

A Tower, A Bridge, A Landmark: Three New York Laboratories

Course Number TH207

Thursday, June 21, 2018, 7:30 AM – 9:00 AM

Learning Units 1.50

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PRESENTATION AGENDA

Overview of Biomedical Research in New York City

Robert Easton, Moderator

Co-Chairman, Bionest Partners, New York, New York

The Tower: Weill Cornell Medicine, Belfer Research Building

Todd Schliemann FAIA

Design Partner, Ennead Architects

The Landmark: The Rockefeller University, Collaborative Research Center

Paul Broches FAIA

Partner, Mitchell Giurgola Architects

The Bridge: The Rockefeller University, The Rockefeller University

Jay Bargmann FAIA

Vice President, Rafael Viñoly Architects

Panel Questions & Discussion with Audience

Moderator & Panel

LEARNING OBJECTIVES

Discover how building configuration and massing strategies—horizontal, vertical, or adaptive re-use—influence research facility design and see how to work within the constraints of each.

Learn how zoning prerequisites impact research facility design and how early negotiations and consensus building—within an institution and with external agencies and authorities—can put goals within reach.

Gain an understanding of how integrated planning of final designs and construction phasing benefits the process as well as the final occupied building.

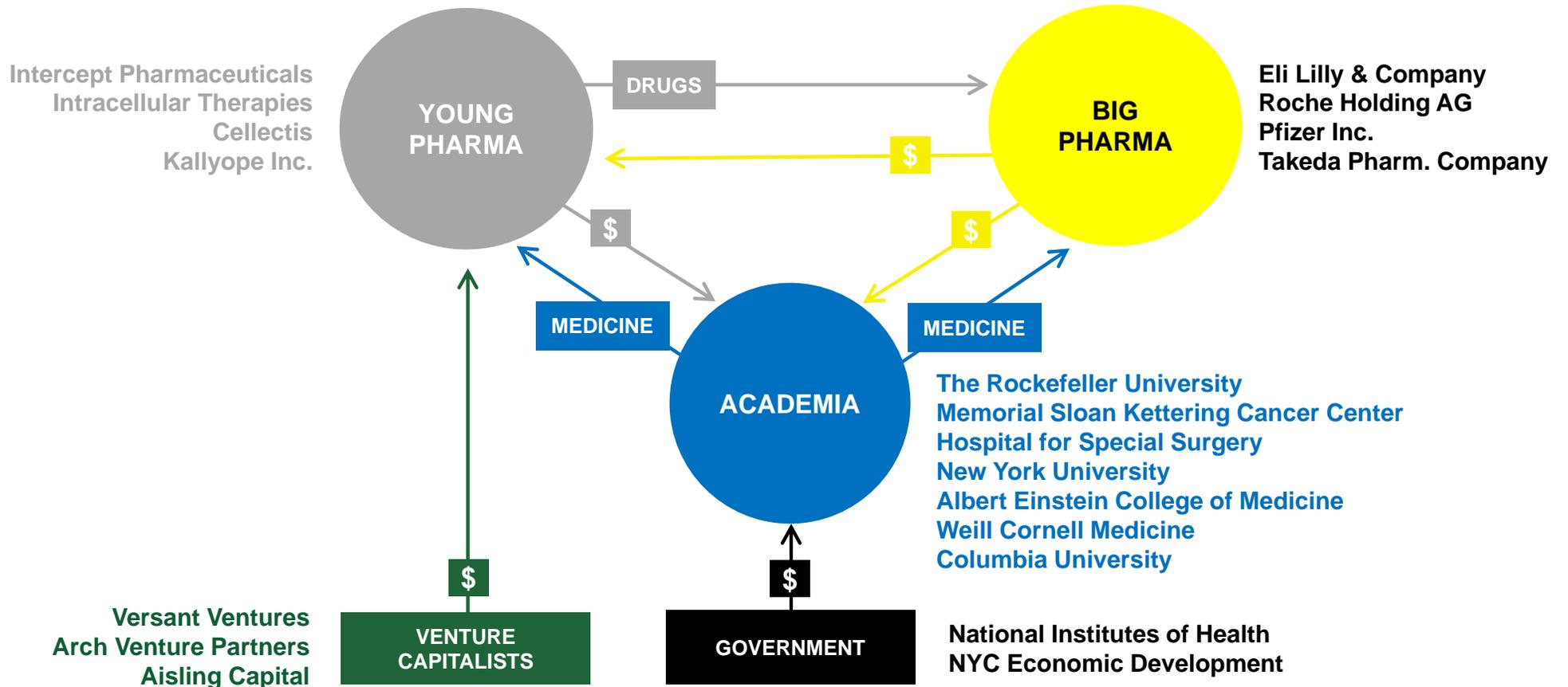
Begin identifying the options large urban institutions have before, during, and after design to facilitate resilient, sustainable structures that support research.

An aerial photograph of New York City, showing a dense urban landscape with numerous skyscrapers and buildings. Central Park is visible in the upper center, surrounded by greenery and trees. The Hudson River is on the right side, and the East River is on the left. The text "OVERVIEW OF BIOMEDICAL RESEARCH IN NEW YORK CITY" is overlaid in white, bold, uppercase letters across the middle of the image.

OVERVIEW OF BIOMEDICAL RESEARCH IN NEW YORK CITY

Robert Easton

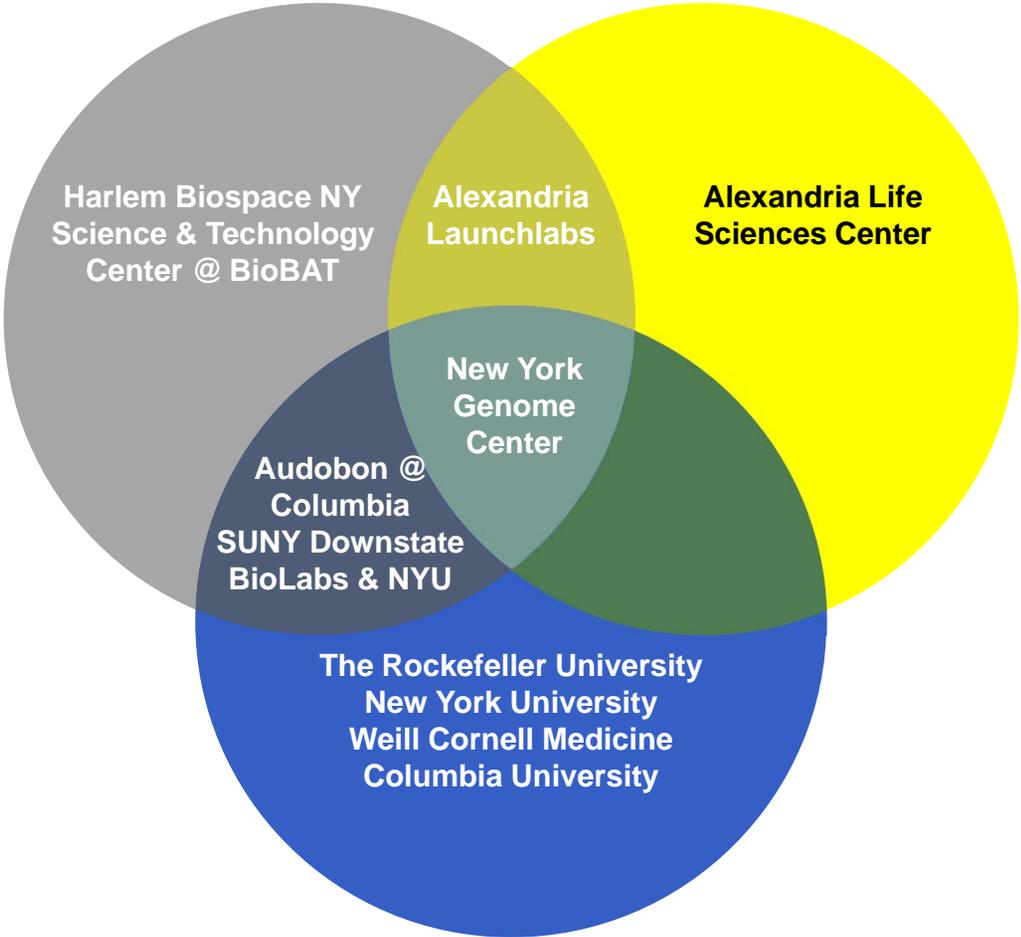
MAJOR PLAYERS OF BIOMEDICAL RESEARCH IN NEW YORK CITY



MAJOR SITES OF BIOMEDICAL RESEARCH IN NEW YORK CITY

INCUBATOR LABS

COMMERCIAL RESEARCH LABS



ACADEMIC RESEARCH LABS

MAJOR SITES OF BIOMEDICAL RESEARCH IN MANHATTAN

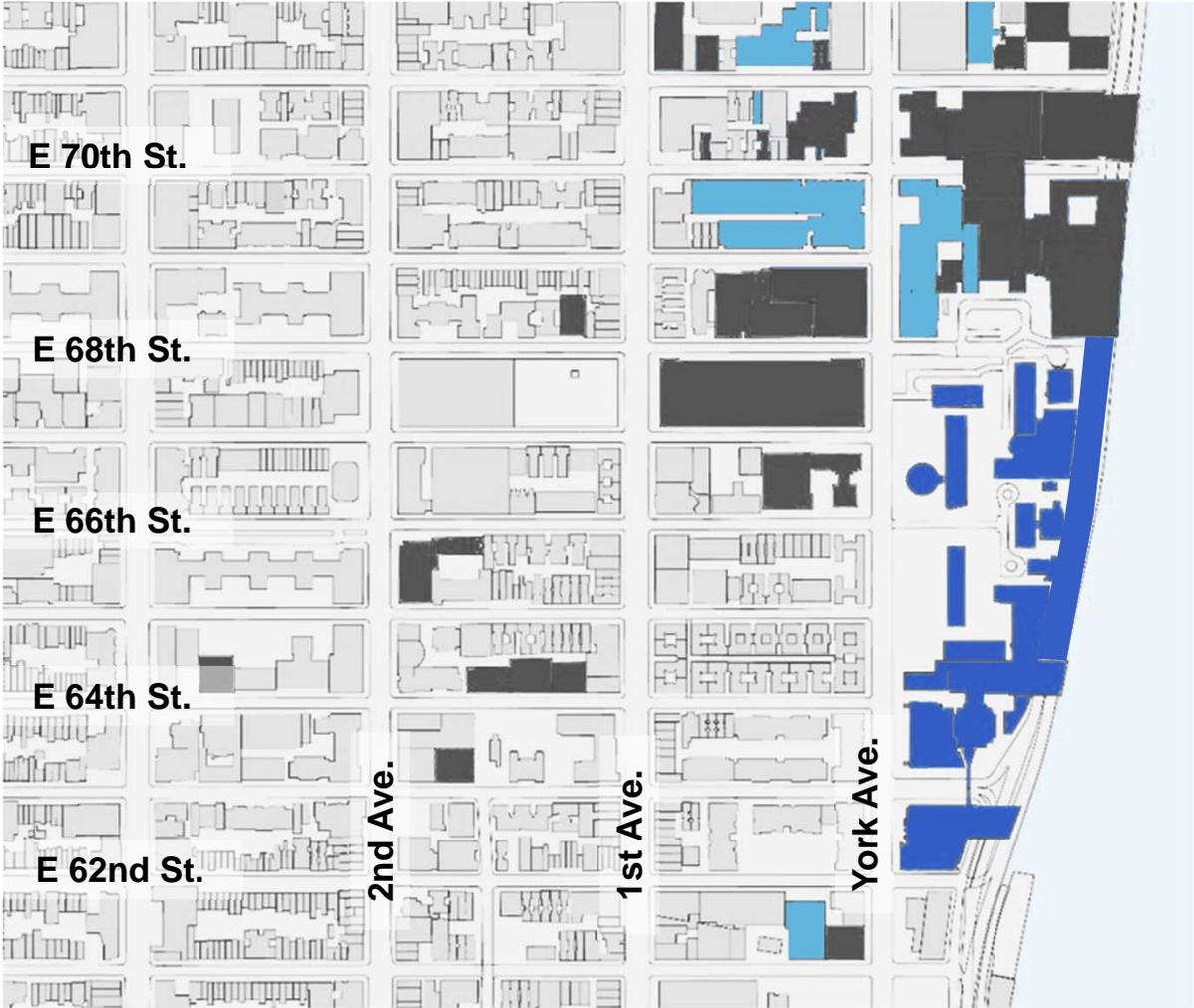


- Academic Research Labs
- Commercial Research Labs
- Incubator Labs

- Weill Cornell Medicine*
- The Rockefeller University River Campus & Collaborative Research Center*
- Albert Einstein College of Medicine
- Icahn @ Mount Sinai
- Hospital for Special Surgery
- New York Genome Center
- New York University
- Memorial Sloan Kettering Cancer Center
- Zuckerman @ Columbia University
- Audubon Center at Columbia University
- BioLabs @ NYU Langone
- SUNY Downstate Biotechnology
- Cornell Tech
- Harlem Biospace NY
- Science & Technology Center @ BioBAT
- Alexandria LaunchLabs
- Alexandria (Lilly, Roche, Pfizer)
- Intercept Pharmaceuticals
- Intracellular Therapies
- Collectis
- Kallyope, Inc.

MAJOR ACADEMIC RESEARCH LABS IN THE UPPER EAST SIDE

-  Weill Cornell Medical Center
-  The Rockefeller University
-  Other Research Institutions



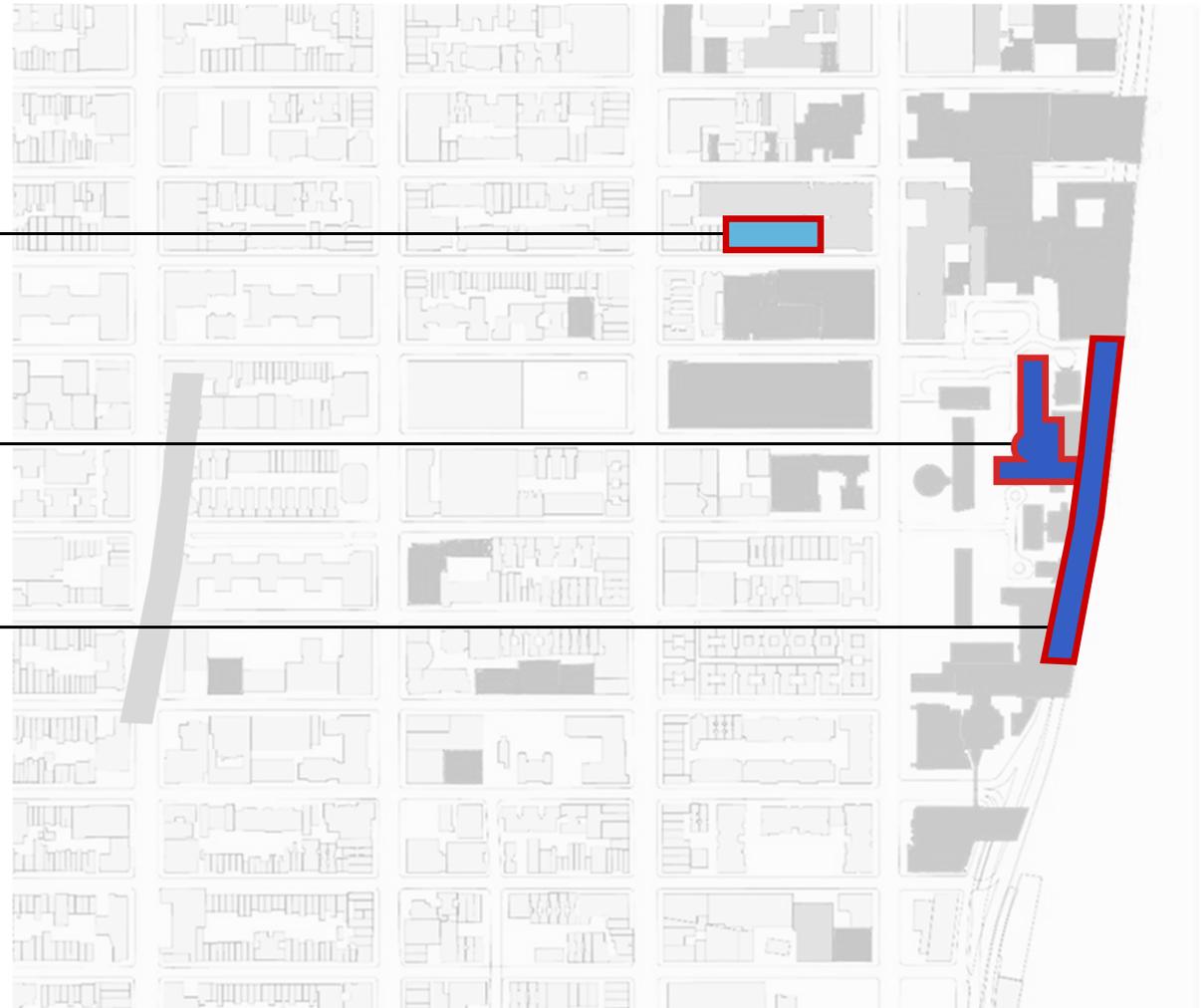
A TOWER, A BRIDGE, A LANDMARK: THREE NEW YORK LABORATORIES

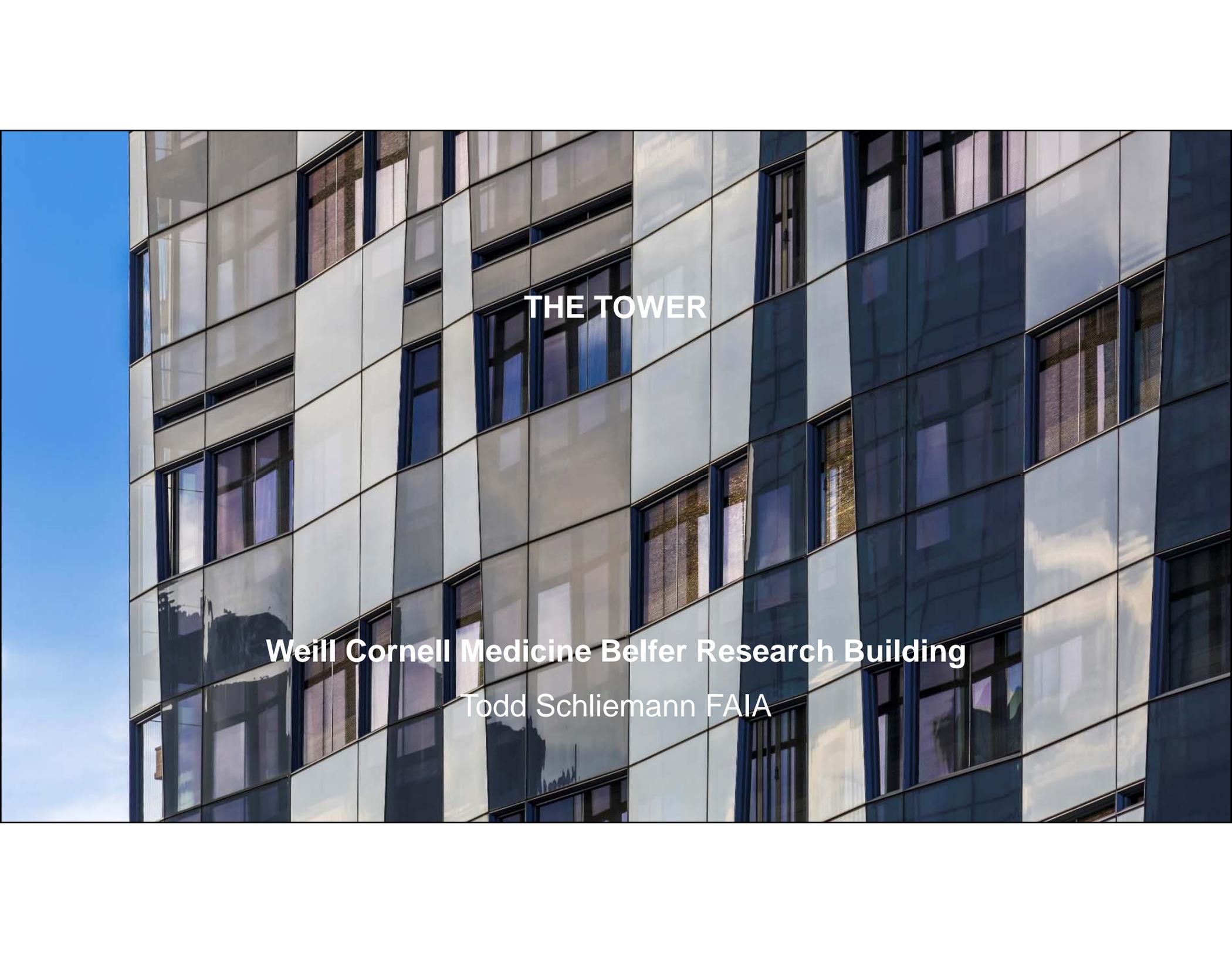
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1 THE TOWER
Weill Cornell Medicine,
Belfer Research Building

2 THE LANDMARK
The Rockefeller University,
Collaborative Research Center

3 THE BRIDGE
The Rockefeller University,
Stavros-Niarchos Foundation
David Rockefeller River Campus





THE TOWER

Weill Cornell Medicine Belfer Research Building

Todd Schliemann FAIA

WEILL CORNELL MEDICINE BELFER RESEARCH BUILDING Project Overview

13



Completed
2014

Area
476,000 square feet

Master planning for a new Weill Cornell Campus

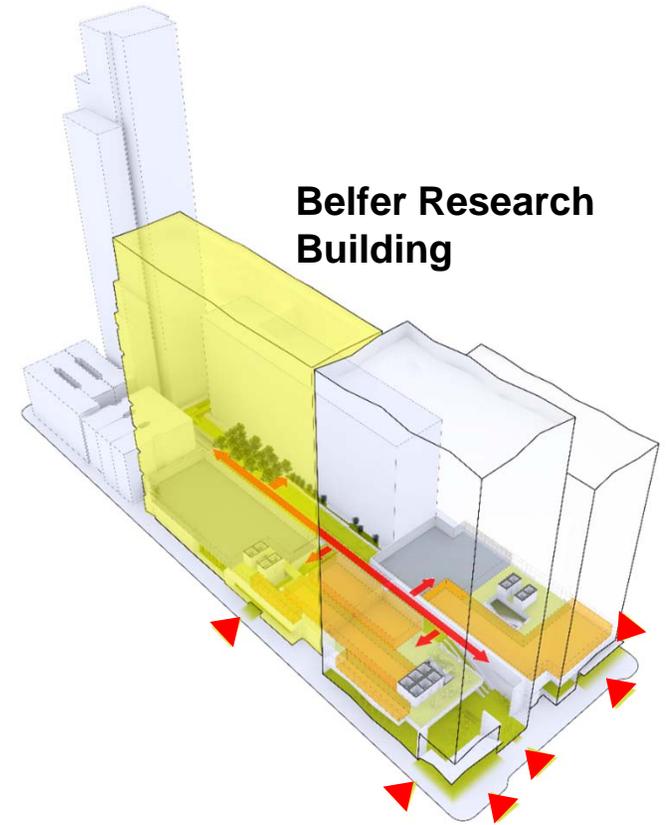
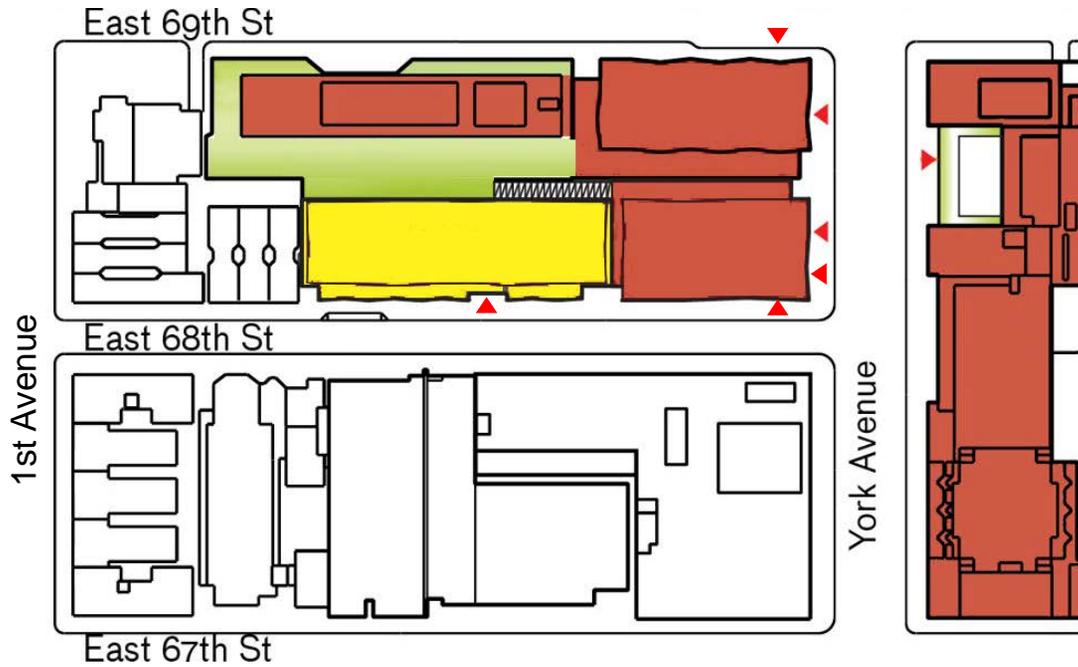
Zoning approval process with variances to achieve research programmatic need

Programming, planning, and design for collaboration

Sustainability initiatives to achieve LEED Gold

Construction challenges on a dense urban site

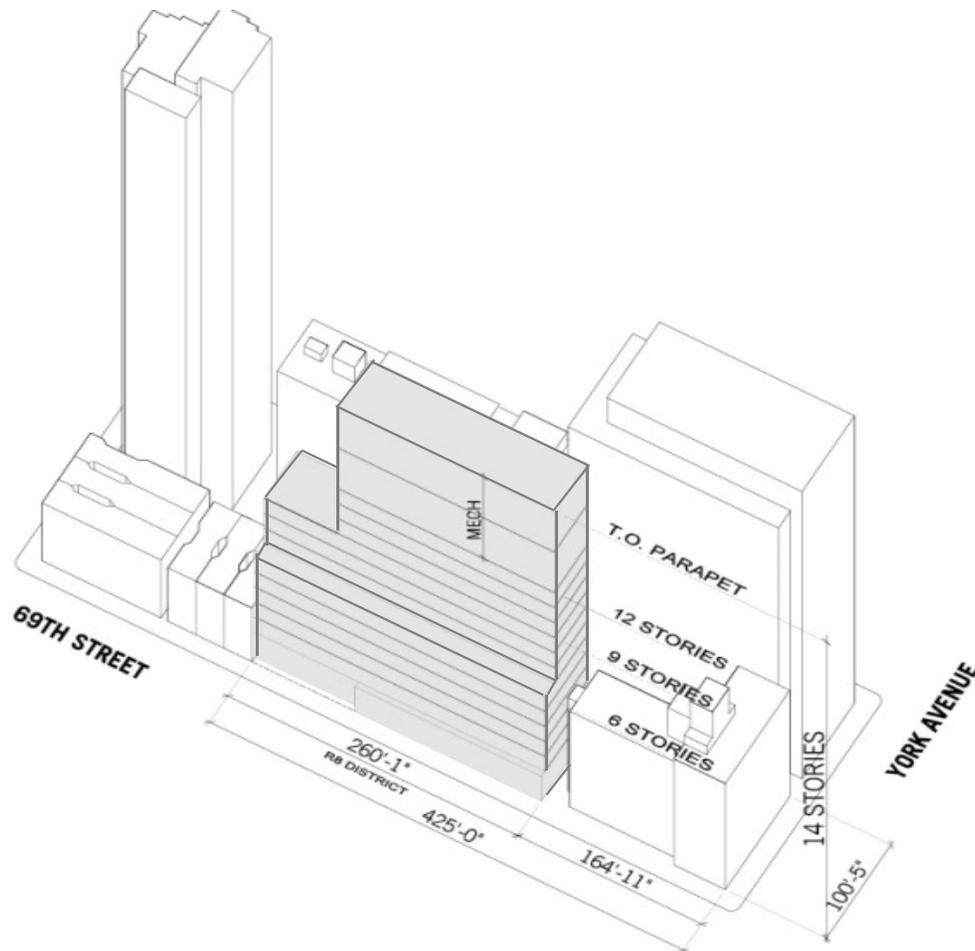
WEILL CORNELL CAMPUS SITE PLAN & BUILDING CONNECTIONS DIAGRAM



-  New Campus Green
-  Weill Cornell Campus / NY Presbyterian Hospital
-  Belfer Research Building

