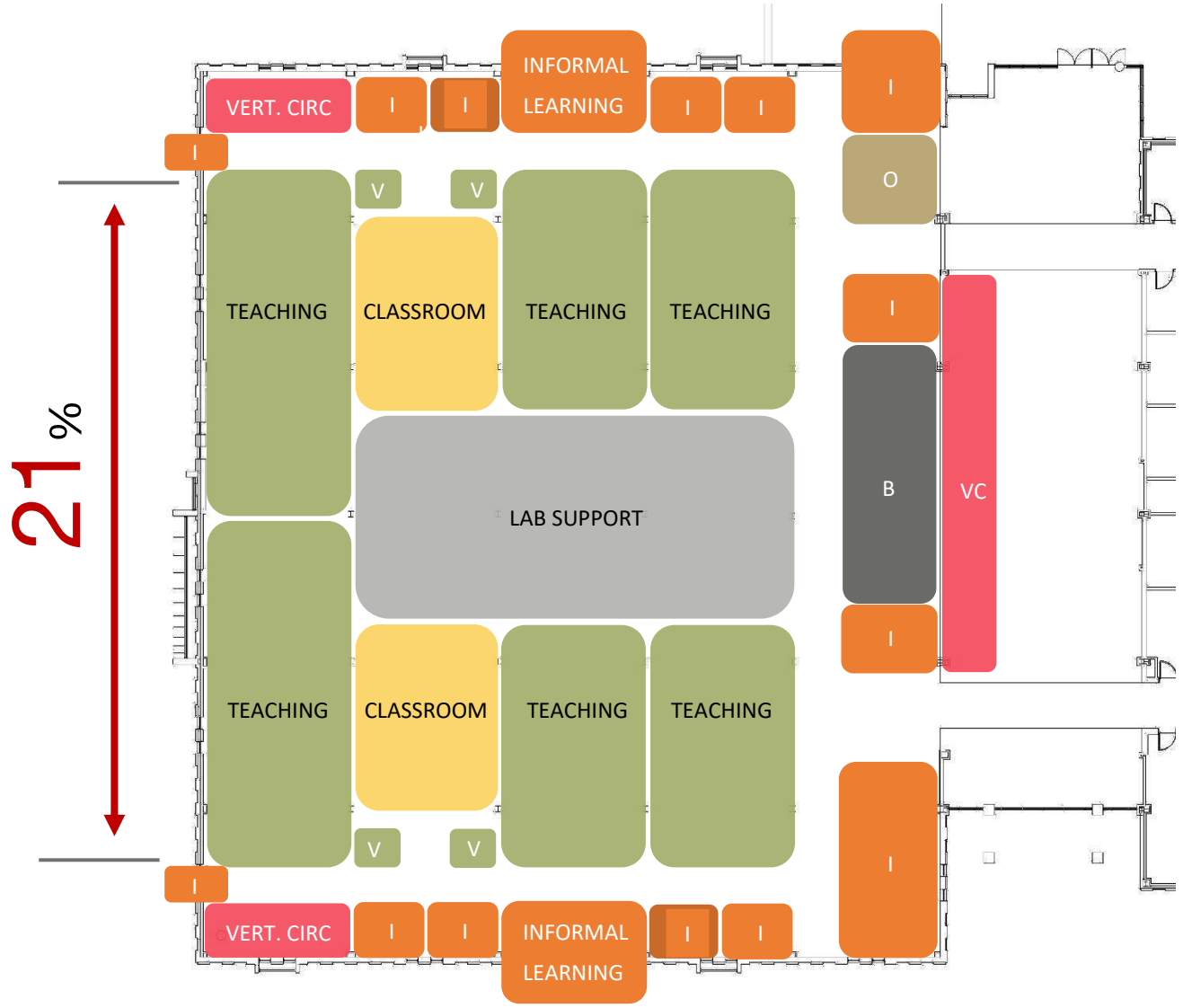


USC / CHALLENGE – FIRST IMPRESSIONS

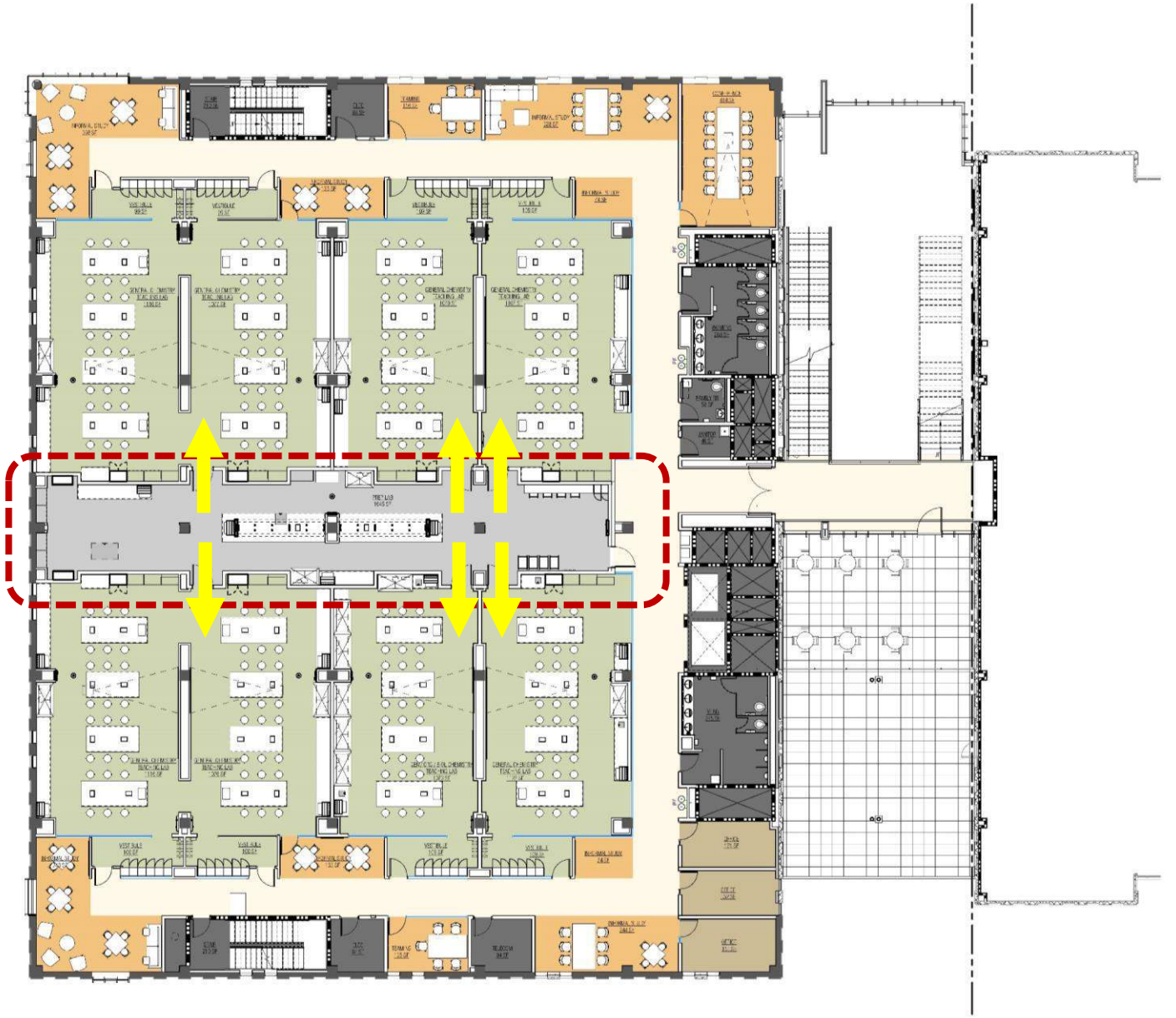


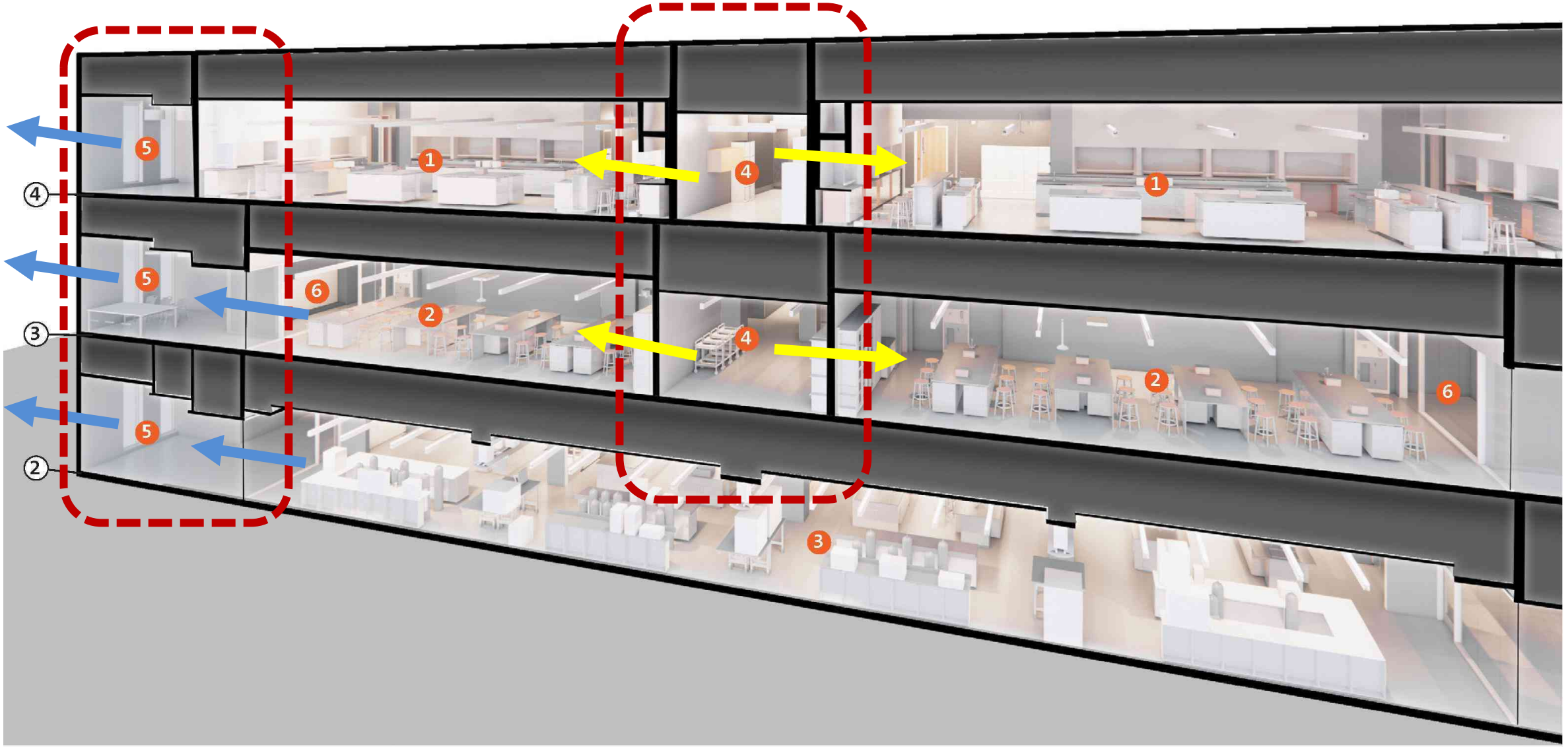
USC / CHALLENGE – CHANGE OF USE FROM UNPRESSURIZED TO PRESSURIZED

USC / PLANNING APPROACH – THERMAL PERFORMANCE



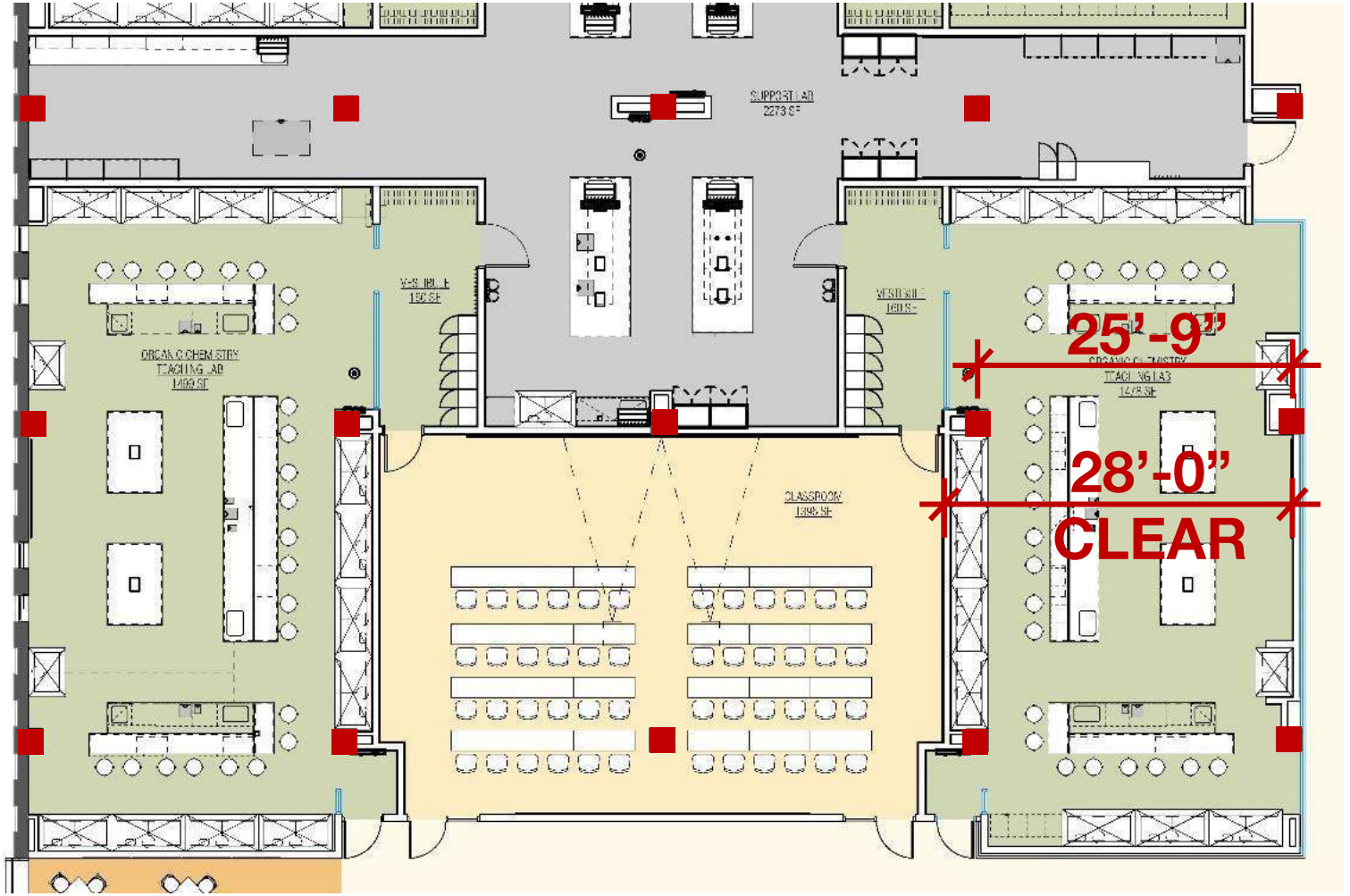
USC / PLANNING APPROACH – DEEP LAB BLOCK





1. Organic Chemistry Teaching Lab
2. General Chemistry Teaching Lab
3. Instrumentation and Advanced Chemistry Labs
4. Central Prep Lab
5. Student Collaboration
6. Vestibule

