

Natural Sciences Building  
Planning Study

DRAFT  
March 2016



## **Natural Sciences Building**

Planning Study

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March 2016

SUNY College at Old Westbury  
P.O. Box 210  
Old Westbury, NY 11568

Dr. Calvin O. Butts, III, President

### **Steering Committee**

Mary Marquez Bell, Vice President of Enrollment Services  
Barbara Hillery, Dean of Arts and Sciences  
Judith Johnson, Lab Manager  
Evan Kobolakis, Chief Information Officer  
Martha Livingston, Chair of Public Health  
Judith Lloyd, Chair of Chemistry and Physics  
Ray Maggiore, Director of Capital Planning  
Timothy McGarry, Director of Maintenance and Facilities  
Fernando Nieto, Chair of Biological Sciences  
Ronald Welton, Assistant Vice President of Academic Affairs



### **Prepared by:**

#### **JMZ Architects and Planners, P.C.**

190 Glen Street - P.O. Box 725  
Glens Falls, New York 12801  
(518) 793-0786  
[www.JMZarchitects.com](http://www.JMZarchitects.com)

Jean Stark, AIA, LEED AP, Principal-in-Charge  
Jason Henault, AIA, Project Manager



#### **Cameron Engineering**

100 Sunnyside Boulevard, Suite 100  
Woodbury, NY 11797  
(516) 827-4900  
[www.CameronEngineering.com](http://www.CameronEngineering.com)

Nicholas Kumbatovic, PE, LEED AP, Principal-in-Charge  
Patrick Fahy, PE, Project Manager



#### **Baer & Associates**

190 Glen Street - P.O. Box 725  
Glens Falls, New York 12801  
(518) 793-0786  
[www.JMZarchitects.com](http://www.JMZarchitects.com)

Joseph Dommer, Principal-in-Charge  
Josh Telenko, Project Manager

# *Executive Summary*



## **Introduction**

This planning study evaluates the condition and suitability of the Natural Sciences Building at SUNY Old Westbury and makes recommendations for future use. The study includes an assessment of existing conditions, an analysis of how instructional space is utilized, and the development of space programs, design concepts, and cost estimates. The findings from each phase of the study are summarized below and detailed in each section of this report.

## **Methodology**

The primary goal of the study is to provide recommendations for a phased renovation of the Natural Sciences Building, so that the building can better accommodate the current and future space needs of Biological Sciences, Chemistry/Physics, and Public Health. In general, the scope of work included the following:

- Review the Natural Sciences Building and Academic Village: Wing A to assess the condition of each building
- Prepare a code review for each building
- Conduct a campus-wide instructional space utilization study to determine how instructional space in the Natural Sciences Building and all other campus buildings is utilized
- Meet with administrators, faculty, and staff to gain a better understanding of current and future space needs
- Prepare enrollment projections and determine the number of classrooms and class labs that will be required
- Develop space programs for all departments affected by the renovations
- Develop multiple concept alternatives to explore how the Natural Sciences Building can accommodate the identified space needs for each department
- Prepare final concept, space program, phasing strategies, and cost estimates

## **Building Conditions Assessment**

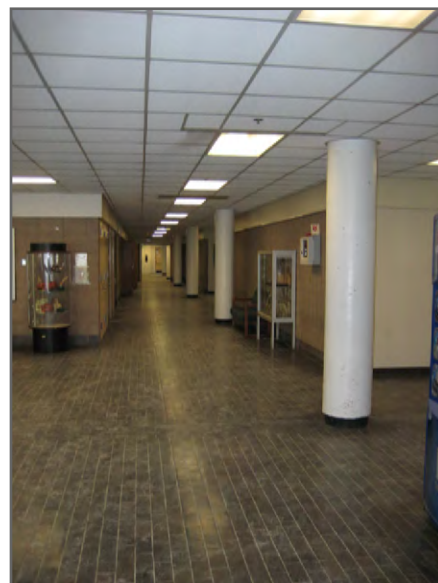
The planning team toured the Natural Sciences Building and Academic Village: Wing A to assess the physical condition of each building, determine functional challenges, and identify building code issues. Major findings of the assessment include the following:

### Natural Sciences Building

- The Natural Sciences Building is suitable for classrooms, teaching labs, research labs, and faculty offices.
- Many of the interior finishes and building systems have exceeded their useful life and should be replaced.



Natural Sciences Building



Natural Sciences Building  
First Floor Corridor



Natural Sciences Building  
Interdisciplinary Lab



Natural Sciences Building  
Lecture Hall



Academic Village: Wing A



Academic Village: Wing A  
Main Lobby

- The College reported several concerns with the large, interdisciplinary lab (S102) on the first floor of the building. First, acoustic separation between lab sections is not sufficient. Second, students and staff moving through the lab while class is in session can be a distraction to some students.
- The College has made significant progress improving accessibility throughout the building. Several items, such as the seating in the lecture hall and lab benches in the interdisciplinary lab, do not conform to the current building code. While updates are not required at this time, these issues should be addressed when the building is renovated.

#### Academic Village: Wing A

- The layout of the building and type of construction (concrete walls) will make renovation and reconfiguration very difficult.
- Exterior walls, interior finishes, and building systems are in poor condition and should be replaced.
- Roof leaks have resulted in damage to interior finishes and mold growth.
- Large cracks in the concrete waffle slab that may indicate building settlement.
- The central boiler and chiller plant was separated from the other buildings that were originally part of the Academic Village. As a result, piping and equipment is largely oversized.
- Based on the condition of the building and limitations for reuse, this study recommends demolition of Academic Village: Wing A.

### **Code Review**

A code review based on the 2010 Building Code of New York State and 2010 Existing Building Code of New York State was prepared for each building. The results of the review were used to inform the concept alternatives, final recommendation, and phasing strategies.

### **Instructional Space Utilization**

A campus-wide instructional space utilization study was conducted as a part of this planning study. All classrooms and class labs that were scheduled during the fall 2014 semester were included in this study. Major findings of the study include the following:

- During the day, nine classrooms met or exceeded the seat fill target of 80 percent. Only six classrooms met or exceeded the target in the evening.
- No classrooms met the hourly utilization target of 75 percent during the day. Eighteen classrooms located in the New Academic Building met or exceeded the target in the evening.
- During the day, seven class labs met or exceeded the seat fill target of 80 percent. Four class labs met or exceeded the target in the evening.
- Only one class lab (S102) met the hourly utilization target of 60 percent during the day. Two labs (S102 & 0109) met or exceeded the target in the evening.
- Both classrooms and class labs were underutilized on Fridays.
- The College has done a good job matching class size to room capacity. In fact, 53 percent of courses were scheduled in rooms of appropriate size.

### **Academic Program Assessment**

The planning team made a concerted effort to fully engage members of the college community throughout the planning process. Administrators, faculty, and staff participated in formal interviews with the goal of understanding and prioritizing the



academic and space needs for all departments affected by the renovation of the Natural Sciences Building. The information gathered during the interviews, as well as from the Steering Committee, formed the basis for the space programs. Other factors that were considered include programmatic requirements, institutional priorities, functional adjacencies, funding opportunities, and the overall project budget. These factors led to the development of three space programs.

The first (STEM Building - Full Program) includes all academic programs currently located in the Natural Sciences Building, Mathematics, Computer/Information Science, Innovation Center, Sustainability Center, Data Center, and two COIL (Collaborative Online International Learning) Classrooms. The second (Science Building - Full Program) includes only the programs in the Natural Sciences Building. The final space program (Science Building - Core Program) includes only spaces that were deemed essential to the academic mission of the College:

## Concept Alternatives

The planning team developed multiple phasing strategies and renovation options for the Natural Sciences Building. The goal of each was to provide the academic departments located in the building with appropriate space, establish parameters for future growth, and determine the most effective way to complete the work.

Department	STEM Building	Science Building	Science Building
	Full Program	Full Program	Core Program
Biological Sciences	22,810	22,810	21,900
Chemistry/Physics	28,560	28,560	27,770
Public Health	5,540	5,540	4,390
STEP/CSTEP	1,340	1,340	1,340
Mathematics/Computer & Information Science	25,500	0	0
Innovation Center	5,160	0	0
Sustainability Center	2,560	0	0
Data Center	2,500	0	0
COIL Classrooms	2,400	0	0
Other Departments	11,370	11,370	8,060
<b>TOTAL NASF</b>	<b>107,740</b>	<b>69,620</b>	<b>63,460</b>

Figure 1.1: Space Programs

## Final Recommendation

Once the preferred concept alternative was selected by the Steering Committee, the final concepts were developed based on the Science Building - Core Program. The first concept includes an addition to the Natural Sciences Building and full renovation of the existing building. The addition will be constructed before the renovations, therefore, swing space will only be required for faculty and staff offices. The total cost of this option, including the addition and full renovation of the existing building, is approximately \$67,351,000.

The second concept includes a phased renovation of the Natural Sciences Building in order to maintain a portion of the interdisciplinary lab during all phases of construction. Since an addition is not included in the scope of work, swing space will be required. The total cost of this option is approximately \$36,627,000. A premium of 2.5 percent was added to the project cost for phasing the work. Each concept is shown on the following pages. Detailed cost estimates are included in the appendices of this report.

# Concept 1: Addition and Renovation

Lower Level



Figure 1.2: Concept 1 - Lower Level

Legend	Research Labs	Lab Service
<div></div> Research Labs	6 Research Labs <ul style="list-style-type: none"><li>• 18 Researchers</li><li>• 240 NSF/Researcher</li></ul>	Support Space 900 NSF
<div></div> Lab Service	1 Research Office (Bullpen) <ul style="list-style-type: none"><li>• 25 Research Assistants</li><li>• 1.4 Research Assistants/Researcher</li></ul>	Chemical Storage 250 NSF
<div></div> Research Assistants	Nuclear Magnetic Resonance Lab	Radioactive Storage 250 NSF
<div></div> Other		General Storage 260 NSF
		Other
		Resource Room 600 NSF
		Teaching Institute 400 NSF

# Concept 1: Addition and Renovation

## First Floor

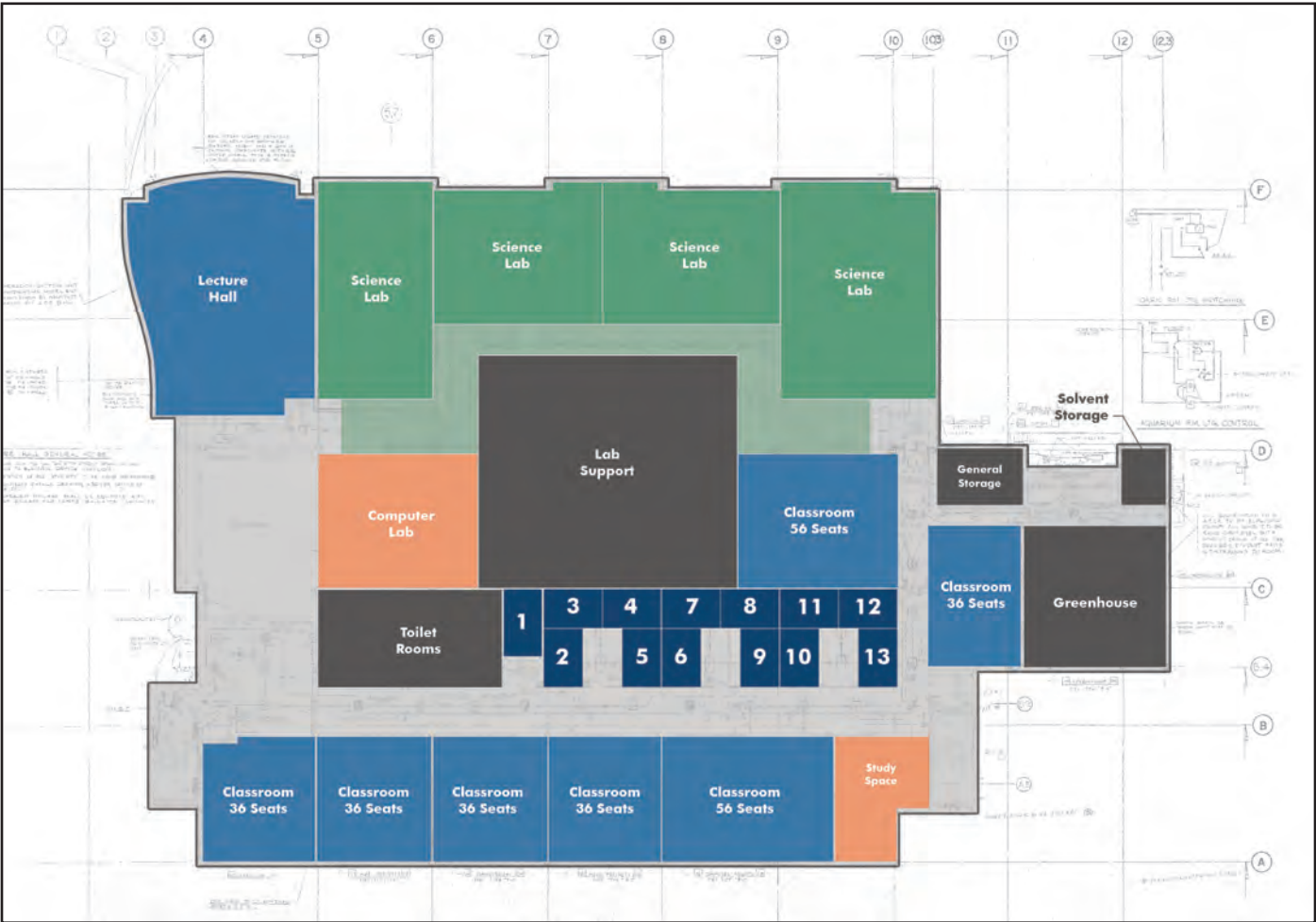


Figure 1.3: Concept 1 - First Floor

<b>Legend</b> <ul style="list-style-type: none"> <li>Classrooms</li> <li>Class Labs</li> <li>Support Space</li> <li>Faculty/Staff Offices</li> <li>Other</li> </ul>	<b>Instructional Space</b> <ul style="list-style-type: none"> <li>Lecture Hall 2,300 NSF</li> <li>Classrooms 6,470 NSF</li> <li>Science Labs 6,050 NSF</li> </ul>	<b>Support Space</b> <ul style="list-style-type: none"> <li>Lab Service 3,635 NSF</li> <li>Lab Offices 320 NSF</li> <li>Greenhouse 880 NSF</li> </ul>
	<b>Faculty/Staff Offices</b> <ul style="list-style-type: none"> <li>13 Faculty/Staff Offices               <ul style="list-style-type: none"> <li>13 Interior Offices</li> <li>120 NSF/Office</li> </ul> </li> </ul>	<b>Other</b> <ul style="list-style-type: none"> <li>Student Lounge 1,000 NSF</li> <li>Computer Lab 1,260 NSF</li> <li>Study Space 600 NSF</li> </ul>