ZONING APPROVAL PROCESS & REQUIRED VARIANCES

15



Complying Building

14 Stories, including 2 mechanical
9 Laboratory Floors

Metrics

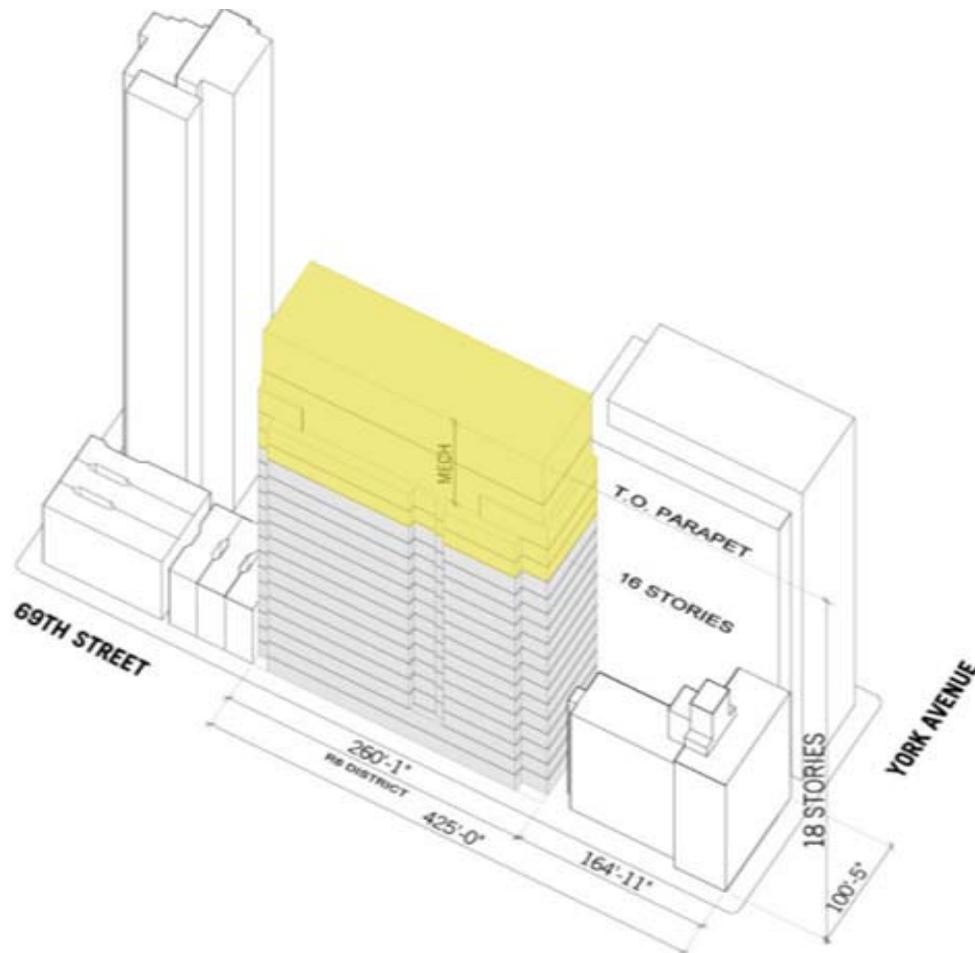
FAR	6.5
GSF	318,050
ZSF	169,754
ASF	144,835
ASF, Lab	89,700
PI, Total	76-100

Laboratory Floor Plate Size

Floors 3-6 17,030 GSF (~8 researchers)
Floors 7-9 13,130 GSF (~6 researchers)
Floors 10-12 10,100 GSF (~3-4 researchers)

ZONING & VARIANCE APPROVAL PROCESS

16



Approved Building

18 Stories, including 2 mechanical
13 Laboratory Floors

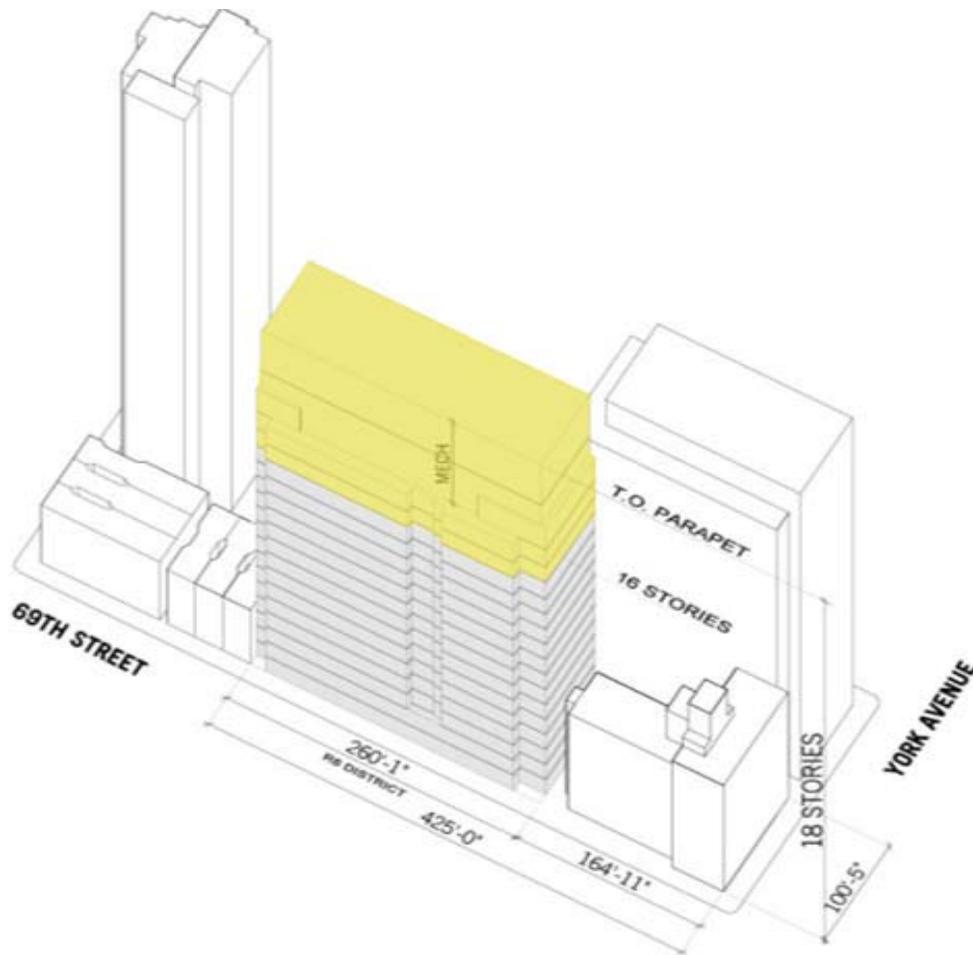
Metrics

FAR	12.41
GSF	476,069
ZSF	324,153
ASF	270,519
ASF, Lab	199,462
PI, Total	104-140

Laboratory Floor Plate Size

Typical Floor 21,187 GSF (~10 researchers)

ZONING & VARIANCE APPROVAL PROCESS



NYC Board of Standards & Appeals Variances Granted

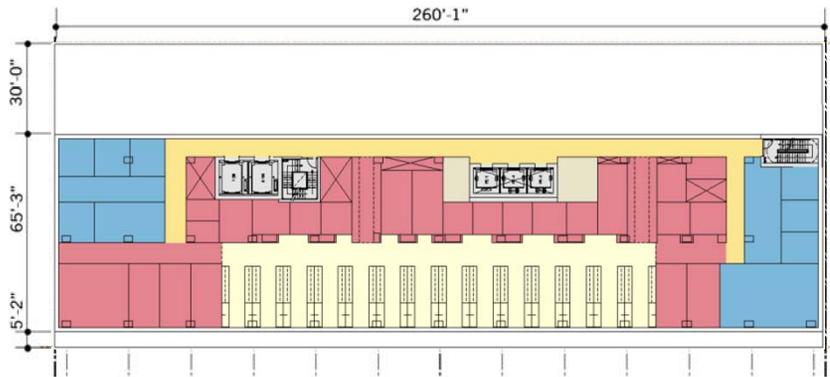
Floor Area	Permitted – 169,754 SF Approved – 331,945 SF
Lot Coverage	Permitted – 65% Maximum Approved – 92%
Front Height	Required – 20'-0" @ 85' Approved – No Front Setback
Side Yard	Required – 8' Wide Approved – 5' Wide
Rear Yard	Required – 30'-0" Above 23' Approved – 15'-0" Above 23'

ZONING & VARIANCE APPROVAL PROCESS

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Complying Building – Floors 4-6

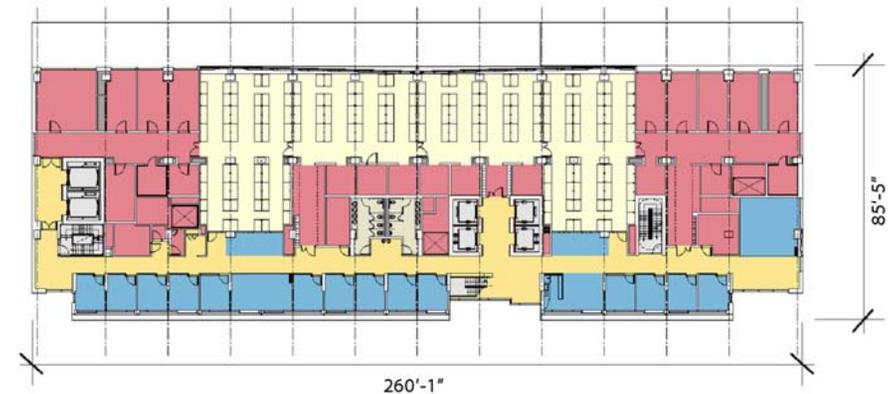
NYC Zoning restricts floor size / requires setbacks



- ~144,000 ASF total research program
- ~17,030 GSF per typical lab floor
- Accommodates ~8 researchers per floor
- Divides researchers into two small groups remotely located
- Distance limits research collaboration and restricts scientific discovery

Approved Building – Floors 3-16

Labs require large, deep, repetitive floors



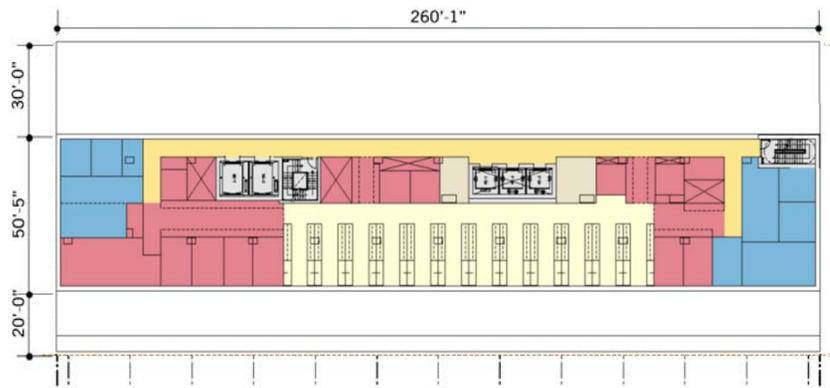
- ~200,000 ASF total research program
- ~22,000 GSF per typical lab floor
- Accommodates ~10 researchers per floor
- Large open lab for flexibility in research assignment
- Research offices located along a common corridor

ZONING & VARIANCE APPROVAL PROCESS

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Complying Building – Floors 7-9

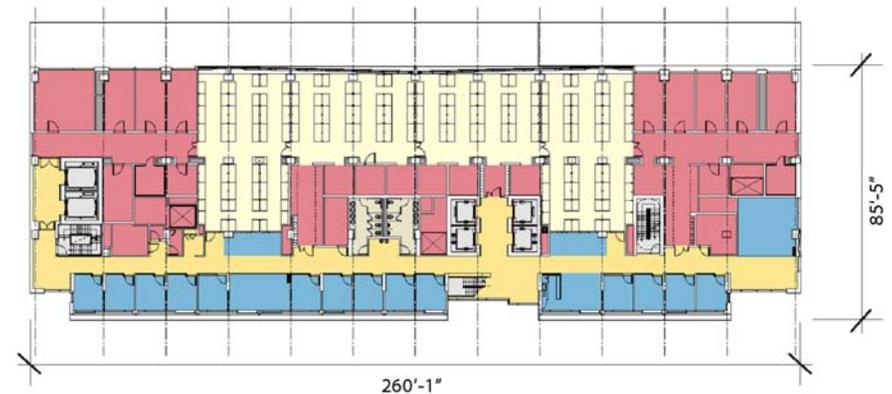
NYC Zoning restricts floor size / requires setbacks



- ~144,000 ASF total research program
- ~13,130 GSF per floor
- Accommodates ~6 researchers per floor
- Divides researchers into two small groups remotely located
- Distance limits research collaboration and restricts scientific discovery

Approved Building – Floors 3-16

Labs require large, deep, repetitive floors



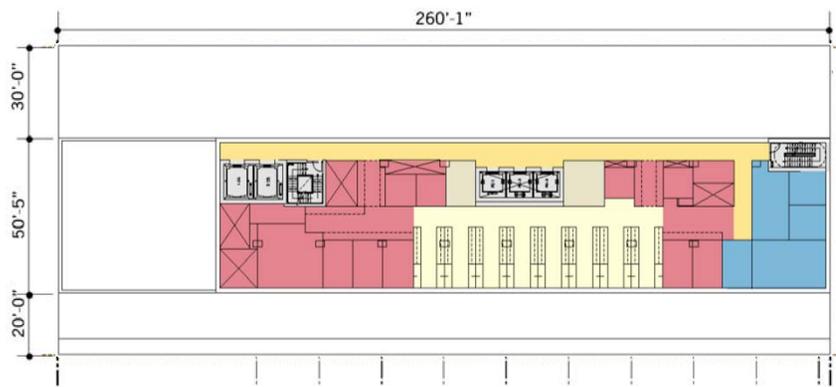
- ~200,000 ASF total research program
- ~22,000 GSF per typical lab floor
- Accommodates ~10 researchers per floor
- Large open lab for flexibility in research assignment
- Research offices located along a common corridor

ZONING & VARIANCE APPROVAL PROCESS

20

Complying Building – Floors 10-12

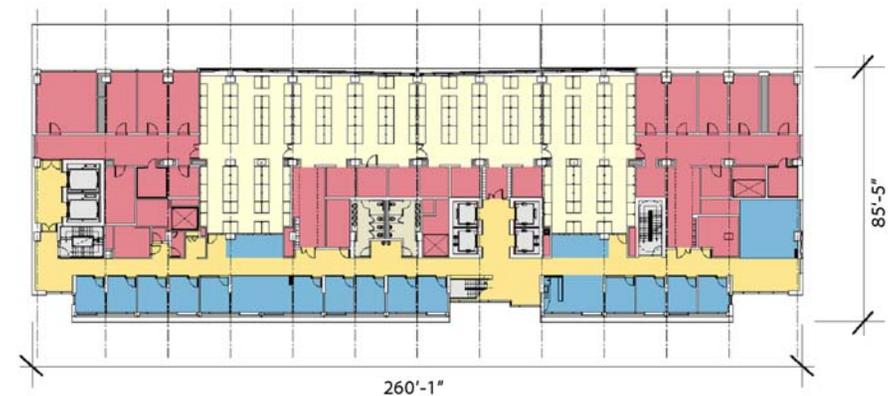
NYC Zoning restricts floor size / requires setbacks



- ~144,000 ASF total research program
- ~10,130 GSF per floor
- Accommodates 3-4 researchers per floor
- Creates undesirable space assignments
- Limits collaboration
- Requires building systems transfers

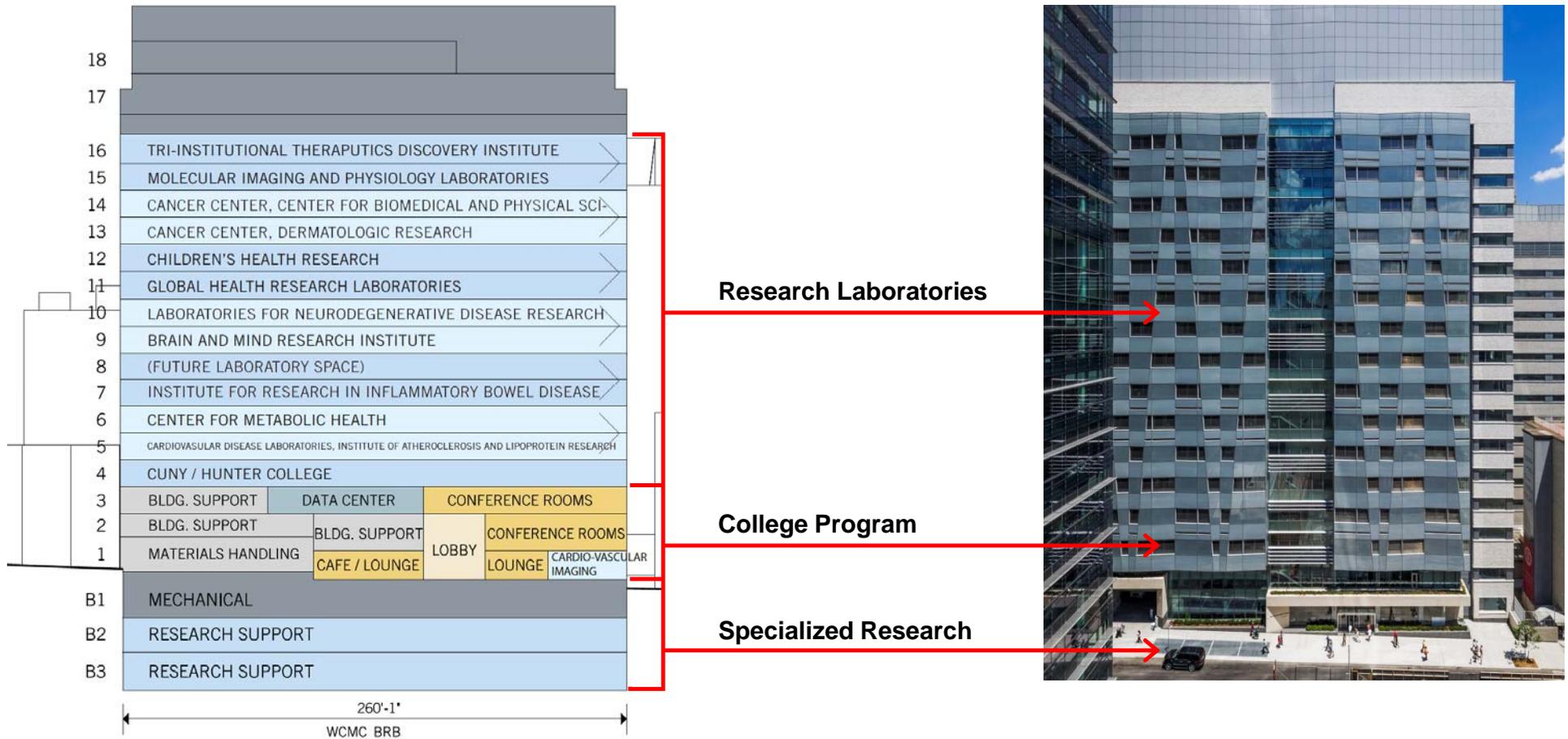
Approved Building – Floors 3-16

Labs require large, deep, repetitive floors

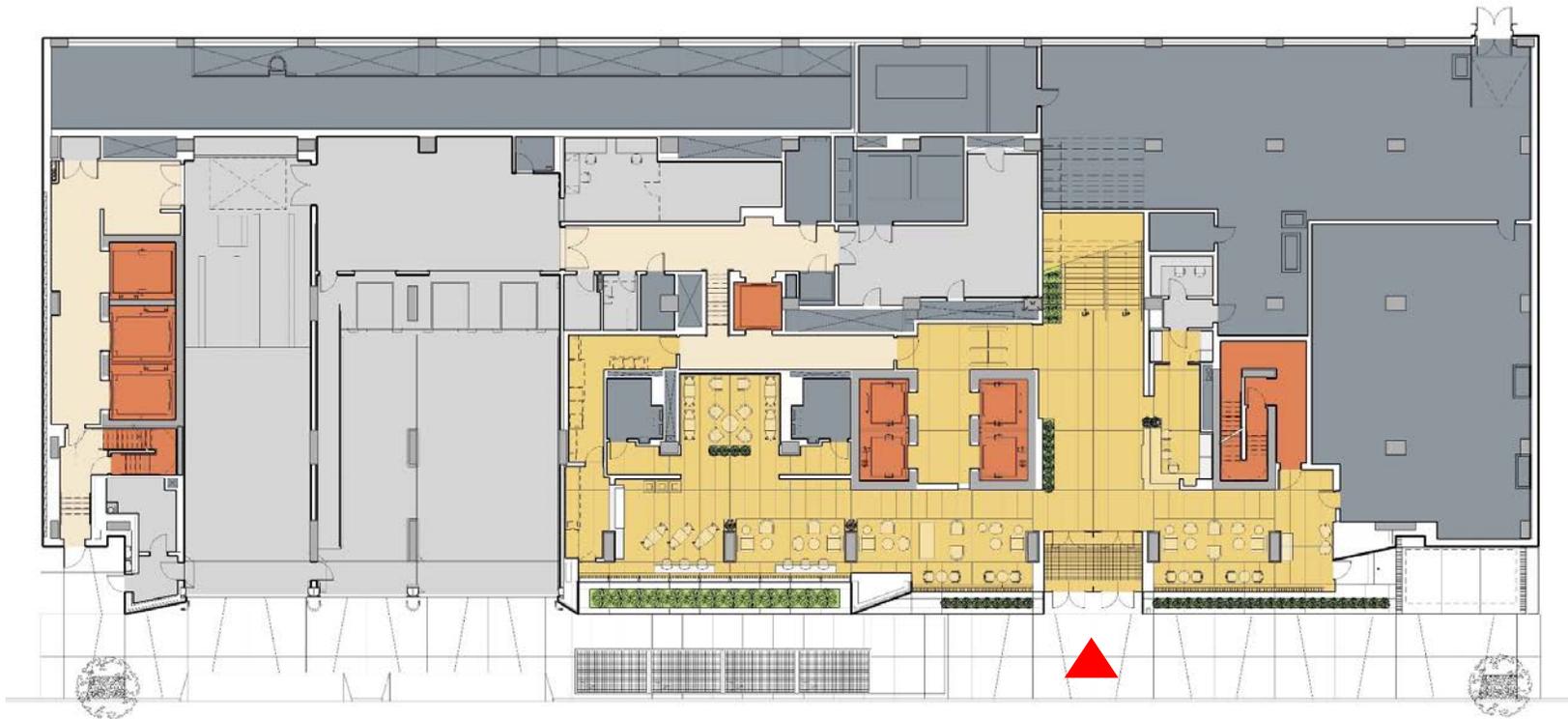


- ~200,000 ASF total research program
- ~22,000 GSF per typical lab floor
- Accommodates ~10 researchers per floor
- Large open lab for flexibility in research assignment
- Research offices located along a common corridor

BUILDING PROGRAM Disease-Based Organization Targeted Toward Researcher Recruitment



FIRST FLOOR Building Entrance, Welcome Lounge, Loading Dock, Mechanical Space

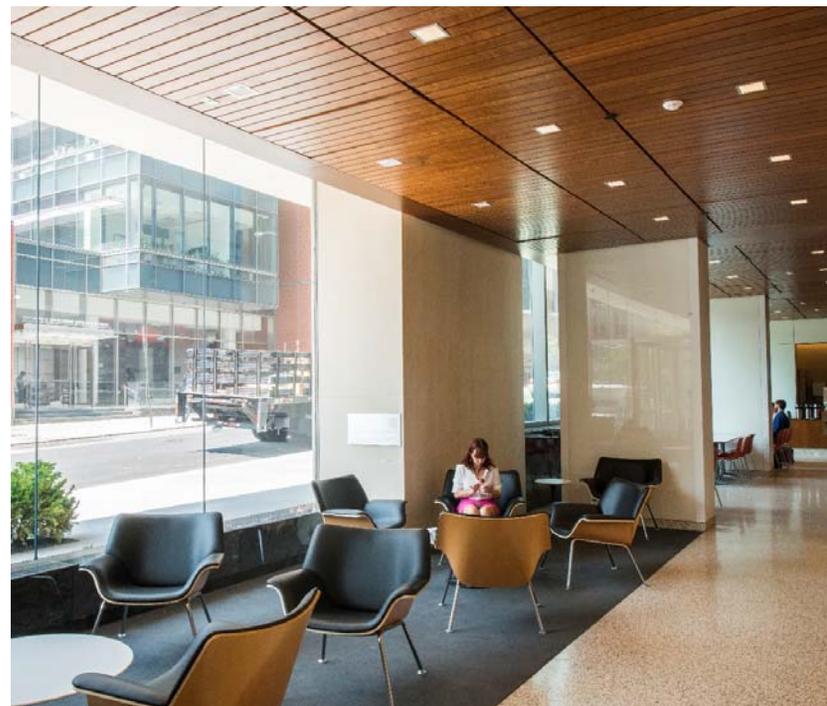
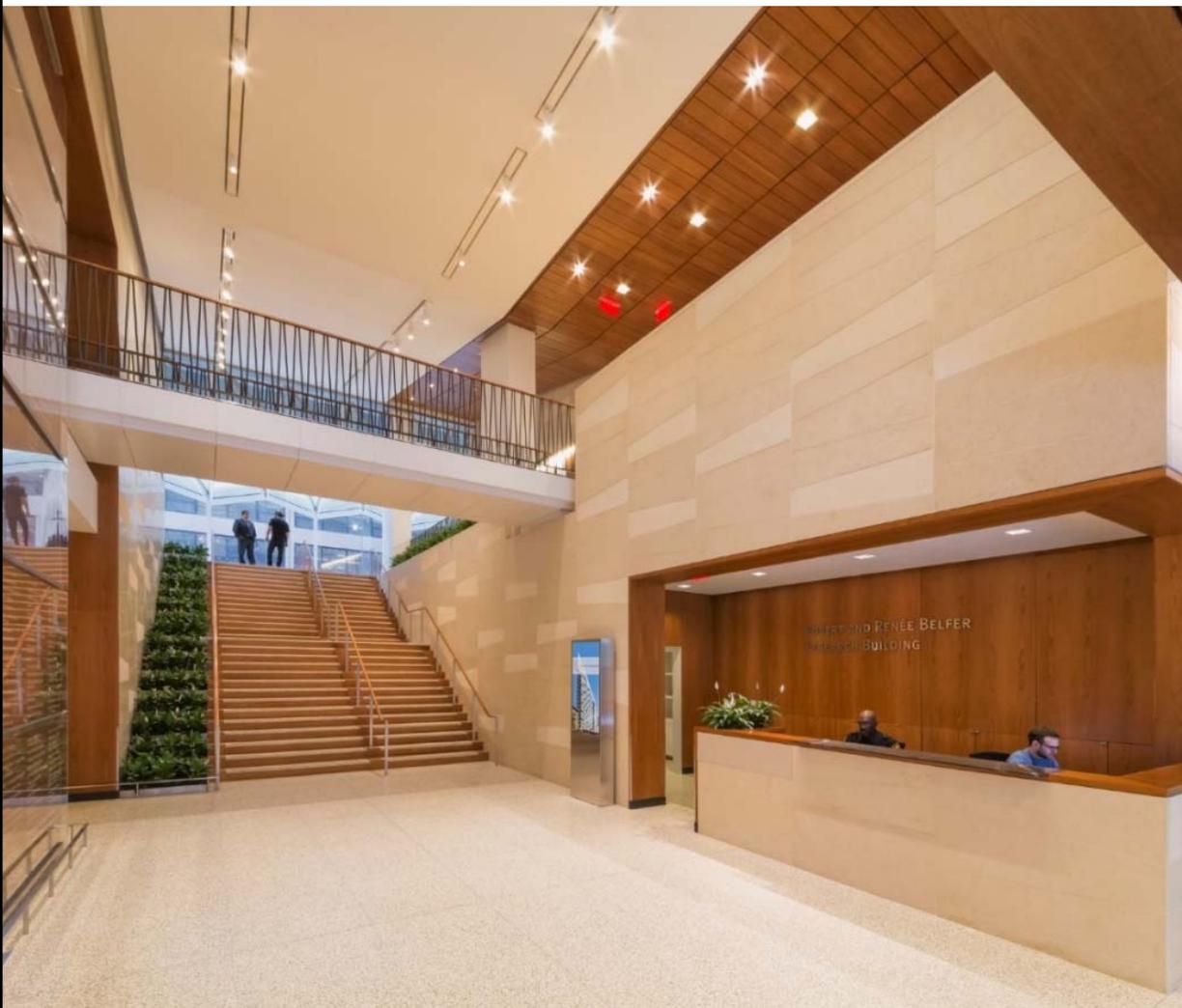