USC / INTEGRATING LABS INTO STRUCTURAL MODULE

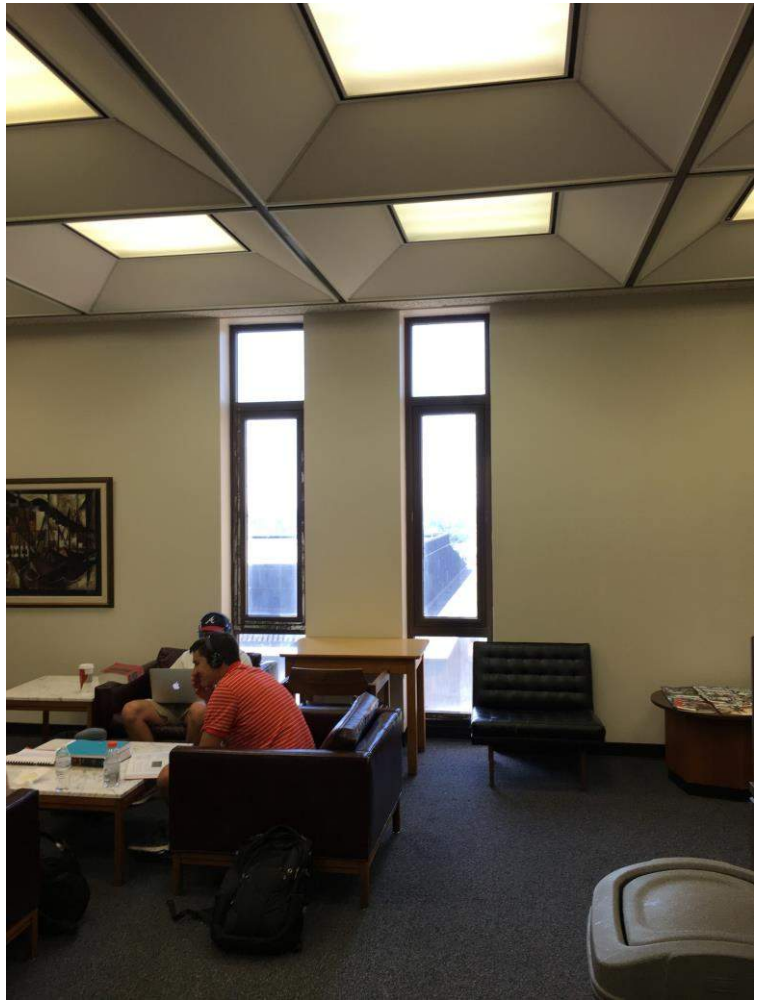


USC / A WHOLE NEW SAFETY CULTURE

USC FIRST IMPRESSION BEFORE

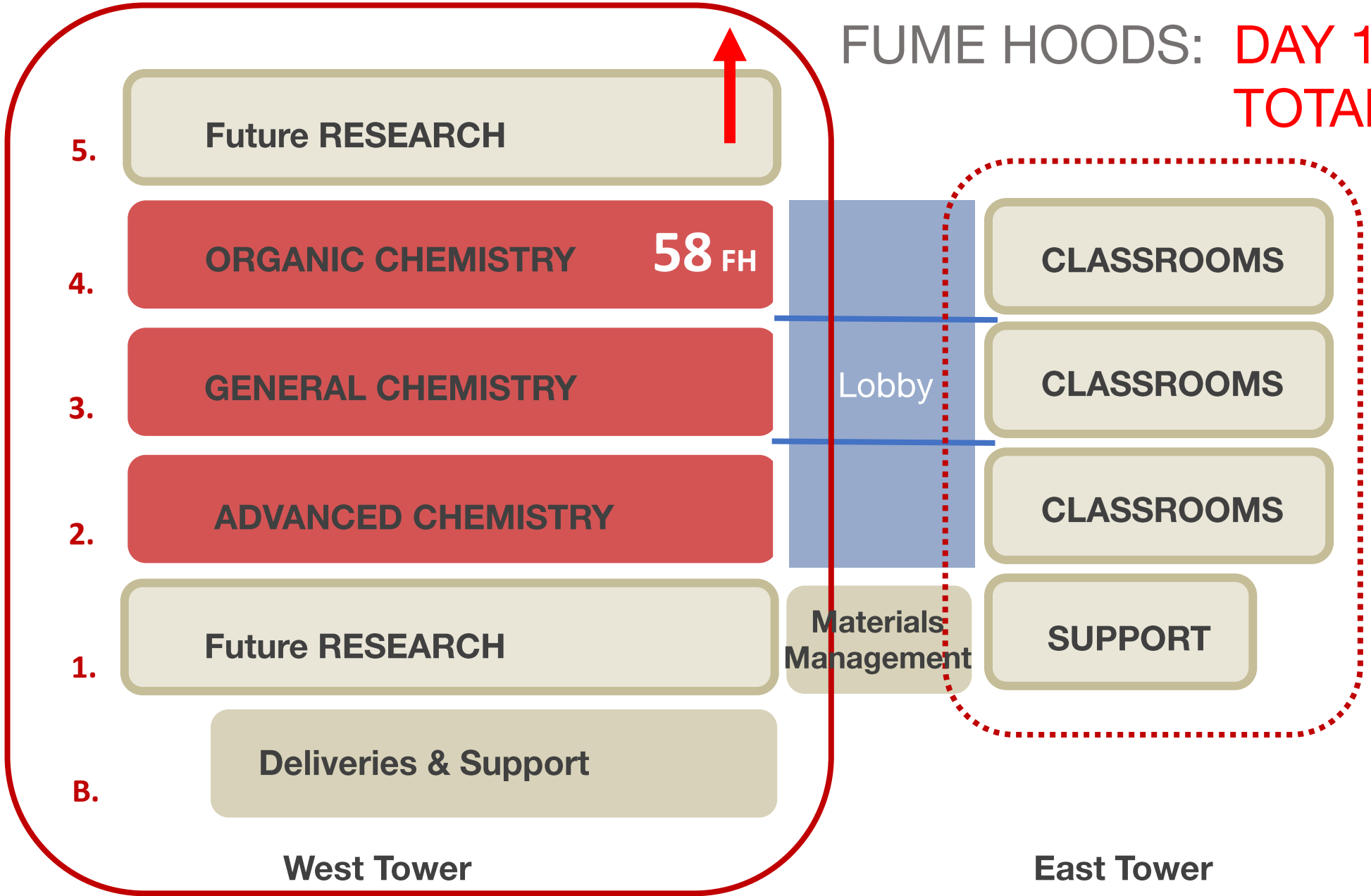
USC FIRST IMPRESSION NOW

USC / TRANSFORMING STUDENT EXPERIENCE – DAYLIGHT & VIEWS

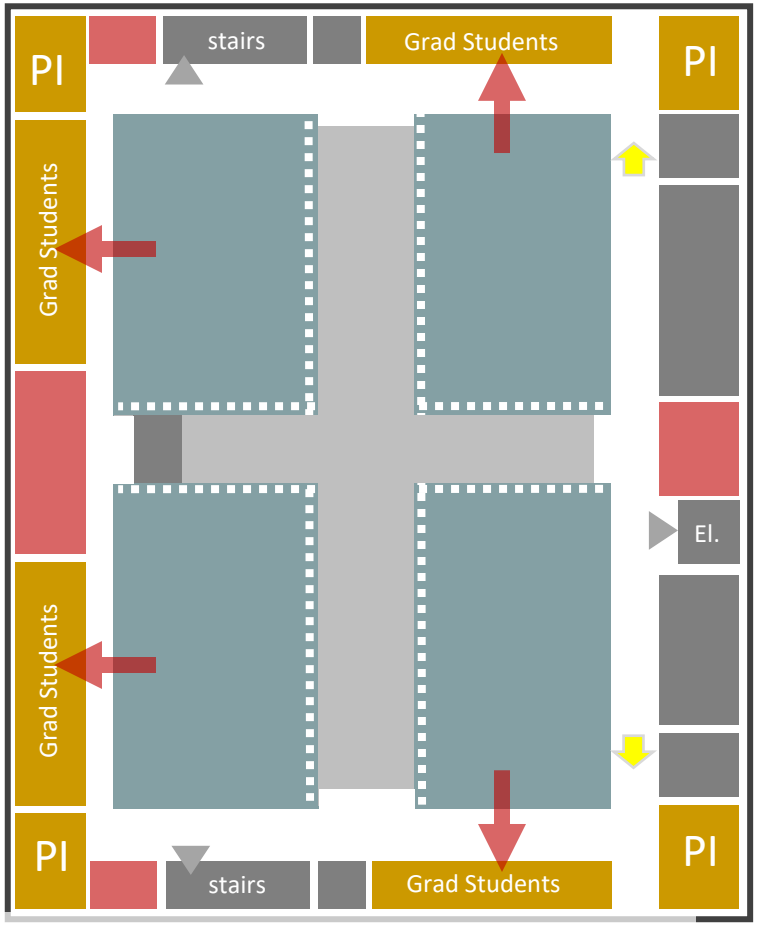


- Lighting / Daylight Strategies
- Teaching Hood Shutdown Process
- Energy Monitors

FUME HOODS: DAY 1 = 90
TOTAL = 120

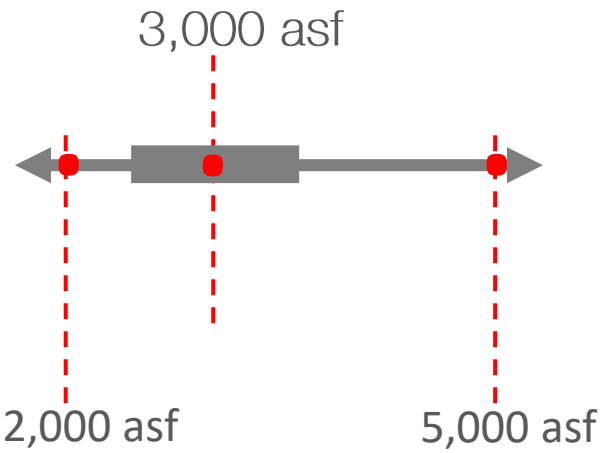


USC / PHASED APPROACH



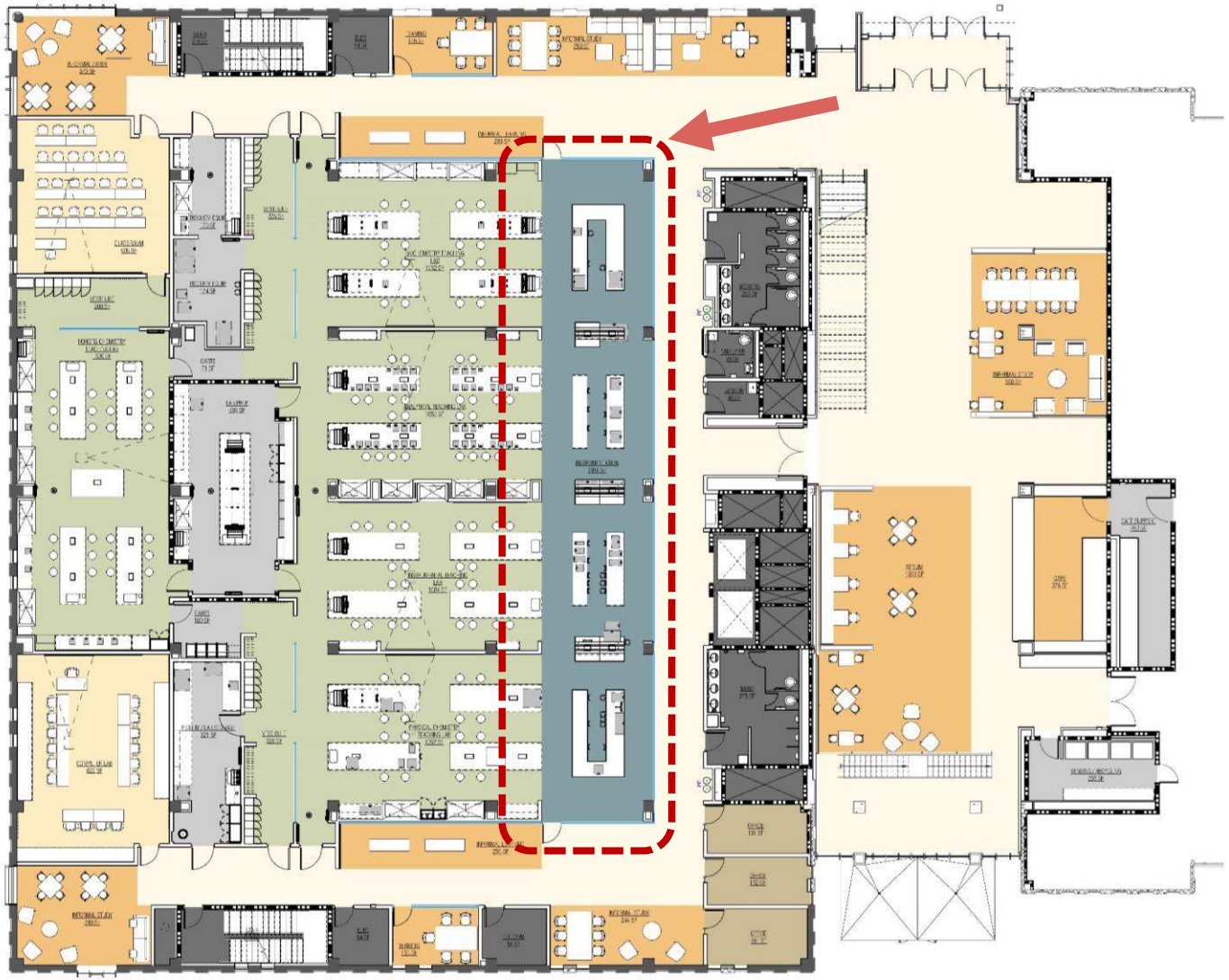
Chemistry Research Floor

- 19,900 nsf = 154’ x 129’
- 15,600 = Assignable Space
- 12,600 Lab Space = 122’ x 103’
  - 3,150 asf = 4 PI
  - 2,500 asf = 5 PI
  - 2,100 asf = 6 PI



USC A NEW FRONT DOOR

USC WELCOMING EXPERIENCE




ADVANCED
CHEMISTRY

USC / PAYBACK: $$$$$

FACILITIES AND OPERATIONS ROI

- Utility & Energy Efficiency Cost Savings: 15% per year / 5-year payback
- EUI: 13.5% Reduction
- LEED Gold

IMPROVED STUDENT OUTCOMES

- Student Faintings are Down
- Reduction in Accidents
- Increased Lab Spaces – Allowed for New Courses to be Added and Support for New Programs
- Enhanced Student Experience with Increased Study Spaces
- Increased Instrument Collaboration and Usage