# Concept 1: Addition and Renovation

## Second Floor

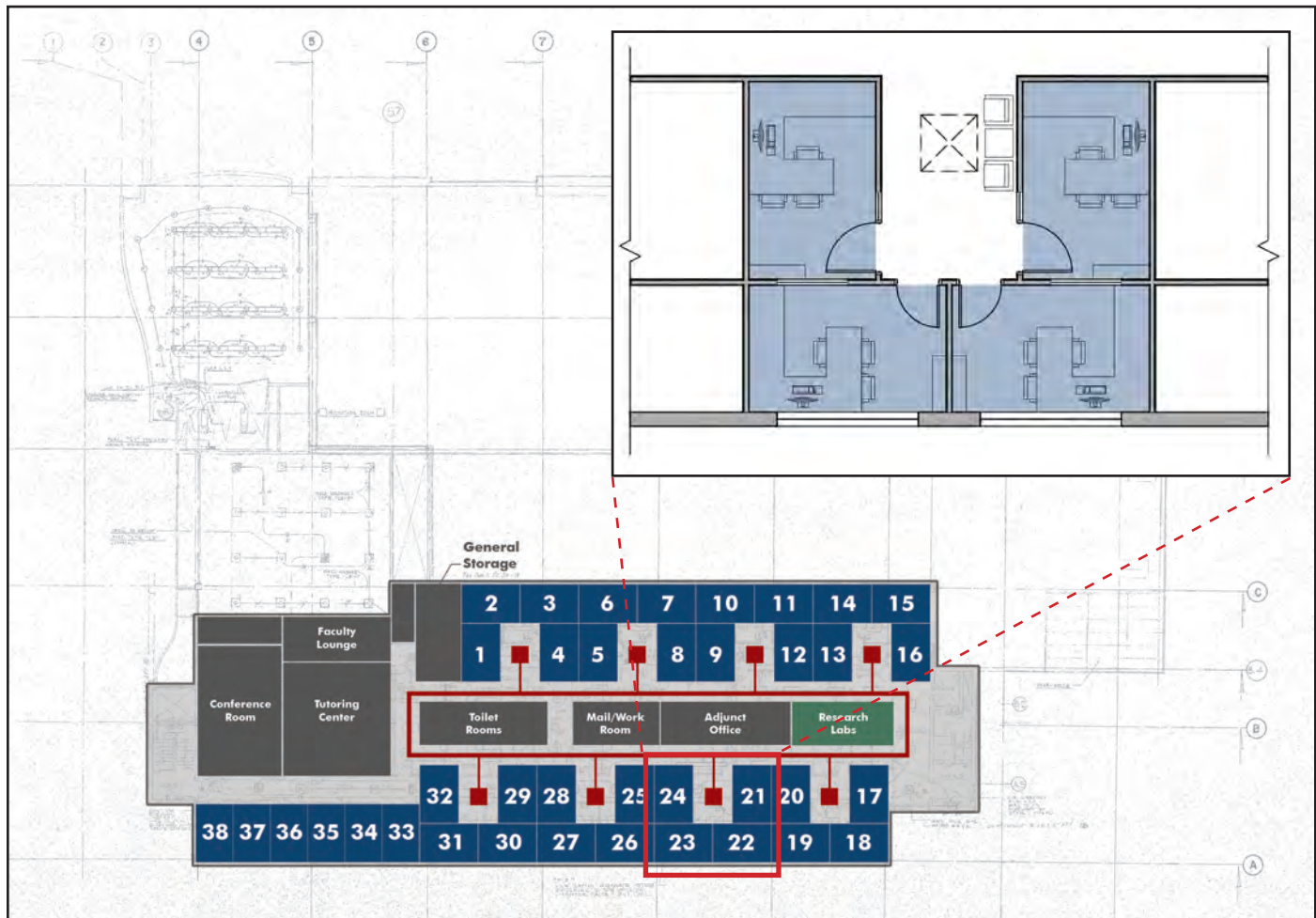


Figure 1.4: Concept 1 - Second Floor

Legend

Faculty/Staff Offices

Support Space

Research Labs

Faculty/Staff Offices

38 Faculty/Staff Offices

• 22 Perimeter Offices

• 16 Interior Offices

• 120 NSF/Office

Support Space

Conference Room400 NSF

Tutoring Center640 NSF

Adjunct Office320 NSF

Faculty Lounge240 NSF

Work/Mail Room200 NSF

General Storage400 NSF

Research Labs

Public Health300 NSF



## Concept 2: Phased Renovation

Lower Level (Phase 1)



Figure 1.5: Concept 2 - Lower Level (Phase 1)

Legend	
<span style="display:inline-block; width:15px; height:15px; background-color:darkgreen;"></span>	Research Labs
<span style="display:inline-block; width:15px; height:15px; background-color:darkgrey;"></span>	Lab Service
<span style="display:inline-block; width:15px; height:15px; background-color:purple;"></span>	Research Assistants
<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span>	Vivarium

Research Labs	
6 Research Labs	
• 18 Researchers	
• 240 NSF/Researcher	
1 Research Office (Bullpen)	
• 20 Research Assistants	
• 1.1 Research Assistants/Researcher	
Nuclear Magnetic Resonance Lab	

Lab Service	
Support Space	900 NSF
Chemical Storage	250 NSF
Radioactive Storage	250 NSF
General Storage	260 NSF

Vivarium	
Vivarium	200 NSF
Animal Quarters	640 NSF
Surgical Suite	240 NSF
Food Prep	100 NSF
Wash Room	100 NSF

# Concept 2: Phased Renovation

First Floor (Phase 1)

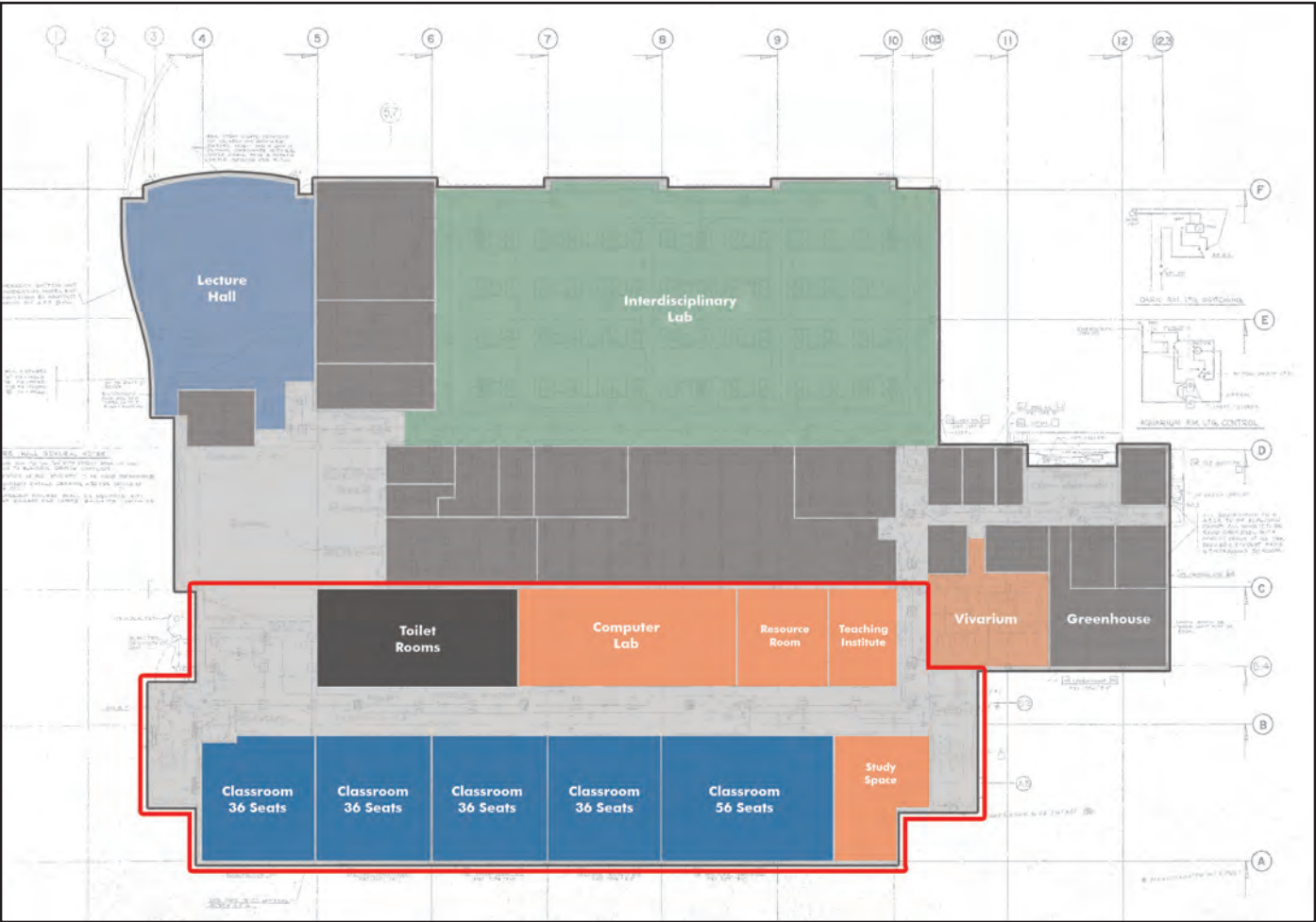


Figure 1.6: Concept 2 - First Floor (Phase 1)

Legend	
<div></div>	Classrooms
<div></div>	Class Labs
<div></div>	Support Space
<div></div>	Other

Instructional Space	
Classrooms	4,420 NSF

Support Space	
Computer Lab	1,260 NSF
Resource Room	600 NSF
Teaching Institute	400 NSF
Study Space	600 NSF

# Concept 2: Phased Renovation

First Floor (Phase 2)

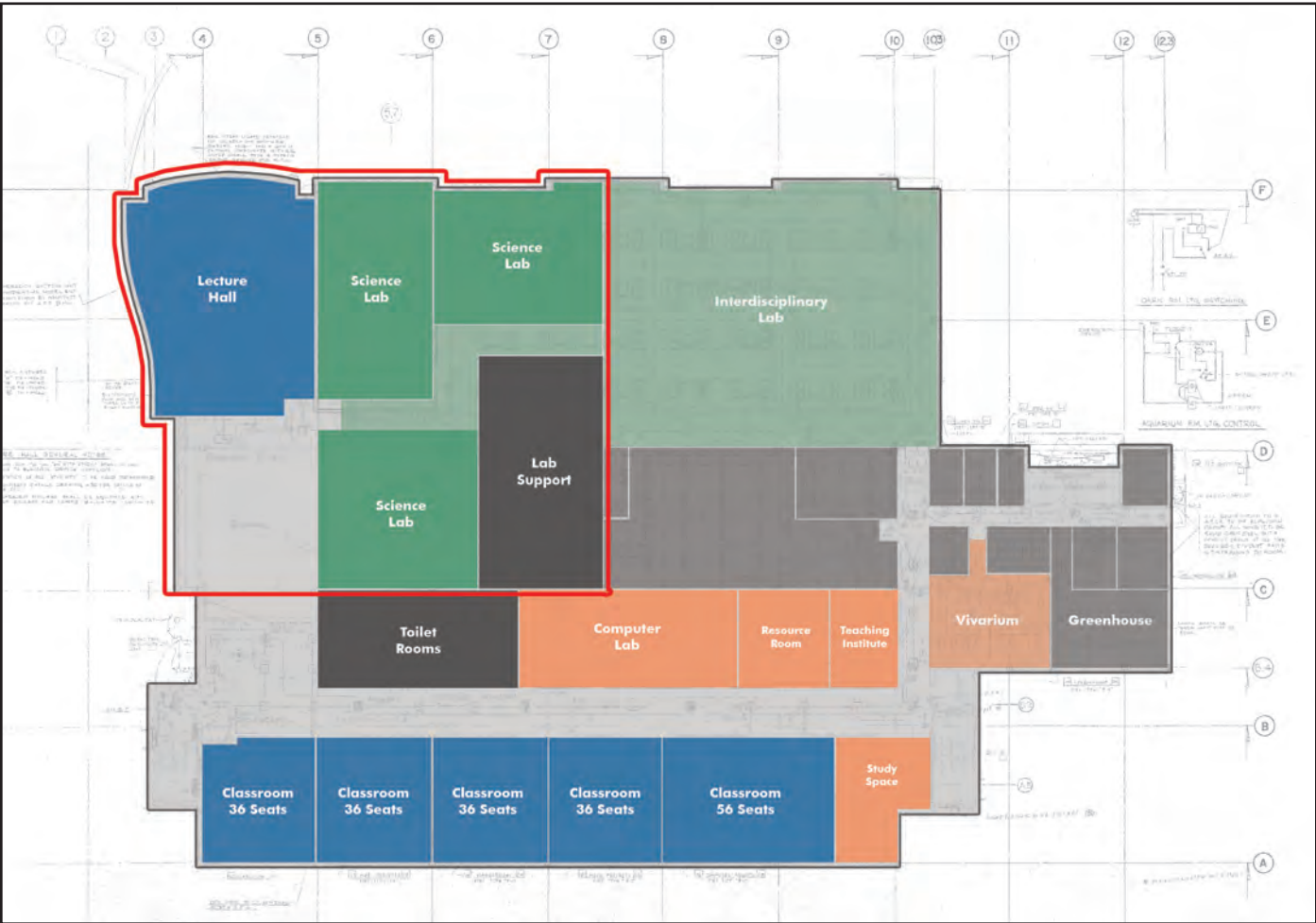


Figure 1.7: Concept 2 - First Floor (Phase 2)

<div> <b>Legend</b> <div> <div>Classrooms</div> <div>Class Labs</div> <div>Support Space</div> <div>Other</div> </div> </div>	<div> <b>Instructional Space</b> <div> Lecture Hall2,300 NSF Classrooms4,420 NSF Science Labs4,200 NSF </div> </div>	<div> <b>Support Space</b> <div> Lab Service1,600 NSF Lab Offices320 NSF </div> </div>
		<div> <b>Other</b> <div> Student Lounge1,000 NSF Computer Lab1,260 NSF Resource Room600 NSF Teaching Institute400 NSF Study Space600 NSF </div> </div>

# Concept 2: Phased Renovation

First Floor (Phase 3)

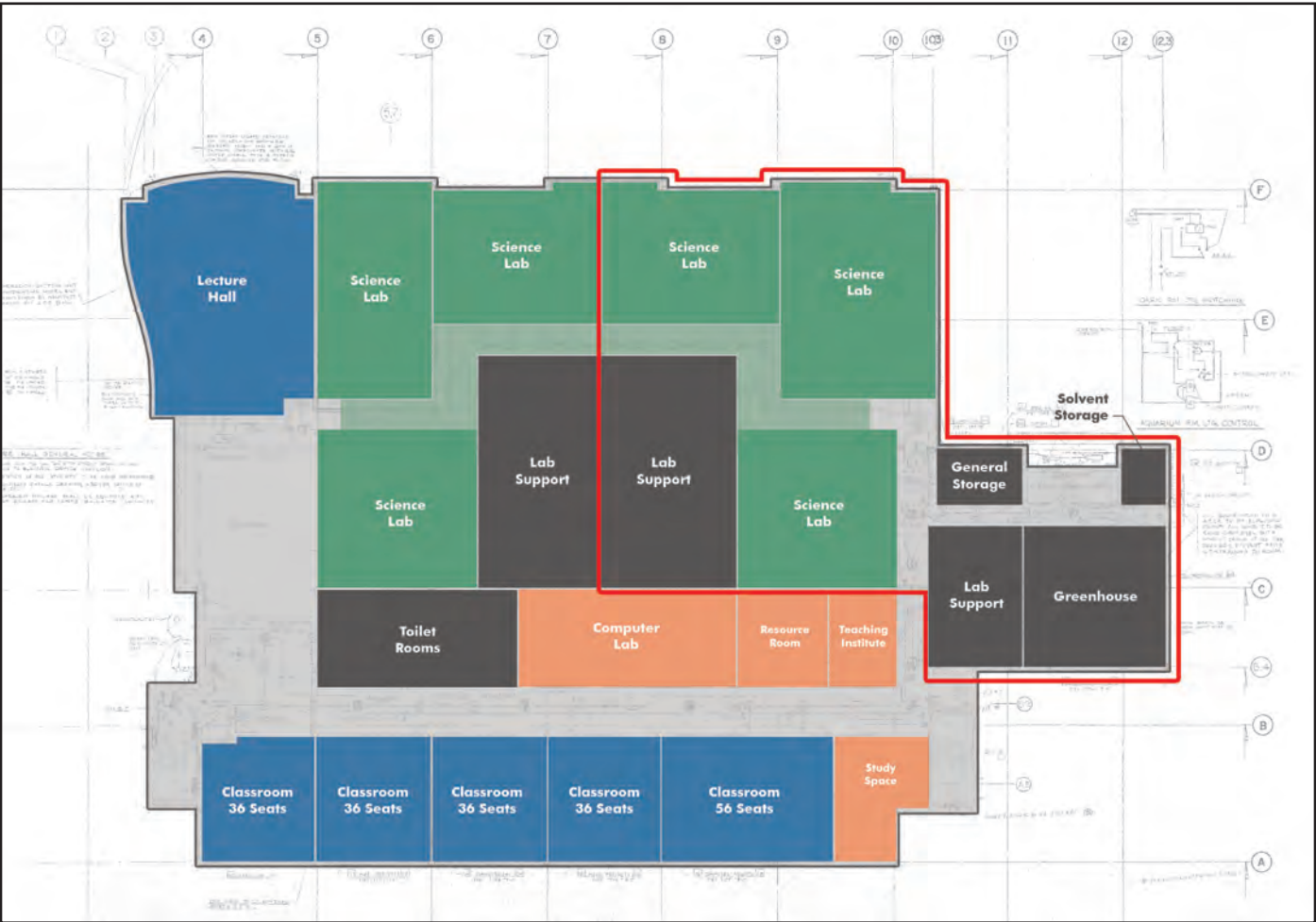


Figure 1.8: Concept 2 - First Floor (Phase 3)

Legend		Instructional Space		Support Space	
<div></div>	Classrooms	Lecture Hall	2,300 NSF	Lab Service	4,475 NSF
<div></div>	Class Labs	Classrooms	4,420 NSF	Lab Offices	320 NSF
<div></div>	Support Space	Science Labs	8,850 NSF	Greenhouse	880 NSF
<div></div>	Other				

Other	
Student Lounge	1,000 NSF
Computer Lab	1,260 NSF
Resource Room	600 NSF
Teaching Institute	400 NSF
Study Space	600 NSF



# Concept 2: Phased Renovation

Second Floor (Phase 1)