East 69th Street

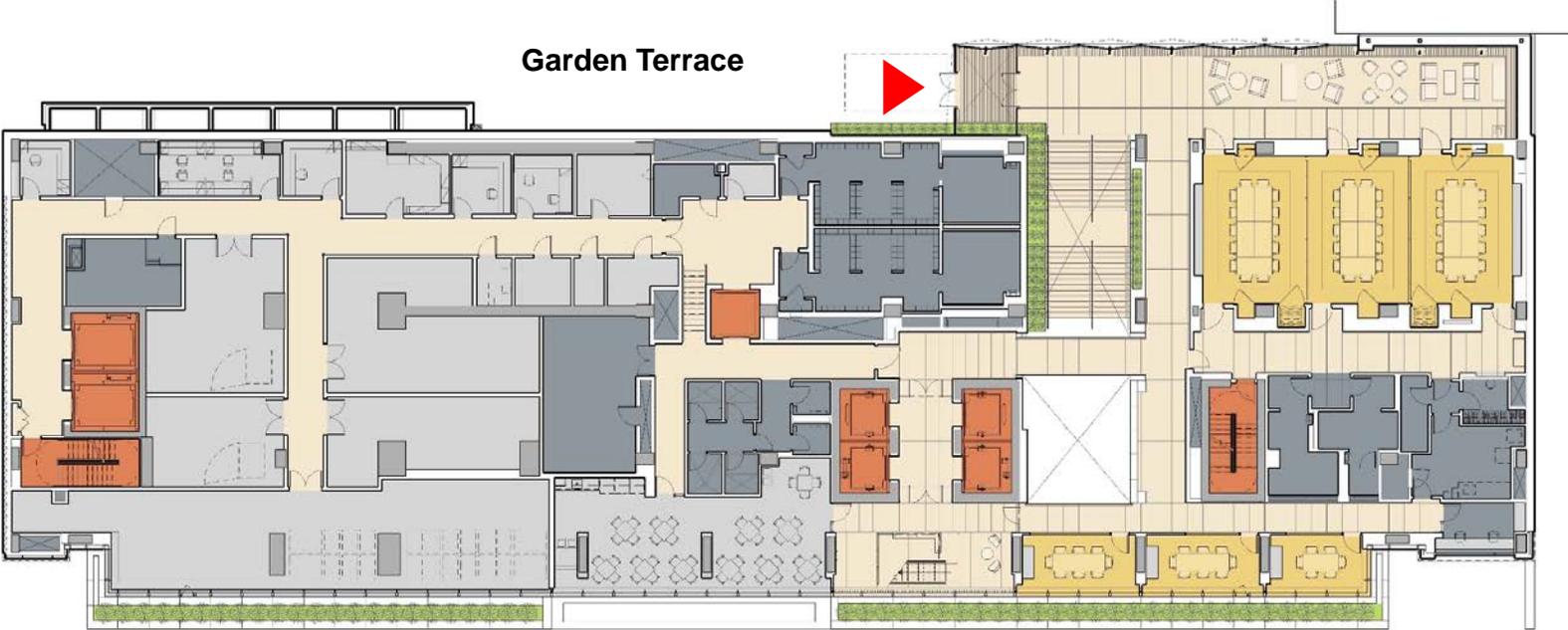
- | | | |
|--|----------------------|-------------------|
|  | Building Systems | 22,700 GSF |
|  | Vertical Circulation | 9,140 NSF |
|  | Building Support | 40% Efficiency |
|  | College Program | |
|  | Corridor | |

FIRST FLOOR Building Entrance & Welcome Lounge

23

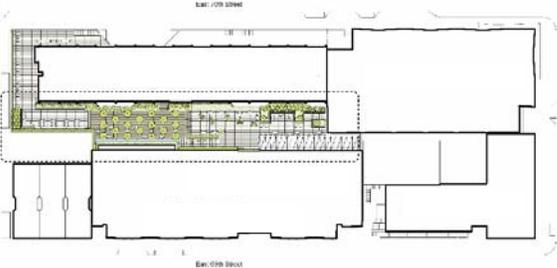


SECOND FLOOR Conference Center, Skylight Lounge & Campus Green



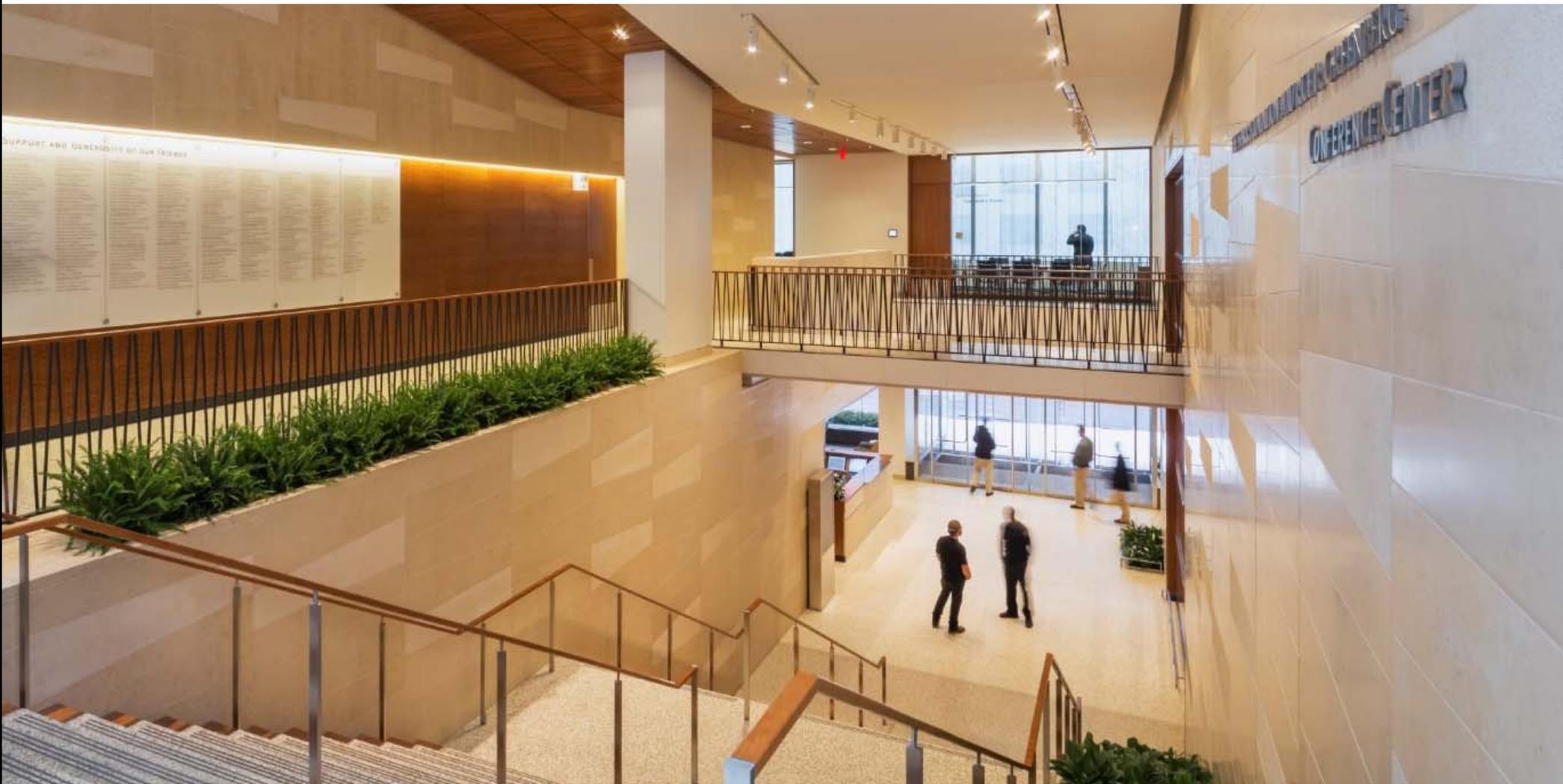
- Building Systems
- Vertical Circulation
- Building Support
- College Program
- Corridor

21,164 GSF
11,305 NSF
53% Efficiency



SECOND FLOOR View of Double Height Lobby

25

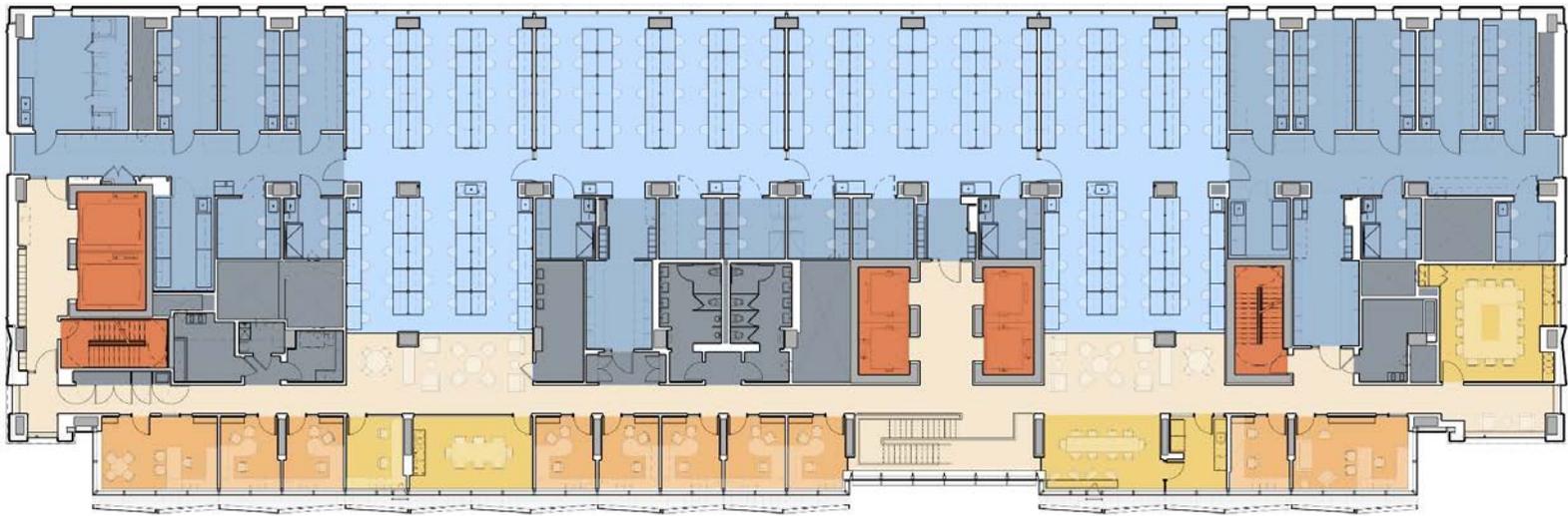


SECOND FLOOR Skylight Lounge & Campus Green

26



LABORATORY PLANNING Modified Laminated Plan Provides Building Transparency

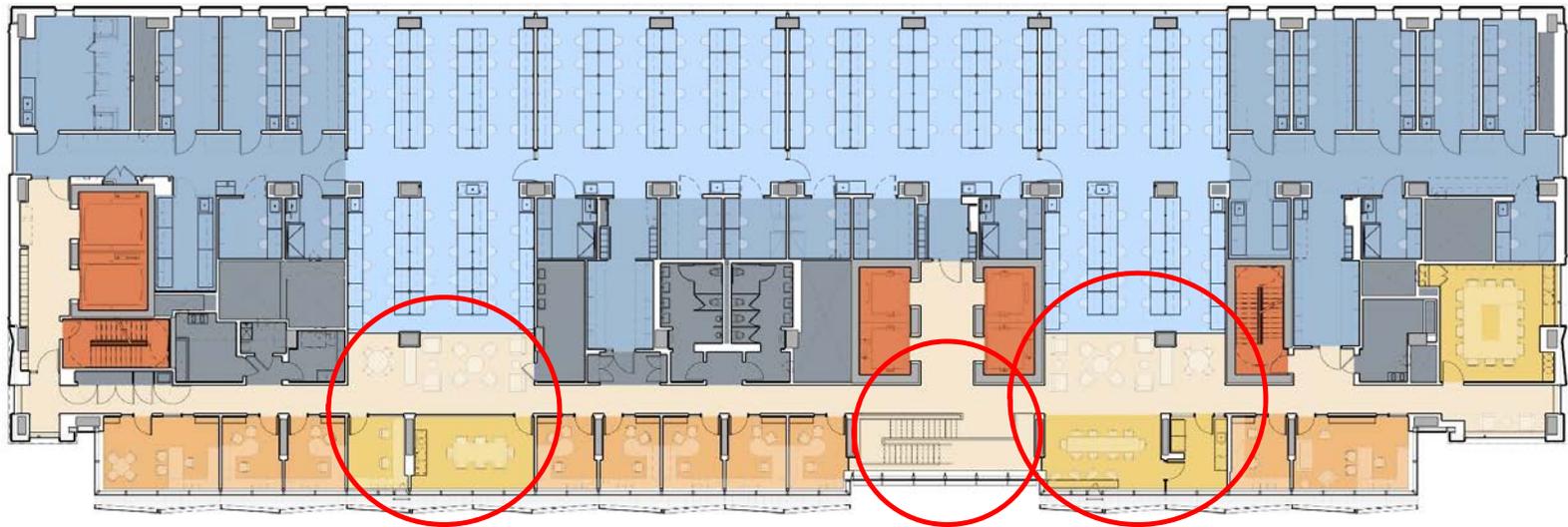


	Building Systems	21,200 GSF / Floor
	Vertical Circulation	15,400 NSF
	Office	73% Efficiency
	Conference	~10 PI Groups / Floor
	Lab	1 Group = PI + 8 Researchers
	Lab Support	

LABORATORY PLANNING Connecting Stair, Collaborative Lounges, and Flexibility to Expand

← Expand →

← Expand →



- Building Systems
- Vertical Circulation
- Office
- Conference
- Lab
- Lab Support

LABORATORY PLANNING Building Transparency & Connecting Floors





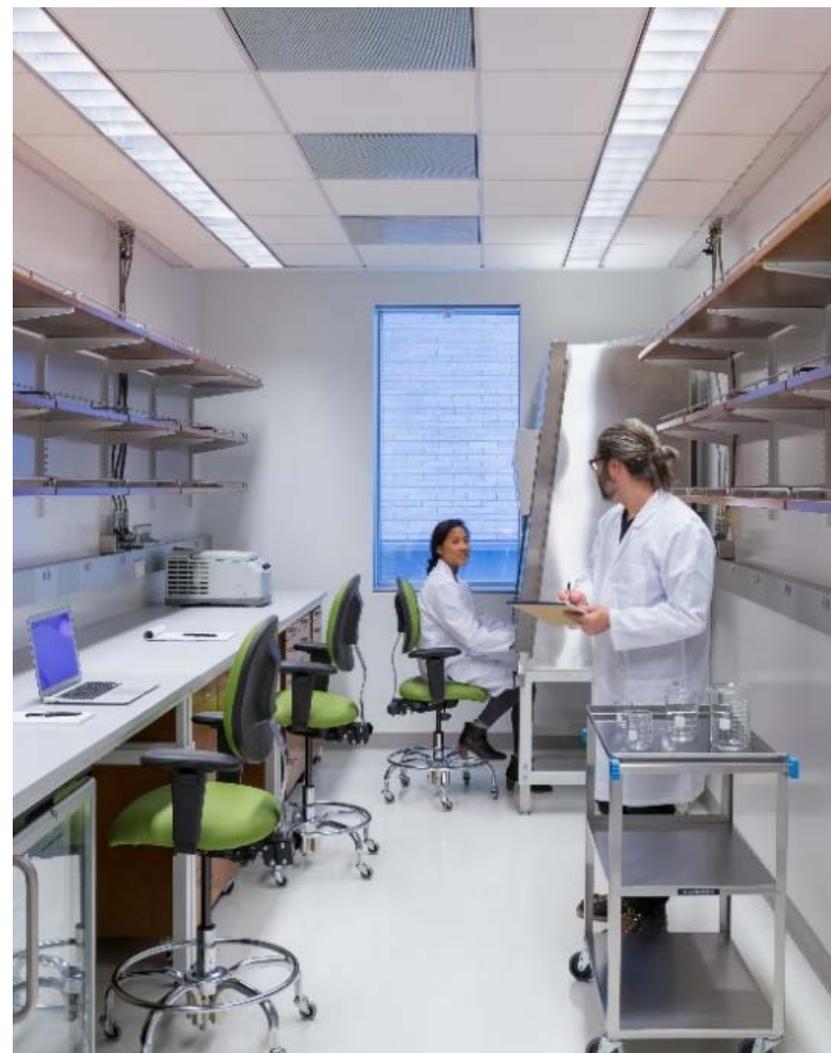
TYPICAL LABORATORY FLOOR Wet-bench Open Lab with Workstations in the Lab

31

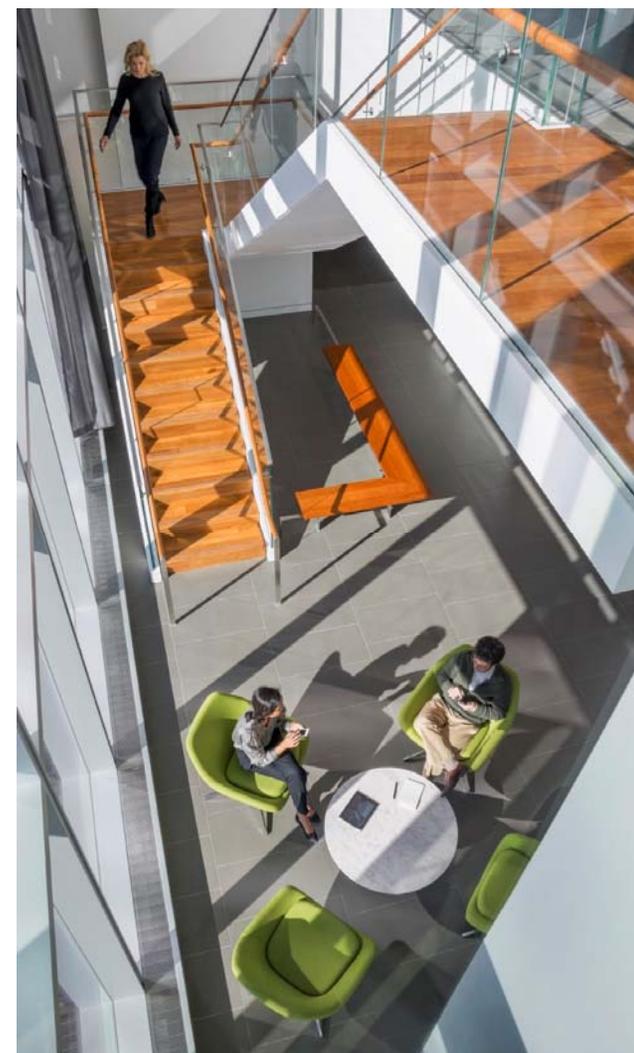
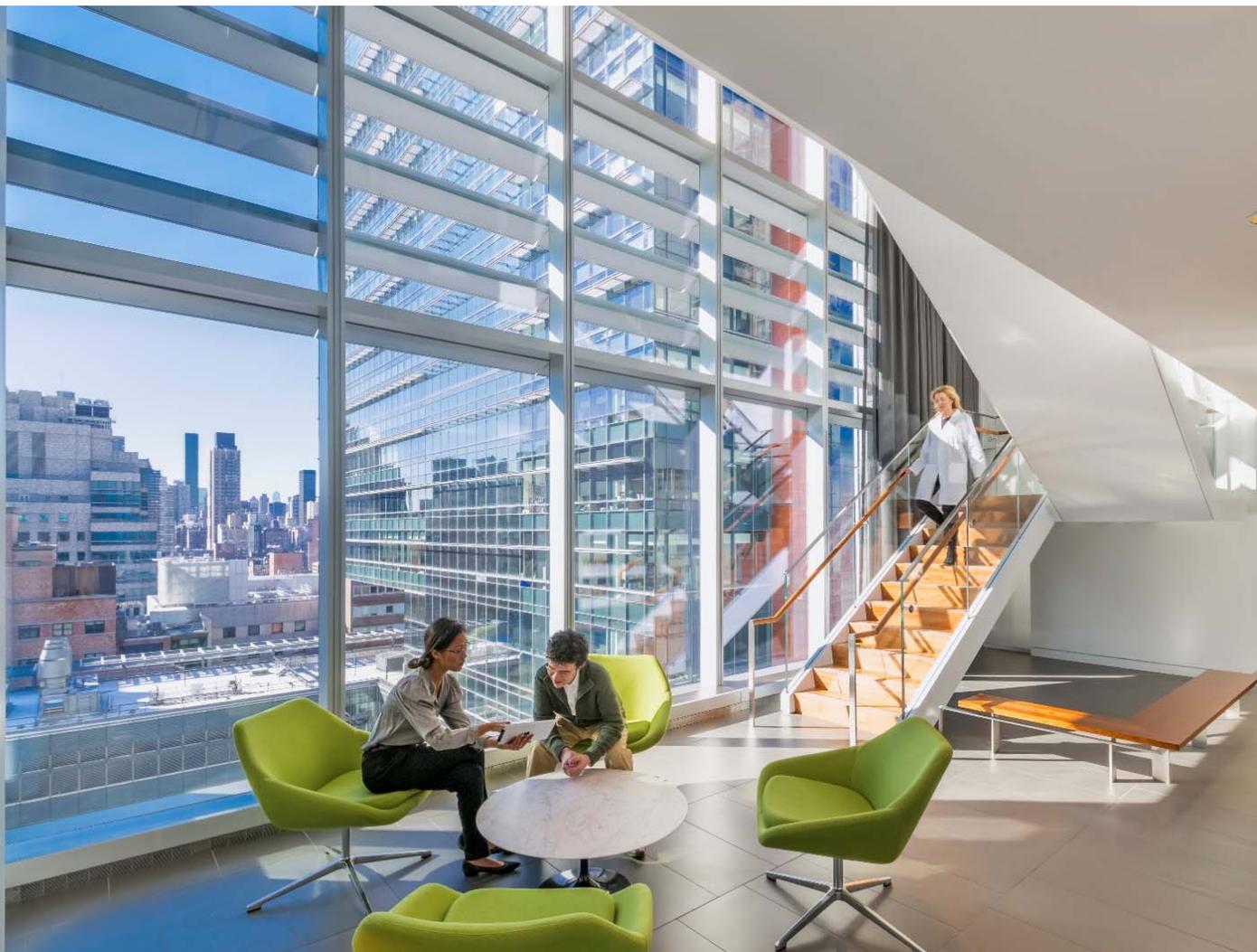


TYPICAL LABORATORY FLOOR Wet-bench Lab with View to Offices & Lab Support Space

32



TYPICAL LABORATORY FLOOR Interconnecting Stairs & Lab Entry Lounge

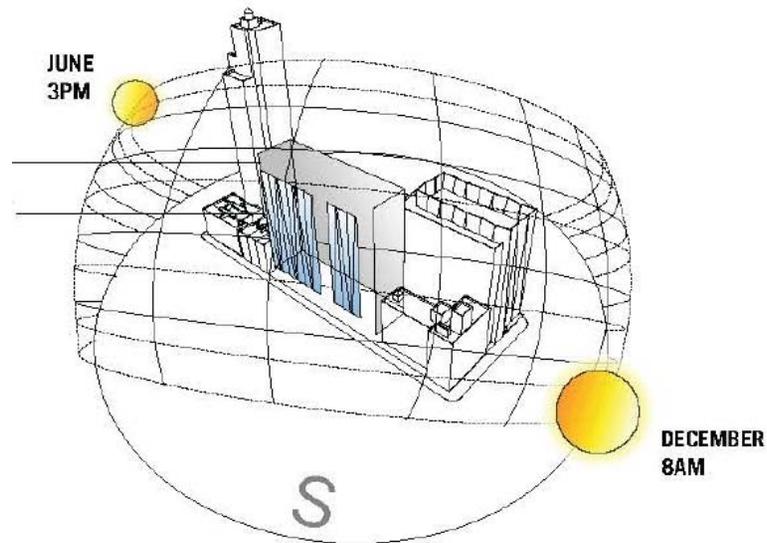


HIGH PERFORMANCE FAÇADE Double-skinned Curtain Wall on South Facade

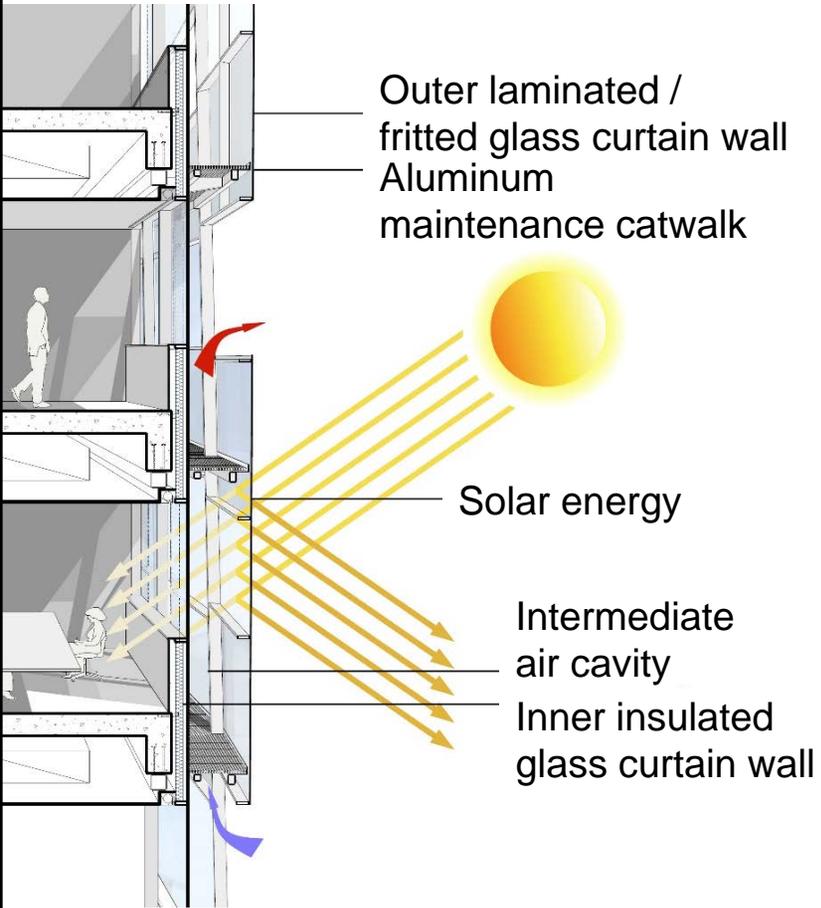


**BELFER
RESEARCH
BUILDING**

**WEILL
GREENBERG
CENTER**



HIGH PERFORMANCE FAÇADE Double-skinned Curtain Wall, Segmented for Passive Ventilation 35