KIMTECH
KIMTECH
DELL

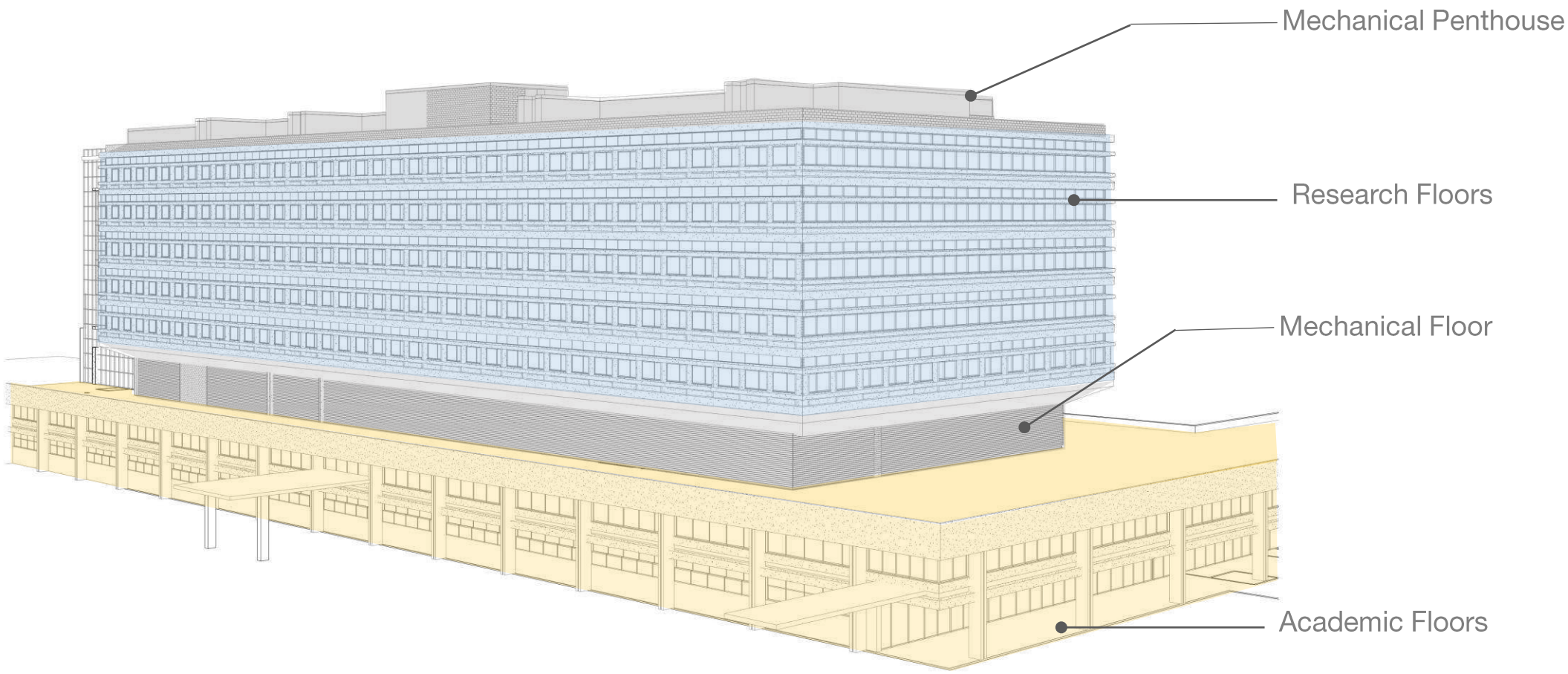
“This Organic Chemistry Teaching Lab is so cool, bright and airy … *I think I will be able to* ***pass organic chemistry this semester!***”

Chemistry student

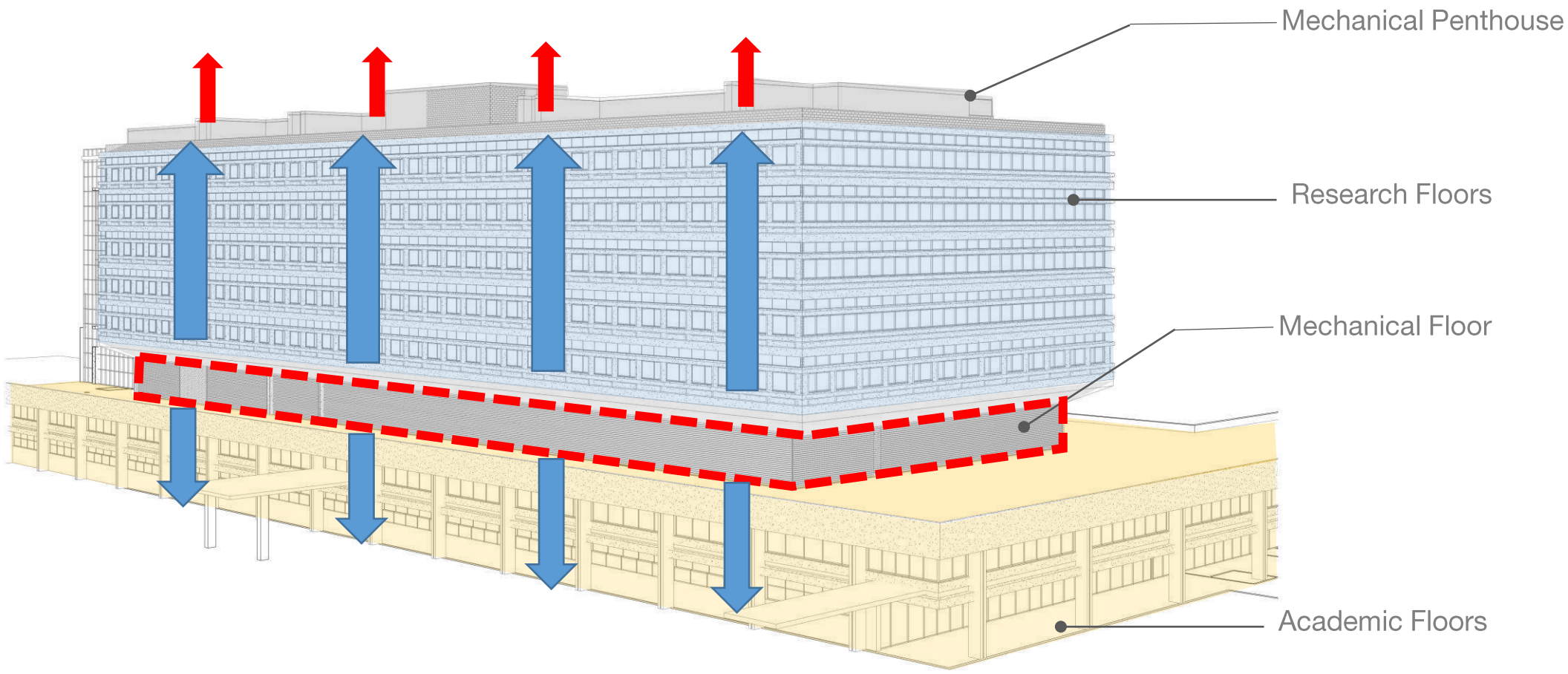
Overheard stepping into the new labs for the first time

RUTGERS UNIVERSITY

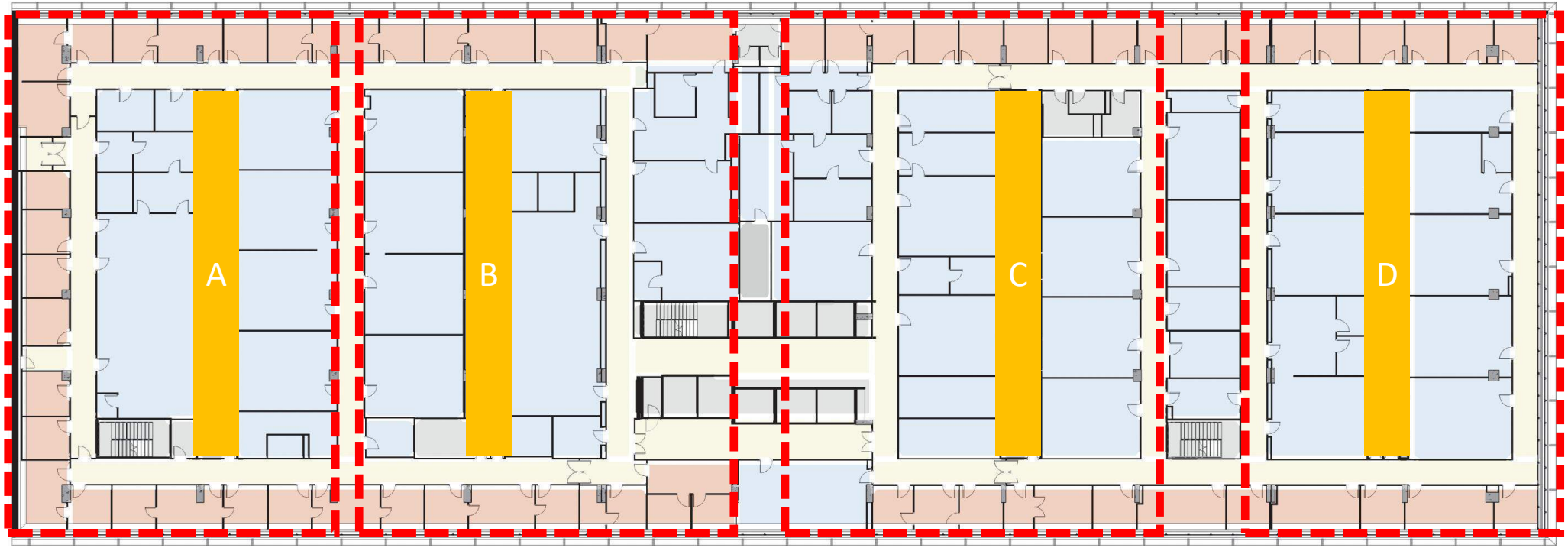
UNDERSTANDING THE BUILDING / BASIC ARRANGEMENT