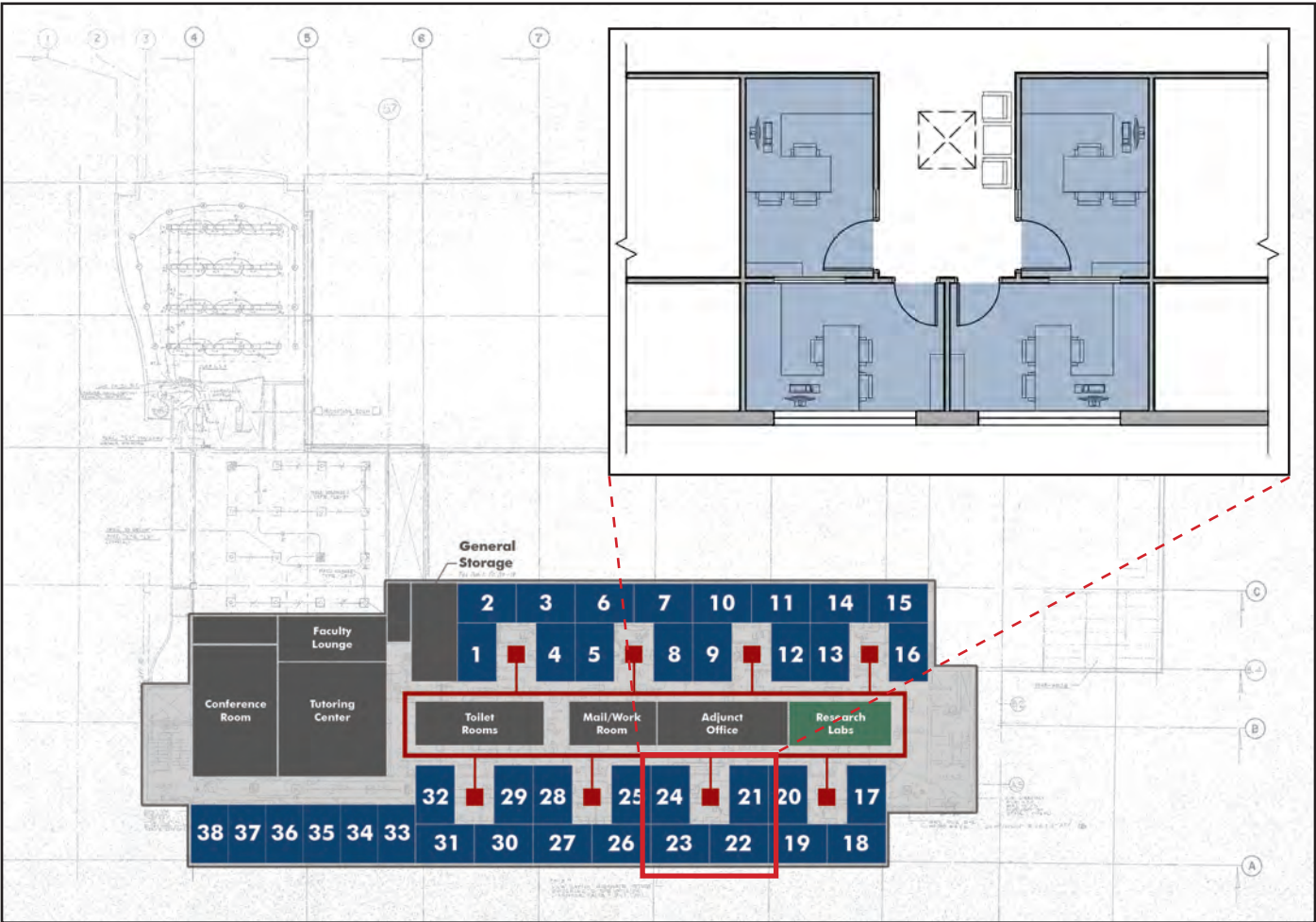


Figure 1.9: Concept 2 - Second Floor (Phase 1)

Legend	
	Faculty/Staff Offices
	Support Space
	Research Labs

Faculty/Staff Offices	
38 Faculty/Staff Offices	
• 22 Perimeter Offices	
• 16 Interior Offices	
• 120 NSF/Office	

Support Space	
Conference Room	400 NSF
Tutoring Center	640 NSF
Adjunct Office	320 NSF
Faculty Lounge	240 NSF
Work/Mail Room	200 NSF
General Storage	400 NSF

Research Labs	
Public Health	300 NSF



# *Academic Program Assessment*

## **Introduction**

The space programs used to develop the design concepts and phasing strategies were based on information gathered during the steering committee meetings and academic programming interviews. They represent the current and projected space needs of all academic programs currently located in the Natural Sciences Building, as well as programs that could be relocated to the building to create a STEM facility.

## **Academic Programming Interviews**

The planning team made a concerted effort to fully engage members of the college community throughout the planning process. Administrators, faculty, and staff participated in formal interviews with the goal of understanding and prioritizing the academic and space needs for all departments affected by the renovation of the Natural Sciences Building.

### **Patrick O'Sullivan Provost, Senior Vice-President for Academic Affairs**

Meeting Date: 23 June 2015

Time: 9:00 AM

Location: New Academic Building 2034

#### ***Enrollment***

- Enrollment is currently 4,500 students. Because it is difficult for smaller colleges with fewer academic programs to adjust to fluctuations in the economy, the College plans to grow enrollment to 5,500 students and offer additional academic programs.
- Target enrollment projections have been submitted to SUNY. The College anticipates 2.5 percent growth overall per year. Provost O'Sullivan will send Ray Maggiore enrollment projections for the consultant's use by Tuesday, June 30.
- The College is making an effort to increase online and hybrid courses.
- The fastest growing academic disciplines include:
  - Biology
  - Data Analytics
  - Forensic Accounting
  - Healthcare Management
  - Public Health

#### ***Academic Programs***

- The College would like to grow enrollment in graduate programs and hopes to have 500-600 graduate students by 2018.
- Public Health is expected to grow and will be accredited by 2017.



Natural Sciences Building



Science Lab S102



Greenhouse

- The following academic programs are currently in development:
  - Data Analytics, MS (2016)
  - Environmental Science, BS
  - Environmental Studies, BS
  - Forensic Accounting, MS (2016)
  - Healthcare Management (2016)
  - Quantitative Social Science Research, MS
  - Hispanism, BA (2016)
  - Economics, BS (2016)
  - Physics, BS
  - Adolescent Special Education, MS
  - Bioinformatics, MS
  - Literacy, MS
  - Professional Special Education, MS
  - Speech Pathology, MS (related to special education)
- Old Westbury is considering the possibility of starting a Physician's Assistant program in conjunction with SUNY Stony Brook.
- The College does not have sufficient space to adequately accommodate all of the proposed programs in the New Academic Building (NAB). Additional space will be required elsewhere on campus. If Math and Computer Science move into an addition to the Natural Sciences Building (NSB), then space will become available in the New Academic Building and Library for new programs and expanded services for students.

### ***Research Institutes***

- The proposed addition should include dedicated space for research institutes.
- George Stefano (former director of the Neuroscience Research Institute - NRI) started a company and took several researchers and students off campus. The College should investigate SUNY requirements for establishing incubators on campus. Providing space for future start-ups at SUNY Old Westbury might encourage faculty, staff, and students to remain connected with the College. The presence of start-up companies doing cutting-edge research on the campus could attract research faculty and graduate students to SUNY Old Westbury.
- The NRI database that Professor Stefano developed belongs to SUNY Old Westbury. The College is considering leasing the data to other institutions for research purposes. As a result, Patrick Cadet (new director of the NRI) will require a wet lab and office space in the NSB.

### ***Research Space***

- Additional science faculty who conduct research are needed to help grow graduate programs. Providing research labs for all research faculty is vitally important to attract and keep talented people.
- The Psychology department plans to hire faculty who are interested in research with a biological focus. Research space for these faculty should ideally be provided in the NSB.
- The NSB should include bullpen-type office space for graduate students. This space should ideally be located near research labs.
- Dr. Manya Mascareno is conducting cutting-edge research related to prostate cancer. She will require a dedicated wet lab for her work.

### ***Other***

- The collocation of Mathematics, Computer & Information Science, and electronic media programs in NSB would result in a STEAM Building (Science, Technology, Engineering, Arts, and Math).

## **Barbara Hillery**

### **Dean of School of Arts and Sciences**

Meeting Date: 29 April 2015

Time: 11:30 AM

Location: Campus Center H200

#### ***Instructional Space***

- SUNY Old Westbury is focused on encouraging strong connections between students and faculty by limiting class sizes. Enrollment in lecture courses should be limited to 50 students. Those students would then be distributed into two lab sections of no more than 25 students each.
- Some faculty like to teach in Science Lab S102 because it has high ceilings and natural light (it is not claustrophobic). Some faculty do not like it because the lab is too noisy.
- Science Lab S102 was originally designed to promote collaboration between disciplines. This type of collaboration is important, but rarely occurs in the lab.
- Academic programs currently housed in the building need a minimum of four instructional labs. Five labs would be ideal and should be provided in the new/renovated facility.
- The greenhouse would be used for instruction if it had climate controls.
- The lack of student lockers is a major concern, especially for students taking organic chemistry. When the instructional labs are renovated, lockers should be built into the lab casework.

#### ***Research Institutes***

- The faculty member who started the Neuroscience Research Institute (NRI) is no longer with the College. The future of the NRI is uncertain. Some of the space dedicated to the NRI may be available to be repurposed. Dr. Hillery will discuss the space requirements for the NRI with her colleagues.
- The College would like to grow the Institute of Cancer Research (ICARE). In order to grow, the institute will need one research lab and one office.
- The Institute for the Study of Health Disparities does not require space.

#### ***Research Space***

- All research labs are currently assigned. There is not enough faculty research space in the Natural Sciences Building. The new/renovated facility should provide additional research labs and space for shared equipment.
- The vivarium could accommodate more rodents. Aqua Room S127 could be used for frogs.
- Psychology is looking to hire a psychologist with a biological focus. The Natural Sciences Building does not have enough research space to support these new faculty.

#### ***Other***

- Most faculty have lecture courses in the morning and lab courses in the afternoon.
- Irregular course start and stop times often results in poor utilization of instructional space. The College has scheduling software (R25), but does not use it to schedule courses. It is difficult to establish an efficient course schedule without the use of software.
- Dr. Robert Hoyt is phasing into retirement. His departure would result in the availability of two additional faculty offices and additional research space.
- There is no breakage charge for lab glassware.
- If possible, the acid waste pit should be relocated.



## **Fernando Nieto**

### **Biological Sciences Chair**

Meeting Date: 29 April 2015

Time: 12:30 PM

Location: Campus Center H200

#### ***Instructional Space***

- The open architecture of Science Lab S102 provides opportunities for faculty and student interaction.
- Faculty should not be using Science Lab S102 for lecture. To eliminate noise concerns, small lecture rooms should be provided adjacent to the lab, similar to Classroom 102B.
- The College would like to refurbish the greenhouse and use it for instruction.

#### ***Academic Programs***

- The job market for allied health careers will be favorable for the next few years. The College would like to focus on allied health programs, which will directly impact the space needs of Biological Sciences.

#### ***Research Institutes***

- No new faculty lines have been approved for the Institute of Cancer Research or Institute for the Study of Health Disparities.

#### ***Research Space***

- Small individual research labs and shared equipment rooms may work in the new/renovated facility, but some equipment is procured through grants and cannot be shared.
- The vivarium is adequate for current research, but may need to be expanded in the future.
- Ideally, the vivarium would be located near the research labs, but its current location is not a major concern.
- A surgical suite for researchers working with animals should be provided adjacent to the vivarium in the new/renovated facility.
- The College will provide a list of all faculty who conduct research.
- JMZ will provide information on research modules at the next Steering Committee Meeting.

#### ***Other***

- Learning communities are very important!
- Library S225 could be repurposed, but storage space would need to be provided for the periodicals currently housed in the library.
- Office S114 houses one NRI faculty.
- S229 is a tutoring room for STEP and CSTEP.

## **Martha Livingston Public Health Chair**

Meeting Date: 29 April 2015

Time: 1:30 PM

Location: Campus Center H200

### ***Instructional Space***

- Public Health is not lab based, but lab space would be required for environmental and occupational safety programs.
- Lecture Hall S100 should have no more than 75 to 100 seats. It currently has too many seats and feels uncomfortable.
- Conference Room S230 is used for some Public Health courses, but is not scheduled through the Registrar.

### ***Academic Programs***

- Public Health has grown from a program with two full-time faculty and 40 majors (within Biology) in 2004 to a separate department with three full-time faculty, one visiting faculty, and 187 majors. The department expects to hire two additional full-time faculty (one this fall and searching for one more) and offer 207 majors by 2019. The department would like to hire one or two more full time faculty, for a total of six or seven faculty.
- The amount of space currently allocated to Public Health is insufficient and will limit the growth of the program.
- Public Health is expected to continue to grow, largely due to growth in Allied Health.
- Overall, College enrollment is expected to grow by up to 14 percent per year. The largest percentage of this growth is anticipated to be in STEM Programs. The goal of the strategic plan is to grow to 5,000 students.

### ***Research Institutes***

- The Institute for the Study of Health Disparities is a new, campus-wide, multi-disciplinary research institute. It will need dedicated space, but the type of space has not yet been determined.
- A resource room could be created to provide space and a “front door” for all research institutes housed in the Natural Sciences Building. This would provide new institutes with a presence on campus until they were established enough to warrant dedicated space.

### ***Research Space***

- Public Health students do field research and small group research. They currently use Tutoring Room S229 and Conference Room S230, but the space is not ideal.
- The Senior Research Group needs a meeting space. There are currently 60 students that meet in groups of six students. Group study space is being created in the library, but collaborative space should also be included in the new/renovated facility.

### ***Other***

- Faculty offices without windows (inner offices) are not adequate. All faculty offices should have operable windows.
- S112 is an adjunct office with four (4) workstations that is used by all departments in the building. The College will provide the total number of adjuncts for each department.
- S113 was a student study space that was absorbed into Classroom S111.

**Evan Kobolakis**  
**Chief Information Officer**

Meeting Date: 29 April 2015  
Time: 2:30 PM  
Location: Campus Center H200

***Instructional Space***

- An active learning space with telepresence technology should be created for Collaborative Online International Learning (COIL) courses. These types of courses provide an opportunity for SUNY Old Westbury to partner with other higher education institutions, as well as expose faculty and students to cultures and ideas from around the world.
- The new facility (addition) should include an Innovation Lab that supports academic programs, continuing education, community organizations, and outside businesses. It should be an interdisciplinary space that is open during the week and on the weekends. It should be similar to the 15,000 SF lab at SUNY New Paltz and include spaces for CISCO networking programs, visualization, and application development. It would also be home to the Microsoft Academy and contain 3D printers, maker spaces, meeting rooms, and have its own cloud. A dedicated network and data closet should be provided for increased security.

***Academic Programs***

- A Master of Environmental Science Degree is currently being developed.

***Research Institutes***

- The creation of a shared resource room for all institutes located in the Natural Sciences Building is a good idea.
- The Institute of Social Justice and Sustainability focuses on the creation and development of sustainable concepts and ideas. The new facility (addition) should include a lab to test environmental technology, such as sustainable materials. In addition to the lab, a dedicated computer lab and storage space would be required.

***Research Space***

- High speed computing that supports data intensive operations, such as connecting to gene analyzers at Mount Sinai, is required for research. This type of computing will require a dedicated data closet.

***Other***

- The College would like to brand Old Westbury as an environmental campus. "The Greenest School in New York." The College should be a model for the community on all things sustainable. A green roof on the new facility (addition) should be considered.
- A new data center will be located in the new facility (addition).

## **Judith Lloyd**

### **Chemistry and Physics Chair**

Meeting Date: 30 April 2015

Time: 9:30 AM

Location: Campus Center H200

#### ***Instructional Space***

- Lecture Hall S100 is used for final exams (25 students).
- Interdisciplinary collaboration is important, but no one at the College will be pushing to keep a large, interdisciplinary lab. New science labs should have 24 stations, access to computers, access to natural light, and be large enough to not feel “cramped.”
- General Chemistry courses typically use five double fume hoods in Science Lab S102. Organic Chemistry, however, sometimes requires all ten double hoods. The College should consider repairing existing ventilation snorkels, so some of the hoods can be taken off-line during construction.
- Physics Lab S110 is only scheduled 10 hours per week. Analytical Chemistry and Biological Chemistry do not require fume hoods and could temporarily move to the Physics Lab to facilitate renovations.
- If necessary, the number of classrooms in the Natural Sciences Building could be reduced and some classes could move to underutilized classrooms in the New Academic Building.
- Storage rooms associated with first floor classrooms are not heavily used and could be eliminated.
- The following chemical/supply storage spaces are located in the building:
  - S024: Inorganic Solids
  - S030: Glass
  - S128: Solvents (at loading dock)
  - S129: Organic Solids
- Lab storage areas could be purged and infrequently used items could be stored in another building (possibly at Central Receiving) to reduce the amount of storage space required in the Natural Sciences Building. The College will provide a list of the total amount of prep and storage space required in the new/renovated facility.

#### ***Research Space***

- All chemistry faculty (except Duncan Quarless) share research space with another researcher.
- The College should consider allocating research space using scalable research modules, but some research is not compatible and will need a separate lab.
- S001 is a shared instrument room, but there is not enough space for all of the required equipment. A larger, shared equipment room should be provided.