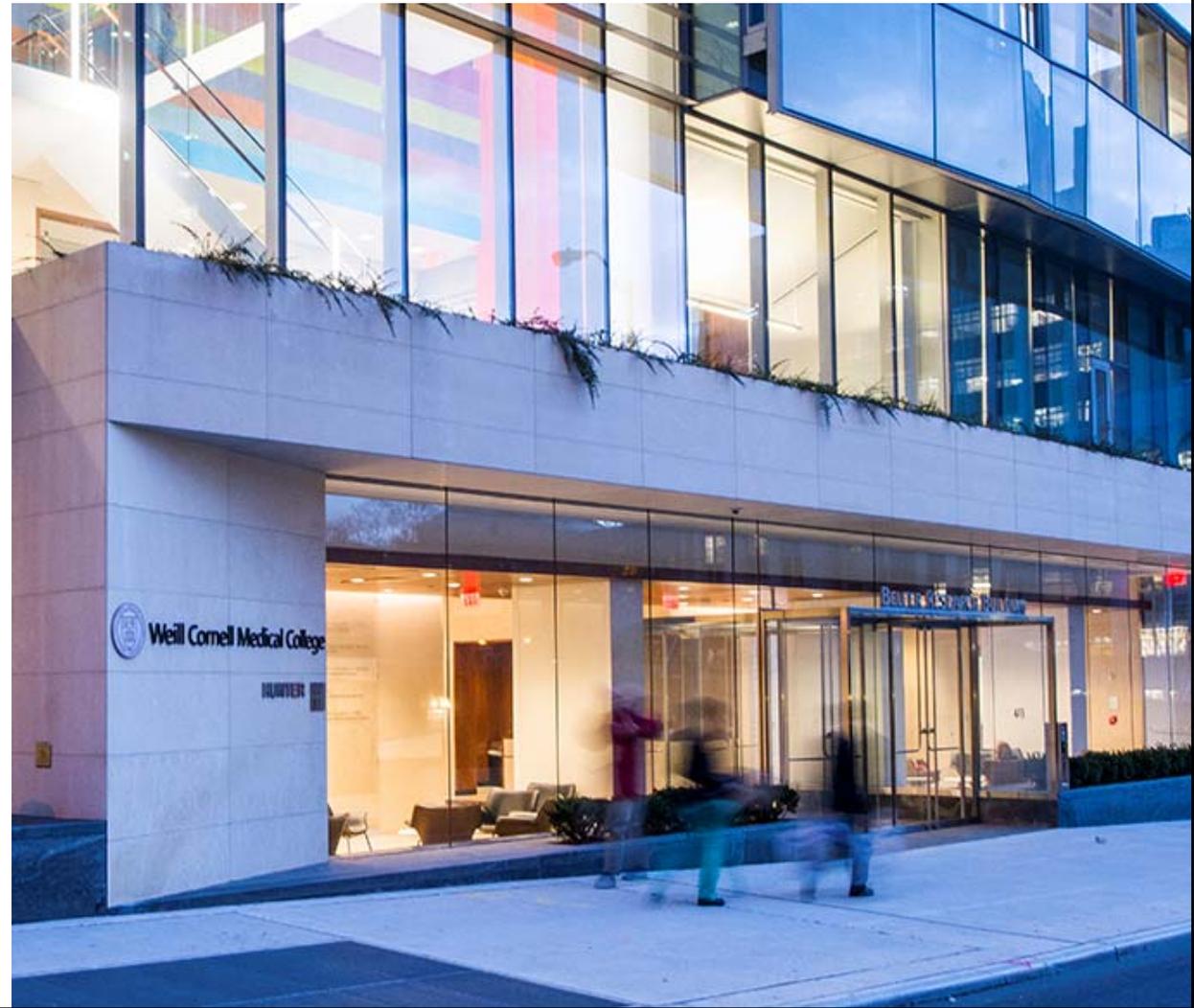


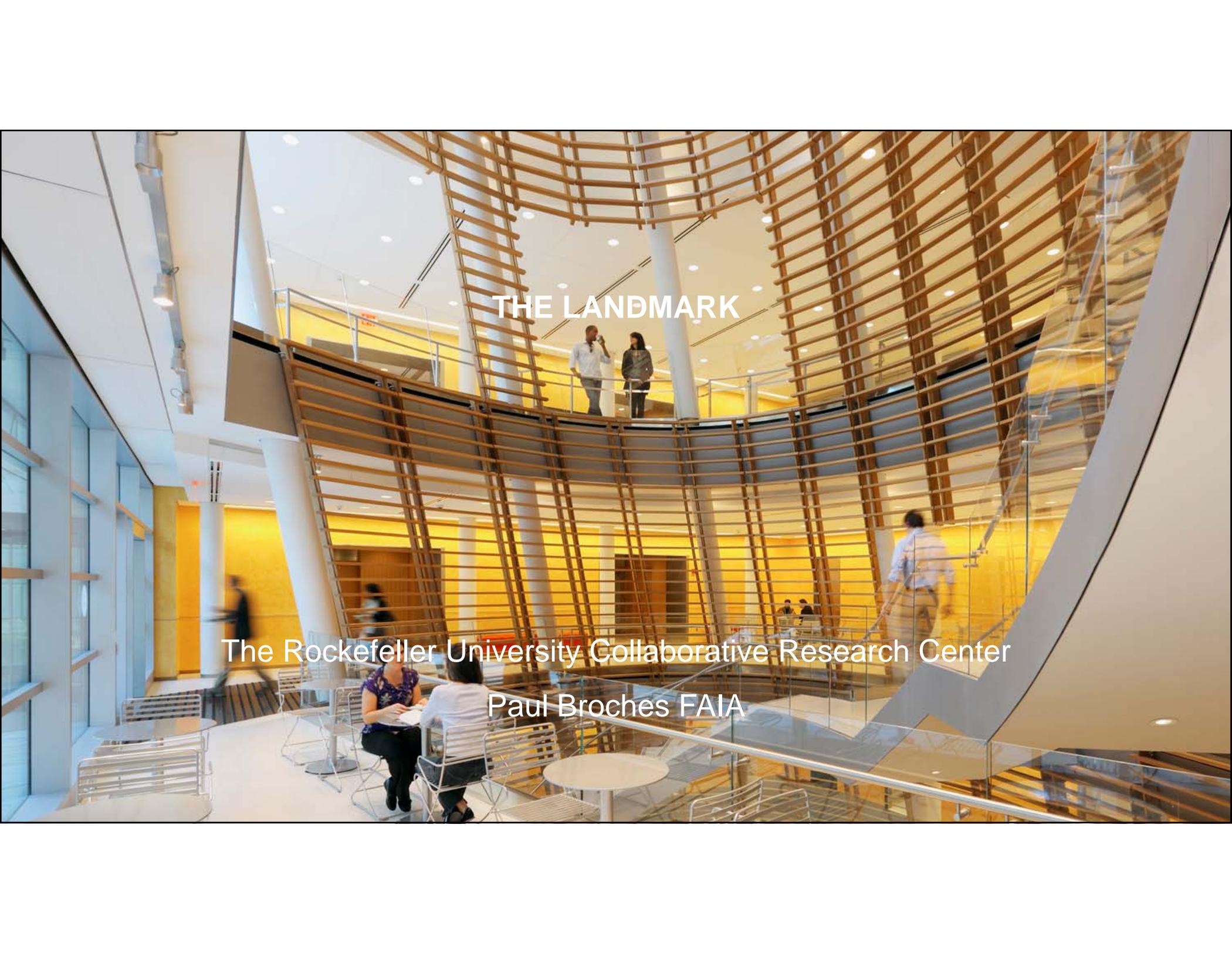
SITE LOGISTICS & VERTICAL CONSTRUCTION



WEILL CORNELL MEDICINE BELFER RESEARCH BUILDING

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The image shows a multi-level atrium with a prominent curved structure made of horizontal wooden slats. The space is bright and open, with people walking on different levels. In the foreground, two people are seated at a table, and another person is walking on a lower level. The architecture features clean lines and a mix of materials, including wood, metal, and glass.

THE LANDMARK

The Rockefeller University Collaborative Research Center

Paul Broches FAIA



Brief History of The Rockefeller University
Campus Development 1901 – 2012

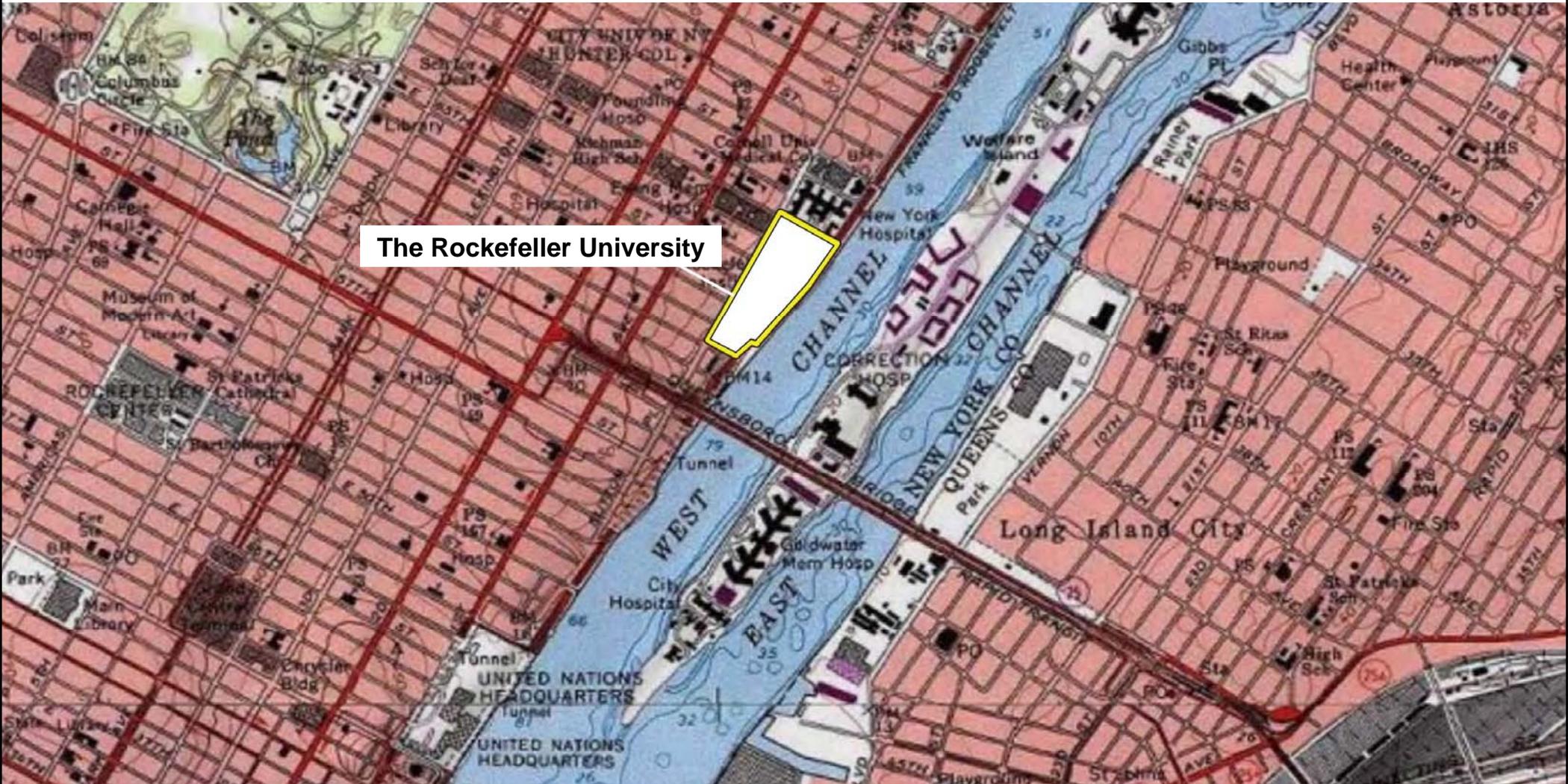
Comparative Analysis of new construction
vs. adaptive re-use