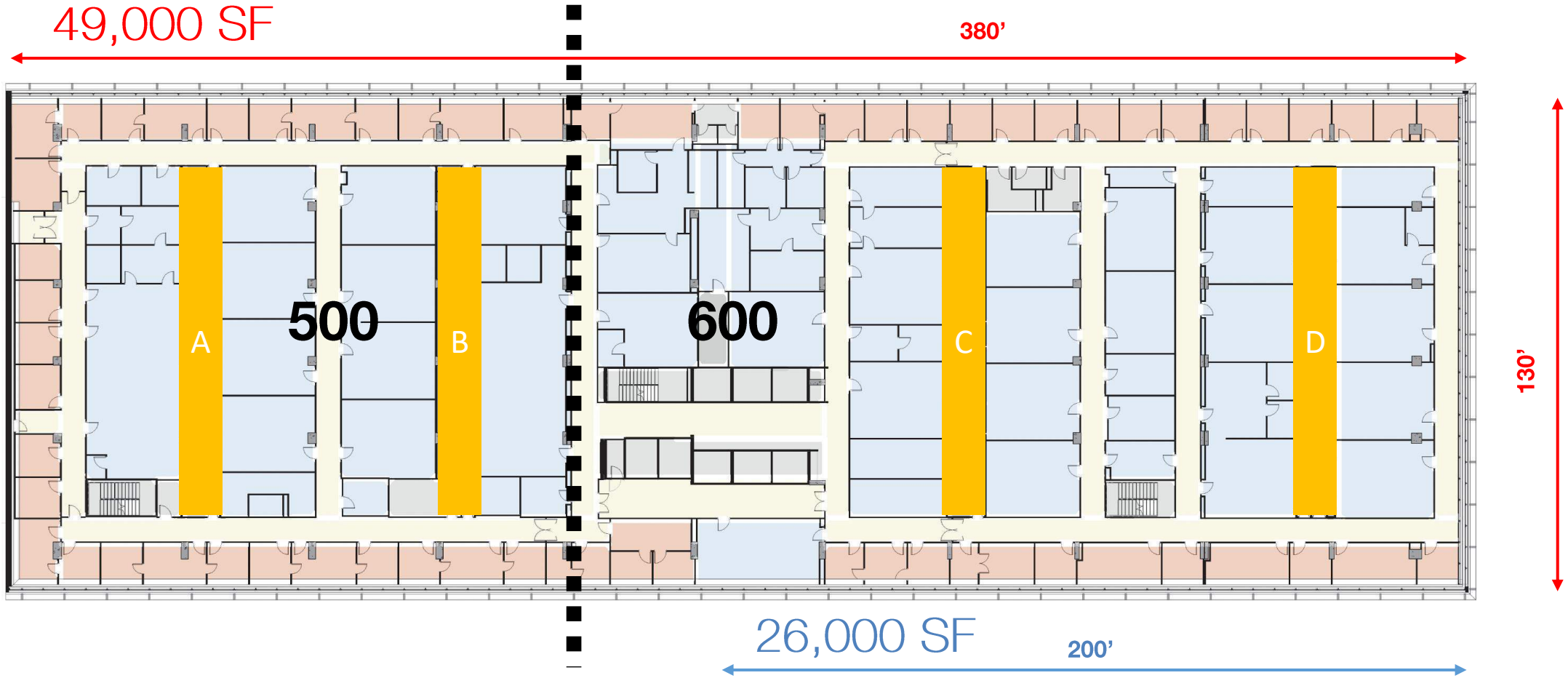
UNDERSTANDING THE BUILDING / BUILDING SERVICES