#### ***Other***

- Break Room S115, Tutoring Room S229, and Conference Room S230 are underutilized.
- Four full-time faculty will retire in the next five years. The College anticipates filling three of those positions. In the short term, additional faculty offices will be required to accommodate new and retiring faculty. In the long term, the additional offices will provide space for future growth.
- The summer schedule is very busy – there is no “off-season” to better accommodate the renovations.
- Enrollment projections will be available the first week of June and provided by the College.



## **Duncan Quarless**

### **Associate Professor of Chemistry and Physics**

Meeting Date: 30 April 2015

Time: 12:00 PM

Location: Campus Center H200

#### ***Instructional Space***

- In addition to scheduled instruction, Science Lab S102 is used for the following:
  - Student Research
  - STEM Education Research (sponsored program for 30 students)
  - Pre-Collegiate Students (secondary students; generally on Saturdays)
  - SMART Scholars
- There is no space in the Natural Sciences Building for the Teaching Institute, which overlaps with the SMART and STEP programs. A dedicated teacher prep space with ten workstations and computers should be provided. This space could be within an instructional lab. Special equipment would be located at designated lab stations. Students would use laptop computers.

#### ***Academic Programs***

- The Biochemistry Degree, established five years ago, is very popular and growing.
- The College is developing the School of Professional Studies. A dedicated lab for pre and inservice teachers should be provided in the new facility (addition).

#### ***Research Space***

- Duncan Quarless is the campus contact for sponsored programs and the SUNY Applied Learning Campus Group. In the sciences, applied learning is in research.
- Existing research labs do not adequately support student research. Students use S102, S102A, and S102C (with support from technical staff) to conduct research.

#### ***Other***

- The STEP and CSTEP programs include peer tutoring and mentorship.
- The Tutoring Center is important for retention and growth. The space should support group activities and individual tutoring. It should include a large, open tutoring area and several small group study rooms. It should be equipped with computers and Wi-Fi.
- Peer tutors work in the Tutoring Center on a regular basis. Staff would also like to hire professional tutors.

## **Geta Techanie**

### **Mathematics, Computer and Information Science Chai**

Meeting Date: 30 April 2015

Time: 1:30 PM

Location: Campus Center H200

#### ***Instructional Space***

- Once renovations are complete, a large portion of the Library will be dedicated to Mathematics. The Powertrack Lab (college algebra) currently occupies one-third of the space on the main floor and three classrooms on the third floor will be dedicated to the department. The Math Learning Center is also scheduled to go into the Library.
- There are three math computer labs (0109, 0111, and 3104). More computer labs will be needed as the program continues to grow.
- Math computer labs should have 40 stations.
- If Mathematics, Computer and Information Science moves to the new/renovated facility, the spaces currently in the Library and New Academic Building could be returned to the Library and/or be used for student support. The following additional spaces are needed:
  - Two Data Analytics Labs (Computing and Networking)
  - Isolation Rooms to work with malware, etc.
  - Lab Manager Office
  - Powertrack Coordinator Office
  - Learning Center Coordinator Office
  - Data Center

#### ***Academic Programs***

- Mathematics is expected to grow six percent per year.
- Management Information Systems is expected to grow five percent per year.
- Computer and Information Science is expected to grow 12 percent per year.
- Data Analytics will be a new academic program.
- Mathematics offers a significant number of service courses.

#### ***Research Space***

- The department would like labs for computational research where faculty and students can work together.




#### ***Other***

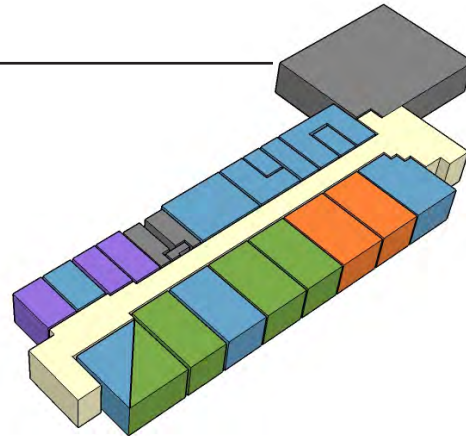
- Mathematics courses (major) are capped at 30 students.
- Services courses (such algebra and calculus) are capped at 35 students.
- The department does not have enough faculty offices. Three full-time faculty (two mathematics and one computer science) will be starting in fall 2015 and there are currently no available offices.
- It was reported that 60 percent of mathematics courses are taught by adjunct faculty. The department would like to reduce the number of courses taught by adjunct faculty to 45 percent.
- The department requires access to high-speed computing.

# Existing Space Allocation






Floor plans showing departmental use of the Natural Science Building are shown below. The lower level consists primarily of research space for Biological Sciences and Chemistry/Physics. The first floor includes a tiered lecture hall, physics lab, interdisciplinary lab, and five general classrooms. The vivarium and greenhouse are located on the east end of the building adjacent to the loading dock. Faculty offices and academic support space is located on the second floor.

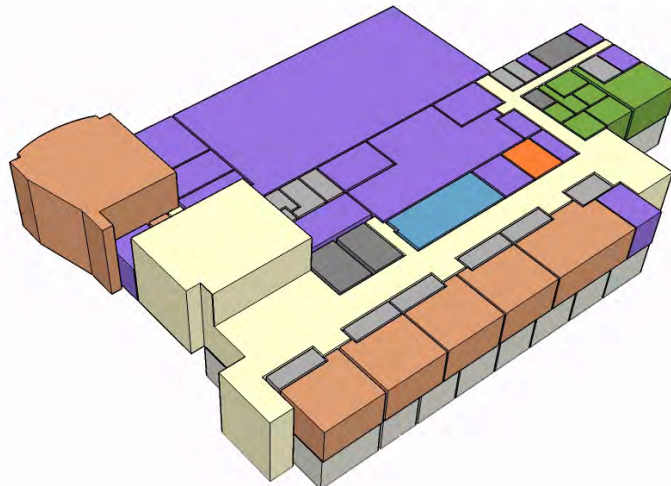
## Existing Lower Level

	<b>Biological Sciences</b> 2,071 NASF
	<b>Chemistry/Physics</b> 3,986 NASF
	<b>NRI</b> 1,209 NASF
	<b>Shared Spaces</b> 760 NASF





## Existing First Floor

	<b>Biological Sciences</b> 1,335 NASF
	<b>Chemistry/Physics</b> 842 NASF
	<b>NRI</b> 296 NASF
	<b>General Classrooms</b> 6,567 NASF
	<b>Shared Spaces</b> 15,854 NASF



## Existing Second Floor

	<b>Biological Sciences</b> 1,650 NASF
	<b>Chemistry/Physics</b> 1,808 NASF
	<b>Public Health</b> 475 NASF
	<b>STEP/CSTEP</b> 764 NASF
	<b>NRI</b> 511 NASF
	<b>MBRS</b> 314 NASF
	<b>Shared Spaces</b> 1,568 NASF

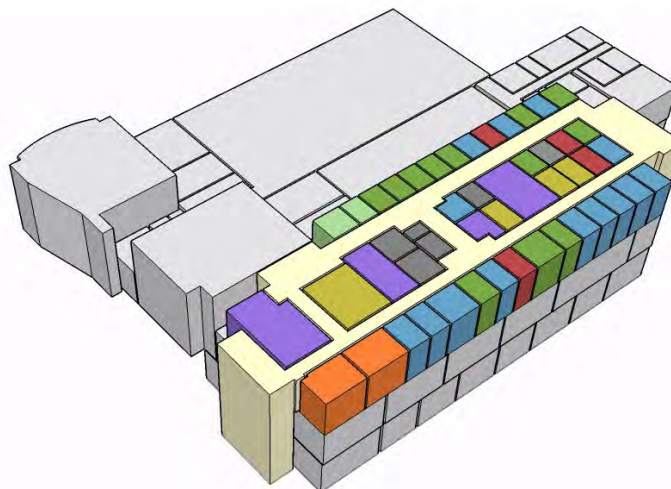


Figure 5.1: Existing Floor Plans

## Enrollment and Space Projections

Headcount projections are used to project the number of faculty and staff that will be required in 2019 and 2024. The projections included the table below (Figure 5.2) were provided by SUNY Old Westbury. They indicate that enrollment in academic programs currently located in the Natural Sciences Building will increase by 77.2 percent over the next ten years. This will result in the need for an additional sixteen faculty and nine staff in 2024.

Department	Existing Fall 2014 Headcount	Projected Fall 2019 Headcount	Projected Fall 2024 Headcount	Percent Change 2014 - 2019	Percent Change 2014 - 2024
Biological Sciences	812	1,023	1,313	26.0%	61.7%
Chemistry/Physics	747	889	1,079	19.0%	44.4%
Public Health	256	459	824	79.3%	221.9%
<b>Sub-Total</b>	<b>1,815</b>	<b>2,371</b>	<b>3,216</b>	<b>30.6%</b>	<b>77.2%</b>
Mathematics	1,565	1,788	2,047	14.2%	30.8%
Computer and Information Science	242	397	681	64.0%	181.4%
<b>Sub-Total</b>	<b>1,807</b>	<b>2,185</b>	<b>2,728</b>	<b>20.9%</b>	<b>51.0%</b>
<b>STEM TOTAL</b>	<b>3,622</b>	<b>4,556</b>	<b>5,944</b>	<b>25.8%</b>	<b>64.1%</b>

Figure 5.2: Headcount Projections

Department	Existing Fall 2014 Faculty	Projected Fall 2019 Faculty	Projected Fall 2024 Faculty	Projected Change 2014-2024
Biological Sciences	12	13	17	5
Chemistry/Physics	11	12	14	3
Public Health	4	7	12	8
<b>Sub-Total</b>	<b>27</b>	<b>32</b>	<b>43</b>	<b>16</b>
Mathematics/Computer and Information Science	11	14	17	6
<b>Sub-Total</b>	<b>11</b>	<b>14</b>	<b>17</b>	<b>6</b>
<b>STEM TOTAL</b>	<b>38</b>	<b>46</b>	<b>60</b>	<b>22</b>

Figure 5.3: Faculty Projections

Department	Existing Fall 2014 Staff	Projected Fall 2019 Staff	Projected Fall 2024 Staff	Projected Change 2014-2024
Biological Sciences	3	4	5	2
Chemistry/Physics	2	3	4	2
Public Health	0	2	3	3
STEP/CSTEP	3	4	5	2
<b>Sub-Total</b>	<b>8</b>	<b>13</b>	<b>17</b>	<b>9</b>
Mathematics/Computer and Information Science	3	4	5	2
<b>Sub-Total</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>2</b>
<b>STEM TOTAL</b>	<b>11</b>	<b>17</b>	<b>22</b>	<b>11</b>

Figure 5.4: Staff Projections



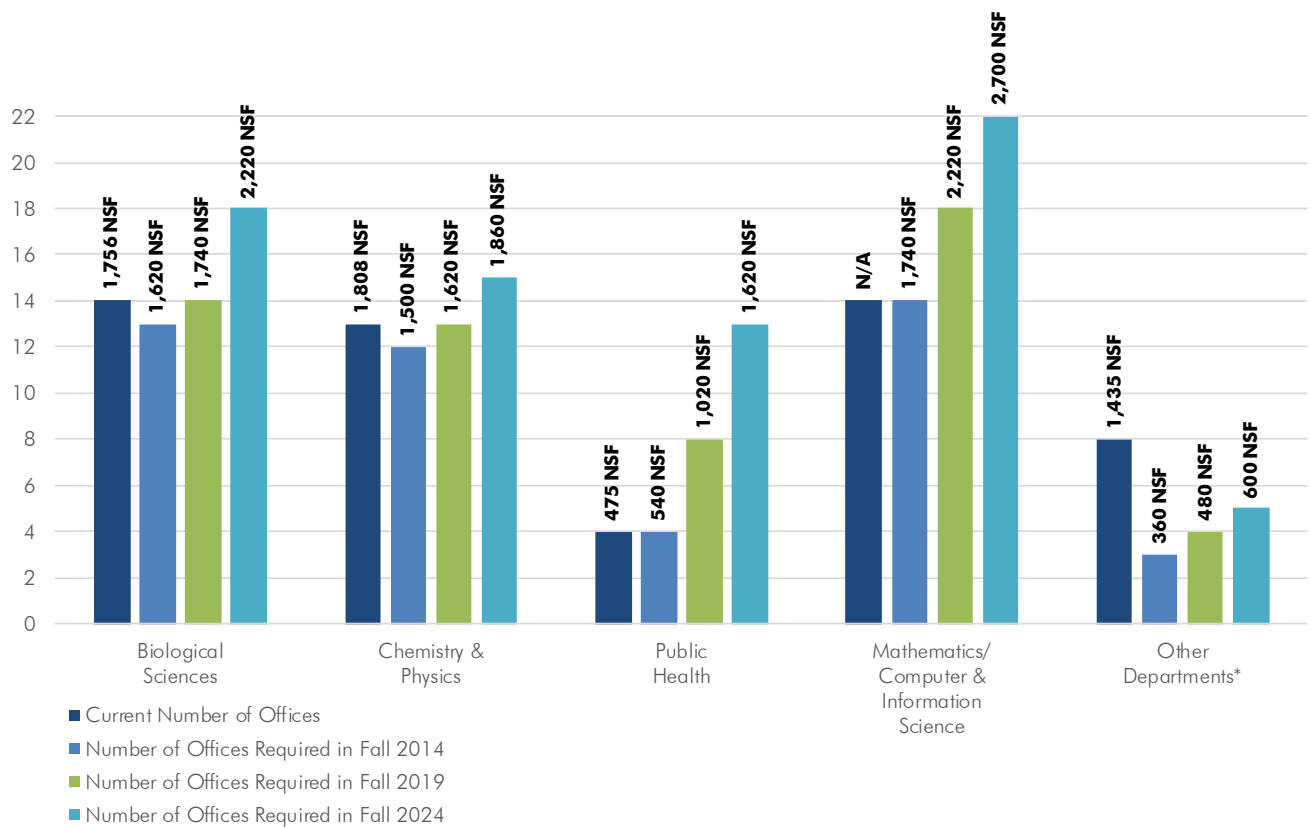
Student Full-Time Equivalent (FTE) projections were also provided by SUNY Old Westbury. They are used to calculate the amount of classroom and class lab space that will be required in 2019 and 2024. Enrollment in academic programs currently located in the Natural Sciences Building is projected to increase 62.6 percent by 2019 and 166.5 percent by 2024 (Figure 5.5). This dramatic increase will result in space deficits in all major space categories. The remaining STEM programs are expected to increase by 42.2 percent by 2019 and 106.5 percent by 2024.