Laboratory concept and collaboration
strategy

Construction challenges with phased
implementation and adaptive reuse

The CRC lab environment and
collaborative culture

1901, THE ROCKEFELLER UNIVERSITY CAMPUS FOUNDED

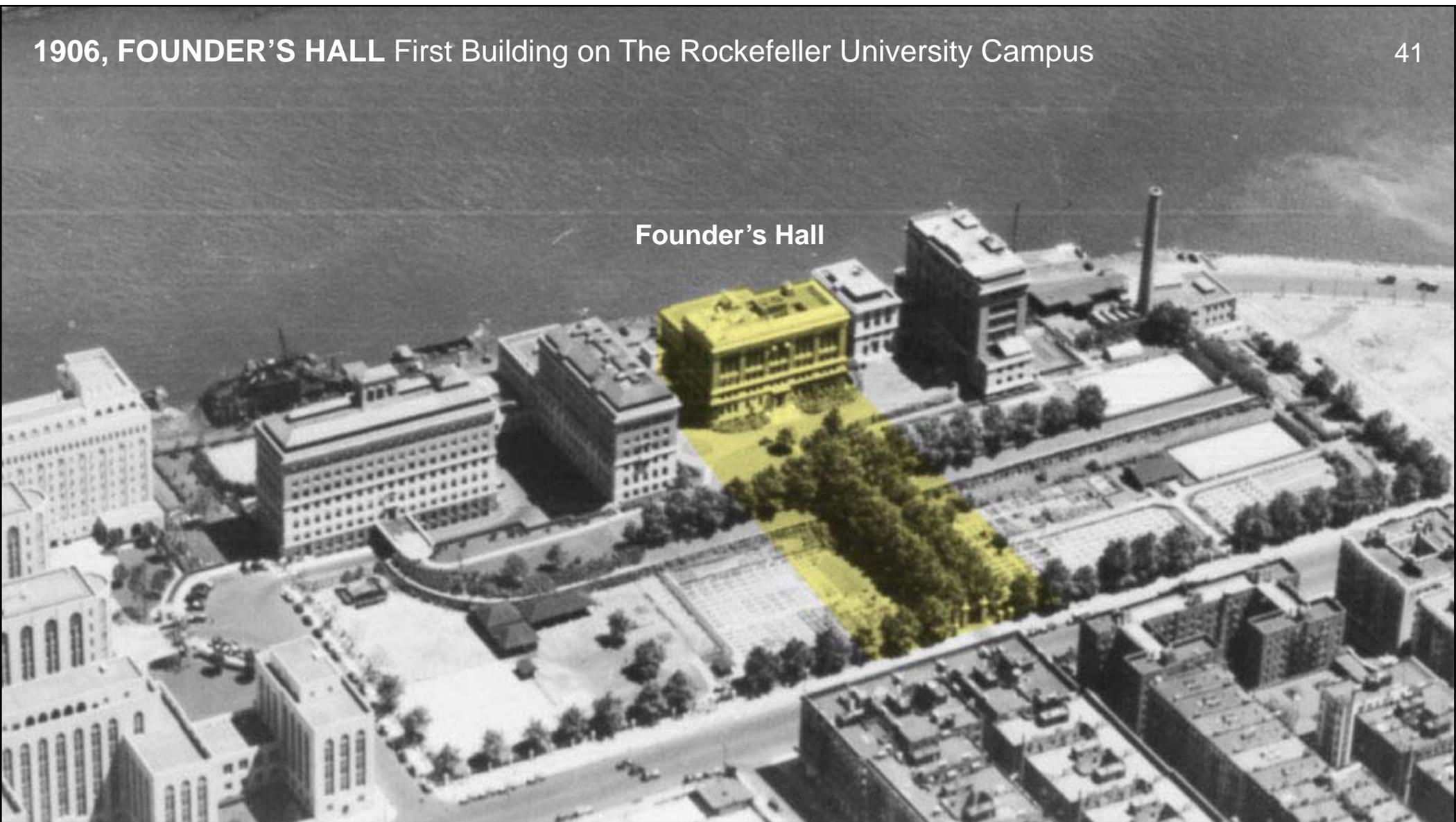


The Rockefeller University

1906, FOUNDER'S HALL First Building on The Rockefeller University Campus

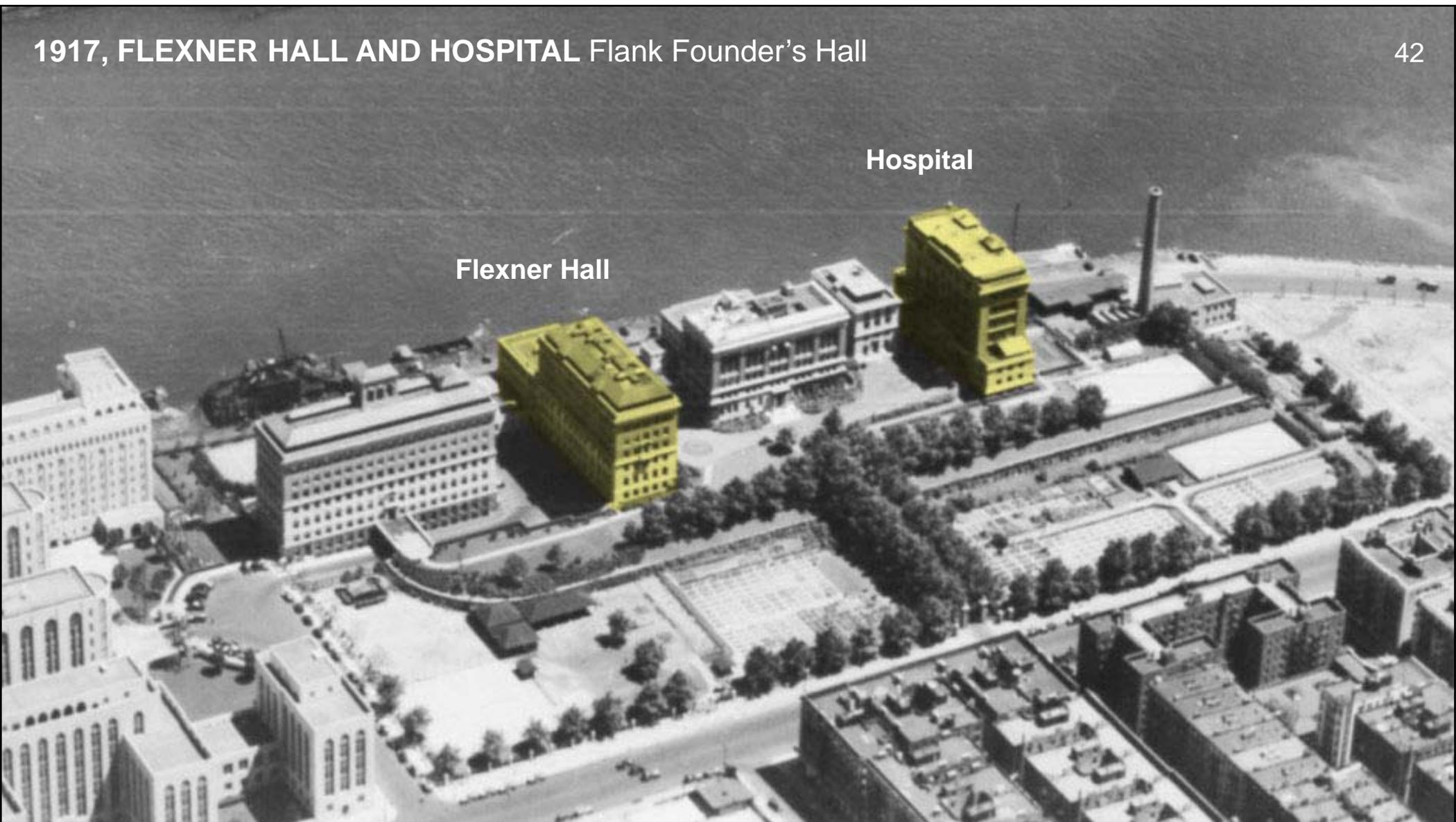
41

Founder's Hall



1917, FLEXNER HALL AND HOSPITAL Flank Founder's Hall

42

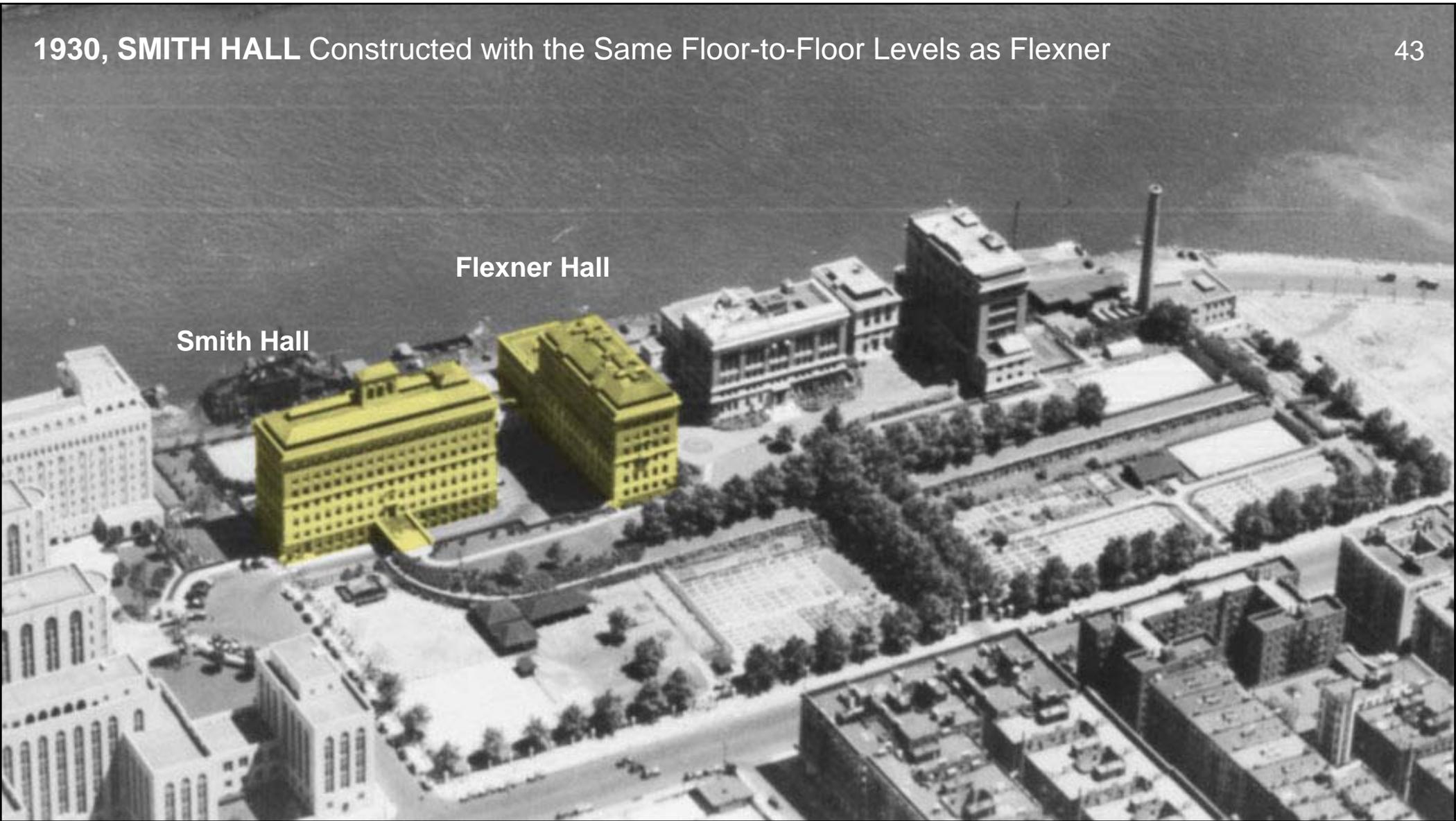


Hospital

Flexner Hall

1930, SMITH HALL Constructed with the Same Floor-to-Floor Levels as Flexner

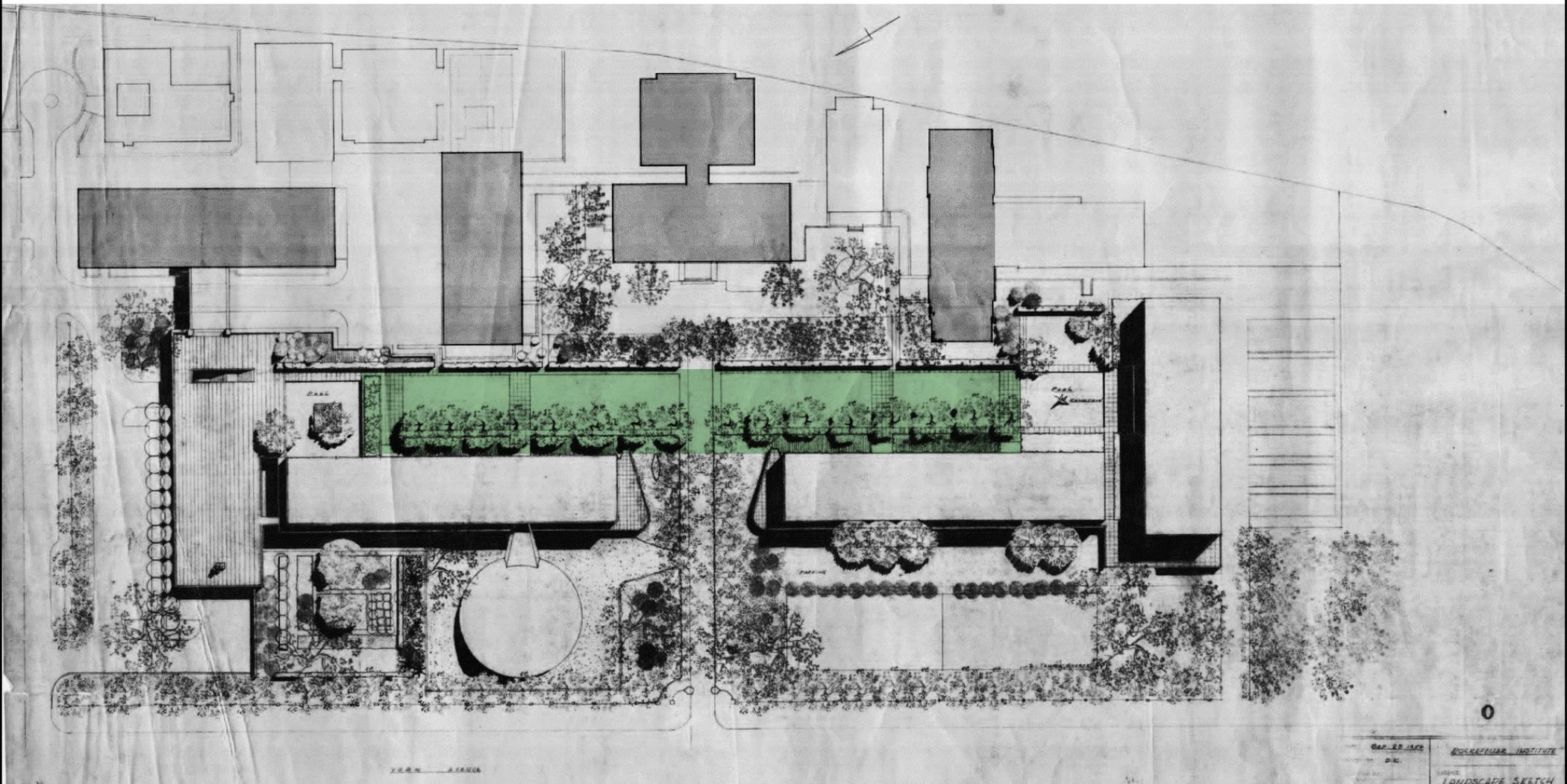
43

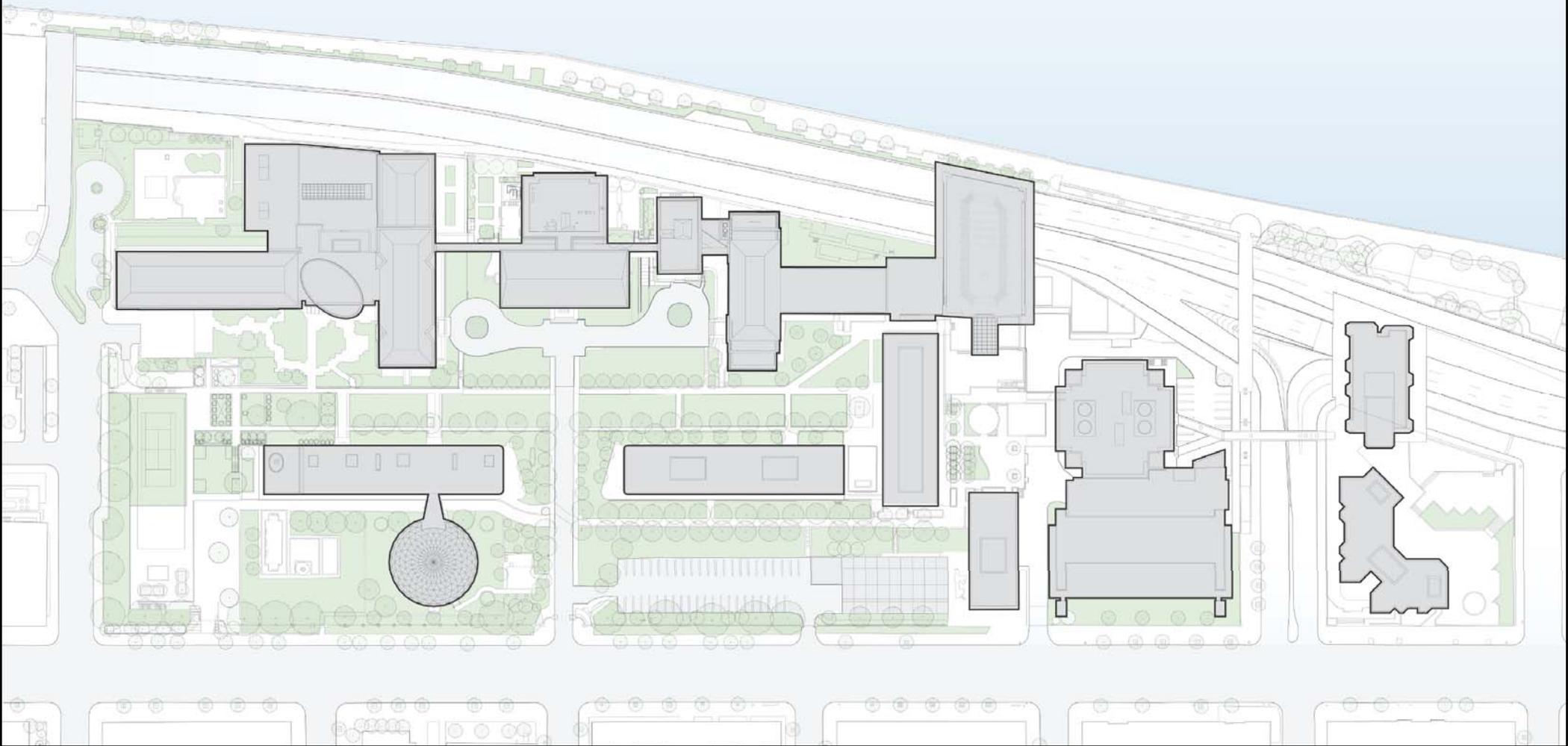


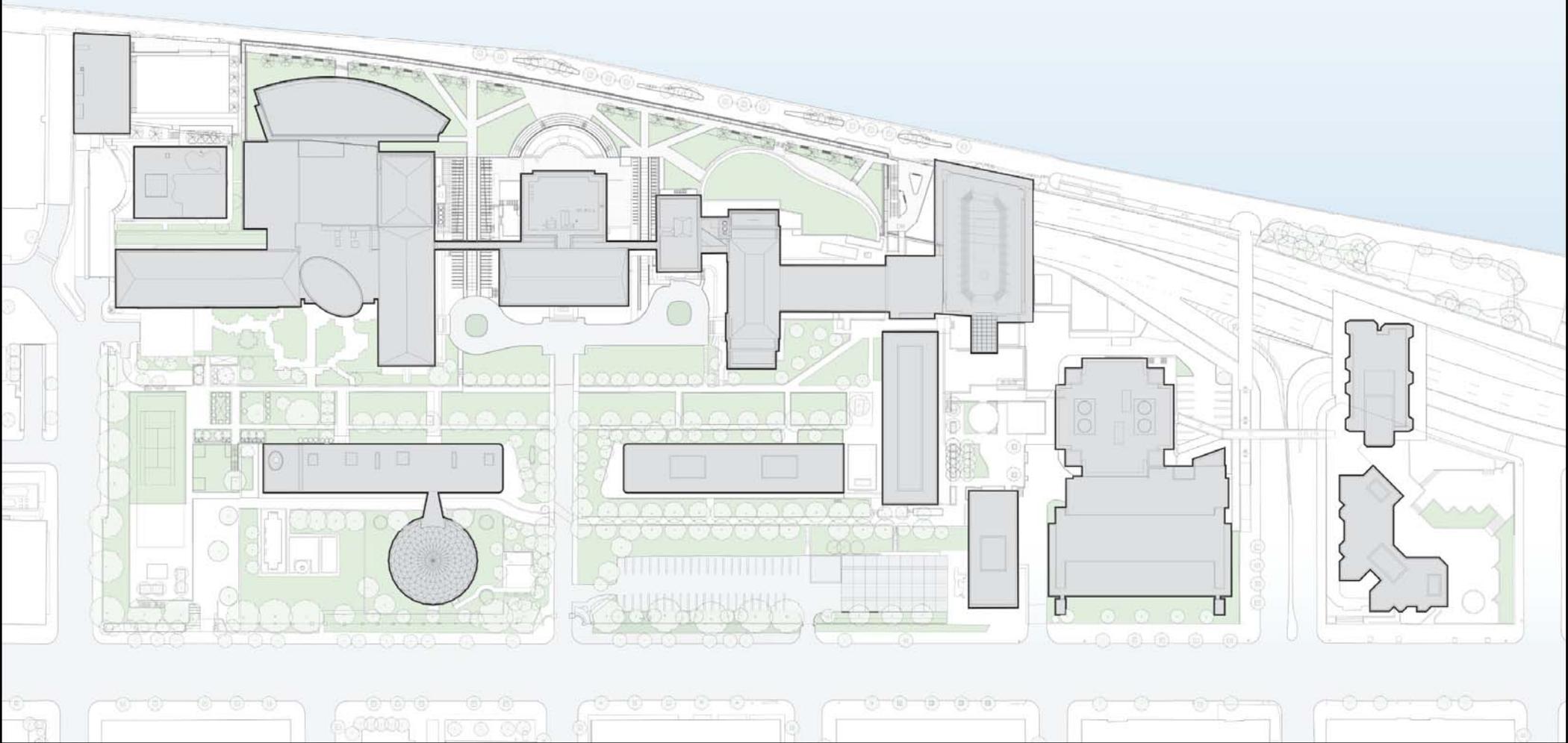
Smith Hall

Flexner Hall

1950s, CAMPUS ESPLANADE & PEDESTRIAN SPINE Dan Kiley Design

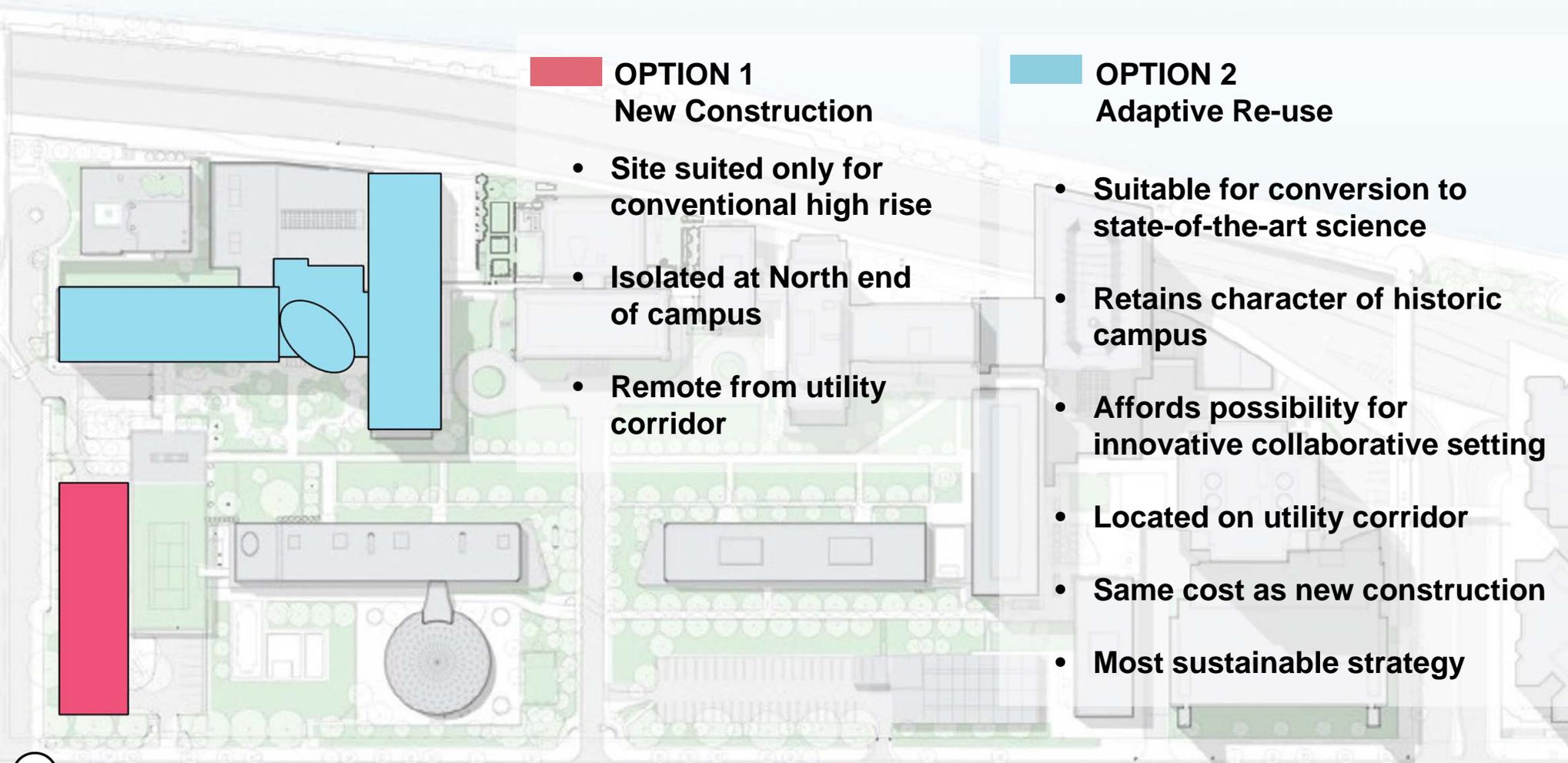






CAMPUS ESPLANADE FORMALIZES THE URBAN CAMPUS





**OPTION 1
New Construction**

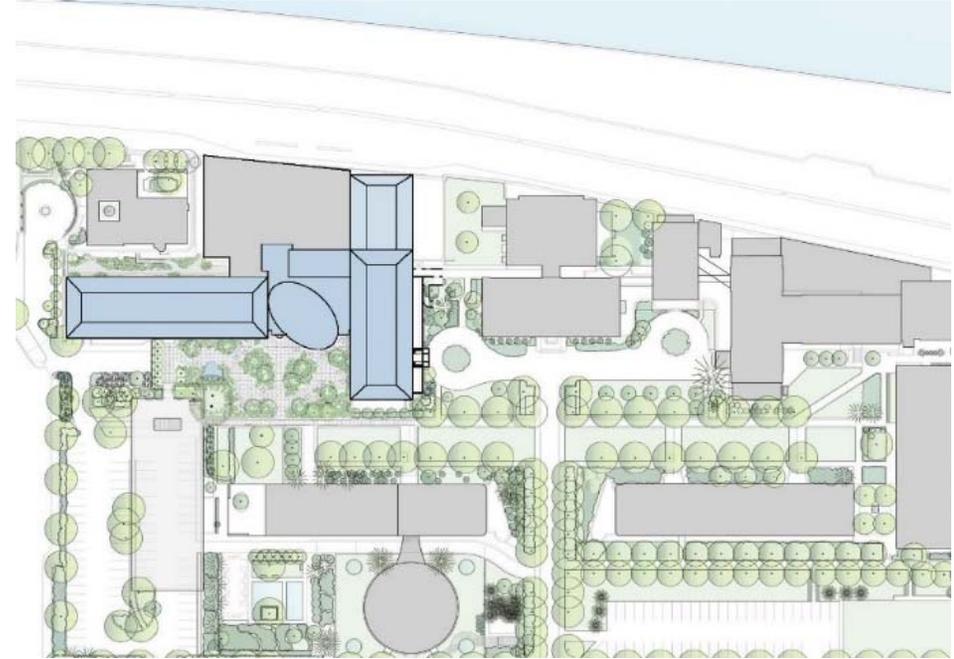
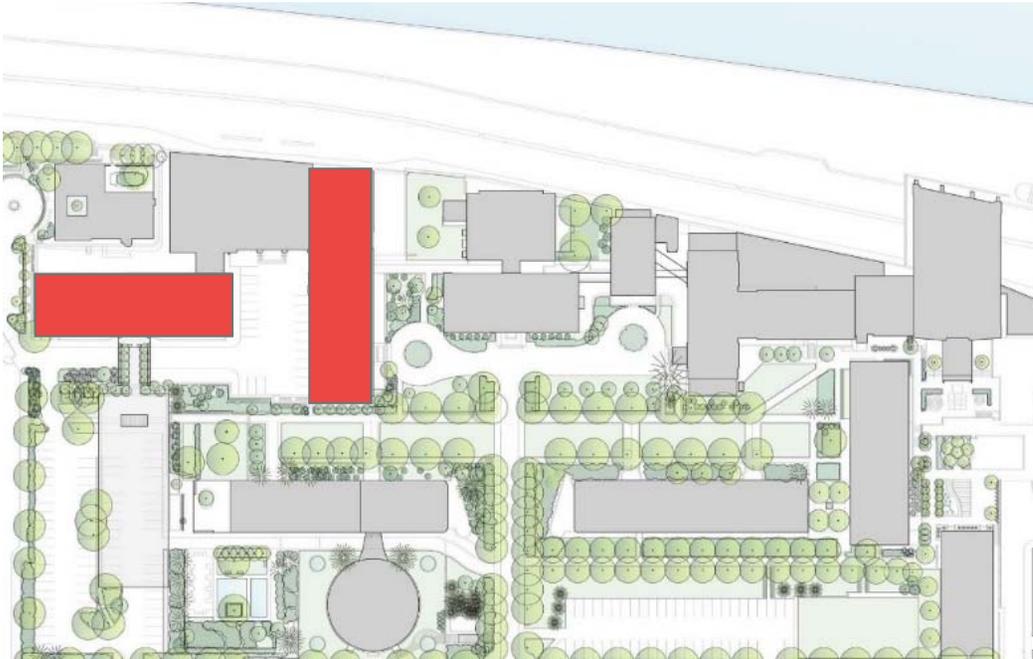
- **Site suited only for conventional high rise**
- **Isolated at North end of campus**
- **Remote from utility corridor**



**OPTION 2
Adaptive Re-use**

- **Suitable for conversion to state-of-the-art science**
- **Retains character of historic campus**
- **Affords possibility for innovative collaborative setting**
- **Located on utility corridor**
- **Same cost as new construction**
- **Most sustainable strategy**

BUILDING CONCEPT Fill the Gap & Join Buildings with Meeting Spaces, Amenities



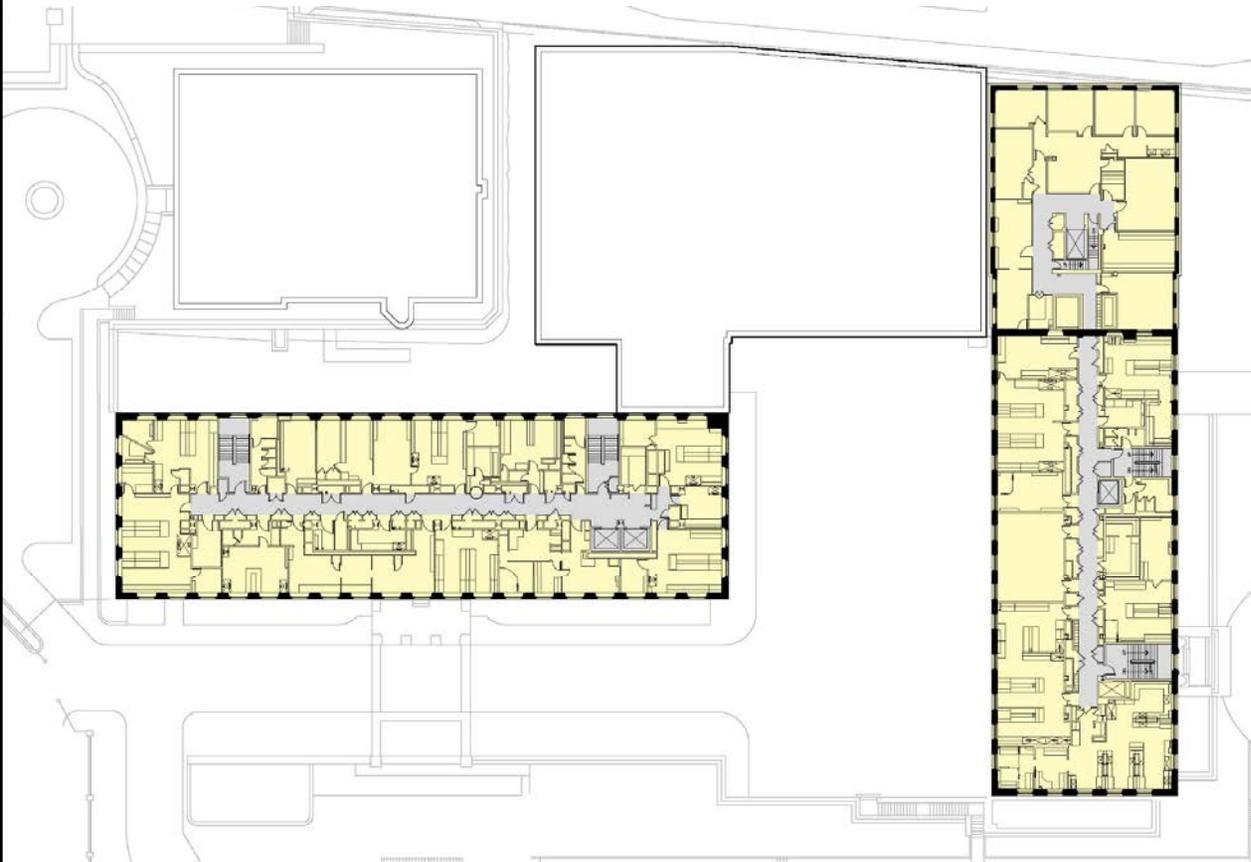
 **Campus Plan Before**
Existing Smith &
Flexner Halls



 **Campus Plan After**
New Collaborative
Research Center

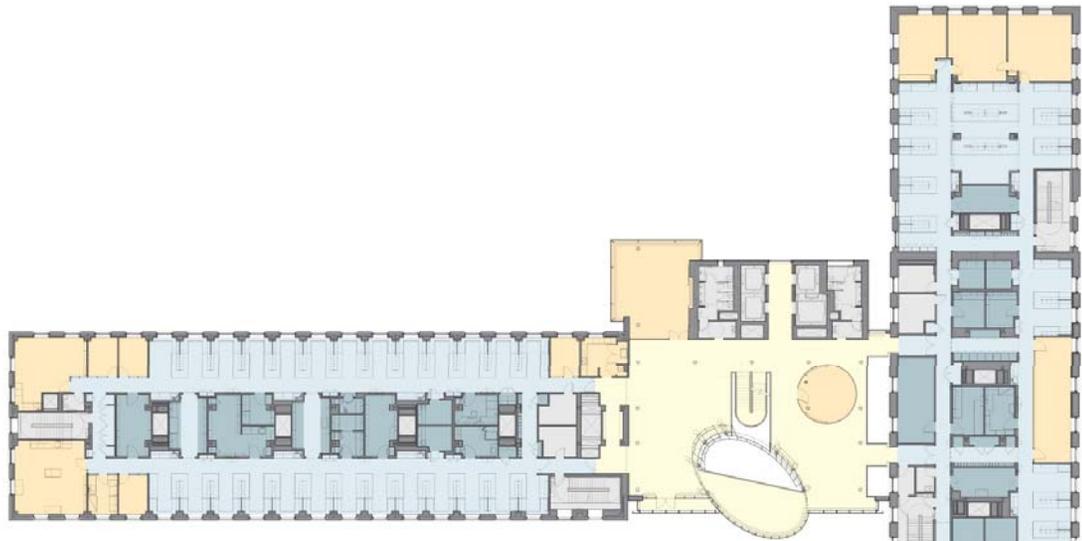


LABORATORY PLANS BEFORE RENOVATION Central Corridor and Random Lab Configurations 50



 Isolated Laboratory Rooms

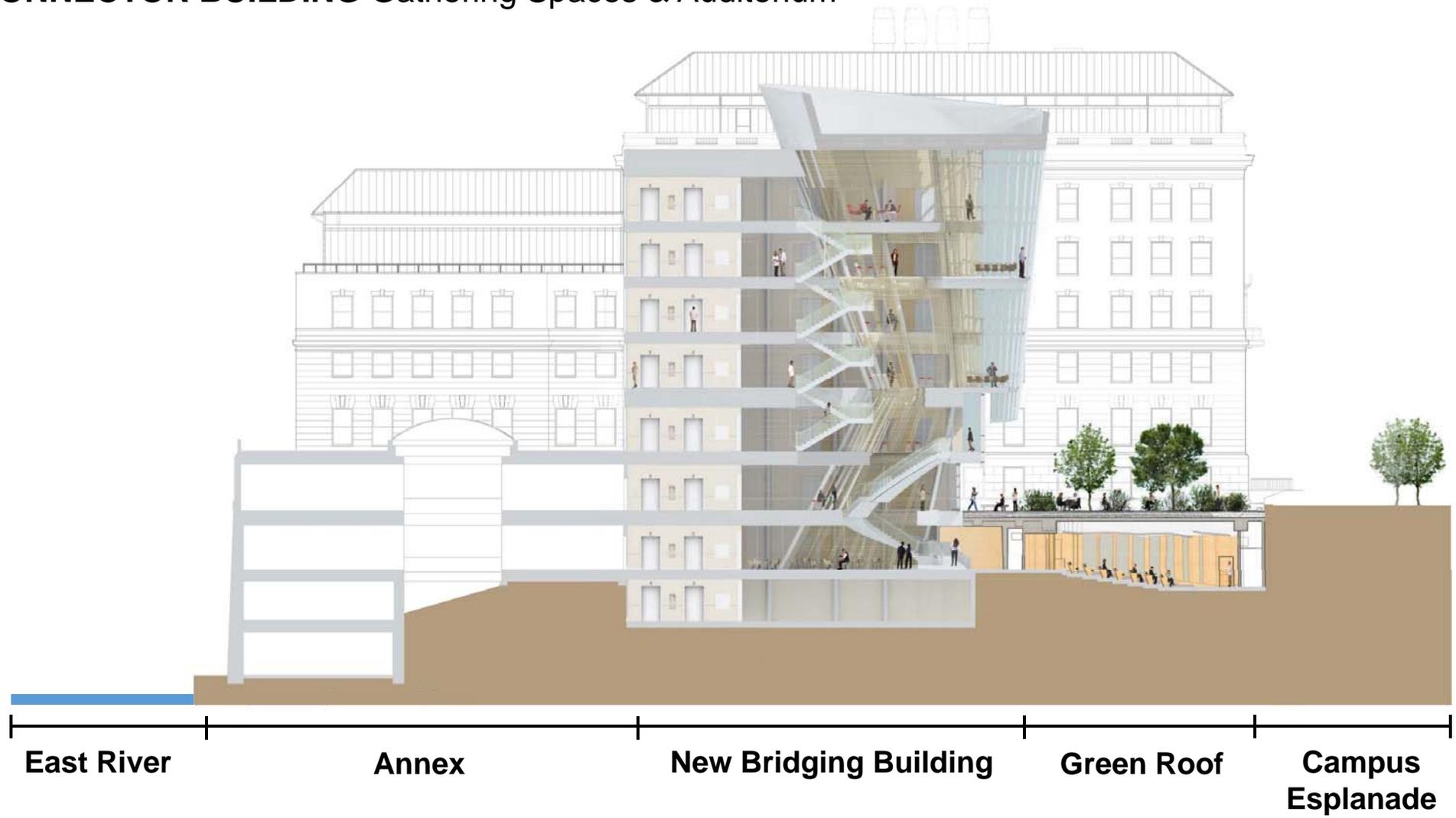
LABORATORY PLANS AFTER RENOVATION Open Labs and Shared Support Spaces



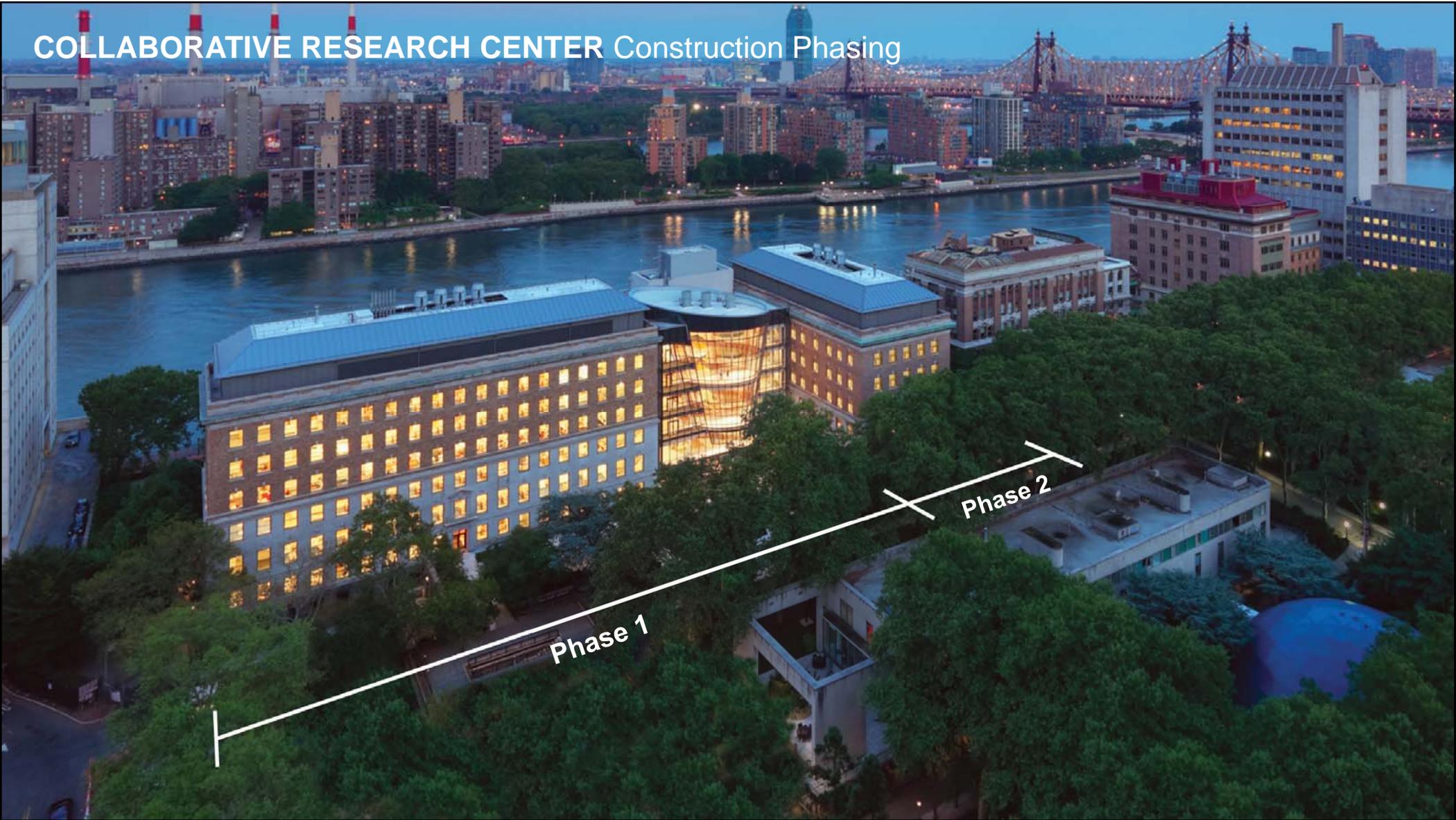
- Office/Meeting Rooms
- Public Circulation
- Support/Shaft Space
- Lab
- Lab Support