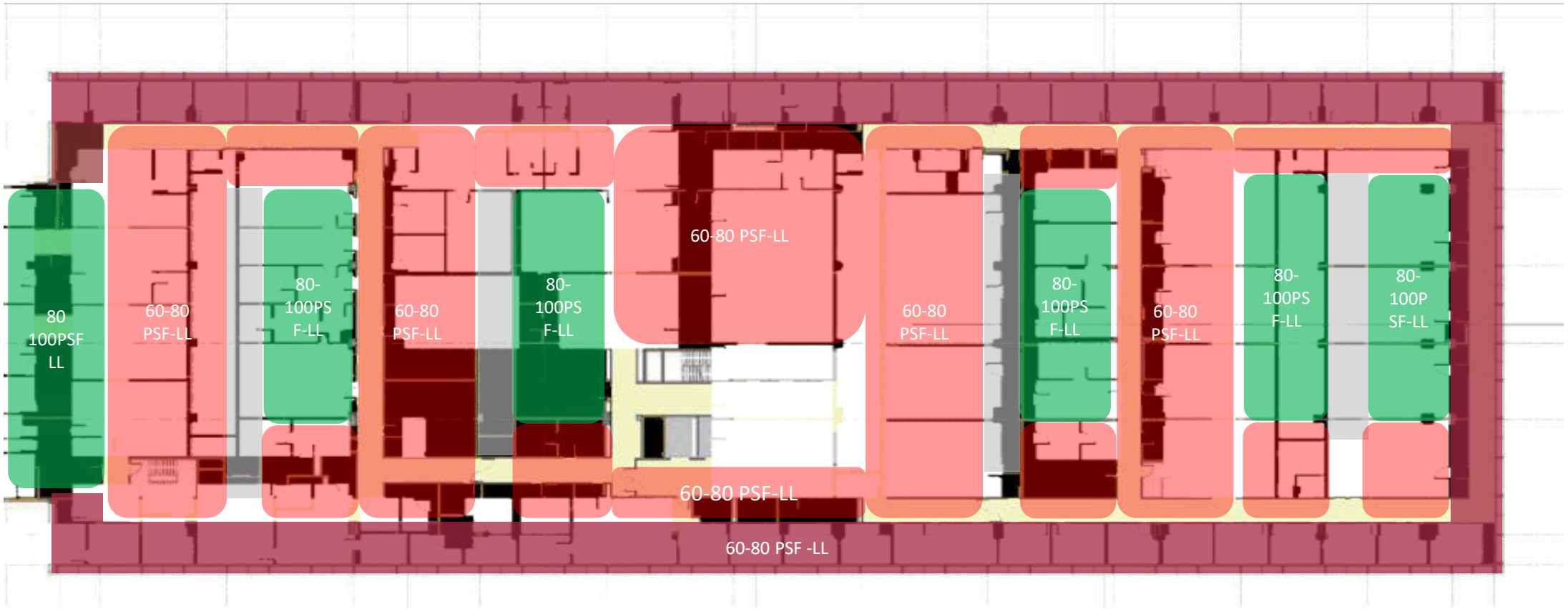
RUTGERS UNIVERSITY NJMS / CHALLENGE – RESEARCH LAB ZONING



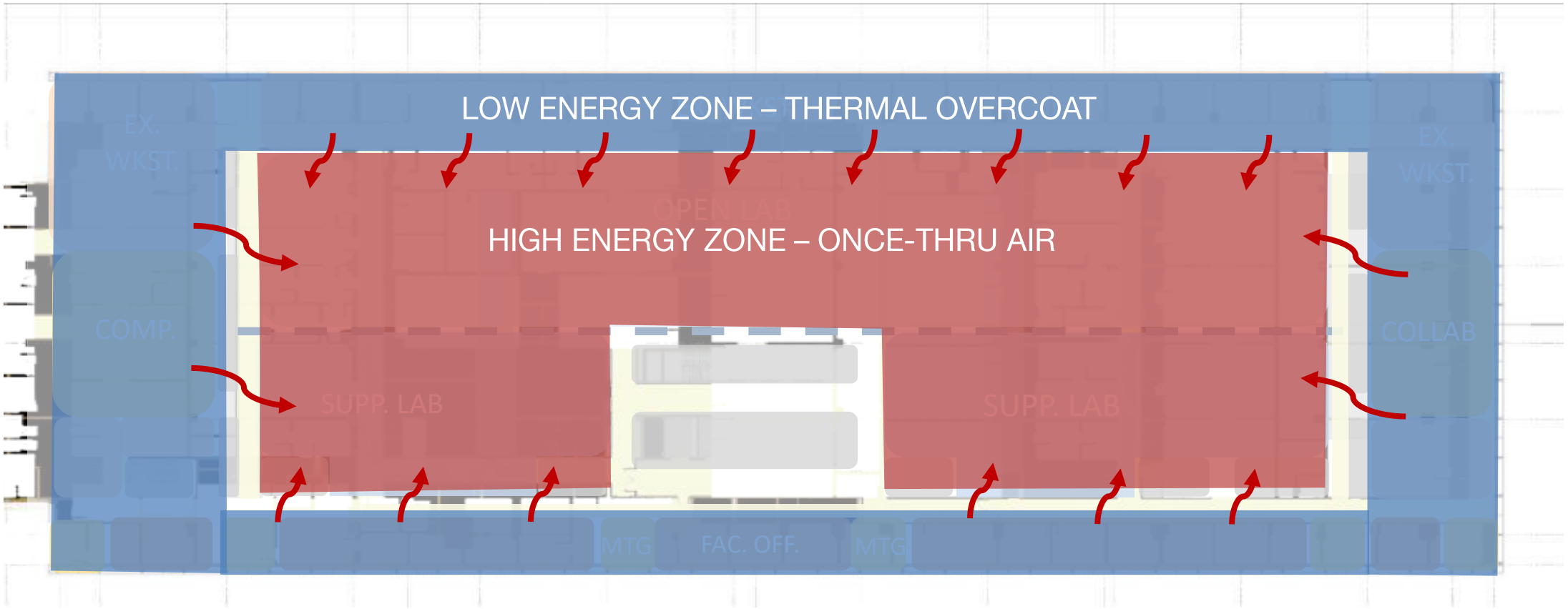
RUTGERS UNIVERSITY NJMS / CHALLENGE – RESEARCH LAB ZONING



RUTGERS UNIVERSITY NJMS / CHALLENGE – LIVE LOAD CAPACITY & VIBRATION CONTROL

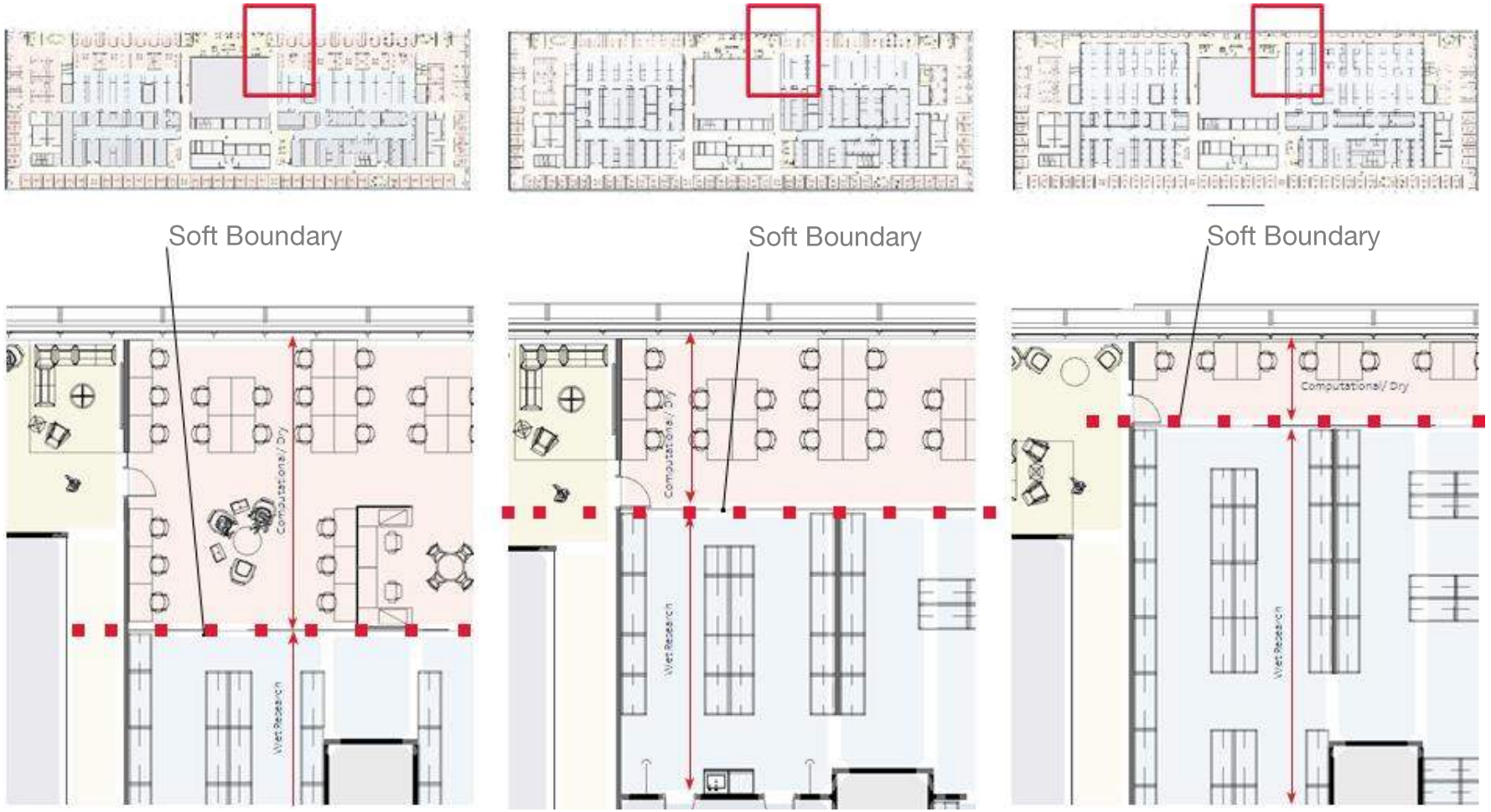


RUTGERS UNIVERSITY NJMS / CHALLENGE – STRUCTURE & EXTERIOR ENVELOPE


LOW ENERGY ZONE – THERMAL OVERCOAT
HIGH ENERGY ZONE – ONCE-THRU AIR
EX. WKST.
OPEN LAB
EX. WKST.
COMP.
SUPP. LAB
SUPP. LAB
COLLAB
MTG
FAC. OFF.
MTG