Department	Existing Fall 2014 FTE	Projected Fall 2019 FTE	Projected Fall 2024 FTE	Percent Change 2014 - 2019	Percent Change 2014 - 2024
Biological Sciences	129	190	279	47.3%	116.3%
Chemistry/Physics	113	183	294	61.9%	160.2%
Public Health	68	131	253	92.6%	272.1%
<b>Sub-Total</b>	<b>310</b>	<b>504</b>	<b>826</b>	<b>62.6%</b>	<b>166.5%</b>
Mathematics	381	510	682	33.9%	79.0%
Computer and Information Science	65	124	239	90.8%	267.7%
<b>Sub-Total</b>	<b>446</b>	<b>634</b>	<b>921</b>	<b>42.2%</b>	<b>106.5%</b>
<b>STEM TOTAL</b>	<b>756</b>	<b>1,138</b>	<b>1,747</b>	<b>50.5%</b>	<b>131.1%</b>

Figure 5.5: FTE Projections

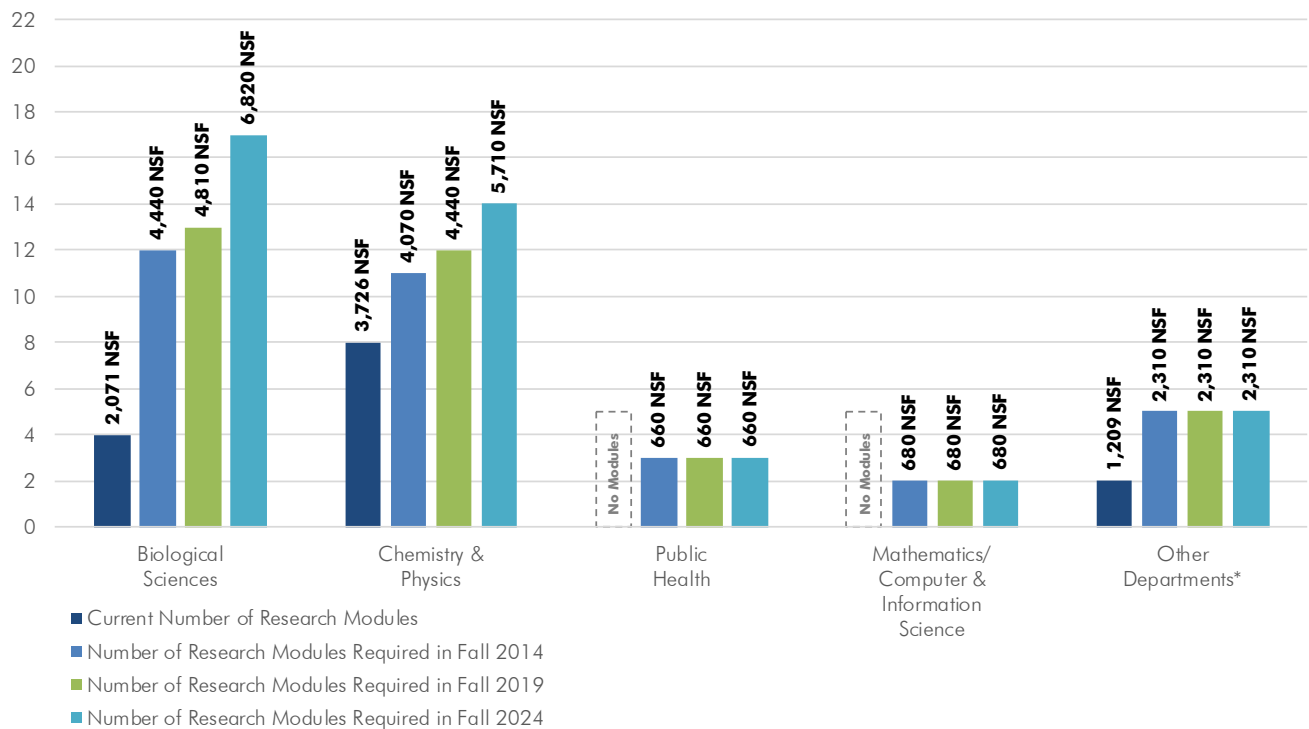
The projected number of faculty and staff was used to determine the number of offices and research modules that will be required in 2019 and 2024. The anticipated enrollment growth will result in the need for an additional 826 NSF of office space, as shown in Figure 5.6 on the following page. The College indicated that all full-time faculty in Biological Sciences and Chemistry/Physics conduct research. Therefore, one research module (370 NSF) was provided for each full-time faculty within these academic departments. Each research module consists of a research lab, office space for research assistants, and support space. The projections indicate that Biological Sciences, Chemistry/Physics, and Public Health will require an additional 4,113 NSF of research space in 2019 and 7,393 NSF in 2024.

If enrollment grows as anticipated, the largest deficit will be in instructional space. In order to support 826 FTE (an additional 516 FTE) in 2024, the academic programs currently located in the Natural Sciences building will need an additional 7,110 NSF of classroom space and 12,740 NSF of class lab space. This is shown in Figures 5.8 and 5.8 on page 5.14. If the College decides to relocate Mathematics and Computer/Information Sciences to the Natural Sciences Building to create a STEM Building, the deficits increase to 11,060 NSF for classrooms and 17,740 NSF for class labs.



\* Includes NRI, MBRS, STEP/CSTEP

Figure 5.6: Academic Support Space Projections



\* Includes NRI, MBRS, Psychology

Figure 5.7: Research Space Projections

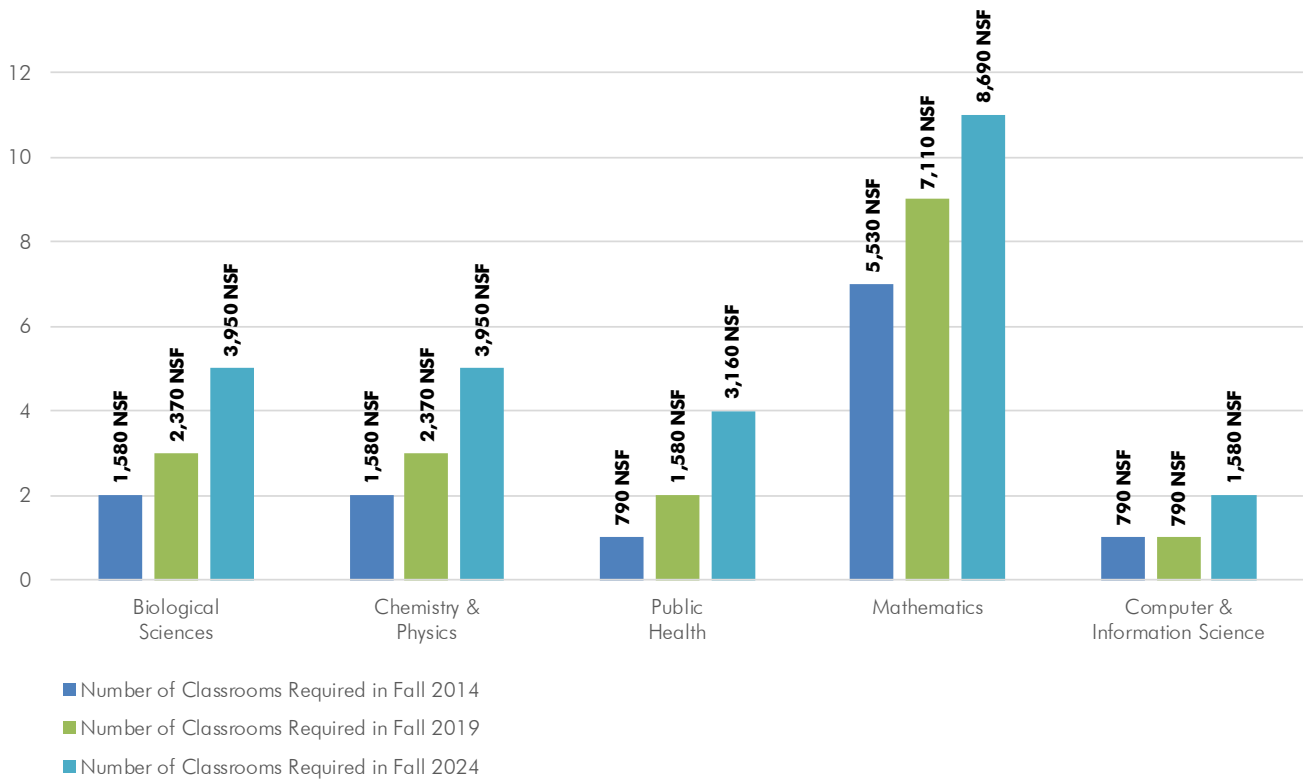
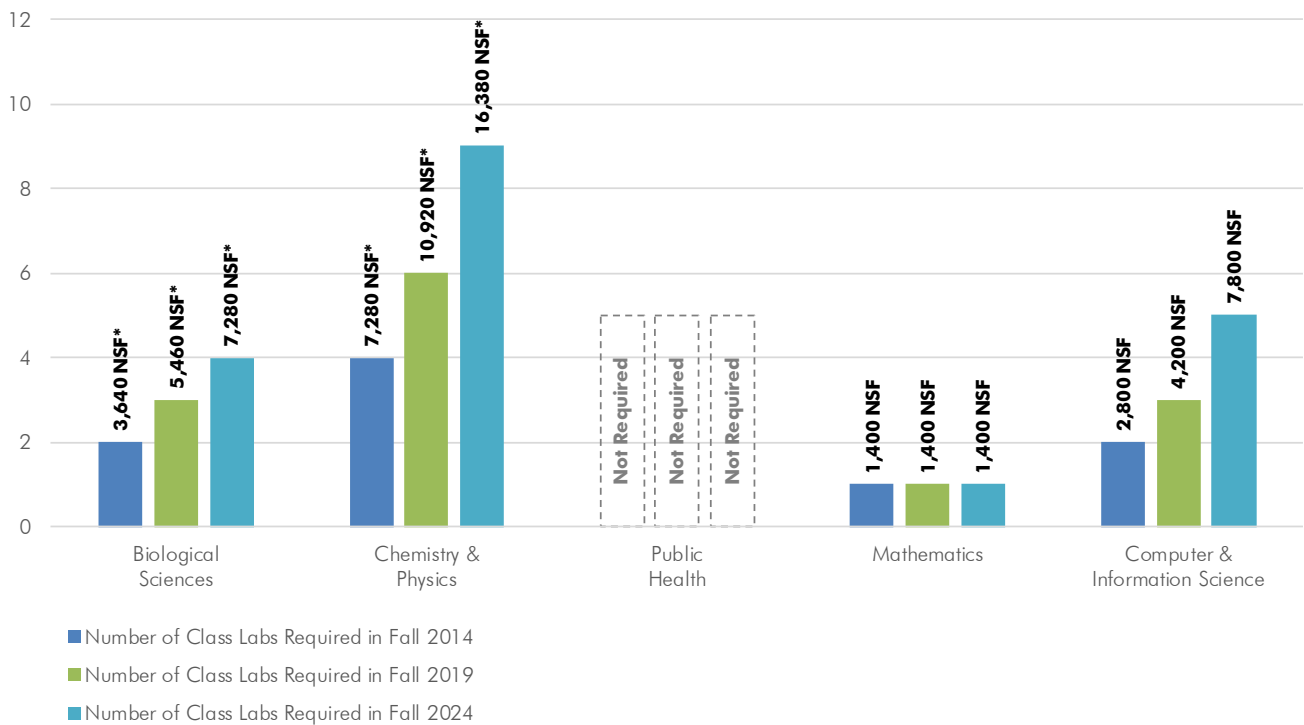


Figure 5.8: Classroom Space Projections



\* Includes Prep Space

Figure 5.9: Class Lab Space Projections

# Space Program

The planning team used the results of the academic programming interviews and space projections to develop a detailed space program for renovations to the Natural Sciences Building. Other factors that were considered include programmatic requirements, institutional priorities, functional adjacencies, funding opportunities, and the overall project budget. Since needs change and priorities shift, the space program should be revisited when the renovation projects are implemented.

The space program for the new STEM Building is summarized in the table below. It includes all of the academic programs currently located in the Natural Sciences Building, as well as Mathematics and Computer/Information Science. The space program also provides space for a new Innovation Center, Sustainability Center, Data Center, and two COIL (Collaborative Online International Learning) Classrooms. Detailed space programs are included in the appendices of this report.

All of the spaces identified in the space program total 107,740 NASF in 2024. Since there is 40,000 NASF available in the Natural Sciences Building, an addition would have to be constructed to accommodate the surplus of required space. Using a grossing factor of 1.7, the addition would be 115,200 GSF and cost approximately \$94,712,000.

Department	Instructional Space			Research Space		Academic Support Space	
	Classrooms	Class Labs	Support Space	Research Labs	Support Space	Offices	Support Space
Biological Sciences	3,950	7,280	1,160	6,820	1,280	2,220	100
Chemistry/Physics	3,950	16,380	300	5,710	260	1,860	100
Public Health	3,160	0	0	660	0	1,620	100
STEP/CSTEP	0	0	0	0	0	600	740
Other Departments	0	0	2,840	2,310	1,400	0	4,820
<b>Sub-Total</b>	<b>11,060</b>	<b>23,660</b>	<b>4,300</b>	<b>15,500</b>	<b>2,940</b>	<b>6,300</b>	<b>5,860</b>
<b>TOTAL NASF</b>							<b>69,620</b>

Department	NASF
Mathematics/Computer & Information Science	25,500
Innovation Center	5,160
Sustainability Center	2,560
Data Center	2,500
COIL Classrooms	2,400
<b>TOTAL NASF</b>	<b>38,120</b>

<b>TOTAL NASF</b>	<b>107,740</b>
NASF in Natural Sciences Building	40,000
NASF in Future Addition	67,740
Grossing Factor	1.7
<b>GSF in Future Addition</b>	<b>115,200</b>

Figure 5.10: STEM Building - Full Program

Since it may not be possible to acquire funding for a 115,200 GSF addition, the planning team looked at ways to reduce the size of the addition. If Mathematics and Computer/Information Science is not relocated to the Natural Sciences Building, a much smaller addition would be required. The full space program for Biological Sciences, Chemistry/Physics, Public Health, STEP/CSTEP, NRI, and MBRS is shown in Figure 5.11. These departments will require 69,620 NASF in 2024. To accommodate all spaces in the space program, a 50,400 GSF addition would be required and cost approximately \$41,437,000.

Department	Instructional Space			Research Space		Academic Support Space	
	Classrooms	Class Labs	Support Space	Research Labs	Support Space	Offices	Support Space
Biological Sciences	3,950	7,280	1,160	6,820	1,280	2,220	100
Chemistry/Physics	3,950	16,380	300	5,710	260	1,860	100
Public Health	3,160	0	0	660	0	1,620	100
STEP/CSTEP	0	0	0	0	0	600	740
Other Departments	0	0	2,840	2,310	1,400	0	4,820
<b>Sub-Total</b>	<b>11,060</b>	<b>23,660</b>	<b>4,300</b>	<b>15,500</b>	<b>2,940</b>	<b>6,300</b>	<b>5,860</b>
<b>TOTAL NASF</b>							<b>69,620</b>

<b>TOTAL NASF</b>	<b>69,620</b>
NASF in Natural Sciences Building	40,000
NASF in Future Addition	29,620
Grossing Factor	1.7
<b>GSF in Future Addition</b>	<b>50,400</b>

Figure 5.11: Science Building - Full Program

To further reduce the size of the addition, the planning team modified the full program to include only spaces that were essential to the academic mission of the College:

- Eliminate two offices for research institutes. Maintain the incubator space in the Natural Sciences Building.
- Three general classrooms were eliminated. The instructional space utilization study revealed that there is capacity in existing classrooms to accommodate additional course meetings. Biological Sciences, Chemistry/Physics, and Public Health will need to utilize general classrooms in other campus buildings.
- Eliminate new greenhouse. Expand existing greenhouse.
- Seven research labs were eliminated including the research labs for the Neuroscience Research Institute, Minority Biomedical Research Support, and Psychology.

The result of these modifications is a 39,900 GSF addition that will cost approximately \$32,804,000. Based on feedback from the Steering Committee, the planning team used the core program to develop concepts for the final recommendation.

Department	Instructional Space			Research Space		Academic Support Space	
	Classrooms	Class Labs	Support Space	Research Labs	Support Space	Offices	Support Space
Biological Sciences	<b>3,160</b>	7,280	<b>1,040</b>	6,820	1,280	2,220	100
Chemistry/Physics	<b>3,160</b>	16,380	300	5,710	260	1,860	100
Public Health	<b>2,370</b>	0	0	<b>300</b>	0	1,620	100
STEP/CSTEP	0	0	0	0	0	600	740
Other Departments	0	0	<b>1,840</b>	<b>0</b>	1,400	0	4,820
<b>Sub-Total</b>	<b>8,690</b>	<b>23,660</b>	<b>3,180</b>	<b>12,830</b>	<b>2,940</b>	<b>6,300</b>	<b>5,860</b>
<b>TOTAL NASF</b>							<b>63,460</b>

<b>TOTAL NASF</b>	<b>63,460</b>
NASF in Natural Sciences Building	40,000
NASF in Future Addition	23,460
Grossing Factor	1.7
<b>GSF in Future Addition</b>	<b>39,900</b>

Figure 5.12: Science Building - Core Program



# VII

## *Final Recommendations*

### **Introduction**

Once the preferred concept alternative was selected by the Steering Committee, the final concepts were developed based on the Science Building - Core Program. The first concept includes an addition to the Natural Sciences Building and full renovation of the existing building. The addition will be constructed before the renovations, therefore, swing space will only be required for faculty and staff offices.

The second concept includes a phased renovation of the Natural Sciences Building. Since an addition is not included in the scope of work, swing space will be required during each phase of construction.

### **Phasing**

A phased renovation of the Natural Sciences Building will minimize the amount of swing space required and maintain a portion of the large interdisciplinary lab during each phase of construction. The first phase will include all research space on the lower level, general classrooms on the first floor, and all academic support space on the second floor.

It would be very difficult to phase renovations of the lower level in a manner that would allow for simultaneous occupancy and construction. Construction activities, such as demolition and floor slab excavation, would cause a significant amount of dust to become airborne. Some percentage of this dust would inevitably travel to portions of the floor that are still occupied, impacting experiments, general cleanliness, and occupant comfort. Additionally, high levels of vibration and noise would greatly impact any learning or experimental activities. The magnitude of work required within the mechanical room alone would likely leave the surrounding rooms unoccupiable. Construction crews would also be required to share egress paths with occupants, causing an intermingling of occupants with contractors, tools, and materials. Close safety controls would have to be strictly enforced throughout construction.

Renovations to the large, interdisciplinary lab will be included in the second and third phase of the renovations. Phasing this work will require the installation of multiple sets of temporary services, such as water, drains, air, natural gas, electric panels, electric feeders, fire alarm devices, and HVAC systems. The existing lab is served by a single air handling unit. Temporary HVAC units (including temporary fume hood equipment) would be required in order to effectively control the environment of the various interim spaces within the current footprint. This can be accomplished by trailer-mounted HVAC equipment or by carefully phasing work in the lower level mechanical room. Temporary HVAC units would appear to be the least impactful option. Any temporary partitions installed during construction would need to be airtight in order to provide proper operation of temporary fume hoods.