CONNECTOR BUILDING Gathering Spaces & Auditorium



COLLABORATIVE RESEARCH CENTER Construction Phasing

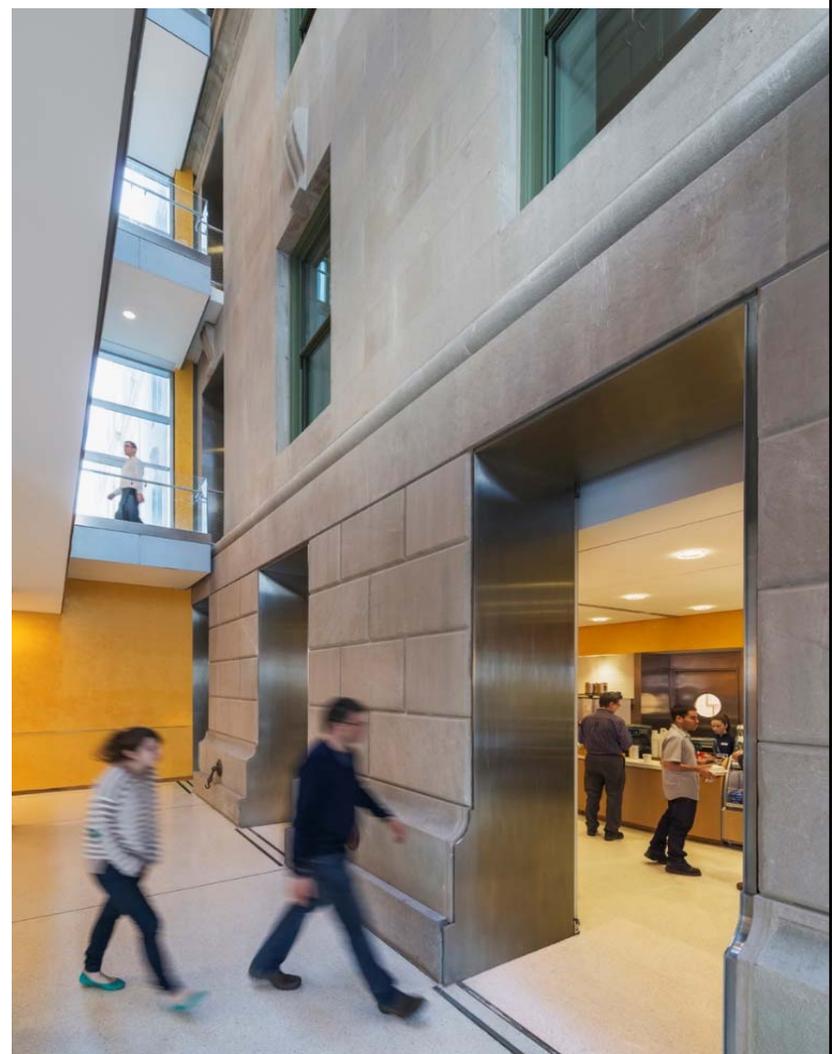


GUT DEMOLITION Retention of Floor Slabs & Exterior Envelope

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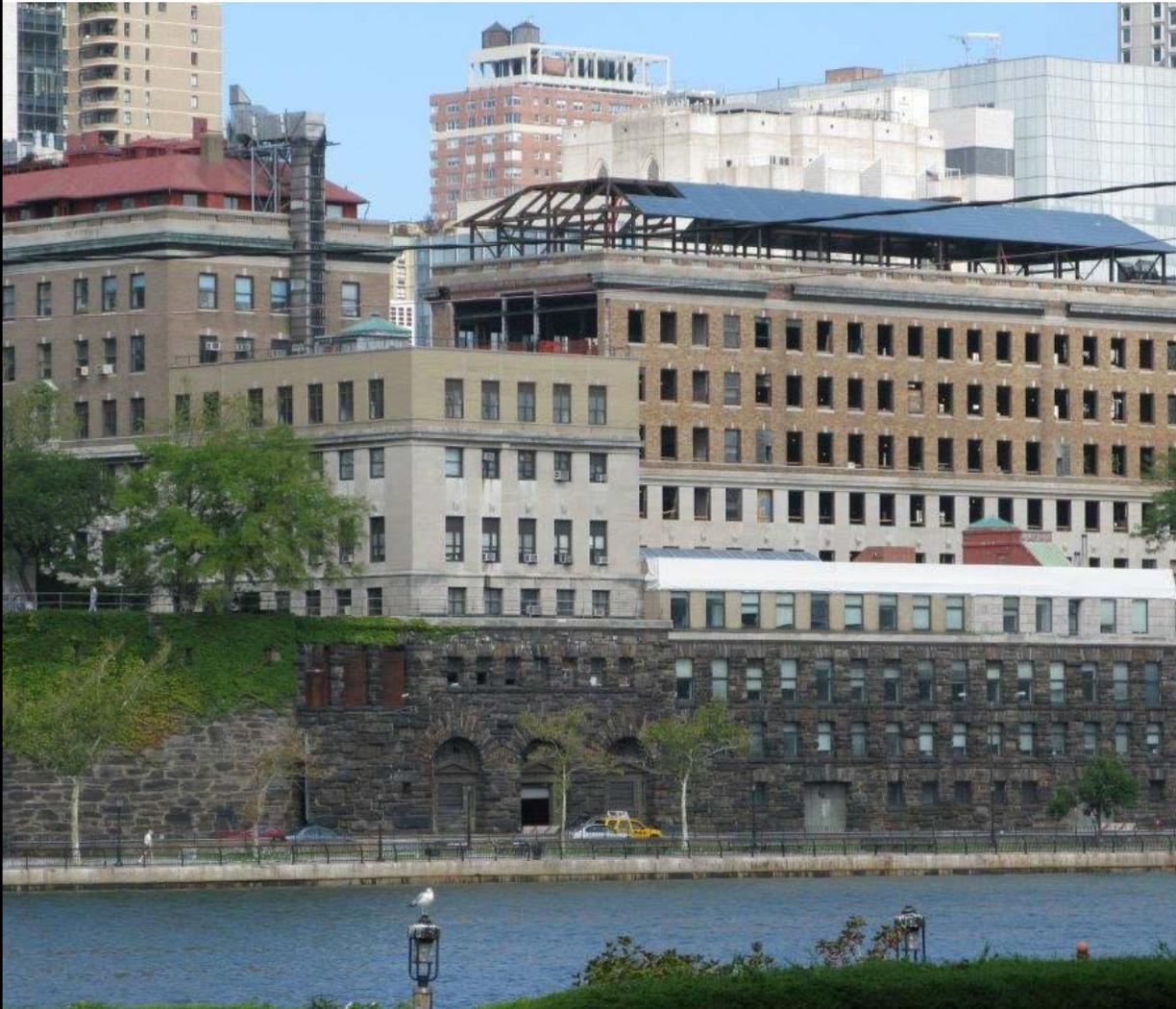


CONSTRUCTION Connector Building



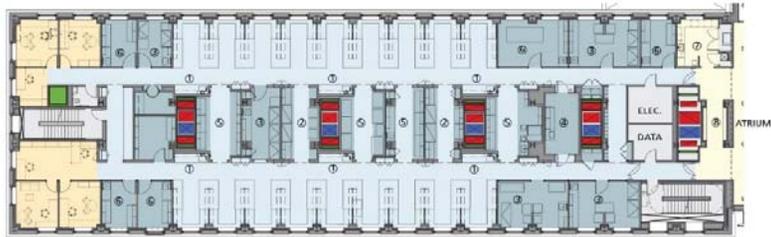
CONSTRUCTION New Mechanical Penthouse

56



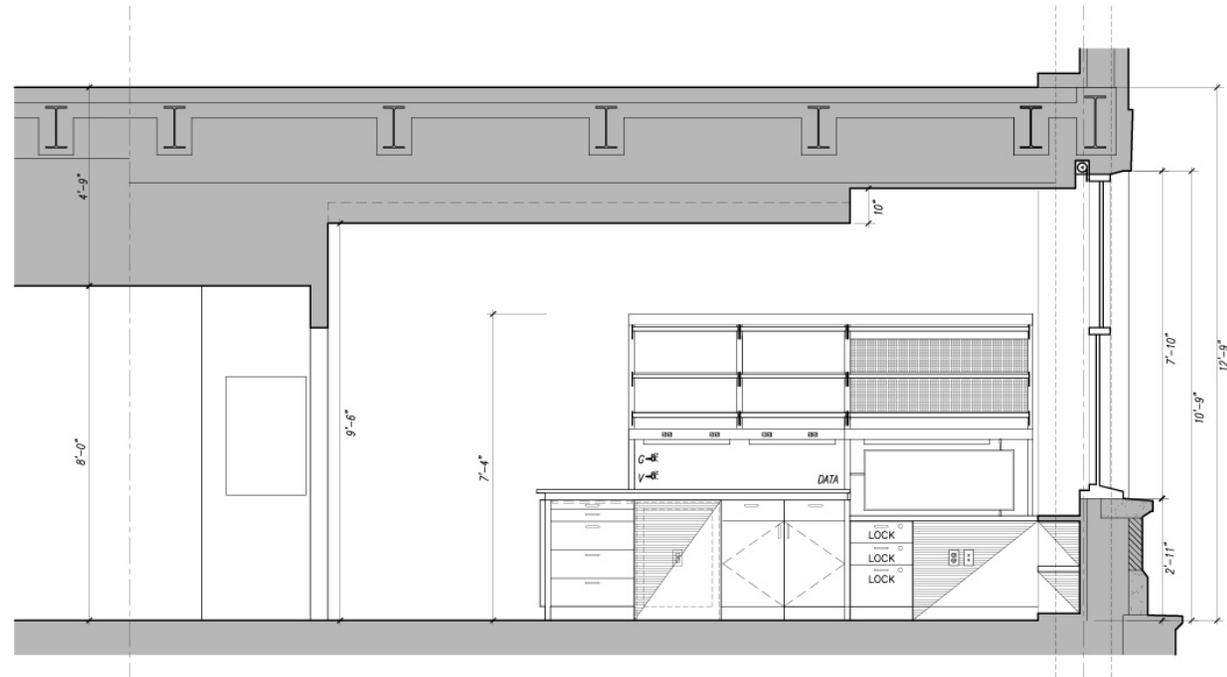
Rooftop and exterior envelope subject to New York State historic preservation review

TRANSFORMATION TO OPEN LAB CONCEPT



New Laboratory Floor Plan

- Shared equipment and procedure rooms
- Open lab configuration with desks at the bench
- Lab Head and computational work in the lab



Typical Bench Module and Lab Section

FLEXIBLE LAB BENCH MODULES

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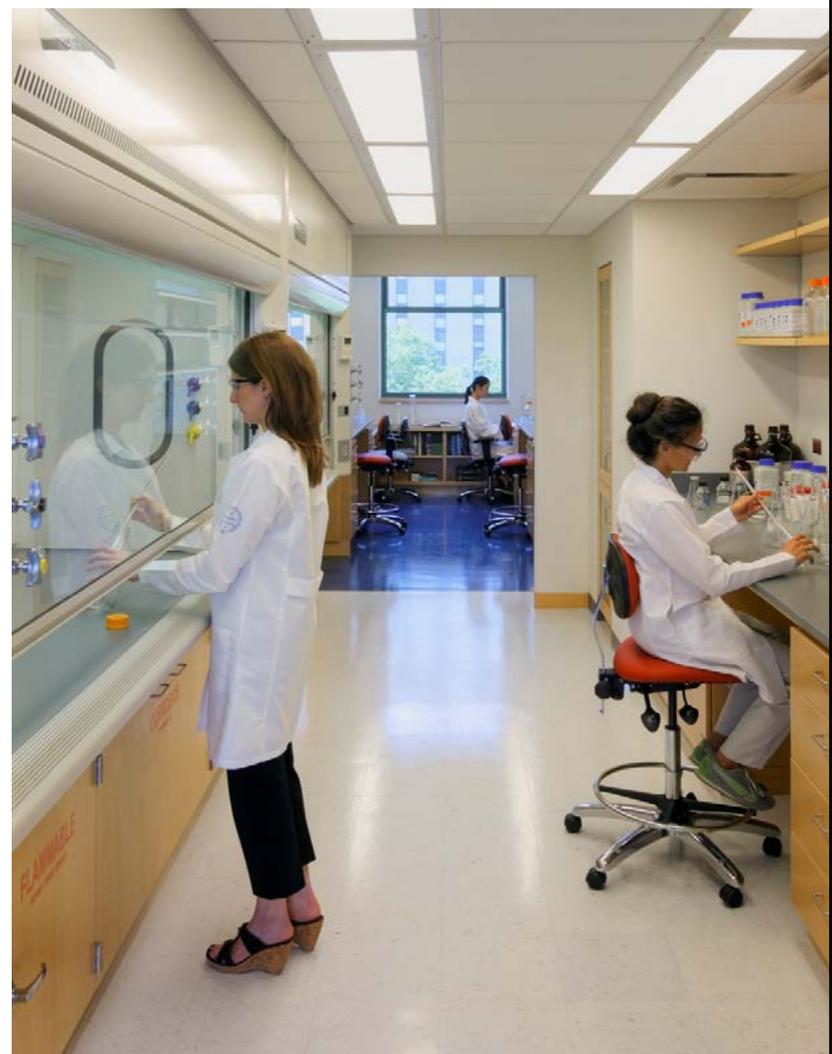
SHARED EQUIPMENT & PROCEDURE ROOM CROSSOVERS

59

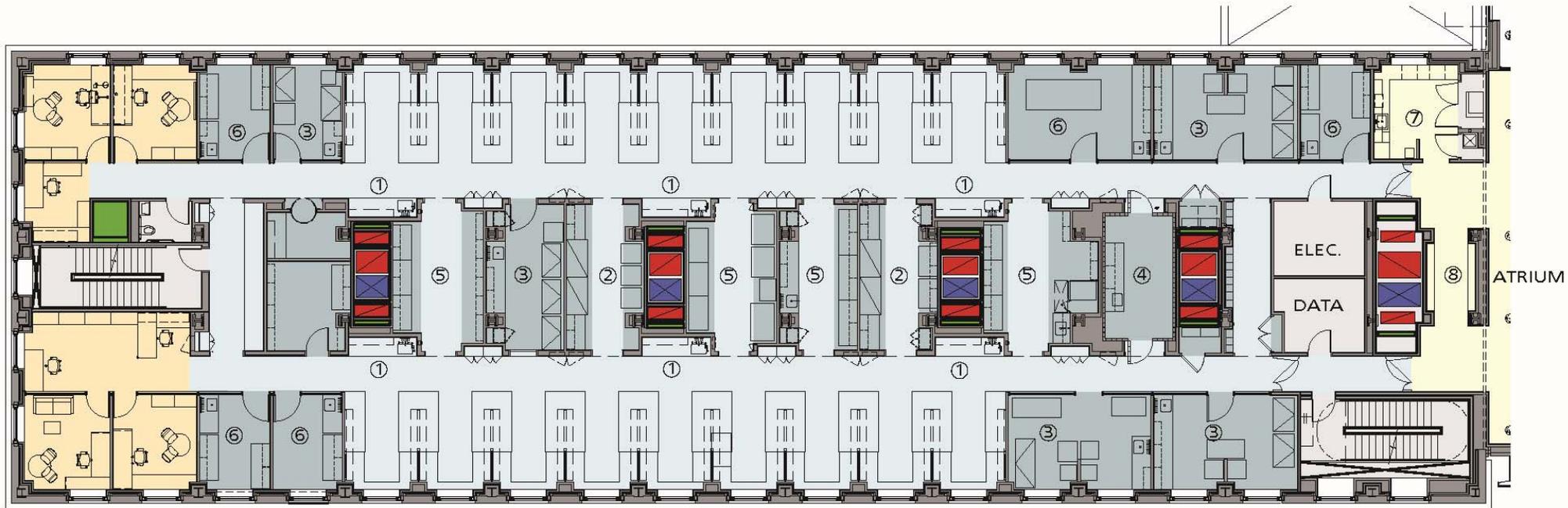


FLEXIBLE, SHARED EQUIPMENT CORE

60



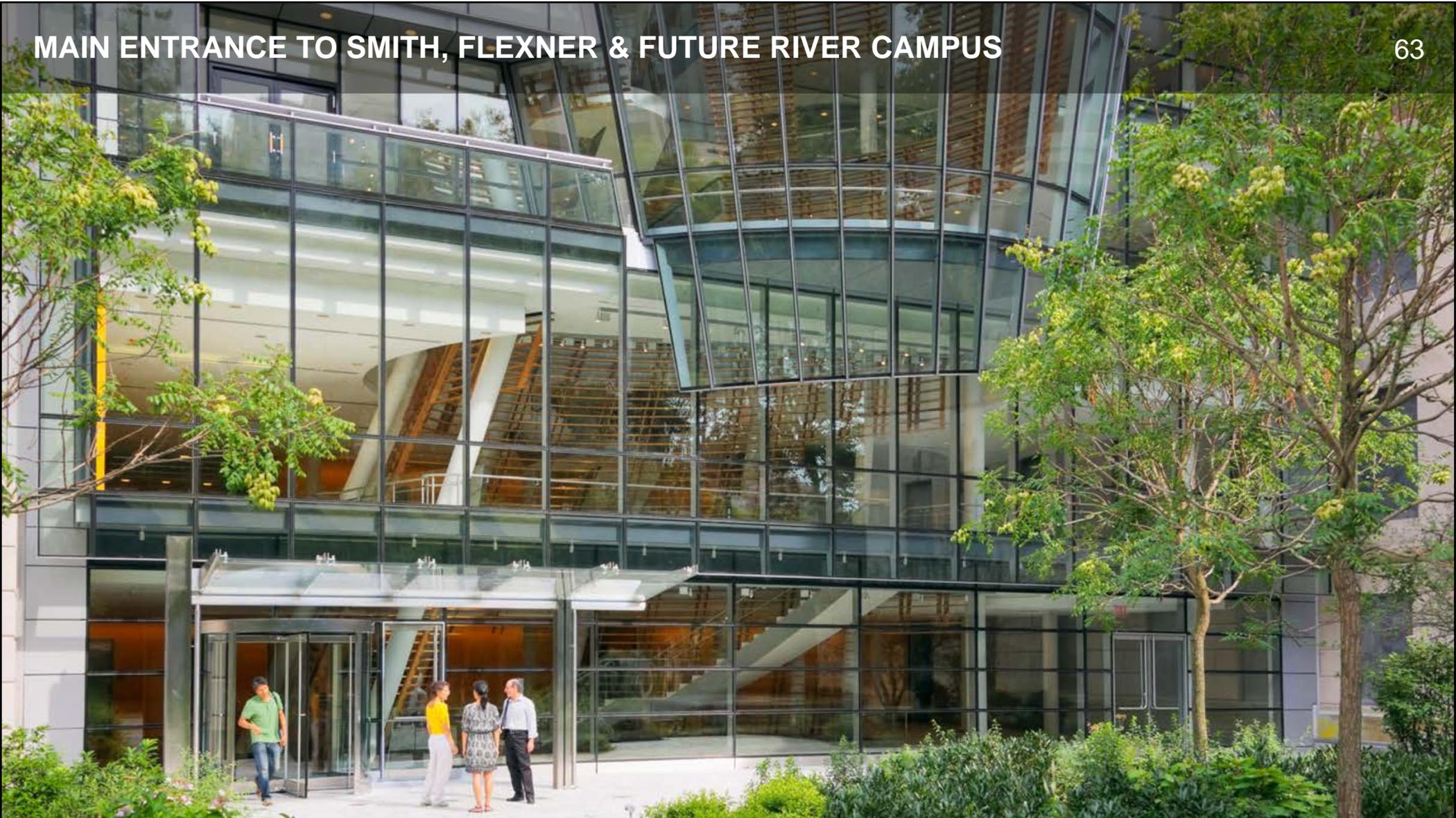
LABORATORY METRICS



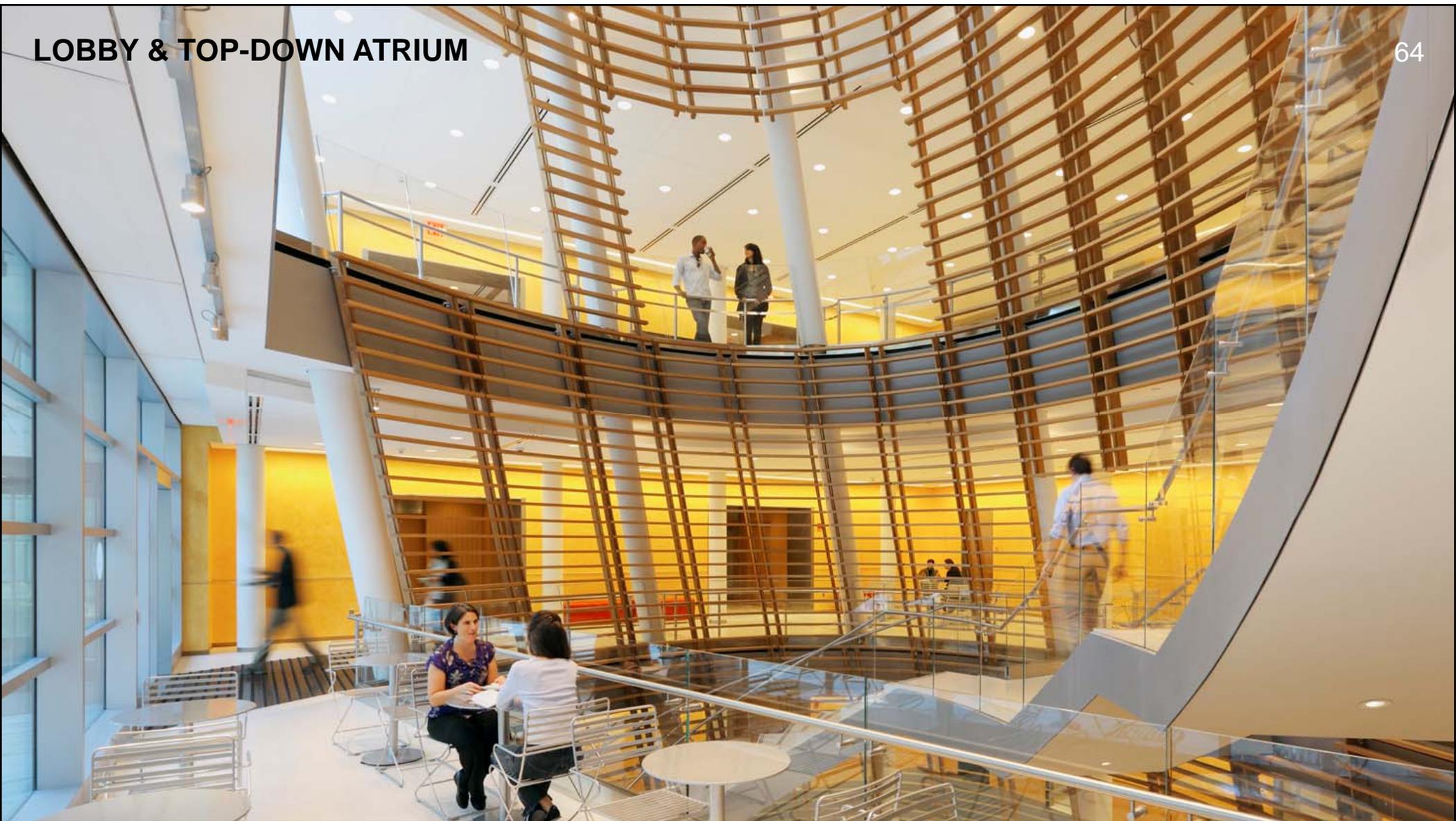
- Office/Meeting Rooms
- Public Circulation
- Support/Shaft Space
- Lab
- Lab Support

CRC Building Area	260,000	GSF
Typical Lab Type A	6,200	NSF
Average per Lab Tech	246	SF
Typical Lab Population	25	
Length of Bench and Desk	7.5	LF
Desk	4	LF
Principal Investigators	29	

MAIN ENTRANCE TO SMITH, FLEXNER & FUTURE RIVER CAMPUS



LOBBY & TOP-DOWN ATRIUM



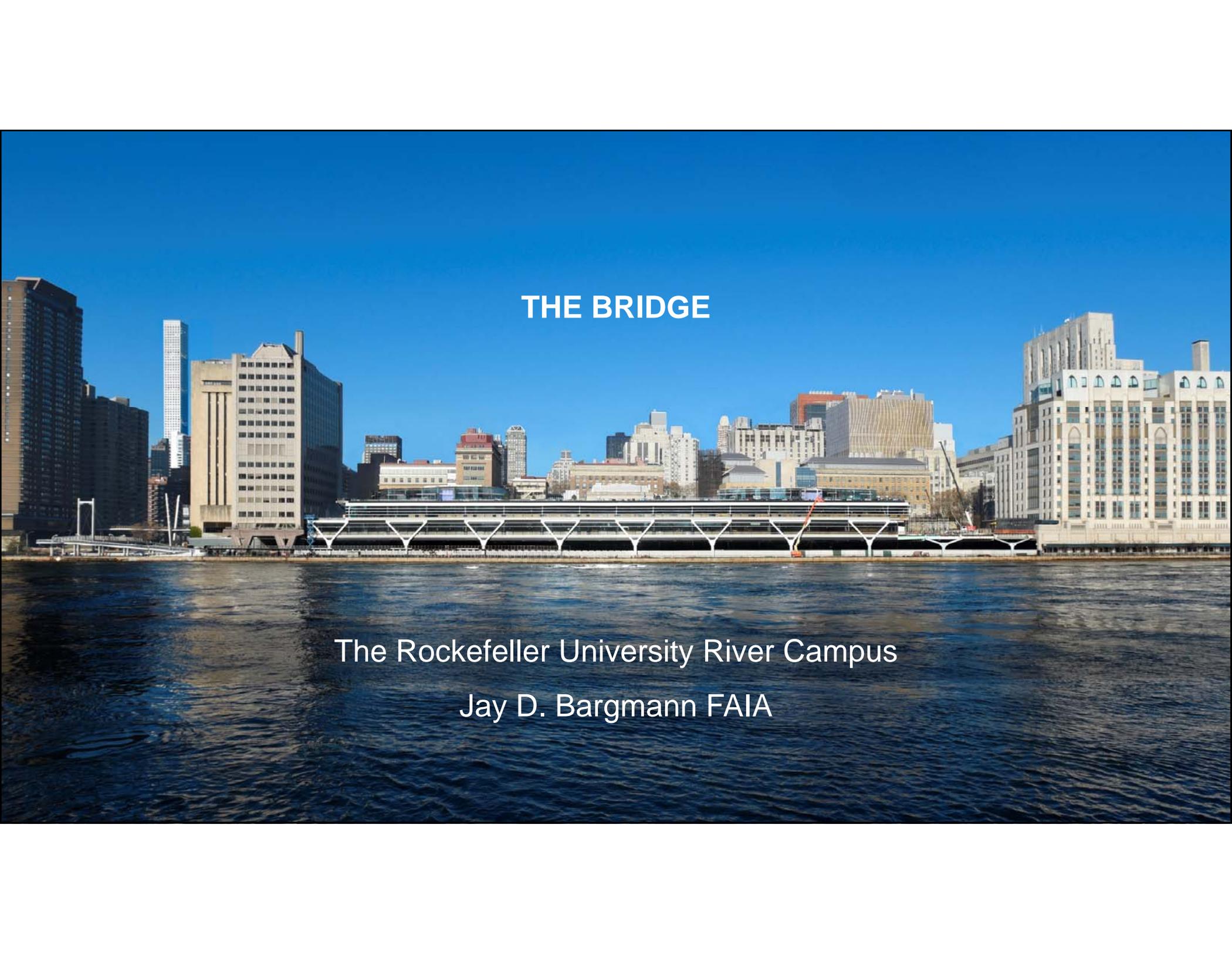
ATRIUM GATHERING SPACE & VERTICAL CIRCULATION