RUTGERS UNIVERSITY NJMS / DISCIPLINED ADAPTABILITY – SOFT BOUNDARIES

RUTGERS UNIVERSITY NJMS / DISCIPLINED ADAPTABILITY – SOFT BOUNDARIES



Computational / Collaboration

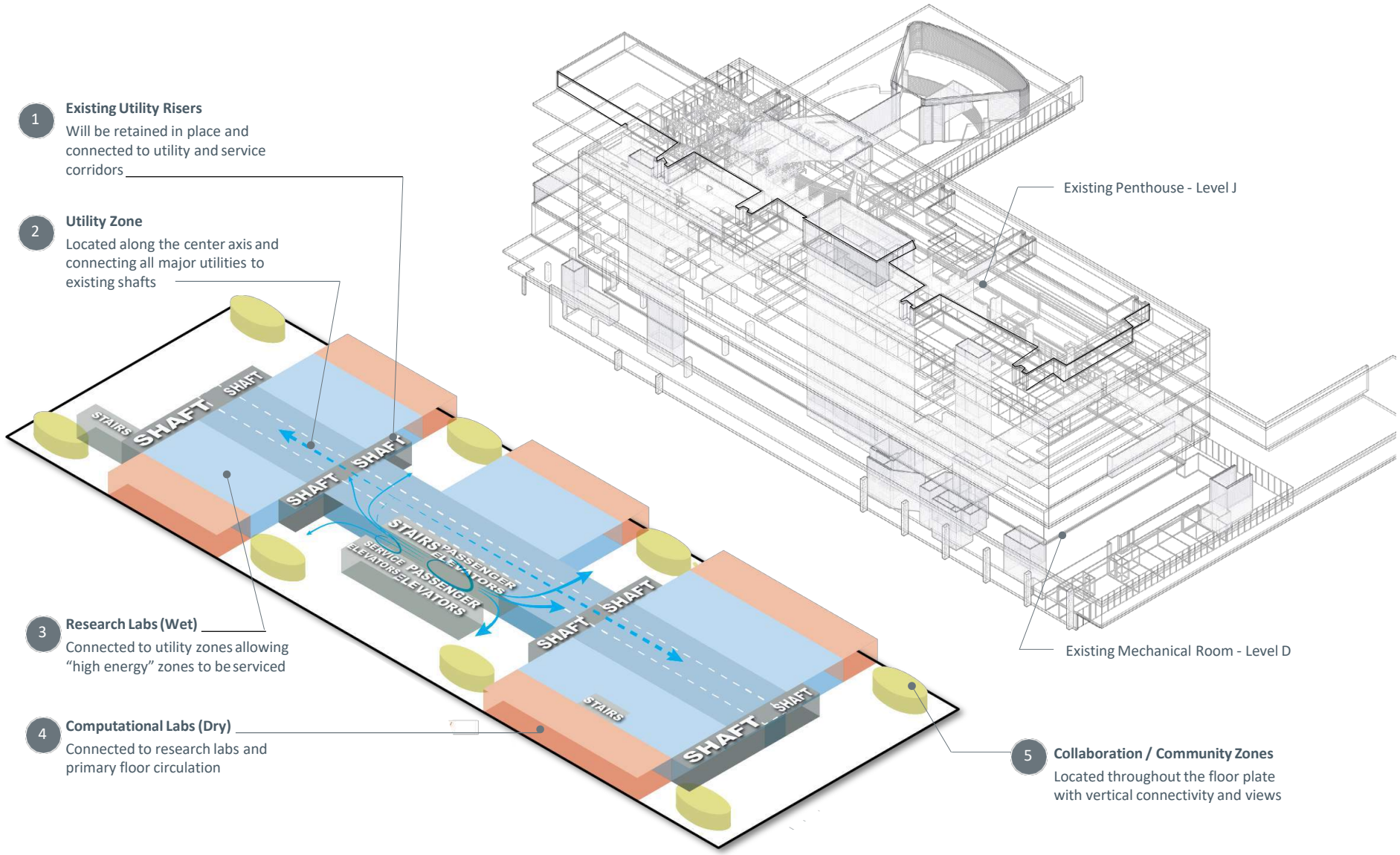
Lab Write-up Assigned

Lab Write-up Hoteling

RUTGERS UNIVERSITY NJM / DISCIPLINED ADAPTABILITY – SOFT BOUNDARIES

RUTGERS UNIVERSITY NJMS / DISCIPLINED ADAPTABILITY – CREATING A UTILITY CHASSIS

RUTGERS UNIVERSITY NJMS / DISCIPLINED ADAPTABILITY – UTILITY CHASSIS

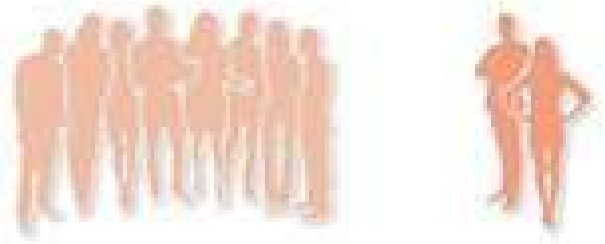


RUTGERS UNIVERSITY NJMS / ORGANIZATION & RESEARCH CULTURE

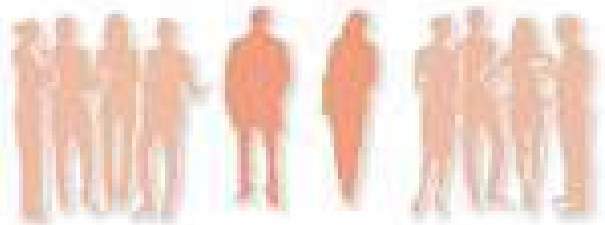
Organization

Culture