Natural Sciences Building  
Main Entrance

# Renovations

In each of the proposed concepts, the Natural Sciences Building will be renovated to better accommodate the current and future needs of Biological Sciences, Chemistry/Physics, and Public Health. The floor plans and cost estimates included in this section of the report are based on the following scope of work. Prior to any demolition or renovation activities, a hazardous material survey should be conducted to identify materials in the building that must be abated.

## Building Exterior

The building conditions assessment revealed that exterior walls, windows, and doors are in good condition. Work will be limited to replacing the roof, repairing the loading dock, and minor repairs to the exterior wall system.

### ***New Construction***

- Roof - Remove existing roof system; install recovery board, tapered insulation, fully adhered roof membrane, and flashing
- Loading Dock - Repair concrete surface of loading dock
- Walls - Repair or replace damaged metal wall panels
- Walls - Repair or replace deteriorated sealant at metal wall panels
- Windows - Repair broken/missing gaskets at windows and skylights
- Ceilings - Replace ceiling panels above main entrance (Concept 2 Only)

## Lower Level

Renovate the lower level of the Natural Sciences Building for research labs and office space for research assistants. Provide space for faculty offices (Concept 1) or the vivarium (Concept 2). Expand the toilet rooms to provide additional fixtures and accessible clearances.

### ***Demolition***

#### Corridors

- Floors - Remove vinyl composition tile
- Walls - Remove concrete block
- Doors - Remove hollow metal doors and frames
- Ceilings - Remove acoustic ceiling tile

#### Research Labs

- Floors - Remove vinyl composition tile and vinyl base
- Walls - Remove concrete block, gypsum wallboard, and framing
- Doors - Remove hollow metal doors and frames
- Ceilings - Remove acoustic ceiling tile, gypsum wallboard, and framing
- Casework - Remove wood casework
- Equipment - Remove sinks and fume hoods
- Salvage all mobile lab equipment

#### Toilet Rooms

- Floors - Remove ceramic mosaic tile
- Walls - Remove ceramic tile
- Doors - Remove hollow metal doors and frames
- Ceilings - Remove gypsum wallboard and framing
- Equipment - Remove sinks, toilets, and metal toilet partitions

### Mechanical

- Remove all existing ductwork, baseboard heating, and heating hot water piping.
- Remove all air handlers, connected ductwork, controls, and connected piping
- Remove chiller, cooling tower, piping, and all associated pumps
- Remove boilers and all associated pumps
- Remove all fume hoods, associated ductwork, and controls
- Remove all toilet exhaust fans, controls, and connected ductwork

### Electrical and Fire Alarm

- Remove existing lighting fixtures, switches, and receptacles in corridors and toilet rooms
- Remove existing lighting fixtures, switches, receptacles, and electrical panels in research labs
- Remove existing fire alarm devices in corridors, toilet rooms, and research labs
- Install temporary fire alarm devices to provide protection during demolition
- Disconnect mechanical equipment marked for removal

### Plumbing and Fire Protection

- Remove all plumbing piping (domestic cold and hot water, sanitary, vent, gas) serving existing fixtures
- Cap piping at nearest riser, header, or main (as applicable) in corridors, research labs, and toilet rooms
- All fire sprinkler heads are to remain to provide protection during demolition

## ***New Construction***

### Corridors

- Floors - Prepare concrete slab; install vinyl composition tile and vinyl base
- Walls - Provide gypsum wallboard on metal framing
- Doors - Provide hollow metal doors in metal frames
- Ceilings - Provide acoustic ceiling tile

### Research Labs

- Floors - Prepare concrete slab; install vinyl composition tile and vinyl base
- Walls - Provide gypsum wallboard on metal framing
- Doors - Provide solid core wood veneer doors in metal frames
- Ceilings - Provide acoustic ceiling tile
- Casework - Furnish and install wood casework with epoxy resin counter
- Equipment/Fixtures - Provide mobile lab tables with overhead utilities, sinks, and fume hoods in each research lab
- Reinstall all mobile lab equipment

### Research Assistants

- Floors - Prepare concrete slab; install vinyl composition tile and vinyl base
- Walls - Provide gypsum wallboard on metal framing
- Doors - Provide solid core wood veneer doors in metal frames
- Ceilings - Provide acoustic ceiling tile

### Faculty and Staff Offices (Concept 1 Only)

- Floors - Prepare concrete slab; install vinyl composition tile and vinyl base
- Walls - Provide gypsum wallboard on metal framing
- Doors - Provide solid core wood veneer doors in metal frames
- Ceilings - Provide acoustic ceiling tile

### Vivarium (Concept 2 Only)

- Floors - Prepare concrete slab; install ceramic tile and tile base
- Walls - Provide ceramic tile on backer board and metal framing
- Doors - Provide solid core wood veneer doors in metal frames
- Ceilings - Provide acoustic ceiling tile
- Casework - Furnish and install wood casework with epoxy resin counter
- Equipment/Fixtures - Provide sink in vivarium, food prep, and wash room

### Toilet Rooms

- Floors - Prepare concrete slab; install ceramic tile and tile base
- Walls - Provide ceramic tile on backer board and metal framing
- Doors - Provide solid core wood veneer doors in metal frames
- Ceilings - Provide moisture-resistant gypsum wallboard on metal framing
- Equipment/Fixtures - Furnish and install sinks, toilets, urinals, stainless steel toilet partitions, and accessories as indicated in final design

### Mechanical

- Provide new ductwork and VAV to all renovated spaces
- Provide new air handlers, controls, ductwork, and piping
- Provide new chiller, cooling tower, piping, and all associated pumps
- Provide new boilers, piping, and all associated pumps
- Provide new fume hood exhaust fans on roof and connect ductwork to new hoods in research labs
- Provide new toilet exhaust fans, controls, and connected ductwork

### Electrical and Fire Alarm

- Provide new ceiling-mounted LED lighting fixtures, vacancy sensor lighting controls, and fire alarm devices in corridors, toilet rooms, research labs, research assistant offices, faculty offices (Concept 1), and vivarium (Concept 2)
- Provide new electrical panels, wiring, receptacles, and circuits for fume hoods in research labs
- Provide power/data circuits and outlets for computers in research labs, research assistant offices, faculty offices (Concept 1), and vivarium (Concept 2)
- Provide pendant mounted LED lighting fixtures, vacancy sensor lighting controls, and power feeds to new HVAC equipment in mechanical room
- Provide electrical support to mechanical work

### Plumbing and Fire Protection

- Provide new domestic cold and hot water, sanitary, vent, acid drain, and gas piping from existing risers, headers, or mains to new fixtures, equipment, and work stations
- Relocate fire sprinkler heads, as necessary, to conform to the new architectural design layout and NYS Building Code requirements

## **First Floor**

First floor renovations include reconfiguring the lecture hall to create collaborative learning environment, expanding the general classrooms, creating individual instructional laboratories, providing student study space, and relocating the computer lab from the second floor. The vivarium will be moved to the addition (Concept 1) or lower level adjacent to faculty research labs (Concept 2). The adjunct office and faculty lounge will be moved to the second floor.

## ***Demolition***

### Corridors

- Floors - Remove vinyl composition tile; existing glazed brick floor to remain
- Walls - Remove concrete block
- Doors - Remove hollow metal doors and frames
- Ceilings - Remove acoustic ceiling tile; Gypsum wallboard in lobby to remain

### Lecture Hall

- Floors - Remove carpet and vinyl base
- Walls - Existing to remain
- Doors - Existing to remain
- Ceilings - Existing to remain
- Equipment/Fixtures - Remove tablet armchairs and wood casework

### Classrooms

- Floors - Remove vinyl composition tile and vinyl base
- Walls - Remove gypsum wallboard and framing
- Doors - Remove hollow metal doors and frames
- Ceilings - Remove acoustic ceiling tile
- Equipment/Fixtures - Remove chalkboards
- Salvage overhead projector, projection screen, and wall-mounted speakers

### Instructional Labs

- Floors - Remove vinyl composition tile and vinyl base
- Walls - Remove gypsum wallboard and framing
- Doors - Remove hollow metal doors and frames
- Ceilings - Remove acoustic ceiling tile
- Casework - Remove wood casework
- Equipment/Fixtures - Remove sinks, fume hoods, and chalkboards

### Lab Service

- Floors - Remove vinyl composition tile, vinyl base, and ceramic mosaic tile
- Walls - Remove gypsum wallboard, ceramic tile, and framing
- Doors - Remove hollow metal doors and frames
- Ceilings - Remove acoustic ceiling tile
- Casework - Remove wood casework
- Equipment/Fixtures - Remove sinks and fume hoods
- Salvage existing data rack

### Vivarium

- Floors - Remove ceramic mosaic tile
- Walls - Remove ceramic tile
- Doors - Remove hollow metal doors and frames
- Ceilings - Remove gypsum wallboard and framing
- Casework - Remove wood casework
- Equipment - Remove sinks

### Greenhouse

- Floors - Existing to remain
- Walls - Remove ceramic tile
- Doors - Remove hollow metal doors and frames
- Ceilings - Remove acoustic ceiling tile



- Casework - Remove wood casework
- Equipment - Remove sinks

#### Offices and Academic Support

- Floors - Remove vinyl composition tile and vinyl base
- Walls - Remove gypsum wallboard and framing
- Doors - Remove hollow metal doors and frames
- Ceilings - Remove acoustic ceiling tile

#### Toilet Rooms

- Floors - Remove ceramic mosaic tile
- Walls - Remove ceramic tile
- Doors - Remove hollow metal doors and frames
- Ceilings - Remove gypsum wallboard and framing
- Equipment - Remove sinks, toilets, and metal toilet partitions

#### Mechanical

- Remove all penthouse mechanical equipment including supply air fans, return air fans, piping, and controls
- Remove all existing ductwork, baseboard heating, and heating hot water piping

#### Electrical and Fire Alarm

- Remove existing lighting fixtures, switches, receptacles, and fire alarm devices in corridors and toilet rooms
- Existing lighting fixtures, switches, receptacles, and fire alarm devices in lecture hall to remain
- Remove existing lighting fixtures, switches, receptacles, electrical panels, and fire alarm devices in classrooms, instructional labs, lab service spaces, vivarium, greenhouse, offices, and academic support spaces
- Install temporary fire alarm devices to provide protection during demolition

#### Plumbing and Fire Protection

- Remove all plumbing piping (domestic cold and hot water, sanitary, vent, gas) serving existing fixtures
- Cap piping at nearest riser, header, or main (as applicable) in corridors, lecture hall, classrooms, instructional labs, lab service spaces, vivarium, greenhouse, offices, academic support spaces, and toilet rooms
- All fire sprinkler heads are to remain to provide protection during demolition

### ***New Construction***

#### Corridors

- Floors - Prepare concrete slab; install vinyl composition tile and vinyl base
- Walls - Provide gypsum wallboard on metal framing
- Doors - Provide hollow metal doors in metal frames
- Ceilings - Provide acoustic ceiling tile

#### Lecture Hall

- Construct Concrete Tiers - Enlarge existing concrete tiers (infill every other tier to create larger tiers that can accommodate seminar tables and chairs)
- Floors - Prepare concrete slab; install carpet and vinyl base
- Equipment/Fixtures - Provide seminar tables with swivel chairs and wood casework with epoxy resin counter at teaching wall

### Classrooms

- Floors - Prepare concrete slab; install carpet and vinyl base
- Walls - Provide gypsum wallboard on metal framing
- Doors - Provide hollow metal doors in metal frames
- Ceilings - Provide acoustic ceiling tile
- Equipment/Fixtures - Provide whiteboards at teaching wall
- Reinstall salvaged overhead projector, projection screen, and wall-mounted speakers

### Instructional Labs

- Floors - Prepare concrete slab; install vinyl composition tile and vinyl base
- Walls - Provide gypsum wallboard on metal framing
- Doors - Provide hollow metal doors in metal frames
- Ceilings - Provide acoustic ceiling tile
- Casework - Furnish and install wood casework with epoxy resin counter; lab tables in the interdisciplinary lab include sinks, gas nozzles, and receptacles; lab tables in the physics lab include gas nozzles and receptacles
- Equipment/Fixtures - Provide sinks and fume hoods

### Lab Service

- Floors - Prepare concrete slab; install vinyl composition tile and vinyl base
- Walls - Provide gypsum wallboard on metal framing
- Doors - Provide hollow metal doors in metal frames
- Ceilings - Provide acoustic ceiling tile
- Casework - Furnish and install wood casework with epoxy resin counter
- Equipment/Fixtures - Provide sinks and fume hoods

### Greenhouse

- Floors - Patch existing concrete floor
- Walls - Provide ceramic tile on backer board and metal framing
- Doors - Provide hollow metal doors in metal frames
- Casework - Furnish and install metal casework
- Equipment - Provide sink in greenhouse

### Offices and Academic Support

- Floors - Prepare concrete slab; install carpet and vinyl base
- Walls - Provide gypsum wallboard on metal framing
- Doors - Provide hollow metal doors in metal frames
- Ceilings - Provide acoustic ceiling tile

### Toilet Rooms

- Floors - Prepare concrete slab; install ceramic tile and tile base
- Walls - Provide ceramic tile on backer board and metal framing
- Doors - Provide solid core wood veneer doors in metal frames
- Ceilings - Provide moisture-resistant gypsum wallboard on metal framing
- Equipment/Fixtures - Furnish and install sinks, toilets, urinals, stainless steel toilet partitions, and accessories as indicated in final design

### Mechanical

- Provide new penthouse mechanical equipment including supply air fans, return air fans, piping, and controls
- Provide new ductwork, baseboard heating, and heating hot water piping

#### Electrical and Fire Alarm

- Provide new ceiling-mounted LED lighting fixtures, vacancy sensor lighting controls, and fire alarm devices in corridors, toilet rooms, classrooms, instructional labs, lab service spaces, greenhouse, offices, and academic support spaces.
- Provide new electrical panels, wiring, receptacles, and power/data circuits and outlets for computers in the classrooms, instructional labs, lab service spaces, greenhouse, offices, and academic support spaces.
- Provide electrical support to mechanical work within the penthouse

#### Plumbing and Fire Protection

- Provide new domestic cold and hot water, sanitary, vent, acid drain, and gas piping from existing risers, headers, or mains to new fixtures, equipment, and work stations
- Relocate fire sprinkler heads, as necessary, to conform to the new architectural design layout and NYS Building Code requirements

### **Second Floor**

Academic support space will be reconfigured on the second floor to provide additional space for the tutoring center and collaborative space for faculty and staff. The computer lab will be relocated to the first floor. Research space for Public Health will be created adjacent to faculty offices.

#### ***Demolition***

##### Corridors

- Floors - Remove vinyl composition tile
- Walls - Remove gypsum wallboard and framing
- Doors - Remove hollow metal doors and frames
- Ceilings - Remove acoustic ceiling tile

##### Offices and Academic Support

- Floors - Remove vinyl composition tile and vinyl base
- Walls - Remove gypsum wallboard and framing
- Doors - Remove hollow metal doors and frames; remove interior aluminum storefront system
- Ceilings - Remove acoustic ceiling tile

##### Toilet Rooms

- Floors - Remove ceramic mosaic tile
- Walls - Remove ceramic tile
- Doors - Remove hollow metal doors and frames
- Ceilings - Remove gypsum wallboard and framing
- Equipment - Remove sinks, toilets, and metal toilet partitions

##### Mechanical

- Remove all penthouse mechanical equipment including supply air fans, return air fans, piping, and controls
- Remove all existing ductwork, baseboard heating, and heating hot water piping

### Electrical and Fire Alarm

- Remove existing lighting fixtures, switches, receptacles, and fire alarm devices in corridors and toilet rooms
- Remove existing lighting fixtures, switches, receptacles, electrical panels, and fire alarm devices in offices and academic support spaces
- Install temporary fire alarm devices to provide protection during demolition

### Plumbing and Fire Protection

- Remove all plumbing piping (domestic cold and hot water, sanitary, vent) serving existing fixtures
- Cap piping at nearest riser, header, or main (as applicable) in corridors, offices, academic support spaces, toilet rooms, and mechanical room
- All fire sprinkler heads are to remain to provide protection during demolition

## ***New Construction***

### Corridors

- Floors - Prepare concrete slab; install carpet and vinyl base
- Walls - Provide gypsum wallboard on metal framing
- Doors - Provide hollow metal doors in metal frames
- Ceilings - Provide acoustic ceiling tile

### Offices and Academic Support

- Floors - Prepare concrete slab; install carpet and vinyl base
- Walls - Provide gypsum wallboard on metal framing
- Doors - Provide hollow metal doors in metal frames
- Ceilings - Provide acoustic ceiling tile

### Toilet Rooms

- Floors - Prepare concrete slab; install ceramic tile and tile base
- Walls - Provide ceramic tile on backer board and metal framing
- Doors - Provide solid core wood veneer doors in metal frames
- Ceilings - Provide moisture-resistant gypsum wallboard on metal framing
- Equipment/Fixtures - Furnish and install sinks, toilets, urinals, stainless steel toilet partitions, and accessories as indicated in final design

### Mechanical

- Provide new penthouse mechanical equipment including supply air fans, return air fans, piping, and controls
- Provide new ductwork, baseboard heating, and heating hot water piping

### Electrical and Fire Alarm

- Provide new ceiling-mounted LED lighting fixtures, vacancy sensor lighting controls, and fire alarm devices corridors, toilet rooms, offices, and academic support spaces
- Provide new electrical panels, wiring, receptacles, and power/data circuits and outlets for computers in the offices and academic support spaces

### Plumbing and Fire Protection

- Provide new domestic cold and hot water, sanitary, and vent piping from existing risers, headers, or mains to new fixtures, equipment, and work stations
- Relocate fire sprinkler heads, as necessary, to conform to the new architectural design layout and NYS Building Code requirements

## Concept 1: Addition and Renovation

The first concept includes an addition to the Natural Sciences Building and full renovation of the existing building.