65



COLLABORATIVE RESEARCH CENTER & THE EAST RIVER





THE BRIDGE

The Rockefeller University River Campus

Jay D. Bargmann FAIA

THE ROCKEFELLER UNIVERSITY RIVER CAMPUS Master Plan Objectives

68

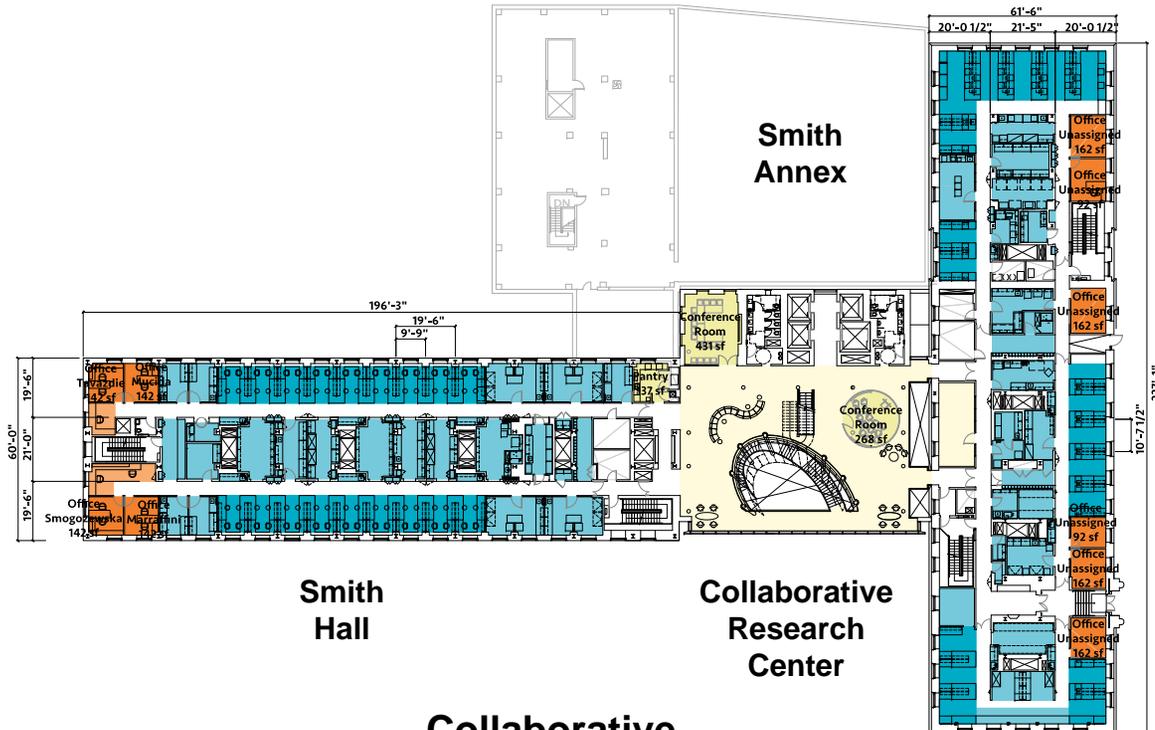


Accommodate researchers from existing buildings of The Rockefeller University

Provide large floor plates that maximize flexibility and collaboration and alternative laboratory environments

Maintain views to and from the historic buildings

Preserve and enhance the garden landscape



- Enclosed Office / Open Office
- Laboratory Common Areas
- Laboratory Bench Areas
- Support Laboratory
- Building Common Area

Collaborative

Research Center

Floor Plate Depth:
60'-0" to 61'-6"
Laboratory Bench
Module:
9'-9" to 10'-7 1/2"

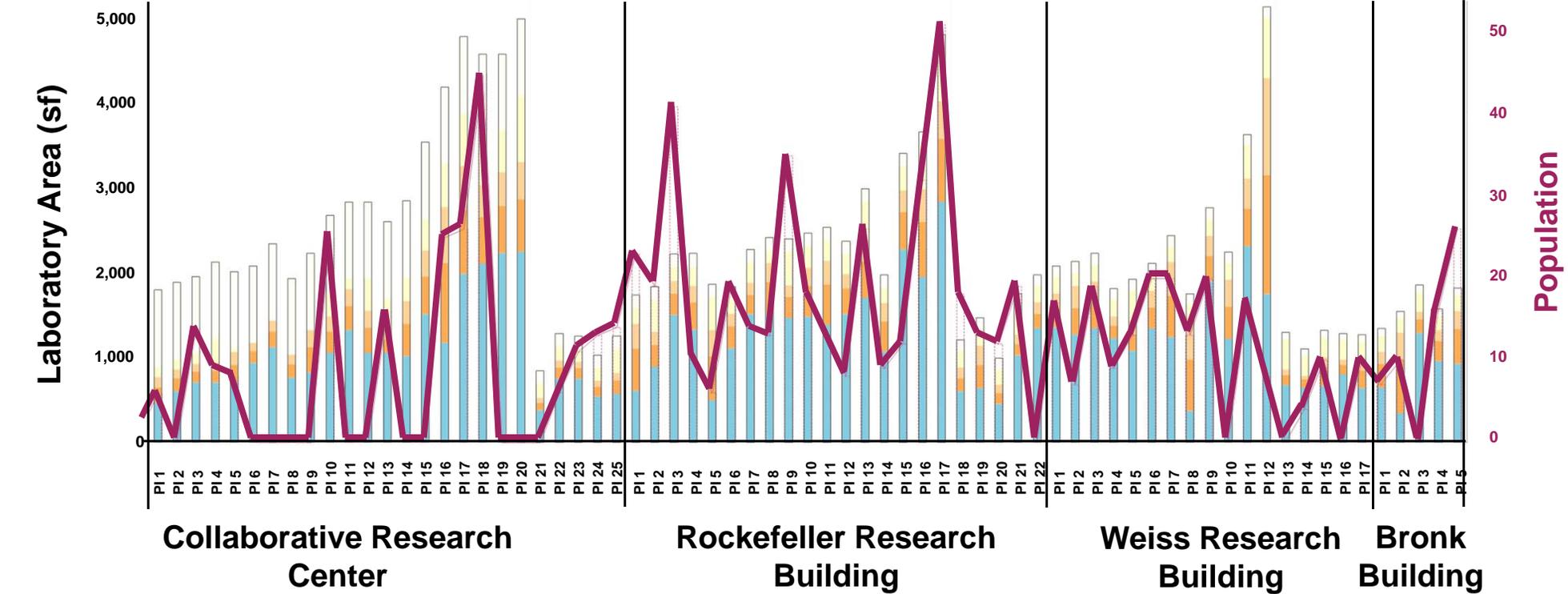
Smith Hall

36 Benches
4 Offices
9 Benches / Office

Flexner Hall

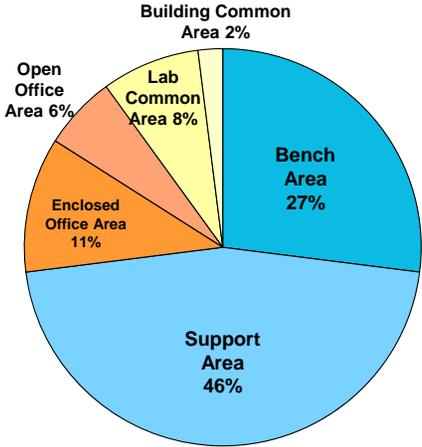
38 Benches
6 Offices
6 Benches / Office

RELATIONSHIP BETWEEN LABORATORY AREA & POPULATION

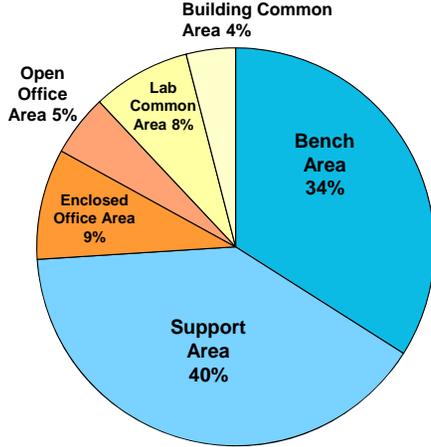


- Enclosed Office / Open Office
- Laboratory Common Areas
- Laboratory Bench Areas
- Building Common Area
- Population

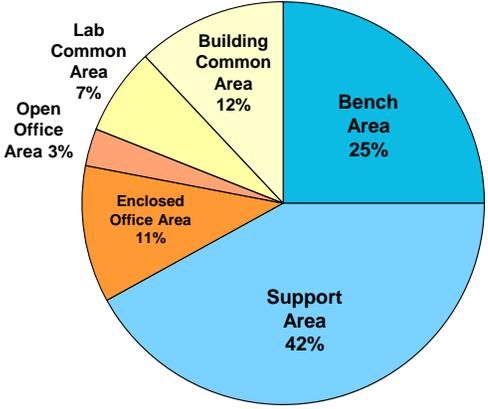
PEER BENCHMARKS Comparison Informs Final Program Targets



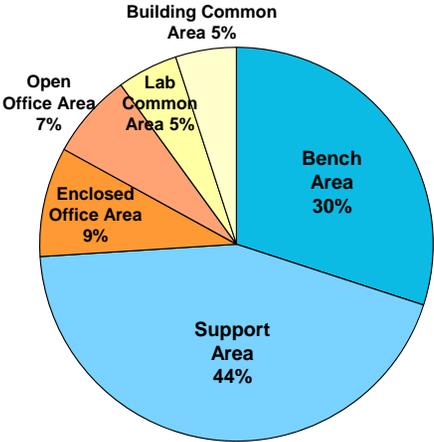
Bronk Building



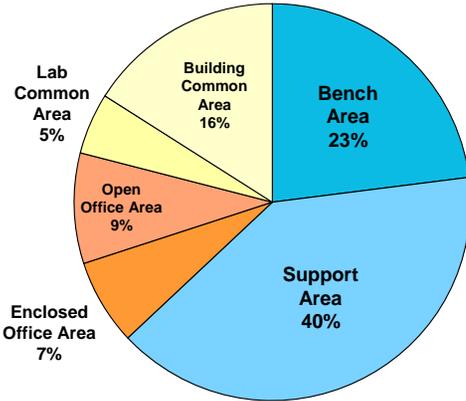
Rockefeller Research Building



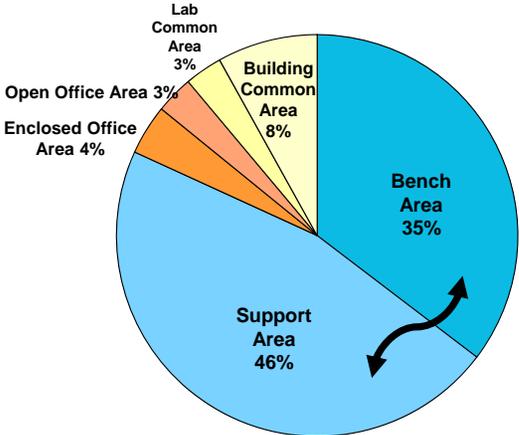
**Howard Hughes Medical Institute
Janelia Research Campus**



Weiss Research Building

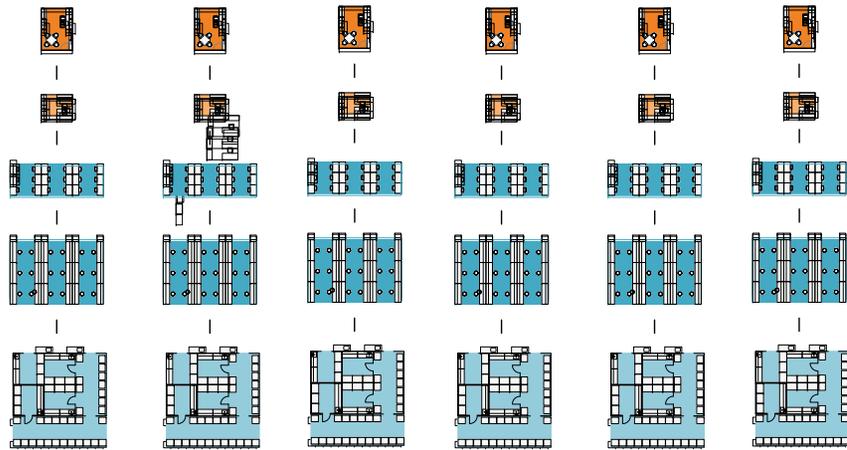


Collaborative Research Center

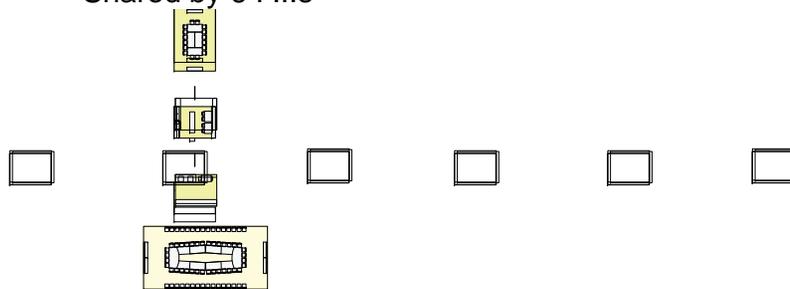


New Laboratory Building

FINAL PROGRAM 4,000 Square Feet per Principal Investigator



Shared by 6 P.I.s



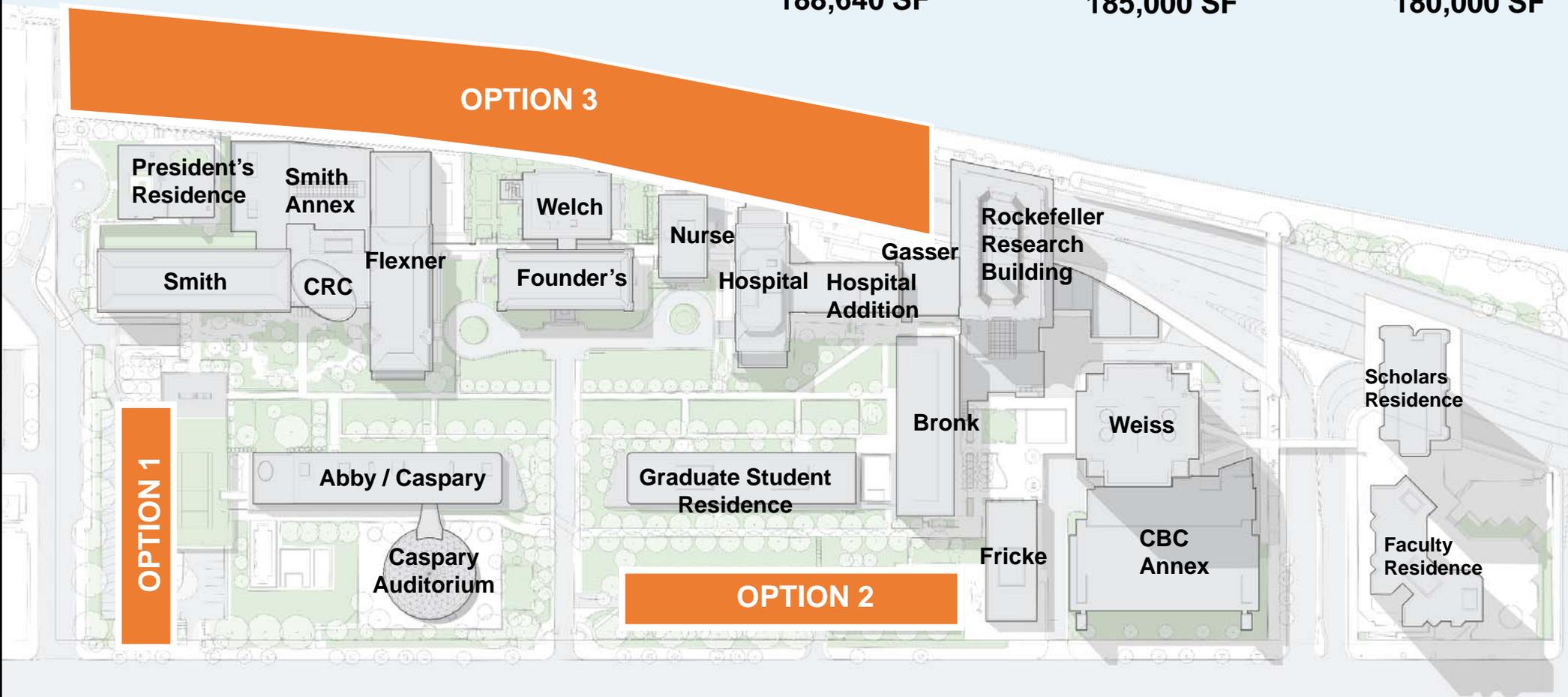
- 1** Principal Investigator Office
- 1** Administrative Workstation
- 13** Write-up Desks
- 13** Benches
- 1** Laboratory Support
- 1** Equipment Corridor
- 0.50** Collaborative Space
- 0.25** Conference Room
- 0.25** Pantry / Break Area
- 0.25** Copy / Supply Space
- 0.04** Flexible Conference Center

- 23** Principal Investigators
- 13** Researchers / PI
- 4,000** Square Feet / PI
- 450** Total Population