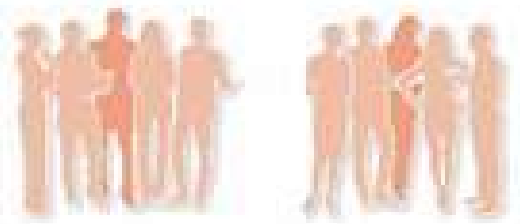
City



Town



Neighborhood



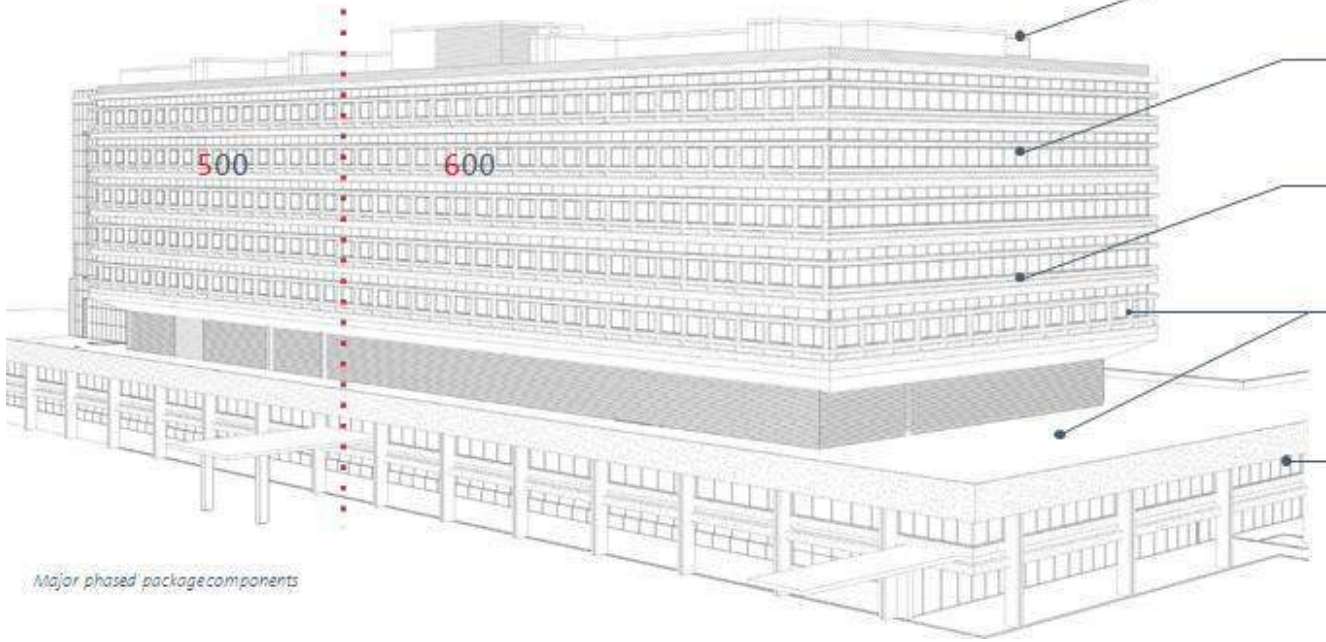
RUTGERS UNIVERSITY NJMS / SCOPE PACKAGES & PHASING

Enabling
Tower
Risers
Skin
Base

E | 5 - 01

01
02 Sequential number
03

500 Side
600 Side
0 Both or N/A



Enabling
Levels A, D and penthouse work

Tower
Research towers, levels E through I

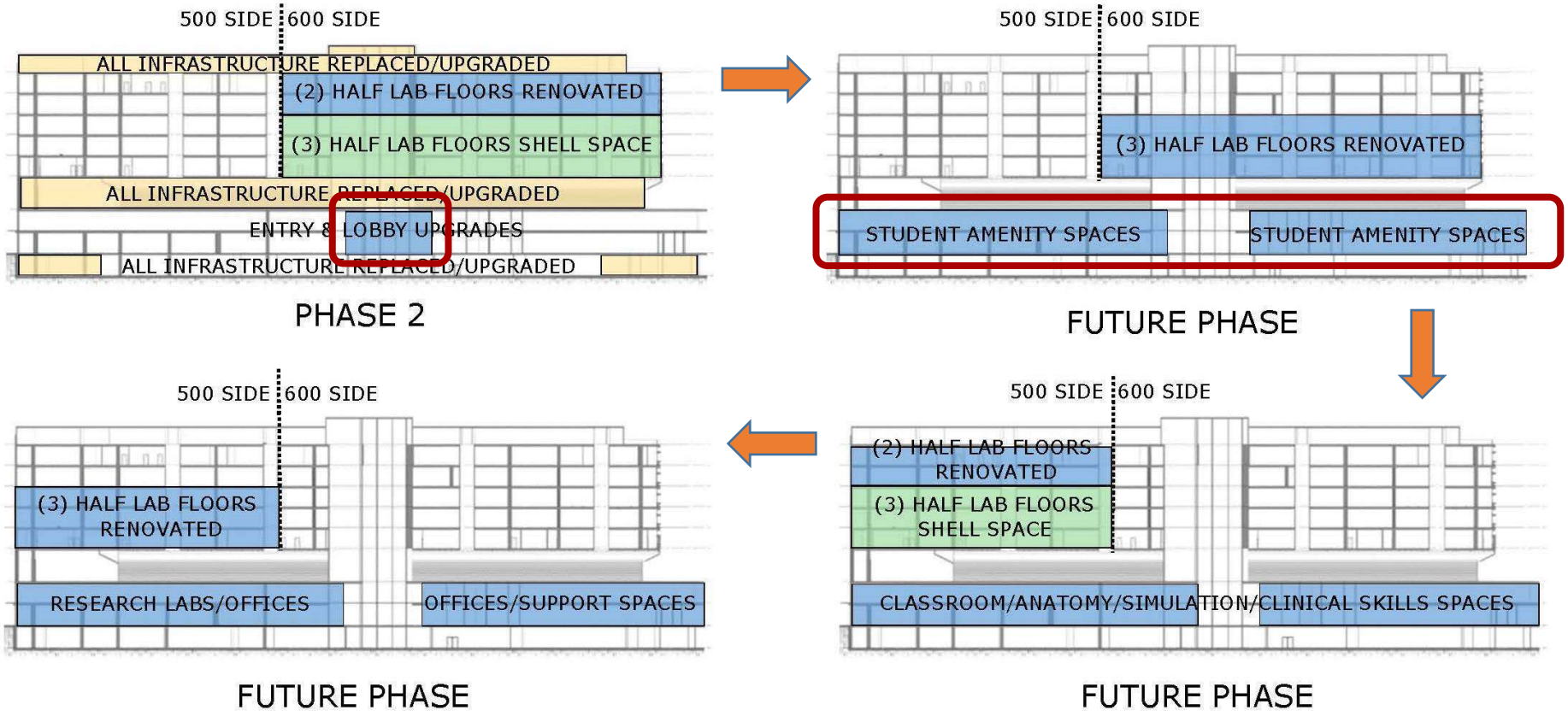
Risers
Internal mechanical shafts A through D

Skin
Building roofs, exterior skin and windows

Base
Levels B and C

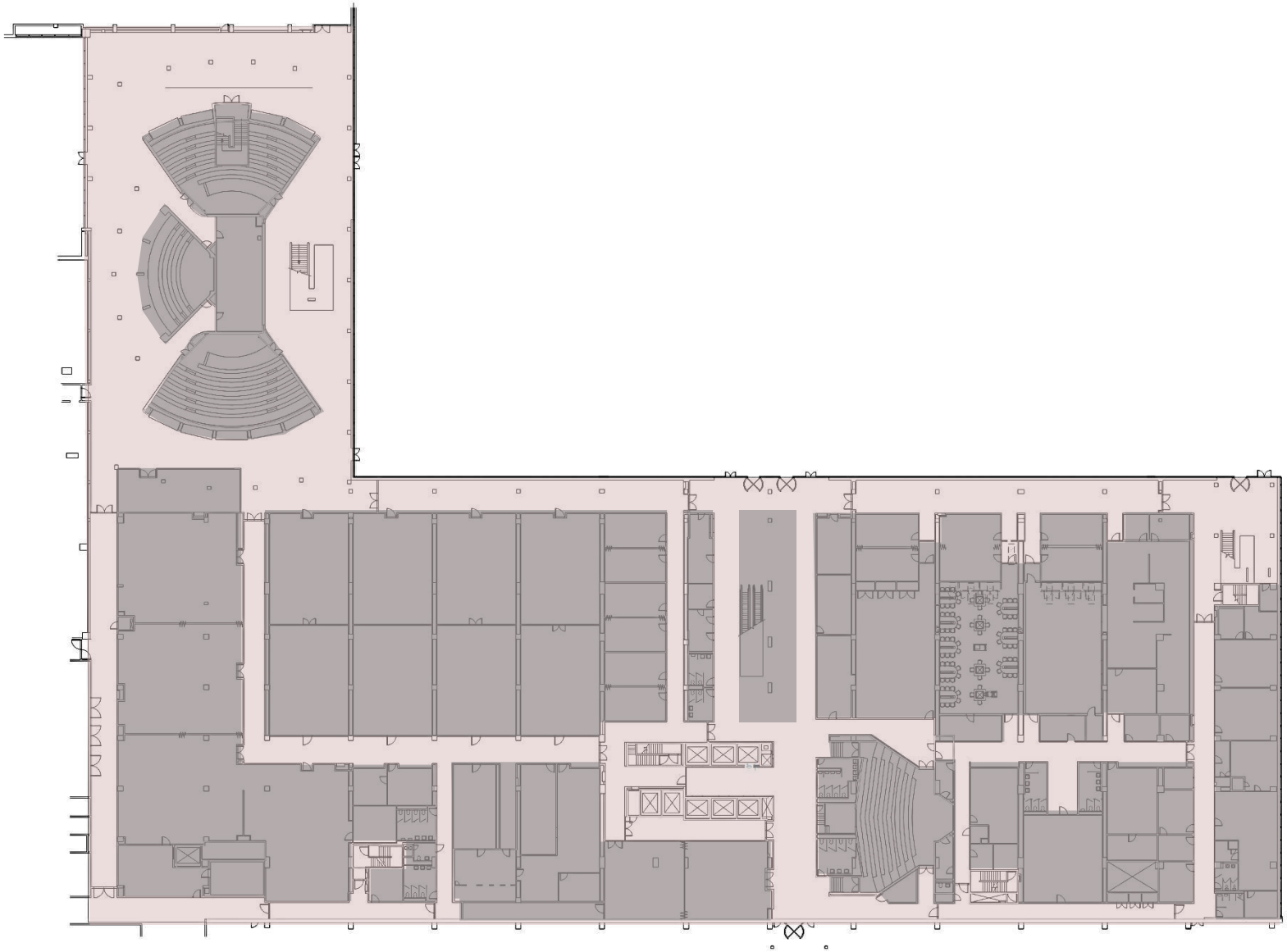
Major phased package components

PHASE 1: ELEVATORS AND FIRE ALARM INFRASTRUCTURE REPLACEMENT (CURRENTLY UNDERWAY)