- Construct an addition to the Natural Sciences Building (Figure 7.1)
  - All class labs and prep space required for fall 2019
  - Research space for 68 percent of faculty anticipated in fall 2019
  - Vivarium
- Move occupants from the existing building into the addition
- Renovate all floors of the existing building (Figures 7.3 through 7.5)
  - Move remaining occupants into available swing space
  - Utilize general classrooms in other campus buildings during construction

The total cost of this option, including the addition and full renovation of the existing building, is approximately \$67,351,000. The estimate does not include costs related to swing space or moving expenses. Detailed cost estimates are included in the appendices of this report.



Figure 7.1: Proposed Location of Addition

Estimated Costs	GSF	Construction Cost/GSF	2015 Construction Cost	2018 Construction Total	Soft Costs	Project Total	Project Cost/GSF
<b>Addition/Renovation</b> Science Building - Core Program							
Addition	39,900	\$560	\$22,344,000	\$24,299,100	\$8,504,685	\$32,804,000	\$822
Renovation	63,300	\$372	\$23,531,000	\$25,590,000	\$8,956,500	\$34,547,000	\$546
<b>Total</b>	<b>103,200</b>	<b>\$445</b>	<b>\$45,875,000</b>	<b>\$49,889,100</b>	<b>\$17,461,185</b>	<b>\$67,351,000</b>	<b>\$653</b>

Figure 7.2: Concept 1 Cost Estimate



# Concept 1: Addition and Renovation

Lower Level



Figure 7.3: Concept 1 - Lower Level

Legend	
<span style="display:inline-block; width:15px; height:15px; background-color:darkgreen;"></span>	Research Labs
<span style="display:inline-block; width:15px; height:15px; background-color:darkgrey;"></span>	Lab Service
<span style="display:inline-block; width:15px; height:15px; background-color:purple;"></span>	Research Assistants
<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span>	Other

Research Labs	
6 Research Labs	
• 18 Researchers	
• 240 NSF/Researcher	
1 Research Office (Bulpen)	
• 25 Research Assistants	
• 1.4 Research Assistants/Researcher	
Nuclear Magnetic Resonance Lab	

Lab Service	
Support Space	900 NSF
Chemical Storage	250 NSF
Radioactive Storage	250 NSF
General Storage	260 NSF

Other	
Resource Room	600 NSF
Teaching Institute	400 NSF

# Concept 1: Addition and Renovation

First Floor

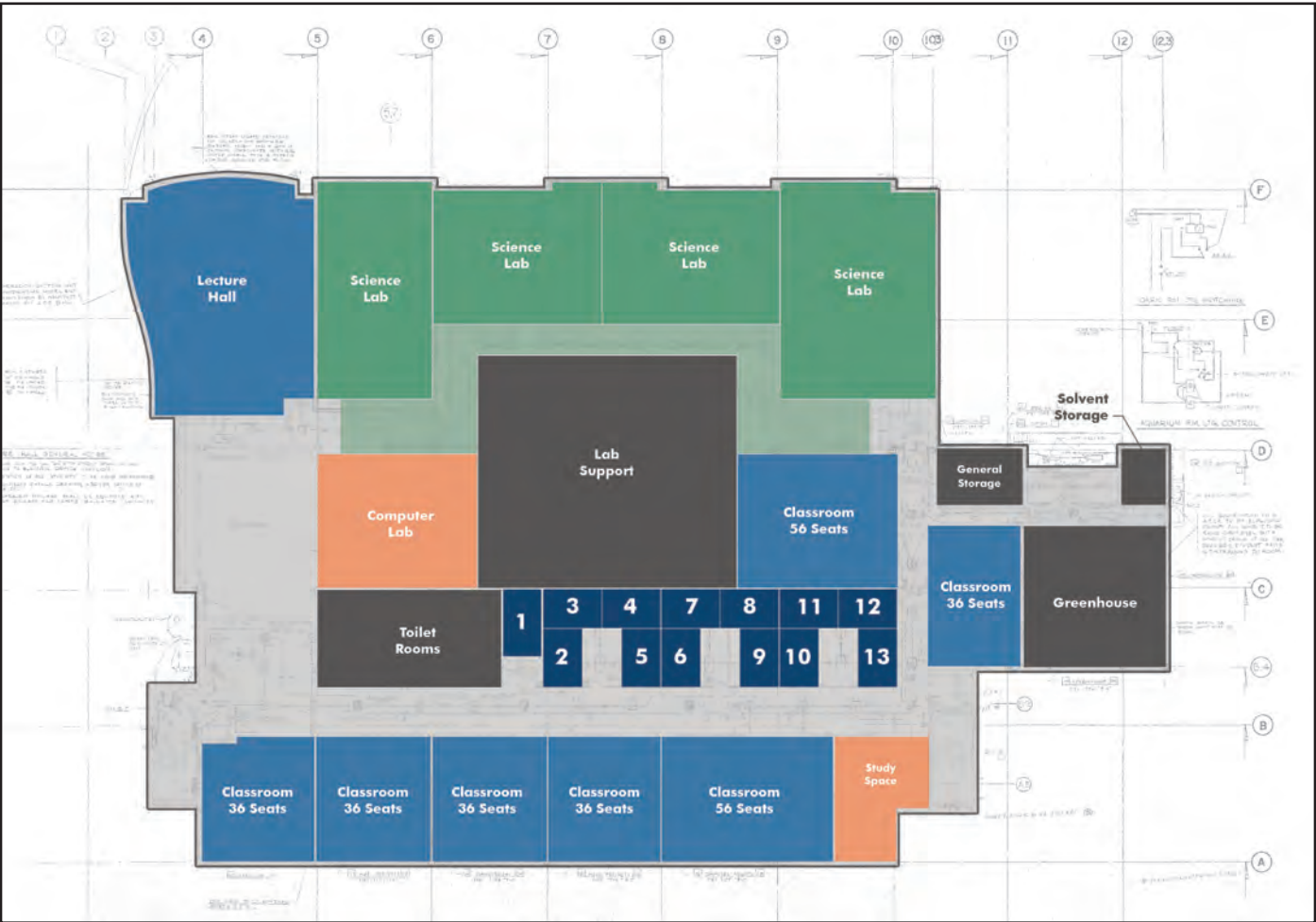


Figure 7.4: Concept 1 - First Floor

<b>Legend</b> <div><div></div> Classrooms</div> <div><div></div> Class Labs</div> <div><div></div> Support Space</div> <div><div></div> Faculty/Staff Offices</div> <div><div></div> Other</div>	<b>Instructional Space</b>		<b>Support Space</b>	
	Lecture Hall	2,300 NSF	Lab Service	3,635 NSF
	Classrooms	6,470 NSF	Lab Offices	320 NSF
	Science Labs	6,050 NSF	Greenhouse	880 NSF
	<b>Faculty/Staff Offices</b>		<b>Other</b>	
	13 Faculty/Staff Offices		Student Lounge	1,000 NSF
	• 13 Interior Offices		Computer Lab	1,260 NSF
	• 120 NSF/Office		Study Space	600 NSF

# Concept 1: Addition and Renovation

## Second Floor

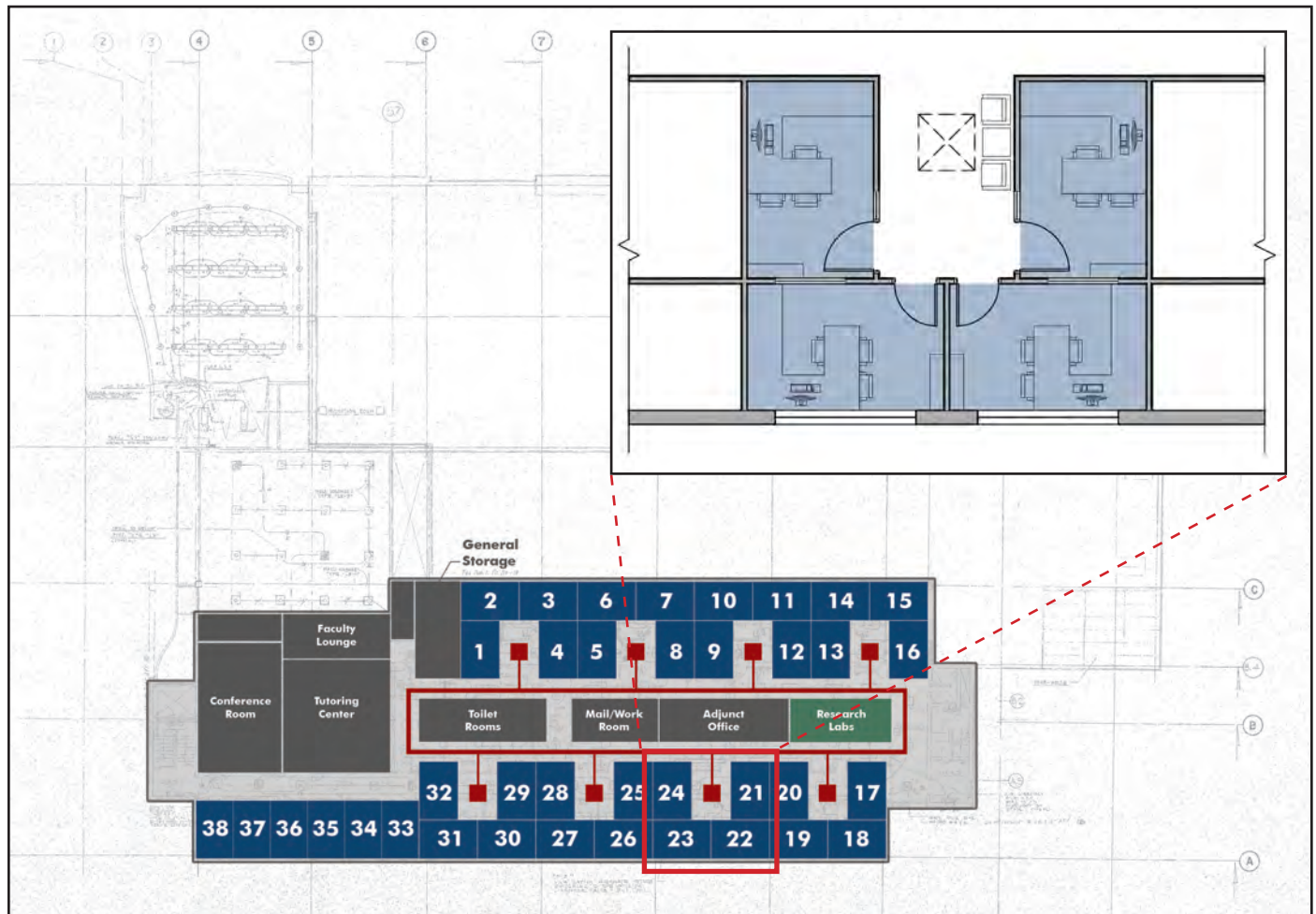


Figure 7.5: Concept 1 - Second Floor

### Legend

- Faculty/Staff Offices
- Support Space
- Research Labs

### Faculty/Staff Offices

- 38 Faculty/Staff Offices
- 22 Perimeter Offices
  - 16 Interior Offices
  - 120 NSF/Office

### Support Space

Conference Room	400 NSF
Tutoring Center	640 NSF
Adjunct Office	320 NSF
Faculty Lounge	240 NSF
Work/Mail Room	200 NSF
General Storage	400 NSF

### Research Labs

Public Health	300 NSF
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## Concept 2: Phased Renovation

In the second concept, the Natural Sciences Building will be renovated in three phases (Figure 7.6) so that a portion of the interdisciplinary lab will be available during all phases of construction. An addition will not be constructed as part of this concept, therefore, additional science labs will be included within the existing building. Since there is a limited amount of space in the building, the following spaces will be excluded from the renovations:

- 6 Classrooms
- 7 Class Labs (including prep space)
- 13 Research Modules
- 13 Faculty and Staff Offices

The College will need to find an alternate location for these spaces or include them in a future addition to the building. The total cost of this option is approximately \$36,627,000. A premium of 2.5 percent was added to the project cost for phasing the work. The estimate does not include costs related to swing space or moving expenses.

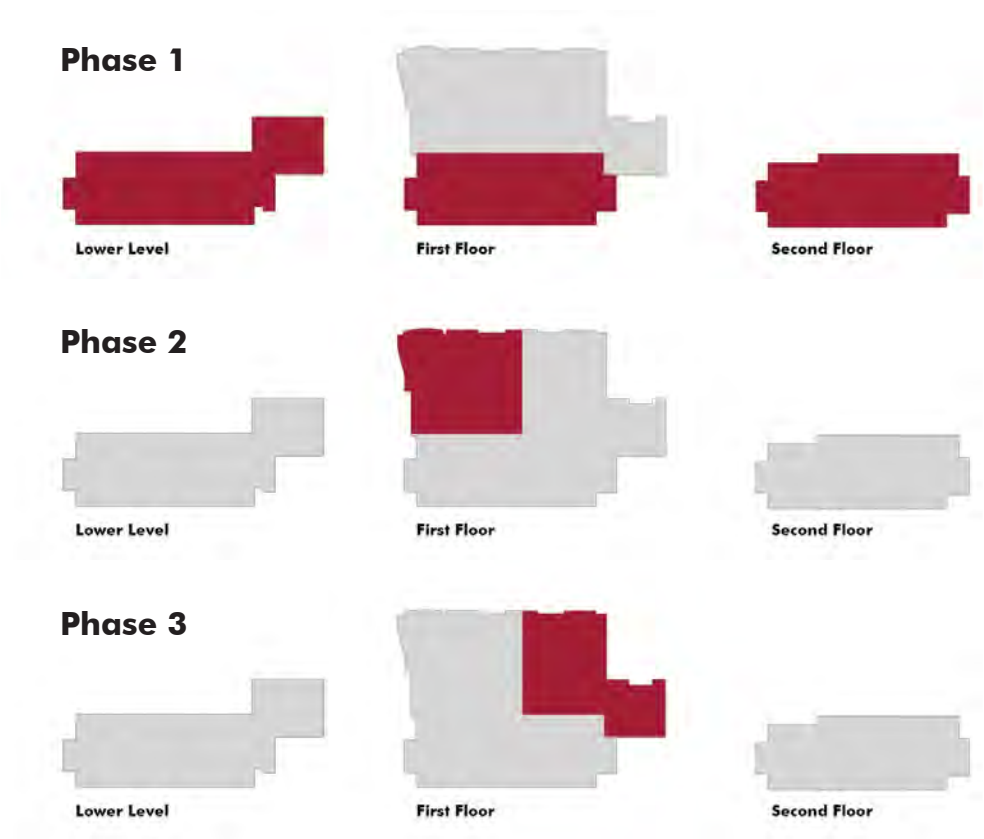


Figure 7.6: Construction Phases

Estimated Costs	GSF	Construction Cost/GSF	2015 Construction Cost	2018 Construction Total	Soft Costs	Project Total	Project Cost/GSF
<b>Phased Renovation No Addition</b>							
Phased Renovation	63,300	\$394	\$24,948,000	\$27,131,000	\$9,495,850	\$36,627,000	\$579
<b>Total</b>	<b>63,300</b>	<b>\$394</b>	<b>\$24,948,000</b>	<b>\$27,131,000</b>	<b>\$9,495,850</b>	<b>\$36,627,000</b>	<b>\$579</b>

Figure 7.7: Concept 2 Cost Estimate



## Concept 2: Phased Renovation

Lower Level (Phase 1)



Figure 7.8: Concept 2 - Lower Level (Phase 1)

Legend	
<span style="display:inline-block; width:15px; height:15px; background-color:darkgreen;"></span>	Research Labs
<span style="display:inline-block; width:15px; height:15px; background-color:grey;"></span>	Lab Service
<span style="display:inline-block; width:15px; height:15px; background-color:purple;"></span>	Research Assistants
<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span>	Vivarium

Research Labs	
6 Research Labs	
• 18 Researchers	
• 240 NSF/Researcher	
1 Research Office (Bulpen)	
• 20 Research Assistants	
• 1.1 Research Assistants/Researcher	
Nuclear Magnetic Resonance Lab	