OPTION 1
12 Stories
188,640 SF

OPTION 2
9 Stories
185,000 SF

OPTION 3
2 Stories
180,000 SF



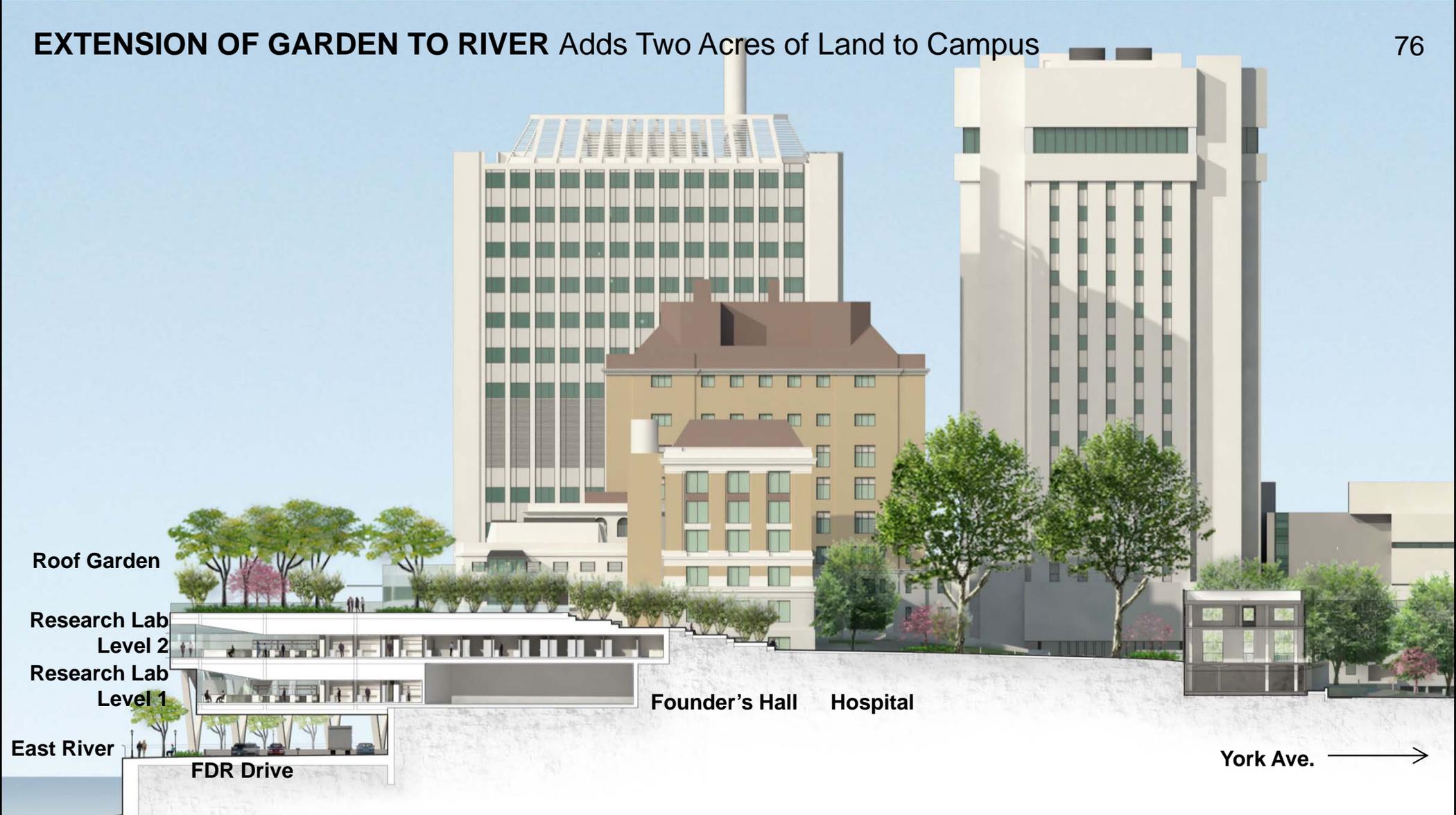
OPTION 3

OPTION 1

OPTION 2



EXTENSION OF GARDEN TO RIVER Adds Two Acres of Land to Campus



SITE PLAN

Tri-Institutional
Conference Center

EAST RIVER

Two Levels of
Research Laboratories

Academic
Pavilion

President's
Residence

Smith
Annex

Welch

Dining
Commons

Rockefeller
Research
Building

FDR DRIVE

Smith

CRC

Flexner

Nurse

Hospital
Hospital
Addition

Gasser

Scholars
Residence

Abby / Caspary

Graduate Student
Residence

Bronk

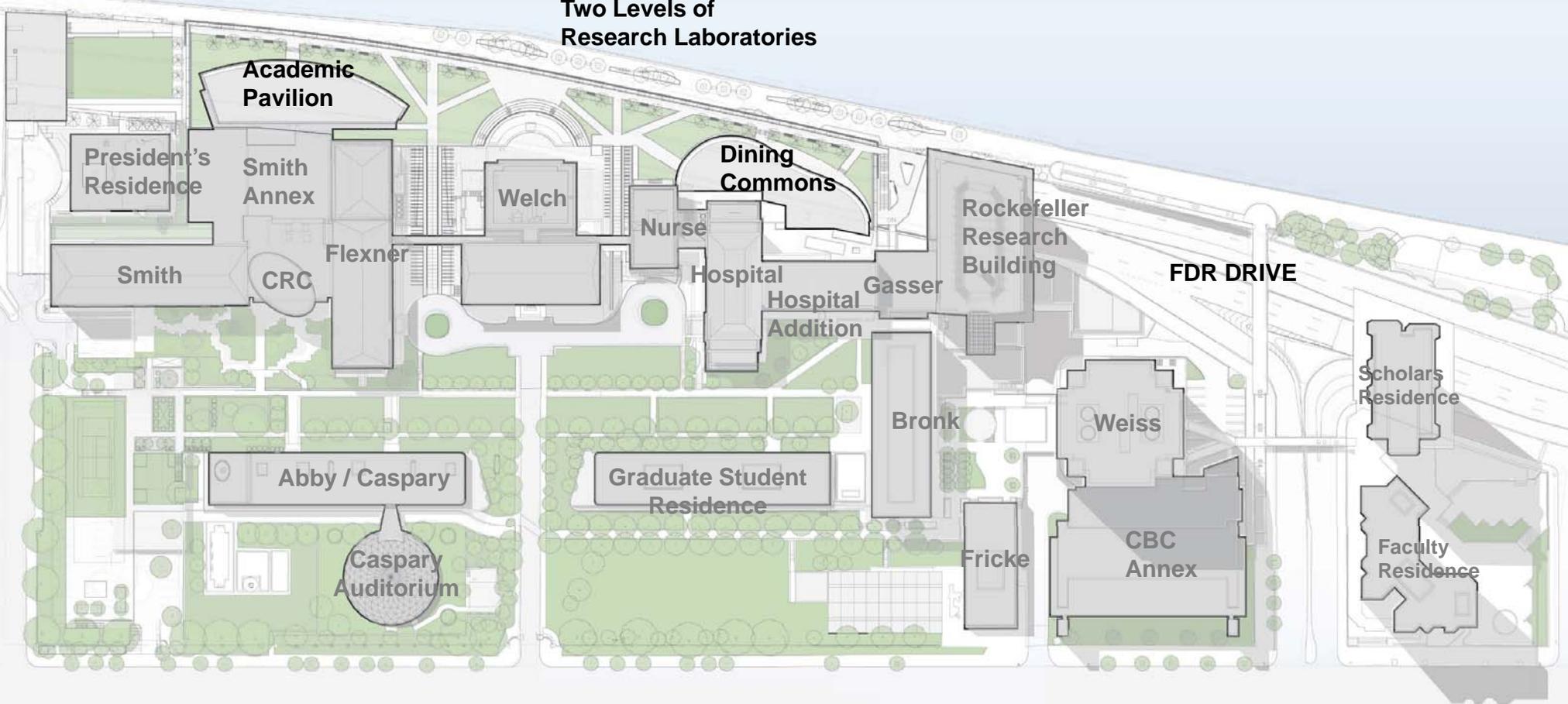
Weiss

Caspary
Auditorium

Fricke

CBC
Annex

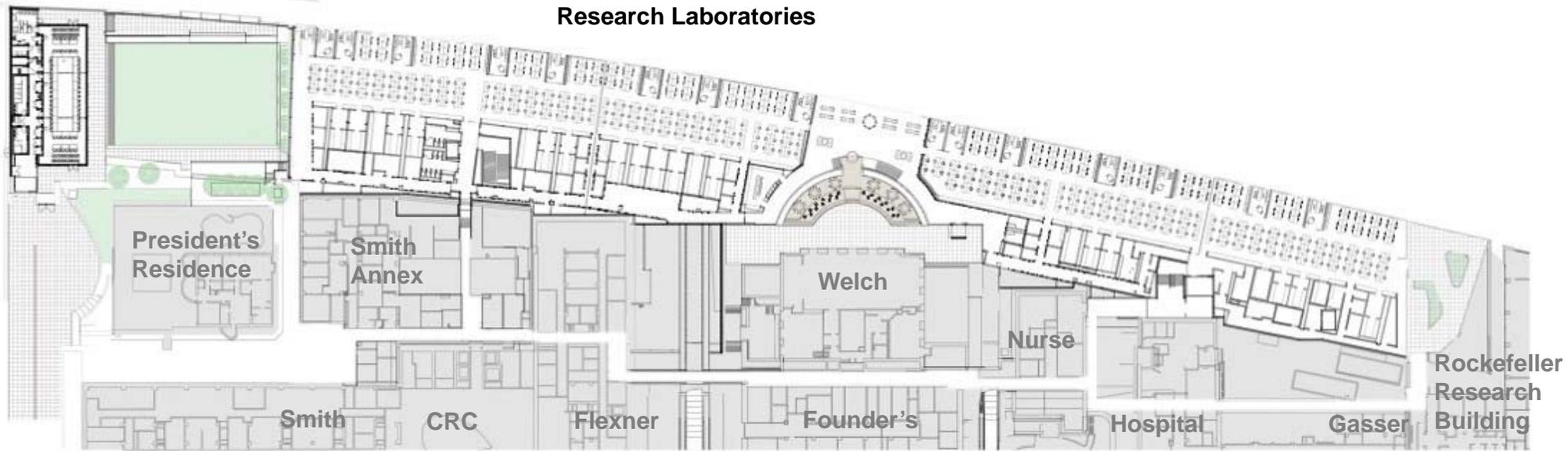
Faculty
Residence



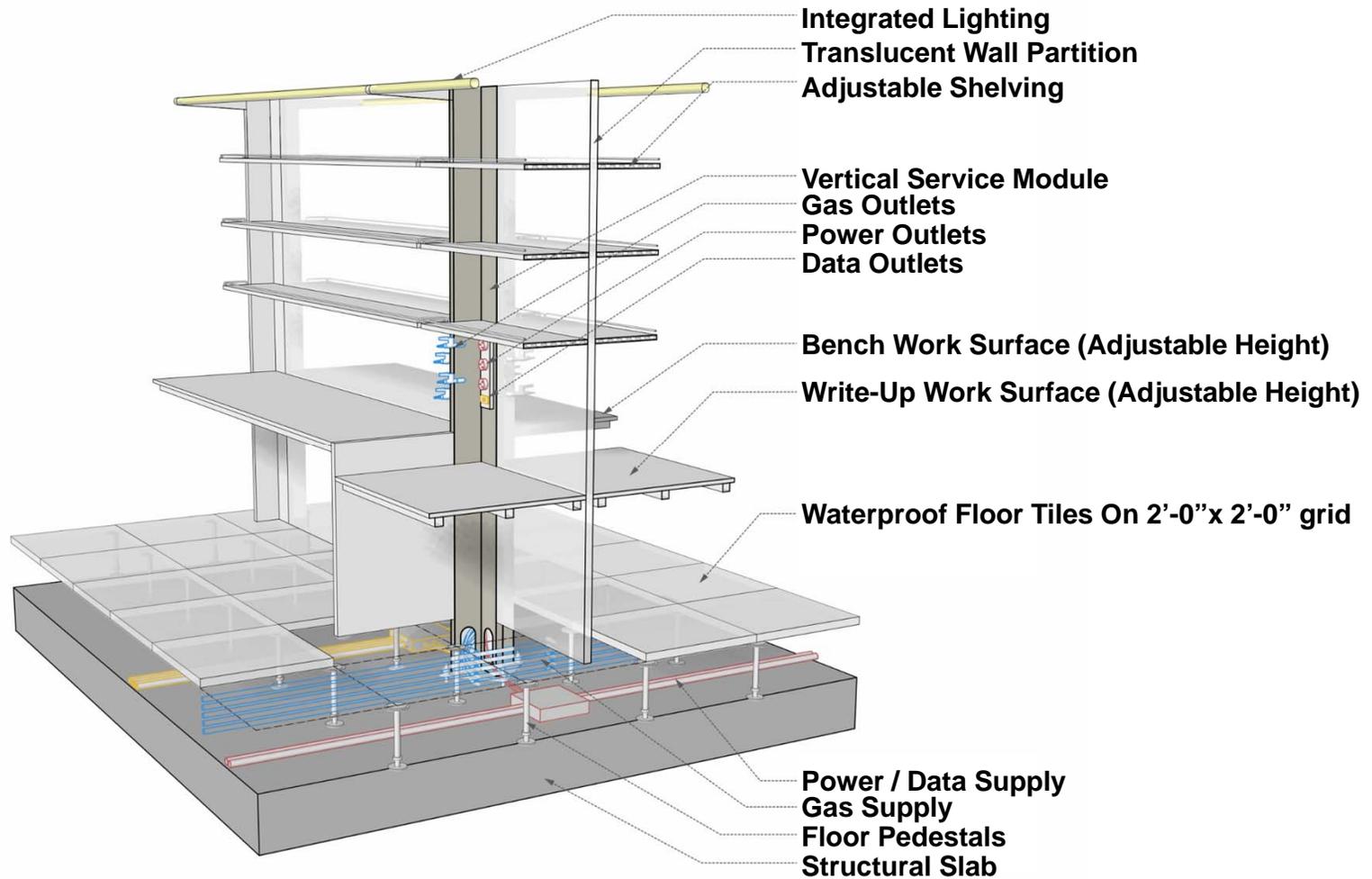
FIRST & SECOND LEVEL PLAN

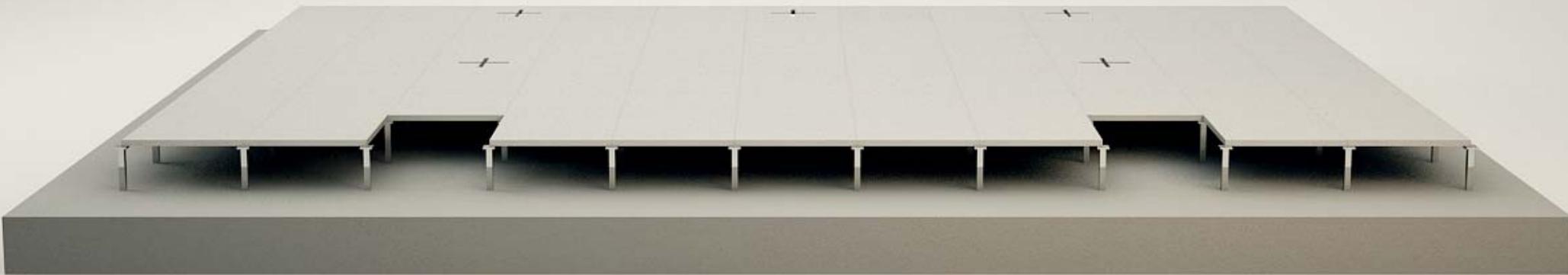
Tri-Institutional
Conference Center

Two Levels of
Research Laboratories



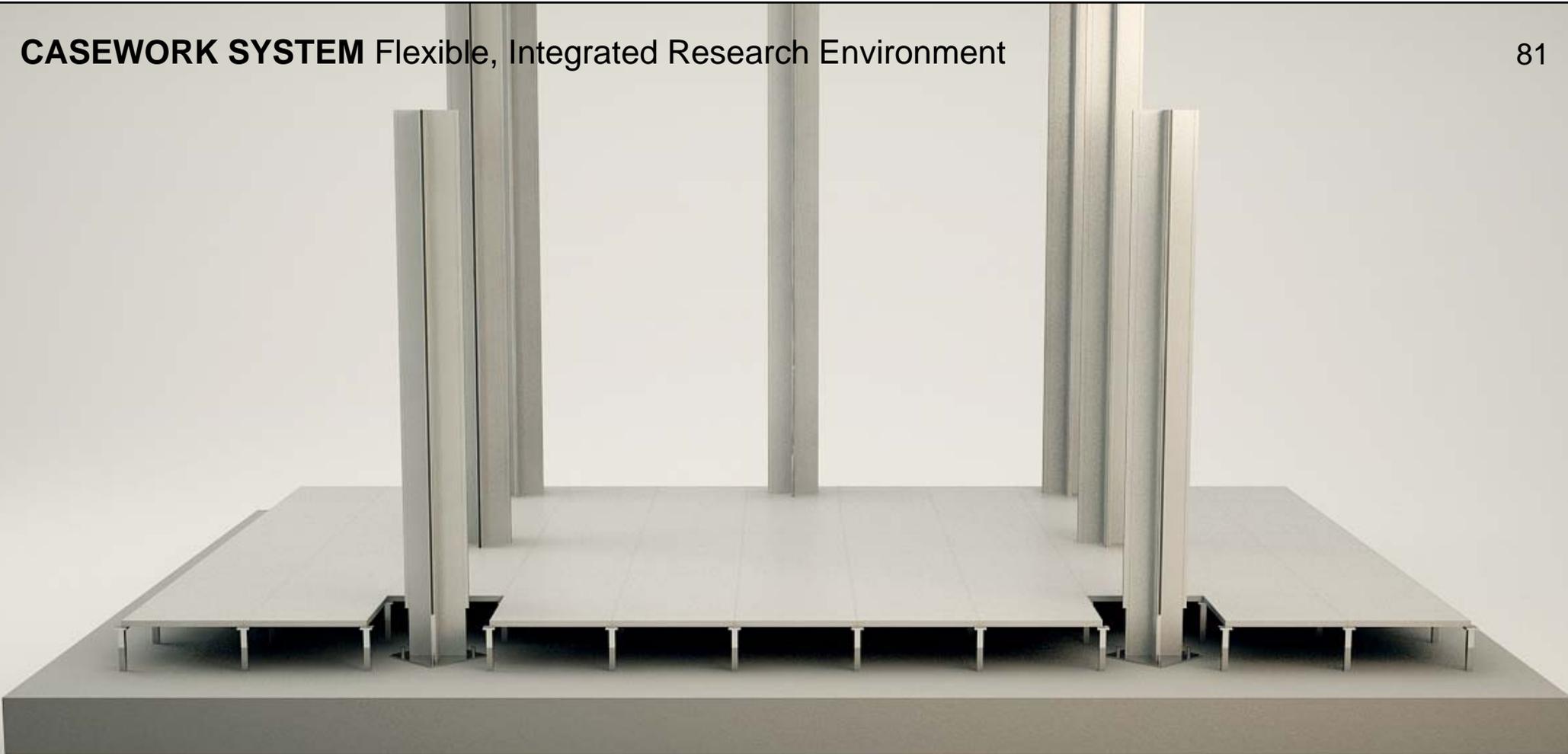
CASEWORK SYSTEM Flexible, Integrated Research Environment





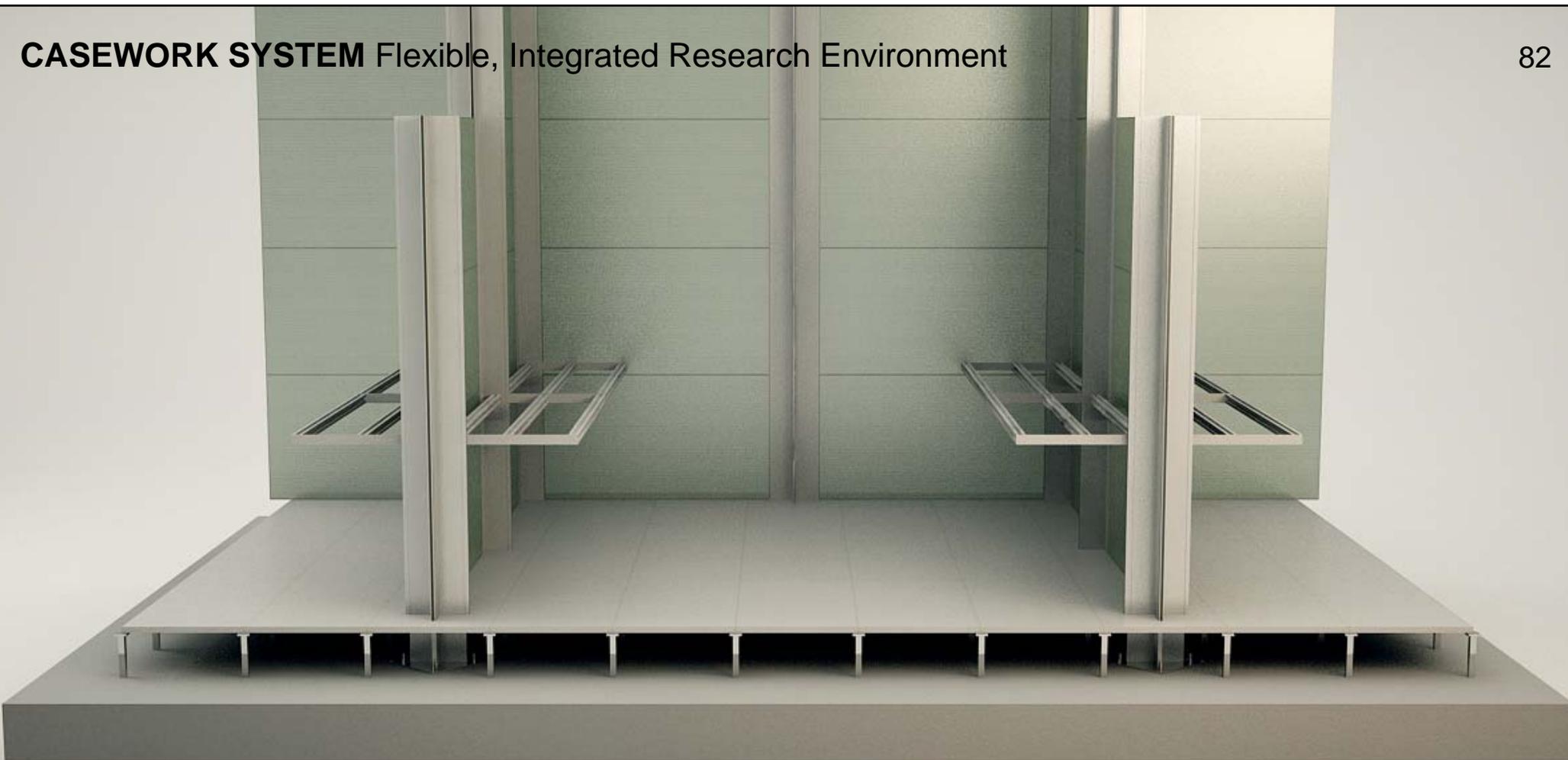
CASEWORK SYSTEM Flexible, Integrated Research Environment

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CASEWORK SYSTEM Flexible, Integrated Research Environment

82



CASEWORK SYSTEM Flexible, Integrated Research Environment

83



CASEWORK SYSTEM CONFIGURATION



CASEWORK SYSTEM CONFIGURATION



CAMPUS AMENITIES Include Garden, Dining, & Conference Center



UPGRADES TO THE PUBLIC ESPLANADE



IMPLEMENTATION CHALLENGES

Construction atop Franklin D. Roosevelt East River Drive – unique circumstances / solution

Engaged with traffic consultants and negotiated up to 24 full overnight road closures

Offsite fabrication, add value, and “bench check” in a controlled environment the methodology, connections, computerized crane systems

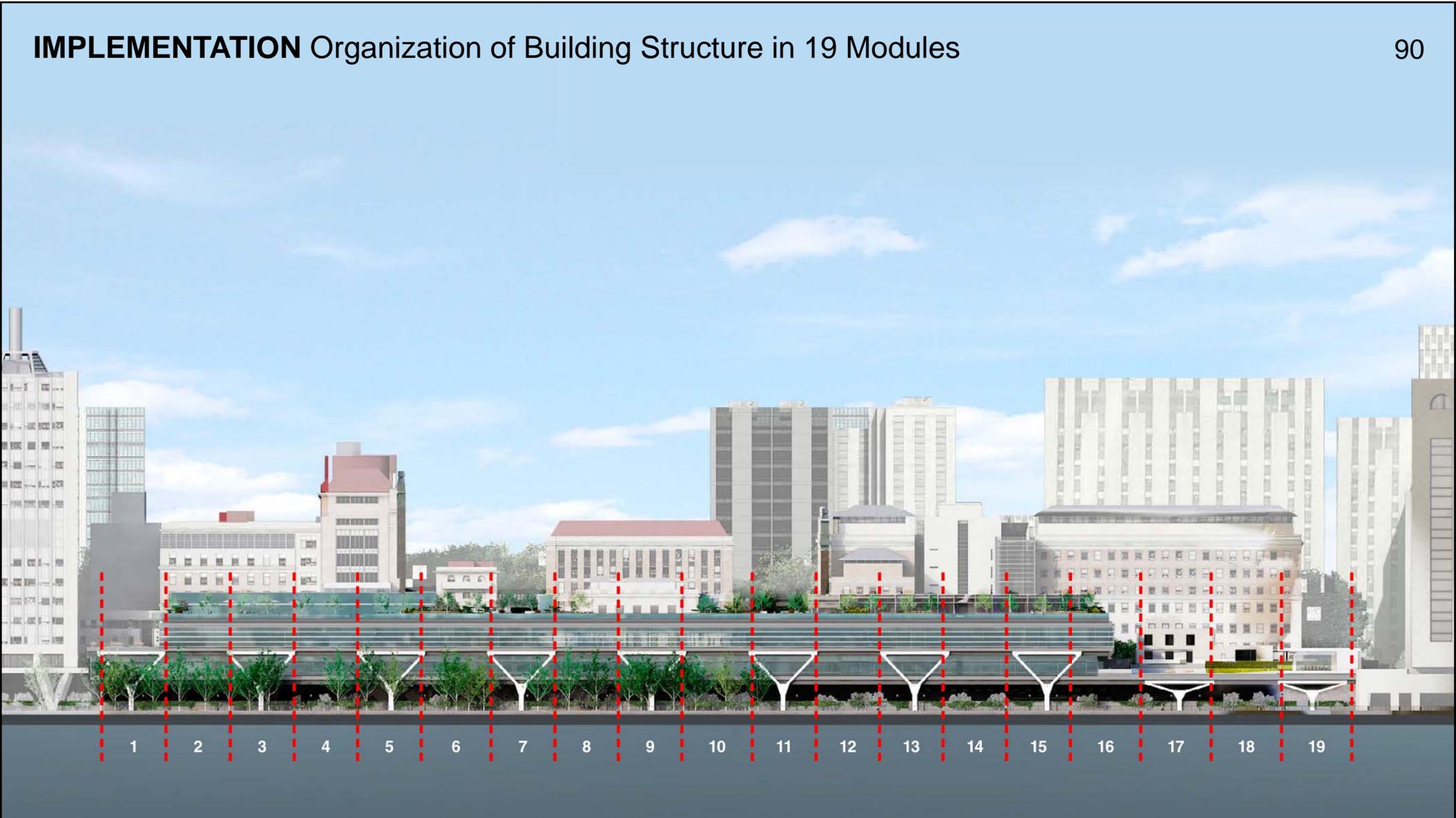


IMPLEMENTATION CHALLENGES Construction Atop Franklin D. Roosevelt East River Drive

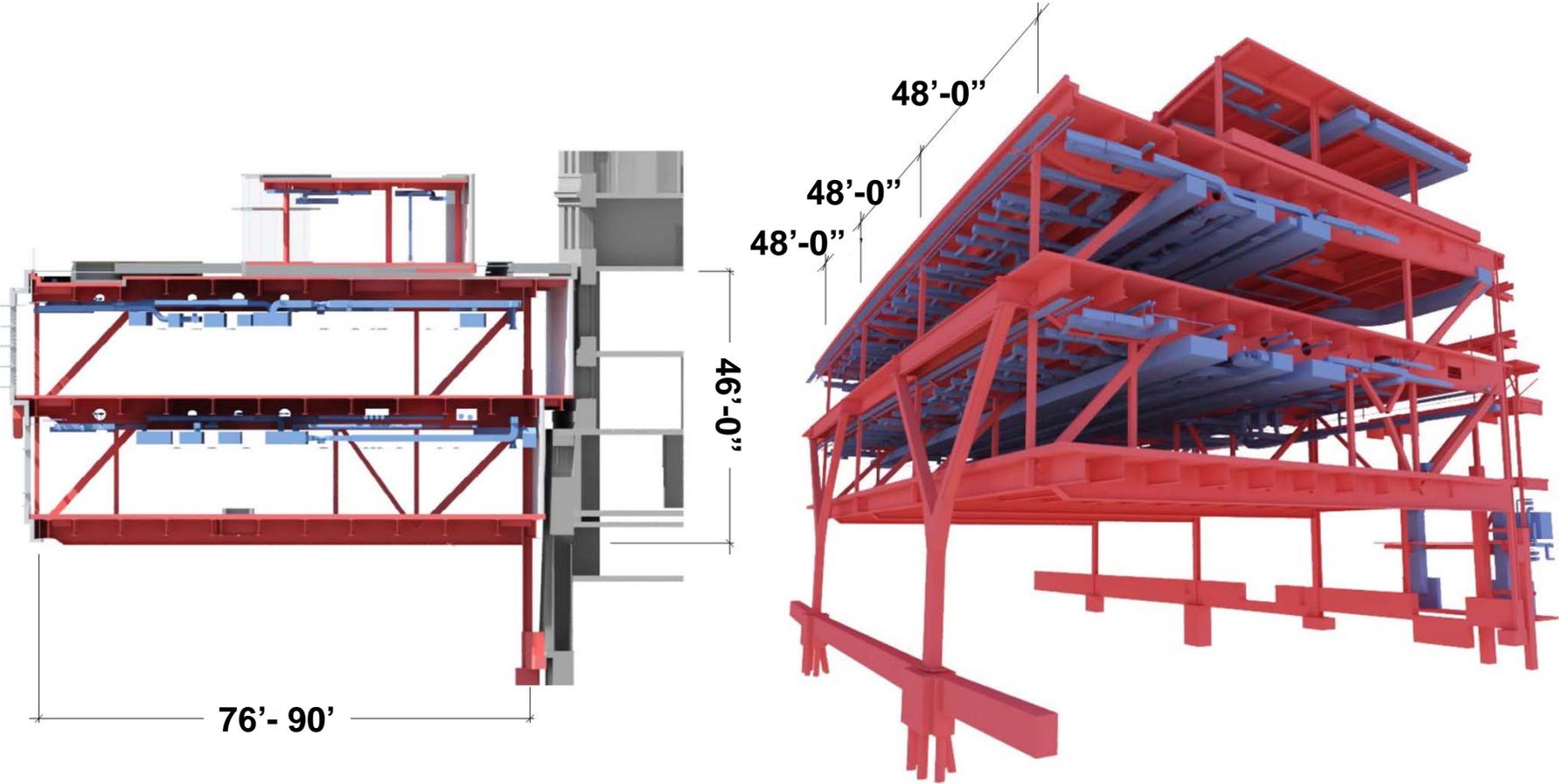
89



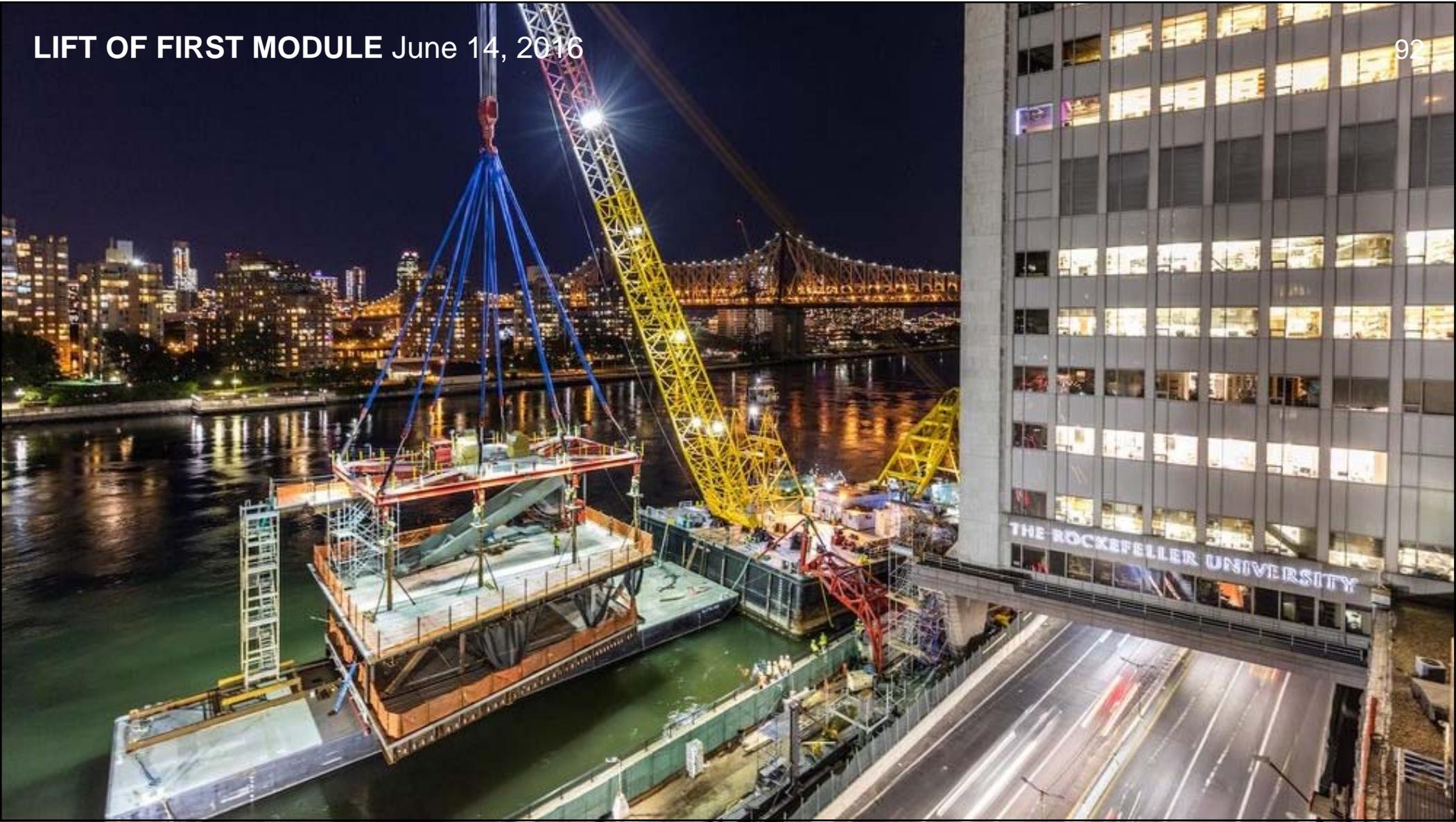
IMPLEMENTATION Organization of Building Structure in 19 Modules



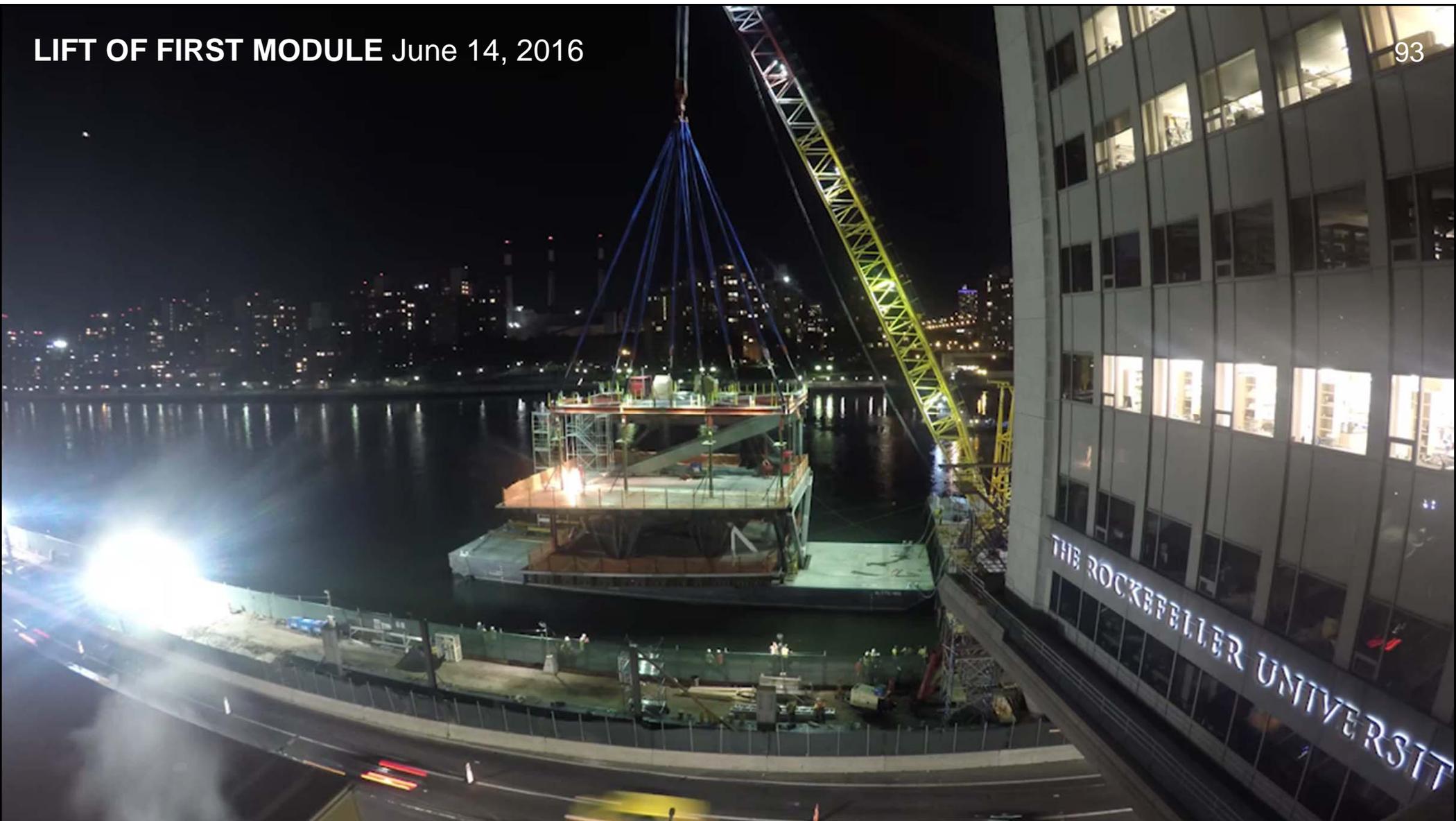
STEEL MODULES 19 Units, ±700 Tons Each



LIFT OF FIRST MODULE June 14, 2016



LIFT OF FIRST MODULE June 14, 2016











PANEL DISCUSSION

98

- How frequently should an institution prepare a master plan?

PANEL DISCUSSION

99

- How frequently should an institution prepare a master plan?
- When and how should users be involved in the programming and planning process?

PANEL DISCUSSION

100

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- **How is the expansion and contraction of laboratories accommodated?**

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- **How does a building's floor plan impact the research activities in the building?**

PANEL DISCUSSION

102

- How frequently should an institution prepare a master plan?
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- How does a building's floor plan impact the research activities in the building?
- What are the planning and construction challenges of restricted urban sites?

PANEL DISCUSSION

103

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- How is the expansion and contraction of laboratories accommodated?
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- What are the planning and construction challenges of restricted urban sites?
- Is it justifiable to pay high cost per square foot to build laboratories in dense urban settings?

PANEL DISCUSSION

104

- **How frequently should an institution prepare a master plan?**
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- **What are the planning and construction challenges of restricted urban sites?**
- **Is it justifiable to pay high cost per square foot to build laboratories in dense urban settings?**

ACKNOWLEDGEMENTS

105

Weill Cornell Medicine

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Dean (1997-2012)

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Program Director

Robert J. Musco
Director Major Projects

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106

The Rockefeller University

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THANK YOU.