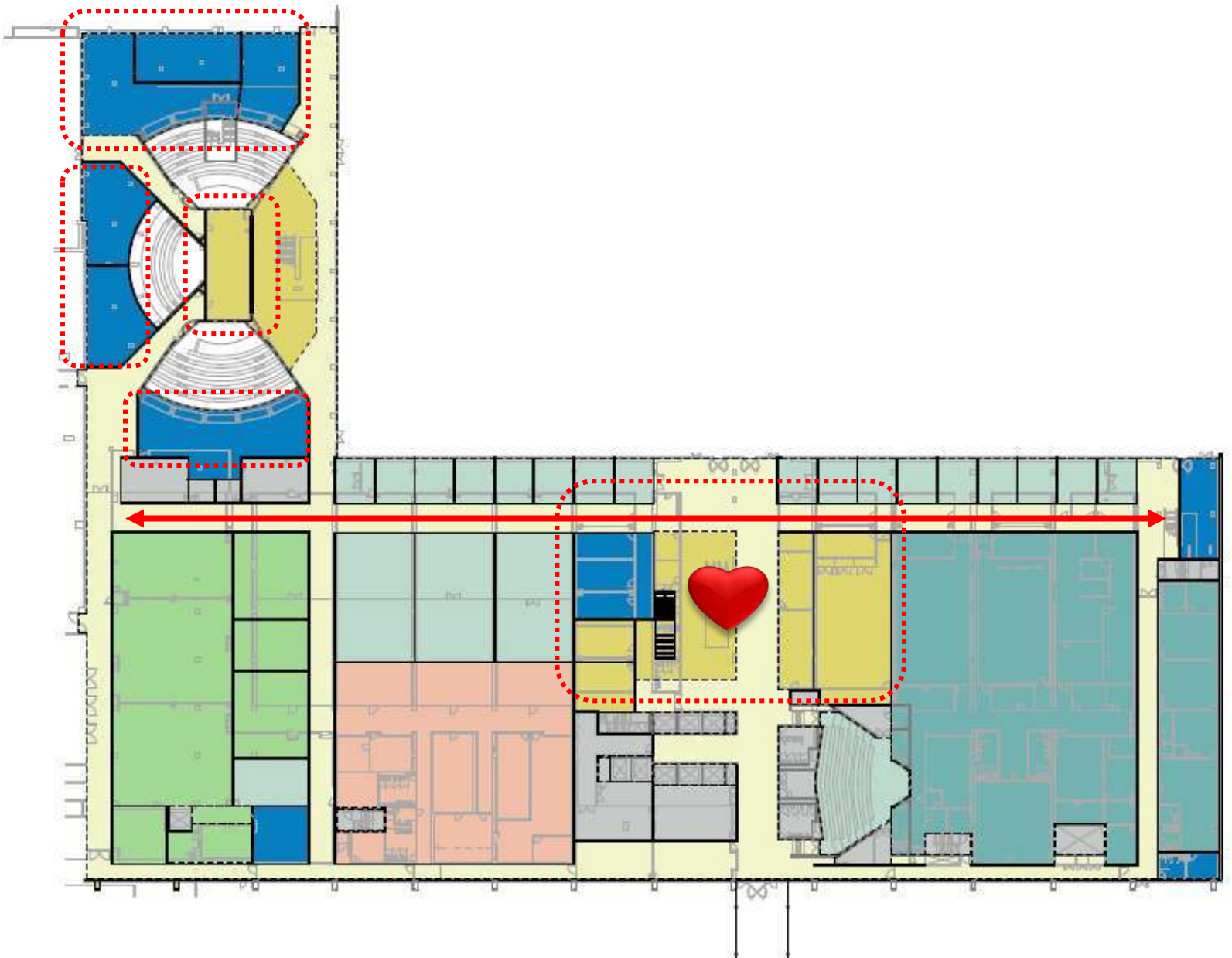


RUTGERS UNIVERSITY NJMS / SHARED BUILDING AMENITIES & ACADEMIC

- EXISTING EFFICIENCY = 39%
- TYPICAL BENCHMARK IS 20 – 30%
- CLASSROOM SIZES
- LITTLE NATURAL LIGHT

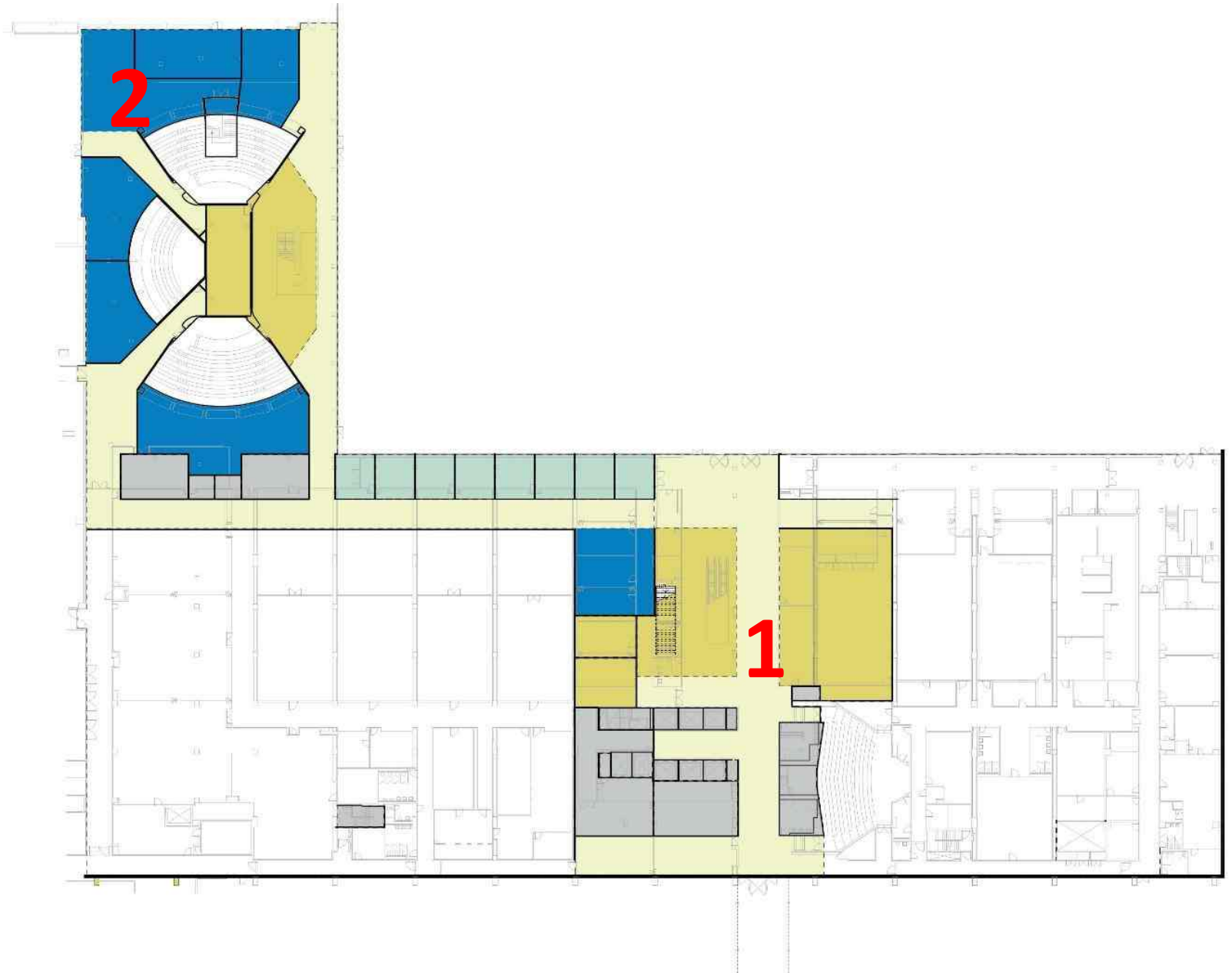


- NO ADDITIONS, JUST RECONFIGURATION
- CREATE “MAIN STREET” CORRIDOR TO RIGHT-SIZE CLASSROOMS
- ACTIVATE A CENTRAL SPACE FOR THE BUILDING
- REPURPOSE UNDERUTILIZED CIRCULATION AREA IN NORTHWEST WING



RUTGERS UNIVERSITY NJMS / SHARED BUILDING AMENITIES & ACADEMIC

- LIVING ROOM
- TEAM ROOMS
- EVENT SPACE
- ENTRANCE IMPROVEMENTS



RUTGERS UNIVERSITY NJMS / SHARED BUILDING AMENITIES & ACADEMIC

RUTGERS UNIVERSITY NJMS / SHARED BUILDING AMENITIES & ACADEMIC

RUTGERS UNIVERSITY NJMS / SHARED BUILDING AMENITIES & ACADEMIC

RUTGERS UNIVERSITY NJMS / PAYBACK: $$$$$

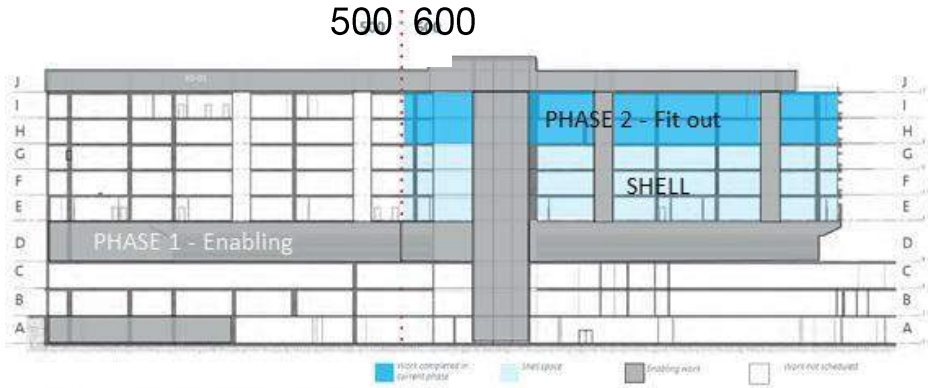
FACILITIES AND OPERATIONS ROI

- Utility & Energy Efficiency Cost Savings: $1M/Year Long Term
- O&M Labor and Material: $550K/Year Long Term
- Deferred Maintenance Cost Savings: $4M/Year Short Term
- Continuity of Operations and Research: **Priceless**

INCREASE IN FUNDED RESEARCH

Phase 2: 600 Side of H&I Levels

- Existing Number of R01 Equivalents: 19
- Potential Number of R01 Equivalents to Recruit: 50
  (21-30 Wet Labs; 20-25 Dry Labs)



Phase 1: Building infrastructure
Phase 2: 2 half research floors

This concludes The American Institute of Architects
Continuing Education Systems Course

Page/

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