Lab Service	
Support Space	900 NSF
Chemical Storage	250 NSF
Radioactive Storage	250 NSF
General Storage	260 NSF

Vivarium	
Vivarium	200 NSF
Animal Quarters	640 NSF
Surgical Suite	240 NSF
Food Prep	100 NSF
Wash Room	100 NSF



# Concept 2: Phased Renovation

First Floor (Phase 1)

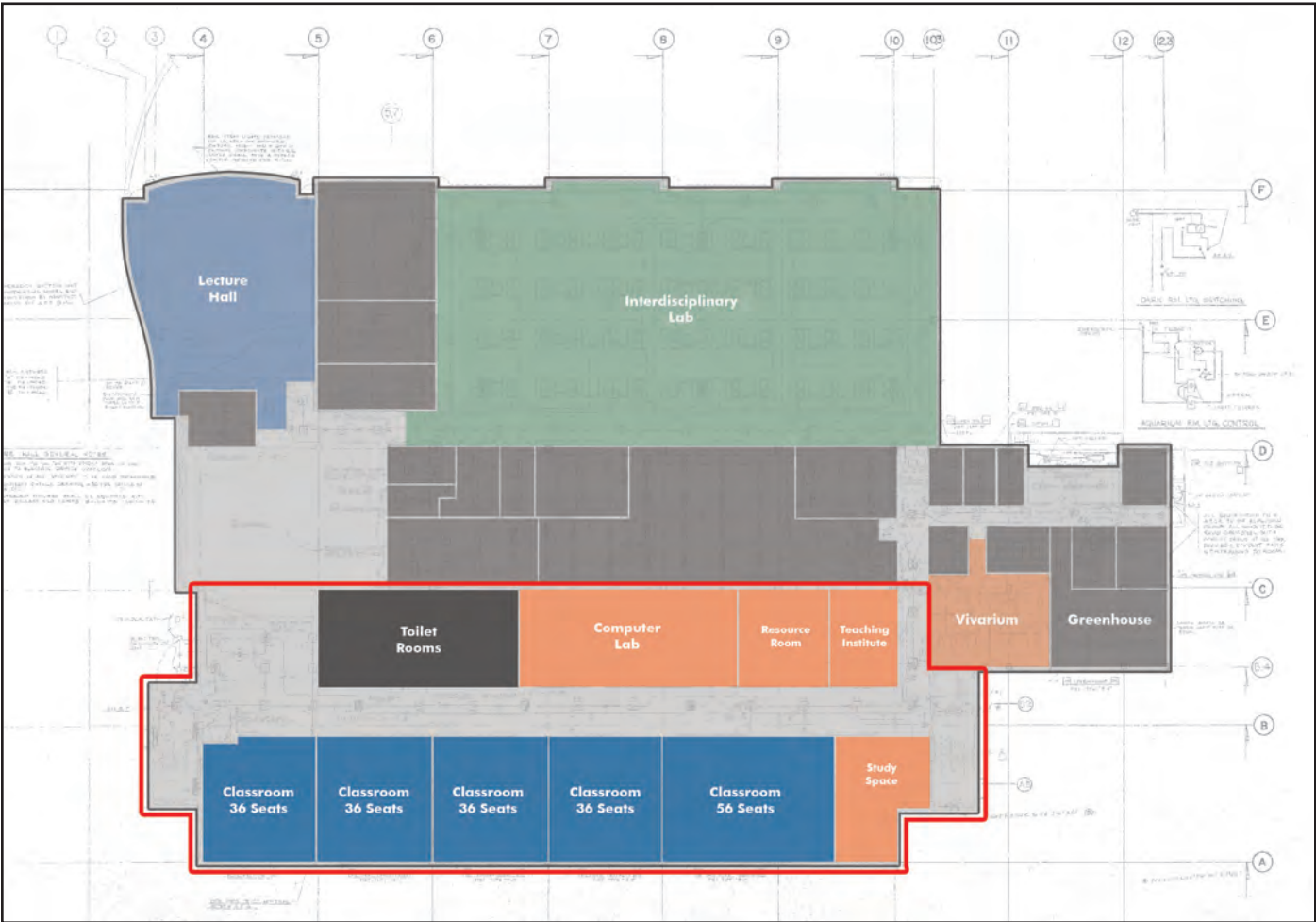


Figure 7.9: Concept 2 - First Floor (Phase 1)

Legend	
<div></div>	Classrooms
<div></div>	Class Labs
<div></div>	Support Space
<div></div>	Other

Instructional Space	
Classrooms	4,420 NSF

Support Space	
Computer Lab	1,260 NSF
Resource Room	600 NSF
Teaching Institute	400 NSF
Study Space	600 NSF

# Concept 2: Phased Renovation

First Floor (Phase 2)

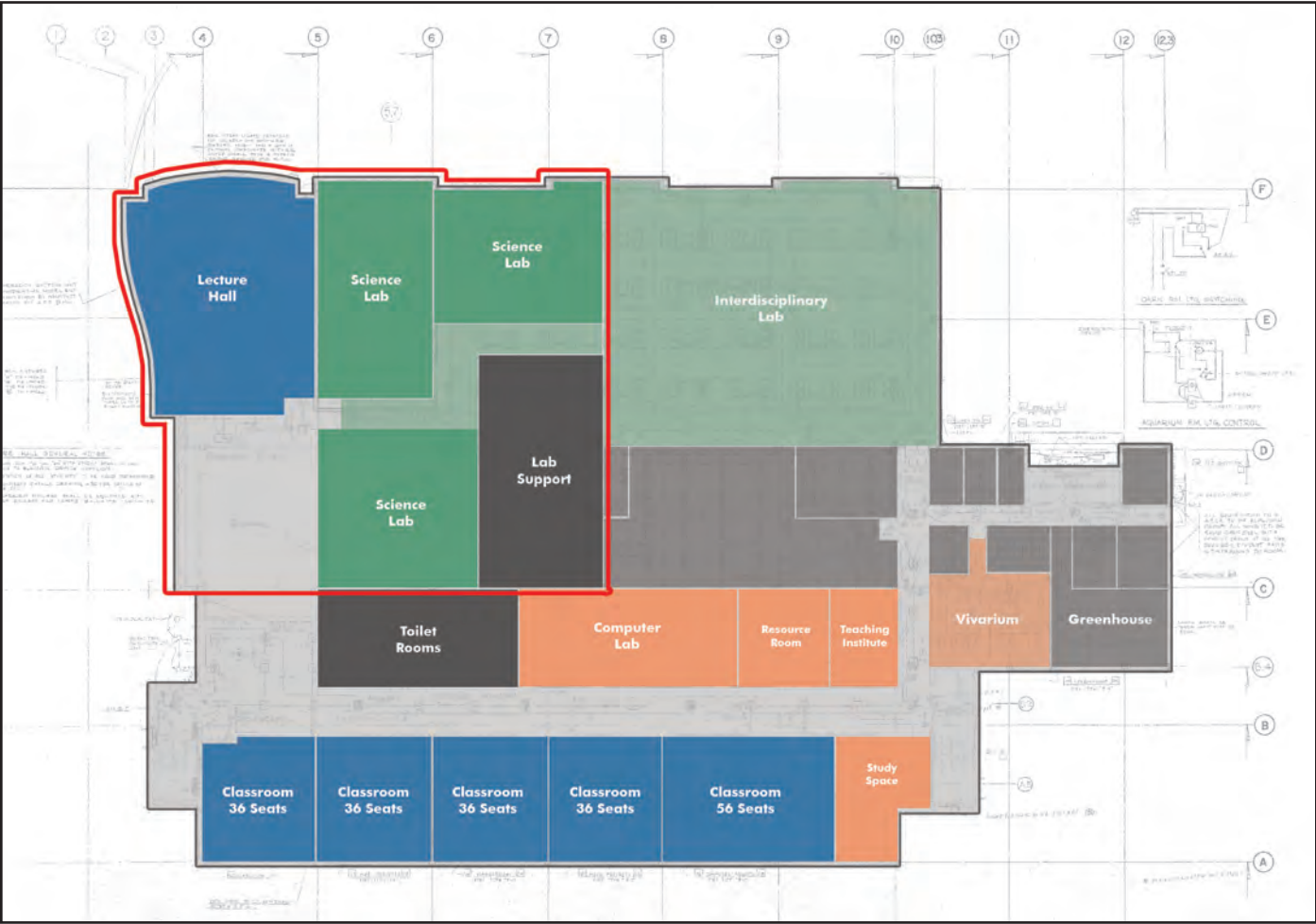


Figure 7.10: Concept 2 - First Floor (Phase 2)

<div> <div>Legend</div> <div> <div>Classrooms</div> <div>Class Labs</div> <div>Support Space</div> <div>Other</div> </div> </div>	<div> <div>Instructional Space</div> <div> <div>Lecture Hall2,300 NSF</div> <div>Classrooms4,420 NSF</div> <div>Science Labs4,200 NSF</div> </div> </div>	<div> <div>Support Space</div> <div> <div>Lab Service1,600 NSF</div> <div>Lab Offices320 NSF</div> </div> </div>
		<div> <div>Other</div> <div> <div>Student Lounge1,000 NSF</div> <div>Computer Lab1,260 NSF</div> <div>Resource Room600 NSF</div> <div>Teaching Institute400 NSF</div> <div>Study Space600 NSF</div> </div> </div>

# Concept 2: Phased Renovation

First Floor (Phase 3)



Figure 7.11: Concept 2 - First Floor (Phase 3)

Legend	
<div></div>	Classrooms
<div></div>	Class Labs
<div></div>	Support Space
<div></div>	Other

Instructional Space	
Lecture Hall	2,300 NSF
Classrooms	4,420 NSF
Science Labs	8,850 NSF

Support Space	
Lab Service	4,475 NSF
Lab Offices	320 NSF
Greenhouse	880 NSF

Other	
Student Lounge	1,000 NSF
Computer Lab	1,260 NSF
Resource Room	600 NSF
Teaching Institute	400 NSF
Study Space	600 NSF

## Concept 2: Phased Renovation

Second Floor (Phase 1)

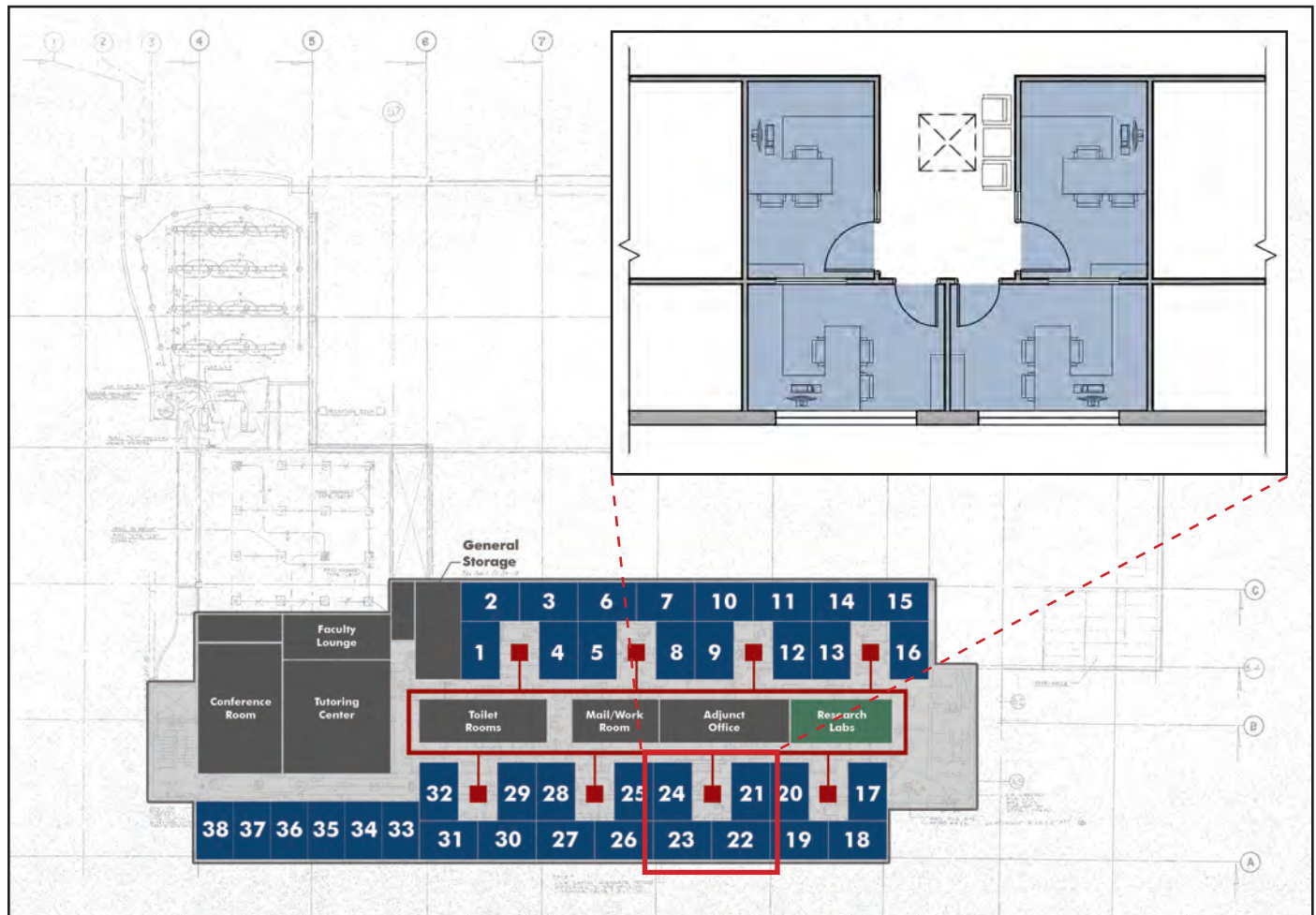


Figure 7.12: Concept 2 - Second Floor (Phase 1)

### Legend

- Faculty/Staff Offices
- Support Space
- Research Labs

### Faculty/Staff Offices

- 38 Faculty/Staff Offices
- 22 Perimeter Offices
  - 16 Interior Offices
  - 120 NSF/Office

### Support Space

Conference Room	400 NSF
Tutoring Center	640 NSF
Adjunct Office	320 NSF
Faculty Lounge	240 NSF
Work/Mail Room	200 NSF
General Storage	400 NSF

### Research Labs

Public Health	300 NSF
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# Cost Estimates

The cost estimate summary below includes an analysis of Concept 1: Addition and Renovation using all three space programs identified in Section V: Academic Program Assessment. The project cost per square foot decreases from \$724/GSF to \$653/GSF as the size of the addition decreases. The project cost for Concept 2: Phased Renovation is approximately \$579/GSF.

Estimated Costs	GSF	Construction Cost/GSF	2015 Construction Cost	2018 Construction Total	Soft Costs	Project Total	Project Cost/GSF
<b>Addition/Renovation</b> STEM Building - Full Program							
Addition	115,200	\$560	\$64,512,000	\$70,156,800	\$24,554,880	\$94,712,000	\$822
Renovation	63,300	\$372	\$23,531,000	\$25,590,000	\$8,956,500	\$34,547,000	\$546
<b>Total</b>	<b>178,500</b>	<b>\$493</b>	<b>\$88,043,000</b>	<b>\$95,746,800</b>	<b>\$33,511,380</b>	<b>\$129,259,000</b>	<b>\$724</b>
<b>Addition/Renovation</b> Science Building - Full Program							
Addition	50,400	\$560	\$28,224,000	\$30,693,600	\$10,742,760	\$41,437,000	\$822
Renovation	63,300	\$372	\$23,531,000	\$25,590,000	\$8,956,500	\$34,547,000	\$546
<b>Total</b>	<b>113,700</b>	<b>\$455</b>	<b>\$51,755,000</b>	<b>\$56,283,600</b>	<b>\$19,699,260</b>	<b>\$75,984,000</b>	<b>\$668</b>
<b>Addition/Renovation</b> Science Building - Core Program							
Addition	39,900	\$560	\$22,344,000	\$24,299,100	\$8,504,685	\$32,804,000	\$822
Renovation	63,300	\$372	\$23,531,000	\$25,590,000	\$8,956,500	\$34,547,000	\$546
<b>Total</b>	<b>103,200</b>	<b>\$445</b>	<b>\$45,875,000</b>	<b>\$49,889,100</b>	<b>\$17,461,185</b>	<b>\$67,351,000</b>	<b>\$653</b>
<b>Phased Renovation</b> No Addition							
Phased Renovation	63,300	\$394	\$24,948,000	\$27,131,000	\$9,495,850	\$36,627,000	\$579
<b>Total</b>	<b>63,300</b>	<b>\$394</b>	<b>\$24,948,000</b>	<b>\$27,131,000</b>	<b>\$9,495,850</b>	<b>\$36,627,000</b>	<b>\$579</b>

Figure 7.13: Cost Estimate Summary